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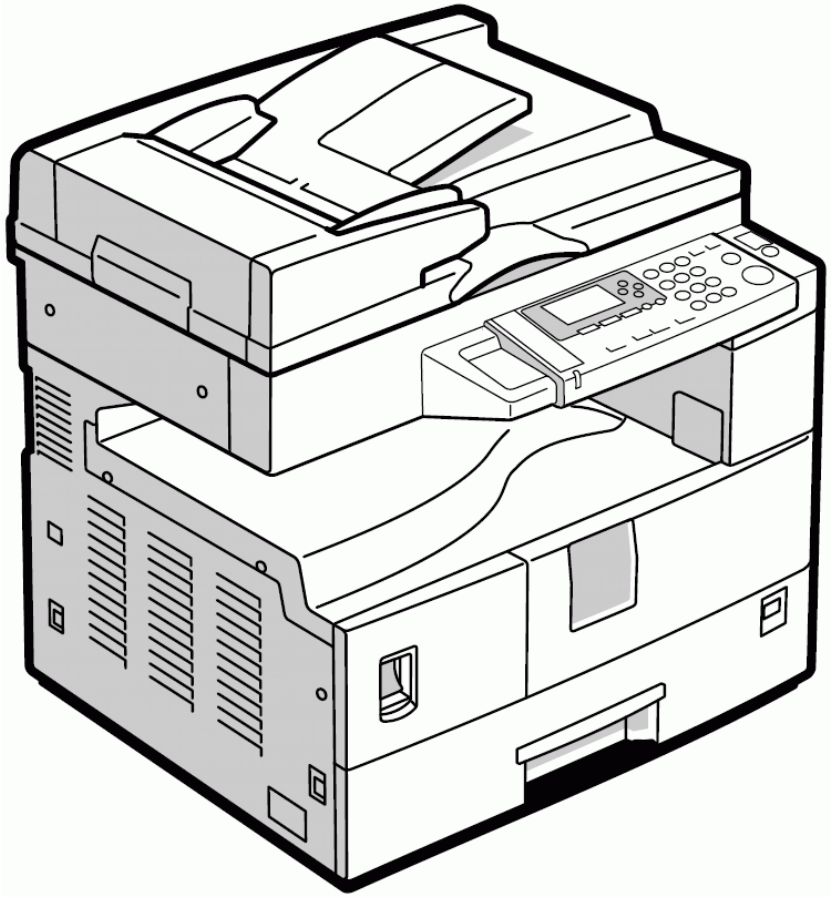

D096

SERVICE MANUAL

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D096
SERVICE MANUAL

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LANIER RICOH SAVIN

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Ricoh Americas Corporation

LEGEND

PRODUCT CODE	COMPANY			
	GESTETNER	LANIER	RICOH	SAVIN
D096	MP 1900	LD319	MP 1900	N/A

DOCUMENTATION HISTORY

REV. NO.	DATE	COMMENTS
*	04/2010	Original Printing

D096

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DF 2000 (B813)

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Read This First

Safety Notices

Important Safety Notices

Prevention of Physical Injury

1. Before disassembling or assembling parts of the copier and peripherals, make sure that the 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 a job has started before the copier completes the warm-up or initializing period, keep hands away from the mechanical and electrical components because the starts making copies as soon as the warm-up period is completed.
5. 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

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

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

Safety and Ecological Notes for Disposal

1. 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.

Handling Toner

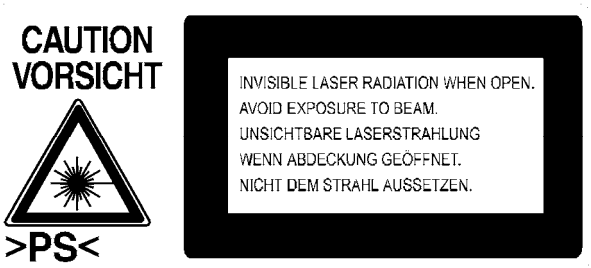
- Work carefully when removing paper jams or replacing toner bottles or cartridges to avoid spilling toner on clothing or the hands.
- If toner is inhaled, immediately gargle with large amounts of cold water and move to a well ventilated location. If there are signs of irritation or other problems, seek medical attention.
- If toner gets on the skin, wash immediately with soap and cold running water.
- If toner gets into the eyes, flush the eyes with cold running water or eye wash. If there are signs of irritation or other problems, seek medical attention.
- If toner is swallowed, drink a large amount of cold water to dilute the ingested toner. If there are signs of any problem, seek medical attention.
- If toner spills on clothing, wash the affected area immediately with soap and cold water. Never use hot water! Hot water can cause toner to set and permanently stain fabric.
- Always store toner and developer supplies such as toner and developer packages, cartridges, and bottles (including used toner and empty bottles and cartridges) out of the reach of children.
- Always store fresh toner supplies or empty bottles or cartridges in a cool, dry location that is not exposed to direct sunlight.

Laser Safety

The Center for Devices and Radiological Health (CDRH) prohibits the repair of laser-based optical units in the field. The optical housing unit can only be repaired in a factory or at a location with the requisite equipment. The laser subsystem is replaceable in the field by a qualified Customer Engineer. The laser chassis is not repairable in the field. Customer engineers are therefore directed to return all chassis and laser subsystems to the factory or service depot when replacement of the optical subsystem is required.

⚠WARNING

- **Use of controls, or adjustment, or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.**

⚠WARNING FOR LASER UNIT
WARNING: Turn off the main switch before attempting any of the procedures in the Laser Unit section. Laser beams can seriously damage your eyes. **CAUTION MARKING:** 

Symbols and Abbreviations

This manual uses several symbols and abbreviations. The meaning of those symbols and abbreviations are as follows:

	See or Refer to
	Clip ring
	Screw
	Connector
	Clamp
SEF	Short Edge Feed
LEF	Long Edge Feed

PRODUCT INFORMATION

REVISION HISTORY		
Page	**Date**	**Added/Updated/New**
		None

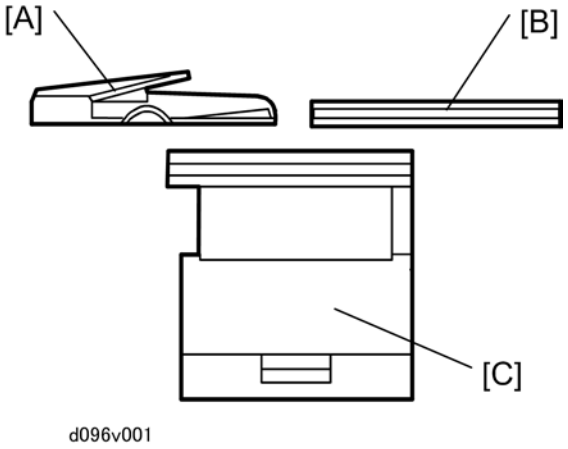
1. PRODUCT INFORMATION

1.1 SPECIFICATIONS

See "Appendices" for the following information:

- General Specifications
- Supported Paper Size
- Optional Equipment

1.2 MACHINE CONFIGURATION



Unit/Component		Machine Code	Diagram
Copier	Copier (1-tray non-duplex model)	D096	[D]
	Platen cover (optional)	B406	[B]
	ADF (optional)	B813	[A]
	Accessibility Handle Type A (optional)	B272	-

1.3 GUIDANCE FOR THOSE WHO ARE FAMILIAR WITH PREDECESSOR PRODUCTS

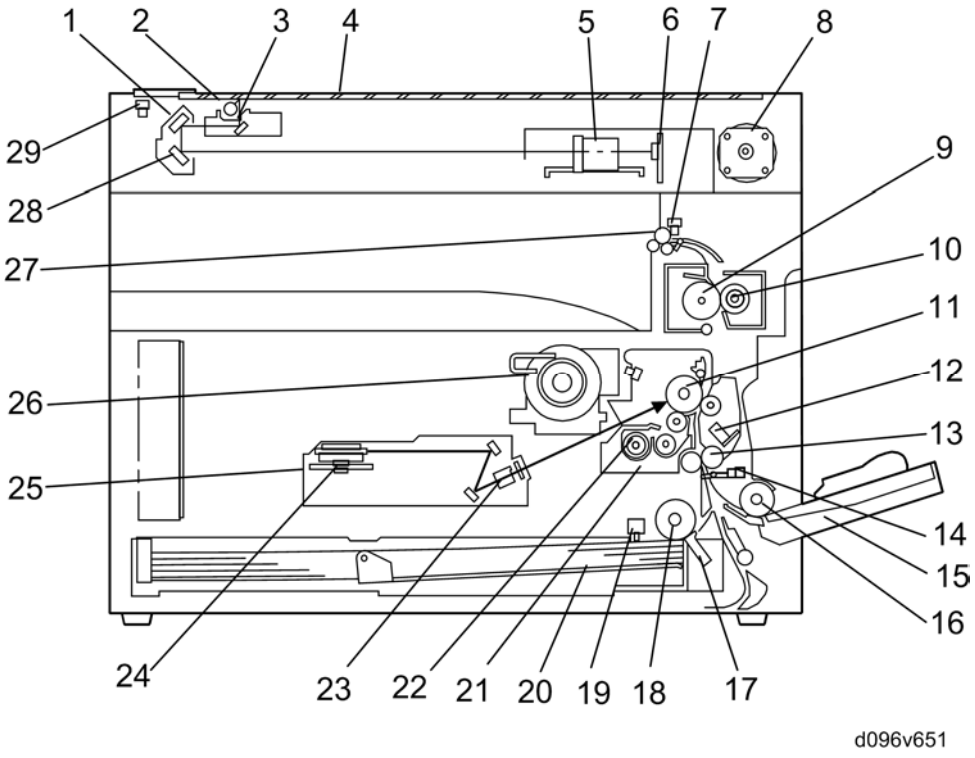
The D096 model is successor models to the B245 model. If you have experience with the predecessor products, the following information will be of help when you read this manual.

Different Points from Predecessor Products

	D096	B245
Duplex	Not available	Not available
Paper Tray	One tray	One tray
Printer/ Scanner	Not available	Not available
Fax	Not available	Not available
GDI Controller	Not available	Not available
GW Controller	Not available	Not available
APS (Mainframe)	Not available	Available
Copy Speed	19 cpm	15cpm

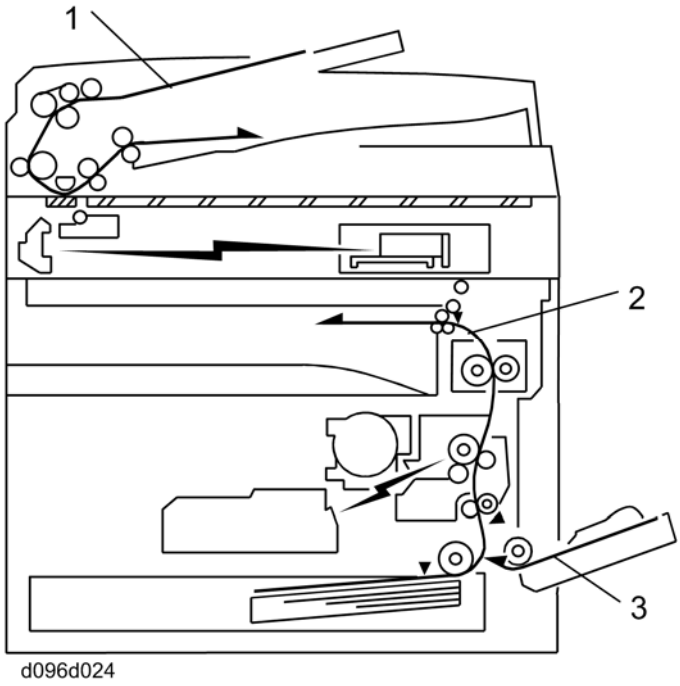
1.4 OVERVIEW

1.4.1 COMPONENT LAYOUT



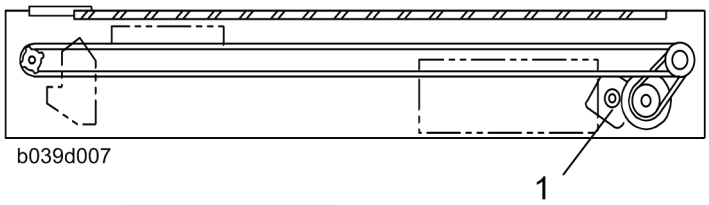
1. 2nd Mirror 2. Exposure Lamp 3. 1st Mirror 4. Exposure Glass 5. Lens Block 6. SBU 7. Exit Sensor 8. Scanner Motor 9. Hot Roller 10. Pressure Roller 11. OPC Drum 12. Image Density Sensor 13. Registration Roller 14. Registration Sensor	15. By-pass Tray 16. By-pass Feed Roller 17. Friction Pad 18. Paper Feed Roller 19. Paper End Sensor 20. Bottom Plate 21. PCU 22. Development Roller 23. WTL 24. Polygon Mirror Motor 25. Laser Unit 26. Toner Supply Bottle Holder 27. Exit Roller 28. 3rd Mirror 29. Scanner HP Sensor

1.4.2 PAPER PATH



1. Original Feed from ADF
2. Paper Feed from Tray 1
3. Paper Feed from By-pass Tray

1.4.3 DRIVE LAYOUT



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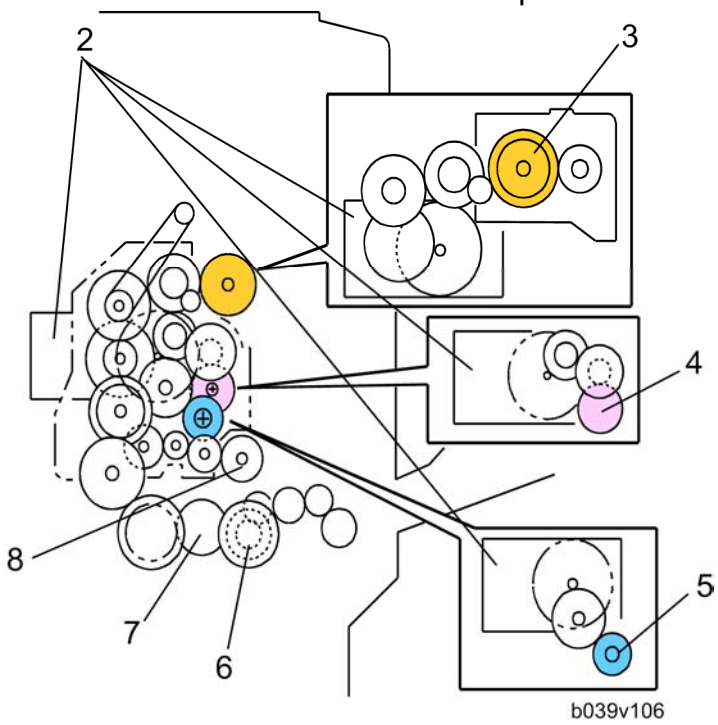

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1. Scanner Motor	5. Development Roller
2. Main Motor	6. By-pass Feed Clutch
3. Hot Roller	7. Paper Feed Clutch
4. OPC Drum	8. Registration Clutch

INSTALLATION

REVISION HISTORY		
Page	**Date**	**Added/Updated/New**
		None

2. INSTALLATION

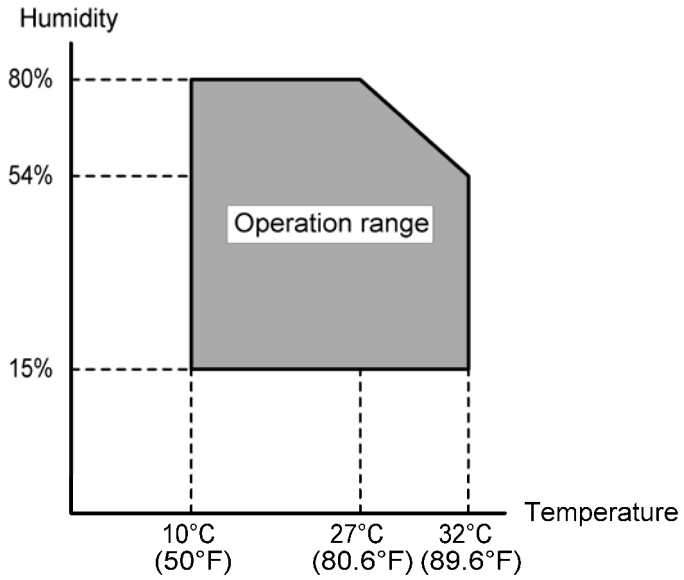
2.1 INSTALLATION REQUIREMENTS

⚠CAUTION

- Before installing options, please do the following:
- If there is a printer option in the machine, print out all data in the printer buffer.
- Turn off the main switch and disconnect the power cord, the telephone line, and the network cable.

2.1.1 ENVIRONMENT

–Temperature and Humidity Chart–



▪ Temperature Range:	10°C to 32°C (50°F to 89.6°F)
▪ Humidity Range:	15% to 80% RH
▪ Ambient Illumination:	Less than 1,500 lux (do not expose to direct sunlight)
▪ Ventilation:	3 times/hr/person or more
▪ Ambient Dust:	Less than 0.075 mg/m^3 (2.0 x 10-6 oz/yd3)

Installation Requirements

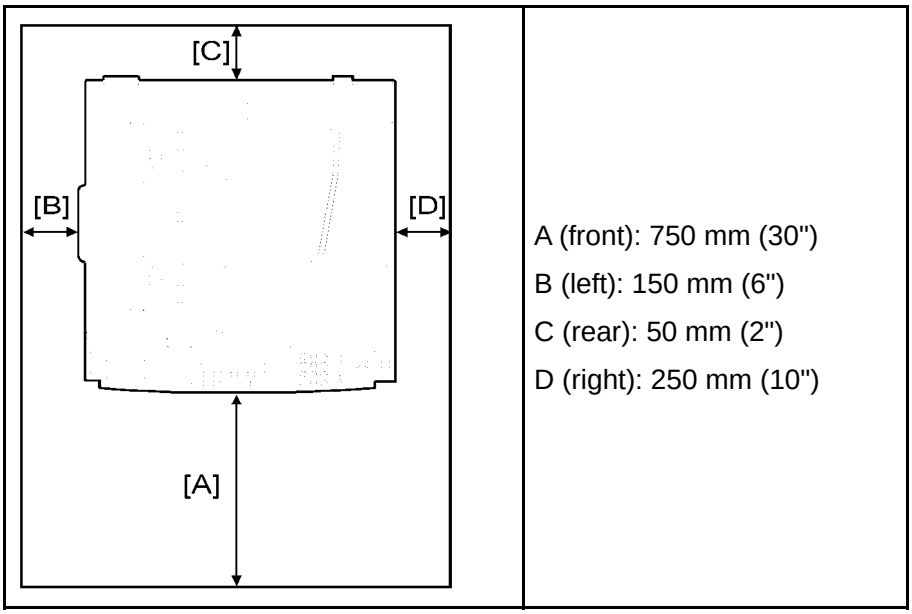
▪ Avoid areas exposed to sudden temperature changes: 1) Areas directly exposed to cool air from an air conditioner. 2) Areas directly exposed to heat from a heater.
▪ Do not place the machine in areas where it can get exposed to corrosive gases.
▪ Do not install the machine at any location over 2,000 m (6,500 ft.) above sea level.
▪ Place the machine on a strong and level base. (Inclination on any side should be no more than 5 mm.)
▪ Do not place the machine where it is subjected to strong vibrations.

2.1.2 MACHINE LEVEL

Front to back:	Within 5 mm (0.2") of level
Right to left:	Within 5 mm (0.2") of level

2.1.3 MINIMUM SPACE REQUIREMENTS

Place the copier near the power source, providing clearance as shown:



A (front): 750 mm (30")
B (left): 150 mm (6")
C (rear): 50 mm (2")
D (right): 250 mm (10")

The recommended 750 mm front space is sufficient to allow the paper tray to be pulled out. Additional front space is required to allow operators to stand at the front of the machine.

2.1.4 POWER REQUIREMENTS

⚠CAUTION

- Make sure that the wall outlet is near the machine and easily accessible. After. completing installation, make sure the plug fits firmly into the outlet.
- Avoid multi-wiring.
- Be sure to ground the machine

Input voltage:

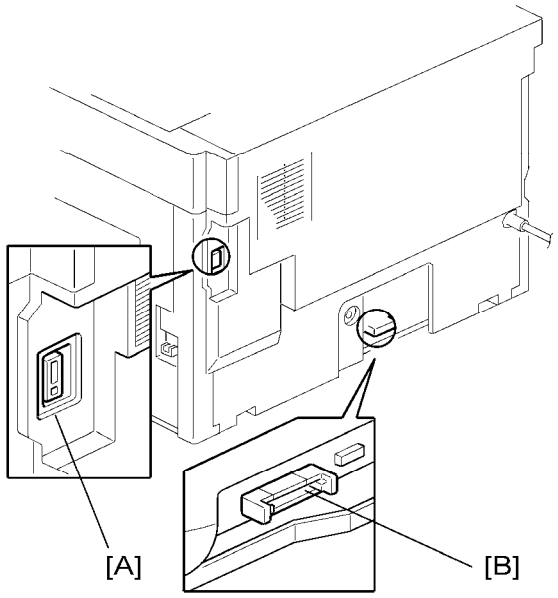
North and South America, Taiwan:	110 – 120 V, 60 Hz, 12 A
Europe, Asia:	220 – 240 V, 50/60 Hz, 7 A

2.2 COPIER INSTALLATION

2.2.1 POWER SOCKETS FOR PERIPHERALS

⚠CAUTION

- Make sure to plug the cables into the correct sockets.



[A]: Socket for ADF (Rated voltage output max. DC24 V)

[B]: Socket for paper tray unit (Rated voltage output max. DC24 V)

2.2.2 ACCESSORY CHECK

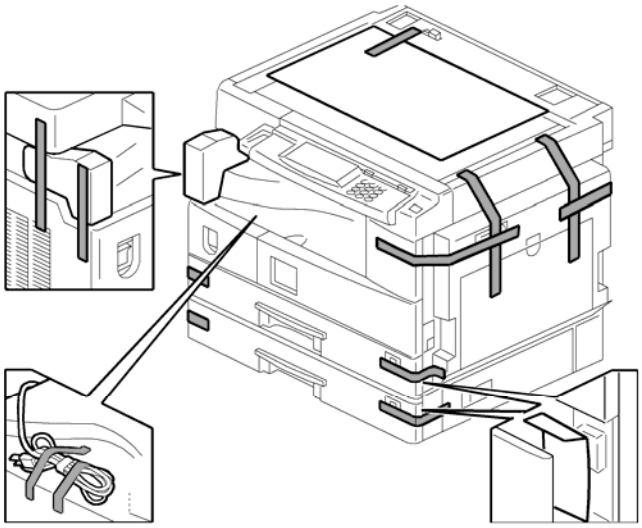
Check that you have the accessories in this list.

No.	Description	Q'ty
1	Multi-language (-17, -27,-19, -29)	1
2	NECR-English (-17)	1
3	Model Name Plate (-22, -19, -29)	1
4	Operating Instruction (-17, -19, -29)	1

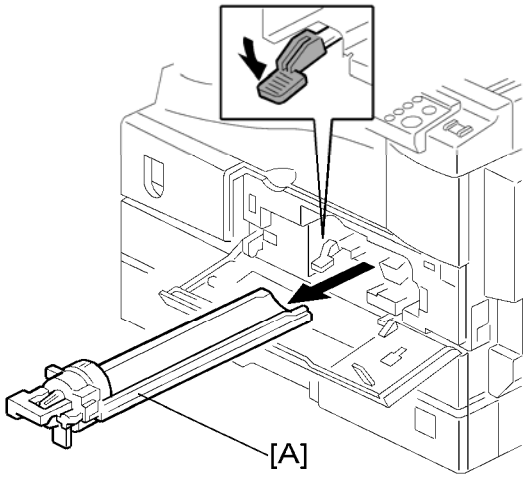
2.2.3 INSTALLATION PROCEDURE

⚠CAUTION

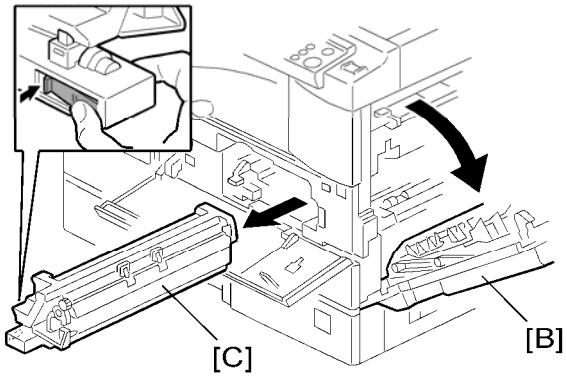
- Unplug the machine power cord before starting the following procedure.



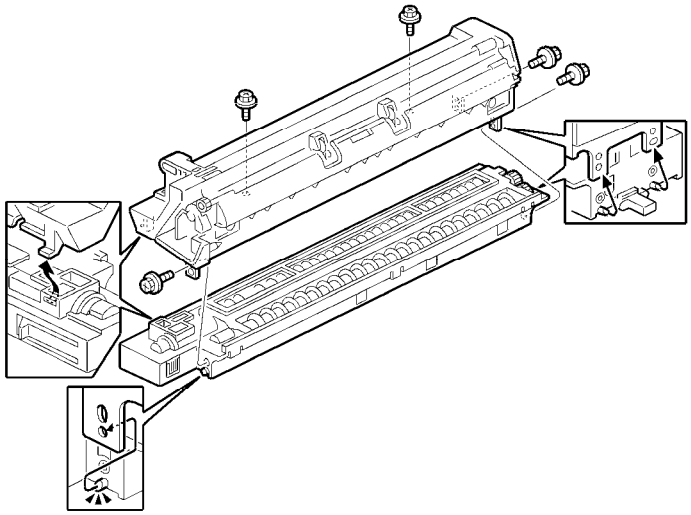
1. Remove filament tape and other padding.



2. Open the front door and remove the toner bottle holder [A]



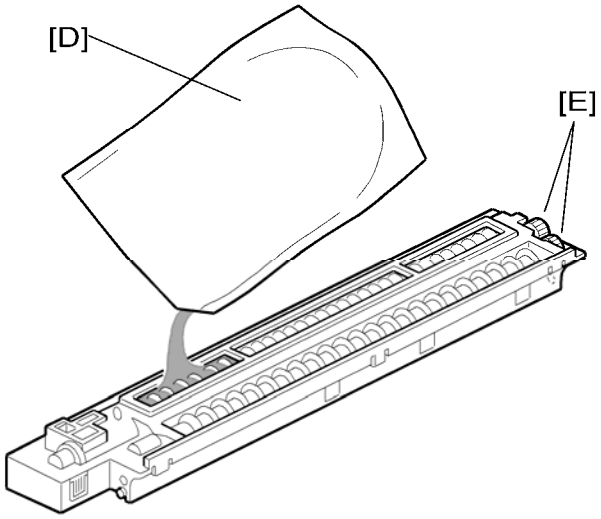
3. Open the right door [B], and remove the PCU (photoconductor unit) [C].



4. Separate the PCU into the upper part and the lower part (x 5).
5. Put a sheet of paper on a level surface and place the upper part on it.

Note

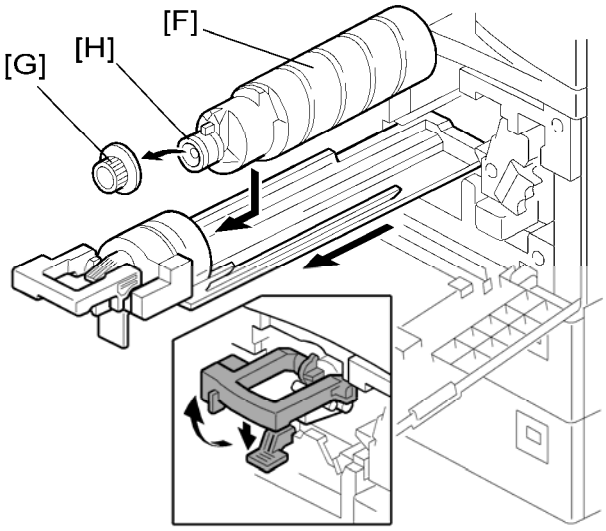
- This prevents foreign material from getting on the sleeve rollers



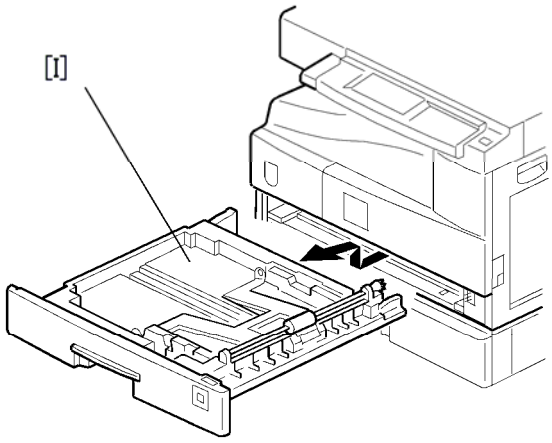
6. Distribute a pack of developer [D] to all openings equally.

Note

- Do not spill the developer on the gears [E]. If you have spilled it, remove the developer by using a magnet or magnetized screwdriver.
- Do not turn the gear [E] too much. The developer may spill.



7. Reassemble the PCU and reinstall it.
8. Shake the toner bottle [F] several times. (Do not remove the bottle cap [G] before you shake the bottle.)
9. Remove the bottle cap [G] and install the bottle on the holder. (Do not touch the inner cap [H].)
10. Set the holder (with the toner bottle) in the machine.



11. Pull out the paper tray [I] and turn the paper size dial to the appropriate size. Adjust the positions of the end and side guides.

Note

- To move the side guides, release the green lock on the rear side guide.

12. Install the optional ADF or platen cover.
13. Plug in the main power cord and turn on the main switch.
14. Activate the SP mode and execute "Devlpr Initialize" (SP 2214 1).

15. Wait until the message "Completed" shows (about 45 seconds).
16. Activate the User Tools and select the menu "Language."
17. Specify a language. This language is used for the operation panel.
18. Load the paper in the paper tray and make a full size copy, and make sure the side-to-side and leading edge registrations are correct.

2.3 PLATEN COVER INSTALLATION

2.3.1 ACCESSORY CHECK

Check that you have the accessories indicated below.

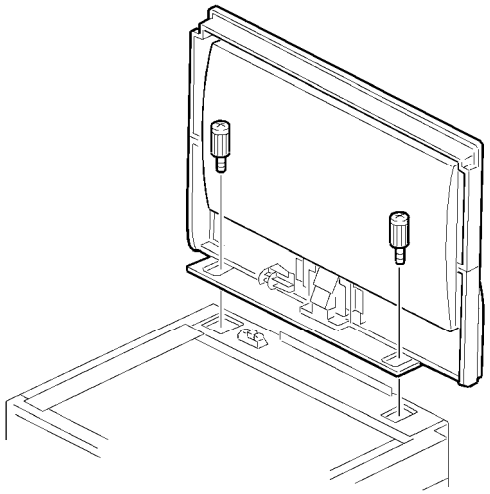
No.	Description	Q'ty
1	Stepped Screw	2

2.3.2 INSTALLATION PROCEDURE

⚠CAUTION

- Unplug the machine power cord before starting the following procedure.

Install the platen cover (x 2).

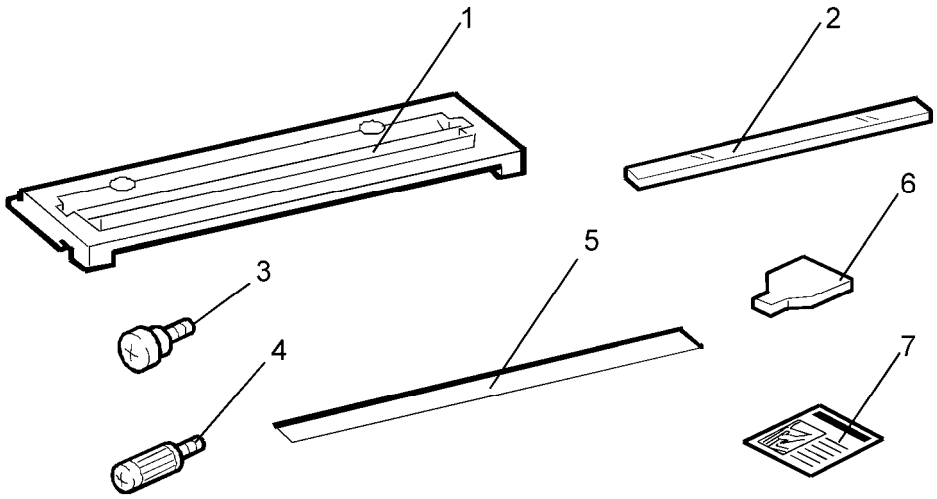


2.4 ADF INSTALLATION

2.4.1 ACCESSORY CHECK

Check the quantity and condition of the accessories against the following list.

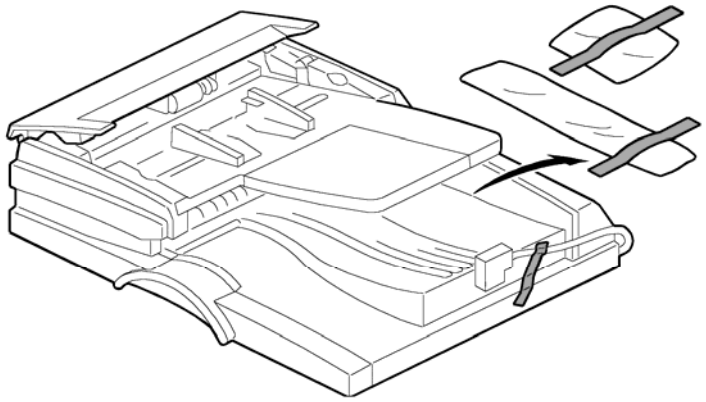
No.	Description	Q'ty
1	Scale Guide	1
2	DF Exposure Glass	1
3	Stud Screw	2
4	Fixing Screw	2
5	Original Size Decal	2
6	Screwdriver Tool	1
7	Attention Decal - Top Cover	1
8	Stamp Cartridge	1
9	Installation Procedure	1



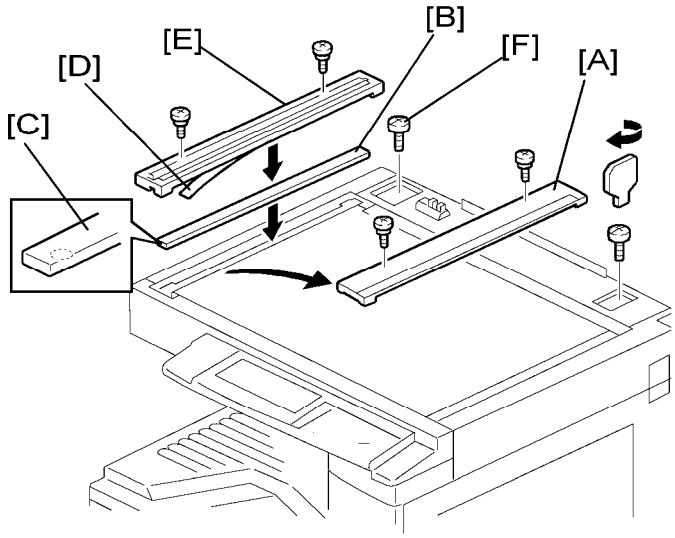
2.4.2 INSTALLATION PROCEDURE

⚠CAUTION

- Unplug the machine power cord before starting the following procedure.

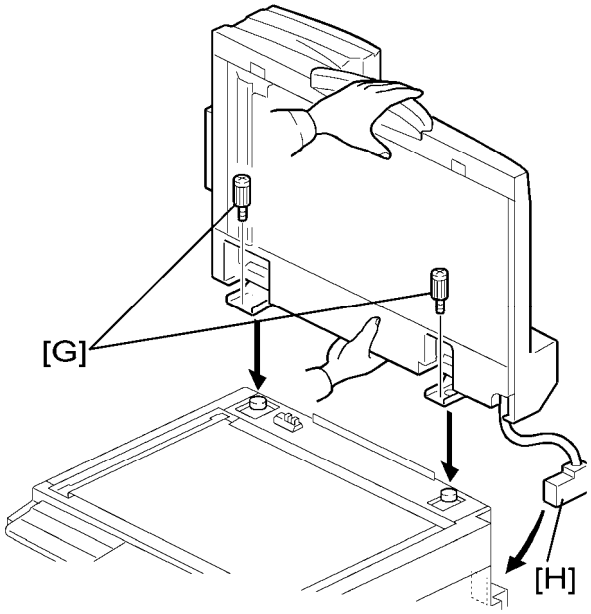


1. Remove the strips of tape.

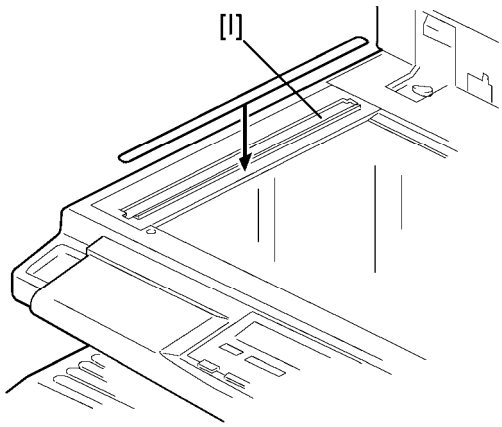


2. Remove the left scale [A] (x 2).
3. Place the DF exposure glass [B] on the glass holder. Make sure that the white mark [C] is on the bottom at the front end.
4. Peel off the backing [D] of the double-sided tape attached to the rear side of the scale guide [E], then install the scale guide (x 2 [removed in step 2]).
5. Install the two stud screws [F].
6. Mount the ADF on the copier, and then slide it to the front.

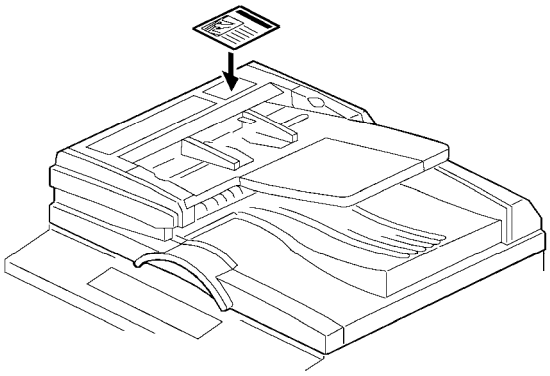
ADF Installation



7. Secure the ADF unit with the fixing screws [G].
8. Connect the cable [H] to the copier.



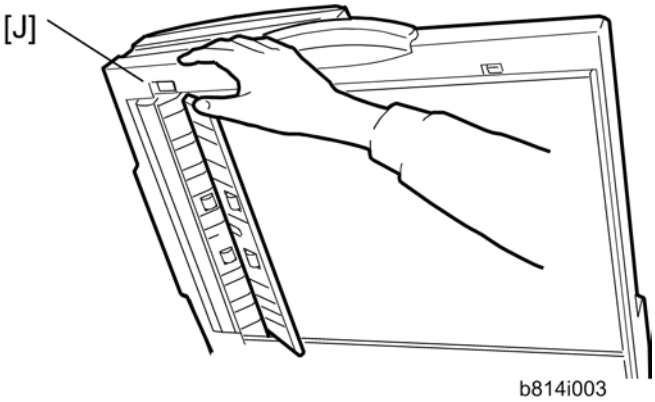
9. Attach the appropriate scale decal [I] as shown.



10. Attach an attention decal to the top cover.

Note

- The attention decals in the package are written in different languages.

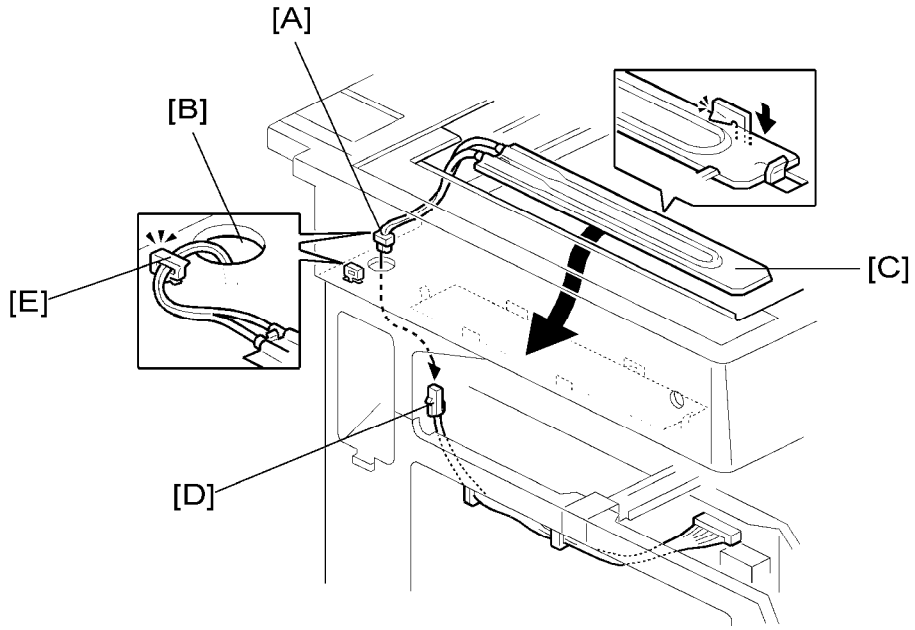


11. Open the ADF [J].
12. Turn the main power switch on. Then check if the document feeder works properly.
13. Make a full size copy, and check that the side-to-side and leading edge registrations are correct. If they are not, adjust the side-to-side and leading edge registrations. (☛ p.4-63).

2.5 ANTI-CONDENSATION HEATER INSTALLATION

CAUTION

- Unplug the machine power cord before starting the following procedure.



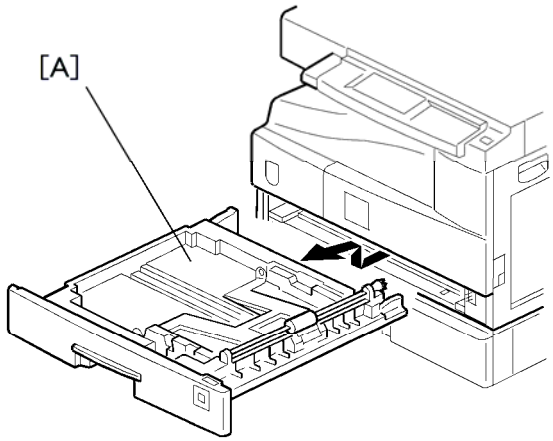
1. Remove the exposure glass.
2. Remove the left cover.
3. Pass the connector [A] through the opening [B].
4. Install the anti-condensation heater [C], as shown.
5. Join the connectors [A, D].
6. Clamp the harness with the clamp [E].
7. Reinstall the left cover and exposure glass.

2.6 TRAY HEATER

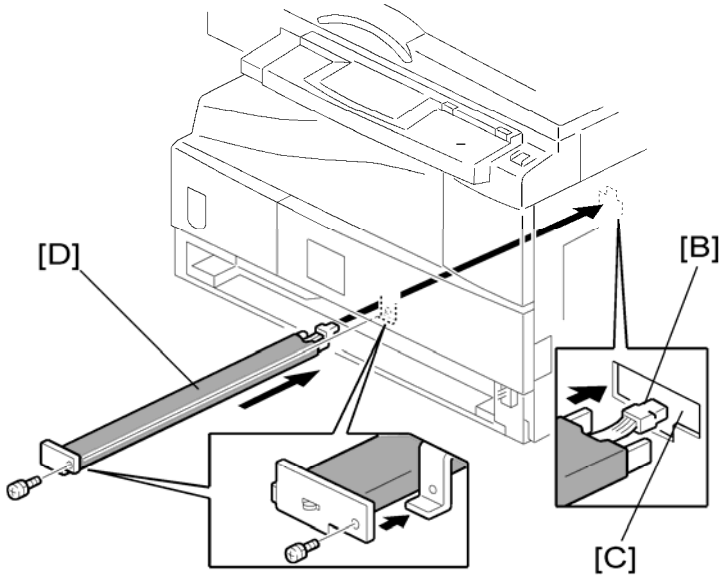
⚠CAUTION

- Unplug the machine power cord before starting the following procedure.

2.6.1 TRAY HEATER

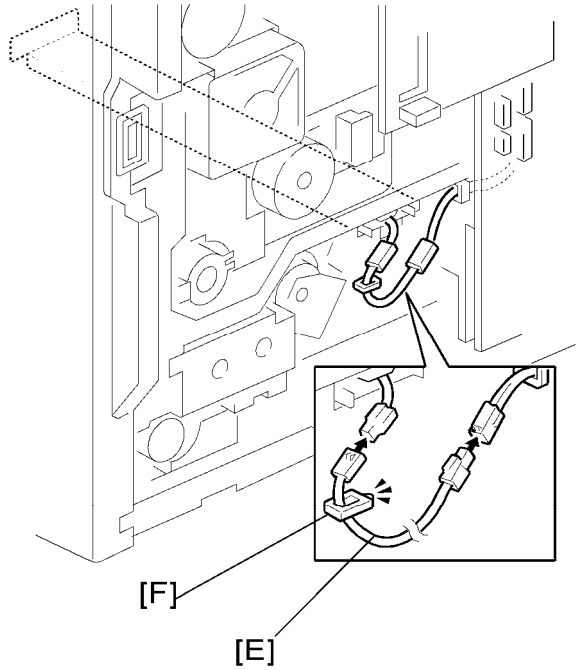


1. Remove the 1st tray cassette [A].
2. Remove the rear cover.



3. Pass the connector [B] through the opening [C] and install the tray heater [D] (x 1).

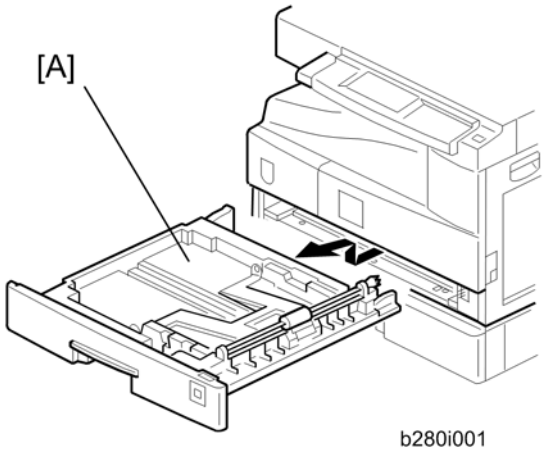
Tray Heater



4. Install the relay harness [E].
5. Fix the harness with the clamp [F].
6. Reinstall the 1st tray cassette and the rear cover.

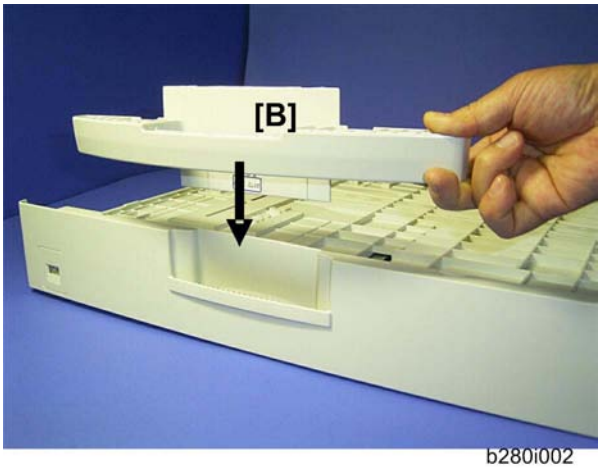
2.7 ACCESSIBILITY HANDLE INSTALLATION

The following procedure is for the paper tray for the main copier only.



b280i001

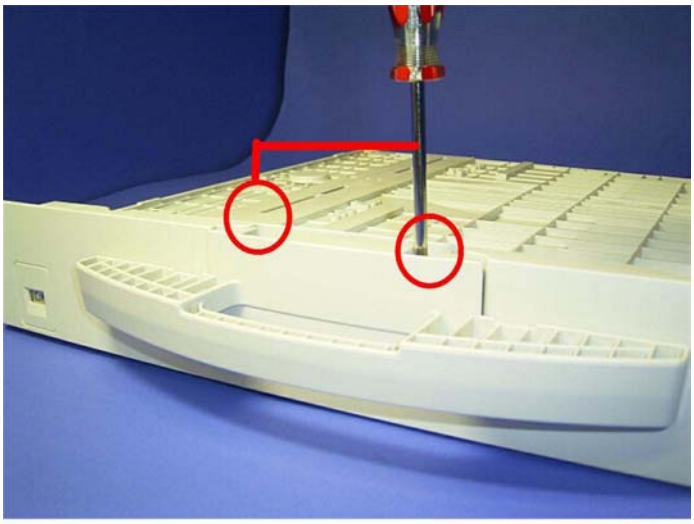
1. Remove the paper tray [A] from the main copier.



b280i002

2. Turn the paper tray over to the opposite side.
3. Lower the paper tray grip handle [B] into the paper tray slot as shown with the arrow in the above illustration.

Accessibility Handle Installation



b280i003

4. Attach the grip handle to the paper tray (x 2) as shown above.
5. Put the paper tray back into the machine.

PREVENTIVE MAINTENANCE

REVISION HISTORY		
Page	**Date**	**Added/Updated/New**
		None

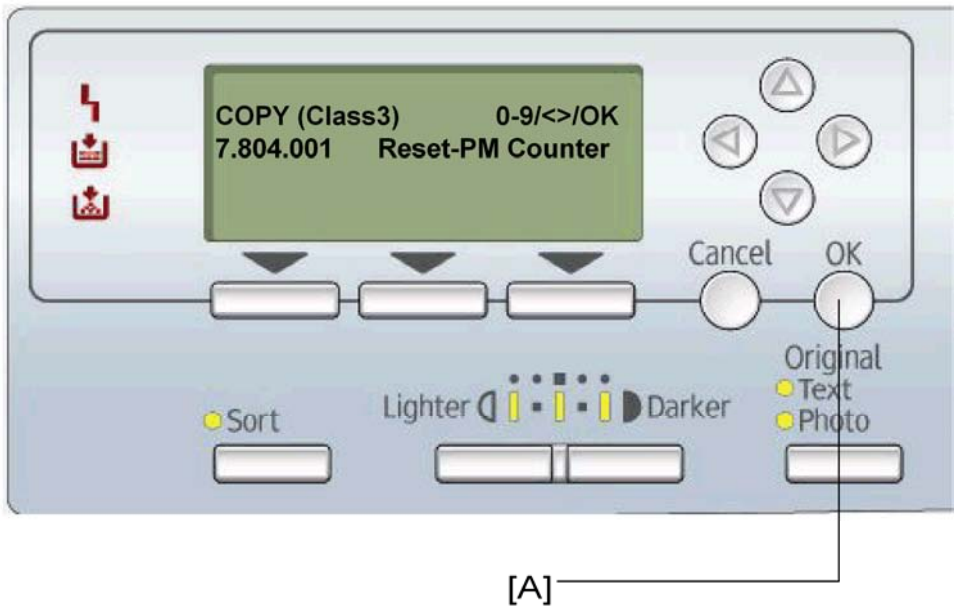
3. PREVENTIVE MAINTENANCE

3.1 PM TABLES

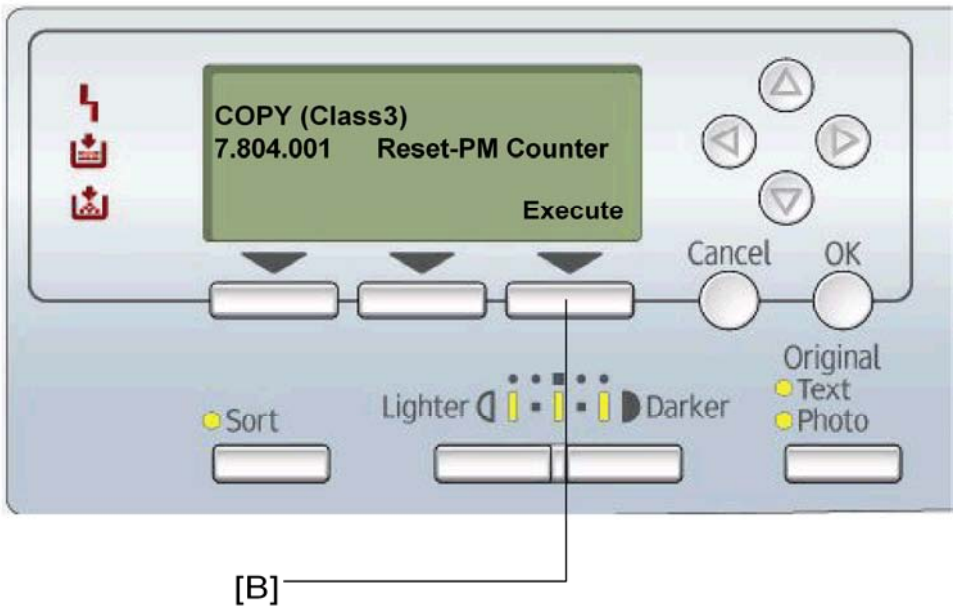
See "Appendices" for the "PM Tables".

3.2 HOW TO RESET THE PM COUNTER

After preventive maintenance work, reset the PM counter (SP 7804 1) as follows.

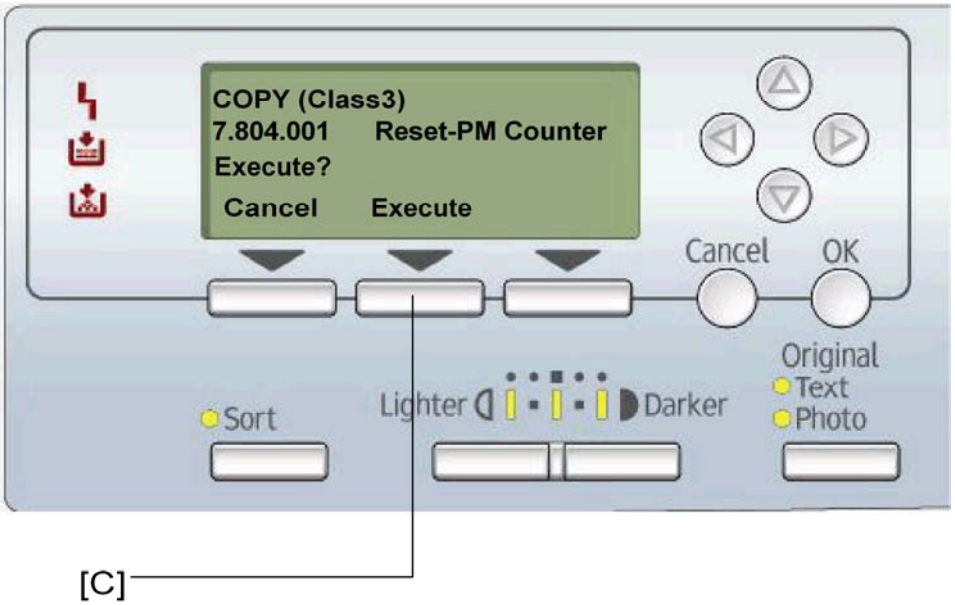


1. Activate the SP mode.
2. Select SP 7804 1 (Reset–PM Counter).
3. Press the OK key [A]. The message "Execute" shows.

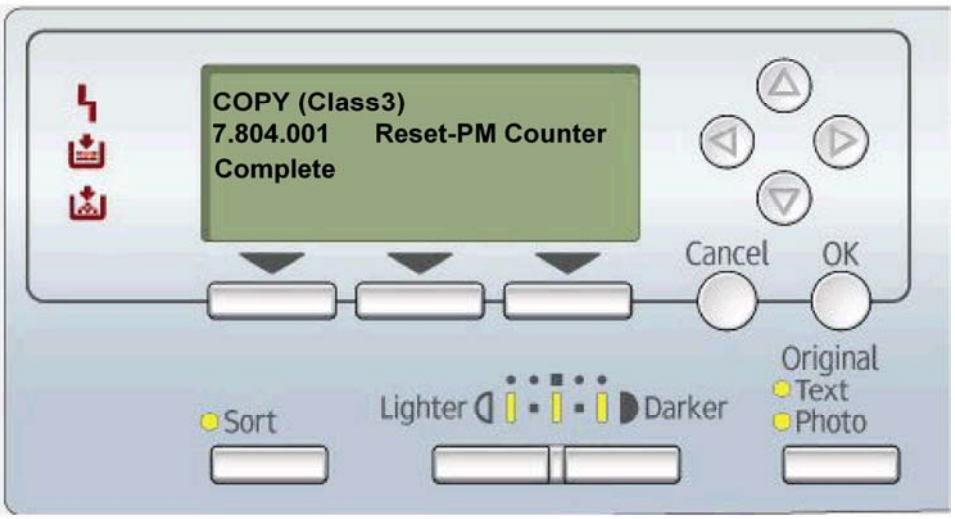


4. Press the button [B] below the message "Execute."

5. The messages "Execute?" followed by "Cancel" and "Execute" show.



6. To reset the PM counter, press the button [C] below the message "Execute."



7. Wait until the message "Completed" shows.
8. Quit the SP mode.

REPLACEMENT AND ADJUSTMENT

REVISION HISTORY		
Page	**Date**	**Added/Updated/New**
		None

4. REPLACEMENT AND ADJUSTMENT

4.1 GENERAL CAUTIONS

Do not turn off the main switch while any of the electrical components are active. Doing so may result in damage to units (such as the PCU) as they are pulled out or replaced.

4.1.1 PCU (PHOTOCONDUCTOR UNIT)

The PCU consists of the OPC drum, charge roller, development unit, and cleaning components. Observe the following precautions when handling the PCU.

1. Never touch the drum surface with bare hands. If the drum surface is dirty or if you have accidentally touched it, wipe it with a dry cloth, or clean it with wet cotton and then wipe it dry with a cloth.
2. Never use alcohol to clean the drum. Alcohol will dissolve the drum surface.
3. Store the PCU in a cool dry place.
4. Do not expose the drum to corrosive gases (ammonia, etc.).
5. Do not shake a used PCU, as this may cause toner and developer to spill out.
6. Dispose of used PCU components in accordance with local regulations.

4.1.2 TRANSFER ROLLER

1. Never touch the surface of the transfer roller with bare hands.
2. Be careful not to scratch the transfer roller, as the surface is easily damaged.

4.1.3 SCANNER UNIT

1. Use alcohol or glass cleaner to clean the exposure and scanning glass. This will reduce the static charge on the glass.
2. Use a blower brush or a water-moistened cotton pad to clean the mirrors and lenses.
3. Make sure to not bend or crease the exposure lamp's ribbon cable.
4. Do not disassemble the lens unit. This will cause the lens and copy image to get out of focus.
5. Do not turn any of the CCD positioning screws. This will put the CCD out of position.

4.1.4 LASER UNIT

1. Do not loosen or adjust the screws securing the LD drive board on the LD unit. This will put the LD unit out of adjustment.
2. Do not adjust the variable resistors on the LD unit. These are adjusted at the factory.
3. The polygonal mirror and F-theta lens are very sensitive to dust.
4. Do not touch the toner shield glass or the surface of the polygonal mirror with bare hands.

4.1.5 FUSING UNIT

1. After installing the fusing thermistor, make sure that it is in contact with the hot roller and that the roller can rotate freely.
2. Be careful to avoid damage to the hot roller stripper pawls and their tension springs.
3. Do not touch the fusing lamp and rollers with bare hands.
4. Make sure that the fusing lamp is positioned correctly and that it does not touch the inner surface of the hot roller.

4.1.6 PAPER FEED

1. Do not touch the surface of the paper feed rollers.
2. To avoid misfeeds, the side and end fences in each paper tray must be positioned correctly so as to align with the actual paper size.

Important

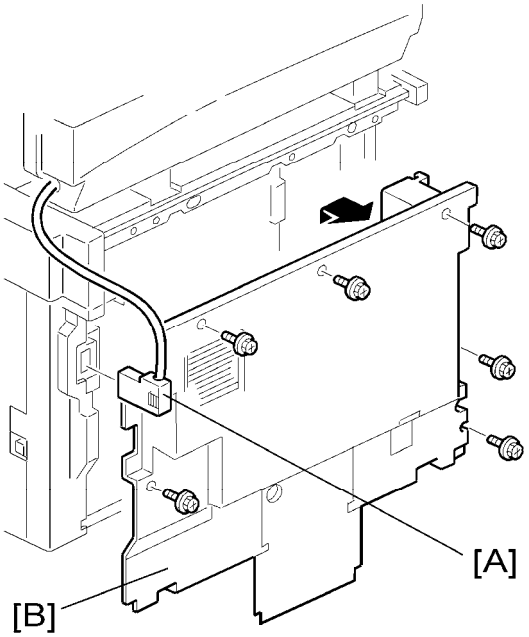
- You must run SP 2214 to initialize the TD sensor after you install a new PCU. After starting initialization, be sure to wait for it to reach completion (wait for the motor to stop) before you re-open the front cover or turn off the main switch.
- If the optional tray heater or optics anti-condensation heater is installed, keep the machine's power cord plugged in even while the main switch is off, to keep the heater(s) energized.

4.2 SPECIAL TOOLS AND LUBRICANTS

Part Number	Description	Q'ty
A0069104	Scanner Positioning Pins (4 pins/set)	1 set
A2929500	Test Chart S5S (10 pcs/set)	1 set
VSSM9000	FLUKE 87 Digital Multimeter	1
N8036701	4MB Flash Memory Card	1
A2579300	Grease Barrierta S552R	1
52039502	Grease G-501	1

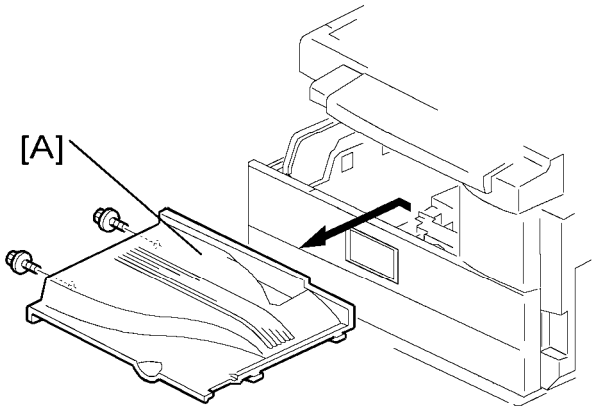
4.3 EXTERIOR COVERS & OPERATION PANEL

4.3.1 REAR COVER



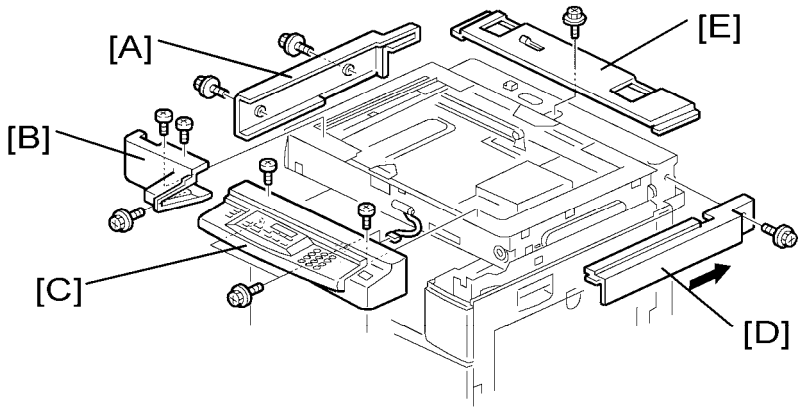
1. Unplug the DF cable [A] (if installed).
2. Rear cover [B] (x 6)

4.3.2 COPY TRAY



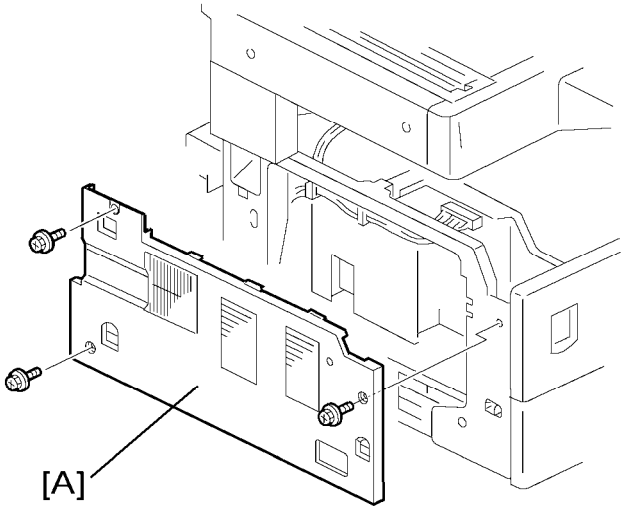
1. Copy tray [A] (x 2)

4.3.3 UPPER COVERS



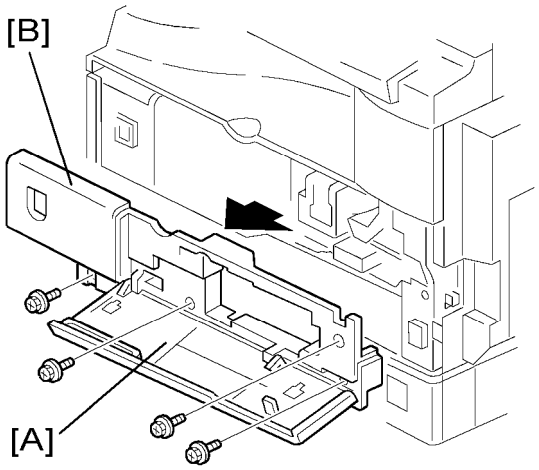
1. Platen Cover or ADF (if installed)
2. Rear cover
3. Left upper cover [A] (x 2)
4. Front upper left cover [B] (x 3)
5. Operation panel [C] (x 4, x 1)
6. Right upper cover [D] (x 1, 3 hooks)
7. Push the cover to the rear side to release the hooks.
8. Top rear cover [E] (x 1)

4.3.4 LEFT COVER



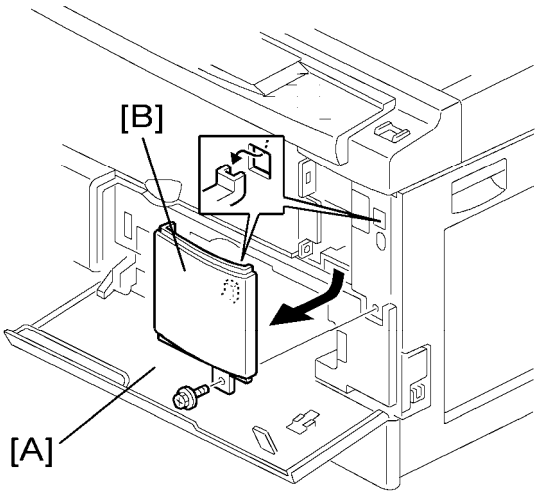
1. Left cover [A] (x 3)

4.3.5 FRONT COVER



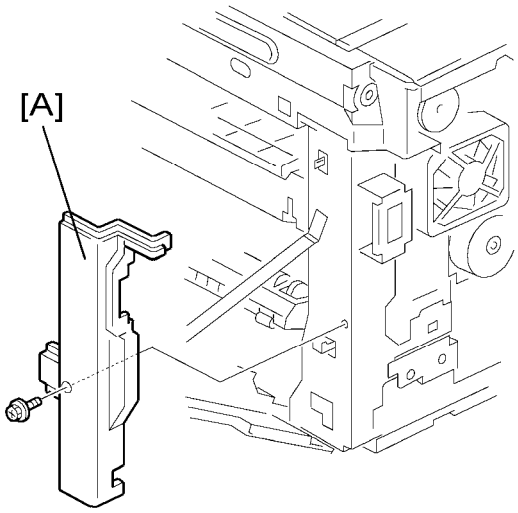
1. Pull out the (top) paper tray.
2. Open the front door [A].
3. Front cover [B] (x 4)

4.3.6 FRONT RIGHT COVER



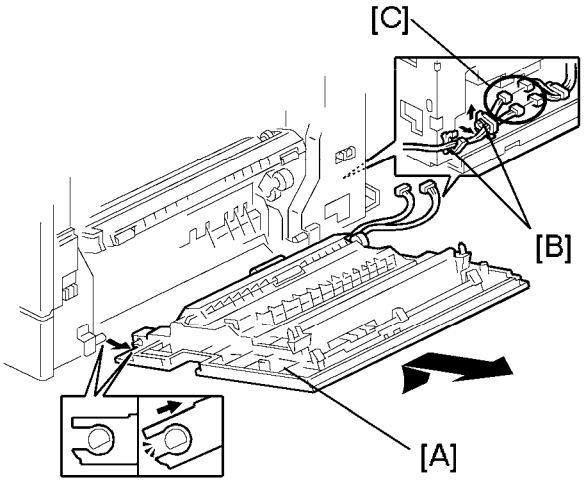
1. Open the front door [A].
2. Front right cover [B] (x 1)

4.3.7 RIGHT REAR COVER



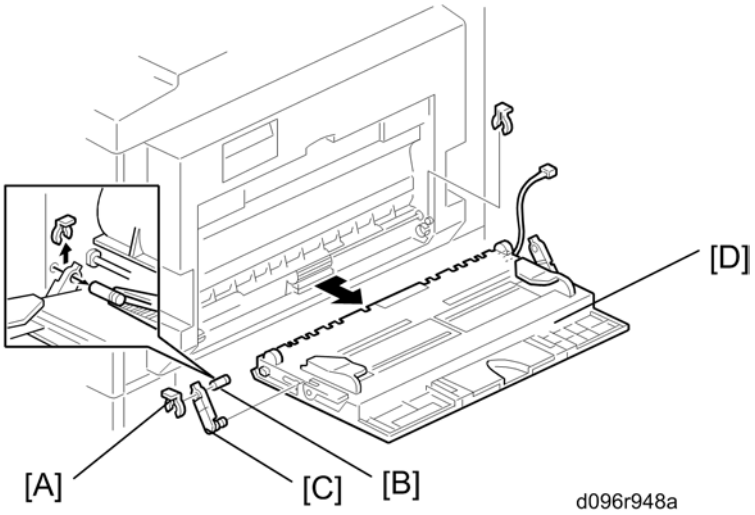
1. Right upper cover (☛ p.4-5 "Upper Covers")
2. Open the right door.
3. Right rear cover [A] (x 1)

4.3.8 RIGHT DOOR



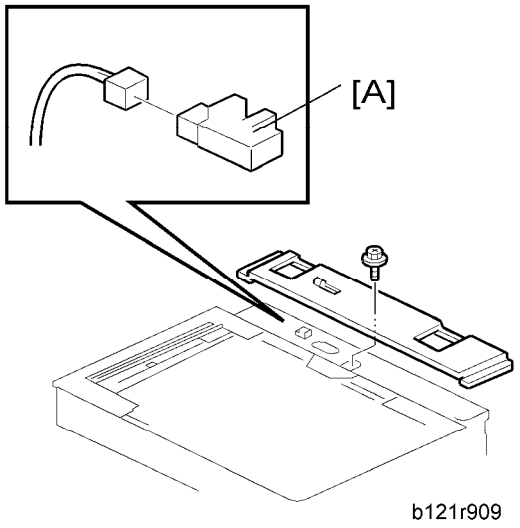
1. Right rear cover (see above)
2. Open the right door [A].
3. Open the clamps [B] and disconnect the two connectors [C].
4. Right door

4.3.9 BY-PASS TRAY



1. Right rear cover (above)
2. Open the right door.
3. Release the by-pass tray cable from the clamps (see [A] on the preceding procedure) and disconnect the connector (5-pin connector with colored wires).
4. Front-side clip ring [A]
5. Front-side pin [B] (You can push the pin from behind the right door.)
6. Front-side tray holder arm [C]
7. Remove the rear-side clip ring, pin, and tray holder arm in the same manner.
8. By-pass tray [D]

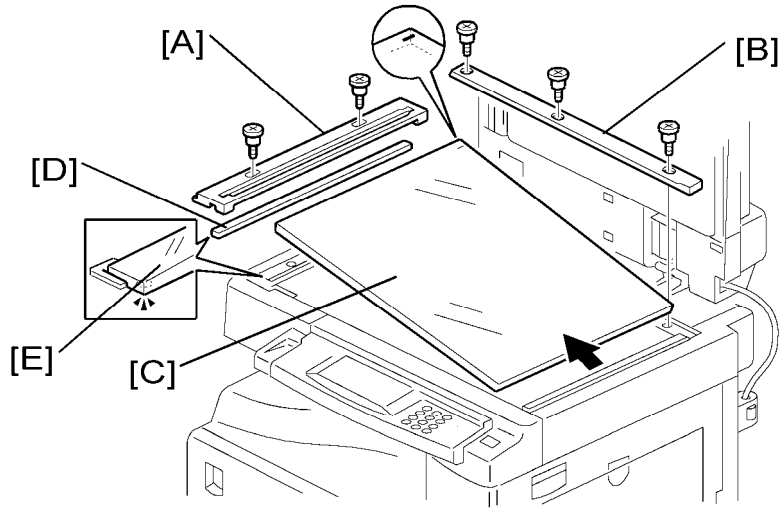
4.3.10 PLATEN COVER SENSOR



1. Top rear cover
2. Platen cover sensor [A] (x 1)

4.4 SCANNER UNIT

4.4.1 EXPOSURE GLASS/DF EXPOSURE GLASS



- Exposure Glass -

1. Front upper left cover (☛ p.4-5 "Upper Covers")
2. Left scale [A] (x 2)
3. Rear scale [B] (x 3)
4. Exposure glass [C]

Note

- Make sure that the mark is at the rear left corner, and that the left edge is aligned to the support on the frame when you reinstall the exposure glass.

- DF Exposure Glass -

1. Front upper left cover (☛ p.4-5 "Upper Covers")
2. Left scale [A]
3. DF exposure glass [D]

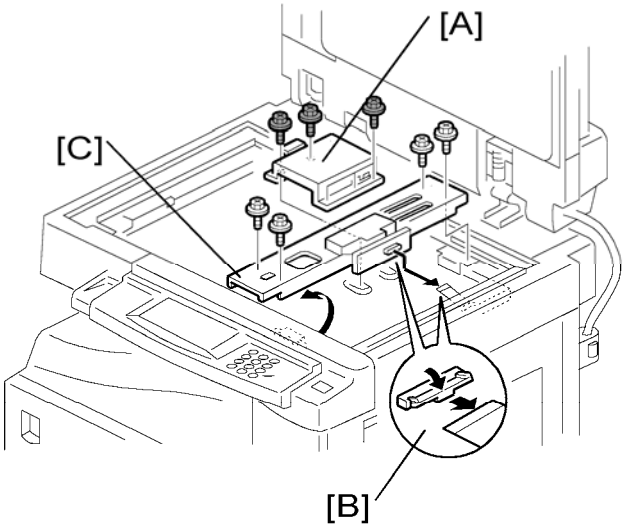
Note

- Make sure that the mark [E] is on the bottom at the front end when reinstall the exposure glass.

4.4.2 LENS BLOCK

⚠CAUTION

- Do not touch the paint-locked screws on the lens block. The position of the lens assembly (black part) is adjusted before shipment.
- Do not grasp the PCB or the lens assembly when you handle the lens block. The lens assembly may slide out of position.

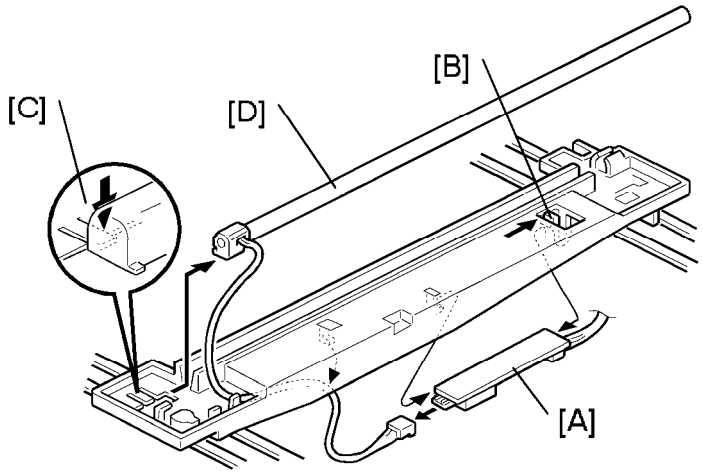


1. Exposure glass (☛ p.4-10 "Exposure Glass/DF Exposure Glass ")
2. Lens cover [A] (x 5)
3. Disconnect the flat cable [B].
4. Lens block [C] (x 4).

Note

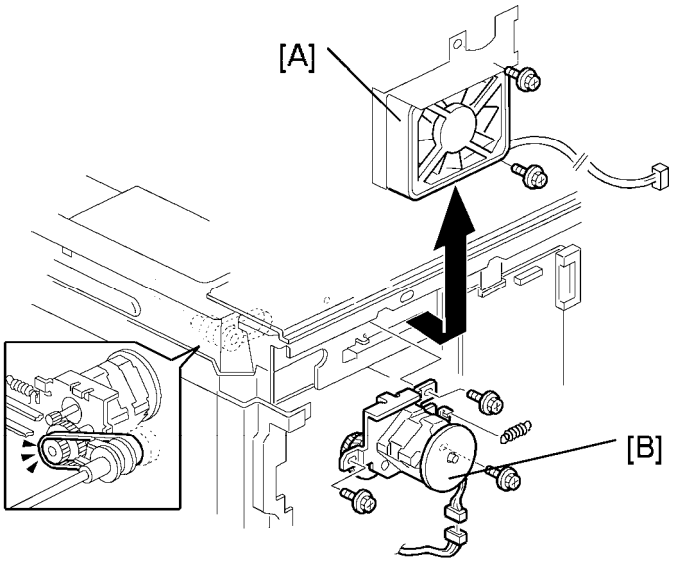
- Adjust the image quality (☛ p.4-58 "Copy Adjustments Printing/Scanning") after you install a new lens block.

4.4.3 LAMP STABILIZER BOARD AND EXPOSURE LAMP



1. Operation panel (☛ p.4-5 "Upper Covers")
2. Exposure glass (☛ p.4-10 "Exposure Glass/DF Exposure Glass ")
3. Slide the first scanner to a position where the front end of the lamp is visible.
4. Place one hand under the lamp stabilizer board [A] and release the hook [B].
5. Lamp stabilizer board (x 2)
6. Press the plastic latch [C] and push the front end of the lamp toward the rear.
7. Lamp [D] (with the cable)

4.4.4 SCANNER MOTOR

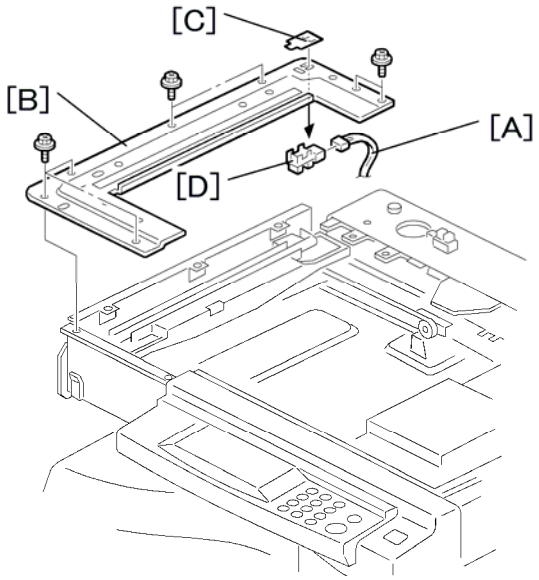


1. Left upper cover, front upper left cover, operation panel, top rear cover (☛ p.4-10 "Exposure Glass/DF Exposure Glass ")
2. Exposure glass (☛ p.4-10 "Exposure Glass/DF Exposure Glass ")
3. Scanner motor [B] (x 3, x 1, 1 spring, 1 belt)

Note

- Install the belt first, and then set the spring when you reassemble. Fasten the leftmost screw (viewed from the rear), and fasten the other two screws.
- Adjust the image quality after you install the motor.

4.4.5 SCANNER HOME POSITION SENSOR



1. Left upper cover, top rear cover.
2. Exposure glass, DF exposure glass (if installed) (☛ p.4-10 "Exposure Glass/DF Exposure Glass ")
3. Disconnect the connector [A].
4. Scanner left lid [B] (🔩 x 7)
5. Sensor tape [C].
6. Scanner home position sensor [D]

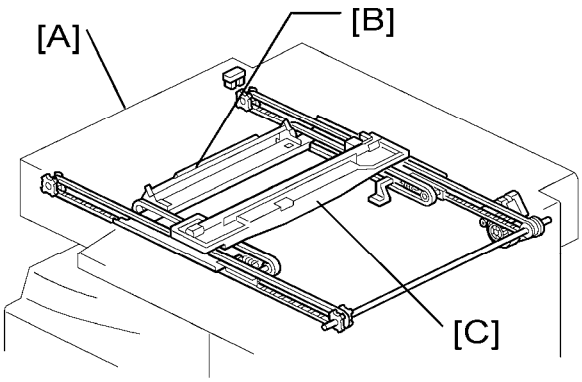
4.4.6 ADJUSTING SCANNER POSITIONS

⚠CAUTION

- Grasp the front and rear ends (not the middle) of the first scanner when you manually move it. The first scanner may be damaged if you press, push, or pull its middle part.

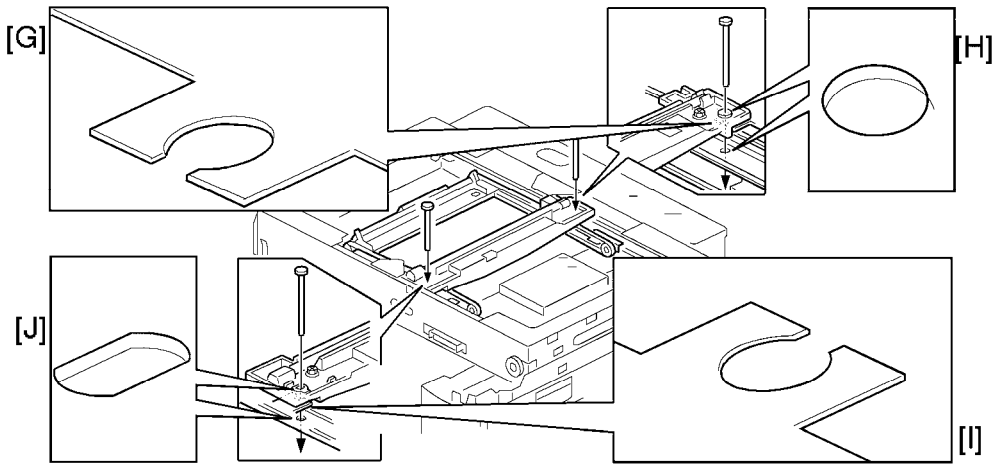
- Overview -

Adjust the scanner positions when the first scanner [C] and second scanner [B] are not parallel with the side frames [A], or, when you have replaced one or more of the scanner belts.



To adjust the scanner positions, do either of the following:

- To adjust the belt contact points on the first scanner (See "Adjusting the First Scanner Contact Points" below.**)**
- To adjust the belt contact points on the scanner bracket (See "Adjusting the Second Scanner Contact Points" below.)



The two actions above have the same objectives--to align the following holes and marks:

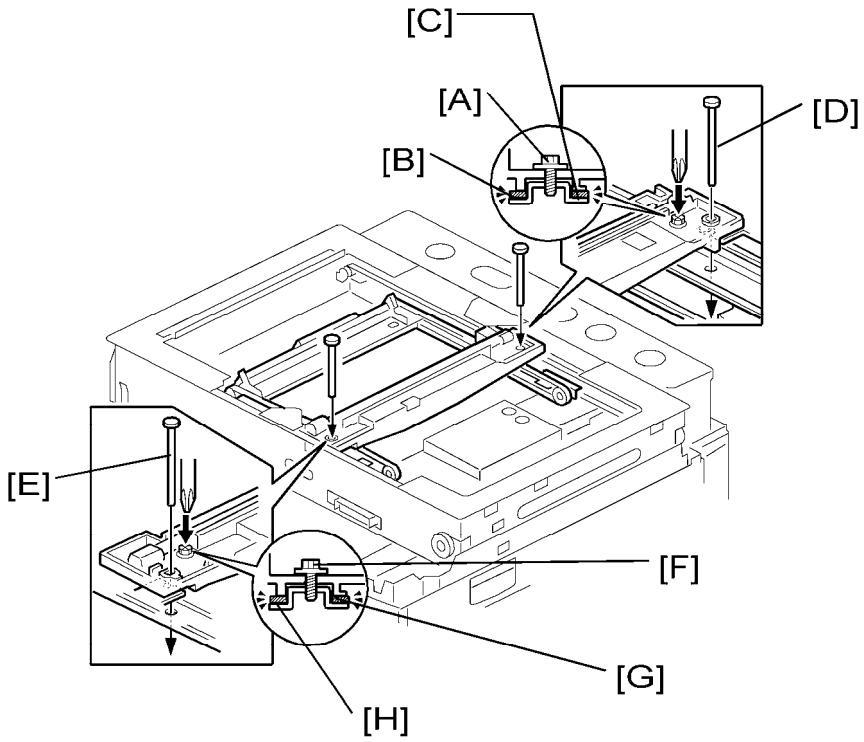
- The adjustment holes [H] [J] in the first scanner

Scanner Unit

- The adjustment holes [H] [J] in the second scanner
- The alignment marks [G] [I] on the frames

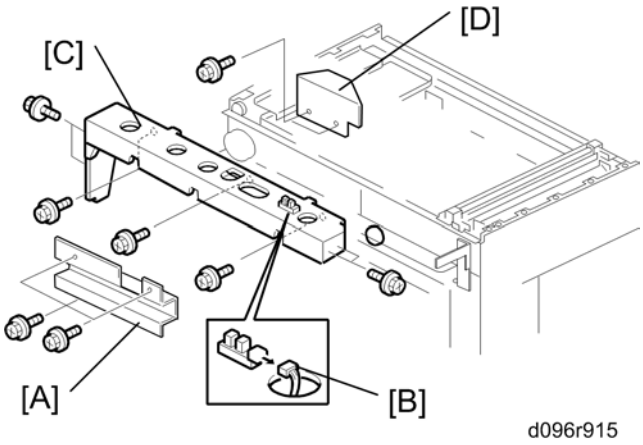
The scanner positions are correct when these holes and marks are aligned.

- Adjusting the First Scanner Contact Points -

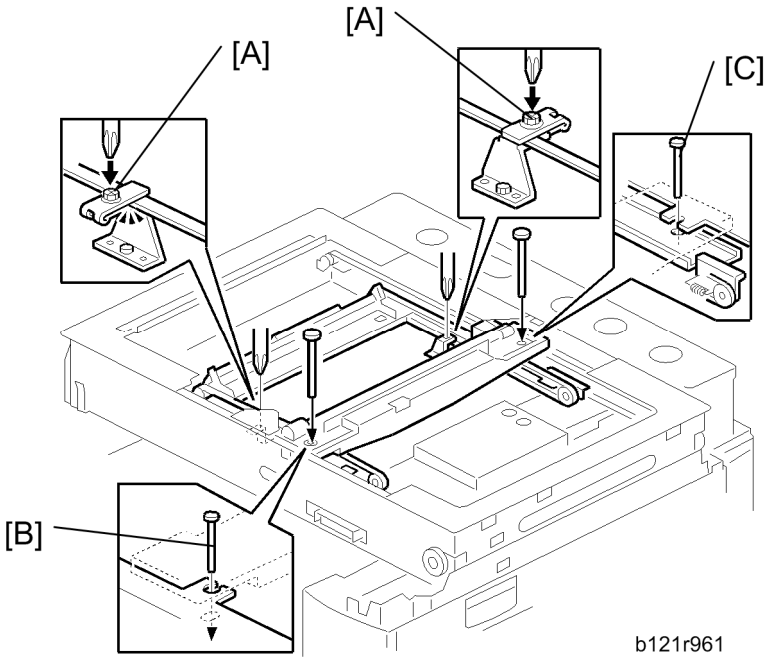


1. ADF or platen cover
2. Operation panel, top rear cover (☛ p.4-5 "Upper Covers").
3. Exposure glass (☛ p.4-10 "Exposure Glass/DF Exposure Glass ")
4. Loosen the 2 screws [A] [F].
5. Slide the 1st and 2nd scanners, or one of them, to align the following holes and marks
6. The adjustment holes in the first scanner
7. The adjustment holes in the second scanner
8. The alignment marks on the frames
9. Insert the positioning tools [D] [E] through the holes and marks.
10. Check that the scanner belts [B] [C] [G] [H] are properly set between the bracket and the 1st scanner.
11. Tighten the screws [A] [F].
12. Remove the positioning tools.
13. Reassemble the machine and check the operation.

- Adjusting the Second Scanner Contact Points -



1. ADF or platen cover
2. Operation panel, top rear cover (☛ p.4-5 "Upper Covers").
3. Exposure glass (☛ p.4-10 "Exposure Glass/DF Exposure Glass ")
4. Controller bracket [A] (x 3)
5. Disconnect the platen-cover-sensor connector [B].
6. Rear frame [C] (x 7)
7. Scale bracket [D] (x 2)



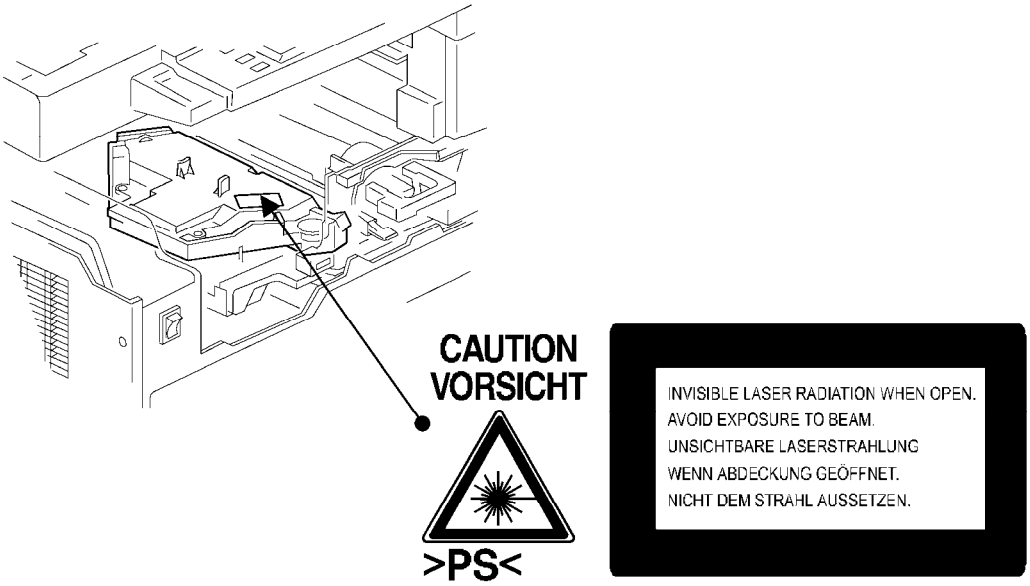
8. Loosen the 2 screws [A].
9. Slide the 2nd scanner to align the following holes and marks
10. The adjustment holes in the first scanner
11. The adjustment holes in the second scanner
12. The alignment marks on the frames
13. Insert the positioning tools [B] [C] through the holes and marks.
14. Check that the scanner belts are properly set in the brackets.
15. Remove the positioning tools.
16. Reassemble the machine and check the operation.

4.5 LASER UNIT

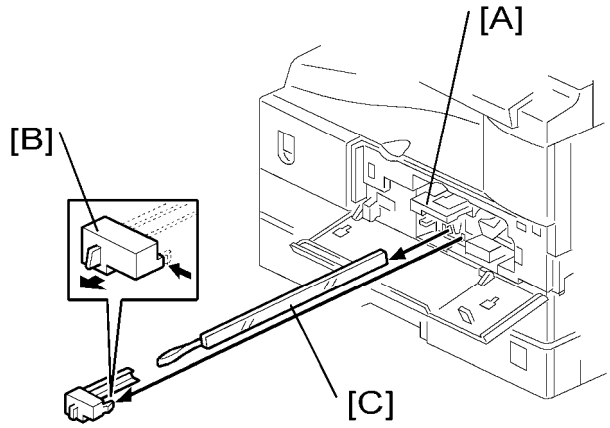
⚠WARNING

- The laser beam can seriously damage your eyes. Be absolutely sure that the main power switch is off and that the machine is unplugged before you access the laser unit.

4.5.1 LOCATION OF CAUTION DECAL

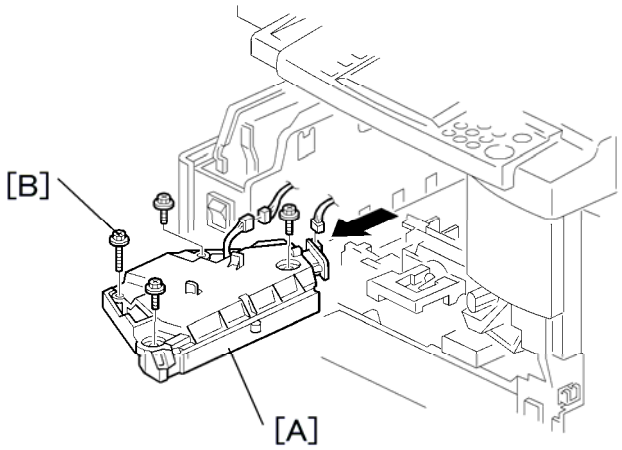


4.5.2 TONER SHIELD GLASS



1. Open the front door.
2. Lift the toner cartridge latch [A].
3. Press the toner shield glass cover [B] to the left and pull it out.
4. Pull out the toner shield glass [C].

4.5.3 LASER UNIT



1. Toner shield glass.
2. Copy tray
3. Pull out the (upper) paper tray.
4. Front cover
5. Laser unit [A] (x 2, x 4)

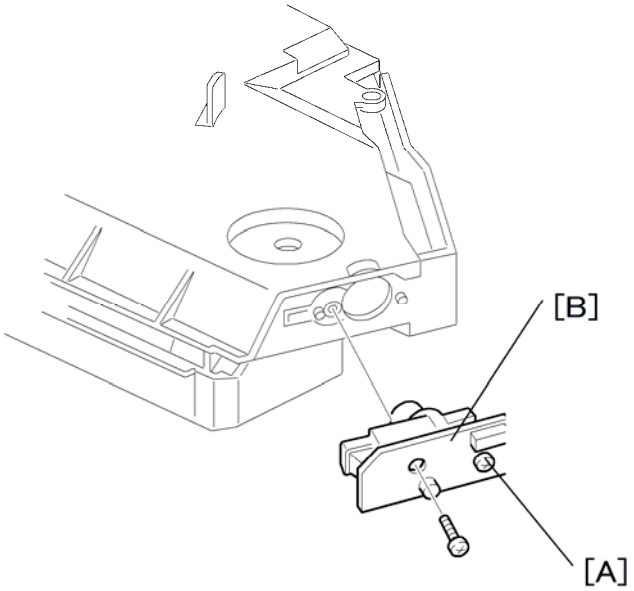
Note

- The screw at the left front position [B] is longer than the other three.

4.5.4 LD UNIT

CAUTION

- Do not touch the paint-locked screw [A]. The LD position is adjusted before shipment.

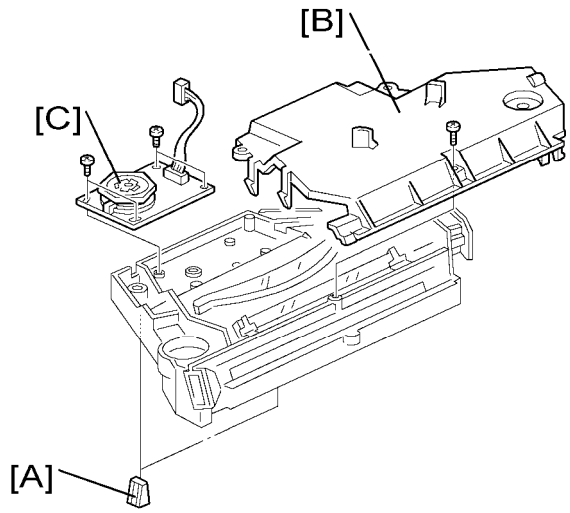


1. Laser unit
2. LD unit [B] (x 1)

Note

- Do not screw the LD unit in too tightly when you install it.

4.5.5 POLYGONAL MIRROR MOTOR

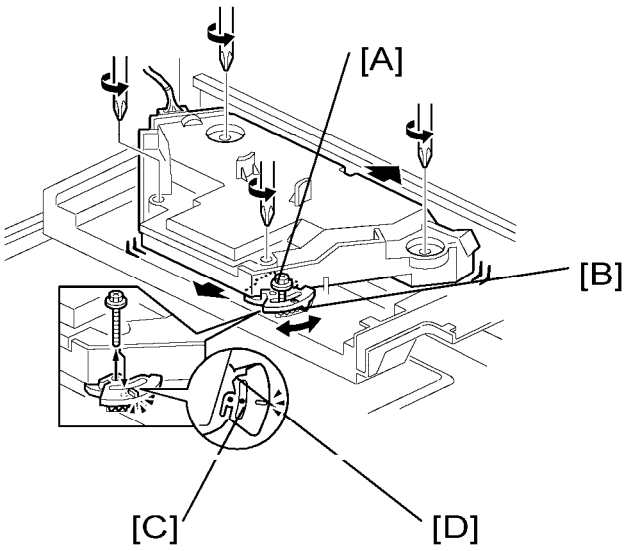


1. Laser unit
2. Two rubber bushings [A]
3. Laser unit cover [B] (x 1)
4. Polygonal mirror motor [C] (x 4)
5. After reassembling, adjust the image quality (☛ p.4-58 "Copy Adjustments Printing/Scanning").

4.5.6 LASER UNIT ALIGNMENT ADJUSTMENT

⚠WARNING

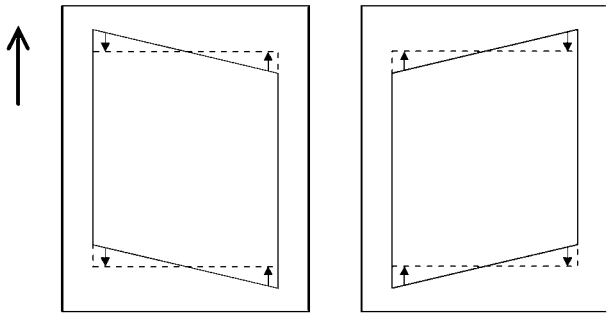
- Reinstall the copy exit tray before you turn the main switch on. The laser beam may go out of the copier when the copy exit tray is not installed. The laser beam can seriously damage your eyes.



1. Start the SP mode.
2. Select SP 5902 1 and output the 'Trimming Area' pattern (pattern 10).
3. Make sure that the four corners of the pattern make right angles:
   - If they make right angles, you do not need to adjust the laser unit alignment.
   - If they do not make right angles, go on to the next step.
4. Check the screw position on the lever [B].
   - If the screw is in the hole [C], go on to the next step.
   - If the screw is in the slot [D], loosen the screw on the lever, loosen the four screws on the laser unit, and go on to step 9.

   Note
   - The initial position of the screw is in hole [C].
5. Four screws in the laser unit (☛ p.4-21)
6. Remove the lever (🔩 x 1), confirm the position of the hole beneath the slot [D], and reinstall the lever.
7. Install the screw (through the slot [D]) loosely into the hole beneath the slot (do not tighten the screw).
8. Install the four screws for the laser unit loosely (do not tighten the screws).
9. When you rotate the lever clockwise or counterclockwise by one notch of the lever, the

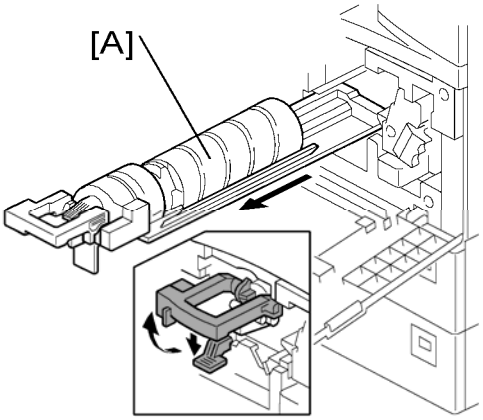
corners of the pattern shift by ±0.4 mm (from the leading and trailing edges). See the trim pattern made in step 2, and find how much the corners should be shifted.



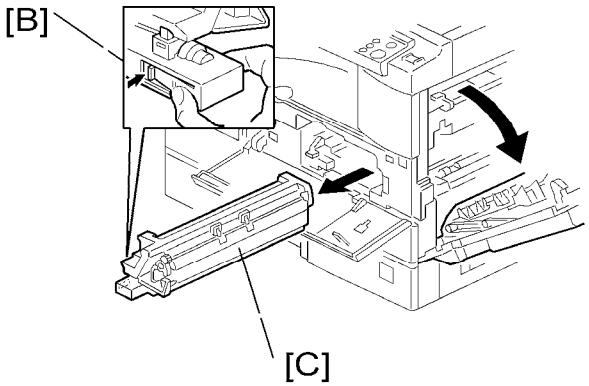
10. Tighten the screw [A].
11. Tighten the screws on the laser unit.
12. Reinstall the copy tray.
13. Print the trim pattern and check the result. Do the procedure again if further adjustment is required.

4.6 PCU SECTION

4.6.1 PCU



1. Toner bottle with the holder [A]
2. Open the right door.



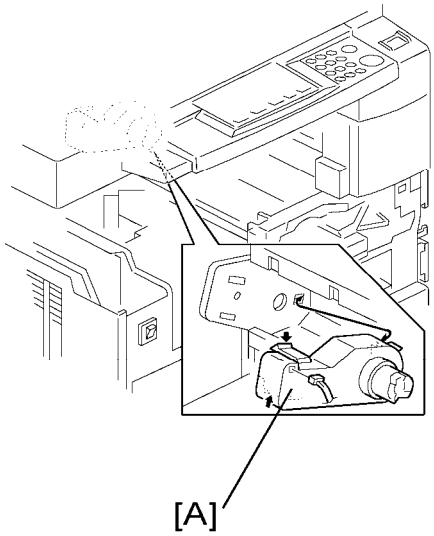
3. Press the latch [B] and pull out the PCU [C].

Note

- Do not touch the OPC drum surface with bare hands.

4. Load new developer (☛ p.4-32).
5. Do SP 2214 to reinitialize the TD sensor when you reassemble.

4.6.2 TONER SUPPLY MOTOR

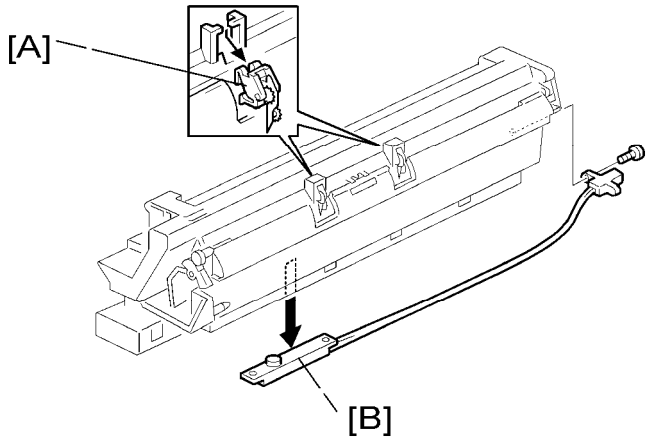


1. Copy tray (☛ p.4-5 "Upper Covers")
2. Open the front door.
3. Toner bottle holder (☛ p.4-26 "PCU")
4. Toner supply motor [A] (x 1)

4.6.3 PICK-OFF PAWLS AND TONER DENSITY SENSOR

CAUTION

- Do not turn the PCU upside down. This causes toner and developer to spill out.



1. PCU (☛ p.4-26)
2. Pawl [A]

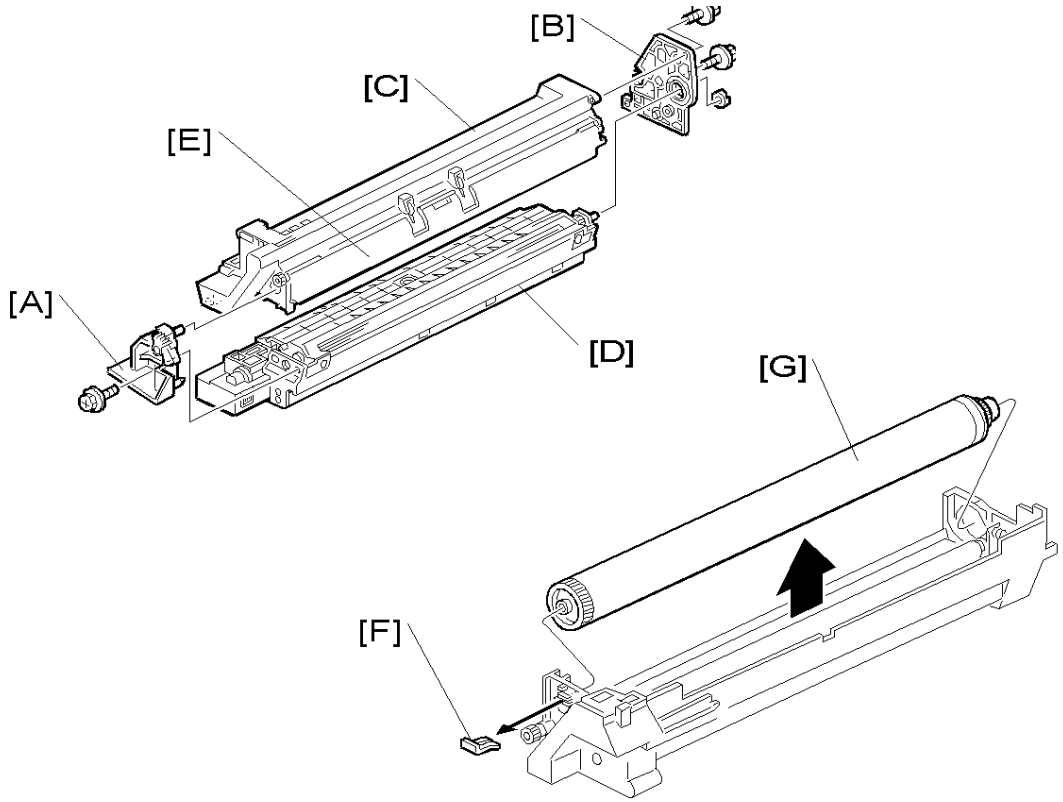
   Note

   - Pull down the pawl and release the bottom end.
3. Toner density sensor [B] (x 1)

   Note

   - The toner density sensor is taped to the bottom of the PCU. Pry it off with a regular screwdriver.
4. After reinstalling the pick-off pawls or toner density sensor, adjust the image quality (☛ p.4-33 "After Replacement or Adjustment").

4.6.4 OPC DRUM



1. PCU (☛ p.4-26)
2. Front side piece [A] (x 1)
3. Rear side piece [B] (x 2, 1 coupling)
4. Separate the drum section [C] from the developer section [D].

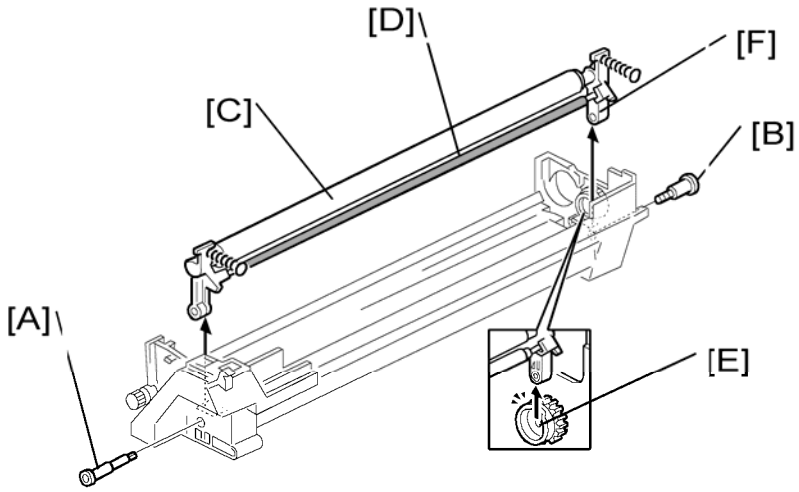
   Note

   - To ensure that the left-side gears line up, keep the drum cover [E] closed when reinserting the front side piece.
5. Pry out the drum retaining clip [F].

   Note

   - Install the clip in the same orientation (with the lip facing away from the drum shaft) when you reassemble.
6. OPC drum [G]
7. When reassembling, adjust the image quality (☛ p.4-33 "After Replacement or Adjustment").

4.6.5 CHARGE ROLLER AND CLEANING BRUSH

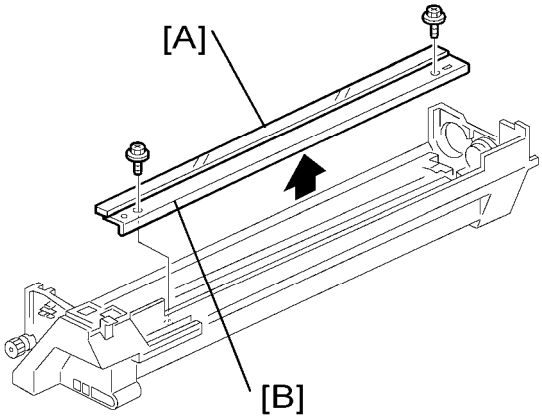


1. OPC Drum (☛ p.4-29)
2. Holding pin [A]
3. Stepped screw [B]
4. Charge roller [C] and cleaning brush [D] (with the holders and springs)

   Note

   - Turn the gear [E] (as necessary) so that the rear holder [F] comes out.
5. When reassembling, adjust the image quality (☛ p.4-33 "After Replacement or Adjustment").

4.6.6 CLEANING BLADE

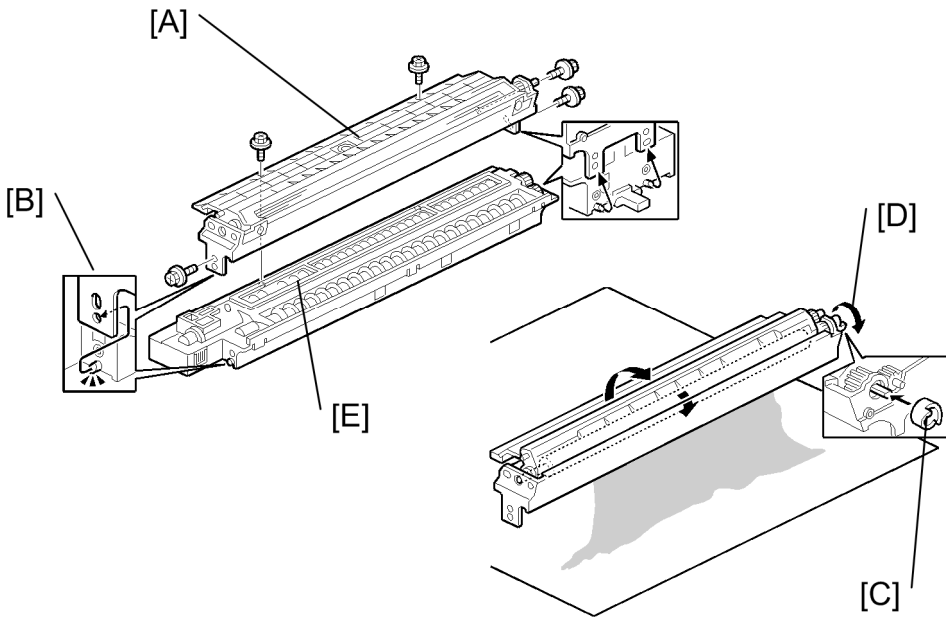


1. Drum charge roller (☛ p.4-30 "Charge Roller and Cleaning Brush")
2. Cleaning blade [B] (x 2)
3. When reassembling, adjust the image quality (☛ p.4-33 "After Replacement or Adjustment").

Important

- Apply toner to the edge of the new cleaning blade when you replace the cleaning blade. This prevents possible damage to the OPC drum and blade.
- After installing the cleaning blade, remove some of the toner from the old blade with your finger.
- Apply the toner to the edge [A] of the new cleaning blade. Make sure to apply the toner evenly along full length of the new cleaning blade.

4.6.7 DEVELOPER



1. PCU (☛ p.4-26)
2. To let the toner fall to the development section, gently tap about eight different spots on the top of the PCU with a screwdriver. Each spot must be approximately at an equal distance from the next spot.
3. Reinstall the PCU in the copier.
4. Turn the main switch on.
5. Open and close the front door and wait for the machine to rotate the development roller for about 10 seconds.
6. Repeat the previous step two more times.
7. PCU (☛ p.4-26)
8. Separate the developer section from the OPC drum section (☛ p.4-29).
9. Top part [A] of the development unit (x 5)

Note

- Release the hook [B].

10. Set the coupling [C] back to the shaft.
11. Turn the coupling in the direction of the arrow [D] to remove developer from the roller.
12. Turn the bottom part [E] over and rotate the gears to remove the developer.
13. Load new developer.
14. When reassembling, execute SP 2214 to reinitialize the TD sensor.

Note

- Make sure no toner or developer stays on the gear. Clean the gears as necessary with a blower brush, etc.
- Be sure to replace the Mylar at the rear side in the correct position. (The Mylar protects the gears at the rear side from falling toner).

4.6.8 AFTER REPLACEMENT OR ADJUSTMENT

Important

- Do the following procedure after replace or adjust any of the PCU components. This procedure is not necessary when you replaced the whole PCU with a new one.

1. Take 5 sample copies.
2. If black dots (dropped toner) show on any of the copies, continue as follows. (If all copies are clean, you don't need to do the following steps.)
3. Remove the PCU from the mainframe.
4. Tap the top of the PCU with a screwdriver at eight evenly spaced locations (two or three taps at each spot), to knock the recycled toner down into the development section.
5. Put the PCU back into the mainframe.
6. Turn the main power on. Then open and close the door and wait for the machine to rotate the development roller for 10 seconds. Then open and close the door two more times, so that total rotation time is 30 seconds.
7. Make some sky-shot copies (or solid black prints).

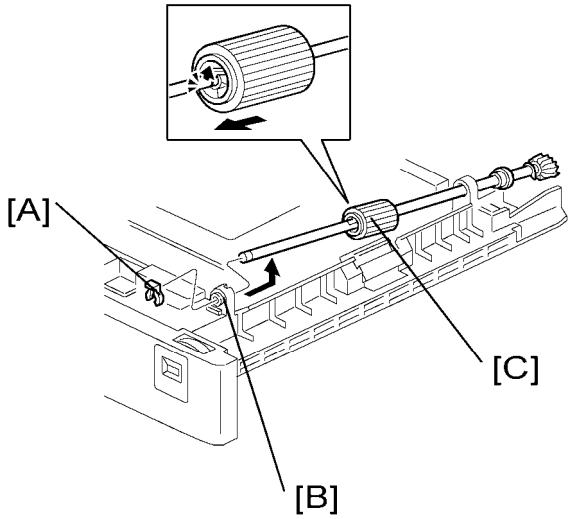
- If using A4 or $8^1/_2$" x 11" paper, make 4 copies/prints.
- If using A3 or 11" x 17" paper, make 2 copies/prints.
- To make solid black prints, use SP 5902 pattern 8.

Note

- Step 7 is required only after parts replacement or adjustment. You do not need to make sky-shot (or solid black) copies after you replace the developer.

4.7 PAPER FEED SECTION

4.7.1 PAPER FEED ROLLER

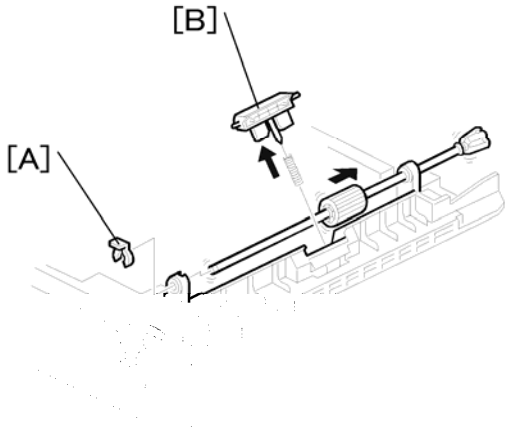


1. Paper cassette
2. Clip [A]
3. Push the shaft back through the opening, and tilt it up.

   Note

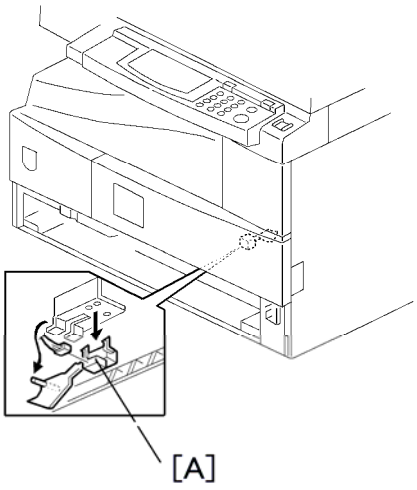
   - If the black plastic bushing [B] comes off, make sure you remount it when reinstall the shaft.
4. Paper feed roller [C]

4.7.2 FRICTION PAD



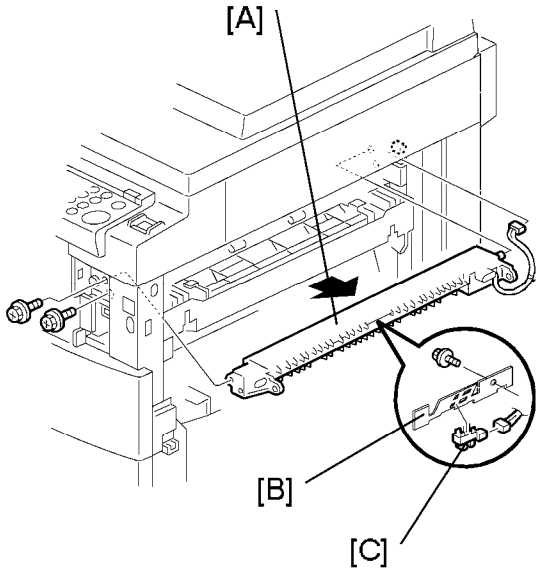
1. Paper cassette
2. Clip [A]
3. Push the shaft back through the opening, so that the roller moves clear of the friction pad.
4. Friction pad [B]

4.7.3 PAPER END SENSOR



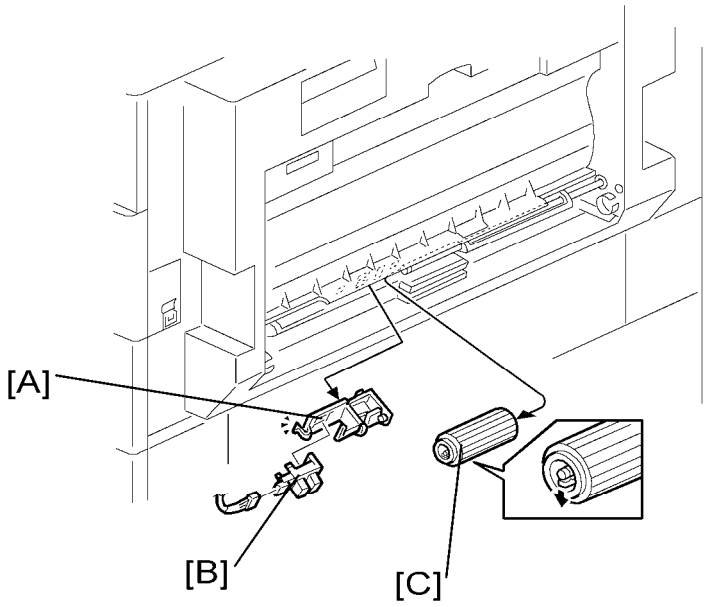
1. Paper cassette
2. Paper end sensor [A] (x 1)

4.7.4 EXIT SENSOR



1. Open the right door.
2. Front right cover
3. Guide [A] (x 2)
4. Exit sensor bracket [B] (x 1)
5. Exit sensor [C] (x 1)

4.7.5 BY-PASS FEED ROLLER AND PAPER END SENSOR



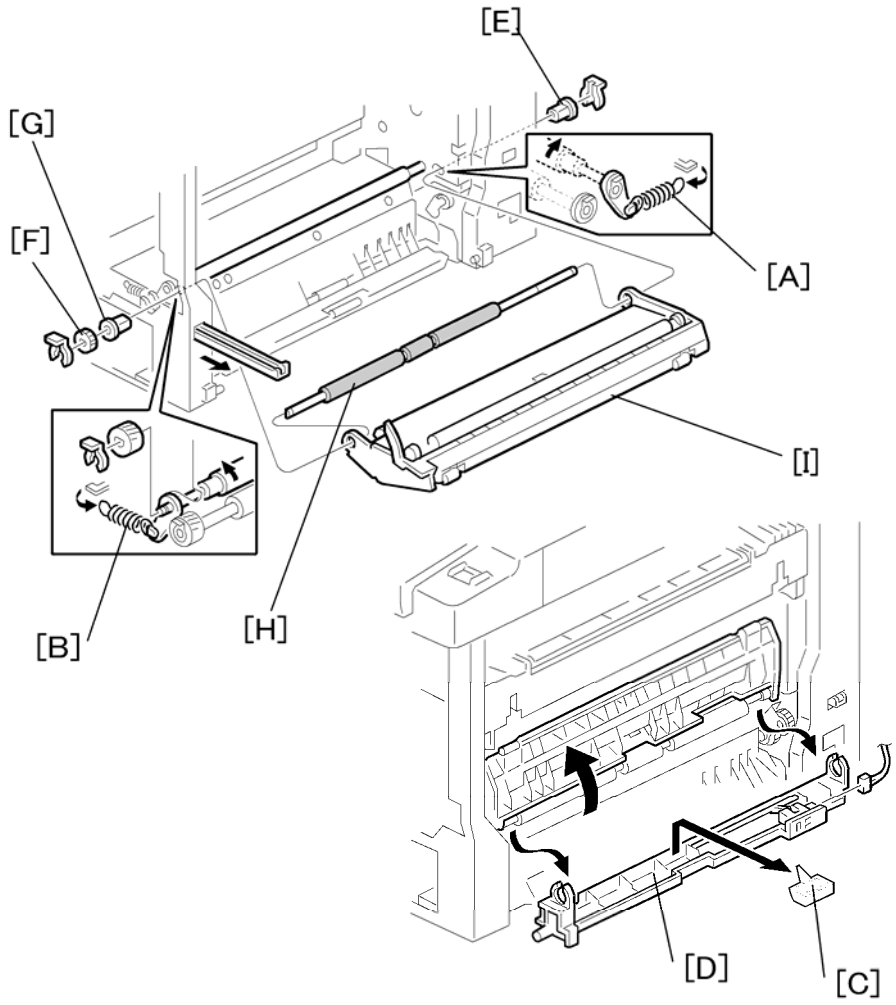
1. By-pass tray

Note

- If you have a support to keep the by-pass tray within the reach of the connector cable, you do not need to disconnect the connector. When you do so, use caution not to place too much load on the cable.

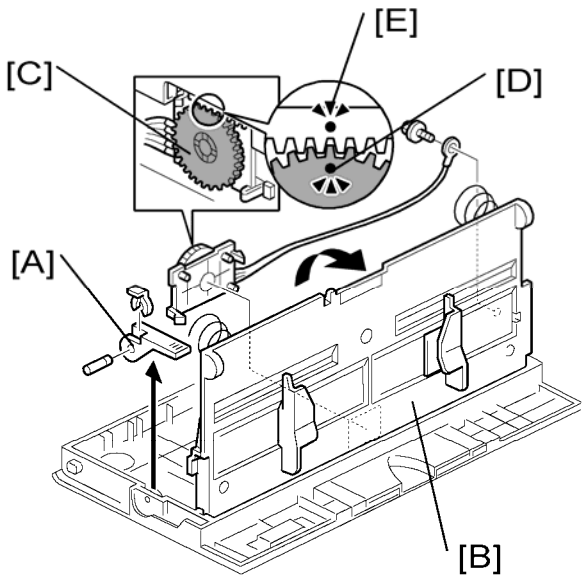
2. Sensor holder [A]
3. By-pass paper end sensor [B] (x 1)
4. By-pass feed roller [C]

4.7.6 REGISTRATION ROLLER



1. PCU
2. Front cover
3. Right door
4. Rear cover
5. High-voltage power supply
6. Registration clutch
7. Unhook the springs [A] and [B] at the rear and front sides.
8. Guide support [C] and guide [D] (x 1, x 1)
9. Bushing [E] (x 1)
10. Gear [F] and bushing [G] (x 1)
11. Registration roller [H] with the image transfer unit [I]

4.7.7 BY-PASS PAPER SIZE SWITCH

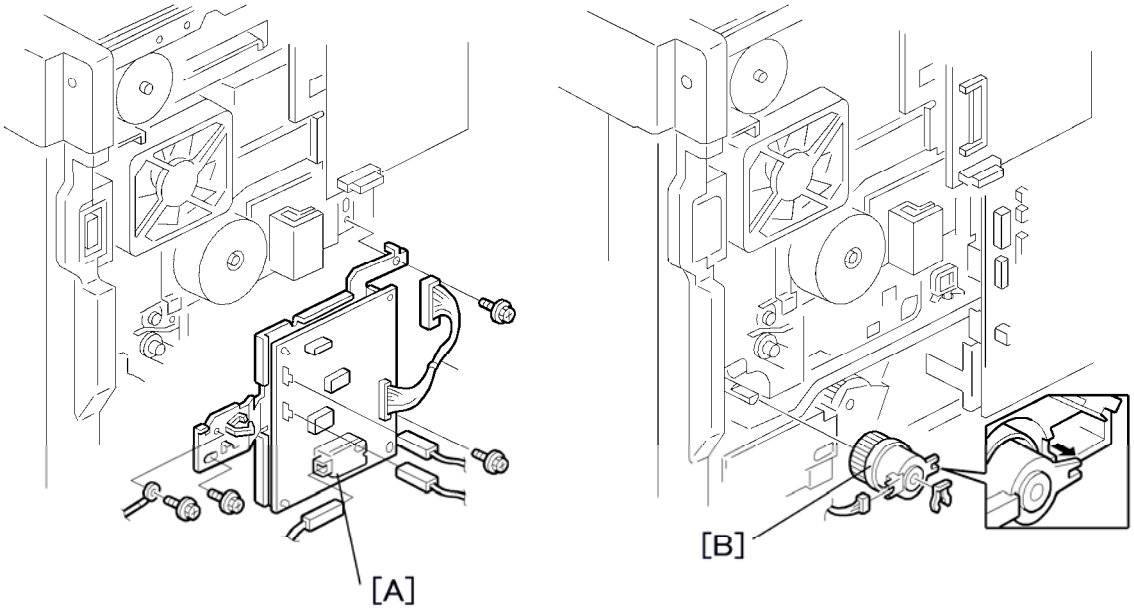


1. By-pass tray
2. Tray lever [A] (x 1, 1 pin)
3. Lift the upper tray [B]
4. By-pass paper size switch [C] (x 1)

Note

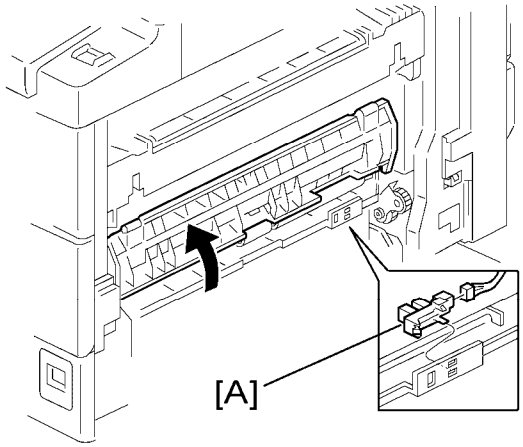
- When reinstalling the switch: Move the paper guides to their middle position (about halfway between fully open and fully closed), and install the round gear so that the hole in the gear [D] aligns with the peg [E] on the sliding gear.

4.7.8 REGISTRATION CLUTCH



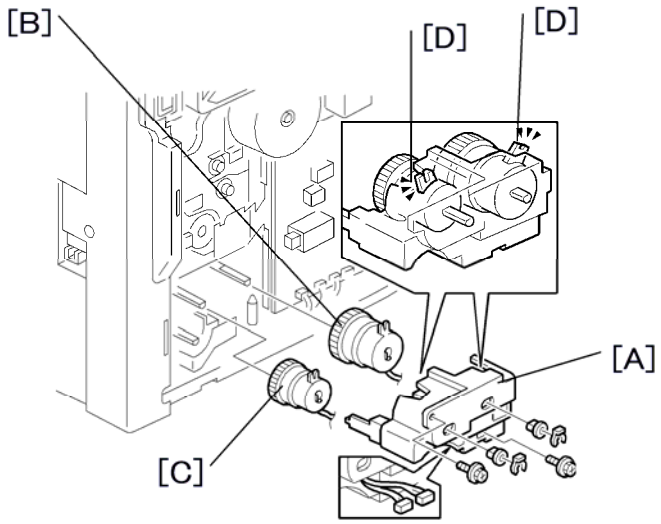
1. Rear cover
2. High-voltage power supply board (with the bracket) [A] (x 4, all connectors)
3. Registration clutch [B] (x 1, x 1)

4.7.9 REGISTRATION SENSOR



1. Open the right door.
2. Registration sensor [A] (x 1)

4.7.10 PAPER FEED CLUTCH AND BY-PASS FEED CLUTCH

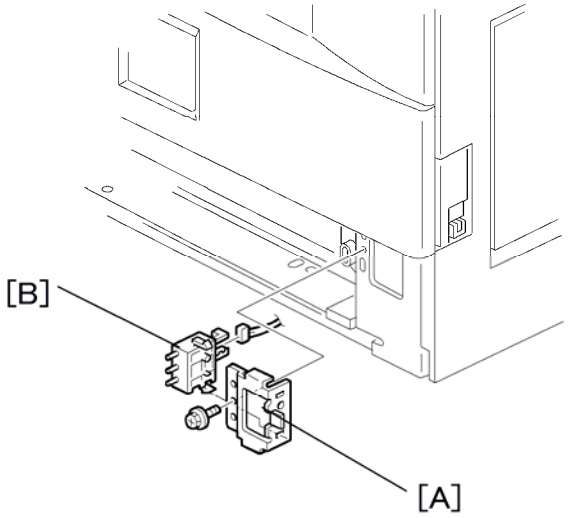


1. Rear cover
2. High-voltage power supply board
3. Clutch cover [A] (x 2, 2 bushings, x 2)
4. Paper feed clutch [B] (x 1)
5. By-pass feed clutch [C] (x 1)

Note

- Make sure that the rotation-prevention tabs [D] on the clutches fit correctly into the corresponding openings on the clutch cover when you reinstall.

4.7.11 PAPER SIZE SWITCH



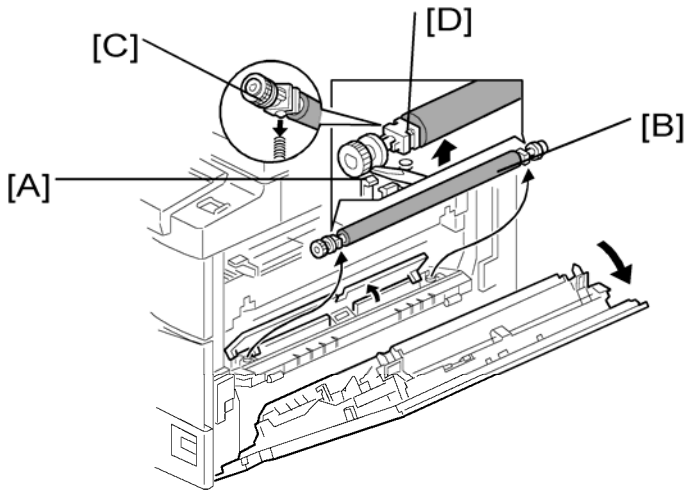
1. Paper cassette
2. Switch cover [A] (x 1)
3. Paper size switch [B] (x 1)

4.8 IMAGE TRANSFER

4.8.1 IMAGE TRANSFER ROLLER

CAUTION

- Do not touch the transfer roller surface with bare hands

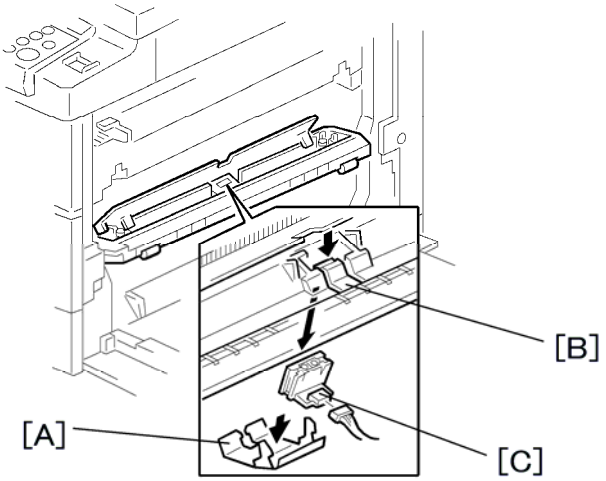


1. Open the right door.
2. Lift the plastic holders [A] with the image transfer roller [B].

Note

- Leave the springs under the holders. Make sure that the pegs [C] on the holders [D] engage with the springs when you reassemble.

4.8.2 IMAGE DENSITY SENSOR



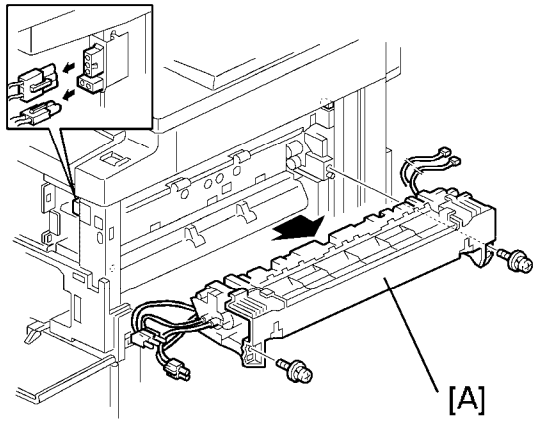
1. Open the right door.
2. Plastic cover [A]
3. Image transfer roller (☛ p.4-43)
4. Push down on the notch [B] to free the sensor.
5. Image density sensor [C] (x 1)

4.9 FUSING

4.9.1 FUSING UNIT

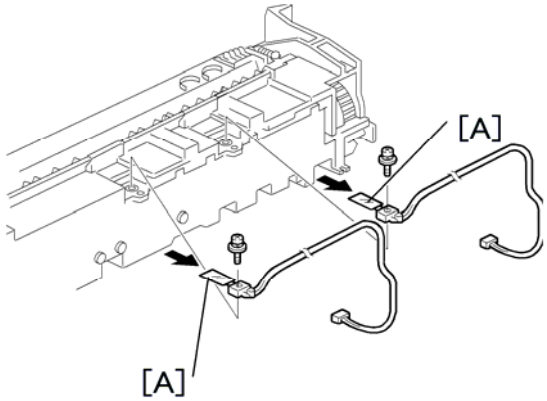
⚠CAUTION

- The fusing unit can become very hot. Make sure that it has cooled down sufficiently before you handle it.



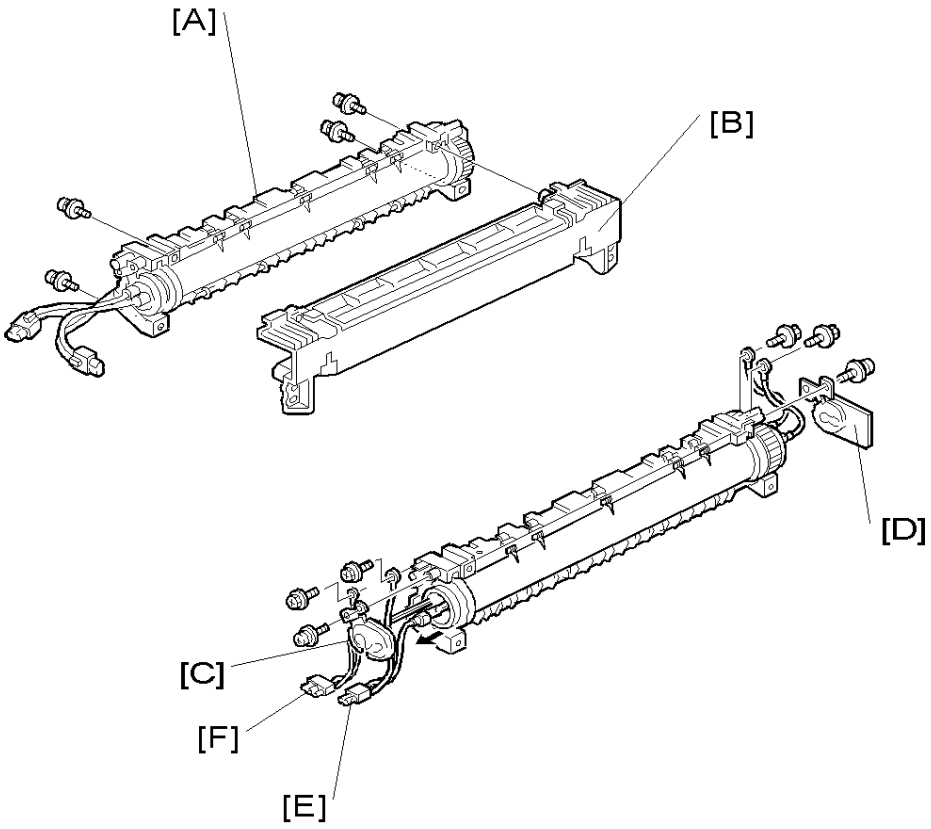
1. Turn off the main switch, and unplug the machine.
2. Front right cover
3. Open the right door.
4. Fusing unit [A] (x 2, x 4)

4.9.2 THERMISTOR



1. Fusing unit (see above)
2. Thermistors [A] (x 1, x 1)

4.9.3 FUSING LAMPS

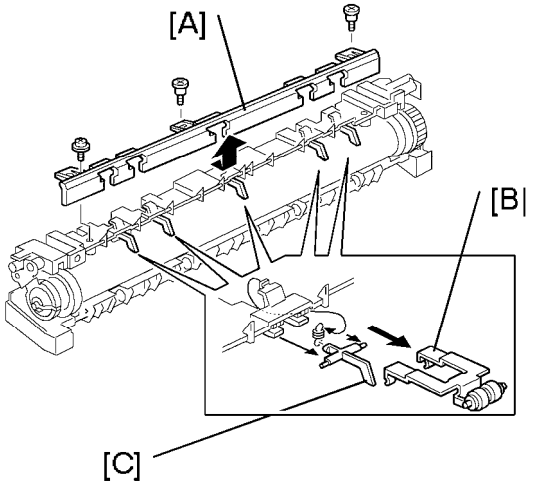


1. Fusing unit
2. Separate the hot roller section [A] from the pressure roller section [B] (x 4).
3. Front holding plate [C] (x 1)
4. Rear holding plate [D] (x 1)
5. Fusing lamp with the connector (600W) [E] (x 2)
6. Fusing lamp with the connector (550W) [F] (x 2)

Note

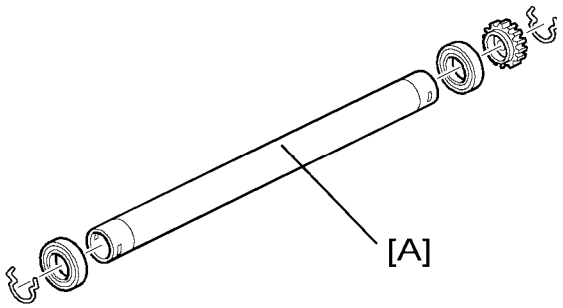
- Check that the front ends of the two lamps fit in the front holding plate when you reassemble. They do not fit in there if you arrange the two lamps incorrectly.

4.9.4 HOT ROLLER STRIPPER PAWLS



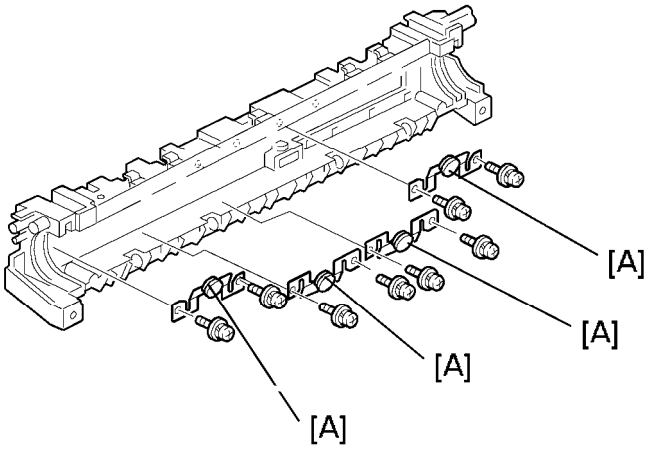
1. Hot roller section (See above)
2. Roller guard [A] (x 3)
3. Metal holders [B] (1 holder for each)
4. Hot roller stripper pawls [C] (1 spring for each)

4.9.5 HOT ROLLER



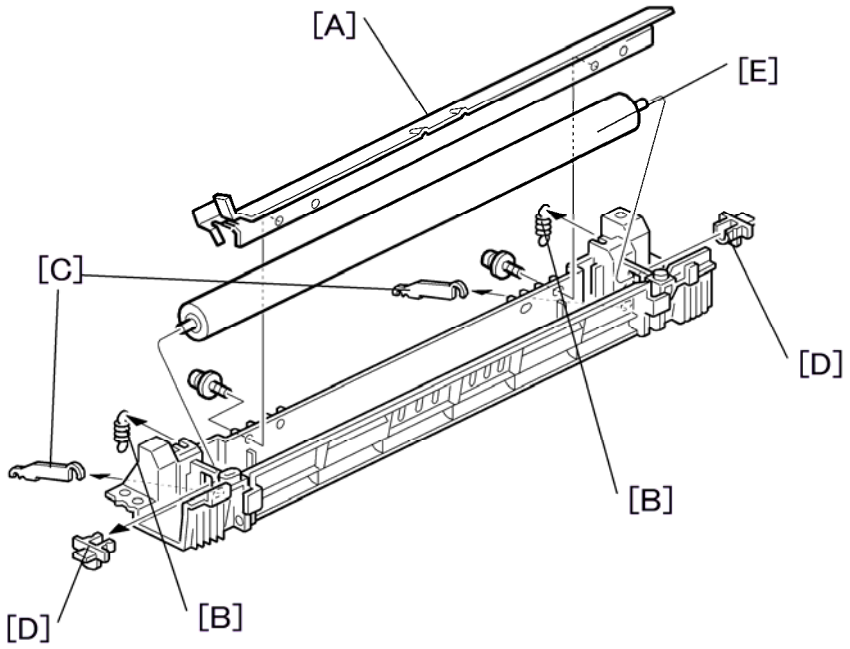
1. Hot roller stripper pawls (See above)
2. Hot roller [A] (2 C-rings, 1 gear, 2 bearings)

4.9.6 THERMOSTAT



1. Hot roller (See above)
2. Thermostat [A] (x 2 for each)

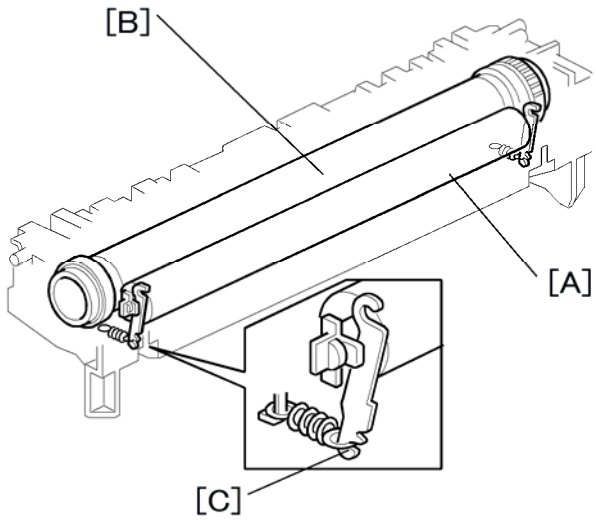
4.9.7 PRESSURE ROLLER AND BUSHINGS



1. Separate the hot roller section from the pressure roller section (☛ p.4-46 "Fusing Lamps").
2. Fusing entrance guide [A] (x 2)
3. 2 springs [B]
4. 2 pressure arms [C]
5. 2 Bushings [D]
6. Pressure roller [E]

4.9.8 NIP BAND WIDTH ADJUSTMENT

Do this adjustment when the fusing unit is at its operating temperature. The size of the OHP sheet must be A4/LT LEF. Any other sizes may cause a paper jam.



1. Pressure roller
2. Hot roller

1. Place an OHP sheet on the by-pass feed table.
2. Enter SP mode, and run SP 1109.
3. Press '1' (Yes)
4. Press ⊙ twice. The machine feeds the OHP sheet into the fusing section, stops it there for 20 seconds, then ejects it to the copy tray.
5. Press the ⊙ key.
6. Quit the SP mode.
7. Check that the nip band (the opaque stripe) across the ejected OHP sheet is symmetrical, with both ends slightly thicker than the center.

Note

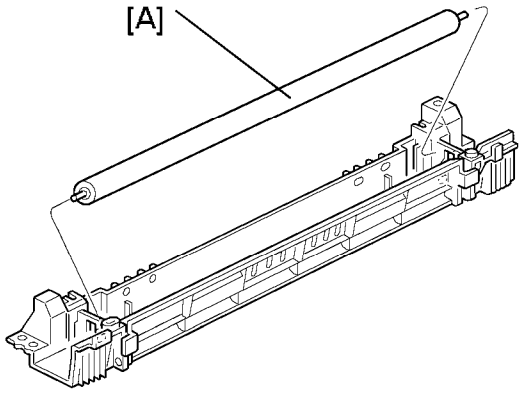
- There is no standard value for the nip band on this machine. Make the adjustment based on the band's appearance.

8. If the band is not as described above, change the position of the spring hooks [C] (one on each side), and then check the band again.

Note

- The higher hook position produces greater tension.

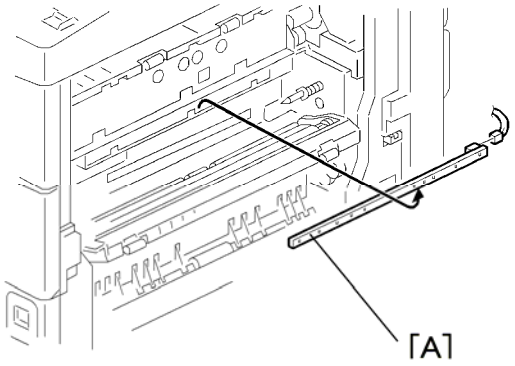
4.9.9 CLEANING ROLLER



1. Pressure roller and bushings (☛ p.4-49)
2. Cleaning roller [A]

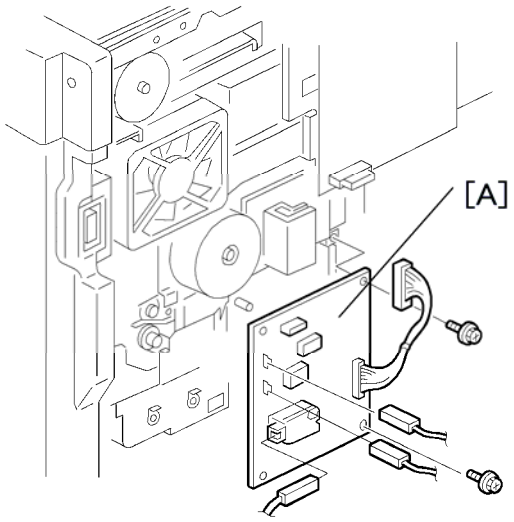
4.10 OTHER REPLACEMENTS

4.10.1 QUENCHING LAMP



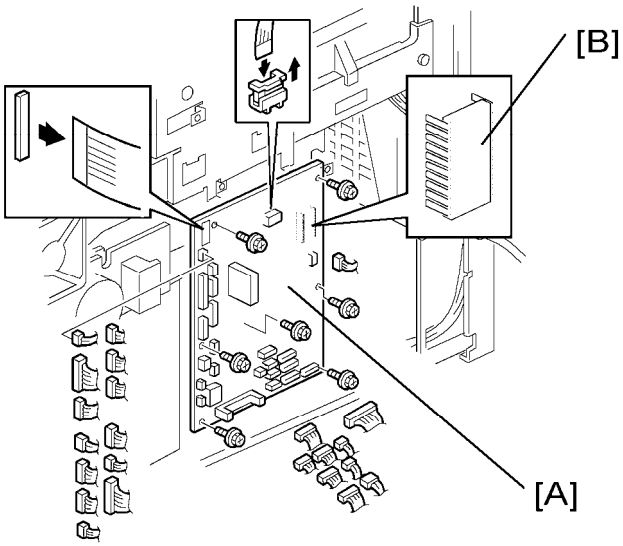
1. PCU
2. Quenching lamp [A] (x 1)

4.10.2 HIGH-VOLTAGE POWER SUPPLY BOARD



1. Rear cover
2. High-voltage power supply board [A] (x 2, 3 standoffs, all connectors)

4.10.3 BICU (BASE-ENGINE IMAGE CONTROL UNIT)

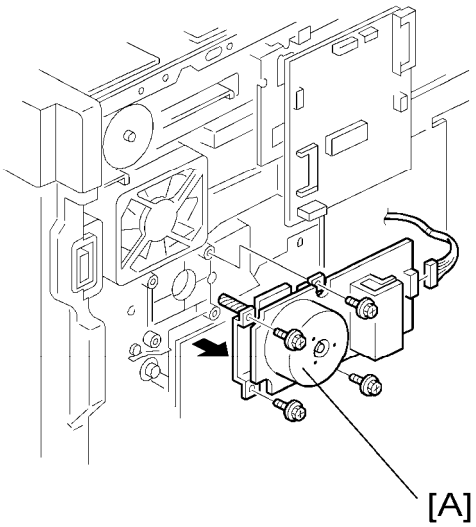


1. Rear cover
2. BICU [A] (x 7, all connectors, 2 flat cables)

Note

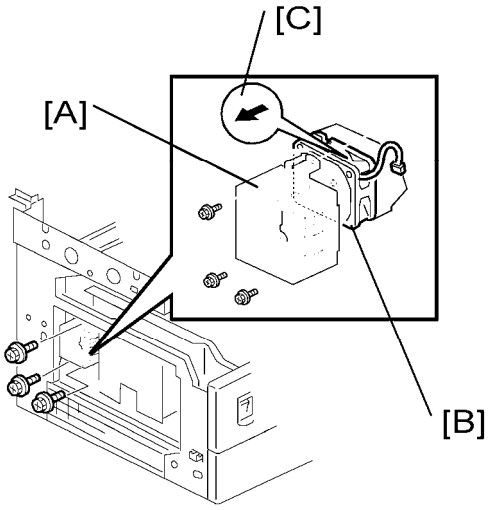
- Remove the NVRAM [B] from the old BICU and install it on the new BICU when you replace the BICU. The NVRAM keeps machine-specific data.

4.10.4 MAIN MOTOR



1. Rear cover
2. Main motor [A] (x 4, x 1)

4.10.5 LEFT EXHAUST FAN

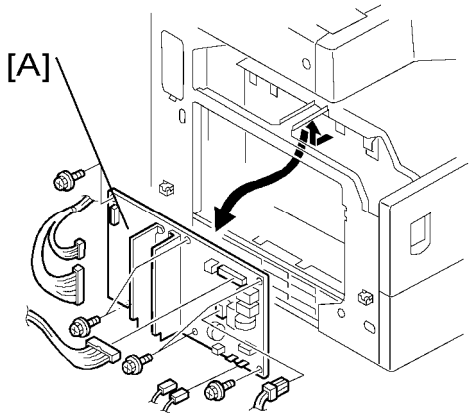


1. Rear cover
2. Left cover
3. Fan cover [A] (x 3)
4. Fan [B] (x 3, x 1)

Important

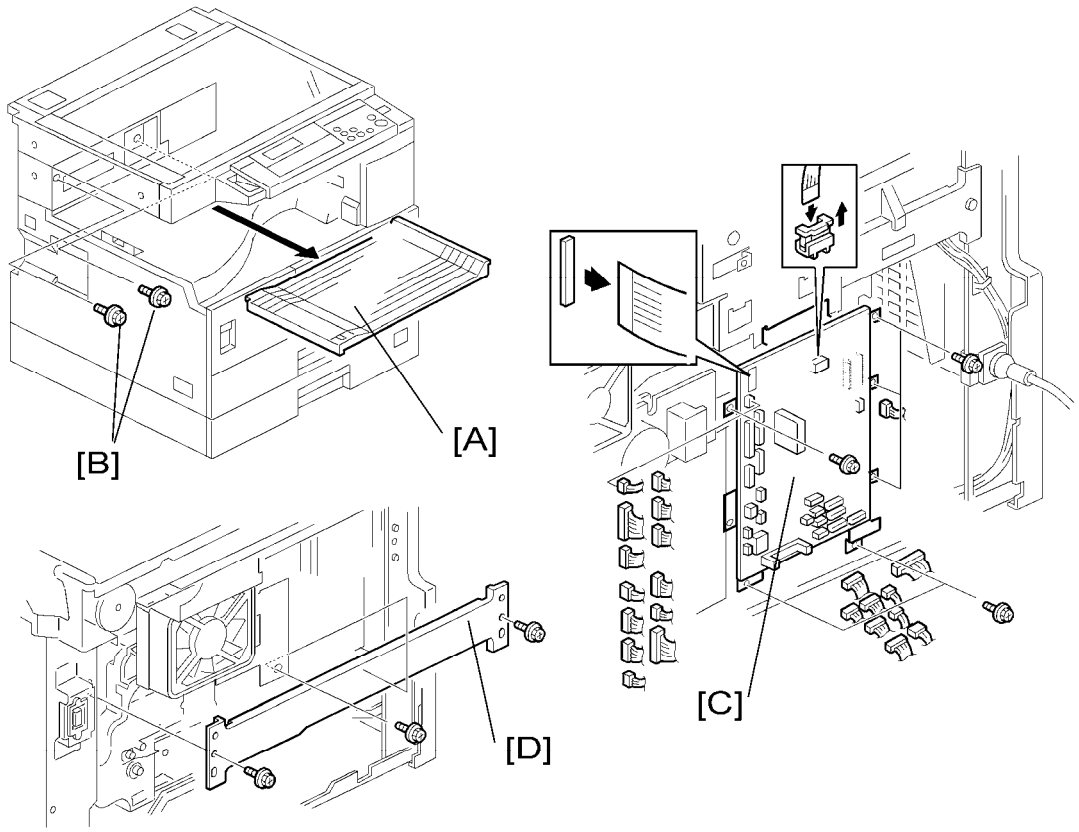
- Make sure that the arrow on the fan [C] points the outside of the copier when you reassemble. The arrow indicates the direction of the air current.

4.10.6 PSU (POWER SUPPLY UNIT)



1. Left cover
2. PSU [A] (All connectors, x 6)

4.10.7 GEARBOX



- Replacement Procedure -

1. Inverter tray [A]
2. Two screws [B] from the middle rear cover

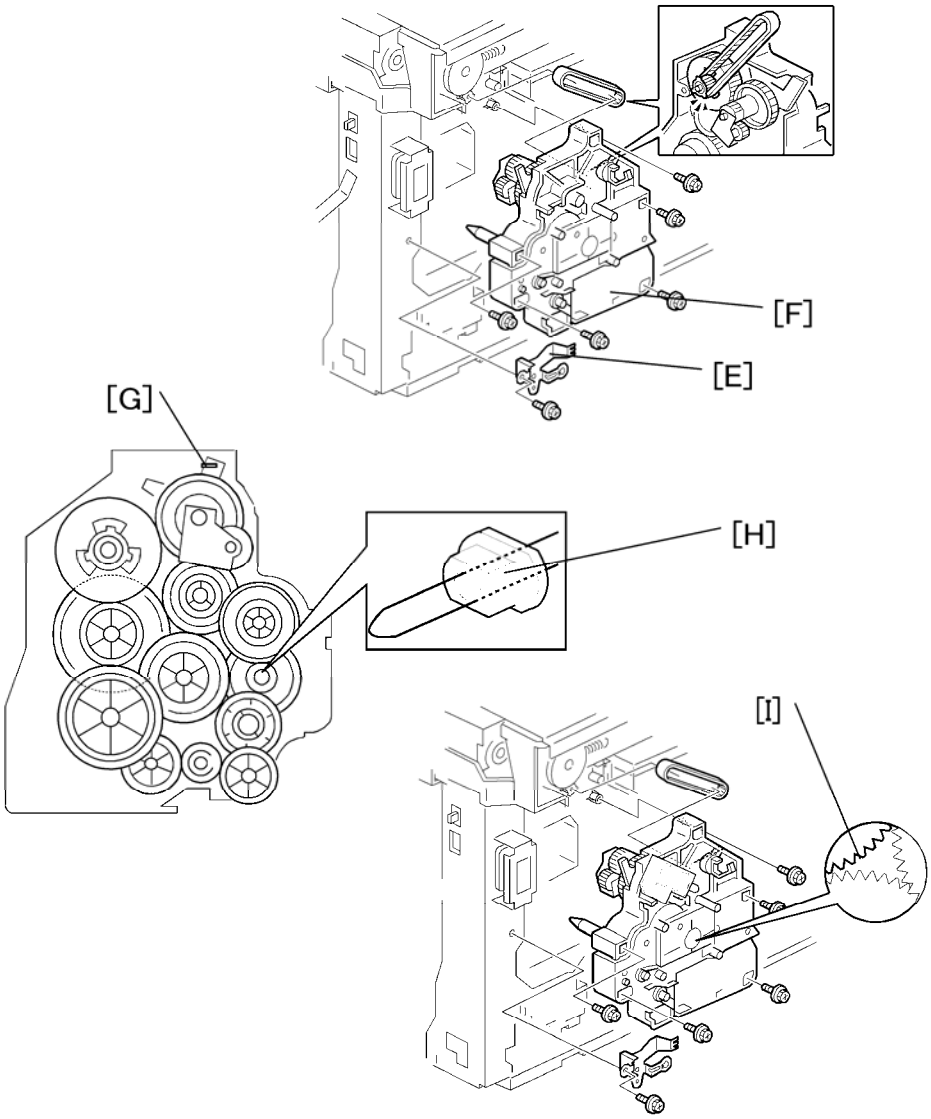
   Note

   - This step releases the topmost part of the BICU bracket.
3. High-voltage power supply board (with the bracket) (☛ p.4-40)
4. BICU (with the bracket) [C] (x 6)

   Note

   - If you have difficulty to remove the bracket, remove the screw at the middle of the crosspiece (see step 6).
5. Main motor
6. Crosspiece [D] (x 3)
7. Registration clutch

Other Replacements



8. PCU

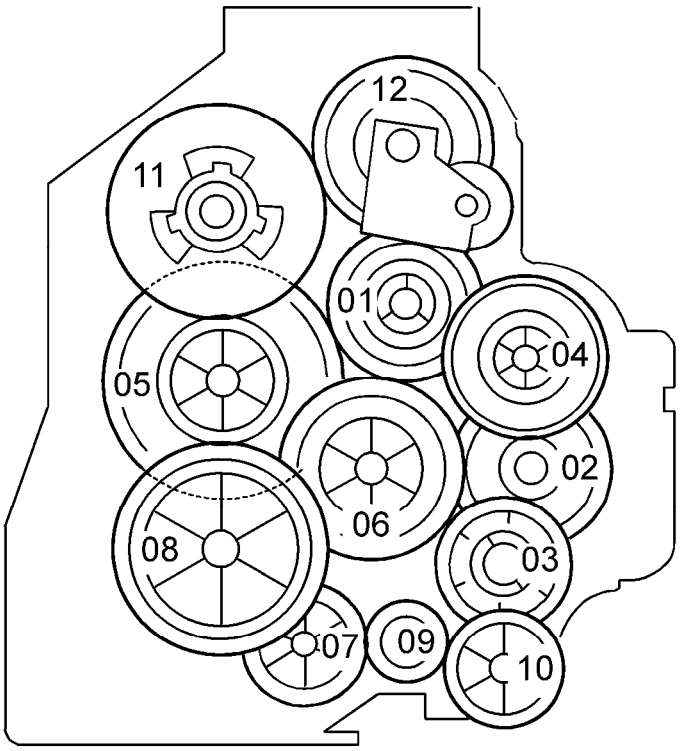
Note

- This step releases the gear (on the gearbox) that drives the PCU.

9. Ground plate [E] (x 2)
10. Gearbox [F] (x 5, 1 belt)

Do not change the position of the spring [G] and make sure that the bushing [H] on the PCU drive shaft is in the correct position you when you reassemble. You can adjust its position by rotating the gear [I] seen from the opening of the gearbox.

- Gear Arrangement in the Gearbox -



The gears are numbered 1 to 12 in the order in which they are to be installed in the gearbox. These numbers show both on the gearbox and on the front (exposed) surface of each gear. If the gears fall out, start by finding gear number 1 and installing it onto location number 1 (setting it into place so that the side with the printed number stays visible). Then install the remaining gears (2 to 12) in the same way.

4.11 COPY ADJUSTMENTS PRINTING/SCANNING

Note

- You need to perform the adjustment after you do a Memory All Clear, and after you replace or adjust any of the following parts.
- First or second scanner
- Lens Block
- Scanner Motor
- Polygonal Mirror Motor
- Paper Tray
- Paper Side Fence
- For detailed explanations about how to access and use the SP modes, see Section 5.

4.11.1 PRINTING

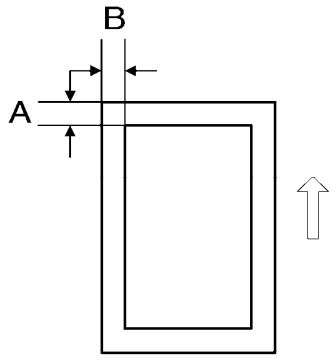
Note

- Make sure the paper is installed correctly in each paper tray before you start these adjustments.
- Use the Trimming Area Pattern (SP 5902, No.10) to print the test pattern for the printing adjustments below.
- Set SP 5902 to 0 again after you complete these printing adjustments.

- Registration - Leading Edge/Side-to-Side -

1. Check the leading edge registration for each paper feed station, and adjust each of these registrations using SP 1001.
2. Check the side-to-side registration for each paper feed station, and adjust these registrations using SP 1002.

Tray	SP mode	Specification
All Trays	SP 1001 1	2 ± 1.5 mm
By-pass feed	SP 1001 2	
1st tray	SP 1002 1	
By-pass feed	SP 1002 5	



A: Leading Edge Registration

B: Side-to-side Registration

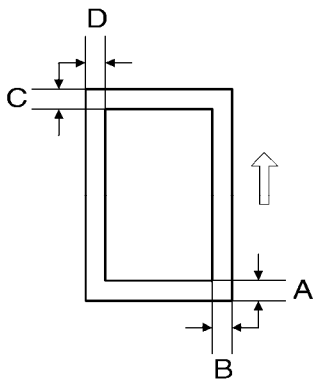
- Blank Margin -

Note

- If the leading edge or side-to-side registration cannot be adjusted to within the specification, then adjust the leading-edge blank margin or the left-side blank margin.

1. Check the trailing edge and right side edge blank margins, and adjust them using the following SP modes.

	SP mode	Specification
Trailing edge	SP 2101 2	2 +2.5/–1.5 mm
Right edge	SP 2101 4	
Leading edge	SP 2101 1	2 ± 1.5 mm
Left edge	SP 2101 3	



A: Trailing Edge Blank Margin

B: Right Edge Blank Margin

C: Leading Edge Blank Margin

D: Left Edge Blank Margin

- Main Scan Magnification -

1. Print the single-dot grid pattern (SP 5902 1).
2. Check the magnification (the grid size should be 2.7 x 2.7 mm), and if necessary use SP 2998 to adjust it. The specification is 100 ± 1%.

4.11.2 SCANNING

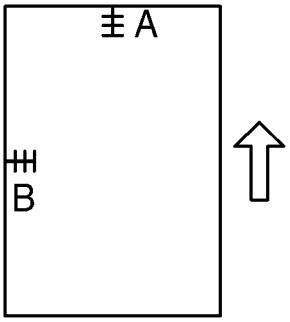
Note

- Before doing the following scanner adjustments, check and adjust the printing leading-edge and side-to-side registrations and the printing blank margins (as described above).
- Use an A3 test chart to perform the following adjustments.

- Registration: Platen Mode -

1. Place the test chart on the exposure glass and make a copy from one of the feed stations.
2. Check the leading edge and side-to-side registration, and adjust as necessary with the following SP modes.

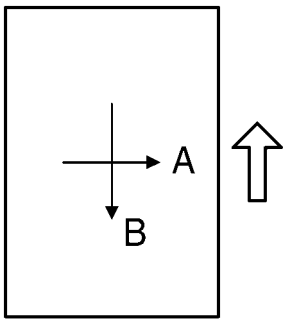
	SP mode	Specification
Leading edge	SP 4010	2 ± 1.5 mm
Side-to-side	SP 4011	



A: Leading edge registration

B: Side-to-side registration

- Magnification -



A: Main scan magnification

B: Sub-scan magnification

- Main Scan Magnification -

1. Place the A3 test chart on the exposure glass and make a copy from one of the feed stations.
2. Check the magnification ratio. If necessary, adjust the magnification using the following SP mode.

	SP mode	Specification
Main Scan Magnification	SP 4009	± 1.0%

- Sub-Scan Magnification -

1. Place the OS-A3 test chart on the exposure glass and make a copy from one of the feed stations.
2. Check the magnification ratio. If necessary, adjust the magnification with the following SP mode.

	SP mode	Specification
Sub-scan magnification	SP 4008	± 1.0%

- Standard White Density Adjustment -

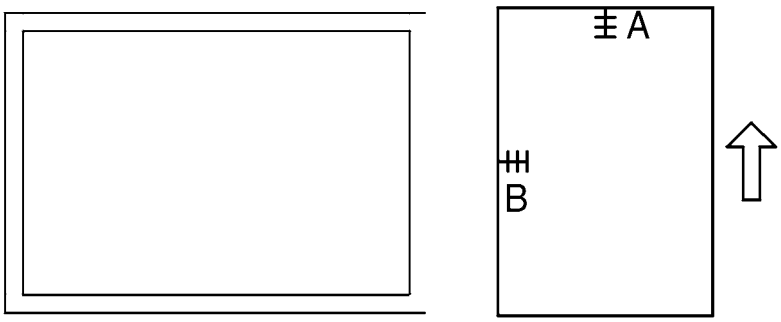
This procedure adjusts the standard white density level. Do this adjustment after you do any of the following:

- After you replace the standard white plate.
- After you replace the NVRAM on the BICU. (But note that you do not need to carry out this adjustment if you have replaced the BICU itself but retained the previous NVRAM board [by moving it over onto the new BICU].)
- After you perform a memory all clear (SP 5801 2)

Procedure:

1. Place 10 sheets of new A4/LTR paper (sideways, LEF) or new A3/DLT paper on the exposure glass, and close the platen cover or the ADF.
2. Enter SP 4428 1 and select "1: YES". The machine automatically adjusts the standard white density.

4.11.3 ADF IMAGE ADJUSTMENT



A: Leading edge registration

B: Side-to-side registration

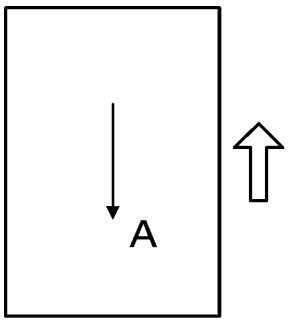
Note

- Make a temporary test chart as shown above, using A3/11" x 17" paper.

1. Place the temporary test chart on the ADF and make a copy from one of the feed stations.
2. Check the registrations, and adjust as necessary with the appropriate SP modes, as follows.

	SP mode
Side-to-side registration	SP 6006 1
Leading edge registration	SP 6006 2
Blank margin for the trailing edge	SP 6006 3

- Sub-scan Magnification -



A: Sub-scan magnification

Note

- Make a temporary test chart as shown above, with A3/11" x 17" paper.

Place the temporary test chart on the ADF and make a copy from one of the feed stations. Check the registration, and if necessary adjust it with SP 6006 5. The specification is ±1.0%.

SERVICE TABLES

REVISION HISTORY		
Page	**Date**	**Added/Updated/New**
		None

5. SERVICE TABLES

5.1 SERVICE PROGRAM MODE

Note

- Do not let the user access the SP mode. Only service representatives are allowed to access the SP mode. The machine quality or its operation is NOT guaranteed if persons other than service representatives accesses the SP mode.

5.1.1 SP TABLES

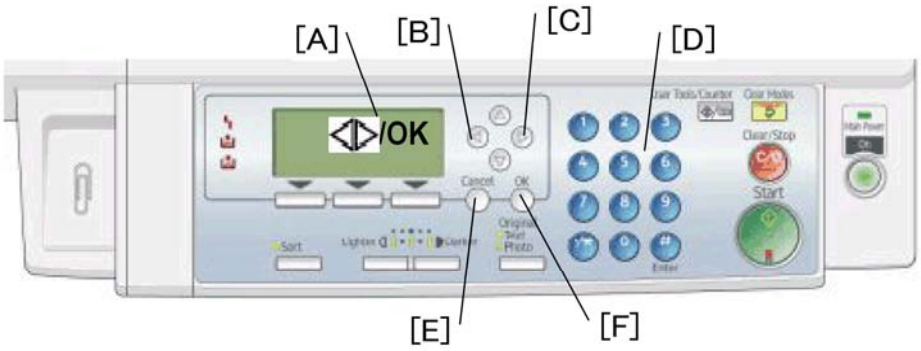
See "Appendices" for the following information:

- System SP Tables

5.1.2 HOW TO ENTER THE SP MODE

The following two modes are available:

- SP Mode (Service Program Mode): The SP Mode includes the programs that are necessary for standard maintenance work.



Starting SP Mode

Selecting Programs

- When a blinking underscore (or several blinking underscores) shows, you can type a number from the numeric keypad [D].
- When the sign "◄►/OK" [A] shows in the upper right corner, you can scroll through the menu by pressing the left-arrow key [B] or the right-arrow key [C]. To select a program, press the "OK" key [F].

Specifying Values

- After locating a program, press the "OK" key. A blinking underscore (or several blinking underscores) indicates which value you can change. The value in parentheses is the default value of the menu.
- Type a necessary value from the numeric keypad. To switch between positive (plus) and negative (minus) values, press the [./*] (period/asterisk) key.
- To validate the value, press the "OK" key. To cancel the value, press the cancel key [E].

Activating Copy Mode

You can activate the copy mode while the SP mode is running. When you do so, the copier outputs images or patterns that help you adjust the SP-mode program.

- Press the key. The copy mode is activated.
- Specify copy settings and press the "OK" key.
- To return to the SP mode, press the key.

Note

- You cannot end the SP mode while the copy mode is activated.

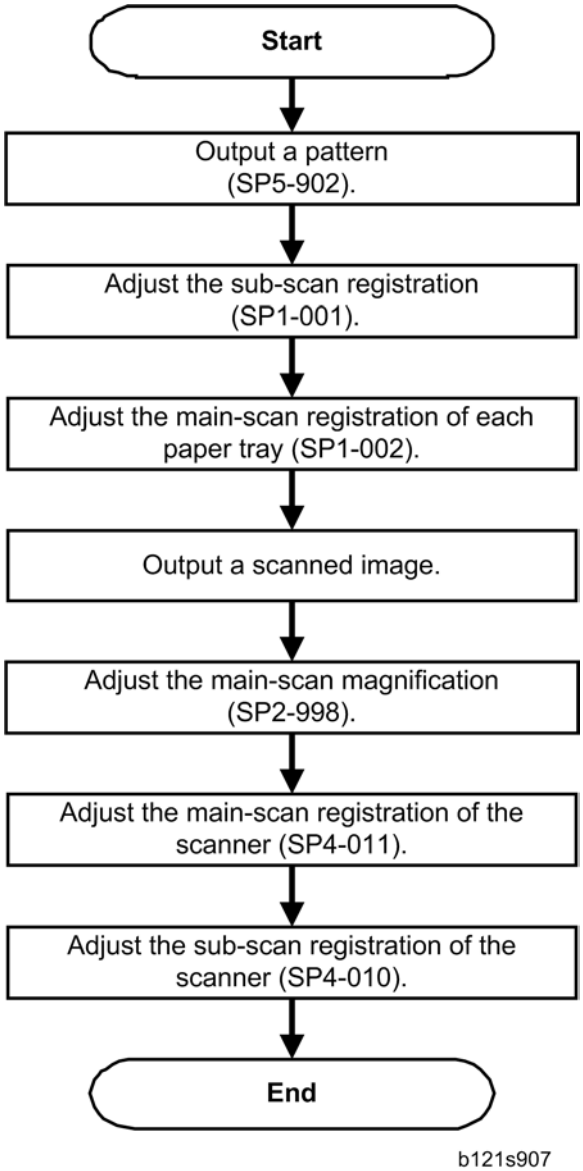
Quitting Programs/Ending (S)SP Mode

Press the key or the "Cancel" key to quit the program. You can end the SP mode by pressing one of these keys several times.

5.2 USING SP MODES

5.2.1 ADJUSTING REGISTRATION AND MAGNIFICATION

To adjust the registration and magnification, you need to use several service programs. The chart shows an example of the procedure to adjust the machine in the basic configuration.



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5.2.2 ID SENSOR ERROR ANALYSIS (SP 2221)

The image quality may become very bad when the ID sensor does not operate properly. However, there is no such SC code that indicates ID-sensor malfunction; instead, SP 2221 shows you some information on the ID sensor. Check this information when the image quality is not very good.

The table lists the information shown with SP 2221 (ID Sensor Error Analysis).

SP	Error condition	Possible cause	Remarks
SP 2221 1 Vsg (VG in the display)	Vsg < 2.5V or (Vsg – Vsp) < 1.00V	ID sensor defective ID sensor dirty Drum not charged	
SP 2221 2 Vsp (VP in the display)	Vsp > 2.5V or (Vsg – Vsp) < 1.00V	Toner density very low ID sensor pattern not created	
SP 2221 3 Power (PW in the display)	Vsg < 3.5V when maximum power (979) is applied	ID sensor defective ID sensor dirty Drum not get charged	Power source for the ID-sensor light
SP 2221 4 Vsdp	No Error Conditions		
SP 2221 5 Vt	Vt > 4.5V or Vt < 0.2V	TD sensor defective	
SP 2221 6 Vts			

5.2.3 MEMORY CLEAR

This machine stores all the data in the NVRAM on the BICU. The data is cleared by SP 5801 2 (see exceptions)

002	Main Motor Reverse
003	Quenching Lamp

Data	NVRAM	Cleared by	Remarks
All data	BICU	SP 5801 2	

- Exceptions -

SP 5801 2 clears most of the settings and counters stored in the NVRAM on the BICU (the values return to their default values). However, the following settings are not cleared:

- SP 5807 (Area Selection)
- SP 5811 1 (Serial Num Input [Code Set])
- SP 5811 3 (Serial Num Input [ID2 Code Display])
- SP 5812 1 (Service TEL [Telephone])
- SP 5812 2 (Service TEL [Facsimile])
- SP 5907 (Plug & Play: Not used in this model)
- SP 7 (Data Log)
- SP 8 (History)

Use SP 5802 2 (basic machine) after you have replaced the BICU NVRAM or when the BICU NVRAM data is corrupted. When the program ends normally, the message "Completed" shows.

- With Flash Memory Card

1. Upload the NVRAM data to a flash memory card (☛ NVRAM Data Upload/Download (SP 5824/5825)).
2. Print out all SMC data lists (☛ SMC Print (SP 5990)).

   Note

   - Be sure to print out all the lists. You have to manually change the SP settings if the NVRAM data upload ends abnormally.
3. Select SP 5801 2.
4. Press the OK key.

5. Select "Execute." The messages "Execute?" followed by "Cancel" and "Execute" shows.
6. Select "Execute."
7. When the program has ended normally, the message "Completed" shows. If the program has ended abnormally, an error message shows.
8. Press the cancel key.
9. Turn the main switch off and on.
10. Download the NVRAM data from a flash memory card (☛ NVRAM Data Upload/Download (SP 5824/5825))

- Without Flash Memory Card -

1. Print out all SMC data lists (☛ SMC Print (SP 5990)).
2. Select SP 5-801.
3. Press the OK key.
4. Select "Execute." The messages "Execute?" followed by "Cancel" and "Execute" show.
5. Select "Execute."
6. When the program has ended normally, the message "Completed" is displayed. If the program has ended abnormally, an error message shows.
7. Turn the main switch off and on.
8. Adjust the printer and scanner registration and magnification (☛ p.4-58 "Copy Adjustments Printing/Scanning").
9. Refer to the SMC lists, and enter any values that differ from the factory settings. Double-check the values for SP 4901.
10. Adjust the standard white level (SP 4428).
11. Initialize the TD sensor (SP 2214).
12. Check the copy quality and the paper path.

5.2.4 INPUT CHECK (SP 5803)

- Conducting an Input Check -

1. Select SP 5803.
2. Select the number (see the table below) corresponding to the component.
3. Select "Execute." The copy mode is activated.
4. The sign "01H" or "00H" show (see the table below).

- Input Check Table -

Num.	Sensor/Switch	01H	00H
001	Safety SW	Open	Closed
002	Safety SW-LD 5V	Open	Closed
003	Right Cover SW	Open	Closed
004	Right Low Cover SW	Open	Closed
005	Tray Cover SW	Open	Closed
006	Upper Relay S	Paper detected	Not detected
007	Lower Relay S	Paper detected	Not detected
008	Vertical Trans S	Paper detected	Not detected
009	Registration Sensor	Paper detected	Not detected
010	Exit Sensor	Paper detected	Not detected
011	Duplex Inverter S	Paper detected	Not detected
012	Duplex Entrance S	Paper detected	Not detected
013	Duplex Exit S	Paper detected	Not detected
014	By-pass PE S	Paper detected	Not detected
015	By-pass P Size S	*1	
016	Upper PE S	Paper detected	Not detected

Num.	Sensor/Switch	01H	00H
017	Lower PE S	Paper detected	Not detected
018	Upper P Size SW	*1	
019	Lower P Size SW	*1	
020	BK-Upper Paper End S	Paper detected	Not detected
021	BK-Lower Paper End S	Paper detected	Not detected
022	BK-Up P Size SW	*1	
023	BK-Low P Size SW	*1	
024	BK-Up P Height S	*2	
025	BK-Low P Height S	*2	
026	BK-Upper Lift S	At upper limit	Not at upper limit
028	BK type	*3	
030	Duplex Installed	Installed	Not installed
031	Lower Lift S	At upper limit	Not at upper limit
032	Main M Lock	Locked	Not locked
033	Polygon M Lock	Locked	Not locked
034	BK-Lift M Lock	Locked	Not locked
035	Total CO Install	Installed	Not installed
036	Key CO Install	Installed	Not installed
037	L-Synchronization	Detected	Not detected
038	DF-Position S	Detected	Not detected
039	DF-Cover Open S	Detected	Not detected
040	DF-Original Set S	Detected	Not detected

Num.	Sensor/Switch	01H	00H
041	DF-Registration S	Detected	Not detected
042	DF-Exit S	Detected	Not detected
043	DF-Trailing S	Detected	Not detected
044	DF-Reverse S	Detected	Not detected
045	Platen Cover S	Open	Closed
046	1 bin Installed	Installed	Not installed
047	1 bin Exit S	Paper detected	Not detected
048	1 bin Paper S	Paper detected	Not detected
049	1 bin Tray S	Open	Closed
050	Fan Motor Lock	High speed	Not high speed
051	2 Tray BK Install	Installed	Not installed
053	HP Sensor	Detected	Not detected
054	Duplex Fan M Lock	Locked	Not locked

Note

- *1 Paper Size

Copier	00	01	02	03	04	05	06	07
Europe	Not set	A4 LEF	8Hx13 SEF	A4 SEF	A5 LEF	LT LEF	--	A3 SEF
North America	Not set	A4 LEF	8Hx13 SEF	LT SEF	LG SEF	LT LEF	--	DLT SEF
China	Not set	A4 LEF	B5 LEF	A4 SEF	A5 LEF	B4 SEF	--	A3 SEF

Paper Feed Unit	00	01	03	04	05	0A	0C	0E	0F
Europe	Not set	LT SEF	LG SEF	A4 LEF	--	DLT SEF	A4 SEF	LT LEF	A3 SEF
North America	Not set	LT SEF	LG SEF	A4 LEF	--	DLT SEF	A4 SEF	LT LEF	A3 SEF
China	Not set	LT SEF	LG SEF	A4 LEF	--	DLT SEF	A4 SEF	LT LEF	A3 SEF

By-Pass Tray	04	0C	08	00	01	03	02	06	
Europe	A5 SEF	A5 SEF	A5 SEF	A5 SEF	8x13 SEF	A4 SEF	A3 SEF	A3 SEF	
North America	HLT SEF	HLT SEF	HLT SEF	HLT SEF	HLT SEF	LG SEF	DLT SEF	DLT SEF	
China	B6 SEF	B6 SEF	A5 SEF	A5 SEF	B5 SEF	A4 SEF	B4 SEF	A3 SEF	

- *2 Paper Amount -

10	Near end
11	About 25%
00	About 75%
00	About 100%

- *3 Available Paper Feed Unit -

00	None
20	2-tray paper feed unit
30	1-tray paper feed unit

5.2.5 OUTPUT CHECK (SP 5804)

- Conducting an Output Check –

Note

- To prevent mechanical or electrical damage, do not keep an electrical component on for a long time.

1. Select SP 5804.
2. Select the number (see the table below) corresponding to the component.
3. Select "ON."
4. To stop the operation, select "OFF."

- Output Check Table -

Number 005, 006, 040, and 041 may not respond when the fusing temperature is high.

Num.	Component
001	Main Motor Forward
002	Main Motor Reverse
003	Quenching Lamp
004	Toner Supply Motor Forward
005	Fan Motor High
006	Fan Motor Low
007	Registration Clutch
008	By-pass Feed Clutch
009	Upper Feed Clutch
010	Lower Feed Clutch
011	BK-Low Lift Motor Up
012	BK-Low Lift Motor Down
013	Relay Clutch

Num.	Component
014	BK-Relay Clutch
015	BK-Upper Feed Clutch
016	BK-Lower Feed Clutch
017	BK-Lift Motor
018	BK-Up Lift Motor Up
019	BK-Up Lift Motor Down
020	Duplex Inv Motor Reverse
021	Duplex Inv Motor Forward
022	Duplex Trans Motor
023	Duplex Gate Solenoid
024	Duplex Inv Motor Hold
025	Dup Trans Motor Hold
026	Polygon Motor
027	Polygon M/LD
028	LD
029	DF-Transport Motor
030	DF-Feed Motor
031	DF-Feed Clutch
032	DF-Pickup Solenoid
033	DF-Stamp Solenoid
034	DF-Gate Solenoid
035	1 bin Gate Solenoid

Num.	Component
036	1 bin Tray Motor
037	1 bin Tray Motor Hold
038	Fusing Solenoid
040	Duplex Fan Motor High
041	Duplex Fan Motor Low

5.2.6 SERIAL NUMBER INPUT (SP 5811)

- Specifying Characters -

SP 5811 1 specifies the serial number. For this machine, you use the numeric keypad.

A serial number consists of 11 characters. You can change each character by pressing one of the first 11 keys on the numeric keypad (❶, ❷, ❸, ...❾, ⓪,❿).

For example, when you press the ❶ key, the first character of the serial number changes as follows:

0 ⇒ 1 ⇒ 2 ⇒ ... ⇒ 8 ⇒ 9 ⇒ A ⇒ B ⇒ ... ⇒ X ⇒ Y ⇒ Z.

When you press the ❷ key, the second character changes likewise.

You can specify a digit ("0" to "9") or a capital letter ("A" to "Z") for the first four characters of a serial number, and you can specify a digit in the other seven characters (not capital letters).

5.2.7 NVRAM DATA UPLOAD/DOWNLOAD (SP 5824/5825)

Note

- Make sure that you turn off the main switch before inserting or removing a flash memory card. Installing or removing a flash memory card while the main switch is on may damage the BICU or memory.

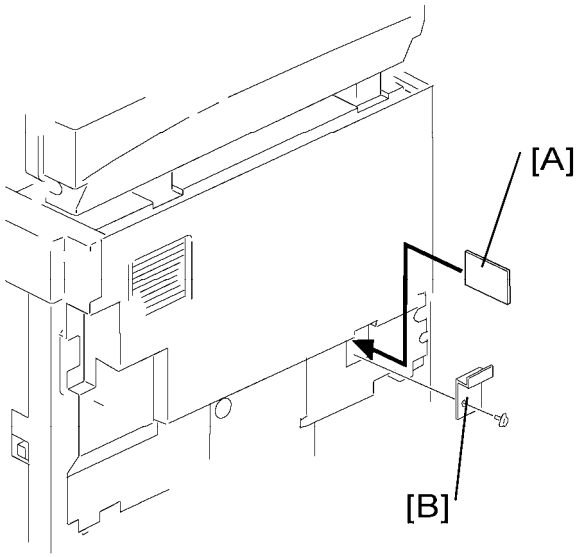
- Overview -

You can copy the data from the NVRAM to a flash memory card (NVRAM Upload), or from a flash memory card to the NVRAM (NVRAM download).

SP 5824 1 (NVRAM Upload)	From the BICU to a flash memory card
SP 5825 1 (NVRAM Download)	From a flash memory card to the BICU

You should execute NVRAM Upload before replacing the NVRAM or before executing SP 5801 2 (☛ Memory Clear). You can copy back the data from the flash card to the NVRAM as necessary.

- NVRAM Upload (SP 5824 1) -



1. Turn off the main switch.
2. Remove the card cover [B] (1 rivet).
3. Turn the face of the flash memory card [A] ("A" is printed on it) toward your left-hand

side, and insert it into the card slot.

4. Turn on the main switch.
5. Start the SP mode and select SP 5824 1.
6. The machine erases the settings on the card (if any), then writes the machine's settings to the flash memory card. This takes about 20 seconds. If uploading fails, an error message appears. If an error message appears, retry the upload procedure.
7. Turn off the main switch.
8. Remove the memory card.

- NVRAM Download (SP 5825 1) -

SP 5825 1 copies the data from the flash memory card to the NVRAM. The following data is NOT copied (the data in the NVRAM remains unchanged).

- SP 8221 1 (ADF Original Feed [Front])
- SP 8381 1 (Total: Total Printer Pages)
- SP 8382 1 (Copy Application: Total Print Pages)
- SP 8391 1 (Large Size Print Pages [A3/DLT, Larger])

1. Turn off the main switch.
2. Remove the card cover [B] (1 rivet).
3. Turn the face of the flash memory card [A] ("A" is printed on it) toward your left-hand side, and insert it into the card slot.
4. Turn on the main switch.
5. Start the SP mode and select SP 5825 1.
6. The machine erases the current settings, then writes the new settings onto the NVRAM on the BICU board. This takes about 1 second. If downloading fails, an error message appears. If an error message appears, retry the download procedure.
7. Turn off the main switch.
8. Remove the memory card.

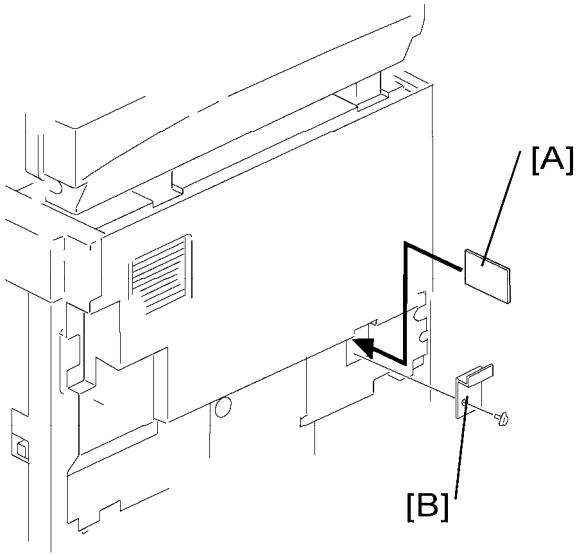
5.2.8 FIRMWARE UPDATE PROCEDURE

This section shows how to update the firmware.

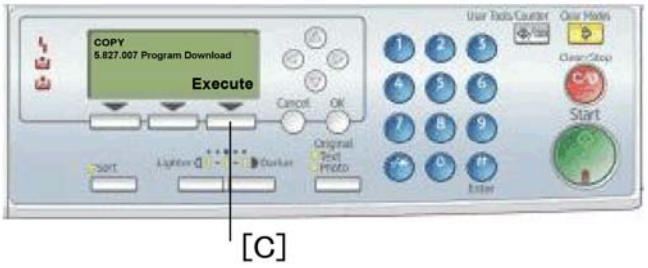
The machine has the following firmware programs

Firmware Type	SP Mode
Engine (BICU)	7801 2

- **Engine (BICU) Firmware Update Procedure -**

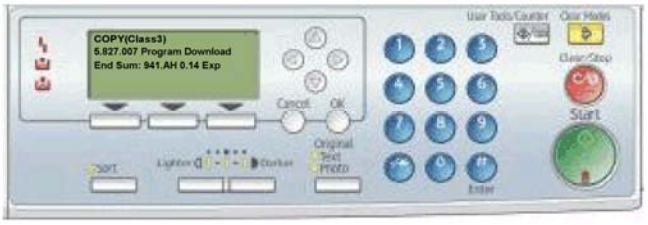


1. Turn the main switch off.
2. Remove the card cover [B] (1 rivet).
3. Insert the flash memory card [A].



4. Press down the power switch on the operation panel and hold it, and turn on the main switch.
5. Select "Execute" [C].

6. Do not touch any key while the message "Load Status..." shows. This message indicates that the program is running.



7. Make sure the message "End Sum..." shows. This message indicates that the program has ended normally.
8. Turn off the main switch.
9. Remove the flash memory card.
10. Replace the card cover [B] (1 rivet).
11. Turn the main switch on.
12. Check the operation.

5.2.9 TEST PATTERN PRINT (SP 5902 1)

- Executing Test Pattern Printing -

1. Specify the pattern number and press the OK key.
2. Press the copy start key. The copy mode is activated
3. Specify copy settings and press the ⓪ key.
4. To return to the SP mode, press the ⓪ key.

- Test Patterns -

Test Patterns Using VCU	
No.	**Pattern**
0	(No print)
1	Vertical Lines (Single Dot)
2	Horizontal Lines (Single Dot)
3	Vertical Lines (Double Dot)
4	Horizontal Lines (Double Dot)
5	Grid Pattern (Single Dot)
6	Grid Pattern (Double Dot)
7	Alternating Dot Pattern
8	Isolated one dot
9	Black Band (Horizontal)
10	Trimming Area
11	Argyle Pattern (Single Dot)
12	Grayscales (Horizontal)
13	Grayscales (Vertical)
14	Grayscales (Vertical/Horizontal)

Test Patterns Using VCU	
15	Grayscales (Vertical/Horizontal Overlay)
16	Grayscales With White Lines (Horizontal)
17	Grayscales with White Lines (Vertical)
18	Grayscales with White Lines (Vertical/Horizontal)

Test Patterns Using IPU	
No.	**Pattern**
30	Vertical Lines (Single Dot)
31	Horizontal Lines (Single Dot)
32	Vertical Lines (Double Dot)
33	Horizontal Lines (Double Dot)
34	Isolated Four Dots
35	Grid Pattern (Double Dot)
36	Black Band (Vertical, 1024 Dots)
37	Grayscales (Horizontal, 512 Dots)
38	Grayscales (Vertical, 256 Dots)
39	ID Patch
40	Cross
41	Argyle Pattern (128-Dot Pitch)
42	Square Gradation (64 Grades)
43	Square Gradation (256 Grades)
44	Grayscales (Horizontal, 32-Dot Width)
45	Grayscales (Vertical, 32-Dot Width)

Test Patterns Using IPU	
46	Trimming Area (A3)
47	A4 Gradation Patches 1 (128 Grades)
48	A4 Gradation Patches 2 (128 Grades)
49	Trimming Area (A4)

Test Patterns Using SBU	
No.	**Pattern**
51	Grid Pattern (double dot)
52	Gray scale 1 (256 grades)
53	Gray scale 2 (256 grades)

5.2.10 PAPER JAM COUNTERS (SP 7504)

The table lists the menu numbers (the last three digits of SP 7504 XXX) and the paper jam timings and locations.

Code	
001	Paper jam occurs at power on.
010	Paper does not reach the registration sensor (from a paper tray).
050	Paper does not reach the registration sensor (from the by-pass tray).
070	Paper is caught at the registration sensor.
120	Paper is caught at the exit sensor (previous page).
121	Paper does not reach the exit sensor.
122	Paper is caught at the exit sensor.

5.2.11 SMC PRINT (SP 5990)

SP 5990 outputs machine status lists.

1. Select SP 5990.
2. Select a menu:
   - 001 All, 002 SP, 003 UP, 004 Log, or 005 Big Font

   Note

   - The output given by the menu "Big Font" is suitable for faxing.
3. Press the "Execute" key.
   - The copy mode is activated

     Specify copy settings and press the ⓪ key. The machine status lists is output.
4. To return to the SP mode, press the ⓒ key.

5.2.12 ORIGINAL JAM HISTORY DISPLAY (SP 7508)

- Viewing the Copy Jam History -

You can view the information on the most recent 10 events. The information on older events is deleted automatically.

Note

- The information on jam history is saved in the NVRAM.

1. Select SP 7508.
2. Select one of the menu items ("Latest 1" through Latest 10").
3. Press the OK key. The summary of the jam history shows.
4. To view more information, select "Detail."

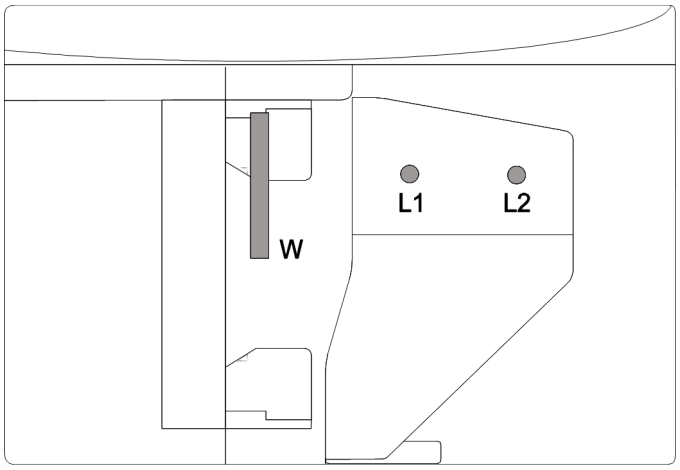
5.2.13 JAM HISTORY CODES

Code	Meaning
210	Original does not reach the registration sensor.
211	Original caught at the registration sensor.
216	Short interval between originals.

5.2.14 ADF APS SENSOR OUTPUT DISPLAY (SP 6901)

- Sensor Positions -

	Large to Small			
W1	1	0	0	1
W2	0	0	1	1



b121s921

- Reading Data -

W1	W2	L1	L2	Paper Size	
				NA	EU/AA
0	0	0	0	—	B5 LEF
0	0	1	1	11" x 17"	B4
0	1	0	0	$8^1/_2$" x $5^1/_2$" LEF	A5 LEF
0	1	1	0	$8^1/_2$" x 11" SEF	A4 SEF
1	1	1	1	$8^1/_2$" x 14"	$8^1/_2$" x 13"
1	0	0	0	11" x $8^1/_2$" LEF	A4 LEF
1	0	1	1	11" x 17"	A3
1	1	0	0	$5^1/_2$" X $8^1/_2$" SEF	A5 SEF
1	1	1	0	—	B5 SEF

1: Detected

TROUBLESHOOTING

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6. TROUBLESHOOTING

6.1 SERVICE CALL CONDITIONS

For "Service Call Conditions" information, see "Appendices".

6.2 ELECTRICAL COMPONENT DEFECTS

6.2.1 SENSORS

Component	CN	Condition	Symptom
Registration	111-2 (BICU)	Open	The Paper Jam message will appear whenever a copy is made (paper has not reached the sensor).
		Shorted	The Paper Jam message appears even if there is no paper at the sensor.
Paper End	114-2 (BICU)	Open	The Paper End indicator lights when the 1st paper tray is selected, even if there is paper in the tray.
		Shorted	The Paper End indicator does not light when the 1st paper tray is selected, even if there is no paper in the tray. The Paper Jam message will appear whenever a copy is made from the 1st paper tray.
By-pass Paper End	136-7 (BICU)	Open	The Paper End indicator lights when the bypass tray is selected, even if there is paper in the tray.
		Shorted	The Paper End indicator does not light when the bypass tray is selected, even if there is no paper in the tray. The Paper Jam message will appear whenever a copy is made from the bypass tray.
Exit	124-2 (BICU)	Open	The Paper Jam message will appear whenever a copy is made (paper has not reached the sensor).
		Shorted	The Paper Jam message appears even if

Component	CN	Condition	Symptom
			there is no paper at the sensor.
Toner Density	125-3 (BICU)	Open	SC390 is displayed.
		Shorted	
Image Density	123-2 (BICU)	Open	The toner density control process is changed (see the note below the table).
		Shorted	
Scanner H.P.	102-2 (BICU)	Open	SC120 shows.
		Shorted	
Platen Cover	102-5 (BICU)	Open	Auto Reduce/Enlarge do not function correctly.
		Shorted	If the Start button is pressed with the platen cover or A(R) DF closed, “Cannot detect original size” is displayed.

Note

- SC392 is activated when the CPU detects an ID sensor error during developer initialization (SP 2214). However, SC392 is not displayed on the LCD but simply logged in the SC log (SMC printout), unless the technician exits SP Mode as soon as an error message is displayed.

6.2.2 SWITCHES

Component	CN	Condition	Symptom
Paper Size	115-1,2,4 (BICU)	Open	The CPU cannot detect the proper paper size, and misfeeds may occur when a copy is made from the 1st paper tray.
		Shorted	
By-pass Paper Size	136-1,2,4,5 (BICU)	Open	The CPU misdetects or is not able to detect the size of the paper set in the bypass tray, causing possible misfeeds when feeding from this tray.
Right Door	124-5 (BICU)	Open	The Cover Open indicator is lit even if the right door is closed.
		Shorted	The Cover Open indicator is not lit even if the right door is open.
Front/Right Cover	130-1 (BICU)	Open	The Cover Open indicator is lit even if doors are closed.
		Shorted	The Cover Open indicator is not lit even if doors are open.
Main	281-3,4 (PSU)	Open	The machine does not turn on.
		Shorted	The machine does not turn off.

6.3 BLOWN FUSE CONDITIONS

All the fuses in the following table are on the power supply board.

Fuse	Rating	
	120 V	**220 – 240 V**
FU1	15A/125V	8A/250V
FU2	5A/125V	2.5A/250V
FU3	1A/250V	1A/250V
FU4	4A/250V	4A/250V
FU5	4A/250V	4A/250V
FU6	4A/250V	4A/250V
FU7	4A/250V	4A/250V

6.4 LED DISPLAY

6.4.1 BICU

Number	Function
LED 1	Monitors the +5 V line for the CPU and the surrounding circuit. Usually, this LED is blinking.

ENERGY SAVING

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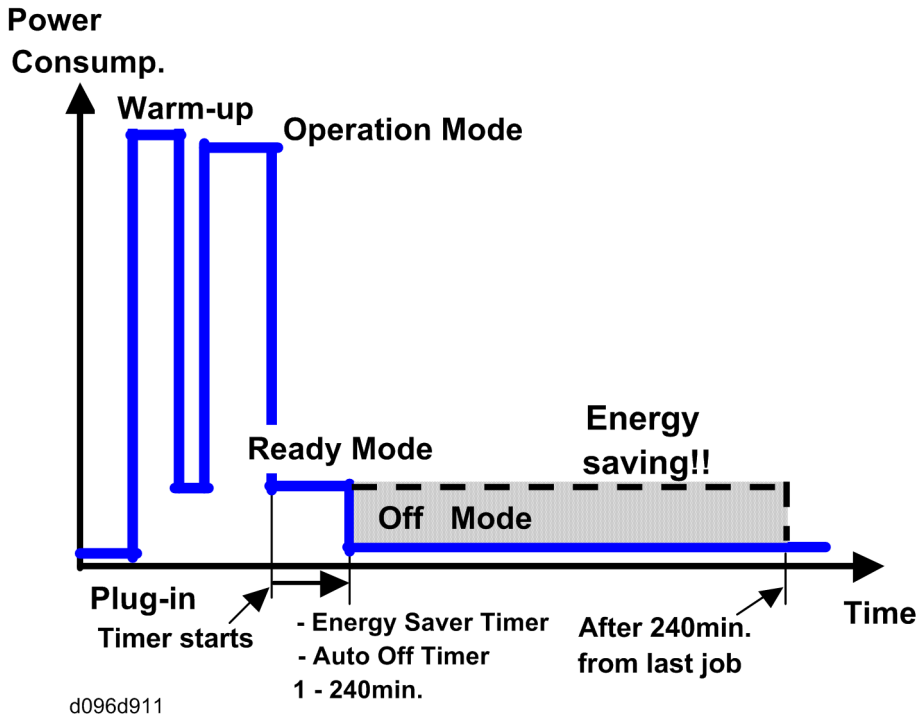
7. ENERGY SAVING

7.1 ENERGY SAVE

7.1.1 ENERGY SAVER MODES

Customers should use energy saver modes properly, to save energy and protect the environment.



The area shaded in this diagram represents the amount of energy that is saved when the timers are at the default settings. If the timers are changed, then the energy saved will be different. For example, if the timers are all set to 240 min., the grey area will disappear, and no energy is saved before 240 min. expires.

Timer Settings

The user can set these timers with User Tools (System settings > Timer setting)

- Energy saver timer (1– 240 min): Energy Saver Mode. Default setting: 1minute
- Auto off timer (1 – 240 min): Off Mode. Default settings: 1 minute

Normally, Energy Saver timer < Auto Off timer. But, for example, if Auto Off timer < or = Energy Saver timer, the machine goes immediately to Off mode when the Auto Off timer expires. It skips the Energy Saver Mode.

Example

- Energy saver timer: 1 min.
- Auto Off: 1 min.
- The machine goes to Off mode after 1 minute. Energy Saver Mode is not used.

Return to Stand-by Mode

Off Mode

Recovery time.

- Max 10 sec.

Recommendation

We recommend that the default settings should be kept.

- If the customer requests that these settings should be changed, please explain that their energy costs could increase, and that they should consider the effects on the environment of extra energy use.
- If it is necessary to change the settings, please try to make sure that the Auto Off timer is not too long. Try with a shorter setting first, such as 30 min., then go to a longer one (such as 60 min.) if the customer is not satisfied.
- If the timers are all set to the maximum value, the machine will not begin saving energy until 240 minutes has expired after the last job. This means that after the customer has finished using the machine for the day, energy will be consumed that could otherwise be saved.
- If you change the settings, the energy consumed can be measured using SP8941, as explained below.

7.1.2 ENERGY SAVE EFFECTIVENESS

SP 8941 (Machine Status) keeps a record of the amount of time that the machine spends in each mode.

- 8941-001: Operating mode
- 8941-002: Standby mode
- 8941-003: Panel off mode (not used in this machine)
- 8941-004: Low power mode (Energy saver mode)
- 8941-005: Off/sleep mode

With this data, and the power consumption values from the specifications, we can estimate the amount of energy that is used by the machine.

This should only be used as a reference value, because the power consumption specifications are measured in a controlled environment with a constant power supply.

To get an exact measurement at the customers site, a watt meter must be used to measure the actual energy consumed.

To use SP8941 to calculate the energy consumed:

- At the start of the measurement period, read the values of SP8941 001 to 005.
- At the end of the measurement period, read the values of SP8941 001 to 005 again.
- Find the amount of time spent in each mode (subtract the earlier measurement from the later measurement).
- Multiply this by the power consumption spec for each mode.
- Convert the result to kWh (kilowatt hours)

Here is an example calculation.

Energy Save

Machine Date	Power Consumption (W): **Data: a**	SP8941:Machine Status	Start Time: (min.) **Data: b**	End Time: (min.) **Data: c**	Time Differences (Data:b - Data: c) (min.) **Data: d**	Power Consumption (Data:a x Data:d) (Wmin.) **Data: e**
① Operating mode	1081.8	001: Operating Time	21089.0	21386.0	297.0	321294.6
② Ready mode (standby)	214.0	002: Standby Time	306163.0	308046.0	1883.0	402962.0
③ Energy mode	214.0	003: Energy Save Time	71386.0	75111.0	3725.0	797150.0
④ Off/Sleep mode	7.0	005: Off mode Time	508776.0	520377.0	11601.0	81207.0
Total Time of Data: d (min.)					17506.0	
Total Time of Data: d/60min. (Hour)					291.77	
Total Power Consumption of Data: e (Wmin.)						1602613.60
Total Power Consumption of Data: e /60min./1000W (KWH)						26.71

D096
SERVICE MANUAL APPENDICES

D096 APPENDICES

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APPENDIX:

SPECIFICATIONS

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1. APPENDIX: SPECIFICATIONS

1.1 GENERAL SPECIFICATIONS

Configuration:	Desktop	
Copy Process:	Dry electrostatic transfer system	
Originals:	Sheet/Book/Object	
Original Size:	Maximum A3/11" x 17"	
Copy Paper Size:	Maximum:	A3/11" x 17"
	Minimum:	A5 LEF/$8^1/_2$" x $5^1/_2$" (Paper tray), A6 SEF/$5^1/_2$" x $8^1/_2$" (By-pass)
	Custom sizes in the by-pass tray:	Width: 90 – 297 mm (3.55" – 11.69"), Length: 148 – 600 mm (5.83" – 23.62")
	NOTE: Physically, the by-pass tray can handle the following size (but this size is not recognized by the application software): Width: 305 mm Length: 1,260 mm	
Copy Paper Weight:	Paper Tray: 60 – 90 g/m^2, 16 – 24 lb. By-pass: 52 – 162 g/m^2, 14 – 43 lb.	

<table>
<tr><td>Reproduction Ratios:</td><td colspan="3">3 enlargement and 4 reduction</td></tr>
<tr><td rowspan="4">-</td><td></td><td>A4/A3 Version</td><td>LT/DLT Version</td></tr>
<tr><td>Enlargement</td><td>200%
141%
122%</td><td>155%
129%
121%</td></tr>
<tr><td>Full Size</td><td>100%</td><td>100%</td></tr>
<tr><td>Reduction</td><td>93%
82%
71%
50%</td><td>93%
78%
65%
50%</td></tr>
<tr><td>Zoom:</td><td colspan="3">50% to 200%, in 1% steps</td></tr>
<tr><td rowspan="4">Power Source:</td><td>Taiwan:</td><td colspan="2">110 V, 60 Hz, 12 A</td></tr>
<tr><td>Korea:</td><td colspan="2">220 V, 60 Hz, 7 A</td></tr>
<tr><td>North America:</td><td colspan="2">120 V, 60 Hz, 12 A</td></tr>
<tr><td>Europe, Asia:</td><td colspan="2">220 – 240 V, 50/60 Hz, 7 A</td></tr>
<tr><td rowspan="3">Power Consumption:</td><td>Full System:</td><td colspan="2">Not above 1.28 kW</td></tr>
<tr><td>Off Mode:</td><td colspan="2">Not above 1 W</td></tr>
<tr><td colspan="3">Note
▪ Full system - Maximum possible power consumption (any combination of mainframe and options), excluding optional heaters.</td></tr>
</table>

Noise Emission:	Standby (Mainframe/Full system):	Not above 40 dB(A)
	Operating (Mainframe only):	Not above 62 dB(A)
	Operating (Full System):	Not above 66 dB(A)
	Note ▪ The above measurements were made in accordance with ISO 7779. Measurements were taken from the normal position of the operator.	
Dimensions (W x D x H):	550 x 568 x 420 mm (21.7" x 22.4" x 16.5") **Measurement Conditions** With by-pass feed table closed Without the ADF	
Weight:	35 kg (78 lb.) (Excluding ADF, platen cover, toner, and developer)	

Copying Speed in Multicopy Mode (copies/minute):

Mode			cpm
1-sided ↓ 1-sided	Memory copy	A3 SEF/11" × 17"	11
		A4 LEF/11" x $8^1/_2$"	19
-	DF 1-to-1	A3 SEF/11" × 17"	9
		A4 LEF/11" x $8^1/_2$"	18

Note

- Measurement Conditions:
- Figures are for one-sided original to one-sided copy except where stated otherwise
- 100% size

General Specifications

Warm-up Time:	Less than 10 seconds (at 20°C [68°F])
First Copy Time:	Not more than 6.5 seconds **Measurement Conditions** ▪ From the ready state, with the polygonal mirror motor operating. ▪ A4/LT copying ▪ 100%size ▪ Paper feed from the upper tray
Copy Number Input:	Numeric keypad, 1 to 99 (increment, decrement)
Manual Image Density:	5 steps
Automatic Reset:	Default is 60 seconds. Can be set from 10 to 999 seconds with user tools.
Automatic Shut-off:	Default is 1 minute. Can be set from 1 to 240 minutes with user tools.
Copy Paper Capacity:	Paper Tray: 250 sheets By-pass Tray: 100 sheets (sheets up to 432 mm [17"]) 40 postcards 10 envelopes Copy weight: 80 g/m^2 (20 lb.)
Toner Replenishment:	Cartridge replacement (260 g/cartridge)
Optional Equipment:	Platen cover Auto document feeder Tray heater Optics anti-condensation heater Universal Handle

Toner Yield:	9k copies (A4 LEF, 6% full black, 1 to 2 copying, normal text mode)
Copy-Tray Capacity	250 sheets
Memory	16 MB (BICU)

1.2 SUPPORTED PAPER SIZES

1.2.1 ORIGINAL SIZE DETECTION

North America, Europe, Asia, Taiwan

Paper	Size (W x L)	North America		Europe/Asia/Taiwan	
		Platen	ADF	Platen	ADF
A3 SEF	297 x 420 mm	O	O	O	X
B4 SEF	257 x 364 mm	O	O	O	X
A4 SEF	210 x 297 mm	O	A4/LT	O	X
A4 LEF	297 x 210 mm	O	A4/LT	O	X
B5 SEF	182 x 257 mm	O	O	O	X
B5 LEF	257 x 182 mm	O	O	O	X
A5 SEF	148 x 210 mm	O	O	O	X
A5 LEF	210 x 148 mm	O	O	O	X
B6 SEF	128 x 182 mm	O	O	O	O
B6 LEF	182 x 128 mm	O	O	O	O
8K SEF	267 x 390 mm	O	O	O	O
16K SEF	195 x 267 mm	O	O	O	O
16K LEF	267 x 195 mm	O	O	O	O
DLT SEF	11" x 17"	O	X	O	O
SEF	11" x 15"	O	O	O	O
LG SEF	$8^1/_2$" x 14"	O	X	O	O
LT SEF	$8^1/_2$" x 11"	O	X	O	A4/LT

Supported Paper Sizes

Paper	Size (W x L)	North America		Europe/Asia/Taiwan	
		Platen	ADF	Platen	ADF
LT LEF	11" x 8 1/2"	O	X	O	A4/LT
HLT SEF	5 1/2" x 8 1/2"	O	X	O	O
HLT LEF	8 1/2" x 5 1/2"	O	X	O	O
F/GL (F4) SEF	8" x 13"	O	O	O	F
Foolscap SEF	8 1/2" x 13"	O	O	O	F
Folio SEF	8 1/4" x 13"	O	O	O	F
USB4 SEF	10" x 14"	O	O	O	O
Eng Quarto SEF	8" x 10"	O	O	O	O
Eng Quarto LEF	10" x 8"	O	O	O	O

Key:

X:	Detected
O:	Not detected
F:	Detected as F (8 1/2" x 13")
S:	Detected as specified
A4/LT:	Detected as A4 or LT as specified

China, Korea

Paper	Size (W x L)	China/Korea		China/Korea (localized)	
		Platen	ADF	Platen	ADF[*1]
A3 SEF	297 x 420 mm	O	X	O	O
B4 SEF	257 x 364 mm	O	X	O	O
A4 SEF	210 x 297 mm	O	X	O	O
A4 LEF	297 x 210 mm	O	X	O	O
B5 SEF	182 x 257 mm	O	X	O	O
B5 LEF	257 x 182 mm	O	X	O	O
A5 SEF	148 x 210 mm	O	X	O	X
A5 LEF	210 x 148 mm	O	X	O	X
B6 SEF	128 x 182 mm	O	O	O	O
B6 LEF	182 x 128 mm	O	O	O	O
8K SEF	267 x 390 mm	O	O	O	X
16K SEF	195 x 267 mm	O	O	O	X
16K LEF	267 x 195 mm	O	O	O	X
DLT SEF	11" x 17"	O	O	O	O
SEF	11" x 15"	O	O	O	O
LG SEF	$8^1/_2$" x 14"	O	O	O	O
LT SEF	$8^1/_2$" x 11"	O	A4/LT	O	O
LT LEF	11" x $8^1/_2$"	O	A4/LT	O	O
HLT SEF	$5^1/_2$" x $8^1/_2$"	O	O	O	O

Supported Paper Sizes

Paper	Size (W x L)	China/Korea		China/Korea (localized)	
		Platen	ADF	Platen	ADF*1
HLT LEF	$8^1/_2$" x $5^1/_2$"	O	O	O	O
F/GL (F4) SEF	8" x 13"	O	F	O	F
Foolscap SEF	$8^1/_2$" x 13"	O	F	O	F
Folio SEF	$8^1/_4$" x 13"	O	F	O	F
USB4 SEF	10" x 14"	O	O	O	O
Eng Quarto SEF	8" x 10"	O	O	O	O
Eng Quarto LEF	10" x 8"	O	O	O	O

Key:

X:	Detected
O:	Not detected
F:	Detected as F ($8^1/_2$" x 13")
S:	Detected as specified
A4/LT:	Detected as A4 or LT as specified

Note

- *1: Change the settings of SP 4305 1.

1.2.2 PAPER FEED AND EXIT

Main Frame

Paper	Size (W x L)	Main frame tray			
		China/ Korea	North America	Europe	Asia/ Taiwan
A3 SEF	297 x 420 mm	X	M	X	X
A3 LEF	420 x 297 mm	O	O	O	O
B4 SEF	257 x 364 mm	X	M	M	M
B4 LEF	364 x 257 mm	O	O	O	O
A4 SEF	210 x 297 mm	X	M	X	X
A4 LEF	297 x 210 mm	X	X	X	X
B5 SEF	182 x 257 mm	M	M	M	M
B5 LEF	257 x 182 mm	X	M	M	M
A5 SEF	148 x 210 mm	O	O	O	O
A5 LEF	210 x 148 mm	X	M	X	X
B6 SEF	128 x 182 mm	O	O	O	O
B6 LEF	182 x 128 mm	O	O	O	O
A6 SEF	105 x 148 mm	O	O	O	O
A6 LEF	148 x 105 mm	O	O	O	O
DLT SEF	11" x 17"	M	X	M	M
DLT LEF	17" x 11"	O	O	O	O
LG SEF	$8^1/_2$" x 14"	M	X	M	M
LG LEF	14" x $8^1/_2$"	O	O	O	O

Paper	Size (W x L)	Main frame tray			
		China/ Korea	North America	Europe	Asia/ Taiwan
Gov. LG SEF	$8^1/_4$" x 14"	M	M	M	M
Gov. LG LEF	14" x $8^1/_4$"	O	O	O	O
LT SEF	$8^1/_2$" x 11"	M	X	M	M
LT LEF	11" x $8^1/_2$"	M	X	X	X
HLT SEF	$5^1/_2$" x $8^1/_2$"	O	O	O	O
HLT LEF	$8^1/_2$" x $5^1/_2$"	M	M	M	M
Executive SEF	$7^1/_4$" x $10^1/_2$"	M	M	M	M
Executive LEF	$10^1/_2$" x 71/4"	M	M	M	M
F SEF	8" x 13"	M	M	M	M
F LEF	13" x 8"	O	O	O	O
Foolscap SEF	$8^1/_2$" x 13"	M	X	X	X
Foolscap LEF	13" x $8^1/_2$"	O	O	O	O
Folio SEF	$8^1/_4$" x 13"	M	M	M	M
Folio LEF	13" x $8^1/_4$"	O	O	O	O
8K SEF	267 x 390 mm	M	M	M	M
8K LEF	390 x 267 mm	O	O	O	O
16K SEF	195 x 267 mm	M	M	M	M
16K LEF	267 x 195 mm	M	M	M	M
C5 Env. SEF	162 x 229 mm	O	O	O	O
C6 Env. SEF	114 x 162 mm	O	O	O	O
DL Env. SEF	110 x 220 mm	O	O	O	O

Supported Paper Sizes

Paper	Size (W x L)	Main frame tray			
		China/ Korea	North America	Europe	Asia/ Taiwan
Com10 SEF	$4^1/_8$" x $9^1/_2$"	O	O	O	O
Monarch SEF	$3^7/_8$" x $7^1/_2$"	O	O	O	O
Custom		O	O	O	O

Key:

X:	Detected
O:	Not detected
M:	Selected manually
K:	Specified from the key pad

Note

- Custom; W: 90 to 297 mm, L: 148 to 600 mm

1.3 OPTIONAL EQUIPMENT

1.3.1 ADF

Original Size:	Standard sizes (Single-sided mode only): ▪ A3 to A5, 11" x 17" to $5^1/_2$" x $8^1/_2$" Non-standard sizes (Single-sided mode only): ▪ Max. width 297 mm ▪ Min. width 105 mm ▪ Max. length 1,260 mm ▪ Min. length 128 mm
Original Weight:	52 – 105 g/m^2 (14 – 28 lb)
Table Capacity:	30 sheets (80 g/m^2, 22 lb)
Original Standard Position:	Center
Separation:	FRR
Original Transport:	Roller transport
Original Feed Order:	From the top original
Reproduction Range:	50 – 200%
Power Source:	24 and 5 Vdc (from the main frame)
Power Consumption:	25 W
Dimensions (W x D x H):	550 mm x 470 mm x 90 mm
Weight:	Not above 7 kg (15 lb)

APPENDIX:

PREVENTIVE MAINTENANCE

REVISION HISTORY		
Page	**Date**	**Added/Updated/New**
		None

2. APPENDIX: PREVENTIVE MAINTENANCE

2.1 PM TABLES

Note

- After preventive maintenance work, reset the PM counter (SP 7804 1).
- PM intervals (60k, 80k, and 120K) indicate the number of prints.

Key: AN: As necessary, C: Clean, R: Replace, L: Lubricate, I: Inspect

Optics

	EM	60k	120k	AN	NOTE
Reflector	C				Optics cloth
1st mirror	C			C	Optics cloth
2nd mirror	C			C	Optics cloth
3rd mirror	C			C	Optics cloth
Scanner guide rails	C				Do not use alcohol.
Platen cover	I			C	Replace the platen sheet if necessary. Blower brush or alcohol
Exposure glass	C			C	Blower brush or alcohol
Toner shield glass	C				Blower brush

Drum Area

	EM	60k	120k	AN	NOTE
PCU		I			
Drum		R			
Developer		R			
Charge roller		R			
Cleaning brush (charge roller)		R			
Cleaning blade (OPC drum)		R			
Pick-off pawls (OPC drum)		R			
Transfer roller			R		
ID sensor	C			C	Blower brush

Paper Feed

	EM	60k	120k	AN	NOTE
Paper feed roller		C	R	C	Clean with water or alcohol.
Friction pad		C	R	C	Clean with water or alcohol.
Bottom-plate pad		C		C	Clean with water or alcohol.
Paper feed roller (by-pass tray)		C		C	Clean with water or alcohol.
Friction pad (by-pass tray)		C		C	Clean with water or alcohol.
Bottom-plate pad (by-pass tray)		C		C	Clean with water or alcohol.
Registration rollers		C		C	Clean with water or alcohol.
Paper feed guides		C		C	Clean with water or alcohol.
Paper-dust Mylar		C		C	Clean with water or alcohol.

Fusing Unit

	EM	60k	120k	AN	NOTE
Hot roller			R		
Pressure roller			R		
Pressure roller cleaning roller			R		
Hot roller bushings			I		
Pressure-roller bushing			R		
Hot roller stripper pawls			R	C	Dry cloth
Thermistor		C		C	Dry cloth
Cleaning roller bushing			C	C	Dry cloth

ADF

	80k	AN	NOTE
Feed belt	R	C	Clean with water or alcohol.
Separation roller	R	C	Clean with water or alcohol.
Pick-up roller	R	C	Clean with water or alcohol.
Stamp		R	Replace when necessary.
White plate		C	Clean with water or alcohol.
DF exposure glass		C	Clean with water or alcohol.
Platen cover		C	Clean with water or alcohol.

APPENDIX:

TROUBLESHOOTING GUIDE

REVISION HISTORY		
Page	**Date**	**Added/Updated/New**
		None

3. APPENDIX: TROUBLESHOOTING GUIDE

3.1 SERVICE CALL CONDITIONS

3.1.1 SUMMARY

There are four levels of service call conditions.

Level	Definition	Reset Procedure
A	To prevent damage to the machine, the main machine cannot be operated until the SC has been reset by a service representative (see the note below).	Enter SP mode, and then turn the main power switch off and on.
B	If the SC was caused by incorrect sensor detection, the SC can be reset by turning the main power switch off and on.	Turn the main power switch off and on.
C	The main machine can be operated as usual, excluding the unit related to the service call.	Turn the main power switch off and on.
D	The SC history is updated. The machine can be operated as usual.	The SC will not be displayed. Only the SC history is updated.

Note

- If the problem concerns electrical circuit boards, first disconnect then reconnect the connectors before replacing the PCBs.
- If the problem concerns a motor lock, first check the mechanical load before replacing motors or sensors.

3.1.2 SC CODE DESCRIPTIONS

No.	Definition	Symptom	Possible Cause
101	B	Exposure Lamp Error	
		The standard white level was not detected properly when scanning the white plate.	Exposure lamp defective Exposure lamp stabilizer defective Exposure lamp connector defective Dirty scanner mirror or scanner mirror out of position SBU board defective SBU connector defective Lens block out of position Incorrect position or width of white plate scanning (SP4015)
120	B	Scanner home position error 1	
		The scanner home position sensor does not detect the off condition during initialization or copying.	Scanner home position sensor defective Scanner drive motor defective Scanner home position sensor connector defective Scanner drive motor connector defective BICU board defective

121	B	Scanner home position error 2	
		The scanner home position sensor does not detect the on condition during initialization or copying.	Scanner home position sensor defective Scanner drive motor defective Scanner home position sensor connector defective Scanner drive motor connector defective BICU board defective
143	D	SBU white/black level correction error	
		The automatic SBU adjustment has failed to correct the black level. The automatic SBU adjustment has failed to correct the white level twenty times consecutively.	Exposure lamp defective Dirty white plate Incorrect position or width of white plate scanning (SP4015) BICU board defective SBU board defective
144	B	Communication Error between BICU and SBU	
		The BICU board cannot detect the SBU connect signal.	The flat cable between the BICU board and the SBU has a poor connection The flat cable between the BICU board and the SBU is damaged BICU board defective SBU defective

Service Call Conditions

145	D	Automatic SBU adjustment error	
		During the automatic SBU adjustment, the machine detects that the white level read from the white plate or paper is out of range. (SP4015)	Exposure lamp defective Dirty white plate Incorrect position or width of white plate scanning (SP4015) BICU board defective SBU board defective
302	B	Charge roller current leak	
		A current leak signal for the charge roller is detected.	Charge roller damaged High voltage supply board defective Poor connection of the PCU
320	B	Polygonal mirror motor error	
		The polygon mirror motor does not reach operating speed within 10 seconds after the motor ON signal is sent, or does not turn on within one of the 200 ms check intervals during operation.	Polygon mirror motor defective Poor connection between the polygonal mirror motor driver and the BICU board Damaged cable between BICU and polygonal mirror motor driver BICU board defective
321	C	No laser writing signal (F-GATE) error	
		The laser-writing signal (F-GATE) fails to turn Low after the laser crosses 5 mm on the drum surface from the laser writing start position.	BICU board defective

322	B	Laser synchronization error	
		The main scan synchronization detector board cannot detect the laser synchronization signal for more than 5 consecutive 100 ms intervals.	Poor connection between the LD unit and the BICU board Damaged cable between BICU and LD unit LD unit out of position LD unit defective BICU board defective
390	B	TD sensor error	
		The TD sensor outputs less than 0.2 V or more than 4.0 V 10 times consecutively during copying.	TD sensor abnormal Poor connection of the PCU
391	B	Development bias leak	
		A development bias leak signal is detected.	Poor connection of the PCU High voltage supply board defective
392	B	TD sensor initial setting error	
		TD sensor initial setting is not performed correctly.	ID sensor defective No developer Drum does not turn Development roller does not turn Poor connection of the PCU The voltage is not applied to charge roller

Service Call Conditions

401	B	Transfer roller leak error 1	
		A current leak signal for the transfer roller is detected. A current feedback signal for the transfer roller is not detected.	High voltage supply board defective Poor connection of the PCU Transfer/separation unit set incorrectly Transfer roller damaged
402	B	Transfer roller leak error 2	
		A current leak signal for the transfer roller is detected. A current feedback signal for the transfer roller is not detected.	High voltage supply board defective Poor connection of the PCU Transfer/separation unit set incorrectly Transfer roller damaged
500	B	Main motor lock	
		A main motor lock signal is not detected for more than 7 consecutive checks (700 ms) after the main motor starts to rotate, or the lock signal is not detected for more than 7 consecutive checks during rotation after the last signal.	Too much load on the drive mechanism Main motor defective
541	A	Fusing thermistor open (center)	
		The fusing temperature detected by the thermistor is below 71°C and is not corrected after the main power switch is turned on.	Fusing thermistor defective or out of position Power supply board defective Loose connectors

542	A	Fusing temperature warm-up error (center)	
		The fusing temperature rises less than 7 degrees in 2 seconds, and this continues 5 times consecutively. The fusing temperature is not detected in 25 or 35 seconds.	Fusing thermistor defective or out of position Fusing lamp open Power supply board defective
543	A	Fusing overheat error (center)	
		The fusing temperature is over 230°C for 1 second (detected by the thermistor).	Fusing thermistor defective Power supply board defective
544	A	Fusing overheat error (center) 2	
		The fusing temperature is over 250°C for 1 second (detected by the fusing temperature monitor circuit).	Fusing thermistor defective Power supply board defective
545	A	Fusing lamp overheat error (center)	
		After the fusing temperature reaches the target temperature, the fusing lamp does not turn off for 12 consecutive seconds.	Fusing thermistor defective or out of position Power supply board defective

Service Call Conditions

546	A	Unstable fusing temperature (center)	
		The fusing temperature varies 50°C or more within 1 second, and this occurs 2 consecutive times.	Thermistor defective or out of position Power supply unit defective
547	B	Zero cross signal malfunction	
		Zero cross signals are not detected within 5 seconds after the main power switch is turned on, or are not detected within 1 second after operation begins.	Power supply board defective BICU defective
551	A	Fusing thermistor open (rear)	
		The fusing temperature detected by the thermistor is below 71°C and is not corrected after the main power switch is turned on.	Fusing thermistor defective or out of position Power supply board defective Loose connectors
552	A	Fusing temperature warm-up error (rear)	
		The fusing temperature rises less than 7 degrees in 2 seconds, and this continues 5 times consecutively. The fusing temperature is not detected in 25 or 35 seconds.	Fusing thermistor defective or out of position Fusing lamp open Power supply board defective

553	A	Fusing overheat error (rear)	
		The fusing temperature is over 230°C for 1 second (detected by the thermistor).	Fusing thermistor defective Power supply board defective
555	A	Fusing lamp overheat error (rear)	
		After the fusing temperature reaches the target temperature, the fusing lamp does not turn off for 20 consecutive seconds.	Fusing thermistor defective or out of position Power supply board defective
556	A	Unstable fusing temperature (rear)	
		The fusing temperature varies 50°C or more within 1 second, and this occurs 2 consecutive times.	Thermistor defective or out of position Power supply unit defective
559		Jam error detected 3 times in succession	
		The exit sensor and the duplex sensor detect a paper jam 3 times in succession This condition can occur when SP 1159 1 is set to 'on'. The default is 'off'.	Paper jams can occur for the following reasons. Dampness Paper curl Incorrect paper setting in the paper tray Stripper pawls coming apart
590	B	Left exhaust fan motor error	
		The CPU detects an exhaust fan lock signal for more than 5 seconds.	Loose connection of the exhaust fan motor Too much load on the motor drive

Service Call Conditions

621	B	ADF connection error	
		An incorrect ADF (an ADF for some other copier) is detected.	ADF incorrect (The ADF for B039/B040/B043 or B121/B122/B123 is installed on this machine.)
760	B	ADF gate abnormal 1	
		The ADF Gate signal line between the ADF main board and the BICU is disconnected.	ADF main board defective Input/output board defective Poor connection (ADF Gate line) between the ADF main board and the BICU.
761	B	ADF gate abnormal 2	
		The FGATE signal is not issued from the ADF within 30 seconds after the ADF starts feeding.	ADF connector defective SBU board defective
762	B	ADF gate abnormal 3	
		The FGATE signal is not terminated by the ADF within 60 seconds after the ADF starts feeding.	ADF connector defective SBU board defective
901	B	Mechanical total counter	
		The mechanical total counter does not work properly.	Mechanical total counter defective BICU defective Disconnected mechanical total counter
903	B	Engine total counter error	
		The checksum of the total counter is not correct.	NVRAM on the BICU defective

928	B	Memory error	
		The machine detects a discrepancy in the write/read data during its write/read test (done at power off/on and at recovery from low power or night/off mode).	Memory defective BICU defective Poor connection between BICU and memory
929	B	IMAC Hardware Error	
981	B	NVRAM error	
		The machine detects a discrepancy in the NVRAM write/read data when attempting to save actual data to the NVRAM (i.e. during actual use).	NVRAM defective Poor connection between BICU and NVRAM NVRAM is not connected BICU defective

982	B	Localization error	
		The localization settings in the nonvolatile ROM and RAM are different (SP5807).	First machine start after the NVRAM is replaced Incorrect localization setting NVRAM defective
		The download (program, print data, language data) from the IC card does not execute normally.	Board installed incorrectly BICU board defective IC card defective NVRAM defective Loss of power during downloading Important Notes About SC999 Primarily intended for operating in the download mode, logging is not performed with SC999. If the machine loses power while downloading, or if for some other reason the download does not end normally, this could damage the BICU or the PCB targeted for the download and prevent subsequent downloading. If this problem occurs, the damaged PCB must be replaced.

APPENDIX:

SP MODE TABLES

REVISION HISTORY		
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		None

4. APPENDIX: SP MODE TABLES

4.1 SP MODE TABLES

The following codes are used:

- Asterisk (*): The settings are saved in the NVRAM. Most of them return to the default values when you execute SP 5801 2
- The DFU menu is for design or factory use only. You must not change the settings.
- Brackets ([ ]): The brackets enclose the setting rage, default value, and minimum step (with unit) as follows: [Minimum to Maximum / Default / Step].

4.1.1 SP1-XXX (FEED)

1001*	Leading Edge Registration	
	Adjusts the printing leading-edge registration from paper trays.	
1001 1	All Trays	[–9.0 to 9.0 / **0.0** / 0.1 mm/step] (☛ Copy Adjustments Printing/Scanning)
1001 2	By-pass	

1002*	Side-to-Side Registration	
	Adjusts the printing side-to-side registration from each paper feed station, using the Trimming Area Pattern (SP 5902, No.10). Adjustments are supported for all 4 possible feed trays (including optional trays). The SP 1002 1 setting is applied to all trays, not just the 1st tray. Settings for trays 2 to 4 are offsets relative to the SP 1002 1 setting. For duplex copies, the value for the front side is determined by SP 1002 1 to 4, and the value for the rear side is determined by SP 1002 6.	
1002 1	1st tray	[–9.0 to 9.0 / **0.0** / 0.1 mm/step] (☛ Copy Adjustments Printing/Scanning)
1002 5	By-pass	

1003*	Paper Feed Timing	
	Adjusts the amount of buckle the paper feed clutch applies to the paper after the registration sensor is activated. A higher setting applies greater buckling.	
1003 1	1st tray	[0 to 10 / **5** / 1 mm/step]
1003 4	By-pass feed	[0 to 10 / **6** / 1 mm/step]

1007	Display By-pass	
1007 1	Display By-pass	Displays the by-pass paper width switch output.

1103*	Fusing Idling	
	This program decides the action of the Fusing Drive Release Mechanism. When you select "1," the contact/release control is disabled and the drive power is always transmitted to the fusing unit. As a result, the machine takes a longer time to warm up the fusing unit. Use SP 1103 1 if fusing quality is low even when the room temperature is not very low.	
1103 1	Fusing Idling	[**0 = No** / 1 = Yes]

1105*	Fusing Temperature Adjustment	
	Adjusts the target fusing temperature. "Center" indicates the center of the roller; "End" indicates the front and rear ends.	
1105 1	Warm Up-Center	[140 to 180 / **160** / 1°C/step]
1105 2	Warm Up-End	
1105 3	Standby-Center	[140 to 170 / **155** / 1°C/step]
1105 4	Standby-End	[140 to 165 / **150** / 1°C/step]
1105 5	Copying-Center	[140 to 185 / **160** / 1°C/step]
1105 6	Copying-End	

1105 7	Low Level 2-Center	[0 to 80 / **60** / 1°C/step]
1105 8	Low Level 2-End	
1105 9	Thick-Center	[140 to 185 / **175** / 1°C/step]
1105 10	Thick-End	
1105 11	Warm Up Low-Center	[140 to 180 / **170** / 1°C/step]
1105 12	Warm Up Low-End	

1106	Display Fusing
1106 1	Displays the fusing temperature (center)

1107*	Fusing Soft Start	
	Adjusts the number of zero-cross cycles of the fusing lamp AC supply needed to bring the fusing lamp power to 100% while bringing the lamp up to the standby temperature or while copying. Increase this value if the machine is experiencing sudden power dropouts (☛ Fusing Temperature Control).	
1107 1	Warm Up Soft Start	[0 = 10 cycles / **1 = 20 cycles** / 2 = 50 cycles]
1107 2	Other Soft Start	[0 = 5 cycles / **1 = 10 cycles** / 2 = 20 cycles]

1108*	Set-Fusing Start	[0 = 1s / **1 = 1.5s** / 2 = 2s]
1108 1	Specifies the interval for fusing-temperature control (☛ Fusing Temperature Control).	

1109	Nip Band Check
1109 1	Checks the fusing nip band (☛ NIP Band Width Adjustment).

1110*	Fan Control Timer
1110 1	[30 to 60 / **30** / 1 s/step] Inputs the fan control time. The fan maintains normal speed for the specified time after occurrence of an SC or following entry into Warm-up mode, Low Power mode, or Night/Off mode.

1159*	Fusing Jam SC Code Setting	**0=No** 1=Yes
1159 1	This SP mode detects SC559. Set this SP mode to 'Yes' if the machine experiences paper jam problems on a continual basis.	

1902	Display-AC Freq.
1902 1	Displays the fusing lamp power control frequency (as detected by the zero cross signal generator). The displayed value is 1/5 the actual frequency: 10 = 50 Hz, 12 = 60 Hz.

1903*	Feed Clutch Boost	
	Adjusts the amount of extra push that the feed clutch gives to the paper after the skew has been corrected at registration. This feature helps the registration roller feed certain types of paper (such as thick paper). Increase the value if thick paper is jamming after feeding from the registration roller.	
1903 1	By-pass tray	[0 to 10 / **6** / 1 mm/step]

1911*	By-pass Envelope
1911 1	[**0 = Disabled** / 1= Enabled The program dedicated to envelope printing runs when you enable this program (SP 1911 1) and you select "Thick Paper" as the paper type of the by-pass tray (System Settings > Tray Paper Settings > Paper Type: By-pass Tray).

4.1.2 SP2-XXX (DRUM)

2001*	Charge Roller Bias Adjustment	
2001 1	Printing	[–2100 to –1500 / **–1700** / 1 V/step]
	Adjusts the voltage applied to the charge roller when printing. The actually applied voltage changes automatically as charge roller voltage correction is carried out. The value you set here becomes the base value on which this correction is carried out.	
2001 2	ID sensor pattern	[0 to 400 / **300** / 1 V/step]
	Adjusts the voltage applied to the charge roller when generating the Vsdp ID sensor pattern (as part of charge roller voltage correction). The actual charge-roller voltage is obtained by adding this value to the value of SP 2001 1.	

2101*	Erase Margin Adjustment	
2101 1	Leading edge	[0.0 to 9.0 / **2.0** / 0.1 mm/step] (☛ Copy Adjustments Printing/Scanning) Specification: 2 ± 1.5 mm
	Adjusts the leading edge erase margin.	
2101 2	Trailing	[0.0 to 9.0 / **3.0** / 0.1 mm/step] (☛ Copy Adjustments Printing/Scanning) Specification: 2 +2.5/–1.5 mm
	Adjusts the trailing edge erase margin. The rear trailing edge is this value plus 1.2 mm.	
2101 3	Left side	[0.0 to 9.0 / **2.0** / 0.1 mm/step] (☛ Copy Adjustments Printing/Scanning) Specification: 2 ± 1.5 mm
	Adjusts the left edge erase margin. The rear left edge is this value plus 0.3 mm.	

2101 4	Right side	[0.0 to 9.0 / **2.0** / 0.1 mm/step] (☛ Copy Adjustments Printing/Scanning) Specification: 2 +2.5/–1.5 mm
	Adjusts the right edge erase margin. The rear right edge is this value plus 0.3 mm.	

2201*	Development Bias Adjustment	
2201 1	Printing	[–1500 to –200 / **–650** / 1 V/step]
	Adjusts the voltage applied to the development roller when printing. This can be adjusted as a temporary measure if faint copies are being produced due to an aging drum.	
2201 2	ID sensor pattern	[–2 = LL (220 V) / **-1 = L (260 V**) / 0 = N (300 V) / 1 = H (340 V) / 2 = HH (380 V)]
	Adjusts the voltage applied to the development roller when generating the ID sensor pattern. The actual voltage applied is this setting plus the value of SP 2201 1. The setting affects ID sensor pattern density, which in turn affects the toner supply.	

2213*	Outputs after Near End
2213 1	[**0 = 50 pages** / 1 = 20 pages] Sets the number of copy/print pages that can be made after toner near-end has been detected. Reduce the number of pages if the user normally makes copies with a high image ratio.

2214	Developer Initialization
2214 1	Initializes both the TD sensor toner supply target voltage and the TD sensor gain value. Carry this out after replacing the developer or the TD sensor.

2220	TD Sensor Output Value Display
2220 1	Displays: Vt: the current TD sensor output value and Vref: the target TD output value Vts (SP 2926) + correction for ID sensor output. The TD sensor output value changes every copy. If 1 > 2, toner is supplied to the development unit.

2221	ID Sensor Error Analysis	
2221 1	Vsg	Displays the Vsg value.
2221 2	Vsp	Displays the Vsp value.
2221 3	PWM	Displays the PWM value.
2221 4	Vsdp	Displays the Vsdp value.
2221 5	Vt	Displays the Vt value.
2221 6	Vts	Displays the Vts value.

2301*	Transfer Current Adjustment	
2301 1	Normal paper	[–2 = –4 mA / **–1 = –2 mA** / 0 = 0 mA / 1 = 2 mA / 2 = +4 mA]
	Adjusts the current applied to the transfer roller when feeding from a paper tray. Use a high setting if the user normally feeds relatively thick paper (within spec) from a paper tray (☛ Image Transfer Current Timing).	

2301 2	Thick/Special paper	[–2 = –4 mA / **–1 = –2 mA** / 0 = 0 mA / 1 = 2 mA / 2 = +4 mA]
	Adjusts the current applied to the transfer roller when feeding from the by-pass tray. Use a high setting (a) if the user normally feeds relatively thick paper from the by-pass tray, or (b) if waste toner is re-attracted from the drum (which can occur when using transparencies). (☛ Image Transfer Current Timing)	
2301 4	Cleaning	[–10 to 0 / **–1** / 1 mA/step]
	Adjusts the current applied to the transfer roller for roller cleaning. Increase the current if toner remains on the roller after cleaning. (Remaining toner may cause dirty background on the rear side.) (☛ Image Transfer Current Timing)	

2802	Forced Developer Churning
2802 1	Initializes the developer and checks the TD sensor output (Vt). The machine mixes the developer for 2 minutes while reading and displaying the Vt value. The machine does not initialize the TD sensor output. If the machine has not been used for a long period of time, prints may have a dirty background. In this case, use this SP mode to mix the developer. The message "Completed" is displayed when the program ends normally.

2906*	Tailing Correction	
2906 1	Shift value	[0.0 to 1.0 / **0.0** / 0.1 mm/step]
	Shifts the image writing position in intervals specified by SP 2906 2. When making many copies of an original that contains vertical lines (such as in tables), the paper may not separate correctly. This can cause tailing images (ghosts of the vertical lines continuing past the bottom of the table). This SP can be used to prevent this.	

2906 2	Interval	[1 to 10 / **1** / 1 page/step]
	Changes the interval for the image shift specified by SP 2906 1.	

2908	Forced Toner Supply
2908 1	Forces the toner bottle to supply toner to the toner supply unit. Press "1" to start. The machine continues to supply toner until the toner concentration in the development unit reaches the standard level, or for up to 2 minutes (whichever comes first).

2915*	Polygon Mirror Motor Idling Time
2915 1	[0 = None / **1 = 15 s** / 2 = 25 s] Selects the polygon mirror motor idling time. To increase the speed of the first copy, the mirror motor begins idling when the user sets an original, touches a key, or opens the platen cover or DF. If this setting is left at the default (15 s), the motor will stop if the user does nothing for 15s. If the setting is "0", the motor will not switch off during standby. (But note that regardless of the setting, the motor will switch off when the machine enters energy saver mode.)

2921*	Toner Supply Mode
2921 1	[**0 = Sensor 1** / 1 = Sensor 2 (**DFU**) / 2 = Fixed 1 (**DFU**) / 3 = Fixed 2] Selects the toner supply mode. Under normal conditions this should be set to "0". You can temporarily change this to "3" if the TD sensor is defective. Do not set to "1" or "2", as these are for design use only (☛ Toner Density Control).

2922*	Toner Supply Time
2922 1	[0.1 to 5.0 / **0.4** / 0.1 s/step] Adjusts the toner supply motor ON time for Sensor 1 and Sensor 2 toner supply mode. Accordingly, this setting is effective only if SP 2921 is set to "0" or "1" Raising this value increases the toner supply motor ON time. Set to a high value if the user tends to make many copies having high proportions of solid black image areas (☛ Toner Density Control).

2923*	Toner Recovery Time
2923 1	[3 to 60 / **30** / 1 s/step] Adjusts the toner supply motor ON time used during toner recovery from Toner Near End or Toner End. This setting is effective only if SP 2921 is set to "0" Since toner recovery is carried out in 3-second cycles, the input value should be a multiple of 3 (3, 6, 9...). (☛ Toner Density Control)

2925*	Toner Supply Rate
2925 1	Adjusts the toner supply time for fixed toner supply mode. This setting is effective only if SP 2921 is set to "2" or "3".[0 to 7 / 0]t = 200ms, and settings are as follows 0 = t , 1 = 2t, 2 = 4t, 3 = 8t, 4 = 12t, 5 = 16t, 6 = on continuously, 7 = 0 s Raising this value increases the toner supply motor ON time. Set to a high value if the user tends to make many copies having high proportions of solid black image areas (☛ Toner Density Control).

2926*	Standard Vt
2926 1	[0.00 to 5.00 / **2.50** / 0.01 V/step] **DFU** Adjusts Vts (the Vt value for new developer). The TD sensor output is adjusted to this value during the TD sensor initial setting process]. This SP is effective only when SP 2921 is "0", "1", or "2".

2927*	ID Sensor Control
2927 1	[**0 = No** / 1 = Yes] Selects whether the ID sensor is or is not used for toner density control. This value should normally be left at "1". If the value is "0", dirty background may occur after long periods of non-use.

2928	Toner End Clear
2928 1	Clears the toner end condition without adding new toner. The following are cleared: Toner end indicator (goes out) Toner near-end counter Toner near-end level This function should generally not be used. If you clear the toner end condition without adding new toner, there is a risk that the drum may eventually begin to attract carrier after many more copies are made and toner runs out. This attracted carrier may damage the drum.

2929*	Vref Limits	
	Adjust the upper or lower Vref limit.	
2929 1	Upper	[0.50 to 3.50 / **3.20** / 0.01V/step] **DFU**
2929 2	Lower	[0.50 to 3.50 / **0.70** / 0.01V/step] **DFU**

2994*	ID Sensor Detection Temperature	[30 to 90 / **30** / 1 °C/step]
2994 1	While the machine is recovering from an energy saver mode, or while the machine starts, the BICU ignores the ID-sensor signals if the fusing temperature is at the specified value or higher.	

2996*	Transfer Roller Cleaning
2996 1	Selects whether the transfer roller is cleaned before each copy job. Set this to "1" if dirty background is appearing on the reverse side of the first page of copy jobs. Note that this will increase the time required to generate the first copy. If the setting is "0", the transfer roller is never cleaned (☛ Transfer Roller Cleaning).

2998*	Main Scan Magnification	[–0.5 to +0.5 / **0.0** / 0.1%/step]
2998 1	Adjusts the magnification along the main scan direction, for all print modes (copy, printing). The specification is 100 ± 1.0% (☛ Copy Adjustments Printing/Scanning).	

4.1.3 SP4-XXX (SCANNER)

4008*	Sub-Scan Magnification (Scanner)	[-0.9 to +0.9 / **0.0** / 0.1%/step]
4008 1	Adjusts the actual sub-scan direction scanning magnification. The higher the setting, the lower the scanner motor speed.	

4009*	Main Scan Magnification (Scanner)	[–0.9 to +0.9 / **0.0** / 0.1%/step]
4009 1	Adjusts the magnification along the main scan direction, for scanning. The specification is 100 ± 1.0% Main scan magnification is implemented in steps of 0.5. Accordingly, your input value should be a multiple of 0.5 (–1.0, –0.5, 0, +0.5, or +1.0)	

4010*	Leading Edge Registration (Scanner)	[–5.0 to +5.0 / **0.0** / 0.1 mm/step]
4010 1	Adjusts the leading edge registration for scanning in platen mode (☛ Copy Adjustments Printing/Scanning). (–): The image moves toward the leading edge. (+): The image moves toward the trailing edge The specification is 2 ± 1.5 mm.	

4011*	Side-to-side Registration (Scanner)	[–4.2 to +4.2 / **0.0** / 0.1 mm/step]
4011 1	Adjusts the side-to-side registration for scanning in platen mode (☛ Copy Adjustments Printing/Scanning) Increasing the value shifts the image to the right The specification is 2 ± 1.5 mm.	

4012*	Scan Erase Margin	
	Adjusts the scanning margin individually for each of the four edges. It is generally best to adjust the scanning margin as little as possible, and use the printing margin for image adjustments.	
4012 1	Leading edge	[0 to 9.0 / **1.0** / 0.1 mm/step]
4012 2	Trailing edge	
4012 3	Left	
4012 4	Right	

4013	Scanner Free Run
4013 1	Performs a scanner free run with the exposure lamp on. Press ON or to start. Press OFF to stop.

4015*	White Plate Scanning	
4015 1	Start position	[–3.0 to +6.0 / **0.0** / 0.1 mm/step]
	Adjusts the scanning start position on the white plate for auto shading. The base value stored in the machine is 15.2 mm toward the white plate from the scanner HP. This SP setting specifies the offset from this base value.	
4015 2	Scanning length	[–3.0 to +6.0 / **0.0** / 0.1 mm/step]
	Adjusts the length of the white plate scan, in the main scan direction. The scan begins at the start position set above [in SP 4015 1] and extends for the specified length. The base value stored in the machine is 4.76 mm. This SP setting specifies the offset from this base value.	

4305*	APS Priority	[0 = Normal / **1 = A4/LT** / 2 = 8K/16K]
4305 1	1. A4/LT ▪ North America model: When the ASP detects the LT size, the BICU interprets it as the A4 size. ▪ Other models: When the ASP detects the A4 size, the BICU interprets it as the LT size. 2. 8K/16K (for the China model only) ▪ When the ASP detects the A3/B4 SEF, the BICU interprets it as the 8K SEF. ▪ When the ASP detects the B5/A4 SEF, the BICU interprets it as the 16K SEF. ▪ When the ASP detects the B5/A4 LEF, the BICU interprets it as the 16K LEF. The Europe model interprets undetected original sizes as A5 LEF under the following conditions: 1. SP 4303 1 is "Yes," and 2. SP 4305 1 is "Normal" The Europe model interprets undetected original sizes as LT SEF under the following conditions: 1. SP 4303 1 is "Yes," and 2. SP 4305 1 is "A4/LT"	

4428	Scan Auto-Adjustment
4428 1	Performs the automatic scanner adjustment. Use this SP mode after replacing the white plate.

4901	SBU White Level Adjustment	
4901 2	Black Feedback-EVEN	[0 to o 8191]
	Displays the feedback value of the even channels given by the SBU. Normally, the value is 1, 2, 3, ..., 8188, 8189, or 8190. However, machine may operate normally even when the value is 0 or 8191.	
4901 3	Black Feedback-ODD	[0 to 8191]
	Displays the feedback value of the odd channels given by the SBU. Normally, the value is 1, 2, 3, ..., 8188, 8189, or 8190. However, machine may operate normally even when the value is 0 or 8191.	
4901 4	Black Display-Target	[0 to 63 / **10** /step]
	Displays the target value for the black-level adjustment executed during machine initialization. Normally, the value is 10. Other values indicate that the adjustment has ended unsuccessfully.	
4901 5*	White Target	[0 to 511 / **511** / 1/step]
	Displays the target value for the white-level adjustment.	
4901 6	White Result	[0 to 511 / **0** / 1/step]
	Displays the result of the white-level adjustment.	
4901 10	White Number of Attempt	[0 to 20 / **0** / 1/step]
	Displays how many times the white-level adjustment is retried. The value does not include the first execution of the white adjustment. For example, if the value is "2", this indicates that the white-level adjustment has been executed three times. The white-level adjustment can be executed 20 times or less. Therefore, if the value is "20," this indicates that the white-level adjustment has ended abnormally (as described, the value "20" does not include the first execution). If the white-level adjustment is unsuccessful, the machine uses the result of the latest, successful white-level adjustment.	

4901 11	Auto Adjustment Setting	[222 to 281 / **256** / 1/step]
	Displays the parameter of the white-level adjustment. The value is based on the result of SP 4901 12.	
4901 12	Auto Adjustment-Result	[0 to 600 / **0** / 1/step]
	Displays the result of the white-level adjustment. Normally, the value is between 228 and 281 (including the both values). When the value is normal, it is stored as the value of SP 4901 11.	

4902*	Exposure Lamp ON
4902 1	Turns the exposure lamp on or off. To turn off the exposure lamp, select "OFF". (The exposure lamp shuts off automatically after 180 seconds.)

4903*	ADS Level	[0 to 255 / **252** / 1/step]
4903 1	Adjusts the ADS level.	

4904*	ADS Lower Limit	[0 to 255 / **80** / 1/step]
4904 1	Adjusts the ADS lower limit.	

4905*	ADS Area Select	[**0 = All** / 1 = One]
4905 1	Checks the whole area (0 = All) or the area between 15 mm and 90 mm from the left edge (1 = One) to adjust the ADS level.	

4921*	Image Adj Selection	
4921 1	Image Adj Selection (Copy)	[0 to 10 / **0** / 1]
	Selects which mode the settings from SP 4922 to SP 4932 and are used for: 0 = None, 1 = Text 1, 2 =Text 2, 3= Photo 1, 4 = Photo 2, 5 = Photo 3, 6 = Special 1, 7 = Special 2, 8 = Special 3, 9 = Special 4, 10 = Special 5	

4922*	Scanner Gamma	
	Selects "text" or "photo" as the priority output mode. This setting is applied to all image processing modes of SP 4921.	
4922 1	Scanner Gamma (Copy)	[0=System default/**1=Text**/2=Photo]

4923*	Notch Selection	
	Selects the value of the center ID adjustment notch for the ID adjustment LEDs. Normally the center notch is 3 (range 1-5). If –1 is selected, each notch shifts down (becomes lighter). If +1 is selected, each notch shifts up (becomes darker). This setting is applied to all image processing modes of SP 4921.	
4923 1	Notch Selection (Copy)	[–1 = Light / **0 = Normal** / +1 = Dark]

4926*	Texture Removal	
	Adjusts the texture removal level that is used with error diffusion. 0: The default value for each mode is used. Text 1, Photo 2, Special 2, and Special 5 have a default of 3 and Photo 1, 3 have a default of 1. 1: No removal applied. 2 – 5: Removal applied at the level specified here. The higher the setting (level), the less clear the image will become (more texture removal). This setting is only applied to the originals in SP 4921.	

4926 1	Texture Removal (Copy)	[0 to 6 / **1**/step]

4927*	Line Width Correction	
	Adjusts the line width correction algorithm. Positive settings produce thicker lines; negative settings produce thinner lines. This setting is only applied to the originals in SP 4921.	
4927 1	Line Width Correction (Copy)	[–2 to 2 / **0** / 1/step]

4928*	Independent Dot Erase	
	Selects the dot erase level. Higher settings provide greater erasure. This setting is only applied to the originals in SP 4921.	
4928 1	Independent Dot Erase (Copy)	[–2 to 2 / **0** / 1/step]

4929*	Positive/Negative	[**0 = No**, 1 = Yes]
	Inverts white and black. This setting is only applied to the originals in SP 4921.	
4929 1	Positive/Negative (Copy)	

4930*	Sharpness-Edge	[–2 to 2 / **0** / 1/step]
	Adjust the clarity. This setting is only applied to the originals in SP 4921.	
4930 1	Sharpness-Edge (Copy)	

4931*	Sharpness-Solid	[–2 to 2 / **0** / 1/step]
	Adjust the clarity. This setting is only applied to the originals in SP 4921.	
4931 1	Sharpness-Solid (Copy)	

4932*	Sharpness-Low ID	[–2 to 2 / **0** / 1/step]
	Adjust the clarity. This setting is only applied to the originals in SP 4921.	
4932 1	Sharpness- Low ID (Copy)	

4941*	White Line Erase	[0 to 2 / **1** / 1/step]
4941 1	Selects the white line erase level. 0: None, 1: Weak, 2: Strong This setting is effective only Photo 1, Photo 3, Special 3 or Special 4 mode. 0: White line erase is not used, and white level correction is used instead. This setting is applied regardless of what mode has been selected in SP 4921.	

4942*	Black Line Erase	[0 to 3 / **2** / 1/step]
4942 1	Selects the black line erase level. This setting is effective only when originals are scanned by the ADF. [0 = No / 1 = Very weak / 2 = Weak / 3 = Strong] This setting is applied regardless of what mode has been selected in SP 4921.	

4.1.4 SP5-XXX (MODE)

5001	All Indicators On
5001 1	All LEDs turn on. The LCD turns on or off every 3 seconds. Press the reset key to end this program.

5104*	A3/DLT Double Count	[**0 = Enabled** / 1 = Disabled / 2 = Disabled if the size is undetected]
5104 1	Selects whether the machine counts twice for each sheet of A3/11"x 17". If this is set to "Yes" is selected, the total (mechanical) counter and the current user counter will both increment by two for each A3/11" x 17" sheet.	

5113*	Optional Counter Type	**0: None** 11: MF key card (Increment) 12: MF key card (Decrement)
5113 1	Selects the corresponding key for installed devices such as coin lock.	

5120*	Clr-OP Count Remv	[0=Yes / **1=Standby only** / 2=No]
5120 1	Determines under which conditions the copy job settings are reset when the key counter is removed. With 0, the settings are cleared if the counter is removed at the end of a job or midway through a job. With 1, they are only cleared if the counter is removed at the end of a job. With 2, they are not cleared at all, under either condition. With duplex copies, the job settings are always preserved, regardless of the setting of this SP mode.	

5121*	Count Up Timing	[**0 = Feed In** / 1 = Exit]
5121 1	Selects whether the key counter increments at time of paper feed-in or at time of paper exit.	

5501*	PM Alarm Interval (Printout)	[0 to 9999 / **0** / 0K copies/step]
5501 1	Specifies when the PM alarm occurs.	

5801	Memory Clear
5801 2	Engine (☛ Memory Clear)

5802	Machine Free Run
5802 1	Starts a free run of both the scanner and the printer. Press "ON" to start; press "OFF" to stop.

5803	Input Check
	(☛ Input Check (SP 5803))

5804	Output Check
	(☛ Output Check (SP 5804))

5807*	Area Selection
5807 1	Selects the display language group. 1 = Japan, **2 = South America**, 3 = Europe, 4 = Taiwan, 5 = Asia, 6 = China, 7 = Korea SP 5807 1 is not cleared by SP 5801 2 (☛ Memory Clear).

5811*	Serial Num Input	
5811 1	Setting	Sets the machine serial number. **FA**

5812*	Service TEL
5812 1	Service TEL (Telephone)
	Use this to input the telephone number of the service representative. (The number is displayed when a service call condition occurs.) To input a dash, press#. To delete the current telephone number, press*.
5812 2	Service TEL (Facsimile)
	Use this to input the fax number printed on user counter reports. To input a dash, press#. To delete the current fax number, press*.

5824	NVRAM Upload
5824 1	(☛ NVRAM Data Upload/Download (SP 5824/5825))

5825	NVRAM Download
5825 1	(☛ NVRAM Data Upload/Download (SP 5824/5825))

5827	Program Download
5827 1	Downloads programs to the machine

5901	Printer Free Run
5901 1	Executes the free run. Press "ON" to start; press "OFF" to stop.

5902	Test Pattern Print
5902 1	(☛ Test Pattern Print (SP 5902 1))

5907*	Plug & Play Setting
5907 1	Selects the brand name and production name for the Plug and Play function. These names are registered in the NVRAM. If the NVRAM becomes defective, these names should be re-registered. Use the right-arrow or left-arrow key to scroll through the list of brand names. To select a brand name, press the OK key. An asterisk (*) indicates which manufacture is currently selected. (☛ Memory Clear)

5990	SMC Print	
5990 1	All	(☛ SMC Print (SP 5990))
5990 2	SP	
5990 3	User Program	
5990 4	Logging Data	
5990 5	Big font	

4.1.5 SP6-XXX (PERIPHERALS)

6006*	ADF Adjustment (☛ ADF Image Adjustment) NOTE: Available menus depend on the machine model and its configuration.	
6006 1	ADF Adjustment (StoS/Front Regist)	[–5.0 to +5.0 / **0.0** / 0.1 mm/step]
	Adjusts the side-to-side registration for the front side of the original, for ADF mode. Use the # key to select "+" or "–" before entering the value	
6006 2	ADF Adjustment (Leading Regist)	[–5.0 to +5.0 / **0.0** / 0.1 mm/step]
	Adjusts the leading edge registration for ADF mode. Use the # key to select "+" or "–" before entering the value.	
6006 3	ADF Adjustment (Trailing Erase)	[–3.0 to +3.0 / **–1.0** / 0.1 mm/step]
	Adjusts the trailing edge erase margin for ADF mode. Use the # key to select "+" or "–" before entering the value.	
6006 5	ADF Adjustment (Sub-scan Magnif)	[–0.9 to +0.9 / **0.0** / 0.1 %/step]
	Adjust the sub-scan magnification for the ADF.	

6009	ADF Free Run
6009 1	Performs an ADF free run. Press "ON" to start; press "OFF" to stop.

6901	Display ADF/APS
6901 1	Displays the status of the ADF original size sensors (☛ ADF APS Sensor Output Display (SP 6901)).

6910*	ADF Shading Time	[0 to 60 / **10** / 1 s/step]
6910 1	Adjusts the interval used for the shading processing in the ADF mode. Light and heat in the room may affect the scanner response. Reduce this setting if copy quality indicates that the white level is drifting during ADF copy jobs.	

4.1.6 SP7-XXX (DATA LOG)

7001*	Total Operation
7001 1	Shows the total operation time (total drum rotation time).

7401*	Counter–SC Total	[0 to 9999 / **0** / 1/step]
7401 1	Shows how many times SC codes are generated.	

7403*	SC History
7403 1	Shows the histories of the latest 10 SC codes.

7502*	Counter–Paper Jam	[0 to 9999 / **0** / 1/step]
7502 1	Shows the total number of copy paper jams.	

7503*	Counter–Orgn Jam	[0 to 9999 / **0** / 1/step]
7503 1	Shows the total number of original jams,	

7504*	Counter-Each P Jam	[0 to 9999 / **0** / 1/step]
	Displays the total number of the paper jams classified by timing and location.	
7504 1	Counter-Each P Jam (At power on)	
	Paper jam occurs at power on.	
7504 10	Counter-Each P Jam (Off-Regist NoFeed)	
	Paper does not reach the registration sensor (from a paper tray).	

7504 50	Counter-Each P Jam (Off-Regist By-pass)
	Paper does not reach the registration sensor (from the by-pass tray).
7504 70	Counter-Each P Jam (On-Regist SN)
	Paper is caught at the registration sensor.
7504 120	Counter-Each P Jam (On-Exit SN)
	Paper is caught at the exit sensor (previous page).
7504 121	Counter-Each P Jam (Off-Exit SN)
	Paper does not reach the exit sensor.
7504 122	Counter-Each P Jam (On-Exit SN)
	Paper is caught at the exit sensor.

7505*	Counter-Each O Jam	[0 to 9999 / **0** / 1/step]
	Displays the total number of the original jams on the ADF that have occurred at a certain timing or at a certain location.	
7505 210	Counter-Each O Jam (Off-Regist SN)	
	The original does not reach the registration sensor.	
7505 211	Counter-Each O Jam (On-Regist SN)	
	The original is caught at the registration sensor.	
7505 216	Counter-Each O Jam (Insufficient gap)	
	The distance between originals is not sufficient. This jam can occur when the original is not of the standard size.	

7507*	Dsply-P Jam Hist
7507 1	Displays the latest 10 paper-jam history. The list below shows the possible 22 codes: 1, 10, 11, 12, 21, 22, 31, 32, 50, 60, 70, 120, 121, 122, 123, 125, 126, 127, 128, 129, 130, 131 The codes correspond to the menus of SP 7504. For example, the code 1 corresponds to SP 7504 1, and the code 10 corresponds to SP 7504 10.

7508*	Dsply-O Jam Hist
7508 1	Displays the total number of the original-jams history. The following are the possible seven codes: 210, 211, 212, 213, 214, 215, 216 The codes correspond to the menus of SP 7505. For example, the code 210 corresponds to SP 7505 210, and the code 211 corresponds to SP 7505 211.

7801	Memory/Version/PN
7801 2	Memory/Version (BICU)
	Displays the version of the BICU board
7801 5	Memory/Version (ADF)
	Displays the P/N and suffix of the ADF ROM.

7803*	Display–PM Count
7803 1	Displays the PM counter.

7804	Reset–PM Counter
7804 1	Resets the PM counter (SP 7803 1). When the program ends normally, the message "Completed" is displayed.

7807	Reset–SC/Jam Counters
7807 1	Resets the SC, paper, original, and total jam counters. When the program ends normally, the message "Completed" is displayed. SP 7807 1 does not reset the following logs: SP 7507 (Display-Paper Jam History) and SP 7508 (Display-Original Jam History).

7808	Reset–Counters
7808 1	Resets all counters except for the management counters. The management counters are the counters that are not changed by NVRAM Download (SP 5825 1) When the program ends normally, the message the message "Completed" is displayed.

7810	Reset–Key Op Code
7810 1	Resets the key operator code. Use SP 7810 1 when the customer has forgotten the key-operator code. When the program ends normally, the message "Completed" is displayed, if the program ends abnormally, an error message is displayed. If the customer forgets the key operator code. To specify a new key-operator code, use the User Tools: System Settings → Key Operator Tools → Key Operator Code → On → Enter Key Operator Code.

7832*	Display-Self-Diag
7832 1	Displays the SC codes and the number of their occurrences. Each number is in the range of 0 to 9999.

7991*	Dsply–Info Count
	Displays the total operating time or the total number of operations. The time is displayed in the following format: day:hour:minute:second.
7991 1	Dsply–Info Count (Dsply-Timer Count)
	The total of the time when the main switch is kept on (excluding the time when the safety switch is off (☛ LD Safety Switch).
7991 3	Dsply-Info Count (Dsply-ID S Work)
	The total of the time when the ID sensor is working.
7991 4	Dsply-Info Count (Dsply-Dev Counter)
	The total number of paper outputs.
7991 5	Dsply-Info Count (Dsply-ID Er Count)
	The total number of ID-sensor errors.

7992*	Reset–Info Count
7992 1	Reset–Info Count (Reset-Timer Count)
	Clears the counter of SP 7991 1.
7992 5	Reset-Info Count (Reset-ID Er Count)
	Clears the counter of SP 7991 5.

4.1.7 SP8-XXX (HISTORY)

8192*	C: Total Scan PGS	[0 to 9999999 / **0** / 1 sheet/step]
8192 1	Displays the total number of scanned copies. Both sides are counted when the front and reverse sides of an original (fed from the ADF) are scanned.	

8221*	ADF Org Feed	[0 to 9999999 / **0** / 1 sheet/step]
8221 1	ADF Org Feed (Front)	
	Displays the total number of scanned front sides of originals fed from the ADF.	

8381*	T: Total Prt PGS	[0 to 9999999 / **0** / 1 sheet/step]
8381 1	Displays the print count of all application programs.	

8382*	C: Total Prt PGS	[0 to 9999999 / **0** / 1 sheet/step]
8382 1	Displays the print count of the copier application program.	

8391*	L size Prt PGS (A3/DLT, Larger)	[0 to 9999999 / **0** / 1 sheet/step]
8391 1	Displays the print count of the AS/DLT size or larger paper.	

8442*	C: PrtPGS/Ppr Size	[0 to 9999999 / **0** / 1 sheet/step]
	Displays the number of pages printed by the copier application program.	
8442 1	(A3)	
8442 2	(A4)	
8442 3	(A5)	
8442 4	(B4)	
8442 5	(B5)	
8442 6	(DLT)	
8442 7	(LG)	
8442 8	(LT)	
8442 9	(HLT)	
8442 254	Other (Standard)	
8442 255	Other (Custom)	

8451*	C: PrtPGS/Ppr Tray	[0 to 9999999 / **0** / 1 sheet/step]
	Displays the total print count classified by paper source.	
8451 1	By-pass Tray	
8451 2	Tray 1	

8462*	C: PrtPGS/Ppr Type	[0 to 9999999 / **0** / 1 sheet/step]
	Displays the total print count classified by paper size.	
8462 1	Normal	
8462 4	Thick	
8462 7	OHP	
8462 8	Other	

8522*	C: PrtPGS/FIN (Sort)	[0 to 9999999 / **0** / 1 sheet/step]
8522 1	Displays the total number of printing classified by paper size.	

B813

DOCUMENT FEEDER DF2000

B813 DOCUMENT FEEDER DF2000 REVISION HISTORY		
Page	**Date**	**Added/Updated/New**
		None

DOCUMENT FEEDER DF2000 B813
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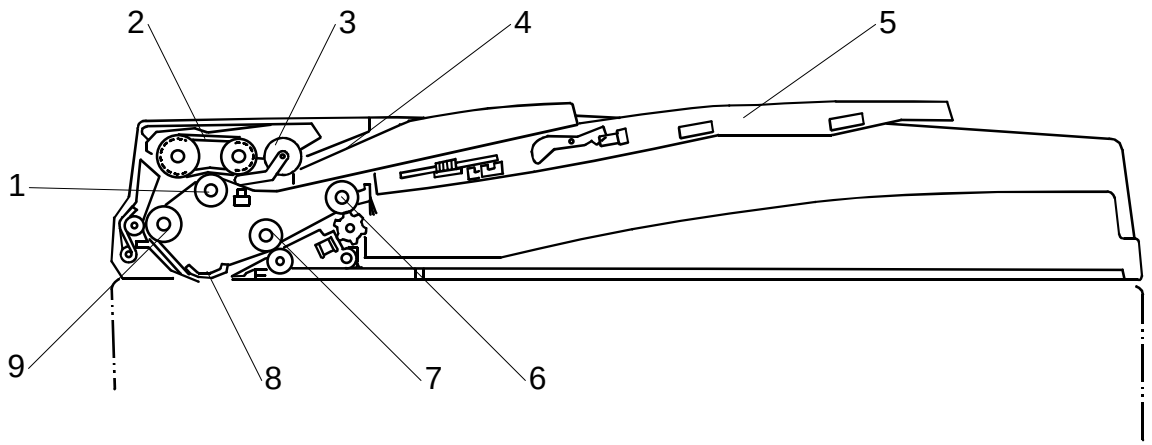
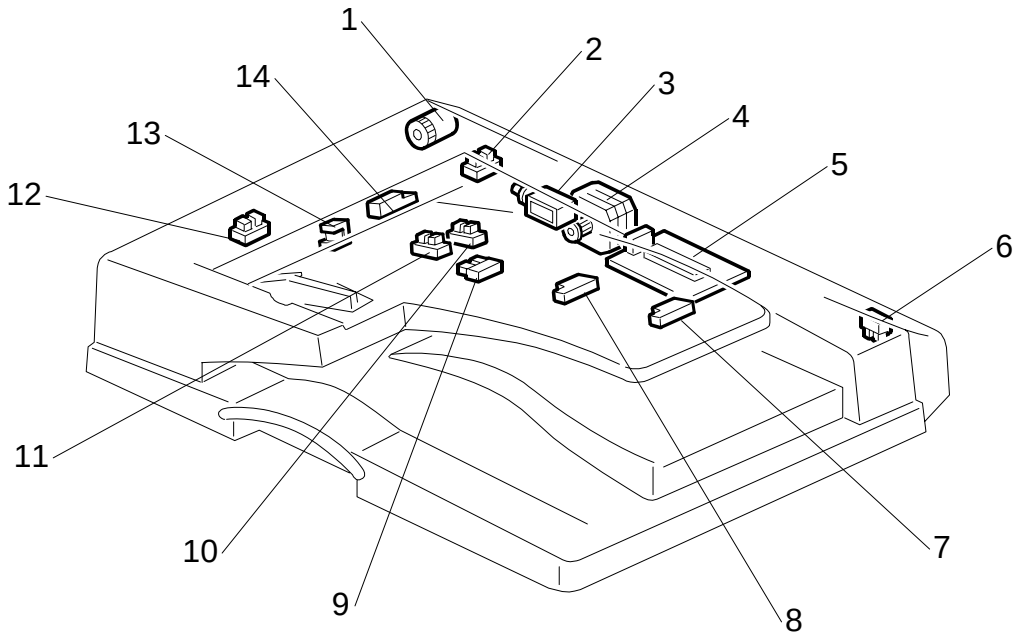
1. OVERALL INFORMATION

1.1 MECHANICAL COMPONENT LAYOUT



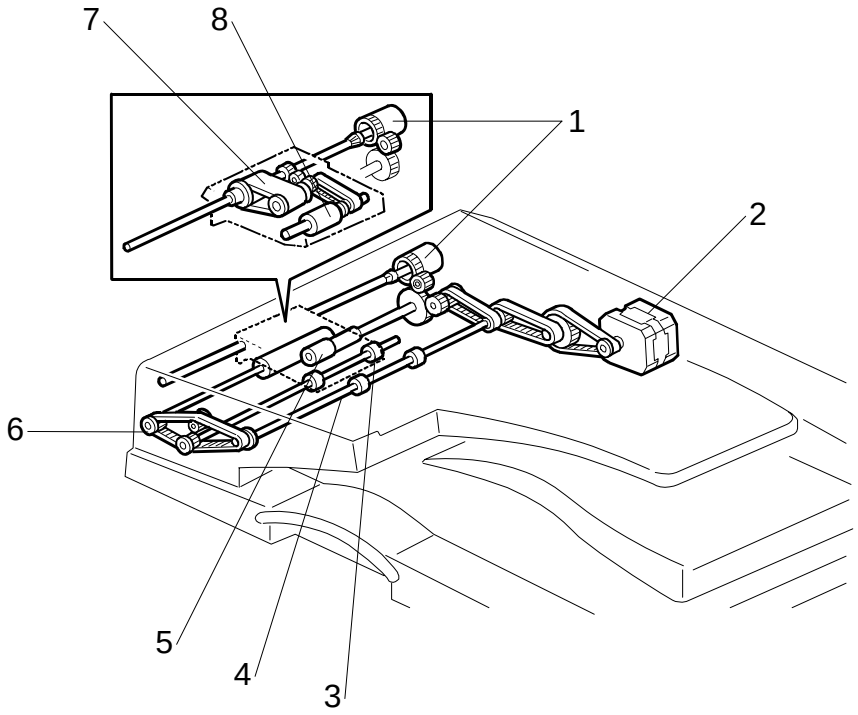
1. Separation roller
2. Original feed belt
3. Pick-up roller
4. Original entrance guide
5. Original table
6. Original exit roller
7. 2nd transport roller
8. Original exposure guide
9. 1st transport roller

1.2 ELECTRICAL COMPONENT LAYOUT



1. DF feed clutch
2. Feed cover open sensor
3. DF pick-up solenoid
4. DF transport motor
5. DF drive board
6. DF position sensor
7. Original length sensor 2
8. Original length sensor 1
9. Original trailing edge sensor
10. Original width sensor 1
11. Original width sensor 2
12. Original set sensor
13. Stamp solenoid
14. Registration sensor

1.3 DRIVE LAYOUT



1. DF feed clutch
2. DF transport motor
3. 2nd transport roller
4. Exit roller
5. Separation roller
6. 1st transport roller
7. Original feed belt
8. Pick-up roller

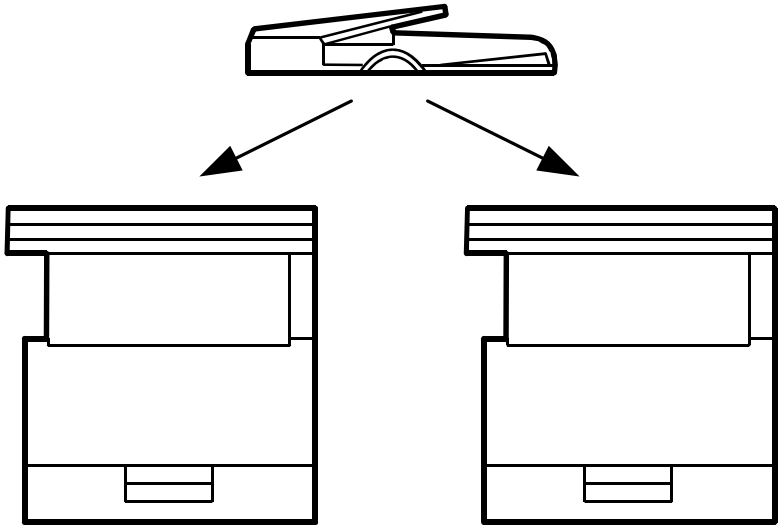
2. DETAILED SECTION DESCRIPTIONS

2.1 ADF B813 AND ARDF B814

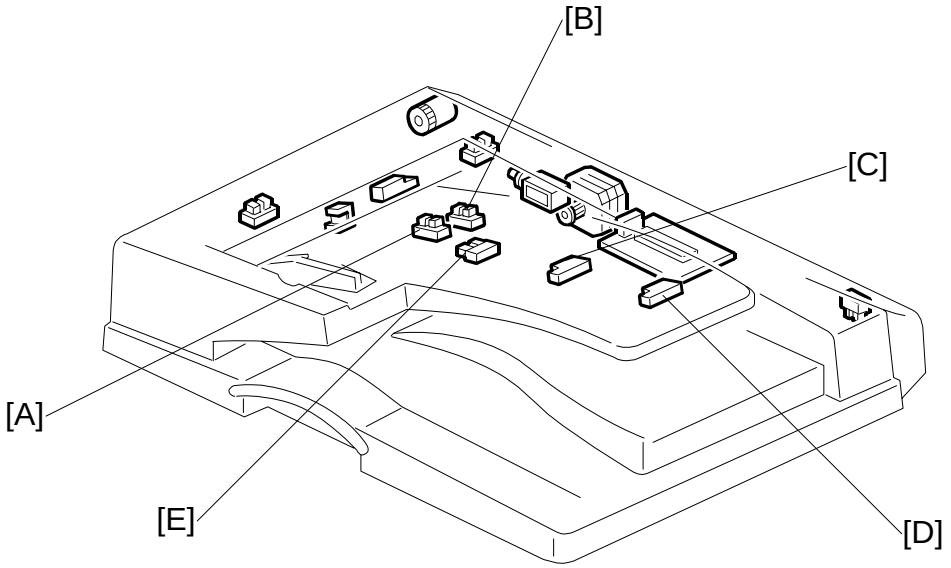
ADF B813 and ARDF B814 are both applicable to model B277 and model B229. When the copier starts, the controller of the document feeder communicates with the controller of the copier. The document-feeder controller checks the line speed of the copier, and decides the line speed of the document feeder. The table lists the line speeds of ADF B813 and ARDF B814.

	B277	B229
ADF B813	100 mm/sec	100 mm/sec (Color mode: 66.7 mm/sec)
ARDF B814	100 mm/sec	100 mm/sec (Color mode: 66.7 mm/sec)

NOTE: The line speed of B277 is 100 mm/sec; the line speed of B229 is 100 mm/sec (Color mode: 66.7 mm/sec).



2.2 ORIGINAL SIZE DETECTION



The DF uses two width sensors (width sensor 1 [A] and width sensor 2 [B]) to detect the original width, and two length sensors (length sensor 1 [C] and length sensor 2 [D]) to detect the original length. The DF detects the original size based on the combination of inputs from these sensors, as indicated in the table on the next page.

If using a non-standard original size, the user must input the original length at the operation panel.

The original width sensors have four possible output states: P1 to P4. The output depends on the position of the ridges on the toothed plate attached to the original rear fence.

During one-to-one copying, copy paper is fed to the registration roller in advance to increase the copy speed. The original exit trailing edge sensor [E] monitors the stack of originals in the feeder, and detects when the trailing edge of the last page has been fed in. This stops the ADF from causing the feed of an unwanted extra sheet of copy paper.

ORIGINAL SIZE DETECTION

		NA	EU	Original Length 1	Original Length 2	P1	P2	P3	P4
1	A3 (297 x 420)	✗	❍	ON	ON	-	-	-	ON
2	B4 (257 x 364)	✗	❍	ON	ON	-	-	ON	-
3	A4 SEF (210 x 297)	✗	❍	ON	-	-	ON	-	-
4	A4 LEF (297 x 210)	✗	❍	-	-	-	-	-	ON
5	B5 SEF (182 x 257)	✗	❍	ON	-	ON	-	-	-
6	B5 LEF (257 x 182)	✗	❍	-	-	-	-	ON	-
7	A5 SEF (148 x 210)	✗	❍	-	-	ON	-	-	-
8	A5 LEF (210 x 148)	✗	❍	-	-	-	ON	-	-
9	11" x 17"	❍1	✗	ON	ON	-	-	-	ON
10	11" x 15"	●1	✗	ON	ON	-	-	-	ON
11	10" x 14"	❍	✗	ON	ON	-	-	ON	-
12	8 1/2" x 14"	❍2	✗	ON	ON	-	ON	-	-
13	8 1/2" x 13"	✗	❍4	ON	ON	-	ON	-	-
14	8" x 13"	●2	●4	ON	ON	-	ON	-	-
15	8 1/2" x 11" SEF	❍3	✗	ON	-	-	ON	-	-
16	11" x 8 1/2" LEF	❍	✗	-	-	-	-	-	ON
17	8" x 10" SEF	●3	✗	ON	-	-	ON	-	-
18	5 1/2" x 8 1/2" SEF	❍	✗	-	-	ON	-	-	-
19	8 1/2" x 5 1/2" LEF	❍	✗	-	-	-	ON	-	-

NA: America (North, Middle, South) EU: Europe, Asia, China, Taiwan
✗: No ❍: Yes ON: Paper present

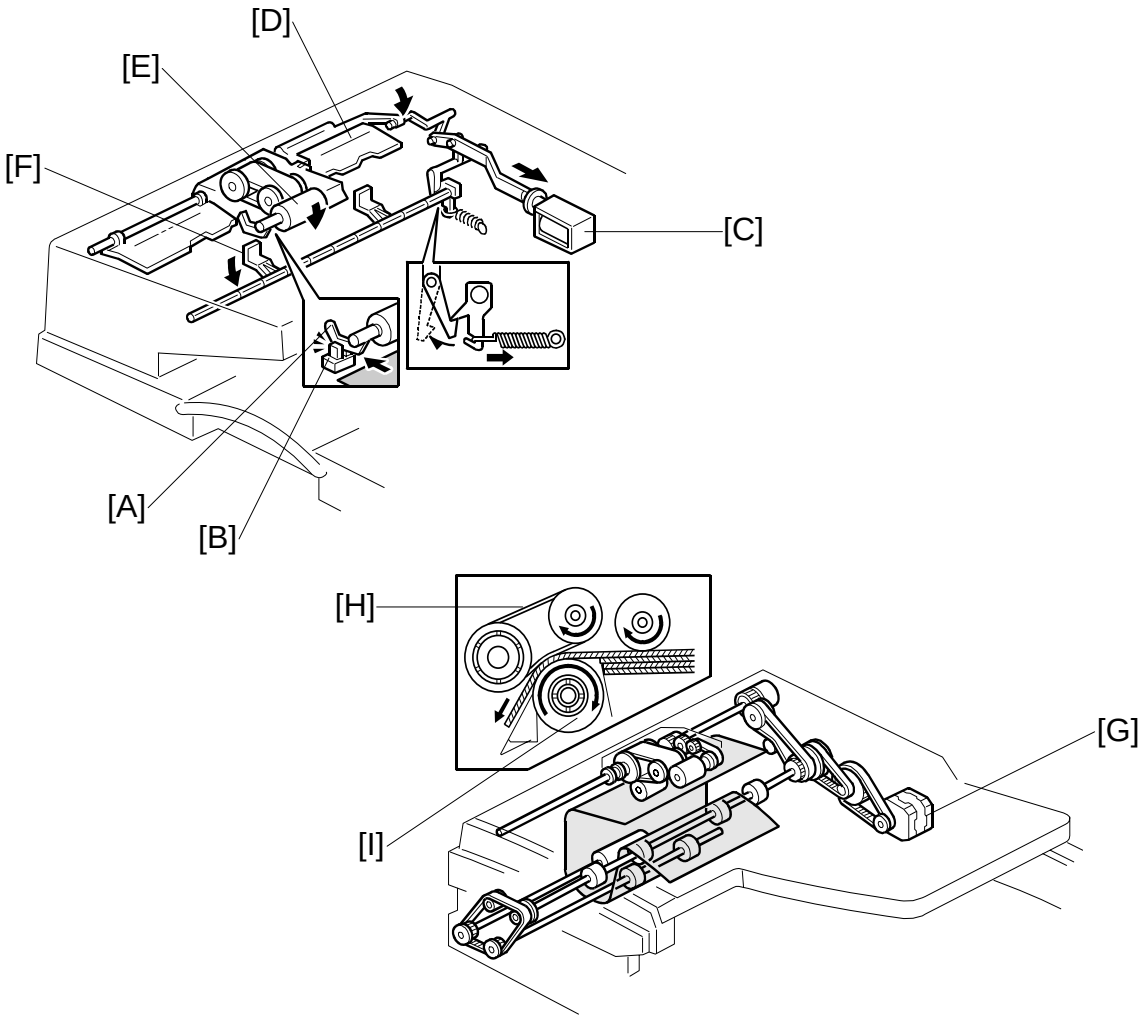
❍1, ●1: In NA, original size 11" x 15" is detected as 11" x 17"
❍2, ●2: In NA, original size 8" x 13" is detected as 8 1/2" x 14"
❍3, ●3: In NA, original size 8" x 10" is detected as 8 1/2" x 11"
❍4, ●4: In EU, original size 8" x 13" is detected as 8 1/2" x 13"

- Original Width Sensor States -

Width Sensor 1	High	Low	Low	High
Width Sensor 2	High	High	Low	Low
Detection State	P1	P2	P3	P4

Low = Blocked High = Open

2.3 PICK-UP AND SEPARATION

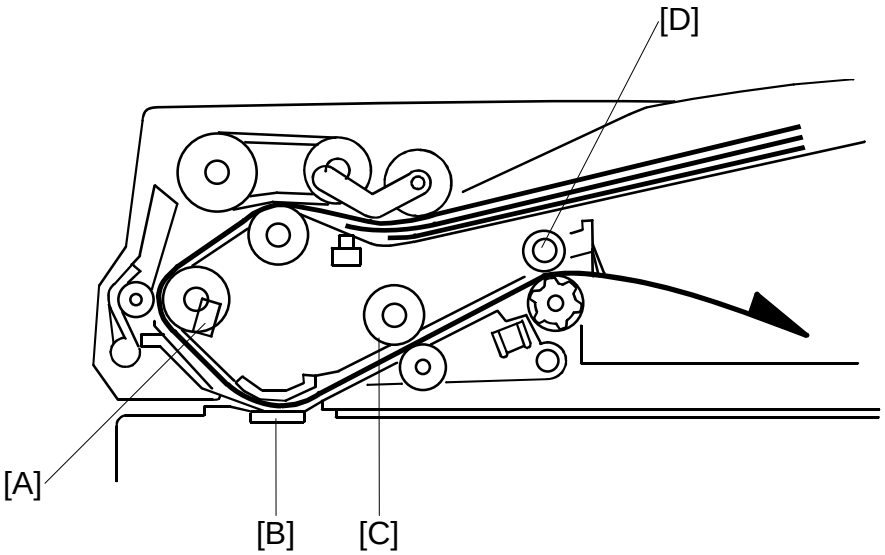


An FRR (feed and reverse roller) system is used.

Setting original(s) onto the feed table lifts the original set sensor feeler [A], causing the original set sensor [B] to issue a signal informing the main CPU that the DF is ready to start feeding.

When the Start key (◇) is pressed, the DF pick-up solenoid [C] turns on, causing the transport guide [D] and pick-up roller [E] to lower onto the original, while at the same time causing the original stoppers [F] to drop down to clear the feed path for the original. After 200 ms, the DF transport motor [G] turns on, feeding the top original page to the paper feed belt [H], where it is separated by the separation roller [I].

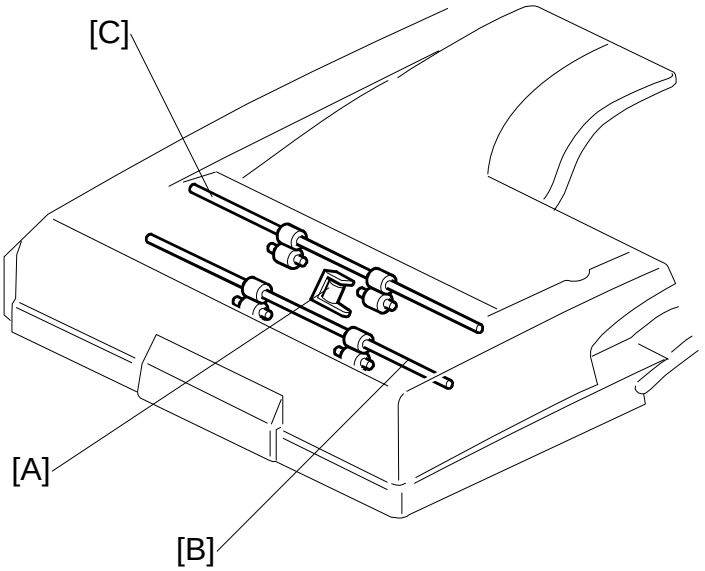
2.4 ORIGINAL TRANSPORT AND EXIT MECHANISM



When the leading edge of the original reaches the registration sensor at [A], the DF transport motor turns off. After a short time the DF transport motor turns on again. The original is fed past the DF exposure glass [B], where it is scanned. It is then fed through to the 2nd transport roller [C] and fed out by the exit roller [D].

The DF transport motor uses a constant speed to feed the original up to the registration sensor. When the motor turns on again to feed the original to the DF exposure glass, however, the speed depends on the selected reproduction ratio. At 100%, the speed is 100 mm/s (Color mode: 66.7mm/sec).

2.5 STAMP



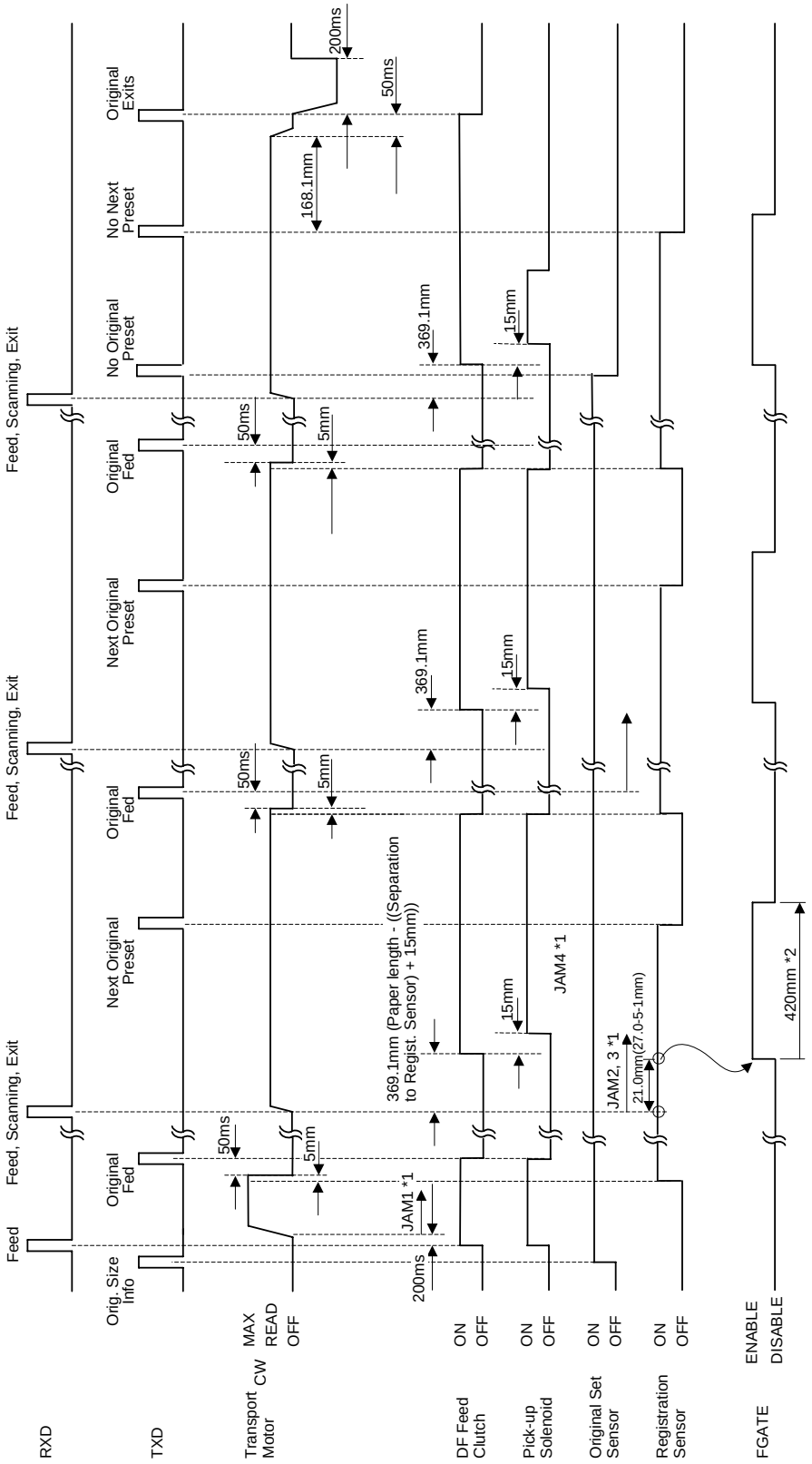
This function is only for fax mode. The fax unit includes the stamp.

The stamp solenoid [A] is located between the 2nd transport roller [B] and the exit roller [C]. The copier controls this solenoid directly.

When the original reaches the stamp position, the DF transport motor stops. Provided that the page was sent successfully (immediate transmission) or stored successfully (memory transmission), the stamp solenoid then comes on 300 ms after the DF motor stops. After stamping, the DF transport motor resumes feeding, at about 1.3 times the normal speed.

The positioning of the stamp on the original can be adjusted using SP6-010.

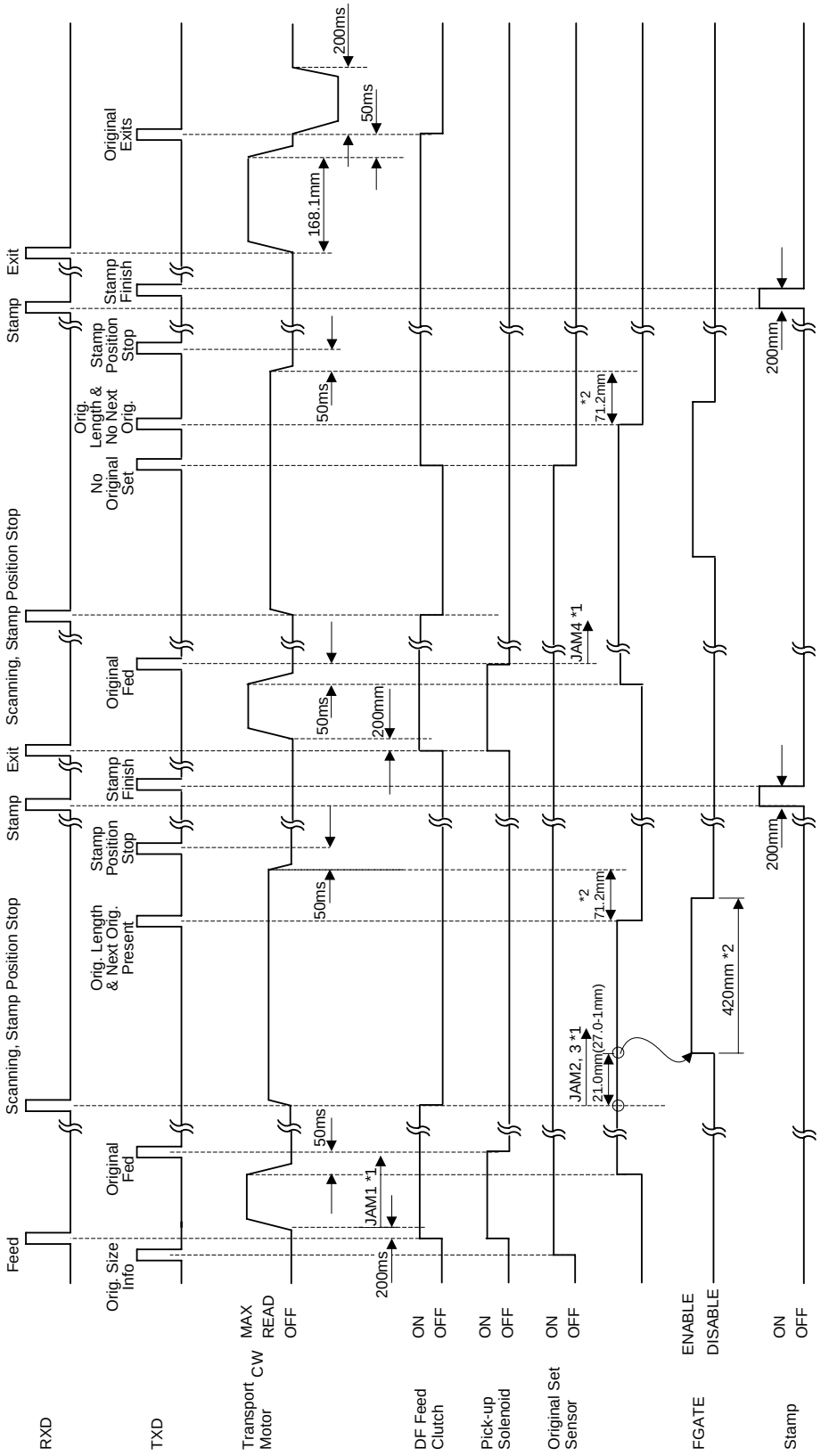
2.6 TIMING CHARTS



*1 For information about jam conditions, see Section 2.6.

*2 F Gate: This signal goes high when the laser start to wire a pate to the drum. The distance depends on SP mode setting 6-006-2 and -3.

2.6.1 A3, STAMP MODE



*1 For information about jam conditions, see Section 2.6.

*2 F Gate: This signal goes high when the laser start to wire a pate to the drum.
The distance depends on SP mode setting 6-006-2 and -3.

2.7 JAM DETECTION

JAM 1: If the registration sensor fails to turn on within x_1 ms after the DF transport motor comes on to feed the original from the original tray.

x_1 = 2267 ms

JAM 2: If the registration sensor fails to turn off within x_2 ms after the DF transport motor comes on to feed the original from the original tray.

x_2 = 1234 ms

JAM 3: If there is no original at the registration sensor when scanning is started, even though the sensor had already turned on.

JAM 4: The current original is stopped after the registration sensor detects its leading edge, but the previous original is still at the scanning position.

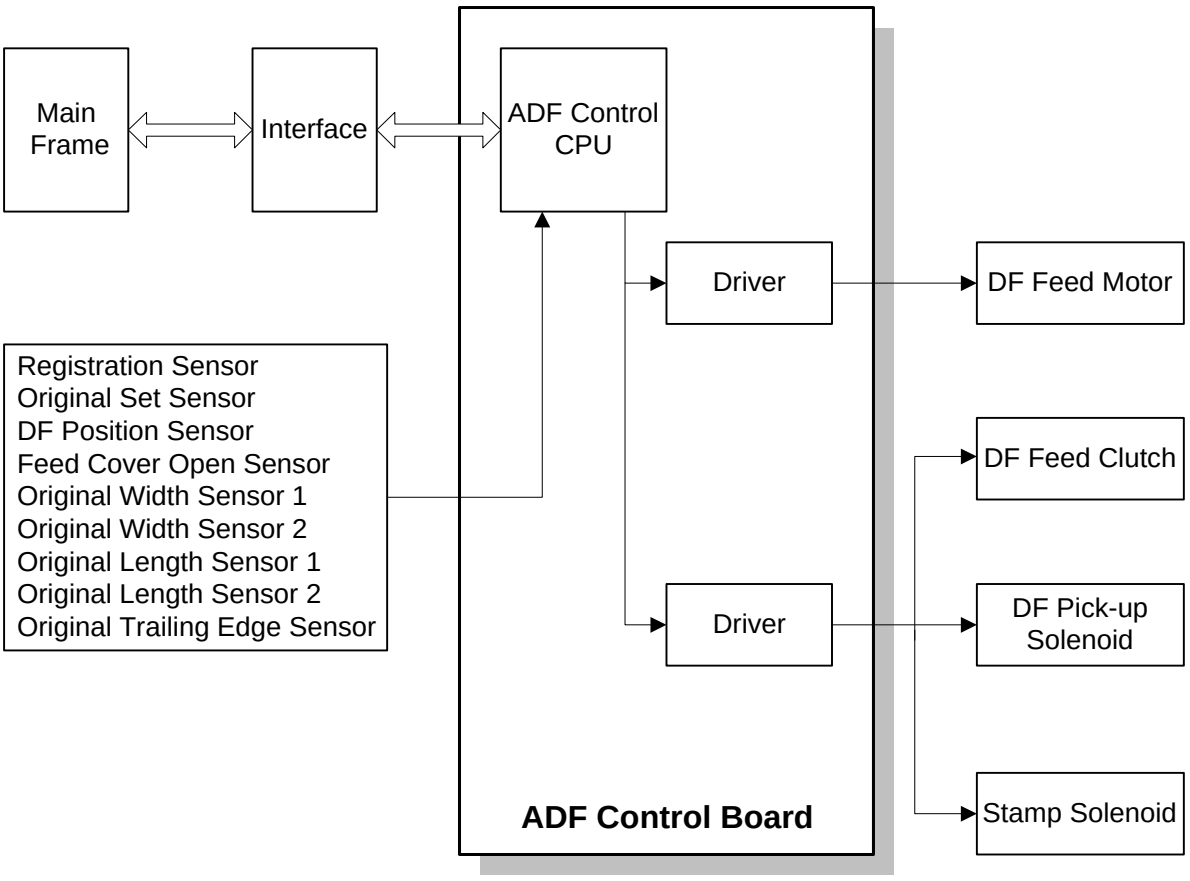
JAM 5: If the original stopped at the stamp position is removed.

JAM 6: If the cover is opened or the ADF is lifted up while the ADF is in operation.

JAM 7: If the DF gate signal (indicating that the original is now in the correct position for scanning) is not asserted when the original trailing edge passes the DF exposure glass.
JAM 7 occurs when the original is pulled out while it is being scanned.

2.8 OVERALL ELECTRICAL CIRCUIT

The DF CPU controls the DF transport motor, DF feed clutch, DF pick-up solenoid, and stamp solenoid. The DF CPU also monitors all sensors and provides updated status when prompted at regular intervals by the mainframe, which may then take action based on this information. The DF/mainframe connection is checked automatically immediately after the mainframe is powered on.



2.9 FREE RUN

You can use DIP switch 100 (on the DF control board) to carry out a one-sided free run.

Mode\Bits	Bit0	Bit1	Bit2	Bit3
Normal	Off	Off	Off	Off
FR with paper	On	Off	Off	Off
Feed/Transport Motor Test	On	On	Off	Off
Feed Solenoid Test	Off	Off	On	Off
Feed Clutch Test	On	Off	On	Off
Stamp Solenoid Test	Off	On	On	Off
Special I/F Test	Off	Off	Off	On
FR without paper	On	Off	Off	On
Transport Motor Test	On	On	Off	On

FR: Free run

Procedure

1. Set bit 1 and/or bit 2 on SW100 (on the DF control board) to ON.
2. Set originals on the original table.
3. The free run starts automatically after about 2 seconds.
4. To stop the run, set SW100 bits 1 and 2 back to OFF. To ensure that the system correctly resets, turn power off and then back on.

Free Run Process

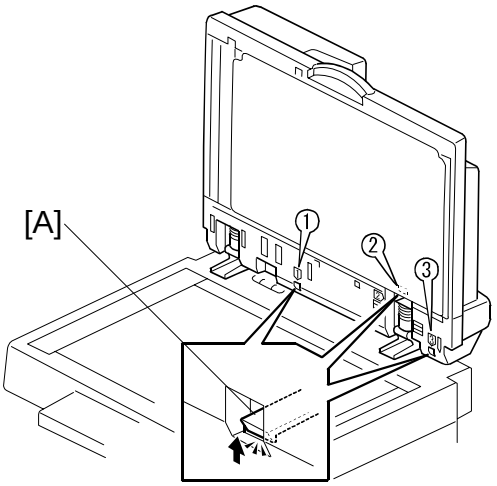
1. Set originals on the DF table.
2. The first original sheet feeds into the DF.
3. The sensor detects the original.
4. The DF outputs the original to the exit tray.
5. Steps 2 through 4 repeat for each subsequent original sheet. When all originals have been fed, the DF stops and waits for more.

3. REPLACEMENT AND ADJUSTMENT

3.1 EXTERIOR COVERS

3.1.1 REAR COVER

1. Lift the DF.
2. Unhook the three latches [A] in the order marked on the DF body.
3. Close the DF.
4. Open the DF feed cover [B].
5. Rear cover [C] (x 1)

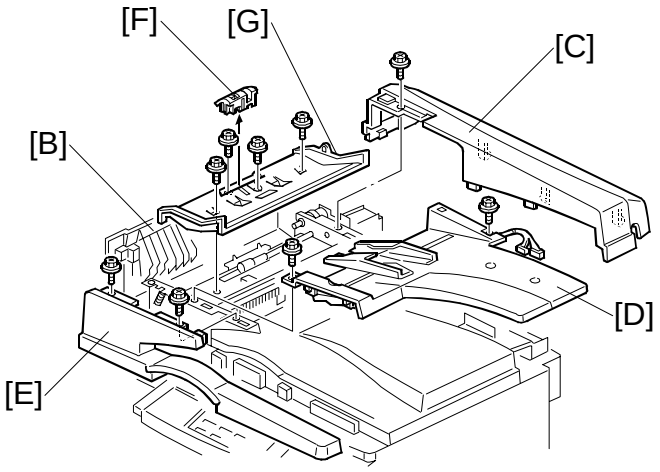


3.1.2 ORIGINAL TABLE

1. Rear cover (☛ 3.1.1)
2. Original table [D] (x 2, x 2)

3.1.3 FRONT COVER

1. Open the DF feed cover [B].
2. Original table. (☛ 3.1.2)
3. Front cover [E] (x 2)

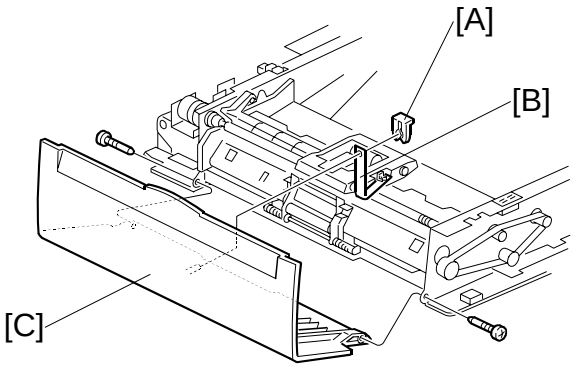


3.1.4 ORIGINAL ENTRANCE GUIDE

1. Feed unit (☛ 3.2)
2. Original table (☛ 3.1.2)
3. Roller cover [F]
4. Original entrance guide [G] (x 4)

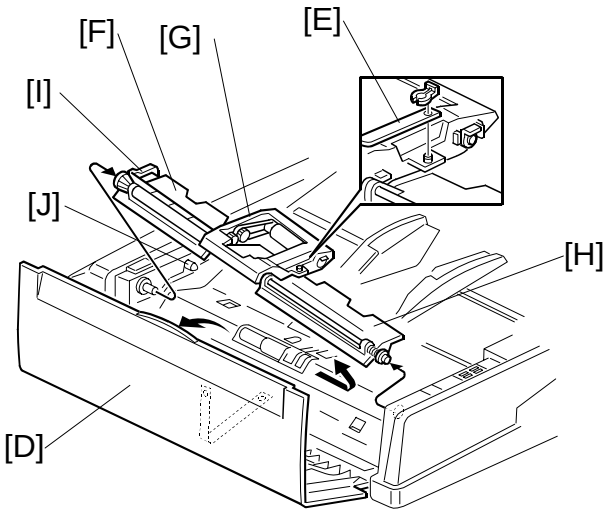
3.1.5 DF FEED COVER

1. Rear cover (☛ 3.1.1)
2. Original table (☛ 3.1.2)
3. Front cover (☛ 3.1.3)
4. Clip [A]
5. Strap [B] (🔩 x 1)
6. DF feed cover [C] (🔩 x 2)



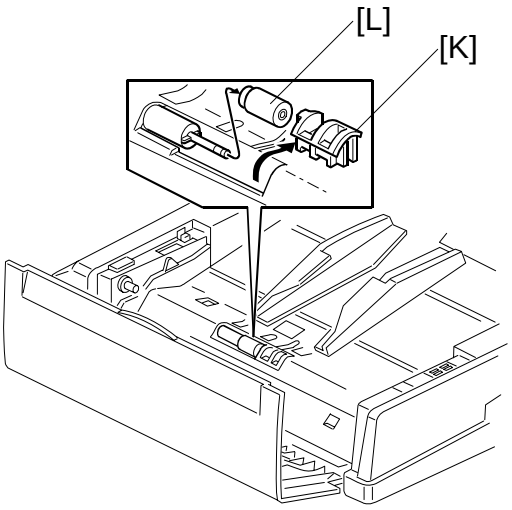
3.2 FEED UNIT

1. Open the DF feed cover [D] and detach the strap [E] (🔩 x 1).
2. Raise the front guide flap [F] to about a 45-degree angle, and push the feed unit [G] into the spring so that it comes free.
   NOTE: 1) The feed unit comes off very easily if you first lift flap [H] to about a 45-degree angle.
   2) When reinstalling, be sure that the lever [I] is above the pin [J].

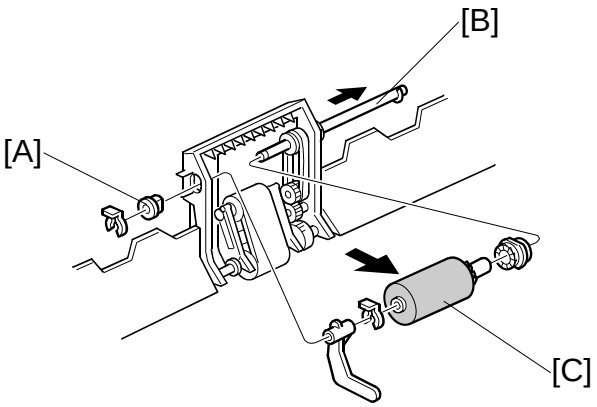


3.3 SEPARATION ROLLER

1. Feed unit (☛ 3.2)
2. Roller cover [K]
3. Separation roller [L] (🔩 x 1).

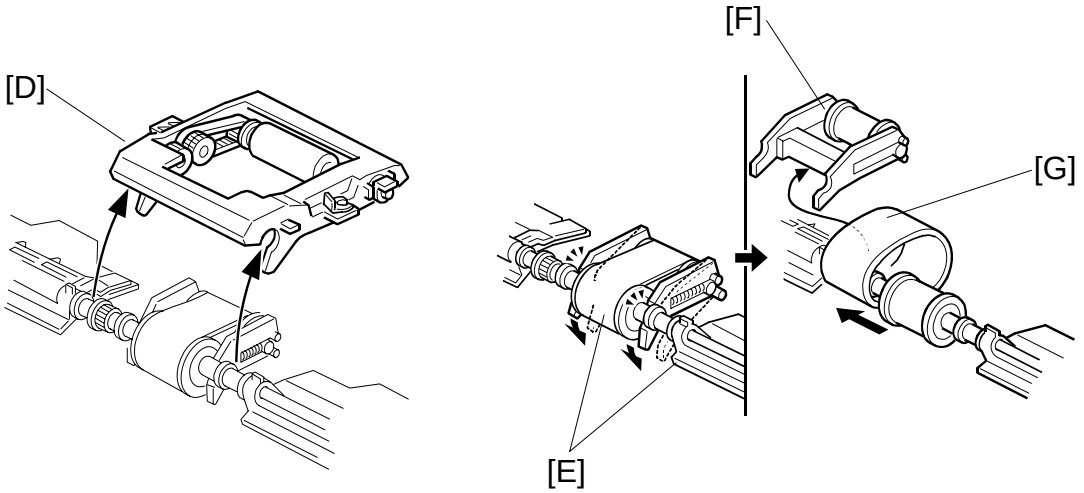


3.4 PICK-UP ROLLER



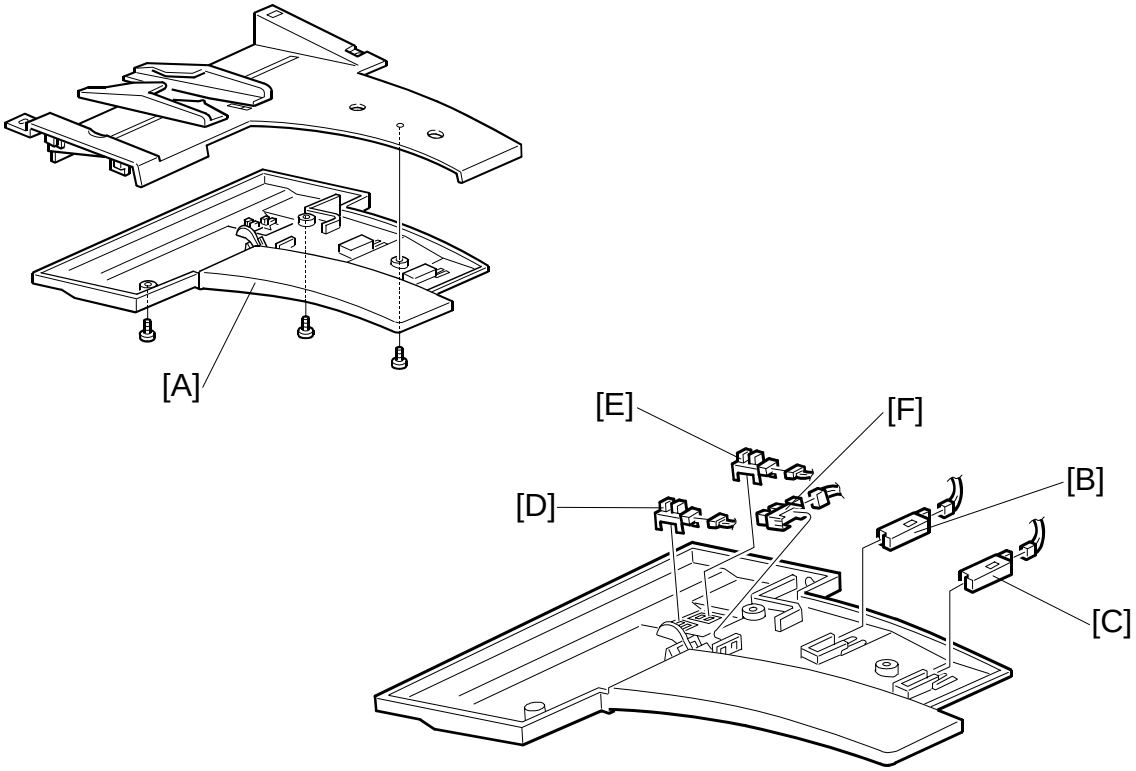
1. Feed unit (☛ 3.2)
2. Remove 2 clip rings and 1 bushing [A]
3. Pull the shaft [B] part way out at the gear end, so that the pick-up roller [C] can be taken off.

3.5 FEED BELT



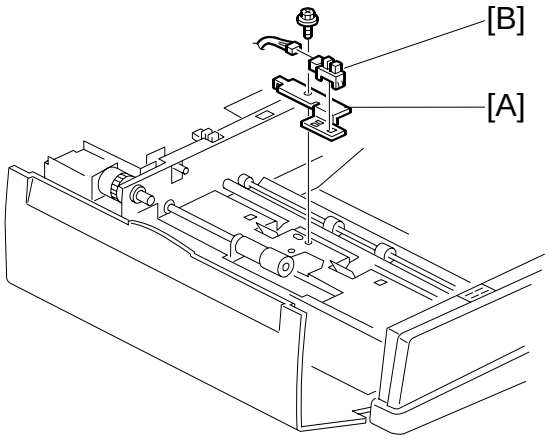
1. Feed unit (☛ 3.2)
2. Pick-up roller housing [D]
3. Push down on the lower wings [E] of the tensioning piece [F], so that the tensioning piece comes free of the shaft.
4. Take the tensioning piece out, and then remove the belt [G].

3.6 ORIGINAL SENSORS (WIDTH, LENGTH, TRAILING EDGE)



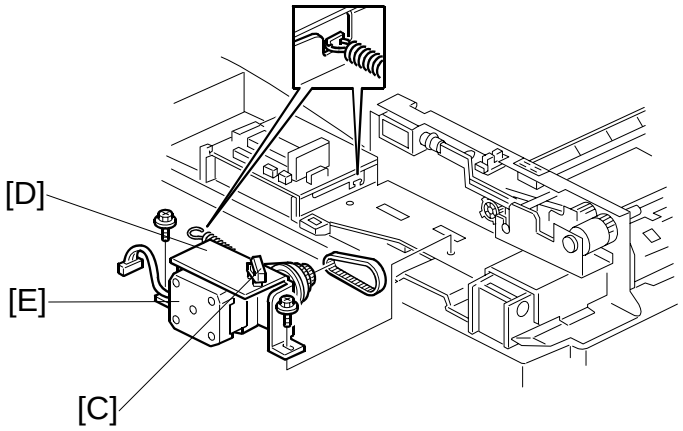
1. Original table (☛ 3.1.2)
2. Sensor platform [A] (🔩 x 3).
3. Length sensors [B], [C] (✋ x 1 on each sensor)
   NOTE: Replace both sensors at the same time, together with the wiring and connectors.
4. Width sensors [D], [E], and trailing edge sensor [F] (✋ x 1 on each sensor)
   NOTE: Replace all three sensors at the same time, together with the wiring and connectors.

3.7 ORIGINAL SET SENSOR



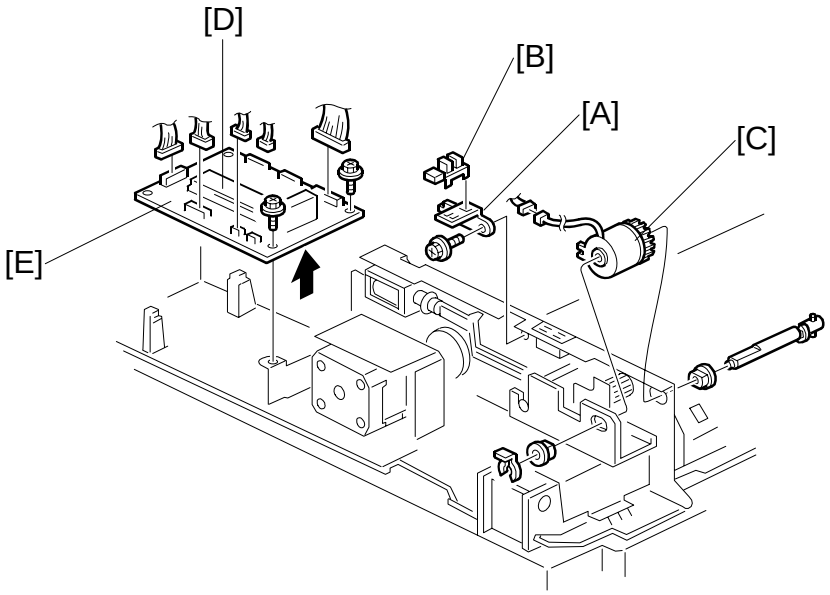
1. Original entrance guide (☛ 3.1.4)
2. Sensor bracket [A] (🔩 x 1)
3. Original set sensor [B] (🖑 x 1)

3.8 TRANSPORT MOTOR



1. Rear cover (☛ 3.1.1)
2. Open the wire clamp [C] at the top of the motor bracket [D].
3. Motor bracket [D] (🔩 x 2 , 1 spring)
   NOTE: Unhook the spring at the board side.
4. Transport motor [E] (🔩 x 2, 🖑 x 1)

3.9 FEED COVER OPEN SENSOR/ FEED CLUTCH/ROM/DF DRIVE BOARD



Exterior

1. Rear cover (☛ 3.1.1)

Feed Cover Open Sensor

2. Sensor bracket [A] (🔩 x 1)
3. Feed cover open sensor [B] (✋ x 1)

Feed Clutch

2. Feed unit (☛ 3.2)
3. Feed clutch [C] (⚙ x 1, 1 bushing, ✋ x 1).
   NOTE: Pull the shaft inward until the clutch can be removed.

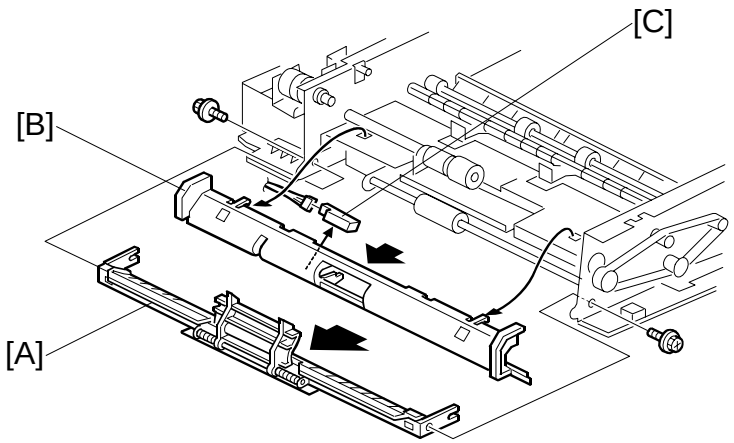
ROM

2. Replace the ROM [D] on the DF drive board.

DF Drive Board

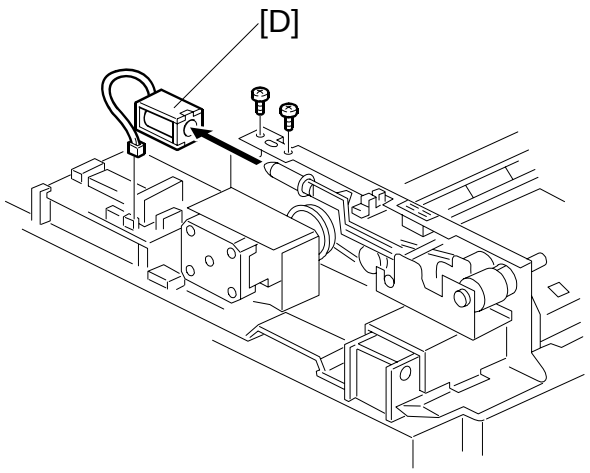
2. DF drive board [E] (🔩 x 3, all connectors)

3.10 REGISTRATION SENSOR



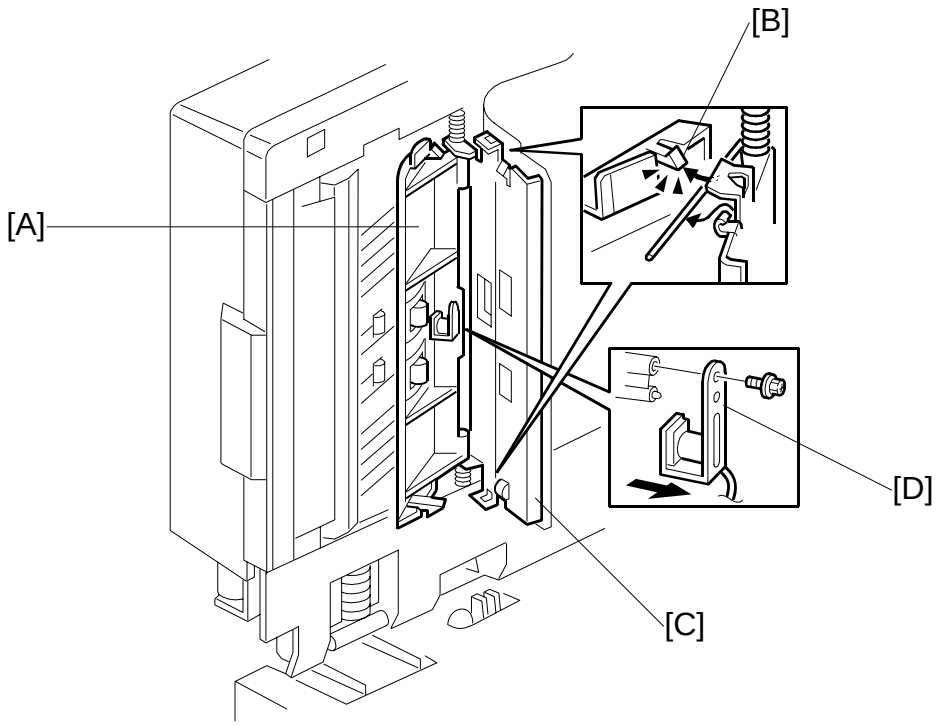
1. DF feed cover (☛ 3.1.5)
2. Original entrance guide (☛ 3.1.4)
3. Outer turn guide [A] (🔩 x 2)
4. Pop out the inner turn guide [B], and remove the registration sensor [C] (✋ x 1)

3.11 PICK-UP SOLENOID



1. Rear cover (☛ 3.1.1)
2. Pick-up solenoid [D] (🔩 x 2, ✋ x 1)

3.12 STAMP SOLENOID



1. Rear cover (☛ 3.1.1)
2. Disconnect the stamp solenoid connector.
   NOTE: Pull out the small connector piece from the large connector. (The large connector itself cannot fit through the hole in the frame.)
3. Lift the ADF upright and pull open the exit guide [A]. Release the front and rear hooks [B] and open the cover [C].
4. Remove the stamp solenoid [D] (🔩 x 1), and pull it out together with the wire.