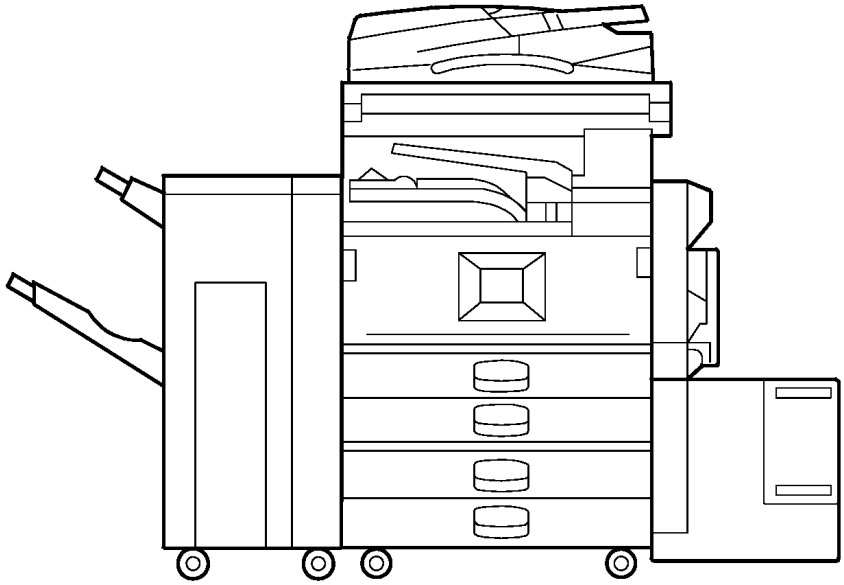
Gestetner LANIER RICOH savin



B135/B138
SERVICE MANUAL

001903MIU

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Ricoh Corporation

LEGEND

PRODUCT CODE	COMPANY			
	GESTETNER	LANIER	RICOH	SAVIN
B135/B182*	DSm635	LD135	Aficio 2035e	4035e
B138/B183*	DSm645	LD145	Aficio 2045e	4045e

* Machines pre-configured with the Printer/Scanner option (B654) will use the B182/B183 product codes.

DOCUMENTATION HISTORY

REV. NO.	DATE	COMMENTS
*	2/2004	Original Printing

B135/B138

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1 BIN TRAY B544

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FAX UNIT B653

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INTERNET FAX IFAX

SEE SECTION IFAX FOR DETAILED TABLE OF CONTENTS

DATAOVERWRITESECURITY UNIT B692/B694

SEE SECTION B692/B694 FOR DETAILED TABLE OF CONTENTS

⚠IMPORTANT SAFETY NOTICES

PREVENTION OF PHYSICAL INJURY

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

HEALTH SAFETY CONDITIONS

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

OBSERVANCE OF ELECTRICAL SAFETY STANDARDS

1. The copier and its peripherals must be installed and maintained by a customer service representative who has completed the training course on those models.
2. The NVRAM on the system control board has a lithium battery which can explode if replaced incorrectly. Replace the NVRAM only with an identical one. The manufacturer recommends replacing the entire NVRAM. Do not recharge or burn this battery. Used NVRAM must be handled in accordance with local regulations.

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

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.

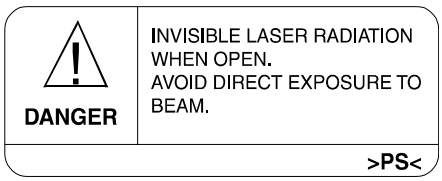
⚠WARNING

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

⚠WARNING

WARNING: Turn off the main switch before attempting any of the procedures in the Laser Unit section. Laser beams can seriously damage your eyes.

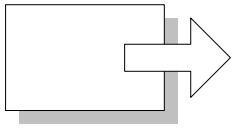
CAUTION MARKING:



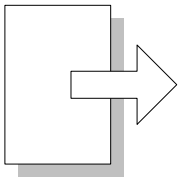
Conventions in this Manual

This manual uses several symbols.

Symbol	What it means
☛	Refer to section number
CT	See Core Tech Manual for details
	Screw
	Connector
	E-ring
	Clip ring



Short Edge Feed (SEF)



Long Edge Feed (LEF)

INSTALLATION
AUTO REVERSE DOCUMENT FEEDER B541
FAX OPTION B653

PREVENTIVE MAINTENANCE
PAPER TRAY UNIT B542
PRINTER OPTION B654

REPLACEMENT AND ADJUSTMENT
LARGE CAPACITY TRAY B543

TROUBLESHOOTING
BOOKLET FINISHER B546
1000 SHEET FINISHER B408
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SERVICE TABLES

DETAILED DESCRIPTIONS

SPECIFICATIONS
1-BIN TRAY B544

BRIDGE UNIT B538
DATAOVERWRITESECURITY Unit B692/B694

INSTALLATION

1. INSTALLATION PROCEDURE

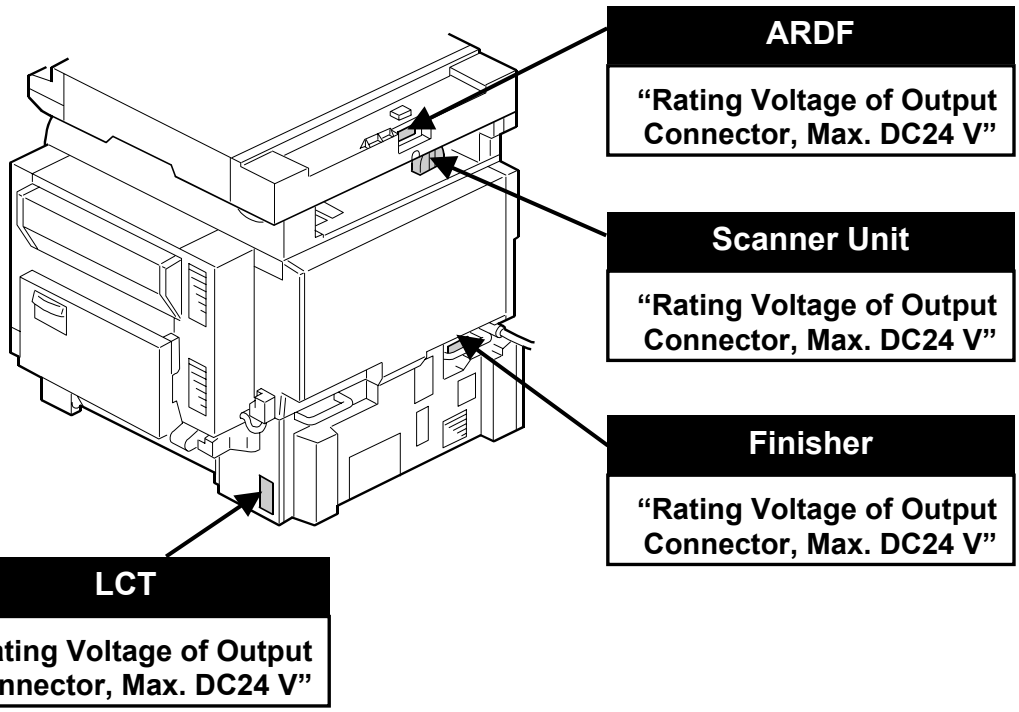
⚠CAUTION

Never turn off the main power switch when the power LED is lit or flashing. To avoid damaging the hard disk or memory, press the operation power switch to switch the power off, wait for the power LED to go off, and then switch the main power switch off.

NOTE: The main power LED lights or flashes while the platen cover or ARDF is open, while the main machine is communicating with a facsimile or the network server, or while the machine is accessing the hard disk or memory for reading or writing data.

1.1 INSTALLATION REQUIREMENTS

⚠CAUTION



1.1.1 ENVIRONMENT

1. Temperature Range: 10 °C to 32 °C (50 °F to 90 °F)
2. Humidity Range: 15% to 80% RH
3. Ambient Illumination: Less than 1,500 lux (do not expose to direct sunlight.)
4. Ventilation: Room air should turn over at least 30 m^3/hr/person
5. Ambient Dust: Less than 0.10 mg/m^3 (2.7 x 10/6 oz/yd^3)
6. 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.
7. Do not place the machine where it will be exposed to corrosive gases.
8. Do not install the machine at any location over 2,000 m (6,500 ft.) above sea level.
9. Place the main machine on a strong and level base. Inclination on any side should be no more than 5 mm (0.2").
10. Do not place the machine where it may be subjected to strong vibrations.

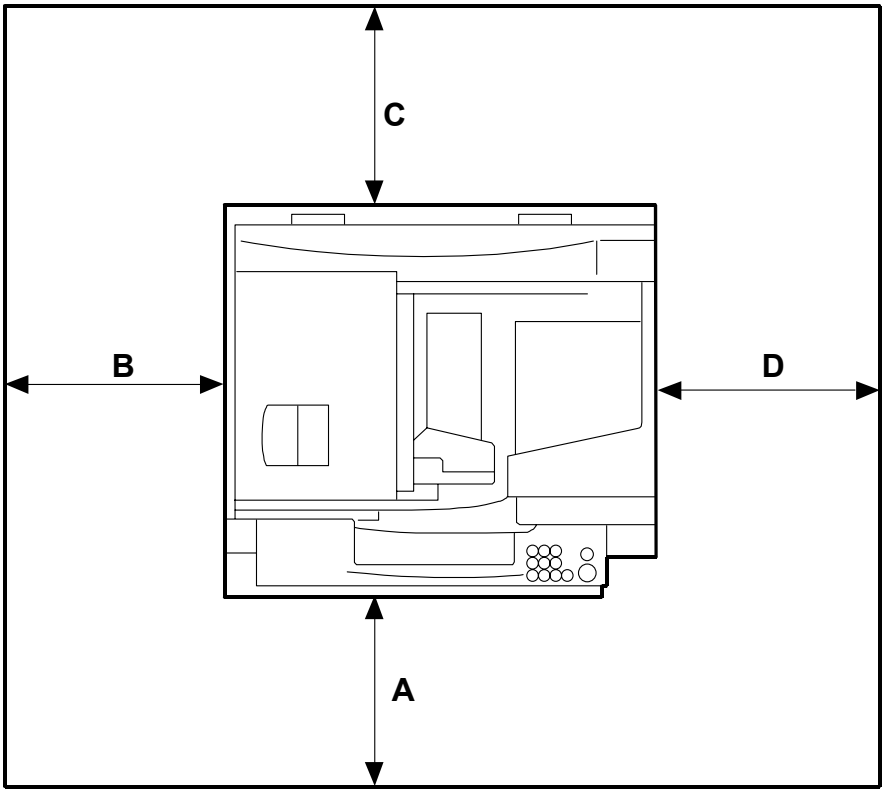
1.1.2 MACHINE LEVEL

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

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

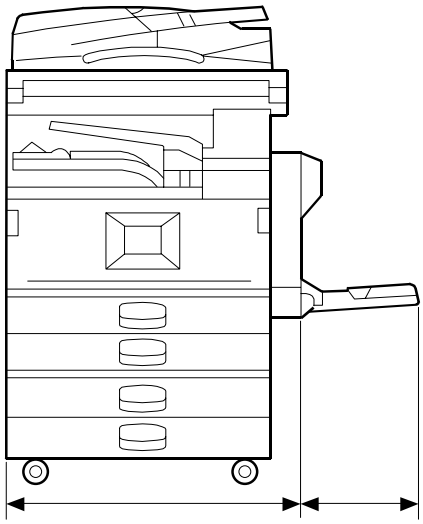
1.1.3 MINIMUM SPACE REQUIREMENTS

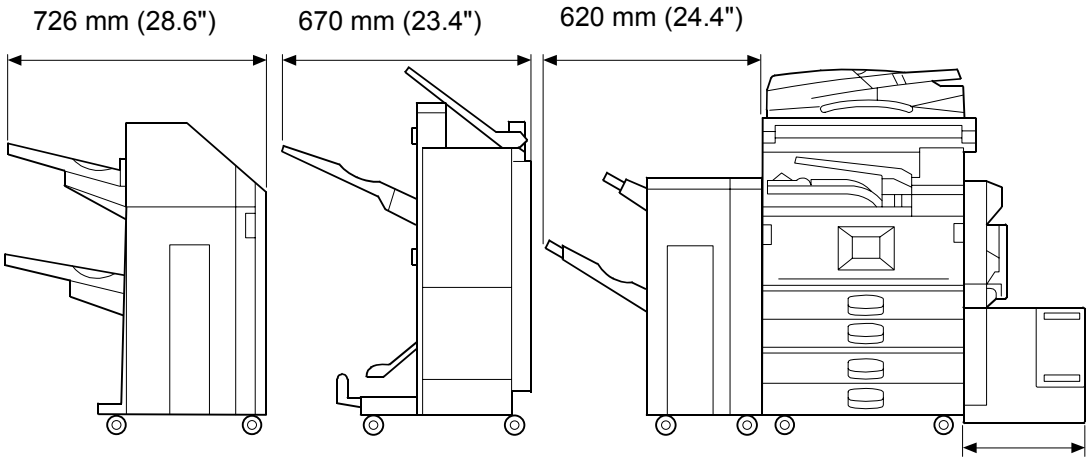
Place the main machine near the power source, providing clearance as shown:



A: Front: >75 cm (29.6")
B: Left: > 10 cm (4")
C: Rear: > 10 cm (4")
D: Right > 10 cm (4")

NOTE: The 75 cm (29.5") recommended for the space at the front is for pulling out the paper tray only. If the operator stands at the front of the main machine, more space is required.


670 mm (26.4")
180 mm (7.1")


726 mm (28.6")
670 mm (23.4")
620 mm (24.4")

1.1.4 POWER REQUIREMENTS

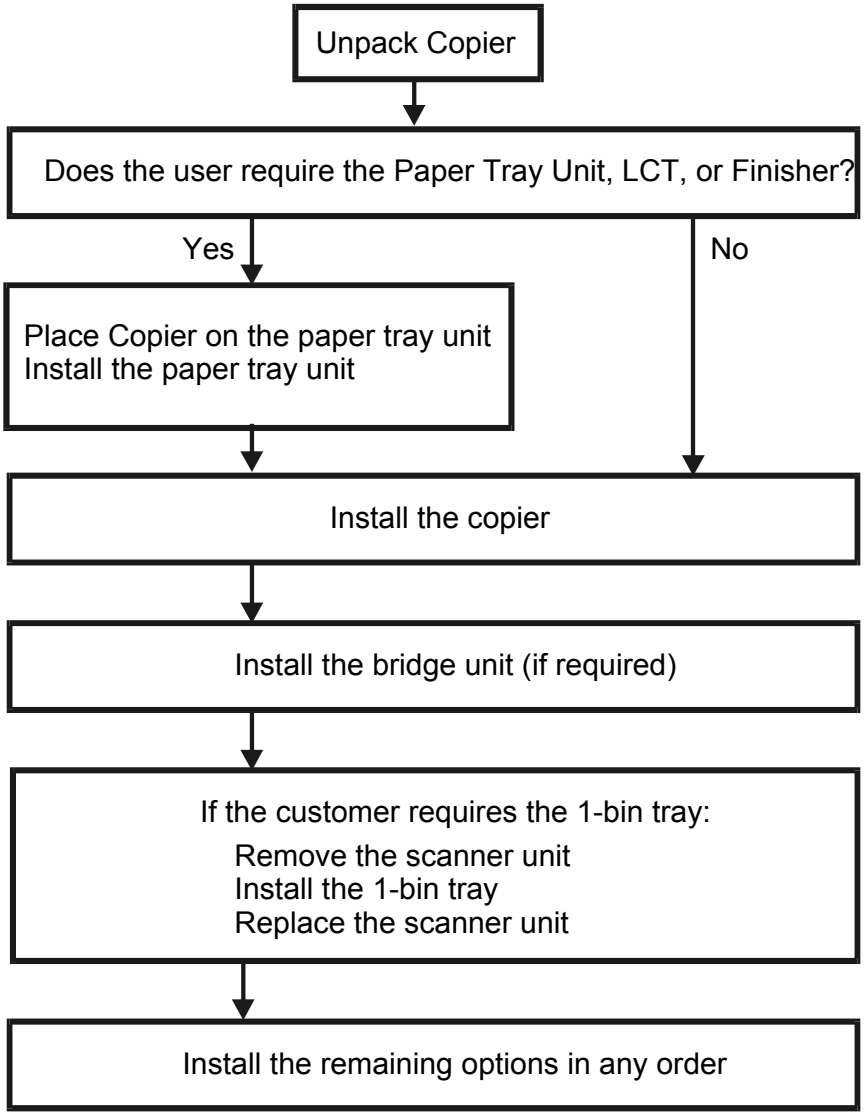
⚠CAUTION

1. Make sure that the wall outlet is near the main machine and easily accessible. Make sure the plug is firmly inserted in the outlet.
2. Avoid multi-wiring.
3. Be sure to ground the machine.

1. Input voltage level:
   North America 120 V, 60 Hz: More than 12.5 A
   Europe/Asia 220 V ~ 240V, 50 Hz/60 Hz: more than 6.8 A
2. Permissible voltage fluctuation: ±10 %
3. Never set anything on the power cord.

1.2 INSTALLATION FLOW CHART

The following flow chart shows how to install the optional units more efficiently.



Bridge Unit: Needed for the finishers and external output tray.

Paper Tray Unit: Needed for LCT and finishers.

Other requirements: See Overall Machine Information – Installation Option Table.

1.3 MAIN MACHINE INSTALLATION

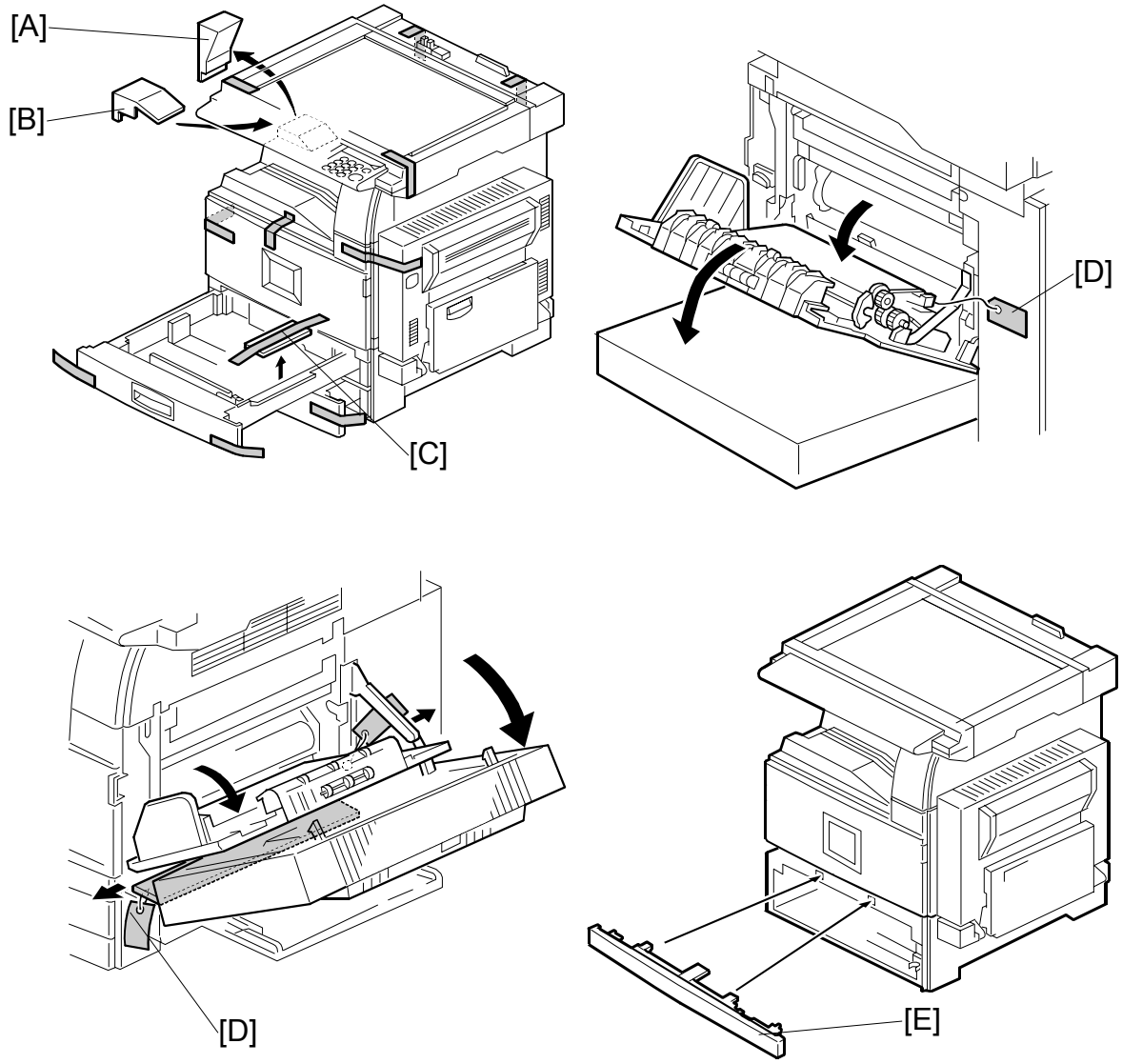
1.3.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box against the following list:

Description	Q'ty
1. Operation Instructions – System Setting	1
2. Operation Instructions – Copy Reference	1
3. Exposure Glass Cleaner Holder	1
4. Exposure Glass Cleaner	1
5. Paper Size Decal	1
6. Middle Front Cover	1
7. NECR – English (-17, -19, -21, -28, -29, -57 Machines)	1
8. NECR – Multi-Language (-26, -27, -66, -67 Machines)	1
9. HDD Caution Decals (-17, -29, -57 Machines)	1
10. Model Name Decal (-17, -29, -57 Machines)	1
11. Stamp (-17 Machine)	1
12. EU Safety Information (-26, -27, -66, -67 Machines)	1
13. Operation Panel Indicator Decals (-26, -27, -66, -67 Machines)	1
14. Address Information Sheet – China (-21 Machine)	1
15. Paper Caution Sheet – China (-21 Machine)	1
16. Energy Start Sticker (-26, -66 Machines)	1

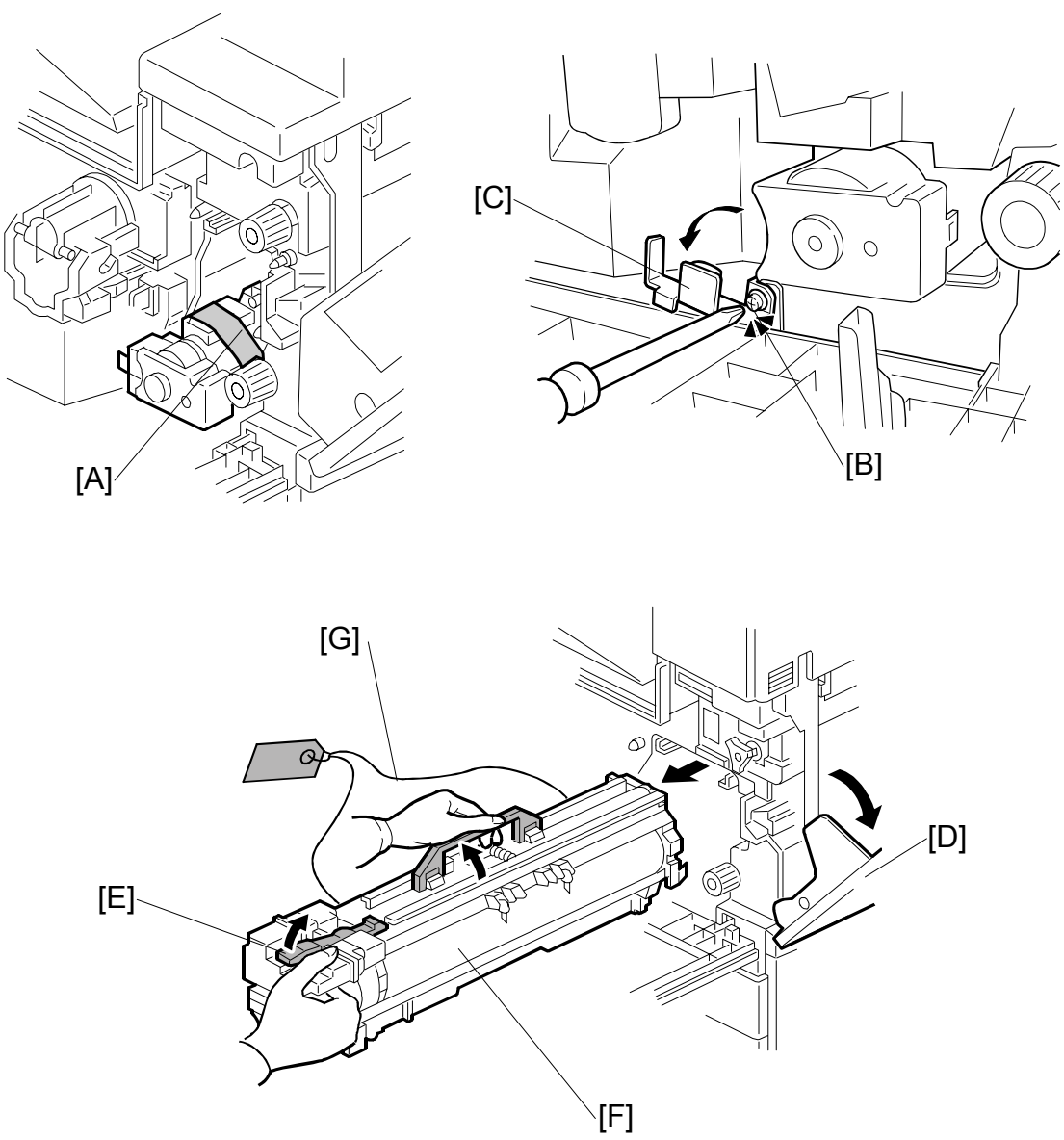
(NCER: New Equipment Condition Report)

1.3.2 INSTALLATION PROCEDURE

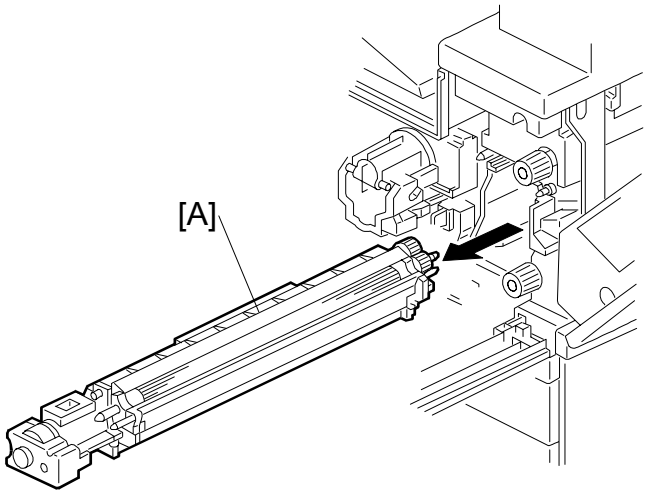


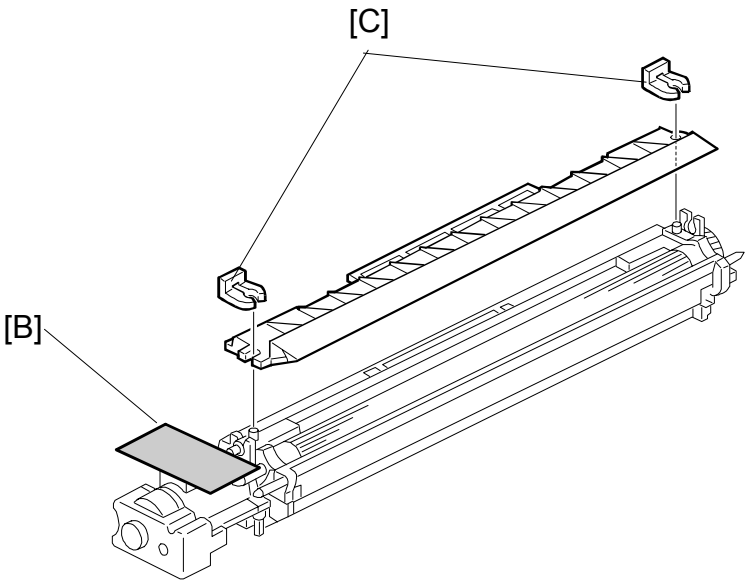
1. Remove the main machine from the box, and remove all shipping retainers and tapes.
   NOTE: Store all shipping retainers as you remove them. You will need them if the machine is moved to another location in the future.
2. Remove scanner cushion [A], and install the end fence [B].
3. Pull out the paper trays and remove all tape and bottom plate stoppers [C].
4. On the right side of the machine, open the by-pass tray, duplex unit, and transfer right cover, and then remove all the shipping retainers [D]
   NOTE: If the paper tray unit is to be installed, do this now. (☛1.4)
5. If the paper tray unit is not to be installed, install the middle front cover [E] (provided in the second paper tray).

Development Unit and PCU

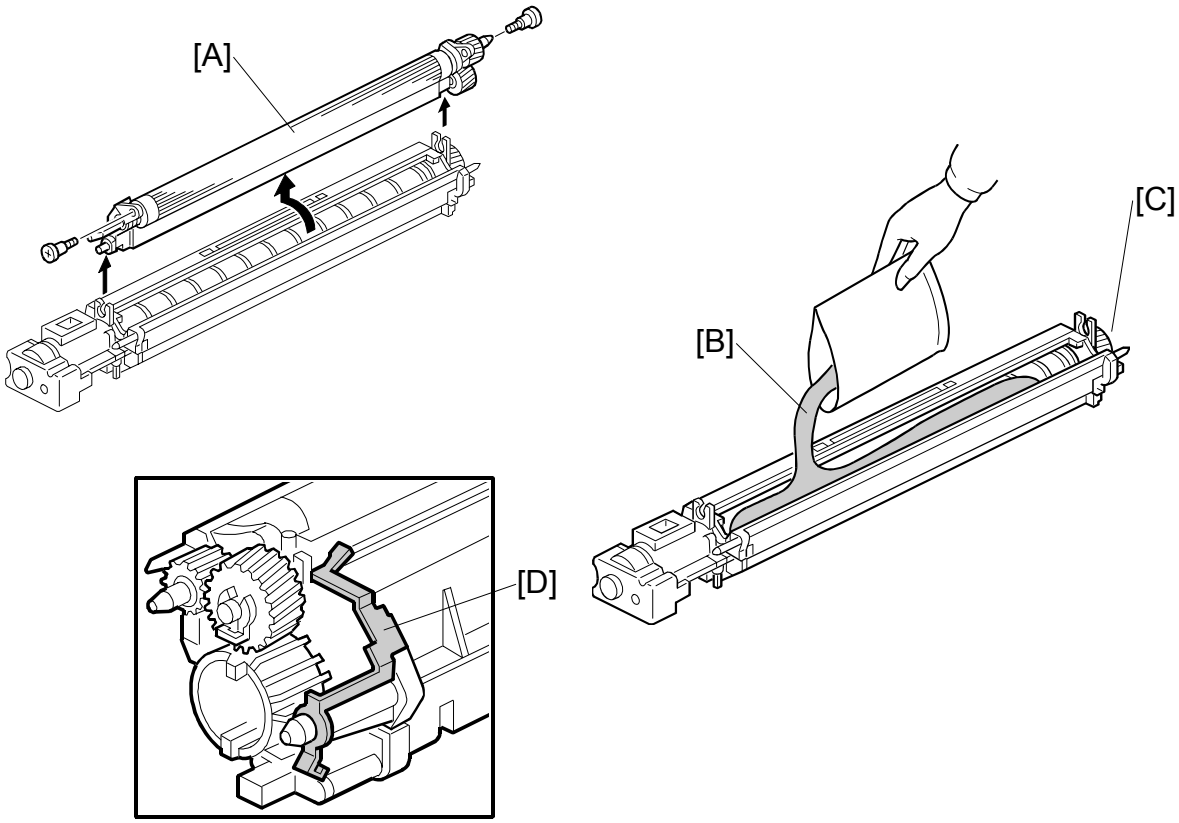


1. Open the front cover and remove the tape and retainers [A].
2. Loosen [B] (🔩 x 1) and rotate the bracket [C].
3. Open the right cover [D].
4. Raise the lever [E]
5. Holding the PCU [F] as shown slide it out and place it on a clean flat surface.
6. Remove clamps and wire [G].

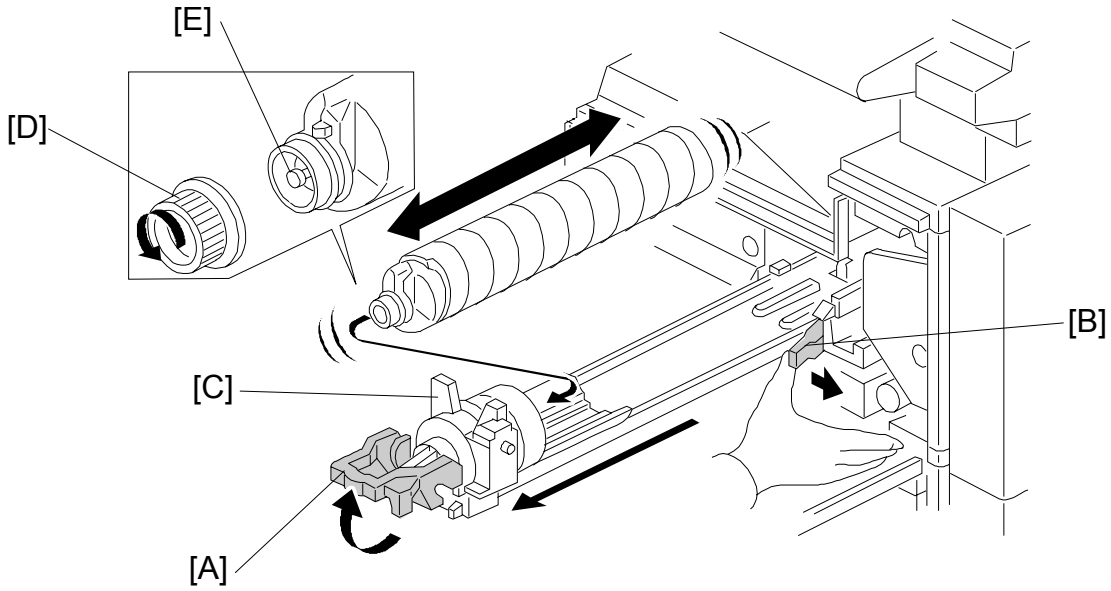




7. Spread a large piece of paper on a flat surface.
   NOTE: Make sure the area is free of pins, paper clips, staples, etc. to avoid attraction to the magnetic development roller.
8. Slide the development unit [A] out and place it on the paper.
9. Remove the tape and tag [B] from the development unit
10. Remove the entrance seal plate [C] (x 2).



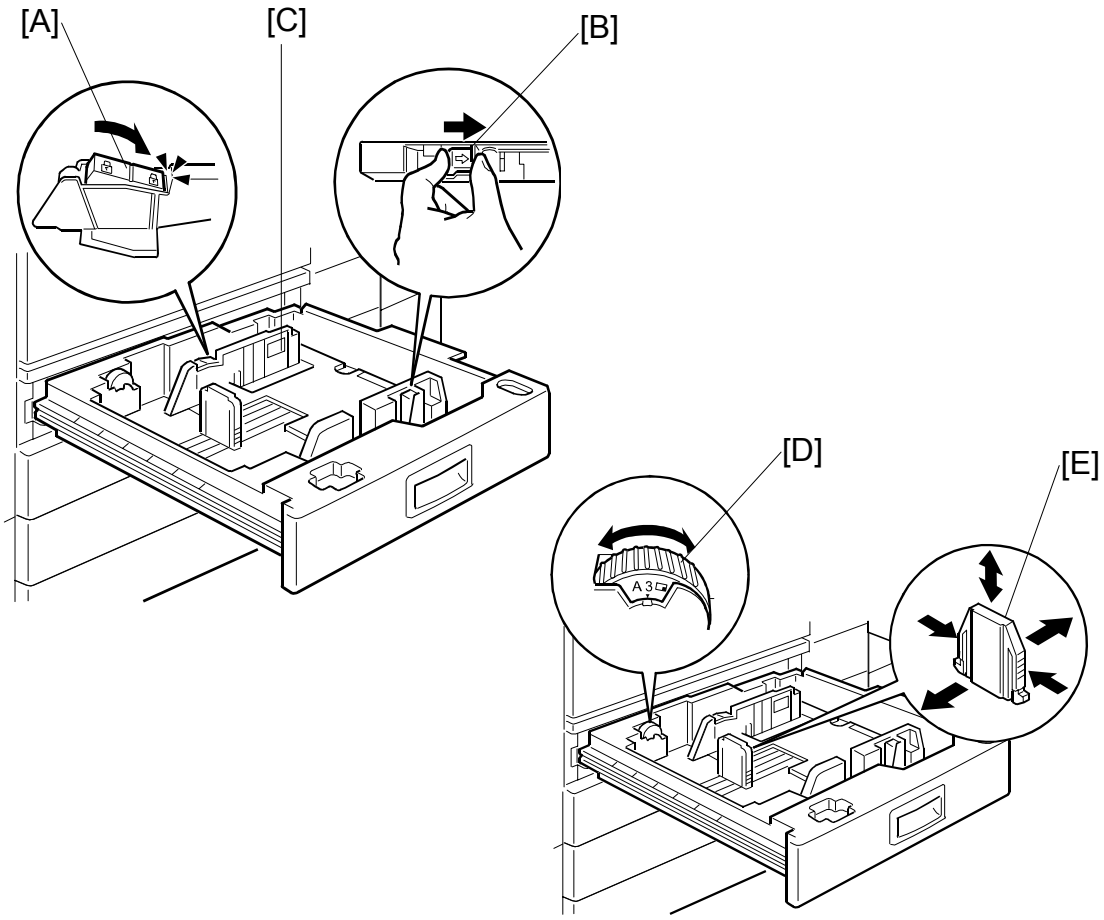
11. Remove the development roller unit [A], and set it on the paper.
12. Pour the developer [B] into the development unit.
    NOTE: The developer lot number is embossed on the end of the developer package. Do not discard the package until you have recorded the lot number. (☛1-15)
    1) Pour approximately 1/3 of the developer evenly along the length of the development unit.
    2) Rotate the drive gear [C] to work the developer into the unit.
    3) Repeat until all the developer is in the development unit.
    4) Continue to turn the drive gear until the developer is even with the top of the unit.
13. Reassemble the development unit.
    NOTE: Make sure that the earth plate [D] is positioned correctly.
14. Re-install the development unit and PCU.



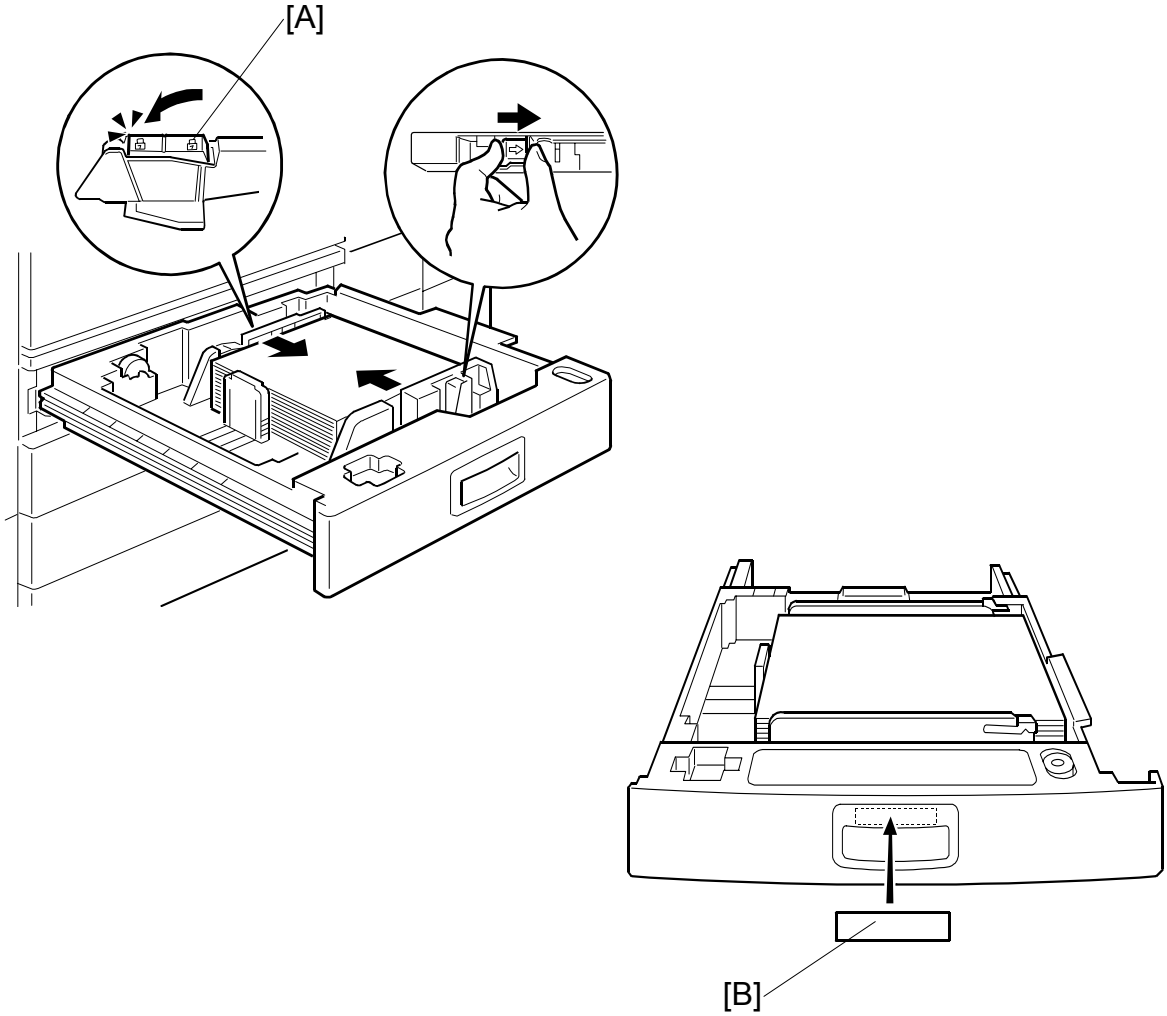
Toner Bottle

1. Raise the toner bottle holder lever [A], push the lever [B] to the side, and then pull the toner bottle holder [C] out.
2. Shake the new toner bottle well.
   NOTE: Do not remove the toner bottle cap [D] until after shaking.
3. Unscrew the bottle cap and set the bottle in the holder.
   NOTE: Do not touch the inner bottle cap [E].
4. Push the toner bottle holder into the main machine until it locks in place, and then lower the holder lever to secure the toner bottle.
   NOTE: The holder lever cannot be lowered unless the toner bottle is installed.

Paper Trays



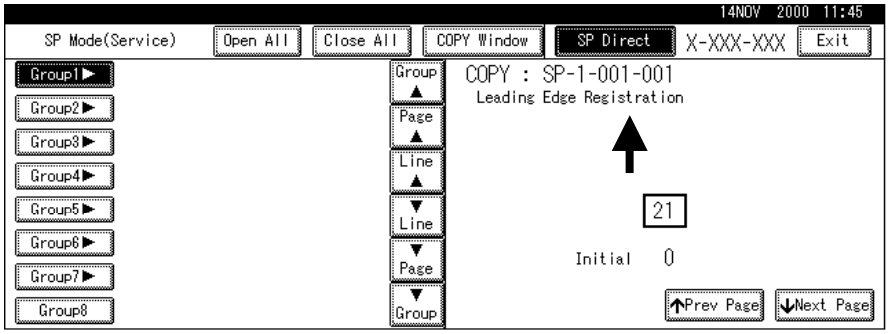
1. Open the 1st paper tray, and then press down on the right side of the lock [A] switch to unlock the side fences.
2. Press in on the sides of the fence release [B], and slide the side fences [C] to the appropriate mark for the paper size.
3. Turn the dial [D] to the correct setting for the paper size.
4. Pinch the sides of the bottom fence [E] and move it to the appropriate mark for the paper size, then load the paper.
5. Check the position of the stack.
   - Confirm that there is no gap between the stack and the side fences. If you see a gap, adjust the position of the side fences.
   - After loading the stack, confirm that the right side of the stack is not on top of both cushions.



6. Press down the lock [A] to lock the side fences.
7. Attach the appropriate paper size decal [B] to the paper tray.
8. Paper size decals are also used for the optional paper tray unit. Keep any remaining decals for use with the paper tray unit.
9. Repeat this procedure to load paper in the 2nd paper tray.

Initialize TD Sensor and Developer

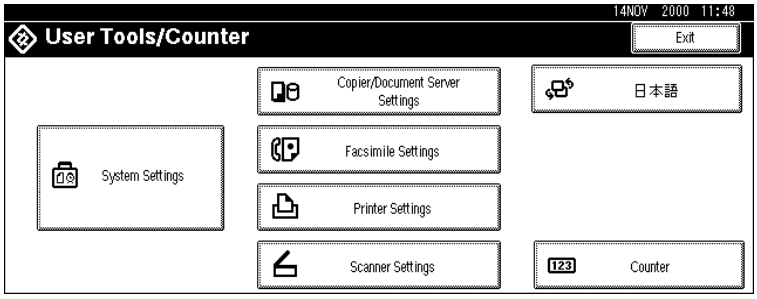
1. Connect the main machine to the power outlet, switch on the main machine, and wait for the fusing unit to warm up.
2. On the operation panel, press Clear Mode ⊡.
3. Use the number keys to enter 107.
4. Press and hold Clear/Stop Ⓒ/Ⓒ for three seconds.
5. On the touch-panel, press Copy SP.
6. Press SP Direct to highlight “SP Direct”, enter 2801, and then press Ⓗ.



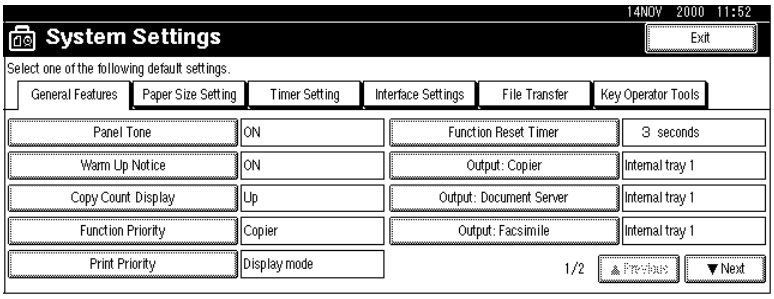
7. When the message prompts you to enter the lot number of the developer, enter the 7-digit lot number, press [Yes], and then press [Execute] on the touch-panel. This initializes the TD sensor.
   NOTE: The lot number is printed on the end of the developer package. Recording the lot number could help troubleshoot problems later. If the lot number is unavailable, enter any seven-digit number.
8. Press SP Direct to highlight “SP Direct” and enter 2805, press Ⓗ, and then press Execute on the touch-panel. This initializes the developer.
9. Press Exit twice to return to the copy window.

Set Paper Size for Paper Trays

1. Press User Tools/Counter.



2. On the touch panel, press System Settings.



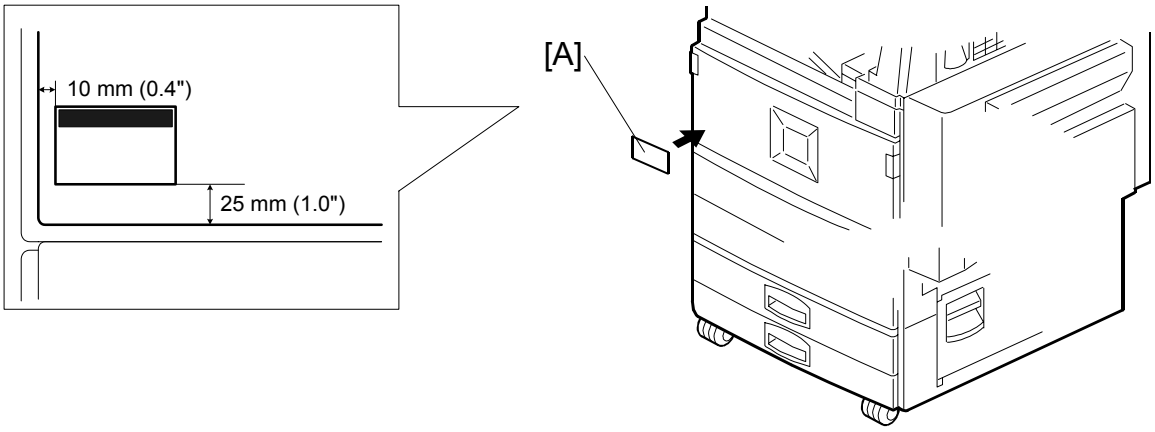
3. Press the Paper Size Setting tab.
4. Press the button for the tray to change.
5. Change the setting and press the [OK] button.
6. Repeat for each tray installed.
7. Press Exit twice to return to the main display
   - The 1st, 2nd, 3rd, and 4th paper trays are provided with paper size dial selectors. The dial settings on the paper trays have priority over the UP settings. However, if you select the asterisk (*) position on the paper size dial, you can select the paper size with the UP setting.
8. Check the copy quality and machine operation.
   NOTE: The test pattern print procedure is slightly different for this machine. Use SP2-902 and select 2 for the IPU Test Print or 3 for the Print Test Patterns. (☛ Chapter 5, 5.1.3 Test Pattern Printing)

Electrical Total Counter

The electrical total counter no longer requires initialization. The new incrementing counter is set to “0” at the factory.

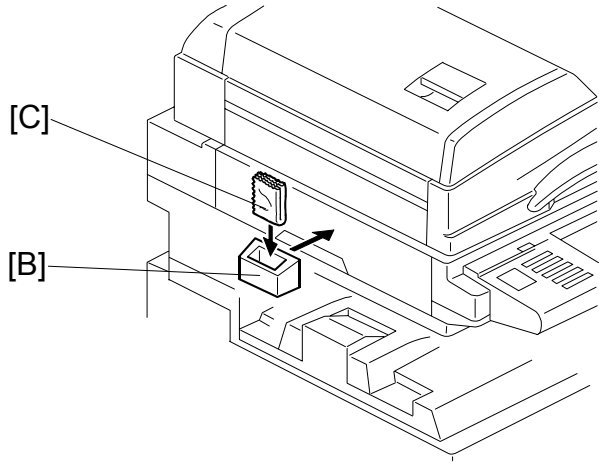
NOTE: SP7825 (Total Counter Reset) remains in the Service but executing this SP has no effect.

HDD Caution Decal



1. Attach the HDD Caution decal [A] to the front cover.

Exposure Glass Cleaner



1. Attach the exposure glass cleaner holder [B] to the left side of the machine.
2. Place the exposure glass cleaner [C] inside the holder.
   NOTE: The exposure glass cleaner is used to clean the ARDF exposure glass, the glass strip to the left of the large exposure glass.

1.4 PAPER TRAY UNIT INSTALLATION (B542)

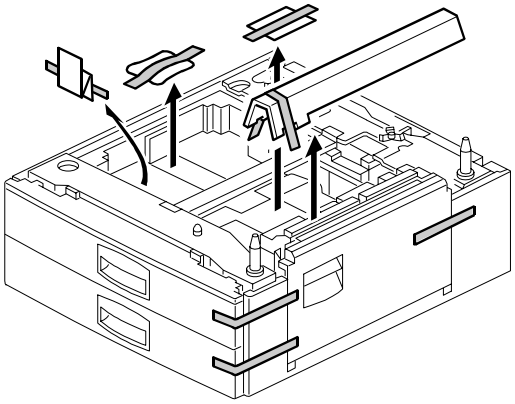
1.4.1 ACCESSORY CHECK

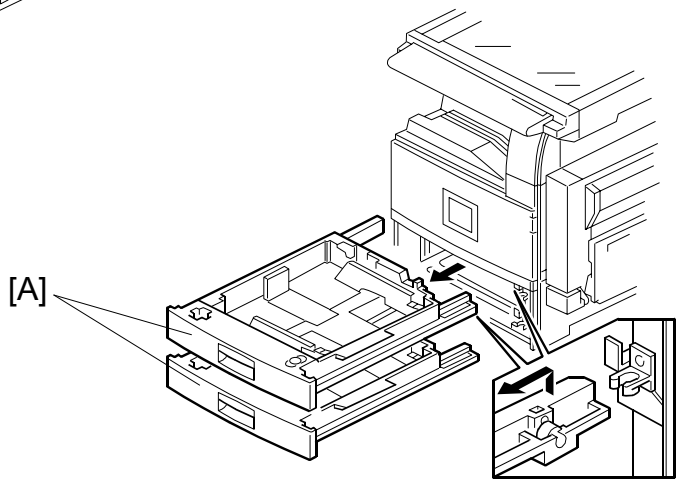
Check the quantity and condition of the accessories in the box against the following list:

Description	Q'ty
1. Knob Screw – M3	1
2. Knob Screw – M4	1
3. Joint Bracket	1
4. Front Stand	1
5. Rear Stand	1
6. Stand Bracket	1
7. NECR	1
8. Installation Procedure	1

(NECR: New Equipment Condition Report)

1.4.2 PAPER TRAY UNIT INSTALLATION PROCEDURE

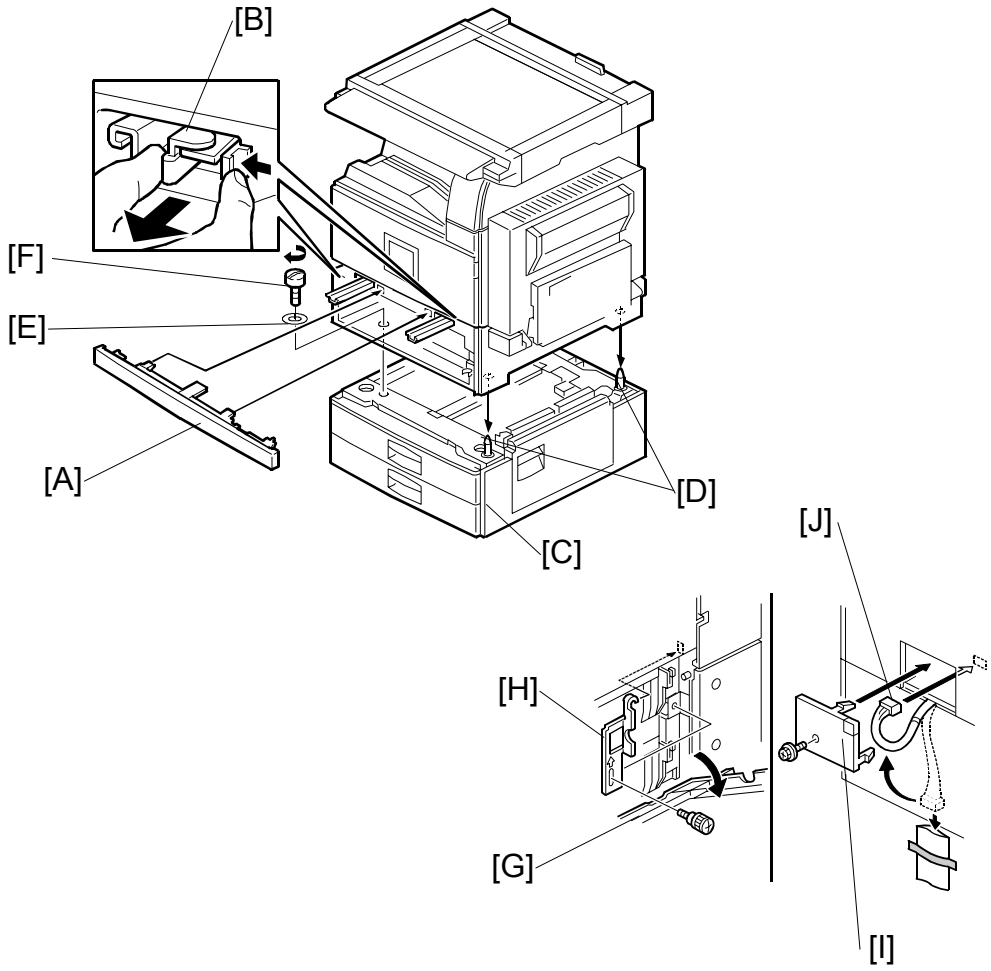




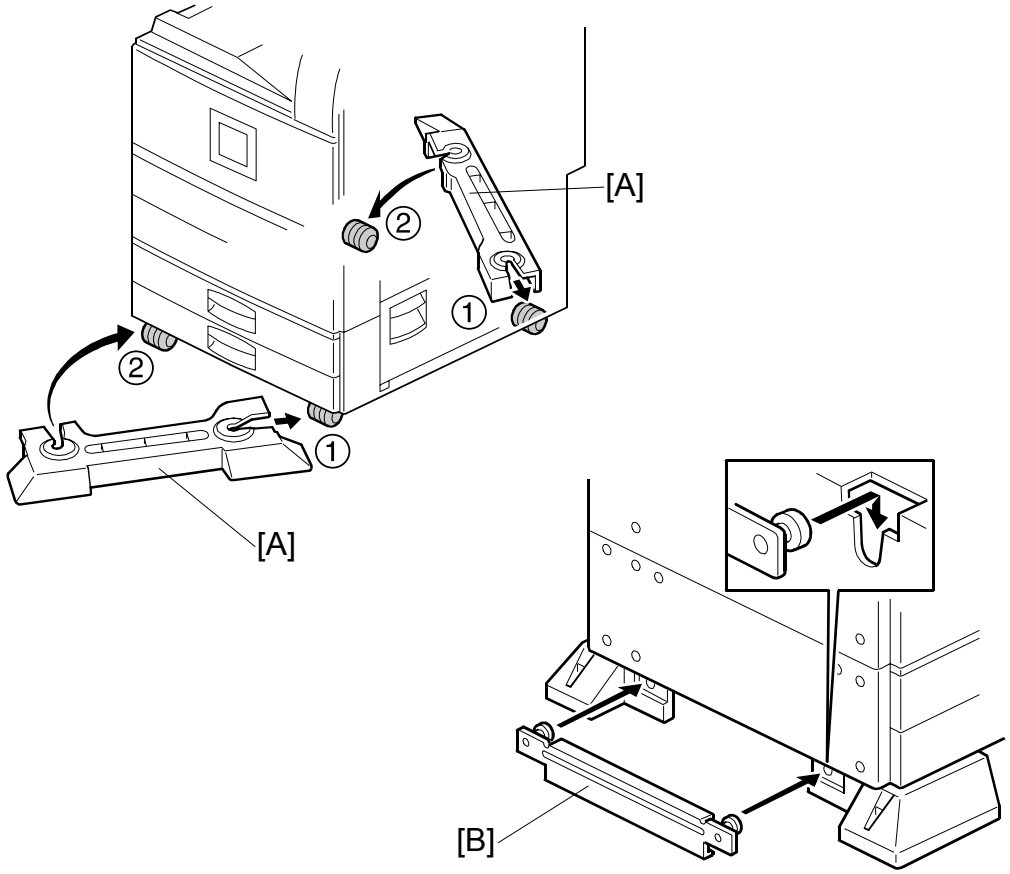
⚠CAUTION

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

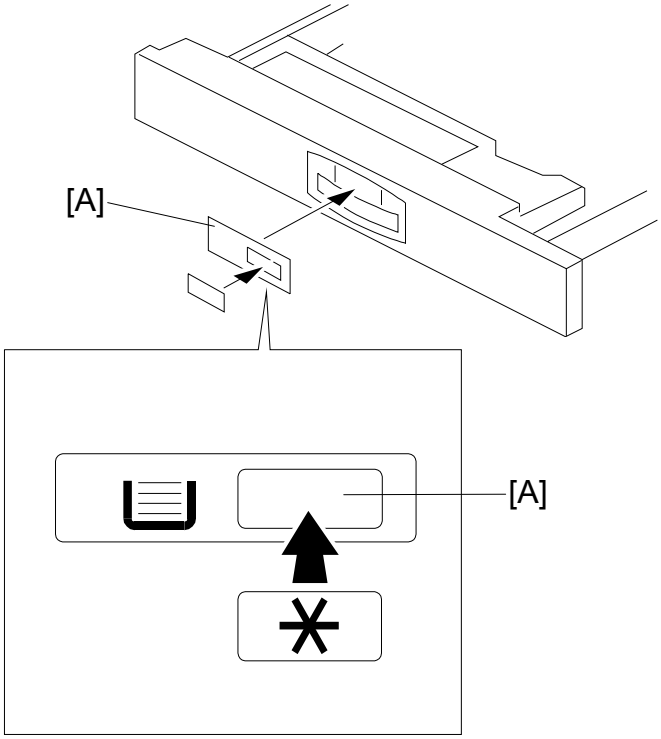
1. Unpack the paper tray unit.
2. Remove all tape and shipping materials.
3. Remove the paper trays [A].



4. Remove the middle front cover [A] and pull out the front handles [B].
5. Using the front handles and rear handles, lift the machine and hold it over the paper tray unit [C].
6. Slowly lower the machine onto the paper tray unit with the pegs [D] aligned with the peg holes on the bottom of the machine.
   NOTE: Do not hold the scanner unit.
7. Re-install the middle front cover [A].
8. Attach the spring washer [E] to the short knob screw [F]. Then, secure the paper tray unit.
9. Open the right cover of the paper tray unit [G].
10. Secure the joint bracket [H] (1 long knob screw).
11. Remove the connector cover [I] of the main machine (🔩 x 1).
12. Connect the paper tray unit harness [J] to the main machine and reinstall the connector cover.



13. Install the front and rear stands [A] as shown above.
14. Install the stand bracket [B].



15. Load paper into the paper tray and install the paper trays.
16. Attach the appropriate tray decals [A] which are included in the accessory box for the main machine.
17. Turn on the ac switch.
18. Turn the paper size dial to the correct setting for the paper size.
19. Check the machine's operation and copy quality.

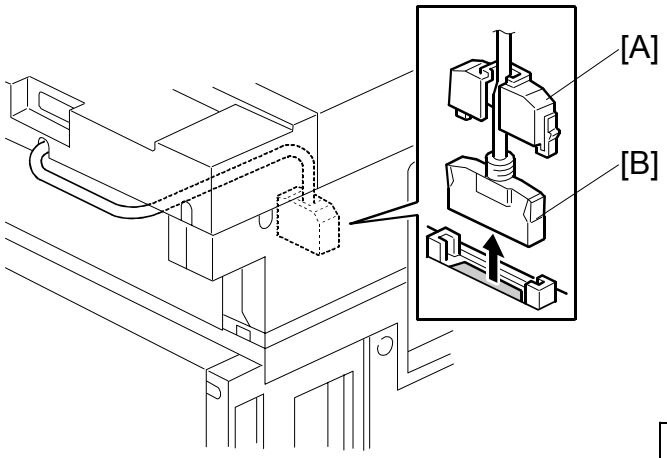
1.5 1-BIN TRAY UNIT INSTALLATION (B544)

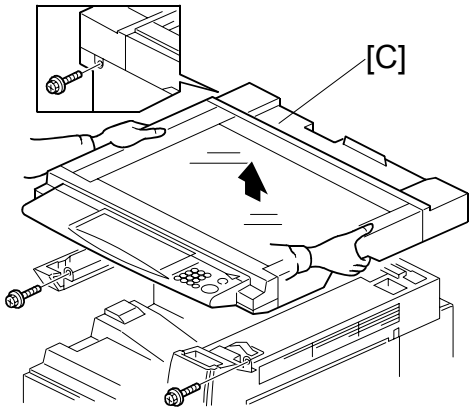
1.5.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box against the following list:

Description	Q'ty
1. Ground Bracket	1
2. Connector Cover	1
3. Base Cover	1
4. Arm Cover	1
5. Copy Tray	1
6. Mylar Strip	2
7. Stepped Screw – M3 x 8	5
8. Screw –M3 x 8	2
9. Screw – M4 x 7	1
10. Tapping Screw – M3 x 6	2
11. Tapping Screw – M3 x 14	1
12. Tapping Screw – M3 x 8	1
13. Installation Procedure	1

1.5.2 1-BIN TRAY INSTALLATION PROCEDURE

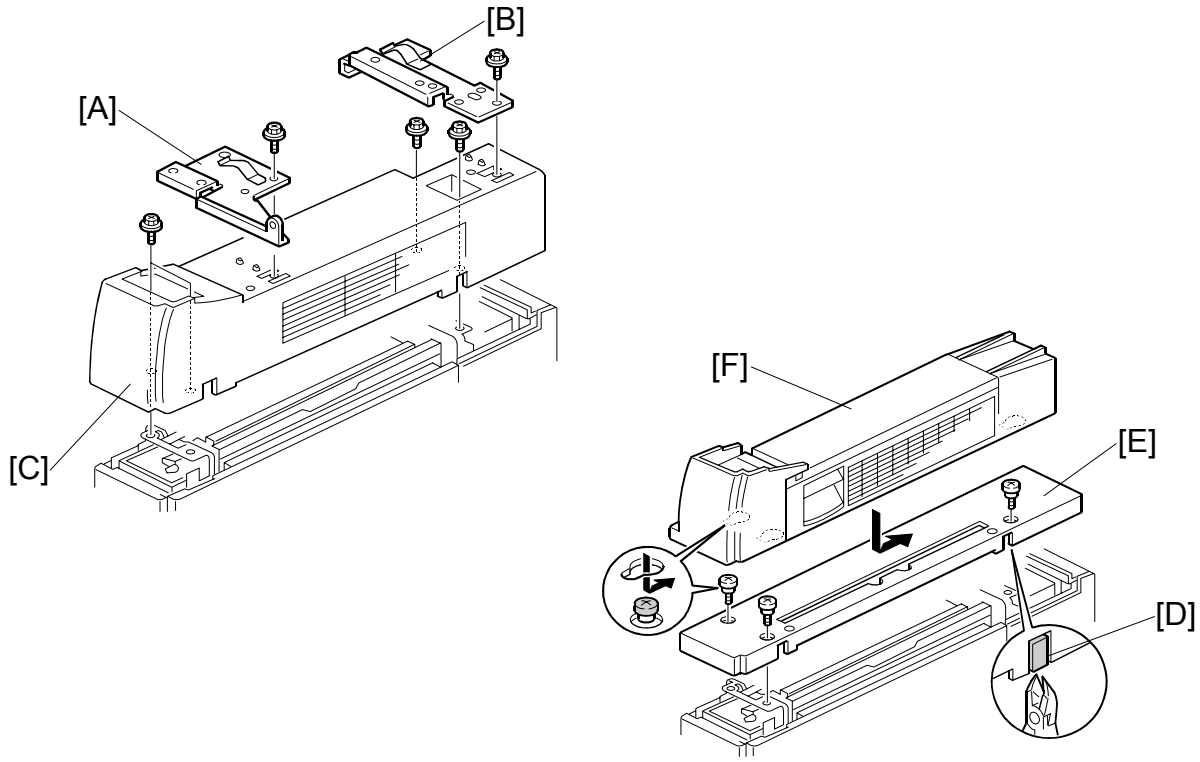




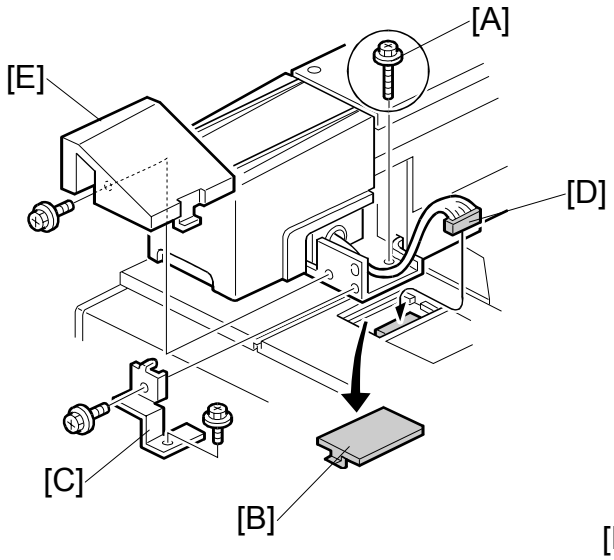
⚠CAUTION

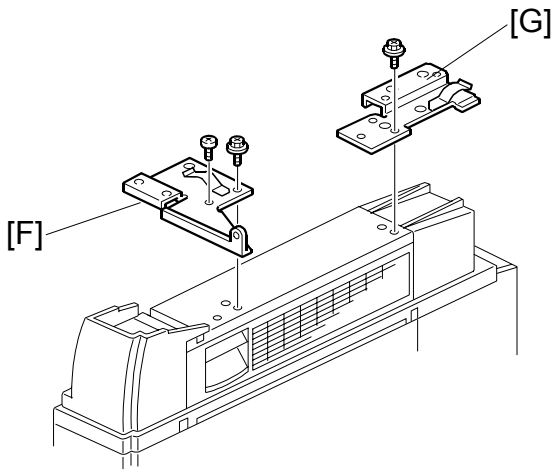
Unplug the main machine power cord before starting the following procedure.

1. Remove Scanner Unit
   NOTE: If the ARDF is installed, remove the ARDF before removing the scanner unit.
   1) Remove the connector cover [A].
   2) Disconnect the scanner cable [B].
   3) Remove the scanner unit [C] (🔩 x 3).

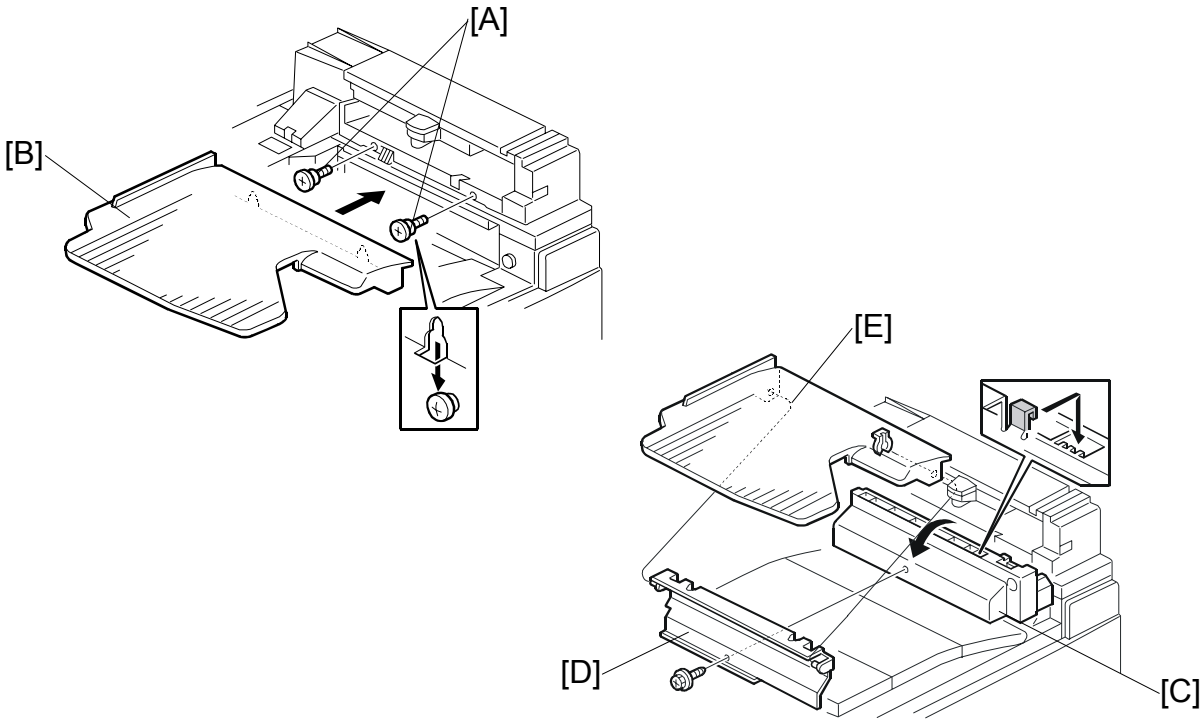


2. Unpack the 1-bin tray unit and remove the tapes.
3. Remove the front bracket [A] (☞ x 1) and rear bracket [B] (☞ x 1) from the top of the paper exit cover [C].
4. Remove the paper exit cover [C] (☞ x 4).
5. Cut away two covers [D] from the base cover [E].
6. Trim the edges so they are smooth.
7. Install the base cover [E] (☞ x 3: stepped screw).
8. Set the 1-bin tray unit [F] on the base cover and slide onto the heads of the stepped screws.





9. Secure the 1-bin tray unit [A] (☞ x 1 M3 x14).
10. Remove the cover [B].
11. Install the grounding bracket [C] (☞ x 2 M3 x 6).
12. Connect the harness [D].
13. Install the connector cover [E] (☞ x 1 M3 x 8)
14. Re-install the front bracket [F] (☞ x 2 M4 x 7, M4 x 10) and the rear bracket [G] (☞ x 1 M4 x 10).



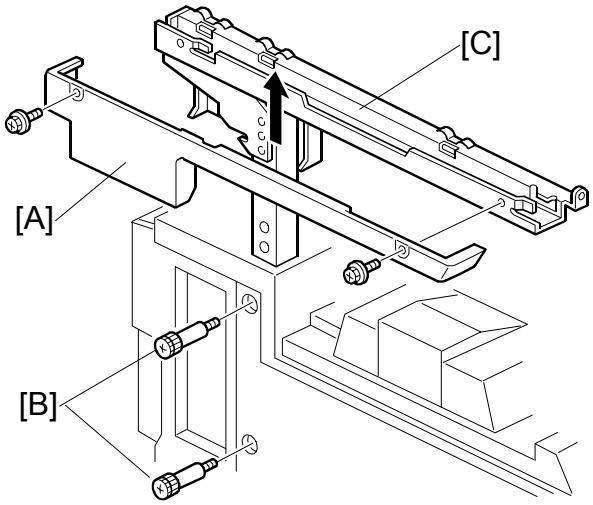
15. Attach the copy tray

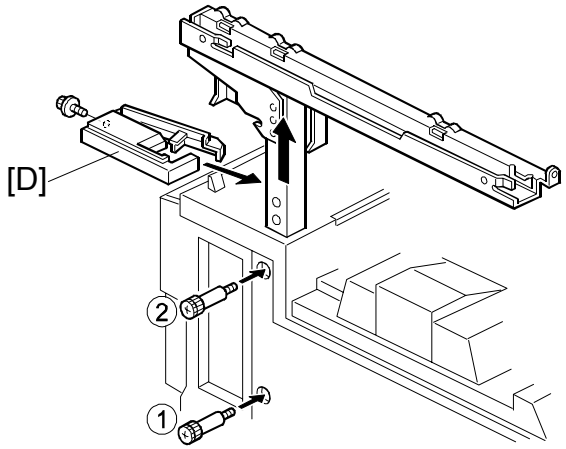
Bridge Unit (B538) has not been installed:

1) Secure [A] (stepped screw x 2) into the side of the 1-bin tray housing.
2) Attach the copy tray [B] to the stepped screws.

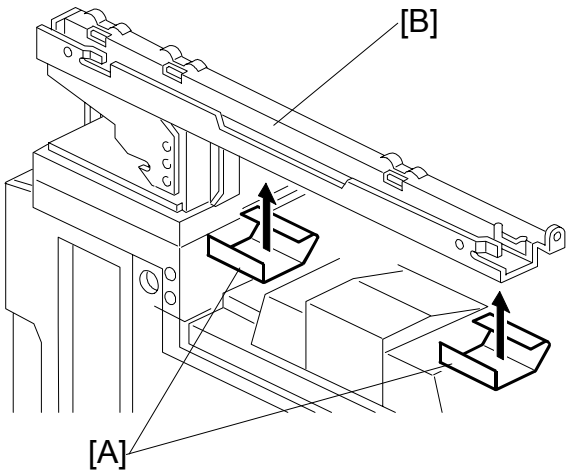
Bridge Unit (B538) has been installed

1) Open the cover of the bridge unit [C].
2) First, remove the copy tray bracket [D] (x 1).
3) Install the copy tray bracket (x 1: tapping screw).
4) Re-install the copy tray [E] (x 1).





16. Remove the scanner stand cover [A] (☞ x 2).
17. To adjust the height of the scanner stand, first remove [B] (☞ x 2) to release the scanner stand [C].
18. Raise the scanner stand until the next set of screw holes in the main frame can be seen through the screw holes in the scanner stand.
19. Secure the stand (☞ x 2: ①, ②) and install the arm cover [D] (☞ x 1).



20. Attach two mylar strips [A] to the scanner stand [B].
21. Reinstall the scanner stand cover.
22. Reinstall the scanner unit.
23. Turn on the main switch and check the 1-bin tray unit operation.

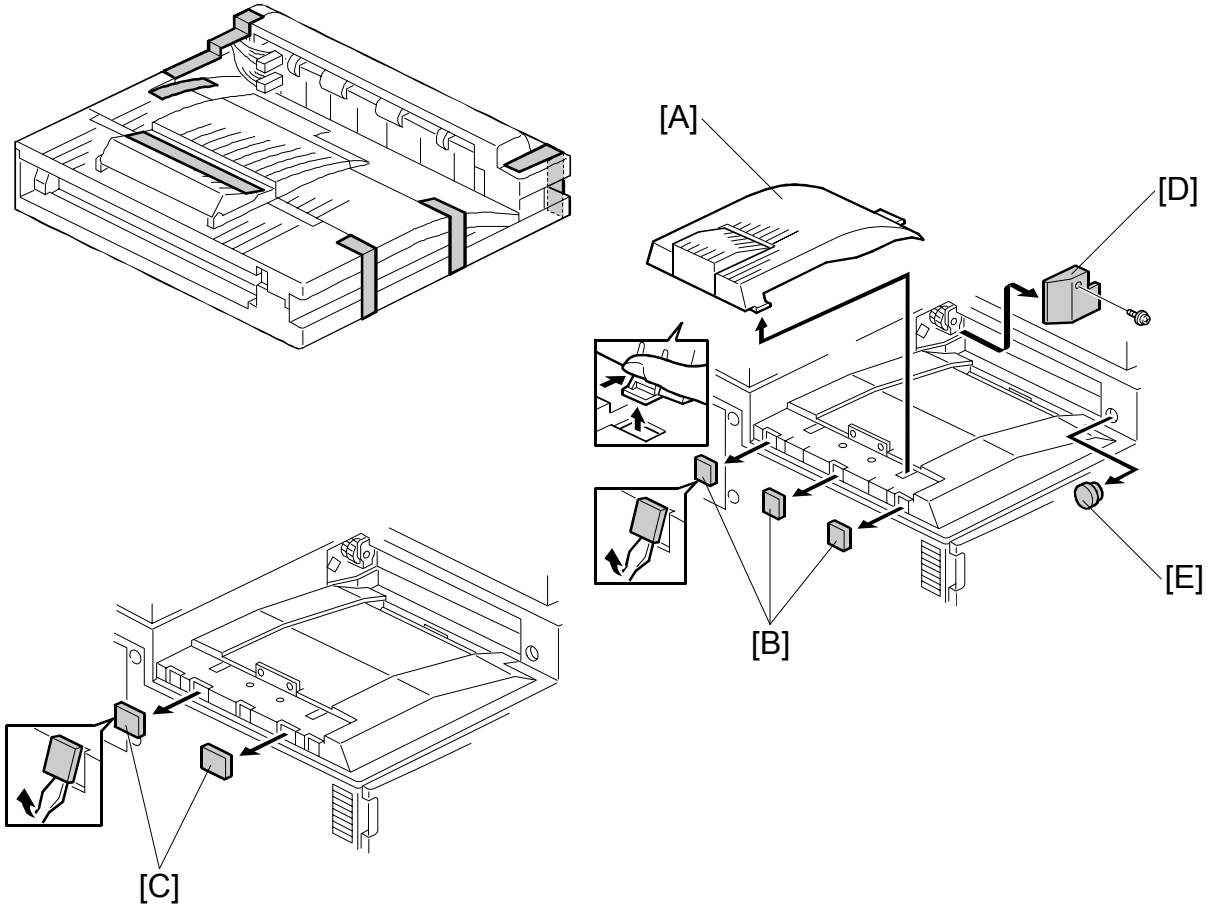
1.6 BRIDGE UNIT INSTALLATION (B538)

1.6.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box against the following list:

Description	Q'ty
1. Stepped Screw	2
2. Connector Cover	1
3. Exit Mylar	2
4. Installation Procedure	1

1.6.2 BRIDGE UNIT INSTALLATION PROCEDURE



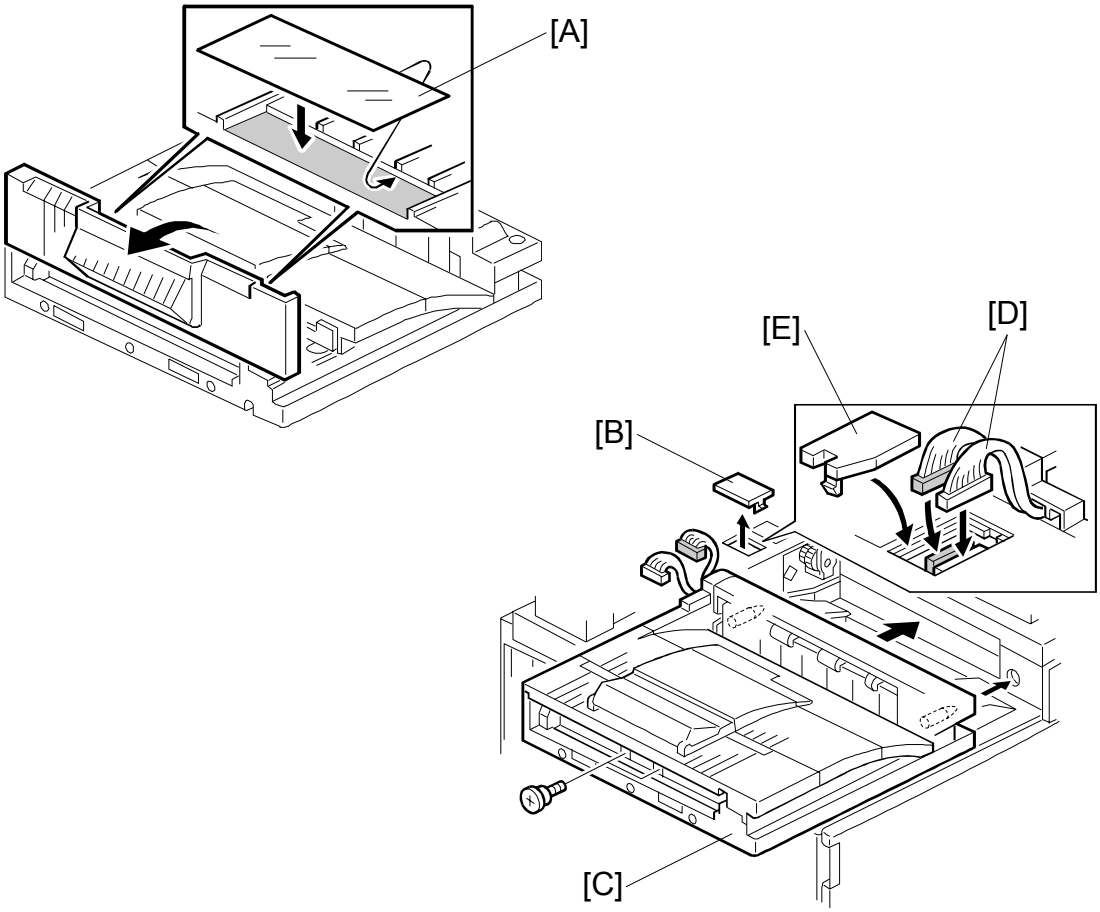
⚠CAUTION

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

1. Unpack the bridge unit and remove all tapes shipping retainers.
2. Remove the inner tray [A].
3. On the side of the machine, remove the three small covers [B].

If the optional external output tray (A825) will be installed (instead of a finisher), do Step 4.

4. Remove the two small covers [C].
5. Remove the cover [D] (☞ x 1).
6. Remove the cap [E].



7. If an optional finisher is to be installed, attach two mylars [A] to the bridge unit.
8. Remove the cover [B].
9. Install the bridge unit [C] (☞ x 2).
10. Connect the bridge unit I/F harnesses [D] (☞ x 2).
11. Install the connector cover [E].
12. Turn on the main switch and check the bridge unit operation (make sure that there are no paper jams).

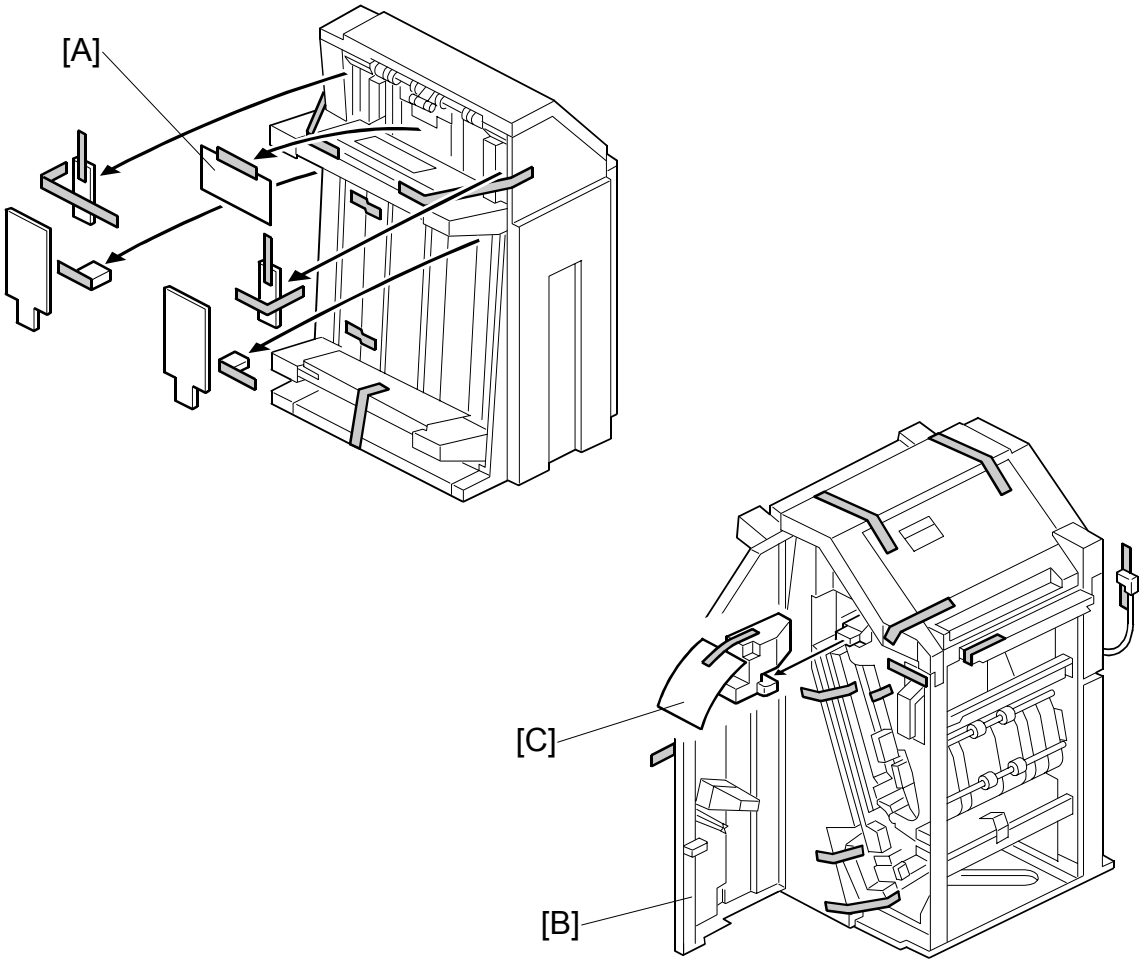
1.7 TWO-TRAY FINISHER INSTALLATION (B545)

1.7.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box against the following list:

Description	Q'ty
1. Front Joint Bracket	1
2. Rear Joint Bracket	1
3. Shift Tray	2
4. Screw – M4 x 8	2
5. Screw – M4 x 12	5
6. Ground Plate	1
7. Installation Procedure	1

1.7.2 TWO-TRAY FINISHER INSTALLATION PROCEDURE

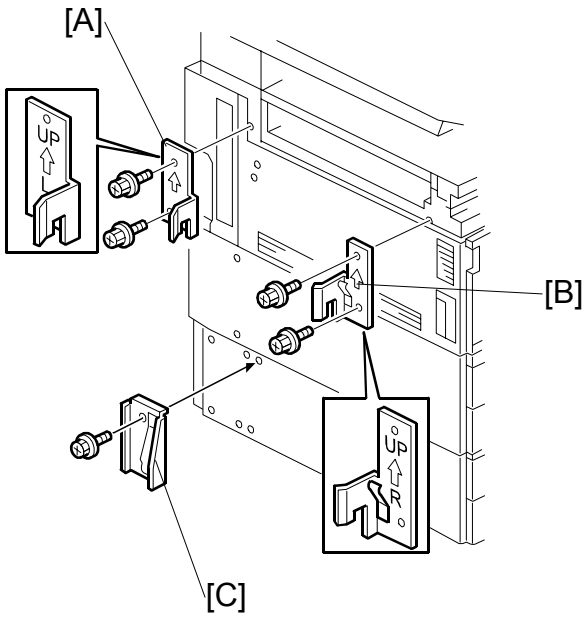


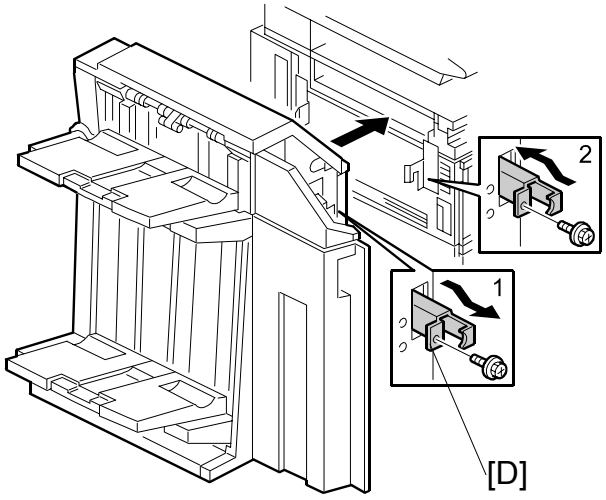
⚠CAUTION

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

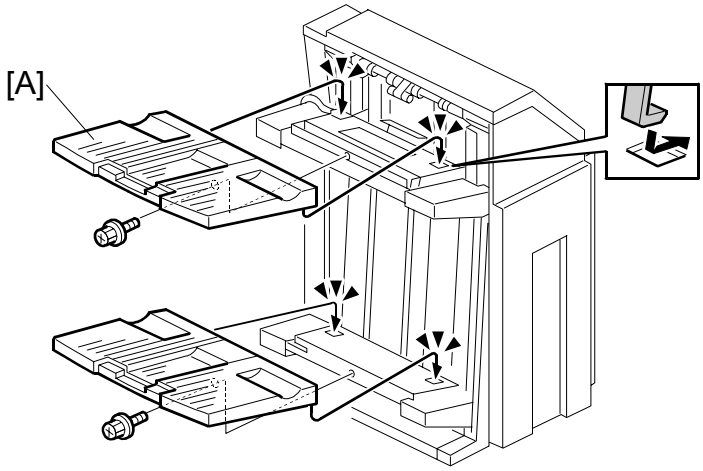
NOTE: The bridge unit (B538) and paper tray unit (B542) must be installed before installing this finisher.

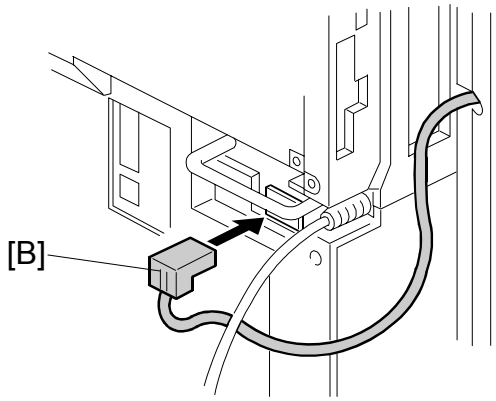
1. Unpack the finisher and remove all tapes and shipping retainers from outside the unit [A].
2. Open the front door [B] and remove all tapes and shipping materials from inside the finisher unit.
3. Save the retainer [C] and other shipping material.
   NOTE: The retainer [C] must be re-installed in the finisher before moving or shipping the finisher to another location.





4. Install the left joint bracket [A] (☞ x 2 M4 x 12) and right joint bracket [B] (☞ x 2 M4 x 12).
5. Attach the ground plate [C] (☞ x 1 M4 x 12) to the center of the paper tray unit as shown.
6. Open the front door of the finisher, and pull out the locking lever [D] (☞ x 1).
7. Push the finisher to the side of the machine with the holes in the finisher aligned with the joint brackets, and then dock the finisher against the machine.
8. Push in the locking lever and secure it (☞ x 1), then close the front door.





9. Install two trays [A] (🔩 x 1 each).
10. Connect the finisher cable [B] to the main machine below the right, rear handle.
11. Turn on the main switch and check the finisher operation.

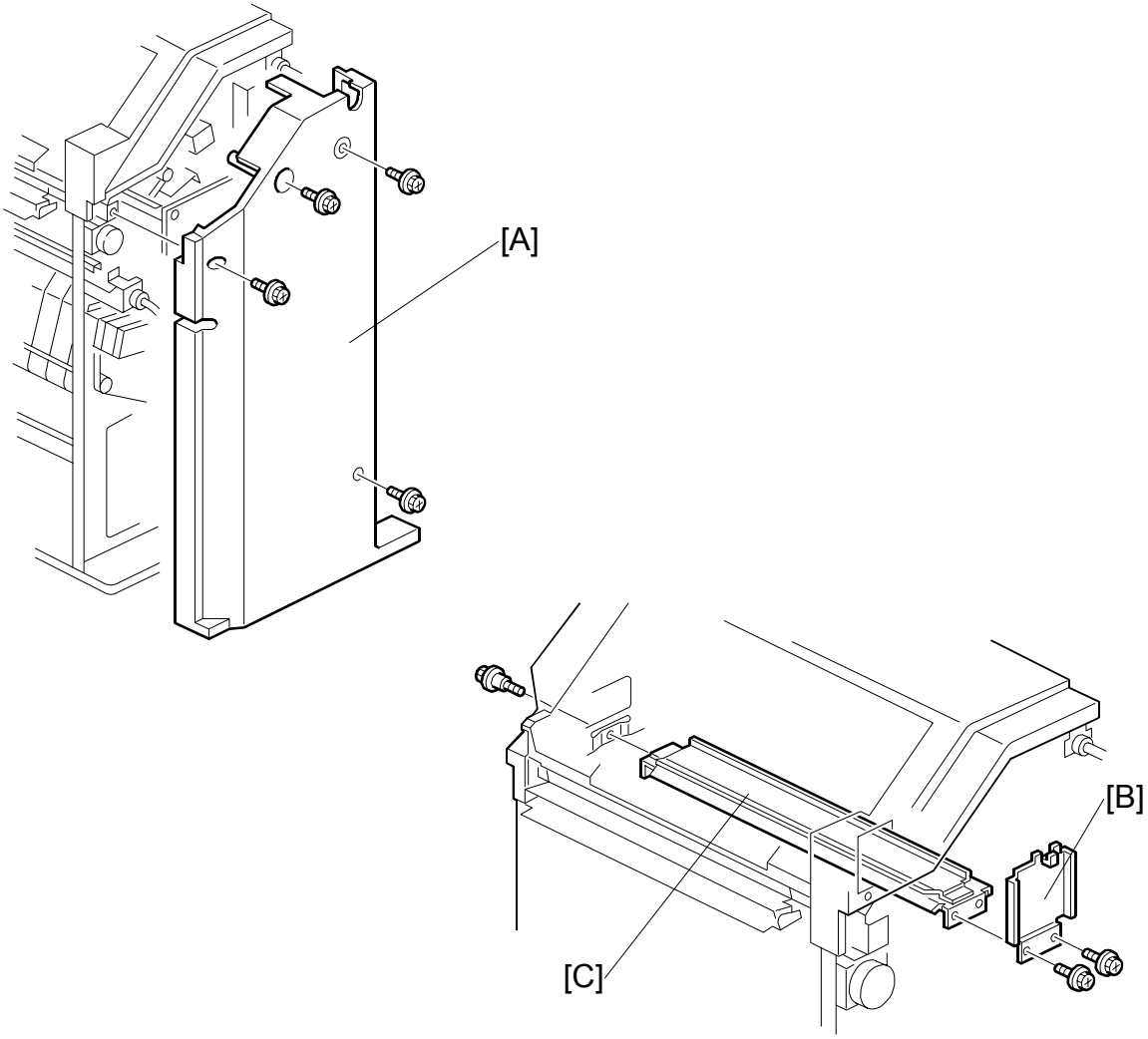
1.8 PUNCH UNIT INSTALLATION (B377)

1.8.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box against the following list:

Description	Q'ty
1. Punch unit	1
2. Sensor arm	1
3. Hopper	1
4. Step screw	1
5. Spring	1
6. Spacer (2 mm)	1
7. Spacer (1 mm)	1
8. Tapping screw	1
9. Tapping screw	2

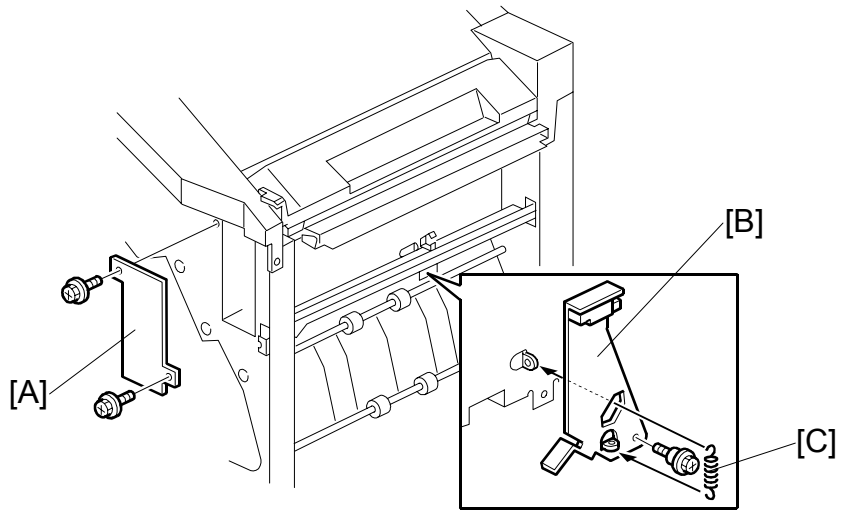
1.8.2 PUNCH UNIT INSTALLATION PROCEDURE

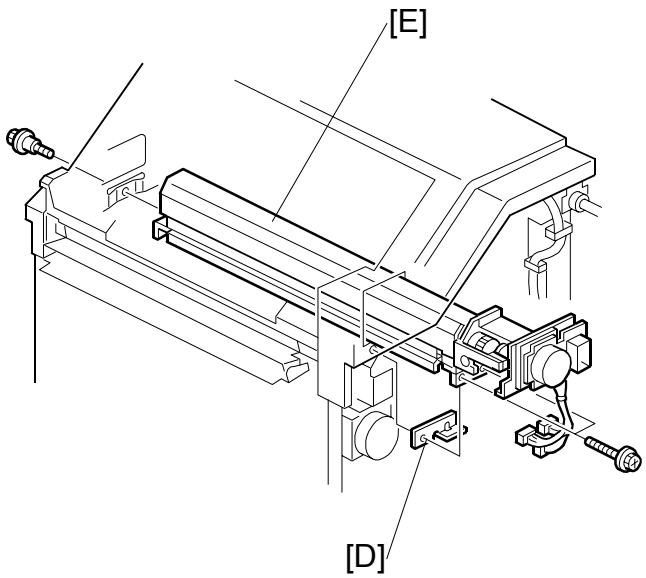


⚠CAUTION

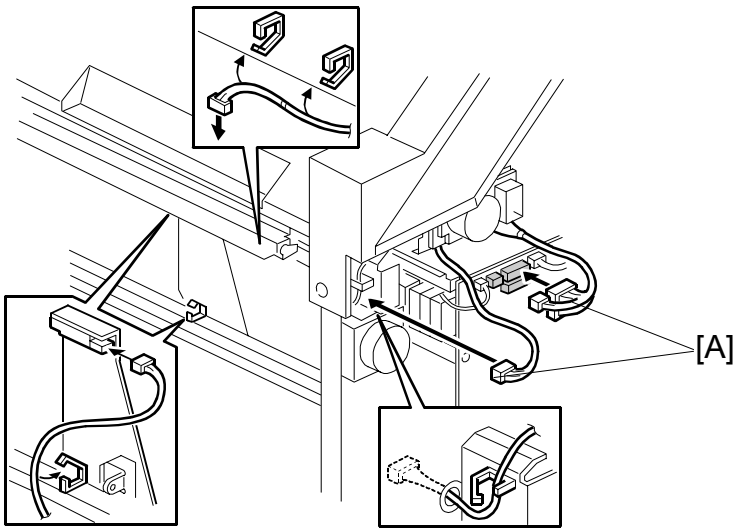
Switch off the main machine and unplug its power cord. If the Two-Tray Finisher is installed, disconnect it and pull it away from the machine. (☛1.7)

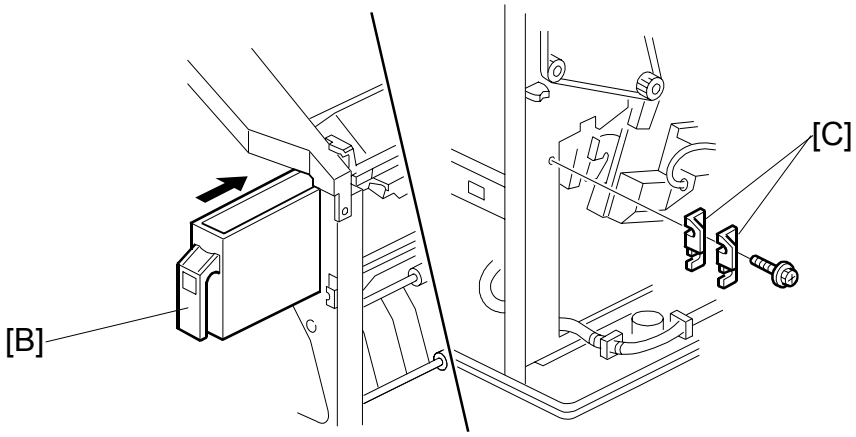
1. Unpack the punch unit and remove all tapes and shipping retainers.
2. Open the front door and remove the rear cover [A] (☞ x4).
3. Remove the bracket [B] (☞ x2) and paper guide [C] (☞ x 1).





4. Remove the hopper cover [A] (☞ x 2).
5. Install the sensor bracket [B] (stepped ☞ x 1).
6. Install the spring [C].
7. Install the 2 mm spacer [D].
8. Install the punch unit [E] (☞ x 2, stepped ☞ x 1)





9. Connect the harnesses [A] and clamp them as shown.
   NOTE: No special DIP switch settings are required for this punch unit. The punch unit sends an identification signal to the machine board so it knows what type of punch unit has been installed.
10. Slide the hopper [B] into the machine.
11. Fasten the two 1 mm spacers [C] to the rear frame for future adjustment.
    NOTE: The spacers are used to adjust the horizontal positioning of the holes.
12. Reassemble the finisher and check the punch operation.

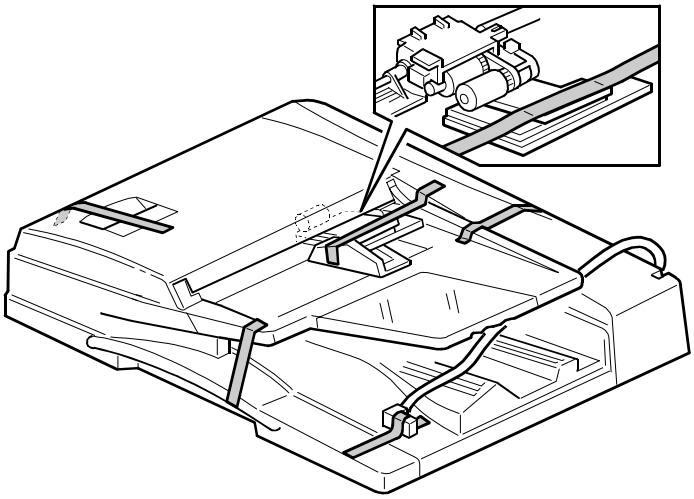
1.9 ARDF INSTALLATION (B541)

1.9.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box against the following list:

Description	Q'ty
1. Stepped Screw	2
2. Screw – M4 x 10	2
3. Attention Decal - Scanner	1
4. Attention Decal – Top Cover	1
5. Installation Procedure	1

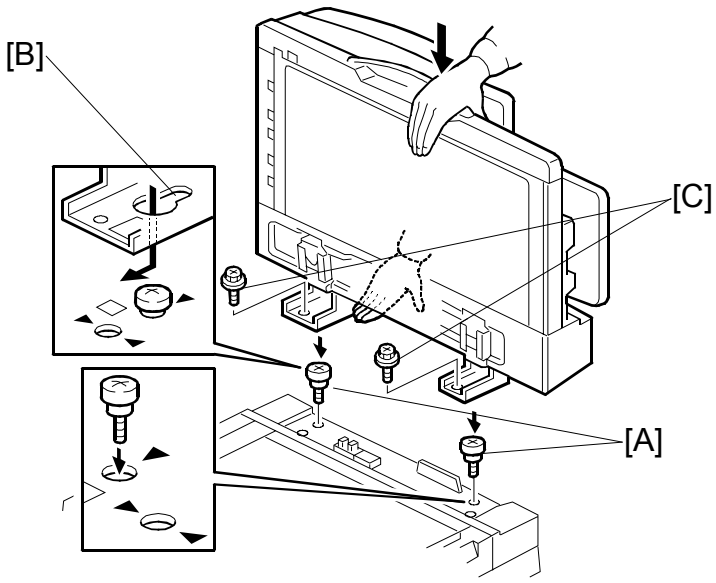
1.9.2 ARDF INSTALLATION PROCEDURE

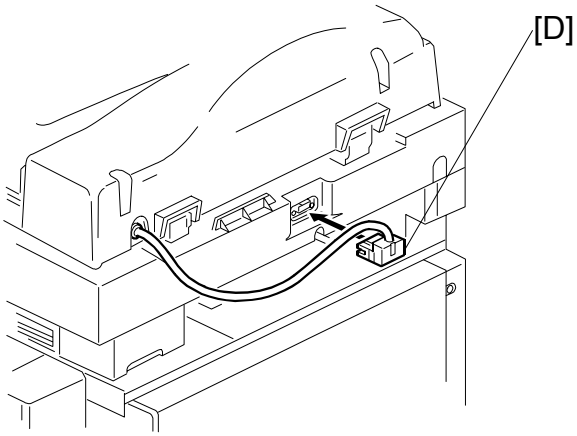


⚠CAUTION

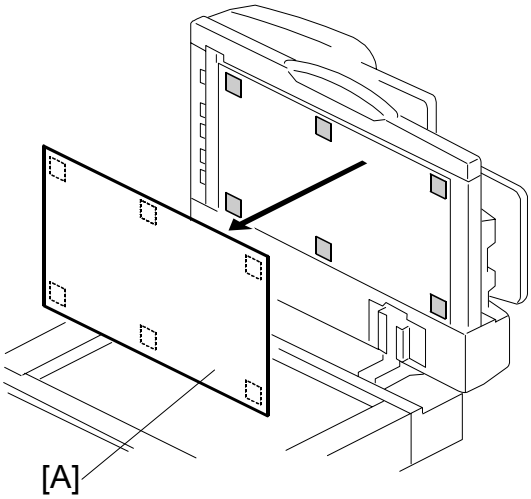
Unplug the main machine power cord before starting the following procedure.

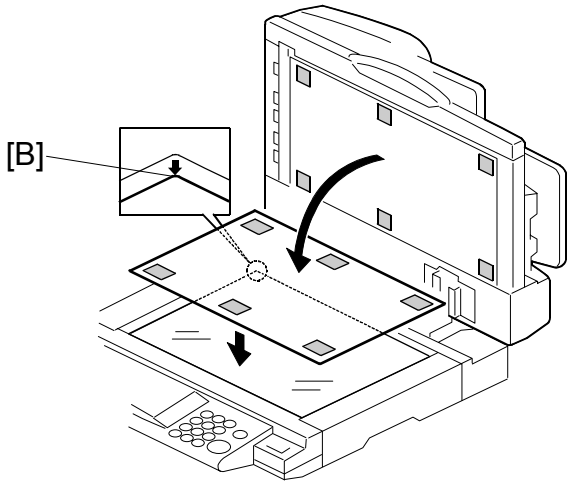
1. Unpack the ARDF and remove all tapes and shipping retainers.

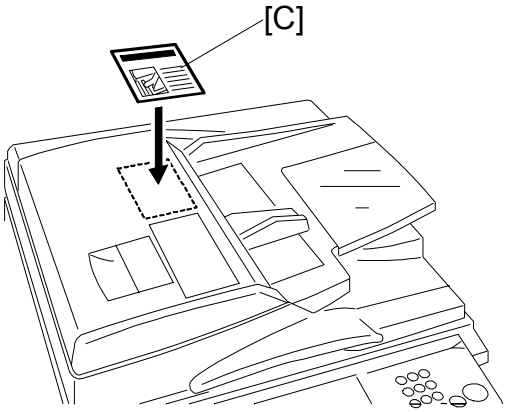


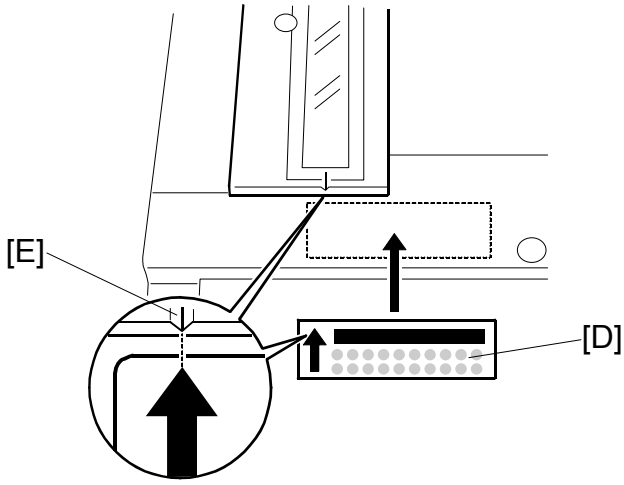


2. Attach and tighten [A] (☞ x 2 stud).
3. Mount the ARDF by aligning the screw keyholes [B] of the ARDF support plate over the stud screws, and slide the ARDF toward the front of the machine.
   NOTE: To avoid damaging the ARDF, hold it as shown in the illustration.
4. Secure the ARDF [C] (☞ x 2).
5. Connect the I/F cable [D] (☞ x 1) to the main machine.



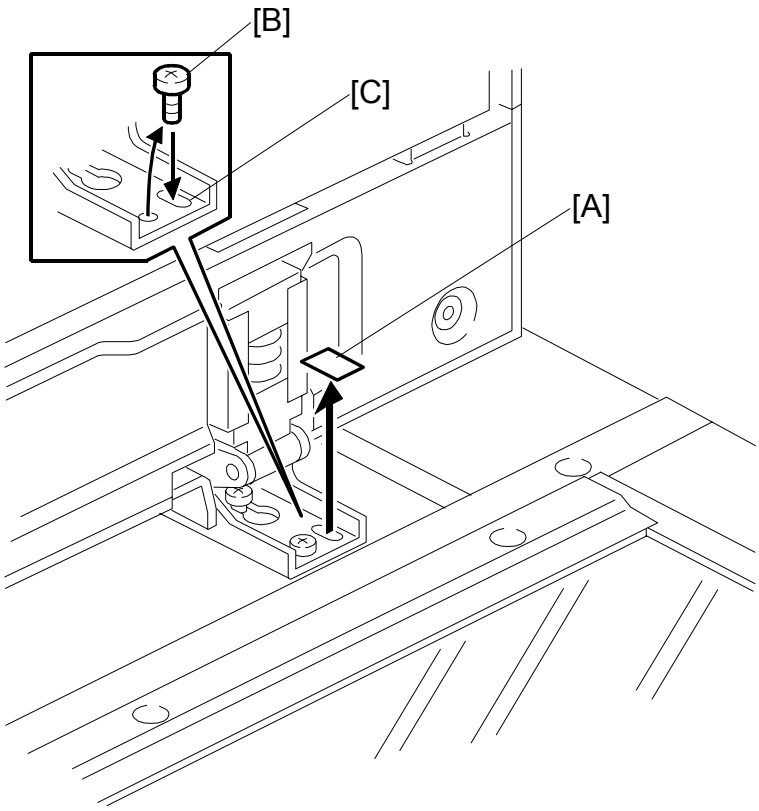






6. Peel off the platen sheet [A] and place it on the exposure glass.
7. Line up the rear left corner of the platen sheet flush against corner [B] on the exposure glass.
8. Close the ARDF.
9. Attach the decal [C] to the top cover as shown, choosing the language most suitable for the machine installed.
10. Attach the decal [D] to the cover so that the arrow on the decal lines up with the groove [E] of the left scale as shown. As with step 9, choose the language most suitable for the machine installed.
11. Turn on the main switch.
12. Check the ARDF operation and copy quality. Be sure to check and adjust the registration for the ARDF with the SP modes

1.9.3 ARDF SKEW ADJUSTMENT



1. Remove the tape [A] covering the elliptical hole.
2. Remove right screw [B] and install it into the elliptical hole [C].
3. Move the right side of the ARDF forward or back to adjust the position then tighten the screw.

1.10 LCT INSTALLATION (B543)

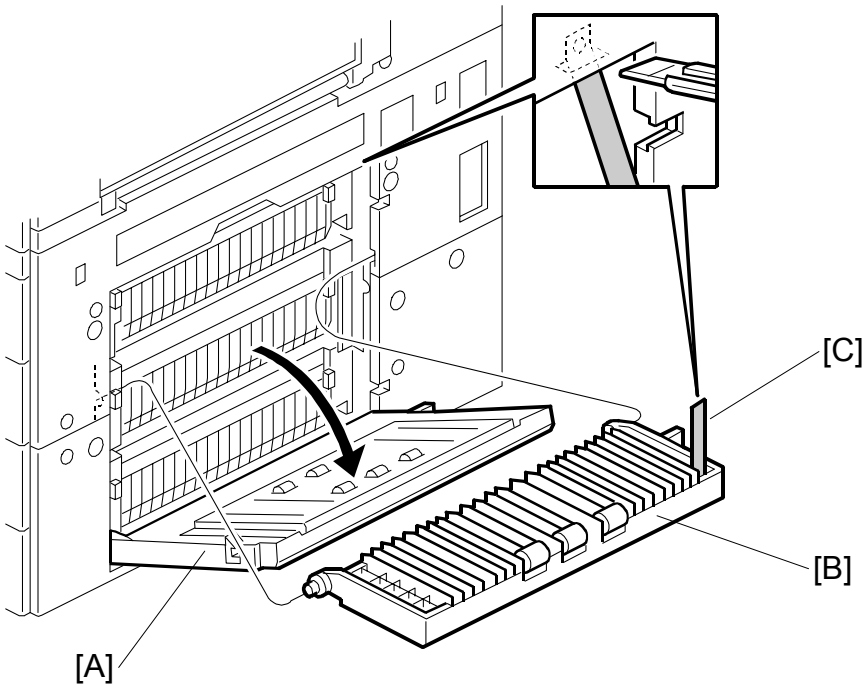
1.10.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box against the following list:

Description	Q'ty
1. Joint Pin	2
2. Stepped Screw M3 x 18	4
3. Magnet Cover	1
4. NECR (-17, -27 machines)	1
5. Installation Procedure	1

(NECR: New Equipment Condition Report)

1.10.2 LCT INSTALLATION PROCEDURE

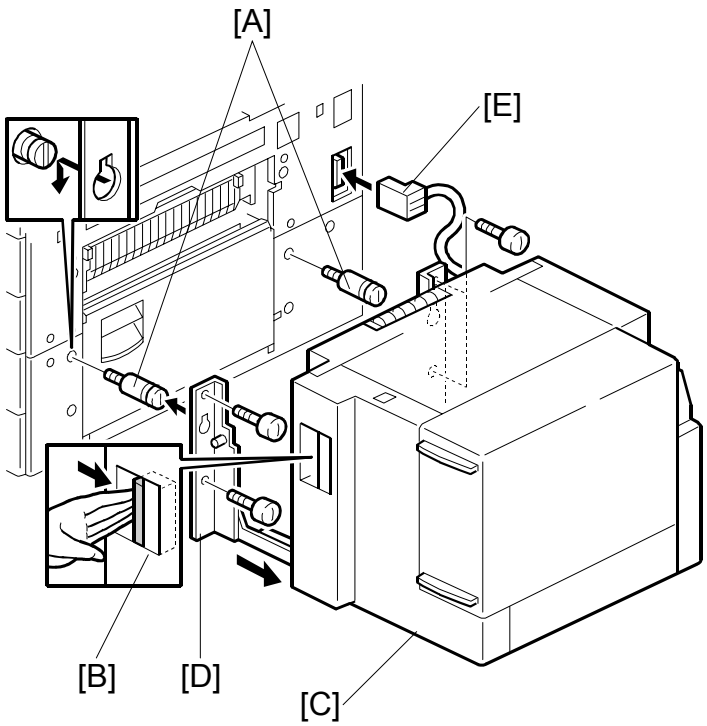


⚠CAUTION

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

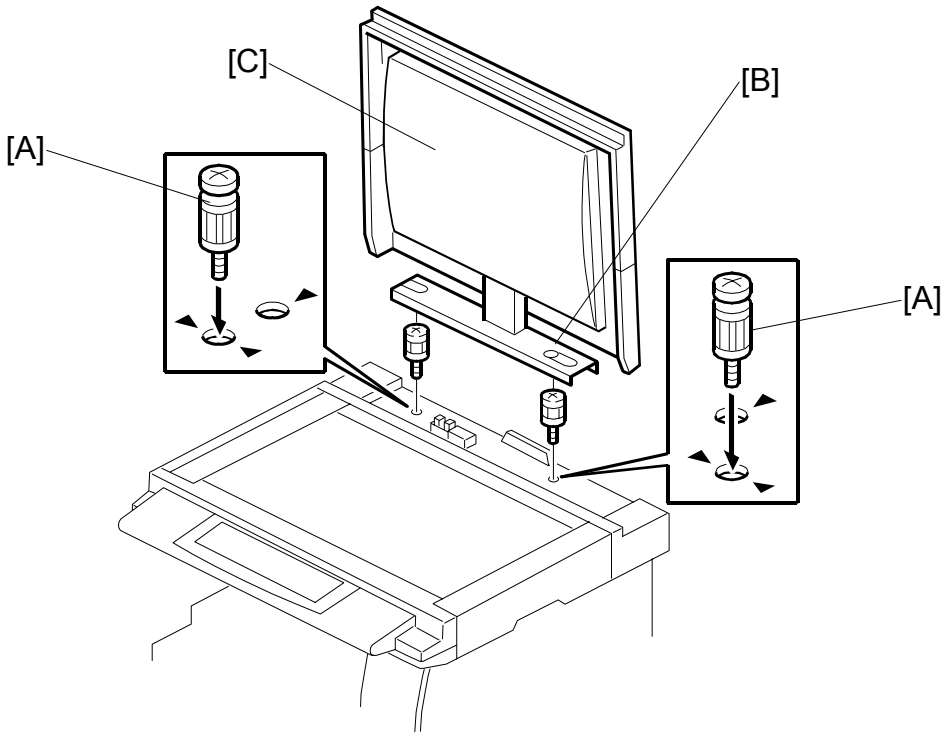
NOTE: The Paper Tray Unit (B542) must be installed before installing the LCT.

1. Unpack the LCT and remove the tapes.
2. Open the right cover of the paper tray unit [A].
3. Open the lower right cover [B] and cut the holding band [C].
   NOTE: When cutting the holding band, the upper part of the band should be cut as shown. Otherwise, paper jams may occur.
4. Remove the lower right cover.



6. Install the joint pins [A].
7. Push the release lever [B] and slide the LCT to the right (front view).
8. Hang the LCT [C] on the joint pins, then secure the brackets [D] (☞ x 4).
9. Return the LCT to the previous position and connect the LCT cable [E].
10. Open the LCT cover and load the paper.
11. Turn on the ac switch and check the LCT operation.

1.11 PLATEN COVER INSTALLATION (G329)

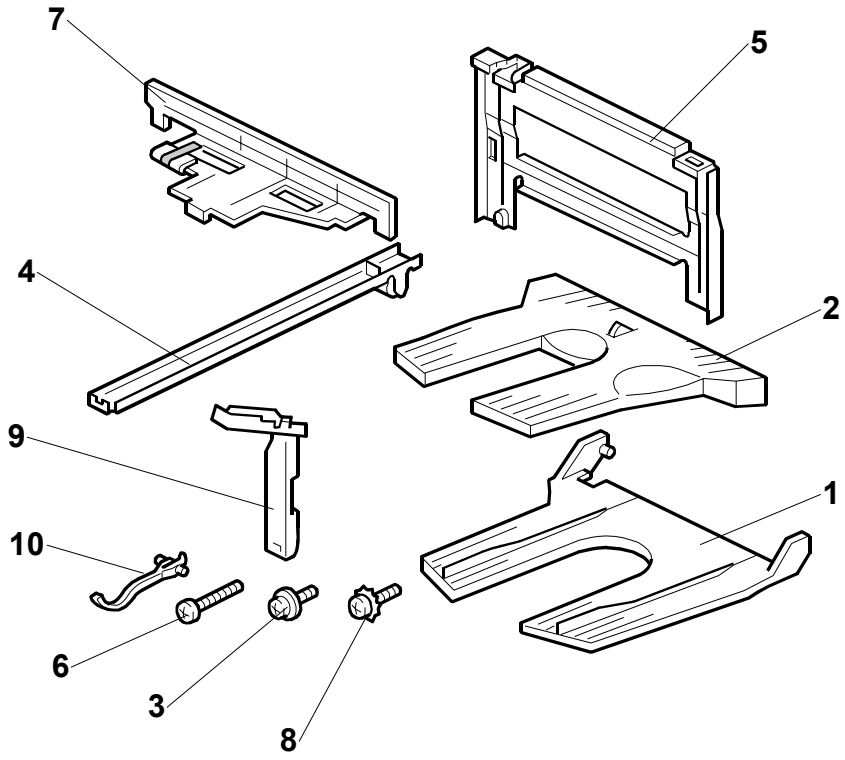


1. Install [A] (☞ x 2) on the top cover as shown.
2. Position the platen cover bracket [B] on the heads of the stud screws and slide the platen cover [C] to the left.

1.12 BOOKLET FINISHER INSTALLATION (B546)

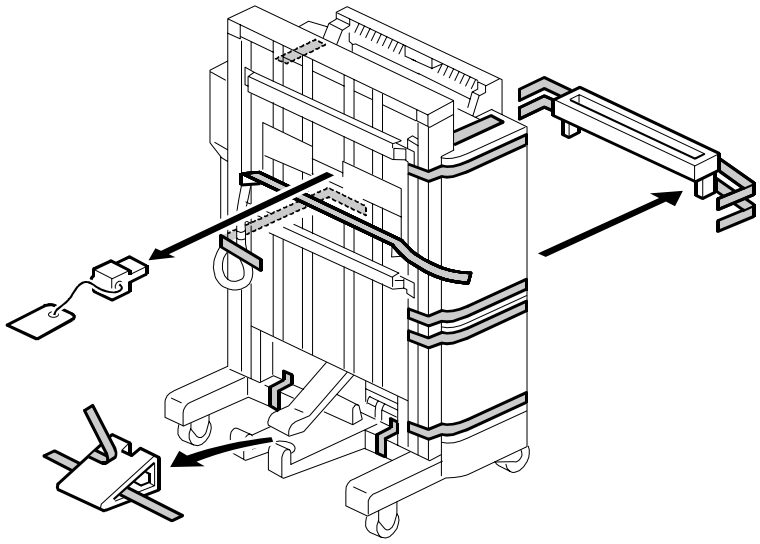
1.12.1 ACCESSORY CHECK

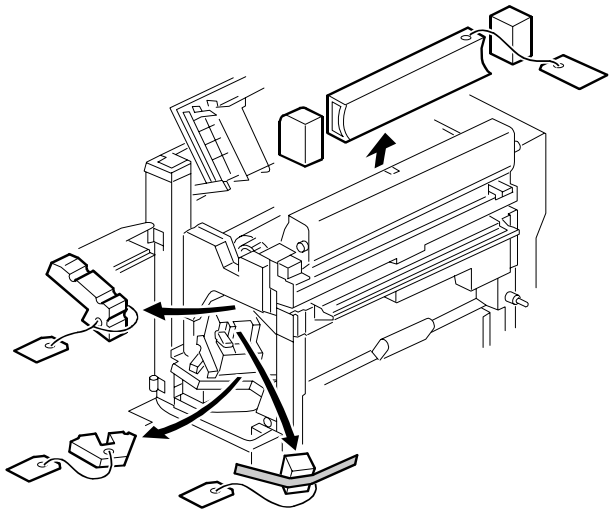
Check the quantity and condition of the accessories in the box against the following list.



Description	Q'ty
1. Upper Tray	1
2. Shift Tray	1
3. Tapping Screw - M4 x 6	2
4. Rail Ass'y	1
5. Joint Bracket	1
6. Tapping Screw - M4 x 16	8
7. Rail Bracket	1
8. Tapping Screw - M4 x 6	1
9. Harness Cover	1
10. Sensor Feeler	1

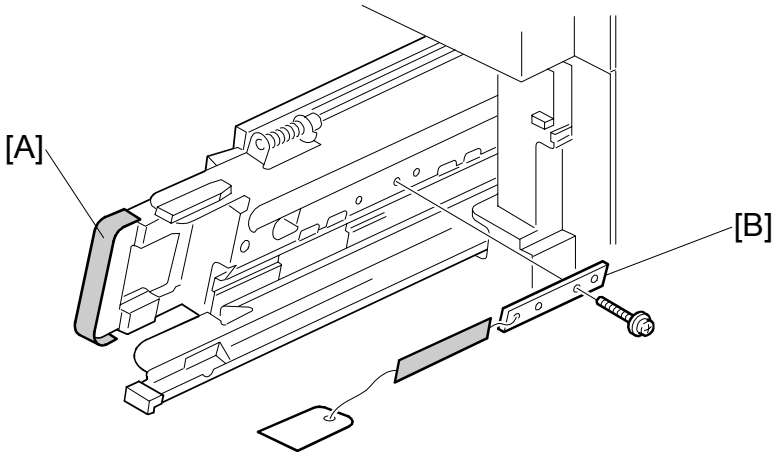
1.12.2 BOOKLET FINISHER INSTALLATION PROCEDURE

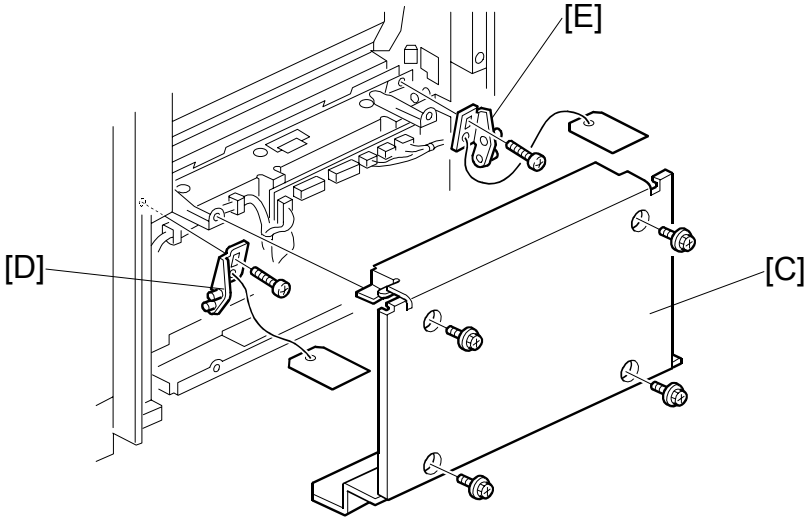




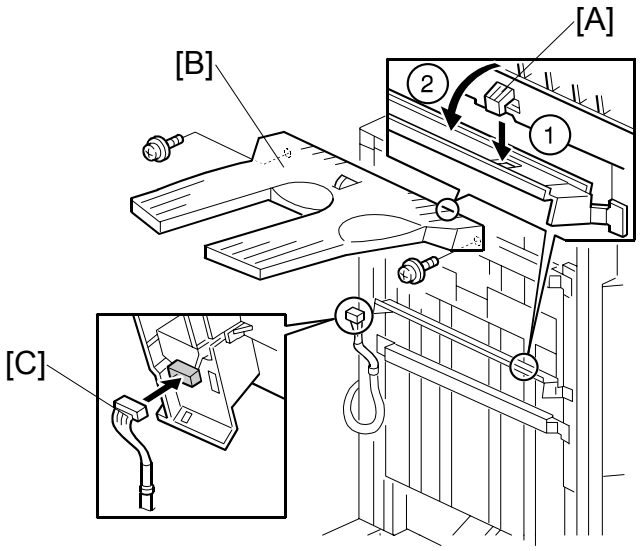
⚠CAUTION
Keep the power cord unplugged when starting the following procedure.

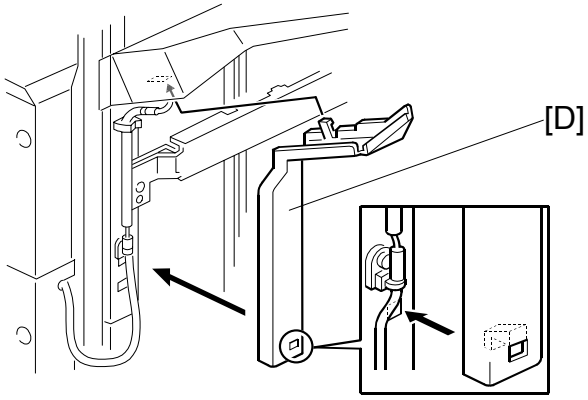
1. Unpack the finisher and remove the tapes and shipping retainers.



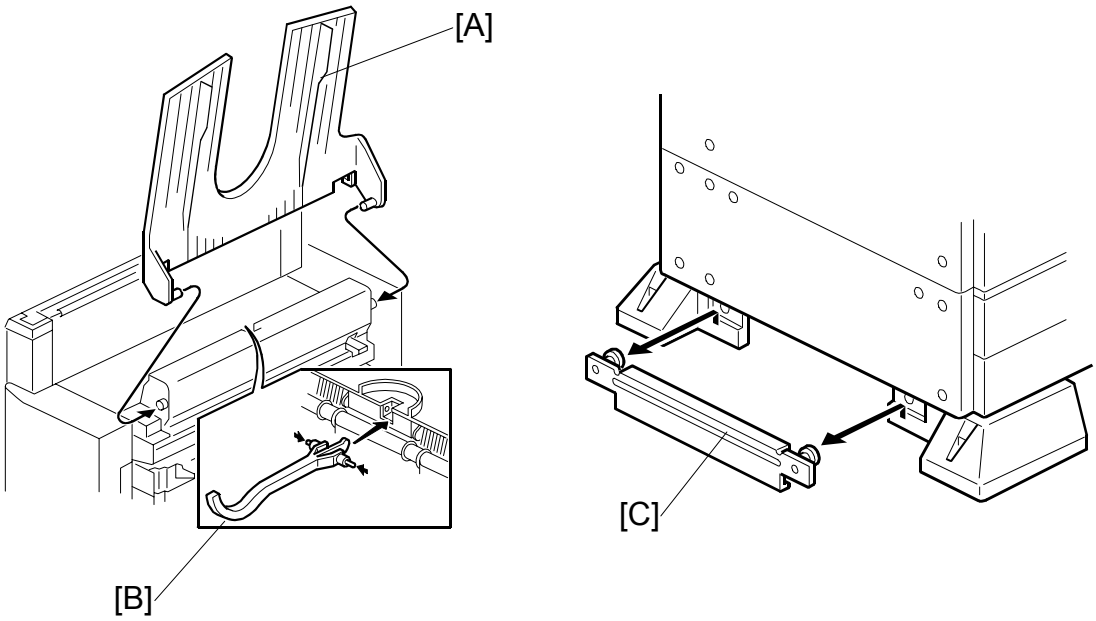


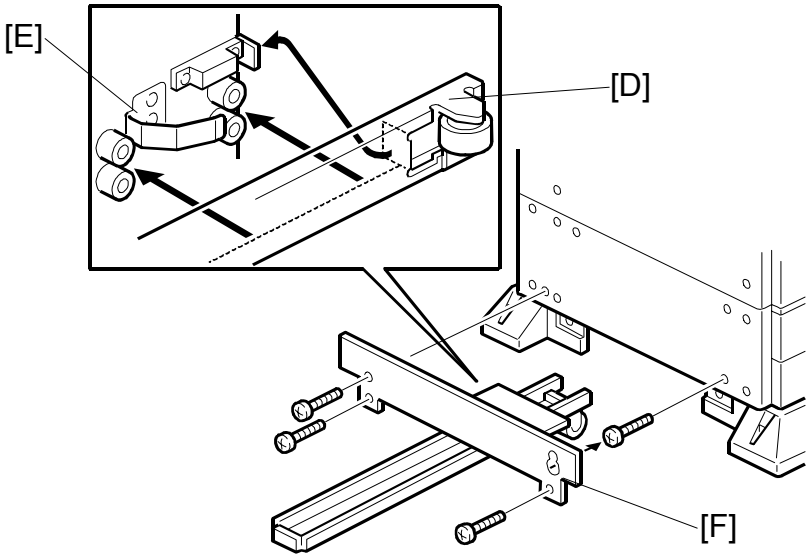
2. Open the front under door and pull out the staple unit [A].
3. Remove the stapler unit lock plate [B] (🔩 x 1).
4. Push in the stapler unit and shut the front lower door.
5. Remove the right lower cover [C] (🔩 x 4).
6. Remove the front pressure release bracket [D] (🔩 x 1).
7. Remove the rear pressure release bracket [E] (🔩 x 1).
8. Reattach the cover [C].



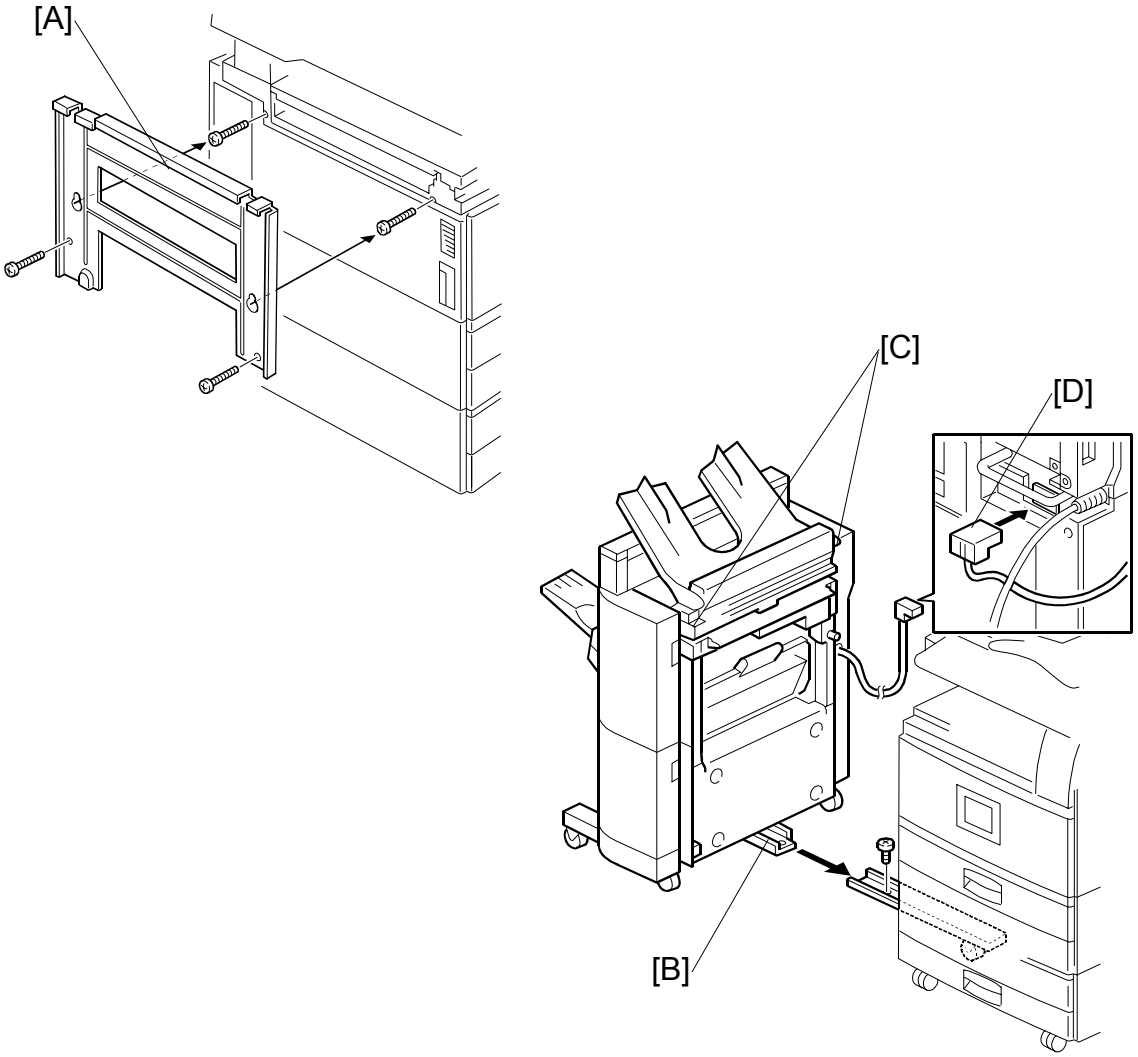


9. Set the hooks [A] of the shift tray [B] in the notches in the shift tray bracket, and secure the tray with two M4 x 6 screws.
10. Connect the shift tray sensor harness [C].
11. Install the harness cover [D] (2 hooks).





12. Install the upper tray [A] (2 pins).
13. Attach the sensor feeler [B] (2 pins).
14. Remove the stand bracket [C].
15. Attach the rail [D] to the rail bracket [E] as shown.
16. Install the rail bracket [F] on the left lower cover of the copier (🖉 x 4).

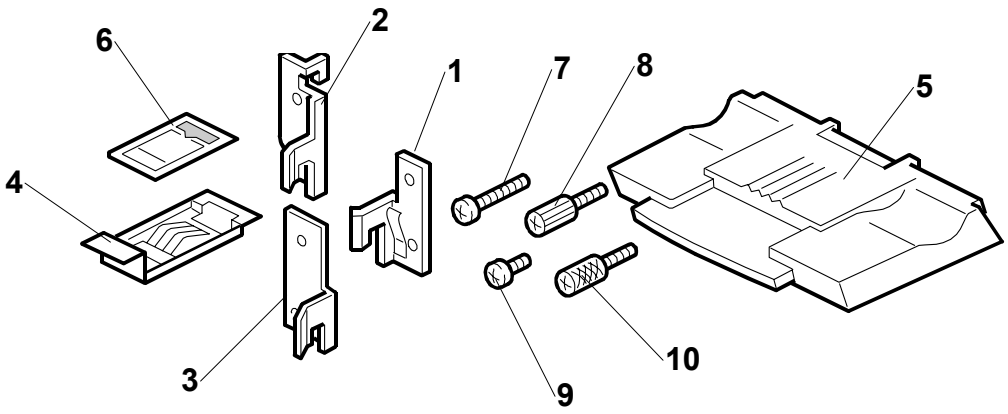


17. Install the joint bracket [A] on the left side of the copier (🔩 x 4).
18. Secure the rail [B] to the booklet finisher with 1 M4 screw.
19. Align the finisher on the joint bracket and lock the 2 hooks [C] of the finisher on the joint bracket.
20. Connect the finisher cable [D] to the copier.
21. Turn on the main switch and check the finisher operation.

1.13 1000 SHEET FINISHER (B408)

1.13.1 ACCESSORY CHECK

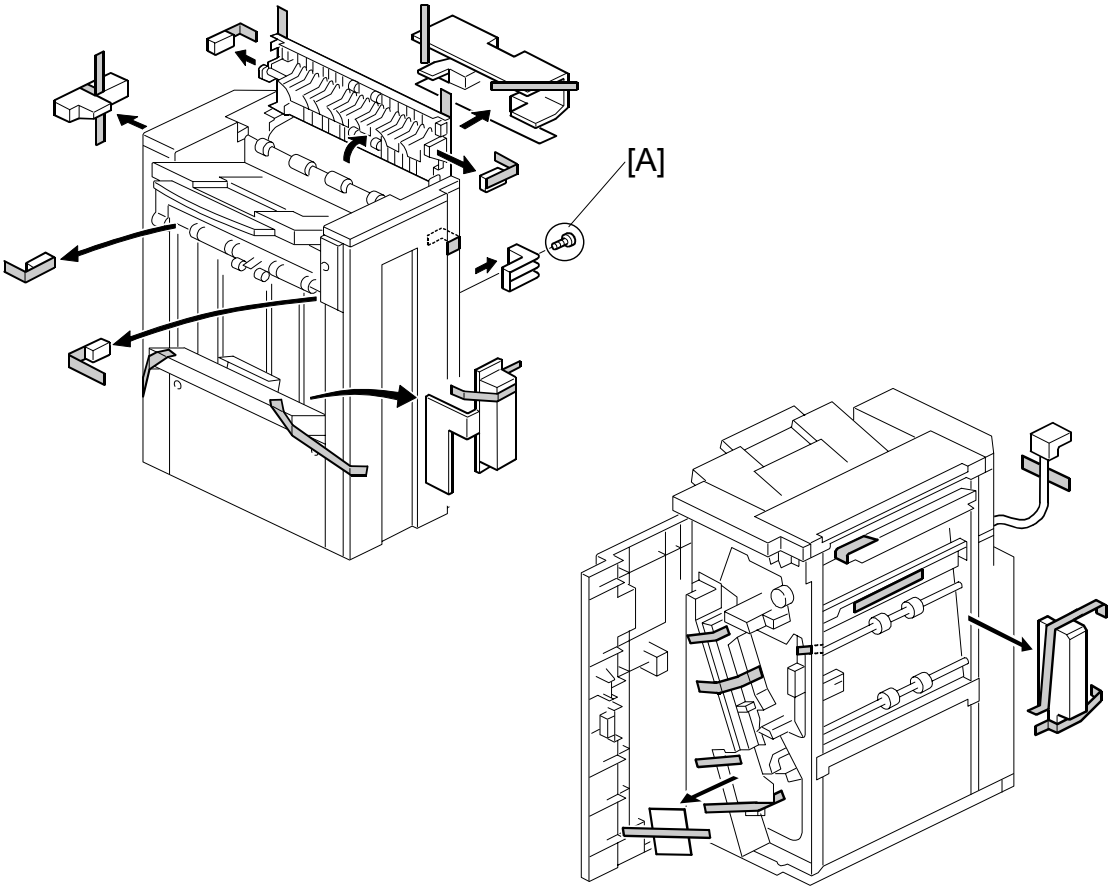
Check the quantity and condition of the accessories against the following list.



Description	Q'ty
1 Front Joint Bracket	1
2 Rear Joint Bracket [*1]	1
3 Rear Joint Bracket	1
4 Grounding Plate	1
5 Copy Tray	1
6 Staple Position Decal	1
7 Screw - M4 x 14	4
8 Knob Screw - M4 x 10	1
9 Screw - M3 x 8	1
10 Knob Screw - M3 x 8	1

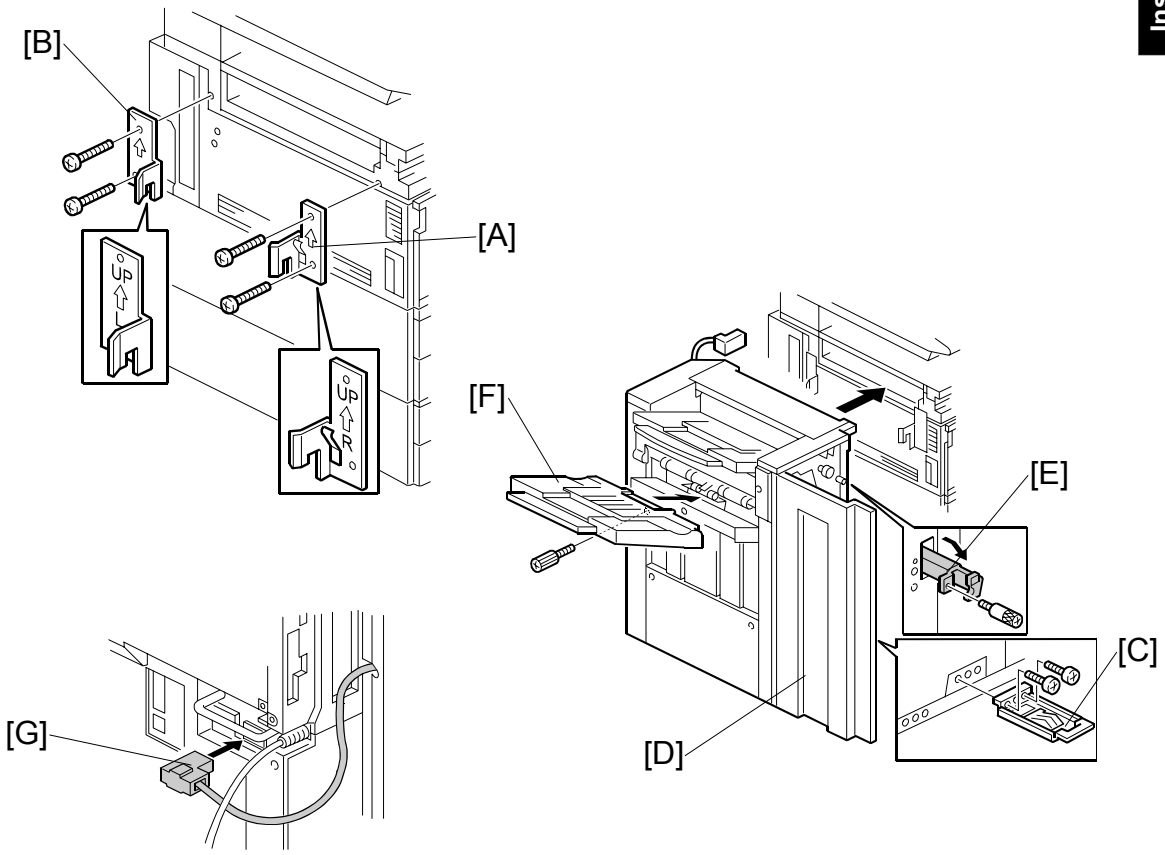
[*1]: Rear joint bracket is not required for these models.

1.13.2 1000 SHEET FINISHER INSTALLATION PROCEDURE

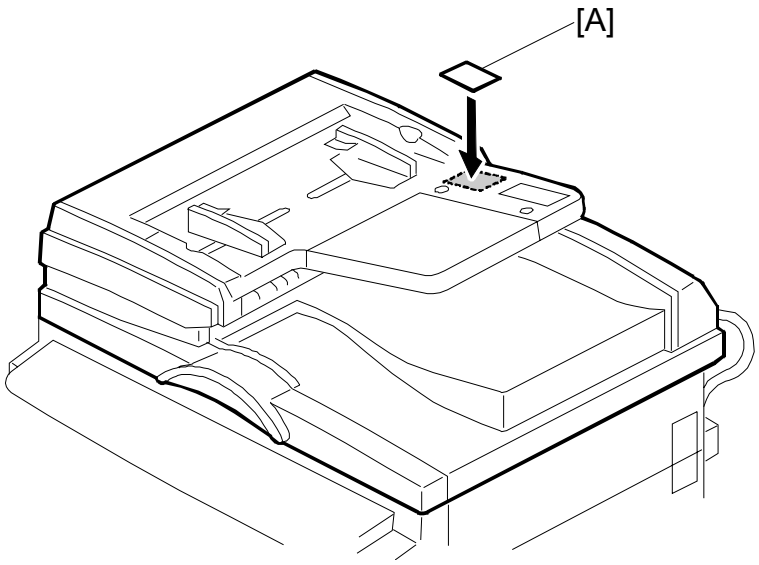


⚠CAUTION
Unplug the main machine power cord before starting the following procedure.

1. The following options must be installed before installing this finisher.
   - Bridge Unit (B538)
   - Paper Tray Unit (B542)
2. Unpack the finisher and remove the tapes.
   NOTE: Be sure to keep screw [A]. It will be needed to secure the grounding plate in Step 3.



3. Install the front joint bracket [A] (2 screws - M4 x 14) and rear joint bracket [B] (☞ x 2 M4 x 14).
4. Install the grounding plate [C] to the finisher (☞ x 2 M3 x 8).
   NOTE: Use the screw removed in step 1 and the screw from the accessory box.
5. Open the front door [D] then pull the locking lever [E].
6. Align the finisher on the joint brackets, and lock it in place by pushing the locking lever.
7. Secure the locking lever (☞ x 1 knob screw M3 x 8).
8. Close the front door.
9. Install the copy tray [F] (☞ x 1 knob screw M4 x 10).
10. Connect the finisher cable [G] to the main machine below the right rear handle.



11. Attach the staple position decal [A] to the ARDF as shown.
12. Turn on the main power switch and check the finisher operation.

1.14 FILE FORMAT CONVERTER B519-17

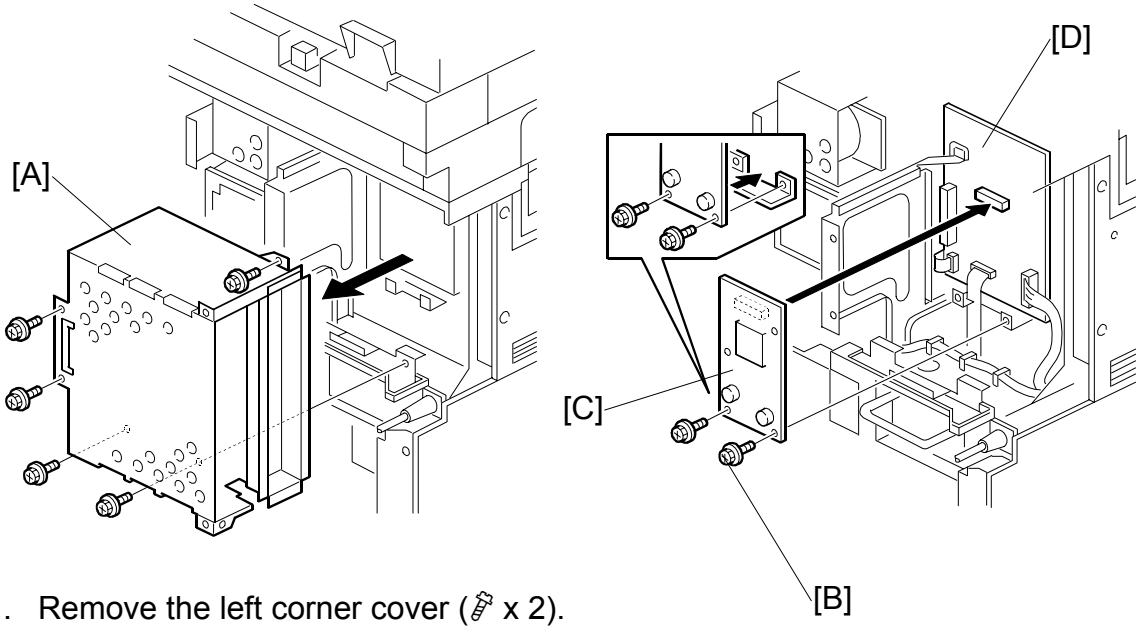
1.14.1 ACCESSORY CHECK

1. File Format Converter Board 1

1.14.2 INSTALLATION PROCEDURE

⚠CAUTION

Switch the machine off and unplug the main machine power cord before starting the following procedure.



1. Remove the left corner cover (🖉 x 2).
2. Remove the rear upper cover (🖉 x 2).
3. Remove the rear lower cover (🖉 x 4).
4. Remove the controller box [A] (🖉 x 2).
5. Remove the two screws [B] from the controller board.
6. Use the screws removed in the previous step to attach the File Format Converter board [C] to the controller board [D] (🖉 x 2)
7. Reattach the controller box and covers.

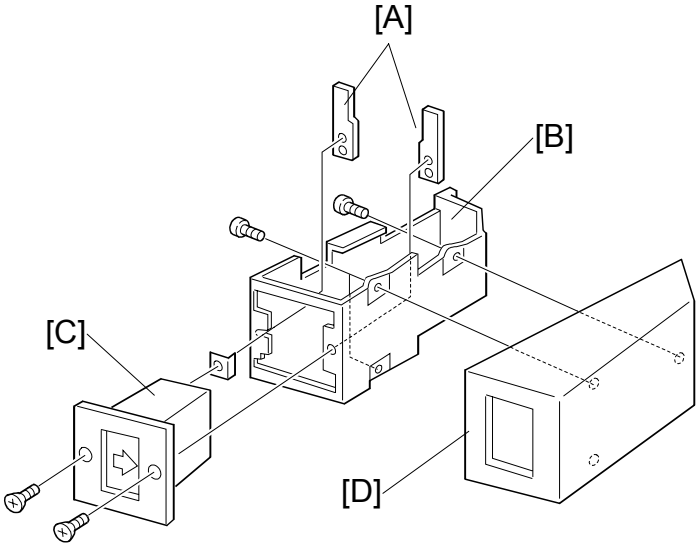
1.14.3 CHECK ALL CONNECTIONS

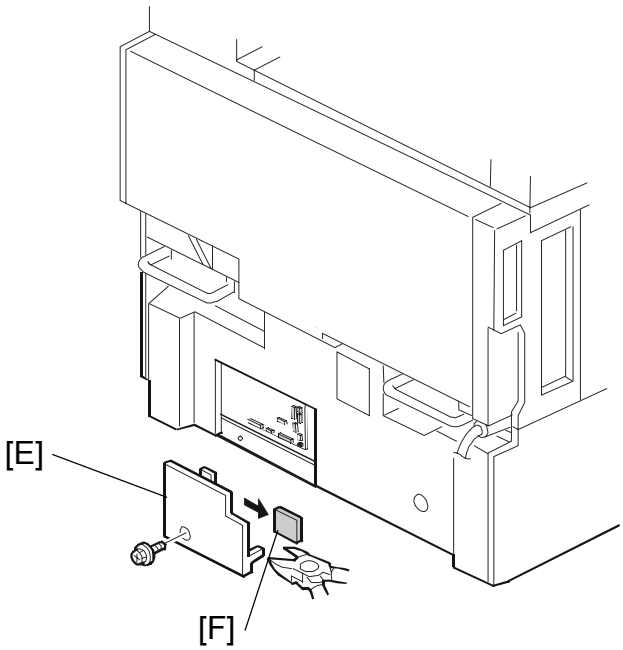
1. Plug in the power cord and turn on the main switch.
2. Enter the printer user mode and print the configuration page.

   User Tools> Printer Settings> List Test Print> Config. Page

   NOTE: The same data can also be printed by executing SP1-004 – Print Summary. All installed options are listed in the “System Reference” column.

1.15 KEY COUNTER INSTALLATION (A674)

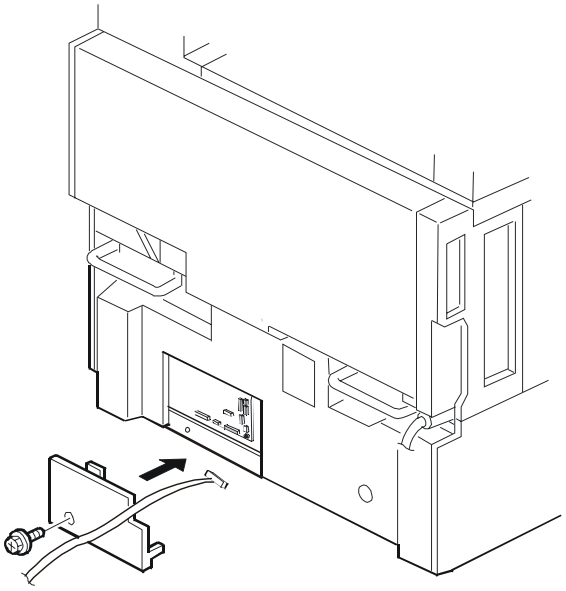


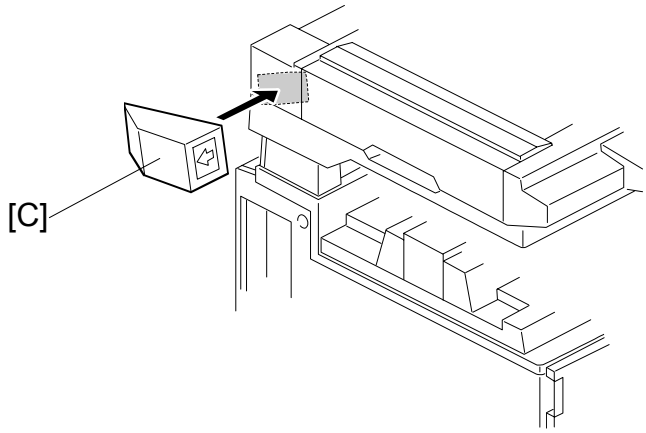


⚠CAUTION

Unplug the machine power cord before starting the following procedure.

1. Hold the key counter plates [A] on the inside of the key counter bracket [B] and insert the key counter holder [C]
2. Secure the key counter holder to the bracket (🔩 x2).
3. Attach the key counter cover [D] (🔩 x2).
4. Remove the connector cover [E] (🔩 x1).
5. Remove the knockout [F] from the connector cover.





6. Connect the key counter connector [A] to CN211 on the I/O board.
7. Reinstall the cover [B] (☞ x1).
8. Attach the double-sided tape to the key counter bracket.
9. Peel off the backing of the double-sided tape and attach the key counter assembly [D] to the left side of the scanner unit.

   NOTE: When attaching the key counter assembly, press the assembly hard against the scanner cover. Otherwise, the key counter assembly may come off easily.

10. Set “User Tools”, “System Settings”, “Key Operator Tools”, and “Key Counter Management” to restrict access to each available function mode.

PREVENTIVE MAINTENANCE

2. PREVENTIVE MAINTENANCE SCHEDULE

2.1 PM TABLE

NOTE: Amounts mentioned as the PM interval indicate the number of prints.

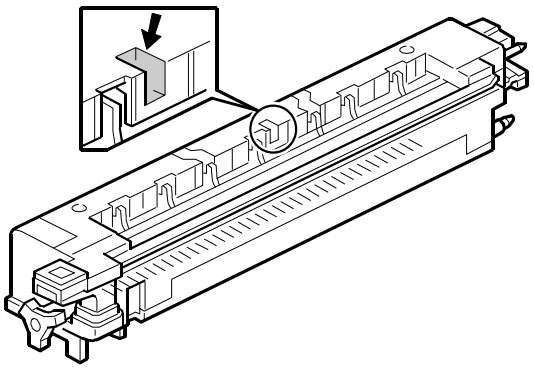
Symbol key: **C**: Clean, **R**: Replace, **L**: Lubricate, **I**: Inspect

B135/B138	EM	150K	300K	450K	NOTE
SCANNER/OPTICS					
Reflector		C	C	C	Optics cloth
1st Mirror		C	C	C	Optics cloth
2nd Mirror		C	C	C	Optics cloth
3rd Mirror		C	C	C	Optics cloth
Scanner Guide Rails		I	I	I	Do not use alcohol. Lubricate if necessary.
Platen Sheet Cover	C	I	I	I	Dry cloth or alcohol. Replace platen sheet if required.
Exposure Glass		C	C	C	Dry cloth or alcohol
Toner Shield Glass		C	C	C	Optics cloth
APS Sensor		C	C	C	Dry cloth or alcohol
Exposure Glass (Sheet through)		C	C	C	Dry cloth or alcohol
DRUM (OPC) AREA					
Charge Roller		R	R	R	
Charge Roller Cleaning Roller		R	R	R	
Drum Cleaning Blade 1		R	R	R	
Drum Cleaning Blade 2		R	R	R	
Quenching Lamp			C		Dry cloth
Pick-off Pawls		R	R	R	
Spurs		C	C	C	Dry cloth or alcohol
ID Sensor		C	C	C	Perform SP3-001-2 after blower brush cleaning.
Cleaning Entrance Seal		C	C	C	Blower brush. Replace if required.
Side Seal		I	I	I	

B135/B138	EM	150K	300K	450K	NOTE
DEVELOPMENT UNIT					
Development Drive Gears		I	I	I	
Development Filter		R	R	R	
Developer		I	R	I	
Entrance Seal		I	I	I	
Side Seal		I	I	I	
Development Roller		C	C	C	Dry cloth
PAPER FEED					
Registration Roller	C	C	C	C	Water or alcohol.
Idle Roller Dust Blade		C	C	C	Detach and tap gently on flat surface to empty. Blower brush.
Registration Roller Dust Blade		C	R	C	Blower brush.
Paper Feed Roller	I	R	R	R	Check counter value for each (SP7-204). If ≥ 150 K, replace roller. After replacing the roller, do SP7-816 to reset counter.
Separation Roller	I	R	R	R	
Pick-up Roller	I	R	R	R	
Paper Feed Roller (By-pass feed table)	I	R	R	R	
Separation Roller (By-pass feed table)	I	R	R	R	
Pick-up Roller (By-pass feed table)	I	R	R	R	
Paper Feed Guides		C	C	C	Water or alcohol.
Relay Rollers		C	C	C	Water or alcohol.
Bottom Plate Pad		C	C	C	Water or alcohol.
Bottom Plate Pad (By-pass feed)		C	C	C	Water or alcohol.
Registration Sensor		C	C	C	Blower brush
Paper Feed Roller Gear		L	L	L	Silicone Grease G-501. See note below.*[1]
Upper Relay Sensor		C	C	C	Blower Brush
DUPLEX UNIT					
Upper Transport Roller		C	C	C	Water or alcohol.
Lower Transport Roller		C	C	C	Water or alcohol.
TRANSFER BELT UNIT					
Transfer Belt	C	R	R	R	Dry cloth
Transfer Belt Cleaning Blade		R	R	R	
Transfer Belt Rollers		C	C	C	Dry cloth
Entrance Seal		C	C	C	Dry cloth
Transfer Entrance Guide	C	C	C	C	Dry cloth
Used Toner Tank	I	C	C	C	Empty the tank.

B135/B138	EM	150K	300K	450K	NOTE
FUSING UNIT AND PAPER EXIT					
Fusing Entrance and Exit Guide Plates		C	C	C	Water or alcohol.
Hot Roller		R	R	R	
Pressure Roller		R	R	R	
Fusing Thermistors		R	R	R	
Cleaning Roller		R	R	R	
Cleaning Roller Bushings		L	L	L	Grease: Barrierta JFE 55/2
Hot Roller Strippers		C	R	C	Water or alcohol.
Paper Exit Guide Ribs		C	C	C	Water or alcohol. (See illustration below.)
Exit Sensor		C	C	C	Blower brush
DRIVE					
Drive Belts			I		Replace if necessary

Clean here.



B541	EM	80K	160K	240K	NOTE
ARDF (for originals)					
Pick-up Roller	C	R	R	R	Belt cleaner
Feed Belt	C	R	R	R	Belt cleaner
Separation Roller	C	R	R	R	Dry or damp cloth
Sensors		C	C	C	Blower brush
Drive Gears		L	L	L	Grease, G501

B542	EM	150K	300K	450K	NOTE
PAPER TRAY UNIT					
Paper Feed Rollers		R	R	R	Check counter with SP7-204. If ≥ 150 K, replace roller. After replacing the roller, do SP7-816 to reset counter.
Pick-up Rollers		R	R	R	
Separation Rollers		R	R	R	
Relay Rollers		C	C	C	Dry or damp cloth
Bottom Plate Pad		C	C	C	Dry or damp cloth

B543	EM	150K	300K	450K	NOTE
LCT					
Paper Feed Roller		R	R	R	Check counter with SP7-204. If ≥ 150 K, replace roller. After replacing the roller, do SP7-816 to reset counter.
Pick-up Roller		R	R	R	
Separation Roller		R	R	R	
Bottom Plate Pad		C	C	C	Dry or damp cloth

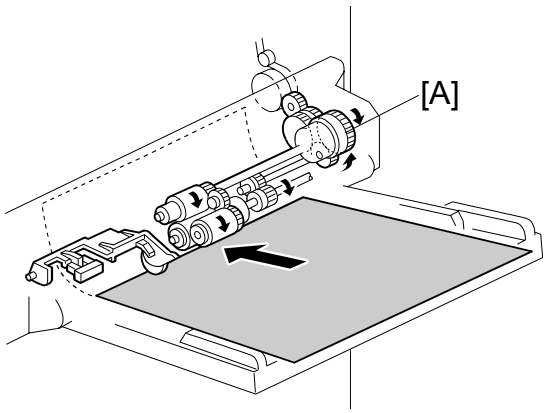
B408/B545	EM	150K	300K	450K	NOTE
1000-SHEET/TWO-TRAY FINISHER					
Rollers	C				Water or alcohol.
Brush Roller (A681 only)	I	I	I	I	Replace if required.
Discharge Brush	C	C	C	C	Dry cloth
Sensors	C				Blower brush
Jogger Fences	I	I	I	I	Replace if required.
Punch Waste Hopper*	I	I	I	I	Empty hopper.

***: Only for B545**

B546	EM	150K	300K	450K	NOTE
BOOKLET FINISHER					
Transport Belt		C	C	C	
Stapler Paddles		C	C	C	

B544	EM	150K	300K	450K	NOTE
1-BIN TRAY UNIT					
Rollers	C				Dry or damp cloth
Copy Tray	C				Dry or damp cloth
Sensors	C				Blower brush

*1: Lubricate the paper feed clutch gear [A] with Silicone Grease G501 every P.M.



REPLACEMENT AND ADJUSTMENT

3. REPLACEMENT AND ADJUSTMENT

3.1 GENERAL CAUTIONS

⚠CAUTION

To avoid damage to the transfer belt, drum, or development unit when it is removed or re-installed, never turn off either power switch while electrical components are active.

⚠CAUTION

Turn off the main power switch and unplug the machine before attempting any of the procedures in this section.

3.1.1 LASER UNIT

1. Do not loosen the screws that secure the LD drive board to the laser diode casing. Doing so would throw the LD unit out of adjustment.
2. Do not adjust the variable resistors on the LD unit, as they are adjusted in the factory.
3. The polygon mirror and F-theta lenses are very sensitive to dust. Do not open the optical housing unit.
4. Do not touch the glass surface of the polygon mirror motor unit with bare hands.
5. After replacing the LD unit, do the laser beam pitch adjustment. Otherwise, an SC condition will be generated.

3.1.2 USED TONER

1. Dispose of used toner in accordance with local regulations. Never throw toner into an open flame, for toner dust may ignite.

3.2 SPECIAL TOOLS AND LUBRICANTS

3.2.1 SPECIAL TOOLS

Part Number	Description	Q'ty
A2309003	Adjustment Cam – Laser Unit	1
A2309004	Positioning Pin – Laser Unit	1
N8036701	Flash Memory Card – 4MB	1
N8031000	Case – Flash Memory Card	1
A0069104	Scanner Positioning Pin (4 pcs/set)	1
A2929500	Test Chart – S5S (10 pcs/Set)	1
G0219350	Parallel Loopback Connector	1

3.2.2 LUBRICANTS

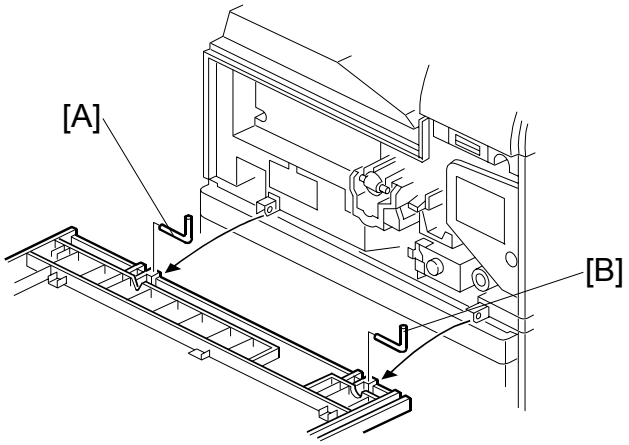
Part Number	Description	Q'ty
A2579300	Grease Barrierta S552R	1
52039502	Silicone Grease G-501	1

3.2.3 SYMBOLS USED IN TEXT

Screw: Connector: C-clamp (snap ring): E-clamp:

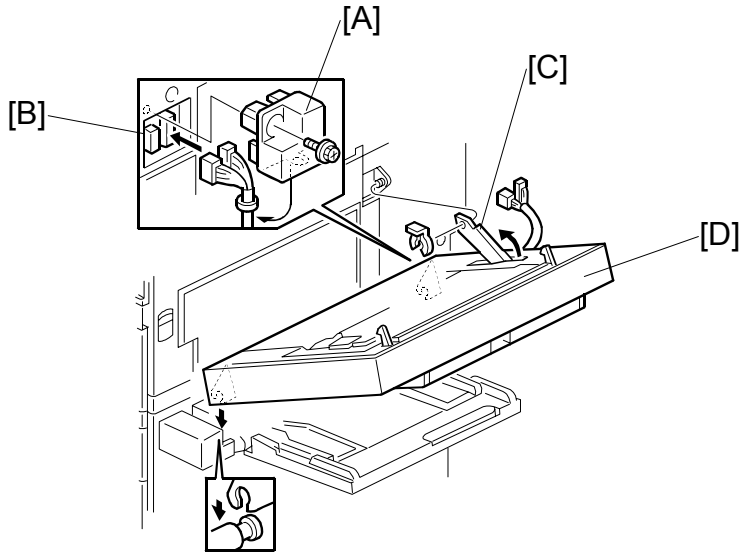
3.3 FRONT DOOR

1. Open front door.



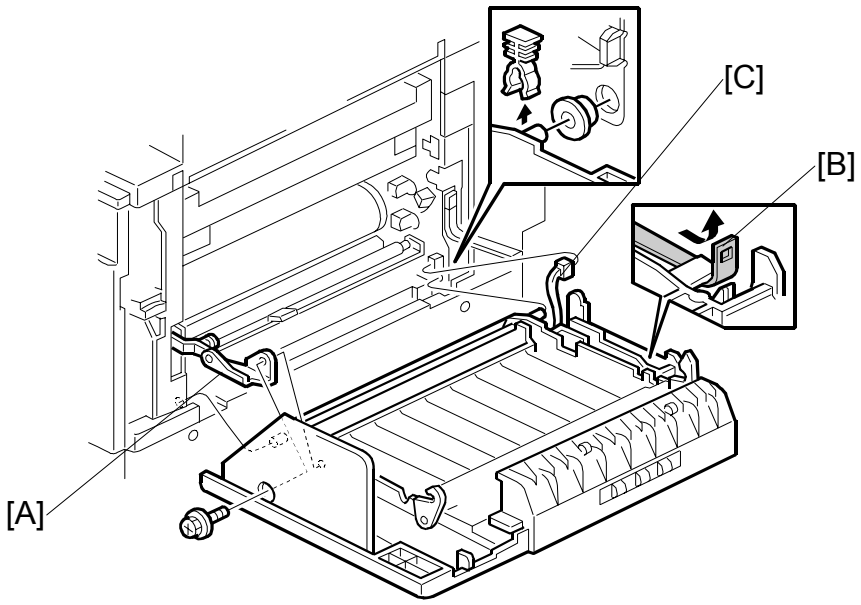
2. Front door. Left pin [A], right pin [B].

3.4 DUPLEX UNIT



1. Connector cover [A] (x1)
2. Duplex connectors [B] (x2)
3. Duplex support arm [C] (x1)
4. Duplex unit [D]
   NOTE: Grip the duplex unit with both hands, slowly rotate it towards you and then lift up.

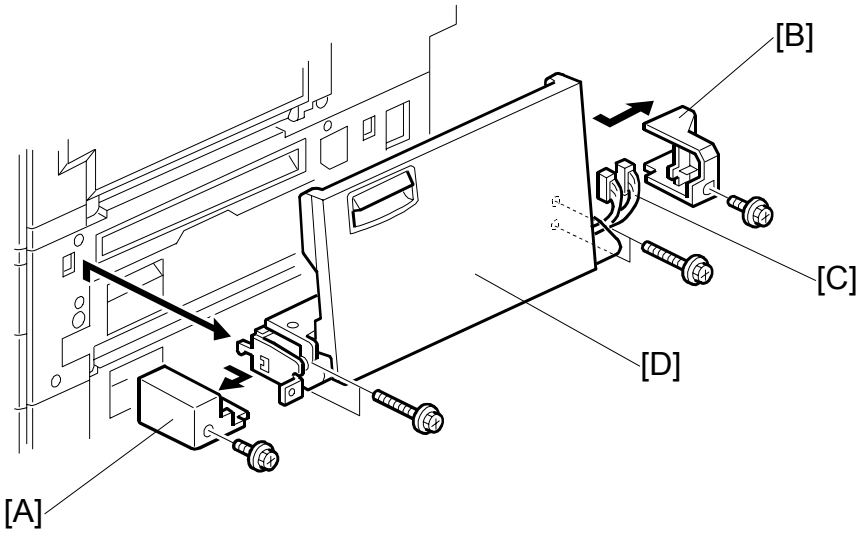
3.5 UPPER RIGHT COVER



NOTE: Work carefully to avoid damaging the development roller.

1. Duplex Unit (☛ 3.4)
2. Transfer belt unit (☛ 3.13.1)
3. Metal support arm [A] (x1)
4. Band support arm [B] (loop fastener)
5. Connector [C] (x1)
6. Upper right cover (x1, Bushing x1)

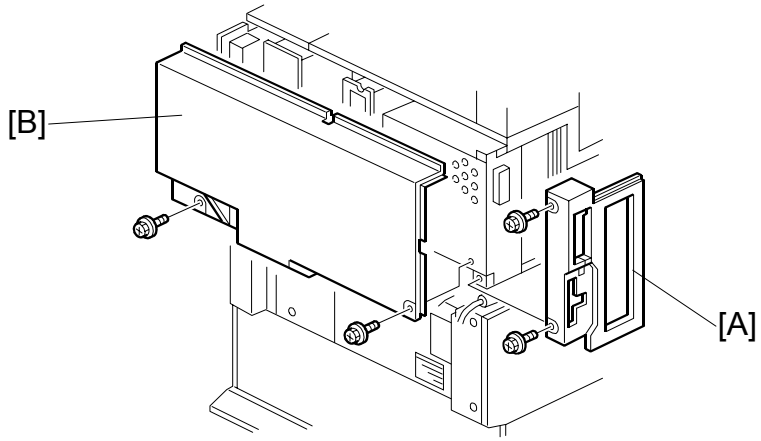
3.6 BY-PASS TRAY



1. Duplex unit (☛ 3.4)
2. Left cover [A] (☞ x1)
3. Right cover [B] (☞ x1)
4. Connectors [C] (☞ x2)
5. By-pass unit [D] (☞ x4)
   NOTE: After removing the screws, lift to unhook the by-pass tray unit from the frame of the machine.

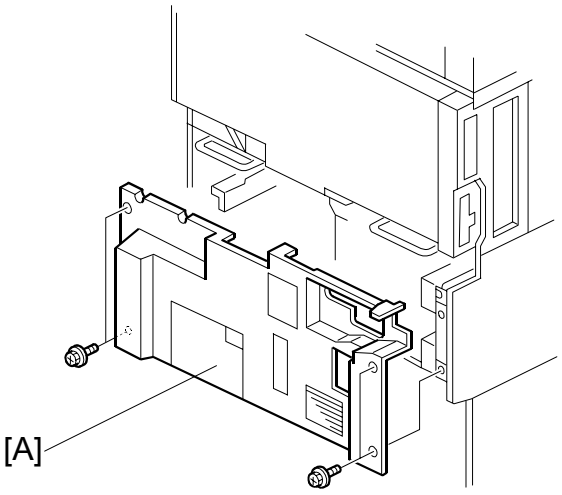
3.7 REAR COVERS

3.7.1 REAR UPPER COVER



1. Left corner cover [A] (x2)
2. Rear upper cover [B] (x2)

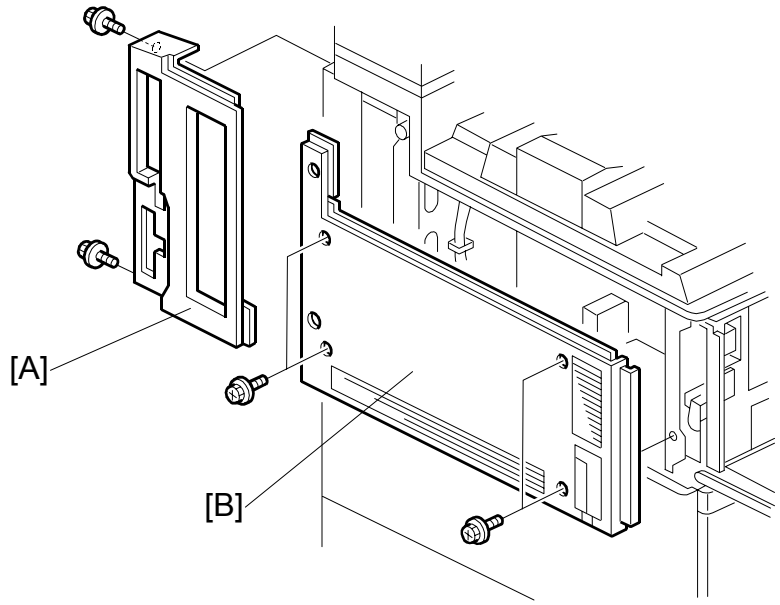
3.7.2 REAR LOWER COVER



1. Rear lower cover [A] (x4)

3.8 LEFT COVERS

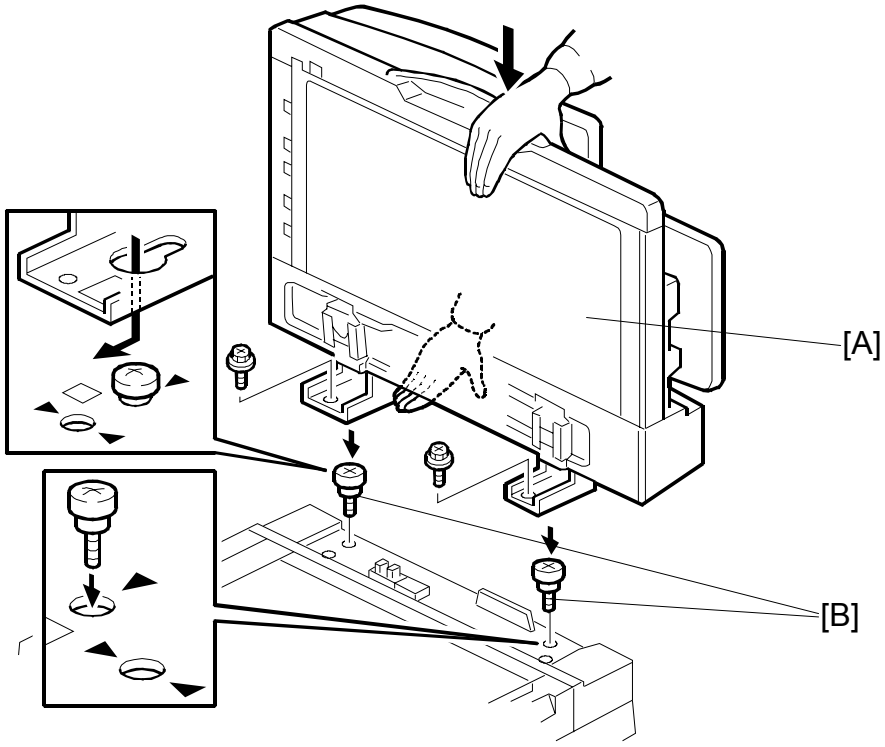
3.8.1 LEFT UPPER COVER



1. Rear left corner cover [A] (☞ x2)
2. Left upper cover [B] (☞ x4)

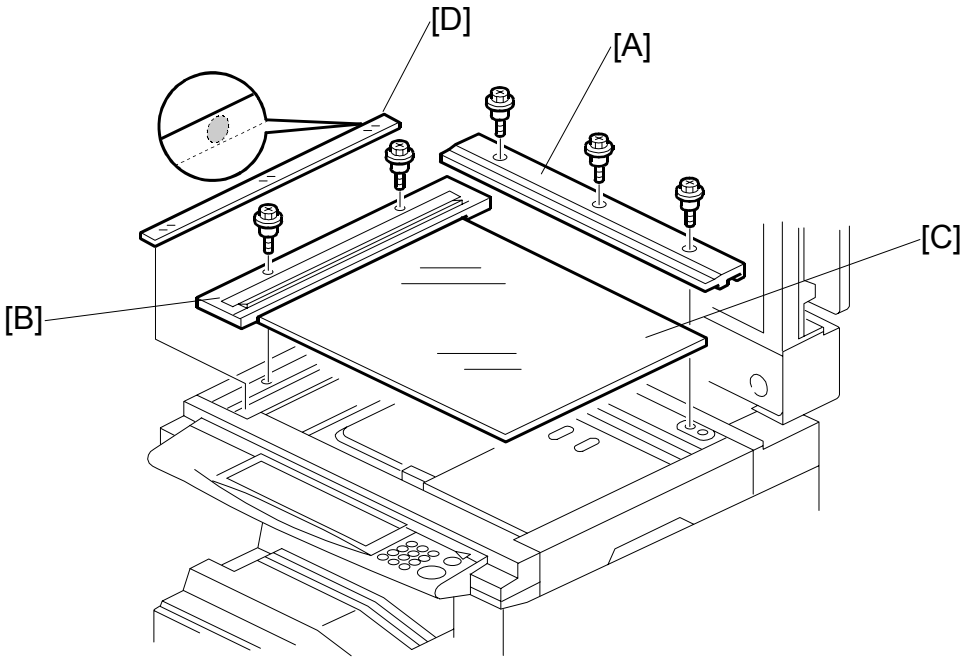
3.9 SCANNER UNIT

3.9.1 ARDF



1. Interface connector
2. ARDF [A] (☞ x2) Push the ARDF towards the front of the machine to align the keyholes (not shown) of the ARDF base with the heads of the stud screws and lift.

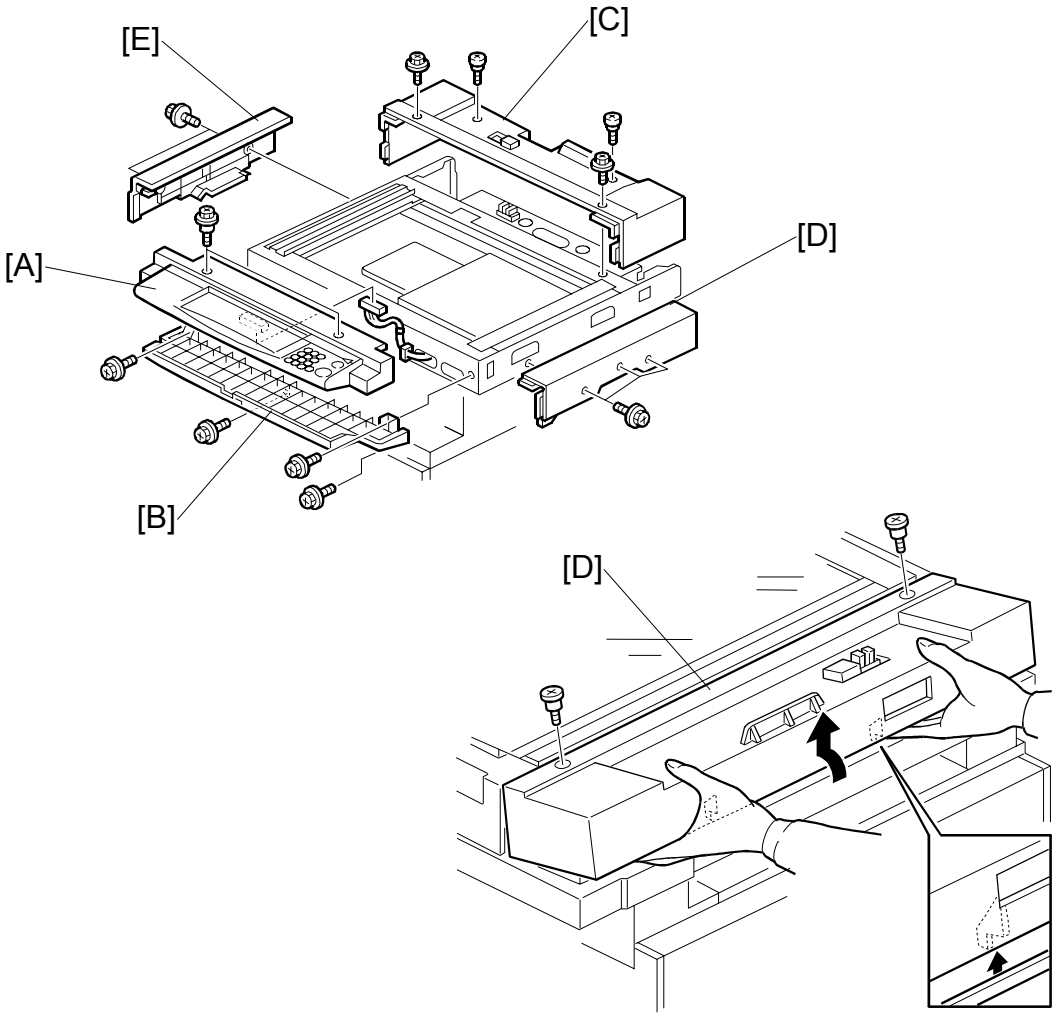
3.9.2 EXPOSURE GLASS



1. Open the ARDF or platen cover.
2. Rear scale [A] (x3)
3. Left scale [B] (x2)
4. Exposure glass [C]
5. DF exposure glass [D]

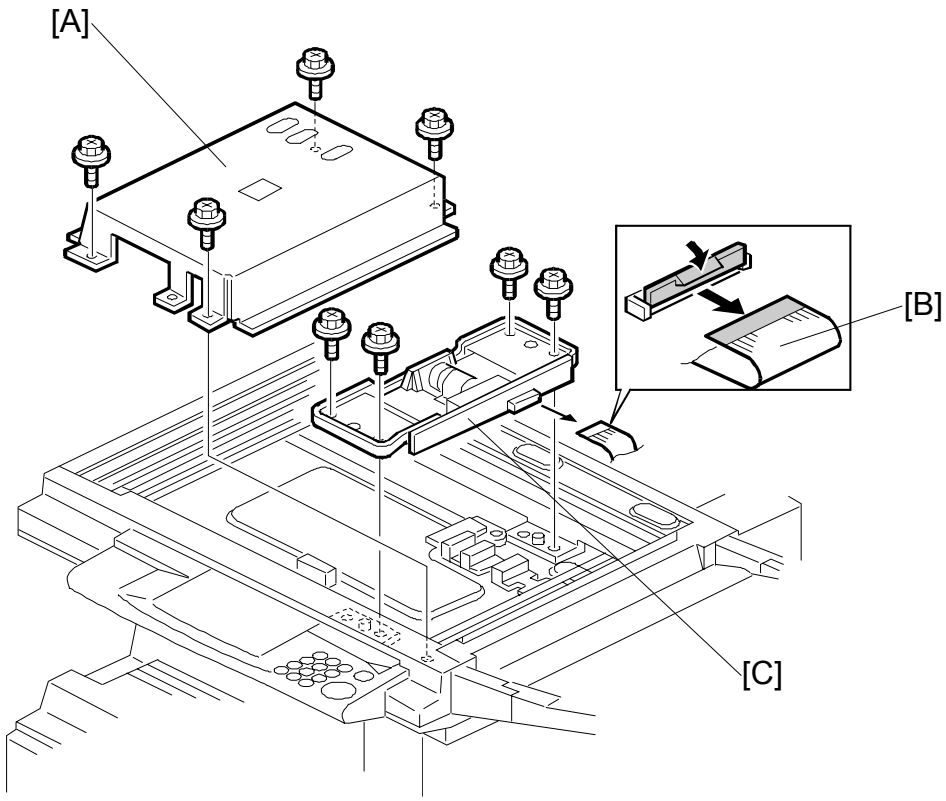
NOTE: When reinstalling the DF exposure glass, make sure that the white dot is positioned, dot down, at the rear left corner.

3.9.3 SCANNER EXTERIOR PANELS/OPERATION PANEL



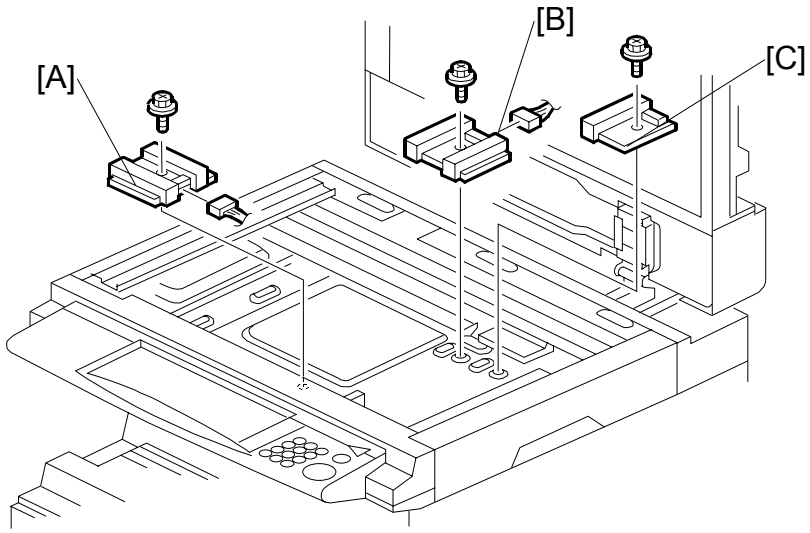
1. ARDF (☛ 3.9.1)
2. Exposure glass and DF exposure glass(☛ 3.9.2)
3. Operation panel [A] (x2, x1)
4. Operation panel base [B] (x4)
5. Rear cover [C] (x4). Carefully lift in the direction of the arrow to disconnect the tab.
6. Right cover [D] (x3)
7. Left cover [E] (x2)

3.9.4 LENS BLOCK/SBU ASSEMBLY



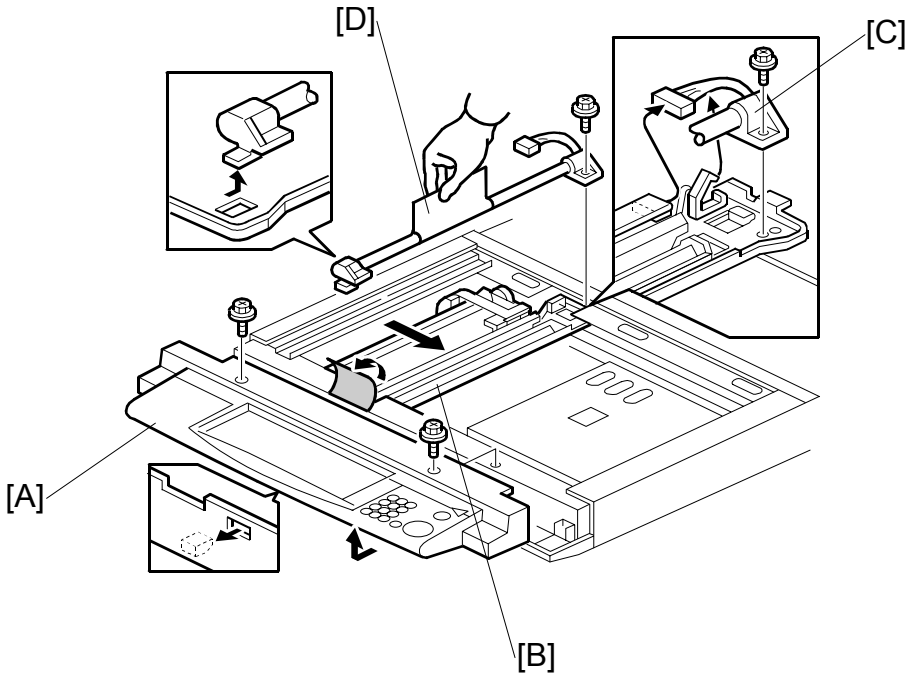
1. ARDF (☛ 3.9.1)
2. Exposure glass and DF exposure glass (☛ 3.9.2)
3. Lens cover [A] (☞ x4)
4. Flexible cable [B] (✋ x1)
5. Lens block assembly [C] (☞ x4)
   NOTE: The elements of the lens block assembly have been factory adjusted and paint locked at 8 points. Do not attempt to replace these items. Replace the unit.
6. Perform scanner and printer copy adjustments (☛ 3.21)

3.9.5 ORIGINAL SIZE SENSORS



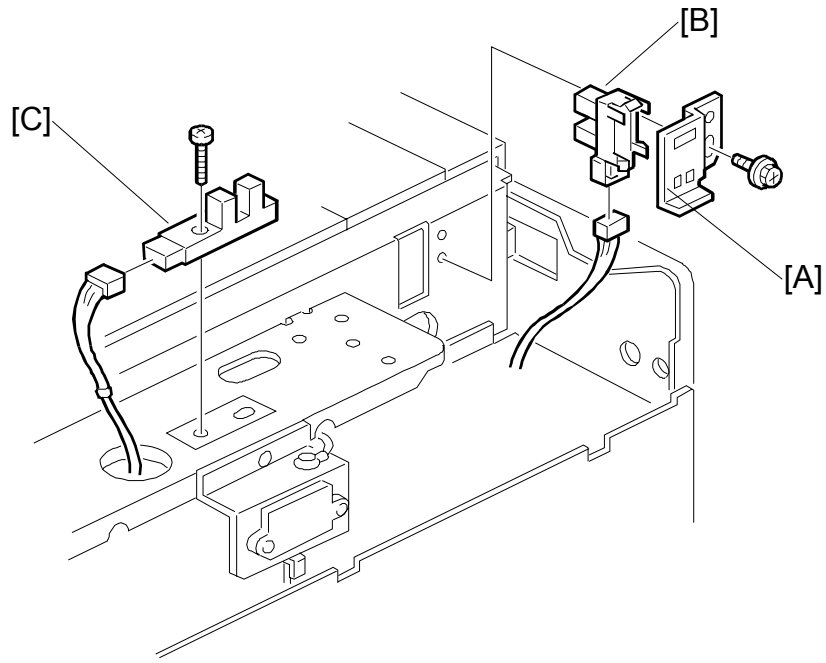
1. ARDF (☛ 3.9.1)
2. Exposure glass (☛ 3.9.2)
3. Lens block (☛ 3.9.4)
4. Original size sensor [A] (x1, x1)
5. Original size sensor [B] (x1, x1)
6. Original size sensor [C] (x1, x1)

3.9.6 EXPOSURE LAMP



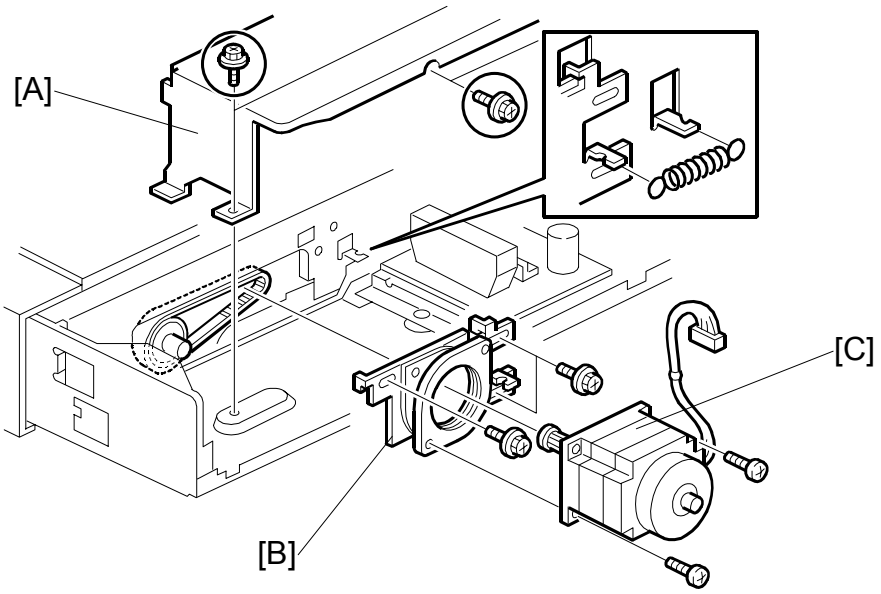
1. ARDF (☛ 3.9.1)
2. Exposure glass (☛ 3.9.2)
3. Operation panel [A] (x2, x1)
4. Slide 1st scanner [B] to the cutout to expose connector and screw.
5. Exposure lamp [C] (x1, x1)
   NOTE: Never touch the glass surface of the exposure lamp with fingers. Slide the exposure lamp toward the rear to disengage the tab on its base from the hole below and then lift out.

3.9.7 SCANNER HP SENSOR/PLATEN COVER SENSOR



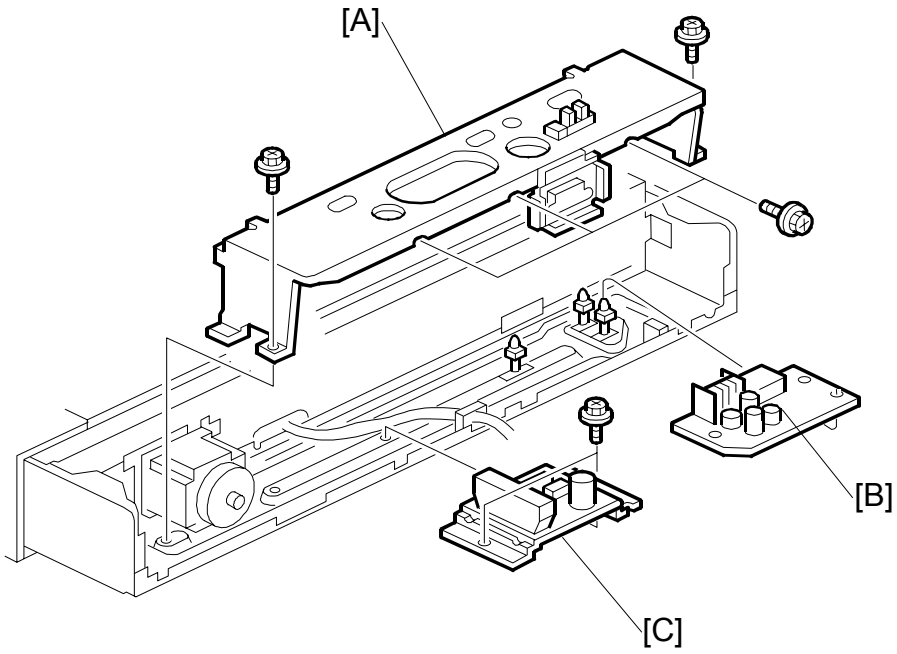
1. ARDF (☛ 3.9.1)
2. Scanner rear cover (☛ 3.9.3)
3. Scanner HP sensor bracket [A] (x1)
4. Scanner HP sensor [B] (x1)
5. Platen cover sensor [C] (x1, x1)

3.9.8 SCANNER MOTOR



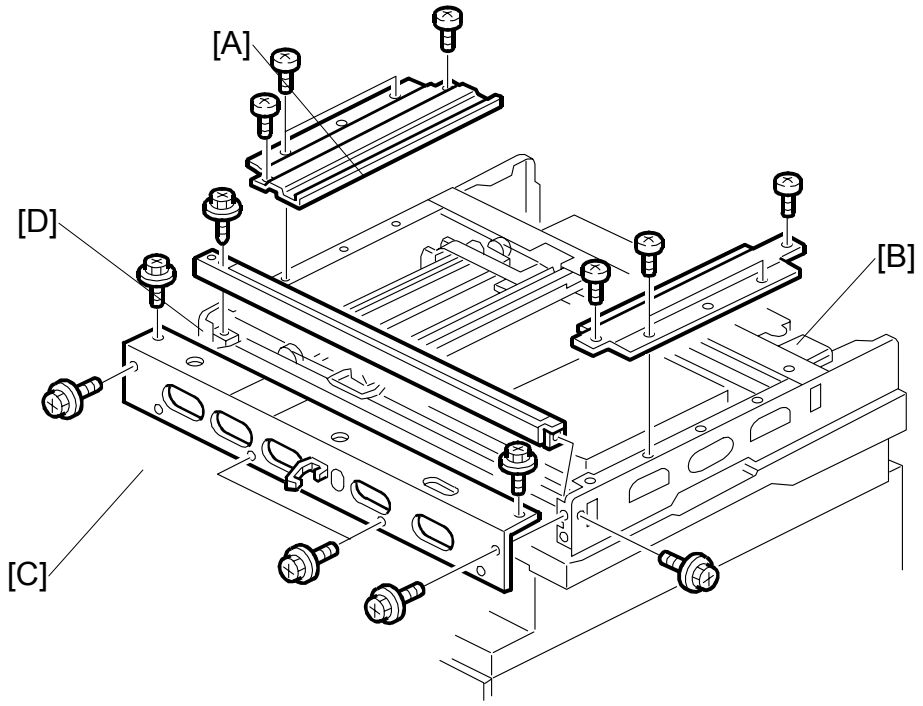
1. ARDF (☛ 3.9.1)
2. Scanner rear cover (☛ 3.9.3)
3. Rear bracket [A] (x5, x2)
4. Scanner motor bracket [B] (x3, x1, spring x1, timing belt x1)
   NOTE: Loosen motor bracket [B] (x3) to release tension on belt (motor slides side to side).
5. Scanner motor [C] (x2, x1)
6. Perform scanner and printer copy adjustments (☛ 3.21)

3.9.9 LAMP STABILIZER AND SCANNER MOTOR DRIVE BOARD



1. ARDF (☛ 3.9.1)
2. Scanner rear cover (☛ 3.9.3)
3. Rear bracket [A] (x5, x2)
4. Lamp stabilizer [B] (x2, standbys x3)
5. Scanner motor drive board [C] (x2, x2)

3.9.10 SCANNER WIRE

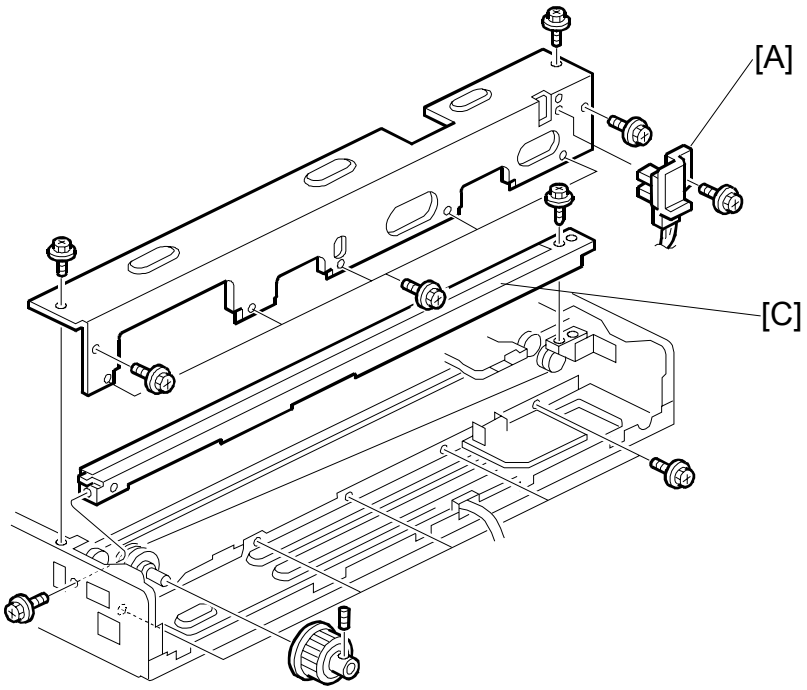


1. ARDF (☛ 3.9.1)
2. Exposure glass (☛ 3.9.2)
3. Scanner exterior panels and operation panel (☛ 3.9.3)

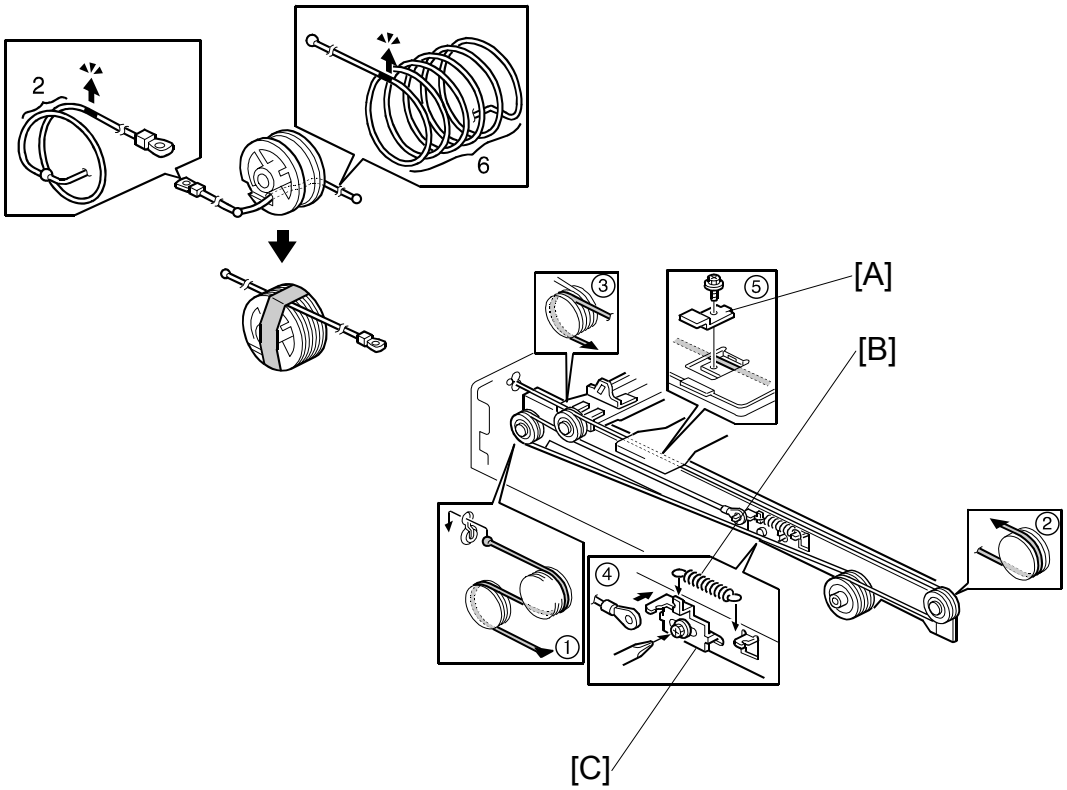
Front wire:

4. Left stay [A] (x4)
5. Right stay [B] (x4)
6. Front stay [C] (x6)
7. Front scanner rail [D] (x2)
8. To replace the scanner wire, see page 3-19.

Rear wire:

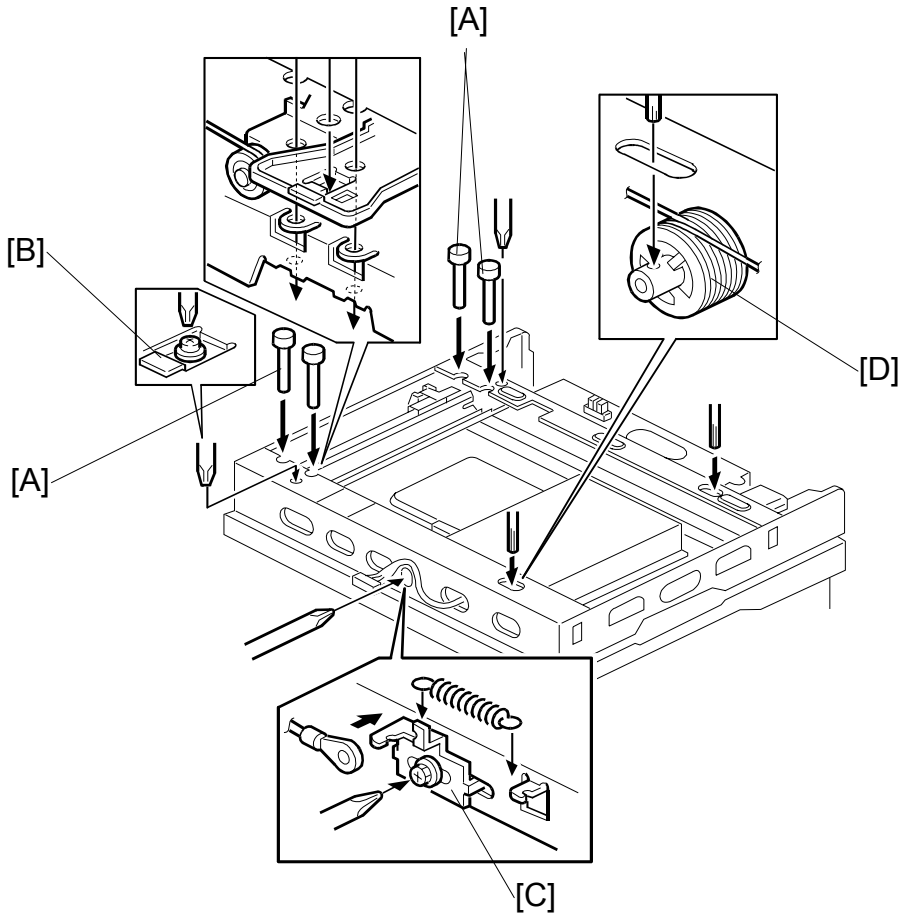


1. Scanner HP sensor bracket [A] (x1)
2. Scanner motor (☛3.9.8)
3. Rear bracket [B] (x9)
4. Rear scanner rail [C] (x2)
5. Scanner drive pulley [D] (x1)



To replace the scanner wire:

1. Front and rear scanner wire bracket [A] (🔩 x1 ea.)
2. Tension spring [B]
3. Tension bracket [C] (🔩 x1). Loosen and do not remove!
4. Remove wires, front and rear.
5. Attach the new wires.
   NOTE: Illustration above shows the front wire.
6. Pass the wire through the pulleys as shown in the illustration, and then pass the bead-end of the wire through the slot in the pulley.
7. Turn the pulley until you see the red mark on the wire. 2 turns and 6 turns (see top illustration)
8. Without allowing the wire to loosen, tape the wire to the pulley.
9. Pass the wire through ①.
10. Complete threading the wire: ②➔③➔④➔Tension spring➔Screw
11. Scanner wire bracket ⑤ (🔩 x1)



Completion:

1. Adjust the 1st scanner [A] position with the scanner positioning tools (P/N A0069104).
2. Secure the 1st scanner with the scanner wire brackets [B] (☞ x2)
3. Tighten tension bracket [C] (☞ x1)
4. Secure scanner wire pulley [D] (Allen screw x1)
   1) Remove the positioning tools. After sliding the scanner to the right and left several times, set the positioning tools to check the scanner wire bracket and tension bracket again.
   2) Reassemble the scanner and do the scanner and printer copy adjustments (☛ 3.21)

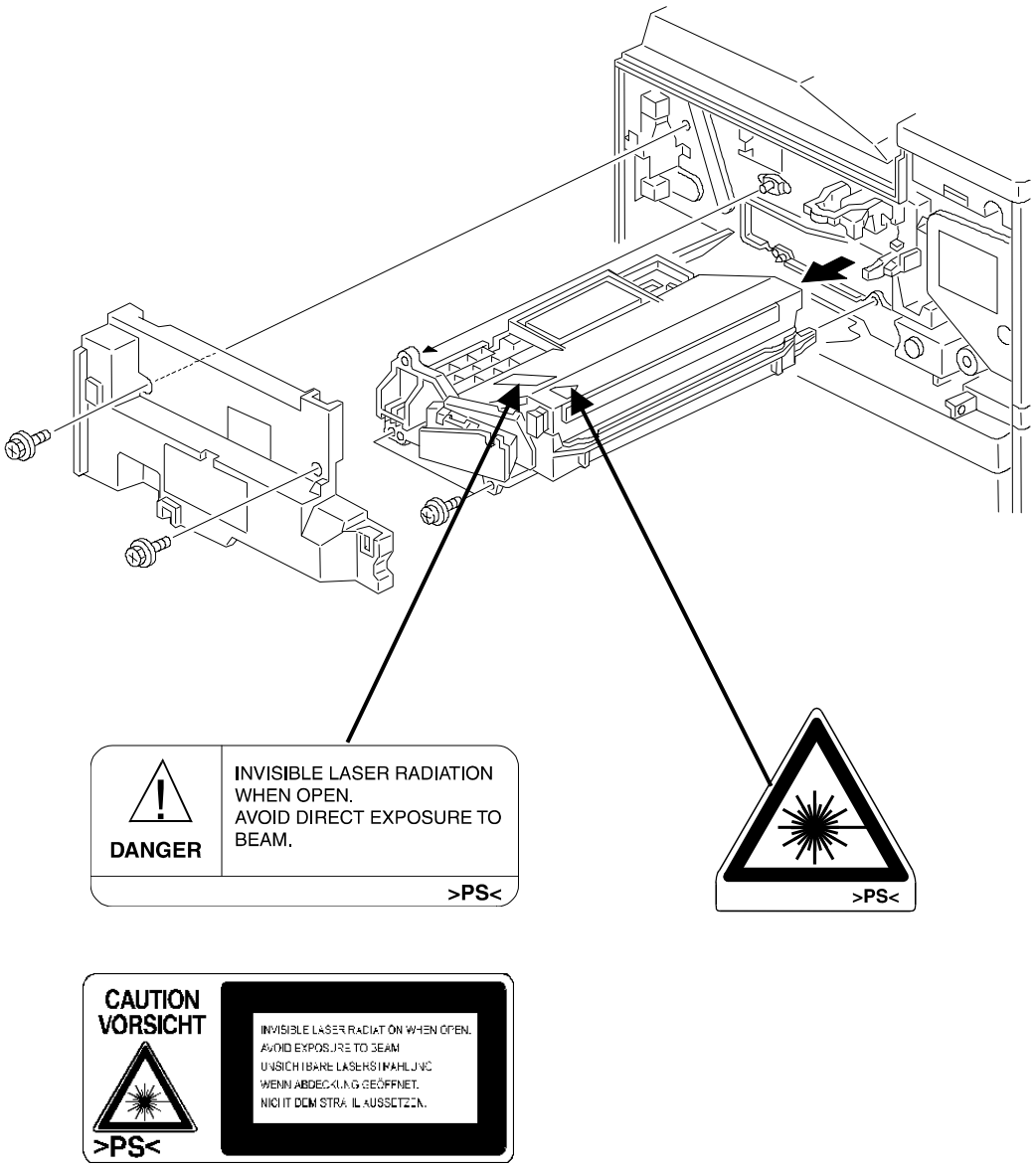
3.10 LASER UNIT

⚠WARNING

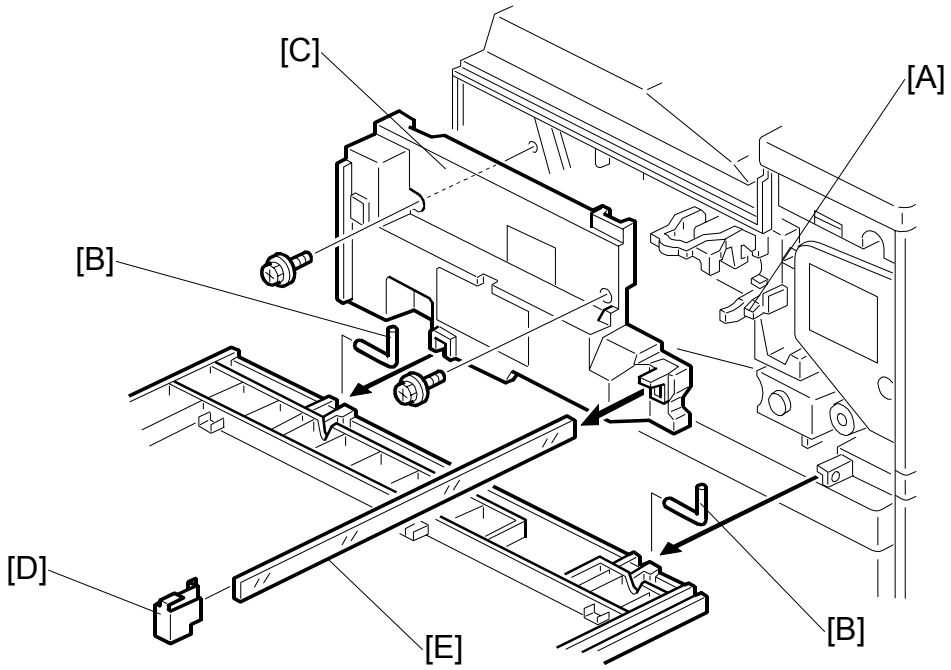
Turn off the main power switch and unplug the machine before attempting any of the procedures in this section. Laser beams can seriously damage your eyes.

3.10.1 CAUTION DECAL LOCATIONS

Two caution decals are located in the laser section as shown below. (See the next page for removal instructions.)



3.10.2 LASER UNIT



⚠WARNING

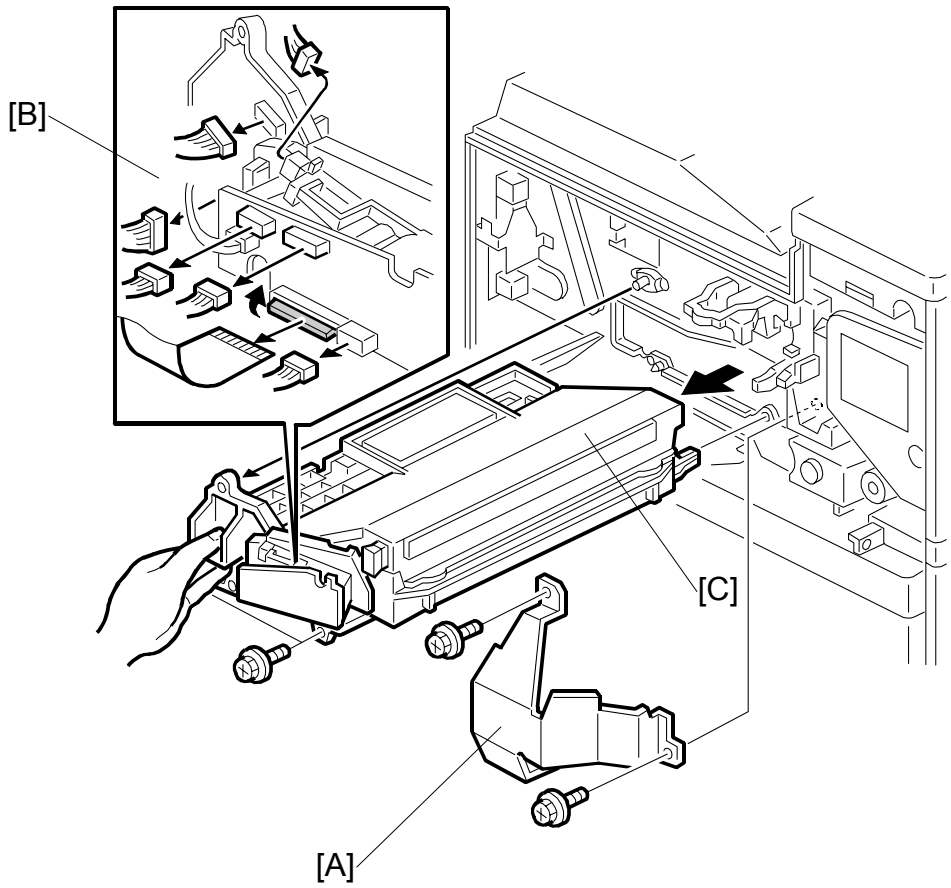
Turn off the main power switch and unplug the machine before attempting this procedure. Laser beams can seriously damage your eyes.

1. Open the front door and raise the toner bottle holder handle [A].
2. Front door (pins [B] x 2)
3. Inner cover [C] (🔩 x 2, ✋ x 1)
4. Shield glass cover [D].

   The shield glass cover holds the shield glass firmly in place and prevents it from accidental removal.

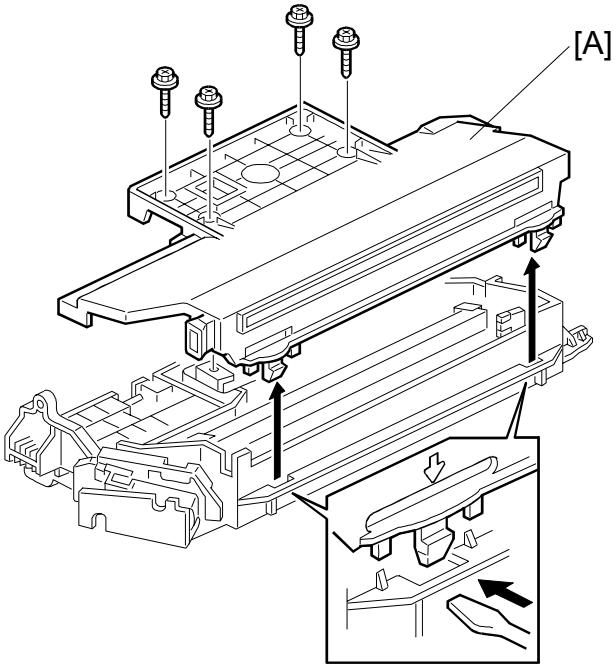
   To remove, on the left side press in the top leaf and pull off.

   When re-attaching the shield glass cover, note that the top leaf lies on top of the plastic form.
5. Shield glass [E]

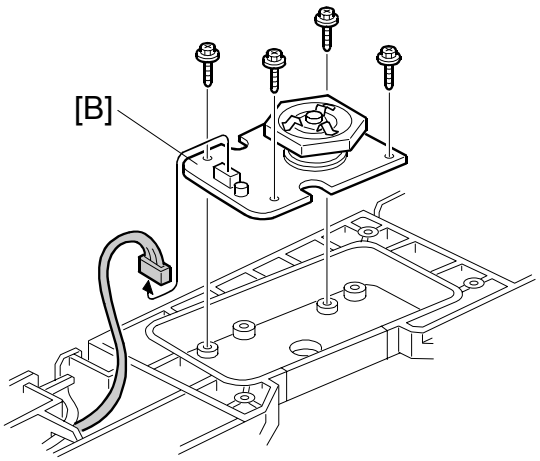


6. Shield plate [A] (☞ x 2)
7. Laser unit connectors [B] (☞ x 6, ☞ x1 flat cable)
   NOTE: Hold the LD board securely when disconnecting connectors.
8. Laser unit [C] (☞ x 2)
   NOTE: When sliding out the laser unit, do not hold the LD board. Hold the laser unit casing.

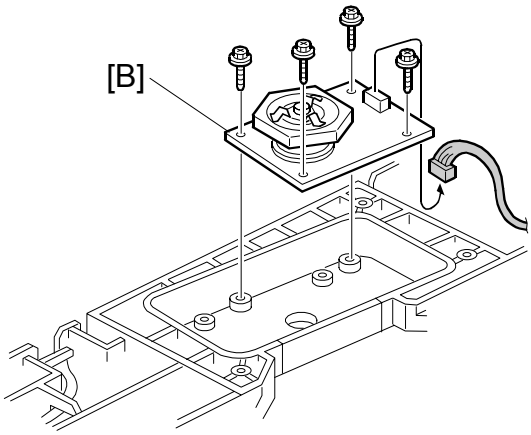
3.10.3 POLYGON MIRROR MOTOR



– 45 cpm machine–

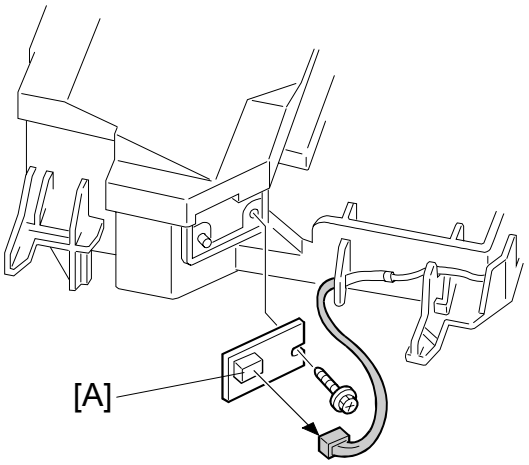


– 35 cpm machine–



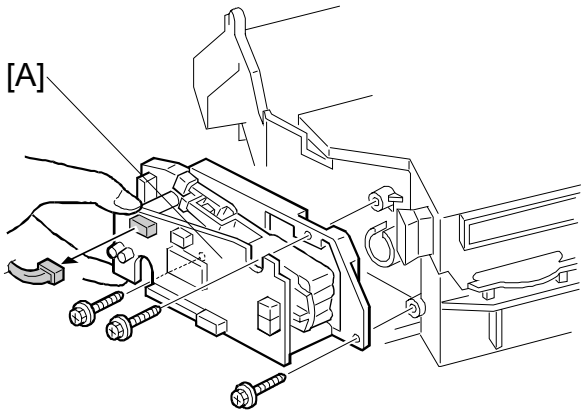
1. Laser unit (☛ 3.10.2)
2. Laser unit cover [A] (x4, 2 hooks)
3. Polygon mirror motor [B] (x4, x1)
4. After replacing the motor, do the image adjustment. (☛ 3.21)

3.10.4 LASER SYNCHRONIZATION DETECTOR



1. Laser unit (☛ 3.10.2)
2. Laser synchronization detector [A] (x1, x1).

3.10.5 LD UNIT



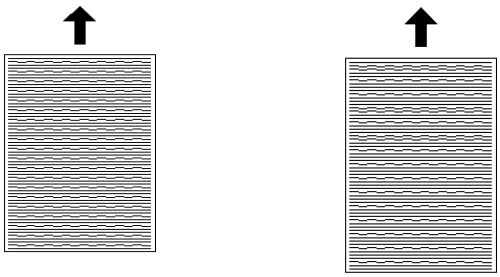
1. Laser unit (☛ 3.10.2)
2. LD unit [A] (x3, x1)
   NOTE: To avoid damaging the LD board, hold it securely when disconnecting the connectors. Hold the laser unit casing.
3. After replacing the LD board, perform SP 2-109 to adjust the laser beam pitch (described on the next page).

Laser beam pitch adjustment

After replacing the LD board, perform the laser beam pitch adjustment. There are two laser beam pitch adjustment procedures: one for 400 dpi, and one for 600 dpi. Use the following SP modes.

SP2-110	Test Mode Dpi (0: 400 dpi, 8: 600 dpi)
SP2-109-1:	LD Beam Pitch Adjustment – 400 dpi
SP2-109-2:	LD Beam Pitch Adjustment – 600 dpi
SP2-109-3:	LD Initial Setting – 400 dpi
SP2-109-4:	LD Initial Setting – 600 dpi

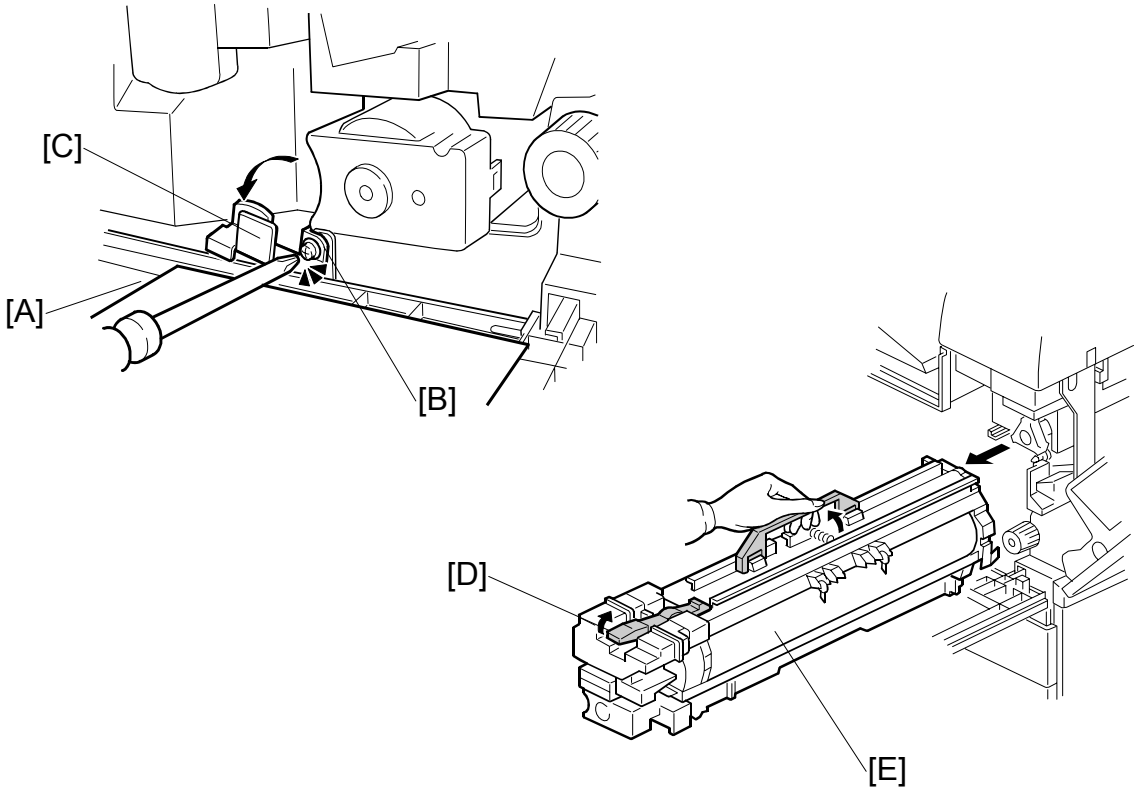
1. Set SP2-110 to 0 (for 400 dpi).
2. Do SP 2-109-8.
3. For SP2-109-1 input 144.
   NOTE: The entry “144” is only a starting reference value that will allow the machine to operate. It is only a starting point for adjustment.
4. Perform SP2-109-3.
5. Print the test pattern onto A3 (11" x 17") paper using SP2-902-3 no.15. (☛ Section 5 Service Tables, 5.1.2 Test Pattern Printing (SP2-902).
6. On the test pattern write 144, the value of SP2-109-1.
7. Change the value of SP2-109-1 and then print another test pattern, repeating steps 2 to 4. Print about 5 patterns with different values for SP2-109-1 (e.g. 48, 96, 192, 240).
8. Check these test patterns. If the laser beam pitch is not correct, the image looks like a black vertical stripe pattern.
   NOTE: For example, if the pattern made with the value 192 has fewer obvious stripes than the other printouts, the correct value is near 192.
9. Do steps 2, 3, and 4 to adjust the laser beam pitch position until thin lines are of uniform thickness (no stripes should appear on the printout).
   NOTE: In step 2, input a value estimated to be correct, then do steps 3 and 4, then if necessary go back to step 1 and try another value.
10. After adjusting the laser beam pitch for 400 dpi, adjust the laser beam pitch for 600 dpi, using the same procedure as for 400 dpi (use the SP modes for 600 dpi). Laser beam pitch for 600 dpi should be 24~48 more than for 400 dpi.



Adjustment not complete Adjustment complete

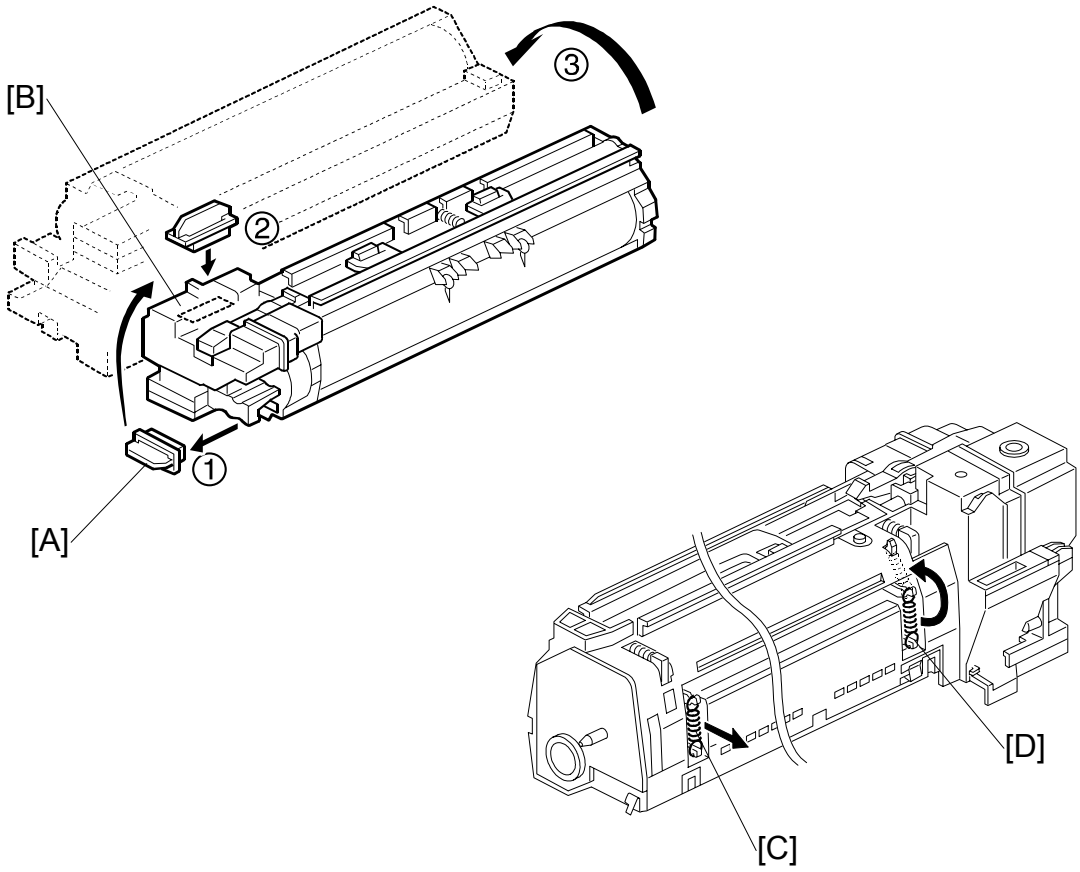
3.11 PHOTOCONDUCTOR UNIT (PCU)

3.11.1 PCU

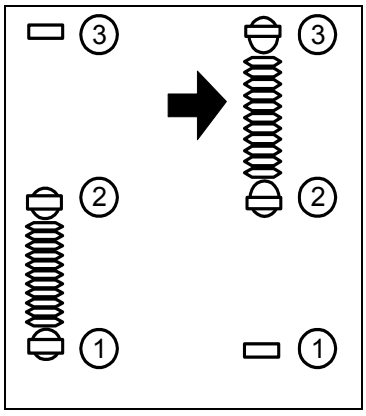


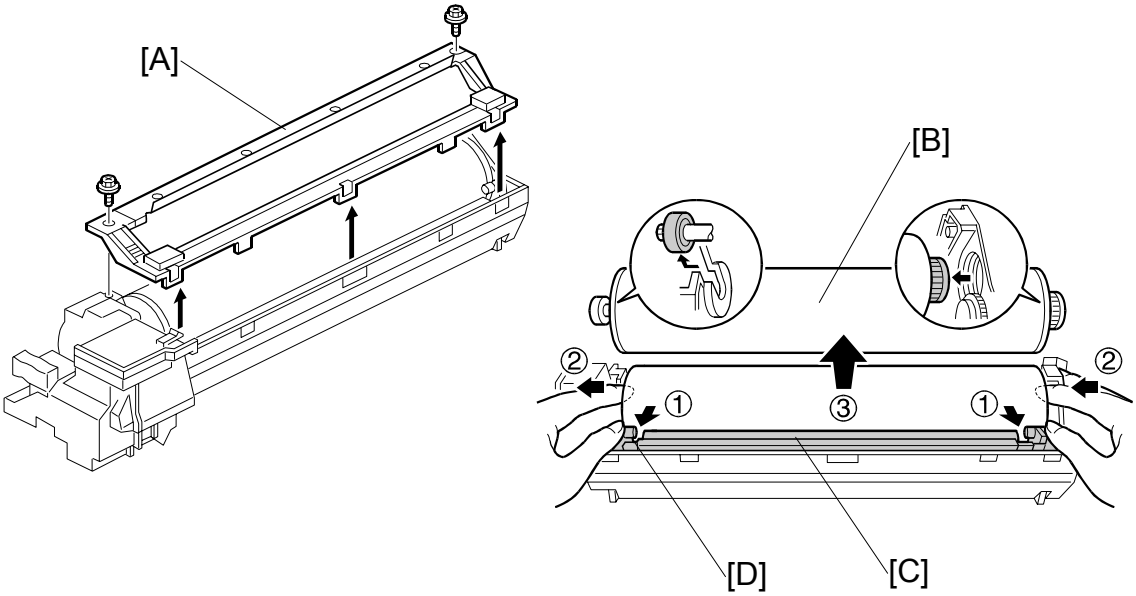
1. Open the front door.
2. Lower the by-pass tray, open the duplex unit, and open the transfer unit right cover.
3. Spread a sheet of A4 or LTR size paper [A] on top of the open front door.
   NOTE: This paper catches any loose toner that may fall from the PCU as it is removed.
4. Loosen [B] (🔩 x 1).
5. Rotate bracket [C] to the left.
6. Raise the release lever [D].
7. Hold the PCU [E] as shown and pull it out of the machine.
   NOTE: If the right cover is to be left open, cover the drum with paper, or remove the PCU and cover it with paper. Before you re-install the PCU, align the brackets on the PCU with the rails above and make sure they are engaged before you slowly push the PCU into the machine.

3.11.2 DRUM



1. Remove the PCU (☛3.11.1)
2. Toner cap [A]
3. Insert cap [A] into the toner entrance hole [B].
   NOTE: Make sure that the cap is inserted completely into the hole.
4. On the left side of the PCU, disconnect the spring [C].
5. On the right side of the PCU disconnect the spring [D] and attach it to hooks as shown.
   - To prevent breaking the weaker hook ①, use a pair of needle-nose pliers to disconnect the spring at ②, then re-attach to ② and ③.
   - Moving this spring retracts the movable drum cleaning blade so it does not touch the surface of the drum when the drum is re-installed.

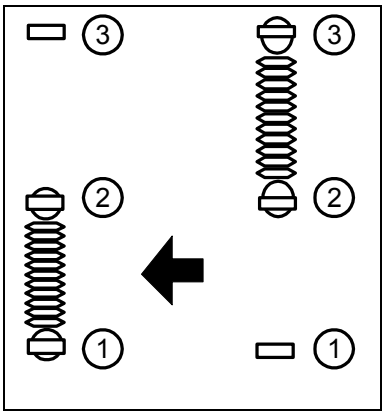




6. Turn the PCU upside-down, and remove lower PCU cover [A] (☞ x 2, 3 pawls).
7. Pull the drum [B] towards the front ② (the left side in the illustration) while releasing the charge roller [C] using the release lever ① [D], and then remove the drum ③.
   CAUTION: Never touch the drum surface with bare hands.
8. Replace the drum and re-attach the lower PCU cover.
9. Detach the spring from ②, ③and re-attach to ①, ②.

   CAUTION: You must re-attach the spring to ①, ② in order for the cleaning blade to operate correctly.

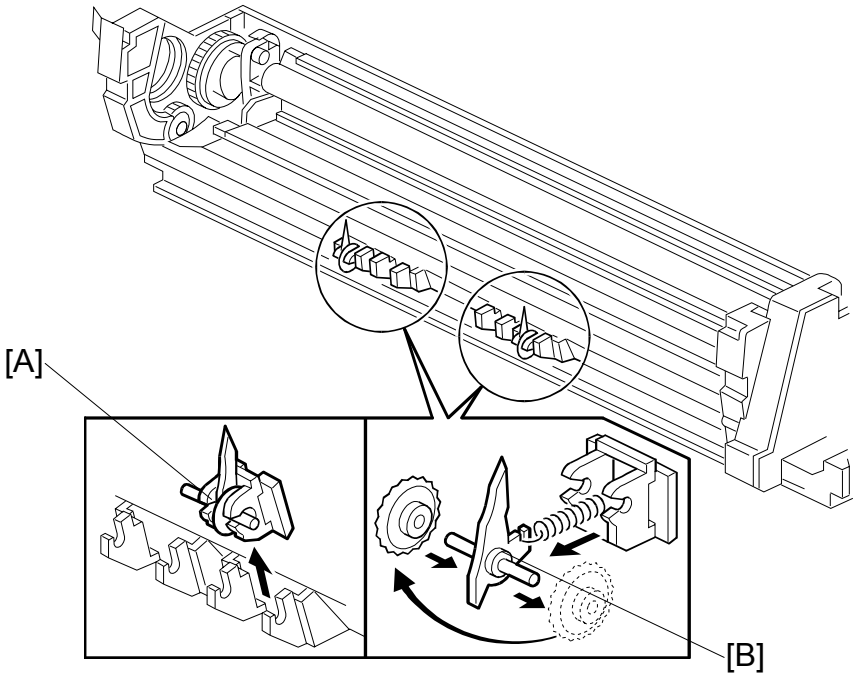
   If you fail to re-attach the spring to ①, ② the movable cleaning blade will not contact the drum for cleaning, but the machine will operate without generating an error. However, copies will gradually become dirty due to toner collecting on the drum.



10. Re-attach the spring on the left side of the PCU.
11. After replacing the drum, perform the ID sensor initial setting using SP3001 002.

⇒12. Do the developer initialization procedure (SP2805).

3.11.3 PICK-OFF PAWLS



1. Remove the drum. (☛ 3.3.2)
2. Pawl assembly [A]
3. Pick-off pawl [B] (spring x 1, spur x 1)

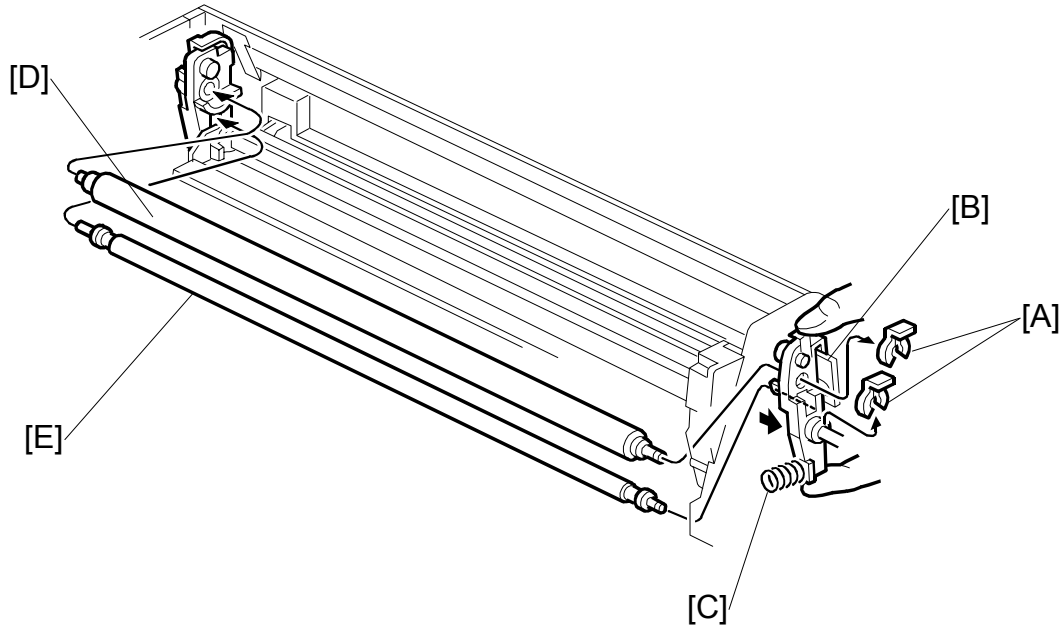
Pick-off pawl position adjustment

If the pick-off pawl has marked the drum with a line, the pick-off pawl position can be adjusted using either method:

- Changing the spur position.
- Changing the pick-off pawl assembly position

CAUTION: After re-assembly make sure that the front spring of the movable cleaning blade is re-attached to the ①, ② position. (☛ 3.11.2)

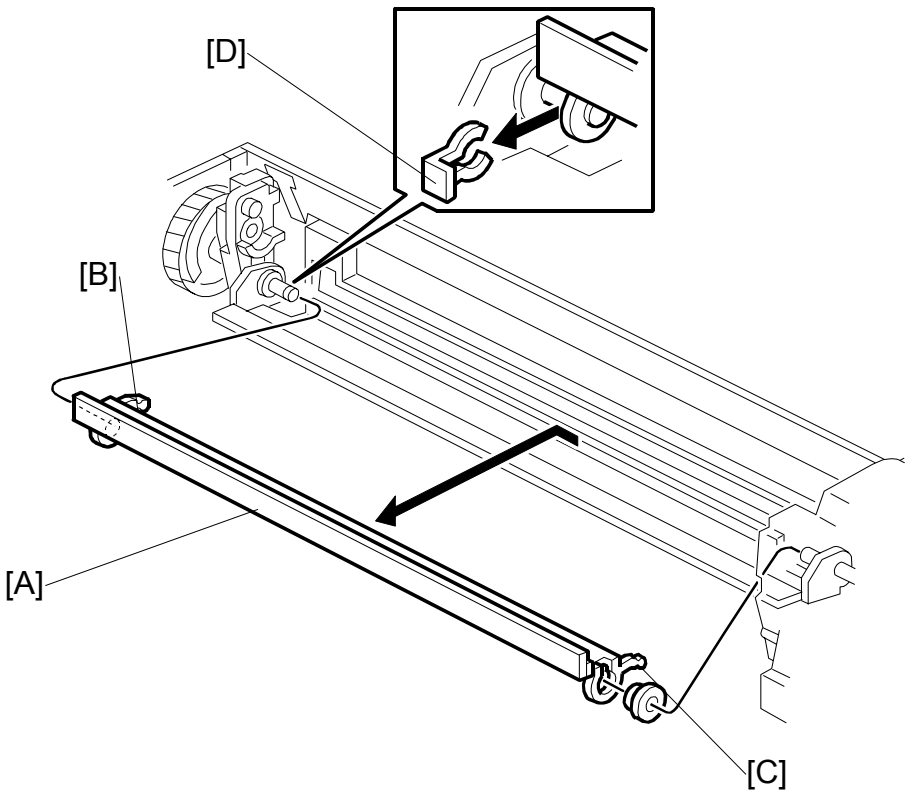
3.11.4 CHARGE ROLLER AND CLEANING ROLLER



1. Remove the drum. (☛ 3.11.2)
2. Two snap rings [A] (⟲ x 2).
3. Push charge roller holder [B] toward the front of the PCU and remove the spring [C].
4. Charge roller [D].
   NOTE: Disengage the charge roller on the right side to remove. Try to avoid touching the charge roller.
5. Cleaning roller [E].
   NOTE: Disengage the cleaning roller on the left to remove.
6. After replacing the charge roller and cleaning roller, check the value of SP2001 001. If it is not at the standard value (1450 V), set SP2001 001 to –1450 V.
   NOTE: If this is not done, the carrier will be attracted to the drum because the charge roller voltage will be too high.

CAUTION: After re-assembly make sure that the front spring of the movable cleaning blade is re-attached to the ①, ② position. (☛ 3.11.2)

3.11.5 DRUM CLEANING BLADE 2



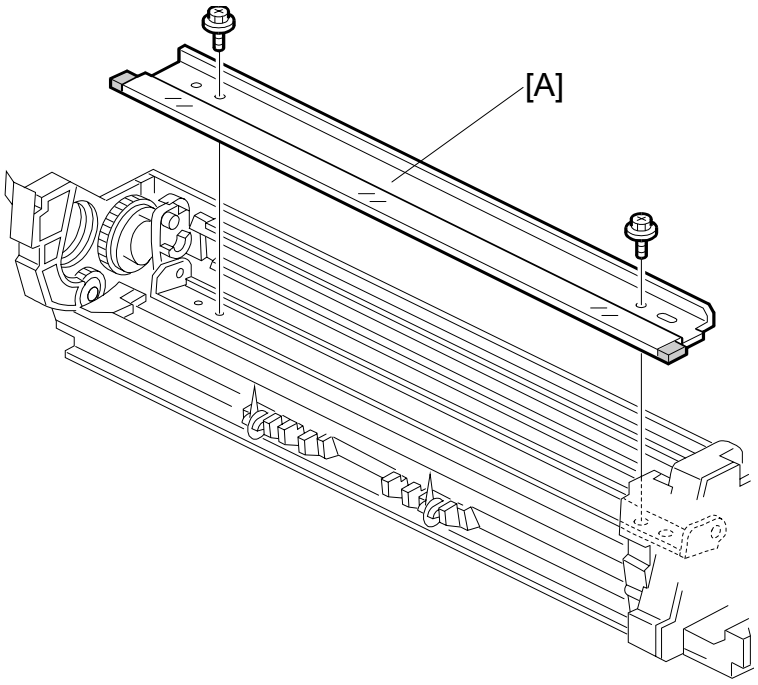
1. Remove the OPC drum. (☛ 3.11.2)
2. Remove the charge roller and cleaning roller. (☛ 3.11.4)
3. Remove the movable cleaning blade [A]. (⟲ x 1)

Re-installation

- Engage the left end of the cleaning blade first, then make sure that both arms [B] and [C] are through the holes on the left and right side.
- When you re-attach the snap-ring, make sure that the head of the snap ring [D] is below the blade.

CAUTION: After re-assembly make sure that the front spring of the movable cleaning blade is re-attached to the ①, ② position. (☛ 3.11.2)

3.11.6 DRUM CLEANING BLADE 1

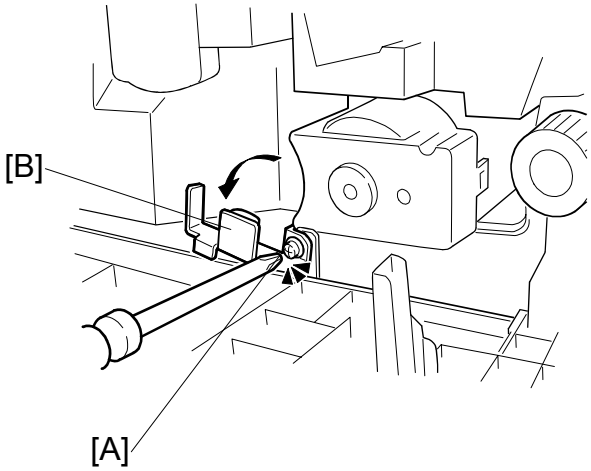


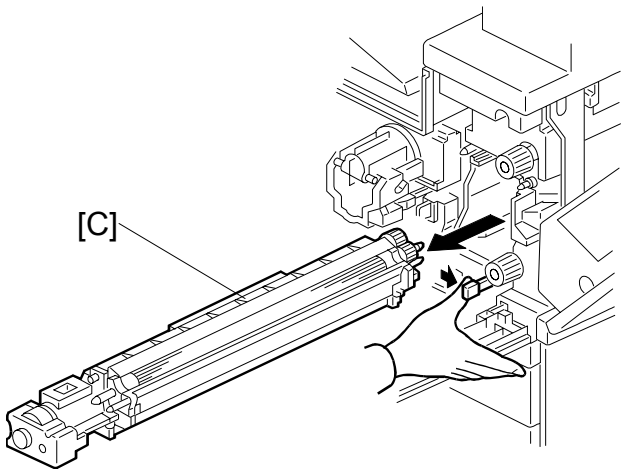
1. Remove the drum. (☛ 3.11.2)
2. Remove the charge roller and cleaning roller. (☛ 3.11.4)
3. Remove the movable cleaning blade. (☛ 3.11.5)
4. Remove the stationary drum cleaning blade [A] (☞ x 2)

CAUTION: After re-assembly make sure that the front spring of the movable cleaning blade is re-attached to the ①, ② position. (☛ 3.11.2)

3.12 DEVELOPMENT

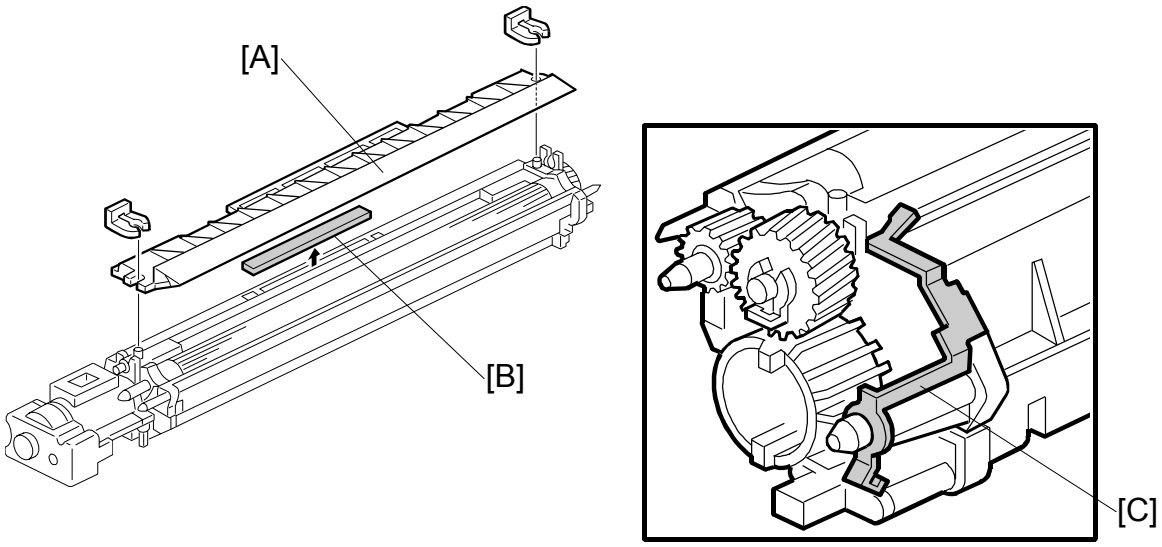
3.12.1 DEVELOPMENT UNIT





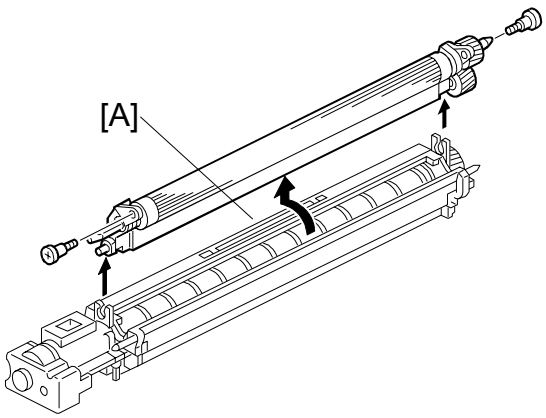
1. Open the right upper cover and front cover.
2. PCU. (☛ 3.11.1)
   NOTE: Spread paper on a clean flat surface that is free of pins, paper clips, staples, screws or any other metal objects.
3. Loosen [A] (☞ x1)
4. Rotate bracket [B] left.
5. Development unit [C]
   NOTE: Pull slowly to avoid scratching or nicking the development roller.
6. Set the development unit on the spread paper.
7. If you are temporarily installing a used development unit for test purposes, perform SP2-220 and 2-802-1 after installation (☛ Chapter 5, “Service Tables”)

3.12.2 DEVELOPMENT FILTER



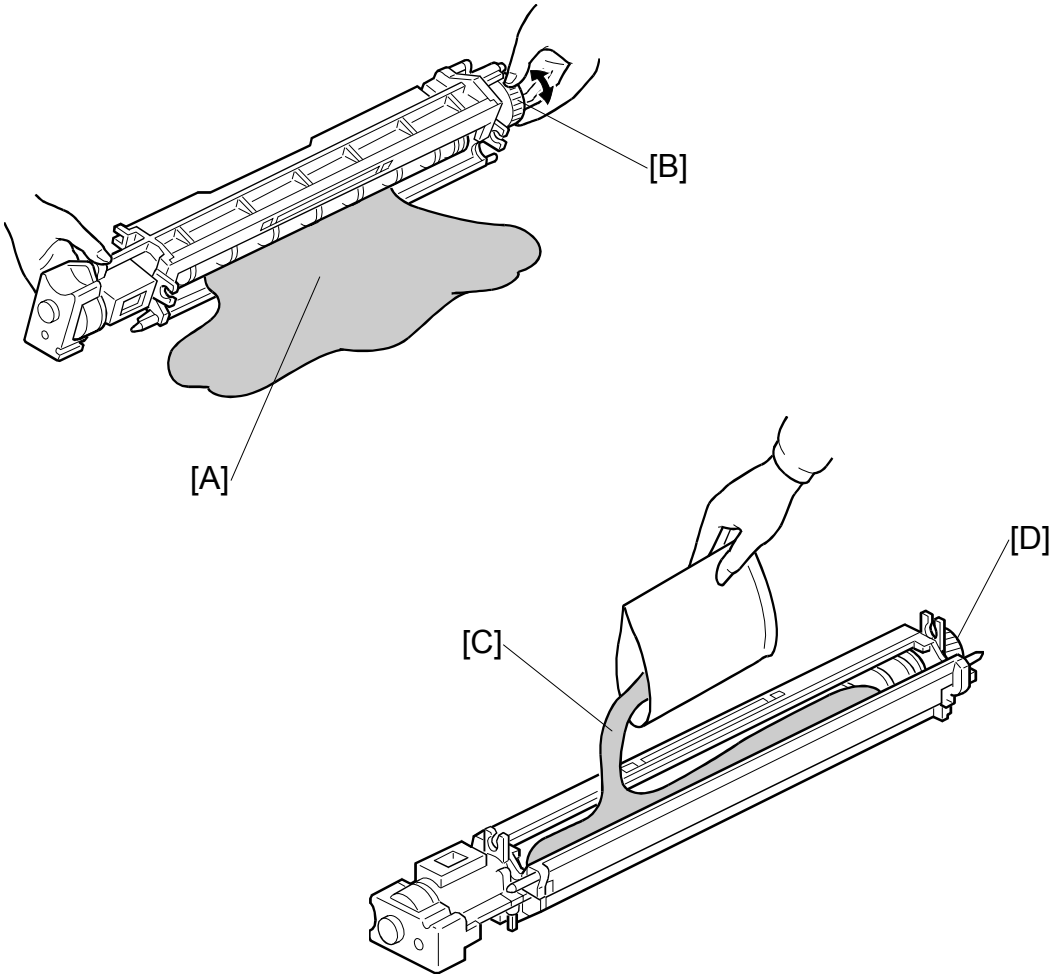
1. Development unit (☛ 3.12.1)
2. Upper development cover [A] (⟲ x 2)
3. Development filter [B]
   NOTE: Make sure that the surface with the red mark is facing up.
4. Make sure that the ground plate [C] is positioned correctly.

3.12.3 DEVELOPMENT ROLLER

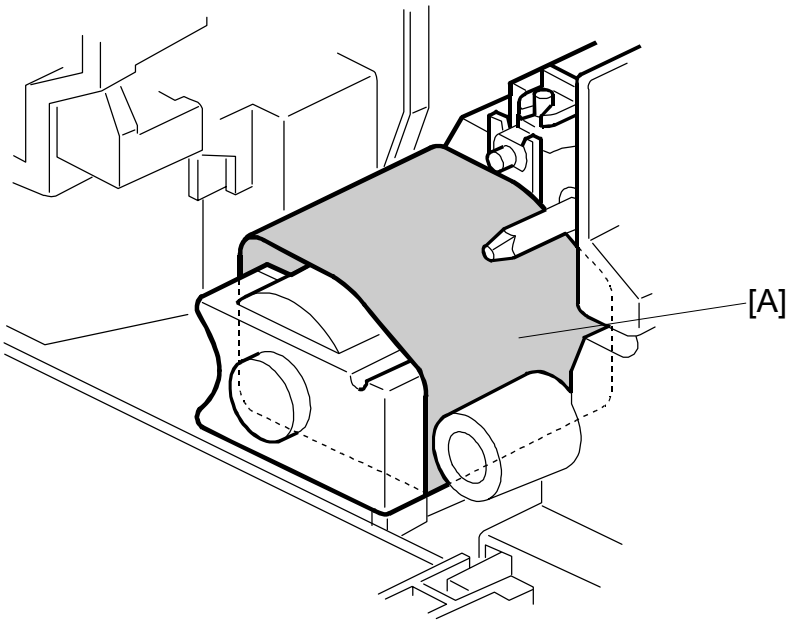


1. Development unit (☛ 3.12.1)
2. Upper development cover (☛ 3.12.2)
3. Development roller [A] (🔩 x2)
   NOTE: Work carefully to avoid scratching or nicking the development roller.

3.12.4 DEVELOPER

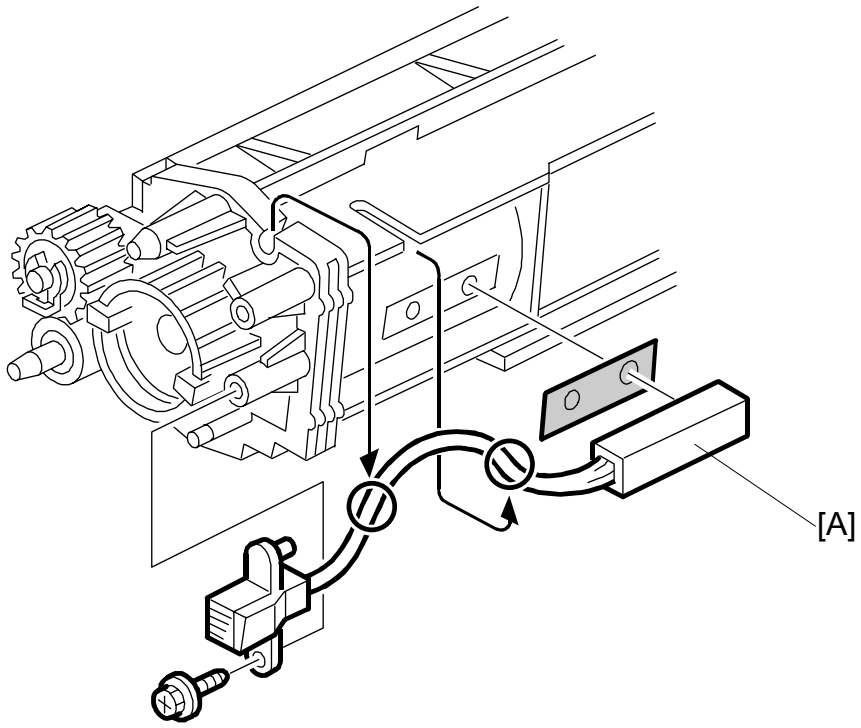


1. Development unit (☛ 3.12.1)
2. Remove the development roller (☛ 3.12.3)
3. Empty toner [A]
4. Turn drive gear [B] to ensure that no developer remains in the unit or on the developer roller.
   NOTE: Dispose of the used developer in accordance with local regulations. Work carefully to avoid scratching or nicking the development roller.
5. Pour approximately 1/3 of the developer [C] evenly along the length of the development unit.
6. Rotate the drive gear [D] to work the developer into the unit. Repeat steps 5 and 6 until all of the developer is in the unit and level with the edges.



7. Reassemble the development unit
8. Cover the toner entrance hole [A] with a piece of paper.
9. Install the development unit in the machine.
10. Turn on the main power switch, make sure that the machine has warmed up, then perform the TD sensor initial setting using SP 2-801.
    NOTE: When performing this setting, cover the toner entrance hole with a piece of paper. This prevents used toner falling from the PCU into the development unit during the TD sensor initial setting and interfering with the Vref setting (toner density reference voltage).
11. After performing the TD sensor initial setting, remove the piece of paper [A] from the development unit.

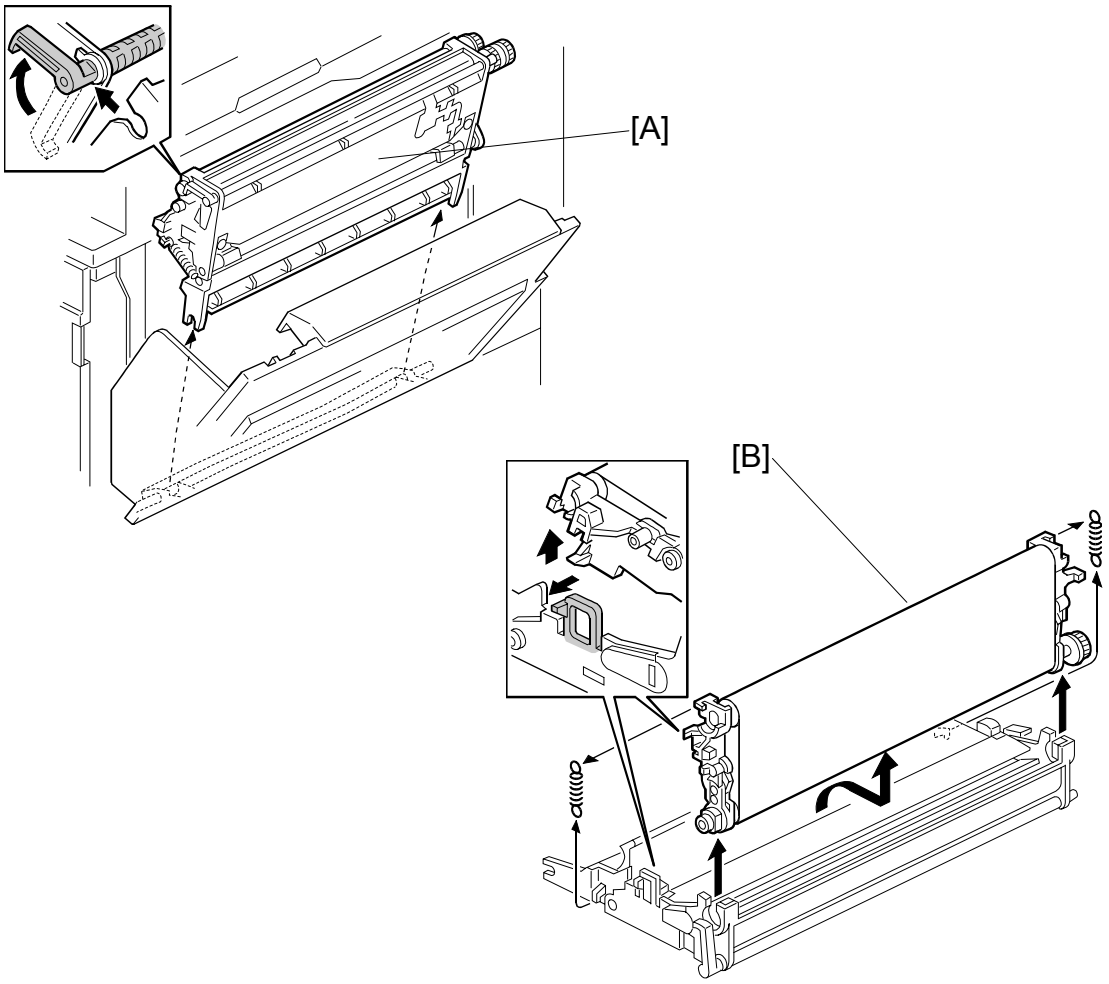
3.12.5 TD SENSOR



1. Remove the development unit (☛ 3.12.1)
2. Empty all developer from the developer (☛ 3.12.4)
3. TD sensor [A] (x1)
   NOTE: The TD sensor is attached to the casing with double-sided tape. Pry it off with the flat head of a screwdriver. Use fresh double-sided tape to re-attach the sensor.
4. Pour new developer into the development unit and perform the TD sensor initial setting using SP2-801.
   NOTE: When performing the TD sensor initial setting, cover the toner entrance hole with a piece of paper (☛ 3.12.4).

3.13 TRANSFER UNIT

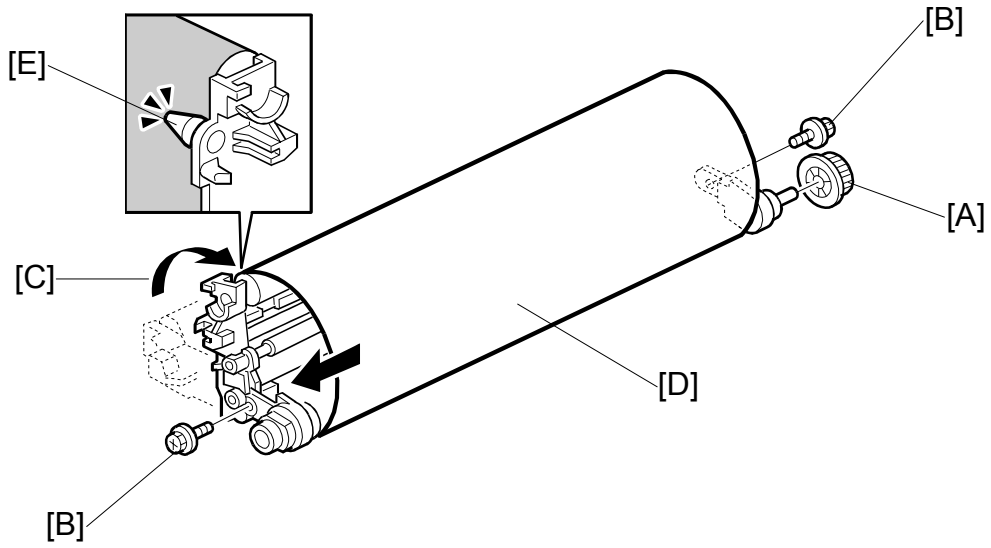
3.13.1 TRANSFER BELT UNIT



NOTE: To avoid exposing the PCU drum to strong light, cover it with paper if the right cover will be open for a long period.

1. Lower the by-pass tray, open the duplex unit, and open the right cover.
2. Transfer unit [A] (1 hook)
3. Transfer belt [B] (springs x2, 1 hook)
   NOTE: Avoid touching the transfer belt surface.

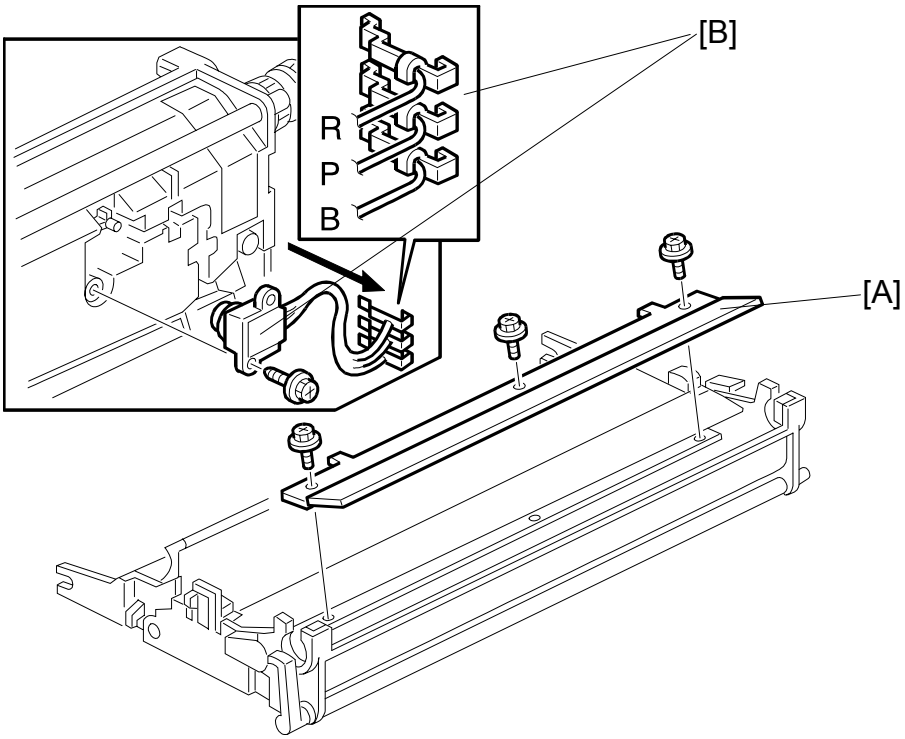
3.13.2 TRANSFER BELT



1. Remove the transfer belt unit. (☛ 3.13.1)
2. Belt drive gear [A]
3. Set screws [B] (☞ x2)
4. Lay on a flat, clean surface and fold the unit to release the tension on the belt [C].
5. Transfer belt [D]

NOTE: 1) Avoid touching the transfer belt surface.
2) Before installing the new transfer belt, clean all the rollers and shafts with alcohol to prevent the belt from slipping.
3) When reinstalling the transfer belt, make sure that the belt is under the pin [E].
4) To avoid damaging the transfer belt during installation, manually turn the rollers and make sure that the new transfer belt is not running over the edges of any of the rollers.

3.13.3 TRANSFER BELT CLEANING BLADE AND TONER OVERFLOW SENSOR



Transfer Belt Cleaning Blade

1. Transfer belt unit. (☛ 3.13.1)
2. Transfer belt. (☛ 3.13.2)
3. Transfer belt cleaning blade [A] (🔩 x3)
   NOTE: Avoid touching the edge of the new blade. Check the new blade for dust or damage.

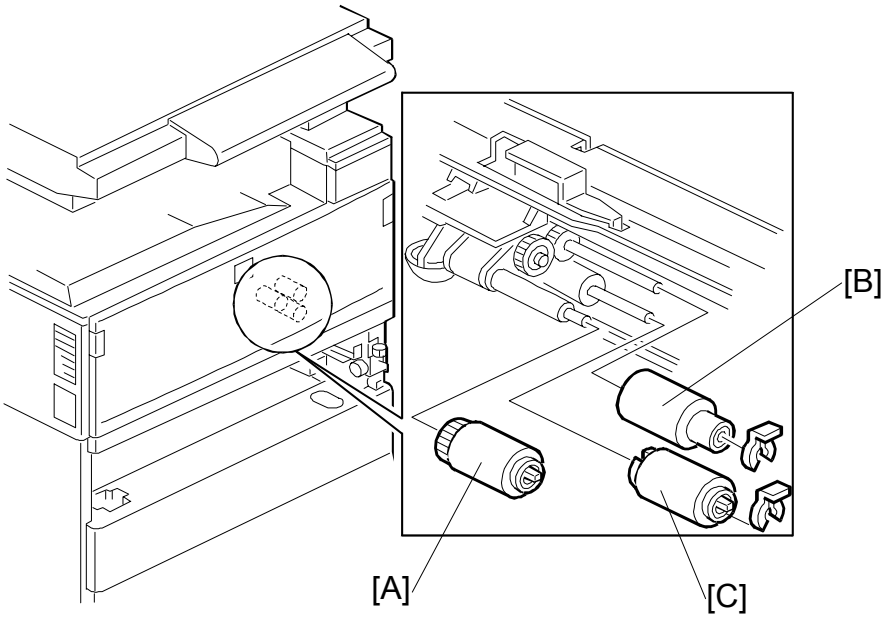
Toner Overflow Sensor

1. Transfer belt unit. (☛ 3.13.1)
2. Transfer belt. (☛ 3.13.2)
3. Transfer belt cleaning blade [A] (🔩 x3)
4. Turn over the transfer unit and empty the used toner in the transfer unit.
5. Toner overflow sensor [B] (🔩 x1, 🖐 x3)

NOTE: Re-install the color-coded wires in the correct order.

3.14 PAPER FEED

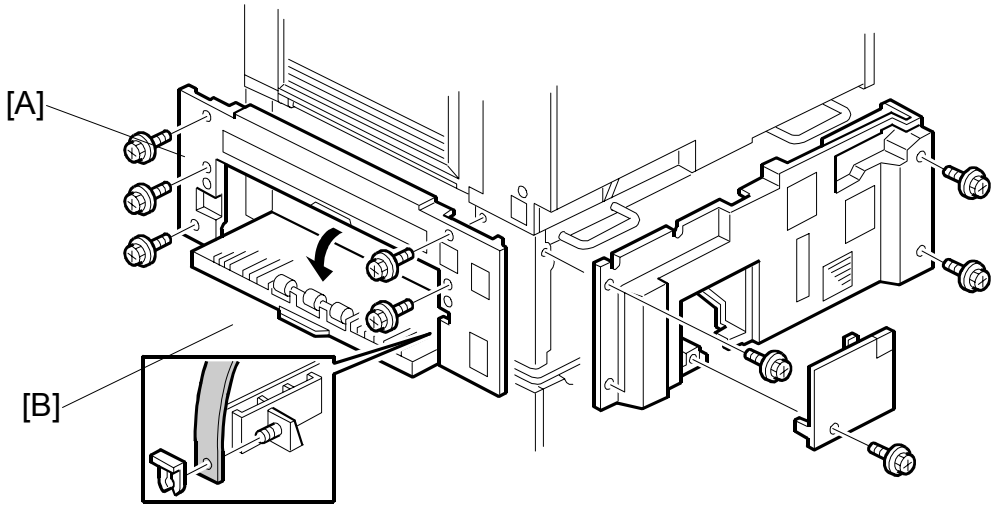
3.14.1 PICK-UP, SEPARATION, AND FEED ROLLERS



1. Paper tray
2. Pick-up roller [A]
3. Feed roller [B] (x 1)
4. Separation roller [C] (x 1)

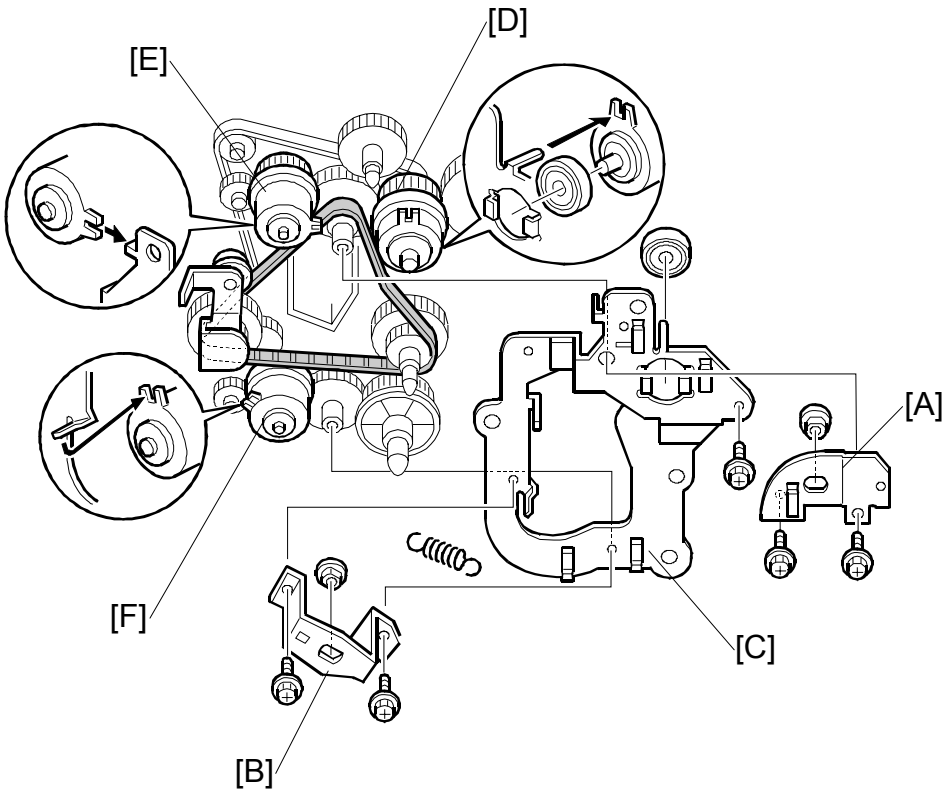
NOTE: Do not touch the roller surface with bare hands. After installing the new rollers, do SP 7-816 for the appropriate paper tray.

3.14.2 LOWER RIGHT COVER



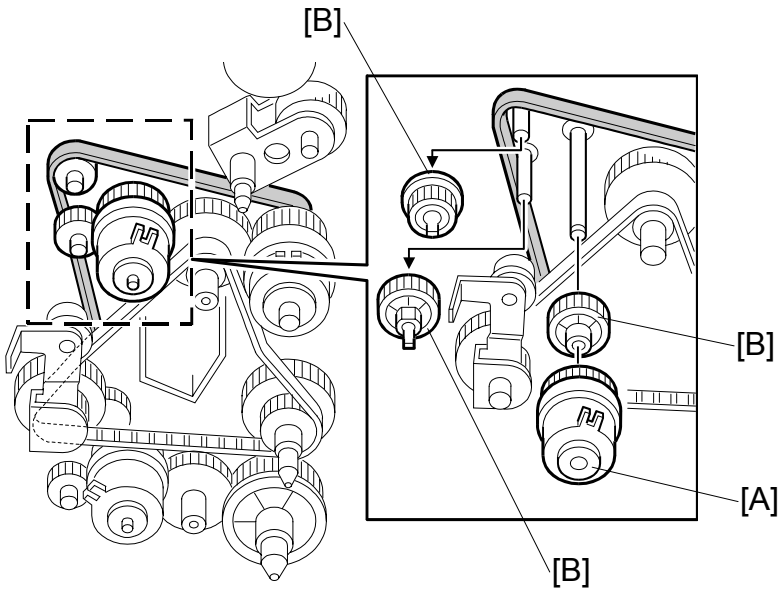
1. Duplex unit (☛ 3.4)
2. By-pass tray (☛ 3.6)
3. LCT (if installed)
4. Lower right cover [A] (x5)
5. Vertical transport cover [B]
   NOTE: Push the cover completely to the left and then press in on the right tab to release the peg from the hole.

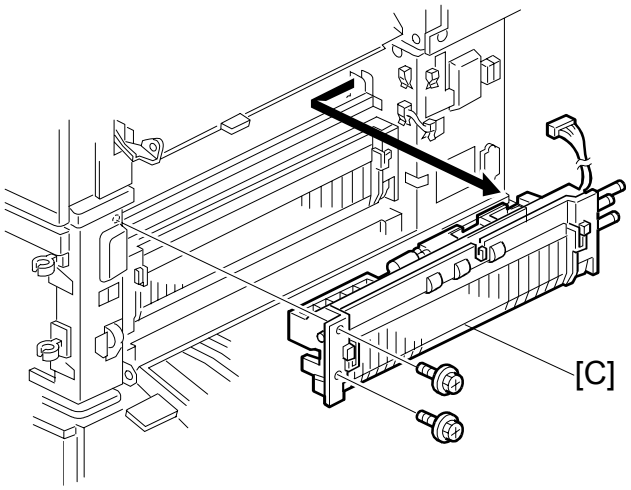
3.14.3 RELAY/UPPER PAPER FEED AND LOWER PAPER FEED CLUTCHES



1. Rear lower cover (☛ 3.7.2)
2. First paper feed clutch bracket [A] (🔩 x2, bushing x1)
3. Second paper feed clutch bracket [B] (🔩 x2, bushing x1)
4. Drive bracket [C] (🔩 x1, spring x1, bearing x1)
5. Relay clutch [D] (✋ x1)
6. Upper paper feed clutch [E] (✋ x1)
7. Lower paper feed clutch [F] (✋ x1)

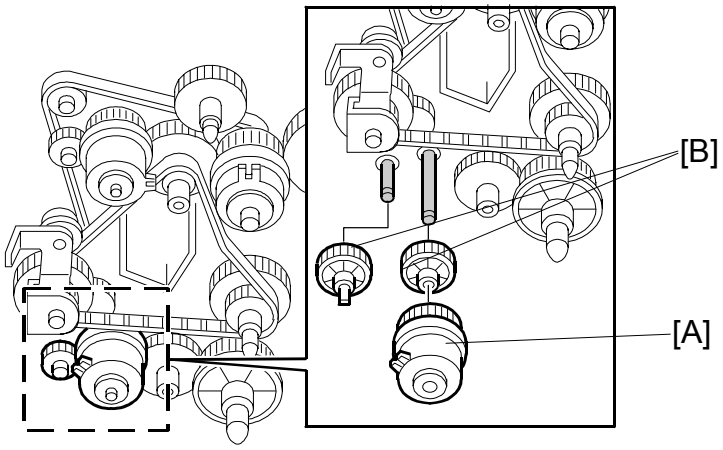
3.14.4 UPPER PAPER FEED UNIT FOR TRAY 1

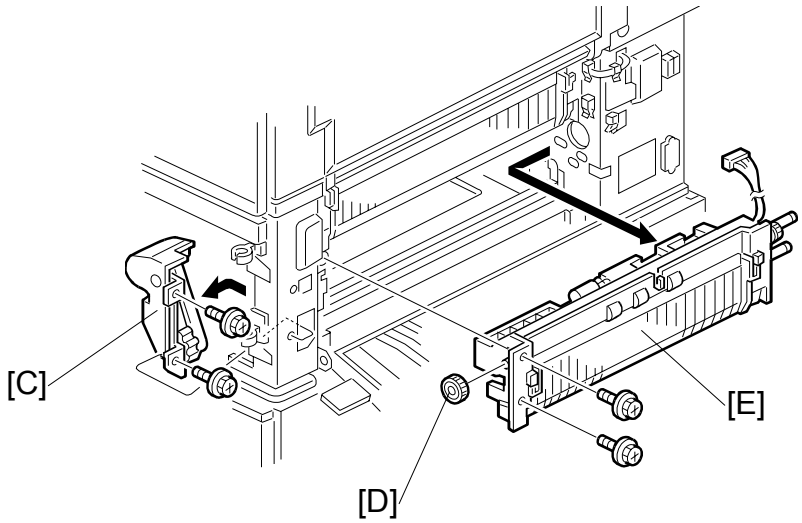




1. Upper paper tray
2. Right lower cover. (☛ 3.14.2)
3. Upper right cover (☛ 3.5)
4. Upper paper feed clutch [A] (☛ 3.14.3)
5. 3 relay gears [B]
6. Upper paper feed unit [C] (🔩 x2, ✋ x1)

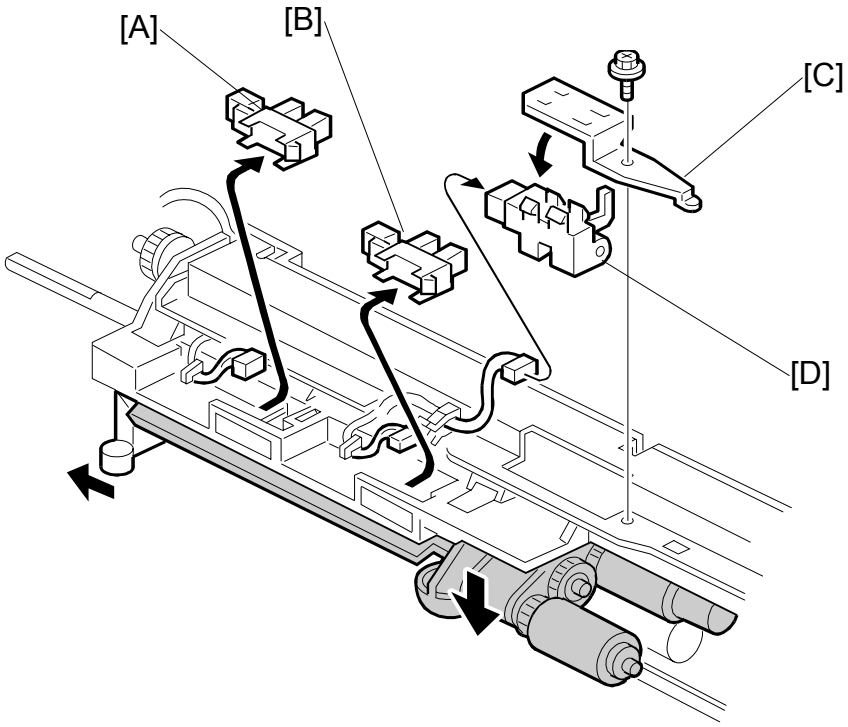
3.14.5 LOWER PAPER FEED UNIT FOR TRAY 2





1. Lower the paper trays
2. Right lower cover (☛3.14.2)
3. Remove the lower paper feed clutch [A] (☛ 3.14.3)
4. Relay gears [B] (x3)
5. Cover [C] (x2)
6. Gear [D] (x1)
7. Lower paper feed unit [E] (x2, x1)

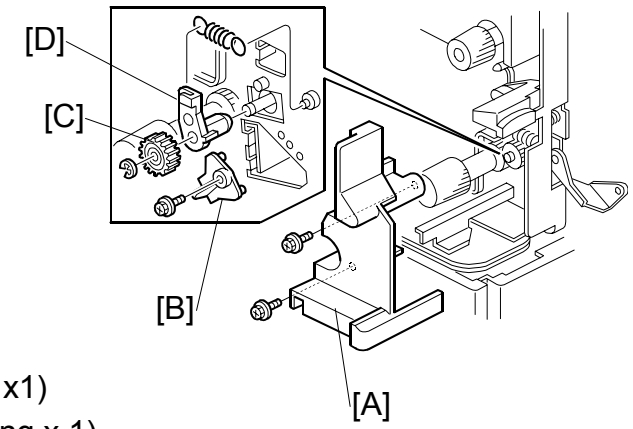
3.14.6 PAPER END/PAPER HEIGHT/RELAY SENSORS



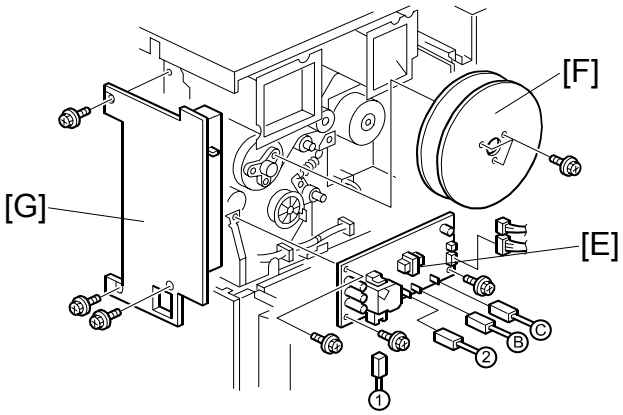
1. Appropriate paper feed unit (☛ 3.14.4, 3.14.5)
2. Paper height sensor [A] (✋ x1)
3. Paper end sensor [B] (✋ x1).
4. Relay sensor bracket [C] (🔩 x1, ✋ x1)
5. Relay sensor [D]

3.14.7 REGISTRATION SENSOR

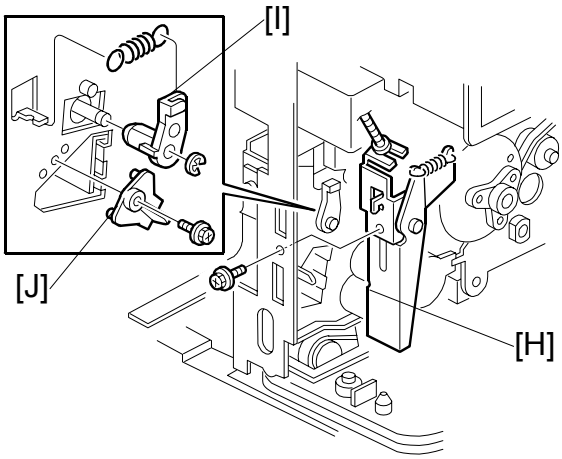
1. Front door (☛ 3-3)
2. Rear upper cover (☛ 3.7.1)
3. Right door and transfer belt unit (☛3.5, 3.13.1
4. PCU (☛ 3.11.1)
5. Development unit (☛ 3.12.1)
6. Inner cover [A] (🔩 x2)
7. Front registration holder [B] (🔩 x1)
8. Front registration roller gear [C] (ℂ x1)
9. Registration roller bushing [D] (Spring x 1)

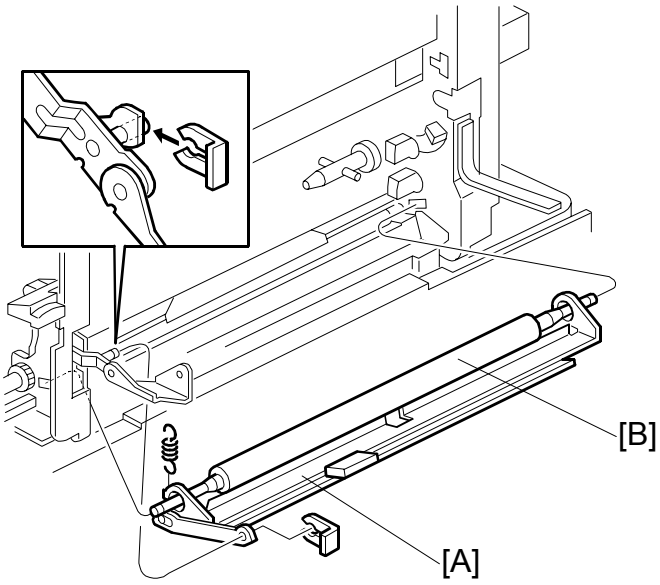


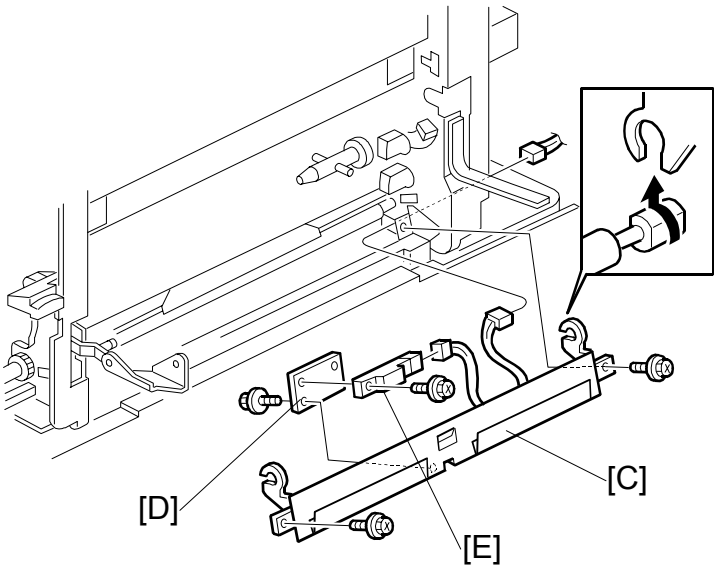
10. High voltage power supply board [E] (🔩 x3, 🔌 x6)
11. Flywheel [F] (🔩 x3)
12. Right rear cover [G] (🔩 x3)



13. Right cover switch bracket [H] (🔩 x1)
14. Rear registration holder [I] (ℂ x1, spring x1)
15. Registration roller bushing [J] (ℂ x1)

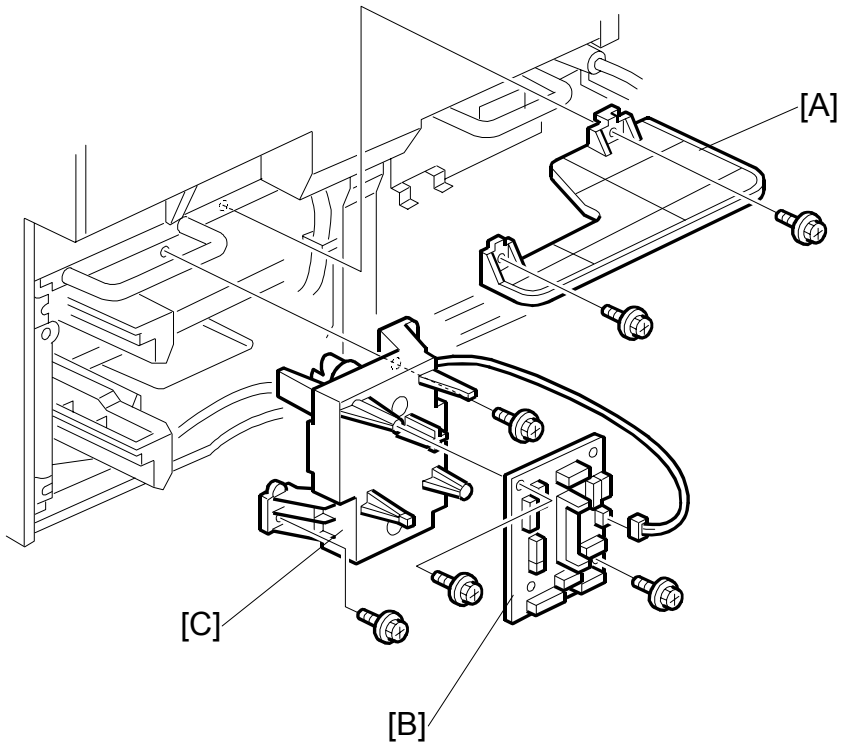






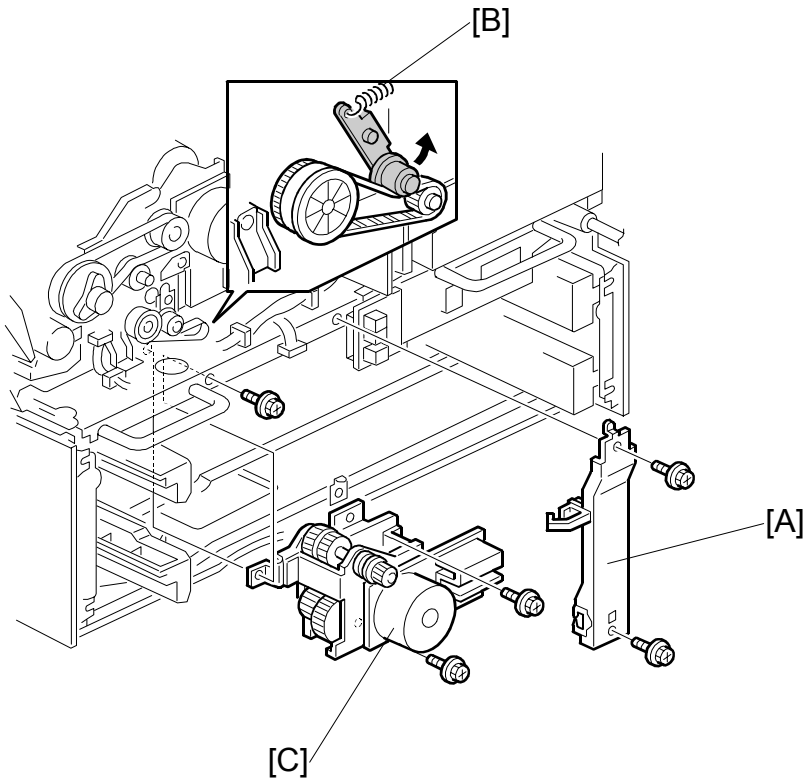
16. Guide plate [A] and registration roller [B] (spring x1, x 1)
17. Registration guide plate [C] (x2, x1)
18. Sensor bracket [D] (x1)
19. Registration sensor [E] (x1, x1)

3.14.8 TRAY LIFT MOTOR



1. Rear lower cover (☛ 3.7.2)
2. Bracket [A] (x2)
3. Motor control board [B] (x2, x13)
4. Tray lift motor [C] (x2)

3.14.9 FEED/DEVELOPMENT MOTOR

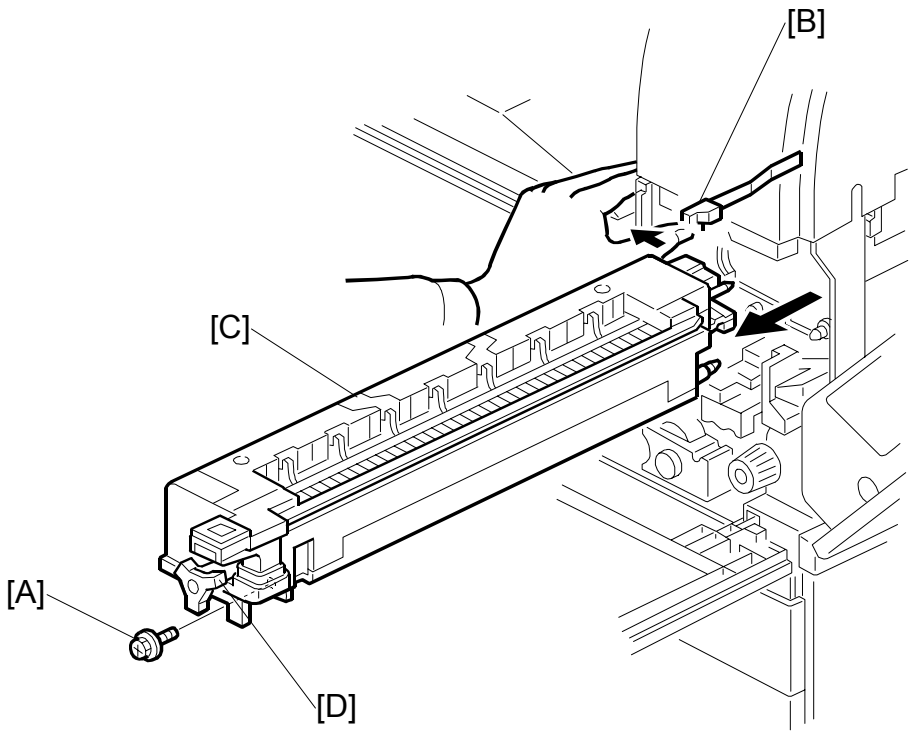


1. Rear lower cover (x4) (☛3.7.2)
2. Rear upper cover (x4) (☛3.7.1)
3. Tray lift motor (☛ 3.14.8)
4. Support [A] (x2, harnesses x2)
5. Timing belt [B] (Raise arm to release tension on belt.)
6. Feed/development motor [C] (x3, x2)

3.15 FUSING UNIT

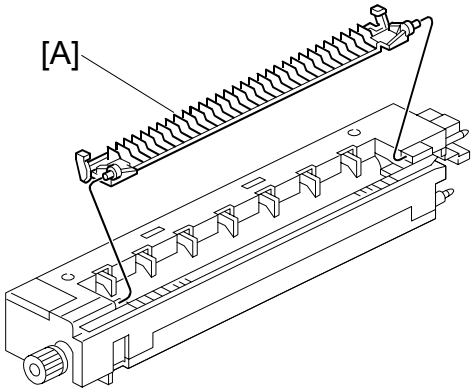
⚠CAUTION
Allow time for the unit to cool before doing the following procedure.

3.15.1 FUSING UNIT REMOVAL



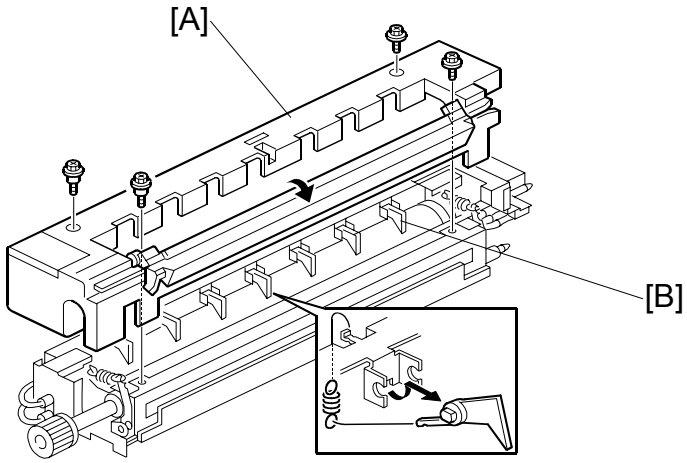
1. Open the front door, duplex unit, and right door.
2. Set screw [A] (🔩 x 1)
3. Fusing unit release lever [B]
4. Slide out the fusing unit [C]

3.15.2 FUSING UNIT EXIT GUIDE



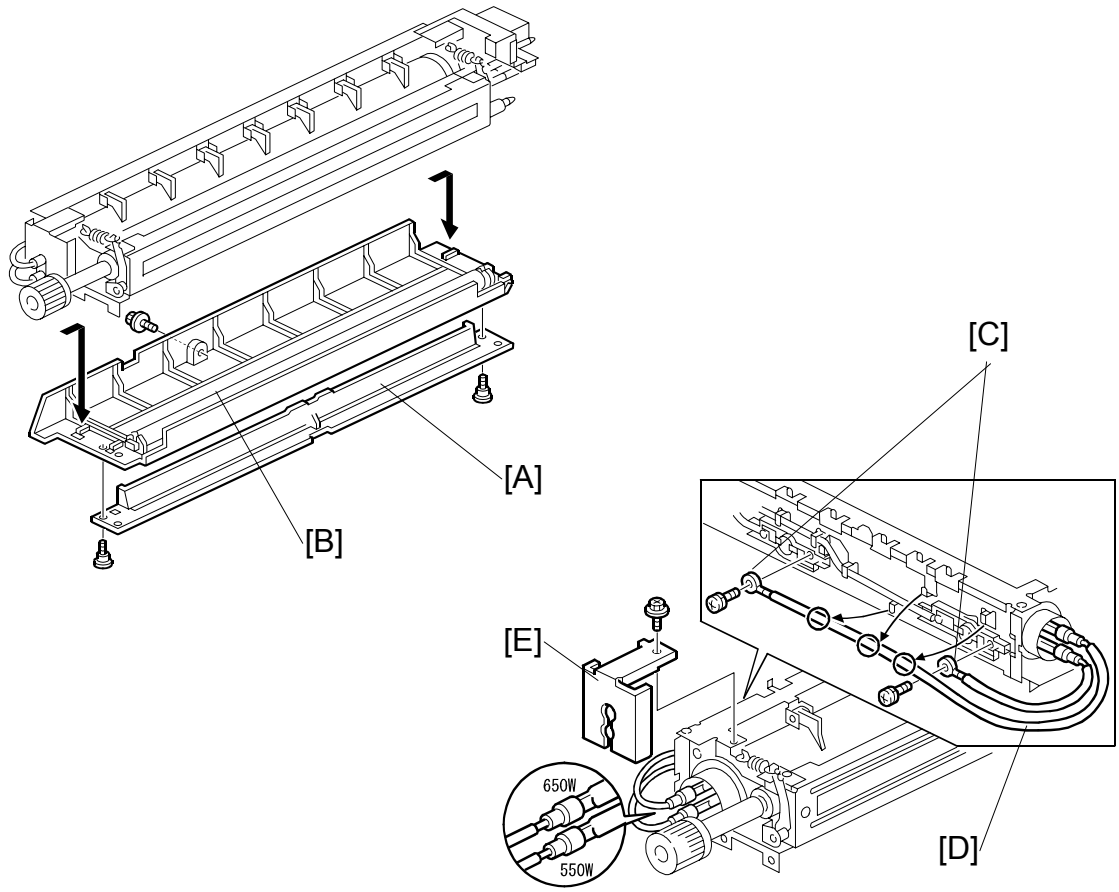
1. Fusing unit (☛ 3.15.1)
2. Exit guide [A]
   NOTE: Press the guide to the left and then press on the right end to release the peg from the hole.

3.15.3 HOT ROLLER STRIPPERS



1. Fusing unit (☛ 3.15.1)
2. Fusing unit cover [A] (🔩 x4)
   NOTE: Note the positioning of the step screws x2 and the set screws x2.
3. Hot roller strippers x7, springs x7

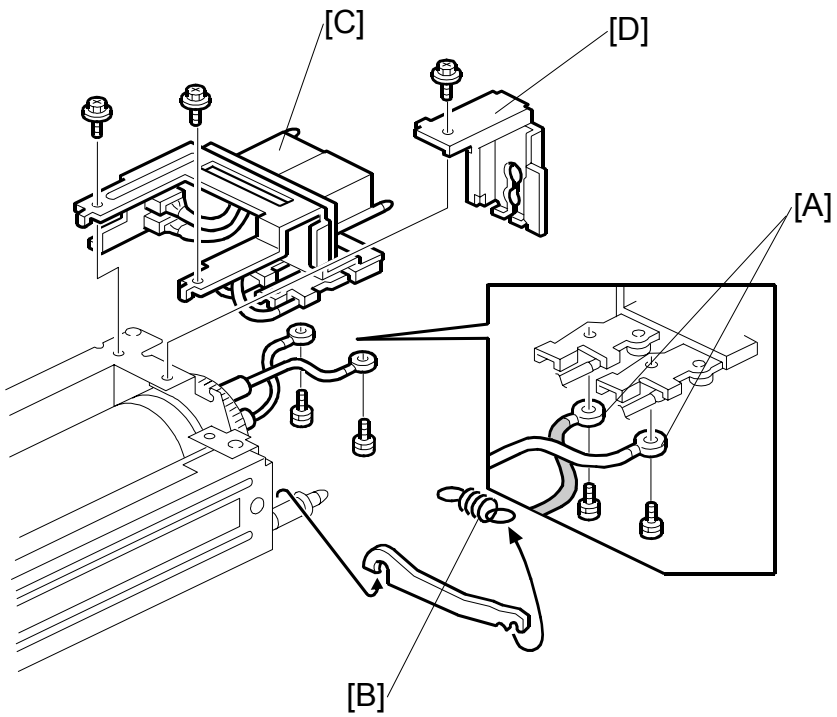
3.15.4 FUSING LAMPS



1. Fusing unit (☛ 3.15.1)
2. Fusing unit cover (☛ 3.15.3)
3. Fusing entrance guide [A] (☞ x2)
4. Lower cover [B] (☞ x1)

Left side

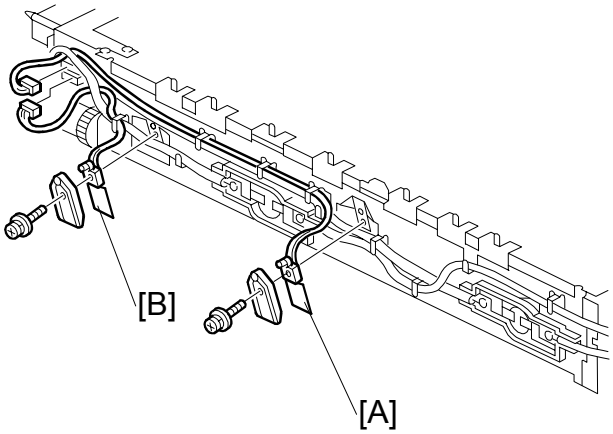
5. Two terminals [C] (☞ x2)
6. Center fusing lamp lead [D] (3 clamps)
7. Bracket [E] (☞ x1)

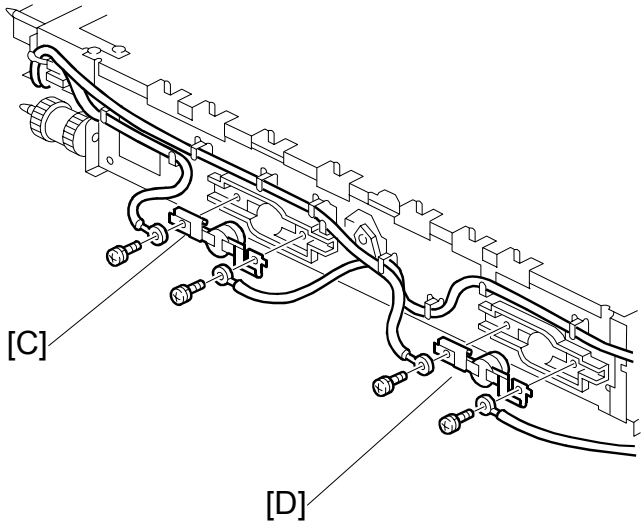


– Right side –

1. Two terminals [A] (☞ x2)
2. Spring [B]
3. Connector bracket [C] (☞ x2)
4. Bracket [D] (☞ x2)
   NOTE: To avoid breaking the fusing lamps, handle them with care. Avoid touching the lamps with your fingers. Note the top/bottom positioning of the fusing lamps as you remove them. The sizes of the holes in the holder match the sizes of the ends of the 650 W lamp (red) and 550 W lamp (brown).
5. Remove both fusing lamps.

3.15.5 THERMISTORS AND THERMOSTATS



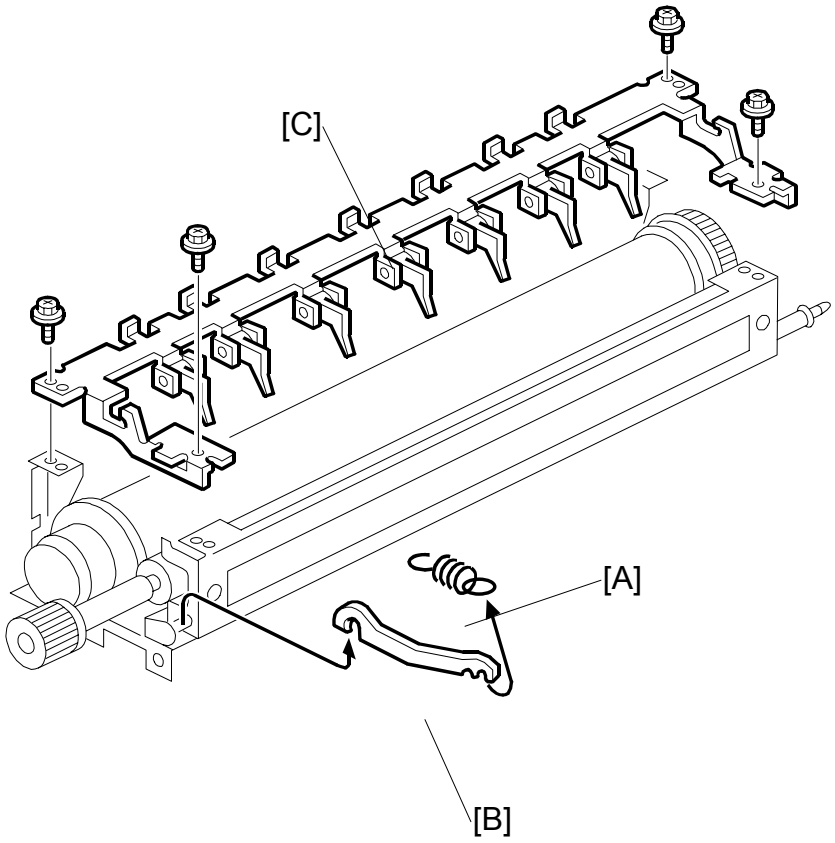


1. Fusing unit (☛ 3.15.1)
2. Fusing upper and lower cover. (☛ 3.15.3, 3.15.4)
3. Center thermistor [A] (x1, x1, holder x1)
4. End thermistor [B] (x1, x1, holder x1)

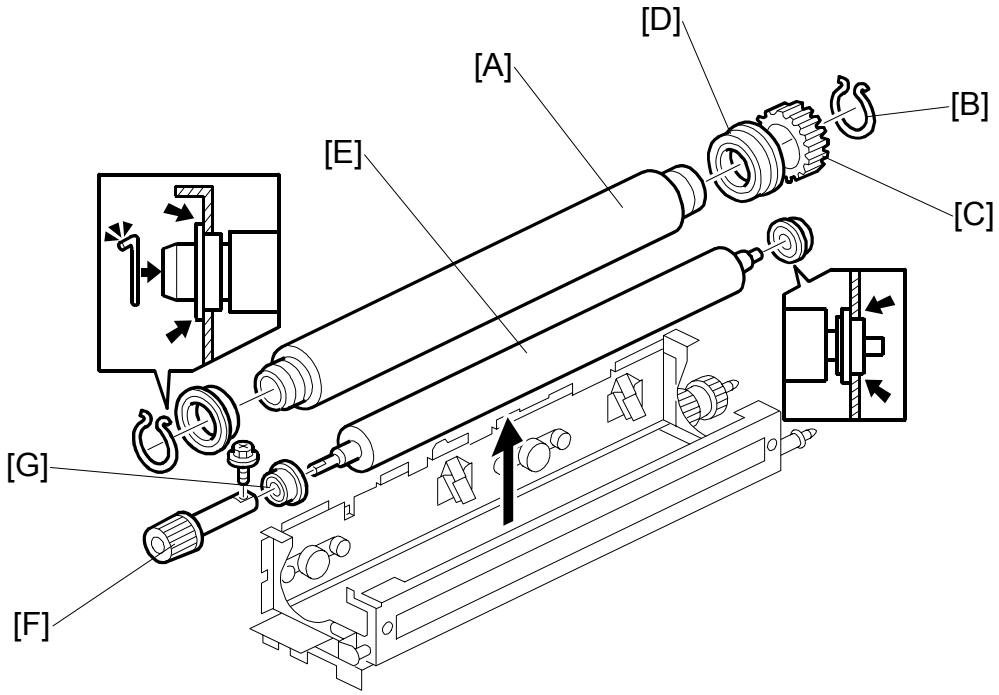
CAUTION: The thermistors are thinly coated and extremely fragile. Handle with care to avoid damaging them. They should be replaced every 150K.

5. Center thermostat [C] (x2)
6. End thermostat [D] (x2)

3.15.6 FUSING ROLLER/PRESSURE ROLLER



1. Fusing unit (☛ 3.15.1)
2. Fusing upper and lower cover. (☛ 3.15.3, 3.15.4)
3. Fusing lamp. (☛ 3.15.4)
4. Springs x2 [A] (both sides)
5. Arms x2 [B] (both sides)
6. Pawl bracket [C] (🔩 x4)



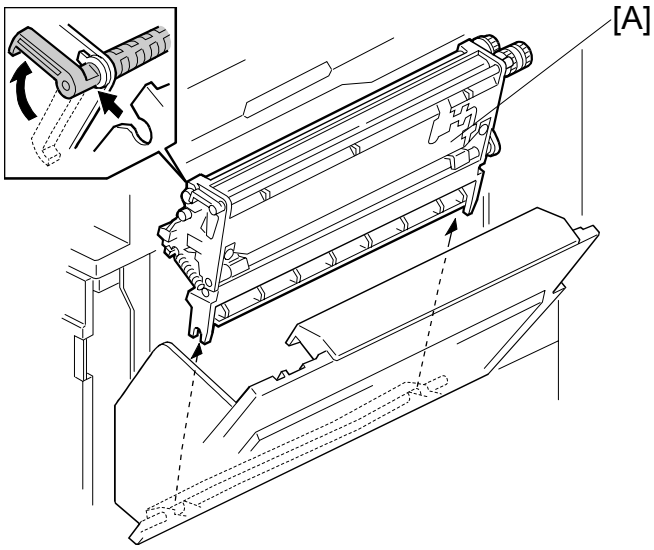
1. Hot roller [A]

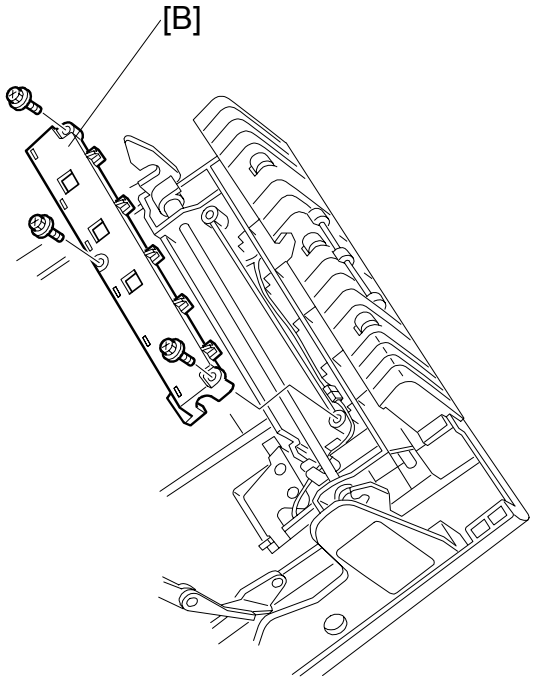
CAUTION: The hot roller is easily damaged. Always handle it carefully.

2. C-rings x2 [B] (both ends)
3. Drive gear [C]
4. Bushing x2 [D] (both ends)
5. Pressure roller [E]
6. Fusing knob [F] (x1)
7. Bushing x2 [G] (both ends)

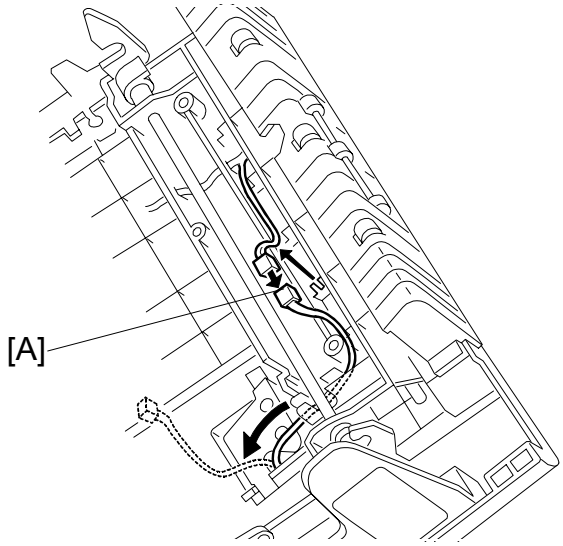
NOTE: 1) Before installing the new hot roller, peel off 3 cm (1 inch) from both ends of the protective sheet on the new roller.
2) Never touch the surface of the rollers.
3) Work carefully to damaging the surface of the hot roller.
4) The standard pressure roller spring position is the upper position.
5) When reinstalling the hot roller assembly and pressure roller assembly, make sure that the flange position of the bushings is as shown.
6) When reinstalling the C-rings [B] of the hot roller, make sure that the position of the C-rings is as shown.

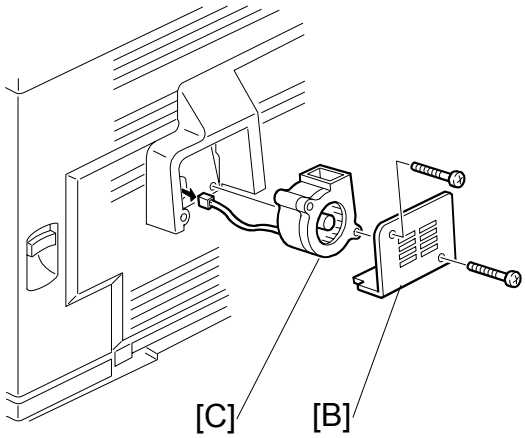
3.15.7 FUSING UNIT SIDE FAN





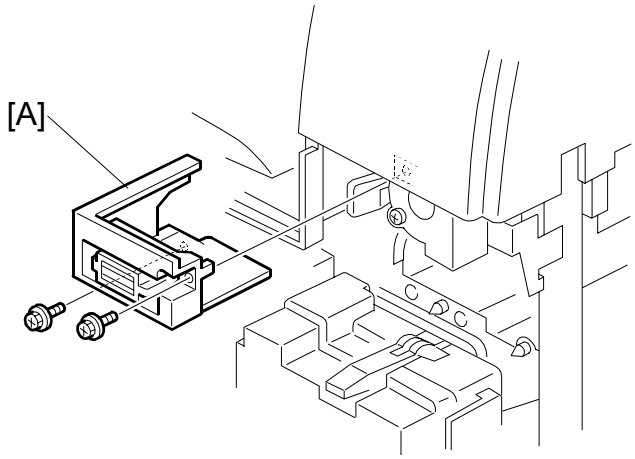
1. Open the duplex unit and right door.
2. Release the transfer unit [A] and remove it.
3. Remove the shaft cover [B] (☞ x 3).

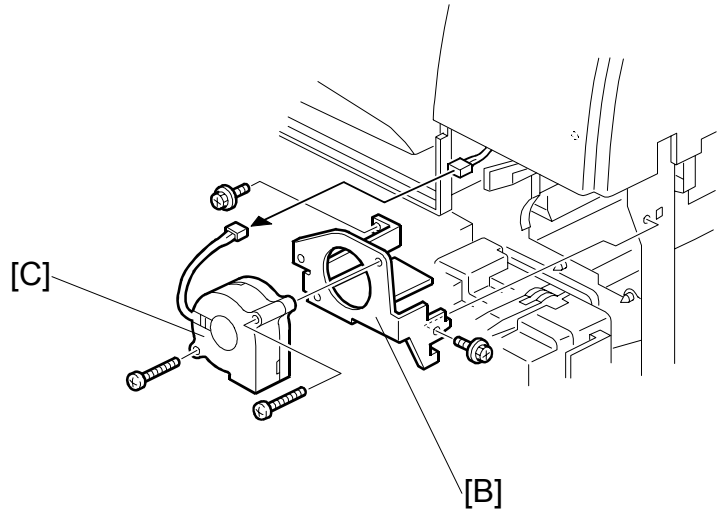




4. Separate the fan connectors [A] (✋ x 1).
   NOTE: When re-connecting, be sure the thread the connector correctly between the gaps.
5. Close the right door.
6. Use a short screwdriver to remove the fan plate [B] (🪛 x 2).
7. Pull the fan [C] out of the machine.

3.15.8 FUSING UNIT CORNER FAN

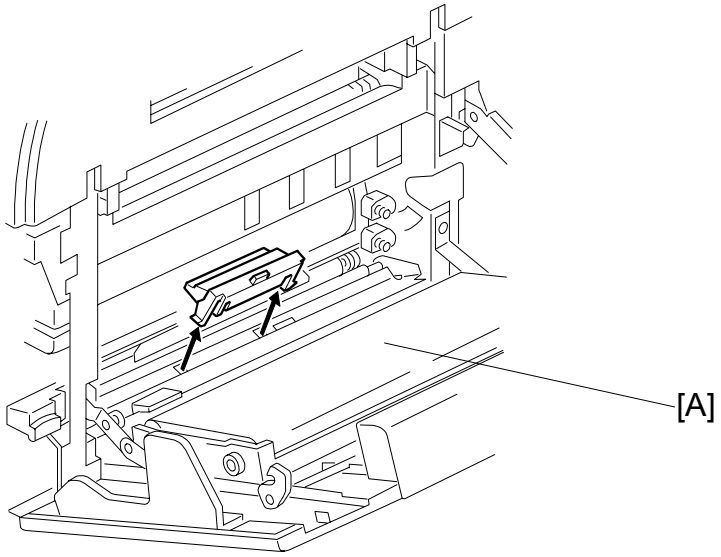




1. Open the front door.
2. Open the duplex unit and right door.
3. Remove the fusing unit. (☛ 3.4.1)
4. Remove the magnet lock [A] of the front door (☞ x 2).
5. Remove the fan bracket [B] (☞ x 2).
6. Remove the fan [C] from the bracket (☞ x 2).

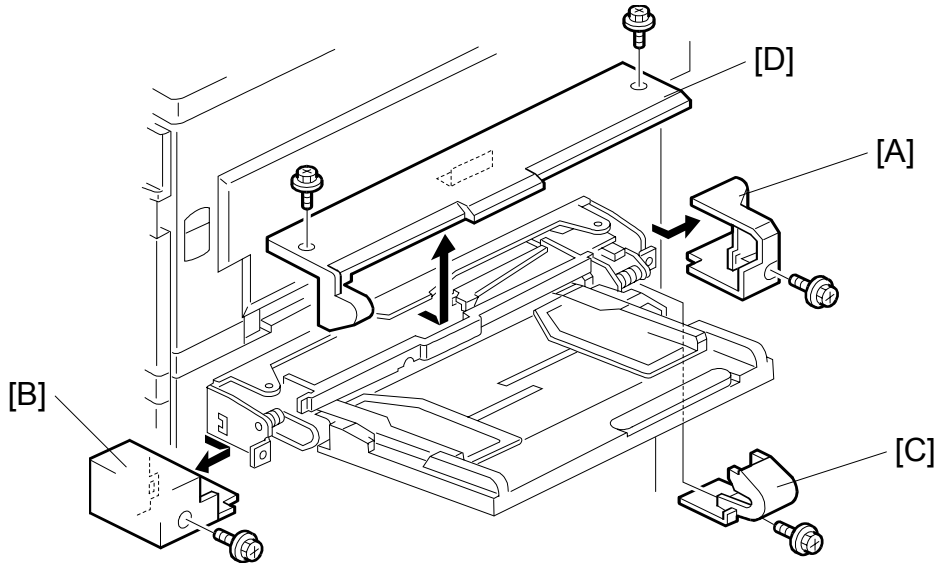
3.16 PAPER FEED

3.16.1 IDLE ROLLER DUST BLADE



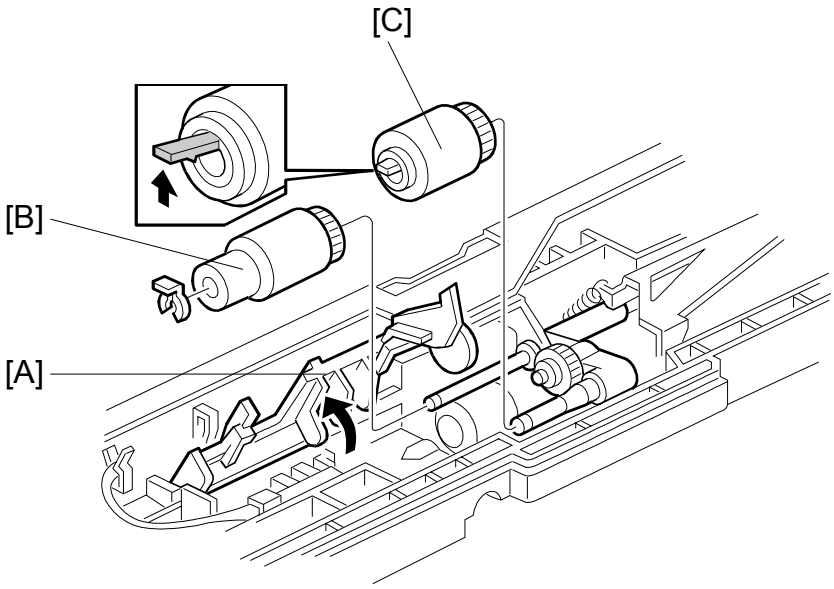
1. Open the duplex unit and right door.
2. Detach the dust blade [A].
3. Spread some paper on a flat surface and tap the dust blade gently to remove paper dust collected in its dust box.

3.16.2 COVER REPLACEMENT



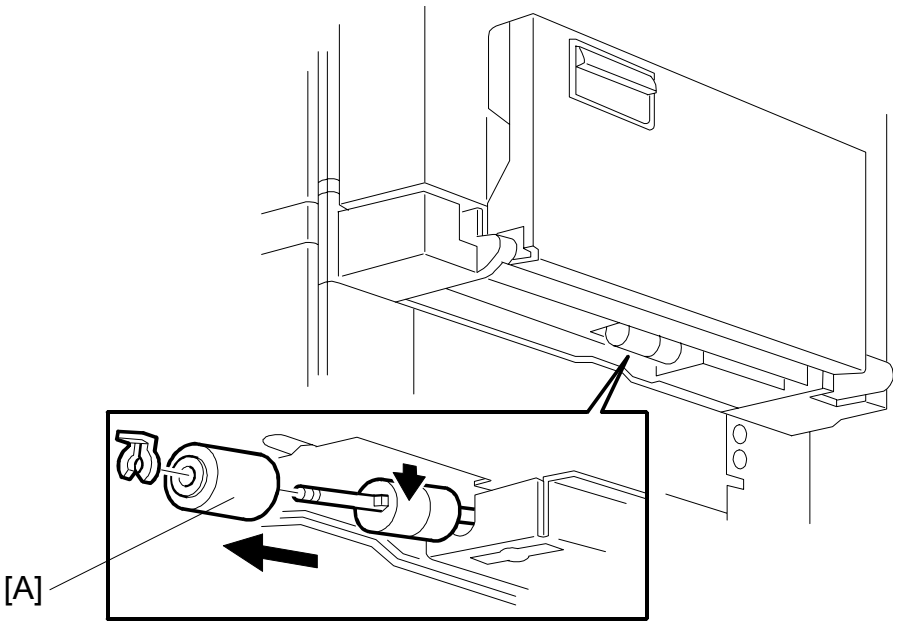
1. Rear cover [A] (☞ x1)
2. Front cover [B] (☞ x1)
3. Hinge cover [C] (☞ x1)
4. Upper cover [D] (☞ x2)
5. Close duplex unit and pull out upper cover.

3.16.3 BY-PASS PAPER FEED AND PICK-UP ROLLER REPLACEMENT



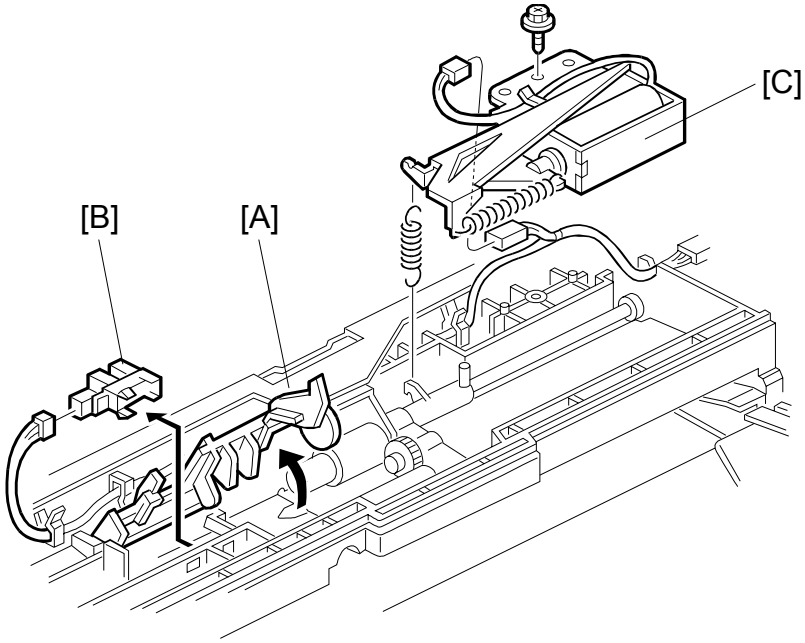
1. Upper cover (☛ 3.16.2)
2. Lift up paper end feeler [A] to lock feeler in position.
   NOTE: Before reinstalling the upper cover, return the paper end feeler to its original position.
3. Replace the paper feed roller [B] (x1)
4. Replace pick-up roller [C].

3.16.4 BY-PASS SEPARATION ROLLER REPLACEMENT



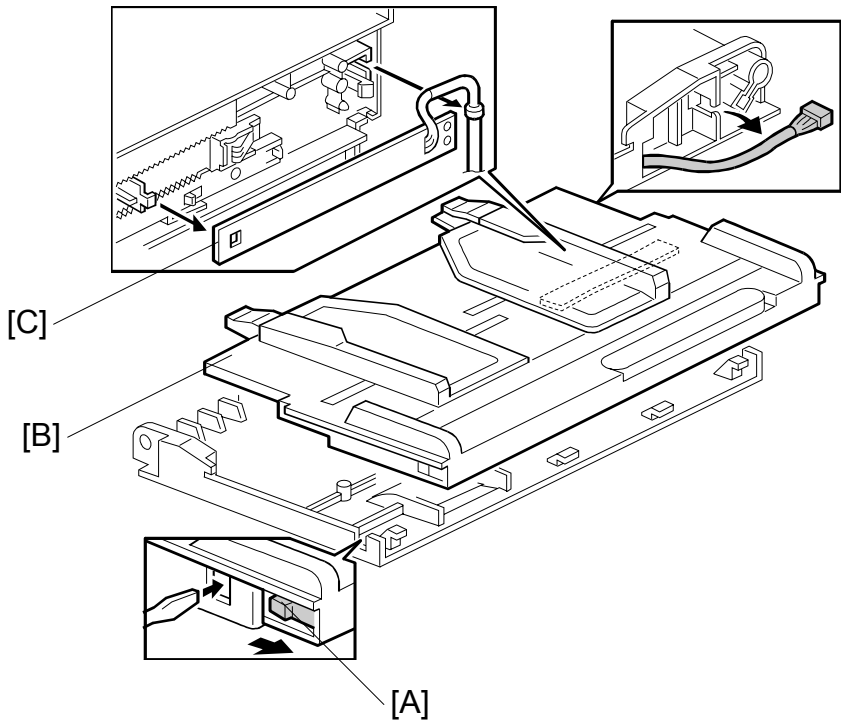
1. Close by-pass table.
2. Remove separation roller [A] from the bottom (⟲ x1)

3.16.5 PAPER END SENSOR AND PICK-UP SOLENOID REPLACEMENT



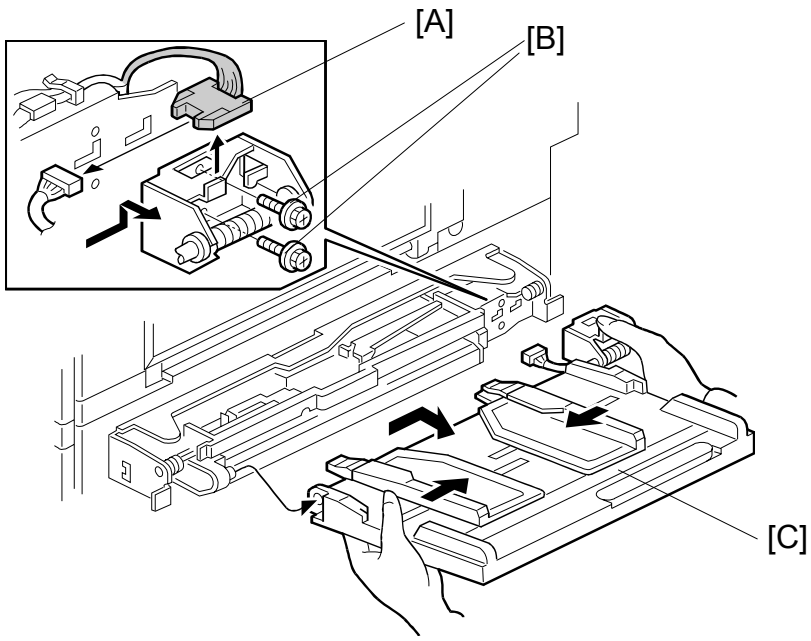
1. Upper cover (☛ 3.16.2)
2. Lift paper end feeler [A].
   NOTE: Before reinstalling the upper cover, return the paper end feeler to its original position.
3. Replace paper end sensor [B] (x1).
4. Pick-up solenoid [C] (x1, x1) x1, spring x1).

3.16.6 PAPER SIZE SENSOR BOARD REPLACEMENT



1. Hook [A]
2. Paper tray [B] (☞ x1).
3. Size sensor board [C].
   NOTE: To avoid breaking the hook of the paper size sensor board, handle it carefully during removal.

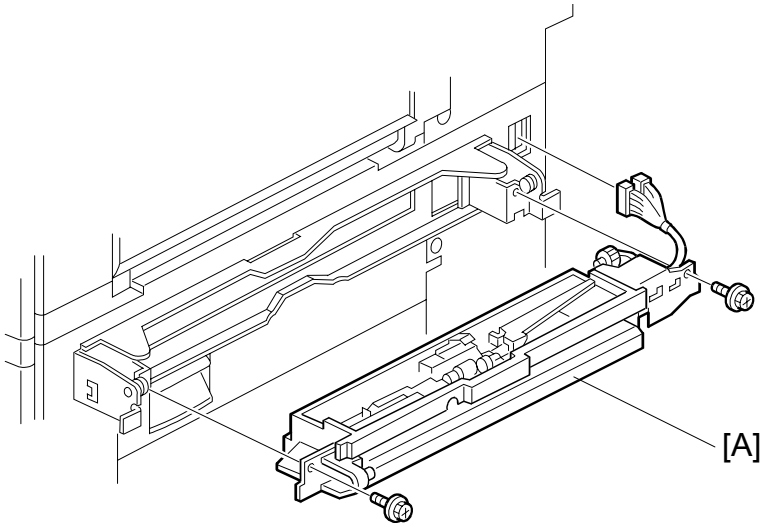
3.16.7 BY-PASS TABLE REMOVAL

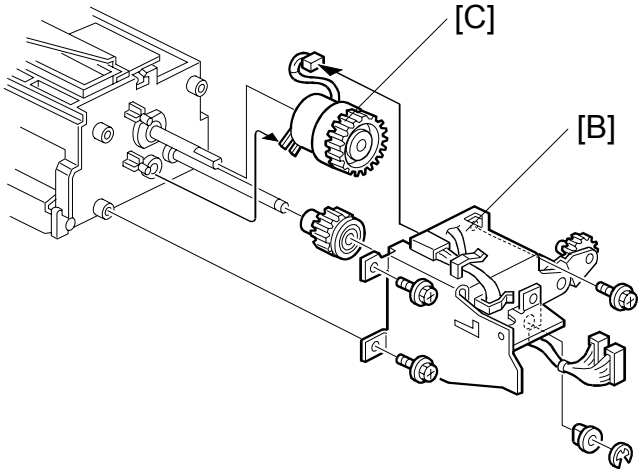


1. Hinge cover (☛ 3.16.2)
1. Harness [A] (🖐 x1).
2. Screws [B] (🔩 x2)
3. Retard spring bracket and remove the by-pass table [C].

CAUTION: To relieve pressure on the spring during removal, depress it as shown in the illustration.

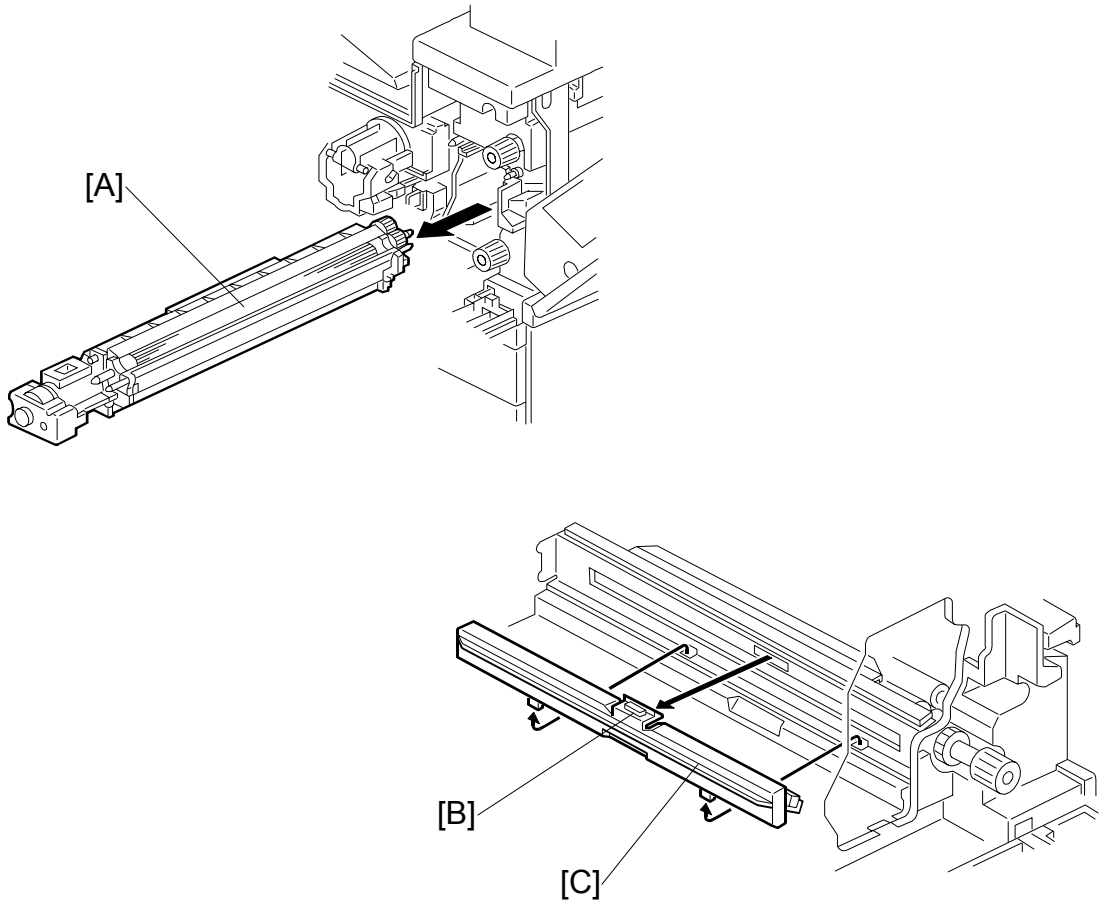
3.16.8 PAPER FEED CLUTCH REPLACEMENT





1. By-pass tray.
2. Paper feed unit [A] (x2, x2)
3. Rear bracket [B] (x4, clip x1, bushing x1)
4. Paper feed clutch [C] (x1)

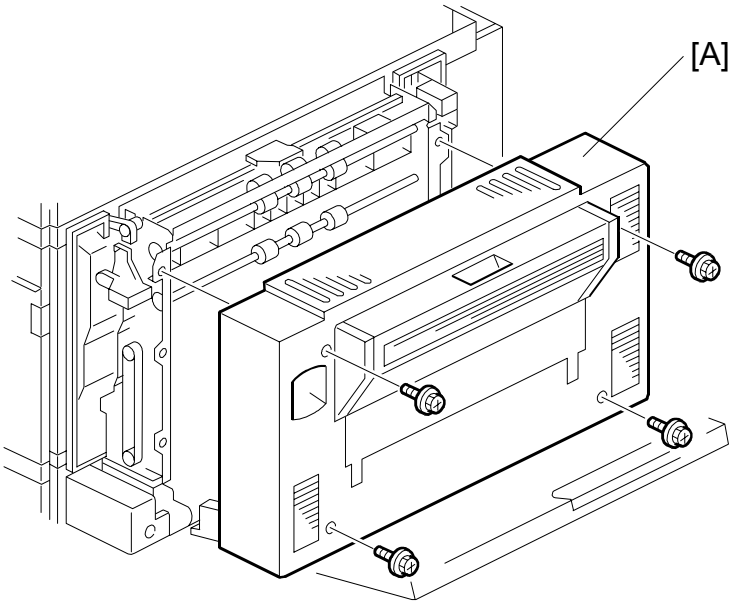
3.16.9 REGISTRATION ROLLER DUST BLADE



1. Open the duplex unit and open the right door.
2. Remove the PCU. (☛3.11.1)
3. Remove the development unit [A].
4. Press the top of the blade [B] to unlock it and open it to the left.
5. Remove the dust blade [C] from the machine.

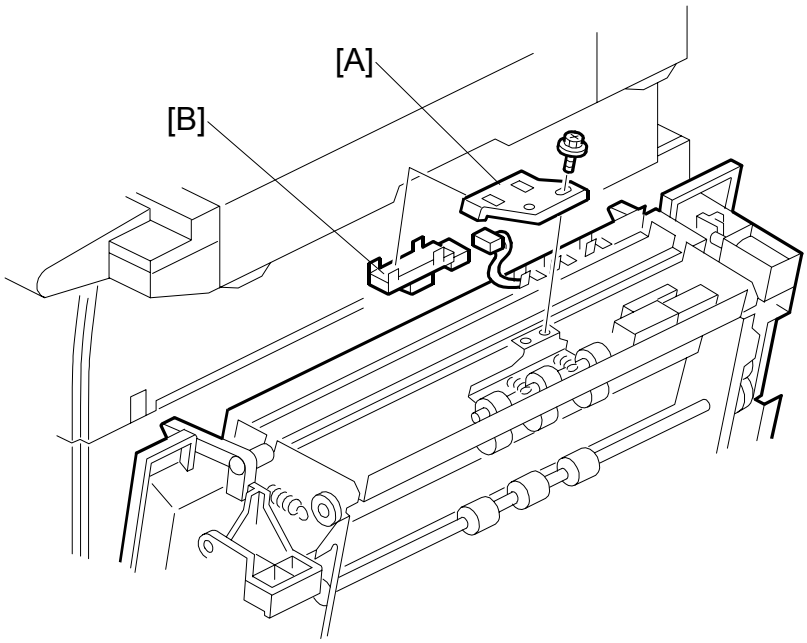
3.17 DUPLEX UNIT

3.17.1 DUPLEX COVER REMOVAL



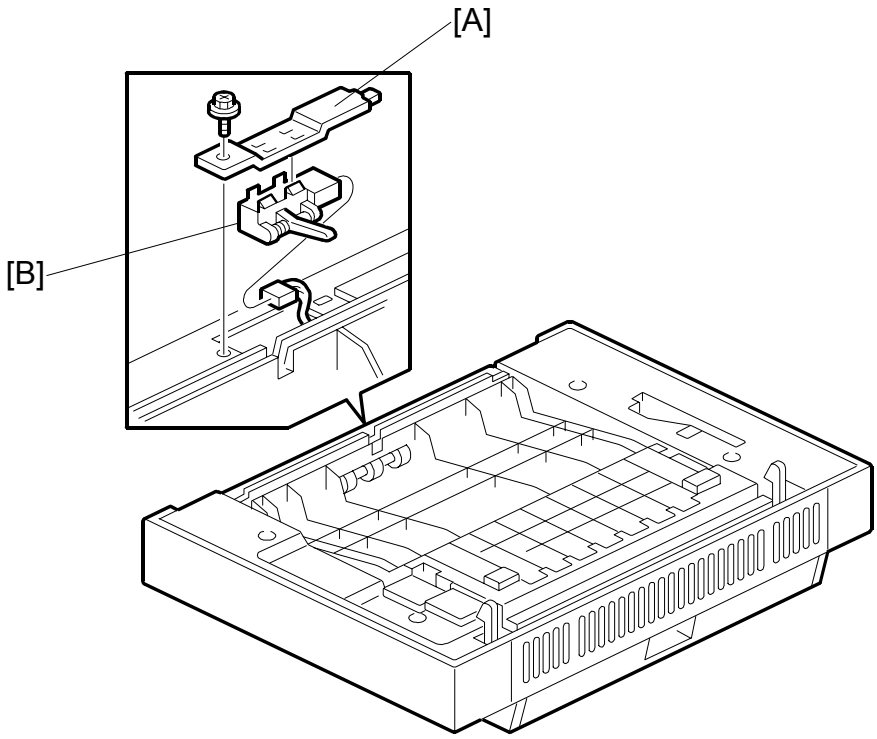
1. Duplex unit cover [A] (x4)

3.17.2 DUPLEX ENTRANCE SENSOR REPLACEMENT



1. Duplex unit cover (☛ 3.17.1)
2. Sensor holder [A] (x1)
3. Entrance sensor [B] (x1)

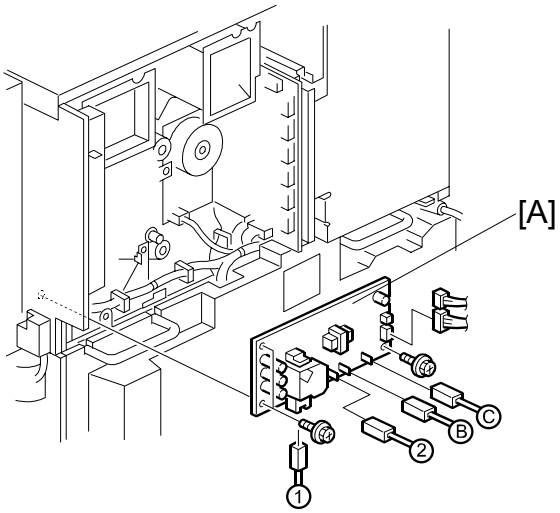
3.17.3 DUPLEX EXIT SENSOR REPLACEMENT

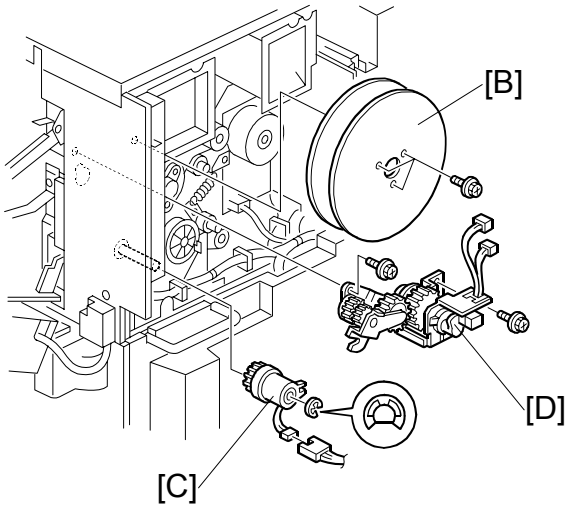


1. Duplex unit (☛3.4)
2. Sensor bracket [A] (🔩 x1)
3. Exit sensor [B] (✋ x1)

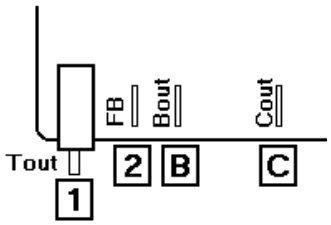
3.18 DRIVE AREA

3.18.1 REGISTRATION CLUTCH AND TRANSFER BELT CONTACT CLUTCH

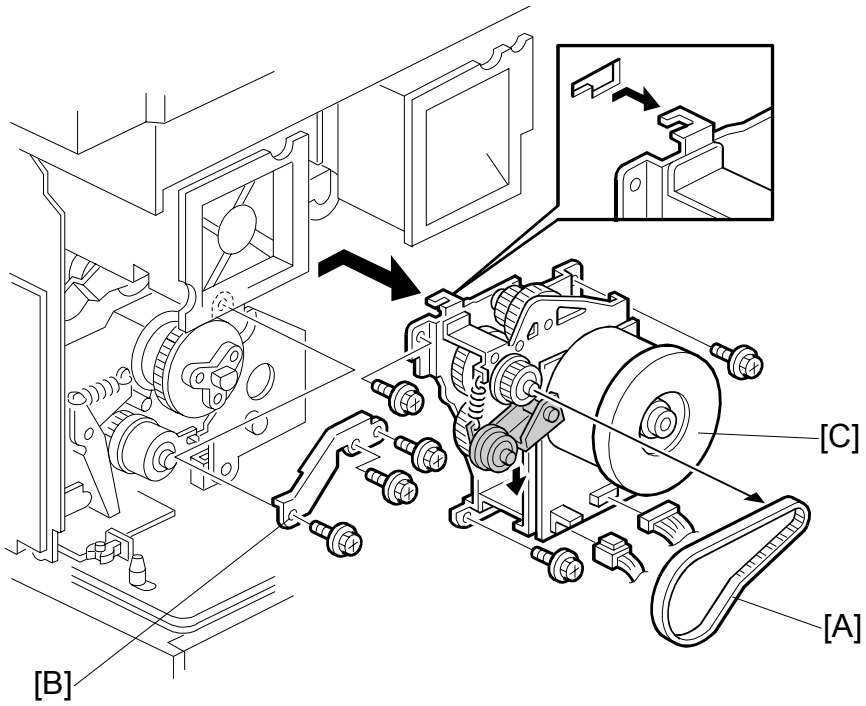




1. Rear upper cover (not shown) (x2)
2. High voltage supply board [A] (x6, x3)
   NOTE: Make sure that you re-connect the wires in the correct order. They are labeled 1 ➔ 2 ➔ B ➔ C
3. Flywheel [B] (x3)
4. Registration clutch [C] (x1, x1)
5. Transfer belt contact clutch [D] (x2, x2)

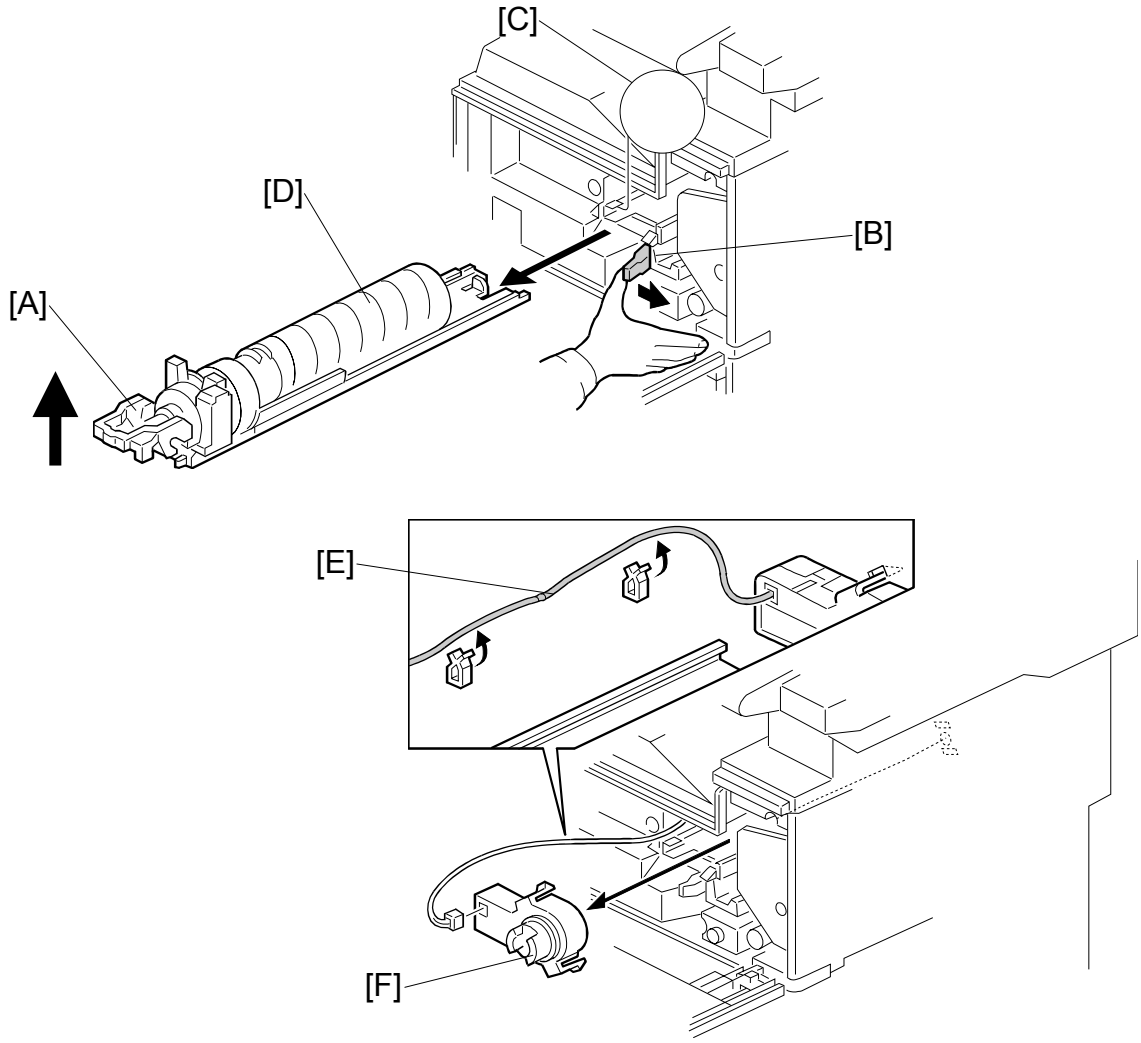


3.18.2 MAIN MOTOR



1. Rear upper cover, high voltage power supply, flywheel (☛ 3.18.1)
2. Timing belt [A] x1
3. Bracket [B] (x3)
4. Main motor [C] (x2, x3)

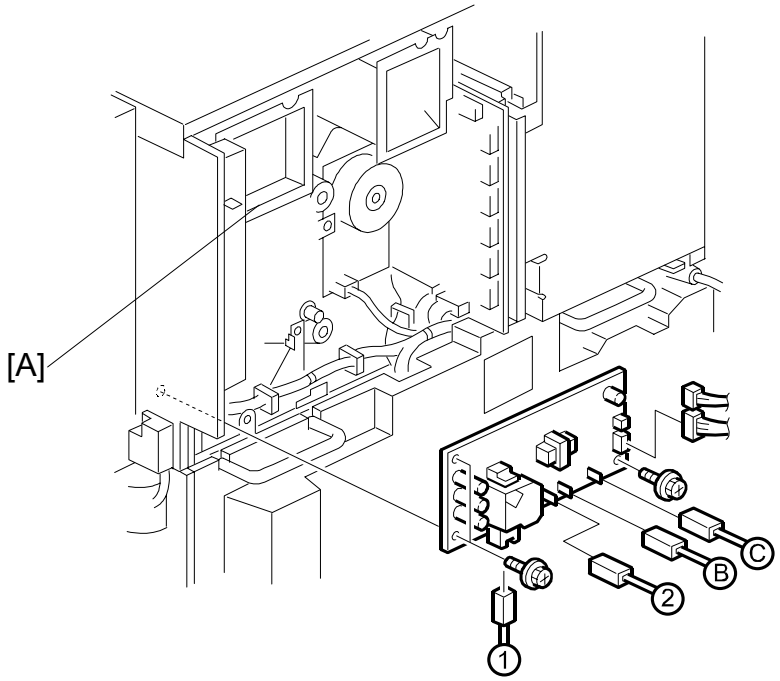
3.18.3 TONER SUPPLY MOTOR



1. Open the front door
2. Raise holder handle [A]
3. Push the holder lever [B] to the right
4. Stopper [C]
5. Toner bottle holder and bottle [D]
6. Motor harness [E] (clamps x 2)
7. Toner supply motor [F] (hooks x2, x1)
   NOTE: Press in on both sides of the motor to release it.

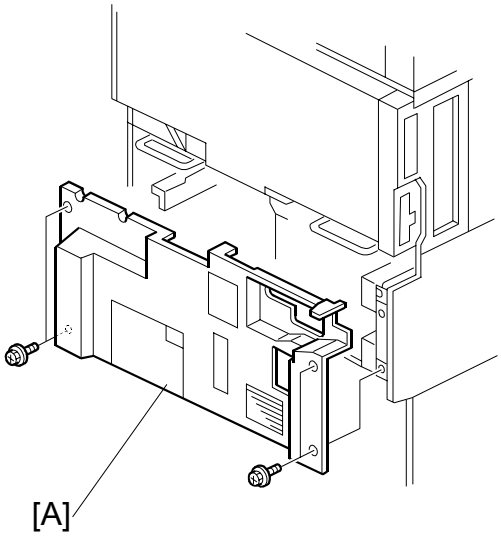
3.19 PRINTED CIRCUIT BOARDS

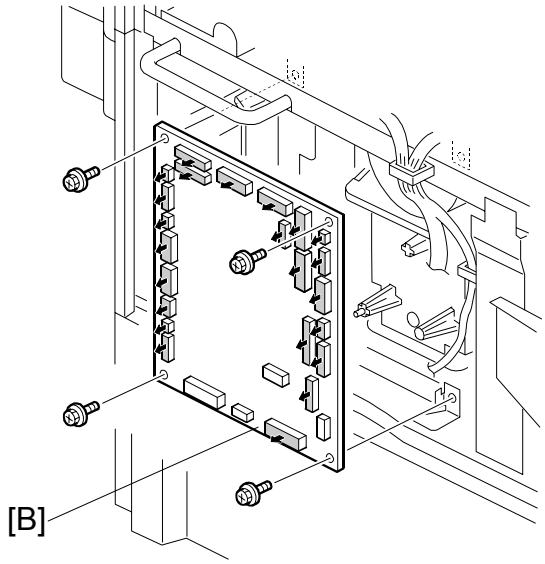
3.19.1 HIGH VOLTAGE POWER SUPPLY



1. Rear upper cover (☛ 3.7.1)
2. High voltage power supply [A] (x3, x6)

3.19.2 I/O BOARD





1. Remove the rear lower cover [A] (x 4).
2. Remove the I/O Board [B] (All, x 4, Ribbon cable x 1).
3. The I/O Board is identical for the B135/B138. However, the DIP switches are set differently for each machine. Check the DIP switches then adjust settings as required. (See next page.)

I/O Board DIP Switch Settings (SW101)

1. The position of SW 1 determines the engine speed. This switch should be UP (ON) for the B135 (35 cpm) or DOWN (OFF) for the B138 (45 cpm)
   NOTE: Move a switch UP to ON or DOWN to OFF.

2. SW 2, 3, 4, and 5 should all be DOWN (OFF). Do not change these settings. This information is only for reference:

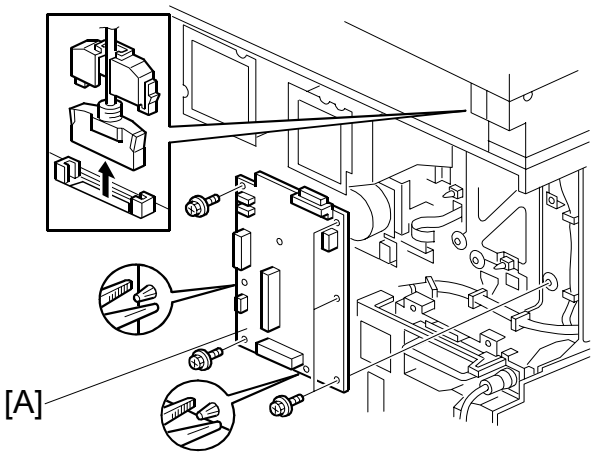
SW	If set to ON
2	Switches off jam detection.
3	Engine program recovery.
4	Print output for debugging.
5	Checking duplex function at the factory.

3. SW 6, 7, 8 should be set for the area where the machine is used and serviced.

6	7	8	Location
OFF	OFF	OFF	Japan
ON	OFF	OFF	North America
OFF	ON	OFF	Europe
OFF	OFF	ON	China
ON	OFF	ON	Taiwan
ON	ON	OFF	Asia
OFF	ON	ON	Korea
ON	ON	ON	Not used

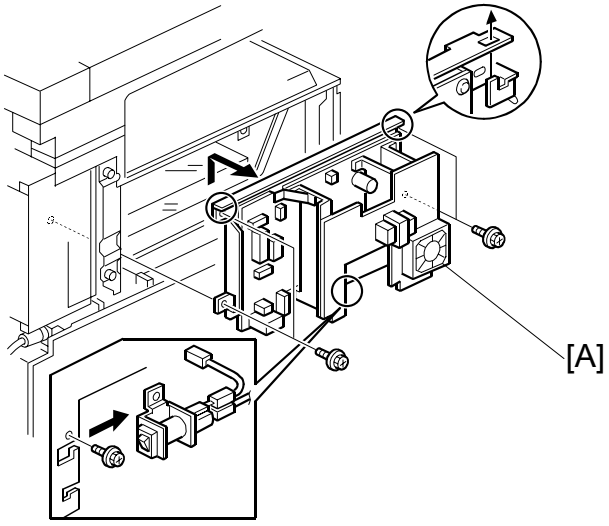
ON: Up
OFF: Down

3.19.3 BICU BOARD



1. I/O Board (☛ 3.19.2)
2. BICU board [A] (🔩 x5, 🖑x all)

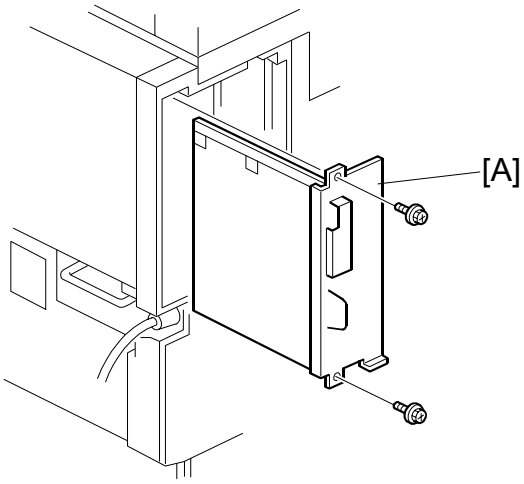
3.19.4 PSU

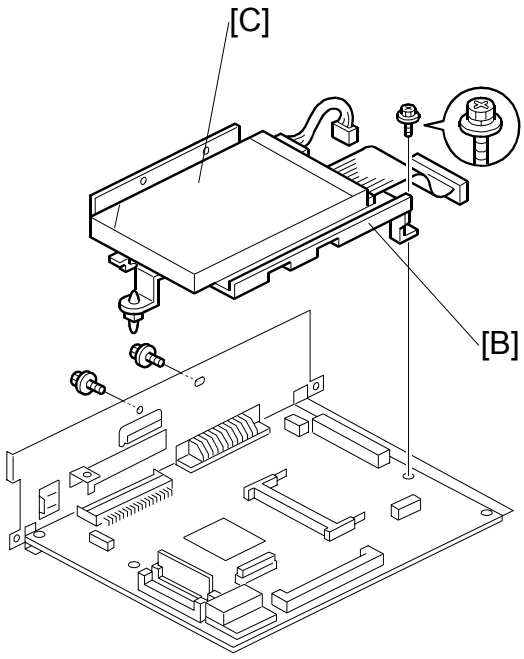


1. Left upper cover (☛ 3.8.1)
2. PSU [A] (🔩 x4, 🖑 x all)

3.20 HARD DISK, CONTROLLER BOARD

NOTE: The controller boards are machine specific, i.e. the controller board for the B135 (35 cpm) must be installed in the B135 copier, and the controller board for the B138 (45 cpm) must be installed in the B138 copier. These controller boards are not interchangeable.





1. Controller board [A] (x 2)
   NOTE: Use the wire handle to slide the HDD out of the expansion box.
2. HDD unit bracket [B] (x 3, x 2)
3. HDD unit [C] (x 4)
   NOTE: Work carefully to avoid dropping or hitting the HDD.

After replacing the HDD, execute SP 5853 to copy the stamp data from the firmware ROM to the new disk. No flash card is needed.

3.21 COPY ADJUSTMENTS: PRINTING/SCANNING

NOTE: 1) Perform these adjustments after replacing any of the following:

- Scanner Wire
- Lens Block/SBU Assembly
- Scanner Drive Motor
- Polygon Mirror Motor
- Paper Side Fence
- Memory All Clear

(☛ Chapter 5, “Service Tables”)

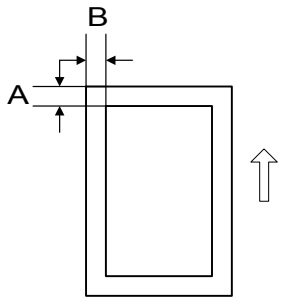
3.21.1 PRINTING

1. Make sure paper is installed correctly in each paper tray before you start these adjustments.
2. Use the Trimming Area Pattern (SP2-902-3, No. 11 to print the test pattern for the following procedures.
3. After completing these printing adjustments, be sure to set SP 2-902-3 to 0 again.

Registration - Leading Edge/Side-to-Side

1. Check the leading edge registration, and adjust it using SP1-001.
   Specification: 3 ± 2mm.
2. Check side-to-side registration for each paper feed station, and adjust with the following SP modes.

	SP mode	Specification
1st paper feed	SP1-002-1	Refer to 5.1.2
2nd paper feed	SP1-002-2	
3rd paper feed (Optional PFU tray 1)	SP1-002-3	
4th paper feed (Optional PTU tray 2)	SP1-002-4	
From the duplex tray	SP1-002-5	
By-pass feed	SP1-002-6	
LCT	SP1-002-7	



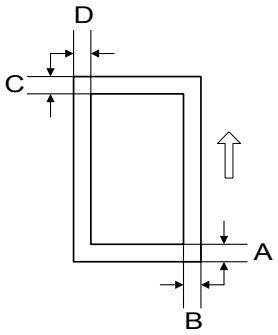
A: Leading Edge Registration
B: Side-to-side Registration

Blank Margin

NOTE: If the leading edge/side-to-side registration cannot be adjusted within specifications, adjust the leading/left side edge blank margin.

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

	SP mode	Specification
Trailing edge	SP2-101-2	3 ± 2 mm
Right edge	SP2-101-4	2 +2.5/-1.5 mm
Leading edge	SP2-101-1	3 ± 2 mm
Left edge	SP2-101-3	2 ± 1.5 mm
Trailing edge (duplex copy, 2nd side)	SP2-101-5	1.2 ± 2 mm
Left edge (duplex copy, 2nd side)	SP2-101-6	0.3 ± 1.5 mm
Right edge (duplex copy, 2nd side)	SP2-101-7	0.3+2.5/-1.5 mm



A: Trailing edge blank margin
B: Right edge blank margin
C: Leading edge blank margin
D: Left edge blank margin

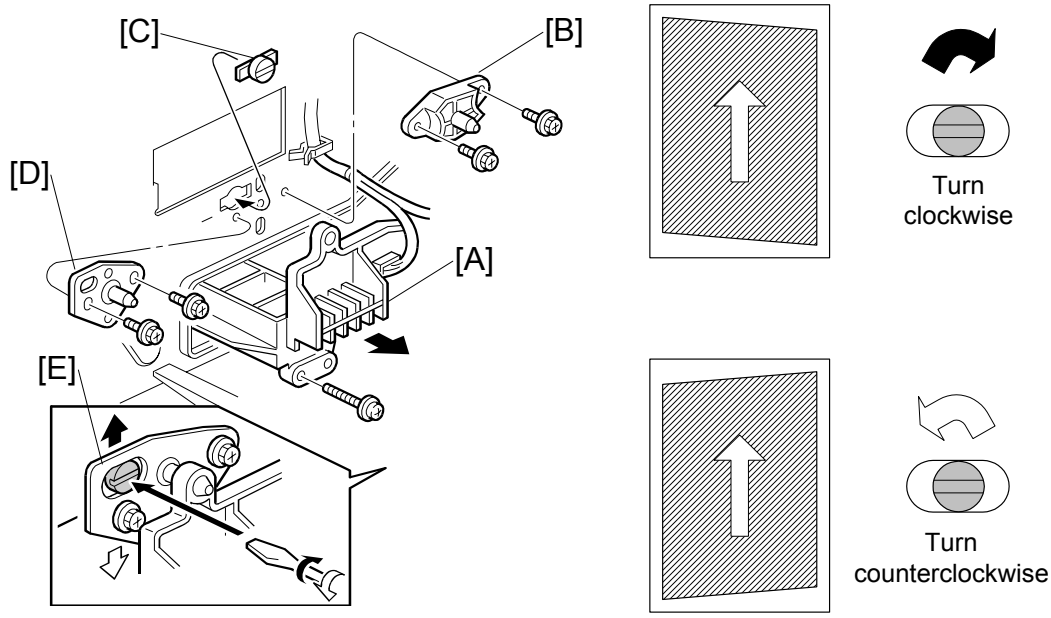
Main Scan Magnification

1. Use SP2-902-3, 5 (Printing Test Pattern, Single-Dot Line) to print a single dot pattern.
2. Check magnification, and then SP2-909-1 (Main Scan Magnification: Copy) to adjust magnification if required. Specification: ±2%.

Parallelogram Image Adjustment

Do the following procedure if a parallelogram prints while adjusting the printing registration or printing margin using a trimming area pattern.

The following procedure should be done after adjusting the side-to-side registration for each paper tray station.



Use SP2-902-3 No. 11 (Printing Test Pattern: Belt Pattern Trimming Area) to determine whether a parallelogram image appears. If the parallelogram pattern appears, perform the following procedure.

1. Laser unit [A]
2. Bracket [B] (☞ x2)
3. Install adjustment cam [C] (P/N: A2309003)
4. Secure positioning pin [D] (P/N A2309004) with the two screws removed with the bracket [B]. Do not tighten the screws at this time.
5. To adjust the position of the laser unit [E]
   1) Adjust the laser unit position by turning the adjustment cam. (See illustration above.)
   2) Tighten the adjustment bracket.
   3) Print the trimming area pattern to check the image. If the results are not satisfactory, repeat steps 1 to 3.

3.21.2 SCANNING

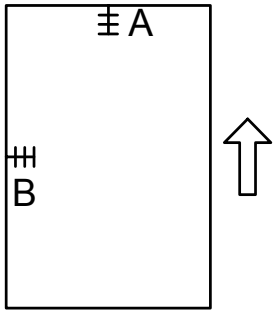
Before doing the following scanner adjustments, perform or check the printing registration/side-to-side adjustment and the blank margin adjustment.

NOTE: Use an OS-S5S 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 them with the following SP modes if necessary.

	SP mode
Leading Edge	SP4-010
Side-to-side	SP4-011



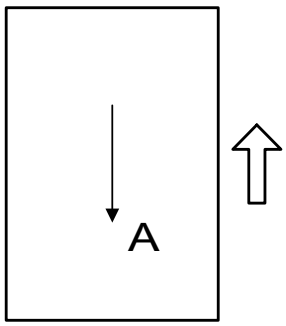
A: Leading Edge Registration
B: Side-to-side Registration

Magnification

Use an OS-S5S test chart to perform the following adjustment.

Sub Scan Magnification

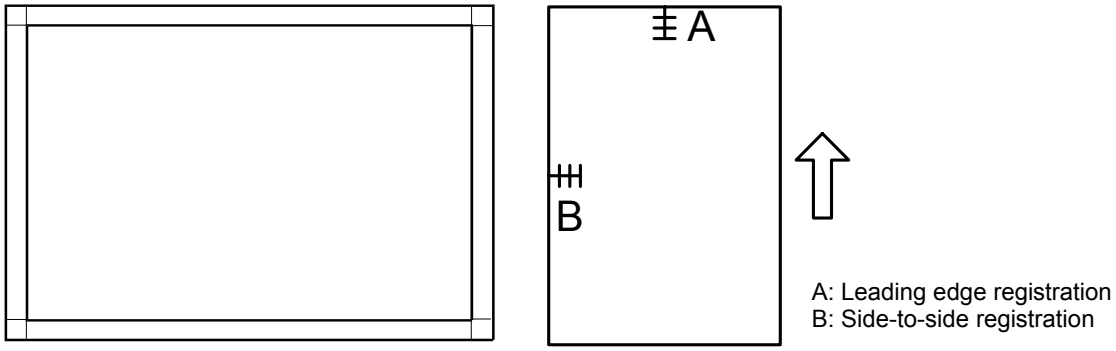
1. Place the test chart on the exposure glass and make a copy from one of the feed stations.
2. Check the magnification ratio. Use SP4-008 (Scanner Sub Scan Magnification) to adjust if necessary.
   Specification: ±0.9%.



A: Main scan magnification

3.21.3 ADF IMAGE ADJUSTMENT

Registration



1. Make a temporary test chart as shown above using A3/DLT paper.
2. Place the temporary test chart on the ADF and make a copy from one of the feed stations.
3. Check the registration, and adjust using the following SP modes if necessary.

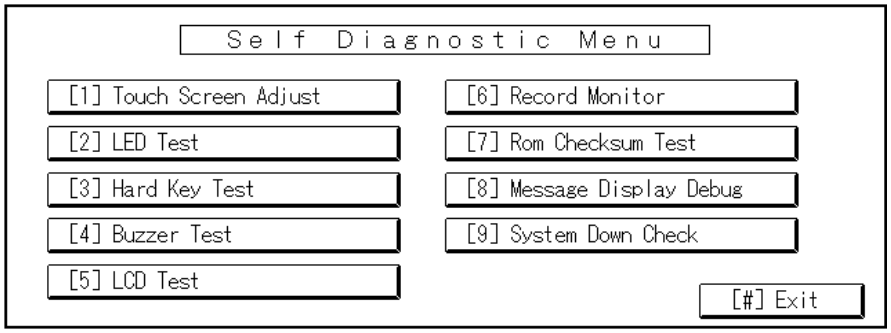
SP Code	What It Does	Adjustment Range
SP6-006-1	Side-to-Side Registration	±3.0 mm
SP6-006-2	Leading Edge Registration (Simplex)	±3.0 mm
SP6-006-3	Leading Edge Registration (Duplex: Front)	±4.2 mm
SP6-006-4	Leading Edge Registration (Duplex: Back)	±4.2 mm

3.21.4 TOUCH SCREEN CALIBRATION

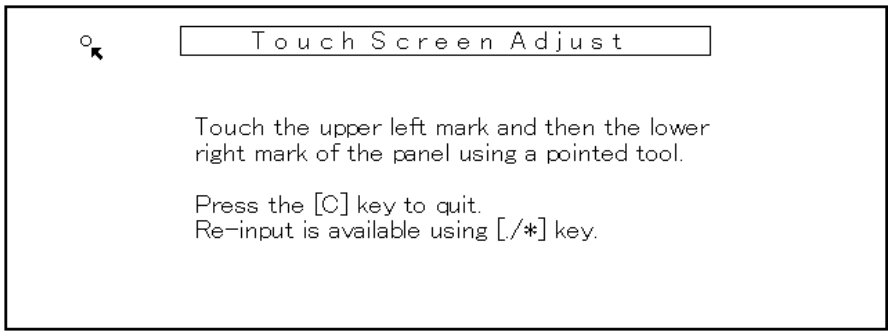
After clearing the memory, or if the touch panel detection function is not working correctly, follow this procedure to calibrate the touch screen.

NOTE: Do not attempt to use items [2] to [9] on the Self-Diagnostic Menu. These items are for design use only.

1. Press [◈], press ①⑨⑨③, and then press [C/©] 5 times to open the Self-Diagnostics menu.



2. On the touch screen press “Touch Screen Adjust” (or press ①).



3. Use a pointed (not sharp!) tool to press the upper left mark ↖.
4. Press the lower right mark ↘ after it appears.
5. Touch a few spots on the touch panel to confirm that the marker (**+**) appears exactly where the screen is touched.

   If the **+** mark does not appear where the screen is touched, press Cancel and repeat from Step 2.
6. When you are finished, press [#] OK on the screen (or press [#]).
7. Touch [#] Exit on the screen to close the Self-Diagnostic menu and save the calibration settings.

TROUBLESHOOTING

4. TROUBLESHOOTING

⚠CAUTION

Never turn off the main power switch when the power LED is lit or flashing. To avoid damaging the hard disk or memory, press the operation power switch to switch the power off, wait for the power LED to go off, and then switch the main power switch off.

NOTE: The main power LED lights or flashes while the platen cover or ARDF is open, while the main machine is communicating with a facsimile or the network server, or while the machine is accessing the hard disk or memory for reading or writing data.

4.1 SERVICE CALL CONDITIONS

4.1.1 SUMMARY

There are 4 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 operation switch and 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 operation 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: 1) If the problem concerns electrical circuit boards, first disconnect then reconnect the connectors before replacing the PCBs.
2) If the problem concerns a motor lock, first check the mechanical load before replacing motors or sensors.

4.1.2 SC CODE DESCRIPTIONS

Code No.		Symptom	Possible Cause
101	C	Exposure lamp error The standard white level was not detected properly when scanning the white plate.	Exposure lamp defective Lamp stabilizer defective Exposure lamp connector defective Standard white plate dirty Scanner mirror or scanner lens out of position or dirty SBU defective
120	B	Scanner home position error 1 The scanner home position sensor does not detect the on condition during initialization or copying.	SIB or scanner drive motor defective Scanner motor defective Harness between SIB and scanner drive motor disconnected Harness between SIB and scanner drive motor power source disconnected Scanner HP sensor defective Harness between SIB and HP sensor disconnected Scanner wire, timing belt, pulley, or carriage defective
121	B	Scanner home position error 2 The scanner home position sensor does not detect the off condition during initialization or copying.	SIB or scanner motor drive board defective Scanner motor defective Harness between SIB and scanner drive motor disconnected Harness between SIB and scanner drive motor power source disconnected Scanner HP sensor defective Harness between SIB and scanner HP sensor disconnected Scanner wire, timing belt, pulley, or carriage defective
130	B	SBU defective Within 1 second after power on, the SOUT signal does not go high, or within 1 second after power on the SOUT signal goes high, but the SBU ID could not be read after two attempts.	SBU defective BICU defective Harness between SBU and BICU disconnected or damaged
131	B	F-Gate asserts during shading F-Gate was asserted by the DF during shading.	While scanning at the DF, a software setting procedure caused an error. You must reboot the machine.
302	C	Charge roller current leak A charge roller current leak signal was detected.	Charge roller damaged High voltage supply board defective PCU harness defective or disconnected
304	C	Charge roller current correction error The charge roller bias correction is performed twice even if the maximum charge roller bias (-2000V) is applied to the roller.	ID sensor defective

Code No.		Symptom	Possible Cause
321	C	F-Gate error: No laser writing signal The laser writing signal (F-GATE) does not go to LOW for more than 30 seconds after the copy paper reaches the registration sensor.	BICU board defective PCI harness between the controller board and the BICU defective or disconnected
322	C	1st laser synchronization error The 1st laser synchronization signal cannot be detected by the main scan synchronization detector board even if the laser diodes are activated.	Poor I/F harness connection between the laser synchronization detector board and the LD unit. Laser synchronization detector board out of position and angle of reflection not correct Laser synchronization detector board defective LD unit defective
323	C	LD drive current over The LD drive board applies more than 100 mA to the LD.	LD unit defective (not enough power, due to aging) Poor connection between the LD unit and the BICU board BICU defective
326	C	2nd laser synchronization error The 2nd laser synchronization signal cannot be detected by the main scan synchronization detector board even if the laser diodes are activated.	Poor connection between the laser synchronization detector board and the LD unit. Laser synchronization detector board out of position Laser synchronization detector board defective LD unit defective
327	B	LD unit home position error 1 The LD unit home position sensor does not detect an on condition when the LD unit moves to its home position.	HP sensor/harness defective LD unit home position sensor defective LD positioning motor harness defective LD unit movement blocked because of incorrect connector routing
328	B	LD unit home position error 2 The LD unit home position sensor does not detect an off condition when the LD unit moves from its home position.	HP sensor/harness defective LD positioning/harness motor defective LD unit movement blocked because of incorrect connector routing
329	B	LD unit beam pitch adjusted incorrectly The LD unit HP sensor does not detect the ON condition while changing the LD unit position for correcting the LD position or changing the dpi.	After initialization of the SP modes, SP2-109-3 or SP2-109-4 was not executed. The harness is blocking the LD drive (PCB), preventing adjustment of the pitch.
335	C	Polygonal Mirror Motor Error 1: ON Timeout	I/F harness of the polygonal mirror motor disconnected or defective. Polygonal mirror motor or polygonal mirror motor driver defective. Polygonal mirror motor drive pulse is not output incorrectly. GABIC cannot monitor XSCRDY signal.

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Code No.		Symptom	Possible Cause
336	C	Polygonal Mirror Motor Error 2: OFF Timeout The XSCRDY signal is not issued (HIGH: Inactive) within 2 s after the polygonal mirror motor switches off.	I/F harness of the polygonal mirror motor disconnected or defective. Polygonal mirror motor or polygonal mirror motor driver defective. Polygonal mirror motor drive pulse is not output incorrectly. GABIC cannot monitor XSCRDY signal.
337	C	Polygonal Mirror Motor Error 3: XSCRDY Signal Error The XSCRDY is not issued (HIGH: Inactive) after the polygonal mirror motor has been rotating normally for 600 ms.	I/F harness of the polygonal mirror motor disconnected or defective. Polygonal mirror motor or polygonal mirror motor driver defective. Polygonal mirror motor drive pulse is not output incorrectly. GABIC cannot monitor XSCRDY signal.
338	C	Polygonal Mirror Motor Error 4: Unstable Timeout The XSCRDY signal is detected LOW (Active) after the polygonal mirror motor switches on, but the signal is not detected LOW after 1 s has elapsed, and not detected after another 500 ms has elapsed.	I/F harness of the polygonal mirror motor disconnected or defective. Polygonal mirror motor or polygonal mirror motor driver defective. Polygonal mirror motor drive pulse is not output incorrectly. GABIC cannot monitor XSCRDY signal.
350	C	ID sensor pattern test error One of the following ID sensor output voltages was detected twice consecutively when checking the ID sensor pattern. 1) Vsp ≥ 2.5V 2) Vsg ≤ 2.5V 3) Vsp = 0V 4) Vsg = 0V	ID sensor defective ID sensor connector defective Poor ID sensor connector connection I/O board (IOB) defective High voltage supply board defective ID sensor dirty Defect at ID sensor pattern writing area of the drum
351	C	ID sensor Vsg test error When the ID sensor was checked, the ID sensor output voltage was 5.0V while the PWM signal input to the ID sensor was 0.	ID sensor defective ID sensor connector defective Poor ID sensor connection I/O board (IOB) defective Scanning system defective High voltage supply board defective ID sensor dirty Defect at the ID sensor pattern writing area of the drum
352	C	ID sensor, pattern edge detect error The ID sensor pattern edge voltage is detected to be not 2.5V twice consecutively during an 800 ms interval.	ID sensor defective ID sensor connector defective Poor ID sensor connector connection I/O board (IOB) defective High voltage supply board defective Dirty ID sensor Defect at the ID sensor pattern writing area of the drum

Code No.		Symptom	Possible Cause
353	C	ID sensor, LED current abnormal at initialization One of the following ID sensor output voltages is detected at ID sensor initialization. 1) Vsg < 4.0V when the maximum PWM input (255) is applied to the ID sensor. 2) Vsg ≥ 4.0V when the minimum PWM input (0) is applied to the ID sensor.	ID sensor defective ID sensor harness defective ID sensor connector defective Poor ID sensor connection I/O board (IOB) defective Exposure system defective High voltage supply board defective Dirty ID sensor
354	C	ID sensor timeout abnormal at adjustment Vsg falls out of the adjustment target (4.0 ± 0.2V) at the start of Vsg checking after 20 seconds	ID sensor defective ID sensor harness defective ID sensor connector defective I/O board (IOB) defective Exposure system defective Poor ID sensor connector connection High voltage supply board defective Dirty ID sensor
390	C	TD sensor error: Test value abnormal The TD sensor output voltage is less than 0.5V or more than 5.0V after 10 consecutive times during copying.	TD sensor defective TD sensor not connected or connector damaged Poor connection between the TD sensor and the I/O board (IOB) I/O board (IOB) defective Toner supply defective
391	C	TD sensor error: Auto adjust error During automatic adjustment of the TD sensor, output voltage is less than 1.8V or more than 4.8V during TD sensor initial setting.	TD sensor abnormal TD sensor disconnected Poor TD sensor connection I/O Board (IOB) defective Toner supply defective
395	C	Development output abnormal A development bias leak signal is detected. High voltage output to the development unit exceeded the upper limit (65%) for 60 ms.	High voltage supply board defective Poor connection at the development bias terminal Poor connection at the high voltage supply board
401	C	Transfer roller leak detected A transfer roller current leak signal is detected.	High voltage supply board defective Poor cable connection or defective cable Transfer connector defective
402	C	Transfer roller open error The transfer roller current feedback signal is not detected.	High voltage supply board defective Transfer connector cable defective Transfer connector defective Poor PCU connection
403	C	Transfer belt position sensor error The transfer belt position sensor does not activate even if the transfer belt contact clutch has been switched on twice and rotated once.	Main motor/drive malfunction Transfer belt contact clutch defective Harness disconnected

Code No.		Symptom	Possible Cause
405	C	Transfer belt error The transfer belt does not move away from the drum during ID sensor pattern checking.	Main motor/drive malfunction Transfer belt position sensor defective Poor transfer belt position sensor connection
440	C	Main motor lock A main motor lock signal is not detected within 2 seconds after the main motor turns on.	Too much load on the drive mechanism Main motor defective
450	C	Feed Development Motor Error The PLL lock signal remains LOW for 2 s while the feed development motor is operating.	Motor lock caused by overload. Motor driver defective.
490	C	Exhaust fan motor lock An exhaust fan motor lock signal is not detected within 5 seconds after the exhaust fan motor turns on.	Too much load on the drive mechanism Exhaust fan motor defective or a loose object is interfering with the fan Poor fan motor connector connection
492	C	Cooling fan motor lock A cooling fan motor lock signal is not detected within 5 seconds after the cooling fan motor turns on.	Too much load on the drive mechanism Cooling fan motor defective or a loose object is interfering with the fan Poor fan motor connector connection
501	C	1st Tray lift malfunction The paper height sensor is not activated after the tray lift motor has been on for 10 seconds. If the main power switch is turned on when the paper is already at the feed height, the paper height position is detected again. At this time, the paper height sensor should de-activate within 5 seconds after the paper bottom plate starts to drop. If it does not deactivate within 5 s four times consecutively, a message will prompt the user to reset Tray 1. After two attempts to release the error by re-setting the paper tray, if this does not solve the problem then this SC is displayed.	Lift motor malfunction or disconnected Height sensor abnormal, or connector loose Loose paper or object between the tray and motor Pick-up arm malfunction
502	C	2nd Tray lift malfunction The paper height sensor is not activated after the tray lift motor has been on for 10 seconds. If the main power switch is turned on when the paper is already at the feed height, the paper height position is detected again. At this time, the paper height sensor should de-activate within 5 seconds after the paper bottom plate starts to drop. If it does not deactivate within 5 s four times consecutively, a message will prompt the user to reset Tray 2. After two attempts to re-set the paper tray, if this does not solve the problem then this SC is displayed.	Lift motor abnormal or disconnected Height sensor defective or disconnected Loose paper or object between the tray and motor Pick-up arm malfunction

Code No.		Symptom	Possible Cause
503	C	3rd Tray lift malfunction (optional paper tray unit) The paper height sensor is not activated after the tray lift motor has been on for 13 seconds. If the main power switch is turned on when the paper is already at the feed height, the paper height position is detected again. At this time, the paper height sensor should de-activate within 5 seconds after the paper bottom plate starts to drop. If it does not deactivate within 5 s four times consecutively, the tray lift motor halts. After two attempts to re-set the paper tray, if this does not solve the problem, then this SC is displayed and tray control halts.	Tray lift motor defective or disconnected Height sensor defective or disconnected
504	C	4th Tray lift malfunction (optional paper tray unit) The paper height sensor is not activated after the tray lift motor has been on for 13 seconds. If the main power switch is turned on when the paper is already at the feed height, the paper height position is detected again. At this time, the paper height sensor should de-activate within 5 seconds after the paper bottom plate starts to drop. If it does not deactivate within 5 s four times consecutively, the tray lift motor halts. After two attempts to re-set the paper tray, if this does not solve the problem, then this SC is displayed and tray control halts.	Tray lift motor defective or disconnected Height sensor defective or disconnected
506	C	Paper tray unit main motor lock (optional paper tray) A main motor lock signal is detected for more than 50 ms during rotation.	Paper tray unit main motor defective Paper tray unit main motor connection loose Too much load on the drive mechanism
507	C	LCT main motor lock (optional LCT) A main motor lock signal is detected for more than 50 ms during rotation.	LCT main motor defective Paper tray unit main motor connection loose Too much load on the drive mechanism

Code No.		Symptom	Possible Cause
510	C	LCT tray malfunction 1) The LCT lift sensor does not activate for more than 18 seconds after the LCT lift motor turned on. 2) The LCT lower limit sensor does not activate for more than 18 seconds after the LCT lift motor turned on. 3) The LCT lift sensor is already activated when the LCT lift motor turns on. 4) After the paper end sensor is actuated while the tray is raising, the upper limit sensor is not actuated within 5 s. A message is displayed to remind the user to set the paper and tray control halts. Resetting the display is done by opening and closing the LCT door. 5) The 4) state has been detected 3 times in succession.	LCT lift motor defective or disconnected. Upper limit sensor defective or disconnected Pick-up solenoid defective or disconnected Paper end sensor defective
520	C	Fusing/Feed-Out Motor Error The PLL lock signal remains LOW for 2 s while the feed development motor is operating.	Motor lock caused by overload. Motor driver defective.
541	A	Fusing thermistor open The fusing temperature detected by the thermistor was below 7°C (44.6°F) for 5 seconds, or 2 seconds after reaching 45°C (113°F) the temperature does not reach an additional 15°C (59°F) after checking five times at 0.1 intervals.	Fusing thermistor disconnected Fusing thermistor connector defective Fusing thermistor damaged or warped Fusing temperature –15% less than the standard input voltage
542	A	Fusing temperature warm-up error The fusing temperature does not reach the fusing standby temperature of 45°C (113°F) within 9 seconds for the B135 (35 cpm) 14 seconds for the B138 (45 cpm) after switching on the main power or closing the front cover, or 40 seconds after reaching 50°C the fusing roller does not reach warm-up temperature.	Fusing lamp defective Poor fusing unit connector Thermistor warped or broken Thermostat has tripped BICU defective Power supply board defective
543	A	Fusing overheat error (software detection) A fusing temperature of over 230°C (446°F) is detected for 5 seconds by the fusing thermistors at the center or at either end of the fusing roller.	Power supply unit defective I/O board (IOB) defective BICU defective Fusing thermistor defective

Code No.		Symptom	Possible Cause
544	A	Fusing overheat error (hardware circuit detection) The dual monitoring circuitry of the BICU detects extremely high temperature and tripped the relay circuit off.	Power supply unit defective I/O board (IOB) defective BICU defective Fusing thermistor defective
545	A	Fusing lamp remains on After warm-up the fusing lamp remains at full power for 10 seconds without the hot roller rotating.	Thermistor is out of position.
546	A	Fusing ready temperature unstable The fusing temperature is fluctuating.	Thermistor connection loose Fusing unit connector loose
547	B	Zero cross signal malfunction The applied power supply ac frequency was detected at over 66Hz or below 45Hz, and the zero cross signals are not detected within a certain period within 500 ms after the main power switch has been turned on.	Power supply board defective Noise on the ac power line
548	A	Fusing unit installation error The machine cannot detect the fusing unit when the front cover and right cover are closed.	Fusing unit is not installed Fusing unit connection loose
599	C	1-bin tray motor lock (optional 1-bin tray unit) A 1-bin tray motor lock signal is not detected for more than 300 ms during rotation.	1-bin tray motor locked from overload 1-bin tray motor defective 1-bin tray motor connection loose
601	C	Communication error between BICU and scanner unit Within 800 ms after power on, after 3 attempts the BICU does not communicate with the SIB via the serial line.	Serial line connecting the BICU and SIB defective External noise on the serial line SIB board defective BICU board defective
610	C	Communication timeout error between BICU and ARDF The BICU cannot receive a response within 100 ms after 3 attempts after sending data to the ARDF.	BICU board and ARDF main board serial line connection defective External noise ARDF main board defective BICU board defective
611	C	Communication break error between BICU and ARDF The BICU receives a break signal from the ARDF main board.	Serial line connecting BICU and ARDF unstable External noise ARDF main board defective BICU board defective
612	C	Communication command error between BICU and ARDF The BICU sends a command to the ARDF main board that it cannot execute.	Abnormal operation performed by software

Code No.		Symptom	Possible Cause
620	C	Communication timeout error between BICU and finisher. The BICU cannot receive a response within 100 ms after 3 attempts after sending data to the finisher or mailbox.	Serial line connecting BICU and finisher unstable External noise BICU board and finisher main board connection defective or loose Finisher main board defective BICU board defective
621	C	Communication timeout error between BICU and finisher. A break (low) signal was received from the finisher.	Serial line connecting BICU and finisher unstable External noise
623	C	Communication timeout error between BICU and paper tray unit The BICU cannot receive a response within 100 ms after 3 attempts after sending data to the paper tray unit.	Serial line connecting BICU and paper tray unit unstable External noise BICU board and paper tray main board connection defective or loose Paper tray main board defective BICU board defective
624	C	Communication break error between BICU and paper tray unit The BICU cannot communicate with the paper tray unit normally as a result of receiving a break signal.	Serial line connecting BICU and paper tray unit unstable External noise BICU board and LCT main board connection defective or loose Optional paper feed unit interface board defective BICU board defective
626	C	Communication timeout error between BICU and LCT The BICU cannot receive a response within 100 ms after 3 attempts after sending data to the LCT.	Serial line connecting BICU and LCT unit unstable External noise BICU board and LCT main board connection defective or loose LCT interface board defective BICU board defective
627	C	Communication break error between BICU and LCT The BICU cannot communicate with the LCT unit normally as a result of receiving a break signal.	Serial line connecting BICU and LCT unit unstable External noise BICU board and LCT main board connection defective or loose LCT interface board defective BICU board defective
630	D	SC630 Communication failure with CSS (RSS) The communication from the copier was detected as abnormal at the CSS center. This error occurs when the acknowledge signal from the LADP does not complete normally.	Occurred with a SC call, CC call, Supply Management call, User call, or CE call. Timeout while no response from the LADP, and signal on the RS-485 line between PI and LADP is abnormal.
640	D	BICU control data transfer sumcheck error A sampling of control data sent from the BICU to the controller reveals a sumcheck error. Only the logging count is performed.	Controller board defective External noise BICU board defective

Code No.		Symptom	Possible Cause
641	D	BICU control data transfer abnormal A sampling of the control data sent from the BICU reveals an abnormality.	Controller board defective External noise BICU board defective
670	B	Engine response error After powering on the machine, a response is not received from the engine within the specified time.	BICU installed incorrectly BICU defective Controller board defective
672	B	Controller-to-operation panel communication error at startup After powering on the machine, the communication circuit between the controller and the operation panel is not opened, or communication with controller is interrupted after a normal startup.	Controller stall Controller board installed incorrectly Controller board defective Operation panel connector loose or defective
690	A	GAVD block I^2C bus error An error is detected in the GAVD communication I^2C control register of the GABIC2.	I^2C bus on BICU defective
691	A	GAVD FCI block I^2C bus error An error is detected in the FCI communication I^2C control register of the GABIC2.	I^2C bus on BICU defective
692	A	CDIC GAVD block I^2C bus error An error is detected in the CDIC communication I^2C control register of the GABIC2.	I^2C bus on BICU defective
700	B	ARDF original pick-up malfunction After the pick-up motor is turned on, the original stopper HP sensor is not detected.	Original stopper HP sensor (output abnormal) Pick-up motor defective (not rotating) Timing belt out of position ARDF main board defective
701	B	ARDF original pick-up/paper lift mechanism malfunction The original pick-up HP sensor does not activate three times consecutively after the pick-up motor has turned on.	Original pick-up HP sensor defective. Pick-up motor defective ARDF main board defective
722	B	Finisher jogger motor error The finisher jogger HP sensor does not return to the home position, or move out of the home position, within the specified time.	Jogger HP sensor defective Jogger motor defective
724	B	Finisher staple hammer motor error Stapling does not finish within 600 ms after the staple hammer motor turned on.	Staple jam Stapler overload caused by trying to staple too many sheets Staple hammer motor defective

Code No.		Symptom	Possible Cause
725	B	Finisher stack feed-out motor error The stack feed-out belt HP sensor does not activate within a certain time after the stack feed-out motor turned on.	Stack feed-out HP sensor defective Stack feed-out motor overload Stack feed-out motor defective
726	B	Finisher shift tray 1 lift motor error Tray shift does not finish within the specified time after the shift motor turned on, or the stack height sensor does not activate within the specified time after the shift tray lift motor turned on.	Shift motor defective or overloaded Shift tray lift motor defective or overloaded
727	B	Finisher stapler rotation motor error Stapler rotation does not finish within the specified time after the staple rotation motor turned on, or the stapler does not return to its home position within the specified time after stapling finished.	Stapler rotation motor defective or overloaded Stapler rotation motor connection loose or connector defective
729	B	Finisher punch motor error After the punch motor is turned on, the punch HP sensor does not activate within the specified time.	Punch motor defective or overloaded Punch HP sensor defective Punch motor connection loose or connector defective
730	B	Finisher stapler positioning motor error After the stapler motor is turned on, the stapler does not return to its home position within the specified time, or the stapler HP sensor does not activate within the specified time after the stapler motor is turned on.	Stapler positioning motor defective or overloaded Stapler HP sensor defective Stapler positioning motor connection loose or connector defective
731	B	Finisher exit guide open/close motor error After the finisher exit guide open/close motor is turned on, the open/close sensor does not activate within the specified time.	Finisher exit guide open/close motor defective Open/close sensor defective
732	C	Finisher upper tray shift motor error The upper tray shift motor does not stop operation with the specified time.	Upper tray shift motor defective or overloaded Upper tray shift sensor defective
733	C	Finisher lower tray lift motor error The stack height sensor does not activate within a certain time period after the lower tray lift motor turned on.	Lower tray lift motor defective or overloaded Upper stack height sensor defective Lower tray lower limit sensor defective
734	C	Finisher lower tray shift motor error The lower tray shift motor driving the lower tray does not stop within the specified time.	Lower tray shift motor defective or overloaded Lower tray shift sensor defective
740		Refer to page 4-13	
741		Refer to page 4-15	
800	B	Startup without video output end error (K) Video transfer to the engine is started, but a video transmission end command was not issued by the engine within the specified time.	Control board defective

Code No.		Symptom		Possible Cause
740	D	**Booklet finisher error in finisher area**		
		01	**Shutter movement error**	• Transport motor defective • Shutter position switch defective • Shift tray safety switch defective
			1) The shutter position switch does not turn on within 1 second after the transport motor starts to turn in reverse. 2) The shutter sensor does not deactivate within 1 second after the transport motor starts to turn in reverse. 3) The shutter position switch is off when the shift tray safety switch is off.	
		02	**Exit motor error**	• Exit motor defective • Exit motor sensor defective
			1) After the exit motor turns on, the exit motor sensor does not send the proper signal to the finisher board. 2) The exit motor sensor does not send the clock signal to the finisher board for certain period while the exit motor is on.	
		03	**Upper exit plate movement error**	• Guide plate motor defective • Upper exit guide 2 switch defective • Upper exit guide sensor defective • Shift tray safety switch defective
			1) The upper exit guide 2 switch does not turn on within 1s after the guide plate motor turns on. 2) The upper exit guide sensor does not activate within 1s after the guide plate motor turns on. 3) The upper exit guide 2 switch does not turn on when the shift tray safety switch is off.	
		04	**Jogger motor error**	• Jogger motor defective • Jogger HP sensor defective
			1) After the jogger motor turns on to move the jogger fence from its home position, the jogger HP sensor does not deactivate within 2s. 2) After the jogger motor turns on to return the jogger fence to its home position, the jogger HP sensor does not activate within 2s.	

⟹ **NOTE:** SC740/741 (Booklet Finisher-related errors) are in the following section: **4.6 Reading SC 740/741 Errors from LED2. (Page 4-23)** The section describes the method for using the LED to read the details for SC740/741, as this information is not displayed on the machine operation panel.

800	B	Startup without video output end error (K) Video transfer to the engine is started, but a video transmission end command was not issued by the engine within the specified time.	• Control board defective
804	B	Startup without video input end (K) A video transmission was requested from the scanner, but a video transmission end command was not issued by the scanner within the specified time.	• Control board defective

Code No.		Symptom	Possible Cause
818	B	Watch Dog Error	
		While the system program is running, a bus hold or interrupt program goes into an eternal loop, preventing any other programs from executing.	• System program defective • Controller board defective • Peripheral device malfunction
819	B	Kernel mismatch error	• Software application error
820	B	Self-Diagnostic Error: CPU	• Controller board defective • Software defective
		The central processing unit returned an error during the self-diagnostic test.	
821	B	Self-Diagnostic Error: ASIC	• Controller board defective
		The ASIC returned an error during the self-diagnostic test because the ASIC and CPU timer interrupts were compared and determined to be out of range.	
822	B	Self-Diagnostic Error: HDD	• HDD defective • HDD connector defective • Controller board defective
		The hard disk drive returned an error during the self-diagnostic test.	
823	B	Self-diagnostic Error: NIB	• Network interface board defective • Controller board defective
		The network interface board returned an error during the self-diagnostic test.	
824	B	Self-diagnostic Error: NVRAM	• NVRAM damaged or abnormal • Backup battery has discharged • NVRAM socket damaged
		The resident non-volatile RAM returned an error during the self-diagnostic test.	
826	B	Self-diagnostic Error: NVRAM/Optional NVRAM	• NVRAM defective
		The NVRAM or optional NVRAM returned an error during the self-diagnostic test.	
827	B	Self-diagnostic Error: RAM	• Memory malfunction
		The resident RAM returned a verify error during the self-diagnostic test.	
828	B	Self-diagnostic Error: ROM	• Controller board defective • Firmware defective
		The resident read-only memory returned an error during the self-diagnostic test.	
829	B	Self-diagnostic Error: Optional RAM	• RAM DIMM defective • Controller board defective
		The optional RAM returned an error during the self-diagnostic test.	
835	B	Self-Diagnostic Error: Parallel Interface	• Loopback connector not detected • IEEE1284 connector defective • Controller board defective

Code No.	Symptom		Possible Cause
836	**B**	Self-diagnostic Error: Resident Font ROM	• Font ROM defective
		The resident font ROM returned an error during the self-diagnostic test.	
837	**B**	Self-diagnostic Error: Optional Font ROM	• Font ROM defective
		The optional font ROM returned an error during the self-diagnostic test.	
840	**C**	Self-Diagnostic Error 1: EEPROM Access Error	• EEPROM defective • EEPROM worn out
		During input/output with the EEPROM, one of the following errors occurred: • A read error occurred, then continued after 3 retries. • Write error occurred.	
841	C	Self-Diagnostic Error 2: EEPROM Read/Write Data Error	• The data is being written into the 3 designated errors differently
		The values of the data written and “mirrored” in 3 errors are all detected as not matching..	
850	**B**	Network I/F Abnormal	• NIB defective • Controller board defective
		NIB interface error.	
851	**B**	IEEE 1394 I/F Abnormal	• IEEE1384 interface board defective Controller board defective
		IEEE1394 interface error.	
853	B	Wireless LAN Error: Card Error 1	• Wireless LAN card not inserted into the wireless LAN board
		The wireless LAN board can be accessed, but the wireless LAN card (IEEE 802.11b or Bluetooth) cannot access the board.	
854	B	Wireless LAN Error Card Error 2	• Wireless LAN card has been removed
		The board that holds the wireless LAN card can be accessed, but the wireless LAN card (802.11b/Bluetooth) itself cannot be accessed while the machine is operating	
855	B	Wireless LAN Error 3: Card Error 3	• Wireless LAN card defective • Wireless card connection not tight
		An error is detected for the wireless LAN card (802.11b or Bluetooth).	
856		Wireless LAN Error 4: Board	• Wireless LAN card board defective • PCI connector loose
		An error is detected for the wireless LAN card (802.11b or Bluetooth).	
857	B	USB I/F Error	• The USB driver can generate three types of errors: RX, CRC, and STALL errors. Only the STALL error can generate this SC code.
		The USB driver is unstable and generated an error. The USB I/F cannot be used.	

Code No.	Symptom		Possible Cause
860	**C**	Startup without HD connection at main power on The hard disk connection is not detected.	• Cable between HDC and HD loose or defective • HD power connector loose or defective • HD defective • HDC defective
861	**C**	Startup without HD detection at power key on The hard disk connection is not detected.	• Cable between HDC and HD loose or defective • HD power connector loose or defective • HD defective • HDC defective
862	**A**	Maximum number of bad sectors detected on HD Up to 101 bad sectors have appeared in the area on the hard disk where image data is archived, and the hard disk may require replacement.	• SC863 returned while reading data from the HD and the number of registered bad sectors reached 101.
863	**B**	Startup without HD data lead Data stored on the hard disk is not read correctly.	• A bad sector occurred during operation of the HD
864	**B**	HD data CRC error During operation of the HD, the HD responded with a CRC error.	• Data transfer was abnormal in the data read from the HD.
865	**B**	HD access error The hard disk detected an error.	• Error detected other that the bad sectors error (SC863) or the CRC error (SC864)
870	B	Address Book Data Error Address book data stored on the hard disk was detected as abnormal when it was accessed from either the operation panel or the network.	• Software defective • HDD defective
871	B	FCU Flash ROM Error The address book written into the flash ROM mounted on the FCU is detected as defective.	• Flash ROM device defective • Replace flash ROM on the MBU
880	B	MLB Error A request for access to the MLB (Media Link Board) was not answered within the specified time.	• MLB defective
900	B	Electronic total counter error The value of the total counter has already exceeded 9,999,999	• NVRAM defective
901	B	SC901 Mechanical total count error The IO board cannot receive the mechanical total count data.	• Mechanical total counter defective

CodeNo.		Symptom	Possible Cause
920	B	Printer Error 1 An internal application error was detected and operation cannot continue.	• Software defective • Insufficient memory
925	**B**	Network File Error NIA	• NIA
951	**C**	F-gate error at write request After the IPU receives an F-gate signal, it receives another F-gate signal.	• Software defective • BICU defective
953	**C**	Scanner setting error During scanned image processing, another command to start scanning was received.	• Software defective
954	B	Printer setting error The IPU does not respond with the settings that are required to start image processing by the printer.	• Software defective
955	**C**	Memory setting error The IPU does not respond with the settings that are required to start image processing using the memory.	• Software defective
964	**C**	Scanner Start Error During scanned image processing, another command to start scanning was received.	• Software defective
984	**B**	Print image data transfer error The image transfer from the controller to the engine via the PCI bus does not end within 15 s after starting.	• Controller board defective • BICU defective Connectors between BICU and controller loose or defective
985	**B**	Scanner image data transfer error The image transfer from the engine to the controller via the PCI bus does not end within 3 s after starting.	• Controller board defective • BICU defective • Connectors between BICU and controller loose or defective • SIB defective
986	**C**	Software write parameter setting error An unstable area at the storage destination in the settings table is set NULL for the parameter received by the write module.	• Software defective

CodeNo.	Symptom		Possible Cause
990	**B**	Software performance error The software attempted to perform an unexpected operation.	• Software defective • Internal parameter incorrect • Insufficient working memory When this SC occurs, the file name, address, and data will be stored in NVRAM. This information can be checked by using SP7-403. Note the above data and the situation in which this SC occurs. Then report the data and conditions to your technical control center.
992	**A**	Unexpected Software Error Software encountered an unexpected operation not defined under any SC code.	• Software defective • An error undetectable by any other SC code occurred
995	**A**	Machine Type Information Error After the machine is powered on, a mismatch is detected between the CPM information sent from the controller to the engine and the CPM information specified by the DIP SW settings.	• The B135 (35 cpm) and B138 (45 cpm) use the same controller board, but the DIP SW settings must be set correctly for the machine speed. For details, see Section "3. Replace and Adjustment".
996	B	FCU board error FCU board is connected but not ready.	• FCU board defective and requires replacement • Firmware incorrect
997	B	Application function selection error The application selected by a key press on operation panel does not start or ends abnormally.	• Software defective • An option required by the application (RAM, DIMM, board) is not installed
998	B	Application start error After power on the application does not start within 60 s. (All applications neither start nor end normally.)	• Software defective • An option required by the application (RAM, DIMM, board) is not installed
999	B	Program download error The download (program, print data, language data) from the IC card does not execute normally.	• Board installed incorrectly • BICU 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 controller board or the PCB targeted for the download and prevent subsequent downloading. If this problem occurs, the damaged PCB must be replaced.

Trouble shooting

4.2 ELECTRICAL COMPONENT DEFECTS

4.2.1 SENSORS

Component (Symbol)	CN	Condition	Symptom
Scanner Home Position (S1)	504-5(SIB)	Open	SC121 is displayed.
		Shorted	SC120 is displayed.
Platen Cover (S2)	504-8 (SIB)	Open	APS and ARE do not function properly.
		Shorted	No symptom.
Original Width (S3)	505-3, 4 (SIB)	Open	CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
Original Length-1 (S4)	505-8,9 (SIB)	Open	CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
Original Length-2 (S5)	505-13 (SIB)	Open	CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
LD Unit Home Position (S6)	204-B2 (IOB)	Open	SC328 is displayed when the laser beam pitch is changed.
		Shorted	SC327 is displayed when the laser beam pitch is changed.
Toner Density (TD) (S7)	222-5 (IOB)	Open	The add toner indicator blinks even if there is toner in the development unit.
		Shorted	SC390-01 is displayed.
Paper Exit (S8)	202-B2 (IOB)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Registration (S9)	224-B2 (IOB)	Open	The Paper Jam indicator lights even if there is no paper.
		Shorted	The Paper Jam indicator will light whenever a copy is made.
Image Density (ID) (S10)	203-5 (IOB)	Open	SC350-03 is displayed after copying.
		Shorted	SC350-01 is displayed after copying.
Upper Paper Height (S11)	220-2 (IOB)	Open	Add Paper is displayed even if there is paper. If this condition occurred four times, SC501-02 will be displayed.
		Shorted	SC501-01 is displayed.
Lower Paper Height (S12)	214-2 (IOB)	Open	Add Paper is displayed even if there is paper. If this condition occurred four times, SC502-02 will be displayed.
		Shorted	SC502-01 is displayed.
Upper Paper End (S13)	220-8 (IOB)	Open	The Paper End indicator lights even if paper is placed in the upper paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the upper paper tray.

Component (Symbol)	CN	Condition	Symptom
Lower Paper End (S14)	214-8 (IOB)	Open	The Paper End indicator lights even if paper is placed in the lower paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the lower paper tray.
Upper Relay (S15)	220-5 (IOB)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Lower Relay (S16)	214-5 (IOB)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Transfer Belt Position (S19)	202-A10 (IOB)	Open	No symptom
		Shorted	SC403 is displayed

4.2.2 SWITCHES

Component (Symbol)	CN	Condition	Symptom
Right Lower Cover (SW1)	216-4 (IOB)	Open	“Doors/Covers Open” is displayed even if the right lower cover is closed.
		Shorted	The LCD goes blank when the lower cover is opened.
Main (SW3)	102-1~4 (PSU) 107-1	Open	The machine does not turn on.
		Shorted	The machine does not turn off.
Front Cover Safety (SW4)	107-1 (PSU)	Open	“Doors/Covers Open” is displayed even if the front cover is closed.
		Shorted	“Doors/Covers” Open is not displayed even if the front cover is opened.

4.3 BLOWN FUSE CONDITIONS

Fuse	Rating		Symptom at power on
	115V	210 ~ 230V	
Power Supply Board			
FU1	6.3A / 125V	6.3A / 250V	“Doors/Covers Open” is displayed
FU2	6.3A / 125V	6.3A / 250V	“Doors/Covers Open” for the finisher is displayed
FU3	6.3A / 125V	6.3A / 250V	Paper end condition
FU5	6.3A / 125V	6.3A / 250V	SC302, or SC403, or SC405 displayed
FU6	3.15A/125V	3.15A/250V	
FU9	4A/125V	4A/250V	
FU101	15A / 125V	---	No response
FU102	10A / 125V	5A / 250V	No response
FU103	2A / 125V	1A / 250V	Normal operation (optional heaters do not work)

4.4 LEDS

BICU LED Sequences

	LED 101 (Green)	LED 102 (Red)	LED 103 (Orange)
Normal Operation	Flashes	Off	Flashes
System Startup	Flashes	On (1~2s) then Off	Flashes
Firmware Update: Normal Execution	Flashes	On	Flashes
Firmware Update: Error	Flashes	Flashes	Flashes
Firmware Update: Normal End	Flashes	Off	Flashes
Energy Save Mode	Off	Off	Off

Controller LED Sequences

	LED 1 (Red)	LED 2 (Red)
System Startup (including Self-Diagnostics)	On	Off
Self-Diagnostic Error	On	On
Normal Operation	Flashes	Off
Firmware Update: Normal Execution	Flashes	Flashes
Firmware Update: Error	Off	Off
Firmware Update: Normal End	On	On

NOTE: LED 1 monitors Data Bus Bit 14, LED 2 monitors Data Bus Bit 15.

4.5 TEST POINTS

Controller Board

Number	Monitored Signal
TP1	GND
TP3	GND
TP6	GND
TP8	DB0 RXD
TP9	DB0 TXD
TP10	GND
TP11	+5VE
TP12	GND
TP13	+5V
TP14	+5VE
TP15	GND
TP16	R_FGATE
TP17	W_FGATE

⇒ 4.6 READING SC740/741 DETAILS FROM LED2:

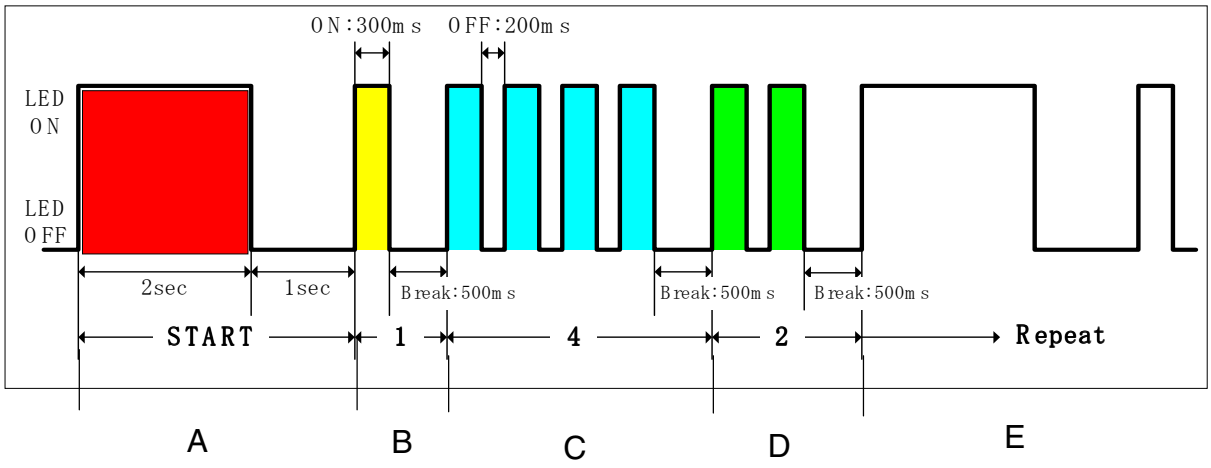
The following describes the method for using the LED to read the details for SC740/741 (Booklet Finisher-related errors), as this information is not displayed on the machine operation panel.

1. Remove the upper rear cover.
2. It is possible to determine which SC740/741 error is occurring by observing the number of flashes and flashing intervals of LED2.

2-1 Flashing pattern when Finisher is operating normally:
Repetition of 500ms ON, 500ms OFF.

2-2 Flashing pattern when an SC has occurred:
Example: Error code 1-4-2. (Jogger Motor Error)

⇒ Flashing intervals of LED2 for SC 740/741 error.



A. START : 2 sec ON, 1 sec OFF
B. **:** 3010ms ON → 500ms Break (OFF)
C. 4**:** 300ms ON, 200ms OFF (repeat 3 times) → 300ms ON → 500ms Break
D. 2**:** 300ms ON, 200ms OFF → 300ms ON → 500ms Break
E. Return to START and repeat.

Error Type	Error Code	Description	Status	Possible Cause
SC	1-1-1	Shutter movement error	The shutter position switch does not turn on within 1 second after the transport motor starts to turn in reverse.	• Transport motor defective • Shutter position switch defective • Shift tray safety switch defective
	1-1-2		The shutter sensor does not deactivate within 1 second after the transport motor starts to turn in reverse.	
	1-1-3		The shutter position switch is off when the shift tray safety switch is off.	
	1-2-1	Exit motor error	After the exit motor turns on, the exit motor sensor does not send the proper signal to the finisher board.	• Exit motor defective • Exit motor sensor defective
	1-2-2		The exit motor sensor does not send the clock signal to the finisher board for certain period while the exit motor is on.	
	1-3-1	Upper exit plate movement error	The upper exit guide 2 switch does not turn on within 1sec. after the guide plate motor turns on.	• Guide plate motor defective • Upper exit guide 2 switch defective • Upper exit guide sensor defective • Shift tray safety switch defective
	1-3-2		The upper exit guide sensor does not activate within 1sec. after the guide plate motor turns on.	
	1-3-3		The upper exit guide 2 switch does not turn on when the shift tray safety switch is off.	
	1-3-4		The guide plate motor sensor does not send the clock signal to the finisher board for certain period while the exit motor is on.	
	1-4-1	Jogger motor error	After the jogger motor turns on to move the jogger fence from its home position, the jogger HP sensor does not deactivate within 2secs.	• Jogger motor defective • Jogger HP sensor defective
	1-4-2		After the jogger motor turns on to return the jogger fence to its home position, the jogger HP sensor does not activate within 2secs.	

Error Type	Error Code	Description	Status	Possible Cause
SC	1-5-1	Stapler motor	After the stapler motor turns on to After the stapler motor turns on to return the stapler unit to its home position, the stapler unit HP sensor does not activate within 4secs.	• Stapler motor defective • Stapler unit HP sensor defective
	1-5-2			
	1-6-1	Staple hammer motor error	The staple hammer HP sensor does not deactivate within 0.5secs. after the staple hammer motor turns on.	• Staple hammer motor defective • Staple hammer HP sensor defective
	1-6-2		The staple hammer HP sensor does not activate within 0.5secs. after the staple hammer motor turns on.	
	1-7-1	Tray lift motor error	The tray lift motor does not stop within 15secs. after being turned on. The shift tray HP sensor does not activate within 15secs. after the tray lift motor turns on.	• Tray lift motor defective • Lift motor sensor 1 defective • Lift motor sensor 2 defective • Shift tray HP sensor defective • Shift tray upper limit switch defective
	1-7-2		The shift tray upper limit switch turns on while the shift tray is being raised.	
	1-7-3		Lift motor sensors 1 & 2 do not send the clock signals to the finisher board every 200ms while the tray lift motor is on.	
	1-8-1	Shift tray height sensor error	Abnormal communication data between finisher board and shift tray height sensor.	• Shift tray height sensor defective • Finisher board defective
	1-8-2		No communication between finisher board and shift tray height sensor for a certain period.	
	1-8-3		The finisher board detects a connection error with the connector for the shift tray height sensor.	
	1-8-4		Adjustment error during shift tray height sensor adjustment.	
	1-9-1	Back-up RAM error	The check sum is abnormal when the main switch is turned on.	• Finisher board defective
	1-10-1	Communication error	Communication error between finisher board and copier mainframe.	• Finisher board defective • Booklet unit board defective • Poor connection of the interface
	1-10-2		Communication error between finisher board and booklet unit board.	

Error Type	Error Code	Description	Status	Possible Cause
SC	1-11-1	Positioning plate motor error	After the positioning plate motor turns on to move the positioning plate from its home position, the positioning plate HP sensor does not deactivate within 1.25s.	• Positioning plate motor defective • Positioning plate HP sensor defective
	1-11-2		After the positioning plate motor turns on to return the positioning plate to its home position, the positioning plate HP sensor does activate within 1sec.	
	1-12-2	Folder roller motor error	The folder roller motor sensor doesn't send the clock pulse to the booklet unit board within a certain period after the folder roller motor turns on.	• Folder roller motor defective • Folder roller motor sensor defective
	1-13-1	Shutter guide motor error	After the shutter guide motor turns on to move the shutter guide from its home position, the shutter guide HP sensor does not deactivate within 0.4s.	• Shutter guide motor defective • Shutter guide HP sensor defective
	1-13-2		After the shutter guide motor turns on to return the shutter guide to its home position, the shutter guide HP sensor does not activate within 1s.	
	1-14-1	Booklet jogger motor error	After the booklet jogger motor turns on to move the booklet jogger plate from its home position, the booklet jogger HP sensor does not deactivate within 0.5s.	• Booklet jogger motor defective • Booklet jogger HP sensor defective
	1-14-2		After the booklet jogger motor turns on to return the booklet jogger plate to its home position, the booklet jogger HP sensor does not activate within 1s.	
	1-15-1	Front stapler motor error	The front staple hammer HP switch does not turn off within 0.5s after the front stapler motor turns on.	• Front stapler motor defective • Front staple hammer HP switch defective
	1-15-2		The front staple hammer HP switch does not turn on within 0.5s after the front stapler motor turns on during jam recovery.	
	1-16-1	Rear stapler motor error	The rear staple hammer HP switch does not turn off within 0.5s after the rear stapler motor turns on.	• Rear stapler motor defective • Rear staple hammer HP switch defective
	1-16-2		The rear staple hammer HP switch does not turn on within 0.5s after the rear stapler motor turns on during jam recovery.	

Error Type	Error Code	Description	Status	Possible Cause
SC	1-17-1	Folder plate motor error	After the folder plate motor turns on to return the folder plate to its home position, the folder plate HP sensor does not activate within 0.3s.	• Folder plate motor defective • Folder plate HP sensor defective • Folder plate return sensor defective • Folder plate motor sensor defective
	1-17-2		After the folder plate motor turns on to move the folder plate from its home position, the folder plate HP sensor does not deactivate within 0.3s.	
	1-17-3		After the folder plate motor turns on to return the folder plate to its home position, the folder plate return sensor does not deactivate within 0.3s.	
	1-17-4		The pulse count from the folder plate motor sensor is lower than the target minimum.	
	1-18-1	Connector error	The connector of the shutter guide HP sensor is not connected.	• Poor connection or no connection of the shutter guide HP sensor connector • Poor connection or no connection of the folder plate HP sensor connector • Poor connection or no connection of the folder plate return sensor connector
	1-18-2		The connector of the folder plate HP sensor is not connected.	
	1-18-3		The connector of the folder plate return sensor is not connected.	

Error Type	Error Code	Description	Status	Possible Cause
SC	1-19-1	Switch error	When the booklet entrance guide sensor, lower door sensor and booklet exit cover sensor are all activated (doors closed), the lower door safety switch does not turn on within 1s after a copy job or warm-up idling begins.	• Booklet entrance guide safety switch defective • Lower door safety switch defective • Booklet exit cover safety switch defective
	1-19-2			
	1-19-3		When the booklet entrance guide sensor, lower door sensor and booklet exit cover sensor are all activated (doors closed), the booklet exit cover safety switch does not turn on within 1s after a copy job or warm-up idling begins.	

SERVICE TABLES

5. SERVICE TABLES

⚠CAUTION

Never turn off the main power switch when the power LED is lit or flashing. To avoid damaging the hard disk or memory, press the operation power switch to switch the power off, wait for the power LED to go off, and then switch the main power switch off.

NOTE: The main power LED (☀) lights or flashes while the platen cover or ARDF is open, while the main machine is communicating with a facsimile or the network server, or while the machine is accessing the hard disk or memory for reading or writing data.

5.1 SERVICE PROGRAM MODE

5.1.1 SERVICE PROGRAM MODE OPERATION

The service program mode is used to check electrical data, change modes, and adjust values. Two service program modes are provided:

- **SP Mode (Service)**. Includes all the options in the SP displays for normal maintenance and adjustments.
- **SSP Mode (Special Service)**. Includes the normal SP modes and *some additional options in the SP displays not required for normal settings and adjustments*. (Most are marked "DFU" (Design or Factory Use) in the following tables.) Do not change these important settings needlessly. For details, contact your supervisor.

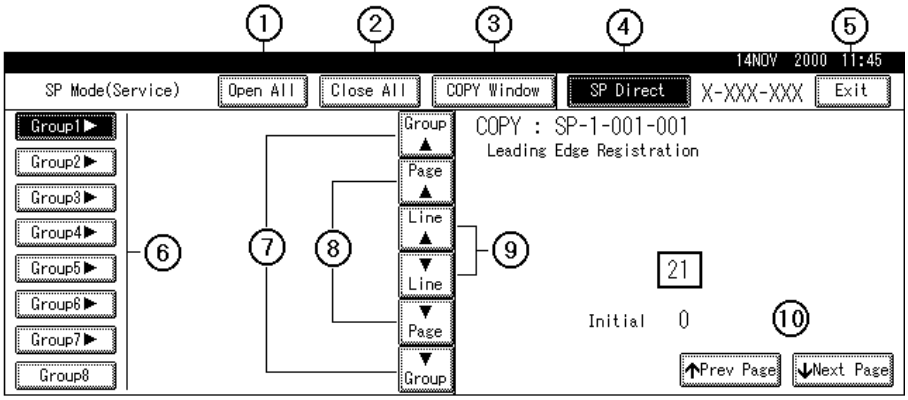
Entering and Exiting SP mode

Clear Mode	1.	Press the Clear Mode key.
1 0 7	2.	Use the keypad to enter "107".
Clear/Stop	3.	Hold down Clear/Stop for at least 3 seconds.
	4.	Enter the Service Mode.
		To enter the Normal Service Mode:
Copy SP		On the touch-panel, press Copy SP.
		To enter the Special service Mode:
# **Copy SP**		Hold down # and then press Copy SP.
Exit	5.	Press Exit twice to return to the copy window.

NOTE: Use SP2-902 to perform test pattern printing. (☛ 5.1.5)

SP Mode Button Summary

Here is a short summary of the touch-panel buttons.



① Opens all SP groups and sublevels.

② Closes all open groups and sublevels and restores the initial SP mode display.

③ Opens the copy window (copy mode) so you can make test copies. To return to the SP mode screen, press SP Mode (highlighted) in the copy window.

④ Enter the SP code directly with the number keys if you know the SP number and then press #. (SP Mode must be highlighted before you can enter the number. Just press SP Mode if it is not highlighted.)

⑤ Press twice to leave the SP mode and return to the copy window to resume normal operation.

⑥ Press any Group number to open a list of SP codes and titles for that group. For example, to open the SP code list for SP1-nnn, press Group1. If an SP has sublevels, click the appropriate button to expand the list.

⑦ Press to scroll the display to the previous or next group.

⑧ Press to scroll to the previous or next display in segments the size of the screen display (page).

⑨ Press to scroll the display to the previous or next line, line by line.

⑩ Press to move the highlight on the left to the previous or next selection in the list.

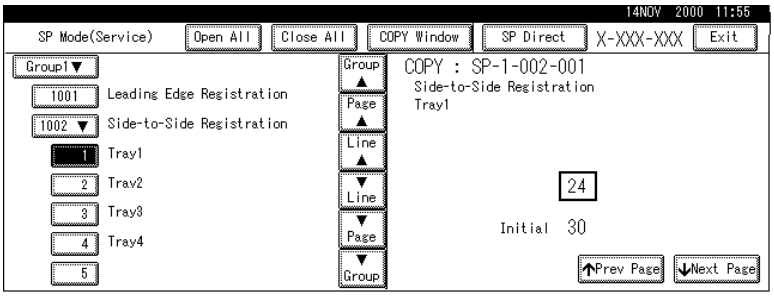
Switching Between SP Mode and Copy Mode for Test Printing

1) In the SP mode, select the test print and then press Copy Window.
2) Use the copy window (copier mode), to select the appropriate settings (paper size, etc.) for the test print.
3) Press Start ⓘ to execute the test print.
4) Press SP Mode (highlighted) to return to the SP mode screen and repeat from step 1.

Selecting the Program Number

Program numbers have two or three levels.

1. Before you begin, refer to the Service Tables to find the SP that you want to adjust. (☛ 5.1.3)
2. Press the Group number on the left side SP Mode window that contains the SP that you want to adjust.
3. Use the scrolling buttons in the center of the SP mode window to display the SP number that you want to open, and then press that number to expand the list.
4. Use the center touch-panel buttons to scroll to the number and title of the item that you want to set and press. The small entry box on the right is activated and displays the default initial and the current setting below.



NOTE: Refer to the Service Tables for the range of allowed settings. (☛ 5.1.3)

5. To enter a setting”
   - Press ⓘ to toggle between plus and minus and then use the keypad to enter the appropriate number. The number you enter will write over the previous setting.
   - Press ⓘ to enter the setting. (If you enter a number that is out of range, the key press is ignored.)
   - When you are prompted to complete the selection, press Yes.
6. If you need to perform a test print, press Copy Window to open the copy window and select the settings for the test print. Press Start ⓘ twice, and then press SP Mode (highlighted) in the copy window to return to the SP mode display.
7. When you are finished, press Exit twice to return to the copy window.

Service Tables

5.1.2 SERVICE TABLE KEY

Notation	What it means
[range / **default** / step] (initial)	Example: [-9 ~ +9 / **+3.0** / 0.1 mm step]. The setting can be adjusted in the range ±9, value reset to +3.0 after an NVRAM reset, and the value can be changed in 0.1 mm steps with each key press.
italics	Comments added for reference.
*	Value stored in NVRAM. After a RAM reset, this default value (factory setting) is restored.
1111	An SP number set in bold-italic denotes a "Special Service Program" mode setting that appears only after entering the SP mode by pressing and holding the # on the 10-key pad and then the "Copy SP" on the touch-screen.
B135	Denotes the 35 cpm model.
B138	Denotes the 45 cpm model.
DFU	Denotes "Design or Factory Use". Do not change this value.
Japan only	The feature or item is for Japan only. Do not change this value.
LEF	Long Edge Feed
SEF	Short Edge Feed
(☛6.2 Image Processing)	Refer to "6.2 Image Processing" in "6. Details". Due to fundamental changes in how image processing adjustment is done with Group 4 SP codes, more details are provided in Section 6.

5.1.3 SERVICE TABLES

SP1-xxx: Feed

1001*	Leading Edge Registration	[+9 ~ –9 / **3.0** / 0.1 mm]
	Adjusts the printing leading edge registration using the trimming area pattern (SP2-902-3, No.11). Use ☺ to toggle between ± before entering the value. Specification: 3 ±2 mm	

1002*	Side-to-Side Registration	
	Adjusts the printing side-to-side registration from the 3rd paper feed station using the trimming area pattern (SP2-902-3, No.11).*Tray3, Tray4 for Paper Feed Unit.* Use the ☺ key to toggle between + and – before entering the value. Specification: 2 ±1.5 mm	
1002 1	Tray 1	[–9 ~ +9/ **+3.0 mm** / 0.1 mm step]
1002 2	Tray 2	[–9 ~ +9/ **+3.0 mm** / 0.1 mm step]
1002 3	Tray 3	[–9~ +9/ **+2.0 mm** / 0.1 mm/step]
1002 4	Tray 4	[–9~ +9/ **+2.0 mm** / 0.1 mm/step]
1002 5	From Duplex Tray	[–9 ~ +9/ **+0.0 mm** / 0.1 mm/step]
1002 6	Bypass Feed	[–9 ~ +9/ **+3.0 mm** / 0.1 mm/step]
1002 7	LCT (if present)	[–9 ~ +9/ **+1.5 mm** / 0.1 mm/step]

1003*	Registration Buckle Adjustment	
	Adjusts the relay clutch timing at registration. Relay clutch timing determines the amount of paper buckle at registration. (A "+" setting causes more buckling.)	
1003 1	Trays 2,3,4 LCT	[–9 ~+9 / **0 /**1 mm step]
1003 2	Duplex	
1003 5	Bypass	
1003 4	Tray 1 Feed	
1003 5	Bypass Thick Paper	

1007*	By-pass Feed Paper Size Display	
	Displays the paper width sensor data for the by-pass feed table.	

1012*	Exit Junction Solenoid Start Timing	
	Adjusts the timing of the solenoids at the entrance and exit of the paper exit section to accommodate the increased speed of the duplex unit. *This SP has been added to compensate for the increased operation speed of the duplex unit for this machine. Increase the value if the leading edges are jamming. Decrease the value if trailing edges are bending at the entrance*	
1012 1*	Exit Entrance Junction Solenoid	B135: [200 ~ 450 ms / **370 ms** / 10 ms] B138: [200 ~ 450 ms / **300 ms** /10 ms]
1012 2*	Exit Last Junction Solenoid	B135: [200 ~ 450 ms / **370 ms** / 10 ms] B138: [200 ~ 450 ms / **370 ms** /10 ms]]

1103*	Fusing Idling	
	Switches fusing idling on/off. When on, printing will not start until enough time has elapsed so the hot roller can reach optimum temperature. This ensures even heat on the hot roller. *Switch on if fusing on the 1st and 2nd copies is incomplete (this may occur if the room is cold.) You must switch SP1103-1 ON before you set the fusing interval with SP1103-2.*	
1103 1*	Enable Fusing Idling	**0 = Off**, 1 = On
1103 2*	Fusing Idling Interval	[0 ~ 60 sec. / **30 sec.** / 1 sec.]

1104*	Fusing Temperature Control	[0~1 / **0** / 1]
	Selects the fusing temperature control method. After changing this setting, be sure the power the machine off and on again with the main power switch to enable the new setting. 0: Normal (ON/OFF control). Allows full application from ac power supply to bring the hot roller up to the target fusing temperature then shuts off. Determines the on time from the present temperature (detected by the thermistor on the hot roller) and the temperature of 1 cycle before. 1: Phase (hysterisis) control. Sets the upper and lower limits for the temperature; at the lower temperature the fusing lamp is on and at the higher temperature the fusing lamp is off. Change this setting to "0" only if the user has excessive electrical noise or interference on the power supply line. Such interference can cause voltage to drop when power is applied using the ON/OFF control method. Interference can be caused by the general poor quality of the power supply lines, or if the machine is sharing a power supply with other electrical devices such as fluorescent lights. Before changing this setting, make sure that the machine is connected to a power supply not shared by other electrical equipment. **Note**: Selecting Phase control ("1") could cause the fusing temperature control board to emit low pitched noise.	

1105*	Fusing Temperature Adjustment	
	Allows adjustment of the hot roller temperature at the center and ends of the roller for the quality or thickness of the paper. The hot roller in this machine has two fusing lamps: one heats the center of the roller, the other heats both ends. Each fusing lamp can be adjusted separately. *The "re-load temperature" is the "print ready temperature. When the fusing temperature exceeds this setting, the machine can operate. Do not set up a re-load temperature* ***(Re-load Temp. = Fusing. Temp – SP Value.)*** *that is higher than the SP1-105-2 setting.*	
1105 1	Roller Center: Trays	35 cpm: [120 ~ 200/ **150** / 1 deg.] 45 cpm: [120 ~ 200 / **170** / 1 deg.]
	Adjusts the fusing temperature at the center of the hot roller.	
1105 2	Roller Ends: Trays	35 cpm: [120 ~ 200 / **160** / 1 deg.] 45 cpm: [120 ~ 200 / **175** / 1 deg.]
	Adjusts the fusing temperature at the ends of the hot roller.	
1105 3	Roller Center – Bypass	35 cpm: [120 ~ 200 / **160** / 1 deg.] 45 cpm: [120 ~ 200 / **170** / 1 deg.]
	Adjusts the fusing temperature at the center of the hot roller for bypass feed.	
1105 4	Roller Center - Ends	35 cpm: [120 ~ 200 / **160** / 1 deg.] 45 cpm: : [120 ~ 200 / **170** / 1 deg]
	Adjusts the fusing temperature at the ends of the hot roller for bypass feed.	
1105 5	Re-load Temp. Minus: Roller Center	[0 ~ 60 / **30** / 1 step]
	Sets the temperature for re-heating the hot roller center.	
1105 6	Re-load Temp. Minus: Roller Ends	[0 ~ 60 / **30** / 1 step]
	Sets the temperature for re-heating the hot roller ends.	
1105 7	Roller Center: Bypass (Thick Paper)	35 cpm: [120 ~ 200 / **170** / 1 deg] 45 cpm: [120 ~ 200 / **170** / 1 deg]
	Adjusts the fusing temperature at the center of the hot roller for thick paper.	
1105 8	Roller Ends: Bypass (Thick Paper)	35 cpm: [120 ~ 200 / **170** / 1 deg] 45 cpm: [120 ~ 200 / **170** / 1 deg]
	Adjusts the fusing temperature at the ends of the hot roller for thick paper.	
1105 9*	Re-load Temp. Minus: Roller Center (Thick Paper)	35 cpm: [0 ~ 60 / **0°C**/ 5] 45 cpm: [0~ 60 / **5°C** /1]
	Sets the temperature for re-heating the hot roller center for thick paper.	
1105 10*	Re-load Temp. Minus: Roller Ends (Thick Paper)	35 cpm: [0 ~ 60 / **0°C**/ 5] 45 cpm: [0~ 60 / **5°C** /1]
	Sets the temperature for re-heating the hot roller ends for thick paper.	

1106	**Fusing Temperature Display**	
1106 1	Roller Center	Displays the fusing temperature for the center of the hot roller.
1106 2	Roller Ends	Displays the fusing temperature for the ends of the hot roller.
1106 3	I/O Board Temp. at Power On	Displays in the internal temperature of the machine when it was powered on.

1109*	Fusing Nip Band Check	[**0**=Off, 1=On]
	Checks the fusing nip band.	

1111*	Paper Reverse Timing (Duplex)	[+5 ~ –5 / **0 mm** / 1 mm step]
	Adjusts the timing for stopping the rotation of the reverse roller after the trailing edge of the paper passes the duplex entrance sensor. *Adjust the timing if paper frequently jams at the inverter gate in the duplex unit.*	

1801*	Motor Speed Adjustment	
	Adjusts the speeds of the main motor, feed/development motor, and fusing exit motor. Each step decreases or increases motor speed in 0.15% increments	
1801 1	Main Motor	[-4 ~ +4 / **0** / 0.15%]
1801 2	Feed/Development Motor	[-4 ~ +4 / **0** / 0.15%]
1801 3	Fusing/Exit Motor	[-4 ~ +4 / **0** / 0.15%]

SP2-xxx: Drum

2001*	Charge Roller Bias Adjustment	
2001 1*	Copying	[–1000 ~ –2000 / **–1500V** / 10V step] See NOTE.
	Adjusts the voltage applied to the charge roller for copying.	
2001 2*	ID Sensor Pattern	[0 ~ 700 / **250V** / 10V step] See NOTE.
	Adjusts the voltage applied to the charge roller when making the VSDP ID sensor pattern (for charge roller voltage correction). The actual charge roller voltage is this value plus the value of SP2001 1.	

2005*	Charge Roller Bias Correction	
2005 1*	Charge Roller Voltage Correction 1	[0.1 ~ 1.0 / **0.85** / 0.05 step]
	Adjusts the lower threshold value for the charge roller correction. *When the value of VSP/VSG is greater than this value, the charge roller voltage increases by 30 V (e.g., from –500 to –530).*	
2005 2*	Charge Roller Voltage Correction 2	[0.1 ~ 1.0 / **0.90** / 0.05 step]
	Adjusts the upper threshold value for the charge roller correction. *When the value of VSP/VSG is greater than this value, the charge roller voltage decreases by 30 V (absolute value).*	
2005 3*	Charge Roller Voltage Adjustment 1	[–1000 ~ **–**2000 / **1500V** / 10V step]
	Adjusts the lower limit value for charge roller voltage correction. See NOTE.	
2005 4*	Charge Roller Voltage Adjustment 2	[–1000 ~ **–**2000 / **2000V** / 10V step]
	Adjusts the upper limit value for charge roller voltage correction.	
2005 5*	Charge Roller Voltage Step	[0 ~ 100V / **30V** / 10V step]
	Adjusts the correction voltage adjustment step size.	

2101*	Printing Erase Margin	
	Adjusts the leading edge (top), trailing edge (bottom), left, and right margins	
2101 1*	Leading Edge (Top)	[0.9 ~ 9.0 / **3** / 0.1 mm step] Spec: ±2 mm
2101 2*	Trailing Edge (Bottom)	[0.9 ~ 9.0 / **3** / 0.1 mm step] Spec: ±2 mm
2101 3*	Left Edge	[0.9 ~ 9.0 / **2** / 0.1 mm step] Spec: ±1.5 mm
2101 4*	Right Edge	[0.9 ~ 9.0 / **2** / 0.1 mm step] Spec: ±1.5 mm
2101 5*	Trailing Edge - Back side	[0.0 ~ 4.0 / **1.2** / 0.1 mm step] *Recommended: 2 ±1.5 mm*
2101 6*	Back Side - Right	[0.0 ~ 9.0 / **0.3** / 0.1 mm step] *Recommended: 2 ±1.5 mm*
2101 7*	Back Side - Left	[0.0 ~ 9.0 / **0.3** / 0.1 mm step] *Recommended: 2 +2.5/-1.5 mm*

2103*	LD Power Adjustment	**DFU**
	Adjusts the intensity of the laser for the copier, printer, and fax unit. The Copier and Printer/Fax settings can be adjusted separately.	
2103 1*	LD1 (Copier)	[–55 ~ +64 / **–5** /1 LSB step] *Approx. 50/128 = .4%*
2103 2*	LD2 (Copier)	[–55 ~ +64 / **–20** /1 LSB step] *Approx. 50/128 = .4%*
2103 3*	LD1 (Printer, FAX)	[–50 ~ –35 / **–25** /1 LSB step]
2103 4*	LD2 (Printer, FAX)	[–50 ~ –35 / **–25** /1 LSB step]
2103 5*	LD1 Adjustment Start/End	OFF/ON
2103 6*	LD2 Adjustment Start/End	OFF/ON

⇒ **NOTE:** Must update the firmware for the Controller to version 2.40 or later and the BICU to version 2.11b or later for the new default settings.

2109*	LD Beam Pitch Adjustment	
	Adjusts the beam gap for the dual beam system. After replacing the LD unit or replacing or clearing the NVRAM, use this SP mode to adjust the laser beam pitch. *This adjustment is performed by specifying the number of pulses to the stepper motor that will adjust the angle of rotation of the LD unit from the home position.*	
2109 1*	400 dpi	[400 dpi: [8 ~ 262 / **144** / 1 pulse step]
	Adjusts the laser beam pitch value for 400 dpi resolution. *After replacing the LD unit or replacing or clearing NVRAM, use this SP and SP2-109-3 to adjust the laser beam pitch.*	
2109 2*	600 dpi	[600 dpi: [30 ~ 284 / **168** / 1 pulse step]
	Adjusts the laser beam pitch value for 600 dpi resolution. *After replacing the LD unit or replacing or clearing NVRAM, use this SP and SP2-109-4 to adjust the laser beam pitch.*	
2109 3*	400 dpi Initial Setting	
	Initializes the laser beam pitch for 400 dpi using the value for SP2-109-1. *After entering a value for SP2-109-1, this SP must be used.*	
2109 4*	600 dpi Initial Setting	
	Initializes the laser beam pitch for 600 dpi using the value for SP2-109-2. *After entering a value for SP2-109-2, this SP must be used.*	
2109 5*	Auto Pitch Adjustment Interval	[0 ~ 65535 / **1000** / 1 step]
	Sets the interval for automatic laser beam pitch adjustment. *When the number of times that the resolution has been changed reaches this value, the laser unit position is automatically corrected.*	
2109 6	Current LD Unit Position	
	Displays the current LD unit position (number of pulses from home position). If this is different from the value of 2-109-1 or 2-109-2, LD unit positioning has failed.	
2109 7	Beam Pitch Change Counter	
	Displays how many times the LD unit position has been changed (how many times the resolution has changed.) *When the laser beam pitch adjustment is done, this counter is reset to zero.*	
2109 8	Beam Pitch Data Reset	
	Resets the values of SP2-109-6 and SP2-109-7. *After replacing the LD unit, this SP mode must be performed. See the LD Unit Removal Procedure.*	

2110	Test Mode dpi	**DFU,** [See below / **8** / 0 ~ 18]
	Sets the scanning resolution (dpi). (Range values: 0 = 400 x 400 dpi, 1 = 391 x 406 dpi, 4= 300 x 300 dpi, **8 = 600 x 600 dpi**, 15 = 439 x 430 dpi, 16 = 476 x 476 dpi, 17 = 483 x 465 dpi, 18 = 465 x 483 dpi)	

2112	Polygon Motor Off Timer	[0 ~ 60 s / **10 s** / 5 s step]
	Input the time that the polygon motor is to switch off after the printer has remained idle for the specified time and entered the standby mode. *If set to zero, the polygon motor never switches off in standby mode. However, if the machine enters the energy saver mode, the polygon motor will ignore the zero setting and switch itself off.*	

2201*	Development Bias Adjustment		
⇒ 2201 1*	Development Bias	[-200 ~ -700 / **-560V** / 10V step]	
	Adjusts the development bias for copying. *Use as a temporary measure to correct faint copies from an aging drum.*		
⇒ 2201 2*	ID Sensor Pattern	[- 200 ~ -700 / -**480V** / 10V step]	
	Adjusts the development bias for the ID sensor pattern for V_{SP}		

2207	Forced Toner Supply
	Forces the toner bottle to supply toner at 1-second intervals for up to 30 seconds. To start, press #.

2208*	Toner Supply Mode	[**0**: Sensor control, 1: Image pixel count]
	Selects the toner mode. *If you select 1, SP2-209-002 should be set to its default value. Use image pixel count modes only as a temporary measure if the ID or TD sensor is defective.*	

2209*	Toner Supply Rate	
2209 1*	Toner Rate	[10 ~ 800 mg/s / **60 mg/s** / 5 mg/s step]
	Sets the amount of toner supplied every second by the toner supply motor. *Increasing this value reduces the toner supply clutch on time. Use a lower value if the user tends to make lots of copies that have a high proportion of black.*	
2209 2*	Toner Supply Correction Data	[25 ~ 300 / **300** / 25 step]
	Displays the toner supply correction coefficient (K). It can also be used to adjust K, but the value is changed again when V_T is measured for the next copy. *The toner supply rate depends on the amount of toner in the toner bottle. This change is corrected using this coefficient. This SP can be used to check the toner supply condition. The lower the value of K, the lower the toner density*	

2210*	ID Sensor Pattern Interval	
	Sets the interval between ID sensor pattern prints.	
2210 1*	Job Page Count	[0 ~ 200 / **10** / 1]
	Sets the interval between ID sensor pattern printing. For users that do not make many copies daily, set a smaller interval to compensate for the effects of seasonal and weather changes.	
2210 2*	Forced Page Count	[2 ~ 999 / **200** / 1]
	Forces creation of the ID sensor pattern to prevent low density copies for customers who use the copier for long copy jobs.	

2213*	Copies After Toner Near-End	[**0**: 90 copies, 1: No copies, 2: 10 copies]
	Selects the number of copies that can be printed once the copier has detected toner near-end. Select 1 or 2 if the customer normally makes copies of high density	

⇒ **NOTE:** Must update the firmware for the Controller to version 2.40 or later and the BICU to version 2.11b or later for the new default settings.

2220*	Vref Manual Setting	[1.0 ~ 5.00 V / **4.00V** / 0.01V step]
	Adjusts the TD sensor reference voltage (Vref). *Change this value after replacing the development unit with another unit that contains toner.* 1. *Check the value of SP2-220 in both the machine containing the test unit and the machine that you are going to move it to.* 2. *Install the test development unit, and then input the VREF for this unit into SP2-220.* 3. *After the test, put back the old development unit, and change SP2-220 back to the original value.*	

2223*	Vt Display
2223 1	Current
	Displays the TD sensor output voltage for the immediately previous copy.
2223 2	Average Previous 10 copies
	Displays the average of the most recent TD sensor outputs (from the previous 10 copies).
2223 3	Rate of Change
	Displays the rate of change in the TD sensor output.
2223 4	GAIN
	Displays the GAIN value used to calculate the on time for the toner supply motor.
2223 5	Image Pixel Count
	Displays the image pixel count.

2301	Transfer Current Adjustment	
2301 1	1st Side of Paper	B135: [20 ~ 100µA / **35** / 1µA step] B138: [20 ~ 100µA / **45**] / 1µA step]
	Adjusts the transfer current for printing the first side of the paper (image area). *If the user uses thicker paper, the current may have to be increased to ensure sufficient transfer of toner.*	
2301 2	2nd Side of Paper	B135: [20 ~ 100µA / **35** / 1µA step] B138: [20 ~ 100µA / **40**] / 1µA step]
	Adjusts the transfer current for printing the second side of the paper (image area).	
2301 3	Leading Edge	B135: [20 ~ 100µA / **35** / 1µA step] B138: [20 ~ 100µA / **45**] / 1µA step]
	Adjusts the transfer current for copying at leading edge of the paper. *Increase the current to separate the paper from the drum properly in high humidity and high temperature conditions.*	
2301 4	Bypass Feed (45ppm)	B138: [20 ~ 100µA / **45** / 1µA step]
	Adjusts the transfer current for copying from the by-pass tray (image area) for the B138 (45 cpm). *If the user normally feeds thicker paper from the bypass tray, use a higher setting.*	
2301 5	Leading Edge Bypass Feed (45ppm)	B138: [20 ~ 100µA / **60 /** 1µA step]
	Adjusts the transfer current for copying at the leading edge of paper fed from the by-pass tray for the B138 (45 cpm). *Increase the current to separate the paper from the drum properly in high humidity and high temperature conditions*.	
2301 6	Bypass Feed (35 ppm)	B135: [20 ~ 100µA / **35** / 1µA step]
	Adjusts the transfer current for copying from the by-pass tray (image area) for the B135 (35 cpm).	
2301 7	Leading Edge Bypass Feed (35 ppm)	B135: [20 ~ 100µA / **45** / 1µA step]
	Adjusts the transfer current for copying at the leading edge of paper fed from the by-pass tray for the B135 (35 cpm).	

2309*	Transfer Current Correction	
2309 1	Paper Lower Width (a)	[0 ~ 297 / **150** / 1 mm step]
	Adjusts the lower paper width threshold for the transfer current, charge voltage, and development bias corrections. *Use this SP when an image problem (e.g., insufficient toner transfer) occurs with a small width paper. If the paper width is smaller than this value, the transfer current will be multiplied by the factor in SP2-309-3 (paper tray) or SP2-309-5 (by-pass).*	
2309 2	Paper Upper Width (b)	[0 ~ 297 / **216** / 1 mm step]
	Adjusts the upper paper width threshold for the transfer current, charge voltage, and development bias corrections. *As for SP2-309-1, but the factors are in SP2-309-4 (paper tray) and SP2-309-6 (by-pass).*	
2309 3	Paper Tray (alpha)	[1.0 ~ 3 / **1.2** / 0.1 mm step]
	Adjusts the transfer current correction coefficient used if the paper width is less than the setting of SP2-309-1.	
2309 4	Paper Tray (beta)	[1.0 ~ 3 / **1.2** / 0.1 mm step]
	Adjusts the transfer current correction coefficient used if the paper width is less than the setting of SP2-309-2.	
2309 5	By-Pass Feed (gamma)	[1.0 ~ 3 / **1.5** / 0.1 mm step]
	Adjusts the transfer current correction coefficient used if the paper width is less than the setting of SP2-309-1.	
***2309** 6*	By-Pass Feed (delta)	[1.0 ~ 3 / **1.5** / 0.1 mm step]
	Adjusts the transfer current correction coefficient used if the paper width is less than the setting of SP2-309-2.	

2801*	TD Sensor Initial Setting
	Performs the TD sensor initial setting. This SP mode controls the voltage applied to the TD sensor to make the TD sensor output about 4.0 V. Press “Execute” to start. After finishing this, the TD sensor output voltage is displayed. *Use this mode only after installing the machine, changing the TD sensor, or adding new developer.*

2802*	TD Sensor Manual Setting	
	Allows you to adjust the TD sensor output manually for the following.	
2802 1	VTS	[1.00 ~ 5.00V / **4.78V** / 0.02V step]
	Adjusts the TD sensor output (VT). *Change this value after replacing the development unit with another one that already contains toner. For example, when using a development unit from another machine for test purposes. To adjust VT, use a similar procedure as for SP2-220.*	
2802 2	VTMAX	[1.00 ~ 5.00V / **4.78**V / 0.02V step]
	Adjusts the maximum value for SP2802 1.	
2802 3	VTMIN	[1.00 ~ 5.00V / **1.00V** / 0.02V step]
	Adjusts the minimum value for SP2802 1.	

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2805*	Developer Initialization
	Performs the developer initialization. Press “Execute” to start. This SP should be performed after doing SP2801-01 at installation and after replacing the drum.

2902	Test Pattern	
2902 2	IPU Test Pattern	Pattern 0 ~ 15
	Prints the test patterns for the IPU chip. *This SP mode is useful for finding whether the BICU or the SBU is defective. If the printout is not OK, the BICU is defective.*	
2902 3	Printing Test Pattern	Pattern 0 ~ 38
	Prints the printer test patterns. Select the number of the test pattern that you want to print. *This SP mode is useful for finding whether the LDDR or the BICU is defective. If the printout is not satisfactory, the LDDR is defective.*	

2909*****	Main Scan Magnification	
	Adjusts the magnification in the main scan direction for copy mode and printer mode. Press # to toggle ±.	
2909 1*	Copier	[–2.0 ~ +2.0 / **0** / 0.1% step]
2909 2*	Printer	[–2.0 ~ +2.0 / **0** / 0.1% step]

2911	Transfer Current On/Off Timing	
2911 1	La (On Timing)	[–30 ~ +30 / **0 mm** / 1 mm step]
	Adjusts the transfer current on timing at leading edge.	
2911 2	Lb (Switch Timing)	[0 ~ +30 / **10 mm** / 1 mm step]
	Adjusts the transfer current switch timing. This determines when the leading edge stops and the image area current begins (see SP2-301).	
2911 3	Lc (Off Timing)	[–30 ~ +30 / **– 5 mm** / 1 mm step]
	Adjusts the transfer current off timing. (e.g. –5 mm is 5 mm after the trailing edge.)	

2912*	Drum Reverse Rotation Interval	**DFU**

2913*	Print Density for Test Pattern	[0 ~ 15 / **15** / 1]
	Sets the print density for the patterns printed with SP2-902-3.	

2914*	Process Control Setting	
2914 1*	C-alpha	[0 ~ 400 / **150** / 10V step]
	Adjusts the charge roller voltage used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-1. *Use this SP when an image problem (such as white spots at the center of black dots or breaks in thin black lines) occurs when paper with a small width is fed from the by-pass feed tray.*	
2914 2*	C-beta	[0 ~ 400 / **0** / 10V step]
	Adjusts the charge roller voltage used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-2. *Use this SP when an image problem (see 2-914-1) occurs when paper with a small width is fed from the by-pass feed tray.*	
2914 3*	B-gamma	[0 ~ 300 / **200** / 10V step]
	Adjusts the development bias used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-1. *Use this SP when an image problem (see 2-914-1) occurs when paper with a small width is fed from the by-pass feed tray.*	
2914 4*	B-delta	[0 ~ 300 / **50** / 10V step]
	Adjusts the development bias used when paper with a small width is fed from the by-pass tray. The paper width below which the correction starts depends on the value of SP2-309-2. *Use this SP when an image problem (see 2-914-1) occurs when paper with a small width is fed from the by-pass feed tray.*	

2920	LD Off Check	**DFU**

2960*	Toner Overflow Sensor	[0 = No, **1** = Yes]
	Selects whether or not the toner overflow sensor is activated.	

2964*	Transfer Cleaning Blade Forming	[0 ~ 30/ **0** / 1 sheets]
	Applies a pattern of toner to the transfer belt at a defined interval between sheets on the transfer belt in order to reduce friction between the belt surface and the cleaning blade. *Under conditions of high temperature and high humidity, the density control feature may reduce the amount of toner, which also reduces the amount of toner on the surface of the transfer belt. With less toner on the belt, the friction between the belt and the blade increases, and could cause the blade to bend or scour the surface of the belt.*	

2969*	LD – PWM Selection	
2969 1*	Printer Output LD – PWM Selection	[1 ~ 4 / **1** / 1 step]
	Changes the LD power PWM control for printed copies. A smaller value produces a lighter image. Use this SP to adjust the image density for printing from a personal computer or printing a received fax message. 1: 87.5% 2: 75% 3: 62.5% 4: 50%	
2969 2*	Fax Output LD – PWM Selection	[1 ~ 4 / **1** / 1 step]
	Changes the LD power PWM control for printed fax messages. A smaller value produces a lighter image. Use this SP to adjust the image density for printing fax messages. 1: 87.5% 2: 75% 3: 62.5% 4: 50%	

2971	Toner Full Sensor Count	**DFU**

2972*	Grayscale Limit	
	A new feature of this machine that controls the halftone density level to prevent deterioration of the OPC. The halftone density is detected by the ID sensor, and the machine adjusts the intensity of the LD beam according to the upper/lower limit setting.	
2972 1*	Upper Limit	[0 ~ 100 / **60** / 1 step]
	Defines the upper limit for grayscale. *A larger value allows a wider range of halftones at the pale end of the scale. If the image contains pale areas with fuzzy borders surrounded by dark areas, reduce this value to make the borders clearer.*	
2972 2*	Lower Limit	[0 ~ 100 / **40** / 1 step]
	Defines the lower limit for grayscale. *A smaller value allows a wider range of halftones at the dark end of the scale.*	

2973*	Grayscale Copy Interval Check	[0 ~ 1000 / **100** / 10 step]
	Sets the halftone operation interval in order to prevent deterioration of the OPC. If the number of copies exceeds this setting, at the end of the job, or if the door is opened and closed, charge correction is executed.	

2974*	Image Density Adjustment	[1 ~ 5 / **3** / 1 step]
	Adjusts image density. Changing this setting adjusts development bias and ID sensor output voltage that in turn raises or lowers image density.	

2975*	Toner End Detection ON Time	[0 ~ 2,000 / **0** / 10 s step]
	Sets a time limit for issuing the toner near end warning on the operation panel. The time may need to be shorter for customers who run especially large print jobs (working at night, for example) to ensure earlier warning of the toner near end condition so toner out does not interrupt a long job. 0: Normal end detection (90 sheets after near-end detected (SP2213)	

2976*	Toner Bottle Total On Time	[0 ~ 2,000,000 / **0** / 1 ms step]
	Displays the total ON time of the toner supply motor, calculated from when the toner bottle was replaced. Use this to check that the toner end count (SP2975) is working properly. *When SP2975 is set to any value other than "0", this value is displayed when it matches the setting of SP2975. When SP2975 is set to "0", SP2976 is disabled. SP2976 is automatically set to zero by toner end recovery.*)	

2980*	Charge Counter	[0 ~ 1000000 / **0** / 1 step]
	Sets the number of pages to print after toner and carrier initialization before the charge input is increased to compensate for deterioration over time in the polarity of the carrier. *The strength in the polarity of the carrier in the toner will eventually decrease and cause lower charge output. Setting the charge output to increase after a specified number of copies can compensate for this effect.*	

2981	Polygon Mirror Rotation Switching	**DFU** **0**: Rpm determined by engine 1: Rpm for B135 (35 cpm) 2: Rpm for B138 (45 cpm)
	Switches the number revolutions per minute of the polygon mirror motor.	

SP3-xxx: Process

3001*	ID Sensor Initial Setting	
3001 1	ID Sensor PWM Setting	[0 ~ 255 / **100** / 1 step]
	Allows you to reset the PWM of the ID sensor LED to avoid a service call error after clearing NVRAM or replacing the NVRAM. *The PWM data is stored by executing SP-3001-2.*	
3001 2	ID Sensor Initialization	—
	Performs the ID sensor initial setting. ID sensor output for the bare drum (V_{SG}) is adjusted automatically to 4.0 ±0.2 V. *Press "Execute" to start. Perform this setting after replacing or cleaning the ID sensor, replacing the drum, or clearing NVRAM.*	

3103*	ID Sensor Output Display	
	Displays the current V_{SG}, V_{SP}, V_{SDP}, and grayscale control If the ID sensor does not detect the ID pattern, "V_{SP} = 5.0 V/V_{SG} = 5.0 V" is displayed and an SC code is generated. If the ID sensor does not detect the bare area of the drum, "V_{SP} = 0.0 V/V_{SG} =0.0 V" is displayed and an SC code is generated.	
3103 1*	Vsg (Drum Surface Output)	[0V ~ 5.00V]
3103 2*	Vsp (Pattern Output)	[0V ~ 5.00V]
3103 3*	Vsdp (Immediate Post-Pattern Output).	[0V ~ 5.00V]
3103 4*	Vsm/Vsg (Grayscale Post-Pattern Output)	[0V ~ 5.00V]

3905*	Hot Roller Stripper Cleaning After Job	
	Toner and carbon clinging to the hot roller strippers can cause poor print quality. To prevent this, toner and carbon are dislodged from the hot roller strippers in two ways: 1) jogging the fusing/feed-out motor 3 times after every print job. 2) freely rotating the hot roller for 12 s. For details, see Section "6.6.2 Hot Roller Stripper Cleaning". Also see SP 5959.	
3905 1*	Number of Rotations	[0 ~ 60 / **1** / 1]
	Sets the number of times the fusing/exit motor is switched off/on in order to dislodge toner clinging to the hot roller strippers. *Raising this setting can increase wear on the hot roller and cleaning roller and shorten the service life of the hot roller.*	
3905 2*	Number of Pages	[0 ~ 1000 / **15** / 1]
	Sets the number of pages to print before the fusing/feed-out motor is jogged (switched off and on rapidly) to dislodge toner and carbon from the hot roller strippers. *Normally the motor is jogged once (switched off and on rapidly) after every print job that exceeds 15 pages.*	

SP4-xxx: Scanner

4008*	Scanner Sub Scan Magnification	[–0.9 ~ 0.9 / **0.0** / 0.1% step]
	Adjusts the magnification of the sub scan direction during scanning. Changing this value changes the scanner motor speed. Press #/* to toggle ±.	

4010*	Scanner Leading Edge Registration	[–0.9 ~ 0.9 / **0.0** / 0.1 mm step]
	Adjusts the leading edge registration for scanning. Press #/* to toggle ±. *As you enter a negative value, the image moves toward the leading edge.*	

4011*	Scanner Side-to-Side Registration	[–4.6 ~ +4.6 / **0.0** / 0.1 mm step]
	Adjusts side-to-side registration for scanning. Press #/* to toggle ±. *As you enter negative values, the image will disappear at the left, and as you enter positive values, the image will appear at the left.*	

4012*	Scanner Erase Margin	
	Adjusts scanning margins for the leading and trailing edges (sub scan) and right and left edge (main scan). Do not adjust unless the customer desires a scanner margin greater than the printer margin.	
4012 1*	Leading Edge	[0 ~ 9 / **1.0** / 0.1 mm step] (Specification: 3 ± 2 mm)
4012 2*	Trailing Edge	[0 ~ 9 / **0.5** / 0.1 mm step] (Specification: 2 ± 2 mm)
4012 3*	Right	[0 ~ 9 / **0.5** / 0.1 mm step] (Specification: +2.5 ~ -1.5 mm)
4012 4*	Left	[0 ~ 9 / **1.0** / 0.1 mm step] (Specification: 2 ± 1.5 mm)

4013	Scanner Free Run
	Performs a scanner free run with the exposure lamp off.

4016	White Board Read Adjust
4016 1	Read Start Position
	Adjusts the scanning start position on the white plate for auto shading. The default is 10.5 mm from the leading edge. The setting specifies how far scanning starts from the default position. [–5.0 ~ +5.0 / **0.0** / 0.1 mm/step]
4016 2	Read Width
	Adjusts the width of the area on the white plate (in the sub scan direction) that is scanned for auto shading. The default is 4.76 mm. The current setting specifies the difference from this default. [–5.0 ~ +5.0 / **0.0** / 0.1 mm/step]

4018	Scanner Optical Adjust Axis **DFU**

4019	Scanner Read Position **DFU**

4301	APS Sensor Output Display
	Displays the time required to detect the size of the paper on the scanner exposure glass. Asterisks (*) are displayed if the size cannot be detected. *Dimensions are displayed in inches for North America and in mm for other areas.*

4303*	APS A5/LT Size Detection	[**0**: not detected, 1: A5 length 5½ x 8½]
	Determines whether the original is A5/HLT size when the APS sensor does not detect the original size. *If 1 is selected, paper sizes that cannot be detected are regarded as A5 SEF. If 0 is selected, "Cannot detect original size" will be displayed.*	

4305*	8K/16K Detection	**0**: 8k/16k not detected, 1: 8K, 16K paper size detect enabled
	Selects whether or not the copier determines that the original is 8K/16K size when the APS sensor does not detect the original size. This SP is intended for use with 8K/16K Chinese paper sizes only and is effective only in China and Taiwan areas.	

4307*	APS Sensor Output Display	0: Original size detection at power on disabled. **1**: Original size detection at power on enabled
	Determines whether or not the original size is detected while the exposure lamp lights during initialization.	

4428	Scanner Adjustment	**DFU**
4428 1	Flag Display	**DFU**
4428 2	Start	**DFU**
4428 3	Flag Reset	**DFU**

4901*	SBU Setting	**DFU**

4903*	Filter Setting	
	Many filter setting SP modes have discussions in section 6. (☛6.5)	
4903 5	Full Size Mode	**0**: No. Normal operation 1: Yes. Main scan magnification always full-size
	Selects whether the copy is always full size, even if the magnification ratio has been changed. Set to 1 to check the main scan magnification. If the magnification is not 100%, the image processing circuits could be malfunctioning. *This SP is used to determine whether magnification is operating correctly. If this SP is set to 1 can make it easier to determine which part of the IPU is malfunctioning.*	
4903 7	Image Shift in Magnification	**DFU,** [0~7199 / **0** / 1 step]
	Adjusts the amount of pixel shift in the main scan direction in the magnification mode.	
4903 8*	Fax 25%, 50% Reduction	**DFU,** [0~3 / **0** / 1 step]
	Determines whether 25% and 50% reduction is available in the fax mode. 0: Off 1: Conducts fax mode OR processing for main scan for resolution below 100 dpi in only Text mode. 2: Conducts pre-filter processing for fax mode. 3: Conducts fax Text mode OR processing for main scan for resolution below 100 dpi. Pre-filter processing is done in every mode except Fax Text mode.	
	4903 10 to 4903 16, Pre-Filter Processing (☛6.5) The following 5 SP modes Selects the filter processing setting for smoothing in order to reduce the incidence of moiré in images in different original modes. Specifically, they set 1) the compression rate for parallel lines in the main scan direction and for long lines in the sub scan direction, and 2) the strength of smoothing. Enter the appropriate number with the10-key pad then press #. *These settings attempt to smooth lines without making them standout. Increasing the strength of a setting can reduce the incidence of moiré but can also decrease sharpness.*	
4903 10*	Pre-Filter: Text	[0~9 / **0** / 1]
4903 12*	Pre-Filter: Photo Mode	[0~9 / **0** / 1 step]
4903 13*	Pre-Filter: Text/Photo	[0~9 / **0** / 1 step]
4903 15*	Pre-Filter: Pale	[0~9 / **0** / 1 step]
4903 16*	Pre-Filter: Generation	[0~9 / **0** / 1 step]
	4903 20 to 4903 35, Text Mode MTF Filter Coefficient and MTF Filter Strength The following 15 SP modes select either the MTF filter coefficient (Level) or the MTF filter strength for text mode at various reproduction ratios. Each SP applies to either the main-scan direction or the sub-scan direction. (☛6.5)	
4903 20*	Main Filter Level: Text 25%-64%	[0~15 / **9** / 1 step]
4903 21*	Sub Filter Level: Text 25%-64%	[0~13 / **13** / 1 step]
4903 22*	Main Filter Strength: Text 25%-64%	[0~7 / **2** / 1 step]
4903 23*	Sub Filter Strength: Text 25%-64%	[0~15 / **2** / 1 step]
4903 24*	Main Filter Level: Text 65%-154%	[0~7 / **12** / 1 step]
4903 25*	Main Filter Strength: Text 65%-154%	[0~13 / **13** / 1 step]
4903 26*	Sub Filter Level: Text 65%-154%	[0~7 / **2** / 1 step]
4903 27*	Sub Filter Strength: Text 65%-154%	[0~7 / **2** / 1 step]
4903 28*	Main Filter Level: Text 155%-256%	[0~15 / **14** / 1 step]
4903 29*	Sub Filter Level: Text 155%-256%	[0~13 / **13** / 1 step]
4903 30*	Main Filter Strength: Text 155%-256%	[0~7 / **2** / 1 step]
4903 31*	Sub Filter Strength: Text 155%-256%	[0~7 / **2** / 1 step]
4903 32*	Main Filter Level: Text 257%-400%	[0~15 / **15** / 1 step]

4903 33*	Sub Filter Level: Text 257%-400%	[0~13 / **13** / 1 step]
4903 34*	Main Filter Strength: Text 257%-400%	[0~7 / **2** / 1 step]
4903 35*	Sub Filter Strength: Text 257%-400%	[0~7 / **2** / 1 step]
	4903 36 to 4903 38, Photo Mode MTF Filter Coefficients (☛6.5) 4903 36: Selects the MTF filter coefficient for edges in the photo mode 4903 37: Selects the filter coefficient for smoothing in the photo mode. The higher the number you select, the greater the applied smoothing effect. 4903 38: Selects the MTF filter coefficient sharpening an entire image in the Photo mode. For 4093 36 and 4093 38, the higher the number you select, the greater the effect on sharpening low contrast text and thin lines. However, a high setting could cause background to drop or, or cause moiré to appear in photos shaded with dots. (0:Off, 1: Softest, 7: Sharpest)	
4903 36*	Photo MTF (Edge)	[[0~7 / **0** / 1]
4903 37*	Smoothing Filter in Photo Mode	[0~7 / **2** / 1]
4903 38*	Photo MTF (All)	[[0~7 / **0** / 1]
	4903 39 to 4903 52, Text/Photo Mode MTF Filter Coefficient (☛6.5) The following 8 SP modes select the filter coefficients for either the edges (Edge) or for the entire image (All) for the Text/Photo mode at various reproduction ratios. Generally, increasing the value can improve the appearance of low contrast text; however, it can also cause background to fade or drop out completely or increase the incidence of moiré. Each SP has a range of 0~7 (0:Off, 1: Softest, 7: Sharpest)	
4903 39*	Text/Photo (Edge) Coefficient 25-64%	[0~7 / **1** / 1]
4903 40*	Text/Photo (All) Coefficient 25-64%	[0~7 / **4** / 1]
4903 43*	Text/Photo (Edge) Coefficient 65-154%	[0~7 / **1** / 1]
4903 44*	Text/Photo (All) Coefficient 65-154%	[0~7 / **4** / 1]
4903 47*	Text/Photo (Edge) Coefficient 155-256%	[0~7 / **1** / 1]
4903 48*	Text/Photo (All) Coefficient 155-256%	[0~7 / **4** / 1]
4903 51*	Text/Photo (Edge) Coefficient 257-400%	[0~7 / **1** / 1]
4903 52*	Text/Photo (All) Coefficient 257-400%	[0~7 / **4** / 1]
	4903 55 and 4903 56, MTF Filter Coefficients for Pale (☛6.5) These modes select the MTF filter coefficient (Level) and strength for originals scanned in the Pale mode. While these SPs can improve the appearance of low contrast originals, a high setting can also increase the incidence of moiré.	
4903 55*	Filter Level: Pale	[0~6 / **6** /1]
4903 56*	Filter Strength: Pale	0: 1/32x, 1: 1/16x, 2: 1/8x, **3**: 1/4x, 4: 1/2x, 5: 1x, 6: 2x, 7: 4x
	4903 57 and 4903 58, MTF Filter Coefficients for Generation Copy (☛6.52) These modes select the MTF filter coefficient (Level) and strength for originals scanned in the Generation Copy mode. While selecting a higher number strengthens the effect of the filter to improve contrast, a very high setting can increase the incidence of moiré.	
4903 57*	Filter Level: Generation Copy	[0~6 / **3** /1 step]
4903 58*	Filter Strength: Generation Copy	0: 1/32x, 1: 1/16x, **2**: 1/8x, 3: 1/4x, 4: 1/2x, 5: 1x, 6: 2x, 7: 4x
	4903 60 to 4903 64, Independent Dot Erase Level The following 4 SP modes select the independent dot erase level for originals scanned in different modes. While selecting a higher setting erases more dots, setting a very high setting can cause very fine text or other detail to fade or drop out completely. 1: Weakest (fewest dots erased), 15: Strongest (most dots erased)	
4903 60*	Independent Dot Erase: Text Mode	[0~15 / **5** / 1 step]
4903 62*	Independent Dot Erase: Text/Photo	[0~15 / **0** / 1 step]
4903 63*	Independent Dot Erase: Pale	[0~15 / **0** / 1 step]

4903 64*	Independent Dot Erase: Generation Copy	[0~15 / **8** / 1 step]
	4903 65 to 4903 69, Background Erase Level The following 5 SP modes adjust the threshold for background erase in originals scanned in different modes. A higher setting reduces more dirty background, but a very high setting can cause the image to reverse or cause other unexpected results. For all these modes, 0 = off (default).	
4903 65*	Background Erase Level: Text Mode	[0~255 / **0** / 1 step]
4903 66*	Background Erase Level: Photo Mode	[0~255 / **0** / 1 step]
4903 67*	Background Erase Level: Text/Photo Mode	[0~255 / **0** / 1 step]
4903 68*	Background Erase Level: Pale	[0~255 / **0** / 1 step]
4903 69*	Background Erase Level: Generation Copy	[0~255 / **0** / 1 step]
	4903 75 to 4903 77, Line Width Correction 4903 75: Determines whether line thickness is adjusted in the main and/or sub scan direction. Enter the appropriate number with the 10-key pad then press # 4903 76 and 4903 77: Select the threshold for line width detection in originals copied in the Generation Copy mode. Higher numbers make it easier to thicken thin lines.	
4903 75*	Line Width Correction: Generation Mode	0: None, 1: Thin, **2**: Thin, 3: Thick
4903 76*	LWC Threshold (Main Scan): Generation Mode	[0~5 / **1** / 1 step]
4903 77*	LWC Threshold (Sub Scan): Generation Mode	[0~5 / **1** / 1 step]
	4903 79 to 4903 93, Filter Strength: Edge, Filter Adj.: Edge Detection, Filter Adj.: Magnification (☛6.5) The following 15 SP modes modify the effects of the MTF filter coefficients set by SP 4903 39 to 4903 52. The related SP mode is in parenthesis in the right column. See page 6-28 for details about how they work.	
4903 79*	Filter Strength: Text/Photo (Edge) 25-64%	[0~3 / **3** / 1] (SP4903 039)
4903 80*	Filter Adj.: Text/Photo (Edge Det.) 25-64%	[0~15 / **3** / 1]] (SP4903 039)
4903 81*	Filter Adj.: Text/Photo (Mag.%) 25-64%	[0~15 / **12** / 1] (SP4903 039)
4903 82*	Filter Strength: Text/Photo (Edge) 65-154%	[0~3 / **3** / 1] (SP4903 043)
4903 83*	Filter Adj.: Text/Photo (Edge Det.) 65-154%	[0~15 / **3** / 1] (SP4903 043)
4903 84*	Filter Adj.: Text/Photo (Mag.%) 65-154%	[0~15 / **12** / 1] (SP4903 043)
4903 85*	Filter Strength: Text/Photo (Edge) 155-256%	[0~3 / **3** / 1] (SP4903 047)
4903 86*	Filter Adj.: Text/Photo (Edge Det.) 155-256%	[0~15 / **3** / 1] (SP4903 047)
4903 87*	Filter Adj.: Text/Photo (Mag.%) 155-256%	[0~15 / **12** / 1] (SP4903 047)
4903 88*	Filter Strength: Text/Photo (Edge) 257-400%	[0~3 / **3** / 1] (SP4903 051)
4903 89*	Filter Adj.: Text/Photo (Edge Det.) 257-400%	[0~15 / **3** / 1] (SP4903 051)
4903 90*	Filter Adj.: Text/Photo (Mag.%) 257-400%	[0~15 / **12** / 1] (SP4903 051)
4903 91*	Filter Strength: Photo (Edge)	[0~3 / **2** / 1] (SP4903 036)
4903 92*	Filter Adj.: Photo (Edge Det.)	[0~15 / **0** / 1] (SP4903 036)
4903 93*	Filter Adj.: Photo (Mag.%)	[0~15 / **15** / 1] (SP4903 036)

4904*	IPU Setting				
	Many IPU setting SP modes have discussions in section 6. (☛6.5)				
4904 1*	Grayscale Photo Mode	**0**: Dithering and smoothing 1: Error diffusion and MTF filter processing			
	Selects the method of grayscale processing for the Photo Mode. "Dithering and smoothing" is the same as the setting for "Print Photo" selected on the operation panel in Photo Mode. Dithering can be adjusted with SP4903 037. "Error diffusion and MTF filter processing" is the same as the setting for "Normal" or "Glossy Photo" selected on the operation panel in Photo Mode. Error diffusion can be adjusted with SP4903 036 and 038.				
4904 2*	Quality Photo Mode	**Value**	**Method**	**Lines**	**Effect**
		0	Dither 8 x 8	75	Screening
		1	Dither 8 x 8	106	Best grayscale
		2	Dither 6 x 6	142	Good grayscale
		3	Dither 4 x 4	212	Good resolution
	Selects the size of the dither matrix for the photo mode.				
4904 3*	Density Setting for Low Density Original Mode	**0**: Selects γ normal density 1: Digitizes to near binary image			
	Selects the density γ factor for the low-density original mode. *Use to achieve better balance between text and images, correct shadows that appear around text in handwritten documents, to enhance documents written in pencil, or to achieve stark contrast when copying blueprints, building plans, etc.*				
4904 4*	Density Setting for Copied Original Mode	**0**: Selects γ normal density 1: Digitizes to near binary image			
	Selects the density γ factor for the copied original mode.				
4904 5*	Special Text Density	[0~7 / **0** / 1] 0: Off, 1: Weaker, 7: Stronger			
	Enter the appropriate number with the 10-key pad then press #. This SP code adjusts the density of the image to eliminate vertical black lines in originals that were caused by previous scanning with a dirty optics. While selecting a higher setting to erase more lines, selecting a very high setting can cause low contrast areas to become faint or cause them to drop out. (☛6.5)				
4904 7*	Error Diffusion Pattern	**0**: Edge threshold pattern is used. 1: Texture Pattern (matrix) 0 is used 2: Texture Pattern (matrix) 1 used. 3: Texture Pattern 2 (matrix) used.			
	Adjusts the threshold level for error diffusion processing in the Text/Photo mode. The effect of error diffusion can vary, depending on the image of the original. Adjust this setting if the results of the texture in copies is not what you expect, especially before starting a large copy job.				
	4904 8 to 4904 12, Gray Adj.: Text/Photo (Edge Det.), Photo (Edge Det.) The following 5 SP modes adjust the setting for edge detection during grayscale processing of originals scanned with the Custom Setting of the Text/Photo mode and Photo mode in the specified magnification range. At defined edges error diffusion executes on text to create sharp lines to better define text characters, but in other areas, error diffusion executes grayscale processing for photographs. Select a lower setting for better reproduction of photographs and a higher setting for sharper text. A lower setting improves the appearance of photographs, but can cause text and thin lines to drop out. A higher setting sharpens text and thin lines, but can also cause grayscale areas to degrade. (☛6.5)				
4904 8*	Gray Adj: Text/Photo (Edge Det.) 25-64%	[0~15 / **8** / 1]			
4904 9*	Gray Adj.: Text/Photo (Edge Det.) 65-154%				
4904 10*	Gray Adj.: Text/Photo (Edge Det.) 155-256%				

4904 11*	Gray Adj.: Text/Photo (Edge Det.) 257-400%		[0~15 / **8** / 1]
4904 13*	Gray Adj.: Photo (Edge Det.)		[0~15 / **0** / 1]
	4904 20 to 4904 23, Text (General) Quality (☛6.2) The following 4 SP modes allow adjustment together with other SP codes to improve image quality of originals copied in Text Mode at magnification within the specified magnification range. Select a lower setting to prioritize reproduction of pictures without moiré, and select a higher setting to prioritize reproduction of text and thin lines. 0: Off, 1: Pictures highest priority, 13: Text/thin lines highest priority		
4904 20*	Text (General) Quality 25-64%		[0~13 / **0** / 1]
4904 21*	Text (General) Quality 65-154%		[0~13 / **0** / 1]
4904 22*	Text (General) Quality 155-256%		[0~13 / **0** / 1]
4904 23*	Text (General) Quality 254-400%		[0~13 / **0** / 1]
4904 24*	Photo (General) Quality	[0~10 / **0** / 1] 0: Off, 1: Picture high priority, 10:Text high priority	
	Allows overall adjustment of photo images in originals scanned in the Photo mode. Select a lower setting to prioritize reproduction of pictures without moiré, and select a higher setting to prioritize reproduction of sharp text. (☛6.5)		
	4904 25 to 4904 28, Text/Photo (General) Quality (☛6.5) The following 4 SP modes allow adjustment with other SP codes to improve quality of images scanned in the Text/Photo mode and in the specified magnification range. Select a lower setting to prioritize reproduction of pictures without moiré, and select a higher setting to prioritize reproduction of sharp text. 0: Off, 1: Pictures highest priority, 10: Text highest priority		
4904 25*	Text/Photo (General) Quality 25-64%		[0~10 / **0** / 1]
4904 26*	Text/Photo (General) Quality 65-154%		[0~10 / **0** / 1]
4904 27*	Text/Photo (General) Quality 155-256%		[0~10 / **0** / 1]
4904 28*	Text/Photo (General) Quality 257-400%		[0~10 / **0** / 1]
4904 29*	Pale (General) Quality	[0~13 / **0** / 1] 0: Off, 1: Picture high priority, 13:Text high priority	
	Allows adjustment with other SP codes to improve the overall quality of images scanned in Pale Mode. Select a lower setting to prioritize reproduction of pictures without moiré, and select a higher setting to prioritize reproduction of text and thin lines. *(☛6.5)*		
4904 30*	Generation (General) Quality	[0~13 / **0** / 1] 0: Off, 1: Picture high priority, 13:Text high priority	
	Allows adjustment with other SP codes to improve the overall quality of images in originals scanned in Generation Copy mode. Select a lower setting to prioritize reproduction of pictures without moiré, and select a higher setting to prioritize reproduction of text and thin lines. *(☛6.5)*		

4905*	Image Data Path	
	SP4905 1 allows switching between filter and magnification processing of the image for testing. SP4905 4 allows switching of the printout for testing.	
4905 1*	Filter Mag. Path Switch	**DFU** **0**: Uses settings of each application and mode 1: Through filter 2: Through magnification 3: Through filter, magnification
4905 4*	Printout Type Selection	**DFU** **0**: Uses settings of each application, mode 1: Reverses image logic (normally inverse black/white).

4909*	Image Data Path	
	SP4909 1 selects the method for image quality through processing. SP4909 20 Forces switching of the data output format between writing for the Ri10, CDIA for testing.	
4905 1*	Image Quality Through Processing	**DFU** **0**: :Normal operation 1: Grayscale through processing 2: Gamma correction through processing 3: Printer gamma, grayscale through processing
4905 20*	Image Data Path – Printer	**DFU** **0**: Normal operation 1: Sets output from the Ri10 to the CDICA for grayscale output (1 pixel/8 bits) 2: Sets output from the Ri10 to the write unit for grayscale output (4 pixles/8 bits) 3: Sets output from the Ri10 to the CDICA for grayscale output (1 pixel/8 bits), also sets output from the Ri10 to the write unit for grayscale output (4 pixels/8 bit)

4999*	ADF Scan Glass Dust Check
	This function checks the narrow scanning glass of the ADF for dust that can cause black lines in copies. If dust is detected a system banner message is displayed, but processing does not stop.
4999 1*	Check On/Off Change
	Issues a warning if there is dust on the narrow scanning glass of the ADF when the original size is detected before a job starts. This function can detect dust on the white plate above the scanning glass, as well as dust on the glass. Sensitivity of the level of detection is adjusted with SP4999 2. [0 ~ 1 / **0** / 1] 0: Off. No dust warning. 1: On. Dust warning. This warning does not stop the job. **Note**: Before switching this setting on, clean the ADF scanning glass and the white plate above the scanning glass.
4999 2*	Detect Level
	Adjusts the sensitivity for dust detection on the ADF scanning glass. This SP is available only after SP49991 is switched on. [0~8 / **4**/ 1] If you see black streaks in copies when no warning has been issued, raise the setting to increase the level of sensitivity. If warnings are issued when you see not black streaks in copies, lower the setting. **Note**: Dust that triggers a warning could move and be removed from the glass by the originals in the feed path. If the dust is removed by passing originals, this is not detected and the warning remains on.

SP5-xxx: Mode

5024*	mm/inch Display Selection	0: Europe/Asia (mm), 1: North America (inch)
	Selects the unit of measurement. After selection, turn the main power switch off and on.	

5044*	Operation Panel Bit SW	**DFU**

5104*	A3/DLT Double Count
	Specifies whether the counter is doubled for A3/DLT. "Yes" counts except from the bypass tray. When "Yes" is selected, A3 and DLT paper are counted twice, that is A4 x2 and LT x2 respectively.

5106*	Density Level Setting	[1~7 / **4** / 1 notch per step]
	Selects the image density level used in ADS mode. Example: If you set SP5106 6 to "2": Pressing the Auto Image Density key toggles the display off and manual notch 2 is selected. *Adjust this SP if the customer cannot attain clean copies after performing automatic density adjustment*	

5112*	Non-Standard Paper Selection	[0: No, **1: Yes**]
	Determines whether a non-standard paper size can be initialized for copying or not. If 1 is selected, a non-standard size can be input using the UP mode.	

5113*	Optional Counter Type	**0**: None 1: Key card (RK3, RK4) 2: Key card (subtraction count setting) 3: Pre-paid card 4: Coin lock 5: MF key card (Peace) **Japan only** 11: MF key card (Increment) 12: MF key card (Decrement)
	Selects the corresponding key for installed devices such as a coin lock.	

5118*	Disable Copying	**DFU**

5120*	Mode Clear Opt. Counter Removal	**0**: Normal reset. 1: Resets only when job finished or before job start. 2: Not normal reset
	Clears all coin devices. **Japan only**	

5121*	Counter Up Timing	**0: Feed**, 1: Exit
	Determines whether the optional key counter counts up at paper feed or at paper exit. *(The total counter is not affected by this SP mode.)*	

5127*	APS Off Mode	**0: Enabled**, 1: Disabled
	Selects whether the APS function is enabled or disabled with the contact of a pre-paid card or coin lock.	

5131*	Paper Size Type Selection	0: Japan, 1: North America, 2: Europe
	Selects the paper size (type) for both originals and copy paper. (Default depends on DIP SW 101 setting.) *After changing the setting, turn the copier off and on. If the paper size of the archive files stored on the HDD is different, abnormal copies could result.*	

5150*	By-Pass Length Setting	**0**: Off, 1: On
	Determines whether the transfer sheet from the by-pass tray is used or not. *Normally the paper length for sub scanning paper from the by-pass tray is limited to 600 mm, but this can be extended with this SP to 1260 mm.*	

5162*	Application Switching Method	**0**: SW, 1: HW
	Determines whether the application screen is switched with a hardware switch or software switch. 0: Soft Key Set 1: Hard Key Set	

5212*	Page Numbering	
	Sets the horizontal and vertical starting points for the front and back sides of duplex copies. *(–10 = Extreme top or extreme right, +10 = Extreme bottom or extreme left)*	
5212 3*	Duplex Printout Right/Left Position	[–10~+10 / **0** / 1 mm step] **DFU**
5212 4*	Duplex Printout High/Low Position	[–10~+10 / **0** / 1 mm step] **DFU**

5302*	Set Time	[–1440~+1440 / 1 min. step]
	Adjusts the RTC time setting for the local time zone. *Example: For Japan (+9 GMT), enter 540 (9 hours x 60 min.)*	

5404	User Code Count Clear	
	Clears the counts for the user codes assigned by the key operator to restrict the use of the machine.	

5501*	PM Alarm	
5501 1*	PM Alarm Level	[0~9999 / **0** / 1 step] **0**: Alarm off 1~9999: Alarm goes off when *Value (1~9999) ≥ PM counter*
5501 2*	Original Count Alarm	0: No alarm sounds **1**: Alarm sounds after the number of originals passing through the ARDF ≥ 10,000

5504*	Jam Alarm
	Sets the alarm to sound for the specified jam level (document misfeeds are not included). [0~3 / **3** / 1 step] 0: Zero (Off) 1: Low (2.5K jams) 2: Medium (3K jams) 3: High (6K jams)

5505*	Error Alarm	[0~255 / **50** / 100 copies per step] **Japan only**

5507*	Supply Alarm	
5507 1*	Paper Supply Alarm	**0: Off**, 1: On, **DFU**
5507 2*	Staple Supply Alarm	**0: Off**, 1: On, **Japan only**
5507 3*	Toner Supply Alarm	**0: Off**, 1: On, **DFU**
5507 128*	Interval :Others	[00250 ~ 10000 / **1000** / 1 Step] **DFU**
5507 132*	Interval :A3	
5507 133*	Interval :A4	
5507 134*	Interval :A5	
5507 141*	Interval :B4	
5507 142*	Interval :B5	
5507 160*	Interval :DLT	
5507 164*	Interval :LG	
5507 166*	Interval :LT	
5507 172*	Interval :HLT	

5508*	CC Call	
5508 1*	Jam Remains	0: Disable, **1:** Enable
	Enables/disables initiating a call for an unattended paper jam.	
5508 2*	Continuous Jams	0: Disable, **1:** Enable
	Enables/disables initiating a call for consecutive paper jams.	
5508 3*	Continuous Door Open	0: Disable, **1:** Enable
	Enables/disables initiating a call when the front door remains open.	
5508 4*	Low Call Mode	0: Normal mode, **1:** Reduced mode
	Enables/disables the new call specifications designed to reduce the number of calls.	
5508 11*	Jam Detection: Time Length	[03~30 / **10** / 1]
	Sets the time a jam must remain before it becomes an ”unattended paper jam”. This setting is enabled only when SP5508 004 is set to 1.	
5508 12*	Jam Detection: Continuous Count	[02~10 / **5** / 1]
	Sets the number of consecutive paper jams required to initiate a call. This setting is enabled only when SP5508 004 is set to 1.	
5508 13*	Door Open: Time Length	[03~30 / **10** / 1]
	Sets the length of time the door remains open before the machine initiates a call. This setting is enabled only when SP5508 004 is set to 1.	

5508 21*	Jam Operation: Time Length	0: Automatic Call **1:** Audible Warning at Machine
	Determines what happens when a paper jam is left unattended.	
5508 22*	Jam Operation: Continuous Count	0: Automatic Call **1:** Audible Warning at Machine
	Determines what happens when consecutive paper jams occur.	
5508 23*	Door Operation: Time Length	0: OFF, **1:** ON
	Determines what happens if the door remains open (15 min.). Displays a warning if set to ON. Pressing the call button will contact the service center. *This setting is available for setting only if SP5508 004 is set for 1.*	

5801	Memory Clear	Resets all correction data for process control and all software counters, and returns all modes and adjustments to their default values. (☛ 5.1.9). *To execute, hold down ① for over 3 seconds, and then turn the copier off and on again.* *Use this SP only after replacing the NVRAM, or after the copier has malfunctioned due to a damaged NVRAM.*
5801 1	All Clear	Initializes items 2 ~ 12 below.
5801 2	Engine	Initializes all registration settings for the engine and processing settings.
5801 3	SCS	System Control Service. Initializes default system settings, CSS settings, operation display coordinates, and ROM update information. SCS: System Control Service
5801 4	IMH Memory Clr	Image Memory Handler. Initializes the registration setting for the image memory handler.
5801 5	MCS	Memory Control Service. Initializes the automatic delete time setting for stored documents.
5801 6	Copier application	Initializes all copier application settings.
5801 7	Fax application	Initializes the fax reset time, job login ID, all TX/RX settings, local storage file numbers, and the off-hook timer.
5801 8	Printer application	Initializes the printer defaults, programs registered, the printer SP bit switches, and printer CSS counter.
5801 9	Scanner application	Initializes the scanner defaults for the scanner and all the scanner SP modes.
5801 10	Web Service/Network Application	Deletes the network file application management files and thumbnails, and initializes the job login ID.
5801 11	NCS	Network Control Service. Initializes the system defaults and interface settings (IP addresses also), SmartDeviceMonitor for Admin, Web Status Monitor settings, and the TELNET settings.
5801 12	R-FAX	Initializes the job login ID, SmartDeviceMonitor for Admin, job history, and local storage file numbers.
5801 14	Clear DCS Settings	
5801 15	Clear UCS Settings	

5802*	Printer Free Run	**Disable** / Enable
	Performs a free run. The scanner scans once and the printer prints for the number of copies requested. To perform the free run, after selecting "1", press the Copy Window to enter copy mode, input the number of copies, and then press the Start key. To stop the free run, press C/⊘.	

5803	Input Check
	Displays the signals received from sensors and switches. (☛ 5.1.6)

5804	Output Check
	Turns on the electrical components individually for test purposes. (☛ 5.1.7)

5807	Option Connection Check	
5807 1	ARDF	Execution will return either a "1" or "0": 0: Device not connected correctly. 1: Device connected correctly.
5807 2	Bank (Paper Tray Unit)	
5807 3	LCT	
5807 4	Finisher (1000-sheet, Two-Tray finisher)	

5811*	Machine Serial Number
	Used to input the machine serial number. This is normally done at the factory. *If you want to know the serial number, print the system parameter list. Press # and then input "A".*

5812*	Service Tel. No. Setting	
	Use these SP modes to input service and support telephone numbers. Enter the number and press *Press the # key to input a pause. Press the "Clear modes" key to delete the telephone number.*	
5812 1*	Service	Service representative telephone number.
5812 2*	Facsimile	Fax number of service representative
5812 3*	Supply	Supplier of consumables
5812 4*	Operation	Operation support

5816*	Remote Service	
5816 1*	I/F Setting	Switches the remote diagnostics function off and on. [0~2 / **2** / 1] 0: Remote diagnostics off. 1: Serial (CSS or NRS) remote diagnostics on. 2: Network remote diagnostics.
5816 2*	CE Call	Allows the customer engineer to start or end the remote machine check using CSS or NRS by pressing the center report key.
5816 3*	Function Flag	Enables and disables remote diagnosis via the NRS network. [0~1 / **0** / 1] 0: Disables remote diagnosis via network. 1: Enables remote diagnosis via network.
5816 4*	Communication Test Call	Executes a transmission test call for NRS. The test returns a value in the range 0 to 99. 0: Normal end (center operating) 1: Normal end (center not operating) Other: Abnormal
5816 5*	Device Information Call	Executes a call to determine whether the machine is operating. The test returns a value in the range 0 to 99. 0: Normal end (center operating) 1: Normal end (center not operating) Other: Abnormal
5816 6*	Device Information Call Display	Determines whether the item for initial setting of the screen for the NRS device information notification call is displayed. **0**: Enabled. Item initial setting not displayed. 1: Disable. Item for initial setting is displayed.
5816 7*	SSL Disable	Determines whether RCG (Remote Communication Gate) confirmation is done by SSL during an RCG send for the NRS via a network interface. **0**: Yes. SSL not used. 1: No. SSL used.
5816 8*	RCG Connect Timeout	Sets the length of time (seconds) for the timeout when the RCG (Remote Communication Gate) connects during a call via the NRS network. [1~90 / **10** / 1 sec.]
5816 9*	RCG Write to Timeout	Sets the length of time (seconds) for the timeout when send data is written to the RCG during a call via the NRS network. [0~100 / **30** / 1 sec.]
5816 10*	RCG Read Timeout	Sets the length of time (seconds) for the timeout when send data is written from the RCG during a call via the NRS network. [0~100 / **30** / 1 sec.]
5816 11*	Port 80 Enable	Determines whether permission is granted for access to the SOAP method via Port 80 on the NRS network. **0**: No. Access denied 1: Yes. Access granted.

5821*	Remote Service Address	**Japan Only**.
5821 1*	CSS PI Device Code	Sets the PI device code. After changing this setting, you must switch the machine off and on.
5821 2*	RCG IP Address	Sets the IP address of the RCG (Remote Communication Gate) destination for call processing at the remote service center. [00000000h ~ FFFFFFFFh/ **00000000h** /

5824	NVRAM Data Upload
	Uploads the UP and SP mode data (except for counters and the serial number) from NVRAM on the control board to a flash memory card. *While using this SP mode, always keep the front cover open. This prevents a software module accessing the NVRAM during the upload.*

5825	NVRAM Data Download
	Downloads the content of a flash memory card to the NVRAM on the control board.

5828*	Network Setting			
5828 66*	Job Spooling Clear: Start Time	Determines whether unprinted jobs on the HDD are printed the next time the machine is switched on. Available only the job spooling feature. ON: Clear spooled jobs from HDD at power on. **OFF**: Print spooled jobs on HDD at power on.		
5828 69*	Job Spooling: Protocol	Disables and enables protocols used for job spooling. The settings are done by entering a “0” (Off) or a “1” for each bit switch. Defaults: 1 (all enabled).		
		Bit	**Protocol**	**Comments**
		0	LPR	
		1	FTP	Not used
		2	IPP	
		3	SMB	
		4	BM Links	Japan Only
		5	Reserved	Not used
		6	Reserved	Not used
		7	Reserved	Not used
5828 74*	Delete Password	Deletes the NCS (Network Control Service) password. Sets the Telnet, WSM (Web Status Monitor), and remote ROM update passwords to NULL (empty)		
5828 84*	Print Settings List	Prints a list of the NCS parameter settings.		
5828 90*	TELNET (0:OFF 1:ON)	Disables or enables Telnet operation. If this SP is disabled the Telnet port is closed. [0~1/ **1** / 1] 0: Disable 1: Enable		
5828 91*	Web (0:OFF 1:ON)	Disables or enables the Web operation. [0~1/ **1** / 1] 0: Disable 1: Enable		

5832	HDD Formatting	
	Enter the SP number for the partition to initialize, then press #. When execution ends, cycle the machine off and on.	
5832 1	ALL	Initializes entire content of the HDD.
5832 2	IMH	Initializes 1) documents stored on the document server, 2) stamp print data, 3) scanner delivery images, 4) fax delivery images.
5832 3	Thumbnail	Initializes MCS thumbnail images.
5832 4	Job Log	Initializes job data used by the Poplar server. **Japan Only**
5832 5	Printer Fonts	Initializes printer fonts, overlay forms.
5832 6	User Info.	Initializes user information (UCS)
5832 7	Mail RX Data	Initializes mail receive data (DCS)
5832 8	Mail TX data	Initializes mail send data (DCS)
5832 9	Data for Design	Designer use only.
5832 10	Fax	Initializes the logs (fax history and debug log)
5832 11	Ridoc I / F	Initializes the NetFile management area.

5833	Job Log On/Off	**0: Off (disable),** 1: On (enable)
	Switches the job log transfer on/off for Poplar server. **Japan Only**	

5834	Operation Panel Image Exposure	**0**: Off (disable), 1: On (enable)
	Enables and disables the operation panel read (dump) feature. After powering on the machine, set this option to 1 to enable this feature. *To reset the machine to 0, the machine must be turned off and on again. Selecting 0 for this option without cycling the power off and on does not restore the default setting (0).*	

5836*	Capture Settings	
5836 1*	Capture Function (0:Off 1:On)	**0**: Disable, 1: Enable
	With this function disabled, the settings related to the capture feature cannot be initialized, displayed, or selected.	
5836 2*	Panel Setting	**0**: Disable, 1: Enable
	Determines whether each capture related setting can be selected or updated from the initial system screen. The setting for SP58361 has priority	
	5836 71 to 5836 76, Copier and Printer Document Reduction The following 6 SP modes set the default reduction for stored documents sent to the document management server via the MLB. [0~2 / **2** / 1] *Enabled only when optional MLB (Media Link Board) is installed*	
5836 71*	Reduction for Copy Color	0: 1to-1, 1: ½, **2**: 1/4
5836 72*	Reduction for Copy B&W Text	0: 1to-1, 1: ½, **0**: 1/4
5836 73*	Reduction for Copy B&W Other	0: 1to-1, 1: ½, **0**: 1/4
5836 74*	Reduction for Printer Color	0: 1to-1, 1: ½, **2**: 1/4
5836 75*	Reduction for Printer B&W	0: 1to-1, 1: ½, **0**: 1/4
5836 76*	Reduction for Printer B&W HQ	0: 1to-1, 1: ½, **0**: 1/4
	5836 81 to 5836 86, Stored document format The following 6 SP modes set Sets the default format for stored documents sent to the document management server via the MLB. *Enabled only when optional MLB (Media Link Board) is installed*	

5836 081*	Format for Copy Color	**0**: JFIF/JPEG, 1: TIFF/MMR, 2: TIFF/MH, 3: TIFF/MR
5836 082*	Format for Copy B&W Text	0: JFIF/JPEG, **1**: TIFF/MMR, 2: TIFF/MH, 3: TIFF/MR
5836 083*	Format Copy B&W Other	0: JFIF/JPEG, **1**: TIFF/MMR, 2: TIFF/MH, 3: TIFF/MR
5836 084*	Format for Printer Color	**0**: JFIF/JPEG, 1: TIFF/MMR, 2: TIFF/MH, 3: TIFF/MR
5836 085*	Format for Printer B&W	0: JFIF/JPEG, **1**: TIFF/MMR, 2: TIFF/MH, 3: TIFF/MR
5836 086*	Format for Printer B&W HQ	0: JFIF/JPEG, 1: TIFF/MMR, **2**: TIFF/MH, 3: TIFF/MR
5836 091*	Default for JPEG	[5~95 / **50** / 1]
	Sets the JPEG format default for documents sent to the document management server via the MLB with JPEG selected as the format. *Enabled only when optional MLB (Media Link Board) is installed.*	

5839*	IEEE 1394	
5839 4	Host Name	Enter name
	Enter the name of the device used on the network. Example: RNP0000000000	
5839 7*	Cycle Master	OFF / **ON**
	Enables or disables the cycle master function for the 1394 bus standard.	
5839 8*	BCR mode	
	Determines how BCR (Broadcast Channel Register) operates on the 1394 standard bus when the independent node is in any mode other than IRM. (NVRAM: 2bits) **Always Effective**: Writes from the IRM. Standard: Copies BCR of the IRM after no data is written from the IRM after the prescribed time has elapsed. IRM Color Copy: BCR normally enabled.	
5839 9*	IRM 1394a Check	
	Conducts a 1394a check of IRM when the independent node is in any mode other than IRM. **OFF**: Checks whether IRM conforms to 1394a. ON: After IRM is checked, if IRM does not conform then independent node switches to IRM.	
5839 10*	Unique ID	
	Lists the ID (Node_Unique_ID) assigned to the device by the system administrator. OFF: Does not list the Node_Unique_ID assigned by the system administrator. Instead, the Source_ID of the GASP header in the ARP is used. **ON:** The Node_Unique_ID assigned by the system administrator is used, and the Source_ID of the GASP header in the ARP is ignored. Also, when the serial bus is reset, extra bus transactions are opened for enumeration.	
5839 11*	Logout	
	Handles the login request of the login initiator for SBP-2. (1bit) OFF: Disable (refuse login). Initiator retry during login. Login refusal on arrival of login request (standard operation) **ON**: Enable (force logout). Initiator retry during login. Login refusal on arrival of login request, and the initiator forces the login.	

5839 12*	Login	
	Enables or disables the exclusive login feature (SBP-2 related). **OFF**: Disables. The exclusive login (LOGIN ORB exClusvie it) is ignored. ON: Enables. Exclusive login is in effect.	
5839 13*	Login MAX	[0~63 / **8** / 1], (0 and 63: Reserved)
	Sets the maximum number of logins from the initiator (6-bits)	

5840*	IEEE 802.11b		
5840 4*	SSID	Enter ID	
	Enters a unique ID (up to 32 characters long) to identify the device when it is operating in an area with another wireless LAN network.		
5840 6*	Channel MAX	JA [1~14/ **14** / 1] NA [1~11 / **11** / 1 EU [1~13 / **13** / 1] China, Taiwan (Same as NA)	
	Sets the maximum number of channels available for data transmission via the wireless LAN. The number of channels available varies according to location. The default settings are set for the maximum end of the range for each area. Adjust the upper 4 bits to set the maximum number of channels. *Displayed only when the option 802.11b for wireless LAN is installed.*		
5840 7*	Channel MIN	JA [1~14 / **1** / 1] NA [1~11 / **1** / 1 EU [1~13 / **1** / 1] China, Taiwan (Same as NA)	
	Sets the minimum number of channels available for data transmission via the wireless LAN. The number of channels available varies according to location. The default settings are set for the minimum end of the range for each area. Adjust the lower 4 bits to set the minimum number of channels. *Displayed only when the option 802.11b for wireless LAN is installed.*		
5840 11*	WEP Key Select	**00**: Key #1	0000 0000
		01: Key #2 (Reserved)	0000 0001
		10: Key #3 (Reserved)	0000 0010
		11: Key #4 (Reserved)	0000 0011
	Selects the WEP key. [00~11 / 00 / 1 binary]		
5840 18*	SSID Key Check		
5840 20*	WEP Mode	**0**: Max. 64-bit (10 characters) 1: Max. 128-bit (10, 26 characters)	
	Determines the operation mode of the WEP key. *Displayed only when the option 801.11b for wireless LAN is installed.*		

5841*	Supply Name Setting	
	Allows setting the following items with the Soft Keyboard after pressing the "Soft Keyboard" button displayed for this SP code. The items you enter are displayed after pressing "User Tools" and then pressing the "Inquiry" button on the touch-panel display.	
5841 1*	Toner Name Setting: Black	Enter the name of the toner in use.
5841 6*	Staple Bind	Enter the name of the staples in use for booklet stapling.
5841 7*	Original Stamp	Enter the names of original stamps. (This is stamped on originals to indicate that they have been fed and scanned for copying.)
5841 11*	Staple Std1	
5841 12*	Staple Std2	
5841 13*	Staple Std3	
5841 14*	Staple Std4	

5842*	Net File Analysis Mode Setting	[8 bits / **0011 1111** / Bit SW]
	Selects each debug output mode for NetFile processing Bit 8 is reserved. Bit 7 is the debug output switch for each mode. Net files are jobs to be printed from the document server using a PC and the Desk Top Binder software.	

5844*	USB	
5844 1*	Transfer Rate	Full Speed / **Auto Change**
	Sets the speed for USB data transmission. Full Speed: (12 Mbps fixed) Auto Change: 480 Mbps/12 Mbps auto adjust	
5844 2*	Vendor ID	[0x0000~0xFFFF/ **0x05CA** /1], **DFU**
	Sets the vendor ID: Initial Setting: 0x05CA Ricoh Company.	
5844 3*	Product ID	[0x0000~0xFFFF/ **0x0403** /1], **DFU**
	Sets the product ID.	
5844 4*	Device Release Number	[0000~9999/ **0100** /1], **DFU**
	Sets the device release number of the BCD (binary coded decimal) display. *Enter as a decimal number. NCS converts the number to hexadecimal number recognized as the BCD.*	

5845*	Delivery Server Setting	
	Provides items for delivery server settings.	
5845 1*	FTP Port No.	[0~65535 / **3670** / 1]
	Sets the FTP port number used when image files to the Scan Router Server.	
5845 2*	IP Address (Primary)	Range: **000.000.000.000** ~ 255.255.255.255
	Use this SP to set the Scan Router Server address. The IP address under the transfer tab can be referenced by the initial system setting.	
5845 6*	Delivery Error Display Time Netfiles:	[0~999 / **300** / 1]
	Use this setting to determine the length of time the prompt message is displayed when a test error occurs during document transfer with the NetFile application and an external device.	
5845 8*	IP Address (Secondary)	Range: **000.000.000.000** ~ 255.255.255.255
	Specifies the IP address assigned to the computer designated to function as the secondary delivery server of Scan Router. This SP allows only the setting of the IP address without reference to the DNS setting.	
5845 9*	Delivery Server Model	[0~4/ **0** / 1]
	Allows changing the model of the delivery server registered by the I/O device. 0: Unknown 1: SG1 Provided 2: SG1 Package 3: SG2 Provided 4: SG2 Package	

5845 10*	Delivery Svr Capability	[0~255 / 0 / 1]
Bit7 = 1 Comment information exits		Changes the capability of the registered that the I/O device registered.
Bit6 = 1 Direct specification of mail address possible		
Bit5 = 1 Mail RX confirmation setting possible		
Bit4 = 1 Address book automatic update function exists		
Bit3 = 1 Fax RX delivery function exists		
Bit2 = 1 Sender password function exists		
Bit1 = 1 Function to link MK-1 user and Sender exists		
Bit0 = 1 Sender specification required (if set to 1, Bit6 is set to “0”)		

5846*	UCS Settings		
5846 1*	Machine ID (For Delivery Server)		Displays ID
	Displays the unique device ID in use by the delivery server directory. The value is only displayed and cannot be changed. This ID is created from the NIC MAC or IEEE 1394 EUI. The ID is displayed as either 6-byle or 8-byte binary.		
5846 2*	Machine ID Clear (For Delivery Server)		Clears ID
	Clears the unique ID of the device used as the name in the file transfer directory. Execute this SP if the connection of the device to the delivery server is unstable. After clearing the ID, the ID will be established again automatically by cycling the machine off and on.		
5846 3*	Maximum Entries	[2000~50000/ **2000** /1]	
	Changes the maximum number of entries that UCS can handle. If a value smaller than the present value is set, the UCS managed data is cleared, and the data (excluding user code information) is displayed.		
5846 4*	Delivery Server Model	**0:** Not used, 1:SG1 Provided, 2: SG1 Package, 3: SG2 Provided 4: SG2 Package	
	Changes the model of the transfer server registered for the I/O device.		
5846 5*	Delivery Server Capability	Bit 7 = 1 Comment information Bit 6 = 1 Address direct entry possible Bit 5 = 1 Mail Rx confirmation possible Bit 4 = 1 Address book auto update Bit 3 = 1 Fax Rx function [0~255 / **0** / 2]	
	Changes the capability of the server registered for the I/O device.		
5846 6*	Delivery Server Retry Timer		[0~255/ **0** /1]
	Sets the interval for retry attempts when the delivery server fails to acquire the delivery server address book.		
5846 7*	Delivery Server Retry Times		[0~255/ **0** /1]
	Sets the number of retry attempts when the delivery server fails to acquire the delivery server address book.		
5846 8*	Delivery Server Maximum Entries		[2000~50000 / **2000** / 1]
	Sets the maximum number account entries of the delivery server user information managed by UCS.		
5846 10*	LDAP Search Timeout		[1~255 / **60** / 1]
	Sets the length of the timeout for the search of the LDAP server.		
5846 50*	Initialize All Directory Info.	Clears all directory information managed by UCS, including all user codes.	
5846 51*	Upload All Directory Info.	Uploads all directory information to the IC card.	
5846 52*	Download All Directory Info.	Downloads all directory information from the IC card.	
5846 70*	LDAP Attribute (Name)	Allows you to enter a search attribute other than the default mail (cn) for the LDAP server search.	
5846 71*	LDAP Attribute (Mail)	Allows you to enter a search attribute other than the default mail address (mail) for the LDAP server search.	
5846 72*	LDAP Attribute (Fax)	Allows you to enter a search attribute other than the default facsimile telephone number (FacsimileTelephoneNumber) for the LDAP server search.	

5846 73*	LDAP Attribute (Organization)	Allows you to enter a search attribute other than the default organization name (o) for the LDAP server search.
5846 74*	LDAP Attribute (Organizational Unit)	Allows you to enter a search attribute other than the default organization unit name (ou) for the LDAP server search.
5846 80*	Backup FCU	Backs up all directory information on the HDD to the FCU ROM.
5846 90*	Plain Data Forbidden	Allows you to prevent the address from plain data. This is a security function that prevents unauthorized access to address book data. **0**: No check. Address book data not protected. 1: Check. Allows operation of UCS without data from HDD or SC card and without creating address book information with plain data.
5846 99*	Bit SW	Sets UCS debug output. **DFU**

5847*	Net File Resolution Reduction	
	5847 1 through 5847 6 changes the default settings of image data transferred externally by the Net File page reference function. [0~2 / **2** / 1] 5847 21 sets the default for JPEG image quality of image files handled by NetFile. "Net files" are jobs to be printed from the document server using a PC and the DeskTopBinder software.	
5847 2*	Rate for Copy B&W Text	0: 1x 1: 1/2x **2**: 1/3x 3: 1/4x
5847 3*	Rate for Copy B&W Other	
5847 5*	Rate for Printer B&W	
5847 6*	Rate for Printer B&W HQ	
5847 21*	Network Quality Default for JPEG	
	Sets the default value for the quality of JPEG images sent as NetFile pages. This function is available only with the MLB (Media Link Board) option installed. [5~95 / **50** / 1]	

5848*	Web Service	
	5847 2 sets the 4-bit switch assignment for the access control setting. Setting of 0001 has no effect on access and delivery from Scan Router. 5847 100 sets the maximum size allowed for downloaded images. The default is equal to 1 gigabyte.	
5848 1*	NetFile (Lower 4 Bits Only)	Bit switch settings.
	0000: No access control 0001: Denies access to DeskTop Binder. Access and deliveries from Scan Router have no effect on capture.	
5848 2*	Repository (Lower 4 Bits)	0000: No access control 0001: Denies access to DeskTop Binder.
5848 3*	Doc. Svr. Print (Lower 4 Bits)	Switches access control on and off. 0000: OFF
5848 4*	User Directory (Lower 4 Bits)	
5848 5*	Delivery Input (Lower 4 Bits)	
5848 6*	Fax Control (Lower 4 Bits)	
5848 7*	Comm. Log Fax (Lower 4 Bits)	
5848 100*	Repository: Max. Size of Download Image	[1~1024 / **1024** / 1K]

5849*	Installation Date	
5849 1*	Display	**DFU**
5849 2*	Switch to Print	**DFU**

5850*	Address Book Function
5850 1*	Switch Module
5850 3*	Replacement of Circuit Classification
	The machine is sold ready to use with a G3 line. This SP allows you to switch all at once to convert to G4 after you add a G4 line. Conversely, if for some reason the G4 line becomes unusable, you can easily switch back to G3.
	Circuit Type
	G3
	Internal
	G21
	G21 Internal
	G22
	G22 Internal
	G23
	G23 Internal
	G3 Open Circuit
	Internal Open Circuit
	I-G3
	I-G3 Internal
	G4

5852*	SMTP	
	Simple Mail Transfer Protocol. The protocol for communication between Internet main MTAs (Message Transfer Agents).	
5852 1*	SMTP Server Name	Allows you to specify the server by either its IP address or host name. If you use the host name, then you must also specify the DNS.
5852 2*	SMTP Server Port Number	Sets the port number of the SMTP server. [0~65535 / **25** / 1]
5852 3*	SMTP Type	
5852 4*	SMTP User Name	Enter a text string for the user name.
5852 5*	SMTP Password	Enter a character string for the password.
5852 7*	POP Before SMTP	During mail sending, determines whether the POP server connection is validated before connecting to the SMTP server. This prevents unauthorized access to the SMTP server and requires users to access and log onto the POP3 server before sending e-mail. **0**: No. POP server connection validated. 1: Yes. POP server connection validated before SMTP connection.
5852 8*	POP Server Name	Sets the name of the POP server. You can use either the IP address or the host name. If you use the host name, then you must also specify the DNS.

5852 9*	POP Server Port Number	Sets the port number of the POP server. [1~65535 / **110** / 1]
5852 10*	POP User Name	Sets the POP user name used to validate POP connection before SMTP connection. This validation is switched on with SP5852 6 (POP Before SMTP). Limit: 63 characters.
5852 11*	POP Password	Sets the POP password used to validate POP connection before SMTP connection. This validation is switched on with SP5852 6 (POP Before SMTP). Limit: 63 characters.
5852 12*	POP Auth. Encryption	Determines whether encryption is done when POP connection is validated before SMTP connection. [0~2 / **0** / 1] 0: Automatic 1: No. Without encryption. 2: Yes. With encryption.

5853*	Stamp Data Download
	Use this SP to download the fixed stamp data stored in the firmware of the ROM and copy it to the HDD. This SP can be executed as many times as required. This SP must be executed after replacing or formatting the hard disks. **Note**: This SP can be executed only with the hard disks installed.

5856	Remote ROM Update
	When set to “1” allows reception of firmware data via the local port (IEEE 1284) during a remote ROM update. This setting is reset to zero after the machine is cycled off and on. [0~1 / **0** / 1] 0: Not allowed 1: Allowed

5857*	Debug Log Save Function	
5857 1*	On/Off (1:ON 0:OFF)	**0**: ON, 1: OFF
	Switches the debug log feature on and off. The debug log cannot be captured until this feature is switched on.	
5857 2*	Target (1:IC Card 2:HDD)	**1**:IC Card, 2:HDD
	Select “1” (IC Card) if an HDD unit is not installed in the machine, or if the HDD unit is temporarily out of service. The IC card can store only 4 MB so use the HDD selection.	
5857 3*	Initialize IC Card	**DFU**
	Initializes the IC card inserted into the controller slot. Initializing erases all data on the IC card. Use to initialize a new card.	
5857 4*	Save to IC Card	**DFU**
	Saves the debug log in memory to the IC card.	
5857 5*	Save to HDD	**DFU**
	Saves the debug log in memory to the HDD. *A unique file name is generated to avoid overwriting existing file names on the SD Card. Up to 4MB can be copied to an SD Card. 4 MB segments can be copied one by one to each SD Card.*	
5857 7*	HDD to IC Card (Latest 4MB)	
	Copies the latest 4 MB of the debug log on the HDD to the IC card. This function erases all data from the IC card as it copies.	

5857 8*	HDD to IC Card (Latest 4MB Any Key)	
	Copies the latest 4 MB of the debug log on the HDD to the IC card, but only those portions of the log specified with a key specified with SP5859 (Debug Save Key No.) This function erases all data from the IC card as it copies. *To enable this SP, the machine must be cycled off and on.*	
5857 11*	Erase Debug Data From HDD	**DFU**.
	Erases all debug log data from the IC card.	

5858*	Debug Save When	
	These SPs select the content of the debugging information to be saved to the destination selected by SP5857 002. SP5858 3 stores one SC specified by number. *Refer to Section 4 for a list of SC error codes.*	
5858 1*	Engine SC Error	Stores SC codes generated by copier engine errors.
5858 2*	Controller SC Error	Stores SC codes generated by GW controller errors.
5858 3*	Any SC Error	[0~65535 / **0** / 1]
5858 4*	Jam	Stores jam errors.

5859*	Debug Log Save Function	
5859 1*	Key 1	These SPs allow you to set up to 10 keys for log files for functions that use common memory on the controller board. (☛5.3.1) [-9999999~9999999 / 0 / 1]
5859 2*	Key 2	
5859 3*	Key 3	
5859 4*	Key 4	
5859 5*	Key 5	
5859 6*	Key 6	
5859 7*	Key 7	
5859 8*	Key 8	
5859 9*	Key 9	
5859 10*	Key 10	

5860*	**SMTP/POP3/IMAP4**	
5860 20*	Partial Mail Receive Timeout	[1~168 / **72** / 1]
	Sets the amount of time to wait before saving a mail that breaks up during reception. The received mail is discarded if the remaining portion of the mail is not received during this prescribed time.	
5860 21*	MDN Response RFC2298 Compliance	[0~1 / **1** /1]
	Determines whether RFC2298 compliance is switched on for MDN reply mail. 0: No 1: Yes	
5860 22*	SMTP Auth. From Field Replacement	[0~1 / **0** / 1]
	Determines whether the FROM item of the mail header is switched to the validated account after the SMTP server is validated. **0**: No. “From” item not switched. 1: Yes. “From item switched.	

5870	Common Key Info Writing
	Writes to flash ROM the common proof for validating the device for NRS specifications.

5871	HDD Function Disable **DFU**	[0~1 / **0** / 1] (0: OFF, 1: ON)
	Disables the HDD functions by suppressing all functions that write data to the HDD. After this SP is executed, the machine must be switched off and on to enable the setting. **Note**: This SP is intended for use during the installation of the security DIMM, an option that is not yet available.	

5872	HDD Overwrite Status Check **DFU**	

5907*	Plug & Play Setting
	Sets the brand name and the production name for Windows Plug & Play. This information is stored in NVRAM. If the NVRAM is defective or has been replaced, these names should be registered again. Allows input of the maker and model on a two-line display. After replacing the NVRAM, the settings can be selected from available maker and model names. To select and enable the maker & model name: 1 Press and hold down #. 2 Enter the number that corresponds to the correct name on the list.

5913	Switchover Permission Time	[3~30 / **3** / 1 s]
	Sets the amount of time to elapse while the machine is in standby mode (and the operation panel keys have not been used) before another application can gain control of the display.	

5914*	Application Counter Display		**0: Off**, 1: On
5914 1*	Printer Counter	Selects whether or not these total counters are displayed in the UP mode.	
5914 2*	Copy Counter		

5915	Mechanical Counter Detection	0: Not detected, **1**: Detected, 2: Unknown
	Confirms that the mechanical counter inside the inner cover is connected.	

5918*	A3/DLT Counter Display	[0, 1 / **0** / --] (0: OFF, 1: ON)
	Sets the key press display for the counter key. This setting has no relation to (SSP) SP5-104 A3/DLT Double Count.	

5923*	Border Removal Area Switching	[0~1 / **0** / 1]
	Toggles between two settings that affect the appearance of the pages for border removal and printed facing pages: (1) Using the original area as the allotted area, or (2) Using only the copy paper as the allotted area. **0**: Original 1: Paper	

5958*	Feed Clutch Start Timing Adjustment, **DFU**	
	Adjusts the clutch timing to optimize the intervals between fed sheets to reduce jams in the feed unit.	
5958 1*	Start Timing: Tray 1, 2	[35 ~ 57.5 / **42.5** / 2.5mm] **DFU**
5958 2*	Start Timing: Tray 3, 4, LCT	35 ~ 57.5 / **42.5** / 2.5mm] **DFU**
5958 3*	Leading Edge Detection	[19~34 / **26.5** /2.5 mm] **DFU**

5959*	1st Print Delay Timing	[0~60 / **0** / 1 s]
	Sets the amount of time the machine waits to project the latent image onto the drum after the feed/development motor, main motor, and fusing/feed-out motor switch on. This setting allows the drum and hot roller to turn freely in order to allow more time for cleaning toner and carbon that has accumulated on the hot roller strippers. Changing this can improve image quality but can also slow down the first print time. Adjust only when necessary.	

5961*	Large Capacity Exit Mode	0: OFF, **1:** ON
	Selects whether or not all stapled copies are sent to Shift Tray 1 when the Two-Tray finisher is installed.	

5962*	8K 16K Paper Mode	**0**: Off, 1: On.		
	Switches on/off the use of 8-kai, and 16-kai China paper sizes. If 'Off', 8-kai, 16-kai paper sizes are not displayed after pressing the selection key. If 'On', 8-kai, 16-kai paper sizes displayed after pressing the selection key. For this setting to take effect, "2" must be selected for SP5131. With "2" (Europe) selected for SP5131, the ADF can select 16-kai LEF. With SP5962 set for "0" (Off), the nearest size is detected as shown below.			
	Size Loaded	16-kai SEF	6-kai LEF	8-kai SEF
	Size Detected	B5 SEF	B5 LEF	B4 LEF

5967*	Copy Server Set Function	**0**: ON, 1: OFF
	Enables and disables the document server. This is a security measure that prevents image data from being left in the temporary area of the HDD. After changing this setting, you must switch the main switch off and on to enable the new setting.	

5970*	Debug Serial Output **DFU**
	Determines whether the debug information is output by the serial port when the machine is powered on. [0~1 / **0** / 1] 0: Disable 1: Enable

5974*	Cherry Server	**0: Lite**, 1: Full
	Switches writing between the Scan Router Lite application provided and the optional full version.	

5990	SP Print Mode (SMC Printout)	
5990 1	All (Data List)	Prints all of the system parameter lists for the item selected. (☛ 5.1.8) Input the number for the item that you want to print, and then press ①: "Execute" on the touch panel.
5990 2	SP (Mode Data List)	
5990 3	User Program	
5990 4	Logging Data	
5990 5	Diagnostic Report	
5990 7	NIB Summary	
5990 8	Capture Log	
5990 21	Copier User Program	
5990 22	Scanner SP	
5990 23	Scanner User Program	

SP6-xxx: Peripherals

6006*	ADF Registration Adjustment	
	Adjusts the side-to-side and leading edge registration for simplex and duplex original feeding in ARDF mode. Press ⊙ to toggle ±. SP6006 5 sets the maximum setting allowed for rear edge erase.	
6006 1*	Side-to-side	[–3 ~ +3 / **0.0** / 0.1 mm step]
6006 2*	Leading Edge (Thin Original)	[–30 ~ +30 / **0.0** / 0.17 mm step]
6006 3*	Leading Edge (Duplex Front)	[–42 ~ +42 / **0.0** / 0.12 mm step]
6006 4*	Leading Edge (Duplex Rear)	[–42 ~ +42 / **0.0** / 0.12 mm step]
6006 5*	Rear Edge Erase	[–20 ~ +20 / **0.0** / 0.5 mm step]

6007	ADF Input Check	
6007 1	Group 1	Displays the signals received from sensors and switches of the ARDF.(☛ 5.1.6)
6007 2	Group 2	
6007 3	Group 3	

6008	ADF Output Check
	Switches on each electrical component (ARDF motor, solenoid, etc.) of the ARDF for testing. (☛ 5.1.7)

6009	ADF Free Run	
	Performs a free run with the ARDF for duplex and stamp testing. Input the number for the item you want to check, and then press ① to start. *This is a general free run controlled from the copier. For more detailed free run modes, see the ARDF manual.*	
6009 1	Duplex Mode	**OFF**/ON
6009 2	Stamp Mode	**OFF**/ON

6010*	ADF Stamp Position Adjustment	[–7~+7 / **0** / 0.5 mm steps]
	Adjusts the horizontal position of the stamp on the scanned originals.	

6016*	Original Size Decision Priority	**Japan**		
		Bit	**0**	**1**
		7	DLT SEF	11"x15"
		North America		
		Bit	**0**	**1**
		6	DLT SEF	11" x 15"
		5	LT LEF	US Exec LEF
		4	LT SEF	8"x10" SEF
		3	LG SEF	F4 SEF
		Europe		
		Bit	**0**	**1**
		2	DLT SEF	8-K SEF
		1	LT SEF	16-K SEF
		0	LT LEF	16-K LEF
	Determines which original sizes are detected when an original is detected that is larger than the size assigned to the original size sensor. This provides an alternate selection for detection, other than that assigned with SP5131.			

6017*	Sheet Through Magnification	[–50.0 ~ +50.0 / **0.0** / 0.1%/step]
	Adjusts the magnification in the sub-scan direction for ADF mode. Use the ⓝ key to toggle between + and - before entering the value	

6105*	Staple Position Adjustment	[–3.5~+3.5 / **0.0** / 0.5 mm step]
	Adjusts the staple position in the main scan direction when using the two-tray finisher. *Press ⓝ to toggle ±. A larger value shifts the staple toward the edge of the paper.*	

6113*	Punch Hole Adjustment	
	Adjusts the punch hole position. SP6113 1: 2-hole punches for Japan, North America, Europe, and 4-hole punches for Northern Europe. SP6113 2: 3-hole punches for North America, and 4-hole punches for Europe. *Press ⓝ to toggle ±. A larger value shifts the holes toward the edge of the paper.*	
6113 1*	2-Holes	[–7~+7 / **0** / 0.5 mm steps]
6113 2*	3-Holes	[–7~+7 / **0** / 0.5 mm steps]

6902*	Fold Position Adjustment	
	Allows fine adjustment of the fold position on paper when the Booklet Finisher is connected and used.	
6902 1*	A3/DLT	[-30~+30 / **0** / 0.5 mm]
6902 2*	B4	[-20~+20 / **0** / 0.5 mm]
6902 3*	A4/LT	[-15~+15 / **0** / 0.5 mm]

SP7-xxx: Data Log

7001*	Main Motor Operation Time	Display: 00000000~99999999 min
	The number of prints and drive time for drum revolutions can be obtained by counting the main motor revolution time. If the amount of time required for the drum to revolve to print 1 copy increases, this data combined with the number of copies can be used to analyze problems and could be useful for future product development.	

7002*	Original Counter	
7002 1*	Total	Select a number to display the total original count (number of originals fed) for the selected item.
7002 2*	Copier	
7002 3*	Fax	
7002 4*	Doc. Svr. Application	
7002 5*	Scanner	
7002 6*	Others	

7003*	Print Counter	
7003 1*	Total Count	Select a number to display the total print count for the selected item.
7003 2*	Copy	
7003 3*	Fax	
7003 4*	Printer	
7003 5*	Others	

7006*	C/O, P/O Counter	
	Displays the number of copies/prints per original when making more than 10 copies. *For example, if you make 15 copies of a 3 page original document, for a total of 45 sheets, then the counter would be 15 (5 copies counted from 11 to 15 x 3 originals). No count will be returned for 1~10 copies of an original.*	
7006 1*	C/O (Copies/Original)	Displays number
7006 2*	P/O (Prints/Original)	

7007*	Other Counters	
7007 1*	Duplex Counter	Displays the count total for the selected item.
7007 2*	A3/DLT Counter	
7007 3*	Staple Counter	
7007 4*	Scan Counter	

7101*	Print Count: Paper Size	
7101 5*	A4 LEF	Displays the total number of prints by paper size.
7101 6*	A5 LEF	
7101 14*	B5 LEF	
7101 38*	LT LEF	
7101 44*	HLT LEF	
7101 132*	A3 SEF	
7101 133*	A4 SEF	
7101 134*	A5 SEF	
7101 141*	B4 SEF	
7101 142*	B5 SEF	
7101 160*	DLT SEF	
7101 164*	LG SEF	
7101 166*	LT SEF	
7101 172*	HLT SEF	
7101 255*	Other	Count for custom (non-standard) paper sizes

7105*	P type Counter	
7105 1*	Normal	Displays the count for each type of special paper, up to 99,999,999.
7105 2*	Recycled	
7105 3*	Special	
7105 4*	Colour	
7105 6*	Letterhead	
7105 7*	Label	
7105 8*	Thick	
7105 9*	OHP	
7105 10*	Used	
7105 11*	Index	
7105 255*	Others	

7201*	Total Scan Counter	Displays the total number of originals scanned.

7204*	Print Counter - Paper Tray	
	Displays the total number of sheets fed from each paper feed tray.	
7204 1*	ByPass	Copier
7204 2*	Tray 1	Copier
7204 3*	Tray 2	Copier
7204 4*	Tray 3	Paper Tray Unit (Option)
7204 5*	Tray 4	Paper Tray Unit (Option)
7204 6*	LCT	Large Capacity Tray (Option)

7205*	Total ADF Counter	Displays the total number of originals fed by the ARDF.

7206*	Staple Counter	
7206 1*	Normal Staple	Display the total number of staples fired.
7206 2*	Binding Staple	

7209*	Punch	Displays the total times the punch has fired.

7401*	Total SC Counter	Displays the total number of service calls that have occurred. Display range: 0000~9999

7403*	SC History	
7403 1*	Latest	Displays the most recent service calls successive groups of 10.
7403 2*	Latest 1	
7403 3*	Latest 2	
7403 4*	Latest 3	
7403 5*	Latest 4	
7403 6*	Latest 5	
7403 7*	Latest 6	
7403 8*	Latest 7	
7403 9*	Latest 8	
7403 10*	Latest 9	

7502*	Total Paper Jam Counter	Displays the total number of copy jams. Display range: 0000~9999

7503*	Total Original Jam Counter	Displays the total number of original jams. Display range: 0000~9999

⇒ 7504*	Paper Jam Counter by Jam Location		Display range: 0000~9999	
	Displays the total number of copy jams by location. *A "Paper Late" error occurs when the paper fails to activate the sensor at the precise time. A "Paper Lag" paper jam occurs when the paper remains at the sensor for longer than the prescribed time.*			
	Paper Late Error No.	**Paper Lag Error No.**	**Error**	
	1*		At Power On	
	3*		1st Paper Feed Sensor	
	4*		2nd Paper Feed Sensor	
	5*		3rd Paper Feed Sensor	
	6*		4th Paper Feed Sensor	
	7*	57*	LCT Tray Relay Sensor	LCT Tray Relay Sensor .OFF
	8*	58*	Transport Sensor 1	Transport Sensor 1.OFF
	9*	59*	Transport Sensor 2	Transport Sensor 2.OFF
	10*	60*	Transport Sensor 3	Transport Sensor 3.OFF
		61*		Transport Sensor 4.OFF
	13*	63*	Registration Sensor	Registration Sensor.OFF
	14*	64*	Fusing Exit Sensor	Fusing Exit Sensor
	16*	66*	Exit Entrance Sensor	Fusing Exit Sensor.OFF
	17*	67*	Relay Sensor 1 (option)	Relay Sensor 1 .OFF
	18*	68*	Relay Sensor 2 (option)	Relay Sensor 2 .OFF
	19*	69*	Duplex Entrance Sensor	Duplex Entrance Sensor.OFF
	23*	73*	Duplex Exit Sensor	Duplex Exit Sensor.OFF
	24*	74*	1-Bin Tray: Sensor	1-Bin Tray: Sensor.OFF
	25*		Finisher Entrance	
	26*		Finisher Proof Tray	
	27*		Finisher Shift Tray	
	28*		Finisher Staple Tray	
	29*		Finisher Tray	
	30*		Mailbox Entrance	
	31*		Mailbox Proof Tray	
	32*		Mailbox Relay	
	33*		Mailbox MBX	
	35*		Booklet FIN Entrance	
	36*		Booklet FIN Transport	
	37*		Booklet FIN Early	
	38*		Booklet FIN Staple	
	39*		Booklet FIN Late Saddle Stitch	
	40*		Ent. FIN Off	
	41*		Exit FIN Off	

7505*	Total Original Jam by Location		Display range: 0000~9999
	Displays the total number of original jams by location. These jams occur when the original does not activate the sensors. A “Paper Late” error occurs when the paper fails to activate the sensor at the precise time. A “Paper Linger” paper jam occurs when the paper remains at the sensor for longer than the prescribed time.		
	1*		At Power On
	Paper Late Error No.	**Paper Lag Error No.**	**Error Location**
	3	53	Skew Correction Sensor
	4	54	Interval Sensor
	5	55	Registration Sensor
	6	56	Relay Sensor
	7	57	Inverter Sensor

7506*	Jam Count by Copy Size	
7506 5*	A4 LEF	Displays the total number of copy jams by paper size.
7506 6*	A5 LEF	
7506 14*	B5 LEF	
7506 38*	LT LEF	
7506 44*	HLT LEF	
7506 132*	A3 SEF	
7506 133*	A4 SEF	
7506 134*	A5 SEF	
7506 141*	B4 SEF	
7506 142*	B5 SEF	
7506 160*	DLT SEF	
7506 164*	LG SEF	
7506 166*	LT SEF	
7506 172*	HLT SEF	
7506 255*	Others	

7507*	Copy Jam History (Transfer Sheet)	
	Displays the copy jam history of the transfer unit in groups of 10, starting with the most recent 10 jams. Display contents are as follows: **CODE** is the SP7-505-*** number. **SIZE** is the paper size code in hex. (See “Paper Size Hex Codes” below.) **TOTAL** is the total jam error count (SP7-003) **DATE** is the date the previous jam occurred	
7507 1*	Latest	Sample Display: CODE: 007 SIZE: 05h TOTAL: 0000334 DATE: Mon Mar 15 11:44:50 2000
7507 2*	Latest 1	
7507 3*	Latest 2	
7507 4*	Latest 3	
7507 5*	Latest 4	
7507 6*	Latest 5	
7507 7*	Latest 6	
7507 8*	Latest 7	
7507 9*	Latest 8	
7507 10*	Latest 9	

7508*	Original Jam History	
	Displays the original jam history of the transfer unit in groups of 10, starting with the most recent 10 jams. Display contents are as follows: **CODE** is the SP7-505-*** number. **SIZE** is the paper size code in hex. (See "Paper Size Hex Codes" below.) **TOTAL** is the total jam error count (SP7-003) **DATE** is the date the previous jam occurred	
7508 1*	Latest	Sample Display: CODE: 007 SIZE: 05h TOTAL: 0000334 DATE: Mon Mar 15 11:44:50 2000
7508 2*	Latest 1	
7508 3*	Latest 2	
7508 4*	Latest 3	
7508 5*	Latest 4	
7508 6*	Latest 5	
7508 7*	Latest 6	
7508 8*	Latest 7	
7508 9*	Latest 8	
7508 10*	Latest 9	

Paper Size Hex Codes

These codes are displayed by SP7507 and SP7508.

Paper Size	Code (hex)
A4 LEF	05
A5 LEF	06
B5 LEF	0E
LT LEF	26
HLT LEF	2C
A3 SEF	84
A4 SEF	85
A5 SEF	86
B4 SEF	8D
B5 SEF	8E
DLT SEF	A0
LG SEF	A4
LT SEF	A6
HLT SEF	AC
Others	FF

7801	ROM No./Firmware Version	Displays the ROM number and firmware version numbers.

7803*	PM Counter Display	Displays the PM counter since the last PM.

7804	PM Counter Reset	Resets the PM counter. To reset, press ①.

7807	SC/Jam Counter Reset	Resets the SC and jam counters. To reset, press ①.
	This SP does not reset the jam history counters: SP7-507, SP7-508.	

7808	Counter Reset	Resets all counters except SP7-003-***, SP7-006-***. To reset, press ①.

7810	Access Code Clear	Clears the access code. To clear, press ①.
	Use to clear the access code if the customer forgets the code. After clearing the code is reset for Null and the password entry display does not open.	

7811	Original Count Clear	Clears the original total display, displayed with SP7-002-***. To clear, press ①.

7816	Print Counter Reset by Tray	
7816 1	Bypass	Resets the total copy count by paper tray. To reset, press ①. Use these SP modes when replacing the pick-up, feed, and separation rollers.
7816 2	Tray 1	
7816 3	Tray 2	
7816 4	Tray 3	
7816 5	Tray 4	
7816 6	LCT	

7825	Total Counter Reset	No longer used. (Has no effect)

7826*	MF Error Counter	**Japan Only**

7827	MF Device Error Counter Clear	**Japan Only**

7832	Self-Diagnosis Result Display	Opens the “Self-Diagnose Result Display”
	Execute to open the “Self-Diagnose Result Display” to view details about errors. Use the keys on in the display on the touch-panel to scroll through all the information. If no errors have occurred, you will see the “No Error” notation.	

7833	Pixel Coverage Ratio	
	Displays the coverage ratio of the output (the ratio of the total pixel area of the image data to the total printable area on the paper). Note that this value is not directly proportional to the amount of toner consumed, although of course it is one factor that affects this amount. The other major factors involved include: the type, total image area and image density of the original, toner concentration and developer potential.	
7833 1*	Last Pages	0% to 100%.
7833 2*	Average Pages	0% to 100%.
7833 3*	Toner Bottles In Use	0 to 65,535 copies
7833 4*	Copy Count: Previous Toner Bottle	0 to 999,999 copies
7833 5*	Copy Count: Toner Bottle Before Previous	0 to 999,999 copies

7834	Clear Pixel Coverage Data	
	These SPs clear the counters of SP7833 (see table above).	
7834 1	Last & Average	Clears counter for SP7833 001, 002
7834 2	Toner Bottles In Use	Clears counter for SP7833 003
7834 3	Page Counts (2 Prev. Toner Bottles)	Clears counter for SP7833 004, 005

7836	Total Memory Size	
	Displays the memory capacity of the controller system.	

7852	ADF Scan Glass Dust Check Counter
	Counts the number of occurrences (0 ~ 65,535) when dust was detected on the scanning glass of the ADF. Counting is done only if SP4991 1 (ADF Scan Glass Dust Check) is switched on. Memory All Clear (SP5801) resets this counter to zero

7901*	Assert Info. **DFU**	
	These SP numbers display the results of the occurrence of the most recent SC code generated by the machine.	
7991 1*	Source File Name	Module name
7991 2*	Line Number	Number of lines
7991 3*	Result	Value

SP8-xxx: Data Log2

Many of these counters are provided for features that are currently not available, such as sending color faxes, and so on. However, here are some Group 8 codes that when used in combination with others, can provide useful information.

SP Numbers	What They Do
SP8 211~SP8 216	The number of pages scanned to the document server.
SP8 401~SP8 406	The number of pages printed from the document server
SP8 691~SP8 696	The number of pages sent from the document server

Specifically, the following questions can be answered:

- How is the document server actually being used?
- What application is using the document server most frequently?
- What data in the document server is being reused?

Most of the SPs in this group are prefixed with a letter that indicates the mode of operation (the mode of operation is referred to as an 'application'). Before reading the Group 8 Service Table, make sure that you understand what these prefixes mean.

PREFIXES	WHAT IT MEANS	
T:	Total: (Grand Total).	Grand total of the items counted for all applications (C, F, P, etc.)..
C:	Copy application.	Totals (pages, jobs, etc.) executed for each application when the job was *not* stored on the document server.
F:	Fax application.	
P:	Print application.	
S:	Scan application.	
L:	Local storage (document server)	Totals (jobs, pages, etc.) for the document server. The L: counters work differently case by case. Sometimes, they count jobs/pages stored on the document server; this can be in document server mode (from the document server window), or from another mode, such as from a printer driver or by pressing the Store File button in the Copy mode window. Sometimes, they include occasions when the user uses a file that is already on the document server. Each counter will be discussed case by case.
O:	Other applications (external network applications, for example)	Refers to network applications such as Web Image Monitor. Utilities developed with the SDK (Software Development Kit) will also be counted with this group in the future.

The Group 8 SP codes are limited to 17 characters, forced by the necessity of displaying them on the small LCDs of printers and faxes that also use these SPs. Read over the list of abbreviations below and refer to it again if you see the name of an SP that you do not understand.

Key for Abbreviations

ABBREVIATION	WHAT IT MEANS
/	"By", e.g. "T:Jobs/Apl" = Total Jobs "by" Application
>	More (2> "2 or more", 4> "4 or more"
AddBook	Address Book
Apl	Application
B/W	Black & White
Bk	Black
C	Cyan
ColCr	Color Create
ColMode	Color Mode
Comb	Combine
Comp	Compression
Deliv	Delivery
DesApl	Designated Application. The application (Copy, Fax, Scan, Print) used to store the job on the document server, for example.
Dev Counter	Development Count, no. of pages developed.
Dup, Duplex	Duplex, printing on both sides
Emul	Emulation
FC	Full Color
FIN	Post-print processing, i.e. finishing (punching, stapling, etc.)
Full Bleed	No Margins
GenCopy	Generation Copy Mode
GPC	Get Print Counter. For jobs 10 pages or less, this counter does not count up. For jobs larger than 10 pages, this counter counts up by the number that is in excess of 10 (e.g., for an 11-page job, the counter counts up 11-10 =1)
IFax	Internet Fax
ImgEdt	Image Edit performed on the original with the copier GUI, e.g. border removal, adding stamps, page numbers, etc.
K	Black (YMCK)
LS	Local Storage. Refers to the document server.
LSize	Large (paper) Size
Mag	Magnification
MC	One color (monochrome)
NRS	New Remote Service, which allows a service center to monitor machines remotely. "NRS" is used overseas, "CSS" is used in Japan.
Org	Original for scanning
OrgJam	Original Jam
Palm 2	Print Job Manager/Desk Top Editor: A pair of utilities that allows print jobs to be distributed evenly among the printers on the network, and allows files to moved around, combined, and converted to different formats. ~~Currently not available~~.
PC	Personal Computer
PGS	Pages. A page is the total scanned surface of the original. Duplex pages count as two pages, and A3 simplex count as two pages if the A3/DLT counter SP is switched ON.
PJob	Print Jobs
Ppr	Paper

ABBREVIATION	WHAT IT MEANS
PrtJam	Printer (plotter) Jam
PrtPGS	Print Pages
R	Red (Toner Remaining). Applies to the wide format model A2 only. This machine is under development and currently not available.
Rez	Resolution
SC	Service Code (Error SC code displayed)
Scn	Scan
Sim, Simplex	Simplex, printing on 1 side.
S-to-Email	Scan-to-E-mail
SMC	SMC report printed with SP5990. All of the Group 8 counters are recorded in the SMC report.
Svr	Server
TonEnd	Toner End
TonSave	Toner Save
TXJob	Send, Transmission
YMC	Yellow, Magenta, Cyan
YMCK	Yellow, Magenta, Cyan, BlacK

NOTE: All of the Group 8 SPs are reset with SP5 801 1 Memory All Clear, or the Counter Reset SP7 808.

8 001	T:Total Jobs	These SPs count the number of times each application is used to do a job. [0~9999999/ **0** / 1] **Note**: The L: counter is the total number of times the other applications are used to send a job to the document server, plus the number of times a file already on the document server is used.
8 002	C:Total Jobs	
8 003	F:Total Jobs	
8 004	P:Total Jobs	
8 005	S:Total Jobs	
8 006	L:Total Jobs	
8 007	O:Total Jobs	

- These SPs reveal the number of times an application is used, not the number of pages processed.
- When an application is opened for image input or output, this counts as one job.
- Interrupted jobs (paper jams, etc.) are counted, even though they do not finish.
- Only jobs executed by the customer are counted. Jobs executed by the customer engineer using the SP modes are not counted.
- When using secure printing (when a password is required to start the print job), the job is counted at the time when either “Delete Data” or “Specify Output” is specified.
- A job is counted as a fax job when the job is stored for sending.
- When a fax is received to fax memory, the F: counter increments but the L: counter does not (the document server is not used).
- A fax broadcast counts as one job for the F: counter (the fax destinations in the broadcast are not counted separately).
- A fax broadcast is counted only after all the faxes have been sent to their destinations. If one transmission generates an error, then the broadcast will not be counted until the transmission has been completed.
- A printed fax report counts as one job for the F: counter.
- The F: counter does not distinguish between fax sending or receiving.
- When a copy job on the document server is printed, SP8022 also increments, and when a print job stored on the document server is printed, SP8024 also increments.
- When an original is both copied and stored on the document server, the C: and L: counters both increment.
- When a print job is stored on the document server, only the L: counter increments.
- When the user presses the Document Server button to store the job on the document server, only the L: counter increments.
- When the user enters document server mode and prints data stored on the document server, only the L: counter increments.
- When an image received from Palm 2 is received and stored, the L: counter increments.
- When the customer prints a report (user code list, for example), the O: counter increments. However, for fax reports and reports executed from the fax application, the F: counter increments.

8 011	T:Jobs/LS	These SPs count the number of jobs stored to the document server by each application, to reveal how local storage is being used for input. [0~9999999/ **0** / 1] The L: counter counts the number of jobs stored from within the document server mode screen at the operation panel.
8 012	C:Jobs/LS	
8 013	F:Jobs/LS	
8 014	P:Jobs/LS	
8 015	S:Jobs/LS	
8 016	L:Jobs/LS	
8 017	O:Jobs/LS	

- When a scan job is sent to the document server, the S: counter increments. When you enter document server mode and then scan an original, the L: counter increments.
- When a print job is sent to the document server, the P: counter increments.
- When a network application sends data to the document server, the O: counter increments.
- When an image from Palm 2 is stored on the document server, the O: counter increments.
- When a fax is sent to the document server, the F: counter increments.

8 021	T:Pjob/LS	These SPs reveal how files printed from the document server were stored on the document server originally. [0~9999999/ **0** / 1] The L: counter counts the number of jobs stored from within the document server mode screen at the operation panel.
8 022	C:Pjob/LS	
8 023	F:Pjob/LS	
8 024	P:Pjob/LS	
8 025	S:Pjob/LS	
8 026	L:Pjob/LS	
8 027	O:Pjob/LS	

- When a copy job stored on the document server is printed with another application, the C: counter increments.
- When an application like DeskTopBinder merges a copy job that was stored on the document server with a print job that was stored on the document server, the C: and P: counters both increment.
- When a job already on the document server is printed with another application, the L: counter increments.
- When a scanner job stored on the document server is printed with another application, the S: counter increments. If the original was scanned from within document server mode, then the L: counter increments.
- When images stored on the document server by a network application (including Palm 2), are printed with another application, the O: counter increments.
- When a copy job stored on the document server is printed with a network application (Web Image Monitor, for example), the C: counter increments.
- When a fax on the document server is printed, the F: counter increments.

8 031	T:Pjob/DesApl	These SPs reveal what applications were used to output documents from the document server. [0~9999999/ **0** / 1] The L: counter counts the number of jobs printed from within the document server mode screen at the operation panel.
8 032	C:Pjob/DesApl	
8 033	F:Pjob/DesApl	
8 034	P:Pjob/DesApl	
8 035	S:Pjob/DesApl	
8 036	L:Pjob/DesApl	
8 037	O:Pjob/DesApl	

- When documents already stored on the document server are printed, the count for the application that started the print job is incremented.
- When the print job is started from a network application (Desk Top Binder, Web Image Monitor, etc.) the L: counter increments.

8 041	T:TX Jobs/LS	These SPs count the applications that stored files on the document server that were later accessed for transmission over the telephone line or over a network (attached to an e-mail, or as a fax image by I-Fax). [0~9999999/ **0** / 1] **Note**: Jobs merged for sending are counted separately. The L: counter counts the number of jobs scanned from within the document server mode screen at the operation panel.
8 042	C:TX Jobs/LS	
8 043	F:TX Jobs/LS	
8 044	P:TX Jobs/LS	
8 045	S:TX Jobs/LS	
8 046	L:TX Jobs/LS	
8 047	O:TX Jobs/LS	

- When a stored copy job is sent from the document server, the C: counter increments.
- When images stored on the document server by a network application or Palm2 are sent as an e-mail, the O: counter increments.

8 051	T:TX Jobs/DesApl	These SPs count the applications used to send files from the document server over the telephone line or over a network (attached to an e-mail, or as a fax image by I-Fax). Jobs merged for sending are counted separately. [0~9999999/ **0** / 1] The L: counter counts the number of jobs sent from within the document server mode screen at the operation panel.
8 052	C:TX Jobs/DesApl	
8 053	F:TX Jobs/DesApl	
8 054	P:TX Jobs/DesApl	
8 055	S:TX Jobs/DesApl	
8 056	L:TX Jobs/DesApl	
8 057	O:TX Jobs/DesApl	

- If the send is started from Desk Top Binder or Web Image Monitor, for example, then the O: counter increments.

8 061	T:FIN Jobs		[0~9999999/ **0** / 1]
	These SPs total the finishing methods. The finishing method is specified by the application.		
8 062	C:FIN Jobs		[0~9999999/ **0** / 1]
	These SPs total finishing methods for copy jobs only. The finishing method is specified by the application.		
8 063	F:FIN Jobs		[0~9999999/ **0** / 1]
	These SPs total finishing methods for fax jobs only. The finishing method is specified by the application. Note: Finishing features for fax jobs are not available at this time.		
8 064	P:FIN Jobs		[0~9999999/ **0** / 1]
	These SPs total finishing methods for print jobs only. The finishing method is specified by the application.		
8 065	S:FIN Jobs		[0~9999999/ **0** / 1]
	These SPs total finishing methods for scan jobs only. The finishing method is specified by the application. Note: Finishing features for scan jobs are not available at this time.		
8 066	L:FIN Jobs		[0~9999999/ **0** / 1]
	These SPs total finishing methods for jobs output from within the document server mode screen at the operation panel. The finishing method is specified from the print window within document server mode.		
8 067	O:FIN Jobs		[0~9999999/ **0** / 1]
	These SPs total finishing methods for jobs executed by an external application, over the network. The finishing method is specified by the application.		
8 06x 1	Sort	Number of jobs started in Sort mode. When a stored copy job is set for Sort and then stored on the document server, the L: counter increments. (See SP8 066 1)	
8 06x 2	Stack	Number of jobs started out of Sort mode.	
8 06x 3	Staple	Number of jobs started in Staple mode.	
8 06x 4	Booklet	Number of jobs started in Booklet mode. If the machine is in staple mode, the Staple counter also increments.	
8 06x 5	Z-Fold	Number of jobs started In any mode other than the Booklet mode and set for folding (Z-fold).	
8 06x 6	Punch	Number of jobs started in Punch mode. When Punch is set for a print job, the P: counter increments. (See SP8 064 6.)	
8 06x 7	Other	Reserved. Not used.	

8 071	T:Jobs/PGS	[0~9999999/ **0** / 1]	
	These SPs count the number of jobs broken down by the number of pages in the job, regardless of which application was used.		
8 072	C:Jobs/PGS	[0~9999999/ **0** / 1]	
	These SPs count and calculate the number of copy jobs by size based on the number of pages in the job.		
8 073	F:Jobs/PGS	[0~9999999/ **0** / 1]	
	These SPs count and calculate the number of fax jobs by size based on the number of pages in the job.		
8 074	P:Jobs/PGS	[0~9999999/ **0** / 1]	
	These SPs count and calculate the number of print jobs by size based on the number of pages in the job.		
8 075	S:Jobs/PGS	[0~9999999/ **0** / 1]	
	These SPs count and calculate the number of scan jobs by size based on the number of pages in the job.		
8 076	L:Jobs/PGS	[0~9999999/ **0** / 1]	
	These SPs count and calculate the number of jobs printed from within the document server mode window at the operation panel, by the number of pages in the job.		
8 077	O:Jobs/PGS	[0~9999999/ **0** / 1]	
	These SPs count and calculate the number of “Other” application jobs (Web Image Monitor, Palm 2, etc.) by size based on the number of pages in the job.		
8 07x 1	1 Page	8 07x 8	21~50 Pages
8 07x 2	2 Pages	8 07x 9	51~100 Pages
8 07x 3	3 Pages	8 07x 10	101~300 Pages
8 07x 4	4 Pages	8 07x 11	301~500 Pages
8 07x 5	5 Pages	8 07x 12	501~700 Pages
8 07x 6	6~10 Pages	8 07x 13	701~1000 Pages
8 07x 7	11~20 Pages	8 07x 14	1001~ Pages

- For example: When a copy job stored on the document server is printed in document server mode, the appropriate L: counter (SP8076 0xx) increments.
- Printing a fax report counts as a job and increments the F: counter (SP 8073).
- Interrupted jobs (paper jam, etc.) are counted, even though they do not finish.
- If a job is paused and re-started, it counts as one job.
- If the finisher runs out of staples during a print and staple job, then the job is counted at the time the error occurs.
- For copy jobs (SP 8072) and scan jobs (SP 8075), the total is calculated by multiplying the number of sets of copies by the number of pages scanned. (One duplex page counts as 2.)
- The first test print and subsequent test prints to adjust settings are added to the number of pages of the copy job (SP 8072).
- When printing the first page of a job from within the document server screen, the page is counted.

8 111	T:FAX TX Jobs	[0~9999999/ **0** / 1]
	These SPs count the total number of jobs (color or black-and-white) sent by fax, either directly or using a file stored on the document server, on a telephone line. **Note**: Color fax sending is not available at this time.	
8 113	F:FAX TX Jobs	[0~9999999/ **0** / 1]
	These SPs count the total number of jobs (color or black-and-white) sent by fax directly on a telephone line. **Note**: Color fax sending is not available at this time.	
8 116	L:FAX TX Jobs	[0~9999999/ **0** / 1]
	These SPs count the total number of jobs (color or black-and-white) sent by fax on a telephone line using a file stored on the document server. Documents sent from fax memory are not counted. **Note**: Color fax sending is not available at this time.	

- These counters count jobs, not pages.
- This SP counts fax jobs sent over a telephone line with a fax application, including documents stored on the document server.
- If the mode is changed during the job, the job will count with the mode set when the job started.
- If the same document is faxed to both a public fax line and an I-Fax at a destination where both are available, then this counter increments, and the I-Fax counter (8 12x) also increments.
- The fax job is counted when the job is scanned for sending, not when the job is sent.

8 121	T:IFAX TX Jobs	[0~9999999/ **0** / 1]
	These SPs count the total number of jobs (color or black-and-white) sent, either directly or using a file stored on the document server, as fax images using I-Fax. **Note**: Color fax sending is not available at this time.	
8 123	F:IFAX TX Jobs	[0~9999999/ **0** / 1]
	These SPs count the number of jobs (color or black-and-white) sent (not stored on the document server), as fax images using I-Fax. **Note**: Color fax sending is not available at this time.	
8 126	L:IFAX TX Jobs	[0~9999999/ **0** / 1]
	These SPs count the number of jobs (color or black-and-white) sent using a file stored on the document server , as fax images using I-Fax. **Note**: Color fax sending is not available at this time.	

- These counters count jobs, not pages.
- The counters for color are provided for future use; the color fax feature is not available at this time.
- The fax job is counted when the job is scanned for sending, not when the job is sent.

8 131	T:S-to-Email Jobs	[0~9999999/ **0** / 1]
	These SPs count the total number of jobs scanned and attached to an e-mail, regardless of whether the document server was used or not.	
8 135	S:S-to-Email Jobs	
	These SPs count the number of jobs scanned and attached to an e-mail, without storing the original on the document server.	
8 136	L:S-to-Email Jobs	
	These SPs count the number of jobs using a file stored on stored on the document server, and attaching it to an e-mail.	

- These counters count jobs, not pages.
- If the job is stored on the document server, after the job is stored it is determined to be color or black-and-white then counted.
- If the job is cancelled during scanning, or if the job is cancelled while the document is waiting to be sent, the job is not counted.
- If the job is cancelled during sending, it may or may not be counted, depending on what stage of the process had been reached when the job was cancelled.
- If several jobs are combined for sending to the Scan Router, Scan-to-Email, or Scan-to-PC, or if one job is sent to more than one destination. each send is counted separately. For example, if the same document is sent by Scan-to-Email as well as Scan-to-PC, then it is counted twice (once for Scan-to-Email and once for Scan-to-PC).

8 141	T:Deliv Jobs/Svr	[0~9999999/ **0** / 1]
	These SPs count the total number of jobs scanned and sent to a Scan Router server.	
8 143	F:Deliv Jobs/Svr	
	These SPs count the number of jobs scanned in fax mode and sent to a Scan Router server.	
8 145	S:Deliv Jobs/Svr	
	These SPs count the number of jobs scanned in scanner mode and sent to a Scan Router server.	

- These counters count jobs, not pages.
- The jobs are counted even though the arrival and reception of the jobs at the Scan Router server cannot be confirmed.
- If even one color image is mixed with black-and-white images, then the job is counted as a “Color” job.
- If the job is cancelled during scanning, or if the job is cancelled while the document is waiting to be delivered, the job is not counted.
- If the job is cancelled during sending, it may or may not be counted, depending on what stage of the process had been reached when the job was cancelled.
- Even if several files are combined for sending, the transmission counts as one job.

8 151	T:Deliv Jobs/PC	[0~9999999/ **0** / 1]
	These SPs count the total number of jobs scanned and sent to a folder on a PC (Scan-to-PC). **Note**: At the present time, 8 151 and 8 155 perform identical counts.	
8 155	S:Deliv Jobs/PC	
	These SPs count the total number of jobs scanned and sent with Scan-to-PC.	

- These counters count jobs, not pages.
- If the job is cancelled during scanning, it is not counted.
- If the job is cancelled while it is waiting to be sent, the job is not counted.
- If the job is cancelled during sending, it may or may not be counted, depending on what stage of the process had been reached when the job was cancelled.
- Even if several files are combined for sending, the transmission counts as one job.

8 161	T:PCFAX TX Jobs	These SPs count the number of PC Fax transmission jobs. A job is counted from when it is registered for sending, not when it is sent. [0~9999999/ **0** / 1] **Note**: At the present time, these counters perform identical counts.
8 163	F:PCFAX TX Jobs	

- This counts fax jobs started from a PC using a PC fax application, and sending the data out to the destination from the PC through the copier.

8 191	T:Total Scan PGS	These SPs count the pages scanned by each application that uses the scanner to scan images. [0~9999999/ **0** / 1]
8 192	C:Total Scan PGS	
8 193	F:Total Scan PGS	
8 195	S:Total Scan PGS	
8 196	L:Total Scan PGS	

- SP 8 191 to 8 196 count the number of scanned sides of pages, not the number of physical pages.
- These counters do not count reading user stamp data, or reading color charts to adjust color.
- Previews done with a scanner driver are not counted.
- A count is done only after all images of a job have been scanned.
- Scans made in SP mode are not counted.

Examples

- If 3 B5 pages and 1 A3 page are scanned with the scanner application but not stored, the S: count is 4.
- If both sides of 3 A4 sheets are copied and stored to the document server using the Store File button in the Copy mode window, the C: count is 6 and the L: count is 6.
- If both sides of 3 A4 sheets are copied but not stored, the C: count is 6.
- If you enter document server mode then scan 6 pages, the L: count is 6.

8 201	T:LSize Scan PGS	[0~9999999/ **0** / 1]
	These SPs count the total number of large pages input with the scanner for scan and copy jobs. Large size paper (A3/DLT) scanned for fax transmission are not counted. **Note**: These counters are displayed in the SMC Report, and in the User Tools display.	
8 205	S:LSize Scan PGS	[0~9999999/ **0** / 1]
	These SPs count the total number of large pages input with the scanner for scan jobs only. Large size paper (A3/DLT) scanned for fax transmission are not counted. **Note**: These counters are displayed in the SMC Report, and in the User Tools display..	

8 211	T:Scan PGS/LS	These SPs count the number of pages scanned into the document server . [0~9999999/ **0** / 1] The L: counter counts the number of pages stored from within the document server mode screen at the operation panel, and with the Store File button from within the Copy mode screen
8 212	C:Scan PGS/LS	
8 213	F:Scan PGS/LS	
8 215	S:Scan PGS/LS	
8 216	L:Scan PGS/LS	

- Reading user stamp data is not counted.
- If a job is cancelled, the pages output as far as the cancellation are counted.
- If the scanner application scans and stores 3 B5 sheets and 1 A4 sheet, the S: count is 4.
- If pages are copied but not stored on the document server, these counters do not change.
- If both sides of 3 A4 sheets are copied and stored to the document server, the C: count is 6 and the L: count is 6.
- If you enter document server mode then scan 6 pages, the L: count is 6.

8 221	ADF Org Feeds		[0~9999999/ **0** / 1]
	These SPs count the number of pages fed through the ADF for front and back side scanning.		
8 221 1	Front	Number of front sides fed for scanning: With an ADF that can scan both sides simultaneously, the Front side count is the same as the number of pages fed for either simplex or duplex scanning. With an ADF that cannot scan both sides simultaneously, the Front side count is the same as the number of pages fed for duplex front side scanning. (The front side is determined by which side the user loads face up.)	
8 221 2	Back	Number of rear sides fed for scanning: With an ADF that can scan both sides simultaneously, the Back count is the same as the number of pages fed for duplex scanning. With an ADF that cannot scan both sides simultaneously, the Back count is the same as the number of pages fed for duplex rear-side scanning.	

- When 1 sheet is fed for duplex scanning the Front count is 1 and the Back count is 1.
- If a jam occurs during the job, recovery processing is not counted to avoid double counting. Also, the pages are not counted if the jam occurs before the first sheet is output.

8 231	Scan PGS/Mode		[0~9999999/ **0** / 1]
	These SPs count the number of pages scanned by each ADF mode to determine the work load on the ADF.		
8 231 1	Large Volume	Selectable. Large copy jobs that cannot be loaded in the ADF at one time.	
8 231 2	SADF	Selectable. Feeding pages one by one through the ADF.	
8 231 3	Mixed Size	Selectable. Select “Mixed Sizes” on the operation panel.	
8 231 4	Custom Size	Selectable. Originals of non-standard size.	
8 231 5	Platen	Book mode. Raising the ADF and placing the original directly on the platen.	

- If the scan mode is changed during the job, for example, if the user switches from ADF to Platen mode, the count is done for the last selected mode.
- The user cannot select mixed sizes or non-standard sizes with the fax application so if the original’s page sizes are mixed or non-standard, these are not counted.
- If the user selects “Mixed Sizes” for copying in the platen mode, the Mixed Size count is enabled.
- In the SADF mode if the user copies 1 page in platen mode and then copies 2 pages with SADF, the Platen count is 1 and the SADF count is 3.

8 241	T:Scan PGS/Org	[0~9999999/ **0** / 1]
	These SPs count the total number of scanned pages by original type for all jobs, regardless of which application was used.	
8 242	C:Scan PGS/Org	[0~9999999/ **0** / 1]
	These SPs count the number of pages scanned by original type for Copy jobs.	
8 243	F:Scan PGS/Org	[0~9999999/ **0** / 1]
	These SPs count the number of pages scanned by original type for Fax jobs.	
8 245	S:Scan PGS/Org	[0~9999999/ **0** / 1]
	These SPs count the number of pages scanned by original type for Scan jobs.	
8 246	L:Scan PGS/Org	[0~9999999/ **0** / 1]
	These SPs count the number of pages scanned and stored from within the document server mode screen at the operation panel, and with the Store File button from within the Copy mode screen	
8 247	O:Scan PGS/Org	[0~9999999/ **0** / 1]
	These SPs count the number of pages scanned by original type by Other applications.	

	8 241	**8 242**	**8 243**	**8 245**	**8 246**	**8 247**
8 24x 1: Text	Yes	Yes	Yes	Yes	Yes	Yes
8 24x 2: Text/Photo	Yes	Yes	Yes	Yes	Yes	Yes
8 24x 3: Photo	Yes	Yes	Yes	Yes	Yes	Yes
8 24x 4: GenCopy, Pale	Yes	Yes	No	Yes	Yes	Yes
8 24x 5: Map	Yes	Yes	No	Yes	Yes	Yes
8 24x 6: Normal/Detail	Yes	No	Yes	No	No	No
8 24x 7: Fine/Super Fine	Yes	No	Yes	No	No	No
8 24x 8: Binary	Yes	No	No	Yes	No	No
8 24x 9: Grayscale	Yes	No	No	Yes	No	No

- If the scan mode is changed during the job, for example, if the user switches from ADF to Platen mode, the count is done for the last selected mode.

8 251	T:Scan PGS/ImgEdt	These SPs show how many times Image Edit features have been selected at the operation panel for each application. Some examples of these editing features are: • Erase> Border • Erase> Center • Image Repeat • Centering • Positive/Negative [0~9999999/ **0** / 1] Note: The count totals the number of times the edit features have been used. A detailed breakdown of exactly which features have been used is not given.
8 252	C:Scan PGS/ImgEdt	
8 254	P:Scan PGS/ImgEdt	
8 256	L:Scan PGS/ImgEdt	
8 257	O:Scan PGS/ImgEdt	

The L: counter counts the number of pages stored from within the document server mode screen at the operation panel, and with the Store File button from within the Copy mode screen.

8 281	T:Scan PGS/TWAIN	These SPs count the number of pages scanned using a TWAIN driver. These counters reveal how the TWAIN driver is used for delivery functions. [0~9999999/ **0** / 1] **Note**: At the present time, these counters perform identical counts.
8 285	S:Scan PGS/TWAIN	

8 291	T:Scan PGS/Stamp	These SPs count the number of pages stamped with the stamp in the ADF unit. [0~9999999/ **0** / 1] The L: counter counts the number of pages stored from within the document server mode screen at the operation panel, and with the Store File button from within the Copy mode screen
8 293	F:Scan PGS/Stamp	
8 295	S:Scan PGS/Stamp	
8 296	L:Scan PGS/Stamp	

8 301	T:Scan PGS/Size	[0~9999999/ **0** / 1]
	These SPs count by size the total number of pages scanned by all applications. Use these totals to compare original page size (scanning) and output (printing) page size [SP 8-441].	
8 302	C:Scan PGS/Size	[0~9999999/ **0** / 1]
	These SPs count by size the total number of pages scanned by the Copy application. Use these totals to compare original page size (scanning) and output (printing) page size [SP 8-442].	
8 303	F:Scan PGS/Size	[0~9999999/ **0** / 1]
	These SPs count by size the total number of pages scanned by the Fax application. Use these totals to compare original page size (scanning) and output page size [SP 8-443].	
8 305	S:Scan PGS/Size	[0~9999999/ **0** / 1]
	These SPs count by size the total number of pages scanned by the Scan application. Use these totals to compare original page size (scanning) and output page size [SP 8-445].	
8 306	L:Scan PGS/Size	[0~9999999/ **0** / 1]
	These SPs count by size the total number of pages scanned and stored from within the document server mode screen at the operation panel, and with the Store File button from within the Copy mode screen. Use these totals to compare original page size (scanning) and output page size [SP 8-446].	
8 30x 1	A3	
8 30x 2	A4	
8 30x 3	A5	
8 30x 4	B4	
8 30x 5	B5	
8 30x 6	DLT	
8 30x 7	LG	
8 30x 8	LT	
8 30x 9	HLT	
8 30x 10	Full Bleed	
8 30x 254	Other (Standard)	
8 30x 255	Other (Custom)	

8 311	T:Scan PGS/Rez	[0~9999999/ **0** / 1]
	These SPs count by resolution setting the total number of pages scanned by applications that can specify resolution settings.	
8 315	S:Scan PGS/Rez	[0~9999999/ **0** / 1]
	These SPs count by resolution setting the total number of pages scanned by applications that can specify resolution settings. **Note**: At the present time, 8 311 and 8 315 perform identical counts.	
8 31x 1	1200dpi ~	
8 31x 2	600dpi~1199dpi	
8 31x 3	400dpi~599dpi	
8 31x 4	200dpi~399dpi	
8 31x 5	~199dpi	

- Copy resolution settings are fixed so they are not counted.
- The Fax application does not allow finely-adjusted resolution settings so no count is done for the Fax application.

8 321	T:Scan PGS/Comp	[0~9999999/ **0** / 1]
	These SPs count by compression method the total number of pages scanned.	
8 325	S:Scan PGS/Comp	[0~9999999/ **0** / 1]
	These SPs count by compression method the total number of pages scanned by the Scan application. **Note**: At the present time, 8 321 and 8 325 perform identical counts.	
8 32x 1	JPEG	
8 32x 2	JPEG2000	
8 32x 3	TIFF (Comp OFF)	
8 32x 4	TIFF (Comp ON)	
8 32x 5	PDF	
8 32x 6	Other	

8 381	T:Total PrtPGS	These SPs count the number of pages printed by the customer. The counter for the application used for storing the pages increments. [0~9999999/ **0** / 1] The L: counter counts the number of pages stored from within the document server mode screen at the operation panel. Pages stored with the Store File button from within the Copy mode screen go to the C: counter.
8 382	C:Total PrtPGS	
8 383	F:Total PrtPGS	
8 384	P:Total PrtPGS	
8 385	S:Total PrtPGS	
8 386	L:Total PrtPGS	
8 387	O:Total PrtPGS	

- When the A3/DLT double count function is switched on with SP5104, 1 A3/DLT page is counted as 2.
- When several documents are merged for a print job, the number of pages stored are counted for the application that stored them.
- These counters are used primarily to calculate charges on use of the machine, so the following pages are not counted as printed pages:
  - Blank pages in a duplex printing job.
  - Blank pages inserted as document covers, chapter title sheets, and slip sheets.
  - Reports printed to confirm counts.
  - All reports done in the service mode (service summaries, engine maintenance reports, etc.)
  - Test prints for machine image adjustment.
  - Error notification reports.
  - Partially printed pages as the result of a copier jam.

8 391	LSize PrtPGS	[0~9999999/ **0** / 1]
	These SPs count pages printed on paper sizes A3/DLT and larger. **Note**: In addition to being displayed in the SMC Report, these counters are also displayed in the User Tools display on the copy machine.	

8 401	T:PrtPGS/LS	These SPs count the number of pages printed from the document server. The counter for the application used to print the pages is incremented. The L: counter counts the number of jobs stored from within the document server mode screen at the operation panel. [0~9999999/ **0** / 1]
8 402	C:PrtPGS/LS	
8 403	F:PrtPGS/LS	
8 404	P:PrtPGS/LS	
8 405	S:PrtPGS/LS	
8 406	L:PrtPGS/LS	

- Print jobs done with Web Image Monitor and Desk Top Binder are added to the L: count.
- Fax jobs done with Web Image Monitor and Desk Top Binder are added to the F: count.

8 411	Prints/Duplex	This SP counts the amount of paper (front/back counted as 1 page) used for duplex printing. Last pages printed only on one side are not counted. [0~9999999/ **0** / 1]

8 421	T:PrtPGS/Dup Comb	[0~9999999/ **0** / 1]
	These SPs count by binding and combine, and n-Up settings the number of pages processed for printing. This is the total for all applications.	
8 422	C:PrtPGS/Dup Comb	[0~9999999/ **0** / 1]
	These SPs count by binding and combine, and n-Up settings the number of pages processed for printing by the copier application.	
8 423	F:PrtPGS/Dup Comb	[0~9999999/ **0** / 1]
	These SPs count by binding and combine, and n-Up settings the number of pages processed for printing by the fax application.	
8 424	P:PrtPGS/Dup Comb	[0~9999999/ **0** / 1]
	These SPs count by binding and combine, and n-Up settings the number of pages processed for printing by the printer application.	
8 425	S:PrtPGS/Dup Comb	[0~9999999/ **0** / 1]
	These SPs count by binding and combine, and n-Up settings the number of pages processed for printing by the scanner application.	
8 426	L:PrtPGS/Dup Comb	[0~9999999/ **0** / 1]
	These SPs count by binding and combine, and n-Up settings the number of pages processed for printing from within the document server mode window at the operation panel.	
8 427	O:PrtPGS/Dup Comb	[0~9999999/ **0** / 1]
	These SPs count by binding and combine, and n-Up settings the number of pages processed for printing by Other applications	
8 42x 1	Simplex> Duplex	
8 42x 2	Duplex> Duplex	
8 42x 3	Book> Duplex	
8 42x 4	Simplex Combine	
8 42x 5	Duplex Combine	
8 42x 6	2>	2 pages on 1 side (2-Up)
8 42x 7	4>	4 pages on 1 side (4-Up)
8 42x 8	6>	6 pages on 1 side (6-Up)
8 42x 9	8>	8 pages on 1 side (8-Up)
8 42x 10	9>	9 pages on 1 side (9-Up)
8 42x 11	16>	16 pages on 1 side (16-Up)
8 42x 12	Booklet	
8 42x 13	Magazine	

- These counts (SP8 421 to SP8 427) are especially useful for customers who need to improve their compliance with ISO standards for the reduction of paper consumption.
- Pages that are only partially printed with the n-Up functions are counted as 1 page.
- Here is a summary of how the counters work for Booklet and Magazine modes:

Booklet	
Original Pages	**Count**
1	1
2	2
3	2
4	2
5	3
6	4
7	4
8	4

Magazine	
Original Pages	**Count**
1	1
2	2
3	2
4	2
5	4
6	4
7	4
8	4

8 431	T:PrtPGS/ImgEdt	[0~9999999/ **0** / 1]
	These SPs count the total number of pages output with the three features below, regardless of which application was used.	
8 432	C:PrtPGS/ImgEdt	[0~9999999/ **0** / 1]
	These SPs count the total number of pages output with the three features below with the copy application.	
8 434	P:PrtPGS/ImgEdt	[0~9999999/ **0** / 1]
	These SPs count the total number of pages output with the three features below with the print application.	
8 436	L:PrtPGS/ImgEdt	[0~9999999/ **0** / 1]
	These SPs count the total number of pages output from within the document server mode window at the operation panel with the three features below.	
8 437	O:PrtPGS/ImgEdt	[0~9999999/ **0** / 1]
	These SPs count the total number of pages output with the three features below with Other applications.	
8 43x 1	Cover/Slip Sheet	Total number of covers or slip sheets inserted. The count for a cover printed on both sides counts 2.
8 43x 2	Series/Book	The number of pages printed in series (one side) or printed as a book with booklet right/left pagination.
8 43x 3	User Stamp	The number of pages printed where stamps were applied, including page numbering and date stamping.

8 441	T:PrtPGS/Ppr Size	[0~9999999/ **0** / 1]
	These SPs count by print paper size the number of pages printed by all applications.	
8 442	C:PrtPGS/Ppr Size	[0~9999999/ **0** / 1]
	These SPs count by print paper size the number of pages printed by the copy application.	
8 443	F:PrtPGS/Ppr Size	[0~9999999/ **0** / 1]
	These SPs count by print paper size the number of pages printed by the fax application.	
8 444	P:PrtPGS/Ppr Size	[0~9999999/ **0** / 1]
	These SPs count by print paper size the number of pages printed by the printer application.	
8 445	S:PrtPGS/Ppr Size	[0~9999999/ **0** / 1]
	These SPs count by print paper size the number of pages printed by the scanner application.	
8 446	L:PrtPGS/Ppr Size	[0~9999999/ **0** / 1]
	These SPs count by print paper size the number of pages printed from within the document server mode window at the operation panel.	
8 447	O:PrtPGS/Ppr Size	[0~9999999/ **0** / 1]
	These SPs count by print paper size the number of pages printed by Other applications.	
8 44x 1	A3	
8 44x 2	A4	
8 44x 3	A5	
8 44x 4	B4	
8 44x 5	B5	
8 44x 6	DLT	
8 44x 7	LG	
8 44x 8	LT	
8 44x 9	HLT	
8 44x 10	Full Bleed	
8 44x 254	Other (Standard)	
8 44x 255	Other (Custom)	

- These counters do not distinguish between LEF and SEF.

8 451	PrtPGS/Ppr Tray	[0~9999999/ **0** / 1]
	These SPs count the number of sheets fed from each paper feed station.	
8 451 1	Bypass	Bypass Tray
8 451 2	Tray 1	Copier
8 451 3	Tray 2	Copier
8 451 4	Tray 3	Paper Tray Unit (Option)
8 451 5	Tray 4	Paper Tray Unit (Option)
8 451 6	Tray 5	LCT (Option)
8 451 7	Tray 6	Currently not used.
8 451 8	Tray 7	Currently not used.
8 451 9	Tray 8	Currently not used.
8 451 10	Tray 9	Currently not used.

8 461	T:PrtPGS/Ppr Type	[0~9999999/ **0** / 1]
	These SPs count by paper type the number pages printed by all applications. • These counters are not the same as the PM counter. The PM counter is based on feed timing to accurately measure the service life of the feed rollers. However, these counts are based on output timing. • Blank sheets (covers, chapter covers, slip sheets) are also counted. • During duplex printing, pages printed on both sides count as 1, and a page printed on one side counts as 1.	
8 462	C:PrtPGS/Ppr Type	[0~9999999/ **0** / 1]
	These SPs count by paper type the number pages printed by the copy application.	
8 463	F:PrtPGS/Ppr Type	[0~9999999/ **0** / 1]
	These SPs count by paper type the number pages printed by the fax application.	
8 464	P:PrtPGS/Ppr Type	[0~9999999/ **0** / 1]
	These SPs count by paper type the number pages printed by the printer application.	
8 466	L:PrtPGS/Ppr Type	[0~9999999/ **0** / 1]
	These SPs count by paper type the number pages printed from within the document server mode window at the operation panel.	
8 46x 1	Normal	
8 46x 2	Recycled	
8 46x 3	Special	
8 46x 4	Thick	
8 46x 5	Normal (Back)	
8 46x 6	Thick (Back)	
8 46x 7	OHP	
8 46x 8	Other	

8 471	PrtPGS/Mag	[0~9999999/ **0** / 1]
	These SPs count by magnification rate the number of pages printed.	
8 471 1	~49%	
8 471 2	50%~99%	
8 471 3	100%	
8 471 4	101%~200%	
8 471 5	201% ~	

- Counts are done for magnification adjusted for pages, not only on the operation panel but performed remotely with an external network application capable of performing magnification adjustment as well.
- Magnification adjustments done with printer drivers with PC applications such as Excel are also counted.
- Magnification adjustments done for adjustments after they have been stored on the document server are not counted.
- Magnification adjustments performed automatically during Auto Reduce/Enlarge copying are counted.
- The magnification rates of blank cover sheets, slip sheets, etc. are automatically assigned a rate of 100%.

8 481	T:PrtPGS/TonSave
8 484	P:PrtPGS/TonSave
	These SPs count the number of pages printed with the Toner Save feature switched on. **Note**: These SPs return the same results as this SP is limited to the Print application. [0~9999999/ **0** / 1]

8 511	T:PrtPGS/Emul	[0~9999999/ **0** / 1]
	These SPs count by printer emulation mode the total number of pages printed.	
8 514	P:PrtPGS/Emul	[0~9999999/ **0** / 1]
	These SPs count by printer emulation mode the total number of pages printed.	
8 514 1	RPCS	
8 514 2	RPDL	
8 514 3	PS3	
8 514 4	R98	
8 514 5	R16	
8 514 6	GL/GL2	
8 514 7	R55	
8 514 8	RTIFF	
8 514 9	PDF	
8 514 10	PCL5e/5c	
8 514 11	PCL XL	
8 514 12	IPDL-C	
8 514 13	BM-Links	Japan Only
8 514 14	Other	

- SP8 511 and SP8 514 return the same results as they are both limited to the Print application.
- Print jobs output to the document server are not counted.

8 521	T:PrtPGS/FIN	[0~9999999/ **0** / 1]
	These SPs count by finishing mode the total number of pages printed by all applications.	
8 522	C:PrtPGS/FIN	[0~9999999/ **0** / 1]
	These SPs count by finishing mode the total number of pages printed by the Copy application.	
8 523	F:PrtPGS/FIN	[0~9999999/ **0** / 1]
	These SPs count by finishing mode the total number of pages printed by the Fax application. **Note**: • Print finishing options for received faxes are currently not available.	
8 524	P:PrtPGS/FIN	[0~9999999/ **0** / 1]
	These SPs count by finishing mode the total number of pages printed by the Print application.	
8 525	S:PrtPGS/FIN	[0~9999999/ **0** / 1]
	These SPs count by finishing mode the total number of pages printed by the Scanner application.	
8 526	L:PrtPGS/FIN	[0~9999999/ **0** / 1]
	These SPs count by finishing mode the total number of pages printed from within the document server mode window at the operation panel.	
8 52x 1	Sort	
8 52x 2	Stack	
8 52x 3	Staple	
8 52x 4	Booklet	
8 52x 5	Z-Fold	
8 52x 6	Punch	
8 52x 7	Other	

NOTE: 1) If stapling is selected for finishing and the stack is too large for stapling, the unstapled pages are still counted.
2) The counts for staple finishing are based on output to the staple tray, so jam recoveries are counted.

8 531	Staples	This SP counts the amount of staples used by the machine. [0~9999999/ **0** / 1]

8 581	T:Counter	[0~9999999/ **0** / 1]
	These SPs count the total output broken down by color output, regardless of the application used. In addition to being displayed in the SMC Report, these counters are also displayed in the User Tools display on the copy machine. **Note:** This SP is expanded for color MFP and color LP machines. For this machine, the count is done for black only.	

8 591	O:Counter	[0~9999999/ **0** / 1]
	These SPs count the totals for A3/DLT paper use, number of duplex pages printed, and the number of staples used. These totals are for Other (O:) applications only.	
8 591 1	A3/DLT	
8 591 2	Duplex	
8 591 3	Staple	

8 631	T:FAX TX PGS	[0~9999999/ **0** / 1]
	These SPs count by color mode the number of pages sent by fax to a telephone number. **Note:** This SP is expanded for color MFP and color LP machines. For this machine, the count is done for black only.	
8 633	F:FAX TX PGS	[0~9999999/ **0** / 1]
	These SPs count by color mode the number of pages sent by fax to a telephone number. **Note:** This SP is expanded for color MFP and color LP machines. For this machine, the count is done for black only.	

- If a document has color and black-and-white pages mixed, the pages are counted separately as B/W or Color.
- At the present time, this feature is provided for the Fax application only so SP8631 and SP8633 are the same.
- The counts include error pages.
- If a document is sent to more than one destination with a Group transmission, the count is done for each destination.
- Polling transmissions are counted but polling RX are not.
- Relay, memory, and confidential mailbox transmissions and are counted for each destination.

8 641	T:FAX TX PGS	[0~9999999/ **0** / 1]
	These SPs count by color mode the number of pages sent by fax to as fax images using I-Fax. **Note:** This SP is expanded for color MFP and color LP machines. For this machine, the count is done for black only.	
8 643	F:FAX TX PGS	[0~9999999/ **0** / 1]
	These SPs count by color mode the number of pages sent by Fax as fax images using I-Fax. **Note:** This SP is expanded for color MFP and color LP machines. For this machine, the count is done for black only.	

- If a document has color and black-and-white pages mixed, the pages are counted separately as B/W or Color.
- At the present time, this feature is provided for the Fax application only so SP8641 and SP8643 are the same.
- The counts include error pages.
- If a document is sent to more than one destination with a Group transmission, the count is done for each destination.
- Polling transmissions are counted but polling RX are not.
- Relay, memory, and confidential mailbox transmissions and are counted for each destination.

8 651	T:S-to-Email PGS	[0~9999999/ **0** / 1]
	These SPs count by color mode the total number of pages attached to an e-mail for both the Scan and document server applications. **Note:** This SP is expanded for color MFP and color LP machines. For this machine, the count is done for black only.	
8 655	S:S-to-Email PGS	[0~9999999/ **0** / 1]
	These SPs count by color mode the total number of pages attached to an e-mail for the Scan application only. **Note:** This SP is expanded for color MFP and color LP machines. For this machine, the count is done for black only.	
8 656	L:S-to-Email PGS	[0~9999999/ **0** / 1]
	These SPs count by color mode the total number of pages attached to an e-mail for LS applications only. **Note:** This SP is expanded for color MFP and color LP machines. For this machine, the count is done for black only.	

NOTE: 1) The count for B/W and Color pages is done after the document is stored on the HDD. If the job is cancelled before it is stored, the pages are not counted.
2) If Scan-to-Email is used to send a 10-page document to 5 addresses, the count is 10 (the pages are sent to the same SMTP server together).
3) If Scan-to-PC is used to send a 10-page document to 5 folders, the count is 50 (the document is sent to each destination of the SMB/FTP server).
4) Due to restrictions on some devices, if Scan-to-Email is used to send a 10-page document to a large number of destinations, the count may be divided and counted separately. For example, if a 10-page document is sent to 200 addresses, the count is 10 for the first 100 destinations and the count is also 10 for the second 100 destinations, for a total of 20.).

8 661	T:Deliv PGS/Svr	[0~9999999/ **0** / 1]
	These SPs count by color mode the total number of pages sent to a Scan Router server by both Scan and LS applications. **Note:** This SP is expanded for color MFP and color LP machines. For this machine, the count is done for black only.	
8 665	S:Deliv PGS/Svr	[0~9999999/ **0** / 1]
	These SPs count by color mode the total number of pages sent to a Scan Router server by the Scan application. **Note:** This SP is expanded for color MFP and color LP machines. For this machine, the count is done for black only.	
8 666	L:Deliv PGS/Svr	[0~9999999/ **0** / 1]
	These SPs count by color mode the total number of pages sent to a Scan Router server by LS applications. **Note:** This SP is expanded for color MFP and color LP machines. For this machine, the count is done for black only.	

NOTE: 1) The B/W and Color counts are done after the document is stored on the HDD of the Scan Router server.
2) If the job is canceled before storage on the Scan Router server finishes, the counts are not done.
3) The count is executed even if regardless of confirmation of the arrival at the Scan Router server.

8 671	T:Deliv PGS/PC	[0~9999999/ **0** / 1]
	These SPs count by color mode the total number of pages sent to a folder on a PC (Scan-to-PC) with the Scan and LS applications. **Note:** This SP is expanded for color MFP and color LP machines. For this machine, the count is done for black only.	
8 675	S:Deliv PGS/PC	[0~9999999/ **0** / 1]
	These SPs count by color mode the total number of pages sent with Scan-to-PC with the Scan application. **Note:** This SP is expanded for color MFP and color LP machines. For this machine, the count is done for black only.	
8 676	L:Deliv PGS/PC	[0~9999999/ **0** / 1]
	These SPs count by color mode the total number of pages sent with Scan-to-PC function with the LS applications. **Note:** This SP is expanded for color MFP and color LP machines. For this machine, the count is done for black only.	

8 681	T:PCFAX TXPGS	These SPs count the number of pages sent by PC Fax. These SPs are provided for the Fax application only, so the counts for SP8 681 and SP8 683 are the same. [0~9999999/ **0** / 1]
8 683	F:PCFAX TXPGS	

- This counts pages sent from a PC using a PC fax application, from the PC through the copier to the destination.
- When sending the same message to more than one place using broadcasting, the pages are only counted once. (For example, a 10-page fax is sent to location A and location B. The counter goes up by 10, not 20.)

8 691	T:TX PGS/LS	These SPs count the number of pages sent from the document server. The counter for the application that was used to store the pages is incremented. [0~9999999/ **0** / 1] The L: counter counts the number of pages stored from within the document server mode screen at the operation panel. Pages stored with the Store File button from within the Copy mode screen go to the C: counter.
8 692	C:TX PGS/LS	
8 693	F:TX PGS/LS	
8 694	P:TX PGS/LS	
8 695	S:TX PGS/LS	
8 696	L:TX PGS/LS	

NOTE: 1) Print jobs done with Web Image Monitor and Desk Top Binder are added to the count.
2) If several documents are merged for sending, the number of pages stored are counted for the application that stored them.
3) When several documents are sent by a Fax broadcast, the F: count is done for the number of pages sent to each destination.

8 701	TX PGS/Port	[0~9999999/ **0** / 1]
	These SPs count the number of pages sent by the physical port used to send them. For example, if a 3-page original is sent to 4 destinations via ISDN G4, the count for ISDN (G3, G4) is 12.	
8 701 1	PSTN-1	
8 701 2	PSTN-2	
8 701 3	PSTN-3	
8 701 4	ISDN (G3,G4)	
8 701 5	Network	

8 741	RX PGS/Port	[0~9999999/ **0** / 1]
	These SPs count the number of pages received by the physical port used to receive them.	
8 741 1	PSTN-1	
8 741 2	PSTN-2	
8 741 3	PSTN-3	
8 741 4	ISDN (G3,G4)	
8 741 5	Network	

8 771	Dev Counter	[0~9999999/ **0** / 1]
	These SPs count the frequency of use (number of rotations of the development rollers) for black and other color toners. **Note:** For machines that do not support color, the Black toner count is the same as the Total count.	

8 791	LS Memory Remain	This SP displays the percent of space available on the document server for storing documents. [0~100/ **0** / 1]

8 801	Toner Remain	[0~100/ **0** / 1]
	This SP displays the percent of toner remaining for each color. This SP allows the user to check the toner supply at any time. **Note:** • This precise method of measuring remaining toner supply (1% steps) is better than other machines in the market that can only measure in increments of 10 (10% steps). • This SP is expanded for color MFP and color LP machines. For this machine, the count is done for black only.	

8 781	Pixel Coverage Ratio **DFU**
8 831	Pixel Coverage Ratio **DFU**
8 841	Pixel Coverage Ratio **DFU**
8 851	**DFU**
8 861	**DFU**
8 871	**DFU**
8 881	**DFU**
8 901	Pixel Coverage Ratio **DFU**
8 911	Pixel Coverage Ratio **DFU**

8 941	Machine Status		[0~9999999/ **0** / 1]
	These SPs count the amount of time the machine spends in each operation mode. These SPs are useful for customers who need to investigate machine operation for improvement in their compliance with ISO Standards.		
8 941 1	Operation Time	Engine operation time. Does not include time while controller is saving data to HDD (while engine is not operating).	
8 941 2	Standby Time	Engine not operating. Includes time while controller saves data to HDD. Does not include time spent in Energy Save, Low Power, or Off modes.	
8 941 3	Energy Save Time	Includes time while the machine is performing background printing.	
8 941 4	Low Power Time	Includes time in Energy Save mode with Engine on. Includes time while machine is performing background printing.	
8 941 5	Off Mode Time	Includes time while machine is performing background printing. Does not include time machine remains powered off with the power switches.	
8 941 6	Down Time/SC	Total down time due to SC errors.	
8 941 7	Down Time/PrtJam	Total down time due to paper jams during printing.	
8 941 8	Down Time/OrgJam	Total down time due to original jams during scanning.	
8 941 9	Down Time/TonEnd	Total down time due to toner end.	

8 951	AddBook Register		
	These SPs count the number of events when the machine manages data registration.		
8 951 1	User Code	User code registrations.	[0~9999999/ **0** / 1]
8 951 2	Mail Address	Mail address registrations.	
8 951 3	Fax Destination	Fax destination registrations.	
8 951 4	Group	Group destination registrations.	
8 951 5	Transfer Request	Fax relay destination registrations for relay TX.	
8 951 6	F-Code	F-Code box registrations.	
8 951 7	Copy Program	Copy application registrations with the Program (job settings) feature.	[0~255 / **0** / 255]
8 951 8	Fax Program	Fax application registrations with the Program (job settings) feature.	
8 951 9	Printer Program	Printer application registrations with the Program (job settings) feature.	
8 951 10	Scanner Program	Scanner application registrations with the Program (job settings) feature.	

List Contents

Here is a brief summary of what is contained on the Logging Data List.

• System Counts	
Total Count CE Count PM Count	
Count Timing	Printed outputs completed.
No Counts	White copied both sides, SMC prints, free runs, DF jams not counted.
Other	Single count only, even if double-count selected. (**Japan only**: (1) Double count setting cannot be performed, (2) Abnormal coin operations are counted.)
ARDF Feed-ins	
Count Timing	Original feed-ins, originals inverted completed.
No Counts	---
Other	Feed-in jams.
Scan Starts	
Count Timing	Engine starts for scanning, image write operations started.
No Counts	Prints from external video.
Other	Prints from sources other than scanning operation are counted. Examples: Less than 2 retention copies, SMC prints, white copies
Staples	
Count Timing	Staple engine cycles completed, number of staples fired.
No Counts	Staple jams.
Other	---
Prints by Paper Feeds	
Count Timing	Paper feeds initiated.
No Counts	White duplex copies, SMC prints, free runs, ARDF jams.
Other	Jams that interfered with the total count. Trays are counted started from the Duplex Tray.
Prints by Paper Size	
Count Timing	Paper feed starts.
No Counts	White duplex copies, SMC prints, free runs, ARDF jams.
Other	Jams that interfered with the total count.
Scanner SCs	
Count Timing	SC10n, SC12n occurrences counted.
No Counts	---
Other	---
IPU SCs	
Count Timing	SC19n occurrences counted.
No Counts	---
Other	---
Printer SCs	
Count Timing	SC30n, SC32n, SC35, SC39n, SC40n, SC42n, SC44n, SC49n, SC52n, SC54n, SC72n occurrences counted.
No Counts	---
Other	

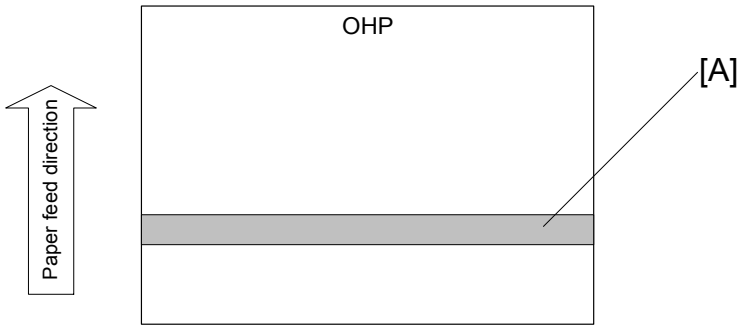
• System Counts	
Other SCs	
Count Timing	SC's generated other than those listed above for Scanner, IPU, Printer.
No Counts	---
Other	---
Operation Time	
Count Timing	Operation time of the main motor in increments of 100 ms.
No Counts	---
Other	Counts scanner and ARDF operation time when these devices are operating alone so these counts will not match the time count for drum rotation.
• Application Software Counts	
Original Total for Copy Application	
Count Timing	Counts the number of times the size of an original is detected for every original feed-in.
Other	For double-sided originals, counts 1 the first time the backside is set. Inverting is not counted. This count is different from the ADF Feed-ins reading described above.
Copy Total for Copy Application	
Count Timing	Feed-ins started.
Other	Blank (white) pages output.
• Mode Counts for Copy Application	
Copies by Magnifications Reduction (25%~49%) Reduction (50%~99%) 1:1 Enlargement (101%~200%) Enlargement (201%~400%) Custom (Paper, dimensions, area, etc.)	
Count Timing	Number of executions for each magnification category.
Other	Also counts white (blank) copies, and the number of times the operation panel keys are operated for zooming. For example, an AMS 71% copy is not counted for 50%~90%.
Copies by Color Black Copies Red Copies Blue Copies 2-Color Copies	
Count Timing	Feed-in starts for each category. Counts according to the selection information of the basic screen.
Other	Also counts white sheets according to the mode.
Copies by Quality Mode Text/Photo Mode Photo Mode Photo Original Mode Pencil Original Mode	
Count Timing	Feed-in starts for each category. Counts according to the selection information of the basic screen.

• **Mode Counts for Copy Application**	
Other	Also counts white sheets according to the mode.
Copies by Print Function Job No. Stamp User Stamp User Pattern Date Stamp Page Numbering	
Count Timing	Feed-in starts for each category. (Counts according to the print tags for each function in the selection information.)
Other	Counts even white sheets (blanks) according to the selected mode. The feed-times of first pages without stamps, for example, are also counted. User patterns are also counted when user stamp is selected or when pattern mode is selected.
Into1 Function Copies	
Count Timing	Feed-ins for multiple page per sheet printing (2-up, 4-up, etc).
Other	White sheets (blank) for each mode.
Copies by Editing Mode	
Center Erase Color Erase All Edit Pen Area Edit Editor Edit Synthesis Nega/Posi Center Erase Center Fill	Mirror Skew Shadow Effect Screening Gradation Background Gradation Repeat, Double Copy Internal, External Color Internal, External Erase
Count Timing	Feed-ins for each edit mode.
Other	White sheets (blank) for each mode. In the Editor Edit mode, the edit and file are counted during fill execution.
Mode Program	
Count Timing	Mode program calls.
Other	---
High Speed	
Count Timing	Feed-in starts while the high speed key is selected.
Other	White sheets (blank) while the high speed key is selected.
Image Rotation	
Count Timing	Feed-in starts for user image rotation, stapler rotation, and duplex rotation.
Other	White sheets (blank) for the selected mode.
Auto Start	
Count Timing	Copy feed-ins for Auto Start mode.
Other	White sheets (blank) for the high speed mode are also counted..
Electronic Collate	
Count Timing	Feed-ins with the collate function selected.

• **Mode Counts for Copy Application**	
Other	Output to the rotational stacker are not counted. White sheets (blanks) for the high speed mode are also counted.
Mechanical Collate	
Count Timing	Feed-in starts with “Sort” selected on the finisher.
Other	Counts even for stapling. White sheets (blanks) for the high speed mode are also counted.
Stapler	
Count Timing	Feed-in starts with “Staple” selected on the finisher.
Other	Not counted for the Collate mode.

5.1.4 NIP BAND WIDTH ADJUSTMENT: SP1-109

When paper wrinkling or image offset occurs, the pressure from the pressure roller



can be adjusted by changing the position of the pressure springs. At this time, the nip bandwidth can also be checked with SP1-109.

1. Execute SP5-802 to perform a free run of about 50 sheets.
2. Open SP1-109-1, press #, and then press Yes to confirm the selection.
3. Press Copy Window to return to the copy window.
4. Place an OHP sheet (A4/8.5" x 11" sideways) on the by-pass feed tray.
5. Press Start twice. The OHP sheet stops in the fusing unit for about 10 seconds, then it exits automatically.
6. Check the nip bandwidth [A]. The relationship between the position of the pressure spring and the bandwidth is as follows.
   NOTE: Check the nip bandwidth around the center of the OHP.

Pressure spring position	Nip width
Upper (default position)	6.0 ± 0.5 mm
Lower	6.5 ± 0.6 mm

If the width is out of the above specification, the pressure spring should be replaced.

5.1.5 TEST PATTERN PRINTING: SP2-902

NOTE: Always print a test pattern to confirm correct operation of the machine.

1. Enter the SP mode and select SP2-902.
2. Press ② or ③.
   - ② IPU Test Print
   - ③ Test Pattern
3. Enter the number for the test pattern that you want to print and press #. (See the tables below.)
4. When you are prompted to confirm your selection, press Yes. This selects the test pattern for printing.
5. Press Copy Window to open the copy window and then select the settings for the test print (paper size, etc.)
6. Press Start ◇ twice. (Ignore the "Place Original" messages) to start the test print.
7. Press SP Mode (highlighted) to return to the SP mode display.

Test Pattern Table (SP2-902-2: IPU Test Print)

No.	Test Pattern	No.	Test Pattern
0	None	8	Grayscale (Horizontal) (8)
1	Vertical Line (1-dot)	9	Grayscale (Vertical) (8)
2	Horizontal Line (1-dot)	10	Cross Pattern (8)
3	Vertical Line (2-dot)	11	Cross Shape
4	Horizontal Line (2-dot)	12	Argyle Pattern
5	Alternate Dot Pattern	13	Cross Pattern (256)
6	Grid Pattern (1-dot)	14	Cross Pattern (64)
7	Vertical Stripes	15	Not used

Test Pattern Table: SP2-902-3 Printing Test Patterns

No.	Test Pattern	No.	Test Pattern
0	None	20	Horizontal Line (1-dot) (Reversed LD1, LD2)
1	Vertical Line (1-dot)	21	Grid Pattern (1-dot) (Reversed LD1, LD2)
2	Horizontal Line (1-dot)	22	Grid Pattern (1-dot pair) (Reversed LD1, LD2)
3	Vertical Line (2-dot)	23	Independent Pattern (1-dot) (Reversed LD1, LD2)
4	Horizontal Line (2 dot)	24	3 Grayscale
5	Grid Pattern (1-dot)	25	Grayscale (Horizontal)
6	Grid Pattern (1-dot pair)	26	Grayscale (Vertical)
7	(not used)	27	Grayscale (Vertical/Horizontal)
8	(not used)	28	Grayscale (Grid)
9	Full Dot Pattern	29	Grayscale (Horizontal Extension)
10	Black band	30	Grayscale (Vertical Extension)
11	Trimming Area	31	Grayscale (Horizontal Margin)
12	Trimming Area (2-dot)	32	Grayscale (Vertical Margin)
13	Argyle Pattern	33	Grayscale (Vertical/Horizontal Margin)
14	Argyle Pattern (2-dot_)	34	Grayscale (Horizontal Extension Margin)
15	Hound's Tooth Check (2-dot Horizontal)	35	Grayscale (Vertical Extension Margin)
16	Checker Flag Pattern	36	White Pattern
17	Point Black Pattern	37	Grid (1-dot pair) (OR Outside Data 1)
18	Black Band (Vertical)		
19	Independent Pattern (4-dot)		

5.1.6 INPUT CHECK

Main Machine Input Check: SP5-803

1. Enter the SP mode and select SP5-803.
2. Enter the number (1 – 13) for the item that you want to check. A small box will be displayed on the SP mode screen with a series of 0's and 1's.
   The meaning of the display is as follows.

   0 0 0 0 0 0 0 0

   Bit 7 6 5 4 3 2 1 0

3. Check the status of each item against the corresponding bit numbers listed in the table below.

Number	Bit	Description	Reading	
			0	1
1: Paper Feed 1 (Upper Tray)	7	Fusing Exit Sensor	Activated	Deactivated
	6	Near End Sensor 2	Activated	Deactivated
	5	Near End Sensor 1	Activated	Deactivated
	4	Not Used	---	---
	3	Paper Size Sensor 4	Activated	Deactivated
	2	Paper Size Sensor 3	Activated	Deactivated
	1	Paper Size Sensor 2	Activated	Deactivated
	0	Paper Size Sensor 1	Activated	Deactivated
2: Paper Feed 2 (Lower Tray)	7	Duplex Unit Set Sensor	Unit set	Unit not set
	6	Near End Sensor 2	Off	On
	5	Near End Sensor 1	Off	On
	4	Fusing/Paper Output Motor Lock	Not Locked	Locked
	3	Paper Size Sensor 4	Activated	Deactivated
	2	Paper Size Sensor 3	Activated	Deactivated
	1	Paper Size Sensor 2	Activated	Deactivated
	0	Paper Size Sensor 1	Activated	Deactivated
3: Registration and Others	7	Zero Cross Signal	Detected	Not detected
	6	Transfer Belt Unit HP Sensor	Not present	Present
	5	Exhaust Fan Lock Signal	Not locked	Locked
	4	Cooling Fan Lock Signal	Not locked	Locked
	3	Main Motor Lock Signal	Not locked	Locked
	2	Toner Overflow Sensor	Tank not full	Tank full
	1	Cover Open	Cover closed	Cover opened
	0	Registration Sensor	Paper detected	Paper not detected

Number	Bit	Description	Reading	
			0	1
4: By-pass Feed	7	Duplex reverse path door	Closed	Open
	6	Paper End Sensor	Paper detected	Paper not detected
	5	Not used		
	4	Paper Size Sensor 4, By-pass	Activated	Deactivated
	3	Paper Size Sensor 3, By-pass	Activated	Deactivated
	2	Paper Size Sensor 2, By-pass	Activated	Deactivated
	1	Paper Size Sensor 1, By-pass	Activated	Deactivated
	0	Unit Set Signal	Yes	No
5: Relay Unit (Bridge Unit)	7	Not used	Yes	No
	6	Unit Set Signal	Connected	Not connected
	5	Paper Sensor	Paper detected	Paper not detected
	4	Relay Sensor	Paper detected	Paper not detected
	3	Exit Sensor	Paper detected	Paper not detected
	2	Left Cover Switch	Switch pressed (cover closed)	Switch not pressed
	1	Middle Cover Switch	Switch pressed (cover closed)	Switch not pressed
	0	Right Cover Switch	Switch pressed (cover closed)	Switch not pressed
6: Unit Set	7	Feed Motor Lock	No	Yes
	6	F-Gate Signal	Active	Not active
	5	Height Sensor	Feed height	Not feed height
	4	Paper Exit Sensor	Paper detected	Paper not detected
	3	Fusing Unit	Detected	Not detected
	2	Total Counter	Not detected	Detected
	1	Key Counter	Detected	Not detected
	0	Key Card Present	Detected	Not detected
7: Paper End	7	Front cover/open closed	Open	Closed
	6	Vertical feed path	Clear	Not clear
	5	2nd Tray Height Sensor	Paper not at upper limit	Paper at upper limit
	4	1st Tray Height Sensor	Paper not at upper limit	Paper at upper limit
	3	Lower Relay Sensor	Paper detected	Paper not detected
	2	Upper Relay Sensor	Paper detected	Paper not detected
	1	Lower Paper End Sensor	Paper not detected	Paper detected
	0	Upper Paper End Sensor	Paper not detected	Paper detected

Number	Bit	Description	Reading			
			0			1
8: DIP Switches	7	Dip Switch - 8	On			Off
	6	Dip Switch - 7	On			Off
	5	Dip Switch - 6	On			Off
	4	Dip Switch - 5	On			Off
	3	Dip Switch - 4	On			Off
	2	Dip Switch - 3	On			Off
	1	Dip Switch - 2	On			Off
	0	Dip Switch - 1	On			Off
9: Duplex Unit	7	Not used				
	6	Right cover open/closed	Closed			Open
	5	1-Bin Unit Set	Detected			Not detected
	4	LD, HP sensor	Positioned			Not positioned
	3	Exit Sensor (Jam)	Paper detected			Paper not detected
	2	Entrance Sensor (Jam)	Paper detected			Paper not detected
	1	Paper End Sensor	Paper detected			Paper not detected
	0	Duplex Unit Switch	Cover closed			Cover open
10: Remainder of Feed Tray 1	7	Tray 4: Bit 1				
	8	Tray 4: Bit 0	**Bit 1**	**Bit 0**		**Capacity**
	5	Tray 3: Bit 1	1	1		Full
	4	Tray 3: Bit 0	1	0		50% or more
	3	Tray 2: Bit 1	0	1		10% or more
	2	Tray 2: Bit 0	0	0		Out, or tray not set
	1	Tray 1: Bit 1				
	0	Tray 1: Bit 0				
11: Remainder of Feed Tray 2	7	By-pass Yes/No				
	6	Not Used				
	5	Not Used				
	4	Not Used				
	3	Not Used	**Bit 2**	**Bit 1**	**Bit 0**	**Capacity**
	2	LCT: Bit 2	1	1	1	Full
	1	LCT: Bit 1	1	0	0	80% or more
	0	LCT: Bit 0	0	1	1	50% or more
			0	1	0	30% or more
			0	0	0	10% or more

Service Tables

Number	Bit	Description	Reading	
			0	1
12: Full Exit Tray 1	7	Mailbox 9-bin	Not full or no tray	Full
	6	Mailbox 8-bin	Not full or no tray	Full
	5	Not used	-	-
	4	Finisher: Shift Tray 1	Not full or no tray	Full
	3	Finisher: Shift Tray 2	Not full or no tray	Full
	2	Not used	-	-
	1	1-Bin Exit	Not full or no tray	Full
	0	Machine Exit	Not full or no tray	Full
13: Full Exit Tray 2	7	Mailbox 7-bin	Not full or no tray	Full
	6	Mailbox 6-bin	Not full or no tray	Full
	5	Mailbox 5-bin	Not full or no tray	Full
	4	Mailbox 4-bin	Not full or no tray	Full
	3	Mailbox 3-bin	Not full or no tray	Full
	2	Mailbox 2-bin	Not full or no tray	Full
	1	Mailbox 1-bin	Not full or no tray	Full
	0	Mailbox Proof Tray	Not full or no tray	Full

Table 1: By-pass Feed Table Paper Size Data

Number.	Bit 4	Bit 3	Bit 2	Bit 1	Paper Width
4: By-pass	1	1	1	1	Post Card
	1	1	1	0	B6 SEF
	1	1	0	1	B5 SEF
	1	1	0	0	A5 SEF / 5.5"
	1	0	1	1	B4 SEF
	1	0	0	1	A4 SEF / 8.5" / 8"
	0	1	1	1	A3 SEF
	0	0	1	1	11" x 17"

ARDF Input Check: SP6-007

1. Enter the SP mode and select SP6-007.
2. Enter the number (1 – 13) for the item that you want to check. A small box will be displayed on the SP mode screen with a series of 0's and 1's.
   The meaning of the display is as follows.

0 0 0 0 0 0 0 0
Bit 7 6 5 4 3 2 1 0

3. Check the status of each item against the corresponding bit numbers listed in the table below.

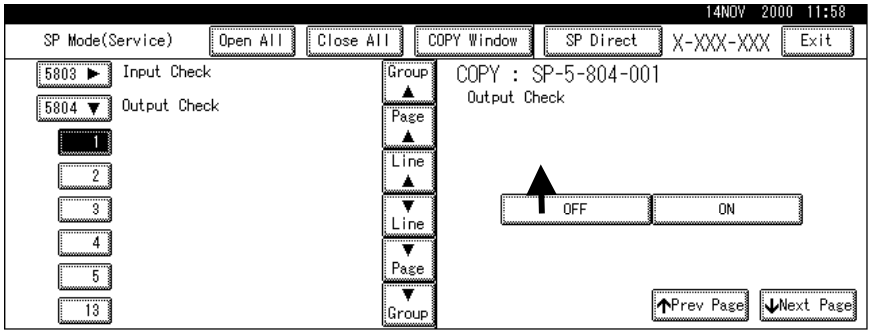
Group	Bit No.	Description	Reading	
			0	1
1	7	Original width sensor 4	Paper not detected	Paper detected
	6	Original width sensor 3	Paper not detected	Paper detected
	5	Original width sensor 2	Paper not detected	Paper detected
	4	Original width sensor 1	Paper not detected	Paper detected
	3	Skew correction sensor	Paper not detected	Paper detected
	2	Original set sensor	Paper not detected	Paper detected
	1	Original B5 sensor	Paper not detected	Paper detected
	0	Original LG sensor	Paper not detected	Paper detected
2	7	Original stopper HP sensor	Original stopper up	Original stopper down
	6	Pick-up HP sensor	Cover closed	Cover opened
	5	Top cover Sensor	Cover closed	Cover opened
	4	Lift sensor	Pick-up roller up	Pick-up roller down
	3	Inverter sensor	Paper not detected	Paper detected
	2	Exit sensor	Paper not detected	Paper detected
	1	Registration sensor	Paper not detected	Paper detected
	0	Interval Sensor	Paper not detected	Paper detected
3	0	Original A4 sensor		

5.1.7 OUTPUT CHECK

NOTE: Motors keep turning in this mode regardless of upper or lower limit sensor signals. To prevent mechanical or electrical damage, do not keep an electrical component on for a long time.

Main Machine Output Check: SP5-804

1. Open SP mode 5-804.
2. Select the SP number that corresponds to the component you wish to check. (Refer to the table on the next page.)
3. Press On then press Off to test the selected item.



NOTE: You cannot exit and close this display until you press off to switch off the output check currently executing. Do not keep an electrical component switched on for a long time.

SP5-804 Output Check Table

No.	Description	No.	Description
1	1st Paper Feed CL	45	Duplex Junction Gate Solenoid ()
2	2nd Paper Feed CL		
3	3rd Paper Feed CL (PTU)	47	Relay Junction Gate Solenoid
4	4th Paper Feed CL (PTU)		
5	By-pass Paper Feed CL	50	Tray Junction Gate Solenoid
6	LCT Paper Feed CL	51	Stapler Junction Gate Solenoid
		52	Positioning Roller Solenoid (Finishers)
13	By-pass Pick-up Solenoid		
14	LCT Pick-up Solenoid	56	Toner Bottle Motor
		57	Transfer Belt Positioning Clutch
17	Transport Motor 1 (Finisher)		
18	Transport Motor 2 (Finisher)	62	Quenching Lamp
19	Exit Motor (Finisher)	63	Charge Bias
20	Staple Motor (Finisher)		
21	Punch Motor (Finisher)	67	Development Bias
25	LCT Motor	69	Transfer Belt Voltage
26	Bank Motor (Paper Tray Unit)	70	ID Sensor LED
27	Fusing/Feed-Out Motor		
28	Main Motor	75	Exhaust Fan
29	Duplex Transport Motor	76	Elec. Equipment Cooling Fan (High Rev.)
30	Duplex Inverter Motor – Rev.		
31	Duplex Inverter Motor – Fwd	78	Relay Fan Motor
32	Feed/Development Motor	79	Fusing Fan Motor
		85	Total Counter
35	Bank Relay Clutch (Paper Tray Unit)		
36	Relay Clutch		
38	LCT Relay Clutch	92	Shift Tray Lift Motor (Finisher)
39	Registration Clutch	93	Jogger Motor (Finisher)
40	Not used	94	Stapler Unit Motor (Finisher)
41	Exit Junction Gate Solenoid (Upper Unit)	95	Stack Feed Out Motor (Finisher)
42	Duplex Junction Gate Solenoid (Lower Unit)	96	Shift Motor (Finisher)
		97	Stapler Rotation Motor (Two-Tray Finisher)

ARDF Output Check: SP6-008)

1. Open SP mode SP6-008.
2. Select the SP number that corresponds to the component you wish to check. (Refer to the table below.)
3. Press On then press Off to test the selected item. You cannot exit and close this display until you click Off to switch off the output check currently executing.

No.	Description
1	Feed Motor (Forward)
2	Feed Motor (Reverse)
3	Drive Motor (Forward)
4	Inverter Motor (Forward)
5	Inverter Motor (Reverse)
6	Feed Clutch
7	Inverter Solenoid
8	Pick-up Motor (Forward)
9	Pick-up Motor (Reverse)

5.1.8 SMC PRINT OUT LISTS: SP5-990

1. Open SP mode 5-990 and select the number corresponding to the list that you wish to print.

SMC (System Parameter and Data Lists)	
1	All Data List
2	SP Mode Data List
3	UP Mode Data List
4	Logging Data List
5	Self-Diagnostics Results List
6	Non-Default
7	NIB Summary
8	NetFile Application Log
21	Copy UP Mode List
22	Scanner SP Mode List
23	Scanner UP Mode List

2. Press “Execute” on the touch panel.
3. Select “Single Face” or “Both Face”.
4. After printing the list, press “Close” to return to the SP mode display.
5. Press Exit twice to close the SP Mode screen and return to copy mode.

5.1.9 MEMORY CLEAR: SP5-801

Executing Memory All Clear resets all the settings stored in the NVRAM to their default settings except the following:

SP7-003-1:	Electrical total counter value
SP5-811-1:	Machine serial number
SP5-907:	Plug & Play Brand Name and Production Name Setting

1. Execute SP5-990 to print out all SMC Data Lists.
2. Open SP mode 5-801.
3. Press the number for the item that you want to initialize. The number you select determines which application is initialized. For example, press 1 if you want to initialize all modules or select the appropriate number from the table below.

5801	Memory Clear	**Comments**
5801 1	All Clear	Initializes items 2 ~ 12 below. [*1]
5801 2	Engine	Initializes all registration settings for the engine and processing settings. [*1]
5801 3	SCS	Initializes default system settings, CSS settings, operation display coordinates, and ROM update information. [*1]
5801 4	IMH Memory Clr	Initializes the registration setting for the image memory handler by deleting all image files on the HDD.
5801 5	MCS	Initializes the automatic delete time setting for stored documents.
5801 6	Copier application	Initializes all copier application settings.
5801 7	Fax application	Initializes the fax reset time, job login ID, all TX/RX settings, local storage file numbers, and off-hook timer.
5801 8	Printer application	Initializes the printer defaults, programs registered, the printer SP Bit SW, and printer CSS counter.
5801 9	Scanner application	Initializes the scanner defaults for the scanner and all the Scanner SP modes.
5801 10	Web Service/Network Application	Deletes the NFA management files and thumbnails, and initializes the JOB login ID.
5801 11	NCS	Initializes the system defaults and interface settings (IP addresses also), the SmartDeviceMonitor for Admin, WebStatusMonitor settings, and the TELNET settings.
5801 12	R-FAX	Initializes the Job login ID, SmartDeviceMonitor for Admin, Job History, and local storage file numbers.
5801 14	Clear DCS Settings	Initialization
5801 15	Clear UCS Settings	Initialization

[1*]: Resetting 1~3 resets the operation panel screen coordinates, so after executing 1, 2, or 3, you must re-calibrate the screen.

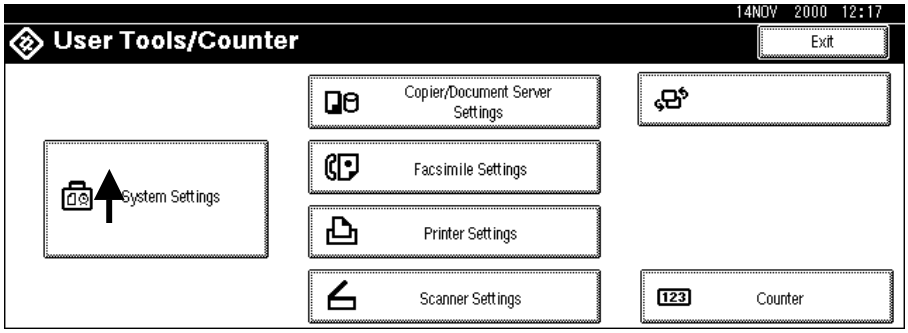
4. Press Execute, and then follow the prompts on the display to complete the procedure.
5. Make sure that you perform the following settings:
   - Do the laser beam pitch adjustment (SP2-109).
   - Do the printer and scanner registration and magnification adjustments (☛ 3.21 Replacement and Adjustment, “Copy Adjustments”.
   - Do the touch screen calibration (☛ 3.21.4 Replacement and Adjustment, “touch screen calibration”).
   - Referring to the SMC data lists, re-enter any values, which had been changed from their factory settings.
   - Do SP 3-001-2 (ID Sensor Initial Setting).
6. Check the copy quality and the paper path, and do any necessary adjustments.

5.1.10 SYSTEM SETTINGS AND COPY SETTING RESET

System Setting Reset

The system settings in the UP mode can be reset to their defaults. Use the following procedure.

1. Press User Tools/Counter.
2. Hold down # and then press System Settings.
   NOTE: You must press # first.

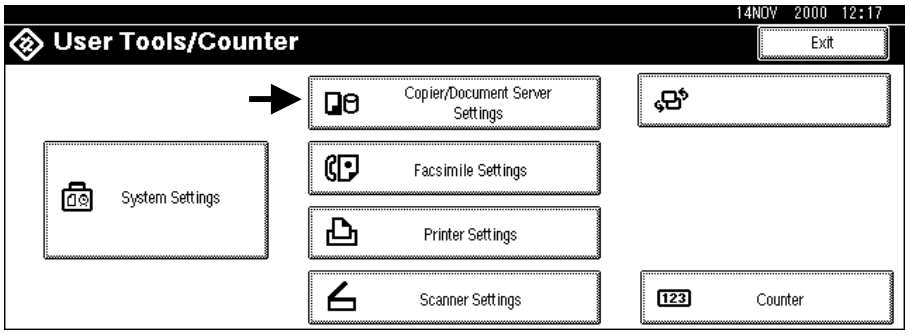


3. When the message prompts you to confirm that you want to reset the system settings, press Yes.
4. When the message tells you that the settings have been reset, press Exit.

Copier Setting Reset

The copy settings in the UP mode can be reset to their defaults. Use the following procedure.

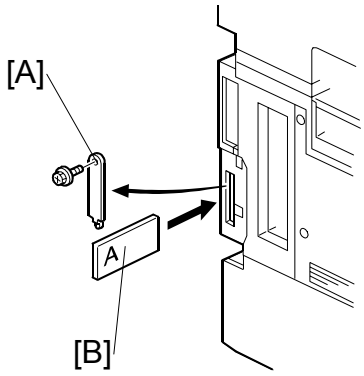
1. Press User Tools/Counter.
2. Hold down # and then press Copier/Document Server Settings.
   NOTE: You must press # first.



3. When the message prompts you to confirm that you want to reset the Copier Document Server settings, press Yes.
4. When the message tells you that the settings have been reset, press Exit.

⇒5.2 SOFTWARE DOWNLOAD

1. Turn OFF the main power switch.
2. Disconnect all external interfaces:
   - Network connection. Including: Wireless Card, USB, Parallel Printer Cable and FireWire.
   - All Fax line connections.
   - Copy Connect Kit.
   - External Auditing devices.
   - Any Remote Monitor Systems.
3. Remove the IC card [A] cover.
4. Insert the IC card [B] containing the software you wish to download into the card slot of the controller.
5. Turn ON the main power.
6. Follow the instructions displayed on the LCD panel
7. Monitor the downloading status on the operation panel.
   - While downloading is in progress, the LCD will display “Writing”. When downloading has been completed, the panel will display “OK”.
   - For operation panel software, the Start key lights red while downloading is in progress, and then lights green again after downloading is completed.



⚠CAUTION

Never switch OFF the power while downloading. Switching OFF the power while the new software is being downloaded will damage the boot files in the controller.

8. After confirming that downloading is completed, turn off the main power and remove the IC card.
9. The following firmware can be recovered if download fails. Follow the firmware download recovery procedure 5.2.1.
   - Controller
   - BICU
   - LCDC
10. If more software needs to be downloaded, repeat steps 1 to 7.
11. Turn the main power ON and confirm that the new software loads and that the machine starts normally.
12. Reconnect any external interfaces removed previous.

⇒5.2.1 SOFTWARE DOWNLOAD RECOVERY PROCEDURE

Controller

1. Turn OFF the main power switch.
2. Remove the Controller PCB.
3. Turn On DIP SW2, #1 (IC Card Boot).
4. Re-install the Controller PCB.
5. Insert the Controller firmware IC Card.
6. Power On machine. Firmware recovery will start automatically. Follow instructions on LCD panel.
7. After the firmware download is complete, power OFF the machine, remove the IC card, remove the Controller PCB and turn OFF DIP SW2, #1. Re-install the Controller PCB and test machine operation.

BICU

1. Turn OFF the main power switch.
2. Remove the lower rear cover.
3. Turn ON DIP SW101, #3 (Engine Program Recovery).
4. Insert the BICU firmware IC Card.
5. Power ON machine. Firmware recovery will start automatically. Follow instructions on LCD panel.
6. After the firmware download is complete, power OFF the machine, remove the IC card and turn OFF DIP SW101, #3. Test machine operation.

LCDC

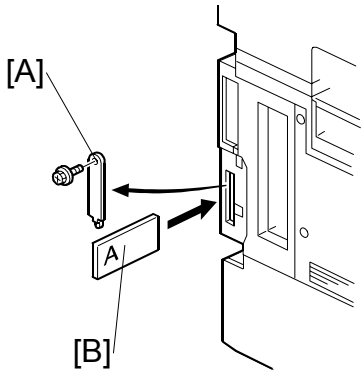
1. Leave LCDC firmware card installed.
2. Power the main power OFF and ON. Recovery will start automatically.

⇒5.3 UPLOADING/DOWNLOADING NVRAM DATA

The content of the NVRAM can be uploaded to and downloaded from a flash memory card.

5.3.1 UPLOADING NVRAM DATA (SP5-824)

1. Turn off the main switch.
2. Remove the IC card cover [A].
3. Plug the flash memory card [B] into the card slot.
4. Turn on the main switch.
5. Execute SP5-824.
6. Press ① to start uploading the NVRAM data.

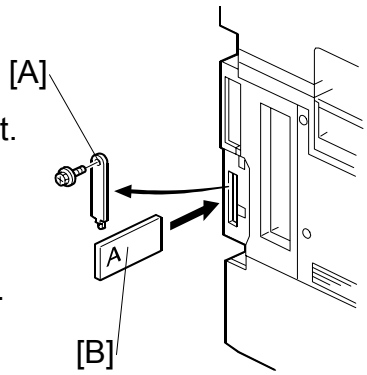


5.3.2 DOWNLOADING NVRAM DATA (SP5-825)

The following data are not downloaded from the flash card:

- Total count categories (SP7-003-*** Copy Counter)
- C/O, P/O Counter (SP7-006-*** C/O, P/O Count Display)
- Dupelx, A3/DLT/Over 420 mm, Staple and Scanner application scanning counters (system settings).

1. Turn off the main switch.
2. Remove the IC card cover [A].
3. Plug the flash memory card [B] into the card slot.
4. Turn on the main switch.
5. Execute SP5-825.
6. Press ① to start downloading the NVRAM data.



Note that the following errors could occur during downloading:

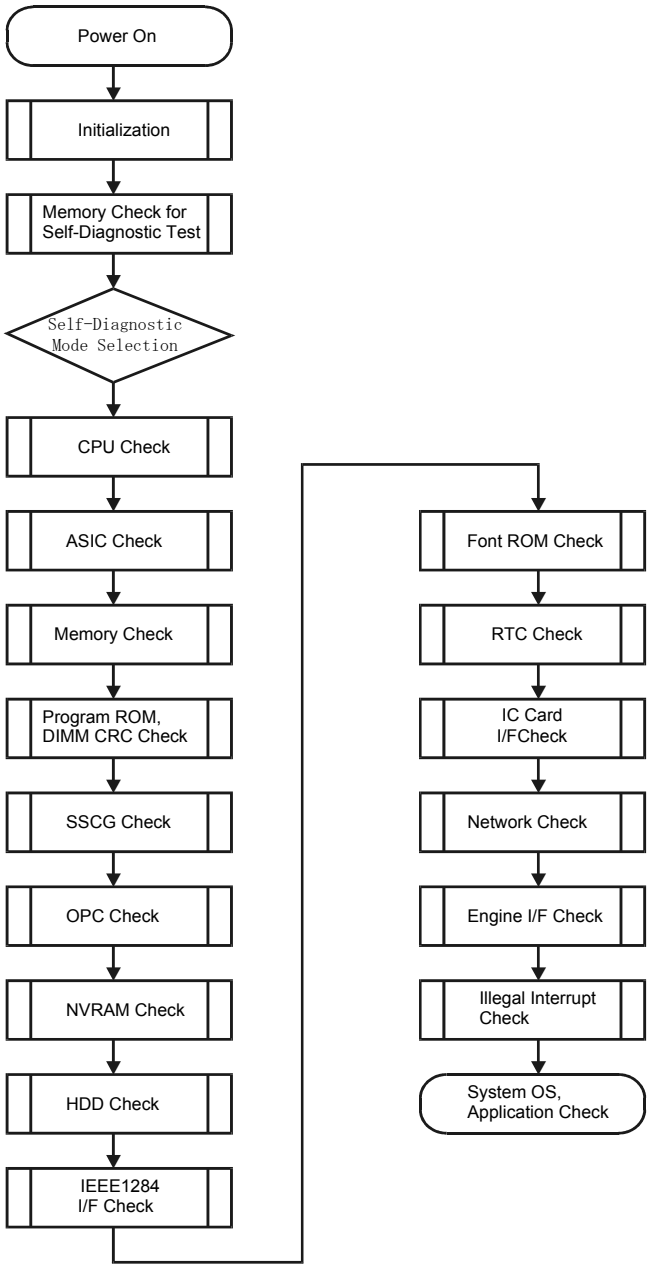
- If a card is not installed in the card slot and a message tells you that downloading cannot proceed, you cannot execute downloading, even by pressing ①.
- If the correct card for the NVRAM data is not inserted in the card slot, after you press ① a message will tell you that downloading cannot proceed because the card is abnormal and the execution will halt.

5.4 SELF-DIAGNOSTIC MODE

5.4.1 SELF-DIAGNOSTIC MODE AT POWER ON

As soon as the main machine is powered on, the controller waits for the initial settings of the copy engine to take effect and then starts an independent self-diagnostic test program. The self-diagnostic test follows the path of the flow chart shown below and checks the CPU, memory, HDD, and so on. An SC code is displayed in the touch panel if the self-diagnostic program detects any malfunction or abnormal condition.

Self-Diagnostic Test Flow



5.4.2 DETAILED SELF-DIAGNOSTIC MODE

In addition to the self-diagnostic test initiated every time the main machine is powered on, you can set the machine in a more detailed diagnostic mode manually in order to test other components or conditions that are not tested during self-diagnosis after power on. The following device is required in order to put the machine in the detailed self-diagnosis mode.

No.	Name
G02119350	Parallel Loopback Connector

Executing Detailed Self-Diagnosis

Follow this procedure to execute detailed self-diagnosis.

1. Switch off the machine, and connect the parallel loopback device to the Centronics I/F port.
2. Hold down #, press and hold down *, and then while pressing both keys at the same time, switch on the machine.

   You will see “Now Loading” on the touch-panel, and then you will see the results of the test.

A report like the one below is printed every time a detailed self-diagnostic test is executed, whether errors were detected or not.

MODEL NAME XXXX

Self-Diagnosis Report

Serial No. : ACLD000034 Firmware P/# : ACP82XXXX [1/1]
Firmware Version : 2.49.01 Wed Nov 22 13:15:30 2000

[System Construction]

Kernel Version	: NetBSD 1.3.3 (SHINYOKOHAMA_ROM) #0: Sat Nov 11 16:15:35 JST 2000		
CPU System Bus Clock	: 100.0 MHz	CPU Pipeline Clock	: 200.0 MHz
Board Type	: 7	ASIC Version	: 1397306160
RTC Existence	: existence	RAM Capacity	: 100.663296 MB
HDD Existence	: existence	HDD Model	:

[Total Counter]

0001000

[Program No. @]

MAIN	: ACP82XXXX	ENGINE	: Ver1.96
LCDC	: V1.39	PI	:
ADF	: B3515620B	SIB	: B0045383
FIN	:	FIN_SDL	:
BANK	: A6825150	LCT	:
MBX	:	FCU	:
DPX	:		

[Error List @@@]

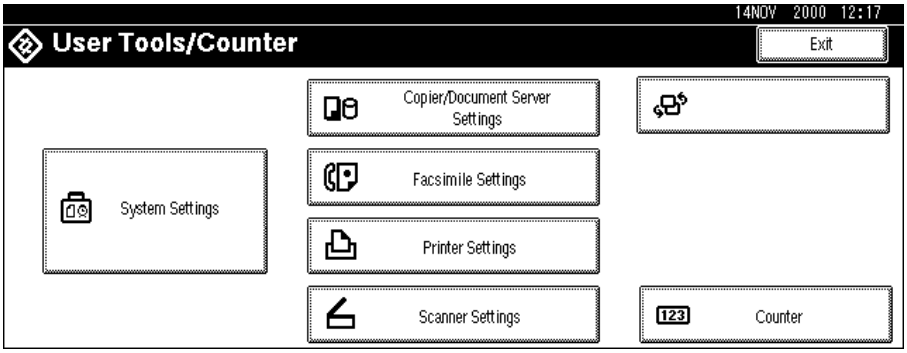
SCCODE (ERROR CODE)	SC CODE (ERROR CODE)	SC CODE (ERROR CODE)	SC CODE (ERROR CODE)
SC835 (110C)	SC820 (0001)	SC820 (0002)	SC820 (0003)
SC820 (0004)	SC820 (0005)		

5.5 USER PROGRAM MODE

The user program (UP) mode is accessed by users and operators, and by sales and service staff. UP mode is used to input the copier's default settings. The default settings can be reset at any time by the user. (☛ 5.1.10)

5.5.1 HOW TO USE UP MODE

UP Mode Initial Screen: User Tools/Counter Display

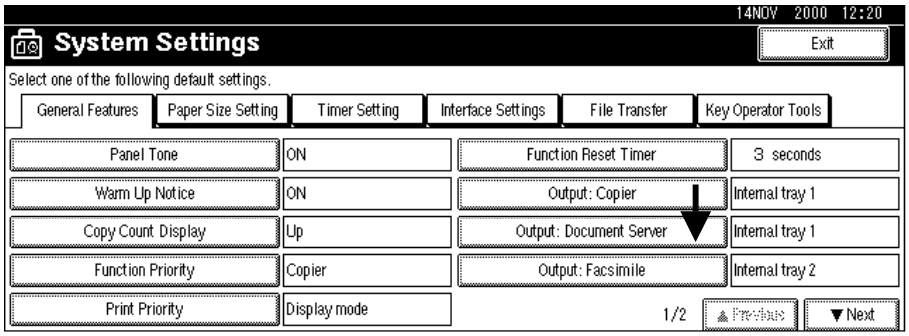


To enter the UP mode, press User Tools/Counter 123.

System Settings

In the User Tools/Counter display, press System Settings.

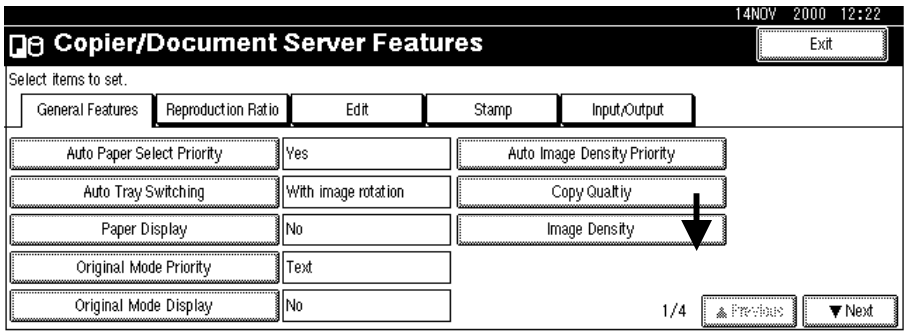
Click a tab to display the settings. If the Next button is lit in the lower right corner, press to display more options. Perform the settings, press Exit to return to the User Tools/Counter display, and then press exit to return to the copy window.



Service Tables

Copier/Document Server Features

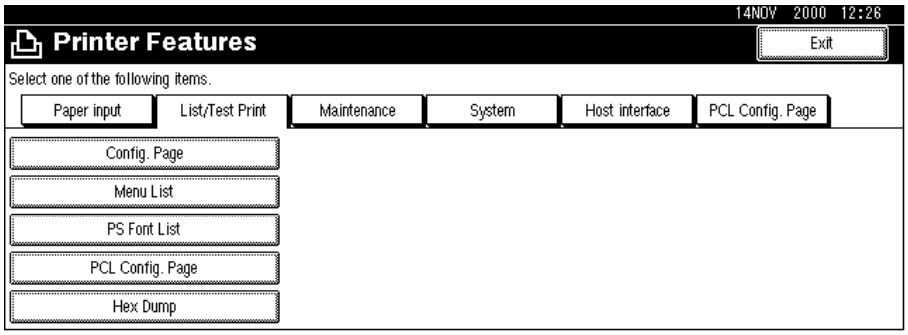
In the User/Tools Counter display, press Copy/Document Server Settings.



Click a tab to display the settings. If the Next button is lit in the lower right corner, press to display more options. Perform the settings, press Exit to return to the User Tools/Counter display, and then press Exit to return to the copy window.

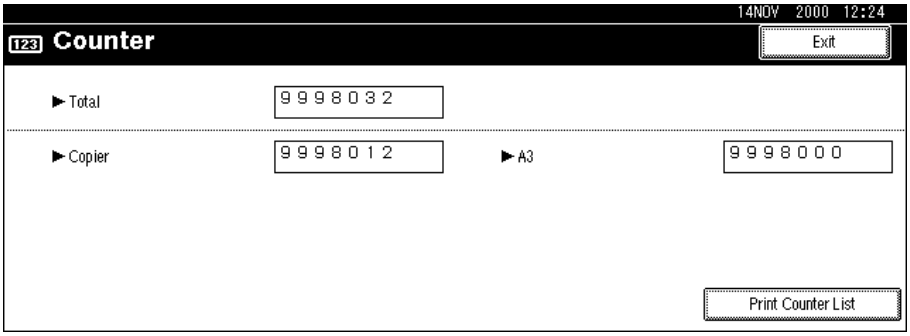
Printer, Facsimile, Scanner Settings

In the User/Tools Counter display, press Printer Settings, Facsimile, or Scanner Settings to open the appropriate screen and then click the tab to display more settings. The screen below shows the Printer Features screen.



Counter

In the User/Tools Counter display, press Counter.



View the settings, press Print Counter Exit to return to the User Tools/Counter display, and then press Exit to return to the copy window.

5.6 DIP SWITCHES

Controller: DIP SW2

DIP SW No.	ON	OFF
1	IC Card Boot	System ROM Boot
2	Keep at “OFF”	
3		
4		

I/O Board: DIP SW101

DIP SW No.	Function	ON				OFF		
1	Copy Speed	35 cpm (180 mm/s)				45 cpm (230 mm/s)		
2	Jam Detection (see Note)	Off				On		
3	Engine Program Recovery	On				Off		
4	Print Output for Debugging	OFF (Do not change)						
5	Factory Duplex Function Check	OFF (Do not change)						
		JPN	**NA**	**EUR**	**China**	**Taiwan**	**Asia**	**Korea**
6	Destination	OFF	ON	OFF	OFF	ON	ON	OFF
7		OFF	OFF	ON	OFF	OFF	ON	ON
8		OFF	OFF	OFF	ON	ON	OFF	ON

NOTE: Disabling jam detection is effective only for the main machine (not for the options).

⇒5.7 USING THE DEBUG LOG

This machine provides a Save Debug Log feature that allows the Customer Engineer to save and retrieve error information for analysis.

Every time an error occurs, debug information is recorded in volatile memory but this information is lost when the machine is switched off and on.

The Save Debug Log feature provides two main features:

- Switching on the debug feature so error information is saved directly to the HDD for later retrieval.
- Copying the error information from the HDD to an IC card.

When a user is experiencing problems with the machine, follow the procedure below to set up the machine so the error information is saved automatically to the HDD.

5.7.1 SWITCHING ON AND SETTING UP SAVE DEBUG LOG

The debug information cannot be saved the until the “Save Debug Log” function has been switched on and a target has been selected.

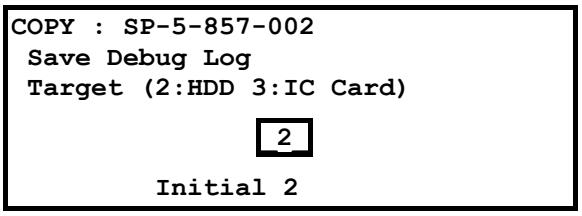
1. Enter the SP mode.
   - Press [Clear Modes] then use the 10-key pad to enter ①⓪⑦.
   - Press and hold down [C/Stop] (Clear/Stop) for more than 3 seconds.
   - Press “Copy SP” on the touch-panel.
   - Enter ⑤⑧⑤⑦ then press ⓗ.
2. Under “5857 Save Debug Log”, press ①.

```
COPY : SP-5857-001
 Save Debug Log
 On/Off (1:ON  0:OFF)
              1
    Initial 0
```

3. On the control panel keypad, press “1” then press ⓗ. This switches the Save Debug Log feature on.
   NOTE: The default setting is “0” (OFF). This feature must be switched on in order for the debug information to be saved.

Service Tables

⟹ 4. Next, select the target destination where the debug information will be saved. Under “5857 Save Debug Log”, touch “2 Target”, enter “2” with the operation panel key to select the hard disk as the target destination, then press #.



NOTE: Select “3 IC Card” to save the debug information directly to the IC card if it is inserted in the service slot.

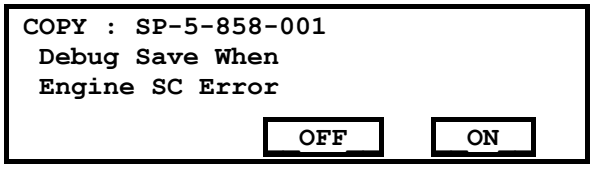
5. Now touch “5858” and specify the events that you want to record in the debug log. SP5858 (Debug Save When) provides the following items for selection.

1	Engine SC Error	Saves data when an engine-related SC code is generated.
2	Controller SC Error	Saves debug data when a controller-related SC Code is generated.
3	Any SC Error	Saves data only for the SC code that you specify by entering code number.
4	Jam	Saves data for jams.

NOTE: More than one event can be selected.

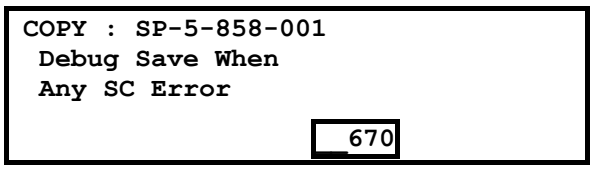
Example 1: To Select Items 1, 2, 4

Touch the appropriate items(s). Press “ON” for each selection. This example shows “Engine SC Error” selected.



Example 2: To Specify an SC Code

Touch “3 Any SC Error”, enter the 3-digit SC code number with the control panel number keys, then press #. This example shows an entry for SC670.



NOTE: For details about SC code numbers, please refer to the SC tables in Section “4. Troubleshooting”.

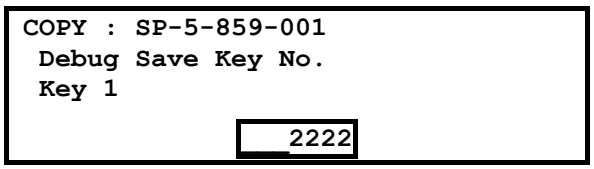
⇒ 6. Next, select the one or more memory modules for reading and recording debug information. Touch “5859”.

Under “5859” press the appropriate key item for the module that you want to record.

Enter the appropriate 4-digit number, then press #.

NOTE: Refer to the two tables below for the 4-digit numbers to enter for each key.

The example below shows “Key 1” with “2222” entered.



The following keys can be set with the corresponding numbers. (The initials in parentheses indicate the names of the modules.)

4-Digit Entries for Keys 1 to 10

KEY NO.	COPY	PRINTER	SCANNER	WEB
1	2222 (SCS)			
2	2223 (SRM)			
3	256 (IMH)			
4	1000 (ECS)			
5	1025 (MCS)			
6	4848 (COPY)	4400 (GPS)	5375 (Scan)	5682 (NFA)
7	2224 (BCU)	4500 (PDL)	5682 (NFA)	6600 (WebDB)
8		4600 (GPS-PM)	3000 (NCS)	3300 (PTS)
9		2000 (NCS)	2000 (NCS)	6666 (WebSys)
10		2224 (BCU)		2000 (NCS)

NOTE: The default settings for Keys 1 to 10 are all zero (“0”).

Key to Acronyms

Acronym	Meaning	Acronym	Meaning
ECS	Engine Control Service	NFA	Net File Application
GPS	GW Print Service	PDL	Printer Design Language
GSP-PM	GW Print Service – Print Module	PTS	Print Server
IMH	Image Memory Handler	SCS	System Control Service
MCS	Memory Control Service	SRM	System Resource Management
NCS	Network Control Service	WebDB	Web Document Box (Document Server)

The machine is now set to record the debugging information automatically on the HDD (the target selected with SP5-857-002) for the events that you selected SP5-858 and the memory modules selected with SP5-859.

⟹ Please keep the following important points in mind when you are doing this setting:

- Note that the number entries for Keys 1 to 5 are the same for the Copy, Printer, Scanner, and Web memory modules.
- The initial settings are all zero.
- These settings remain in effect until you change them. Be sure to check all the settings, especially the settings for Keys 6 to 10. To switch off a key setting, enter a zero for that key.
- You can select any number of keys from 1 to 10 (or all) by entering the corresponding 4-digit numbers from the table.
- You cannot mix settings for the groups (COPY, PRINTER, etc.) for 006~010. For example, if you want to create a PRINTER debug log you must select the settings from the 9 available selections for the “PRINTER” column only.
- One area of the disk is reserved to store the debug log. The size of this area is limited to 4 MB.

⇒5.7.2 RETRIEVING THE DEBUG LOG FROM THE HDD

1. Insert the IC card into the copier.
2. Enter the SP mode and execute SP5857 007 (Copy HDD to IC Card (Latest 4 MB) to write the debugging data to the IC card.
   NOTE: The IC card can hold up to 4MB of data. If the debugging data is larger than 4MB, you can switch to another IC card.
3. After you return to the service center, use a card reader to copy the file and send it for analysis to Ricoh by email, or just send the IC card by mail.

5.7.3 RECORDING ERRORS MANUALLY

Since only SC errors and jams are recorded to the debug log automatically, for any other errors that occur while the customer engineer is not on site, please instruct customers to perform the following immediately after occurrence to save the debug data. Such problems would include a controller or panel freeze.

NOTE: In order to use this feature, the customer engineer must have previously switched on the Save Debug Feature (SP5857-001) and selected the hard disk as the save destination (SP5857-002).

1. When the error occurs, on the operation panel, press (Clear Modes).
2. On the control panel, enter “01” then hold down C/ for at least 3 sec. until the machine beeps then release. This saves the debug log to the hard disk for later retrieval with an IC card by the service representatives.
3. Switch the machine off and on to resume operation.

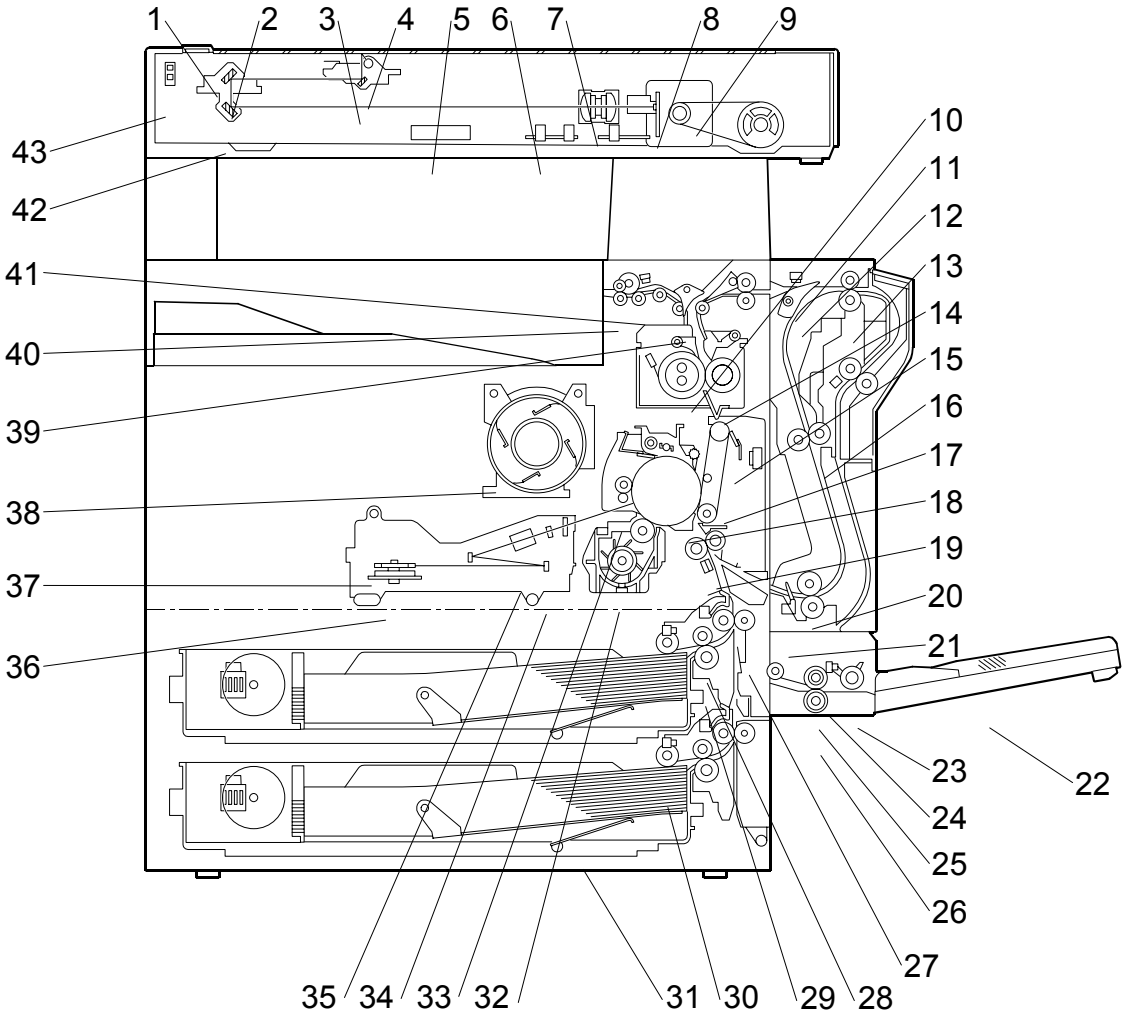
   The debug information for the error is saved on the hard disk so the service representatives can retrieve it on their next visit by copying it from the HDD to an IC card.

DETAILED DESCRIPTIONS

6. DETAILED SECTION DESCRIPTIONS

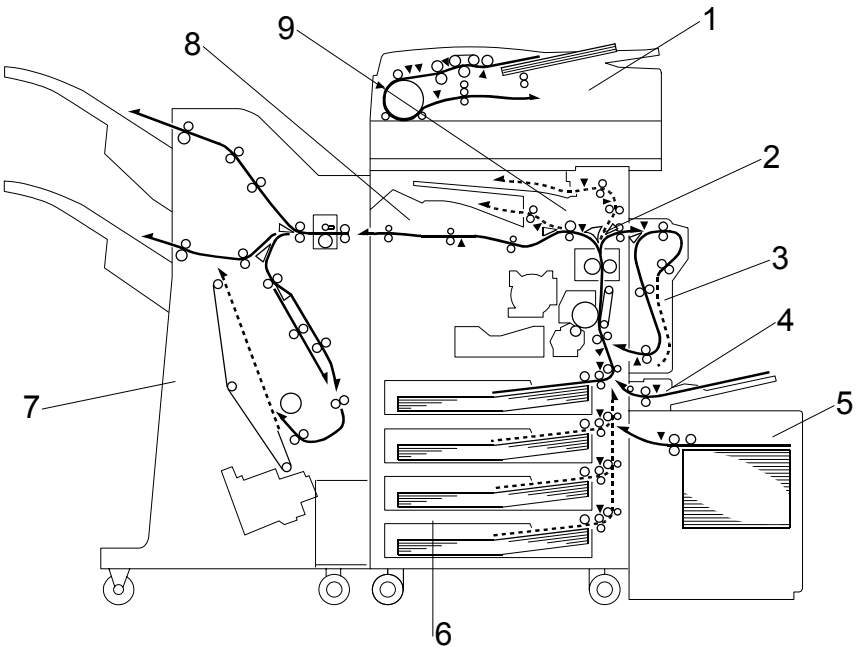
6.1 OVERVIEW

6.1.1 COMPONENT LAYOUT



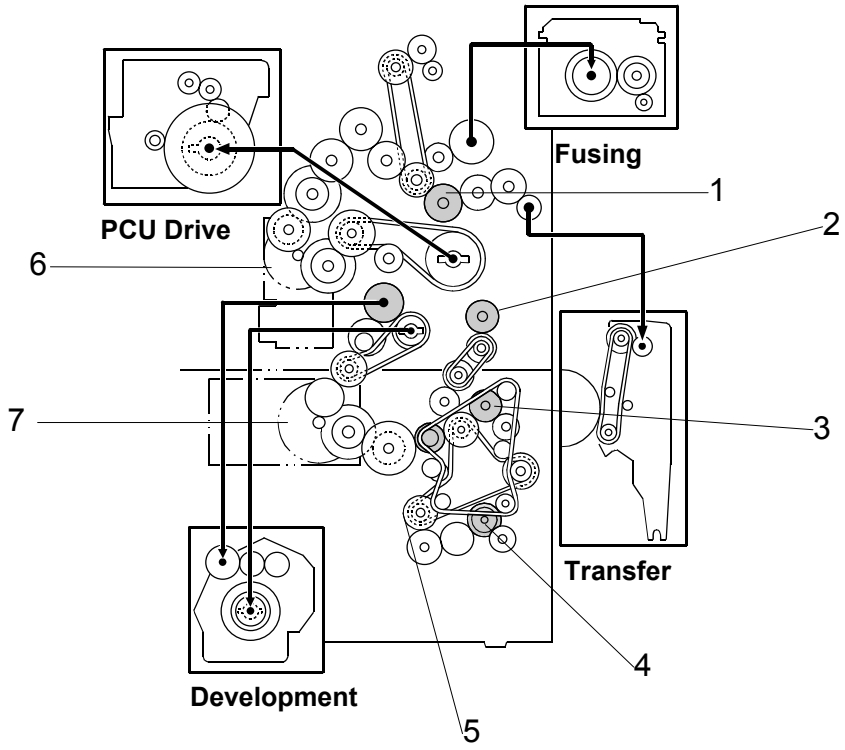
1 Exposure Glass
2 2nd Mirror
3 1st Mirror
4 Exposure Lamp
5 Original Width Sensors
6 Original Length Sensors
7 Lens
8 SBU
9 Scanner Motor
10 Hot Roller
11 Entrance Sensor
12 Inverter Gate
13 Inverter Roller
14 Pressure Roller
15 Transfer Belt Cleaning Blade
16 Upper Transport Roller
17 Transfer Belt
18 OPC Drum
19 Registration Roller
20 Lower Transport Roller
21 Exit Sensor
22 By-pass Tray
23 Pick-up Roller
24 Paper End Sensor
25 Paper Feed Roller
26 Separation Roller
27 Upper Relay Roller
28 Feed Roller
29 Separation Roller
30 Pick-up Roller
31 Bottom Plate
32 Development Unit
33 Charge Roller
34 Fθ Mirror
35 Barrel Toroidal Lens (BTL)
36 Polygonal Mirror Motor
37 Laser Unit
38 Toner Supply Bottle Holder
39 Exit Junction Gate
40 Exit Roller
41 Paper Exit Sensor
42 3rd Mirror
43 Scanner HP Sensor

6.1.2 PAPER PATH



1 ARDF
2 Interchange unit
3 Duplex unit
4 By-pass tray
5 Large Capacity Tray (LCT)
6 Paper tray unit
7 Two-Tray Finisher
8 Bridge unit
9 1-Bin Tray

6.1.3 DRIVE LAYOUT

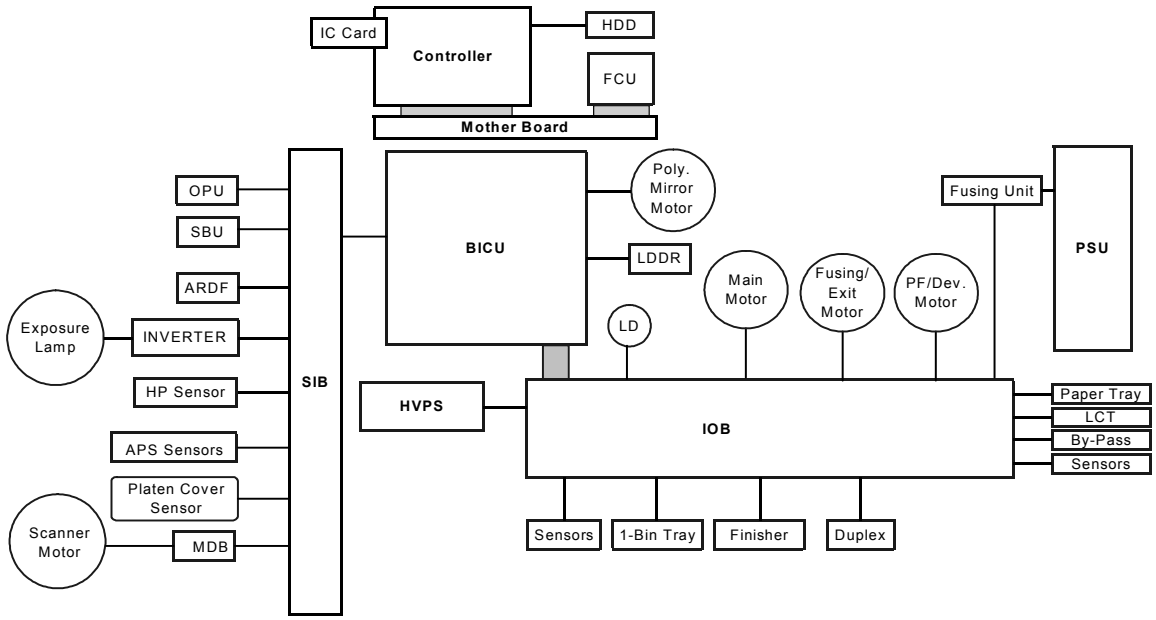


1 Transfer Belt Clutch
2 Registration Clutch
3 Upper Paper Feed Clutch
4 Lower Paper Feed Clutch
5 Relay Clutch
6 Main Motor
7 Paper Feed/Development Motor

In this machine, the development unit is provided with its own motor, separate from the main motor.

6.2 BOARD STRUCTURE

6.2.1 BLOCK DIAGRAM



This machine uses the GW (Grand Workware) architecture, which allows the copier to be expanded as an MFP by installing simple modular components (ROM DIMMs) on the controller board. The BICU and FCU are connected to the controller via a PCI bus.

Controller (Main Board): Takes charge of controlling memory and all peripheral devices.

BICU (Base Engine and Image Control Unit): This is the engine control board. It controls the following functions.

- Engine sequence
- Timing control for peripherals
- Image processing, video control

IOB: The IOB (Input/Output Board) handles the following functions:

- Drive control for the sensors, motors, and solenoids of the main unit
- PWM control for the high voltage supply board
- Serial interface with peripherals
- Fusing control

NOTE: The IOB is now located directly behind the rear covers for easier access. The machine no longer contains the PFB (Paper Function Board). The functions of the PFB (paper feed control) have been taken over by the IOB. The same IOB is used for both the B135 and B138 but the DIP switches must be set correctly for each. See Section “3 Replacement and Adjustment” for details.

SIB (Scanner Interface Board): Controls the scanner, and serves as the signal I/F board for the SBU and the OPU. The SIB passes signals between the BICU and the scanner unit components, and transmits video signals from the SBU to the BICU.

OPU (Operation Panel Unit): Controls operation panel and display.

SBU (Sensor Board Unit): Receives analog signals from the CCD and converts them into digital signals.

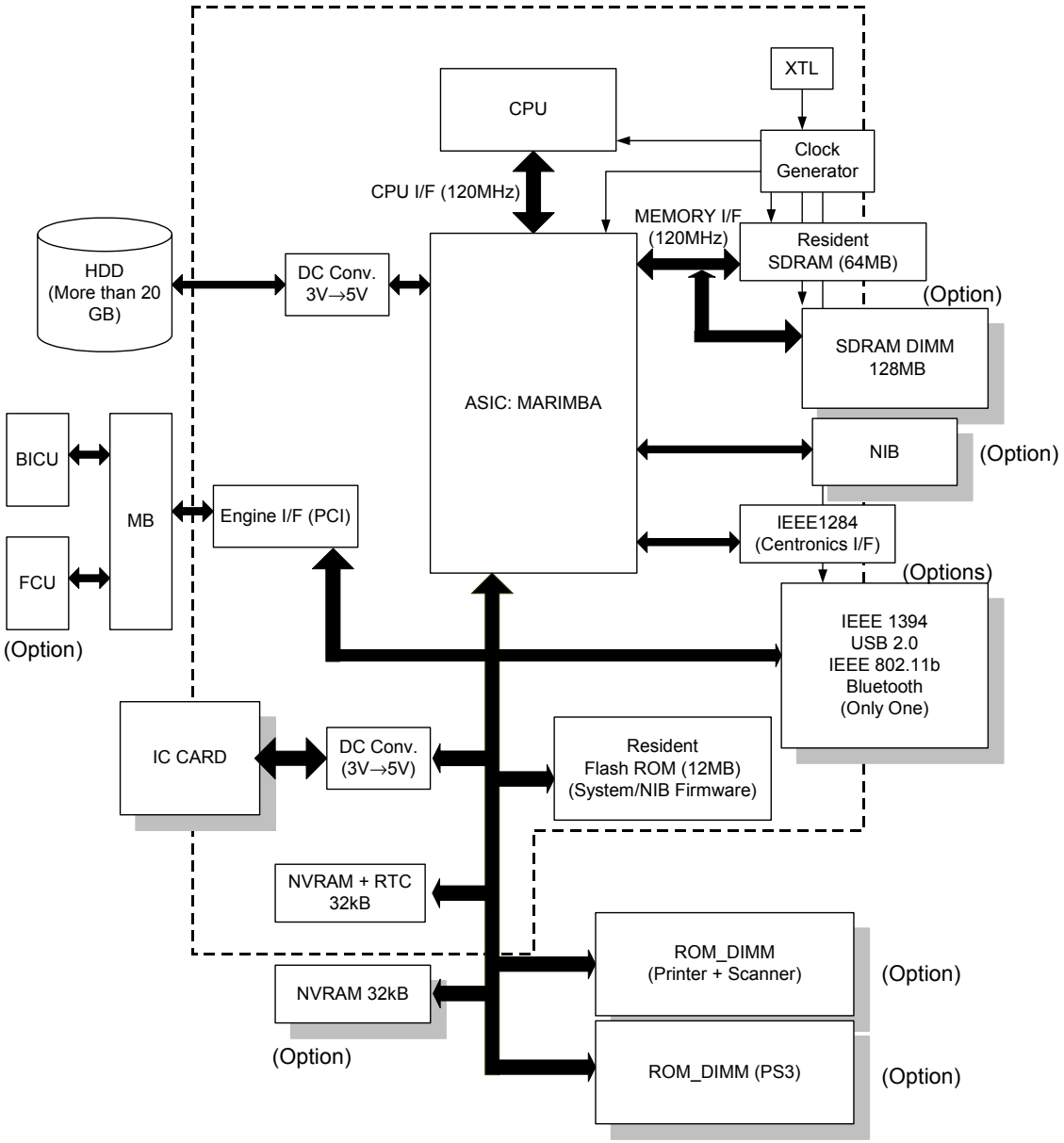
LDDR (Laser Diode Driver): The LD driver circuit board.

MDB (Motor Drive Board): Controls the scanner motor.

Mother Board: This board interfaces the controller and the BICU and FCU.

FCU (Facsimile Control Unit): Controls fax communications and fax features.

6.2.2 CONTROLLER



Detailed Descriptions

The controller controls all applications, including copier, printer, scanner, and fax applications. To add the optional printer, scanner, or fax applications, ROM DIMMs must be installed on the controller. The fax option, however, also requires FCU and NCU installation.

NOTE: The controller boards are machine specific and are not interchangeable. The controller board for the B135 (35 cpm) must be installed in the B135 and controller board for the B138 (45 cpm) must be installed in the B138.

The following firmware and application software can be downloaded from the Controller IC Card slot.

- Controller (System OS)
- Operation panel
- BICU (engine control)
- Printer
- Scanner
- Fax
- PostScript 3
- NIB
- FCU

CPU: Employs RM7065. Clock frequency: 300 MHz.

ASIC: Uses a dedicated chip developed for use with GW architecture. The CPU and memory I/F employ a 120 MHz bus (32 bit). These components perform CPU and I/F control and also control all of the following functions: memory, local bus, interrupts, PCI bus, video data, HDD, network, operation panel, IEEE1284, and image processing.

SDRAM: Comprises a 64 MB RAM chip, expandable with a 128 MB SDRAM.

System Flash ROM: Provided with an 12 MB Flash ROM for the system and NIB firmware.

Flash ROM DIMM Slots: Two slots are provided for two ROM DIMMs (8 MB or 16 MB). Expansion slots provided for the optional printer/scanner, and PostScript 3 applications.

NVRAM: 32 KB of NVRAM are provided for the system. NVRAM stores many settings, including OS system log information, copier calendar, current system settings, user accounts (max. 100) and all settings for the fax, printer, scanner, and network. The NVRAM also has the RTC (Real Time Clock) for time management.

NOTE: Optional NVRAM, which can store to 400 user accounts, can be installed on the controller.

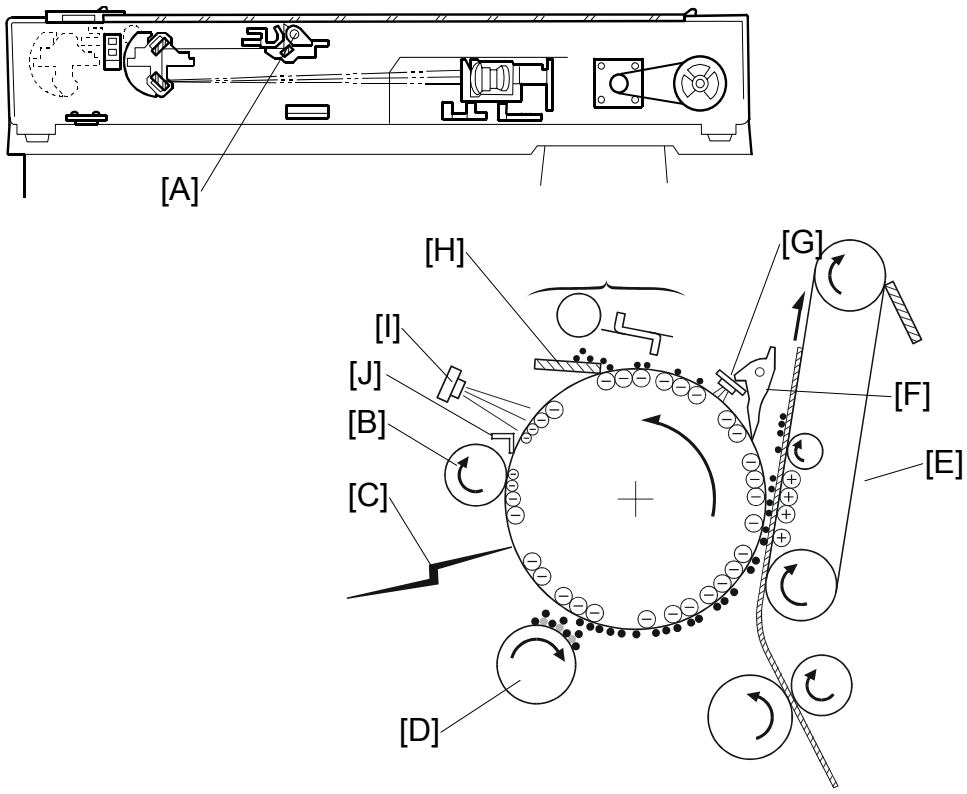
HDD: A 3.5" HDD (more than 20 GB) can be connected using an IDE I/F. The hard disk is partitioned as shown below.

Partition	Size	Function	Power OFF	Comment
File System 1	500 MB	Downloaded fonts, forms.	Remains	
File System 2	500 MB	Job spooling area.	Erased	
File System 3	2000 MB	Work data area	Remains	Used for document server application.
Image TMP	5200 MB	Collation, sample print, protected print.	Erased	Storage capacity (Max. *2): 2500 pp. (Copy) 9000 pp. (Print/ Fax/ Scanner)
Image LS*1	7800 MB	Document server, local storage archive	Remains	
Image Area Management	100MB	Stores image area information	Remains	
Job Log	20 MB	Job log.	Remains	
Others	3362 MB			
Total	**20 GB**		Remains	

*1: When an application uses an image page, first it uses the Image LS area. If this area is in use and not available, then it uses the Image TMP area.

*2: These areas are used for applications to store copy, print, fax, and scanned pages. The actual number of pages that can be stored differs depending on the content of the document and the scanning resolution.

6.3 COPY PROCESS OVERVIEW



Exposure

The xenon lamp [A] exposes the original. The reflected light is passed to the CCD, where it is converted into analog data, processed, and stored in the memory. The data is retrieved and sent to the laser diode for printing

Drum charge

The charge roller [B] gives a negative charge to the organic photoconductive (OPC) drum. The charge remains on the surface of the drum because the OPC layer has a high electrical resistance in the dark.

Laser exposure

Processed data from the scanned original is retrieved from the memory and transferred to the drum by two laser beams [C], which form an electrostatic latent image on the drum surface. The amount of charge remaining as a latent image on the drum depends on the laser beam intensity, controlled by the BICU.

Development

The magnetic developer brush on the development roller [D] contacts the latent image on the drum. Toner particles are electrostatically attracted to the areas of the drum surface where the laser reduced the negative charge on the drum.

Image transfer

Paper is fed into the area between the drum surface and the transfer belt [E] at the proper time to align it with the image on the drum. The transfer bias roller applies a high positive charge to the reverse side of the paper through the transfer belt. This positive charge pulls the toner particles from the drum surface and onto the paper while the paper is electrostatically attracted to the transfer belt.

Separation

Paper separates from the drum as a result of the electrical attraction between the paper and the transfer belt. Pick-off pawls [F] help separate the paper from the drum.

ID sensor

The ID sensor [G] measures the reflectivity of the pattern formed by the laser on the surface of the drum. This output signal is used for toner supply control and also measures the drum surface reflectivity, which is used for charge roller voltage control.

Cleaning

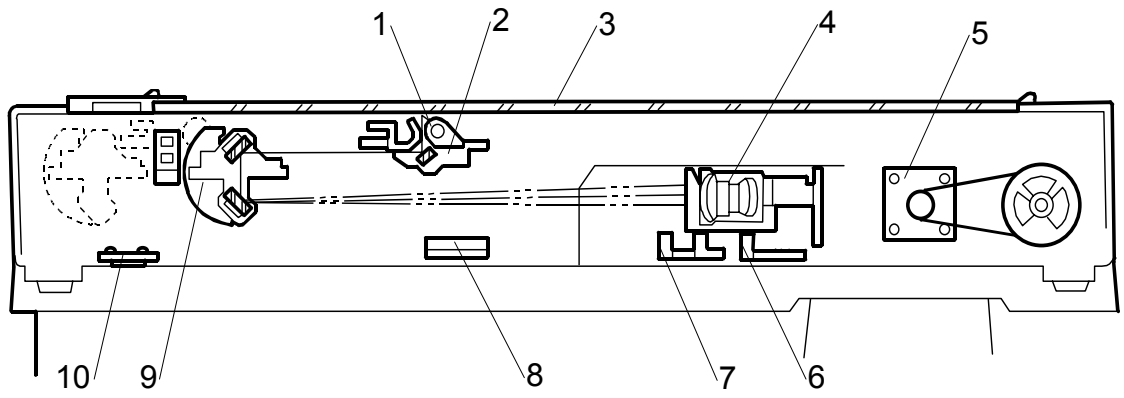
The drum cleaning blades [H] and [J] removes any toner remaining on the drum surface after the image is transferred to the paper.

Quenching

Finally, the light from the quenching lamp [I] electrically neutralizes the charge on the drum surface.

6.4 SCANNING

6.4.1 OVERVIEW



1	Exposure lamp	7	Original length sensors 1, 2
2	1st Scanner	8	Original width sensors
3	Exposure glass	9	2nd Scanner
4	Lens block	10	Anti-condensation heater (option)
5	Scanner drive motor	11	Exposure glass (for document feeder)
6	Original length sensor 3	12	Scanner HP sensor

The original is illuminated by the exposure lamp (a xenon lamp). The image is reflected onto a CCD (charge coupled device) on the lens block via the 1st, 2nd, and 3rd mirrors, and through the lens on the lens block.

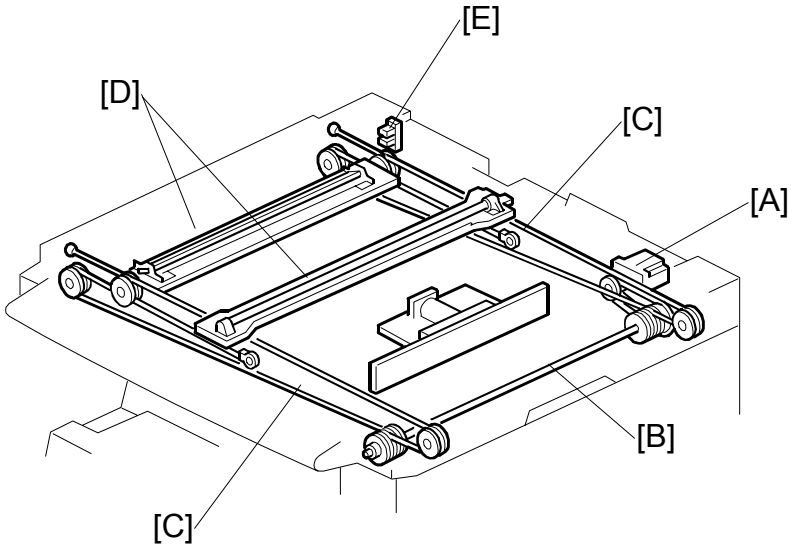
The 1st scanner consists of the exposure lamp, a reflector, and the 1st mirror.

The exposure lamp is energized by a dc supply to avoid uneven light intensity while the 1st scanner moves in the sub scan direction (down the page). The entire exposure lamp surface is frosted to ensure even exposure in the main scan direction (across the page).

The light reflected by the reflector is of almost equal intensity in all directions, to reduce shadows on pasted originals.

The optional optics anti-condensation heater is installed on the left side of the scanner. It turns on whenever the power cord is plugged in.

6.4.2 SCANNER DRIVE



Book Mode

Scanner drive motor [A] and timing belt drive the scanner drive shaft [B]. The drive shaft drives the pulleys attached to the two scanner wires [C] (front and back). The scanner wires move the 1st and 2nd scanners [D] on their rails. The 2nd scanner speed is half that of the 1st scanner.

The scanner interface board (SIB) controls the scanner drive motor. In full size mode, the 1st scanner speed is 230 mm/s during scanning.

In reduction or enlargement mode, the scanning speed depends on the magnification ratio. The returning speed is always the same, whether in full size or magnification mode. The image length change in the sub scan direction is done by changing the scanner drive motor speed, and in the main scan direction it is done by image processing on the BICU board.

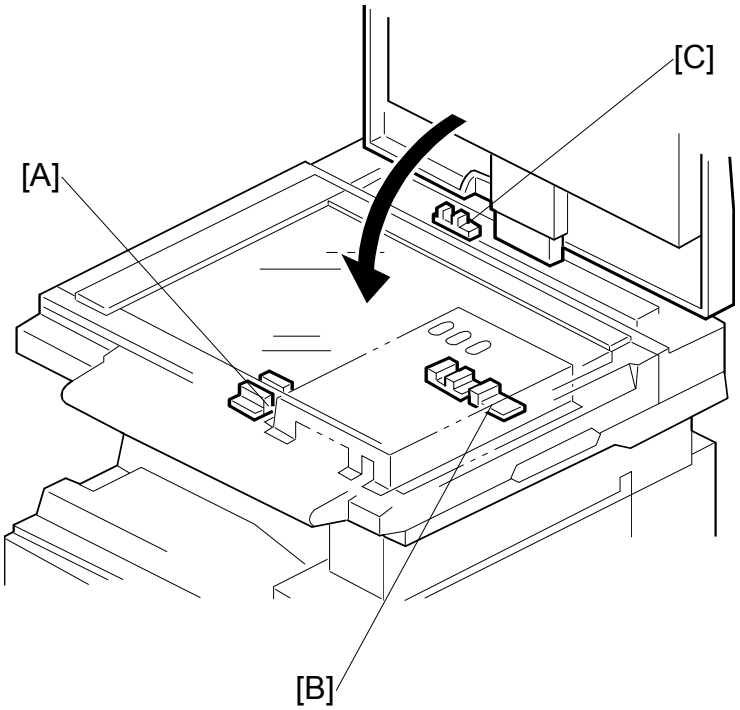
NOTE: Magnification in the sub-scan direction can be adjusted by changing the scanner drive motor speed using SP4-008.

ADF mode

The scanners are always kept at their home position (the scanner home position sensor [E] detects the 1st scanner) to scan the original. The ADF motor feeds the original through the ADF. In reduction/enlargement mode, the image length change in the sub-scan direction is done by changing the ADF motor speed. Magnification in the main scan direction is done in the BICU board, like for book mode.

NOTE: Magnification in the sub-scan direction can be adjusted by changing the ADF motor speed using SP6-017. In the main scan direction, it can be adjusted with SP2-909, like for book mode.

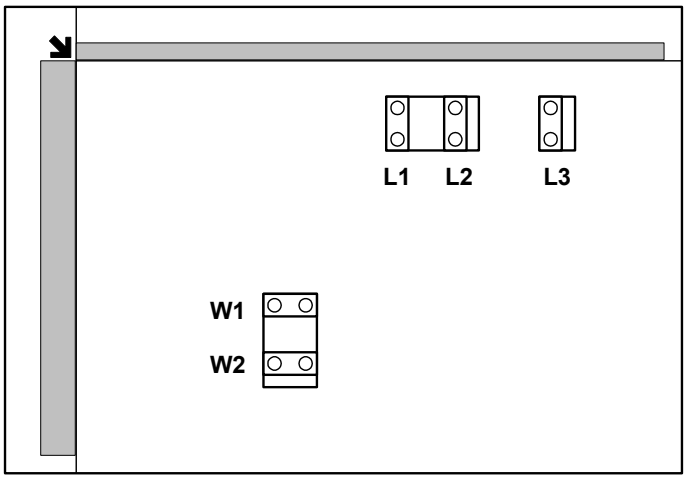
6.4.3 ORIGINAL SIZE DETECTION IN PLATEN MODE



The original width sensors [A] detect the original width, and the original length sensors [B] detect the original length. These reflective photo sensors are referred to collectively as the APS (Auto Paper Select) sensors.

While the power is on, these sensors are active and the original size data is always sent to the CPU. However, the CPU checks the data only when the platen cover sensor [C] is activated after the platen reaches about 15 cm above the exposure glass as it is closed. The main CPU detects the original size by the on/off signals received from the APS sensors.

NOTE: If the copy is made with the platen fully open, the main CPU determines the original size from the sensor outputs after the Start ⓘ key is pressed.



Original Size		Length Sensor			Width Sensor		SP4-301 display
A4/A3 version	**LT/DLT version**	L3	L2	L1	W2	W1	
A3	11” x 17”	O	O	O	O	O	00011111
B4	10” x 14”	O	O	O	X	O	00011101
F4	8.5” x 14” (8” x 13”)	O	O	O	X	X	00011100
A4-L	8.5” x 11”	X	O	O	X	X	00001100
B5-L		X	X	O	X	X	00000100
A4-S	11” x 8.5”	X	X	X	O	O	00000011
B5-S		X	X	X	X	O	00000001
A5-L, A5-S	5.5” x 8.5”, 8.5” x 5.5”	X	X	X	X	X	00000000
	SP4-301 BITS	4	3	2	1	0	7-----0

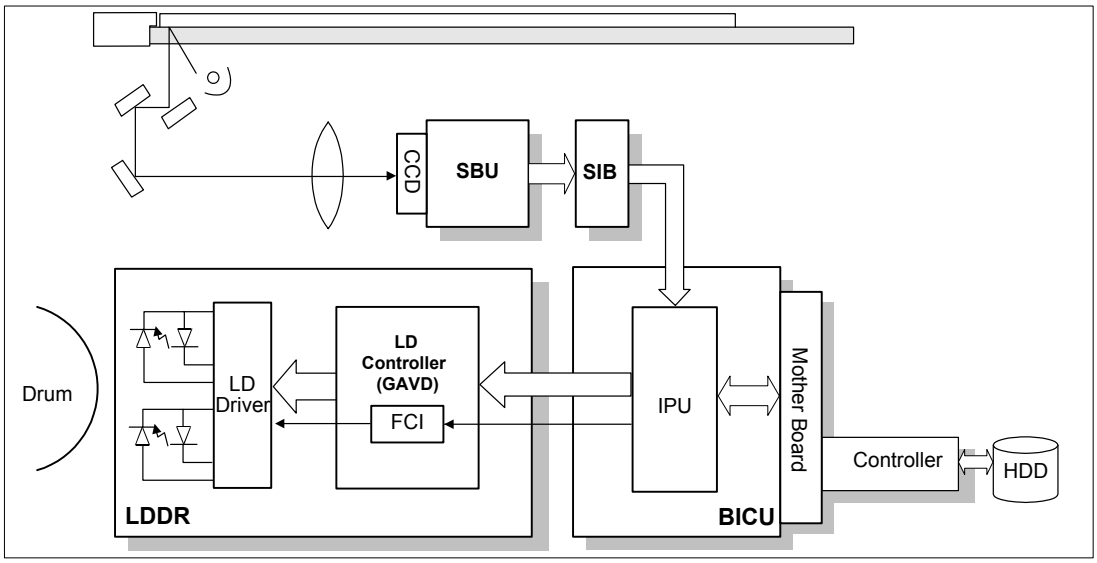
NOTE: L: Lengthwise, S: Sideways, O: Paper present X: Low

For other combinations, "CANNOT DETECT ORIG. SIZE" will be indicated on the operation panel display.

The above table shows the outputs of the sensors for each original size. This original size detection method eliminates the necessity for a pre-scan and increases the machine's productivity.

However, if the by-pass tray is used, note that the machine assumes that the copy paper is lengthwise (L). For example, if A4 sideways paper is placed on the by-pass tray, the machine assumes it is A3 paper and scans a full A3 area, disregarding the original size sensors.

6.5 IMAGE PROCESSING



6.5.1 OVERVIEW

SBU: The SBU (Sensor Board Unit) converts the analog signal from the CCD to an 8-bit digital signal and sends it to the SIB.

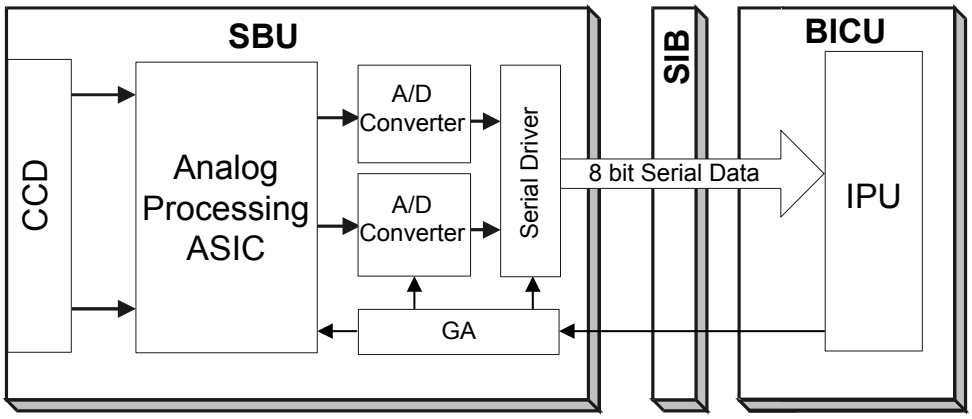
SIB: Relays image signals and controls the scanner.

BICU: The BICU (Base Engine Image Control Unit) performs timing control and command control. The IPU on the BICU processes auto shading, filtering, magnification, γ correction, and gradation. The memory controller performs image compression, decompression, and memory address control (for binary picture processing mode only)

LD Unit: Performs dual channel multi-beam exposure, multiple exposure, and synchronous detection.

Controller: Performs dual channel multi-beam exposure, multiple exposure, and synchronous detection.

6.5.2 SBU (SENSOR BOARD UNIT)



The CCD converts the light reflected from the original into an analog signal. The CCD line has 7200 pixels at a resolution of 600 dpi.

The CCD has two output lines to the analog processing ASIC, one for handling odd and one for handling even pixels. The analog processing ASIC performs the following operations on the signals received from the CCD:

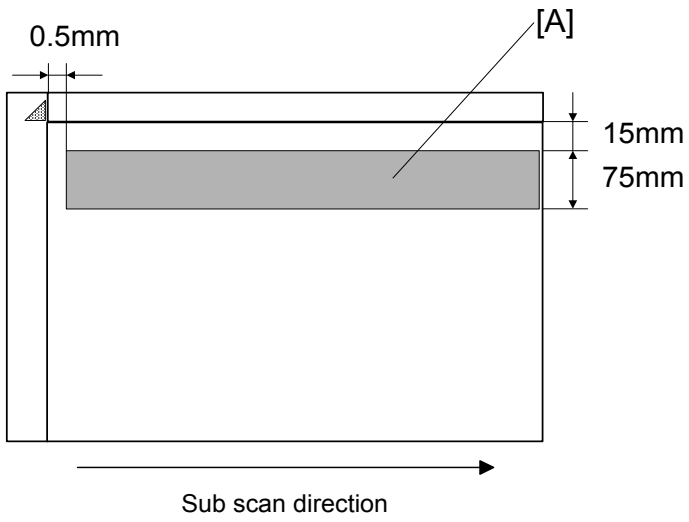
Z/C (Zero/Clamp): Adjusts the black level for even pixels to match the odd pixels.

Signal composition: Analog signals for odd and even pixels from the CCD are merged by a switching device.

Signal amplification: The analog signal is amplified by amplifiers in the AGC circuit. The maximum gains of the amplifiers are controlled by the CPU on the BICU board.

After the above processing, the analog signals are converted to 8-bit signals by the A/D converter. This gives a value for each pixel on a scale of 256 shades of gray. Then, this data goes to the BICU via the SIB.

6.5.3 AUTO IMAGE DENSITY (ADS)



This mode prevents the background of an original from appearing on copies.

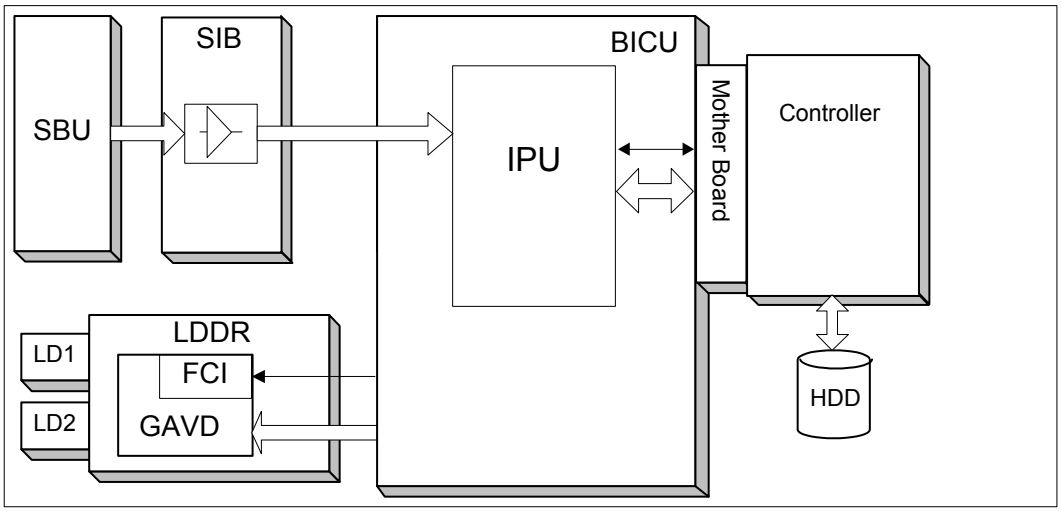
The copier scans the auto image density detection area [A]. This corresponds to a narrow strip at one end of the main scan line, as shown in the diagram. As the scanner scans down the page, the IPU on the BICU detects the peak white level for each scan line, within this narrow strip only. From this peak white level, the IPU determines the reference value for A/D conversion for the scan line. Then, the IPU sends the reference value to the A/D controller on the SBU.

When an original with a gray background is scanned, the density of the gray area is the peak white level density. Therefore, the original background will not appear on copies. Because peak level data is taken for each scan line, ADS corrects for any changes in background density down the page.

As with previous digital copiers, the user can select manual image density when selecting auto image density mode and the machine will use both settings when processing the original.

6.5.4 IPU (IMAGE PROCESSING UNIT)

Overview



The image data from the SBU goes to the IPU (Image Processing Unit) IC on the BICU board, which carries out the following processes on the image data:

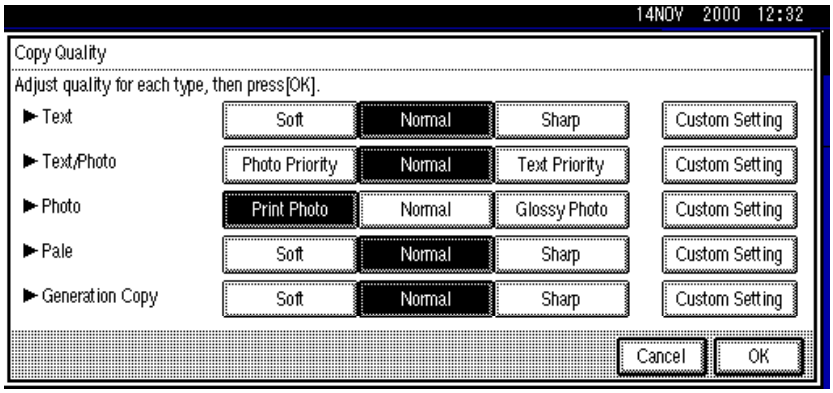
1. Auto shading
2. Filtering (MTF and smoothing)
3. Magnification
4. γ correction
5. Grayscale processing
6. Binary picture processing
7. Error diffusion
8. Dithering
9. Video path control
10. Test pattern generation

The image data then goes to the HDD.

6.5.5 IMAGE PROCESSING MODES

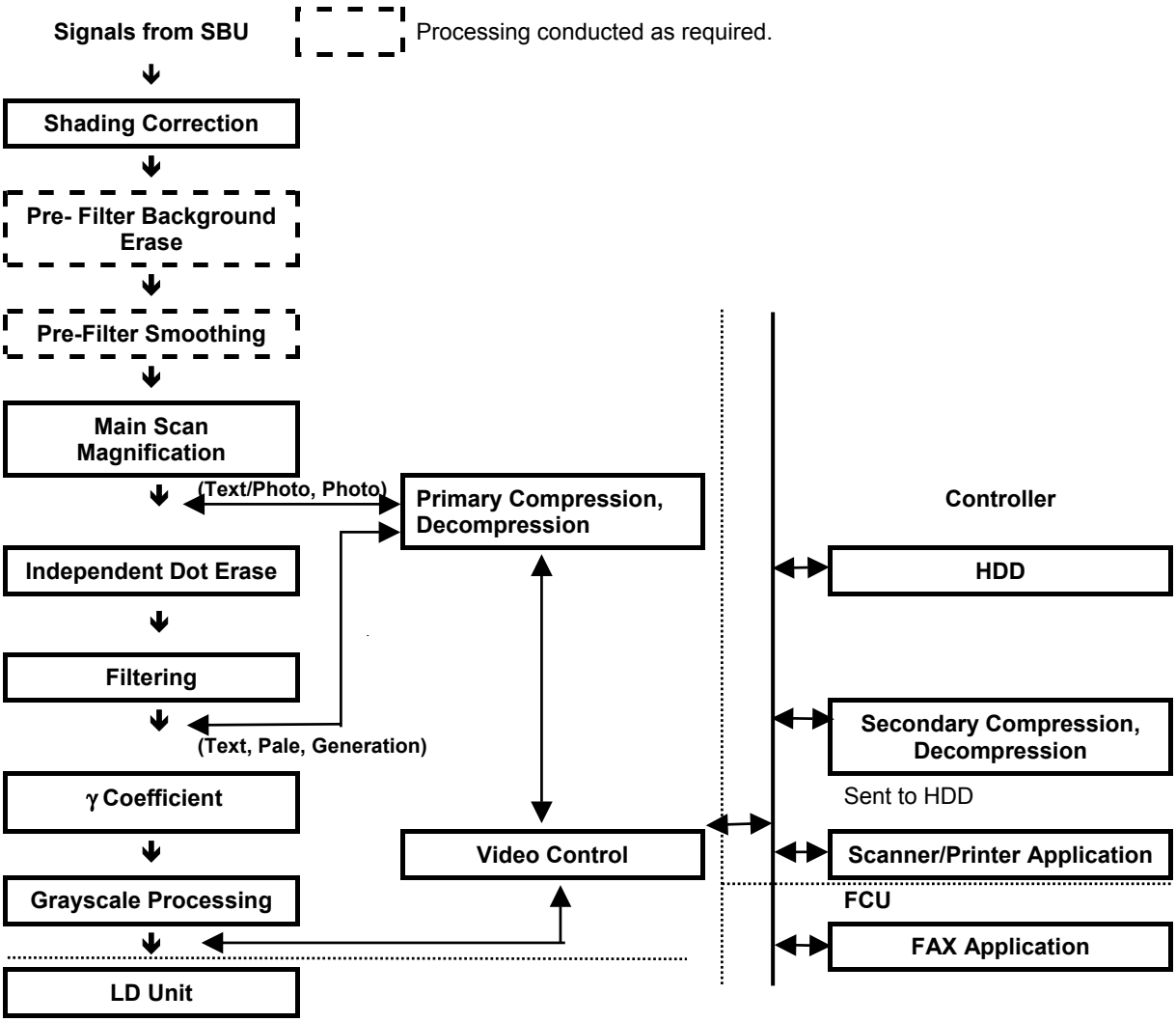
The user can select one of the following modes with the User Tools screen: Text, Text/Photo, Photo, Pale, Generation. Each of these modes has a range of different settings (e.g. Soft, Normal, Sharp, etc). For each mode, a Custom Setting options is also available. This Custom Setting holds the values selected with the SP modes, which can be adjusted to meet special requirements that cannot be covered by the standard settings.

To display this screen, press User Tools/Counter> Copier/Document Server Settings> General Features> Copy Quality.



Mode	Function
Text	Best reproduction of text and sharp lines. Ignores background texture. (☛ pg. 6-23)
Text/Photo	Good reproduction of mixed text and photographs with accurate grayscaling, better than that achieved in the Text mode. (☛ pg. 6.-24)
Photo	Best possible reproduction of photographs. (☛ pg.6-25)
Pale	Reproduction similar to Text mode, but of lower contrast. Ideal for copying thin originals. (☛ pg. 6-26)
Generation Copy	Attempts to achieve the best reproduction of copied originals, which have faded due to making copies of copies. (☛ pg. 6-27)

General Image Processing Flow



6.5.6 SUMMARY OF IMAGE PROCESSING FUNCTIONS

Shading correction: Compensates for the possible differences in the amount of light at the edges and center of a scanned image caused by the scanner lens, or scatter among pixels of the CCD.

Pre-Filter Background erase: Attempts to eliminate the heavy background texture from copies (newspaper print or documents printed on coarse paper). Elements below the selected threshold level are eliminated.

Pre-Filter Smoothing: Reproduces halftones while reducing the incidence of moiré which can occur as a result of compressing and then decompressing the image.

Main scan magnification: Adjusts magnification to the desired level by processing adjusting multiple, adjacent pixels in the direction of main scanning. Adjustment of magnification in the sub scan direction is done by changing the scanning speed.

Independent dot erase: Attempts to recognize and eliminate scattered, independent dots in copies. Processes only pixels of high density and eliminates those of low density.

Filtering (MTF filter/smoothing): Performs mainly edge enhancement with the MTF filter. Performs smoothing only in the Photo mode. The matrix size of the filter is 9 pixels x 7 lines.

Gamma (γ) coefficient: Controls the image density for images processed with grayscaling. Copy density adjustment is achieved with special notch γ coefficient conversion. The best γ coefficient suited for the selected mode can be stored and adjusted as needed.

Grayscale processing: Performs reproduction of grayscales, using mainly error diffusion. (In the Photo mode, conducts processing with dithering.)

6.5.7 IMAGE PROCESSING STEPS AND RELATED SP MODES

Text Mode

The Text mode achieves quality reproduction of text and sharp lines and ignores background texture. Processing is conducted with a high resolution MTF filter; special processing with the γ coefficient prevents background reproduction and achieves the best reproduction of images with error diffusion. Because the Soft and Normal settings use a weak MTF filter, the quality of the image is improved with the elimination of moiré. The Sharp selection uses an MTF filter stronger than that of the Normal setting, thus increasing the sharpness of lines.

Image Processing Flow		Related SP Modes
Scanner Image Correction	Shading Correction	
	↓	
Pre-Filter Processing	Background Erase	SP4903 65 (Background Erase Level: Text Mode)
	↓	
	Pre-Filter Smoothing	***SP4903 10 (Pre-Filter: Text)***
	↓	
Magnification	Main Scan Direction	SP2909 1 (Main Scan Magnification)
	↓	
	Independent Dot Erase	SP4903 60 (Independent Dot Erase: Text Mode)
	↓	
Filter Processing	MTF Correction	SP4904 20~23 Text (General Quality) (☛pg 6-32)
	↓	
Density Control	γ Coefficient	
	↓	
Grayscale Processing	Error Diffusion	

NOTE: An SP code number and name set in ***bold italic*** denotes an SSP (Special Service Program) mode. To access an SSP, enter the SP mode: press and hold down # on the 10-key pad then "Copy SP" on the touch-screen.

Text/Photo Mode

Text/Photo mode achieves high quality reproduction of pictures with accurate grayscaling. Processing is conducted with the special γ coefficient which reproduces a wide range of grayscale. Compared with the Text mode, text reproduced in the Text/Photo mode appears lighter and textured backgrounds could appear on copies, but the incidence of moiré is reduced with and edge detection filter. Because Photo Priority uses an MTF filter weaker than that of the Normal setting, the quality of the image is improved with the elimination of moiré. The Text Priority selection uses an MTF filter stronger than that of the Normal setting, thus increasing the sharpness of lines.

	Image Processing Flow	Related SP Modes
Scanner Image Correction	Shading Correction	
Pre-Filter Processing	Background Erase	SP4903 67 (Background Erase Level: Text/Photo Mode)
	Pre-Filter Smoothing	***SP4903 13 (Pre-Filter: Text/Photo)***
Magnification	Main Scan Direction	SP2909 1 (Main Scan Magnification)
	Independent Dot Erase	SP4903 62 (Independent Dot Erase Level)
Filter Processing	MTF Correction	SP4904 25~28 Text/Photo (General) Quality (☛"Text Photo Mode", pg.6-35)
Density Control	γ Coefficient	
Grayscale Processing	Error Diffusion	

NOTE: An SP code number and name set in ***bold italic*** denotes an SSP (Special Service Program) mode. To access an SSP, enter the SP mode: press and hold down (#) on the 10-key pad then "Copy SP" on the touch-screen.

Photo Mode

Photo mode emphasizes grayscale processing to achieve the best possible reproduction of photographs and eliminate moiré by using the highest density and γ coefficient in the reproduction of grayscales and dithering. Print Photo performs smoothing and dithering for photos copied from magazines, newspapers, etc. The Normal selection uses a higher resolution setting and employs error diffusion but does not use smoothing to improve the appearance of text in photographs. Glossy photo paper employs MTF filter processing and error diffusion to copy glossy or matte photographs and achieves a low incidence of moiré, thus reproducing copies of photographs of high resolution.

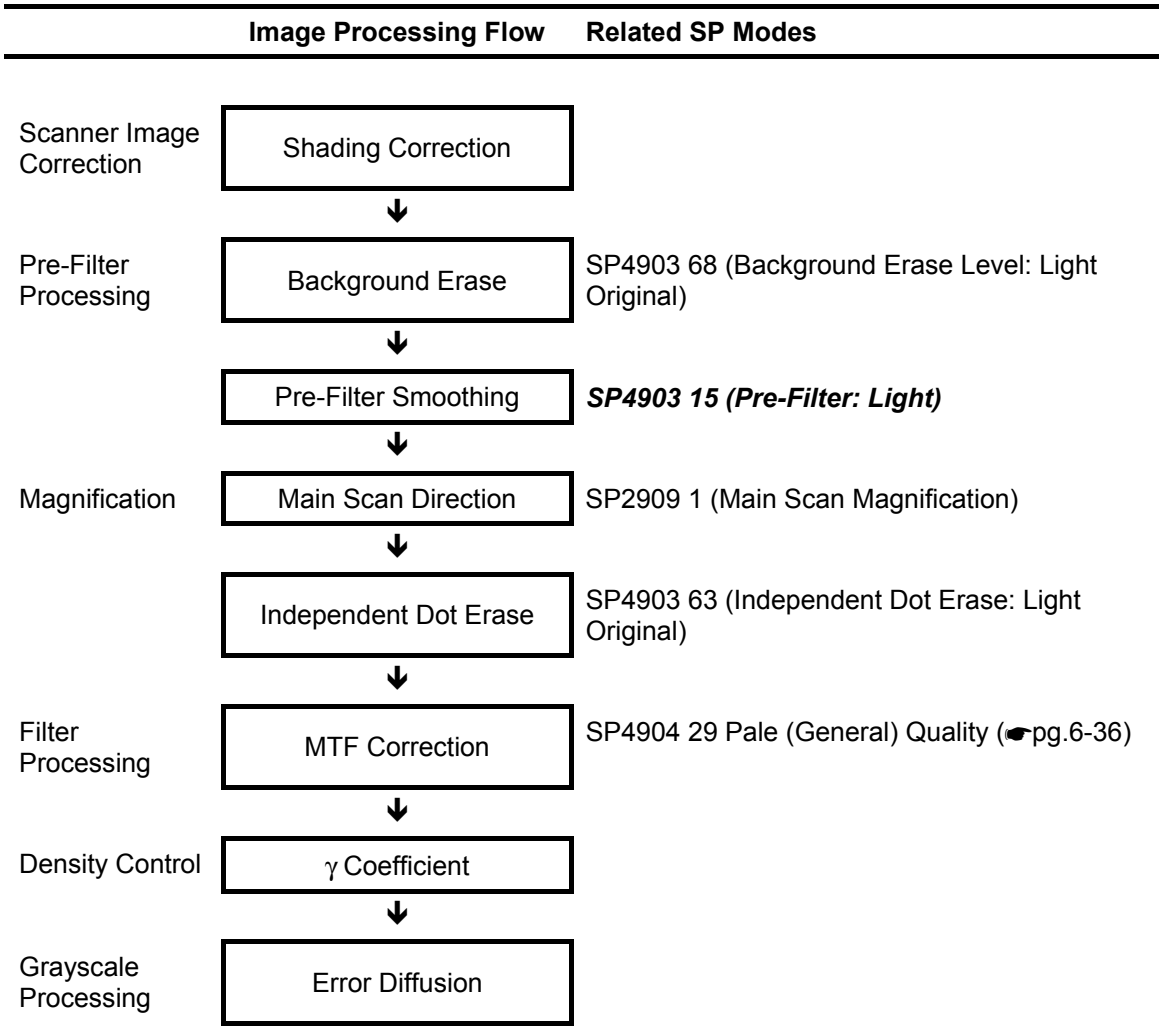
For photo mode, the features used depend on which type of greyscale processing has been selected for Photo mode (either 'dithering and smoothing' or 'error diffusion and MTF'); this depends on the setting of SP 4904 001. Details are explained later in this section.

Image Processing Flow		Related SP Modes
Scanner Image Correction	Shading Correction	
Pre-Filter Processing	Background Erase	SP4903 66 (Background Erase Level: Photo Mode)
	Pre-Filter Smoothing	***SP4903 12 (Pre-Filter: Photo Mode)***
Magnification	Main Scan Direction	SP2909 1 (Main Scan Magnification)
Filter Processing	Smoothing/MTF Correction	SP4904 024 Photo (General Quality) (☛pg.6-34)
Density Control	γ Coefficient	
Grayscale Processing	Dither/Error Diffusion	SP4904 2 (Quality Photo Mode)

NOTE: An SP code number and name set in ***bold italic*** denotes an SSP (Special Service Program) mode. To access an SSP, enter the SP mode: press and hold down (#) on the 10-key pad then "Copy SP" on the touch-screen.

Pale (Low-Density Mode)

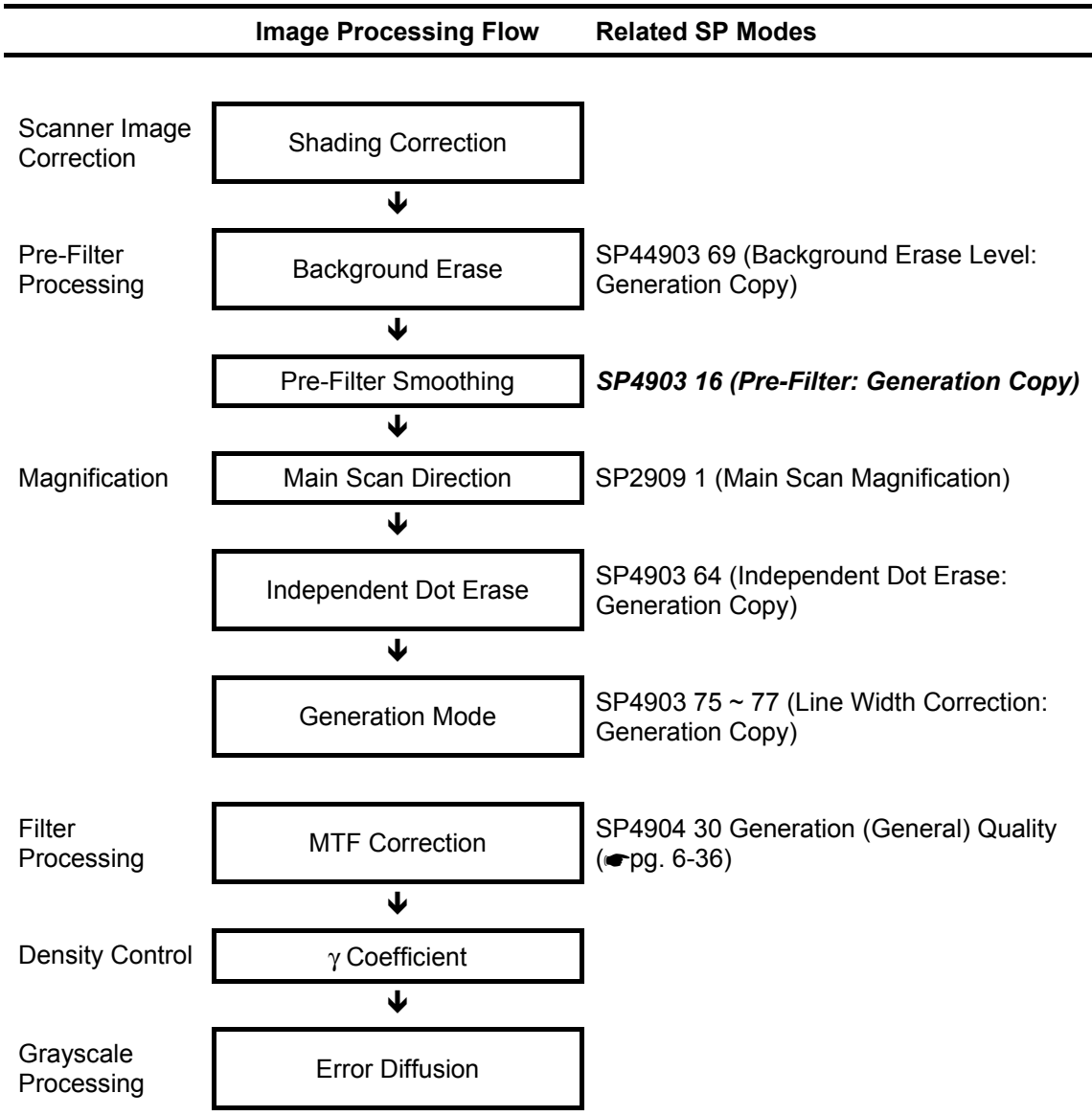
Pale achieves image quality comparable with Text mode, but of lower contrast. Pale employs an MTF filter stronger than that employed by the Text mode and uses a darker γ coefficient, thus increasing the incidence of copying textured backgrounds. Ideal for copying extremely thin originals. Soft employs an MTF filter weaker than Normal, thus achieving a softer image with less moiré. Sharp employs an MTF filter stronger than that of Normal, thus increasing the sharpness of lines.



NOTE: An SP code number and name set in ***bold italic*** denotes an SSP (Special Service Program) mode. To access an SSP, enter the SP mode: press and hold down (#) on the 10-key pad then "Copy SP" on the touch-screen.

Generation Copy Mode

Generation Copy, based mainly on Text mode, aims to achieve the best reproduction of copied originals (so called “generation copies” or copies of copies). This mode 1) employs an MTF filter weaker than that of the Text mode to eliminate spurious dots, 2) uses the γ coefficient to smooth the image, and 3) uses generation processing to thicken thin lines. Soft employs an MTF filter weaker than the Normal setting to achieve a softer image with less moiré. Sharp employs an MTF filter stronger than that for Normal to emphasize lines for better image quality.



NOTE: An SP code number and name set in ***bold italic*** denotes an SSP (Special Service Program) mode. To access an SSP, enter the SP mode: press and hold down (#) on the 10-key pad then “Copy SP” on the touch-screen.

6.5.8 PRE-FILTERING

SP mode settings 4903 10 ~ 15 select pre-filters by changing the filter coefficient settings.

Original Mode	SP No.	Default	Setting	Mag.	Smoothing
Text	***SP4903 10***	0	0	25% ~ 400%	OFF
Photo	***SP4903 12***	0	1	25% ~ 50%	Weak
Text/Photo	***SP4903 13***	0	2	25% ~ 50%	Medium
Pale	***SP4903 15***	0	3	25% ~ 50%	Strong
Generation	***SP4903 16***	0	4	25% ~ 99%	Weak
↓			5	25% ~ 99%	Medium
Range	0 ~ 9		6	25% ~ 99%	Strong
			7	25% ~ 400%	Weak
			8	25% ~ 400%	Medium
			9	25% ~ 400%	Strong

NOTE: An SP code number and name set in ***bold italic*** denotes an SSP (Special Service Program) mode. To access an SSP, enter the SP mode: press and hold down # on the 10-key pad then "Copy SP" on the touch-screen.

These SP mode settings are provided to reduce the incidence of moiré in the reproduction of images whose data signals have been compressed in the direction of the main scan. However, these SP adjustments can cause different effects in the reproduction of images depending on:

- Whether they contain areas shaded with dot screening (newspaper, magazine photos)
- Their reduction ratios.

These adjustments can also cause blurring in the reproduction of images that contain:

- Low density dots
- Low contrast text characters
- Fine lines

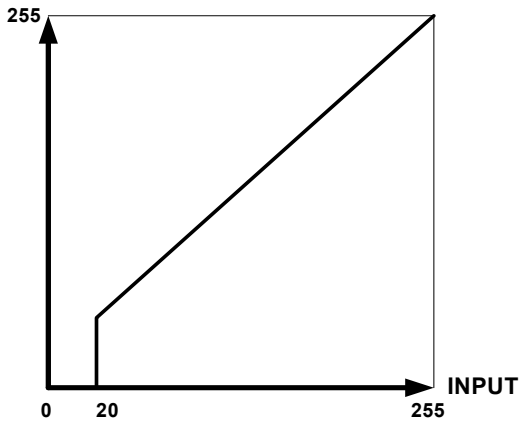
While filter processing is provided to reduce the incidence of moiré generated from digital signals, you must always pay attention to how these adjustments affect text characters and fine lines.

6.5.9 BACKGROUND ERASE

SP4903 65 ~ 69 cut the background from around images scanned from an original of rough texture such as a newspaper or parchment. The larger the setting done for this SP, the more background drops out from behind the image or text.

This SP mode setting for image processing executes separately from the ADS (Auto Image Density) function that is performed in the SBU to set the peak white level for scanning to eliminate background.

For example, if this SP is set for “20”, then the scanning data up to 20 is set to “0” and cut from the image. The range for this SP code adjustment is 0 ~ 255. The recommended range for a normal document is 0 ~ 60. An official document on rough texture paper would fall in the recommended range of 120 ~ 160. The correct setting for any original will vary with the texture and quality of the background, but remember that selecting a higher numbers for this setting will eventually lower the quality of the document or cause unexpected results.



Mode	Background Erase Filter	Default	Range
Text	SP4903 65	0	0 ~ 255
Photo	SP4903 66	0	
Text/Photo	SP4903 67	0	
Pale	SP4903 68	0	
Generation Copy	SP4903 69	0	

NOTE: The “0” setting switches off the background erase filter.

6.5.10 INDEPENDENT DOT ERASE

Independent dot erase (set with the SP mode settings listed in the table below) remains in effect even when a “Custom Setting” is selected with the User Tools.

Independent dot erase targets for elimination random, irregular shaped black dots on the surface of the original that would otherwise appear in the copy after scanning and printing. The strength of the application of this feature can be adjusted for each mode.

The filter compares each pixel with the pixels around an area 7 pixels x 7 lines. If the sum of the pixels at the edges is smaller than the threshold value, the object pixel is changed to zero (white). depending on the strength of the SP mode setting. Setting a larger setting increases the number of dots erased, but if set too high, this SP can also remove small or fine text characters or even portions of large text characters.

Mode	Independent Dot Erase Filter	Default	Range
Text	SP4903 60	5	0 ~ 15
Text/Photo	SP4903 62	0	
Pale	SP4903 63	0	
Generation Copy	SP4903 64	8	

NOTE: The “0” setting switches off the filter.

6.5.11 LINE WIDTH CORRECTION

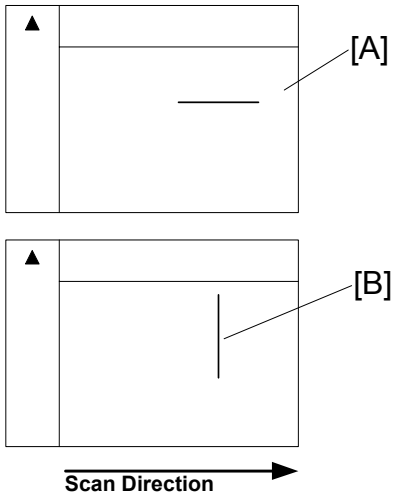
This section describes how to select a setting for line width correction (LWC) for the Generation Copy mode. LWC (Line Width Correction) can make lines thicker or thinner in generation copies.

SP4903 75 LWC: Generation Mode

Setting	Effect
0	No correction
1	Lighter lines
2	Darker lines (Default)
3	Thick lines

SP4903 75 adjusts the thickness of lines in faint generation copies. Specifically, this adjustment affects the lines targeted for adjustment by:

- SP4903 76 (LWC Threshold (Main Scan): Generation Mode). Targets main scan, lines parallel to the direction of feed [A].
- SP4903 77 LWC Threshold (Sub Scan): Generation Mode). Targets sub scan, lines at right angles to the direction of feed [B].



For sharp thin lines, set SP4903 75 for a higher LWC setting, and for softer lines set a lower setting. For thick lines, select “3”.

- To thin (or thicken) lines in the main scan direction, select an SP4903 75 setting larger (or smaller) than the setting for SP4903 76
- To thin (or thicken) lines in the sub scan direction select an SP4903 75 setting larger (or smaller) than the setting for SP4903 77.

However, remember that too large a setting can cause unexpected results in copied images.

SP Mode	Default	Range
SP4903 76 LWC Threshold (Main Scan): Generation Mode	1	0 ~ 5
SP4903 77 LWC Threshold (Sub Scan): Generation Mode	1	

6.5.12 FILTERING

Interactive SP Codes

Overview

The tables in this section are for quick reference. For details about how each SP code operates and interacts with other SP settings, please refer to the sections that follow.

Many of the SP codes used for image processing adjustments are interactive in that they exist as master and slave SPs. Use the *master* SP codes for gross adjustment. If you need to fine adjust a master setting, set the master setting to "0" to access its *slave* SP codes.

NOTE: In the tables below, the master SP codes are set in **bold** type. The slave SP codes are indented and set in normal type.

Keep the following points in mind while you are using these SP codes:

- The slave SP codes cannot be accessed until the master SP is set to "0".
- For the slave SP code settings to take effect, the master SP code must remain set to "0".
- If the master SP code is reset to any value other than "0", then the slave SP codes are disabled and their adjustments have no effect on image processing.
- If a master SP code is provided with both a Strength and Level (coefficient) adjustment, adjust the Strength setting first to achieve the approximate effect that you want, then do the Level adjustment.

Text Mode

Adjust the image for the Text mode with the four master settings within their allowed ranges (for ranges see Section "5. Service Tables". To fine adjust a master setting set it to "0" then perform the adjustments listed below.

SP4904 020 = 0	Text (General) Quality 25-64%
SP4903 020	Main Scan Filter Level: Text 25%-64%
SP4903 021	Sub Scan Filter Level: Text 25%-64%
SP4903 022	Main Scan Filter Strength: Text 25%-64%
SP4903 023	Sub Scan Filter Strength: Text 25%-64%
SP4904 021 = 0	Text (General) Quality 65-154%
SP4903 024	Main Scan Filter Level: Text 65%-154%
SP4903 025	Sub Scan Filter Level: Text 65%-154%
SP4903 026	Main Scan Filter Strength: Text 65%-154%
SP4903 027	Sub Scan Filter Strength: Text 65%-154%
SP4904 022 = 0	Text (General) Quality 155-256%
SP4903 028	Main Scan Filter Level: Text 155%-256%
SP4903 029	Sub Scan Filter Level: Text 155%-256%
SP4903 030	Main Scan Filter Strength: Text 155%-256%
SP4903 031	Sub Scan Filter Strength: Text 155%-256%
SP4904 023 = 0	Text (General) Quality 257%-400%
SP4903 032	Main Scan Filter Level: Text 257%-400%
SP4903 033	Sub Scan Filter Level: Text 257%-400%
SP4903 034	Main Scan Filter Strength: Text 257%-400%
SP4903 035	Sub Scan Filter Strength: Text 257%-400%

Photo Mode

Dithering or Error Diffusion for Photo Mode?

Use SP4904 001 to select either dithering or error diffusion to process image fills and halftones.

0: Selects the dithering and smoothing filter.

1: Selects the error diffusion and MTF filter.

Photo Mode Dithering: SP4904 001 = 0

If you select "0" for SP4904 001 to enable dithering halftones, only one SP code is available for fine adjusting dithering.

SP4903 037	Smoothing Filter in Photo Mode

Photo Mode Error Diffusion: SP4904 001 = 1

If you select "1" for SP4904 001 to enable error diffusion, all the SP codes in the Mode tables below (Text Mode, Text/Photo Mode, etc.) are available for adjustment.

Use the *master* SP codes gross adjustment of the image processing mode after you have set SP4904 001 = 1 for error diffusion. If you need to fine adjust a master setting, set the master setting to "0" to access its slave SP codes.

Adjust the image for the Photo mode with the one master setting within its allowed range (for the range, see Section "5. Service Tables"). To fine adjust the master setting set it to "0" then perform the adjustments listed below.

SP4904 024 = 0	**Photo (General Quality)**
SP4903 036	Photo MTF (Edge)
SP4903 038	Photo MTF (All)
SP4903 091	***Filter Strength: Photo (Edge)***
SP4903 092	***Filter Adj.: Photo (Edge Det.)***
SP4903 093	***Filter Adj.: Photo (Mag.%)***
SP4904 013	***Halftone Adjustment: Edge Detection***

NOTE: An SP code number and name set in ***bold italic*** denotes an SSP (Special Service Program) mode. To access an SSP, enter the SP mode: press and hold down # on the 10-key pad then "Copy SP" on the touch-screen.

Text/Photo Mode

Adjust the image for the Text/Photo mode with the four master settings within their allowed ranges (for ranges, see Section “5. Service Tables”). To fine adjust a master setting set it to “0” then perform the adjustments listed below.

SP4904 025 = 0	**Text/Photo (General) Quality 25%-64%**
SP4903 039	Text/Photo (Edge) Coefficient 25%-64%
SP4903 040	Text/Photo (All) Coefficient 25%-64%
SP4903 079	***Filter Strength: Text/Photo (Edge) 25%-64%***
SP4903 080	***Filter Adj.: Text/Photo (Edge Det.) 25%-64%***
SP4903 081	***Filter Adj.: Text/Photo (Mag.%) 25%-64%***
SP4904 008	***Gray Adj: Text/Photo (Edge Det.) 25-64%***
SP4904 026 = 0	**Text/Photo (General) Quality 65%-154%**
SP4903 043	Text/Photo (Edge) Coefficient 65%-154%
SP4903 044	Text/Photo (All) Coefficient 65%-154%
SP4903 082	***Filter Strength: Text/Photo (Edge) 65%-154%***
SP4903 083	***Filter Adj.: Text/Photo (Edge Det.) 65-154%***
SP4903 084	***Filter Adj. Text/Photo (Mag.%) 65%-154%***
SP4904 009	***Gray Adj.: Text/Photo (Edge Det.) 65-154%***
SP4904 027 = 0	**Text/Photo (General Quality) 155%-256%**
SP4903 047	Text/Photo (Edge) Coefficient 155%-256%
SP4903 048	Text/Photo (All) Coefficient 155%-256%
SP4903 085	***Filter Strength: Text/Photo (Edge) 155%-256%***
SP4903 086	***Filter Adj.: Text/Photo (Edge Det.) 155%-256%***
SP4903 087	***Filter Adj.; Text/Photo (Mag.%) 155%-256%***
SP4904 010	***Gray Adj.: Text/Photo (Edge Det.) 155-256%***
SP4904 028 = 0	**Text/Photo (General) Quality 257%-400%**
SP4903 051	Text/Photo (Edge) Coefficient 257%-400%
SP4903 052	Text/Photo (All) Coefficient 257%-400%
SP4903 088	***Filter Strength: Text/Photo (Edge) 257%-400%***
SP4903 089	***Filter Adj.: Text/Photo (Edge Det.) 257%-400%***
SP4903 090	***Filter Adj.: Text/Photo (Mag.%) 257%-400%***
SP4904 011	***Gray Adj.: Text/Photo (Edge Det.) 257-400%***

NOTE: An SP code number and name set in ***bold italic*** denotes an SSP (Special Service Program) mode. To access an SSP, enter the SP mode: press and hold down # on the 10-key pad then “Copy SP” on the touch-screen.

Also, SP4904 007 adjusts the error diffusion process that is used in text/photo mode.

Gray adjustment: At areas defined as edges, error diffusion is done on text to create sharp lines to better define text characters, but in other areas, grayscale processing for photographs is done. Select a lower setting for better reproduction of photographs and a higher setting for sharper text. For details, refer to the SP table.

Pale Mode

Adjust the image for the Pale mode with the one master setting within its allowed range (for range see Section “5. Service Tables”. To fine adjust the master setting set it to “0” then perform the adjustments listed below.

SP4904 029 = 0	Pale (General) Quality
SP4903 055	Filter Level: Pale
SP4903 056	Filter Strength: Pale

Generation Copy Mode

Adjust the image for the Generation Copy mode with the one master setting within its allowed range (for range see Section “5. Service Tables”. To fine adjust the master setting set it to “0” then perform the adjustments listed below.

SP4904 030 = 0	Generation (General) Quality
SP4903 057	Filter Level: Generation Copy
SP4903 058	Filter Strength: Generation Copy

Text Mode MTF Filter

This section describes how to select the MTF filter coefficient and filter strength for the Text mode. You can use the SP mode settings listed in the table below to adjust these items for scanning in Text mode:

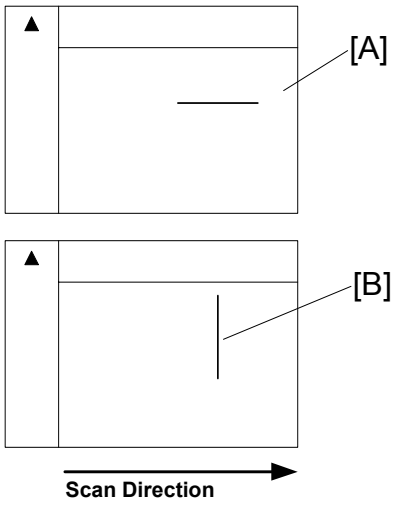
- MTF filter coefficient for the main scan and sub scan
- MTF filter strength for the main scan and sub scan

Text Mode (Mag.)	Coefficient		Strength	
	Main Scan .	Sub Scan .	Main Scan .	Sub Scan .
25% ~ 64%	SP4903 20	SP4903 21	SP4903 22	SP4903 23
65% ~ 154%	SP4903 24	SP4903 25	SP4903 26	SP4903 27
155% ~ 256%	SP4903 28	SP4903 29	SP4903 30	SP4903 31
257% ~ 400%	SP4903 32	SP4903 33	SP4903 34	SP4903 35
Ranges	0 ~ 15	0 ~ 13	0 ~ 7	0 ~ 7

Strengthening the MTF filter sharpens the edges of text characters and improves the appearance of low contrast text but can also cause moiré to appear in photos on the same original.

Conversely, weakening the MTF filter softens the edges of text characters and reduces the occurrence of moiré but low contrast characters may fade.

Strengthen or weaken the MTF filter for the Text mode only when necessary.



Adjustment of the MTF filter coefficient performs very fine level adjustment of the applied strength of the MTF filter. Adjustment of the MTF filter strength greatly affects the rate of the change applied to the image. Basically, you should first just the MTF filter strength in 1 step increments without adjusting the coefficient to achieve nearly the effect you want, and then use the coefficient settings for fine adjustment.

Coefficient and strength adjustments for main scan affect lines parallel to the direction of scanning [A].

Coefficient and strength adjustments for sub scan affect lines at right angles to the direction of scanning [B].

Text/Photo, Photo Mode Filter

SP mode settings listed in Columns 2~4 below adjust the clarity of originals that contain text, thin lines, and photos; the SP codes of Columns 5~6 are intended to adjust the clarity of originals with text and thin lines or only photos. The photo mode settings are only valid if SP 4904 001 is set to 1.

Mode, Mag.	Filter Setting: Edge	Filter Setting: All	Filter Strength: Edge	Filter Adj.: Edge Det.	Filter Adj.: Mag.
Text/Photo 25 ~ 64%	SP4903 39	SP4903 40	***SP4903 79***	***SP4903 80***	***SP4903 81***
Text/Photo 65 ~ 154%	SP4903 43	SP4903 44	***SP4903 82***	***SP4903 83***	***SP4903 84***
Text/Photo 155 ~ 256%	SP4903 47	SP4903 48	***SP4903 85***	***SP4903 86***	***SP4903 87***
Text/Photo 257 ~ 400%	SP4903 51	SP4903 52	***SP4903 88***	***SP4903 89***	***SP4903 90***
Photo (Error Diffusion)	SP4903 36	SP4903 38	***SP4903 91***	***SP4903 92***	***SP4903 93***
Ranges	0~7	0~7	0~3	0~15	0~15

NOTE: An SP code number and name set in ***bold italic*** denotes an SSP (Special Service Program) mode. To access an SSP, enter the SP mode: press and hold down # on the 10-key pad then "Copy SP" on the touch-screen.

Filter Setting: Edge (Column 2): Provides filter processing of edges to improve the clarity of originals that contain text and lines. Selecting a larger value sharpens the clarity. However, increasing the value also increases the possibility of producing moiré in the image.

Filter Setting: All (Column 3): Provides filter processing for the overall image, not to improve just text, lines, or photographs, but to improve the image as a whole. This filter coefficient reduces the incidence of moiré in images that contain shaded areas created with dots. Increasing the value improves reproduction of low contrast text and lines. However, increasing the value also increases the possibility of producing moiré in the image.

Filter Strength: Edge (Column 4): Aims to increase the *strength* of the "Filter Setting: Edge" effect that processes edges to improve the clarity of originals that contain text and lines. Increasing this setting not only increases the strength of the effect and creates thicker text characters and lines, but can also cause moiré to appear in the image. On the other hand, decreasing this setting lessens the effect, creating thinner characters and lines and also reduces the incidence of moiré.

Filter Adj.: Edge Detection (Column 5): Broadens the *range* of the effect of the "Filter Setting Edge" SP. Lowering this setting broadens the range for edge filter processing and increases clarity. Also, using this SP together with "Filter Adj. Mag." below can sharpen edges to an extent that an abnormal looking image is created.

Filter Adj.: Magnification (Column 6): Allows gradual adjustment of clarity in original images that contain varying degrees of clarity between text and lines, or between areas of the same image. Increasing these settings in large increments could easily cause moiré to appear in the images. These settings should always be changed in small increments.

Follow these general rules with these settings:

- Increasing the settings dramatically increases clarity but can also increase the incidence of moiré.
- Reducing the settings produces a smoother image, reduces the incidence of moiré, but also reduces the effect of the filters.
- Adjusting the "Filter Adj. Mag." SPs in combination with other settings can even produce abnormal images.

Also, SP4904 007 adjusts the error diffusion process that is used in text/photo mode.

Pale, Generation Mode Filter

The SP mode settings listed in the table below are used to adjust MTF filter coefficient and strength for the Pale mode and Generation Copy modes.

Mode	Coefficient	Strength
Pale Mode	SP4903 55	SP4903 56
Generation Copy	SP4903 57	SP4903 58
Ranges	0 ~ 6	0 ~ 7

Strengthening the MTF filter sharpens the edges of text characters and improves the appearance of low contrast text but can also cause moiré to appear in photos on the same original. Conversely, weakening the MTF filter softens the edges of text characters and reduces the occurrence of moiré but low contrast characters may fade.

Strengthen or weaken the MTF filter for the Text mode only when necessary.

Adjustment of the MTF filter coefficient performs very fine level adjustment of the applied strength of the MTF filter. Adjustment of the MTF filter strength greatly affects the rate of the change applied to the image. Basically, you should first just the MTF filter strength in 1 step increments without adjusting the coefficient to achieve the effect you want, and then use the coefficient settings for fine adjustment.

Photo Mode Smoothing for Dithering

Strengthening this SP4903 37 (Smoothing Filter in Photo Mode) makes images smoother and reduces the occurrence of moiré but can also cause fading. Strengthen this setting only when necessary. Only valid if SP 4901 001 is at 0.

Smoothing Coefficient	Range
SP4903 37 (Smoothing Filter in Photo Mode)	0 ~ 7

Photo Mode Grayscale

This SP mode adjustment sets how grayscales are processed when the user selects Photo mode on the operation panel.

SP4904 1 Grayscale Photo Mode

Setting	Description
0	Dithering and smoothing
1	Error diffusion, MTF filter correction for edges

If “0” is selected, the image grayscales are processed with dithering and filter processing, just as they are processed with the “Print Photo” selection on the operation panel. In this case the filter processing means smoothing only. The filter coefficient for smoothing can be adjusted with SP4904 37 (Smoothing Filter in Photo Mode).

If “1” is selected, then the image grayscales are processed with error diffusion processing, just as they are processed with the “Normal” and “Glossy Photo” settings on the operation panel. The MTF filter applied is the same as that applied for the “Normal” setting.

To achieve better photo image quality with slightly less clarity in lines and text, select “0” for dithering. You can also adjust SP4904 2 to achieve better reproduction of photographs.

On the other hand, to achieve better clarity in text and lines, with a slight sacrifice in the quality grayscale and smoothness in photographs, select “1” for error diffusion. To improve the clarity of fine lines and text, you can also increase the strength of the MTF filter. However, increasing the strength of the filter can also increase the incidence of moiré in areas of newspaper, magazine, or other photographs created with dot screening.

Photo Mode Image Quality

This section describes how to select a setting to improve image quality in the Photo mode with dithering in order to create an extremely smooth photo image.

Generally, a larger dithering matrix uses rougher dither pattern to reproduce a smoother gray image, but lowering the resolution can make text and lines more difficult to see. Conversely, a smaller dithering matrix uses a finer dithering pattern to reproduce a gray image of rougher texture, but raising the resolution can make text and lines easier to see.

SP4904 002 Quality Photo Mode

Setting	Dither Pattern	Picture Quality	Text Quality	Processing Priority
0	8 x 8 (75 lines)	High	Low	Dot screen areas
1	8 x 8 (106 lines)	Highest	Low	Filled areas (highest priority) Default
2	6 x 6 (142 lines)	Medium	Medium	Filled areas
3	4 x 4 (212 lines)	Low	High	Resolution

For these dither adjustments to take effect, SP4904 1 (Grayscale Photo Mode) must be set to “0” to enable dithering.

Here are some general rules:

- If your main concern is reproducing legible text, use the smaller matrixes, but a smaller matrix could cause spurious lines to appear in images.
- When using the smallest matrix with setting “3” (4 x 4), you should switch off the smoothing filter for the Photo mode by setting SP4903 37 to “0”.
- Use the largest dither matrix (setting “0”) for originals that contain dot screening such as newspaper and magazine photographs.

6.5.13 OTHERS

Vertical Black Line Correction

This section describes how to select a setting to correct vertical black lines. SP4904 5 (Special Text Density) adjusts the overall intensity of the image to eliminate vertical black lines in originals caused by documents scanned on a copy machine with dirty optics.

SP Mode	Default	Range
SP4904 5 Special Text Density	0	0 ~ 7

Normally, the default setting (0) leaves this feature switched off.

Select a higher setting to increase the effect or a lower setting to decrease the effect. High density vertical black lines may require a higher setting, but a higher setting could cause the overall density of the copy to lower, or could cause low density areas to drop out completely.

NOTE: Generally, this SP code corrects most low density vertical black lines but may not be able to correct extremely dark or wide black lines.

Density Settings

This section describes how to adjust the density settings for the Pale mode Generation Copy mode, and Text mode.

SP4904 3 is used to switch the density characteristics to binary digital processing for black and white originals to achieve better balance between text and images, correct shadows that appear around text in handwritten documents, to enhance documents written in pencil, or to achieve stark contrast when copying blueprints, building plans, etc.

SP4904 3 Density Setting for Low Density Original Mode

Settings	Density Characteristics
0	Selects γ normal density (Default).
1	Digitizes to near binary image.

SP4904 4 is used to switch between normal density and better reproduction of areas with graduated fill in originals copied in the Generation Copy mode. To improve the appearance of graduated fill areas of high density, set to “1” so the process can ignore black and more accurately reproduce areas with graduated fill. For example, the “1” setting is ideal for copying Generation Copy originals of medical charts that contain images of internal organs.

SP4904 4 Density Setting for Copied Original Mode

Settings	Density Characteristics
0	Selects normal density (Default) for Generation Copy originals.
1	Produces better gradation in fill areas of high density.

If “1” is selected for SP4904, the following SP mode settings may also need adjustment.

SP No.	Function	Recommended Setting
SP4903 57	Filter Level: Generation Copy	4 (or change as required)
SP4903 58	Filter Strength: Generation Copy	2 (or change as required)
SP4903 64	Independent Dot Erase: Generation Copy	0 (OFF)
SP4903 69	Background Erase Level: Generation Copy	0 OFF
SP4903 75	Line Width Correction: Generation Mode	0 (LWC OFF)

ADS Level

This section shows you how to adjust the center notch for the ADS (Automatic Density Setting) level. The notches are not displayed during ADS adjustment. Of 7 steps (notches) the center notch is 4. This is the value adjusted with this SP code.

SP5106 (ADS Level Selection) selects the image density used in ADS mode. For example, if you set SP5106 to “2”, pressing the Auto Image Density key toggles the display off and manual notch 2 is selected. This SP code is adjusted, if the customer cannot attain clean copies after performing automatic density adjustment.

This mode prevents the background of an original from appearing on copies.

The copier scans the auto image density detection area, a narrow strip at one end of the main scan line. As the scanner scans down the page, the IPU on the BICU detects the peak white level for each scan line in this narrow strip only. The IPU uses this peak white level as a reference value for analog-to-digital conversion of the scan line, then the IPU sends the reference value to the A/D controller on the SBU.

When an original with a gray background is scanned, for example, the density of the gray area becomes the peak white level density, so the original background will not appear on copies. Because peak level data is taken for each scan line, ADS corrects for any changes in background density down the page.

As with previous digital copiers, the user can select manual image density when selecting auto image density mode and the machine will use both settings when processing the original.

6.5.14 PRACTICAL APPLICATION OF SP MODES

Solving Problems

This section describes some common problems that can be solved with SP code adjustments. This table lists the recommended settings; fine adjustments may be required for the actual type of originals that the customer is copying.

NOTE: To do the settings in the table below, first you must set the Master SP code to "0". (☛"FILTERING", 6-23~6-31)

Job	User Tool	Custom Setting Adjustment
Eliminate blue lines from graph paper, or erase shadows caused by originals that have been pasted up for layout.	• Lighten the image density for Text mode. • Select "Soft" for Text mode (User Tools).	• Increase the setting of SP4903 60 (Independent Dot Erase) to about 6 ~ 10. • Increase the setting of SP4903 65 (Background Erase) to about 20 ~ 60.
Eliminate orange or other color backgrounds from official documents.		• Increase the setting of SP4903 60 (Independent Dot Erase) to about 10 ~ 15. • Increase the setting of SP4903 65 (Background Erase) to about 120 ~ 160.
Reproduce blue lines of graph paper.	• Darken the image density for Text/Photo mode. • Select "Sharp" for the Text/Photo mode (User Tools).	
De-emphasize fine lines in jagged valleys and reduce the occurrence of moiré.	• Select "Soft" for Text mode (User Tools).	Weaken the MTF filters for Text mode: • SP4903 24, Main Scan: 9 • SP4903 25, Sub Scan: 13 • SP4903 26, Main Scan: 2 • SP4903 27, Sub Scan: 2
Reduce the occurrence of moiré when reducing the size of the original for copying.	• Select "Soft" for Text mode (User Tools).	Weaken the MTF filters for Text mode reduction: • SP4903 20, Main Scan: 14 • SP4903 21, Sub Scan: 13 • SP4903 22, Main Scan: 1 • SP4903 23, Sub Scan: 1
Reproduce areas of graduated fill in high density originals in Photo mode.	• Select "Glossy Photo" for Photo mode (User Tools).	
Sharpen text in Photo mode.	• Select "Normal" or "Glossy Photo" for Photo mode (User Tools).	Set SP4904 1 to "1" to enable error diffusion. Strengthen the settings for the Photo mode MTF filters coefficients: • SP4903 36: Select "3" • SP4903 38: Select "1"
Improve the appearance of originals handwritten with pencil, or make lighter copies of color originals (invoices and other commonly used business forms)	• Select "Sharp" for Pale mode (User Tools). • Select "Sharp" for Text mode (User Tools).	Strengthen the MTF filters for Pale mode: • SP4903 55: Select "3" • SP4903 56: Select "4" Strengthen the MTF filters for Text mode: • SP4903 24: Set to "9". • SP4903 25: Set to "13". • SP4903 26: Set to "3". • SP4903 27: Set to "3".

Recommended Settings for MTF Filters

Text Mode

– Text Mode Filter Setting (25% ~ 64%) –

MTF Strength	Strong	←			Default			→	Weak
Default Settings:		**Sharp**			**Normal**			**Soft**	
SP4903 20 Main Filter Level: Text	15	14	12	10	9	9	14	10	9
SP4903 21 Sub Filter Level: Text	13	13	12	12	13	10	13	13	10
SP4903 22 Main Filter Strength	2	2	2	2	2	2	1	1	1
SP4903 23 Sub Filter Strength: Text	2	2	2	2	2	2	1	1	1

–Text Mode Filter Setting (65% ~ 154%) –

MTF Strength	Strong		←		Default			→	Weak
Default Settings:		**Sharp**			**Normal**			**Soft**	
SP4903 24 Main Filter Level	9	9	15	14	12	10	9	14	11
SP4903 25 Sub Filter Level	13	11	13	13	13	13	13	13	13
SP4903 26 Main Filter Strength	3	3	2	2	2	2	2	1	1
SP4903 26 Sub Filter Strength	3	3	2	2	2	2	2	1	1

–Text Mode (155% ~ 256%) –

MTF Strength	Strong	←			Default			→	Weak
Default Settings:		**Sharp**			**Normal**			**Soft**	
SP4903 28 Main Filter Level	11	10	9	9	14	12	10	9	9
SP4903 29 Sub Filter Level	13	13	13	10	13	13	13	13	10
SP4903 30 Main Filter Strength	3	3	3	3	2	2	2	2	2
SP4903 31 Sub Filter Strength	3	3	3	3	2	2	2	2	2

–Text Mode (257% ~ 400%) –

MTF Strength	Strong	←			Default			→	Weak
Default Settings:		**Sharp**			**Normal**			**Soft**	
SP4903 32 Main Filter Level	12	11	10	9	15	14	12	10	9
SP4903 33 Sub Filter Level	13	13	13	13	13	13	13	13	13
SP4903 34 Main Filter Strength	3	3	3	3	2	2	2	2	2
SP4903 35 Sub Filter Strength	3	3	3	3	2	2	2	2	2

Pale Mode

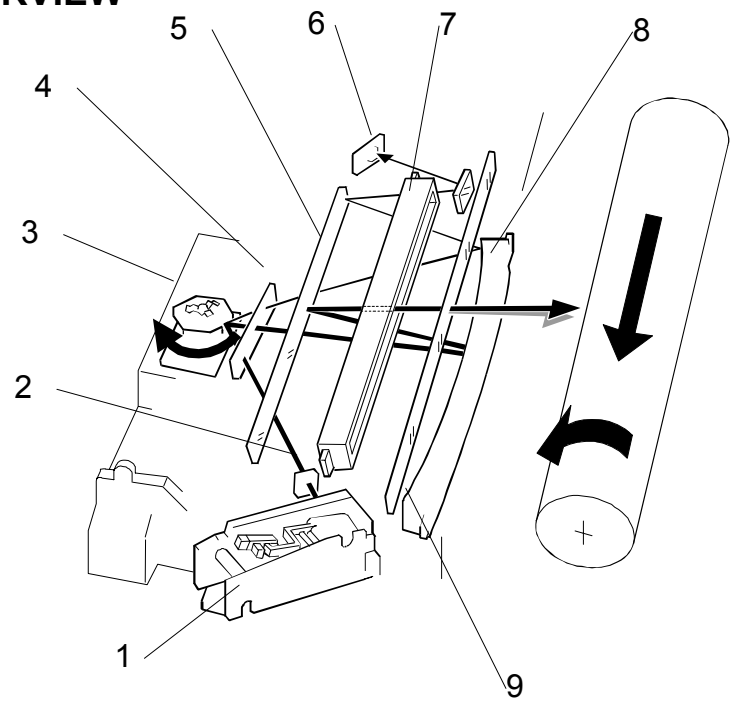
MTF Strength	Strong	←			Default			→	Weak
Default Settings:		**Sharp**			**Normal**			**Soft**	
SP4903 55 Filter Level: Light Original	5	4	3	2	6	4	3	2	6
SP4903 56 Filter Strength: Light Original	4	4	4	4	3	3	3	3	2

Generation Copy Mode

MTF Strength	Strong	←			Default			→	Weak
Default Settings:		**Sharp**			**Normal**			**Soft**	
SP4903 55 Filter Level: Light Original	2	6	5	4	3	2	6	5	4
SP4903 56 Filter Strength: Light Original	2	2	2	2	2	2	1	1	1

6.6 LASER EXPOSURE

6.6.1 OVERVIEW



1 LD unit
2 Cylindrical lens
3 Polygonal mirror
4 Shield glass
5 Mirror
6 Synchronizing detector
7 BTL (Barrel Toroidal Lens)
8 F-theta mirror
9 Toner shield glass

This machine uses two laser diodes to produce electrostatic images on an OPC drum. The laser diode unit converts image data from the BICU board into laser pulses, and the optical components direct these pulses to the drum. To produce a high quality copy image, these are 256 gradations for the laser power.

The output path from the laser diode to the drum is shown above. The LD unit outputs two laser beams to the polygon mirror through the cylindrical lens and the shield glass.

Each surface of the polygon mirror reflects two full main scan lines. The laser beams go to the F-theta mirror, mirror, and BTL (barrel toroidal lens). Then these laser beams go to the drum through the toner shield glass. The laser synchronizing detector determines the main scan starting position.

NOTE: The front door and right door (transfer door) are equipped with safety switches that automatically shut down the laser unit when either door is opened.

6.6.2 AUTO POWER CONTROL (APC)

The LD driver on the LDDR drives the laser diode. Even if a constant electric current is applied to the laser diode, the intensity of the output light changes with the temperature. The intensity of the output decreases as the temperature increases.

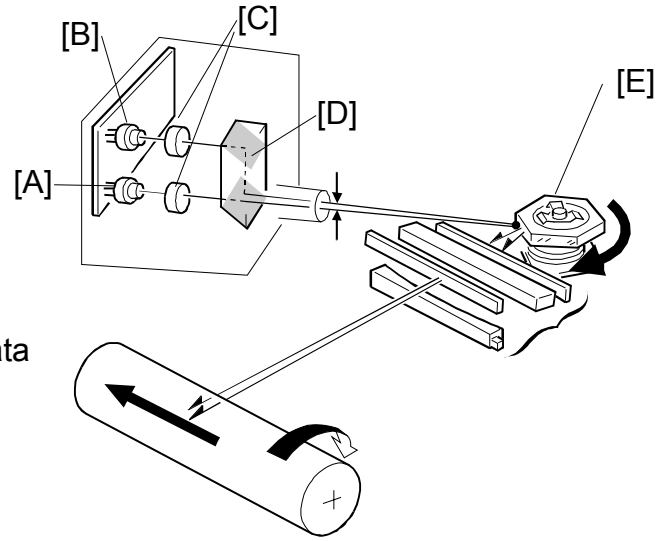
In order to keep the output level constant, the LDDR monitors the electrical current passing through the photodiode (PD). Then it increases or decreases the current to the laser diode as necessary, comparing it with the reference level. This auto power control is done just after the machine is turned on and during printing while the laser diode is active.

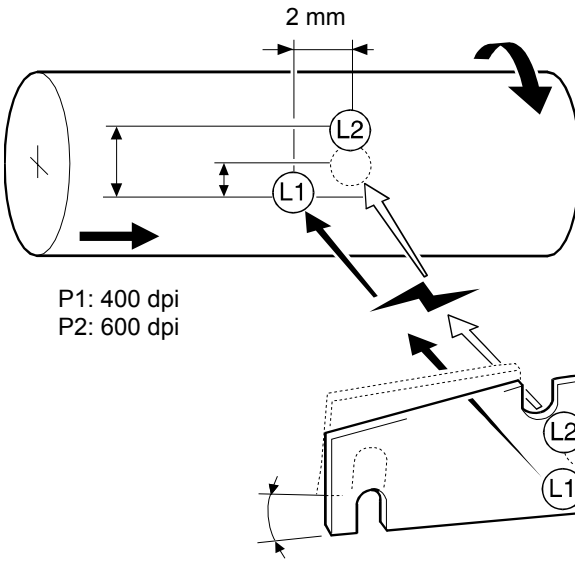
The reference levels are adjusted on the production line. Do not touch the variable resistors on the LDDR in the field.

6.6.3 DUAL BEAM WRITING

This LD unit employs two laser diodes [A] (LD) and [B] (L2). Each face of the polygon mirror writes two main scan lines, and twelve main scans are produced when the polygon mirror rotates once. This reduces polygon motor rotation speed, reduces noise generated by the polygon motor, and reduces the frequency of the image data clock.

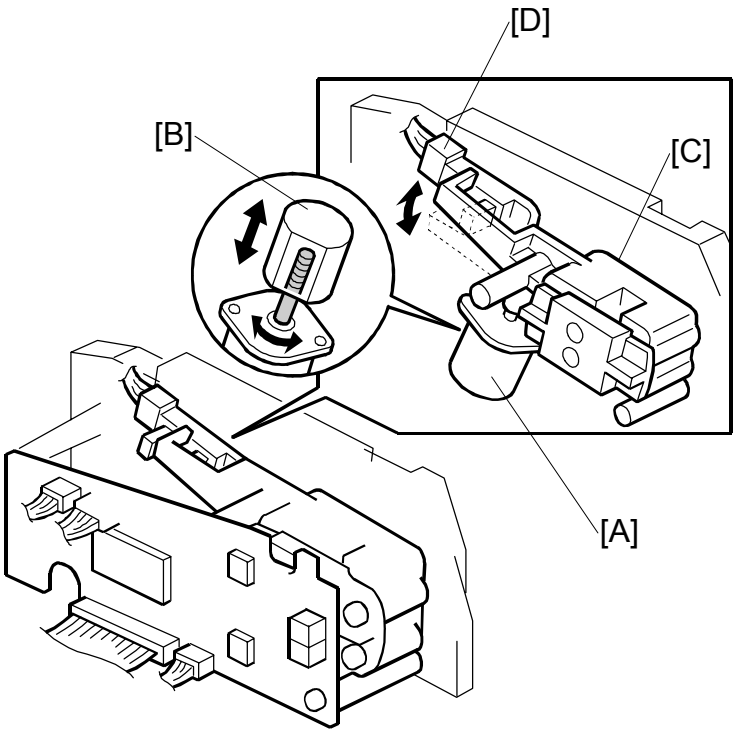
The two laser beams follow the path: collimating lenses [C] ➔ prism [D] ➔ polygonal mirror [E]





The two laser beams arrive on the drum surface about 2 mm apart in the main scan direction and about 0.06 mm apart (at 400 dpi) in the sub scan direction (see the next page). The two-mm difference in the main scan direction allows the machine to detect the laser synchronization signal for each beam.

6.6.4 LASER BEAM PITCH CHANGE MECHANISM

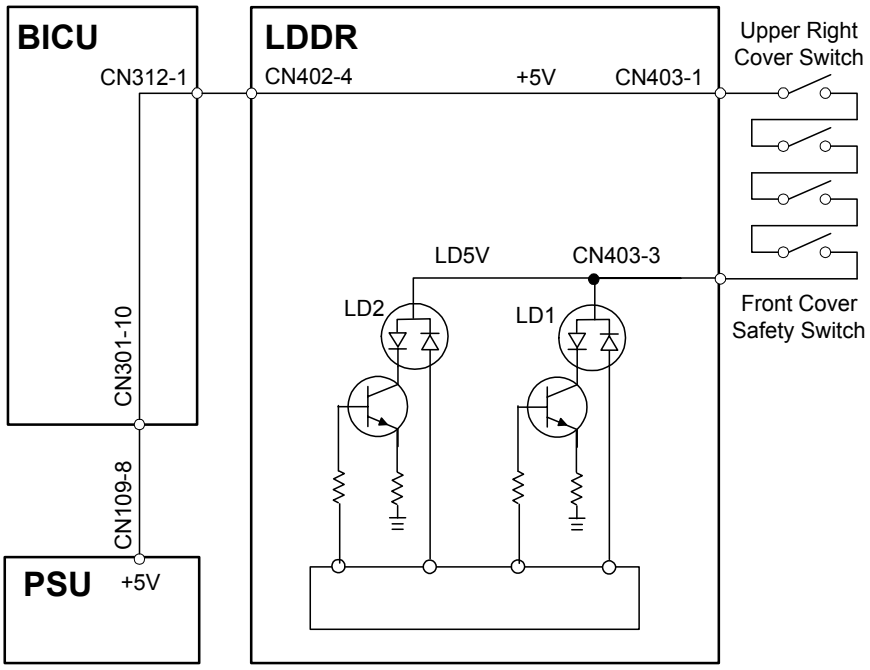


When the LD positioning motor [A] turns, the metal block [B] in contact with the LD unit housing [C] moves up and down and changes the position of L2 (L1 does not move).

Both LD unit positions are at fixed distances from the LD unit home position sensor [D].

Usually, the LD unit moves directly to the proper position. However, when the number of times that the resolution has changed reaches the value of SP2-109-5 (LD Beam Pitch Adjustment), the LD unit moves to the home position, and this re-calibrates the LD unit positioning mechanism.

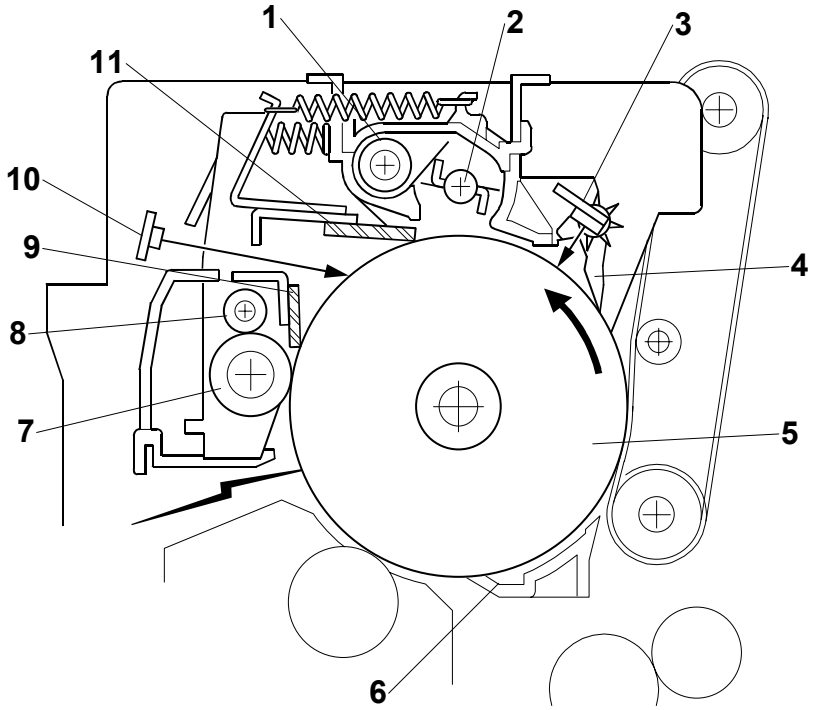
6.6.5 LD SAFETY SWITCHES



To ensure personal safety and to prevent the laser beam from inadvertently switching on during servicing, power to the laser diode is switched off when the front cover or upper right cover is opened. Four safety switches are installed in series on the LD5 V line from the power supply unit (PSU) via the BICU board.

6.7 PHOTOCONDUCTOR UNIT (PCU)

6.7.1 OVERVIEW

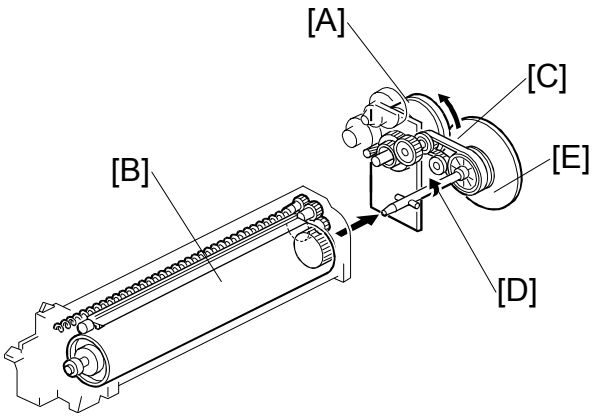


1. Toner Collection Coil
2. Toner Collection Plate
3. Image Density Sensor
4. Pick off Pawl
5. OPC Drum (ϕ60 mm)
6. Transfer Entrance Guide
7. Charge Roller
8. Charge Roller Cleaning Roller
9. Drum Cleaning Blade 2
10. Quenching Lamp
11. Drum Cleaning Blade 1

6.7.2 DRIVE MECHANISM

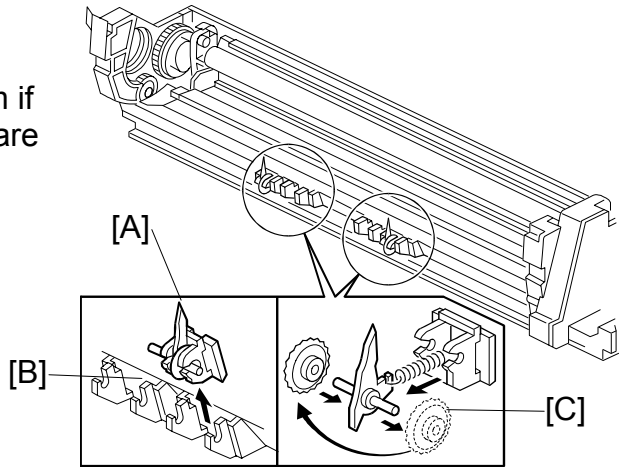
The drive from the main motor [A] is transmitted to the drum [B] through a series of gears, a timing belt [C], and the drum drive shaft [D].

The main motor has a drive controller, which outputs a motor lock signal when the rotation speed is out of the specified range. The flywheel [E] on the end of the drum drive shaft stabilizes the rotation speed (this prevents banding and jitter on copies).



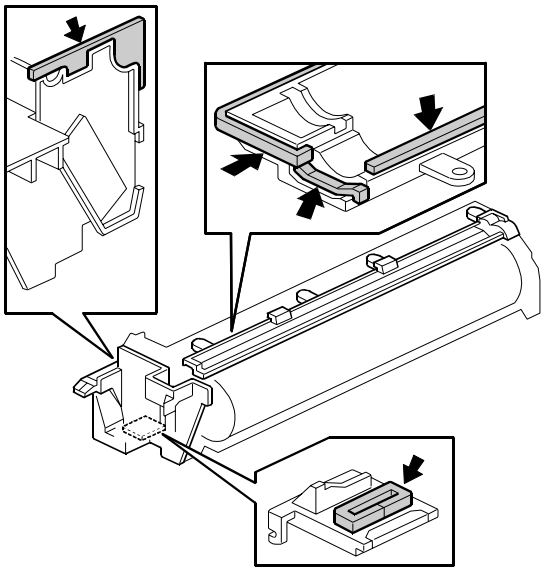
6.7.3 DRUM PAWLS

The pick-off pawls [A], mounted in the holders [B] on the drum and in contact with the drum, strip paper from the drum if it has not yet separated. The gears [C] are removable, and the positions of the holders can be adjusted.

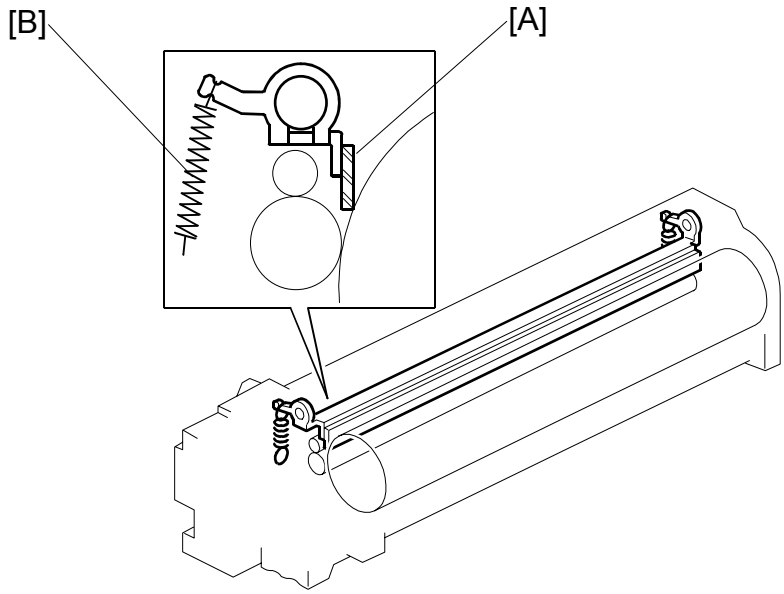


6.7.4 DRUM TONER SEALS

Seals have been added to the structure of the PCU (photoconductor unit) to further prevent toner leakage.



6.7.5 DRUM CLEANING



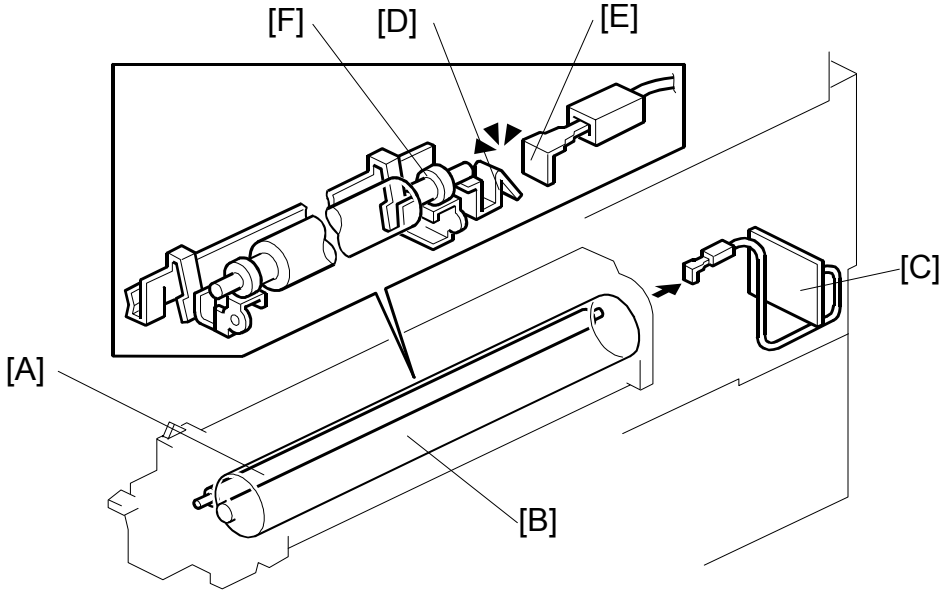
The PxP (Polyester Polymerization) toner of this machine is of much finer particle size so in addition to the stationary cleaning blade, mounted with two screws at the bottom of the PCU, an additional cleaning blade [A] has been added to increase the efficiency of drum cleaning.

The new cleaning blade is held in contact with the drum by two small springs [B] (one on each end) that keep the cleaning blade in contact with the drum. This cleaning blade is not a counter blade.

Every time the PCU is opened for replacement or cleaning, the spring closest to the front of the PCU must moved in order to retract the cleaning blade away from the OPC drum. After cleaning or replacement, the spring must be returned to its original position to keep the blade in contact with the OPC drum for normal operation. For details, see Section “3 Replacement and Adjustment”.

6.8 DRUM CHARGE

6.8.1 OVERVIEW

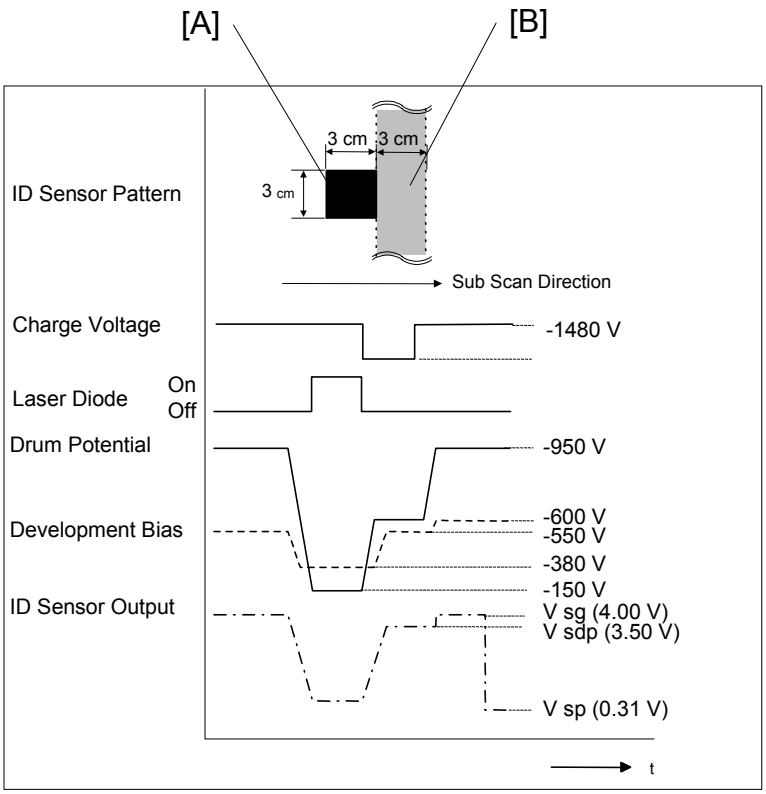


This copier uses a drum charge roller to charge the drum.

The drum charge roller [A] contacts the surface of the drum [B] to give it a negative charge. The high voltage supply board [C] supplies a negative dc voltage to the drum charge roller through the charge roller terminal [D], bias plate [E], and the rear roller bushing [F] to give the drum surface a negative charge of –950V.

6.8.2 CHARGE ROLLER VOLTAGE CORRECTION

Correction for Environmental Conditions



The voltage transferred from roller to drum could vary with the temperature and humidity around the drum charge roller. The lower the temperature or humidity, the higher the applied voltage required.

The ID sensor measures the effects of ambient conditions, and any small change in drum potential caused by changes in temperature/humidity is reflected in the amount of toner transferred to the drum.

This measurement is done immediately after the ID sensor pattern for toner density control. After creating ID sensor pattern [A], another pattern [B] is made. To do this, the LD switches off, the charge roller voltage drops, and the drum potential is reduced to -600V. At the same time, development bias returns to -550V. The drum potential is now slightly higher than the development bias, so only a very small amount of toner transfers to the drum. The ID sensor measures the density of pattern [B], and Vsdp, the output voltage, is compared with Vsg which was read from the bare drum at the same time.

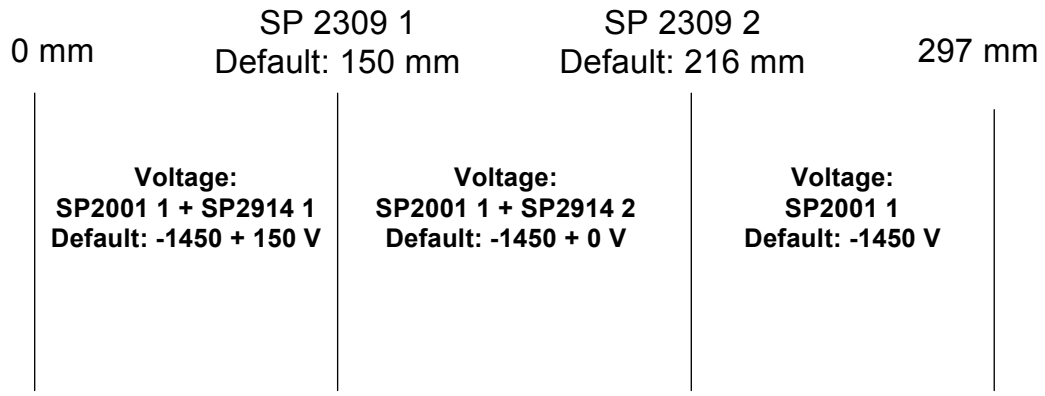
6.8.3 CORRECTION FOR PAPER WIDTH AND THICKNESS

NOTE: This correction is done for the bypass tray only.

The by-pass tray can be used for non-standard paper narrower than sizes accepted by the paper trays. Thicker paper, OHP sheets, etc. can also be loaded in the by-pass tray but adjustments must be performed with the SP modes listed below in order to avoid jams and copy quality problems.

SP Mode	SP Name	
SP2001 1	Charge Roller Bias Adjustment	Width 216 - 297 mm (Default: -1450 V)
SP2309 1	Paper Lower Width [a]	Width limit (Default: 150 mm)
SP2309 2	Paper Upper Width [b]	Width limit (Default: 216 mm)
SP2914 1	C-alpha	Adjust 10V/step (Default: 150 V)
SP2914 2	C-beta	Adjust 10V/step (Default: 0 V)

The way that these SP modes are used is shown below.

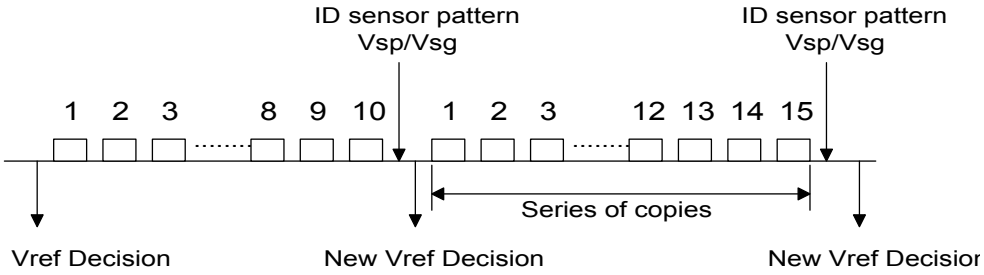


For example, with the default settings, if the paper width fed from the by-pass tray is 200 mm, the charge roller voltage will be –1450 +0 V.

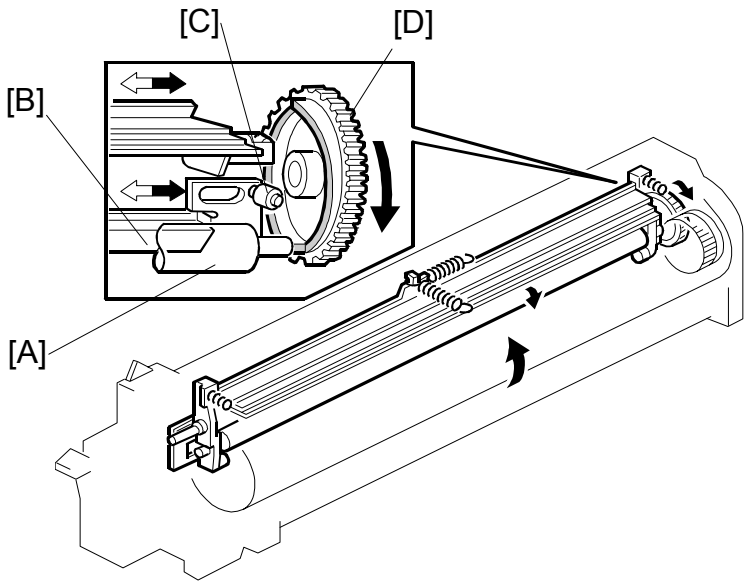
6.8.4 ID SENSOR PATTERN PRODUCTION TIMING

An ID sensor pattern is created after the main machine is powered on, and after finishing a job of 10 or more sheets.

The ID sensor pattern production interval can be adjusted with SP2-210 (ID Sensor Pattern Interval).



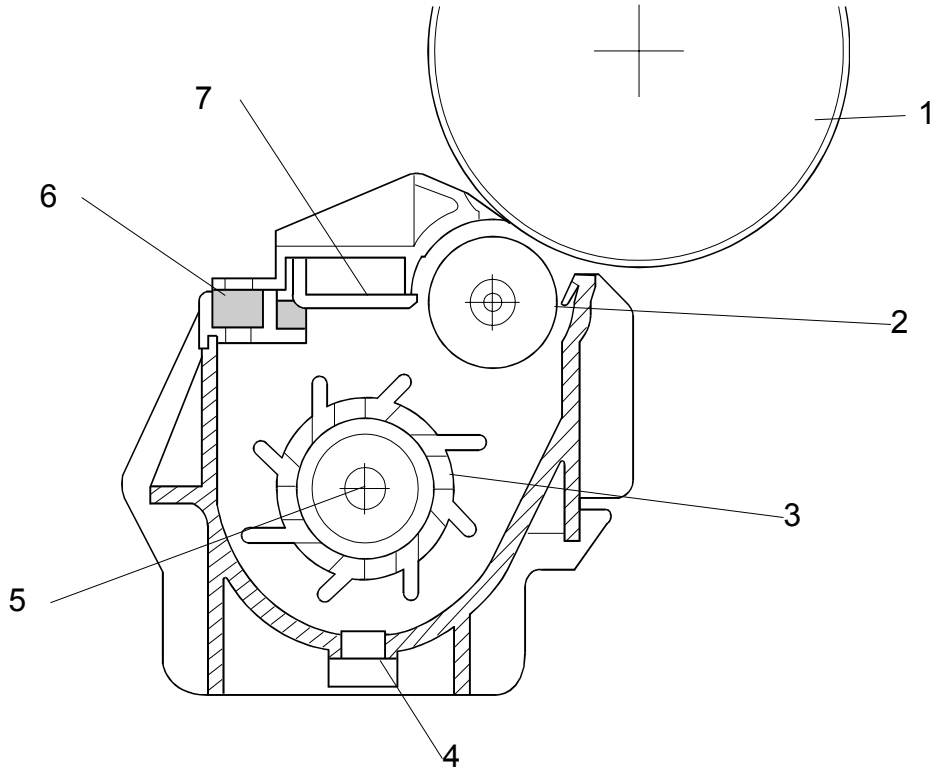
6.8.5 DRUM CHARGE ROLLER CLEANING



The drum charge roller [A], always in contact with the drum, gets dirty easily, so the cleaning pad [B] also remains in contact with the charge roller to clean it. The pin [C] in contact with the cam gear [D] enables the gear to move the cleaning pad from side to side and improve cleaning.

6.9 DEVELOPMENT

6.9.1 OVERVIEW



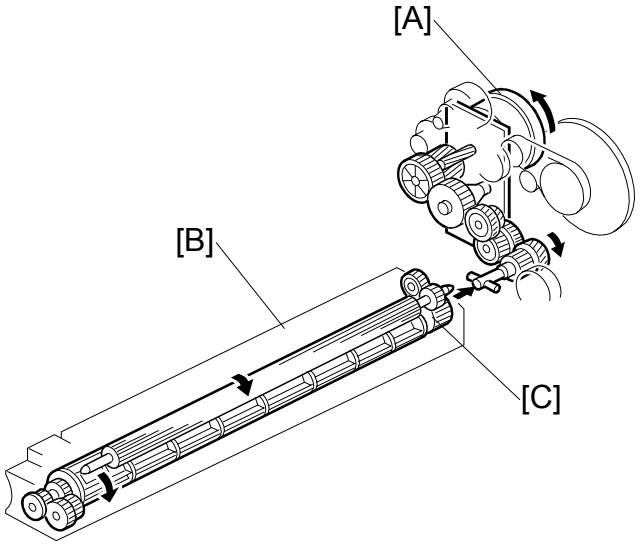
1 Drum
2 Development Roller
3 Paddle Roller
4 TD Sensor
5 Mixing Auger
6 Development Filter
7 Doctor Blade

6.9.2 DRIVE MECHANISM

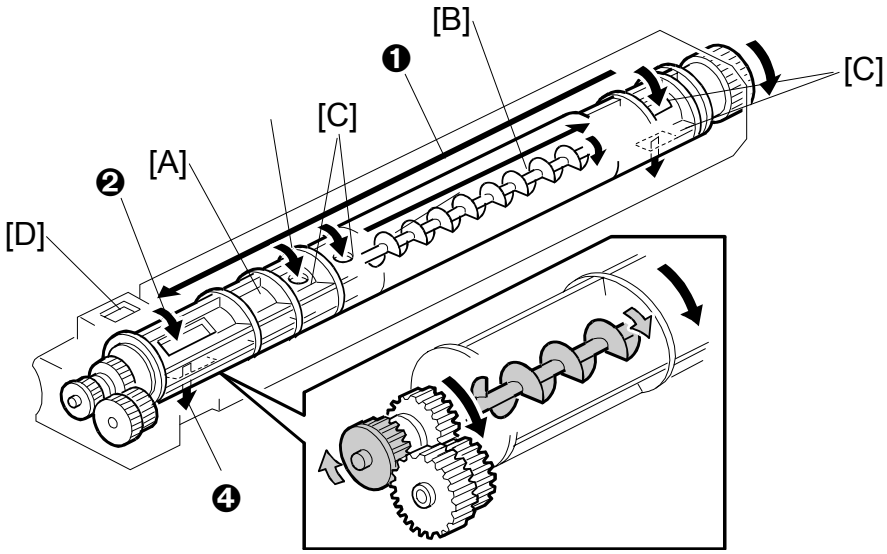
The feed/development motor [A] drives the development roller [B] through the gears and the paddle roller gear [C].

The drive shaft engages and disengages the paddle roller gear when the development unit is inserted into and removed from the machine.

NOTE: The development drive gears are helical gears, quieter than normal gears.



6.9.3 DEVELOPER MIXING



The dual mixing roller consists of the outer paddle [A] and the inner auger [B].

The outer paddle moves developer to the front ❶ and supplies it to the development roller. Developer that spills off by the doctor blade ❷ passes through the holes [C] in the outer paddle, and is transported to the rear ❸ by the inner auger.

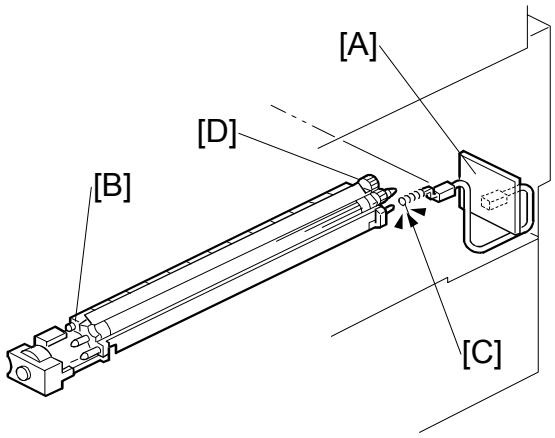
While the dual mixing roller is moving the developer, some developer also passes back to the development unit through the holes in the bottom of the paddle roller ❹. New toner from the toner bottle and recycled toner from the toner collection coil both enter the development unit at [D].

6.9.4 DEVELOPMENT BIAS

Mechanism

Black areas of the latent image are at a low negative charge (about –150 V) and white areas are at a high negative charge (about –950 V).

To attract negatively charged toner to the black areas of the latent image on the drum, the high voltage supply board [A] applies a bias of –510 volts to the development roller throughout the image development process. The bias is applied to the development roller shaft [B] through the bias terminal spring [C] and bias terminal [D].



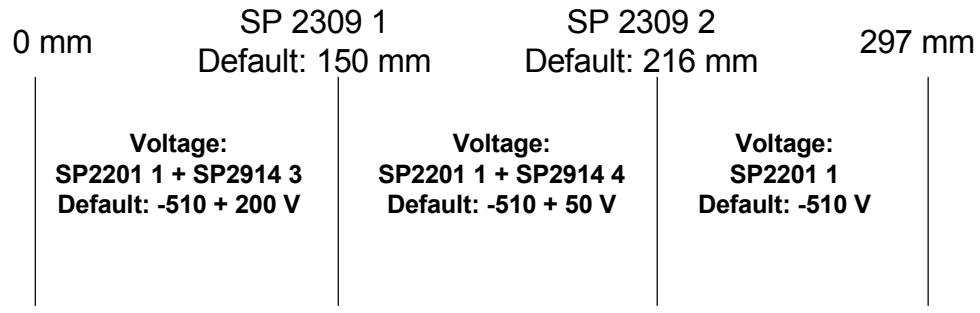
The development bias voltage (-510 V) can be adjusted with SP2-201 (Development Bias).

Correction for paper width and thickness (by-pass tray only)

The by-pass tray can be used for non-standard paper narrow than sizes accepted by the paper trays. Thicker paper, OHP sheets, etc. can also be loaded in the by-pass tray but adjustments must be performed with the SP modes listed below in order to avoid jams and misfeeds.

SP Mode	SP Name	
SP2201 1	Development Bias	Width 216 - 297 mm (Default: -510V)
SP2309 1	Paper Lower Width [a]	Width limit (Default: 150 mm)
SP2309 2	Paper Upper Width [b]	Width limit (Default: 216 mm)
SP2914 3	Process Control Setting (Bγ)	Adjust 10V/step (Default: 200V)
SP2914 4	Process Control Setting (Bδ)	Adjust 10V/step (Default: 50V)

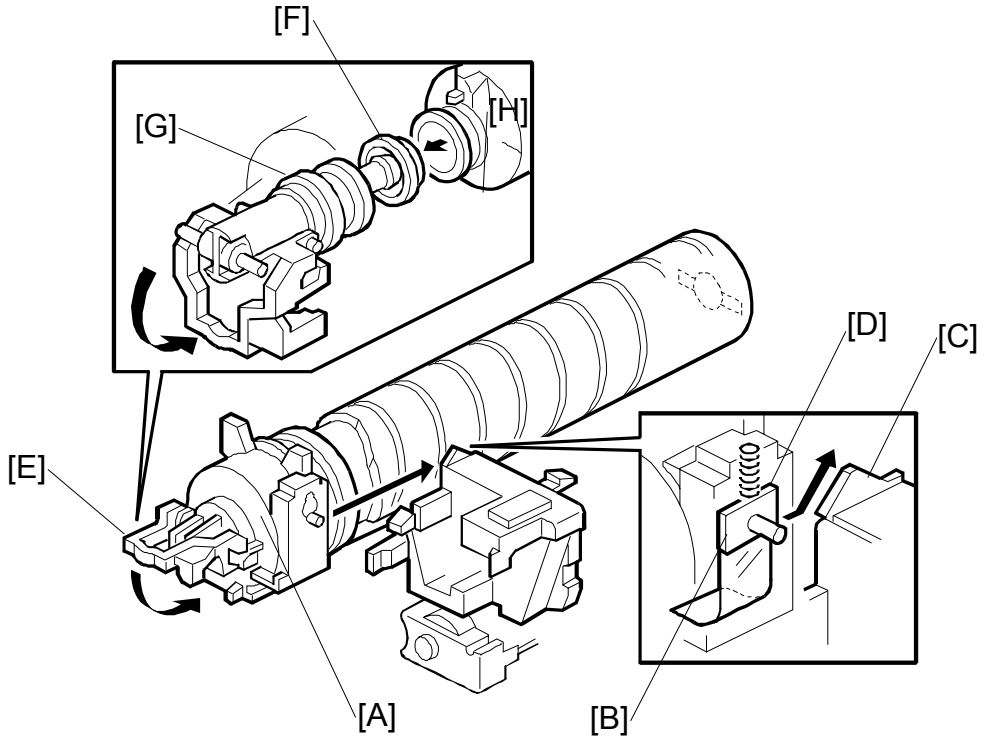
The way that these SP modes are used is shown below.



For example, with the default settings, if the paper width fed from the by-pass tray is 200 mm, the development bias voltage will be –510 + 50 V.

6.9.5 TONER SUPPLY

Toner bottle replenishment mechanism



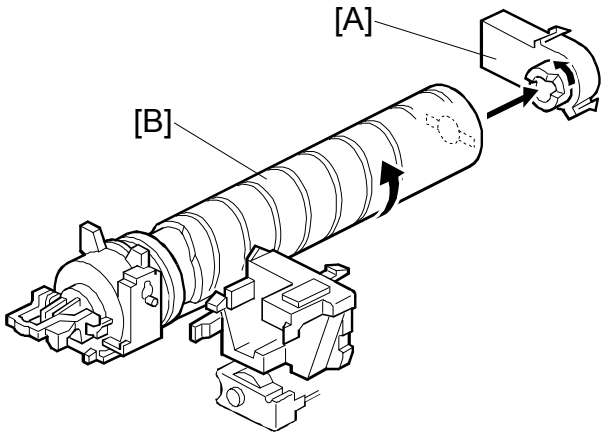
When the toner bottle is installed in the bottle holder [A], pin [B] slides up the side of the PCU [C], pulling out the toner shutter [D]. When the toner bottle holder lever [E] is returned to its original position, the cap [F] pulls away and is kept in place by the chuck [G].

The toner bottle holder lever [E] cannot be lowered when a toner bottle is not installed in the holder. This prevents toner falling out of the holder unit as a result of lowering the handle with no toner bottle installed.

The toner bottle has a spiral groove [H], which rotates the bottle to move toner to the development unit. When the bottle holder unit is pulled out, the chuck [G] releases the toner bottle cap and the toner shutter [D] closes and blocks the opening.

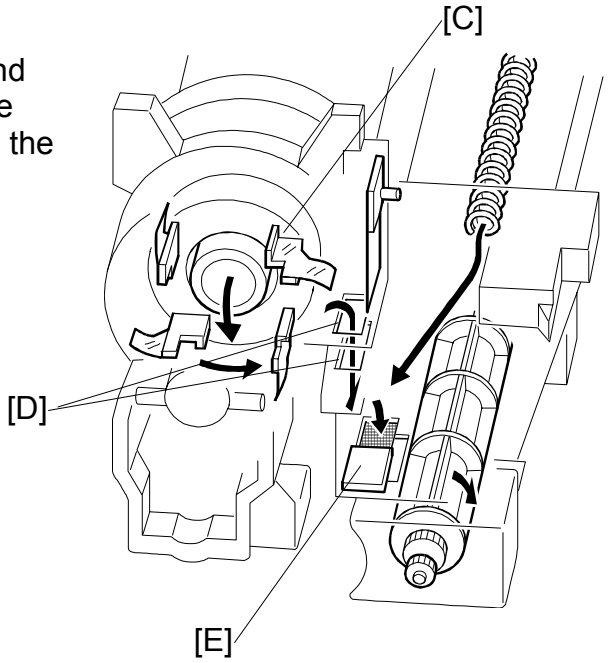
Toner supply mechanism

The toner supply motor [A] rotates the toner bottle [B] and the mylar blades [C].



Toner falls into the toner bottle holder, and the toner supply mylar blades transfer the toner to slit [D]. Installing the PCU opens the shutter [E].

The toner falls into the development unit through the slit.



Toner density control

There are two modes for controlling and maintaining constant toner supply: sensor control (both direct and indirect) and image pixel count control. The mode can be changed with SP2-208-1 (Toner Supply Mode).

NOTE: The factory setting is sensor control mode; image pixel count mode should only be used temporarily until a defective TD or ID sensor can be replaced.

Sensor Control Mode

In the sensor control mode, the amount of toner required to print the page is calculated by the CPU; it adds up the image data value of each pixel and converts the sum to a value between 0 and 255. (255 would mean a completely black page.)

The machine must vary toner supply for each copy in order to maintain the correct amount of toner in the developer and to account for changes in drum reflectivity due to changes in temperature and humidity. The CPU uses data from the TD sensor and ID sensor to determine whether or not the toner supply motor should be switched on and to calculate how long it should remain on in order to supply more toner to the mixture in the development unit.

TD Sensor. When new developer of standard toner concentration is installed, namely 20 g of toner per 500 g of developer (4.0% by weight), the TD sensor must be set to its initial setting of 4.0V with SP2-801. This initial setting is used as the toner supply reference voltage or Vref. For every copy cycle, the TD sensor directly checks the toner density in the developer mixture, and after 10 copies these 10 readings are averaged and this value becomes TD sensor output voltage Vt(10).

The machine compares Vt(10) with Vref. If Vt(10) is greater than Vref, the toner concentration in the development unit judged to be low. When Vt(10) is detected to be greater than Vref 20 times, then this indicates that the toner concentration is consistently low, Vref is incremented by 0.1V, and the conditions are checked again. The result of this check determines the value of K, the toner supply rate coefficient, which is one of the factors that is used in the toner supply motor on-time calculation.

ID Sensor. In addition to comparing Vt(10) from the TD sensor and Vref, after every 10 copies the ID sensor, located at the lower right area of the drum, checks both the reflectivity (Vsg) and the pattern on the drum (Vsp), created by the laser diodes and charge roller. If the reflected light is too strong, this indicates that toner is low and toner is added to the development unit. (The frequency of these checks can be adjusted with SP2-210 (ID Sensor Pattern Interval).

Image Pixel Count Mode

This mode should only be used only as a temporary measure while waiting for replacement parts, such as a TD sensor. This mode controls the toner supply amount using the same method for determining the toner bottle motor on time. However, the values that were in effect when the toner density control mode was changed over to image pixel count mode with SP2-208-1 (Toner Supply Mode) remain in effect and cannot be changed.

6.9.6 TONER NEAR END/END DETECTION

The toner near-end condition is detected based on the Vt(10) output from the TD sensor. If the difference between Vref (toner supply reference voltage) and Vt (10) is less than or equal to –0.45, then toner concentration is judged be very low and K (the toner supply coefficient) is set to 0.25, the machine enters the toner near end condition and the machine switches on the toner supply motor.

If a difference greater than –0.45 is detected, then toner concentration is judged as low but the machine does another test by comparing Vref and Vt (10). If the machine determines that Vt (10) is greater than Vref 40 times, the toner supply motor switches on and remains on for twice the time that Vt (10) was greater than Vref. If the toner concentration is still low, then the machine enters the toner near end condition.

The final toner end is detected using the ID sensor. If the ID sensor detects that the ID sensor pattern is very light (Vsp drops below 2.0V), then the sensor triggers the toner end condition.

If Vsp is less than 2.0V, the density of the ID sensor pattern is very light, so the machine detects the toner end condition. However, if Vsp remains higher than 2.0V but 90 copies have been made after toner near end was determined, the machine enters the toner end condition.

NOTE: The number of copies between toner near-end and toner end can be changed with SP2-213. The default is 90 copies.

6.9.7 TONER END RECOVERY

If the front door is opened and then closed while a toner near end/end condition exists, the machine will attempt to recover. When the front door is closed, the toner supply motor turns on to supply toner. The machine checks the TD sensor output 2 seconds after the main motor turns on (Vtp), and the sensor is checked again every 1 second (Vtp^1)

The machine detects the toner concentration using Vref, Vt (10), Vtp, and Vtp^1. If the toner concentration is still too low, the toner supply motor remains on for another 10 seconds while the machine checks Vt. If toner concentration is judged to be at the standard level, then the toner near end/end condition is cancelled and K (toner supply coefficient) is reset. If toner concentration has not reached the standard level, the toner supply motor rotates continuously until it does (maximum motor on time is 16 seconds) and then it will switch off.

6.9.8 TONER SUPPLY WITH ABNORMAL SENSORS

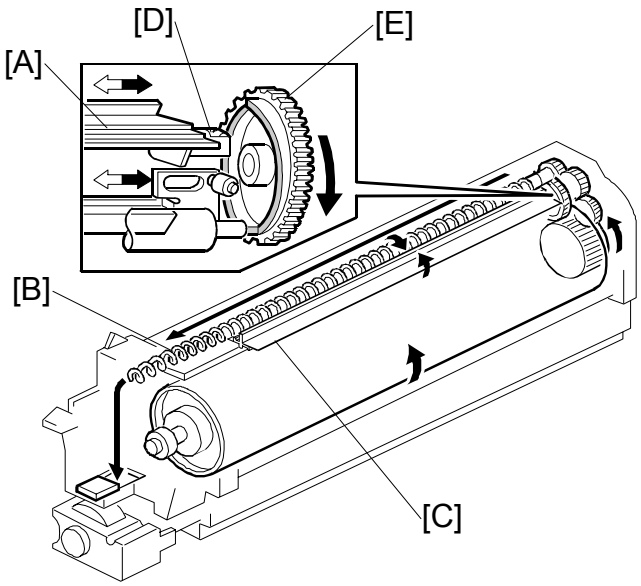
The TD sensor is checked every copy. If the readings from the TD sensor become abnormal during a copy job, the machine holds the GAIN factor constant (GAIN is normally calculated from TD sensor readings) to allow toner supply to vary with only pixel count for the rest of the copy job. Then at the end of the copy job, an SC code is generated and the machine must be repaired.

The ID sensor is checked every 10 copies. If readings become abnormal, an SC code is generated and the machine must be repaired. If this happens during a copy job, Vref is not changed, the copy job is allowed to finish, and then the SC code is generated.

If spare parts are not available, the technician can use SP2-208-1 to temporarily put the machine in image pixel count mode. (☛ Chapter 5 Service Tables)

6.10 DRUM CLEANING AND TONER RECYCLING

6.10.1 DRUM CLEANING

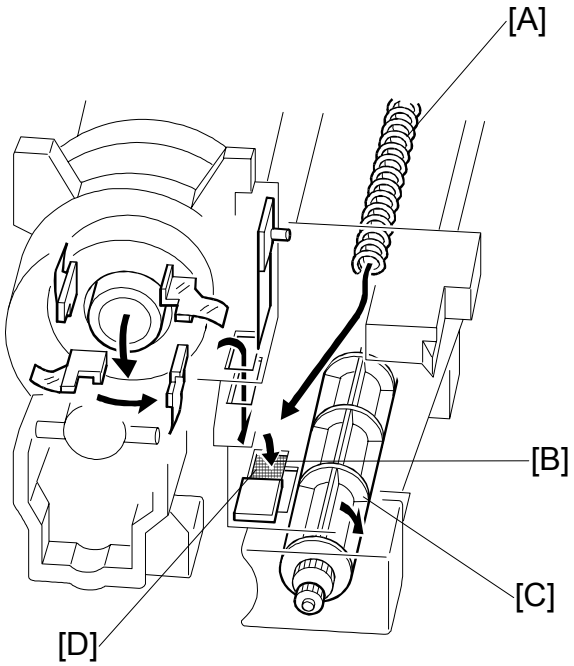


This machine employs a counter blade system. After the image is transferred to paper, a cleaning blade [A] removes any toner remaining on the drum. The toner collection coil [B] carries scraped off toner to the toner collection plate [C].

The collar [D] on the cleaning blade bracket contacts the outer rim of cam gear [E], which moves the cleaning blade side to side. This side-to-side movement disperses accumulated toner to prevent early blade edge wear at one location.

The drum reverses about 5 mm after every copy job to remove particles on the edge of the cleaning blade.

6.10.2 TONER RECYCLING

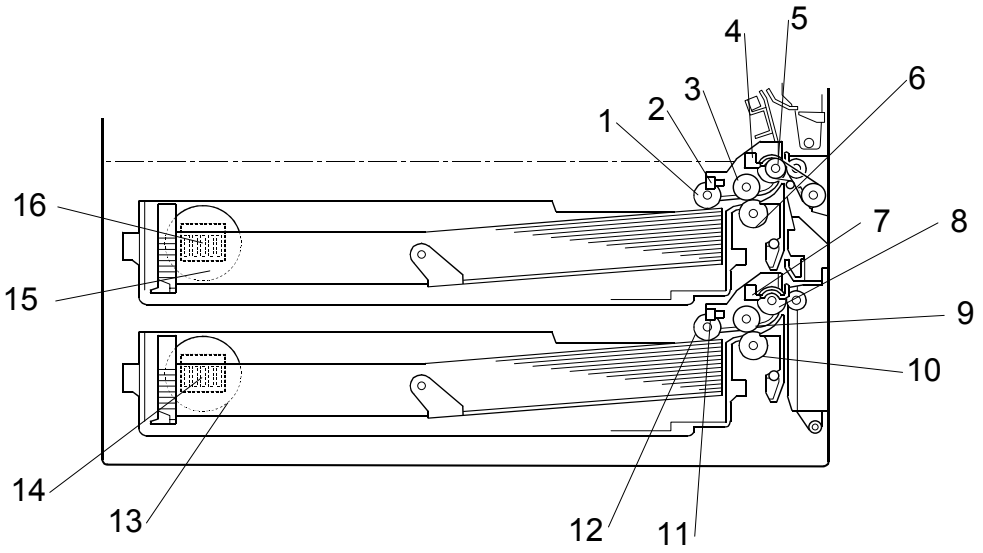


Toner collected by the toner collection coil [A] is transported to the opening [B]. This toner falls into the development unit with new toner coming from the toner bottle. The paddle roller [C] mixes the collected toner with the new toner.

NOTE: A screen filter [D) has been added to strain out paper dust and other foreign matter.

6.11 PAPER FEED

6.11.1 OVERVIEW



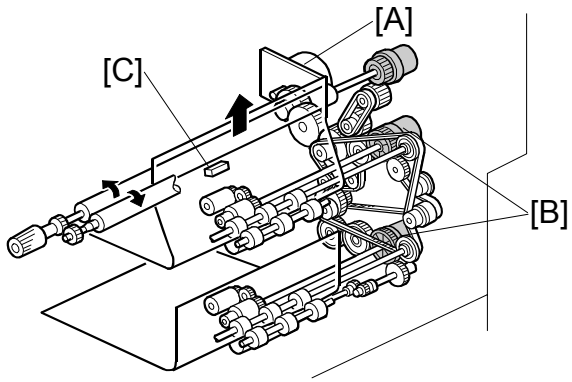
1	Upper pick-up roller	9	Lower paper feed roller
2	Upper paper height sensor	10	Lower separation roller
3	Upper paper feed roller	11	Lower paper height sensor
4	Upper relay sensor	12	Lower pick-up roller
5	Upper relay roller	13	Lower paper size dial
6	Upper separation roller	14	Lower paper size switch
7	Lower relay sensor	15	Upper paper size dial
8	Lower relay roller	16	Upper paper size switch

Each paper tray, which employs the FRR system, can hold 500 sheets. Two relay sensors, positioned above each set of relay rollers, detect paper jams. A selection dial allows you to select the setting for the size of the paper loaded in the tray.

6.11.2 PAPER FEED DRIVE

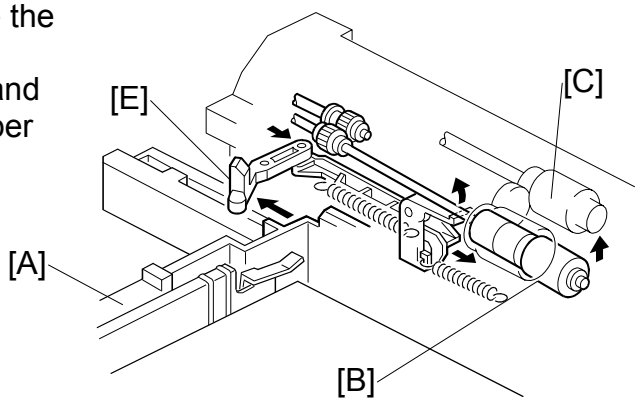
The feed/development motor [A] drives the pick-up and feed mechanism of both the upper and second paper feed stations through gears and the paper feed clutches [B].

When the paper feed clutch turns on, the pick-up roller, paper feed roller, and separation roller start rotating to feed the paper. The paper feed clutch stays on until shortly after the registration sensor [C] actuates.

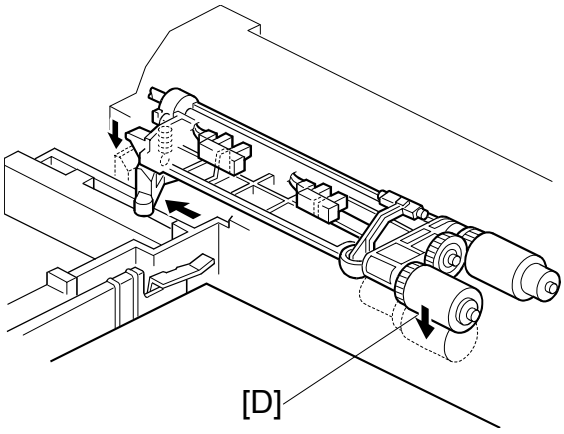


6.11.3 PICK-UP AND SEPARATION ROLLER RELEASE MECHANISM

When the paper tray [A] is not inside the machine, the separation roller [B] is away from the paper feed roller [C] and the pick-up roller [D] stays in the upper position.

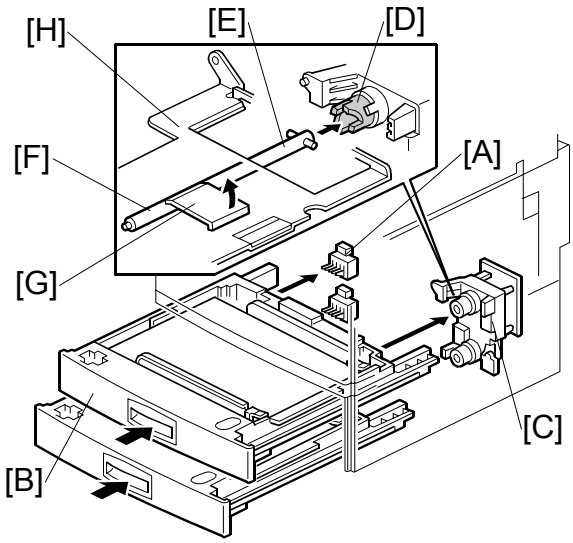


When the paper tray is set into the machine, it pushes the release lever [E]. This causes the pick-up roller [D] to go down and the separation roller [B] to move up and contact the paper feed roller.

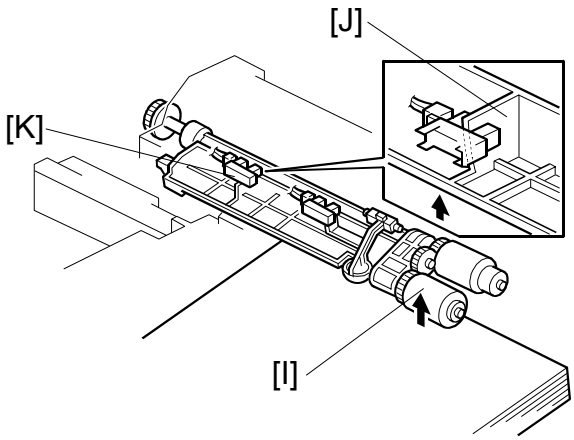


6.11.4 PAPER LIFT

The paper size switch [A] detects when the paper tray [B] is set in the machine, and the tray lift motor [C] rotates, and the coupling gear [D] on the tray lift motor engages the pin [E] on the lift arm shaft [F]. Then the tray lift arm [G] lifts the tray bottom plate [H].



When the paper tray is set in the machine, the pick-up roller [I] lowers. When the top sheet of paper reaches the proper height for paper feed, the paper pushes up the pick-up roller, and the actuator [J] on the pick-up roller supporter activates the paper height sensor [K] to stop the tray lift motor.



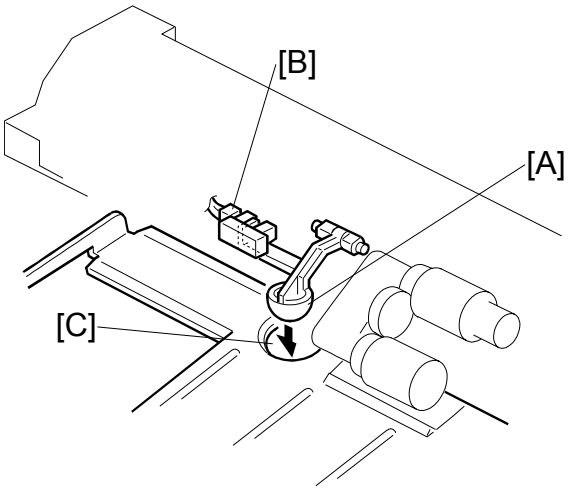
After several paper feed cycles, the paper level gradually lowers and the paper height sensor is de-activated. The tray lift motor turns on again until this sensor is activated again.

When the paper tray is removed from the machine, the tray lift motor coupling gear disengages the pin on the lift arm shaft, and the tray bottom plate then drops under its own weight.

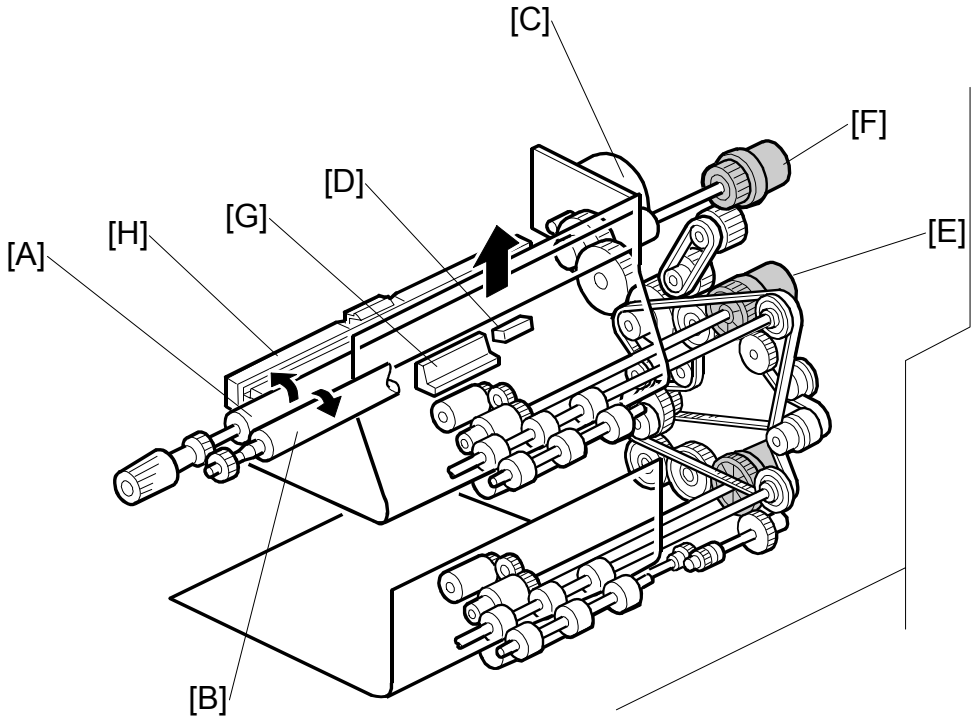
6.11.5 PAPER END DETECTION

If there is paper in the paper tray, the paper end feeler [A] is raised by the paper stack, and the paper end sensor [B] is deactivates.

When the paper tray runs out of paper, the paper end feeler drops into the cutout [C] in the tray bottom plate and the paper end sensor is activated.



6.11.6 PAPER REGISTRATION



The registration drive roller [A] and idle roller [B] correct the skew of the paper to ensure that the leading edge of the paper is positioned correctly at the drum. The paper feed/development motor [C] drives the registration mechanism.

The registration sensor [D] is positioned just before the registration rollers. When the leading edge activates the registration sensor, the registration clutch is switched off and the registration rollers stop turning. However, the relay clutch [E] remains on slightly longer. This delay allows more time for the paper to press against the registration rollers and buckle slightly to correct any skew. The registration sensor also detects misfeeds.

Next, the registration clutch [F] actuates and the relay clutch at the correct time to align the paper with the image on the drum. The registration rollers then feed the paper to the image transfer section.

Two new dust blades have been added around the registration roller. The idle roller dust blade [G] cleans the registration idle roller. This dust blade has a small dust box that collects paper dust that must be emptied periodically.

The registration roller dust blade [H] cleans the registration roller. For details about how to remove and clean these new parts, see Section “3 Replacement and Adjustment”.

6.11.7 PAPER SIZE DETECTION

The paper size switch includes four microswitches. Actuators behind the paper size dial actuate the sensors.

Each paper size has its own actuator, with a unique combination of notches. To determine the paper size, the CPU reads which switches the actuator has turned on.

The CPU disables paper feed from a tray if the paper size cannot be detected. If the paper size actuator is broken, or if there is no tray installed, the printer control board recognizes that the paper tray is not installed.

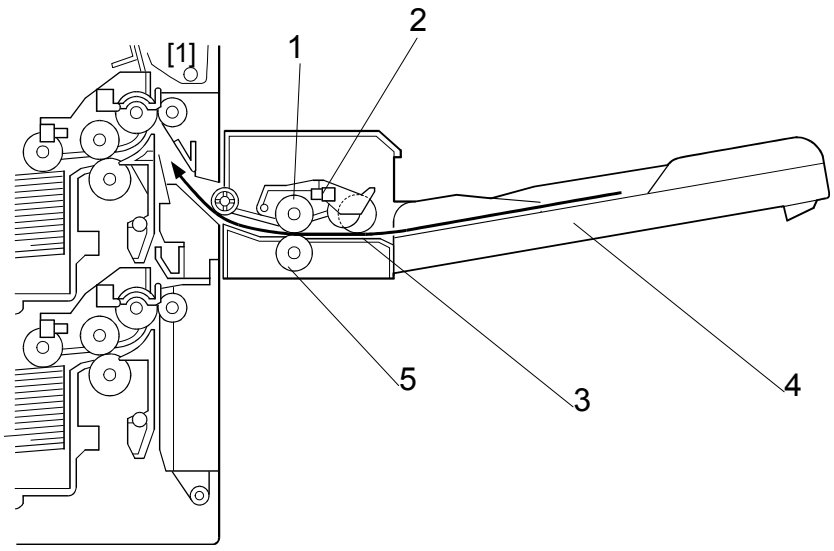
When the paper size actuator is at the "✻" mark, the paper tray can be set up to accommodate one of a wider range of paper sizes by using one of the user tools on the machine's operation panel.

Models		Paper Size Switch			
North America	**Europe/Asia**	**1**	**2**	**3**	**4**
8 1/2" x 13" Portrait	A3 Portrait	ON	ON	OFF	ON
A4 Landscape	A4 Landscape	ON	ON	ON	ON
A4 Portrait	A4 Portrait	ON	OFF	ON	ON
11" x 17" Portrait	A5 Portrait	OFF	OFF	ON	ON
8 1/2" x 14" Portrait	8" x 13" Portrait	ON	OFF	OFF	OFF
8 1/2" x 11" Portrait	8 1/2" x 11" Portrait	ON	ON	OFF	OFF
8 1/2" x 11" Landscape	8 1/2" x 11" Landscape	ON	OFF	ON	OFF
✻	✻	ON	ON	ON	OFF

ON: Pushed OFF: Not Pushed

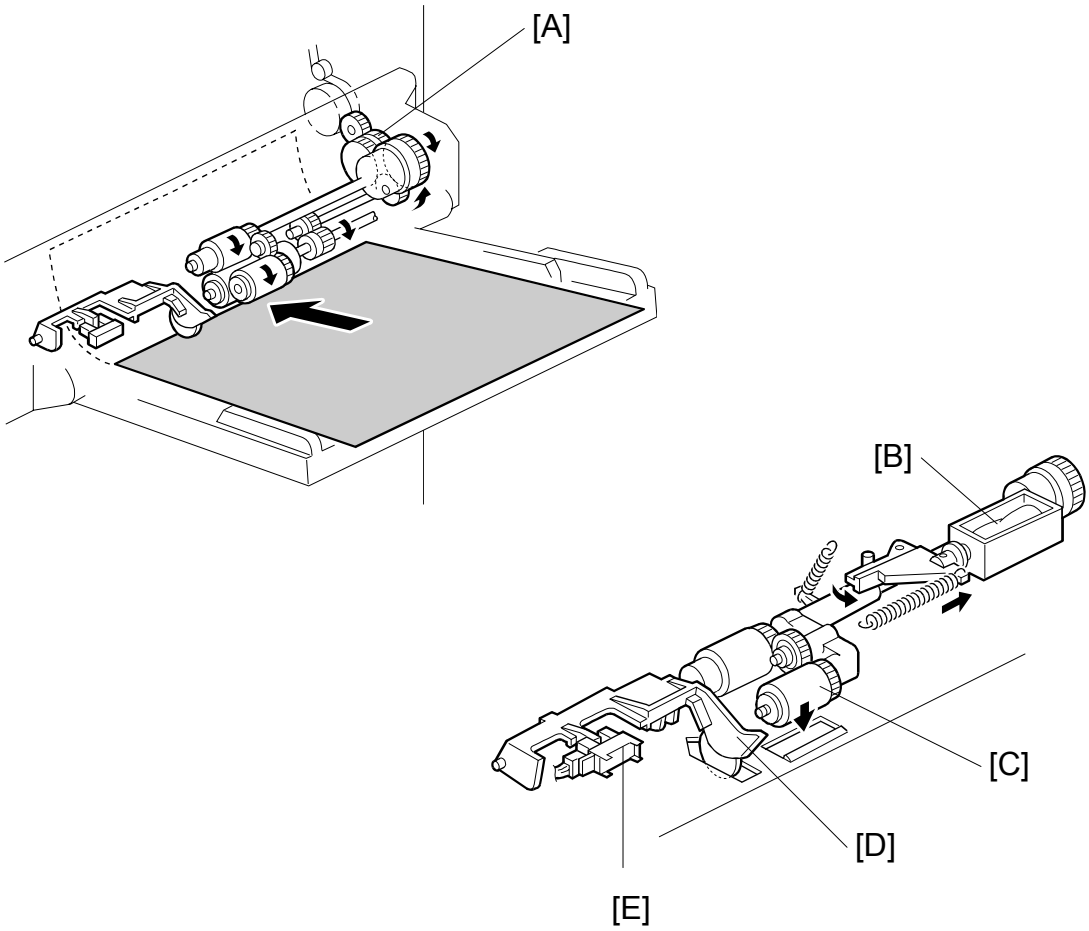
6.12 BY-PASS TRAY

6.12.1 OVERVIEW



1	Paper feed roller
2	Paper end sensor
3	Pick-up Roller
4	By-pass Tray
5	Separation roller

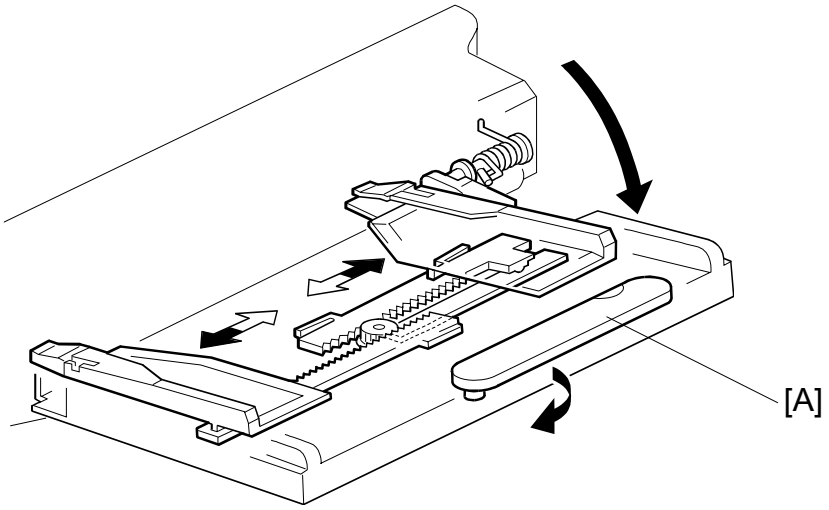
6.12.2 BY-PASS TRAY OPERATION

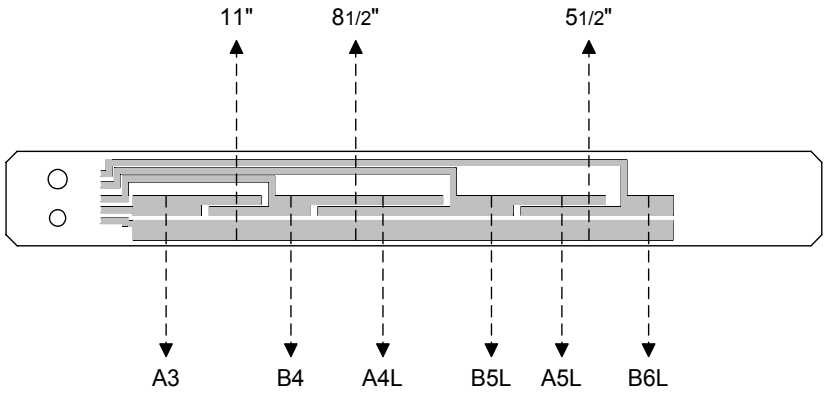


The by-pass unit is directly driven by the copier through gear [A].

When the print key is pressed, the pick-up solenoid [B] turns on and the pick-up roller [C] moves onto the paper. When the by-pass tray runs out of paper, the paper end feeler [D] drops into the cutout in the by-pass tray and the paper end sensor [E] is activated.

6.12.3 BY-PASS PAPER SIZE DETECTION



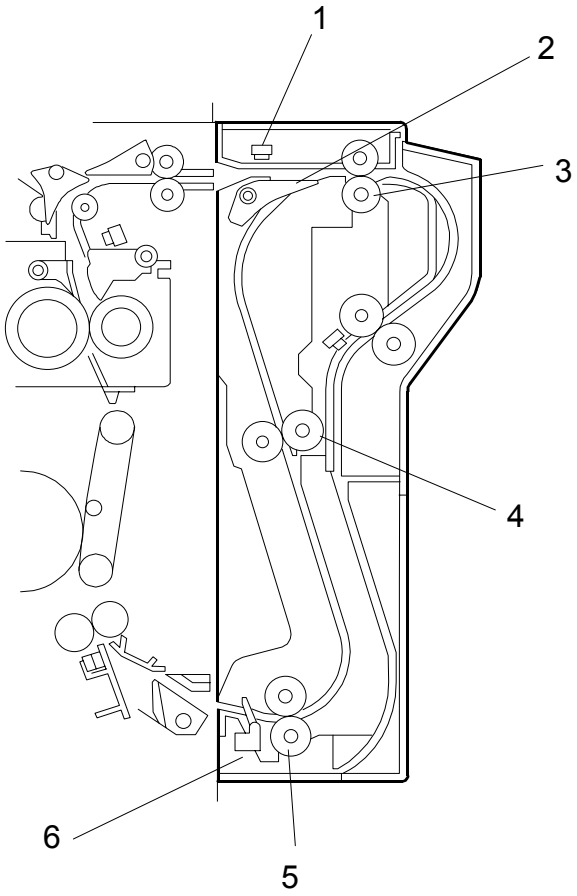


The paper size sensor board [A] monitors the paper width.

The rear side fence is connected to the terminal plate. The pattern for each paper width is unique. Therefore, the copier determines which paper has been placed in the by-pass tray by the signal output from the board. However, the copier does not determine the paper length from the by-pass tray hardware.

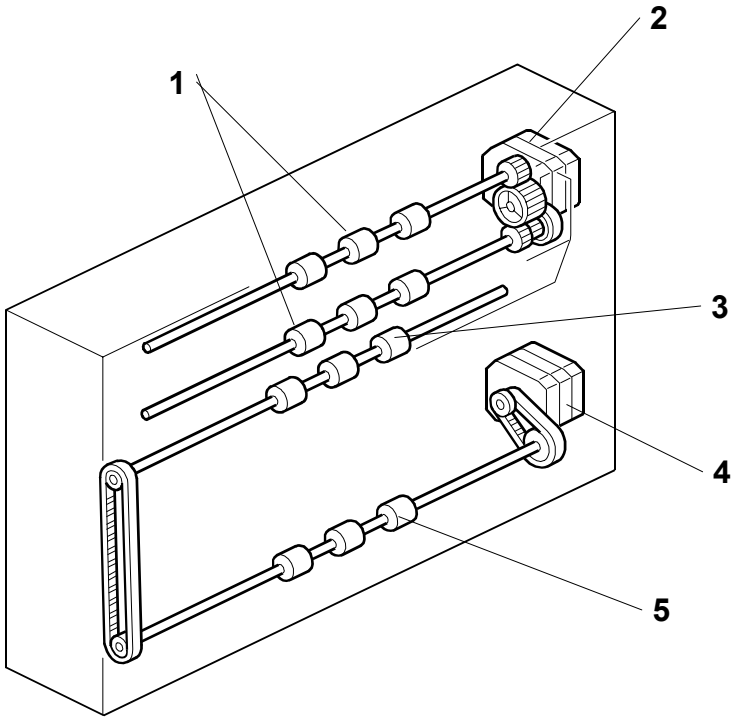
6.13 DUPLEX UNIT

6.13.1 OVERVIEW



1	Entrance sensor	4	Upper transport roller
2	Inverter gate	5	Lower transport roller
3	Inverter roller	6	Exit sensor

6.13.2 DUPLEX DRIVE LAYOUT



1	Inverter roller	4	Transport motor
2	Inverter motor	5	Lower transport roller
3	Upper transport roller		

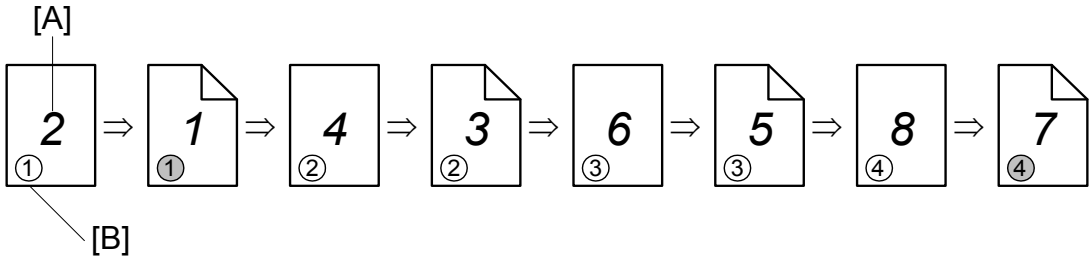
6.13.3 DUPLEX BASIC OPERATION

To increase the productivity of the duplex unit, copies are printed as follows.

Larger than A4 lengthwise/LT lengthwise

The duplex unit can store only one sheet of copy paper.

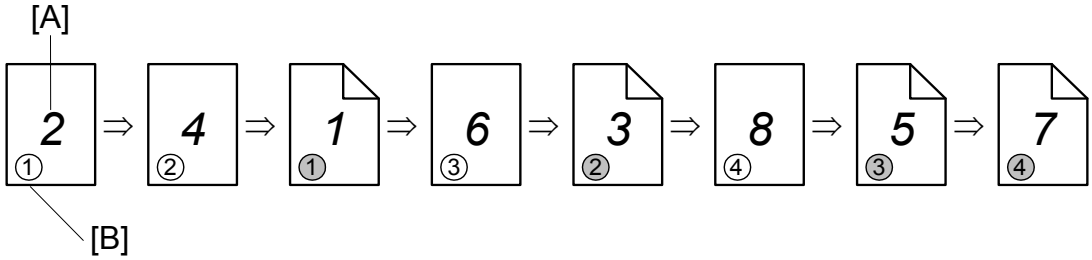
Example: 8 pages. The number [A] in the illustration shows the order of pages. The number [B] in the illustration shows the order of sheets of copy paper (if shaded, this indicates the second side).



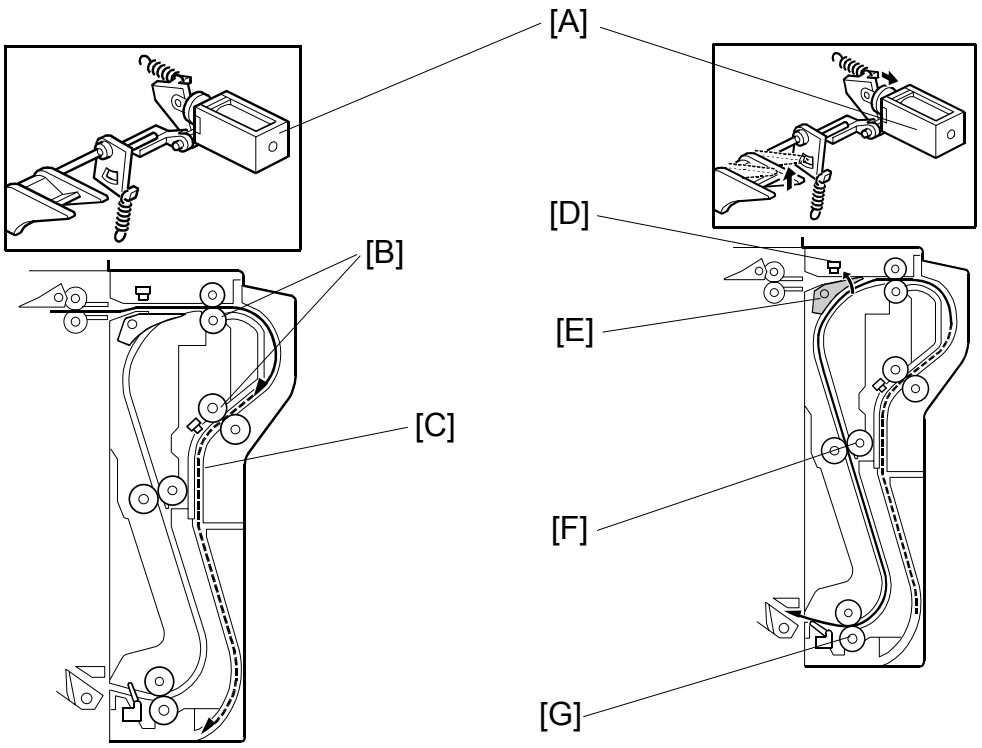
Up to A4 lengthwise/LT lengthwise

The duplex unit can store two sheets of copy paper

Example: 8 pages. The number [A] in the illustration shows the order of pages. The number [B] in the illustration shows the order of sheets of copy paper (if shaded, this indicates the second side).



6.13.4 DUPLEX UNIT FEED IN AND EXIT MECHANISM



Feed-in

The inverter gate solenoid [A] stays off and the inverter rollers [B] rotate clockwise. A sheet of paper is sent to the inverter section [C].

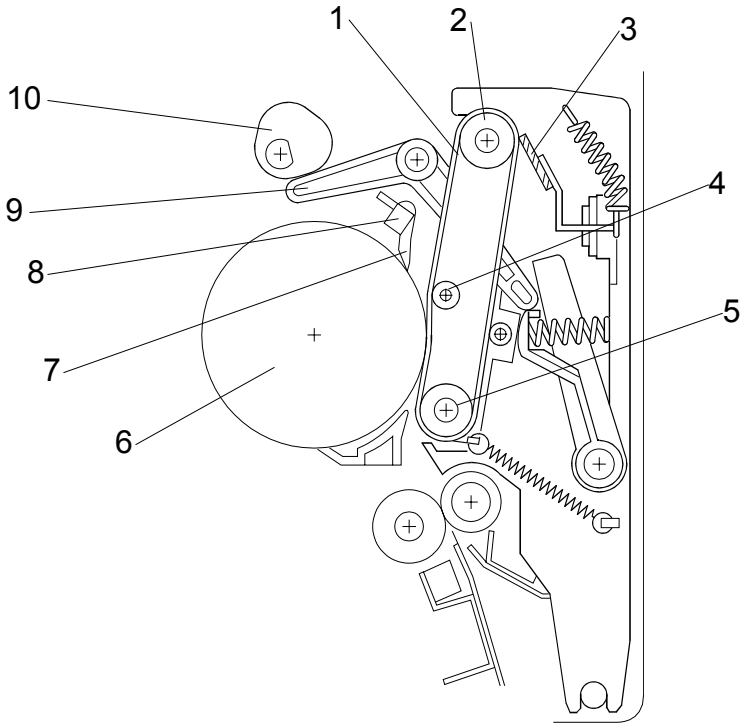
NOTE: The cover guide has been eliminated in order to accommodate paper sizes longer than A4/LT in the reverse feed path which has been lengthened in the design of this machine.

Inversion and Exit

The inverter gate solenoid turns on and the inverter motor turns on in reverse shortly after the trailing edge of the paper passes through the entrance sensor [D]. As a result, the inverter gate [E] is opened and the inverter roller rotates counterclockwise. The paper is sent to the copier through the upper and lower transport rollers [F, G].

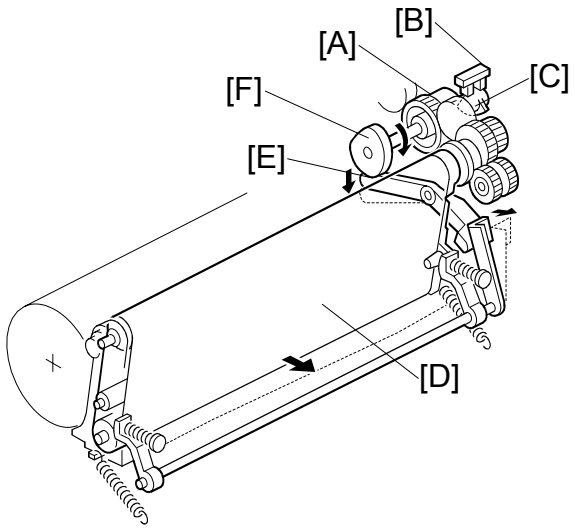
6.14 IMAGE TRANSFER AND PAPER SEPARATION

6.14.1 OVERVIEW



1	Transfer belt	6	OPC
2	Drive roller	7	Pick-off pawls
3	Transfer belt cleaning blade	8	ID sensor
4	Transfer roller	9	Contact lever
5	Idle roller	10	Transfer belt contact clutch

6.14.2 BELT DRIVE MECHANISM

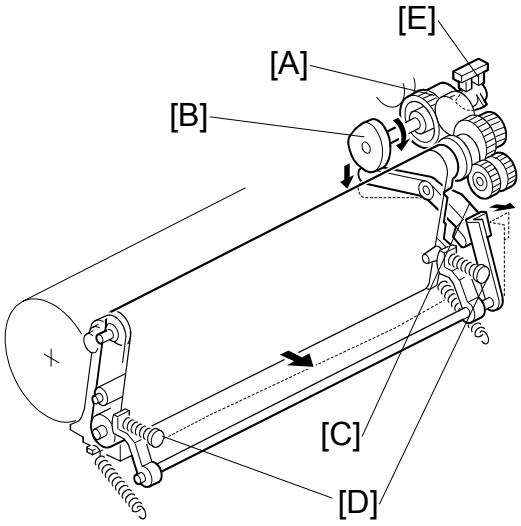


After the main motor switches on during copying, the transfer belt contact clutch [A] switches on after a specified interval and the cam [F] makes a half-turn to raise the contact lever [E] and bring the transfer belt [D] into contact with the drum.

The actuator [C], on the same axis as the cam, and the transfer belt position sensor [B] detect whether the drum and transfer belt are in contact.

When the main motor is off, or when the ID sensor pattern is being measured, the transfer belt unit separates from the drum. The ID sensor pattern must not be transferred to the belt. Also, the transfer belt and drum must not remain in contact for too long, to prevent contamination of the drum with oil or other foreign material from the transfer belt.

6.14.3 TRANSFER BELT UNIT CONTACT MECHANISM

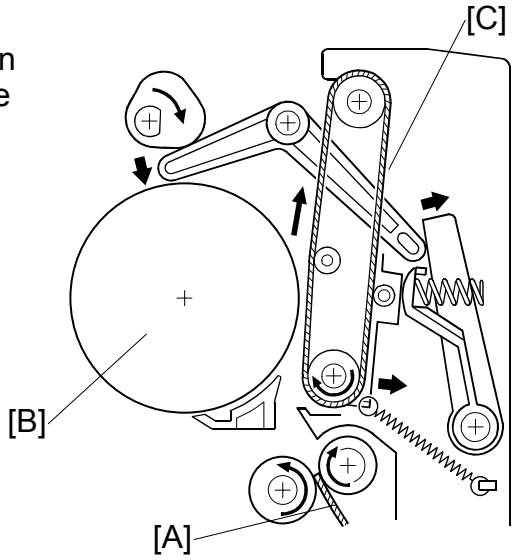


The belt contact and release mechanism consists of the belt contact clutch [A], cam [B], and contact lever [C]. The belt contact clutch turns on and the cam attached to the clutch rotates half a complete rotation. The contact lever, riding on the cam, is lifted up and the spring [D] pushes the belt into contact with the drum.

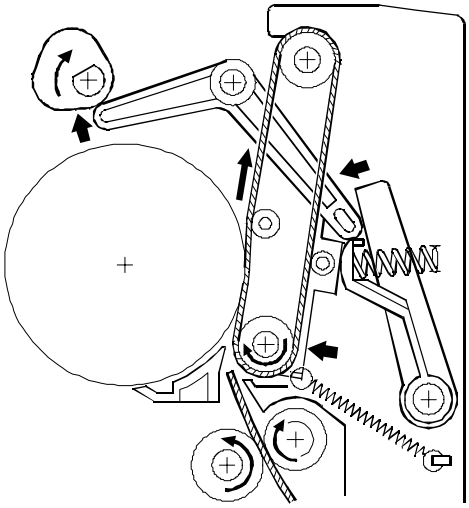
The transfer belt position sensor [E] detects the home position of the cam (this is when the belt is away from the drum). The belt must be released from the drum between copy jobs in order to prevent the ID sensor pattern from being rubbed off and to prevent contamination of the drum from the surface of the belt.

6.14.4 IMAGE TRANSFER AND PAPER SEPARATION MECHANISM

When the registration clutch switches on to align the leading edge of the paper [A] with the image on the drum [B], the transfer belt is [C] is away from the drum.

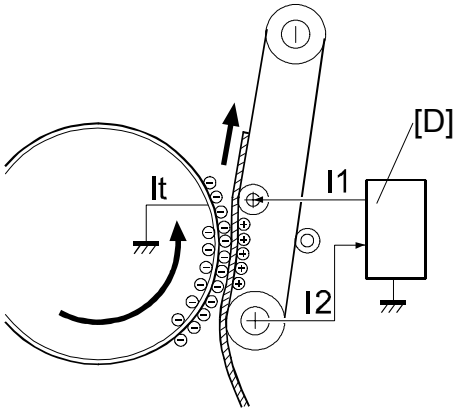


At the designated time after the main motor switches on, the transfer belt contact clutch switches on and the transfer belt touches the drum.



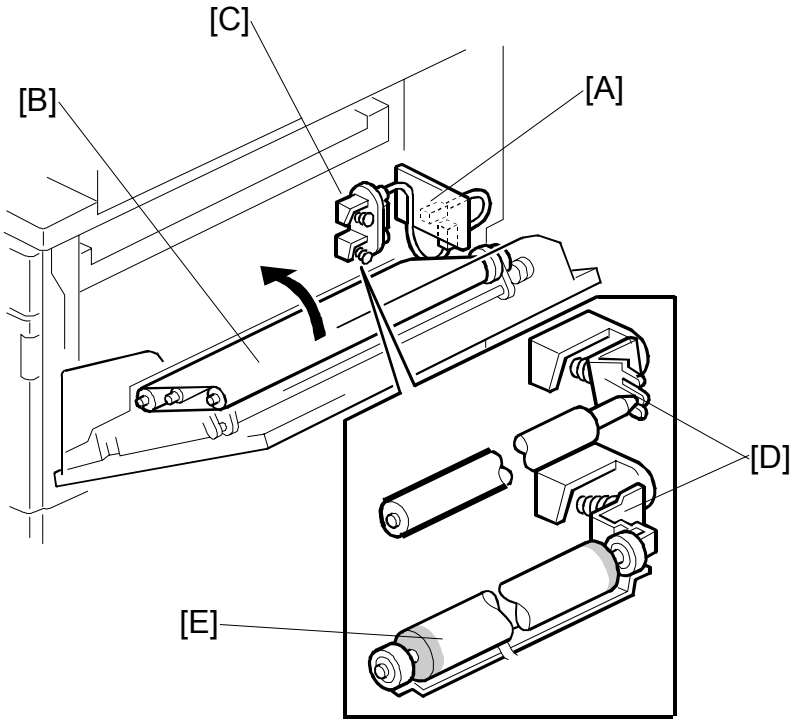
When the paper enters the gap between the belt and the drum, the high voltage supply board [D] applies a high positive current to the belt to transfer the image to the paper.

After receiving the image from the drum, the paper is fed by the belt. The paper moves to the end of the transfer belt unit, where it separates from the belt as the belt curves away and moves on to the fusing unit.



6.14.5 TRANSFER BELT CHARGE

Mechanism



The high voltage supply board [A] applies the positive current to the transfer belt [B] through the terminal block [C], terminal plate [D], and the bias roller [E].

The high voltage supply board adjusts the current to the roller to keep a small but constant current flow to ground through the belt, paper, and drum. If this current is not kept constant, efficiency of toner transfer and paper separation will vary with paper thickness, type, environmental condition, or changes in transfer belt surface resistance.

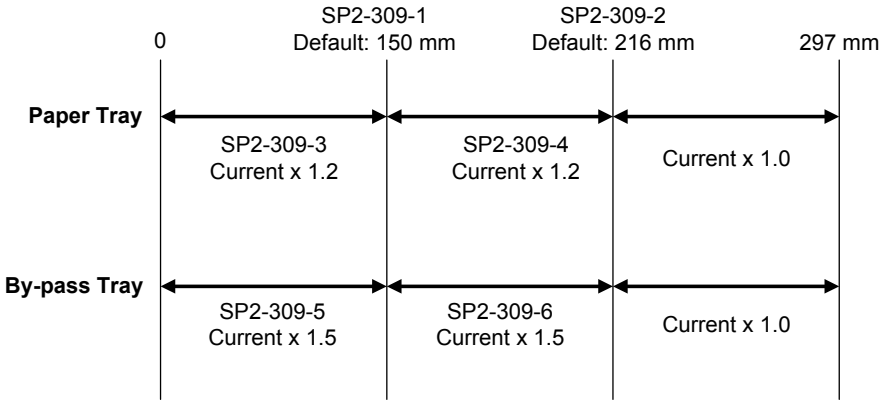
Correction for paper width and thickness

A range of SP modes is available in order to adjust the machine so it can handle papers of non-standard size and thickness.

For paper width, there are two thresholds. The factory settings are 150 mm (5.9”) and 216 mm (8.5”). Below 216 mm, the transfer current can be increased. By default, the current is multiplied by 1.2 for the main machine paper trays. For paper widths below 150 mm, the transfer current can be set higher, but by default it is kept the same as the current for paper widths below 216 mm. The higher current allows for the tendency of the current to flow directly from the transfer belt to the drum and not through the paper which could cause an insufficient amount of toner to transfer to narrow width paper.

Thick paper must be fed from the by-pass tray because SP modes are available only for the by-pass tray in order to accommodate thick paper. By default, the current for paper narrower than 216 mm is 1.5 times the normal current.

This illustration shows the SP modes, which control these currents. The base transfer current (‘current’ in the diagram) depends on SP 2-301. This is different for various parts of the image, and is different for the by-pass tray; see the next page for details.



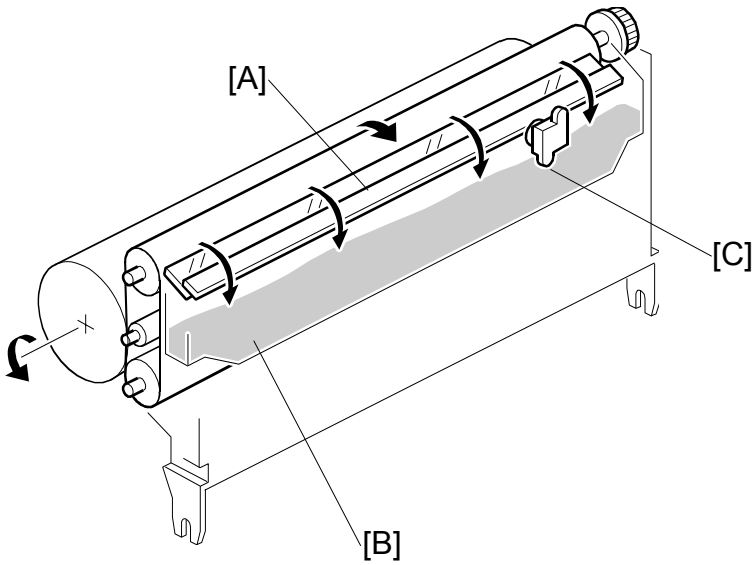
Currents applied to leading edge and image areas, and for by-pass feed

Transfer current can also be adjusted for the leading edge and the image area, and for by-pass feed. The timing for starting to apply leading edge current, for the switchover from leading edge current to image area current, and for switching off at the trailing edge can also be changed.

The table below lists the SP modes you can use to adjust these settings.

SP2-301 Transfer Current Adjustment		
Image areas	SP2-301-1	1st Side of Paper
	SP2-301-2	2nd Side of Paper
	SP2-301-4	By-pass Feed
Leading edge areas	SP2-301-3	Leading Edge
	SP2-301-5	Leading Edge By-pass Feed
SP2-911 Transfer Current Timing		
Timing	SP2-911-1	On Timing
	SP2-911-2	Switch Timing
	SP2-911-3	Off Timing

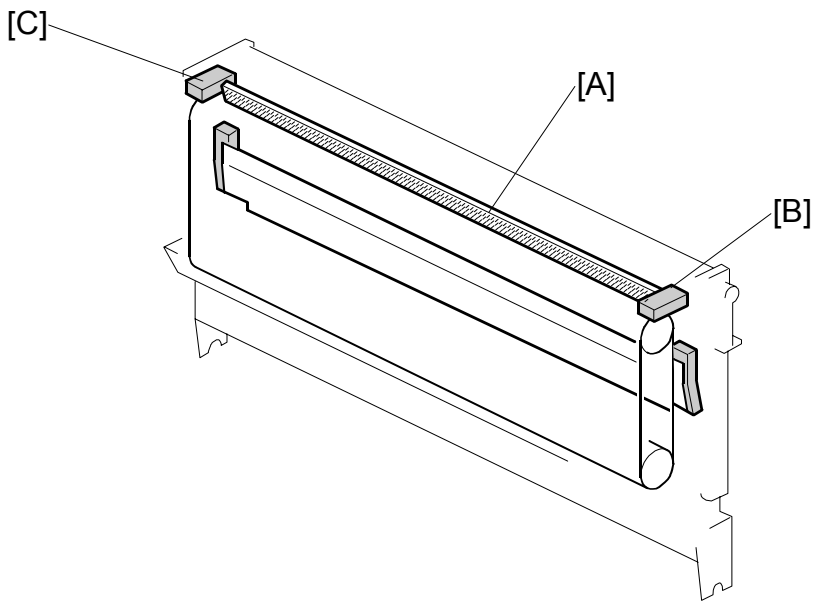
6.14.6 TRANSFER BELT CLEANING MECHANISM



The cleaning blade [A], always in contact with the transfer belt, scrapes off toner and paper dust remaining on the transfer belt.

Scraped off toner and paper dust falls into the toner collection tank [B] in the transfer belt unit. This toner is not recycled. When the toner overflow sensor [C] detects toner overflow, the toner overflow indicator lights. Up to 999 copies can be made before the toner overflow condition shuts down the machine.

6.14.7 TONER SCATTER PREVENTION

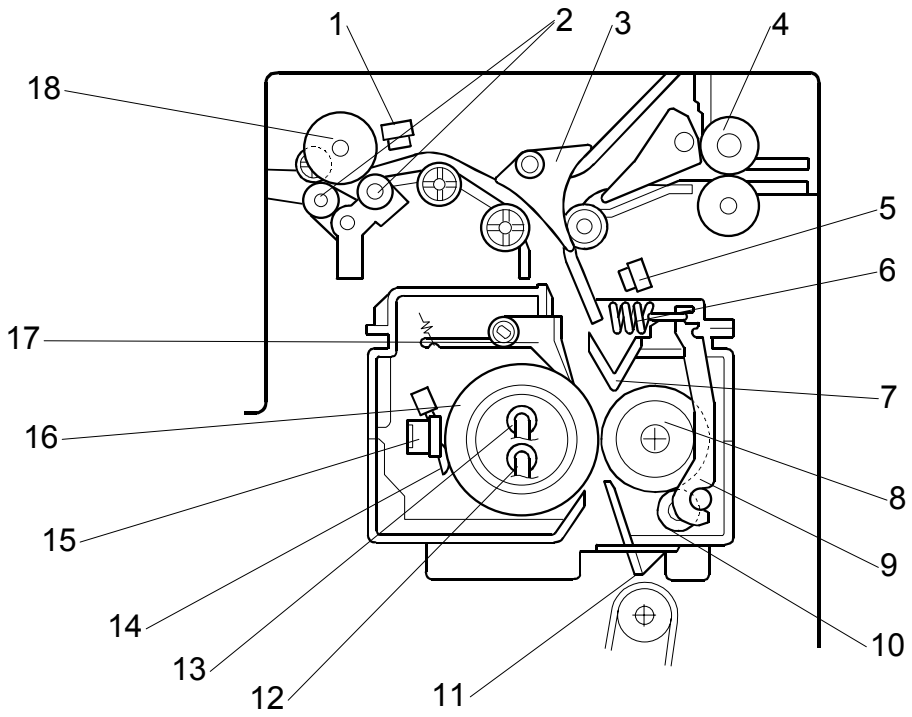


To reduce the incidence of toner scanner, the sponge strip has been replaced with a velvet strip [A] that extends across the length of the transfer belt unit.

At each end of the strip [B] and [C] new seals have been added.

6.15 IMAGE FUSING AND PAPER EXIT

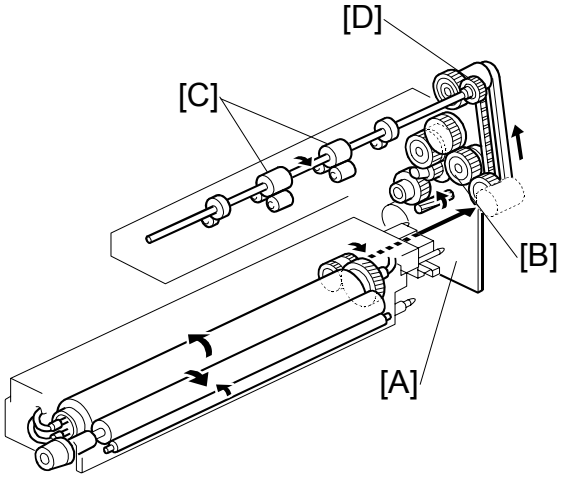
6.15.1 OVERVIEW



1	Paper exit sensor	10	Cleaning roller
2	De-curler rollers 1, 2	11	Entrance guide
3	Junction gate	12	Fusing lamp (center)
4	Idle roller (duplex unit)	13	Fusing lamp (ends)
5	Fusing unit exit sensor	14	Thermistors (central/end)
6	Spring	15	Thermostat (central/end)
7	Fusing exit guide plate	16	Hot roller
8	Pressure roller	17	Hot roller strippers
9	Pressure arm	18	Exit roller

6.15.2 FUSING DRIVE

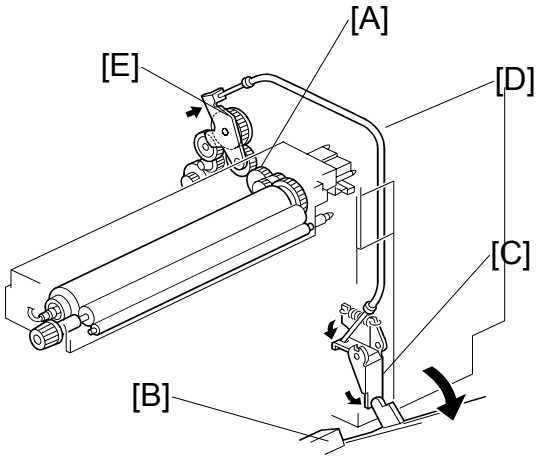
The fusing/exit motor [A] drives the fusing unit through the gears [B] and also drives the paper exit rollers [C] through a gear and a timing belt [D].



6.15.3 FUSING DRIVE RELEASE MECHANISM

The fusing unit drive release mechanism automatically disengages the fusing unit drive gear [A] when the right door [B] is opened.

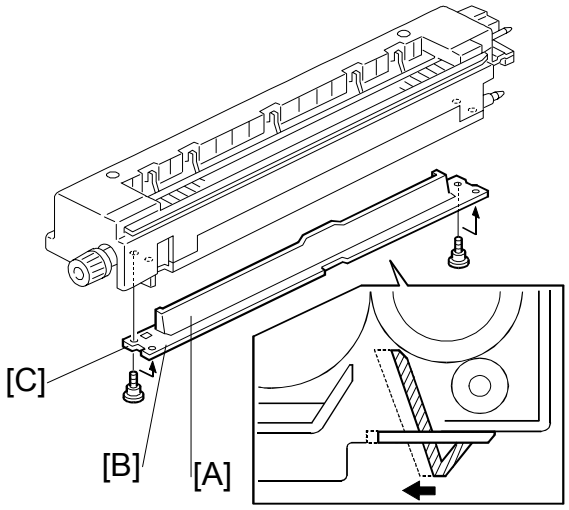
When the right cover is opened, the actuator plate [C] pulls release wire [D]. The wire pulls the fusing drive gear bracket [E] and the fusing unit drive is disengaged.



6.15.4 FUSING ENTRANCE GUIDE SHIFT MECHANISM

The entrance guide [A] has two holes on each side to adjust for paper thickness to prevent creasing. Normally, the left screw hole [C] on each side is used.

For *thin* paper, use screw holes [B] to move the entrance guide to the left. This setting allows more direct access to the gap between the hot and pressure rollers, and prevents thin paper from buckling against the hot roller which can cause blurring at the leading edge of the copy.

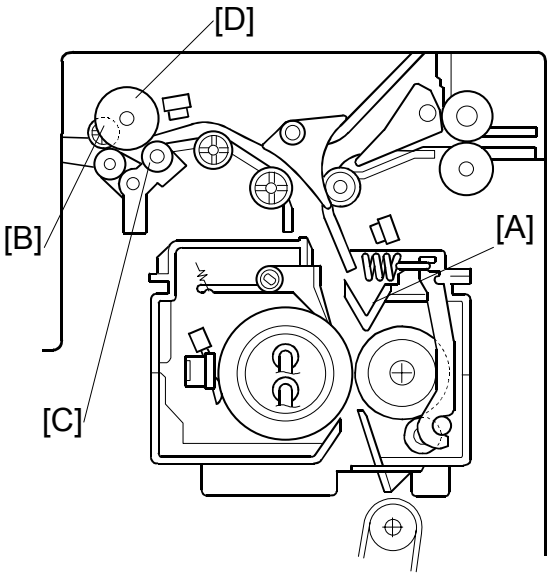


6.15.5 EXIT GUIDE PLATE AND DE-CURLER ROLLERS

The exit guide plate [A] also functions as pressure roller stripper. The exit guide plate can be moved in order to remove jammed paper.

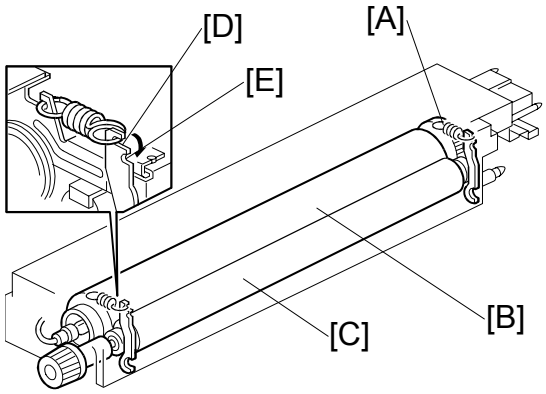
Stacking has been improved by mounting a face-curl correction mechanism at the paper exit roller.

Two de-curler rollers [B] and [C] have been added under the exit roller [D] to correct the curl that paper acquires during transport through the fusing unit.

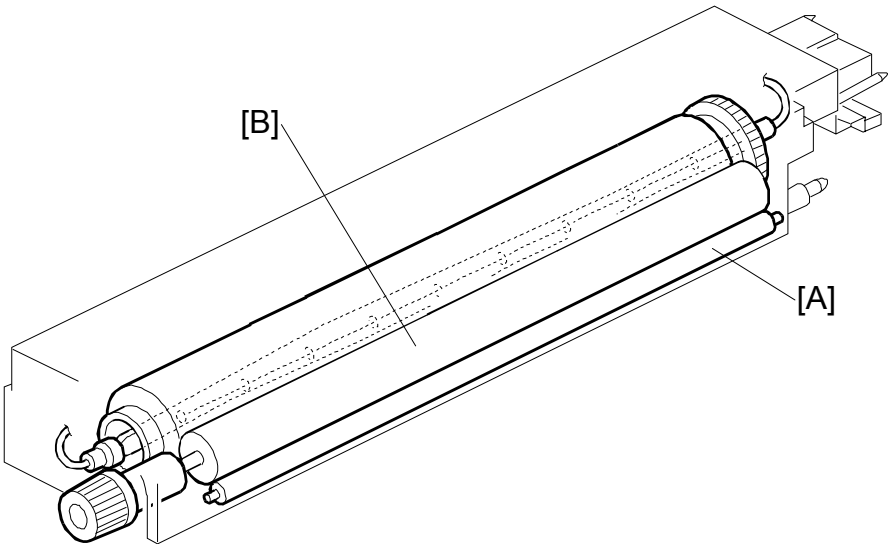


6.15.6 PRESSURE ROLLER

The pressure springs [A] apply constant pressure between the hot roller [B] and the pressure roller [C]. The applied pressure can be changed by adjusting the position of the pressure springs. The left position [D] is the normal setting, and the right position [E] increases the pressure to prevent insufficient fusing by the fusing unit.



6.15.7 CLEANING MECHANISM



The cleaning roller [A], in constant contact with the pressure roller [B], collects toner and paper dust from the surface of the pressure roller.

Because the cleaning roller is metal, it can collect adhering matter better than the pressure roller, which is coated with Teflon.

Some new design features have been implemented in order to cope with the lower temperatures required for new toner which has a melting temperature much lower than the previous toner. The cleaning roller [A] is composed of an aluminum shell with an internal “heat pipe” suspended in the middle of the roller to dissipate heat more rapidly.

6.15.8 HOT ROLLER STRIPPER CLEANING

Toner clinging to the hot roller strippers can cause black dots to appear on the back sides of copies so the widths of the strippers have been reduced from 3 mm to 0.5 mm. In addition to this design change, the hot roller strippers are cleaned by switching the fusing/exit motor off/on to rotate the hot roller and dislodge any toner clinging to these strippers.

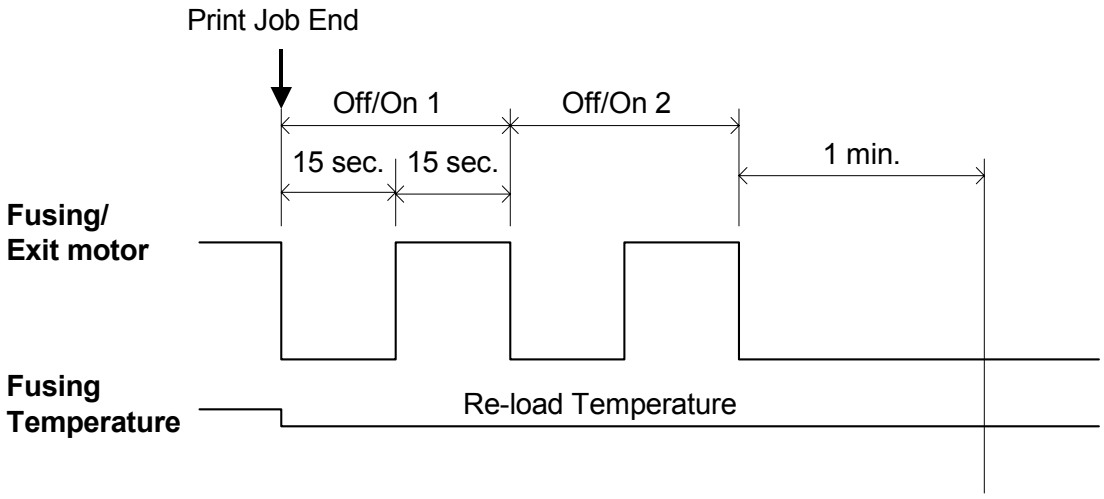
When printing ends, the fusing/exit motor switches off for 15 sec. then switches on for 15 sec. This on/off cycle is repeated for the number of times specified with SP3905 1 (Default: 1 off/on cycle). While the fusing/exit motor is switched off/on during the cleaning cycle, all fans remain on.

The hot roller strippers are also force cleaned by adjusting and raising the setting of SP5959 (1st Print Delay Timing) which allows the drum and hot roller to turn freely to allow more time for cleaning before printing. However, make sure that the customer understands that increasing this SP setting slows down the first print time.

These are the SP codes that control hot roller stripper cleaning. (For details, refer to Section "5. Service Tables".

No.	Name	Function
SP3905 1	Number of Rotations	Prescribes the number of times the hot roller is rotated at the end of the print job if the print job exceeds the number of pages specified with SP3905 2. (Default: 1)
SP3905 2	Number of Pages	Prescribes the number of pages to print and trigger hot roller stripper cleaning. Cleaning executes only if the number of pages in the print job exceeds this number. (Default: 15 pp.)

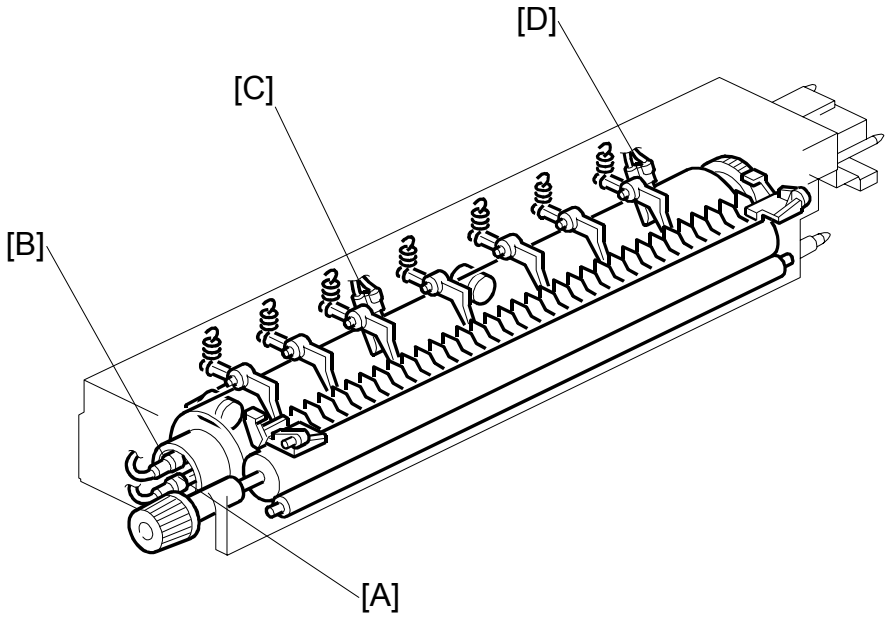
The timing chart below shows the fusing/exit motor switched off and on twice at the end of a print job.



Here are some important points to keep in mind about hot roller stripper cleaning:

- If a request to start a print job is received during cleaning cycle in the timing chart above, cleaning stops and the new print job starts. During a normal print job, the fusing/exit motor switches on as soon as the paper reaches the registration roller, but in this case the fusing/exit motor remains on.
- If a request to enter the Off mode is received while hot roller stripper cleaning is in progress, the machine enters the Off mode and the cleaning cycle stops immediately.
- If the machine switches to any of the energy saver modes (low power mode, etc.) the cleaning cycle completes and does not halt.
- The cleaning cycle is not interrupted during free rotation of the hot roller when the machine is getting ready to print.
- Opening the front door, however, will stop the cleaning cycle.

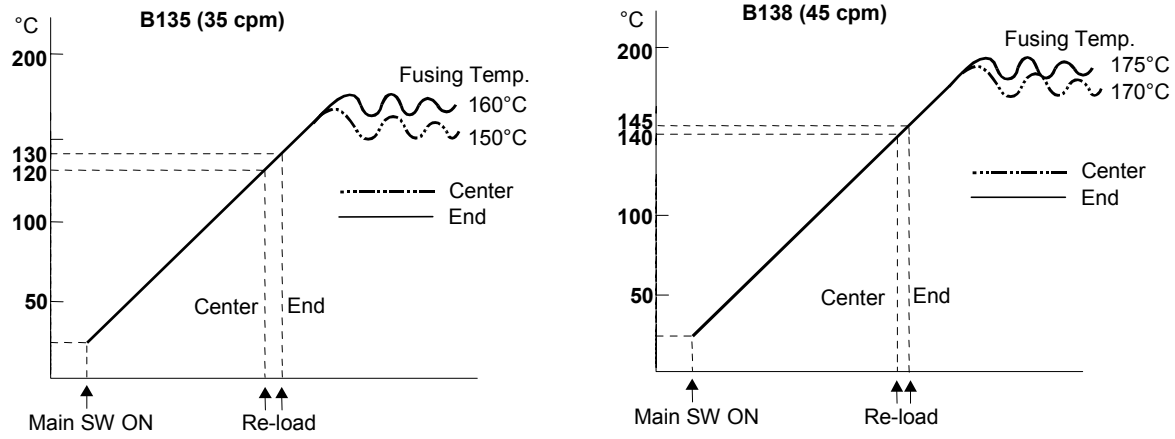
6.15.9 FUSING TEMPERATURE CONTROL



The fusing unit has two fusing lamps: the first fusing lamp (center: 650W) [A] heats the center of the fusing roller, and the second fusing lamp (ends: 550W) [B] heats both ends of the hot roller. This arrangement ensures even heat on all surfaces of the roller.

In order to control the temperature of the roller, two high response thermistors are attached to the unit, one near the center [C] and one at the end [D] of the hot roller.

Temperature Control



There are two types of temperature control:

- On/off control (Default)
- Phase control.

Either mode can be selected with SP1104 (Fusing Temperature Control).

After the machine is powered on, the CPU checks the ac frequency for 500 ms, in case phase control is selected later for the temperature control, and then switches on the fusing lamp.

As soon as both the center and end thermistors detect the print ready temperature (also known as the “re-load” temperature), the machine can operate. The “reload” temperature is 3 °C below the fusing temperature (this depends on the settings of SP1105 1~4, 7, 8). As soon as the thermistors detect the fusing temperature, the CPU switches the lamps off but frequently switches on/off again in order to maintain the fusing temperature.

The default temperatures of SP1105 for these models are set 10 ~ 30 degrees lower than the temperatures for the previous machines. Some new SP codes have been added and others removed. For details, see Section “5. Service Tables”.

Fusing Idling Temperature

If copies are not sufficiently fused soon after the main power switch is turned on, fusing idling should be enabled with SP1103 1.

When fusing idling is enabled, it is done when the temperature reaches the print ready ("re-load") temperature. The re-load temperature can be adjusted with SP1105 5,6.

In the opposite case, even if fusing idling is disabled, it is done when the temperature at power-up ≤ 15 °C

The fusing idling time is as follows.

Temperature at power-on	**Fusing Idling Mode**		
	0: Disabled	**1: Enabled**	SP1103 1
15 °C or less	30 s	30 s	SP1103 2
Higher than 15°C	Not done	30 s	

6.15.10 CPM DOWN FOR THICK PAPER

Because the fusing temperatures are set lower for the new toner which has a lower melting point, the results of printing on thick paper cannot be guaranteed at 45 cpm on the B138. Therefore, the 45 cpm line speed is adjusted down to 35 cpm as follows:

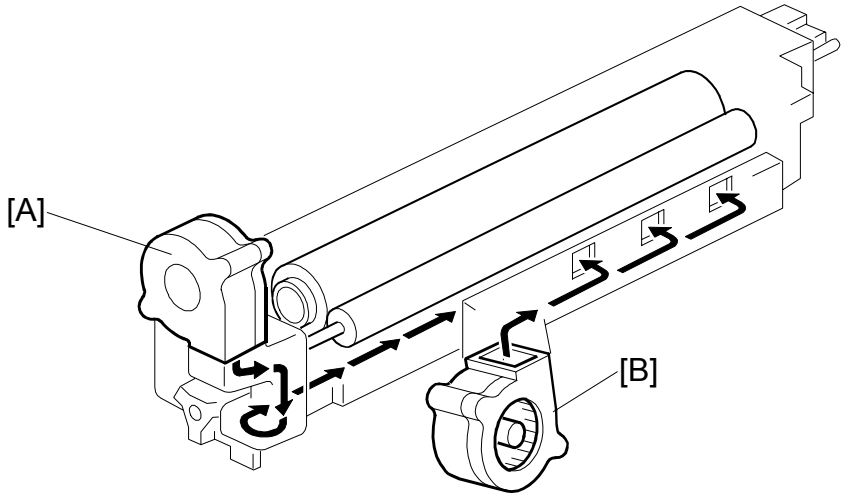
- After switching from Normal to Thick Paper for printing, the machine halts temporarily and re-starts for 35 cpm running.
- If the previous job included stapling or other finisher processing, these settings remain in effect for the next job on thick paper after the line speed is adjusted.
- If the print job on thick paper does not include an image on the page (a cover), then the speed is not adjusted down from 45 cpm to 35 cpm.

NOTE: The previous machine automatically reduced line speed 30% (ppm down) for thick paper. In these models, however, the speed is reduced from 45 cpm to 35 cpm for the 45 cpm machine. This adjustment is performed automatically for the B138 (45 cpm) machine only.

Note these other important points regarding cpm down for thick paper on the 45 cpm machine:

- When the line speed switches from 45 cpm to 35 cpm for thick paper, the transfer current changes to the settings specified with SP2301 (Transfer Current Adjustment). (For details, see Section “5. Service Tables”.) Bias voltage, development and other settings are not affected.
- Fusing temperature adjustment switches on, but no operation can start until the machine reaches the temperature specified for the job.
- The ID sensor pattern is created and the line speed remains the same until the end of the job.
- The intensity of the LD unit is lowered evenly, 30 steps from its specified value.

6.15.11 COOLING AND OVERHEAT PROTECTION



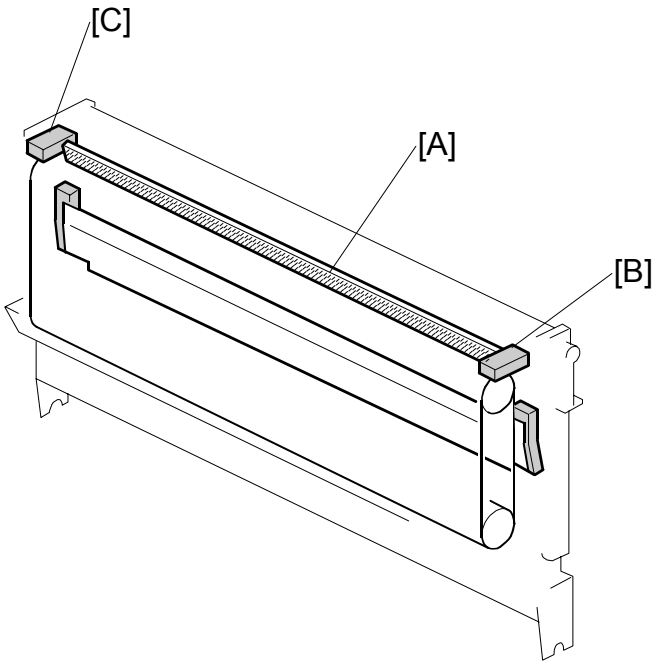
The fusing unit operates at temperatures lower than the previous model in order to accommodate the new toner which has a lower melting temperature. In order to further ensure cooler running temperatures for the fusing unit, two cooling fans have been added.

The side cooling fan [A] and corner cooling fan [B] switch on when the temperature of the fusing unit exceeds 150 °C and switch off when the main motor switches off.

If the hot roller temperature exceeds 230 °C for 5 seconds or more, the CPU cuts off the power to the fusing lamp, and SC543 (Fusing Overheat Error) will be displayed.

Even if the thermistor overheat protection fails, there is a thermostat in series with the common ground line of the fusing lamp. If the temperature of the thermostat reaches 210 °C, the thermostat opens, removing power from the fusing lamp. At the same time, the copier stops operating. At this time, SC542 (Fusing Temperature Warm-up Error) will be displayed.

6.15.12 TONER SCATTER PREVENTION

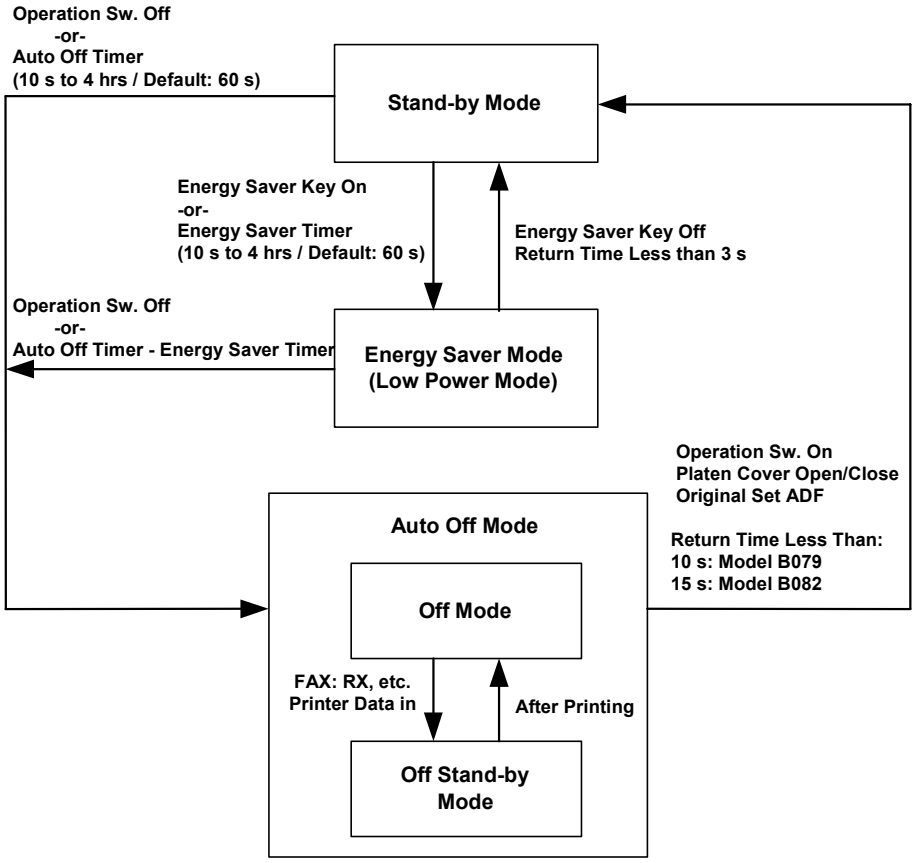


To reduce the incidence of toner scattering, the sponge strip has been replaced with a velvet strip [A] that extends across the length of the fusing unit,

At each end of the strip [B] and [C] new seals have been added.

6.16 ENERGY SAVER MODES

6.16.1 OVERVIEW



When the machine is not used, the energy saver function reduces power consumption by decreasing the fusing temperature.

This machine has two types of energy saver mode as follows.

1) Energy saver mode
2) Auto Off mode

These modes are controlled by the following UP and SP modes.

- Energy timer (UP mode)
- Auto off timer (UP mode)
- Auto off disabling (SP mode)

6.16.2 ENERGY SAVER MODE

Entering the energy saver mode

The machine enters energy saver mode when one of the following is done.

- The Clear Mode/Energy Saver Key is held down for a second.
- The energy saver timer runs out after the end of a job.

What happens in energy saver mode

When the machine enters energy saver mode, the fusing lamp drops to a certain temperature, and the operation panel indicators are turned off except for the Energy Saver LED and the Power LED.

If the CPU receives the image print out command from an application (e. g. to print incoming fax data or to print data from a PC), the fusing temperature rises to print the data.

Return to stand-by mode

If one of the following is done, the machine returns to stand-by mode:

- The Clear Mode/Energy Saver Mode key is pressed
- Any key on the operation panel or touch panel screen is pressed
- An original is placed in the ARDF
- The ARDF is lifted
- A sheet of paper is placed in the by-pass feed table

The recovery time from energy saver mode is about 3 s.

Mode	Operation Switch	Energy Saver LED	Fusing Temp.	+24V	System +5V
Energy Saver	On	On	B135: 130°C B138: 150°C	On	On

6.16.3 AUTO OFF MODE

There are two Auto Off modes: Off Stand-by mode and Off mode. The difference between Off Stand-by mode and Off mode is the machine's condition when the machine enters Auto Off mode.

Entering off stand-by and off modes

The machine enters the Off Stand-by mode or Off mode when one of the following is done.

- The auto off timer runs out
- The operation switch is pressed to turn the power off

If one or more of the following conditions exits, the machine enters Off Stand-by mode. If none of these conditions exist, the machine enters Off Mode.

- Error or SC condition
- An optional G4 unit is installed
- Image data is stored in the memory
- During memory TX or polling RX
- The handset is off hook
- An original is in the ARDF
- The ARDF is open

Off Stand-by mode

The system +5V is still supplied to all components. When the machine detects a ringing signal or receives a stream of data for a print job, the +24V supply is activated and the machine automatically prints the incoming message or executes the print job.

Off Mode

The system +5V supply also turns off. However, +5VE (+5V for energy saver mode) is still activated. When the machine detects a ringing signal, off-hook signal, or receives a print job, the machine returns to the Off Stand-by mode and the system +5V and +24V supplies are activated.

Returning to stand-by mode

The machine returns to stand-by mode when the operation switch is pressed. The recovery time is about 10 s for the B135 and 15 s for the B138.

Mode	Operation Switch	Energy Saver Mode	Fusing Lamp	+24V	System +5V	Note
Off Stand-by	Off	Off	Off (On when printing)	On	On	
Off	Off	Off	Off	Off	Off	+5VE is supplied

SPECIFICATIONS

SPECIFICATIONS

1. GENERAL SPECIFICATIONS

Configuration	Desktop		
Copy Process	Dry electrostatic transfer system		
Original	Sheet/Book		
Original Size	Maximum A3/11" x 17"		
Copy Paper Size	Paper tray, Duplex:	A3/11" × 17" - A5 SEF	
	By-pass tray:	A3/11" × 17" - A6 SEF	
	Non-standard sizes:	Width: 100 - 297 mm (3.9" – 11.7") Length: 148 - 432 mm (5.8" – 17.0")	
Copy Paper Weight	Paper Tray/ Duplex:	64 - 105 g/m^2 (20 - 28 lb.)	
	By-pass:	52 - 163 g/m^2 (16 – 44 lb.)	
Reproduction Ratios	7R5E:	Metric version (%): 400, 200, 141, 122, 115, 93, 82, 75, 71, 65, 50, 25 Inch version (%): 400, 200, 155, 129, 121, 93, 85, 78, 73, 65, 50, 25	
	Zoom:	25 ~ 400% in 1% steps	
Copying Speed	B135:	35 cpm A4, 8 1/2" x 11" LEF, 1-to-1 (ADF)	
	B138:	45 cpm, A4, 8 1/2" x 11" LEF, 1-to-1 (ADF)	
First Copy Time	B135:	4.5 s, 1st Tray, A4/8 1/2" x 11" LEF	
	B138:	3.6 s, 1st Tray, A4/8 1/2" x 11" LEF	
Warm-up Time	B135:	Less than 20 s	
	B138:	Less than 22 s	
Continuous Copy	1~999 (operation panel entry)		
Paper Capacity	1,050 sheets (500 sheets/tray x 2 with 50 sheets in by-pass tray)		
Paper Output	A4, 8 1/2" x 11" and smaller:	500 sheets	
	B4 and larger:	250 sheets	
Power Source	North America:	120V/60 Hz, More than 12.5 A	
	Europe/Asia:	220 – 240 V/50, 60 Hz, More than 6.8 A	
Dimensions (W x D x H)	670 mm x 650 mm x 720 mm (26.3" x 25.6" x 28.3")		
Weight	Less than 79 kg (174 lb.)		
Resolution	600 dpi (Scanning and Printing)		
Gradation	256 levels (Scanning and Printing)		
Original Archive	More than 2,500 A4 pages for document server (ITU-T No. 4 Chart)		
Toner Replenishment	Cartridge exchange (550 g)		
Total Counter	Electric counter		

Power Consumption

Mainframe only

	B135	B138
Copying	Less than 1.2 kW	Less than 1.2 kW
Warm-up	Less than 1.25 kW	Less than 1.25 kW
Stand-by	Less than 139 W	Less than 170 W
Auto Off Mode	Ave. 4.5 W (NA) Ave. 5 W (EU, Asia)	Ave. 4.5 W (NA) Ave. 5 W (EU, Asia)
Maximum	Less than 1.44 kW (NA) Less than 1.5 kW (EU, Asia)	Less than 1.44 kW (NA) Less than 1.5 kW (EU, Asia)

Full system (including options)

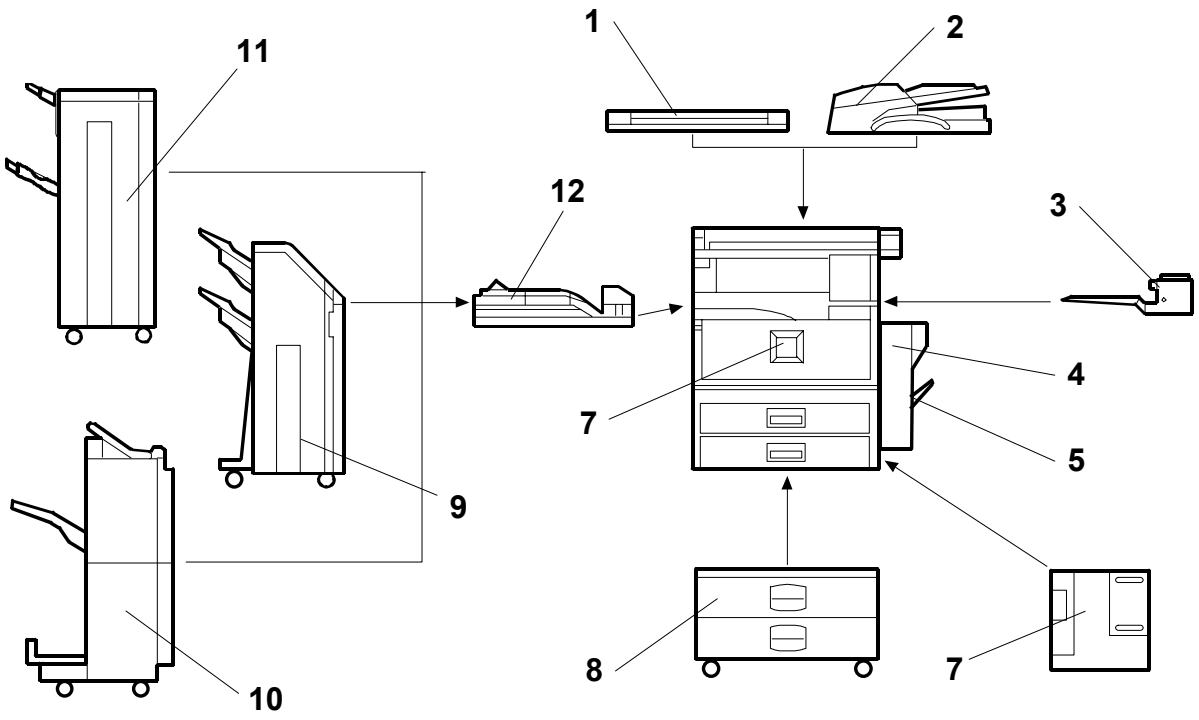
	B135	B138
Copying	Less than 1.4 kW	Less than 1.4 kW
Warm-up	Less than 1.3 kW	Less than 1.3 kW
Stand-by	Less than 170 W	Less than 195 W
Auto Off Mode	Ave. 8 W (NA) Ave. 9 W (EU, Asia)	Ave. 8 W Ave. 9 W (EU, Asia)
Maximum	Less than 1.44 kW (NA) Less than 1.5 kW (EU, Asia)	Less than 1.44 kW (NA) Less than 1.5 kW (EU, Asia)

Noise Emission:

Mode	Model	Mainframe Only	Full System
Copying	B135 B138	69 dB(A) or less 70 dB(A) or less	73 dB(A) or less 74 dB(A) or less
Stand-by	B135 B138	42 dB(A) or less 42 dB(A) or less	

NOTE: 1) The above measurements were made in accordance with ISO 7779.
2) Full system measurements include the ARDF, Finisher and LCT unit.
3) In the above stand-by condition, the polygonal mirror motor is not rotating.

2. MACHINE CONFIGURATION



1. Platen cover
2. ARDF
3. One-bin tray
4. Duplex unit
5. By-pass tray
6. LCT (Large Capacity Tray)
7. Copier
8. Paper tray unit
9. Two-tray finisher (2 shift trays)
10. Booklet Finisher
11. 1000 Sheet Finisher (1 shift tray)
12. Bridge Unit

NOTE: The Bridge Unit is required for the optional finishers.

Key: Symbol: **U**: Unique option, **C**: Option also used with other products

	Item	Key	Machine Code
Copier	B135		B135
	B138		B138
	ARDF (See **Note 1**.)	C	B541
	Platen Cover (See **Note 1**.)	C	G329
	Paper Tray Unit	C	B542
	LCT (Large Capacity Tray)	C	B543
	1-Bin Tray	C	B544
	Bridge Unit	C	B538
	1000-sheet Finisher (See **Note 2**.)	C	B408
	Two-tray Finisher (See **Note 2**.)	C	B545
	Booklet Finisher	C	B546
	Punch Unit (See **Note 3**.)	C	B377-17 (2/3-hole) US
	Punch Unit (See **Note 3**.)	C	B377-27 (2/4-hole) Metric
	Punch Unit (See **Note 3**.)	C	B377-31 (4-hole) Northern Europe/
	Key Counter Bracket	C	A674
	User Account Enhance Unit	C	B443
	PI Board Kit	C	B669
Fax	Fax Option	U	B653
	G3 Interface Unit	C	B591
	Function Upgrade Board	C	A892
	SAF Memory	C	G578
	Handset (USA model only)	C	A646
Printer/ Scanner	Printer/Scanner Unit	U	B654
	PostScript3 Unit	C	G354-17
	Network Interface Board	C	B525-03
	1394 Interface Unit	C	G336
	USB 2.0 Interface Board	C	B525-01
	IEEE 802.11b Wireless LAN	C	B515
	Bluetooth	C	G354-04
	Memory Unit 128 MB	C	G331
	File Format Converter	C	B519-17

NOTE: 1) The ARDF and platen cover cannot be installed together.
2) The finishers require the paper tray unit and bridge unit.
3) The punch unit requires the two-tray finisher.

3. OPTIONAL EQUIPMENT

ARDF (B541)

Original Size:	Normal Original Mode: A3 to B6, DLT to HLT Duplex Original Mode: A3 to B5, DLT to HLT
Original Weight:	Normal Original Mode: 40 ~ 128 g/m^2 (11 ~ 34 lb.) Duplex Original Mode: 52 ~ 105 g/m^2 (14 ~ 28 lb.)
Table Capacity:	80 sheets (80 g/m^2, 20 lb.)
Original Standard Position:	Rear left corner
Separation:	Feed belt and separation roller
Original Transport:	Roller transport
Original Feed Order:	From the top original
Reproduction Range:	30 ~ 200% (Sub scan direction only)
Power Source:	DC 24V, 5V from the copier
Power Consumption:	Less than 60 W
Dimensions (W × D × H):	570 mm x 518 mm x 150 mm (22.4" x 20.4" x 5.9")
Weight:	12 kg

PAPER TRAY UNIT (B542)

Paper Size:	A5 SEF to A3 SEF 5 1/2" x 8 1/2" SEF to 11" x 17" SEF
Paper Weight:	64 g/m^2 ~ 105 g/m^2 (20 lb. ~ 28 lb.)
Tray Capacity:	500 sheets (80 g/m^2, 20 lb.)
Paper Feed System:	FRR
Paper Height Detection:	4 steps (100%, 70%, 30%, Near end)
Power Source:	24 Vdc, 5 Vdc (from the copier) 120 Vac: 115 V version (from the copier) 220 ~ 240 Vac: 224/240 V version (from the copier)
Power Consumption:	50 W
Weight:	Less than 25 kg (55.1 lb.)
Size (W x D x H):	540 mm x 600 mm x 270 mm (21.3" x 23.6" x 10.6")

ONE-BIN TRAY (B544)

Paper Size:	A5 SEF to A3 SEF 5 1/2"x8 1/2" SEF to 11"x17" SEF
Paper Weight:	60 g/m^2 ~ 105 g/m^2 (16 lb. ~ 28 lb.)
Tray Capacity:	125 sheets (80 g/m^2, 20 lb.)
Power Source:	5 Vdc, 24 Vdc (from copier)
Power Consumption:	15 W
Weight:	Less than 4 kg (8.8 lb.)
Size (W x D x H):	470 mm x 565 mm x 140 mm (18.5" x 22.2" x 5.5")

1000 Sheet Finisher (B408)

<table>
<tr><td>Upper Tray</td><td></td></tr>
<tr><td>Paper Size</td><td>A3 to A6
11" x 17" to 5 1/2" x 8 1/2"</td></tr>
<tr><td>Paper Weight</td><td>60 to 157 g/m2 (16 to 42 lb.)</td></tr>
<tr><td>Paper Capacity</td><td>250 sheets, A4 LEF, 8 1/2" x 11" SEF or smaller, 80 g/m^2 (20 lb.)</td></tr>
<tr><td>Lower Tray</td><td></td></tr>
<tr><td>Paper Size</td><td>Staple Mode Off:
A3 to B5, 11" x 17" to 5 1/2" x 8 1/2"
Staple Mode On:
A3, B4, A4, B5, 11" x 17" to 8 1/2" x 11"</td></tr>
<tr><td>Paper Weight</td><td>Staple Mode Off: 60 to 157 g/m^2 (16 ~ 43 lb.)</td></tr>
<tr><td></td><td>Staple Mode On: 64 to 90 g/m^2 (17 ~ 24 lb.)</td></tr>
<tr><td>Stapler Capacity</td><td>30 sheets (A3, B4, 11" x 17", 8 1/2" x 14"
50 sheets (A4, B5 LEF, 8 1/2" x 11"</td></tr>
<tr><td>Paper Capacity</td><td>Staple Mode Off:
1,000 sheets, A4, 8 1/2" x 11" or smaller, 80 g/m^2 (20 lb.)
500 sheets, A3, B4, 11" x 17", 8 1/2" x 14", 80 g/m^2 (20 lb.)</td></tr>
<tr><td></td><td>Staple Mode On:
80 g/m2 (20 lb.)
Number of Sets
<table>
<tr><th>Set Size</th><th rowspan="2">2 to 9</th><th colspan="2">10 to 50</th></tr>
<tr><td>Size</td><td>10 to 30</td><td>31 to 50</td></tr>
<tr><td>A4, 8 1/2"x14" LEF</td><td>100</td><td>100 to 20</td><td>100 to 20</td></tr>
<tr><td>A4, 8 1/2"x11" SEF</td><td>100</td><td>50 to 10</td><td>50 to 10</td></tr>
<tr><td>A3, B4, 11"x17", 8 1/2"x14"</td><td>50</td><td>50 to 10</td><td>---</td></tr>
</table></td></tr>
<tr><td>Staple Positions</td><td>1 Staple: 2 positions (Front, Rear)
2 Staples: 2 positions (Upper, Left</td></tr>
<tr><td>Staple Replenishment</td><td>Cartridge (5,000 staples/cartridge)</td></tr>
<tr><td>Power Source</td><td>DC 24 V, 5V (from copier)</td></tr>
<tr><td>Power Consumption</td><td>50 W</td></tr>
<tr><td>Weight</td><td>25 kg (55.2 lb.)</td></tr>
<tr><td>Dimensions</td><td>527 x 520 x 790 mm
20.8" x 20.5" x 31.1"</td></tr>
</table>

TWO-TRAY FINISHER (B545)

NOTE: The punch unit is an option for this machine.

Paper Size	Normal/Shift Mode: A3 to A5/DLT to HLT (A6L in no shift mode and no staple mode) Staple Mode: A3 to B5/DLT to LT Punch Mode: 2 Holes: A3 to A5/DLT to HLT 3 Holes: A3 to B5/DLT to LT 4 Holes (Europe/Asia) : A3 to A5/ DLT to HLT 4 Holes (North Europe): A3 to B5/DLT to LT
Paper Weight	Normal/Shift Mode: 52 g/m^2 ~ 163 g/m^2 (14 ~ 43 lb.) Staple Mode: 64 g/m^2 ~ 90 g/m^2 (17 ~ 23 lb.) Punch mode (All types): 52 g/m^2 ~ 163 g/m^2 (14 ~ 43 lb.)
Tray Paper Capacity	Upper Tray: 500 sheets (A4S ~ A5S/LTS, 80 g/m^2, 20 lb.) 250 sheets (A3 ~ A4L/DLT ~ LTL, 80 g/m^2, 20 lb.) 100 sheets (A5L/HLT, 80 g/m^2, 20 lb.) Lower Tray (Multi-tray Staple Mode): 1500 sheets (A4S/LTS, 80 g/m^2, 20 lb.) 750 sheets (A3 ~ B5/DLT ~ LTL, 80 g/m^2, 20 lb.) 500 sheets (A5S, 80 g/m^2, 20 lb.) 100 sheets (A5L/HLT, 80 g/m^2, 20 lb.) Lower Tray (Normal Mode): 2000 sheets (A4S/LTS, 80 g/m^2, 20 lb.) 750 sheets (A3 ~ B5/DLT ~ LTL, 80 g/m^2, 20 lb.) 500 sheets (A5S, 80 g/m^2, 20 lb.) 100 sheets (A5L/HLT, 80 g/m^2, 20 lb.)
Stapler Tray Capacity	No Mixed Original Mode: 50 sheets (A4 ~ B5/LT, 80 g/m^2, 20 lb.) 30 sheets (A3 ~ B4/DLT ~ LG, 80 g/m^2, 20 lb.) Mixed Original Mode: 30 sheets (A4S/A3, B5S/B4, LTS/DLT, 80 g/m^2, 20 lb.)
Staple Position	4 positions 1 staple: 3 positions (Front, Rear, Rear-Slant) 2 staple: 1 position
Staple Replenishment	Cartridge (5,000 staples)
Power Source	24 Vdc (from copier)
Power Consumption	60 W
Weight	Less than 53 kg (116.8 lb.) (without punch unit) Less than 55 kg (121.3 lb.) (with punch unit)
Size (W x D x H)	680 mm x 620 mm x 1030 mm (26.8" x 24.4" x 40.6")

Booklet Finisher (B546)

Paper Size	**Tray**		**Modes**		**Sizes**
	Proof tray				A3 to A5, DLT to HLT
	Shift tray	No staple mode			A3 to A5, DLT to HLT
		Staple Mode	Rear		A4 SEF, LG SEF, LT SEF
			Front/Slant		A3 SEF, A4 LEF/SEF, B4 SEF, B5 LEF, DLT SEF, LG SEF, LT LEF/SEF
			Rear/Slant		A3 SEF, A4 LEF, B4 SEF, B5 LEF, DLT SEF, LT LEF
			2 Staple		A3 SEF, A4, LEF, B4 SEF, B5 LEF, DLT SEF, LT LEF
	Booklet tray	Staple Mode			A3 SEF, A4 SEF, B4 SEF, DLT SEF, LT SEF
Paper Weight	**Tray**				**Weight**
	Stack mode				52 g/m^2 to 163 g/m^2, 14 to 42 lb
	Staple mode				64 g/m^2 to 80 g/m^2, 17 to 21 lb
	Saddle stitch mode				64 g/m^2 to 80 g/m^2, 17 to 21 lb 64 g/m^2 to 128 g/m^2, 17 to 34 lb (Cover sheet only)
Paper Capacity[*1]	**Tray**		**Modes**	**Paper size**	**Capacity**
	Proof tray			A4 LEF, LT LEF or shorter	150 sheets
				A4 SEF, LT SEF or longer	75 sheets
	Shift tray		No staple	A4 LEF, LT LEF or shorter	1000 sheets
				A4 SEF, LT SEF or longer	500 sheet
			Staple	A4 LEF, LT LEF or shorter	750 sheets, or 30 sets [*2]
				A4 SEF, LT SEF or longer	500 sheets, or 30 sets [*2]
	Booklet tray			1-5 sheets	25 sets
				6-10 sheets	15 sets
				11-15 sheets	10 sets

[*1]: 80 g/m^2, 20 lb
[*2]: Setting DIP SW 3 No. 5 to ON releases the 30 set limit.

Staple Capacity	Modes	Paper size	Total capacity
	Staple	A4 LEF, LT LEF or shorter	50 sheets
		A4 SEF, LT SEF or longer	30 sheets
	Saddle stitch		15 sheets
Staple Position	Staple mode: 4 positions 1 staple: 3 positions (Rear, Front/Slant, Rear/Slant) 2 staples: 1 position Saddle stitch mode: 2 positions, 2 staples (center), fixed position		
Staple Replenishment	Cartridge Staple: 5000 staples Saddle stitch: 2000 staples		
Power Source	24 Vdc (from copier)		
Power Consumption	Less than 170 W		
Dimensions (w x d x h)	689 x 603 x 1055 mm 27.1 x 23.7 x 41.5 in.		
Weight:	49 kg (107.8 lb.)		

*1: 80 g/m^2, 20 lb

BRIDGE UNIT (B538)

Paper Size	Standard sizes A6 lengthwise to A3 HLT to DLT Non-standard sizes Width: 100 to 305 mm Length: 148 to 432 mm
Paper Weight	52 g/m^2 ~ 135 g/m^2, 16 lb. ~ 42 lb.

LCT (B543)

Paper Size	A4 (S)/LT (S)
Paper Weight	60 g/m^2 ~ 105 g/m^2, 16 lb. ~ 28 lb.
Tray Capacity	1500 sheets (80 g/m^2, 20lb.)
Remaining Paper Detection	5 steps (100%, 75%, 50%, 25%, Near end)
Power Source	24 Vdc, 5 Vdc (from copier)
Power Consumption	40 W
Weight	Less than 17 kg (37.5 lb.)
Size (W x D x H)	390 mm x 500 mm x 390 mm (15.4" x 19.7" x 15.4")

AUTO REVERSE DOCUMENT FEEDER
B541

AUTO REVERSE DOCUMENT FEEDER B541

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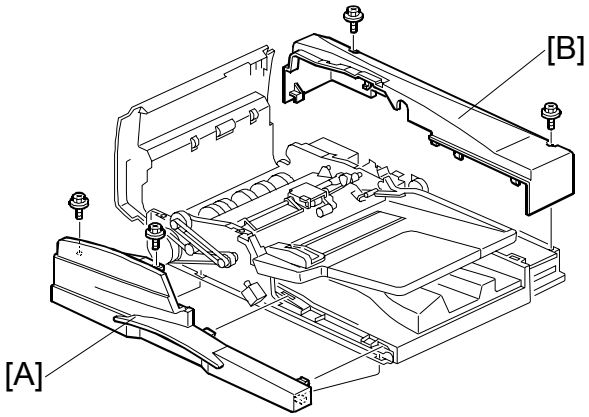
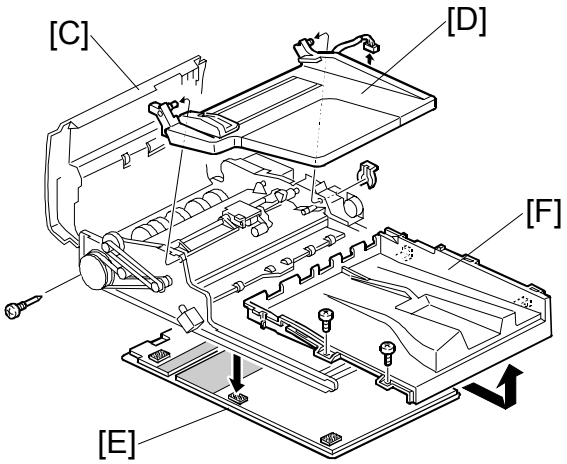
1. REPLACEMENT AND ADJUSTMENT

1.1 COVERS





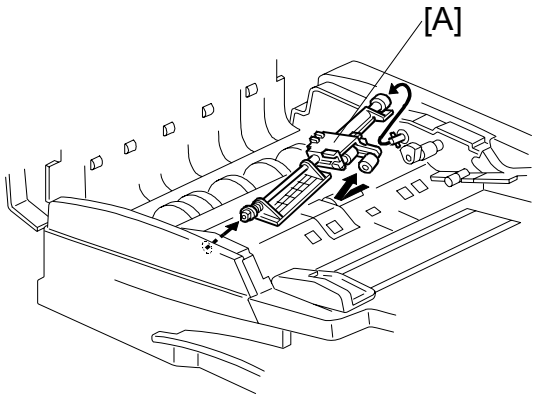
1. Front cover [A] (☞ x2)
2. Rear cover [B] (☞ x2)
3. Top cover [C] (☞ x1, ☞ x2)
4. Original tray [D] (☞ x1, ⌀ x1)
5. Platen sheet [E] (Velcro pads)
6. Original exit tray [F] (☞ x2). Slide to the right and then pull out.

⚠CAUTION

The hinge of the ARDF is spring-loaded and becomes much lighter with all the covers removed. After removing all the covers, lay a heavy book on the front right corner of the ARDF to prevent it from springing up unexpectedly.

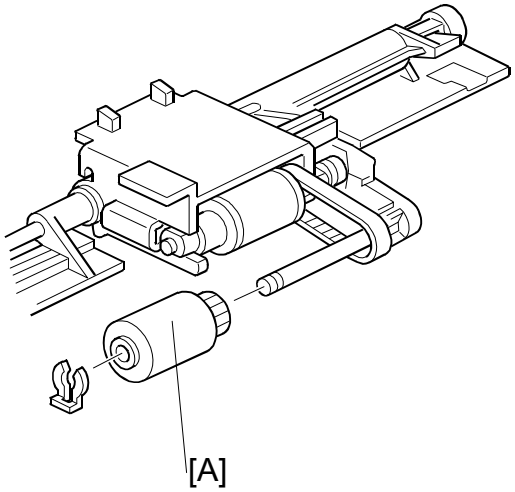
1.2 ORIGINAL FEED UNIT

1. Open the top cover.
2. Original feed unit [A]
   Press it toward you on its shaft to release and lift out.

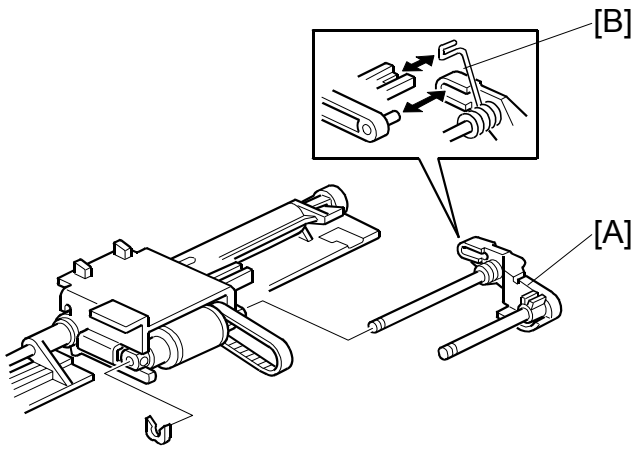


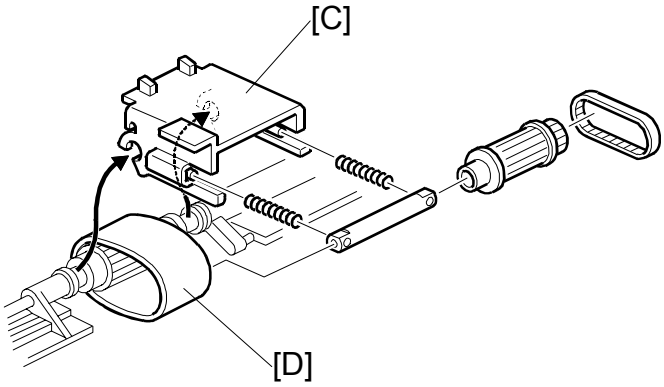
1.3 ORIGINAL PICK-UP ROLLER

1. Original feed unit (☛ 1.2)
2. Pick-up roller [A] (x1)



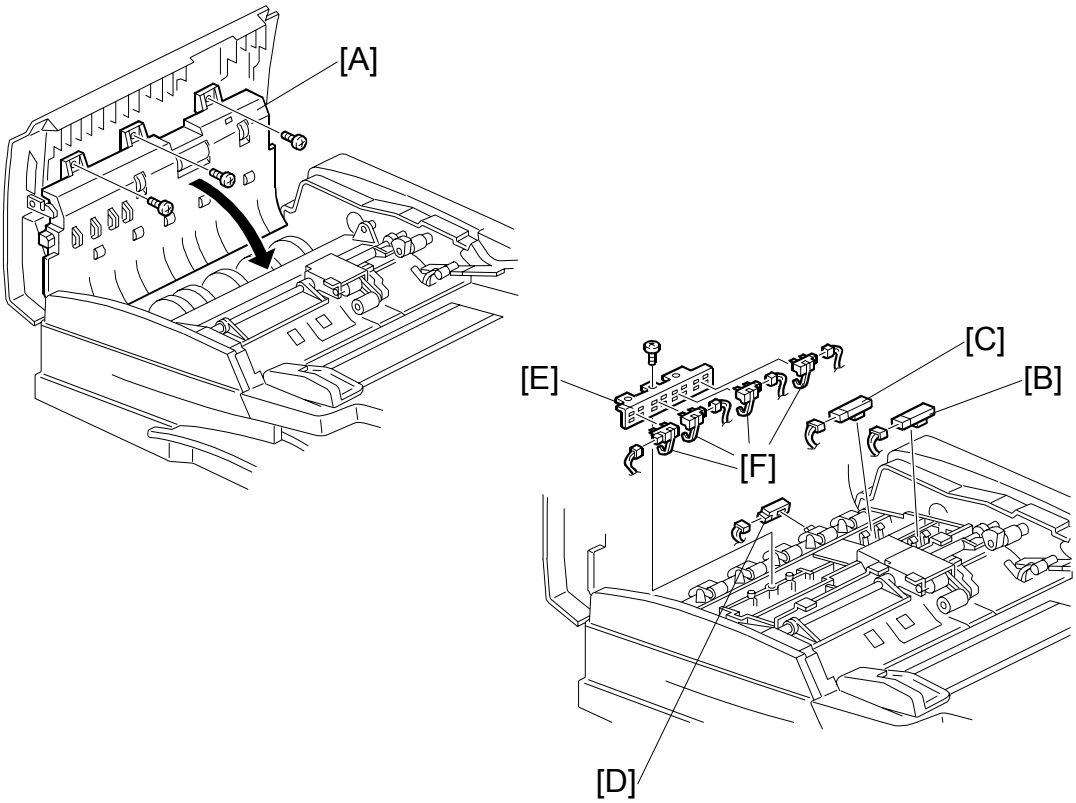
1.4 ORIGINAL FEED BELT





1. Original feed unit and original pick-up roller (☛ 1.2, 1.3)
2. Shaft [A] (⌀ x1, spring x1)
   NOTE: Before removing the shaft, note carefully the positioning of the spring [B]. This must be reset during re-installation.
3. Feed belt cover [C] (Timing belt, gear, shaft, springs x2).
   NOTE: Do not lose the springs.
4. Original feed belt [D].

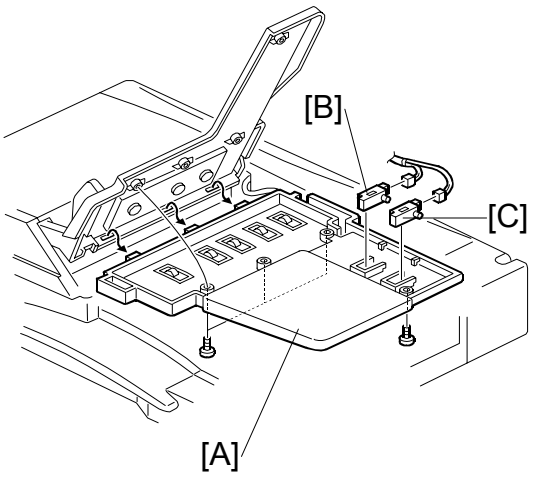
1.5 SKEW CORRECTION/INTERVAL/ REGISTRATION/ORIGINAL WIDTH SENSORS



1. Open the top cover.
2. Upper original guide [A] (☞ x3).
3. Skew correction sensor [B] (☞ x1)
4. Interval sensor [C] (☞ x1)
5. Registration sensor [D] (☞ x1)
6. Original width sensor bracket [E] (☞ x1, ☞ x4)
7. Original width sensors [F]

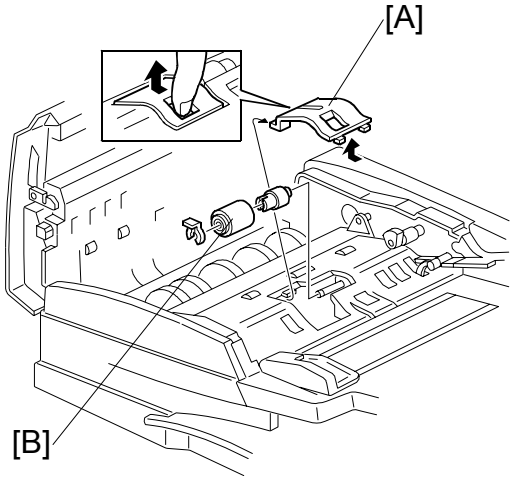
1.6 ORIGINAL LENGTH SENSORS

1. Raise the original table.
2. Lower cover of original tray [A] (x4)
3. Original length sensor-1 [B] (x1)
4. Original length sensor-2 [C] (x1)



1.7 SEPARATION ROLLER

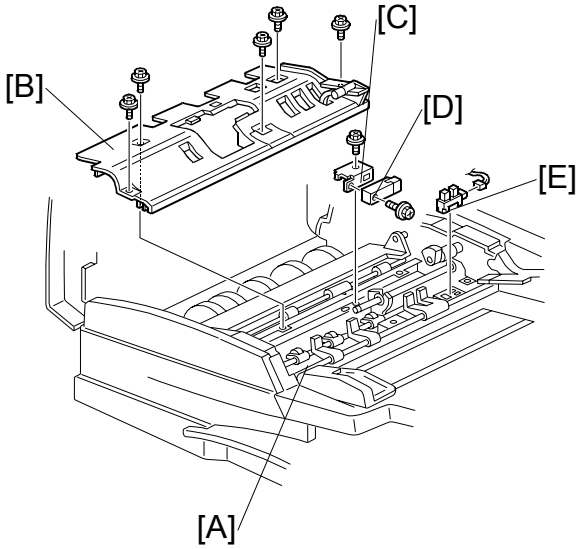
1. Original feed unit.(☛ 1.2)
2. Separation roller cover [A].
3. Separation roller [B] (x1)



1.8 INVERTER /ORIGINAL SET SENSORS

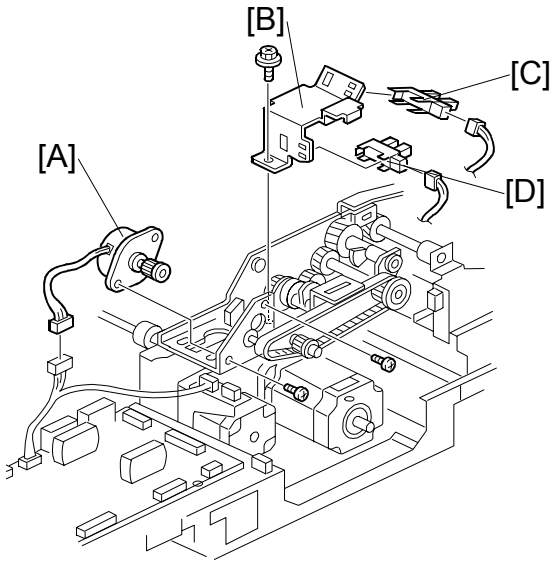
1. Rear cover. (☛ 1.1)
2. Lower the original stopper [A] by rotating the pick-up motor.
3. Original feed unit.(☛ 1.2)
4. Feed guide plate [B] (x5)

   NOTE: Raise the original tray before you re-install the paper feed guide.
5. Separation roller, torque limiter (x1) (☛ 1.7)
6. Bracket [C] (x1, x1)
7. Inverter sensor [D] (x1)
8. Original set sensor [E] (x1)

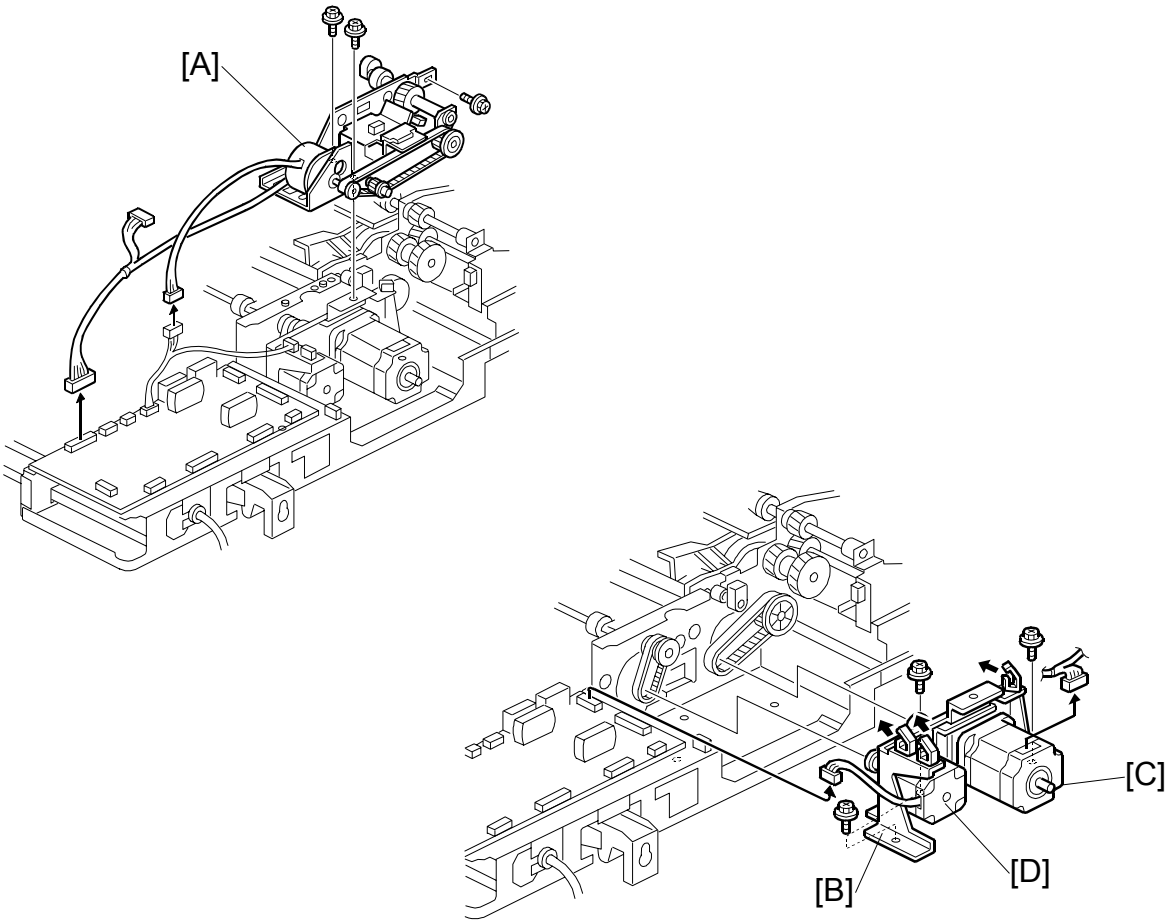


1.9 PICK-UP MOTOR/ORIGINAL STOPPER HP SENSOR/PICK-UP HP SENSOR

1. Rear cover (☛ 1.1)
2. Pick-up motor [A] (x1, x2, Timing belt)
3. Sensor bracket [B] (x2, x1)
4. Pick-up HP sensor [C]
5. Original stopper HP sensor [D]

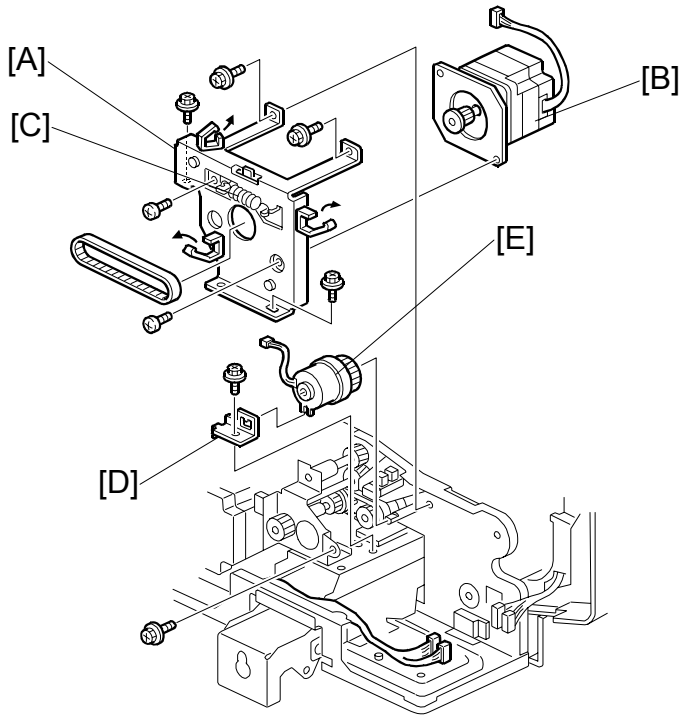


1.10 SCANNER MOTOR AND INVERTER MOTOR



1. Rear cover (☛ 1.1)
2. Pick-up roller assembly [A] (⟲ x1, 🔩 x3, 🔩 x3)
3. Motor bracket [B] (🔩 x3, 🔩 x2, Timing belt x2)
4. Scanner motor [C] (🔩 x2)
   NOTE: To re-install the scanner motor, secure the motor after the motor bracket has been installed.
5. Inverter motor [D] (🔩 x2)

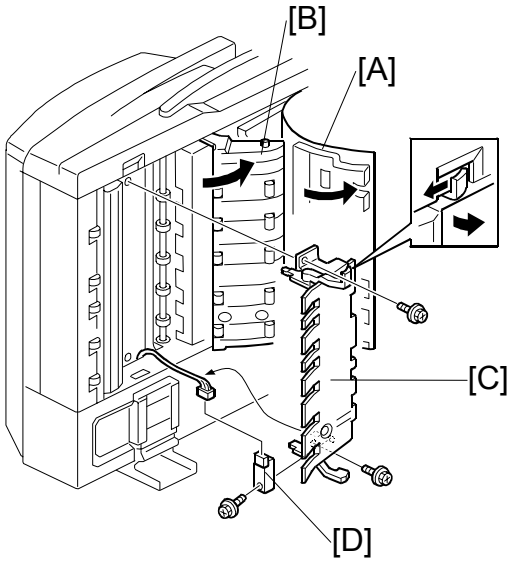
1.11 FEED MOTOR, SKEW CORRECTION ROLLER CLUTCH



1. Rear cover (☛ 1.1)
2. Motor bracket [A] (x5, x1)
3. Feed motor [B] (spring [C] x1)
   NOTE: To re-install the feed motor, secure the motor after the motor bracket has been installed.
4. Clutch stopper [D] (x1)
5. Skew correction roller clutch [E] (x1)

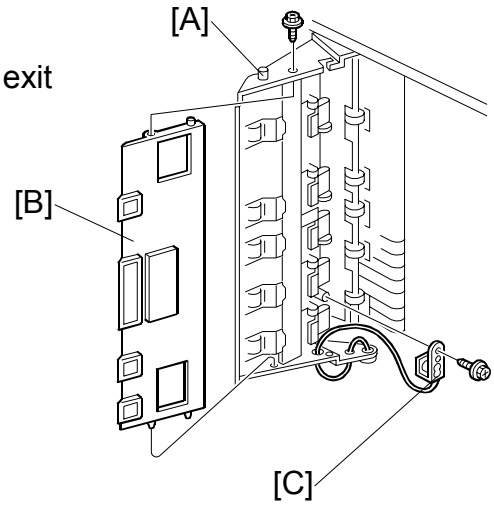
1.12 EXIT SENSOR

1. Open the ARDF.
2. Pull platen cover [A] off halfway.
3. Open exit guide plate [B].
4. Exit guide plate cover [C] (x2)
5. Exit sensor [D] (x1, x1)



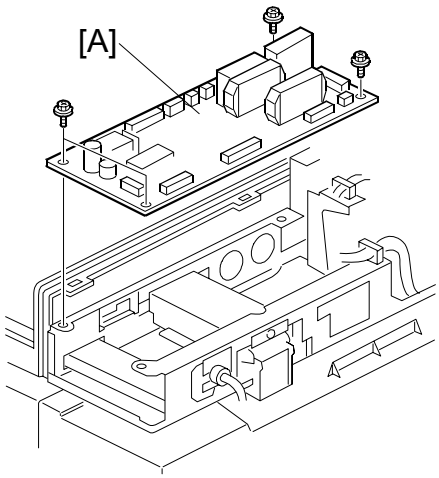
1.13 STAMP SOLENOID

1. Rear cover, front cover, platen sheet, exit tray (☛ 1.1)
2. Open the original guide [A].
3. Plate [B] (x1)
4. Stamp solenoid [C] (x1, x1)



1.14 CONTROLLER BOARD

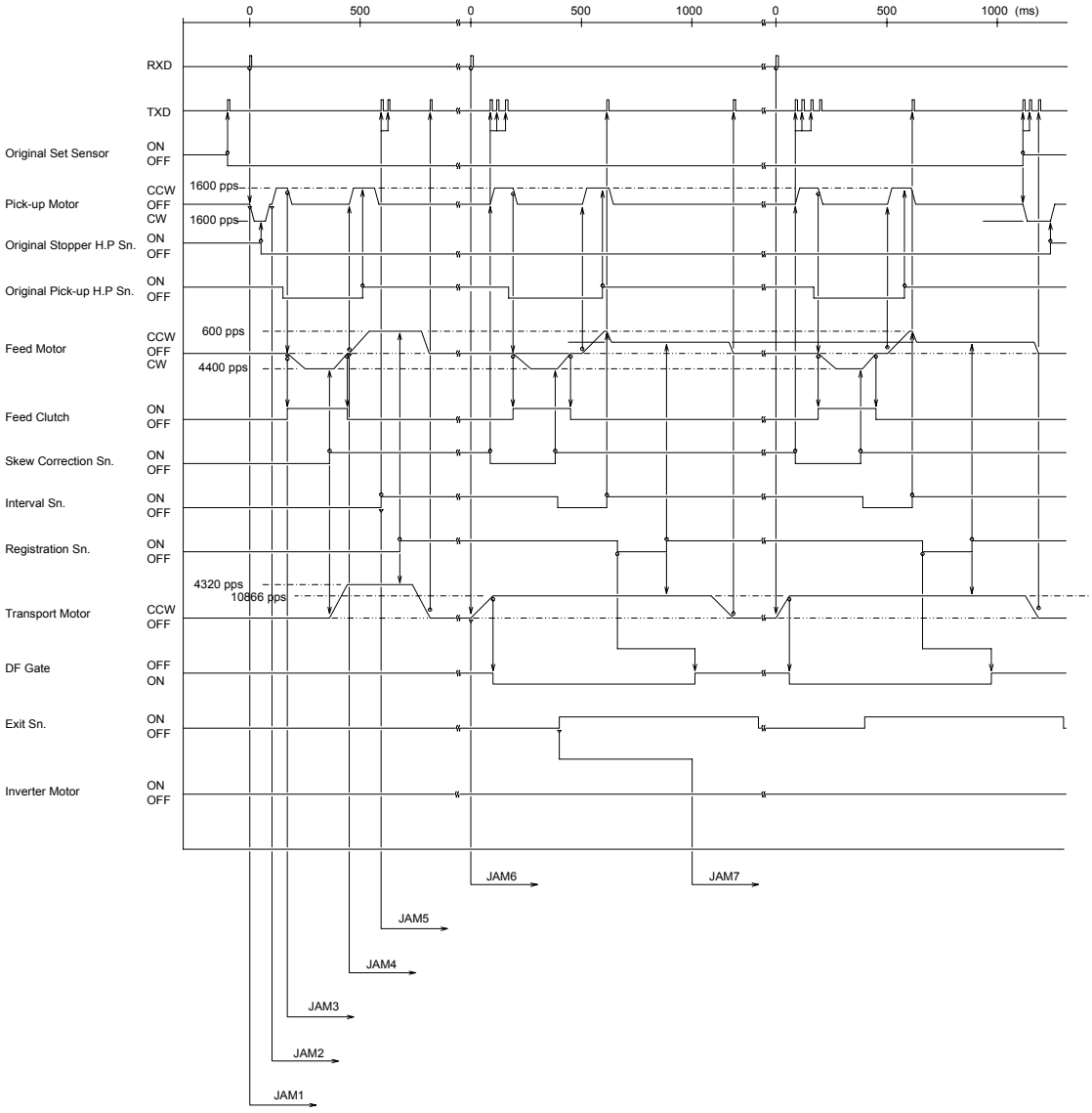
1. Rear cover (☛ 1.1)
2. Controller board [A] (x4, all)



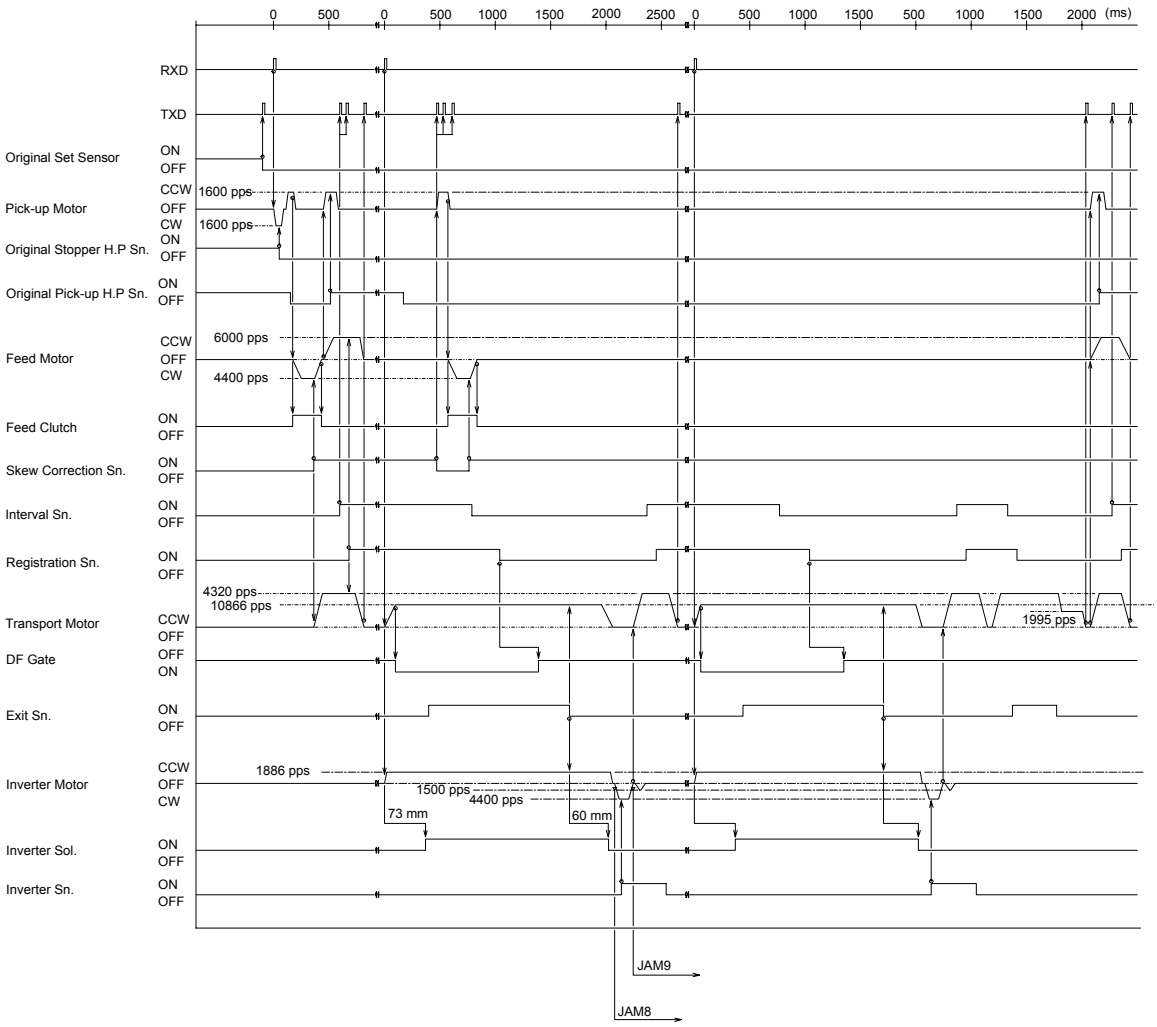
2. TROUBLESHOOTING

2.1 TIMING CHARTS

2.1.1 A4(S)/LT(S) SINGLE-SIDE ORIGINAL MODE



2.1.2 A4(S)/LT(S) DOUBLE-SIDED ORIGINAL MODE



2.2 JAM DETECTION

Jam Site	Cause
Original stopper HP sensor (Jam 1)	Original stopper home position could not be detected within 500 ms after the pick-up motor switched on and started rotating counter-clockwise.
Pick-up HP sensor (Jam 2)	Pick-up roller home position could not be detected within 500 ms after the pick-up motor switched on and started rotating clockwise.
Skew correction sensor jam (Jam 3)	The skew correction sensor does not turn on after the feed motor has fed the original 91.4 mm.
Transport jam (Jam 4)	The interval sensor does not turn on after the feed motor has fed the original 70.7 mm.
Registration sensor (Jam 5)	The registration sensor does not turn on after the interval sensor turned on and the original has been fed 74.1 mm.
Exit jam (Jam 6)	The exit sensor does not turn on after the transport motor has fed the original 124 mm.
Exit jam (Jam 7)	The exit sensor does not turn off after the exit sensor turned on and original has been fed 294 mm.
Inverter sensor jam (Jam 8)	The inverter sensor does not turn on after the inverter motor has fed the original 50 mm.
Interval sensor jam (Jam 9)	The interval sensor does not turn on after the inverter motor has fed the original 388.66 mm.

3. SERVICE TABLES

3.1 DIP SWITCHES

DPS101				Description
1	2	3	4	
0	0	0	0	Normal operating mode, with/without stamp.
0	0	0	1	Not used
0	0	1	0	Not used
0	0	1	1	Not used
0	1	0	0	Feed motor rotation (feed mode) 4400 pps (1-2 phase)
0	1	0	1	Feed motor rotation (pull-out mode) 6100 pps (1-2 phase)
0	1	1	0	Scanner motor rotation 4320 pps (2 phase)
0	1	1	1	Inverter motor rotation 6000 pps (1-2 phase)
1	0	0	0	Free run: one-sided original 100%
1	0	0	1	Free run: one-sided original 30%
1	0	1	0	Free run: one-sided original 71%
1	0	1	1	Free run: one-sided original 200%
1	1	0	0	Free run: two-sided original 100%
1	1	0	1	Free run: two-sided original 200%
1	1	1	0	Free run: one-sided (fax mode) 32.6%
1	1	1	1	Free run: one-sided (mixed original size mode) 100%

3.2 TEST POINTS

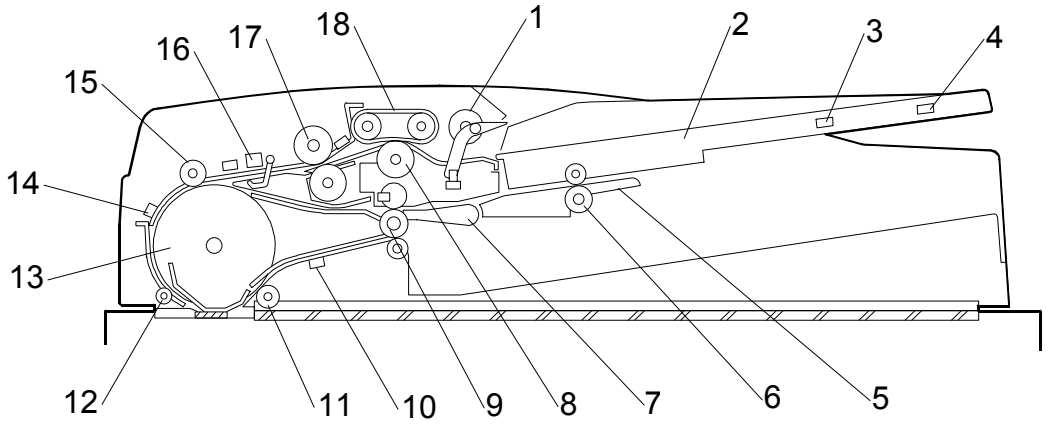
No.	Label	Monitored Signal
TP100	(GND)	Ground
TP101	(Vcc)	+5V
TP103	(TXD)	TXD to the copier
TP104	(RXD)	RXD from the copier

3.3 FUSES

No.	Function
FU101	Protects the 24 V line.

4. DETAILED DESCRIPTION

4.1 MAIN COMPONENTS



1	Pick-up roller	10	Exit sensor
2	Original tray	11	Idle roller 3
3	Original length sensor 1	12	Idle roller 2
4	Original length sensor 2	13	Transport roller
5	Reverse table	14	Registration sensor
6	Inverter roller	15	Idle roller 1
7	Junction gate	16	Original width sensor
8	Separation roller	17	Skew correction roller
9	Exit roller	18	Feed belt

Pick-up Mechanism. Picks up the originals for scanning.

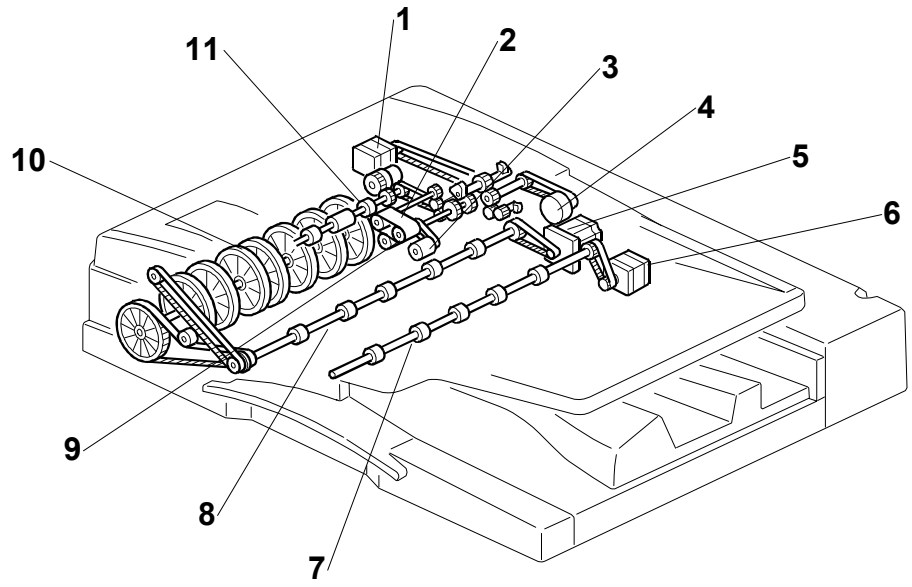
Feed/Separation Mechanism. Comprised of the feed belt and separation roller, feeds and separates the originals, and corrects skew.

Original Size Detection Sensors. Comprised of 4 width sensors and 2 length sensors, detect the sizes of the originals.

Original Transport Mechanism. Comprised of the transport roller, ADF exposure glass, and exit roller.

Original Reverse/Exit Mechanism. Exit/junction gate.

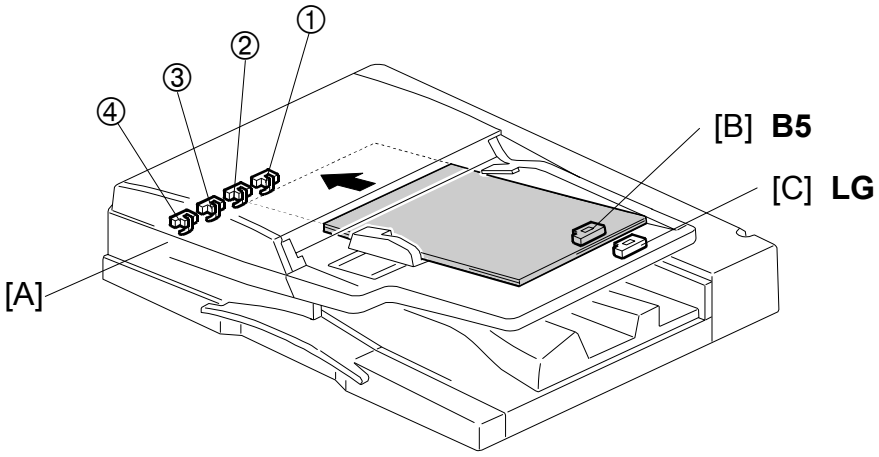
4.2 DRIVE LAYOUT



1	Feed motor	7	Inverter roller
2	Feed belt	8	Exit roller
3	Pick-up roller	9	Separation roller
4	Pick-up motor	10	Transport roller
5	Transport motor	11	Skew correction roller
6	Inverter motor		

4.3 ORIGINAL SIZE DETECTION

4.3.1 BASIC MECHANISM



The original size is detected by the four original width sensors [A] and two original length sensors, [B] and [C].

The machine determines the original width when the leading edge of the original activates the registration sensor.

The ARDF detects the original size by combining the readings of four width sensors and two length sensors. This integrated detection mechanism is detailed in the table on the next page.

Size (Width x Length)	Width Sensor				Length Sensor	
	①	②	③	④	B5	LG
A3 L*[1] (297 x 420 mm)	ON	ON	ON	ON	ON	ON
B4 L (257 x 364 mm)	ON	ON	-	-	ON	ON
A4 L (210 x 297 mm)	ON	-	-	-	ON	-
A4 S*[2] (297 x 210 mm)	ON	ON	ON	ON	-	-
B5 L (182 x 257 mm)	-	-	-	-	ON	-
B5 S (257 x 182 mm)	ON	ON	-	-	-	-
A5 L (148 x 210 mm)	-	-	-	-	-	-
A5 S (210 x 148 mm)	ON	-	-	-	-	-
B6 L (128 x 182 mm)	-	-	-	-	-	-
B6 S (182 x 128 mm)	-	-	-	-	-	-
DLT L (11" x 17")	ON	ON	ON	-	ON	ON
11" x 15" L	ON	ON	ON	-	ON	ON
10" x 14" L	ON	ON	-	-	ON	ON
LG L (8½" x 14")	ON	-	-	-	ON	ON
F4 L (8½" x 13")	ON	-	-	-	ON	ON
F L (8" x 13")	ON	-	-	-	ON	ON
LT L (8.5" x 11")	ON	-	-	-	ON	-
LT S (11" x 8.5"	ON	ON	ON	-	-	-
7¼" x 10½" L	ON	-	-	-	ON	-
10½" x 7¼" S	ON	ON	ON	-	-	-
8" x 10" L	ON	-	-	-	ON	-
HLT L 5½" x 8½"	-	-	-	-	-	-
HLT S 8½" x 5 ½"	ON	-	-	-	-	-
267 x 390 mm	ON	ON	ON	-	ON	ON
195 x 267 mm	ON	-	-	-	ON	-
267 x 195 mm	ON	ON	ON	-	-	-

*[1] L: Lengthways

*[2] S: Sideways

ON: Paper present

4.3.2 MIXED ORIGINAL SIZE MODE

This section explains what happens when the user selects mixed original size mode.

Because this ADF is a sheet-through document feeder, the method for original document width detection is the same as when the originals are the same size, but the document length detection method is different. Therefore, the scanning speed is slightly slower.

Document length detection

From when the registration sensor switches on until the interval sensor switches off, the CPU counts the transport motor pulses. The number of pulses determines the length of the original.

Feed-in cycle

When the original size for the copy modes listed below cannot be determined, the image cannot be correctly scaled (reduced or enlarged) or processed until the document length has been accurately detected. The length must be determined before the image is scanned.

Auto Reduce/Enlarge
Centering
Erase Center/Border
Booklet
Image Repeat

An original follows this path during transport:

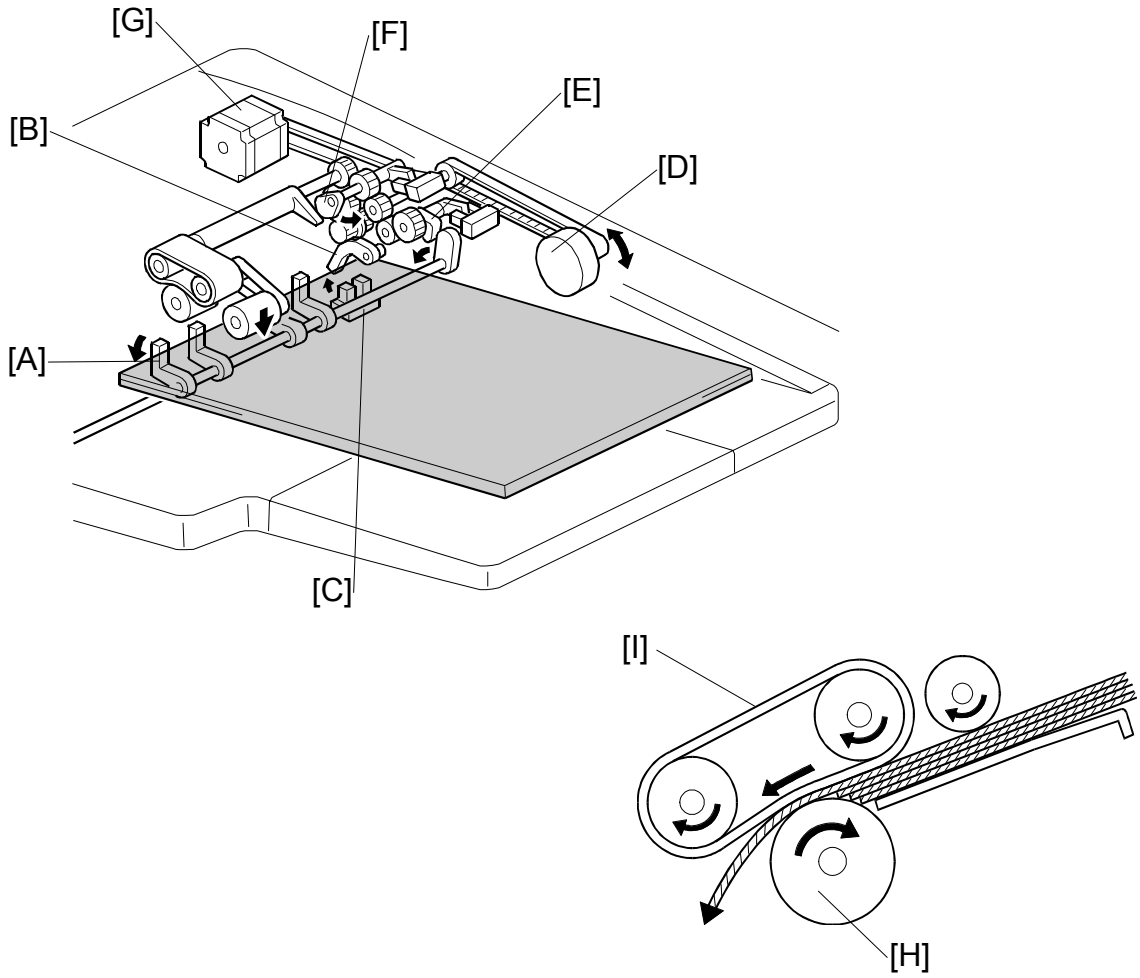
1. Document length detection ➔ Scanning glass ➔ Inverter table
2. Inverter table ➔ Scanning glass ➔ Inverter table (restores original order)
3. Inverter table ➔ Scanning glass (image scanned) ➔ Exit tray

Normal feed-in

In a copy mode other than those listed above, when the rate of reduction/enlargement has been determined, the originals are scanned normally. In order to store the scanned images, a large area of memory (the detected document width x 432 mm) is prepared. Next, only the portion of the image up to the detected document length is read from memory and printed.

4.4 ORIGINAL FEED-IN MECHANISM

4.4.1 PICK AND SEPARATION

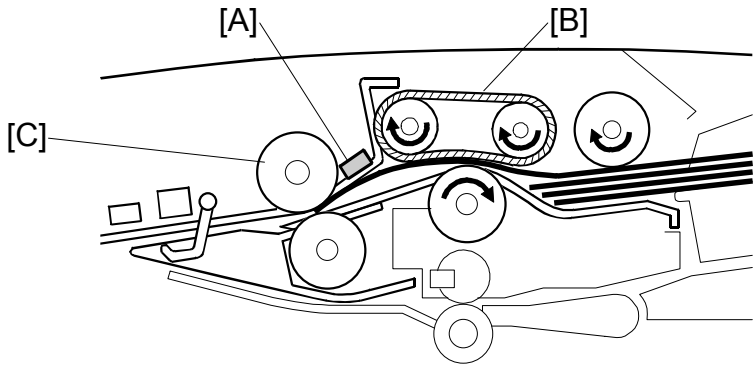


When the original is set on the original table, it contacts the original stopper [A] and pushes the actuator [B] out of the original set sensor [C].

When Start ⓘ is pressed, the pick-up motor [D] turns on and the original stopper cam [E] rotates. The original stopper lowers and releases the original.

Next, the pick-up roller cam [F] lowers the pick-up roller, and then the feed motor [G] turns on to feed the top sheet of paper. After being fed from the pick-up roller, the top sheet is separated from the stack by the separation roller [H] and the feed belt [I].

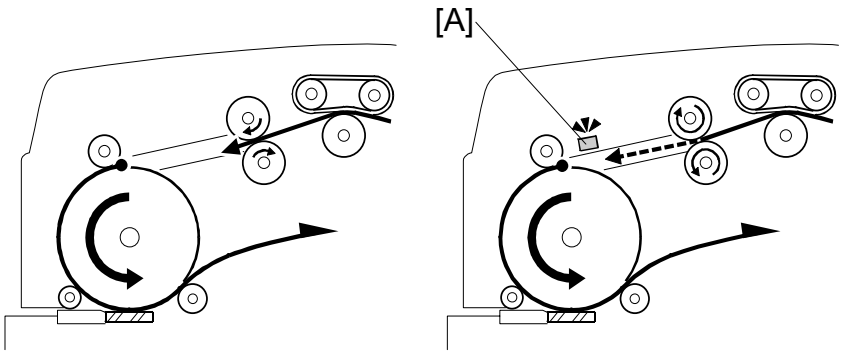
4.4.2 ORIGINAL SKEW CORRECTION



This mechanism is the same as the skew correction used by the registration roller in the main machine.

The feed motor and the skew correction clutch control the skew correction roller. Immediately after separation, the skew correction sensor [A] detects the leading edge of the original. The feed belt [B] moves the paper slightly until it presses against the skew correction roller [C] and buckles slightly to correct any skew.

4.4.3 REDUCING THE INTERVAL BETWEEN PAGES

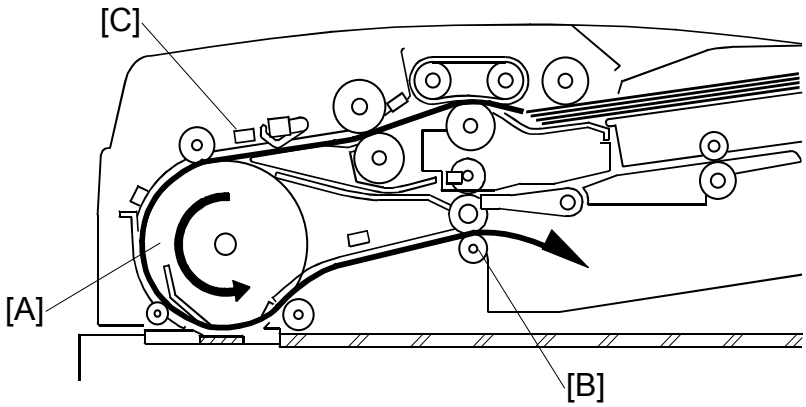


After performing skew correction, the feed motor runs at a speed higher than its original speed in order for the next original to catch up to the one ahead of it. This reduces the gap between the leading edge of the next original with the trailing edge of the one ahead.

When the leading edge of the original activates the interval sensor [A], the feed motor slows to match the speed of paper transport.

4.5 ORIGINAL TRANSPORT AND EXIT

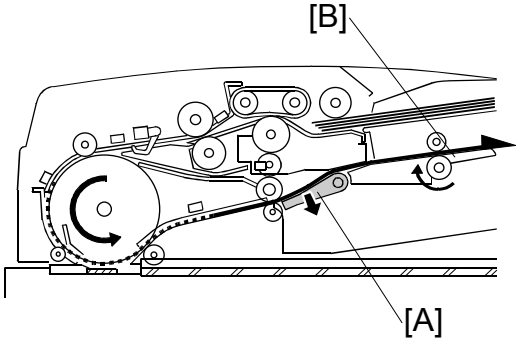
4.5.1 SINGLE-SIDED ORIGINALS



The transport motor drives the transport roller [A] and the exit roller [B]. When the leading edge of the original activates the interval sensor [C], the transport motor rotates the transport roller. The transport roller then feeds the original through scanning area. After scanning, the original is fed out by the exit roller to the exit tray.

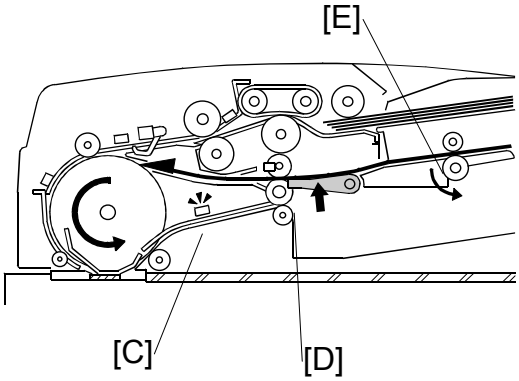
4.5.2 DOUBLE-SIDED ORIGINALS

Shortly after the transport motor has been turned on, the inverter solenoid is activated and junction gate [A] opens. The original is then scanned and transported towards the reverse table [B].

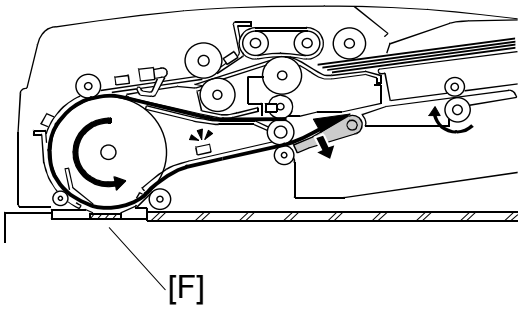


Shortly after the original exit sensor [C] detects the trailing edge of the original, the inverter solenoid turns off and the junction gate [D] closes.

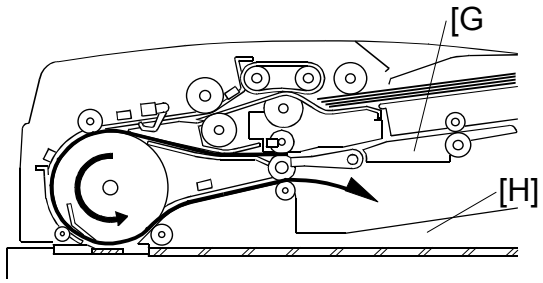
Next, the inverter motor turns on and the inverter roller [E] starts rotating to feed the original from the reverse table.



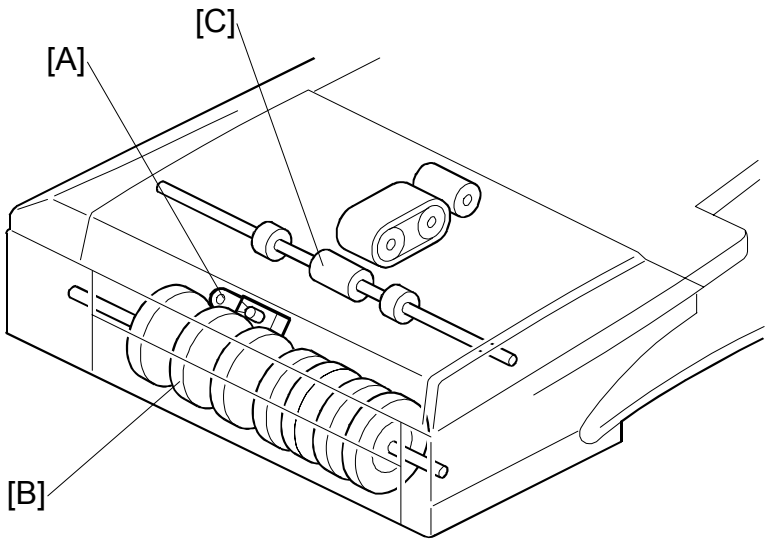
Then the original is fed to the transport roller and the scanning area [F] (where the reverse side is scanned).



After scanning the reverse side of the original, the original is then sent to the reverse table [G] a second time and turned over. This ensures that the double side original will be properly stacked in the correct order, front side down, in the original exit tray [H].



4.6 STAMP



NOTE: This function is only for fax mode.

The stamp [A] is located between the transport roller [B] and the exit roller [C].

When the original reaches the stamp, the transport motor stops and the stamp solenoid turns on if the page is sent successfully (immediate transmission) or stored successfully (memory transmission). After stamping, the ARDF feed motor re-starts to feed out the document.

NOTE: The position of the stamp can be adjusted with the Stamp Position Adjustment SP mode.

⇒ 4.7 DF70, SOFTWARE MODIFICATION HISTORY

DF70 (ARDF) SOFTWARE MODIFICATION HISTORY	SOFTWARE LEVEL	PRODUCTION DATE	VERSION
First mass production	B3515620 **F**	First mass production	1.74
Corrects the following: When scanning originals with the DF in Mixed Original or Double-Sided Original modes, a noise can sometimes be heard when the original is output to the reverse table. To ensure this noise does not occur, bit4 of the ADF controller DIPSW has been modified so that the reverse paper exit speed can be adjusted as follows: ADF DIPSW bit4 OFF: 4310pps (pulses per sec.) ON: 4166pps **This bit is set at the factory, depending on which setting produces less noise (most cases: set to ON). However in the field, if a noise occurs after replacing the motor or ADF controller, this can be eliminated or at least minimized by changing the bit to the opposite setting (e.g. ON → OFF).**	B3515620 **G**	June 2001 Production	1.75
Sometimes with Mixed Original Size mode, the motor remains on and/or a DF jam occurs.	B3515620 **J**	July 2001 Production	1.79

Part Number	Version	C. SUM	Production
B3515620J	1.79	0E62	July 2001 production
B3515620G	1.75	17E9	June 2001 production
B3515620F	1.74	862A	1st mass production

PAPER TRAY UNIT B542

PAPER TRAY UNIT B542

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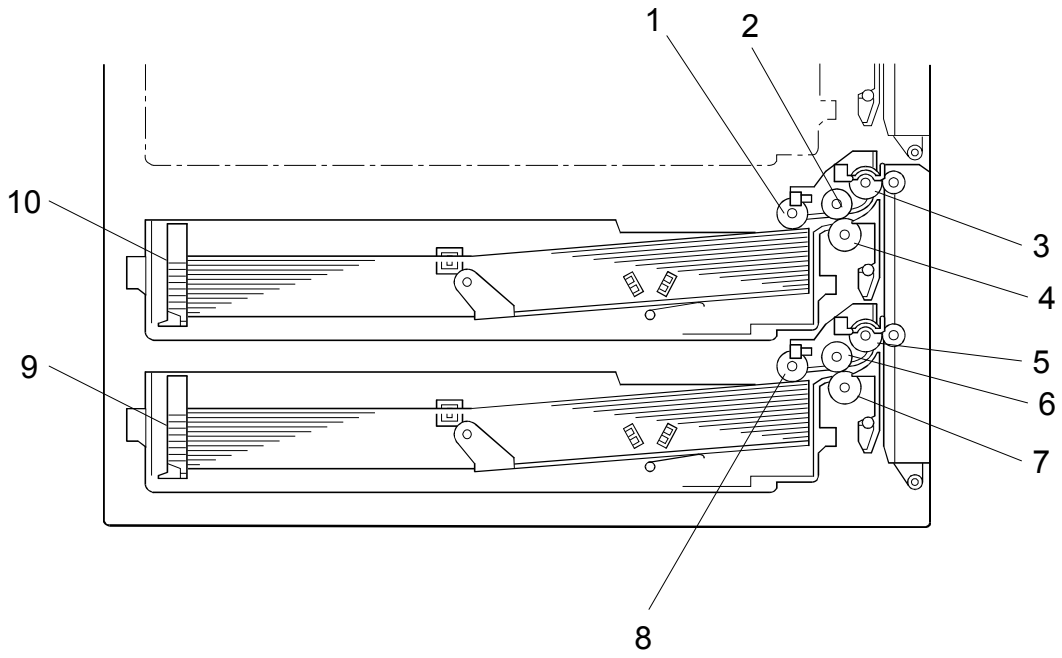
1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

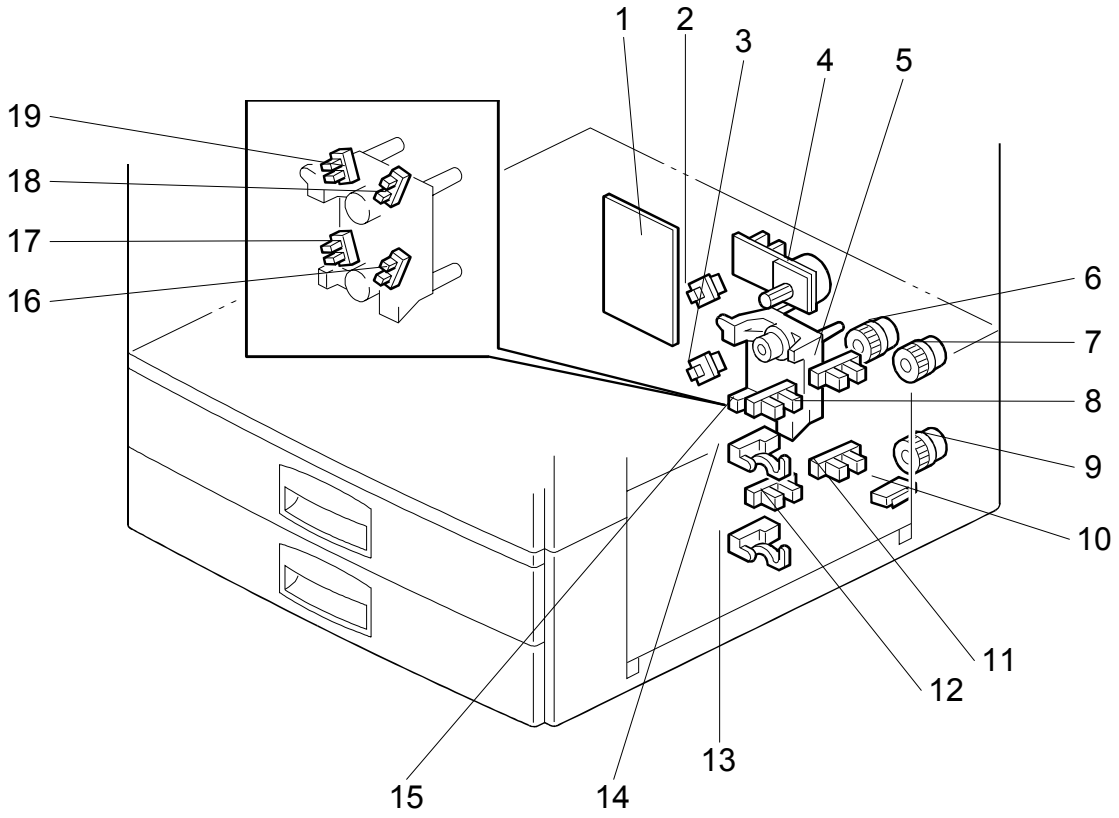
Paper Size:	A5 lengthwise to A3 HLT lengthwise to DLT
Paper Weight:	60 g/m^2 ~ 105 g/m^2, 16 lb ~ 28 lb
Tray Capacity:	500 sheets (80 g/m^2, 20 lb) x 2
Paper Feed System:	FRR (Feed and Reverse Roller)
Paper Height Detection:	4 steps (100%, 70%, 30%, Near end)
Power Source:	24 Vdc, 5 Vdc (from the copier) 120 Vac: 115 V version (from the copier) 220 ~ 240 Vac: 224/240 V version (from the copier)
Power Consumption:	50 W
Weight:	25 kg
Size (W x D x H):	540 mm x 600 mm x 270 mm

1.2 MECHANICAL COMPONENT LAYOUT



1. Upper Pick-up Roller
2. Upper Paper Feed Roller
3. Upper Relay Roller
4. Upper Separation Roller
5. Lower Relay Roller
6. Lower Paper Feed Roller
7. Lower Separation Roller
8. Lower Pick-up Roller
9. Lower Tray
10. Upper Tray

1.3 ELECTRICAL COMPONENT LAYOUT

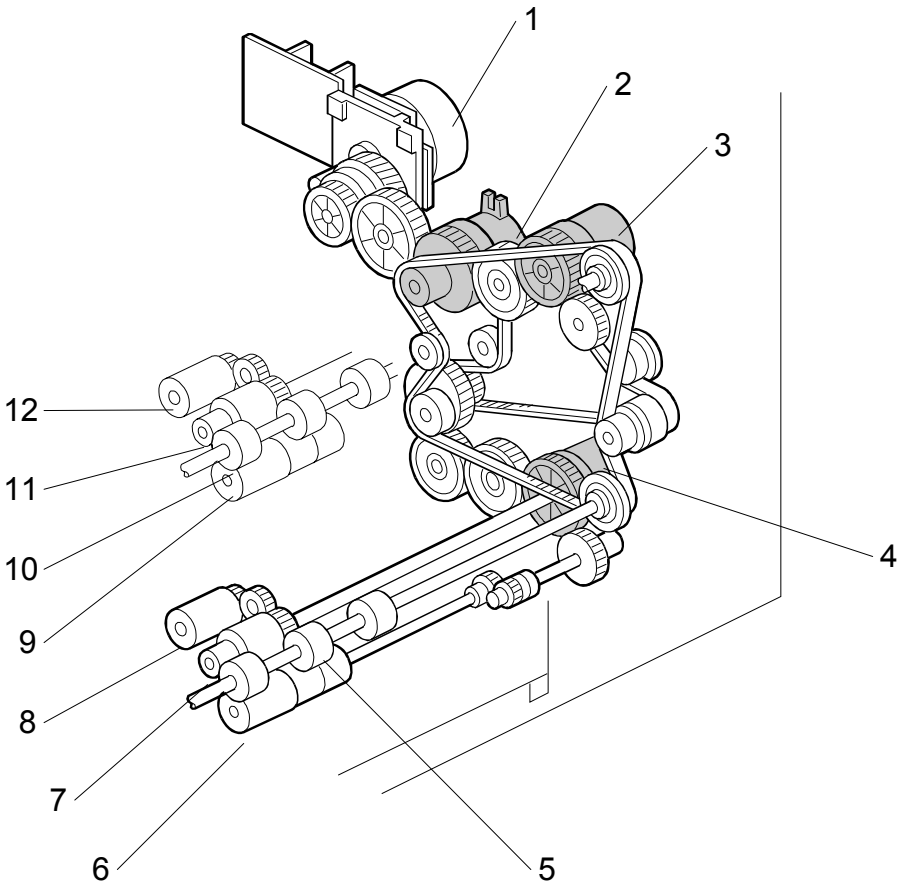


1. Main Board
2. Upper Tray Switch
3. Lower Tray Switch
4. Tray Motor
5. Upper Lift Sensor
6. Relay Clutch
7. Upper Paper Feed Clutch
8. Tray Lift Motor
9. Lower Paper Feed Clutch
10. Vertical Guide Switch
11. Lower Lift Sensor
12. Lower Paper End Sensor
13. Lower Relay Sensor
14. Upper Relay Sensor
15. Upper Paper End Sensor
16. Lower Paper Height 2 Sensor
17. Lower Paper Height 1 Sensor
18. Upper Paper Height 2 Sensor
19. Upper Paper Height 1 Sensor

1.4 ELECTRICAL COMPONENT DESCRIPTION

Symbol	Name	Function	Index No.
Motors			
M1	Tray	Drives all rollers.	4
M2	Tray Lift	Lifts the upper and lower tray bottom plates (there are two motors in this unit, one for each tray.	15
Sensors			
S1	Upper Lift	Detects when the paper in the upper tray is at the correct feed height.	5
S2	Lower Lift	Detects when the paper in the lower tray is at the correct feed height.	11
S3	Upper Paper End	Informs the copier when the upper tray runs out of paper.	15
S4	Lower Paper End	Informs the copier when the lower tray runs out of paper.	12
S5	Upper Relay	Detects misfeeds.	14
S6	Lower Relay	Detects misfeeds.	13
S7	Upper Paper Height 1	Detects the amount of paper in the upper tray.	17
S8	Upper Paper Height 2	Detects the amount of paper in the upper tray.	16
S9	Lower Paper Height 1	Detects the amount of paper in the lower tray.	19
S10	Lower Paper Height 2	Detects the amount of paper in the lower tray.	18
Switches			
SW1	Upper Tray	Informs the copier when the upper tray is set in the machine.	2
SW2	Lower Tray	Informs the copier when the lower tray is set in the machine.	3
SW3	Vertical Guide	Detects whether the vertical guide is opened or not.	10
Magnetic Clutches			
MC1	Upper Paper Feed	Starts paper feed from the upper tray.	7
MC2	Lower Paper Feed	Starts paper feed from the lower tray.	9
MC3	Relay	Drives the transport rollers.	6
PCBs			
PCB1	Main	Controls the paper tray unit and communicates with copier.	1

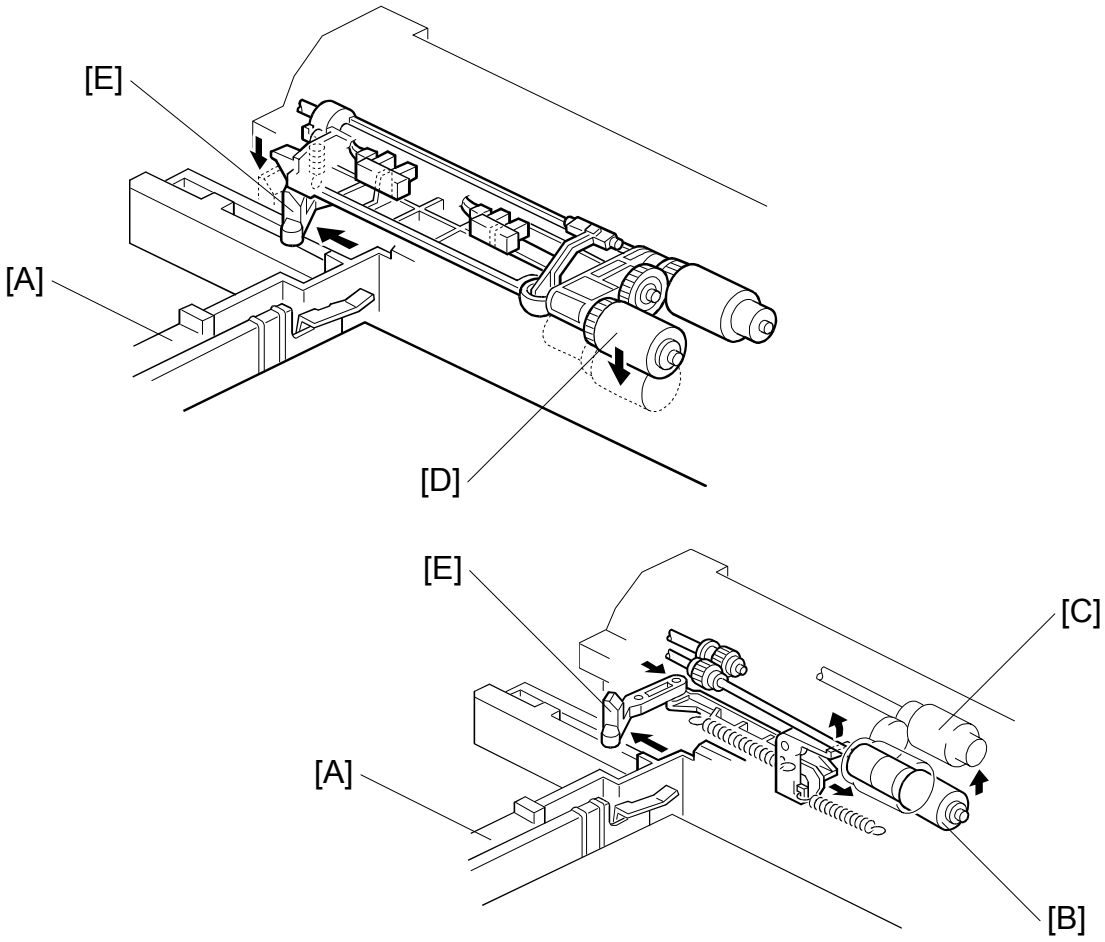
1.5 DRIVE LAYOUT



1. Tray Motor
2. Relay Clutch
3. Upper Paper Feed Clutch
4. Lower Paper Feed Clutch
5. Lower Relay Roller
6. Lower Separation Roller
7. Lower Paper Feed Roller
8. Lower Pick-up Roller
9. Upper Separation Roller
10. Upper Relay Roller
11. Upper Paper Feed Roller
12. Upper Pick-up Roller

2. DETAILED DESCRIPTIONS

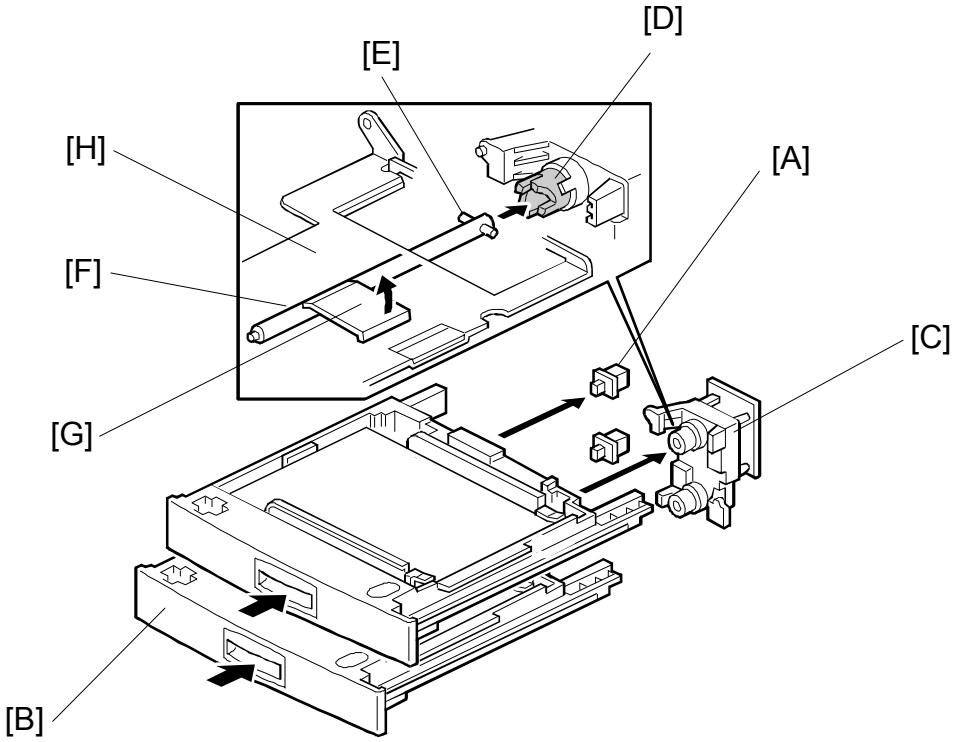
2.1 PICK-UP AND SEPARATION ROLLER RELEASE MECHANISM



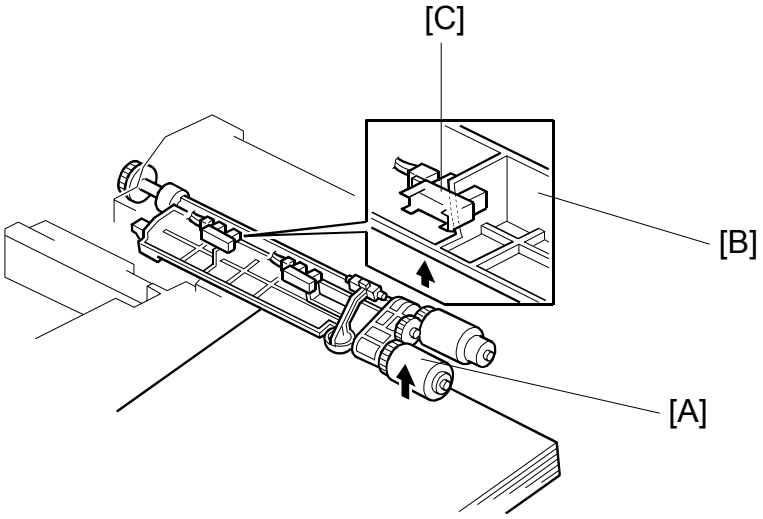
When the paper tray [A] is not inside the paper tray unit, the separation roller [B] is away from the paper feed roller [C], and the pick-up roller [D] stays in the upper position.

When the paper tray is put into the paper tray unit, it pushes the release lever [E]. This causes the pick-up roller to move down (top diagram) and the separation roller to move into contact with the paper feed roller (bottom diagram).

2.2 PAPER LIFT MECHANISM



The paper tray switch [A] detects when the paper tray [B] is placed in the machine. When the machine detects that the paper tray is in the machine, the tray lift motor [C] rotates and the coupling gear [D] on the tray lift motor engages the pin [E] on the lift arm shaft [F]. Then the tray lift arm [G] lifts the tray bottom plate [H].

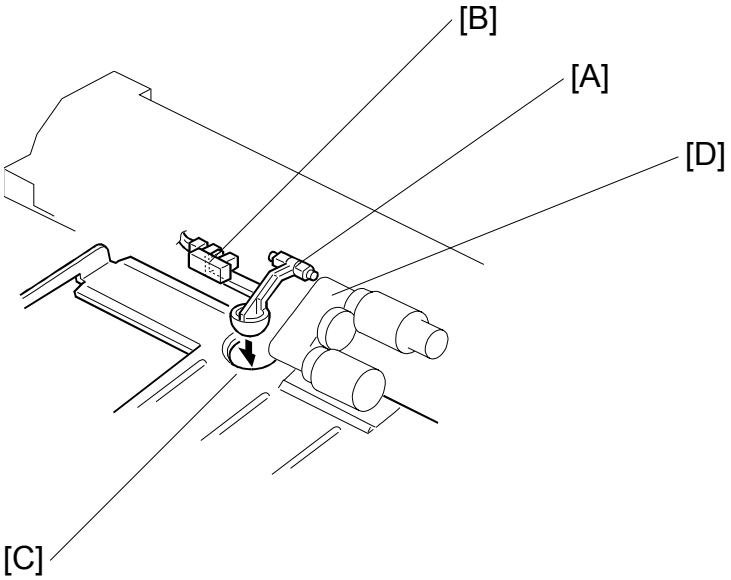


When the paper tray is placed in the machine, the pick-up roller [A] lowers. When the top sheet of paper reaches the proper height for paper feed, the paper pushes up the pick-up roller, and the actuator [B] on the pick-up roller supporter activates the lift sensor [C] to stop the tray lift motor.

After several paper feed cycles, the paper level gradually lowers and the lift sensor is de-activated. The tray lift motor turns on again until this sensor is activated again.

When the tray is drawn out of the machine, the tray lift motor coupling gear disengages the pin on the lift arm shaft, and the tray bottom plate then drops under its own weight.

2.3 PAPER END DETECTION



If there is some paper in the paper tray, the paper end feeler [A] is raised by the paper stack and the paper end sensor [B] is deactivated.

When the paper tray runs out of paper, the paper end feeler drops into the cutout [C] in the tray bottom plate and the paper end sensor is activated.

When the paper tray is drawn out, the paper end feeler is lifted up by the pick-up roller supporter [D].

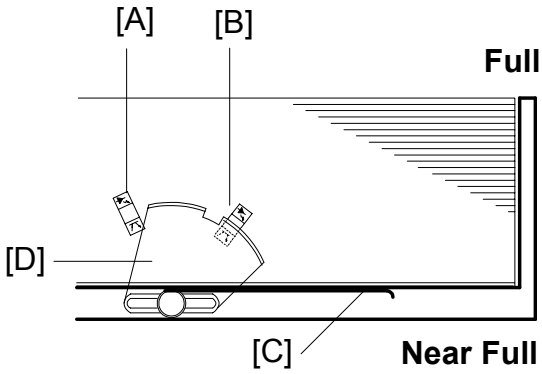
2.4 PAPER HEIGHT DETECTION

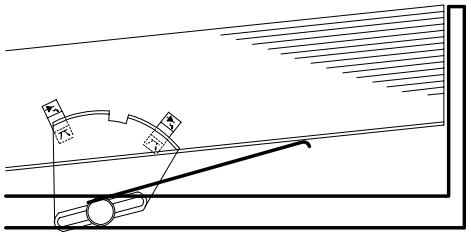
The amount of paper in the tray is detected by the combination of two paper height sensors, [A] and [B].

When the amount of 2 paper decreases, the bottom plate pressure lever [C] moves up and the actuator [D] which is mounted on the same drive shaft as the pressure lever rotates.

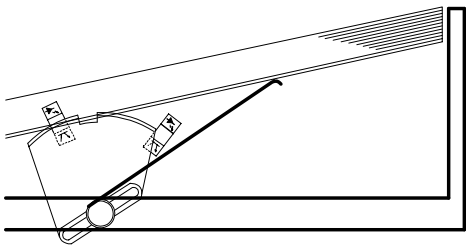
The following combination of sensor signals is sent to the copier.

Amount of Paper	Paper Height Sensor 1	Paper Height Sensor 2
Full	OFF	ON
Near Full	ON	ON
Near End 1	ON	OFF
Near End 2	OFF	OFF

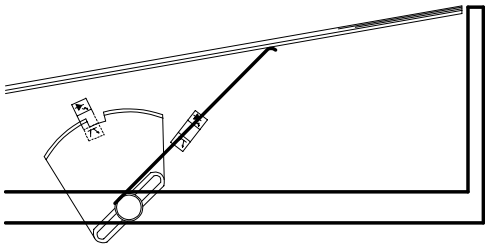




Near End 1



Near End 2



3. SERVICE TABLES

3.1 DIP SWITCHES

DPS101								Description
1	2	3	4	5	6	7	8	
0	0	0	0	0	0	0	0	Default
0	0	0	0	0	0	0	1	Free run, feed from upper tray
0	0	0	0	0	0	1	1	Free run, feed from lower tray
0	0	0	0	0	1	0	1	Free run, feed from upper and lower trays alternately

NOTE: 1) Do not use any other settings.
2) To do the free run, proceed as follows:
1. Remove the paper from the tray (this is because the machine has no jam detection).
2. Set DPS101 for the required free run as shown above.
3. Turn the main power switch off, wait a few seconds, then switch on.
4. Press SW101 to start the free run.
5. To stop the free run, press SW102.

3.2 TEST POINTS

No.	Label	Monitored Signal
TP100	(24 V)	+24 V
TP101	(GND)	Ground
TP103	(TXD)	TXD to the copier
TP104	(RXD)	RXD from the copier
TP105	(5 V)	+5 V
TP106	(GND)	Ground

3.3 SWITCHES

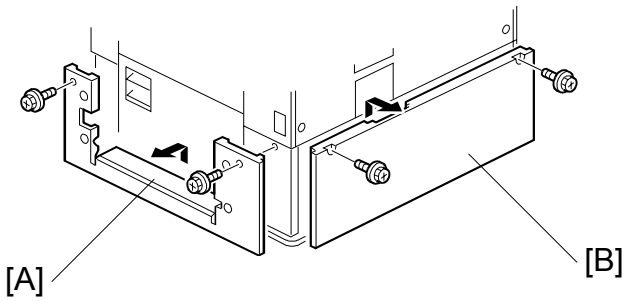
No.	Function
SW101	Starts the free run
SW102	Stops the free run

3.4 FUSES

No.	Function
FU101	Protects the 24 V line.

4. REPLACEMENT AND ADJUSTMENT

4.1 COVER REPLACEMENT



Right Cover

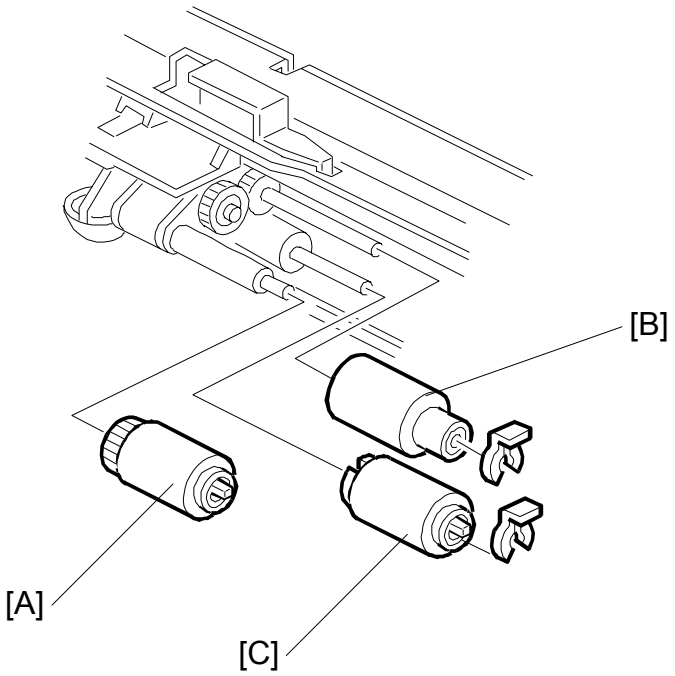
1. Remove the right cover [A] (2 screws).

Rear Cover

1. Remove the rear cover [B] (2 screws).

4.2 ROLLER REPLACEMENT

4.2.1 PAPER FEED, SEPARATION, AND PICK-UP ROLLERS



1. Remove the paper tray.

Pick-up Roller

2. Replace the pick-up roller [A].

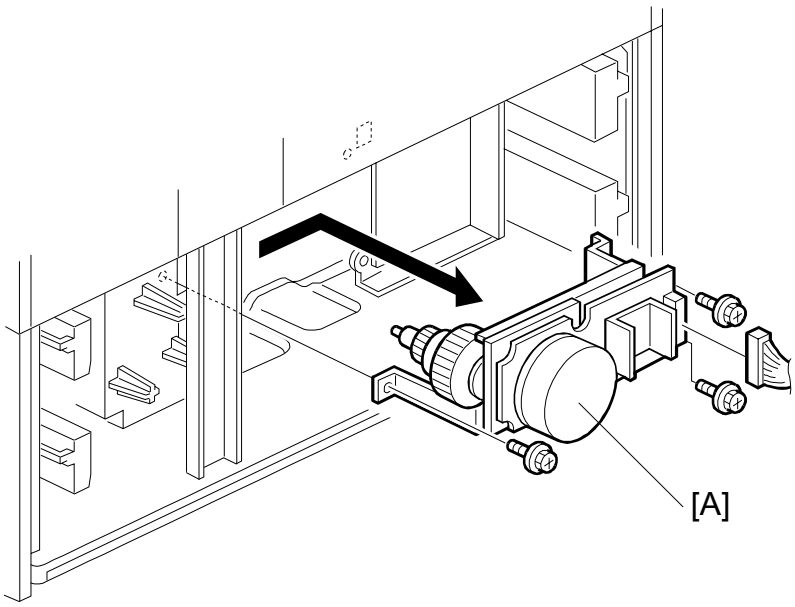
Paper Feed Roller

2. Replace the paper feed roller [B] (1 snap ring).

Separation Roller

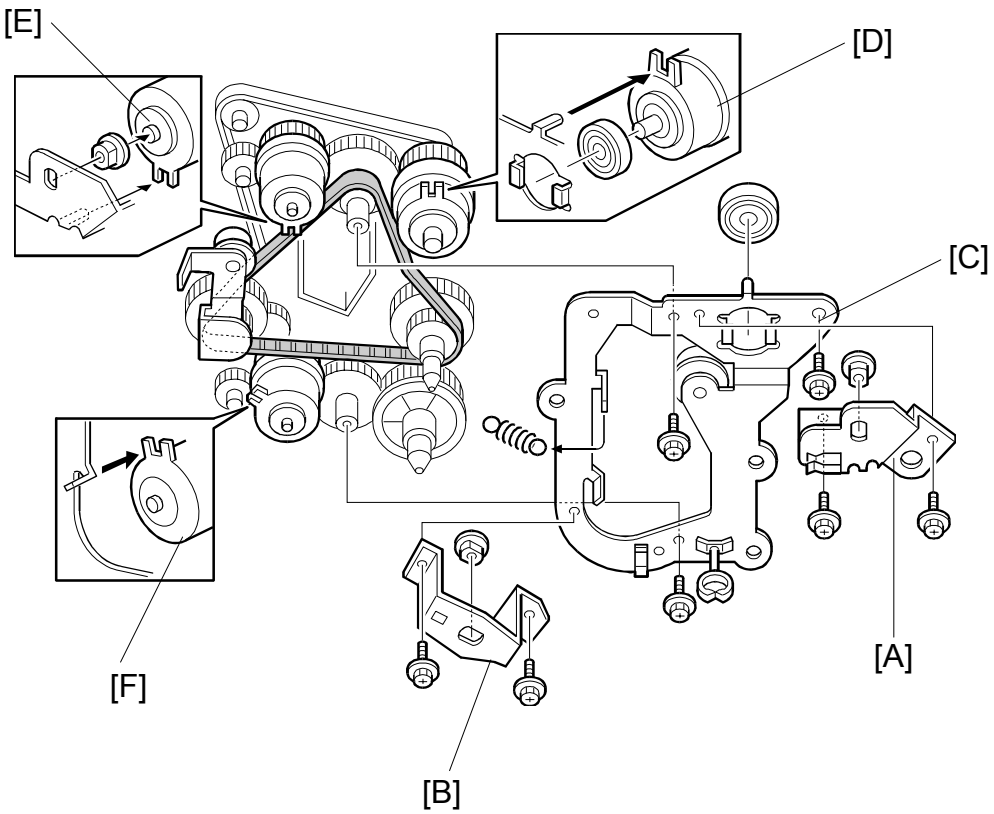
2. Replace the separation roller [C] (1 snap ring).

4.3 TRAY MOTOR REPLACEMENT



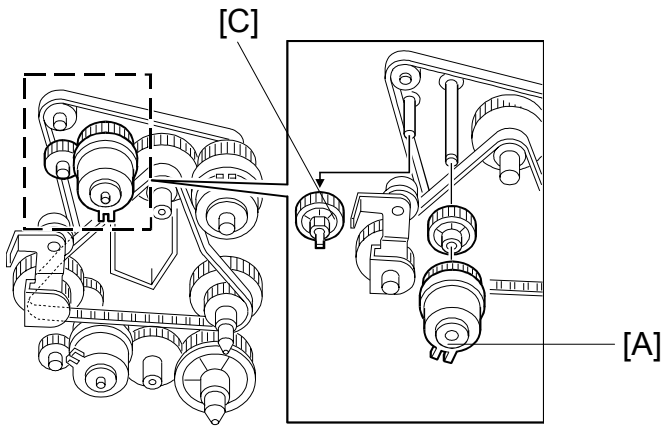
1. Remove the rear cover.
2. Remove the tray motor [A] (1 connector, 3 screws).

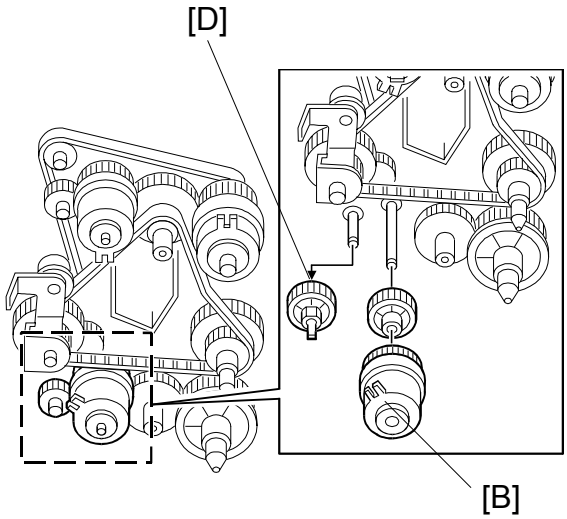
4.4 PAPER FEED AND RELAY CLUTCH REPLACEMENT



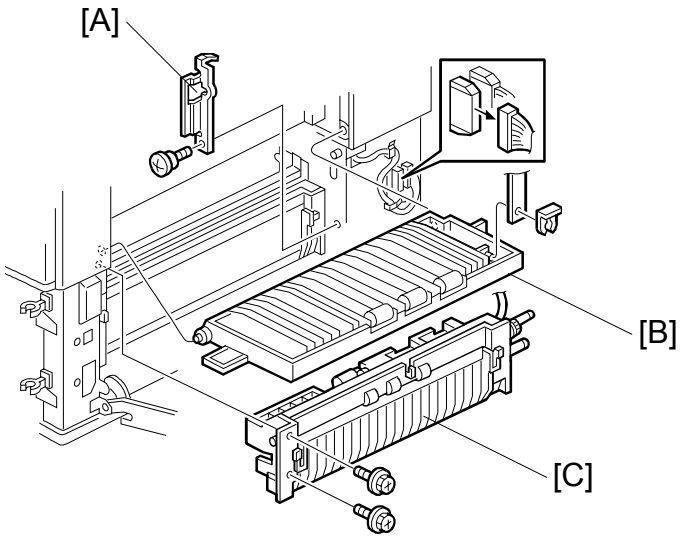
1. Remove the rear cover.
2. Remove the upper paper feed clutch holder [A] (2 screws).
3. Remove the lower paper feed clutch holder [B] (2 screws).
4. Remove the gear holder [C] (3 screws, 1 spring, 1 bearing).
5. Replace the relay clutch [D] (1 connector).
6. Replace the upper feed clutch [E] (1 bushing, 1 connector).
7. Replace the lower feed clutch [F] (1 connector).

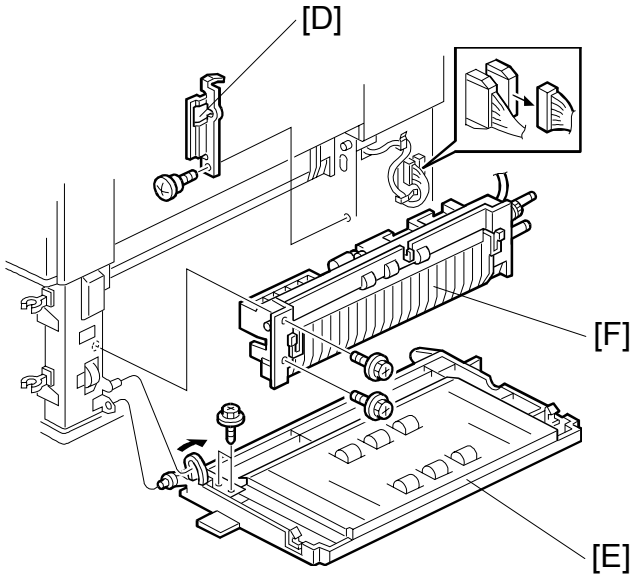
4.5 PAPER FEED UNIT REPLACEMENT





1. Remove the rear cover.
2. Remove the upper and lower paper feed clutch holder.
3. Remove the gear holder.
4. Remove the upper feed clutch [A] or lower feed clutch [B].
5. Remove the upper or lower gear [C, D].





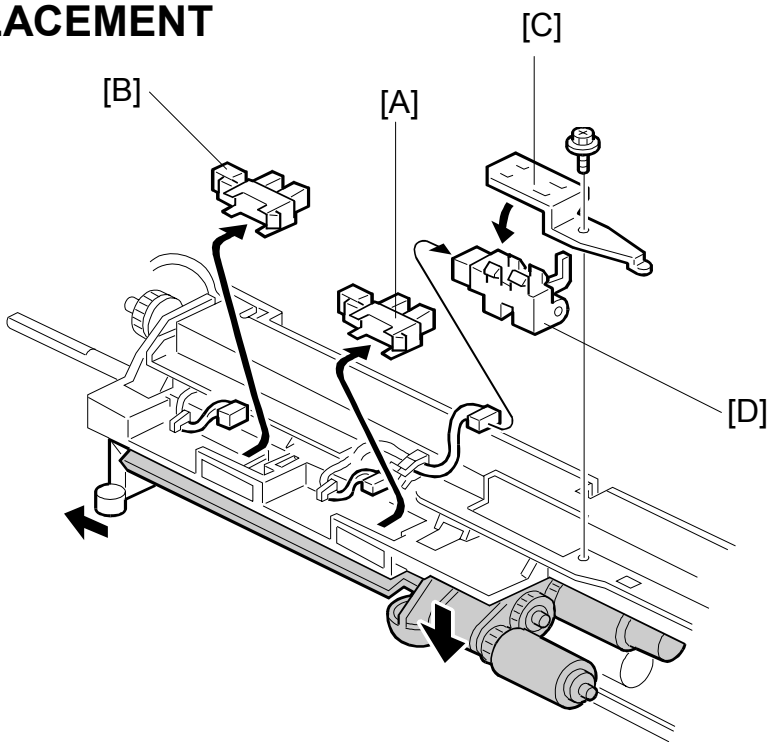
Upper Paper Feed Unit

6. Remove the docking bracket [A] (1 screw).
7. Remove the vertical transport cover [B] of the copier (1 snap ring).
8. Remove the upper paper feed unit [C] (2 screws, 1 connector).

Lower Paper Feed Unit

6. Remove the docking bracket [D] (1 screw).
7. Remove the vertical transport guide [E] (2 screws).
8. Remove the lower paper feed unit [F] (2 screws, 1 connector).

4.6 PAPER END, TRAY LIFT, AND RELAY SENSOR REPLACEMENT



1. Remove the paper feed unit.

Paper End Sensor

2. Replace the paper end sensor [A] (1 connector).

Tray Lift Sensor

2. Replace the tray lift sensor [B] (1 connector).

Relay Sensor

2. Remove the sensor bracket [C] (1 screw).
3. Replace the relay sensor [D] (1 connector).

LARGE CAPACITY TRAY
B543

LARGE CAPACITY TRAY B543

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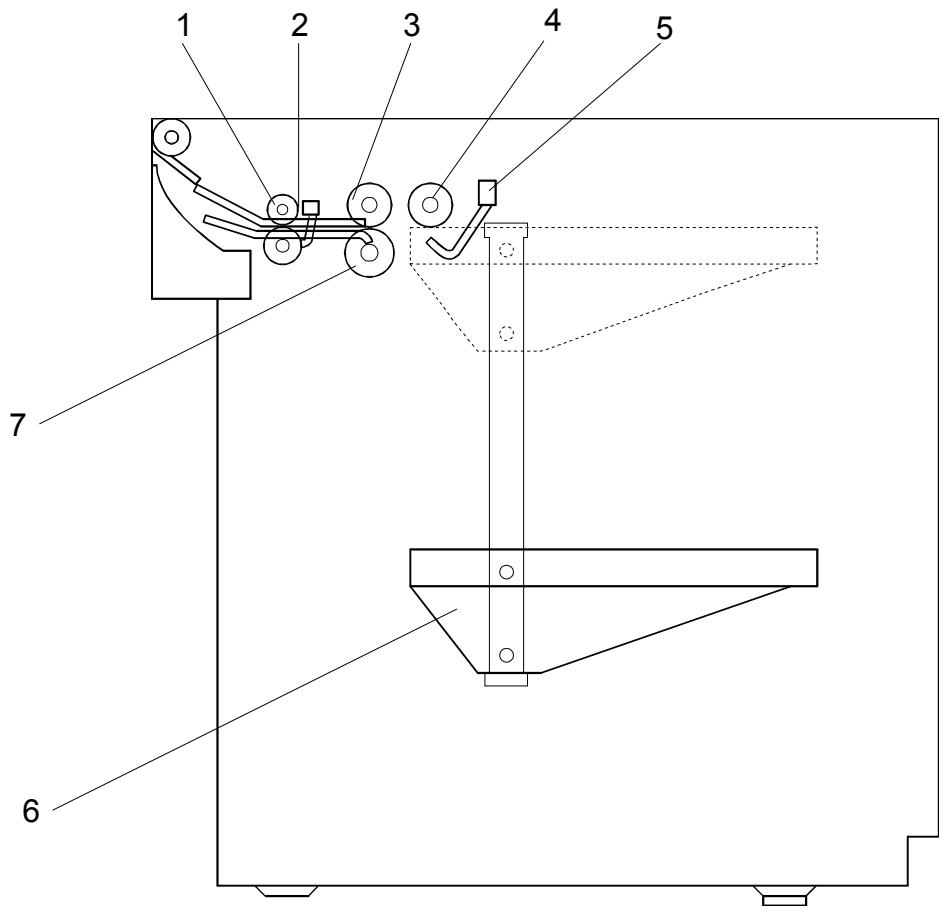
1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

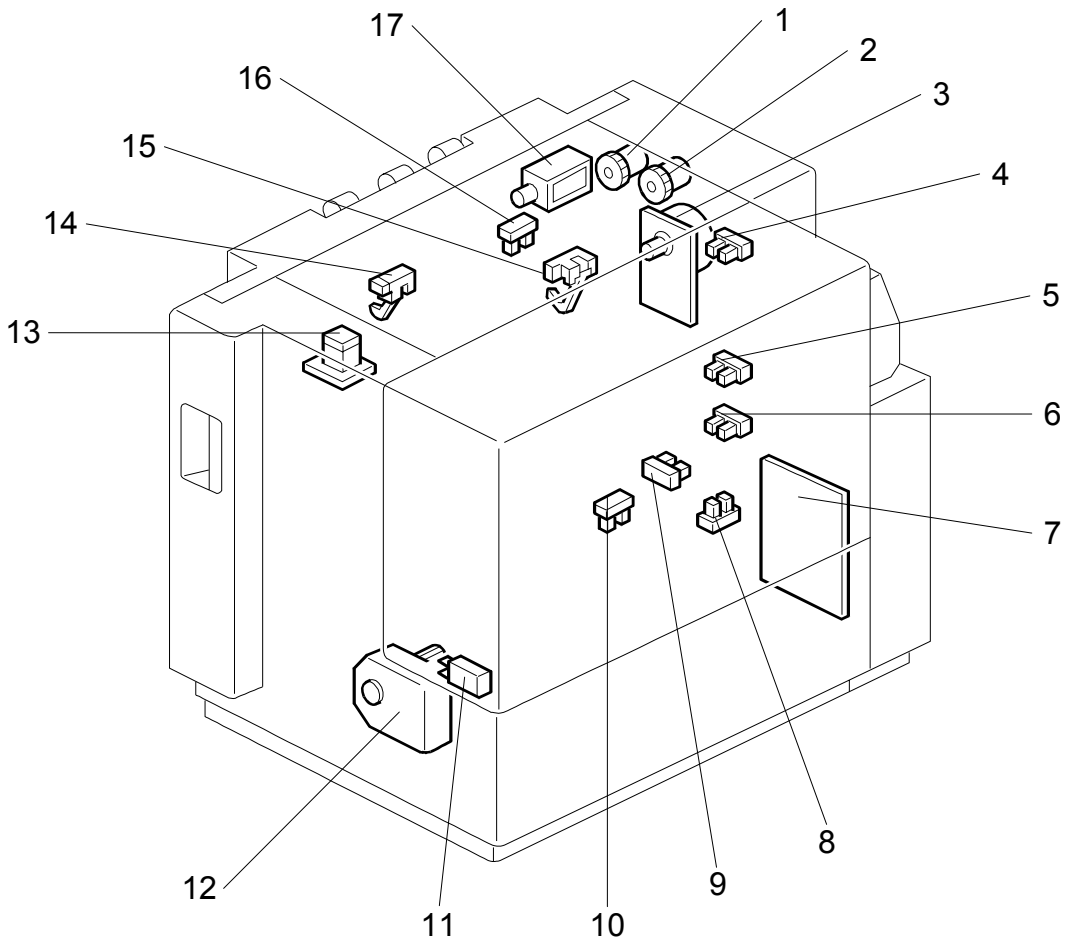
Paper Size:	A4 sideways/LT sideways
Paper Weight:	60 g/m^2 ~ 105 g/m^2, 16 lb ~ 28 lb
Tray Capacity:	1500 sheets (80 g/m^2, 20lb)
Remaining Paper Detection:	5 steps (100%, 75%, 50%, 25%, Near end)
Power Source:	24 Vdc, 5 Vdc (from copier)
Power Consumption:	40 W
Weight:	17 kg
Size (W x D x H):	390 mm x 500 mm x 390 mm

1.2 MECHANICAL COMPONENT LAYOUT



1. Relay Roller
2. Relay Sensor
3. Paper Feed Roller
4. Pick-up Roller
5. Paper End Sensor
6. Paper Tray
7. Separation Roller

1.3 ELECTRICAL COMPONENT LAYOUT

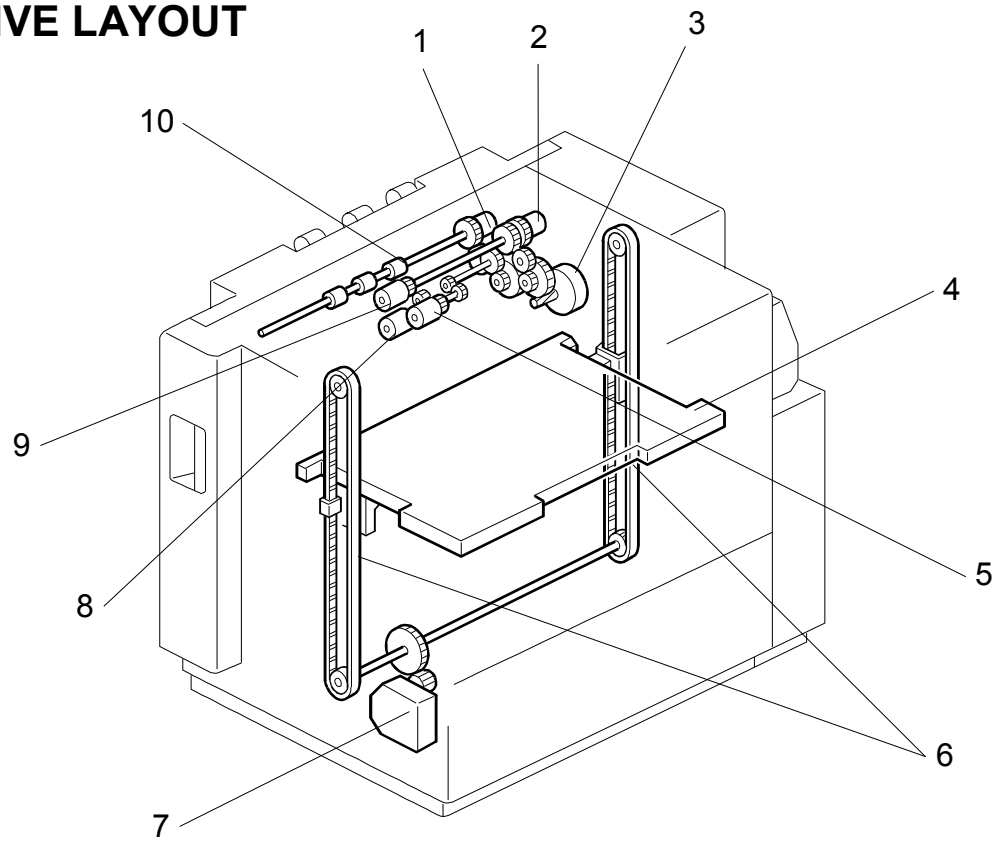


1. Relay Clutch
2. Paper Feed Clutch
3. LCT Motor
4. Paper Height 1 Sensor
5. Paper Height 2 Sensor
6. Paper Height 3 Sensor
7. Main Board
8. Side Fence Position Sensor
9. Lower Limit Sensor
10. LCT Set Sensor
11. Tray Cover Switch
12. Lift Motor
13. Down Switch
14. Relay Sensor
15. Paper End Sensor
16. Lift Sensor
17. Pick-up Solenoid

1.4 ELECTRICAL COMPONENT DESCRIPTION

Symbol	Name	Function	Index No.
Motors			
M1	LCT	Drives all rollers.	3
M2	Lift	Drives the paper tray up or down.	12
Sensors			
S1	Paper End	Informs the copier when the paper has run out.	15
S2	Relay	Detects the copy paper coming to the relay roller and checks for misfeeds.	14
S3	Lift	Detects when the paper is at the correct paper feed height.	16
S4	Lower Limit	Detects when the tray is completely lowered, to stop the LCT motor.	9
S5	Paper Height 1	Detects the paper height.	4
S6	Paper Height 2	Detects the paper height.	5
S7	Paper Height 3	Detects the paper height.	6
S8	LCT Set	Detects whether the LCT is correctly set or not.	10
S9	Side Fence Position	Detects when the side fence is set at the A4 size position.	8
Switches			
SW1	Tray Cover	Stops the LCT lift motor when the tray cover is opened.	11
SW2	Down	Lowers the LCT bottom plate if pressed by the user.	13
Solenoids			
SOL1	Pick-up	Controls up-down movement of the pick-up roller.	17
Magnetic Clutches			
MC1	Paper Feed	Drives the paper feed roller.	2
MC2	Relay	Drives the relay roller.	1
PCBs			
PCB1	Main	Controls the LCT and communicates with the copier.	7

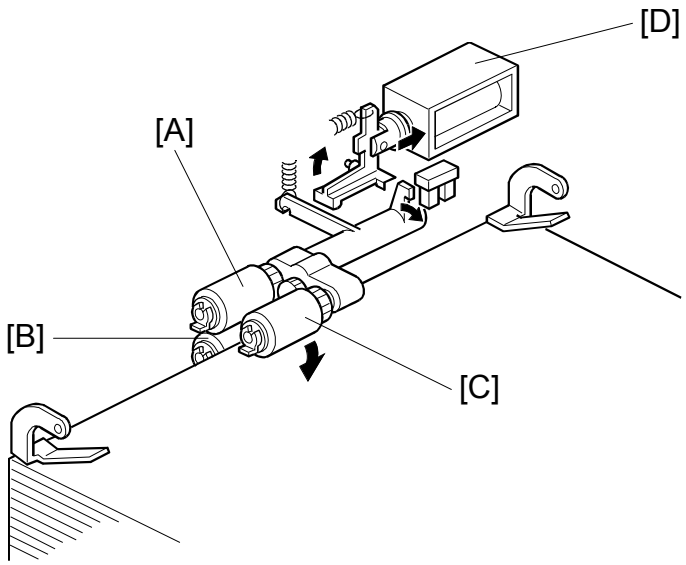
1.5 DRIVE LAYOUT



1. Relay Clutch
2. Paper Feed Clutch
3. LCT Motor
4. Tray Bottom Plate
5. Pick-up Roller
6. Tray Drive Belts
7. Lift Motor
8. Separation Roller
9. Paper Feed Roller
10. Relay Roller

2. DETAILED DESCRIPTIONS

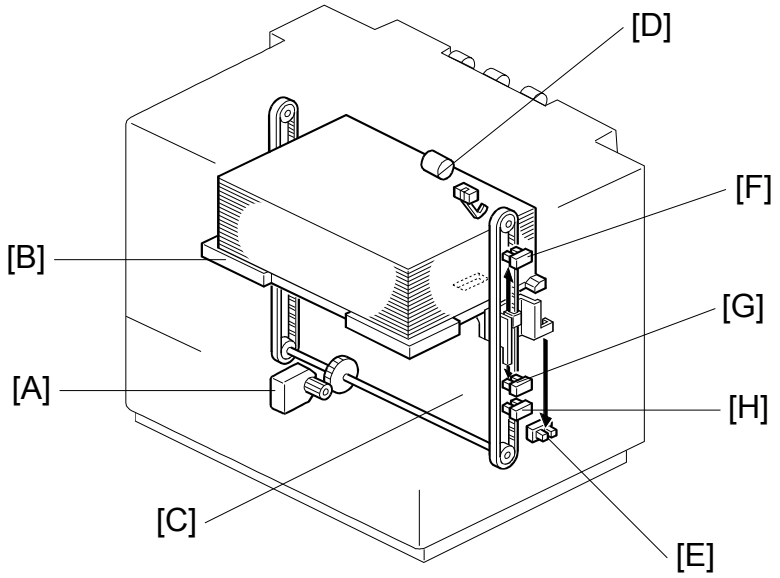
2.1 PAPER FEED MECHANISM



This machine uses the FRR (Feed and Reverse Roller) paper feed system (paper feed roller [A], separation roller [B], pick-up roller [C]).

When the start key is pressed, the pick-up solenoid [D] energizes and the pick-up roller touches the paper.

2.2 TRAY LIFT AND PAPER HEIGHT DETECTION MECHANISM



The lift motor [A] controls the vertical position of the tray bottom plate [B] through gears and timing belts [C].

Tray lifting conditions

When the tray lift sensor [D] turns off in the following conditions, the tray lift motor raises the tray bottom plate until the tray lift sensor [D] turns on again.

- Just after the main switch is turned on
- During copying
- Just after the tray cover is closed
- Just after leaving the energy saving mode

Tray lowering conditions

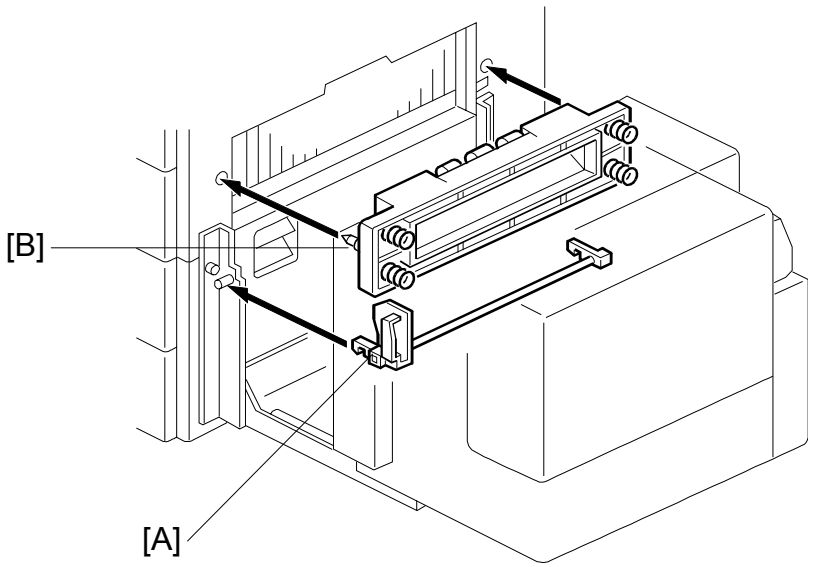
In the following conditions, the lift motor lowers the tray bottom plate until the lower limit [E] sensor turns on.

- Just after the paper end sensor turns on
- Just after the down switch is pressed by the user

The amount of the paper in the tray is detected by combination of high/low outputs from three sensors (paper height sensor 1 [F], 2 [G], and 3 [H].)

Amount of paper	Paper Height Sensor 1	Paper Height Sensor 2	Paper Height Sensor 3
Near end	On (High)	Off (Low)	Off (Low)
25%	Off (Low)	On (High)	Off (Low)
50%	Off (Low)	On (High)	On (High)
75%	Off (Low)	Off (Low)	On (High)
100%	Off (Low)	Off (Low)	Off (Low)

2.3 TRAY UNIT SLIDE MECHANISM



When there is a paper jam between the copier and the LCT, the user releases the lock lever [A] and can slide the LCT away from the copier to remove the jammed paper.

When sliding the LCT back into position, the LCT is secured against the copier in the correct position by the docking pins [B] on the LCT.

3. SERVICE TABLES

3.1 DIP SWITCHES

DPS101								Description
1	2	3	4	5	6	7	8	
1	0	0	0	0	0	0	0	Default
1	0	0	0	0	0	0	1	Free run

NOTE: 1) Do not use any other settings.
2) To do the free run, proceed as follows:
1. Remove the paper from the LCT (this is because the machine has no jam detection).
2. Set DPS101 for the free run as shown above.
3. Turn the main switch off, wait a few seconds, then switch back on.
4. Press SW101 to start the free run.
5. To stop the free run, press SW102.

3.2 TEST POINTS

No.	Label	Monitored Signal
TP100	(24 V)	+24 V
TP101	(GND)	Ground
TP103	(TXD)	TXD to the copier
TP104	(RXD)	RXD from the copier
TP105	(5 V)	+5 V
TP106	(GND)	Ground

3.3 SWITCHES

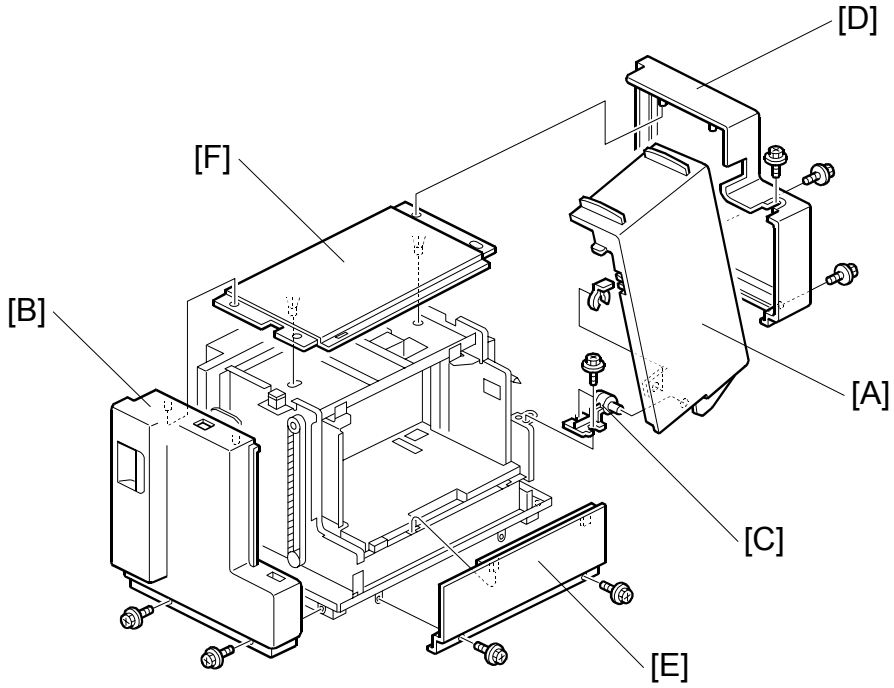
No.	Function
SW101	Starts the free run
SW102	Stops the free run

3.4 FUSES

No.	Function
FU101	Protects the 24 V line.

4. REPLACEMENT AND ADJUSTMENT

4.1 COVER REPLACEMENT



Tray Cover

1. Remove the tray cover [A] (1 snap ring).

Front Cover

1. Remove the front cover [B] (2 screws).

Rear Cover

1. Remove the tray cover.
2. Remove the cover hinge [C] (2 screws).
3. Remove the rear cover [D] (3 screws).

Right Lower Cover

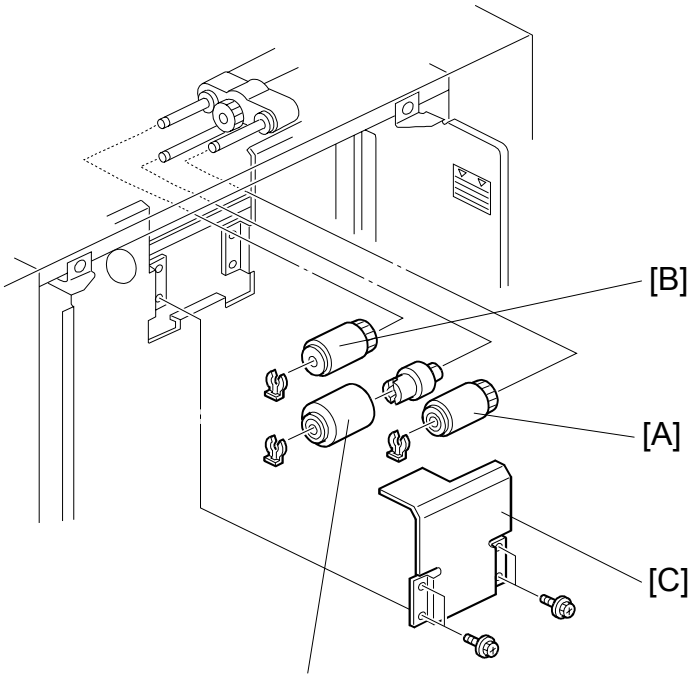
1. Remove the right lower cover [E] (2 screws).

Upper Cover

1. Remove the front cover.
2. Remove the rear cover.
3. Remove the upper cover [F].

4.2 ROLLER REPLACEMENT

4.2.1 PAPER FEED, SEPARATION, AND PICK-UP ROLLERS



1. Push the down switch to lower the tray bottom plate until it reaches its lowest position.
2. Open the tray cover.

Pick-up Roller

3. Replace the pick-up roller [A] (1 snap ring).

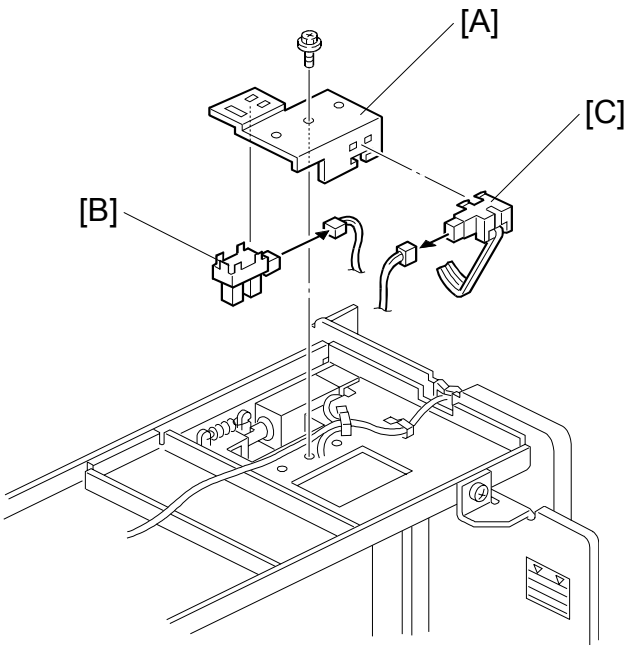
Paper Feed Roller

3. Replace the paper feed roller [B] (1 snap ring).

Separation Roller

3. Remove the guide plate [C] (2 screws).
4. Replace the separation roller [D] (1 snap ring).

4.3 TRAY LIFT AND PAPER END SENSOR REPLACEMENT



1. Remove the front and rear cover.
2. Remove the upper cover.
3. Remove the sensor bracket [A] (1 screw).

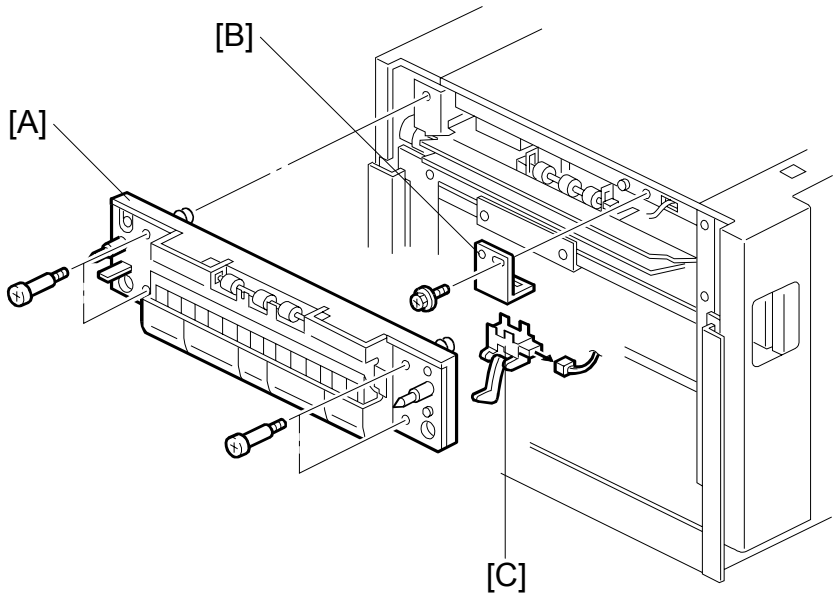
Tray Lift Sensor

3. Replace the tray lift sensor [B] (1 connector).

Paper End Sensor

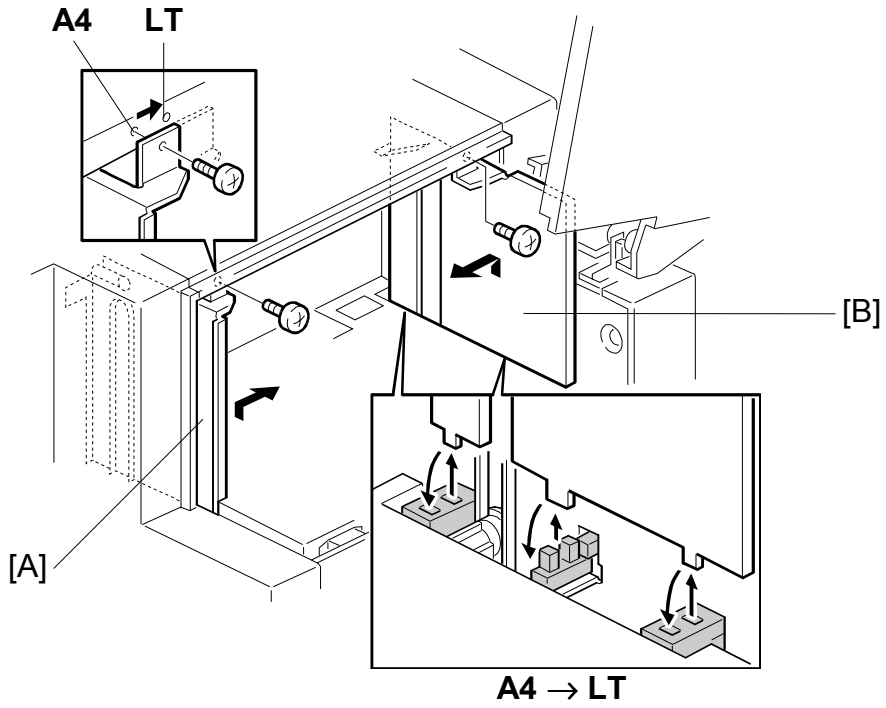
3. Replace the paper end sensor [C] (1 connector).

4.4 RELAY SENSOR REPLACEMENT



1. Pull out the LCT.
2. Remove the joint guide [A] (4 screws).
3. Remove the sensor bracket [B] (1 screw).
4. Replace the relay sensor [C] (1 connector).

4.5 SIDE FENCE POSITION CHANGE



1. Push the down switch to lower the tray bottom plate until it reaches its lowest position.
2. Remove the tray cover.
3. Remove the front and rear side fences [A, B] (1 screw each).
4. Install the side fences in the correct position.

BRIDGE UNIT

B538

BRIDGE UNIT B538

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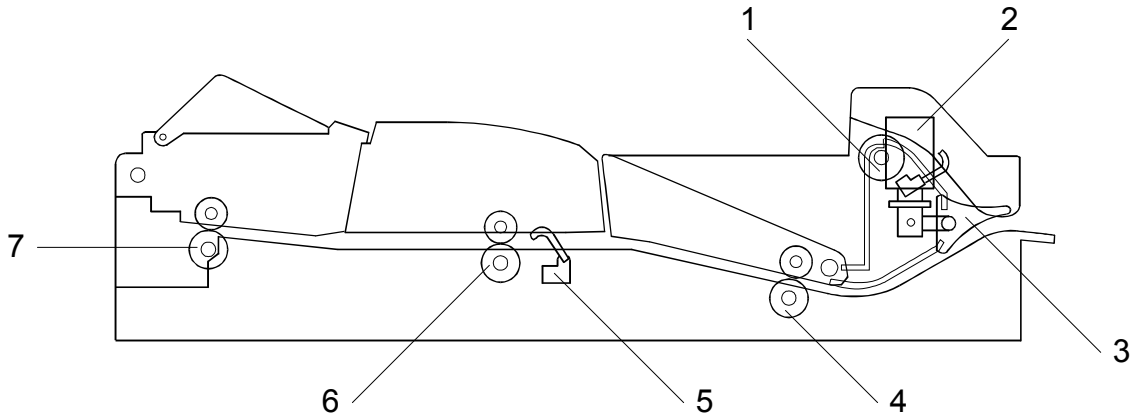
1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

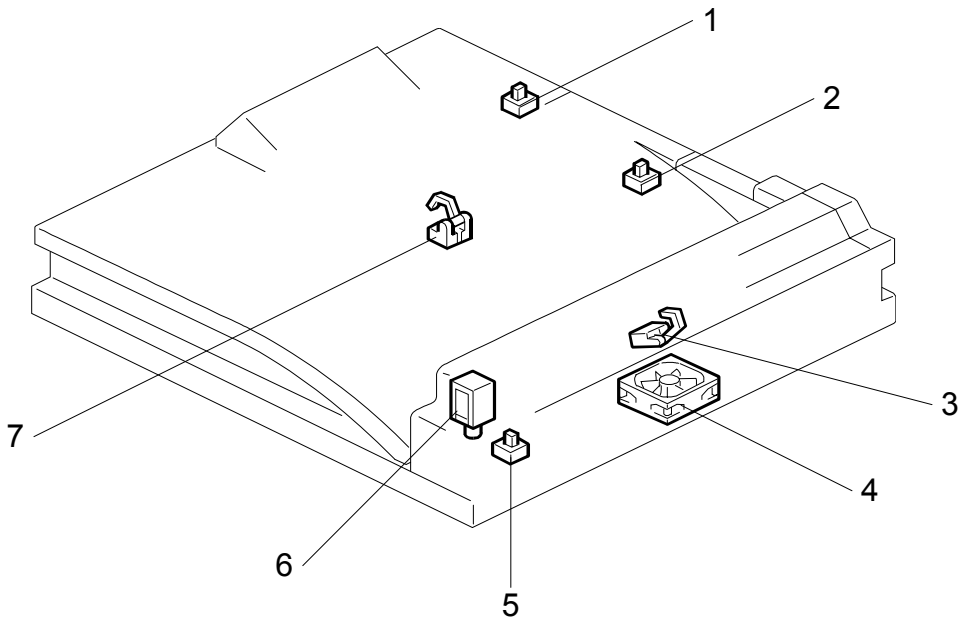
Paper Size:	Standard sizes A6 lengthwise to A3 HLT to DLT Non-standard sizes Width: 100 to 305 mm Length: 148 to 432 mm
Paper Weight:	52 g/m^2 ~ 135 g/m^2, 16 lb ~ 42 lb

1.2 MECHANICAL COMPONENT LAYOUT



1. Upper Exit Roller
2. Junction Gate Solenoid
3. Junction Gate
4. 1st Transport Roller
5. Relay Sensor
6. 2nd Transport Roller
7. Left Exit Roller

1.3 ELECTRICAL COMPONENT LAYOUT

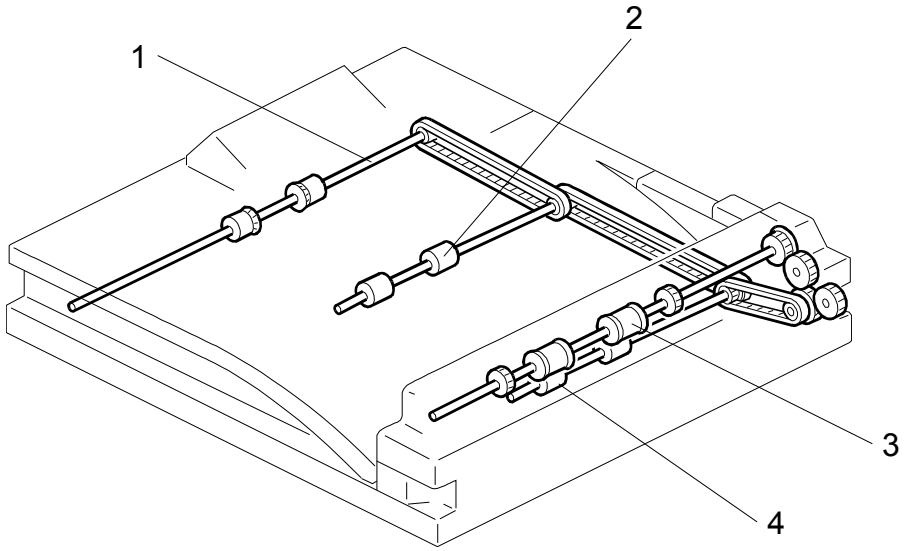


1. Left Guide Switch
2. Right Guide Switch
3. Tray Exit Sensor
4. Cooling Fan Motor
5. Tray Exit Unit Switch
6. Junction Gate Solenoid
7. Relay Sensor

1.4 ELECTRICAL COMPONENT DESCRIPTION

Symbol	Name	Function	Index No.
Motors			
M1	Cooling Fan	Cools the transport unit.	4
Sensors			
S1	Tray Exit	Checks for misfeeds.	3
S2	Relay	Checks for misfeeds.	7
Switches			
SW1	Tray Exit Unit	Detects when the tray exit unit is opened.	5
SW2	Right Guide	Detects when the right guide is opened.	2
SW3	Left Guide	Detects when the left guide is opened.	1
Solenoids			
SOL1	Junction Gate	Moves the junction gate to direct the paper to the upper or left tray.	6

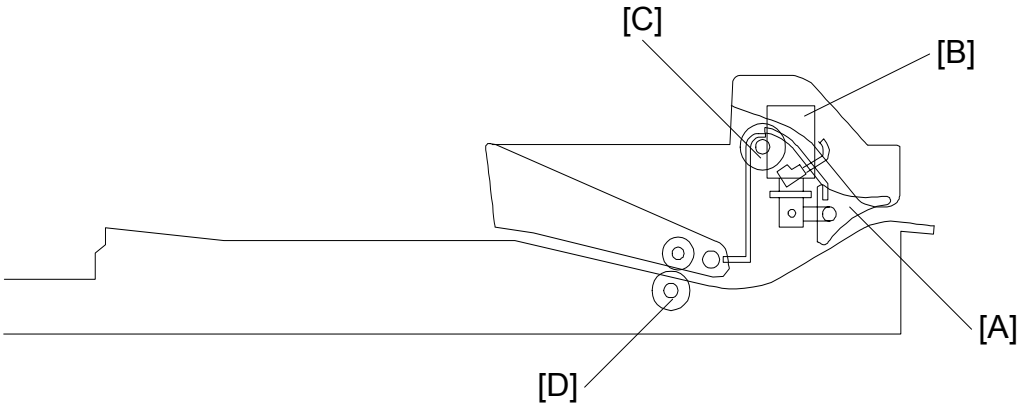
1.5 DRIVE LAYOUT



1. Left Exit Roller
2. 2nd Transport Roller
3. Upper Exit Roller
4. 1st Transport Roller

2. DETAILED DESCRIPTION

2.1 JUNCTION GATE MECHANISM



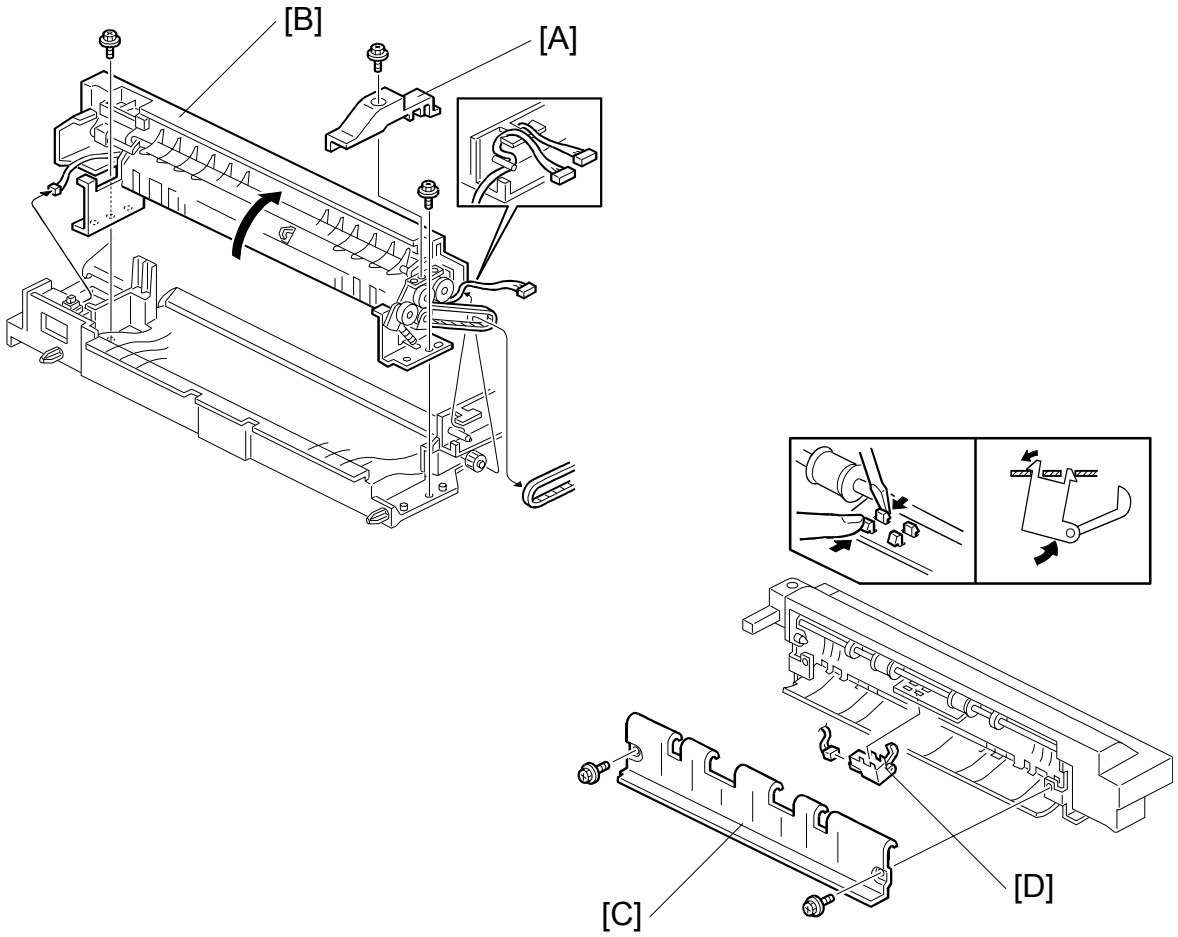
Depending on the selected mode, the copies are directed up or down by the junction gate [A], which is controlled by the junction gate solenoid [B].

When the upper tray is selected, the junction gate solenoid turns on and the paper is sent to the upper tray through the upper exit roller [C].

When the left tray or the finisher is selected, the junction gate stays off and the paper is sent to the left tray or the finisher through the transport rollers [D] and the left exit roller.

3. REPLACEMENT AND ADJUSTMENT

3.1 EXIT SENSOR REPLACEMENT



1. Remove the whole unit from the copier.
2. Remove the rear upper cover [A] (1 screw).
3. Remove the upper cover unit [B] (2 screws, 2 connectors).
4. Remove the exit guide plate [C] (2 screws).
5. Replace the exit sensor [D] (1 connector).

1-BIN TRAY
B544

1-BIN TRAY B544

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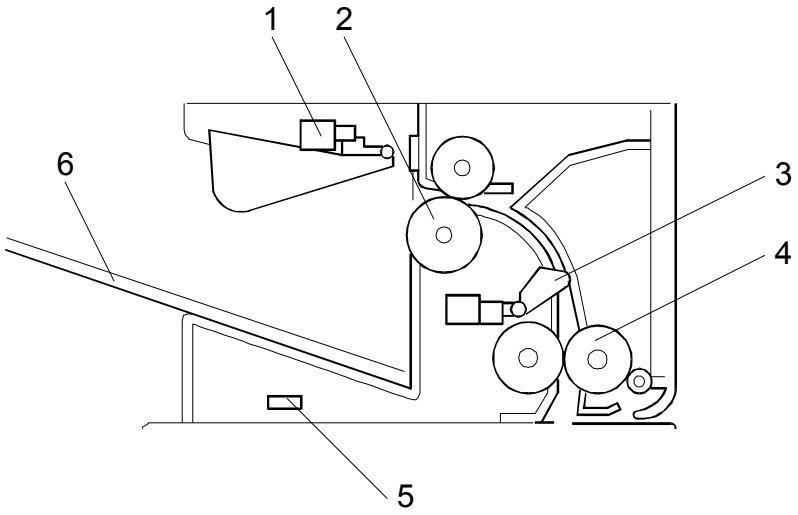
Paper Limit Sensor 7
Entrance Sensor 7

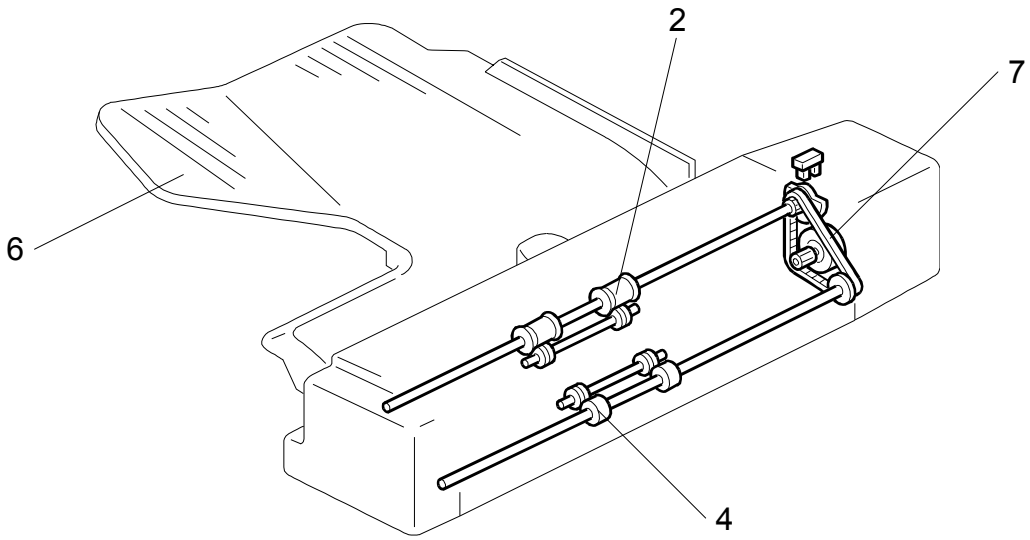
1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

Paper Size:	A5 lengthwise to A3 HLT to DLT
Paper Weight:	60 g/m^2 ~ 105 g/m^2, 16 lb ~ 28 lb
Tray Capacity:	125 sheets (80 g/m^2, 20 lb)
Power Source:	5 Vdc, 24 Vdc (from copier)
Power Consumption:	15 W
Weight:	4 kg
Size (W x D x H):	470 mm x 550 mm x 110 mm

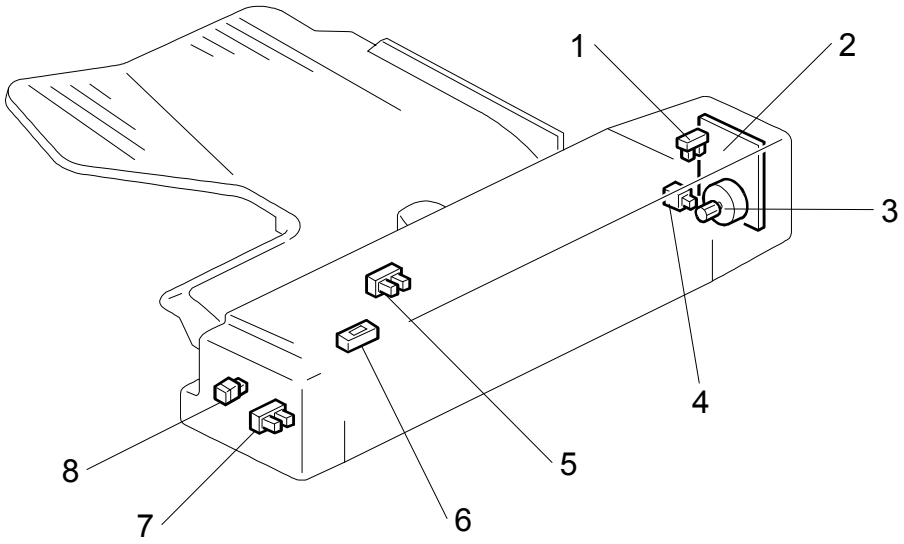
1.2 MECHANICAL COMPONENT AND DRIVE LAYOUT





1. Paper Limit Sensor
2. Exit Roller
3. Entrance Sensor
4. Entrance Roller
5. Paper Sensor
6. Paper Tray
7. Tray Motor

1.3 ELECTRICAL COMPONENT LAYOUT



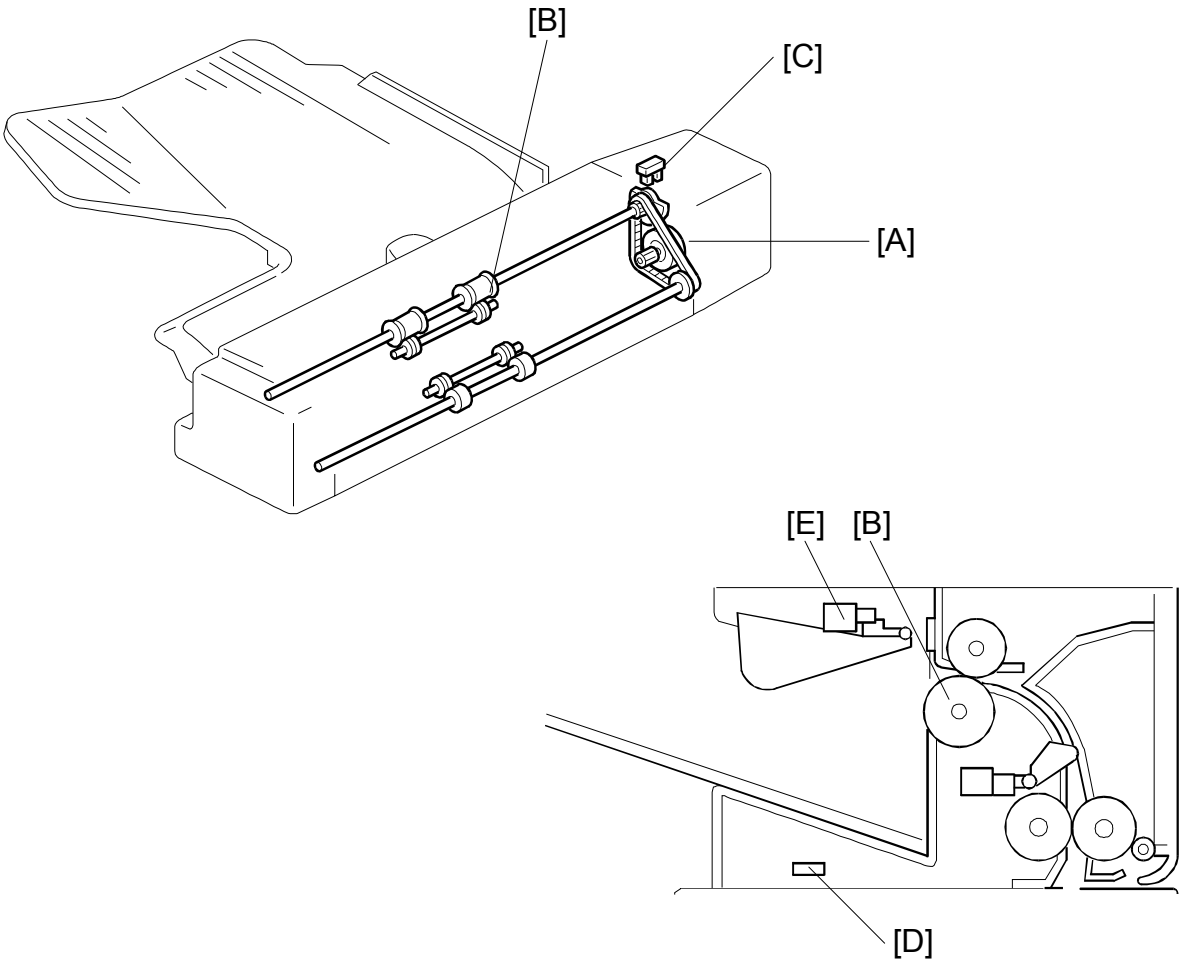
1. Motor Lock Sensor
2. Main Board
3. Tray Motor
4. Right Cover Switch
5. Paper Limit Sensor
6. Paper Sensor
7. Entrance Sensor
8. Paper Indicator

1.4 ELECTRICAL COMPONENT DESCRIPTION

Symbol	Name	Function	Index No.
Motors			
M1	Tray	Drives the entrance and exit rollers.	3
Sensors			
S1	Entrance	Checks for misfeeds.	7
S2	Paper Limit	Detects the paper stack limit in the tray.	5
S3	Paper	Detects whether there is paper in the tray.	6
S4	Motor Lock	Detects whether the tray motor is turning.	1
Switches			
SW1	Right Cover	Detects whether the right cover is opened.	4
PCBs			
PCB1	Main	Controls the 1-bin tray and communicates with the copier.	2
LEDs			
LED1	Paper Indicator	Indicates when there is paper in the tray.	8

2. DETAILED DESCRIPTIONS

2.1 BASIC OPERATION



When the leading edge of the first sheet of copy paper reaches the copier's hot roller, the tray motor [A] starts and turns off approximately 0.5 s after the trailing edge of the paper passes through the exit rollers [B].

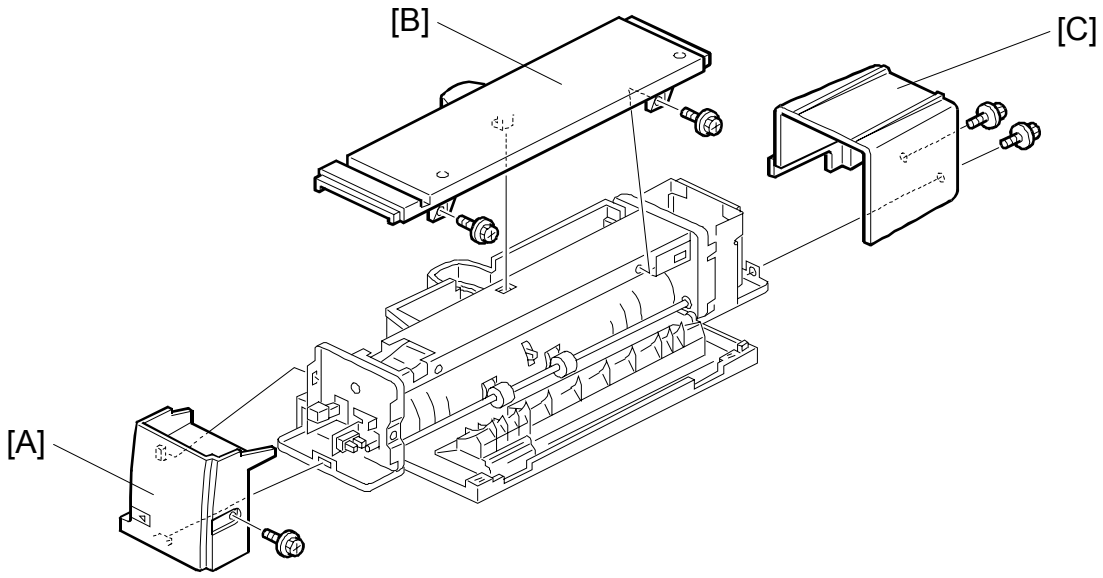
The tray lock sensor [C] checks whether the tray motor rotates or not. When the tray lock sensor does not generate pulses for 300 ms while the tray motor is on, the copier will stop and display an SC code.

The paper sensor [D] checks whether there is paper in the tray or not. The paper sensor turns on when paper is stacked in the tray, and the paper indicator is turned on.

The paper limit sensor [E] detects when the tray is full. While a sheet of copy paper is passing this sensor, the sensor feeler is always pushed up by the paper. When the paper limit sensor stays on for more than the expected time (based on the copy speed and paper size), the copier indicates that the tray is full.

3. REPLACEMENT AND ADJUSTMENT

3.1 COVER REMOVAL



Front Cover

1. Remove the scanner unit if it is at the front.
2. Remove the front cover [A] (1 screw).

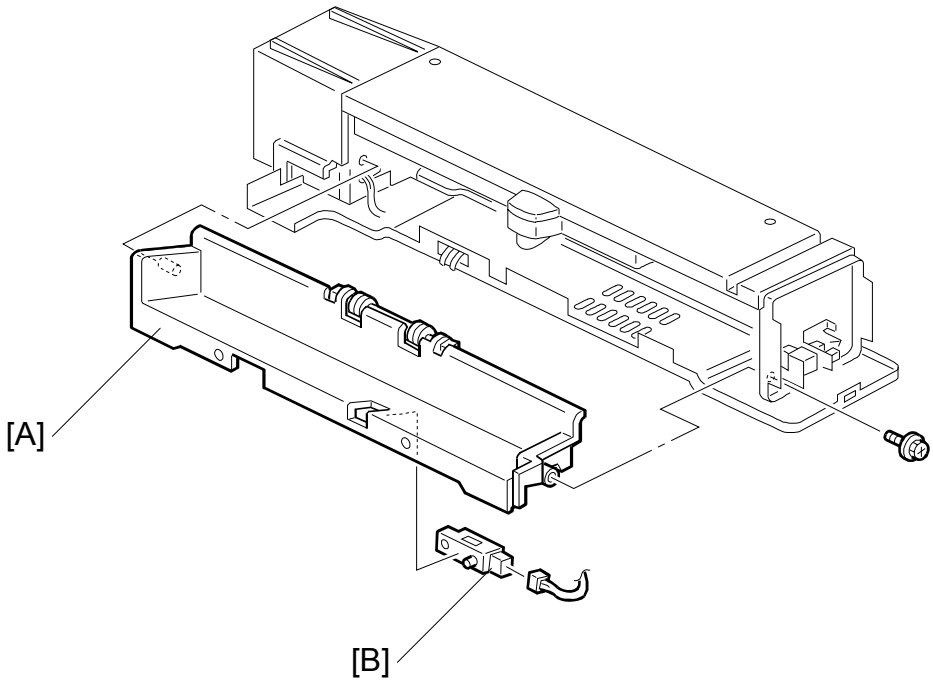
Upper Cover

1. Remove the scanner unit.
2. Remove the upper cover [B] (2 screws).

Rear Cover

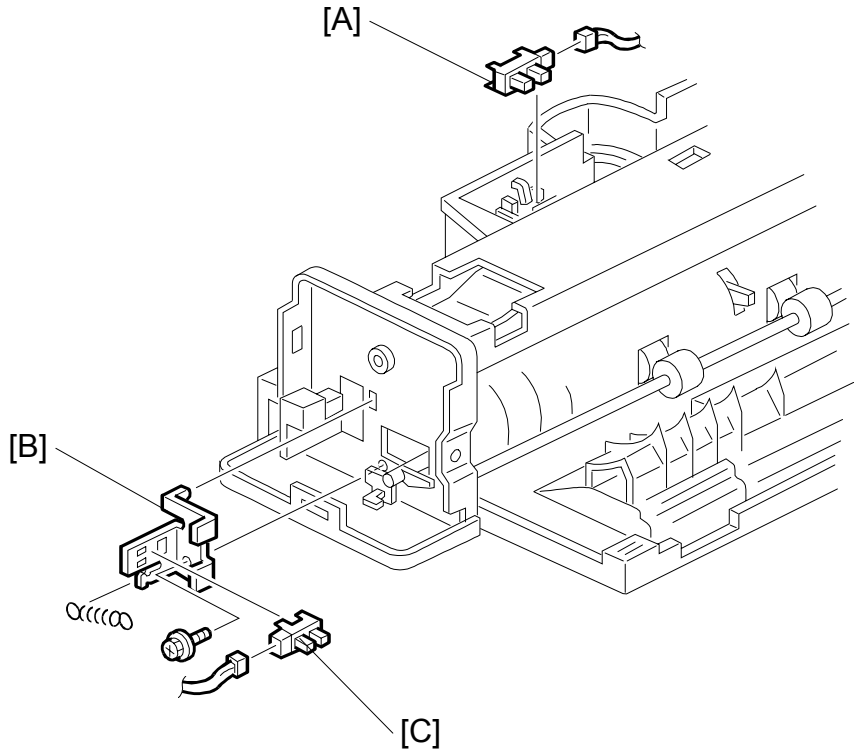
1. Remove the scanner unit.
2. Remove the rear cover [C] (2 screws).

3.2 PAPER SENSOR REPLACEMENT



1. Remove the front cover.
2. Remove the exit guide plate [A] (1 screw).
3. Replace the paper sensor [B] (1 connector).

3.3 ENTRANCE AND PAPER LIMIT SENSOR REPLACEMENT



1. Remove the front and upper covers.

Paper Limit Sensor

2. Replace the paper limit sensor [A] (1 connector).

Entrance Sensor

2. Remove the sensor bracket [B] (1 screw, 1 spring).
3. Replace the entrance sensor [C] (1 connector).

1000-SHEET FINISHER
B408

1000-SHEET FINISHER B408

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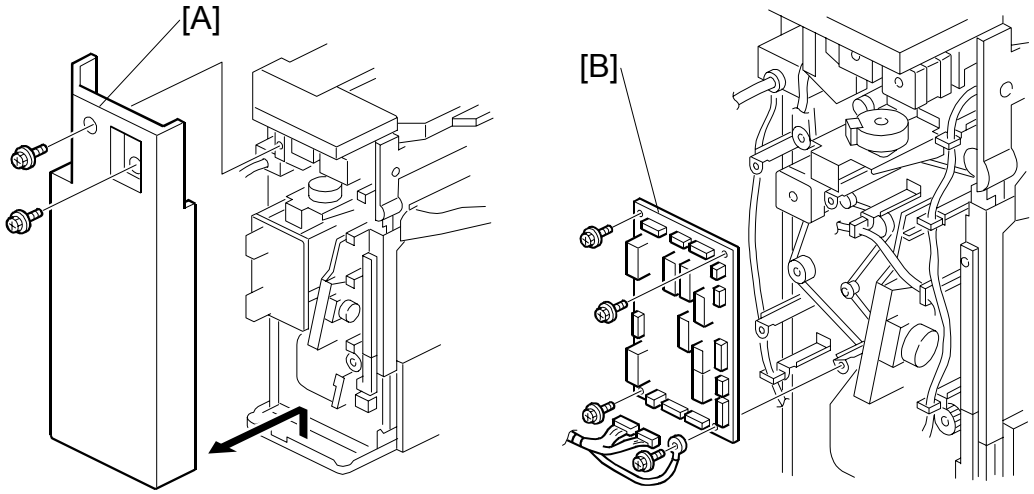
1. REPLACEMENT AND ADJUSTMENT

⚠CAUTION
Turn off the main power switch and unplug the machine before beginning any of the procedures in this section.

NOTE: This manual uses the following symbols.
☛ : See or Refer to : Screws : Connector : Clip ring
 : E-ring

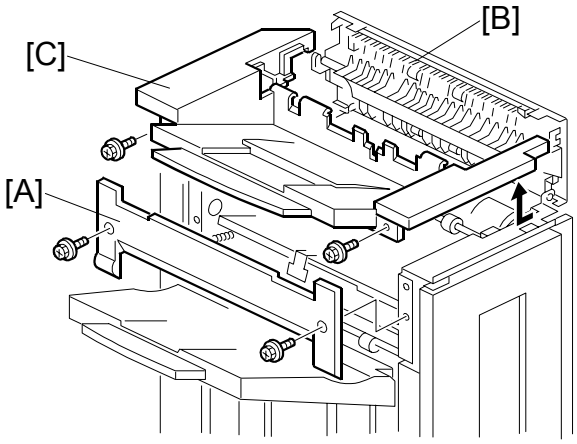
1.1 MAIN PCB



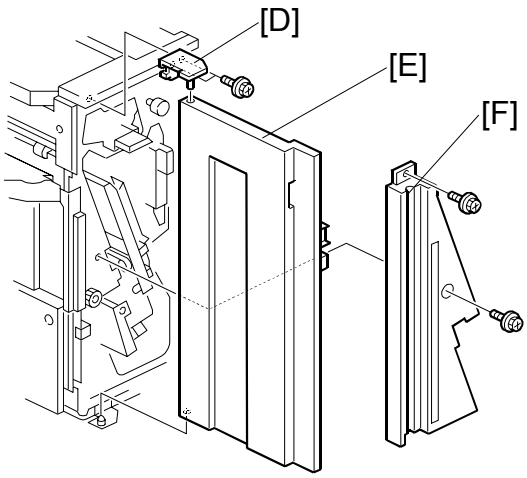
1. Rear cover [A] (x 2)
2. Main PCB [B] (x 4, All)

1.2 STAPLER UNIT

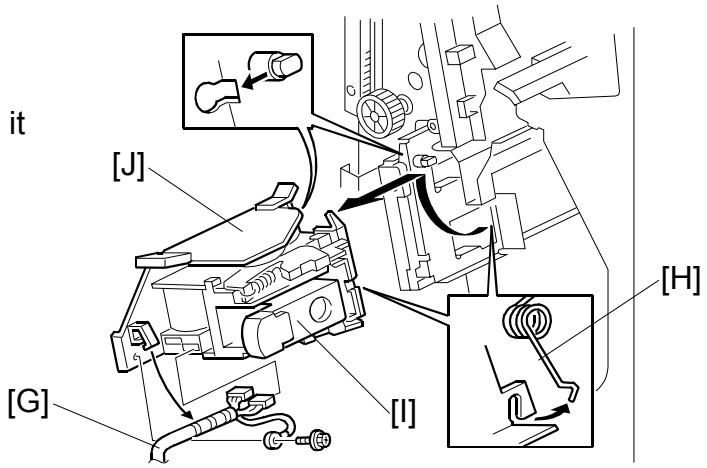
1. Side cover [A] (x 2)
2. Open exit guide plate [B]
3. Upper side cover [C] (x 2)



4. Front cover support plate [D] (x 1)
5. Front cover [E]
6. Front inner cover [F] (x 2)



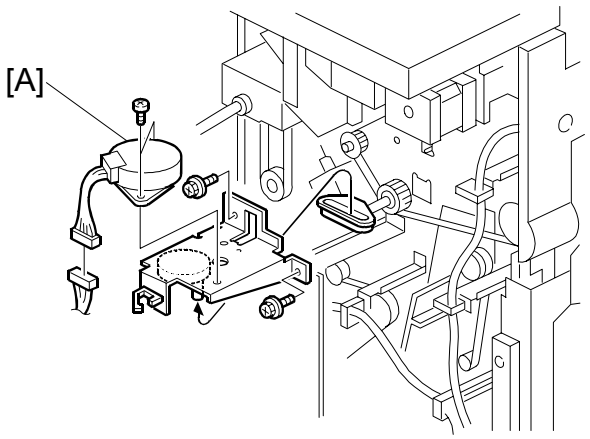
7. Harness [G]
8. Unhook the spring [H]
9. Turn the stapler unit [I] and take it out.
10. Bracket [J] (x 2)



1.3 MOTORS

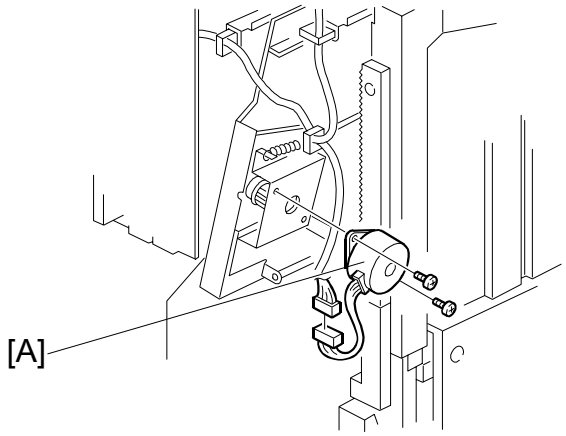
1.3.1 SHIFT MOTOR

1. Rear cover (☛1.1)
2. Shift motor [A] (🔩 x 2, 🖐 x 1)



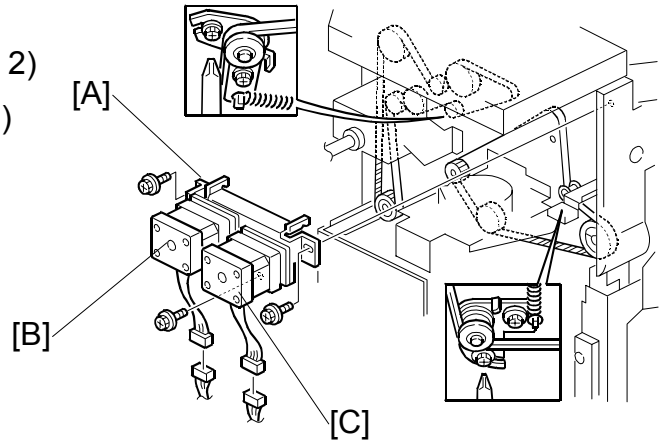
1.3.2 STAPLER MOTOR

1. Rear cover (☛1.1)
2. Stapler motor [A] (🔩 x 2, 🖐 x 1)



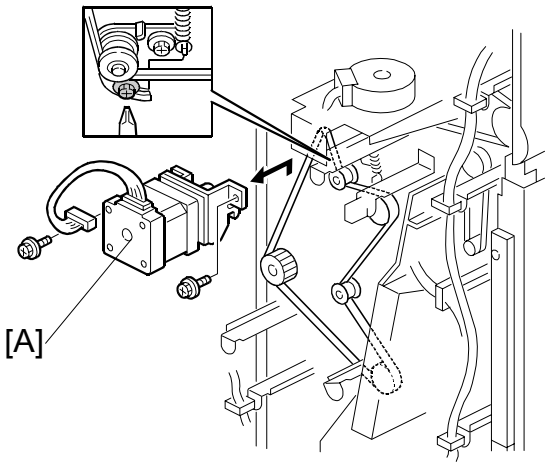
1.3.3 UPPER TRANSPORT MOTOR AND EXIT MOTOR

1. Rear cover (☛1.1)
2. Motor assembly [A] (🔩 x 4, 🖐 x 2)
3. Upper transport motor [B] (🔩 x 4)
4. Exit motor [C] (🔩 x 4)



1.3.4 LOWER TRANSPORT MOTOR

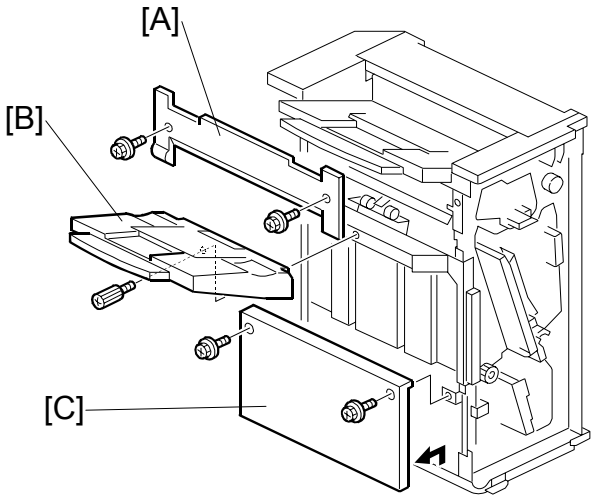
1. Main PCB (☛1.1)
2. Lower transport motor [A] (🔩 x 2, 🖐 x 1)



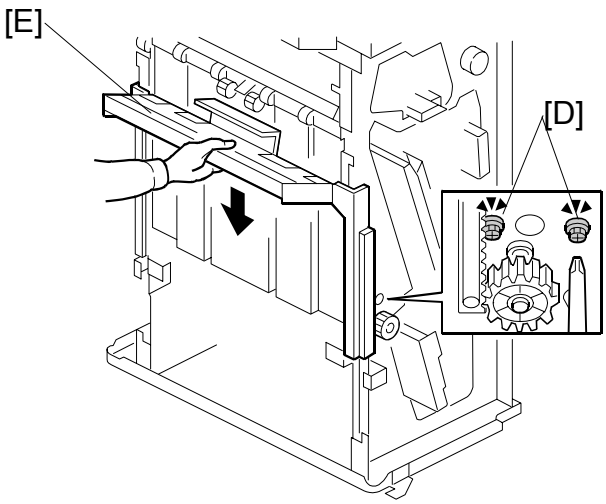
1.4 MOTORS AND SENSORS

1.4.1 PREPARATION

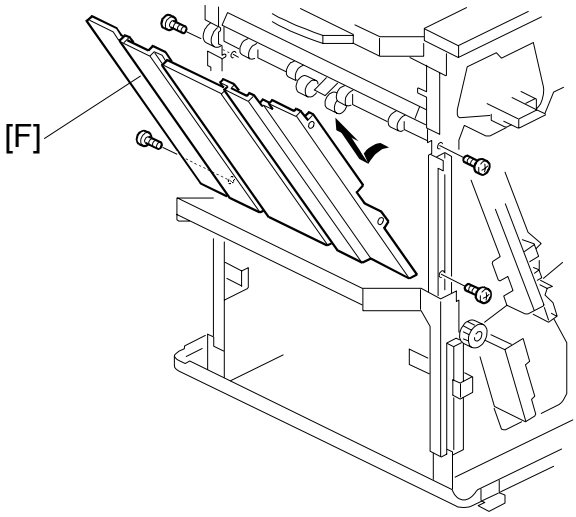
1. Front cover and inner cover (☛1.2)
2. Upper side cover [A] (☞ x 2)
3. Upper tray [B] (☞ x 1)



4. Lower side cover [C] (☞ x 2)
5. Loosen the 2 screws [D].
6. Lower the lower tray guide plate [E].

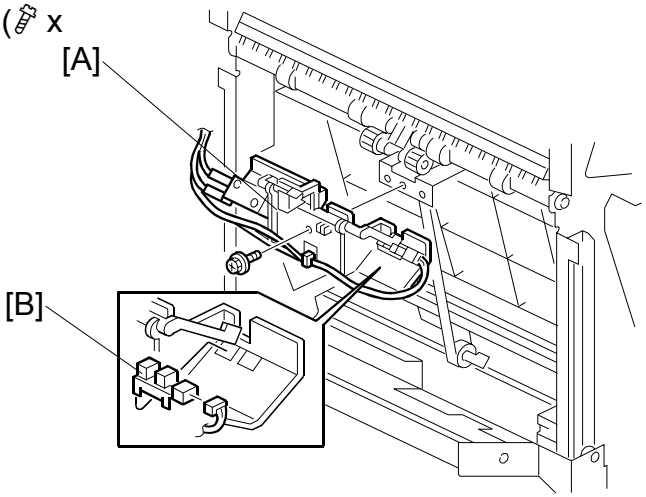


7. Guide plate [F] (☞ x 4)



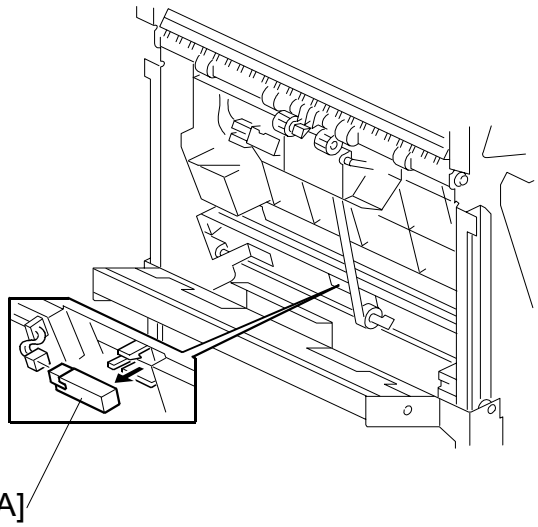
1.4.2 STACK HEIGHT SENSOR

1. Stack height sensor assembly [A] (☞ x 1)
2. Stack height sensor [B] (☞ x 1)



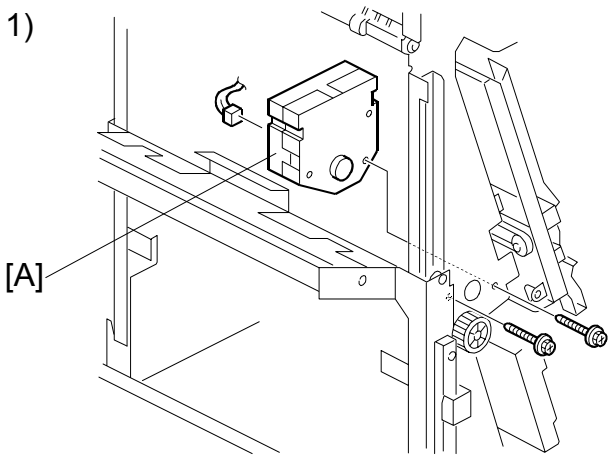
1.4.3 STAPLER TRAY PAPER SENSOR

1. Stapler tray paper sensor [A] (☞ x 1)



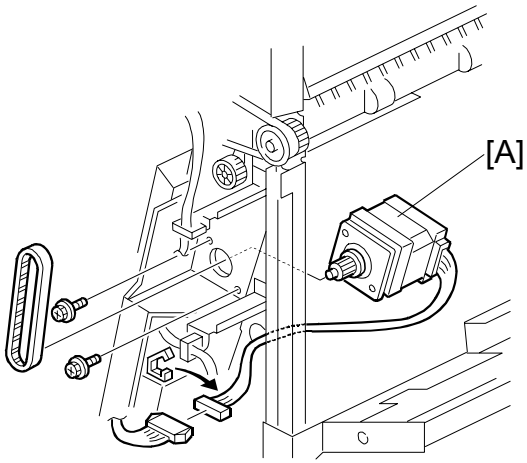
1.4.4 LOWER TRAY LIFT MOTOR

1. Lower tray lift motor [A] (x 2, x 1)



1.4.5 STACK FEED-OUT MOTOR

1. Stack feed-out motor [A] (x 2, x 1)



2. TROUBLESHOOTING

2.1 JAM DETECTION

Mode		Jam	Content
Shift	Staple		
✔	✔	Entrance sensor: On check	The entrance sensor does not turn on within the normal time after the main machine exit sensor turns on
✔	✔	Entrance sensor: Off check	The entrance sensor does not turn off within the normal time after it turns on.
✔		Lower tray exit sensor: On check	The lower tray exit sensor does not turn on within the normal time after the entrance sensor turns off.
✔		Tray exit sensor: Off check	The tray exit sensor does not turn off within the normal time after it turns on.
	✔	Stapler tray entrance sensor: On check	The stapler tray entrance sensor does not switch on within the normal time after the entrance sensor switched on.
	✔	Stapler tray entrance sensor: Off check	The staple tray entrance sensor does not turn off within the normal time after it turns on.
	✔	Lower tray exit sensor: On check	The lower exit sensor does not turn on after the feed-out pawl feeds out the outputs.
	✔	Lower tray exit sensor: Off check	The lower exit sensor turns on when the feed-out pawl returns to its home position after feeding out the outputs.

3. SERVICE TABLES

3.1 DIP SWITCH SETTINGS

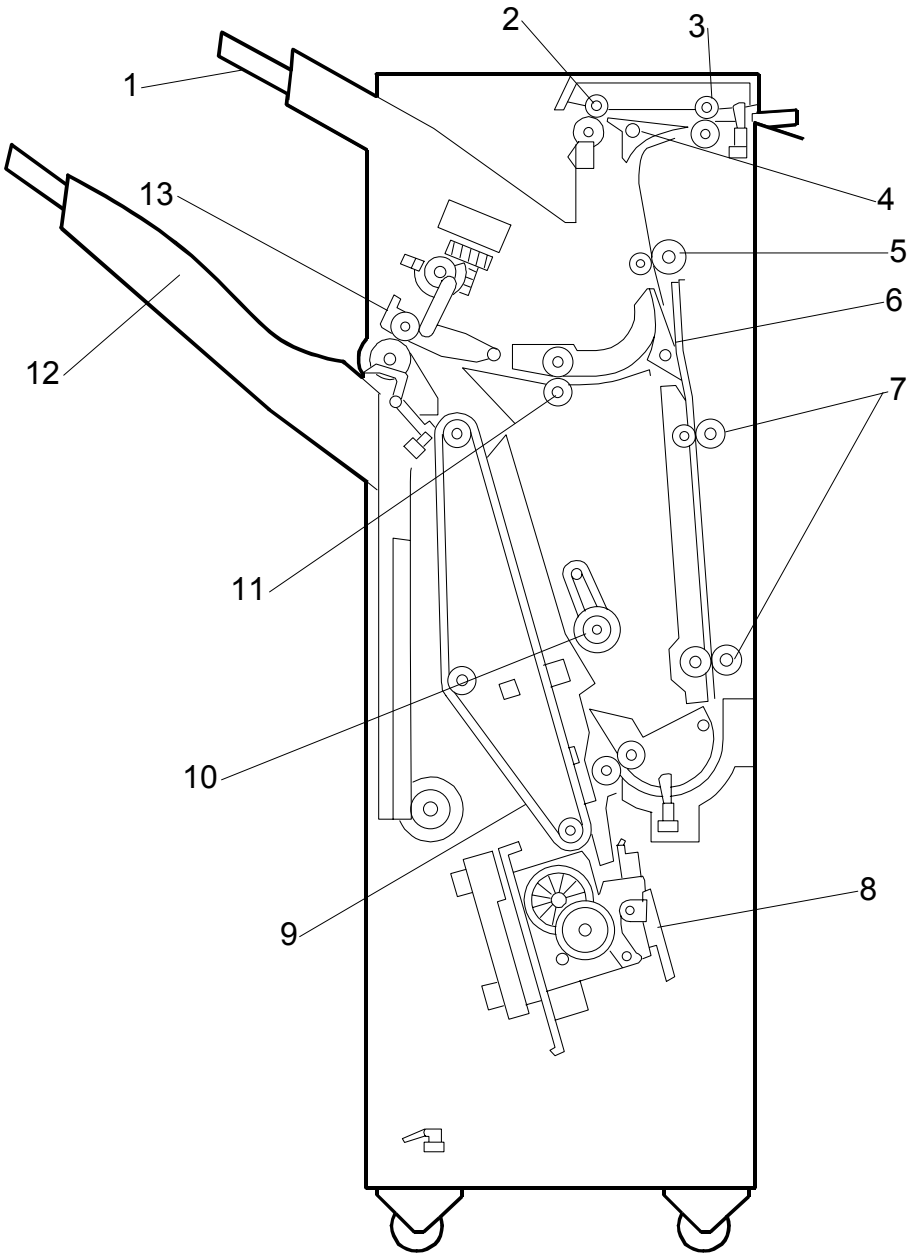
The DIP switches should not be set to any combination other than those listed in the table below.

SW100		Description
1	2	
0	0	Normal operation mode (Default)
1	0	Packing mode.

- Before packing the machine, do the following: Set switch 1 to 1 then back to zero. The lower tray moves to the lowest position. Then turn off the main switch.
- After unpacking the machine, do the following: After turning the main switch back on, the lower tray returns to home position automatically.

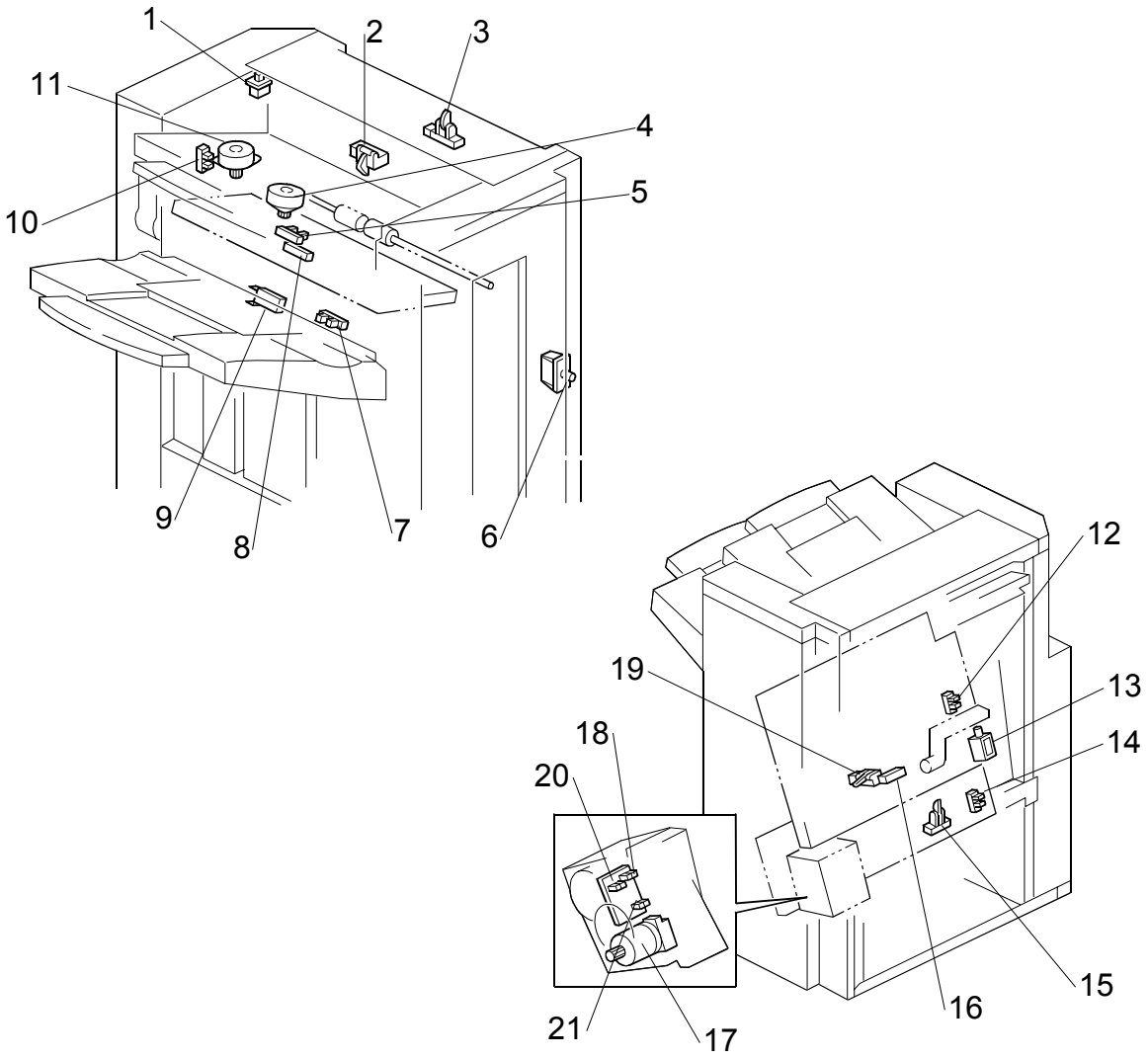
4. DETAILED DESCRIPTIONS

4.1 GENERAL LAYOUT

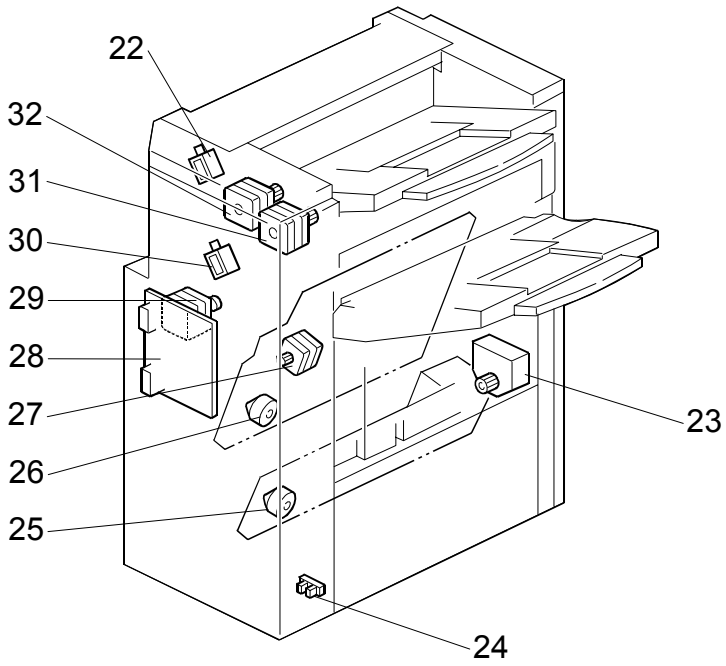


1. Upper Tray
2. Upper Tray Exit Roller
3. Entrance Roller
4. Tray Junction Gate
5. Upper Transport Roller
6. Stapler Junction Gate
7. Lower Transport Rollers
8. Stapler
9. Stack Feed-out Belt
10. Positioning Roller
11. Shift Roller
12. Lower Tray
13. Lower Tray Exit Roller

4.2 ELECTRICAL COMPONENT LAYOUT



1. Upper Cover Switch
2. Paper Limit Sensor
3. Entrance Sensor
4. Exit Guide Plate Motor
5. Exit Guide Plate HP Sensor
6. Front Door Safety Switch
7. Stack Height Sensor
8. Lower Tray Exit Sensor
9. Lower Tray Upper Limit Switch
10. Shift HP Sensor
11. Shift Motor
12. Jogger Fence HP Sensor
13. Positioning Roller Solenoid
14. Stapler HP Sensor
15. Stapler Tray Entrance Sensor
16. Stapler Tray Paper Sensor
17. Stapler Hammer Motor
18. Staple Sheet Sensor
19. Stack Feed-out Belt HP Sensor
20. Stapler Rotation HP Sensor
21. Staple Sensor



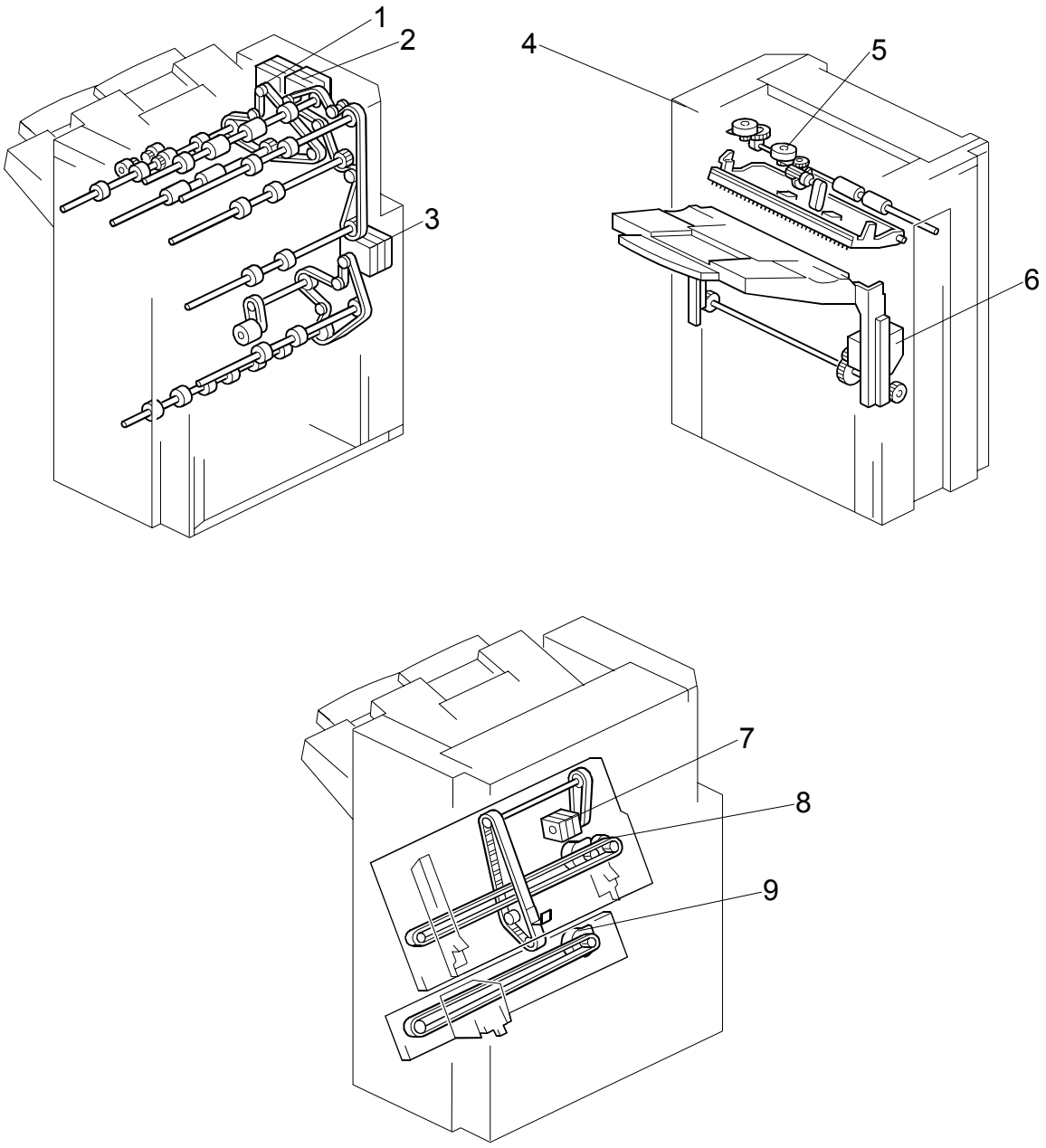
22. Tray Junction Gate Solenoid
23. Lower Tray Lift Motor
24. Lower Tray Lower Limit Sensor
25. Stapler Motor
26. Jogger Fence Motor
27. Stack Feed-out Motor
28. Main Board
29. Lower Transport Motor
30. Stapler Junction Gate Solenoid
31. Exit Motor
32. Upper Transport Motor

4.3 ELECTRICAL COMPONENT DESCRIPTION

Symbol	Name	Function	Index No.
Motors			
M1	Upper Transport	Drives the entrance roller and upper transport rollers.	32
M2	Lower Transport	Drives the lower transport rollers and the positioning roller.	29
M3	Jogger Fence	Drives the jogger fences.	26
M4	Staple Hammer	Drives the staple hammer.	17
M5	Stack Feed-out	Drives the stack feed-out belt.	27
M6	Exit Guide Plate	Opens and closes the exit guide plate.	4
M7	Exit	Drives the exit roller.	31
M8	Lower Tray Lift	Moves the lower tray up or down.	23
M9	Shift	Moves the shift roller from side to side.	11
M10	Stapler	Moves the stapler unit from side to side.	25
Sensors			
S1	Entrance	Detects copy paper entering the finisher and checks for misfeeds.	3
S2	Paper Limit	Detects when the paper stack height in the upper tray is at its limit.	2
S3	Jogger Fence HP	Detects when the jogger fence is at home position.	12
S4	Shift HP	Detects when the shift roller is at home position.	10
S5	Stack Feed-out Belt HP	Detects when the stack feed-out belt is at home position.	19
S6	Stapler HP	Detects when the stapler is at home position.	14
S7	Exit Guide Plate HP	Detects when the exit guide plate is at home position.	5
S8	Stapler Tray Entrance	Detects copy paper entering the stapler tray and checks for misfeeds.	15
S9	Lower Tray Exit	Checks for misfeeds.	8
S10	Stack Height	Detects the top of the copy paper stack.	7
S11	Lower Tray Lower Limit	Detects when the lower tray is at its lower limit position.	24
S12	Stapler Tray Paper	Detects when there is copy paper in the stapler tray.	16
S13	Staple Sheet	Detects the leading edge of the staple sheet.	18
S14	Stapler Rotation HP	Detects when the staple hammer is at home position.	20
S15	Staple	Detects whether there are staples in the staple cartridge.	21
Solenoids			
SOL1	Tray Junction Gate	Drives the tray junction gate.	22
SOL2	Stapler Junction Gate	Drives the stapler junction gate.	30

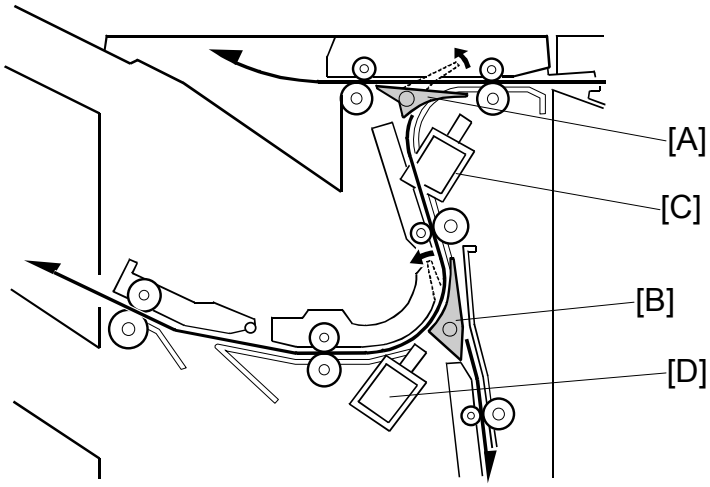
Symbol	Name	Function	Index No.
SOL3	Positioning Roller	Moves the positioning roller.	13
Switches			
SW1	Lower Tray Upper Limit	Detects when the lower tray is at its upper limit position.	9
SW2	Front Door Safety	Cuts the dc power when the front door is opened.	6
SW3	Upper Cover	Cuts the dc power when the upper cover is opened.	1
PCBs			
PCB1	Main	Controls the finisher and communicates with the copier/printer.	28

4.4 DRIVE LAYOUT



1. Exit Motor
2. Upper Transport Motor
3. Lower Transport Motor
4. Shift Motor
5. Exit Guide Plate Motor
6. Lower Tray Lift Motor
7. Stack Feed-out Motor
8. Jogger Motor
9. Stapler Motor

4.5 JUNCTION GATES



Depending on the finishing mode, the copies are directed up, straight through, or down by the combination of the tray junction gate [A] and stapler junction gate [B]. These gates are controlled by the tray junction gate solenoid [C] and stapler junction gate solenoid [D].

Upper Tray Mode

The tray junction gate solenoid remains off. The copies go up to the upper tray.

Sort/Stack Mode

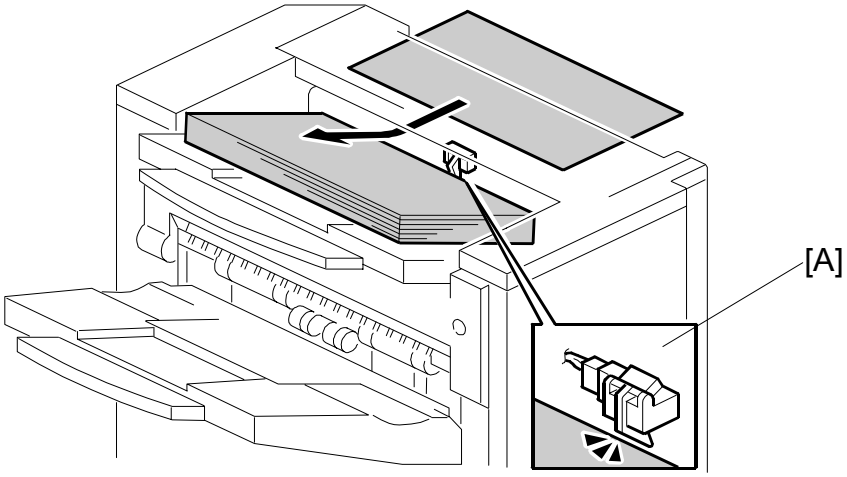
The tray junction gate solenoid turns on and the stapler junction gate solenoid remains off. The copies are sent to the lower tray directly.

Staple Mode

The tray junction gate solenoid and the stapler junction gate solenoid both turn on.

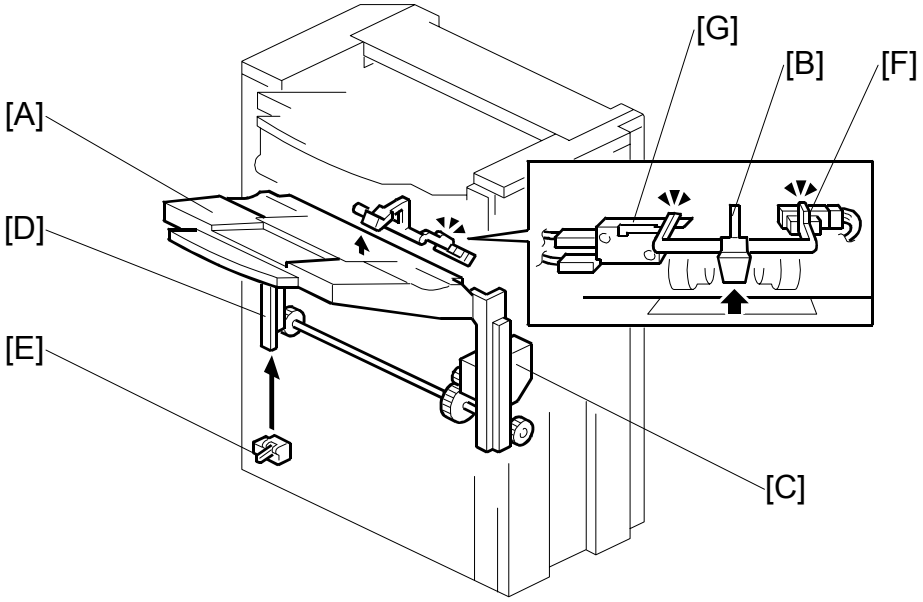
The copies go down to the jogger unit.

4.6 UPPER TRAY



When the paper limit sensor [A] switches on during feed-out for each of three consecutive sheets of paper, paper overflow is detected.

4.7 LOWER TRAY UP/DOWN MECHANISMS



The vertical position of the lower tray [A] depends on the height of the copied paper stack on the lower tray. The stack height sensor feeler [B] contacts the top of the stack, and the lower tray lift motor [C] controls the tray height.

When the lower tray reaches its lowest possible position, the actuator [D] turns on the lower tray lower limit sensor [E], and copying stops.

Tray Up

When the copy paper on the tray is removed, the stack height sensor [F] turns off and the tray lifts up. Then, the tray stops when the sensor turns on again (the tray pushes up the feeler).

If the stack height sensor fails, the lower tray upper limit switch [G] detects the tray and stops the motor. This is a safety measure against stack height sensor failure.

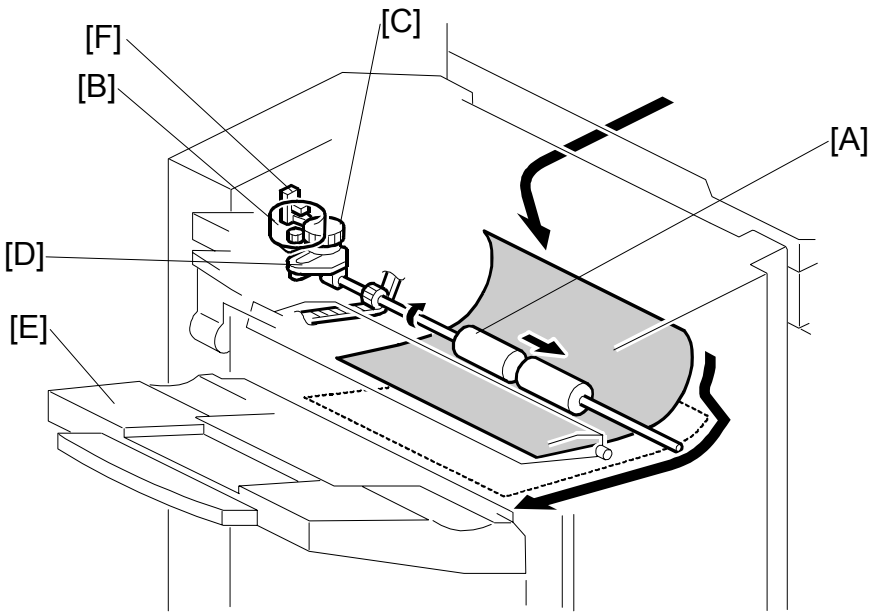
Sort/Stack Mode (Tray Down)

Every five sheets of paper, the tray goes down until the sensor turns off again. Then, it goes up until the sensor is on again.

Staple Mode (Tray Down)

After a stapled copy is fed out, the tray goes up for 220 ms and stops for 300 ms. Then, it goes down for 1 second, waits for 500 ms, then goes up until the sensor turns on.

4.8 PAPER SHIFT MECHANISM



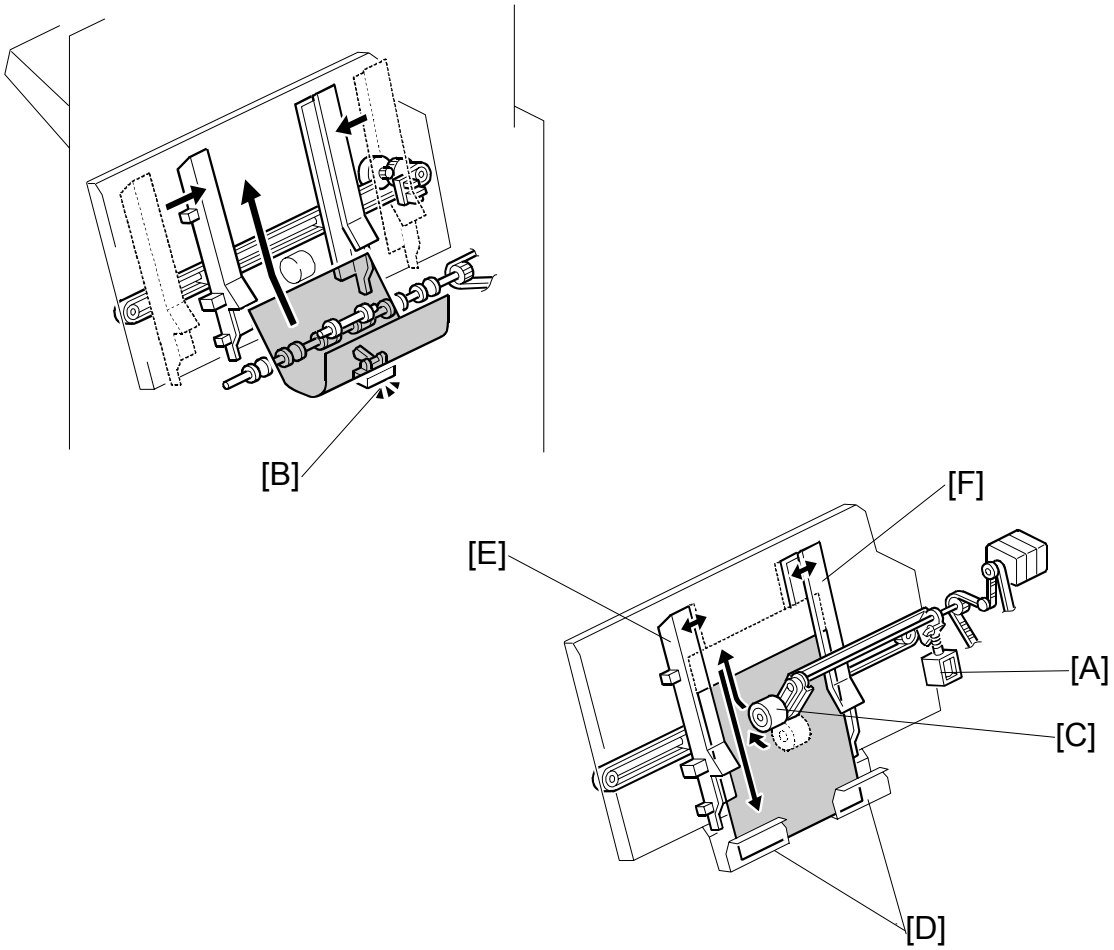
In the sort/stack mode, the shift roller [A] moves from side to side to separate the sets of copies.

The horizontal position of the shift roller is controlled by the shift motor [B] and the shift gear disk [C]. After the trailing edge of the copy passes the upper transport roller, the shift motor turns on, driving the shift gear disk and the link [D].

After the paper is delivered to the lower tray [E], the shift roller moves to its home position, which is detected by the shift HP sensor [F]. Then, when the trailing edge of the next copy passes the upper transport roller, the shift roller shifts again. This operation is done every sheet.

When the trailing edge of each page in the next set of copies passes the upper transport roller, the shift roller shifts in the opposite direction.

4.9 JOGGER UNIT PAPER POSITIONING MECHANISM

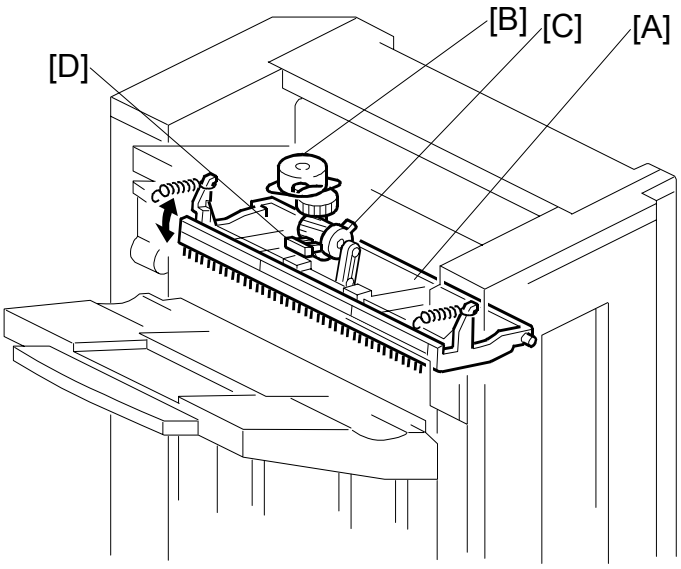


In staple mode, each sheet of copy paper is vertically and horizontally aligned when it arrives in the jogger unit.

For the vertical paper alignment, the positioning roller solenoid [A] turns on shortly after the stapler tray entrance sensor [B] turns off, and the positioning roller [C] pushes the copy against the bottom of the stack stopper [D].

For the horizontal paper alignment, the jogger front fence [E] and the rear fence [F] move to the waiting position, which is 18 mm away from the side of the paper. When aligning the paper vertically, the jogger fence moves in 14 mm from the waiting position. After the vertical position has been aligned, the jogger fence pushes the paper 4 mm against the rear fence to align the paper horizontally. Then the jogger fence moves back to the previous position.

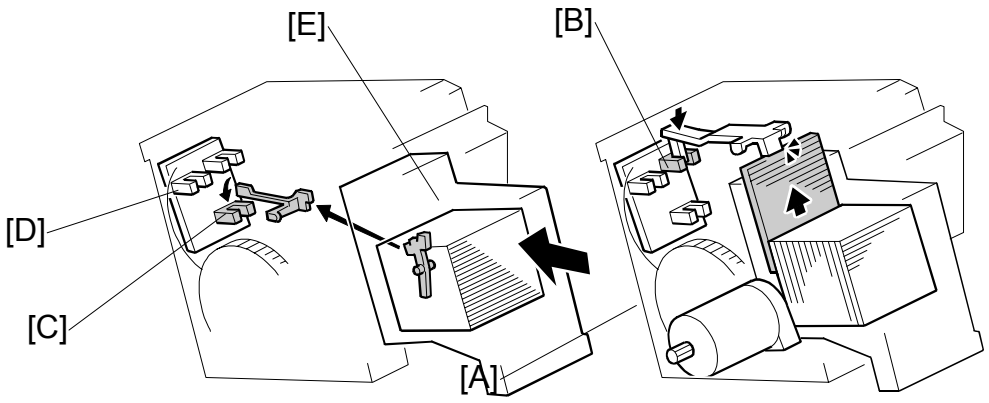
4.10 EXIT GUIDE PLATE



When stacking a large size of paper (such as A3, DLT) in the jogger unit, the leading edge of the paper reaches the exit rollers. To prevent the paper from running into the exit rollers and not being aligned correctly, the exit guide plate [A] is moved up to make a gap between the exit rollers. This operation is done for all paper sizes, but is only needed for the larger sizes.

The exit guide plate motor [B] and exit roller release cam [C] control the exit guide plate movement. When the exit guide plate motor starts, the cam turns and the exit guide plate moves up. When stapling is finished, the exit guide plate motor turns on again to close the exit guide plate. When the exit guide plate HP sensor [D] turns on, the motor stops.

4.11 STAPLER MECHANISM



The staple hammer motor [A] drives the staple hammer.

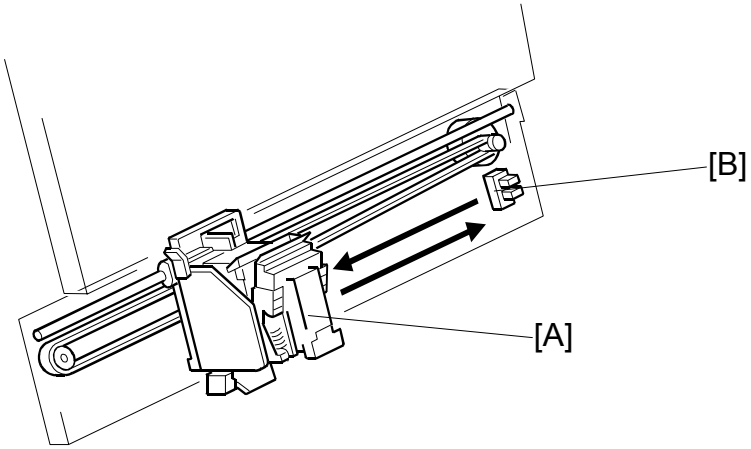
The staple sheet sensor [B] detects the leading edge of the staple sheet at the stapling position to prevent the hammer from operating if there are no staples at the stapling position.

If there is no staple cartridge in the stapler unit or no staples in the staple cartridge, staple end is indicated on the operation panel. The stapler sensor [C] detects this.

The stapler rotation HP sensor [D] checks whether the staple hammer mechanism returns to home position after each stack has been stapled.

When excessive load is applied to the staple hammer motor, the copier detects a staple jam. When a staple jam has occurred, the jammed staple is inside the staple cartridge [E]. Therefore, the jammed staple can be removed easily after pulling out the staple cartridge.

4.12 STAPLER UNIT MOVEMENT MECHANISM

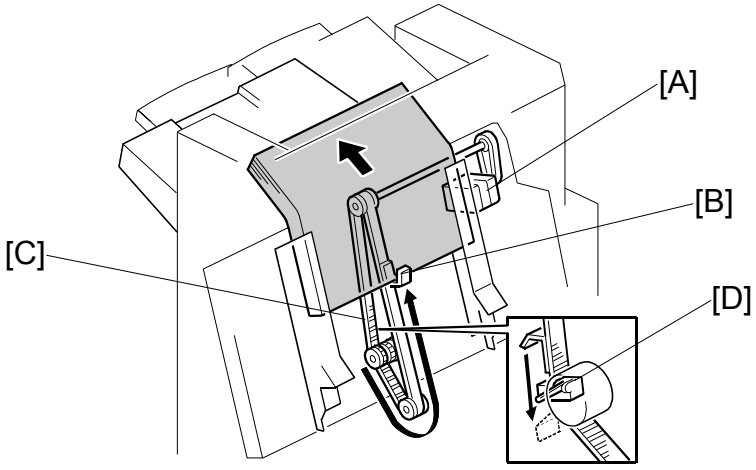


The stapler motor moves the stapler [A] from side to side. After the start key is pressed, the stapler moves from its home position to the stapling position.

If two-staple-position mode is selected, the stapler moves to the front stapling position first, then moves to the rear stapling position. However, for the next copy set, it staples in the reverse order (at the rear side first, then at the front side).

After the job is completed, the stapler moves back to its home position. The stapler HP sensor [B] detects this.

4.13 PAPER FEED-OUT MECHANISM



After the copies have been stapled, the stack feed-out motor [A] starts. The pawl [B] on the stack feed-out belt [C] transports the set of stapled copies up and feeds it to the shift roller. The shift roller takes over stack feed-out after the leading edge reaches this roller.

Just before the stapled stack passes through the lower tray exit sensor, the stack-feed-out motor turns off until the shift rollers have completely fed the stack out to the lower tray. Then, the stack-feed-out motor turns on again until the pawl [B] actuates the stack feed-out belt home position sensor [D].

TWO-TRAY FINISHER
B545

TWO-TRAY FINISHER B545

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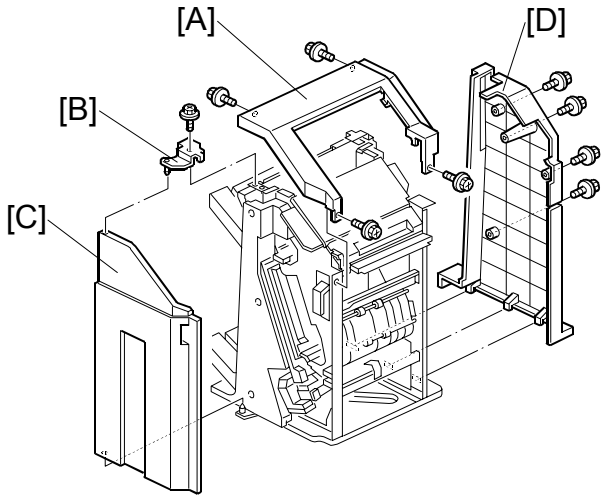
1. REPLACEMENT AND ADJUSTMENT

1.1 COVERS

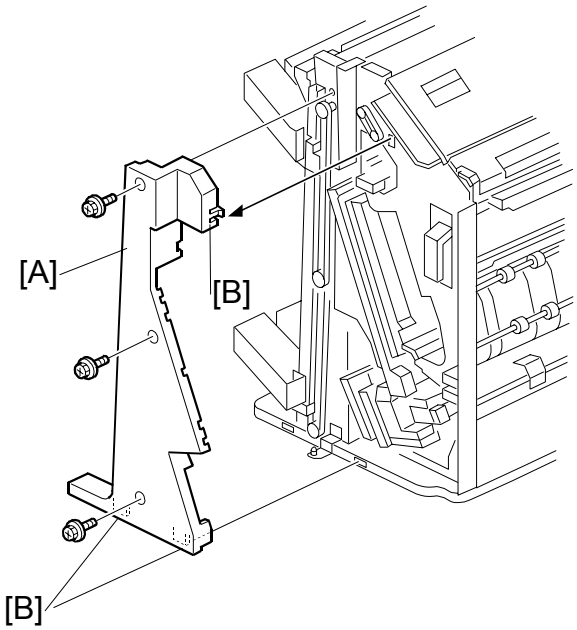
1.1.1 EXTERNAL COVERS

1. Top cover [A] (☞ x4)
   If the shift tray below is blocking the screw hole, remove the shift tray.
2. Bracket [B] (☞ x1)
3. Front door [C]
4. Rear cover [D] (☞ x4)



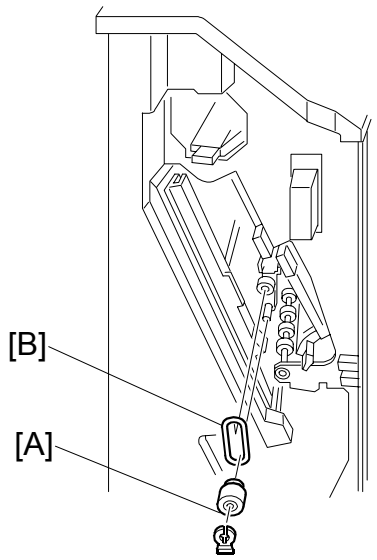
1.1.2 INNER COVER

1. Front cover (☛ 1.1.1)
2. Inner cover [A] (☞ x3, tabs [B] x3)



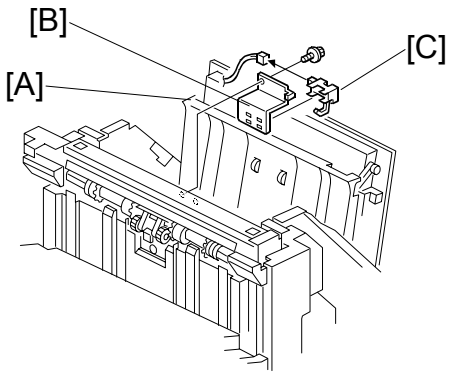
1.2 POSITIONING ROLLER

1. Open the front door.
2. Positioning roller [A] (x1)
3. Belt [B]



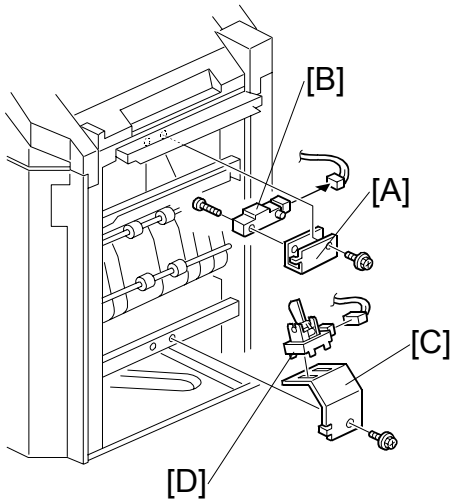
1.3 TRAY 1 EXIT SENSOR

1. Top cover (☛ 1.1.1)
2. Open transport door [A]
3. Bracket [B] (x1, (x1)
4. Tray 1 exit sensor [C]

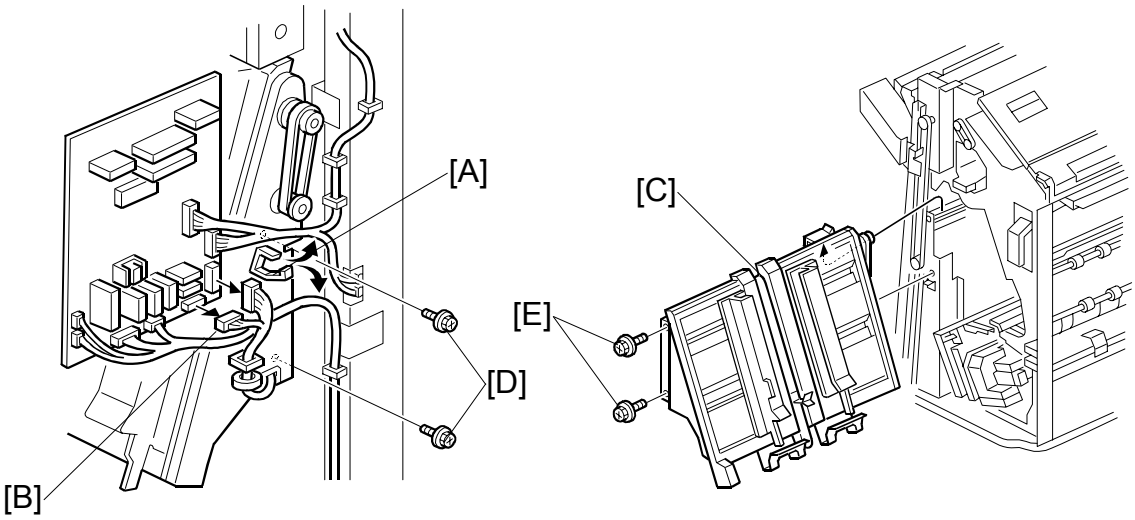


1.4 ENTRANCE SENSOR/STAPLER TRAY ENTRANCE SENSOR

1. Entrance sensor bracket [A] (x1, x1)
2. Entrance sensor [B] (x1)
3. Stapler tray entrance sensor bracket [C] (x1, x1)
4. Stapler tray entrance sensor [D]



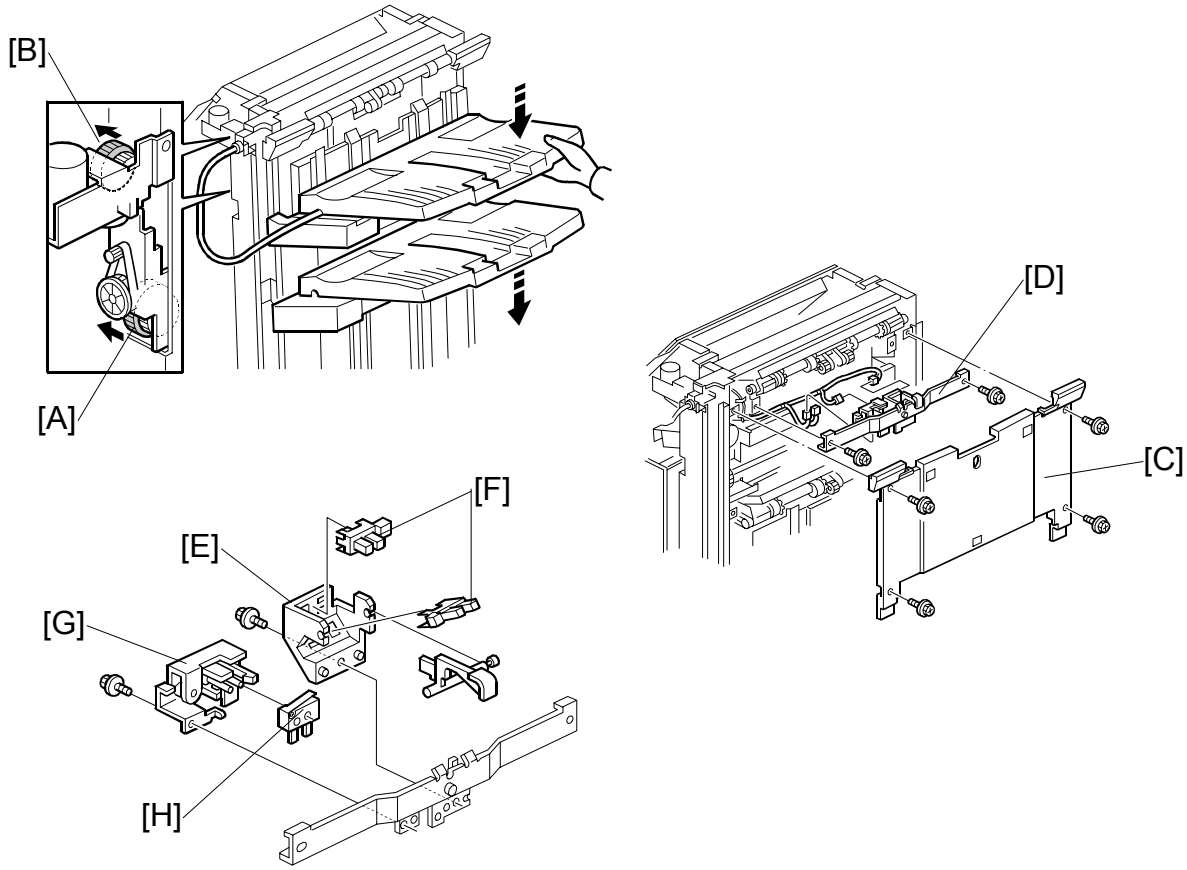
1.5 STAPLER TRAY



1. External covers, front door, inner cover (☛ 1.1.1, 1.1.2)
2. Two clamps [A]
3. Harnesses [B] (x8)
4. Stapler tray [C] (x2 [D], x2 [E])

   At the front of the finisher, pull the stapler tray toward you and lift it out.

1.6 UPPER STACK HEIGHT SENSORS/TRAY 1 UPPER LIMIT SWITCH

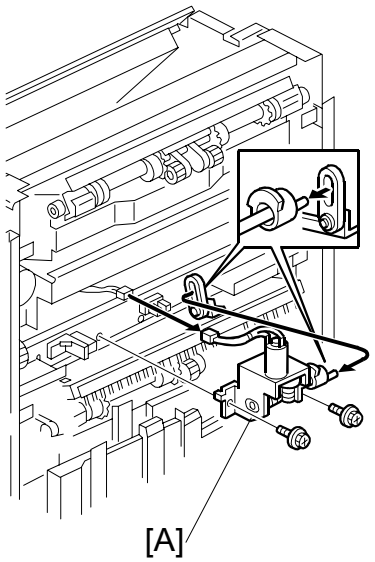


1. External covers (☛ 1.1.1)
2. Place one hand under tray 2 (the lower tray), press in on the gear [A] to release the tray, and then support it with your hand as it descends.
3. Place one hand under tray 1 (the upper tray), press in on the gear [B] to release the tray, and then support it with your hand as it descends.
4. Tray 1 back fence [C] (x4)
5. Sensor stay [D] (x2, (x4)
6. Plastic bracket [E] (x1)
7. Stack height sensors [F]
8. Metal bracket [G] (x1)
9. Upper limit switch [H]

1.7 EXIT GUIDE PLATE MOTOR

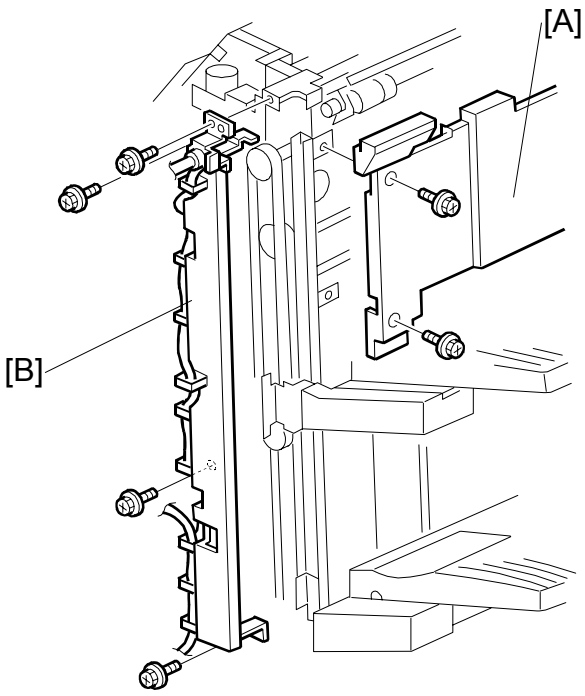
1. Tray 1 back fence (☛ 1.6)
2. Exit guide plate motor [A] (x2, x1)

   Disengage the shaft of the exit guide plate motor from the ring.

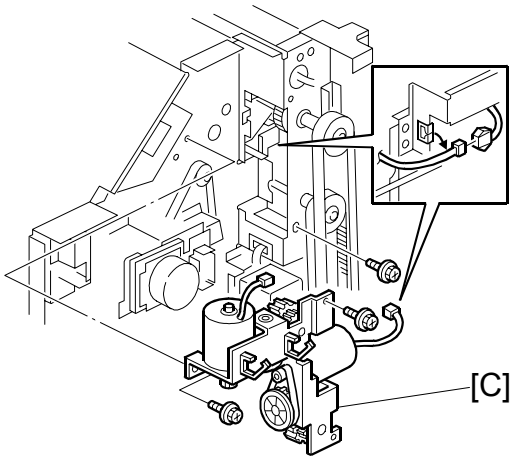


1.8 LIFT MOTORS

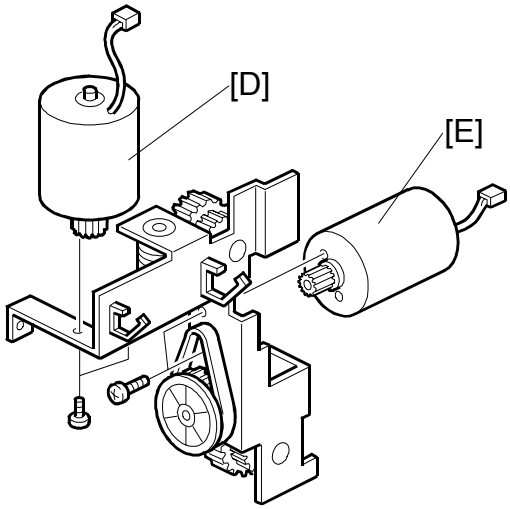
1. Top cover and rear cover (☛ 1.1.1)
2. Tray 1 back fence [A] (☛ 1.6)
3. Sensor stay [B] (x4)



4. Motor bracket [C] (x3, x 2)



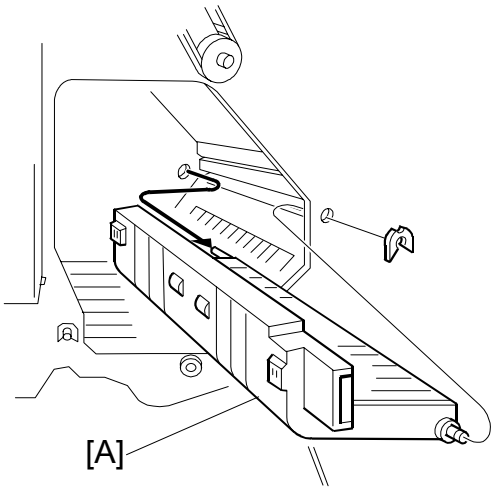
5. Tray 1 lift motor [D] (x2, drive belt)
6. Tray 2 lift motor [E] (x2, drive belt)



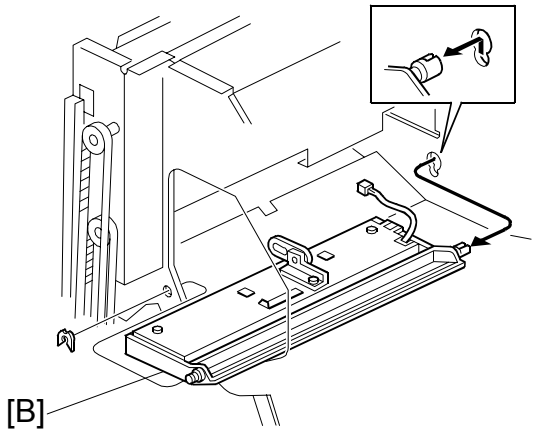
1.9 LOWER EXIT SENSOR

1. Front door, external and internal covers. (☛ 1.1)
2. Exit guide plate motor (☛ 1.7)
3. Guide plate [A] (x1)

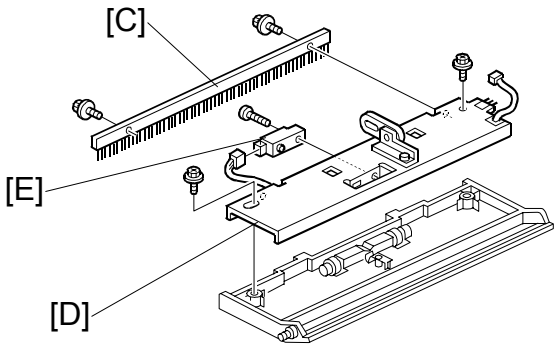
   Pull the shaft toward you through the round hole.



4. Guide plate exit assembly [B] (x1, x1)

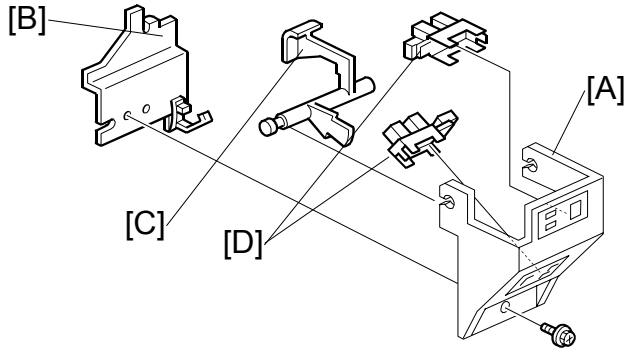


5. Anti-static brush [C] (x2)
6. Bracket guide exit [D] (x2)
7. Lower exit sensor [E] (x1, x1)



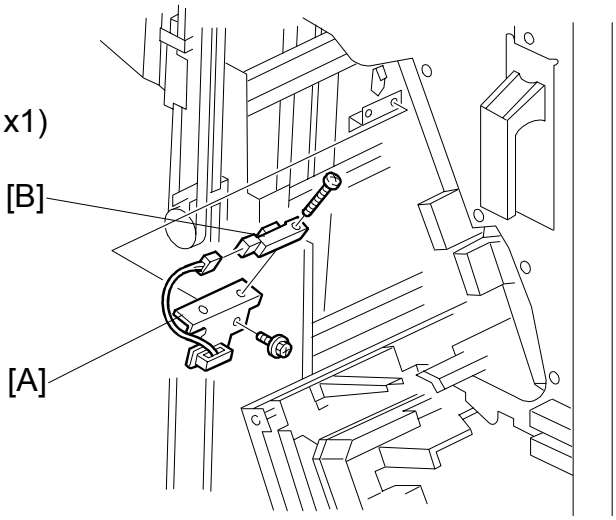
1.10 LOWER STACK HEIGHT SENSORS

1. Stapler tray (☛ 1.5)
2. Sensor bracket [A] (x1, x2)
3. Bracket [B] (x1)
4. Feeler [C]
5. Lower stack height sensors [D]



1.11 TRAY 2 SHUNT POSITION SENSOR

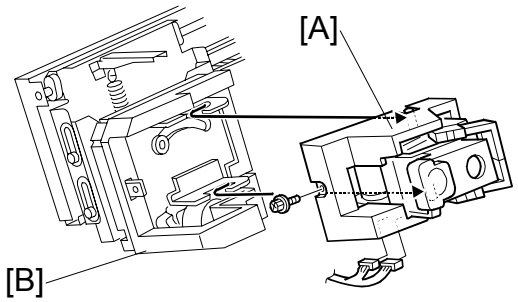
1. Stapler tray (☛ 1.5)
2. Sensor bracket [A] (x1, x1)
3. Tray 2 position shunt sensor [B] (x1)



1.12 STAPLER UNIT

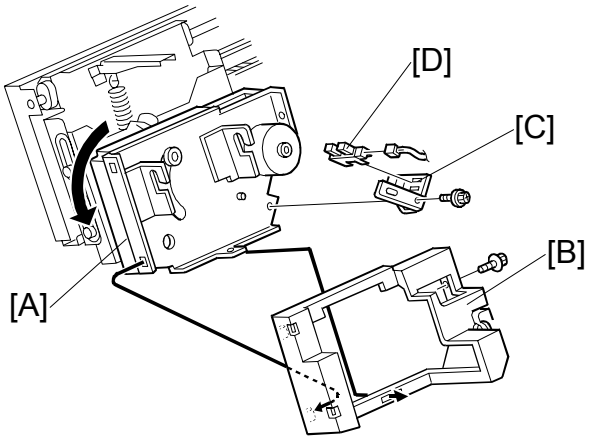
1. Open the front door
2. Stapler unit [A] (x1, x2)

   Hold the stapler holder [B] with one hand as you remove the stapler. Do not twist or rotate the stapler bracket as you remove it.



1.13 STAPLER ROTATION HP SENSOR

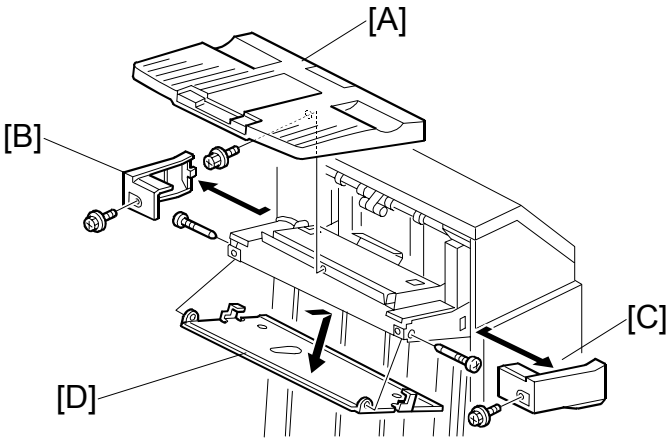
1. Stapler unit (☛ 1.12)
2. Carefully rotate the stapler holder [A].
3. Stapler cover [B] (x1)
4. Sensor bracket [C] (x1, x1)
5. Stapler rotation HP sensor [D]



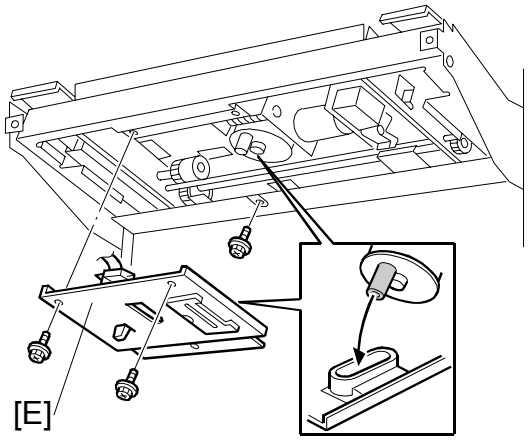
1.14 TRAY 1 INTERIOR

1.14.1 TRAY 1 COVERS

1. Tray 1 [A] (☞ x1)
2. Rear tray cover [B] (☞ x1)
3. Front tray cover [C] (☞ x1)
4. Bottom tray cover [D] (☞ x2)

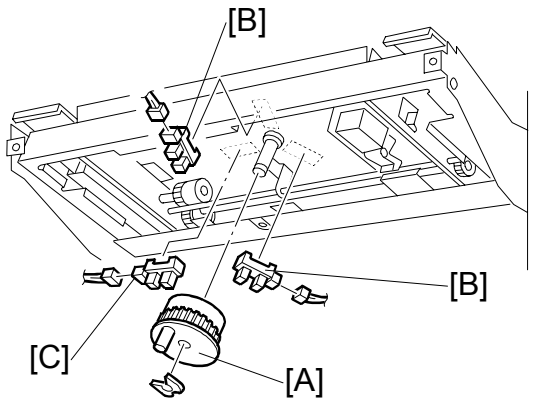


5. Bottom bracket [E] (☞ x3)



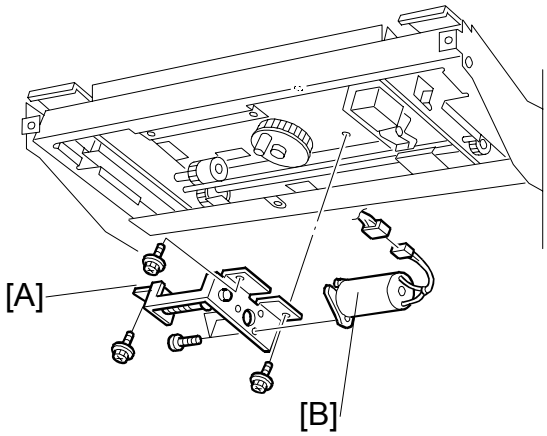
1.14.2 TRAY SHIFT SENSORS AND TRAY RELEASE SENSOR

1. Tray 1 covers (☛ 1.14.1)
2. Gear disk [A] (⟲ x1)
3. Tray shift sensors [B] (🖐 x1 each).
4. Tray release sensor [C] (🖐 x1)



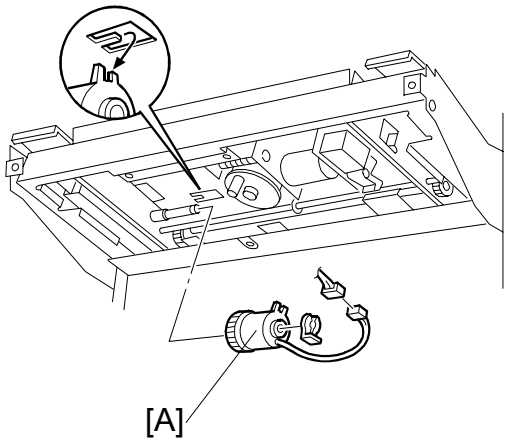
1.14.3 TRAY 1 SHIFT MOTOR

1. Tray 1 covers (☛ 1.14.1)
2. Motor bracket [A] (🔧 x3, 🖐 x1)
3. Tray 1 shift motor [B] (🔧 x3, belt x1)



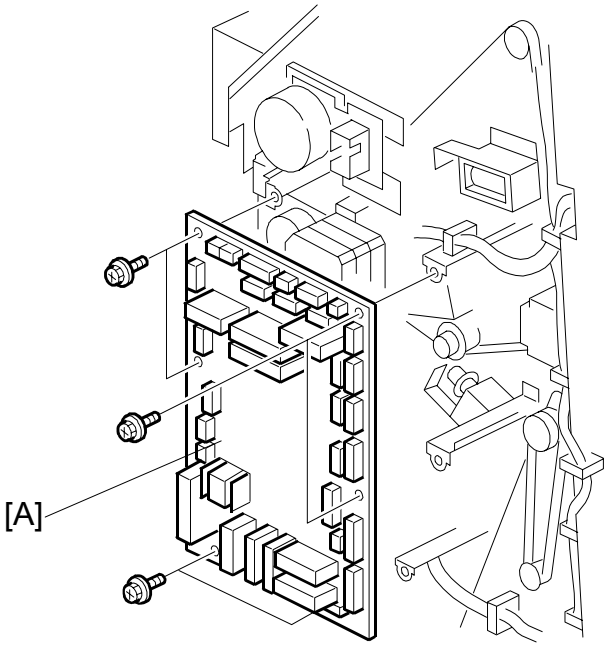
1.14.4 BACK FENCE LOCK CLUTCH

1. Tray 1 covers (☛ 1.14.1)
2. Back fence lock clutch [A] (⟲ x1, 🖐 x1)



1.15 FINISHER MAIN BOARD

1. Rear cover (☛ 1.1.1)
2. Main PCB [A] (🔩 x 6, All 🖑)



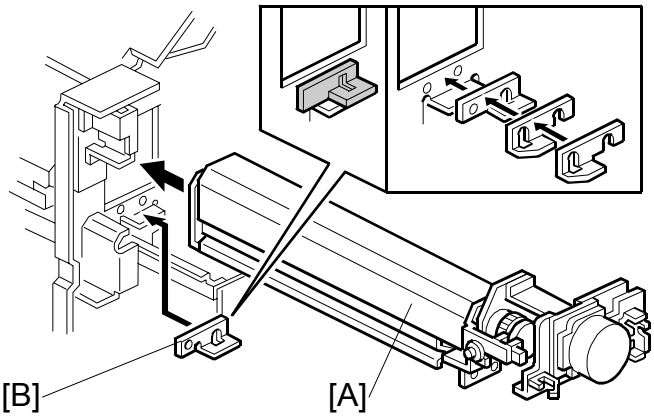
1.16 PUNCH HOLE POSITION ADJUSTMENT

To adjust the position of the punch holes in the paper feed direction, use the appropriate SP mode.

To adjust the horizontal position of the holes, use the spacers provided with the punch unit.

1. Rear cover (☛ 1.1.1)
2. Punch unit [A] (🔩 x3, 🖑 x5)
3. Spacers [B]

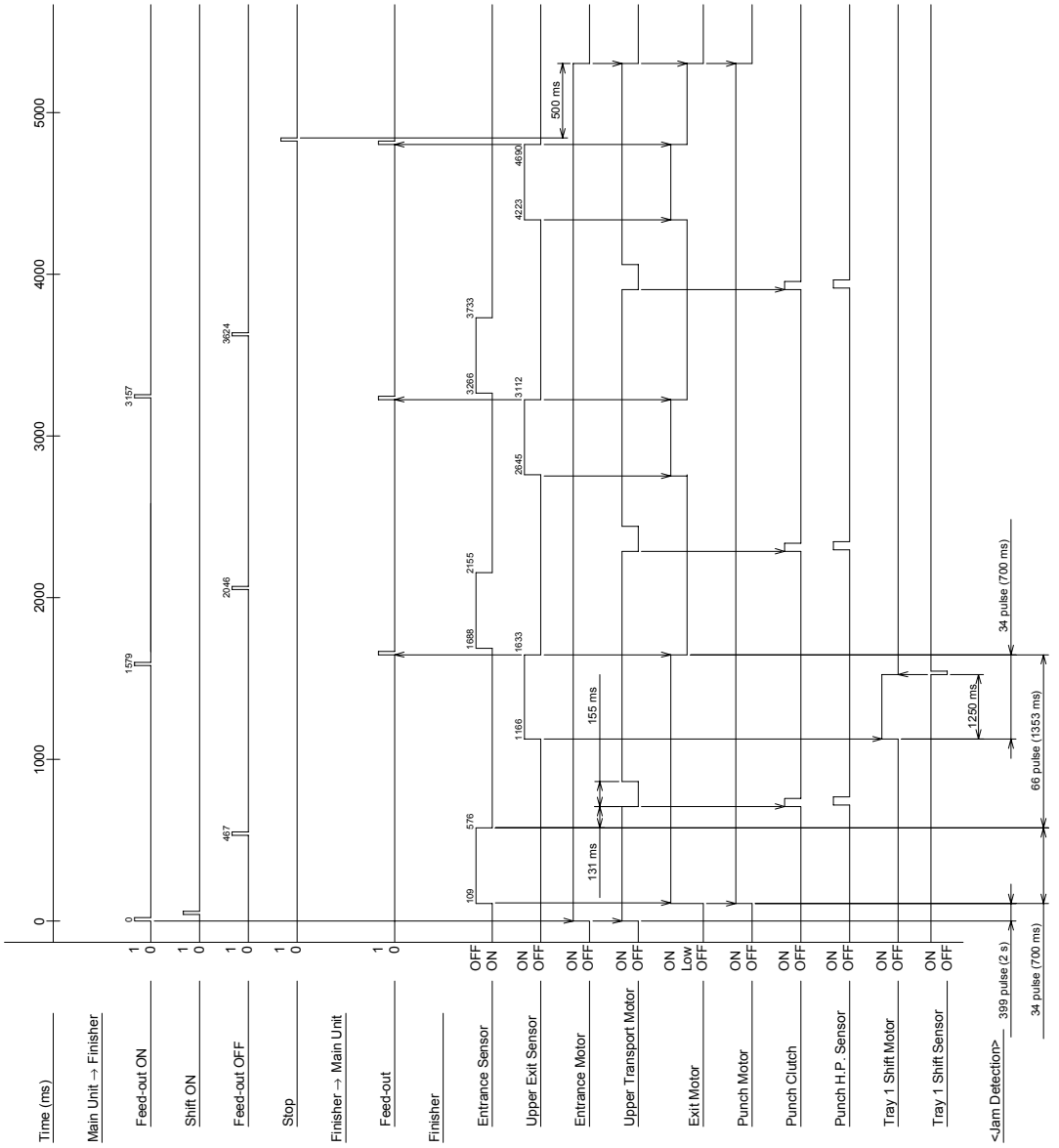
The punch position can be adjusted by up to 4 mm using combinations of the 3 spacers provided with the finisher.



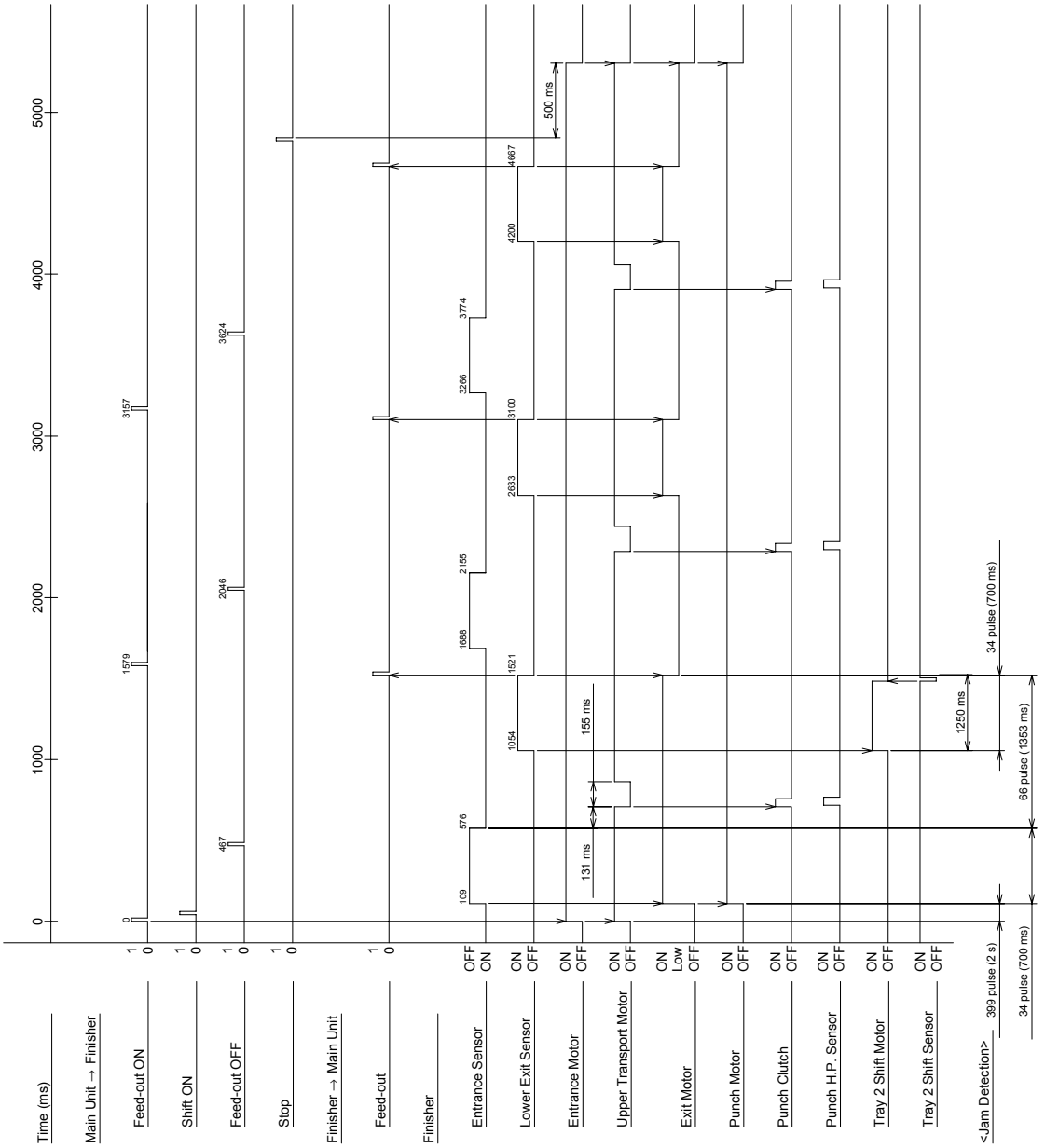
2. TROUBLESHOOTING

2.1 TIMING CHARTS

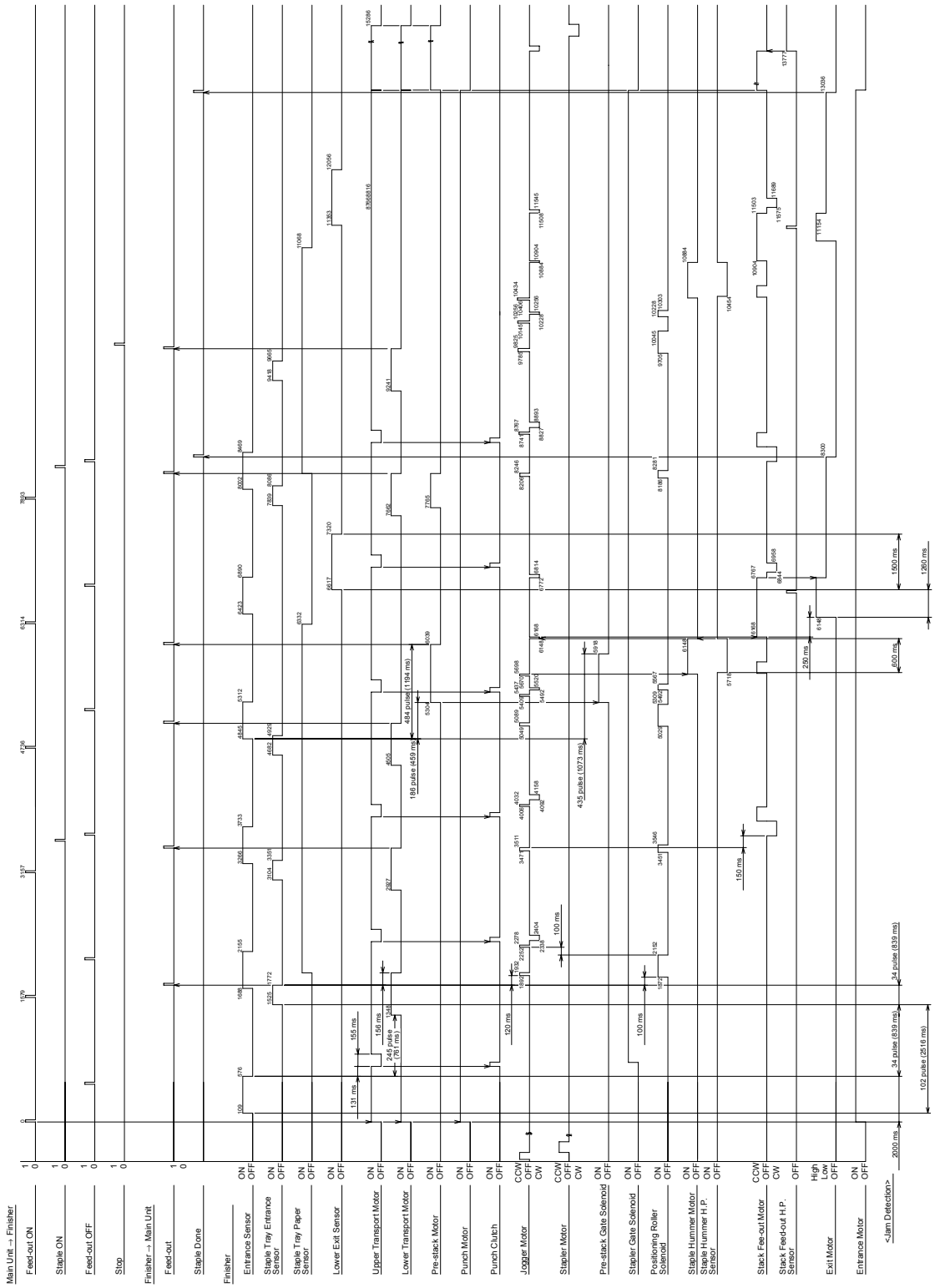
2.1.1 A4(S)/LT(S) SHIFT MODE WITH PUNCH – TRAY 1



2.1.2 A4(S)/LT(S) SHIFT MODE WITH PUNCH – TRAY 2



2.1.3 A4(S)/LT(S) STAPLE MODE WITH PUNCH



2.2 JAM DETECTION

Mode		Jam	Content
Shift	Staple		
✓	✓	Entrance sensor: On check	The entrance sensor does not turn on within 399 pulse after the main machine exit sensor turns off. *1
✓	✓	Entrance sensor: Off check	The entrance sensor does not turn off within 34 pulse after it turns on. *1
✓		Tray exit sensor: On check	The tray exit sensor does not turn on within 66 pulse after the entrance sensor turns off. *1
✓		Tray exit sensor: Off check	The tray exit sensor does not turn off within 66 pulse after the tray exit sensor turns on.
	✓	Stapler tray entrance sensor: On check	The stapler tray entrance sensor does not switch on within 102 pulses after the entrance sensor switched off.*1
	✓	Stapler tray entrance sensor: Off check	The staple tray entrance sensor does not turn off within 34 pulse after the stapler tray entrance sensor turns on.*1
	✓	Lower tray exit sensor: On check	The lower exit sensor does not on within 1260 ms after the stack feed-out motor turns on.
	✓	Lower tray exit sensor: Off check	The lower exit sensor does not off within 1500 ms after it turns on.

*1 Counted by entrance motor pulses because timing differs for feed out.

3. SERVICE TABLES

3.1 DIP SWITCH SETTINGS

The DIP switches should not be set to any combination other than those described in the table below.

DPS101				Mode	Description
1	2	3	4		
0	0	0	0	Default.	
1	1	1	0	Free run.	No paper.
0	0	0	1	Factory shipping.	See the note below.

To position the shift trays for shipping, on the finisher main board set DIP SW4 ON, cycle the main machine power off and on, then set DIP SW4 OFF. The shift trays move automatically to the shipping position. After unpacking the machine again and switching on, turn all DIP switches off to put the machine into factory default mode.

3.2 TEST POINTS

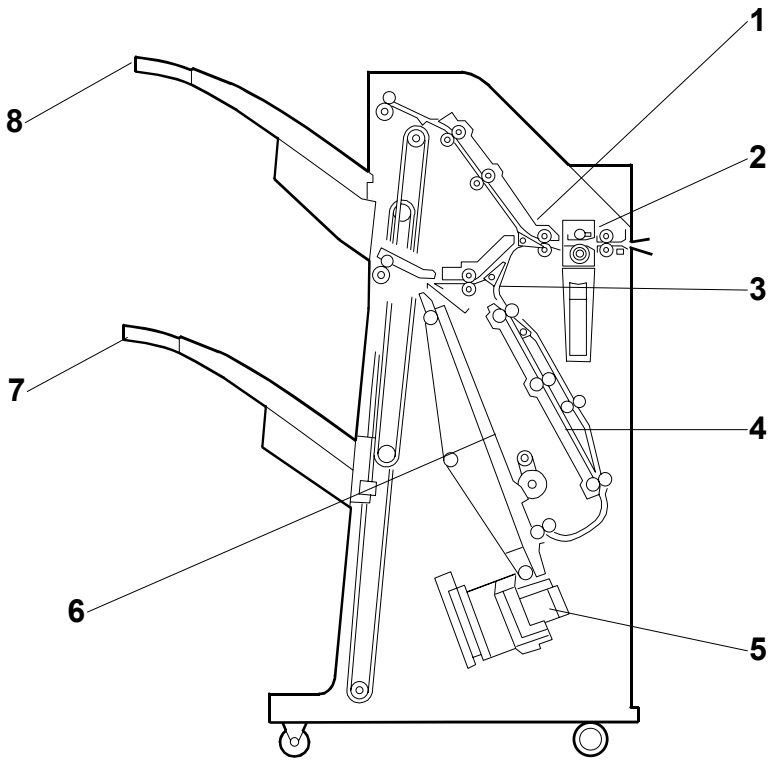
No.	Label	Monitored Signal
TP101	GND	Ground
TP102	5V	5V
TP103	RXD	Received command data
TP104	TXD	Transmitted command data

3.3 FUSES

No.	Function
FU101	Protects 24 V.

4. DETAILED DESCRIPTIONS

4.1 GENERAL LAYOUT



1	Upper junction gate	5	Stapler
2	Punch unit (option)	6	Stapler tray
3	Stapler junction gate	7	Tray 2
4	Pre-stack tray	8	Tray 1

Tray junction gate: Directs paper either to the upper or lower exit. In staple mode, the stack always goes out to the lower exit.

Stapler junction gate: Directs paper either to the lower exit or to the stapler tray.

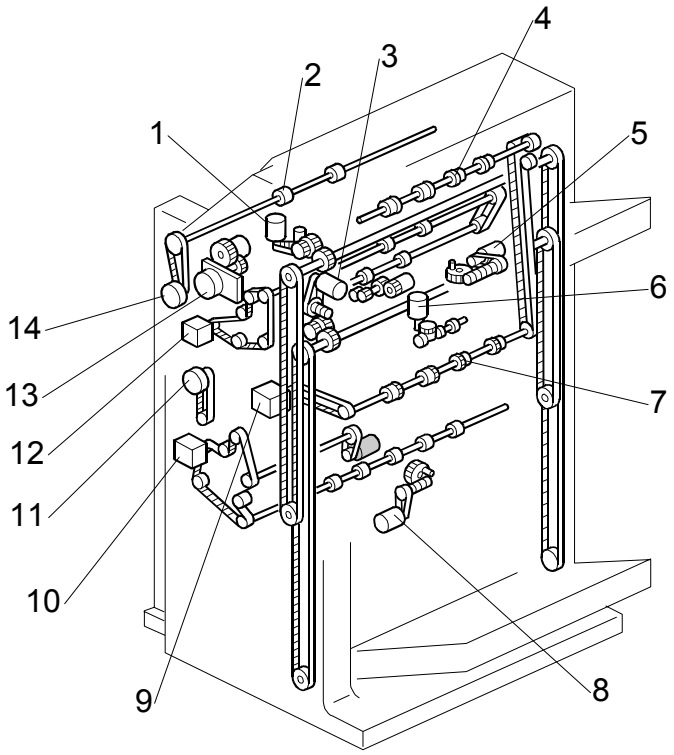
Pre-stack tray: When stapling multiple copies (A4 S, LT S, B5 S only) in the staple mode, the first sheet of the second copy waits here for the next sheet to feed while the previous stack is stapled. After the second copy is fed, the first and second sheets are fed together to the pre-stack tray. This delay allows enough time for the previous stack to be stapled without interrupting paper feed.

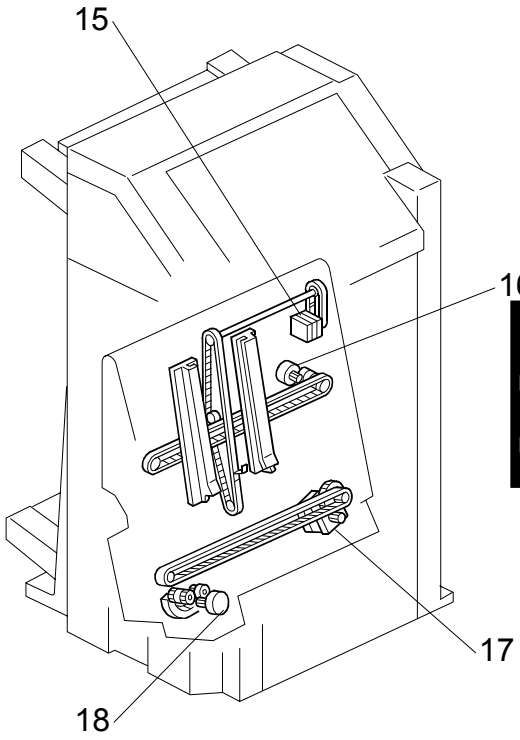
Shift trays: Tray 1 (upper) and tray 2 (lower) shift side to side in the sort mode, and raise and lower to receive ejected copies.

Stapler tray jogger: Employs positioning rollers and jogger fences to align stacks for stapling.

Punch unit. Punches holes in stacked copies.

4.2 DRIVE LAYOUT



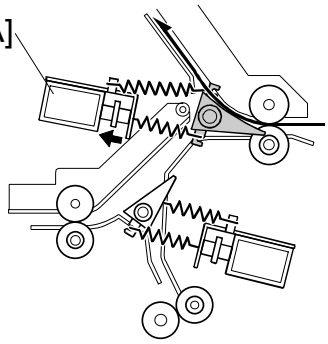


1. Tray 1 lift motor
2. Entrance roller
3. Tray 2 lift motor
4. Upper exit roller
5. Tray 1 shift motor
6. Exit guide plate motor
7. Lower exit roller
8. Tray 2 shift motor
9. Exit motor
10. Lower transport motor
11. Pre-stack motor
12. Upper transport motor
13. Punch motor
14. Entrance motor
15. Stack feed-out motor
16. Jogger motor
17. Stapler motor
18. Stapler rotation motor

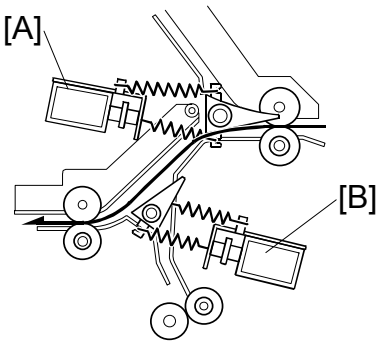
4.3 JUNCTION GATES

The two junction gates can direct paper to three destinations.

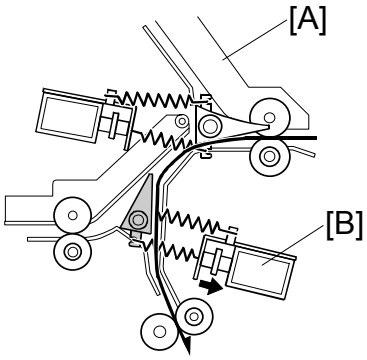
In sort/stack mode for tray 1, the tray junction solenoid [A] is on, and the copies go to the upper exit (tray 1 is at the upper exit for sort/stack mode).



In sort/stack mode for tray 2, both the tray junction gate solenoid [A] and stapler junction gate solenoid [B] are off, and copies go to the lower exit.

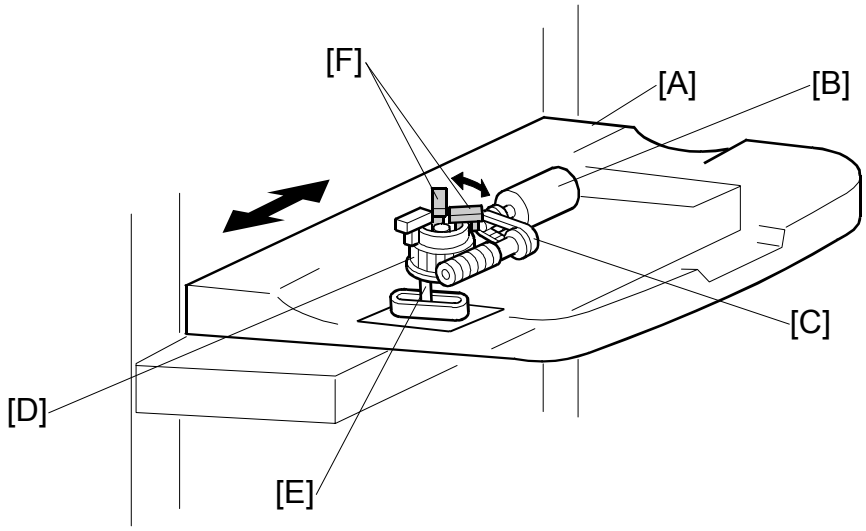


In staple mode, the tray junction solenoid [A] is off and the stapler junction gate solenoid [B] is on, and copies go to the stapler tray.



4.4 TRAY SHIFTING

4.4.1 TRAY SHIFT MECHANISMS



Tray 1 (Upper Tray)

In sort/stack mode, tray 1 [A] moves from side to side to separate the printed sets.

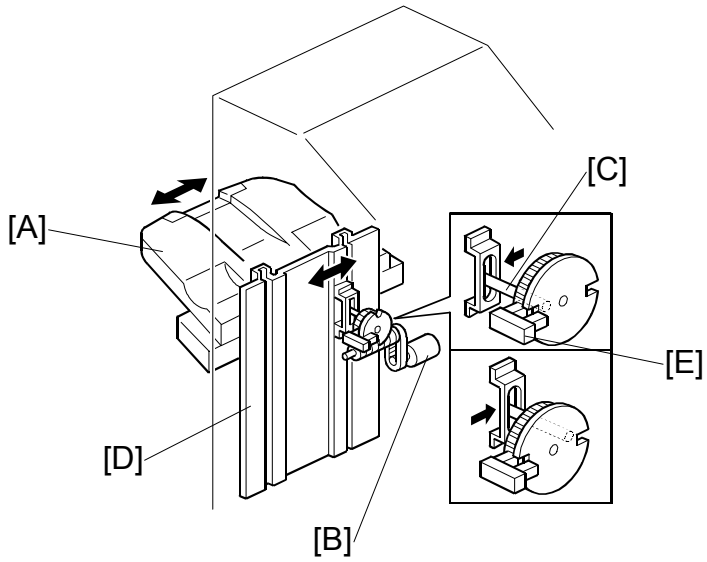
The tray 1 shift motor [B], inside the shift tray, controls the horizontal position of tray 1 through the timing belt [C] and gear disk [D].

After one print set is delivered to tray 1, the shift motor turns on, driving the gear disk and the arm [E], and the tray drive unit moves to one side.

Two shift sensors [F] detect when to stop this side-to-side movement. There is a cut-out in the gear disk. The shift tray moves in one direction until one of the shift sensors detects the cut-out. Then the shift tray stops.

The next set of prints is then delivered, and the gear disk is turned in the opposite direction until the other shift sensor is activated.

Tray 2 (Lower Tray)



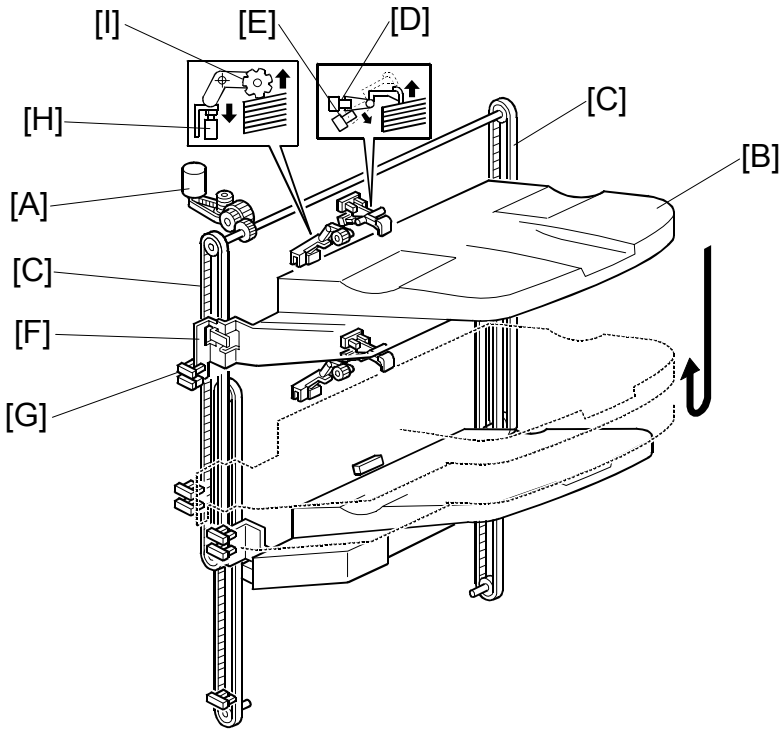
In sort/stack mode, tray 2 [A] moves from side to side to separate the sets of prints.

The shift mechanism for tray 2 is similar to that used for tray 1. However, when the tray 2 shift motor [B] turns on, the arm [D] moves the entire end fence [C] from side to side (not just the tray).

After the gear disk has turned 180 degrees, the cut-out in the gear disk enters the tray half-turn sensor [E], and the motor stops. When the next set of prints is delivered, the motor turns on again, and moves the tray back to its previous position.

4.5 TRAY UP/DOWN MECHANISMS

4.5.1 TRAY 1



Introduction

The tray 1 lift motor [A] controls the vertical position of tray 1 [B] through gears and timing belts [C].

Normal and sort/stack modes

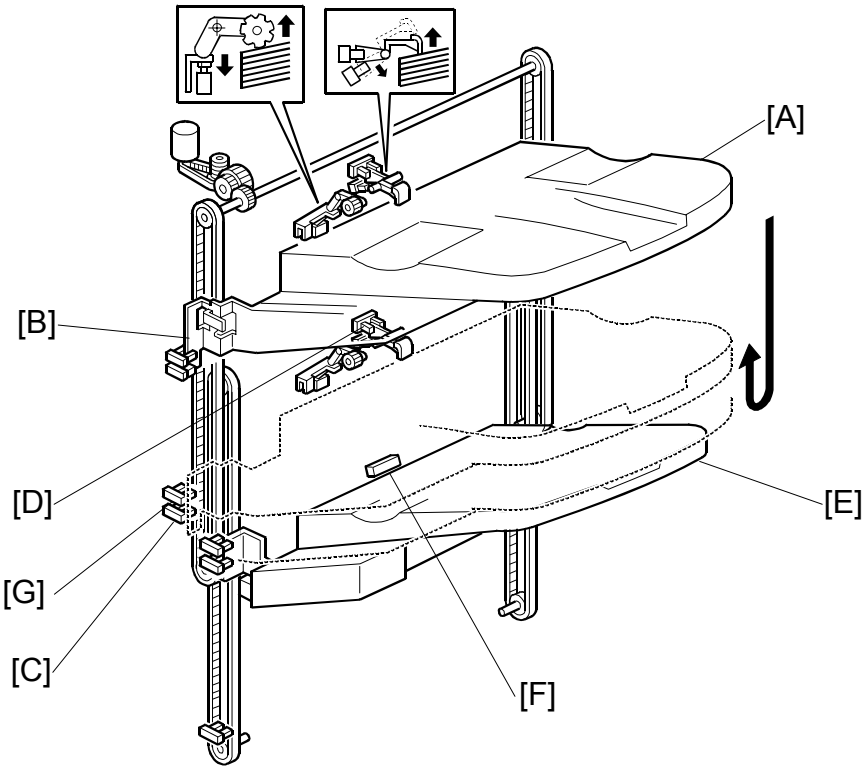
When the main switch is turned on, the tray is initialized at the upper position. To do this, the tray is moved up until upper stack height sensor 1 [D] is de-actuated.

During printing, if upper stack height sensor 2 [E] is actuated, the tray 1 lift motor lowers the tray for a specified time.

When the tray lowers during printing, the actuator [F] will pass through the tray 1 overflow sensor [G]. When the actuator drops below the sensor (to deactivate the sensor), the machine detects that the paper stack height has exceeded a certain limit.

The upper limit switch for tray 1 [H] prevents the drive gear from being damaged if the upper stack height sensor 1 should fail. If the tray is raised to the tray positioning roller [I], the switch will automatically cut the power to the tray 1 lift motor.

Staple mode



In staple mode, stapled stacks can be delivered to either tray, but they can only go to the lower exit. So, if tray 1 is selected, tray 1 [A] moves down to the lower paper exit.

Tray 1 lowers until the actuator [B] enters the tray 1 lower limit sensor [C]. Tray 1 then lifts up until lower stack height sensor 1 [D] is activated.

When tray 1 is moved down to the lower exit, tray 2 must be moved down out of the way. So, tray 2 [E] is also lowered until the tray 2 shunt position sensor [F] detects tray 2 (or the top of the paper stack in tray 2).

The method of paper height detection is the same as for the upper exit area.

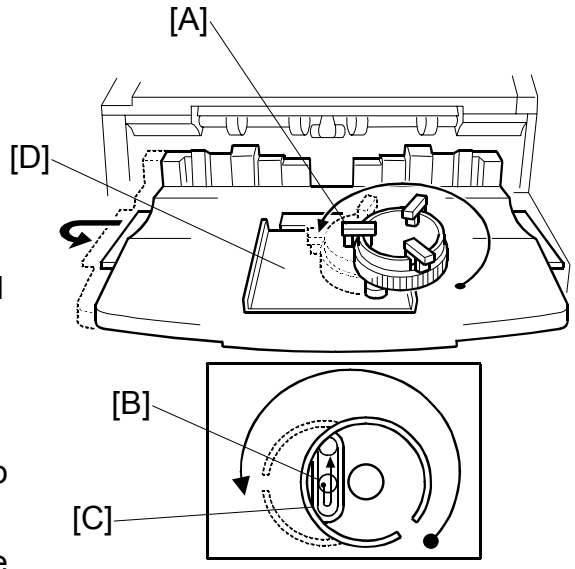
When the tray lowers during printing, the actuator will enter the tray 1 overflow 2 sensor [G]. When this happens, the machine detects that the paper stack height has exceeded the overflow limit.

Tray 1 release mechanism

When tray 1 is selected for staple mode, tray 1 must be moved down to the lower paper exit. However, to move past the sensors at the lower exit, the tray must be moved away from the finisher.

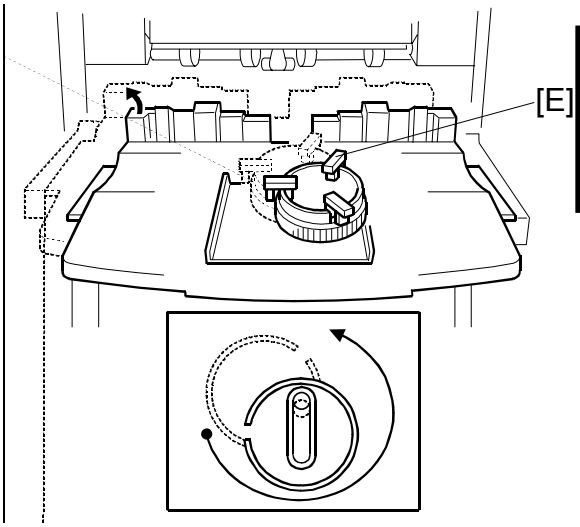
To do this, the tray 1 shift motor turns until the cut-out in the gear disk enters the tray release sensor [A]. At this time, the arm [B] has reached position [C], and is pushing against the plate [D], in towards the finisher. However, the plate is fixed, so the tray moves out away from the finisher.

Then, the tray 1 shift motor stops, then the tray 1 lift motor lowers tray 1.



When the tray 1 lower limit sensor is activated (as described on the previous page), the tray has moved past the sensors at the lower exit. The tray 1 shift motor turns on again until the gear disk activates the tray shift sensor [E]. This moves the tray back against the finisher.

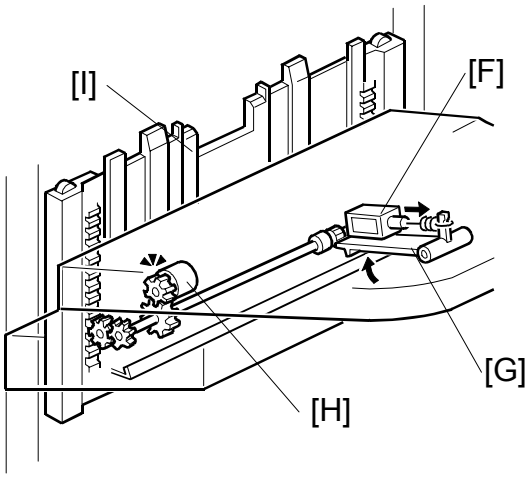
Next, tray 1 lifts until the finisher detects that the tray is at the correct height.



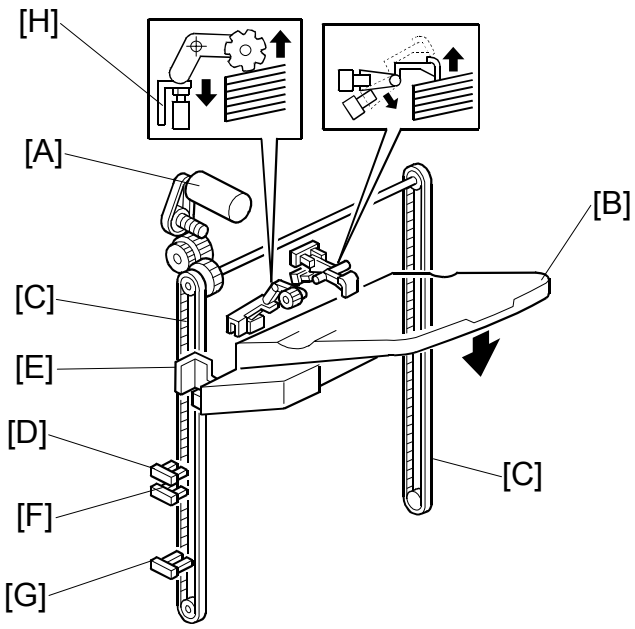
When tray 1 is at the lower exit, the tray lock solenoid [F] is on, and the lever [G] locks the tray. This prevents the user from moving the tray out of position (the first tray has some play when it is at the lower position).

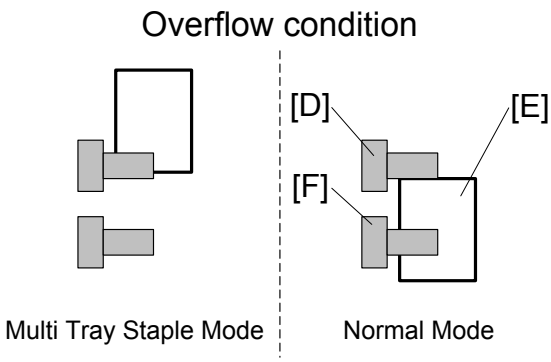
Before tray 1 goes back to the upper exit area, the tray lock solenoid [F] turns off to unlock the tray. In addition, the back fence lock clutch [H] turns on to hold the back fence [I]. This prevents the springs inside the back fence from suddenly contracting (these springs normally keep the tray steady during side-to-side shift).

Then, tray 1 is released and it moves up to the upper exit area.



4.5.2 TRAY 2





The tray 2 lift motor [A] controls the vertical position of tray 2 [B] through gears and timing belts [C].

The paper height detection is the same as for tray 1.

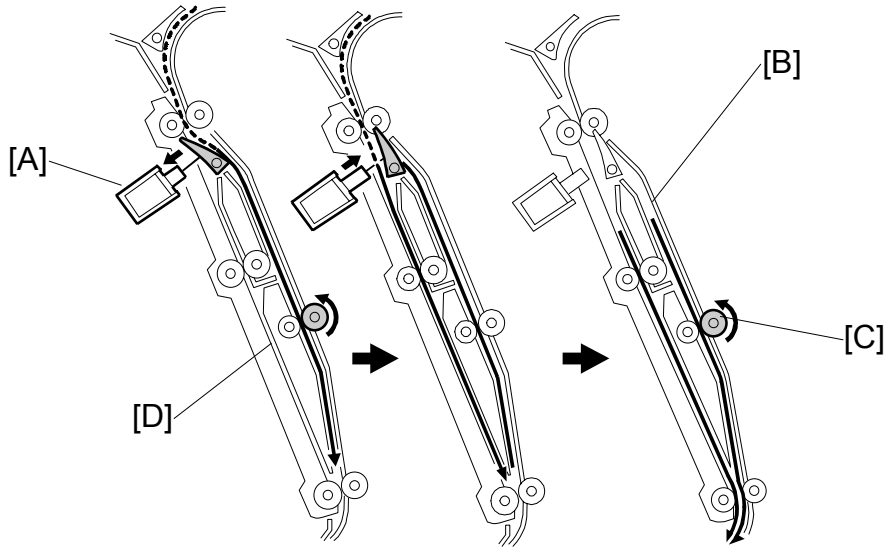
When the tray lowers during printing, the tray is judged to be overflowing when the tray 2 overflow sensor 1 [D] is off and the tray 2 overflow sensor-2 [F] is on (see 'Normal Mode' in the above diagram).

In the multi-tray staple mode (selected by the service technician), the machine detects that the paper stack height has exceeded the overflow limit when the actuator [E] enters the tray 2 overflow 1 sensor [D].

The lower limit sensor [G] for tray 2 detects when tray 2 is at its lowest limit and stops the tray 2 lift motor.

The function of the tray 2 upper limit switch [H] is the same as for tray 1.

4.5.3 PRE-STACK MECHANISM



This feature is available only when using A4 L, LT L, and B5 L.

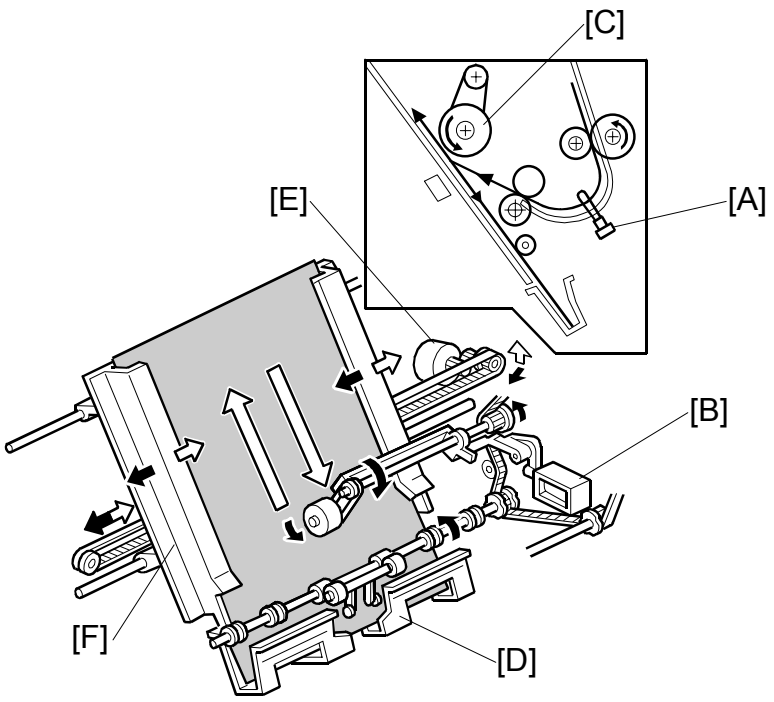
During stapling, the main machine must wait. This mechanism reduces the wait by holding the first two sheets of a job while the previous job is still being stapled. It only works during the second and subsequent sets of a multi-set print job.

The pre-stack junction gate solenoid [A] switches on after the first sheet activates the entrance sensor. This directs the sheet to the pre-stack tray [B].

The pre-stack feed roller [C] stops for a specified time after the trailing edge of the paper has passed through the entrance sensor and stops the paper from leaving the pre-stack tray.

At the same time, the pre-stack junction gate solenoid switches off, and the second sheet is sent to the paper guide [D]. The pre-stack feed roller (controlled by the pre-stack motor) starts to rotate again for a specified time after the trailing edge of the second page has been passed through the entrance sensor, and then both sheets are sent to the stapler tray together.

4.6 JOGGER UNIT PAPER POSITIONING MECHANISM



In staple mode, each sheet of copy paper is vertically and horizontally aligned when it arrives in the stapler tray.

Vertical Paper Alignment

After the trailing edge of the paper passes the stapler tray entrance sensor [A], the positioning roller solenoid [B] is energized for a specified time to push the positioning roller [C] into contact with the paper.

The positioning roller rotates to push the paper back and align the trailing edge of the paper against the stack stopper [D].

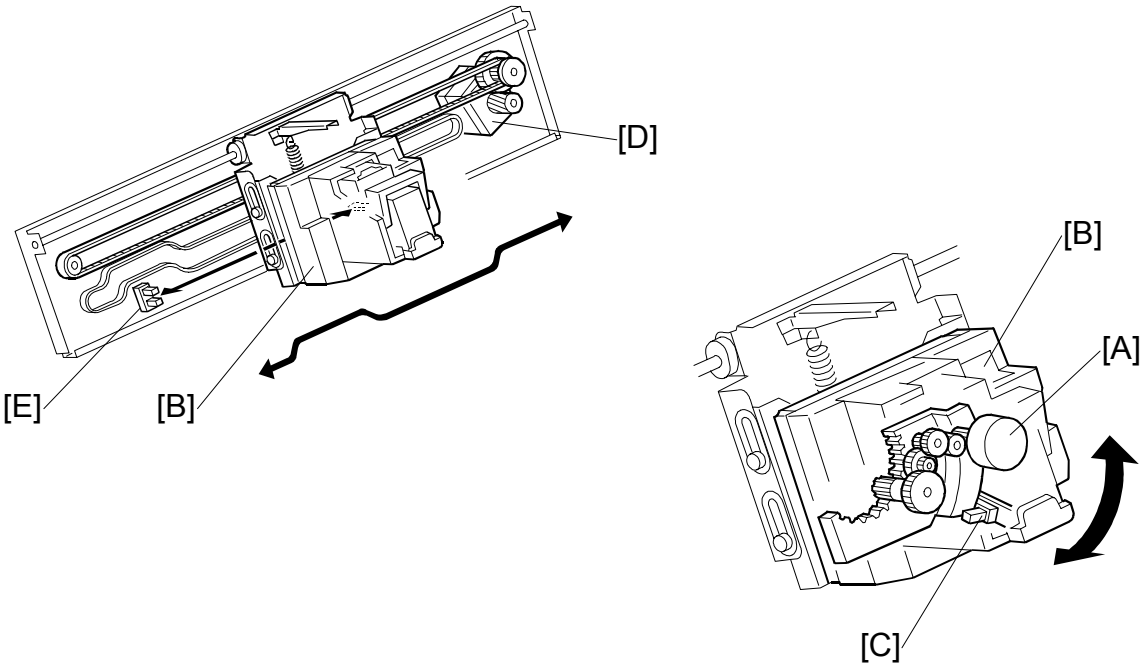
Horizontal Paper Alignment

When the start key is pressed, the jogger motor [E] turns on and the jogger fences [F] move to the waiting position, which is 8 mm wider on both sides than the selected paper.

When the trailing edge of the paper passes the stapler tray entrance sensor, the jogger motor turns on to move the jogger fences 5 mm towards the paper. After a short time, the jogger motor turns on again for the horizontal paper alignment then returns to the waiting position.

4.7 STAPLER MECHANISM

4.7.1 STAPLER MOVEMENT



The stapler can be moved from side to side or rotated according to the requirements of the selected stapling mode.

Stapler Rotation

After the start key is pressed, the stapler rotation motor [A] rotates the staple unit [B] until the stapler rotation HP sensor [C] is activated. Then, the stapler moves from front to rear of the finisher.

When oblique stapling at one position has been selected, after the stapler moves to the stapling position, the stapler rotation motor rotates the stapler 45 degrees (clockwise) at the stapling position before the stapler fires.

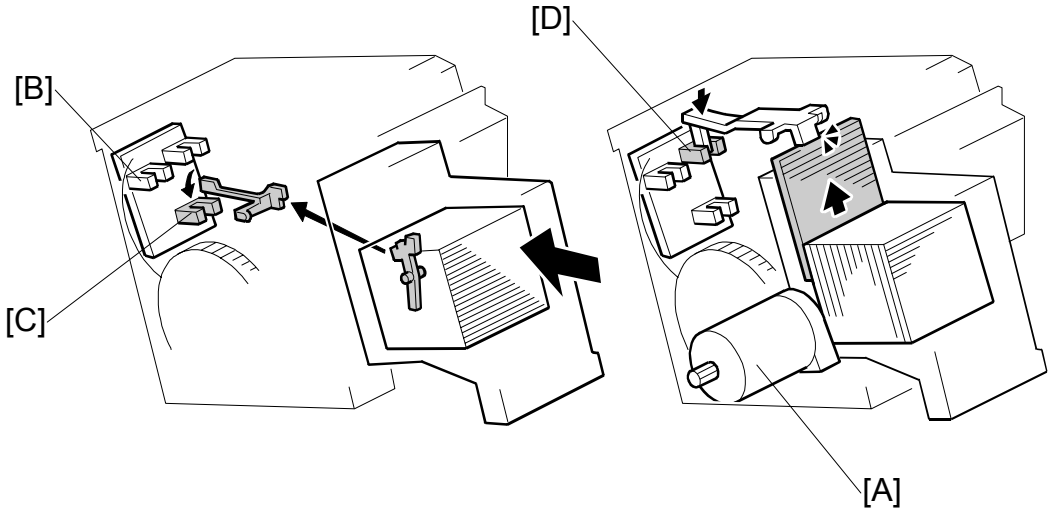
Side-to-Side Movement

The stapler motor [D] moves the stapler from side to side. After the start key is pressed, the stapler moves from its home position to the stapling position.

The amount of movement required to reach the stapling position is determined by the size of the selected paper. If the two-staple mode is selected, the stapler moves to the front stapling position first, and then moves to the rear stapling position. However, for the next print set, it staples in the reverse order.

After the stapling job is finished, the stapler returns to its home position, determined by the stapler HP sensor [E].

4.7.2 STAPLER



The staple hammer is driven by the stapler hammer motor [A] inside the stapler.

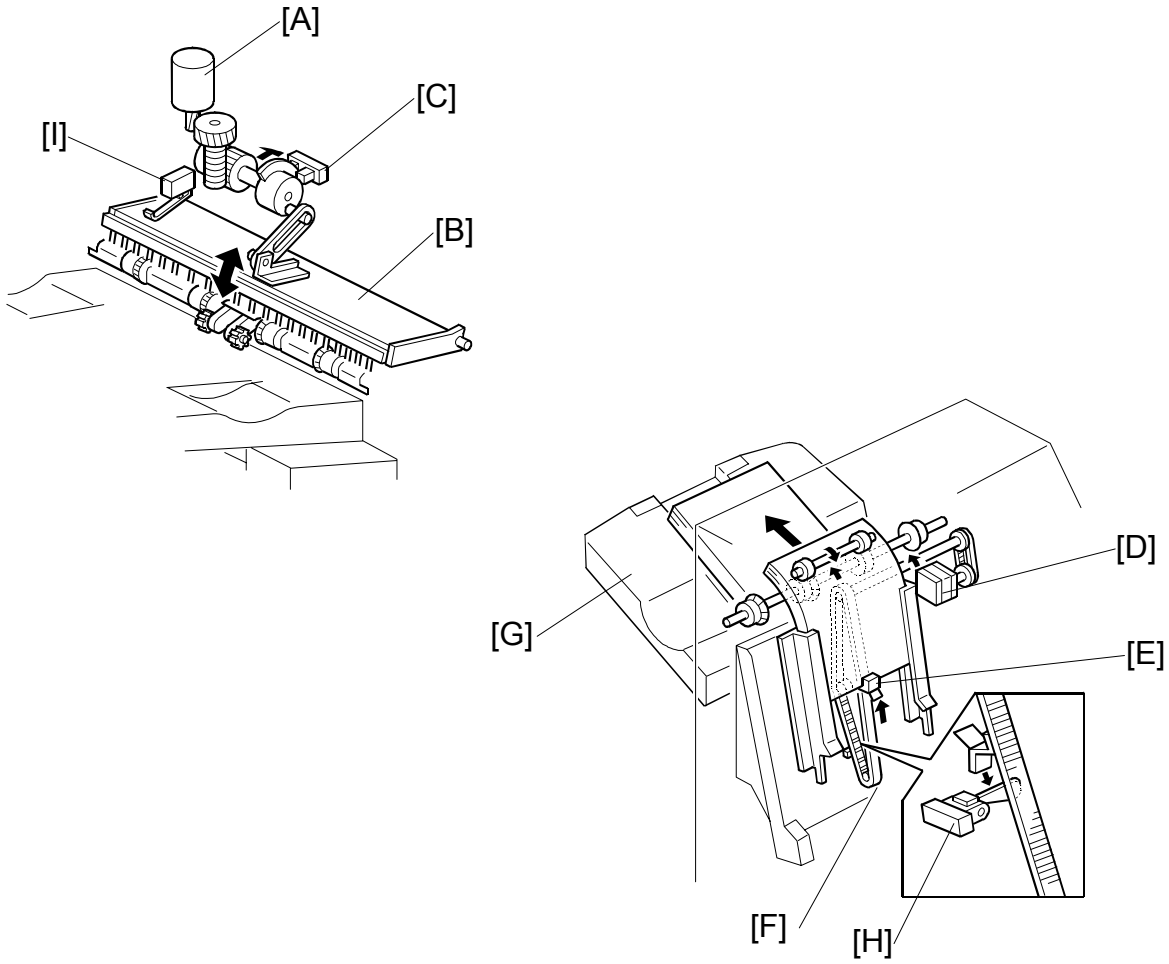
As soon as the paper stack is aligned, the staple hammer motor starts. When stapling is finished, the staple hammer HP sensor [B] is turned on, and the staple hammer motor then stops.

The staple end sensor [C] detects the staple end condition and whether the staple cartridge is installed or not. If a stapler cassette is not installed, or after the stapler cassette runs out of staples, a message is displayed in the operation panel. If this condition is detected during a print job, the indicator will appear, but the print job will not stop.

The staple position sensor [D] detects if there is a staple sheet at the stapling position. After a new staple cartridge is installed, the staple hammer motor turns on to transfer the staple sheet until the staple position sensor is activated by the staple sheet.

If a staple jam occurs and overloads the motor, this causes a staple jam message to appear on the operation panel.

4.7.3 FEED OUT AND TRANSPORT



When stapling starts, the exit guide plate motor [A] switches on and opens the exit guide plate [B], so that the stapled stack can exit to the tray. The exit guide plate sensor [C] detects when to switch off the exit guide plate motor.

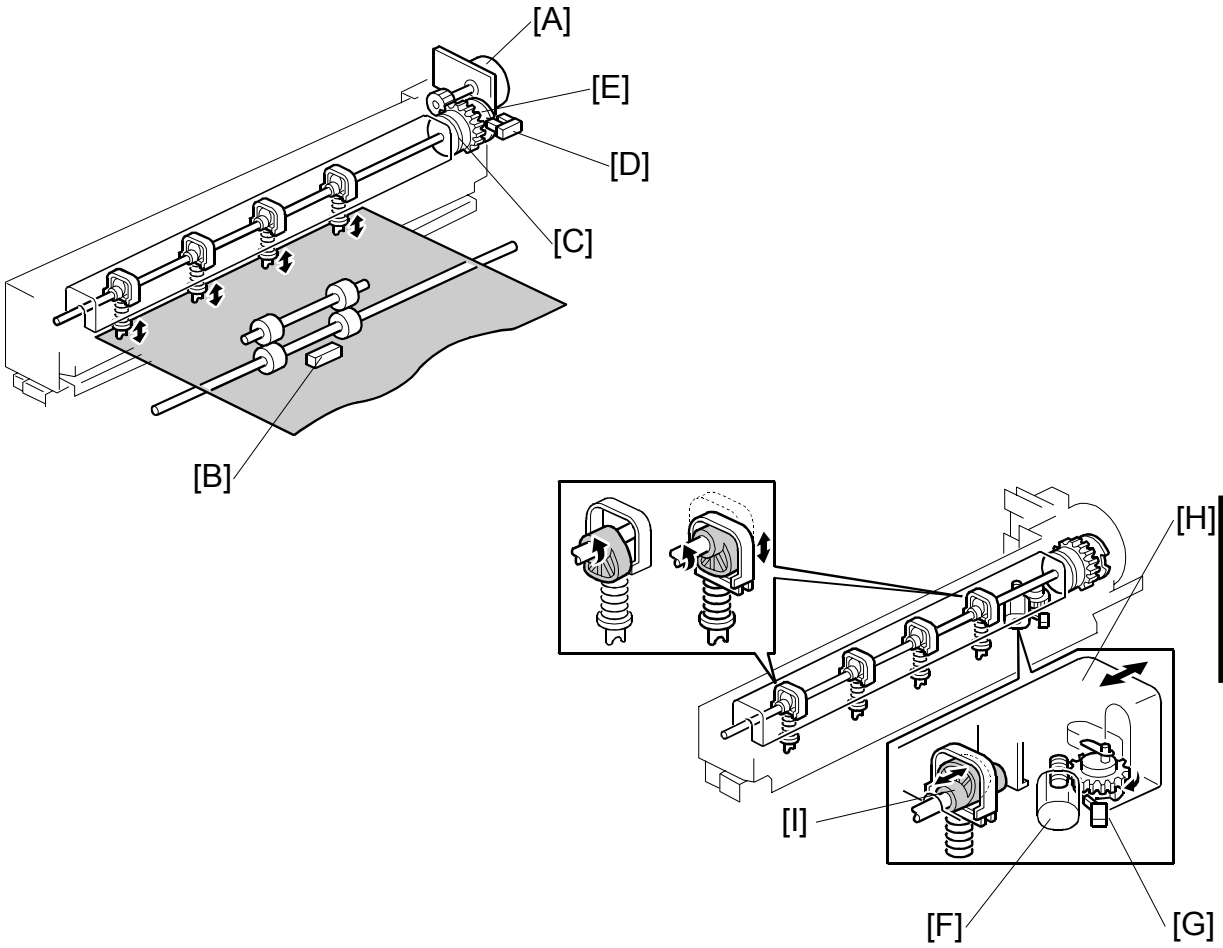
After the prints have been stapled, the stack feed-out motor [D] starts. The pawl [E] on the stack feed out belt [F] lifts the stapled set and feeds it to the tray [G].

The exit guide plate closes at a specified interval after the stapled prints have started to feed out. Then the exit roller takes over the stack feed-out. The stack feed-out motor turns off when the pawl actuates the stack feed-out belt home position sensor [H].

When tray 1 is passing this area on its way back up to the upper exit, the exit guide safety switch [I] cuts power to the tray lift motor if the guide is opened too far. This prevents damage to the user's fingers if they are inside the lower exit when the tray is moving up.

4.8 PUNCH UNIT (OPTIONAL)

The punch unit punches holes in printed sheets, one by one. The punch unit is provided with a new punch mechanism to improve the accuracy of punching.



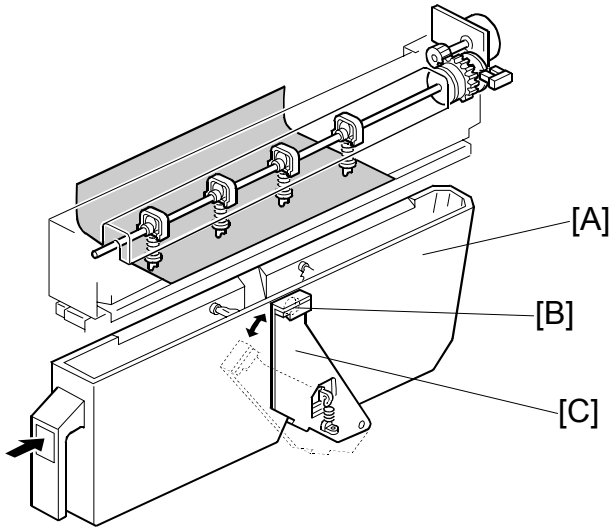
4.8.1 PUNCH DRIVE MECHANISM

The punch drive mechanism is driven by the punch motor [A]. Each sheet is positioned and punched by pressure from above. A certain time after the trailing edge of the paper passes through the finisher entrance sensor [B], the punch motor turns on and the paper stops. Then the punch clutch [C] turns on to make the punch holes.

The home position is detected by the punch HP sensor [D]. When the cut-out in the punch shaft disk [E] enters the punch HP sensor, the punch clutch turns off.

When the finisher has received the command that changes the number of punch holes, the punch hole motor [F] turns on until the disk changes the status of the punch hole switch [G] (until it switches on or off). This indicates that the cover [H] and the punch cam [I] have moved to one side or the other to change the number of holes.

4.8.2 PUNCH WASTE COLLECTION



Waste punchouts are collected in the punch waste hopper [A] below the punch unit inside the finisher.

When the top of the punchout waste in the hopper reaches and actuates the hopper sensor [B], a message will be displayed on the operation panel after the current job is completed.

This sensor also detects whether the punch waste hopper is installed. When the waste hopper is taken out, the arm [C] moves down and this will actuate the sensor and display a message in the operation panel. This message is the same as for the hopper full condition.

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BOOKLET FINISHER

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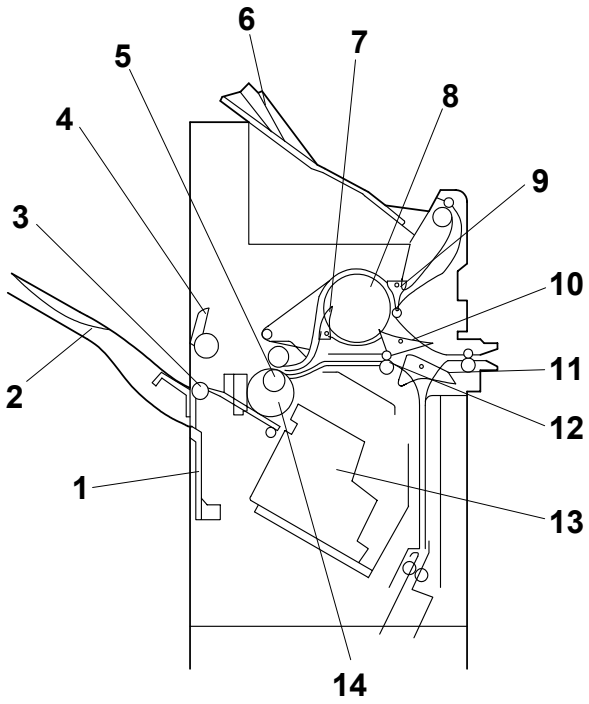
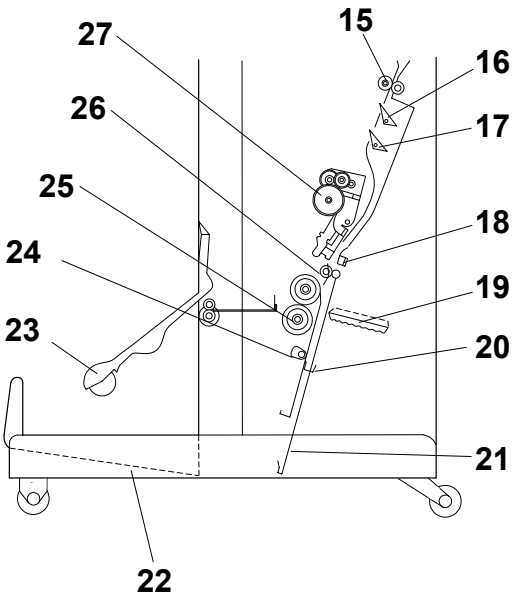
1. OVERALL MACHINE INFORMATION

1.1 MECHANICAL COMPONENT LAYOUT





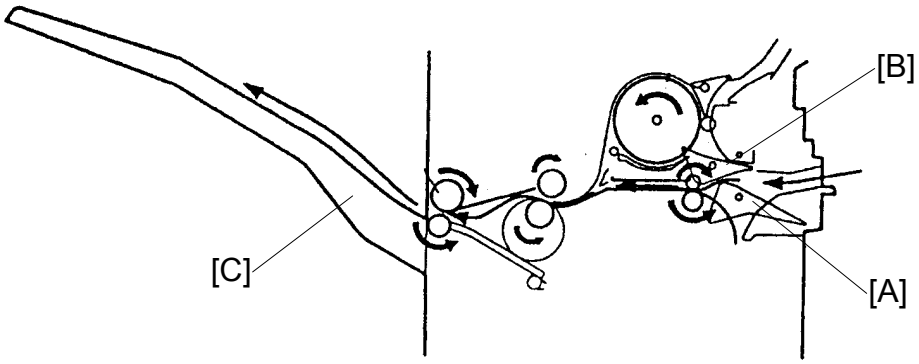
1. Shutter
2. Shift Tray
3. Lower Exit Roller
4. Upper Exit Guide
5. 2nd Transport Roller
6. Proof Tray
7. Buffer Roller Exit Gate
8. Buffer Roller
9. Proof Tray Gate
10. Buffer Roller Entrance Gate
11. Booklet Gate
12. 1st Transport Roller
13. Stapler Unit
14. Transport Belt
15. Booklet Unit Entrance Roller
16. 1st Booklet Unit Gate
17. 2nd Booklet Unit Gate
18. Anvil
19. Folder Plate
20. Positioning Plate
21. Shutter Guide
22. Booklet Tray
23. Exit Guide
24. Positioning Roller
25. Folder Roller
26. Relay Roller
27. Booklet Stapler Unit

2. DETAILED DESCRIPTIONS

2.1 JUNCTION GATE MECHANISM

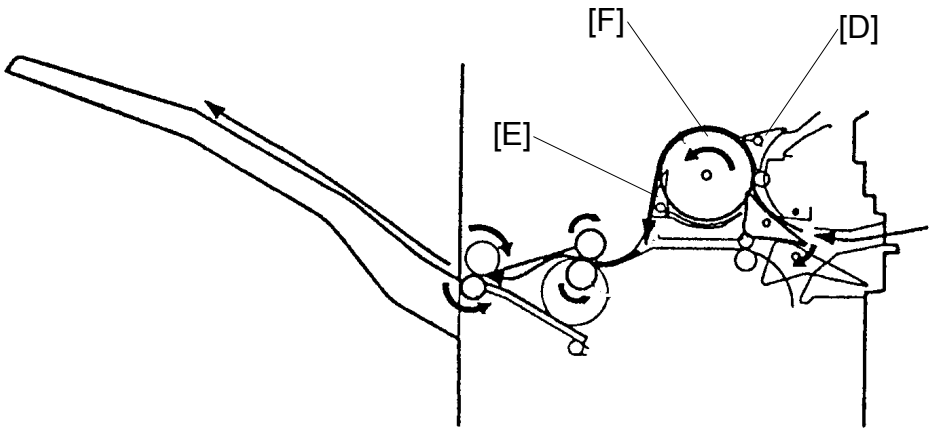
2.1.1 SHIFT TRAY MODE

A4/LT sideways or shorter



The booklet gate [A] and buffer roller entrance gate [B] are closed and the copy paper goes directly to the shift tray [C].

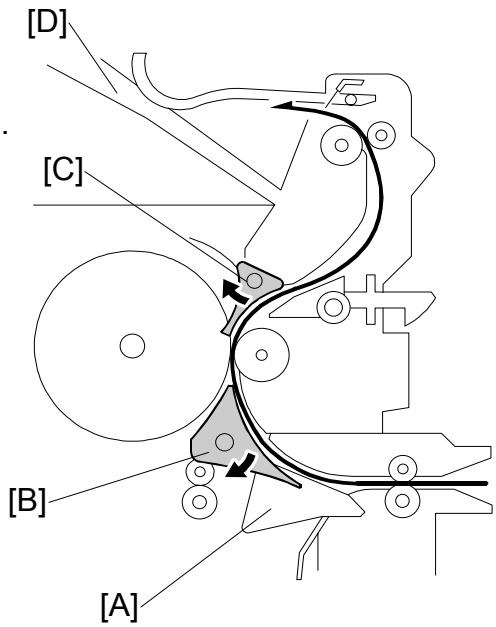
Longer than A4 sideways



The booklet gate, proof tray gate [D], and buffer roller exit gate [E] are closed, and the buffer roller entrance gate is opened. The copy paper passes through the buffer roller [F]. This paper path creates a distance between copies.

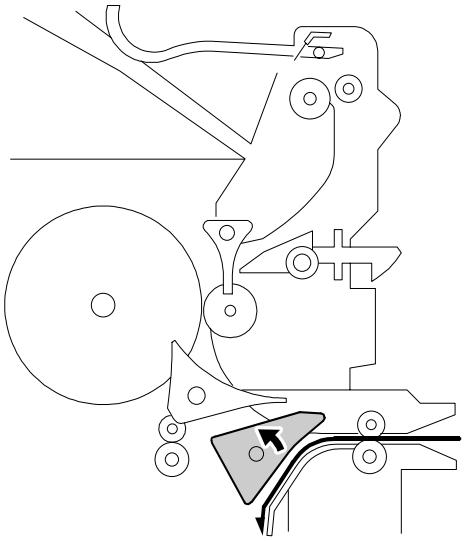
2.1.2 PROOF TRAY MODE

The booklet gate [A] is closed. The buffer roller entrance gate [B] and proof tray gate [C] are closed. The copy paper goes to the proof tray [D].



2.1.3 BOOKLET STITCH MODE

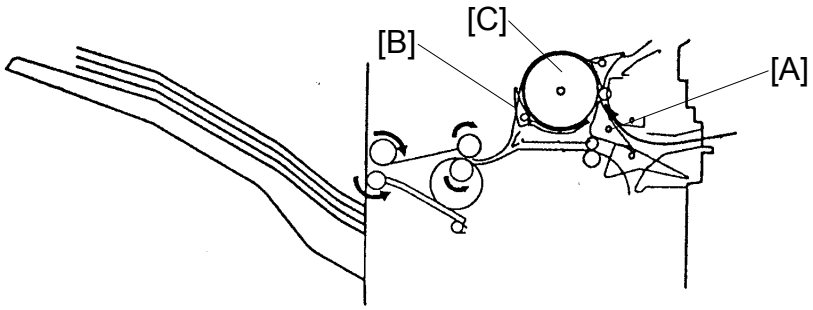
The booklet gate is opened and the copy paper goes to the booklet unit.



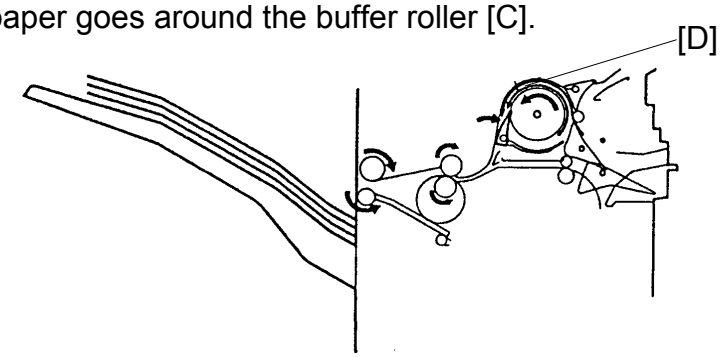
2.2 PRE-STACK MECHANISM

This mechanism improves productivity in staple mode and shift mode.

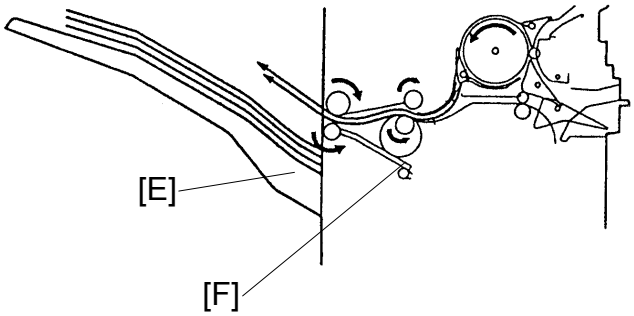
During stapling, the copier has to wait. This mechanism reduces the wait by holding the first two sheets of a job while the previous job is still being stapled. It only works during the second and subsequent sets of a multi-set copy job.



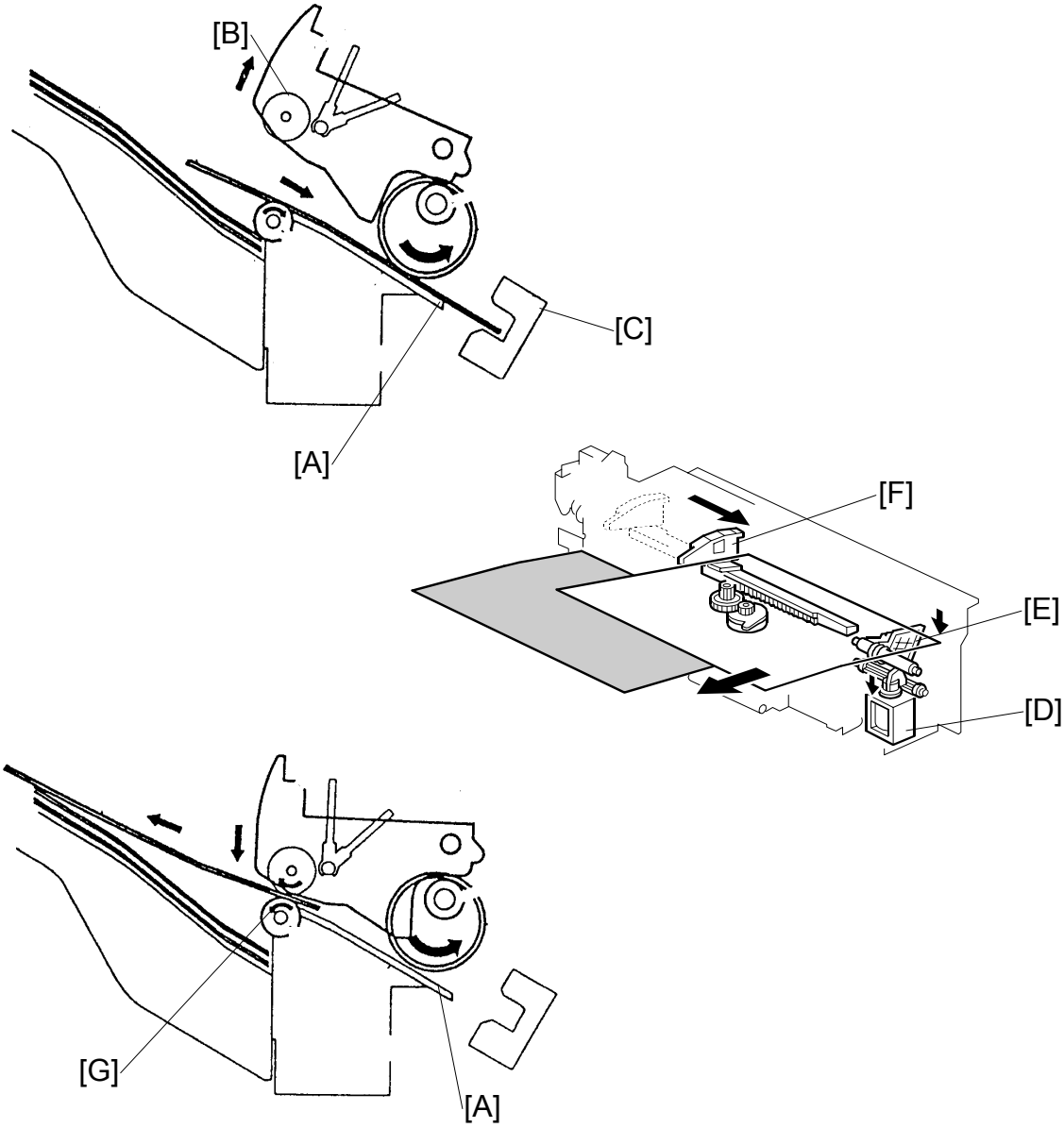
The buffer roller entrance gate [A] and buffer roller exit gate [B] are opened. Then, the 1st sheet of paper goes around the buffer roller [C].



When the 2nd copy [D] comes to the buffer roller, the buffer roller exit gate is closed. The two sheets of paper go to the shift tray [E] or staple tray [F].



2.3 PAPER SHIFT MECHANISM

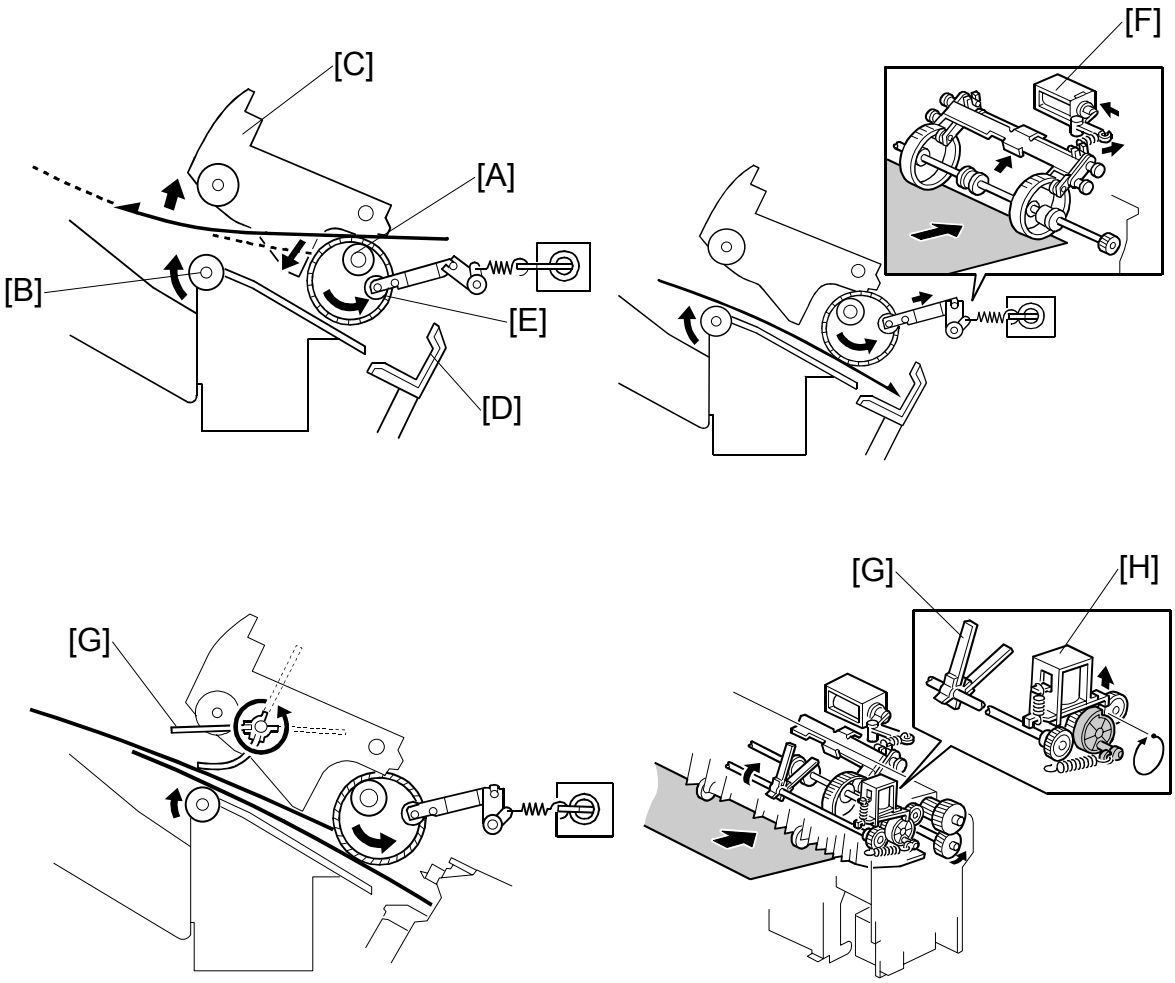


In sort and stack mode, only the 1st sheet of copy paper from the 2nd set is shifted to the front to separate each set of copies.

When the copy paper comes into the staple tray [A], the upper exit guide [B] (which contains the upper exit roller) opens. The paper switches back to the stopper [C]. Then the front guide release solenoid [D] turns on and the front guide [E] is released, the shift motor moves jogger fence [F] to the front, and the copy paper shifts to the front by 30 mm.

After copy paper has been shifted, the upper exit guide closes and the lower exit roller [G] turns in the opposite direction to feed out the copy paper.

2.4 PAPER POSITIONING MECHANISM



When the trailing edge of the 1st copy paper passes the 2nd transport roller [A], the lower exit roller [B] stops and turns reverse. At the same time, the upper guide plate motor turns on and opens the upper exit guide [C]. The copy paper is sent to the stopper [D] by the lower exit roller and feed belt [E], and it is aligned then by jogger motor.

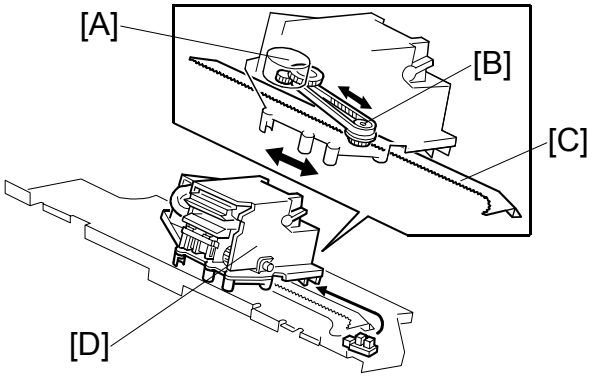
The feed belt solenoid [F] turns on to move the feed belt to the stopper. This function prevents excessive buckling of the paper between belt and stopper.

The paddles [G] send the paper to the stopper starting from the 2nd copy paper. When the trailing edge of the 2nd copy paper passes the 2nd transport roller, the paddle solenoid [H] turns on and the drive from the transport roller transmits to the paddle shaft.

2.5 STAPLER UNIT MOVEMENT MECHANISM

2.5.1 DRIVE

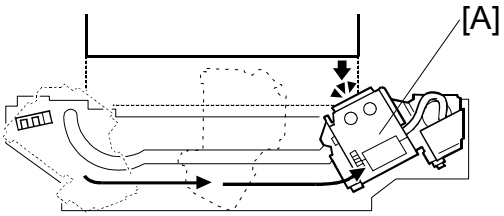
The stapler motor [A] drives the stapler unit drive gear [B] via a timing belt. The stapler unit guide has a rack gear [C]. The stapler unit moves along the rack gear via the stapler unit [D] drive gear.

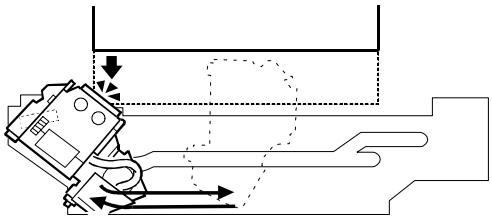


2.5.2 MOVEMENT

Front and Rear Stapling

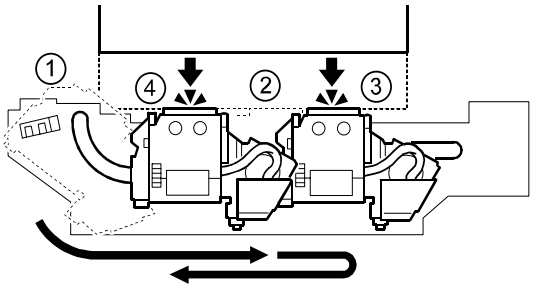
When the print key is pressed, the stapler unit moves to the center. The stapler unit moves to the front (or rear) stapling position when the copy paper comes into the finisher and stays until the copy job finishes. It returns to home position when the job is finished.



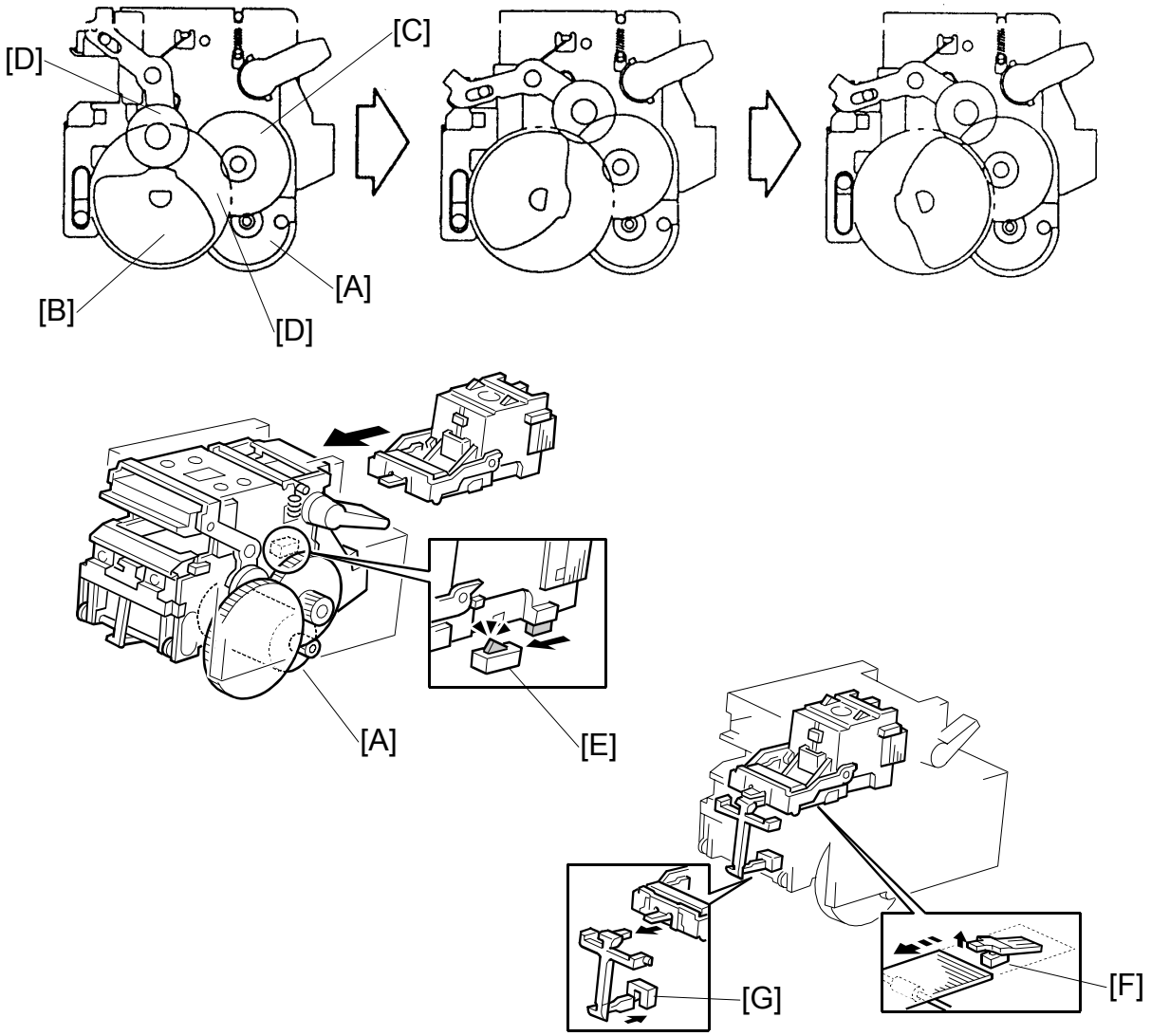


Tow-position Stapling

When the print key is pressed, the stapler unit moves to the center. The stapler unit moves to the rear stapling position first and moves to the front stapling position when stapling. Then it goes back to the center until the copy job finishes. It returns to home position when the job is finished.



2.6 STAPLER

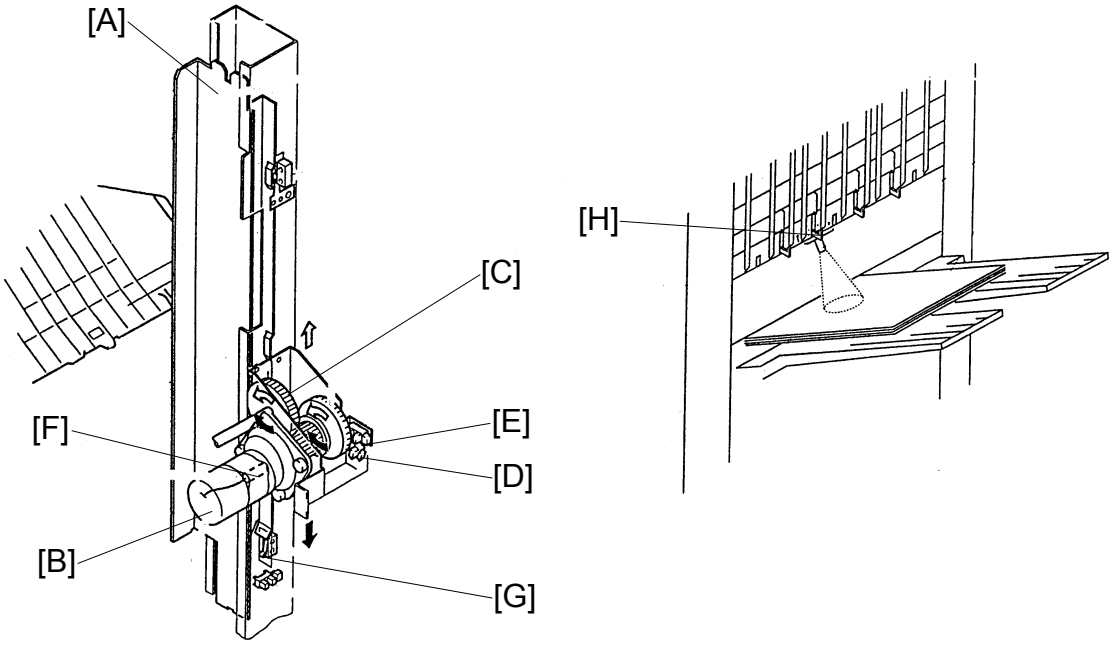


The staple hammer motor [A] drives the cam [B] via 2 gears [C, D] and the guide roller on the staple hammer moves on the cam [D] . When the guide roller moves to the highest position on the cam, the copy paper is stapled.

The stapler unit contains the cartridge set switch [E], staple end switch [F] and staple position sensor [G].

The staple position sensor detects whether the staple sheet has come to the staple unit or not.

2.7 SHIFT TRAY MECHANISM



The guide gear [A] on which the shift tray is mounted is driven by the lift motor [B] via gear [C].

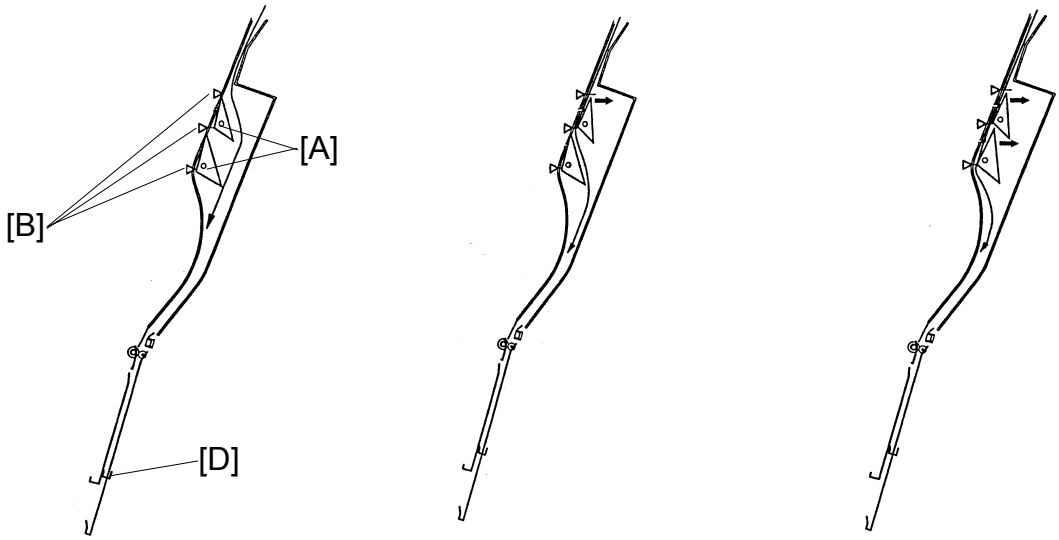
The finisher board detects the direction of the motor rotation and motor position using the lift motor sensors 1 [D] and 2 [E].

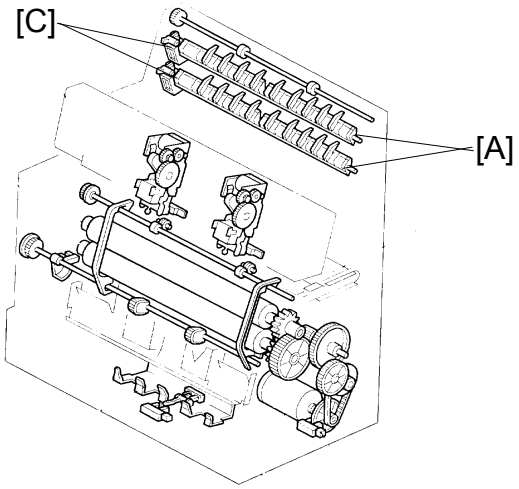
The lift motor contains a thermoswitch [F]. When it detects 73.5º C, the finisher board stops the lift motor until its temperature reaches approximately 40º C.

The shutter position switch [G] cuts the lift motor power for safety when the upper exit guide plate opens.

The shift tray height sensor [H] detects the distance between the sensor and the top of the copy paper on the shift tray.

2.8 BOOKLET UNIT GATE MECHANISM





There are two junction gates [A] and three paper sensors [B] at the entrance area of the booklet unit.

Depending on paper size, the appropriate gate solenoid(s) [C] are energized to close the gate(s) in order to transport paper to the positioning plate [D] through a suitable paper path.

This is done for the following reasons:

- To detect the trailing edge of paper with the correct sensor.
- To prevent the leading edge of the next sheet from hitting the trailing edge of the previous sheets on the positioning plate.

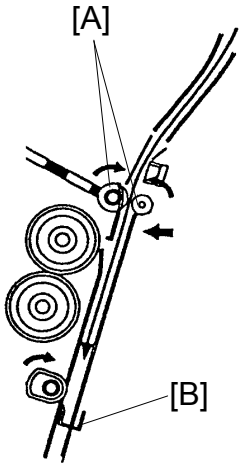
The following tables show the relation between paper sizes and solenoids/sensors:

	A3, 11" x 17"	**B4, 11" x 14"**	**A4, 8 1/2" x 11"**
1st Solenoid (Gate)	OFF (Opened)	ON (Closed)	ON (Closed)
2nd Solenoid (Gate)	OFF (Opened)	OFF (Opened)	ON (Closed)

	A3, 11" x 17"	**B4, 11" x 14"**	**A4, 8 1/2" x 11"**
Trailing Edge Sensor 1	ON	ON	ON
Trailing Edge Sensor 2	OFF	ON	ON
Trailing Edge Sensor 3	OFF	OFF	ON

2.9 RELAY ROLLER AND POSITIONING PLATE MECHANISM

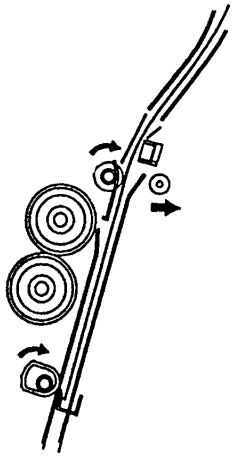
When the first sheet of paper comes to the booklet unit, the booklet transport motor turns on to drive the relay roller [A]. The two relay rollers are out of contact with each other before the paper comes. When the leading edge of the paper passes trailing edge sensor 1, the relay roller solenoid is energized to make the two relay rollers contact each other to transport the paper to the positioning plate [B]. When the trailing edge of the paper passes to the trailing edge sensor, the relay roller solenoid is de-energized. This solenoid on/off cycle is done for each sheet of paper.

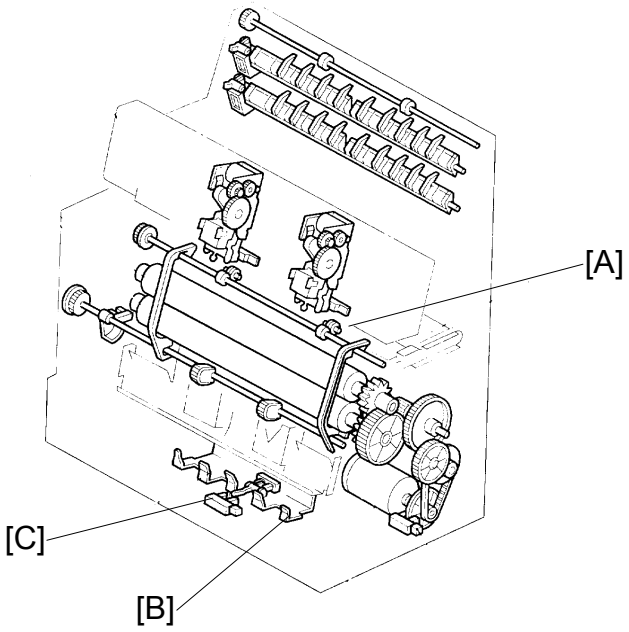


Before paper comes, the positioning plate moves up from the home position to a position that is suitable for the selected paper size in order that the middle of the paper just comes to the stapling position.

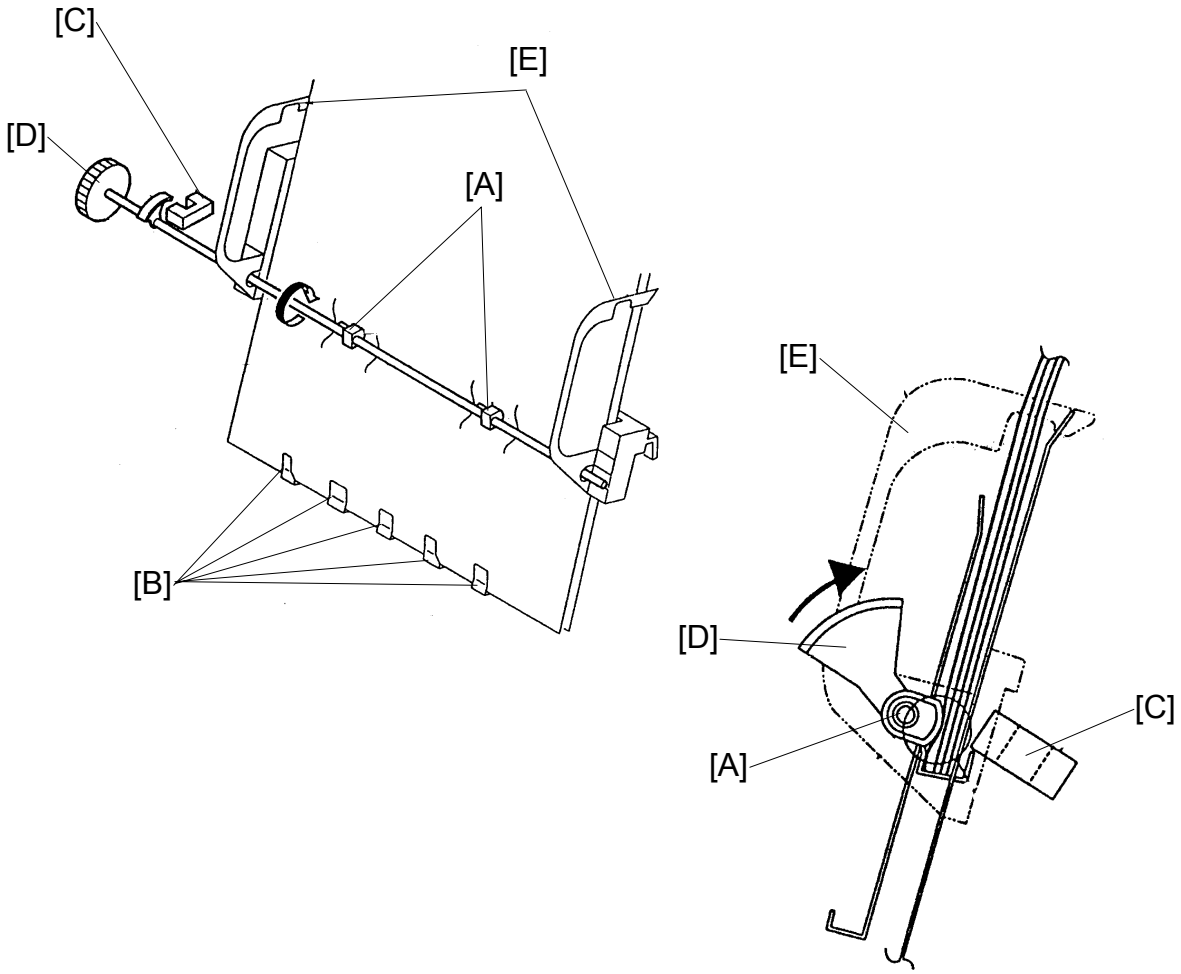
The positioning plate motor drives the positioning plate using pulse counts.

Only when the first sheet of paper reaches the positioning plate, the positioning plate sensor [C] detects the paper.





2.10 POSITIONING ROLLER MECHANISM

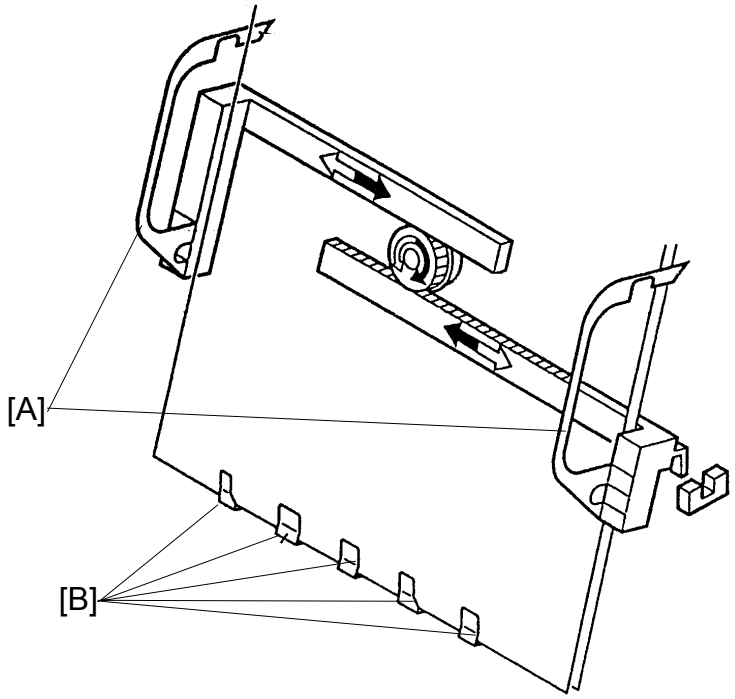


The booklet transport motor also drives the positioning roller [A] to vertically align paper against the positioning plate [B].

The positioning roller is not round but elliptical in shape so that it moves away from the paper while the paper is being horizontally aligned.

The positioning roller sensor [C] detects the actuator [D] on the roller shaft to determine the rotation of the positioning roller. When the sensor is de-actuated, the roller is away from the paper and the jogger fences [E] start moving.

2.11 BOOKLET UNIT JOGGER MOVEMENT MECHANISM

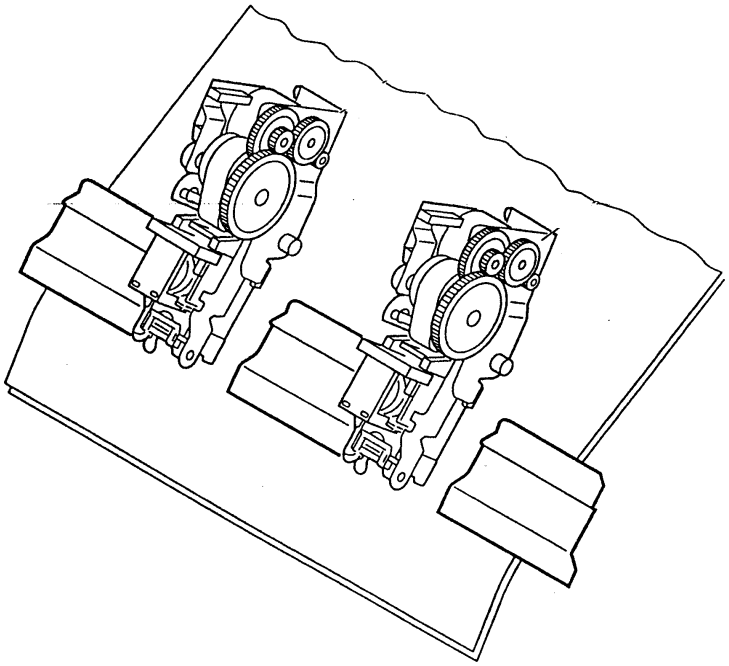


When the start key is pressed, the booklet jogger motor turns on to move the jogger fences [A] to the waiting positions that are 10 mm from each of the paper side edges.

Each time a sheet of paper reaches the positioning plate [B], the jogger fences move toward the paper to align the paper once. The fences move back a short distance and move forward again the paper to align for the second time. Then, the fences go back to the waiting position.

When the last sheet is aligned, the fences stay at the aligning positions during stapling.

2.12 BOOKLET STAPLER UNIT



There are two staplers whose positions are fixed.

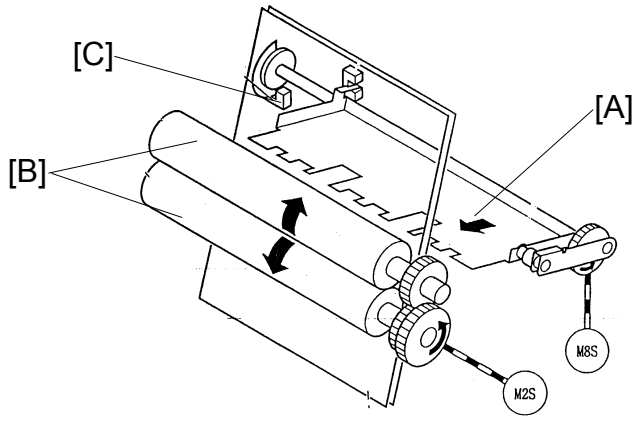
When the jogger fences finish aligning the last sheet, the jogger fences stay at the aligning positions and stapling starts. The two staplers do not operate at the same time, the rear stapler operates first, then the front one. This is for the following reasons:

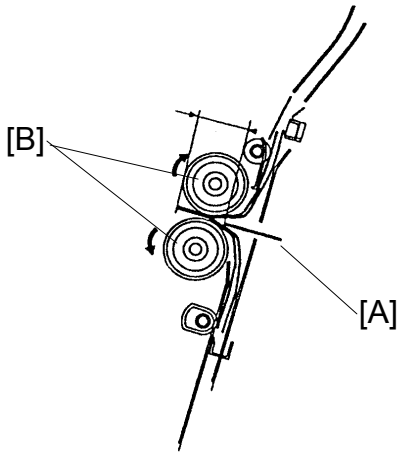
- To prevent paper from becoming waved in the area between the two stapled positions.
- To minimize necessary electric power.

The staple hammer HP switch in each stapler detects a stapling cycle and the staple end sensor detects the presence of staples in the cartridge.

The stapler unit, including the two staplers, can be pulled out to enable staple cartridge replacement or jam removal. The stapler unit set sensor detects when the stapler unit is back in the right position.

2.13 PAPER FOLDER MECHANISM





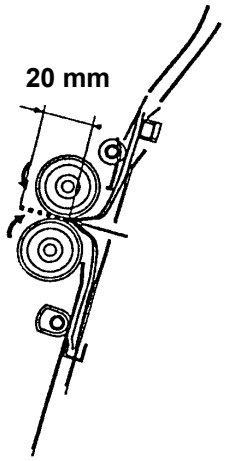


Figure 2.13A

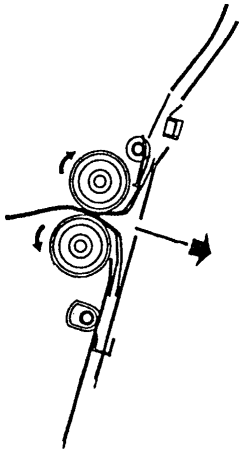


Figure 2.13B

The positioning plate moves down from the stapling position to a position such that the middle of the paper just comes to the folding position. It depends on the paper size.

At the same time, the shutter guide motor moves the shutter guide, which is covering the folder rollers to prevent paper arriving at the positioning plate from being caught by the rollers, down to the home position.

Shortly after that, the folder plate motor and the folder roller motor start rotating. The folder plate [A] moves to push the middle of the stapled sheets of paper toward the folder rollers [B] until the folder plate return sensor [C] is de-actuated. Then, the folder plate comes back to the home position.

After that, the folder rollers and booklet exit roller feed the paper to the booklet tray.

In the case of 10 sheets or more of A4 or 8 1/2" x 11" paper, folding is done twice for 20 mm of the leading edge to fold the paper more firmly.

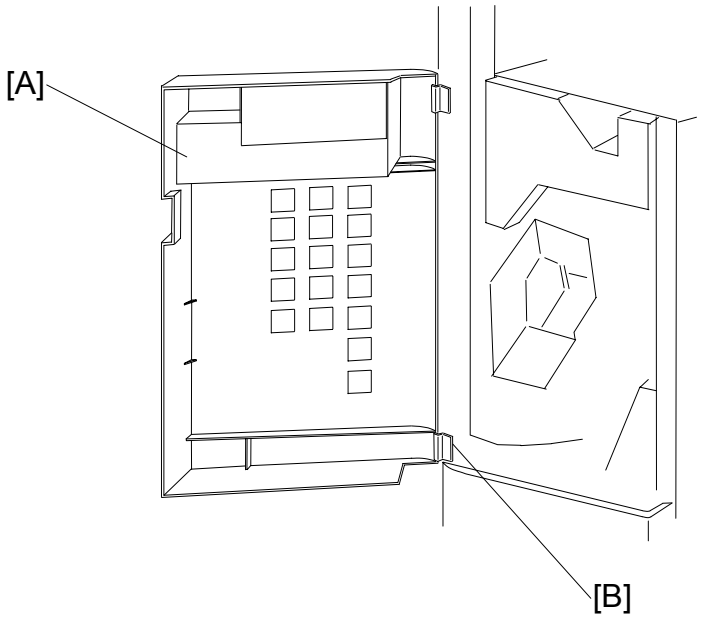
When the leading edge of the folded paper passes 20 mm from the folder rollers, the folder roller motor reverses to feed the paper back 20 mm. During this action, the folder plate stays at the return position. (Figure 2.13A)

Then, the folder roller motor rotates forward again to feed the set of papers out and the folder plate goes back to the home position. (Figure 2.13B)

3. REPLACEMENT AND ADJUSTMENT

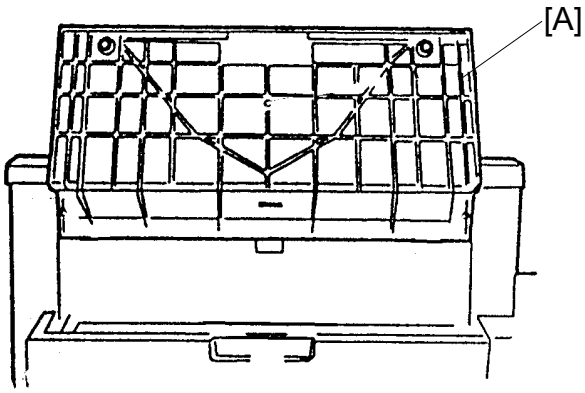
3.1 REMOVAL

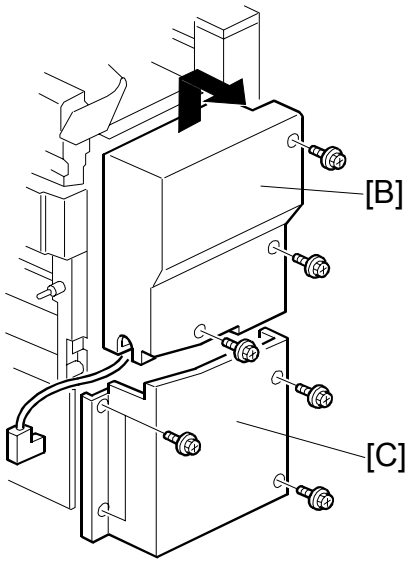
3.1.1 UPPER DOOR



1. Open the upper door [A].
2. Remove the lower hinge [B] (x1).
3. Push up the upper door and remove it.

3.1.2 UPPER REAR COVER



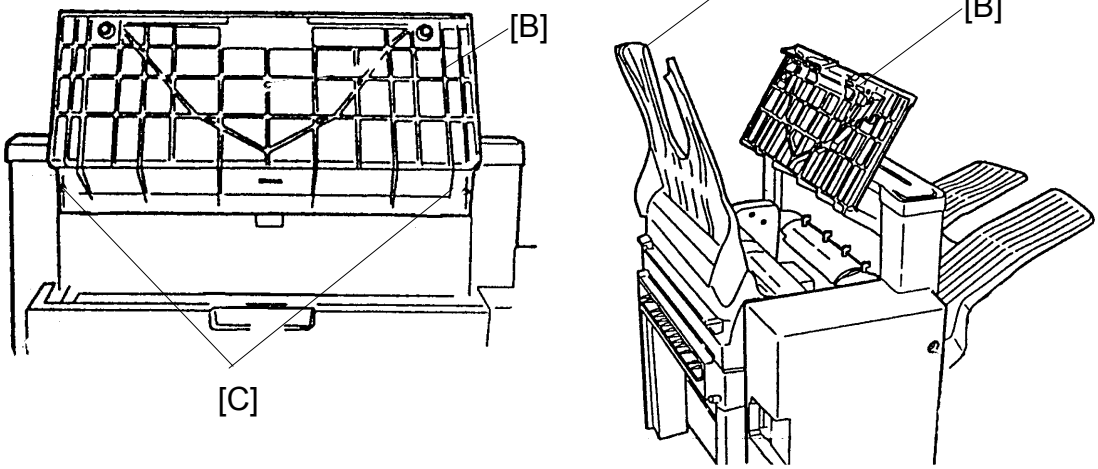


1. Hold up the proof tray and open the top cover [A].
2. Unhook the upper rear cover [B] and remove it (x3).

3.1.3 LOWER REAR COVER

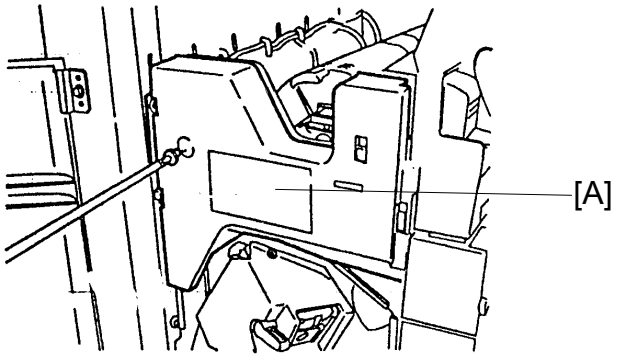
1. Remove the lower rear cover [C] (x4).

3.1.4 TOP COVER



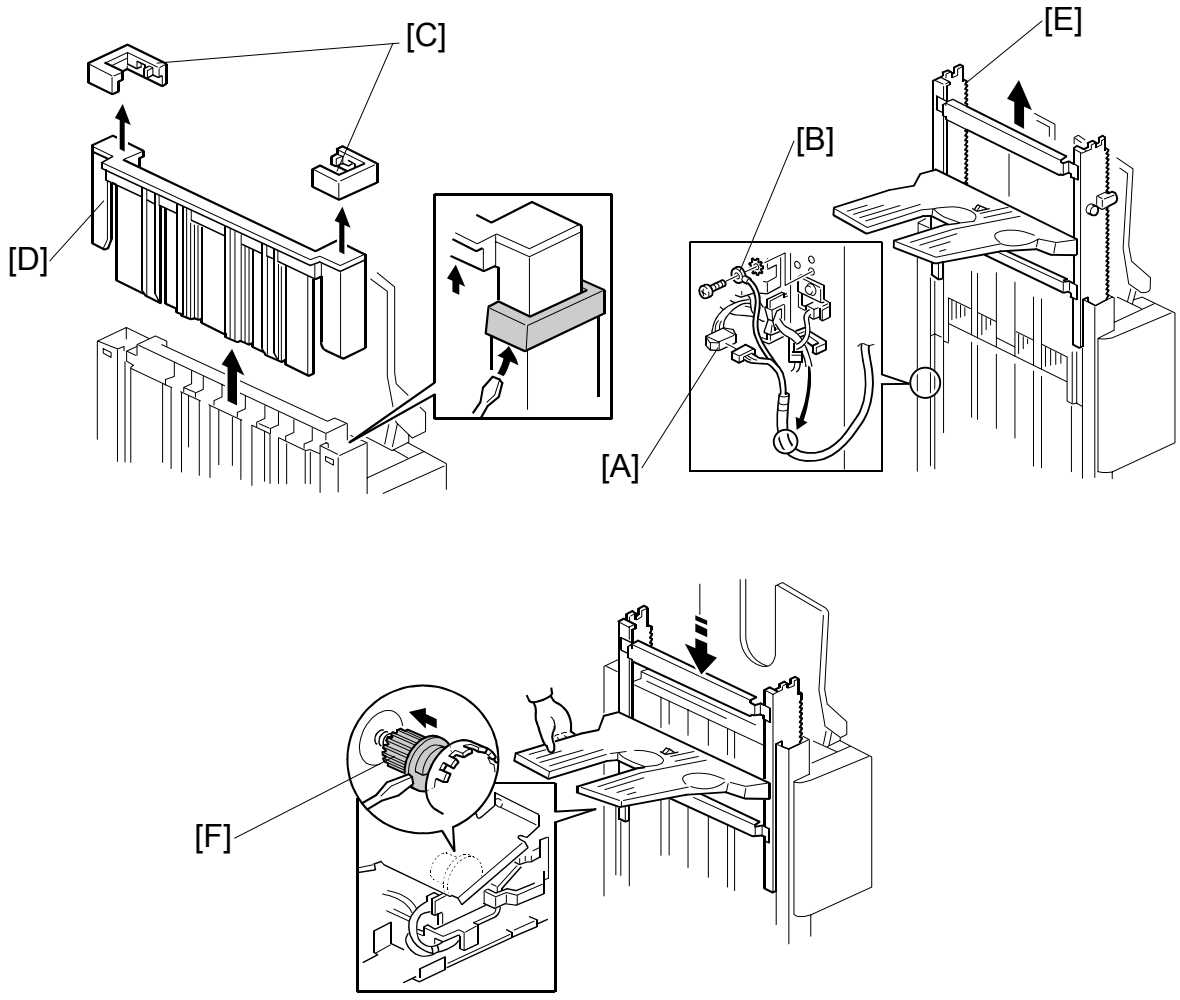
1. Hold up the upper tray [A] and open the top cover [B].
2. Push the hooks [C] of the top cover and remove it.

3.1.5 UPPER INNER COVER



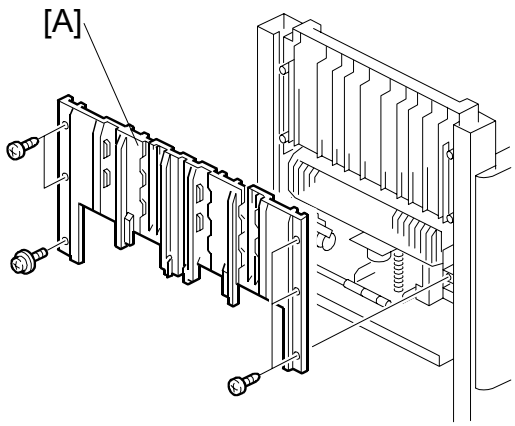
1. Open the upper door.
2. Remove the upper inner cover [A] (x 1).

3.1.6 SHIFT TRAY UNIT



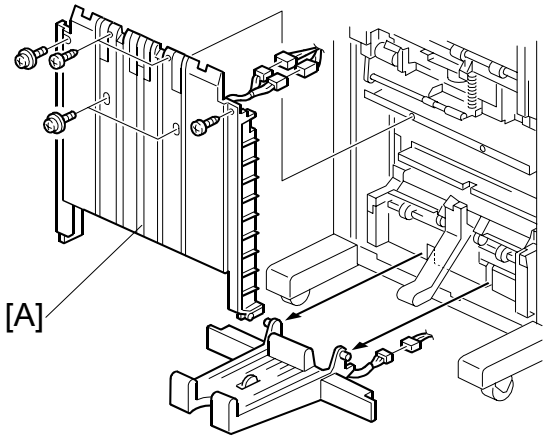
1. Remove the upper and lower rear covers.
2. Disconnect the connector [A] and remove the grounding wire [B] (x 1).
3. Unhook the two stoppers [C] and remove them.
4. Remove the slide guide [D] by pulling it up.
5. Remove the shift tray unit [E] by pulling it up.
   NOTE: When reinstalling the shift tray unit, release the clutch gear [F] of the tray lift motor by carefully inserting a screwdriver.

3.1.7 UPPER SHIFT GUIDE



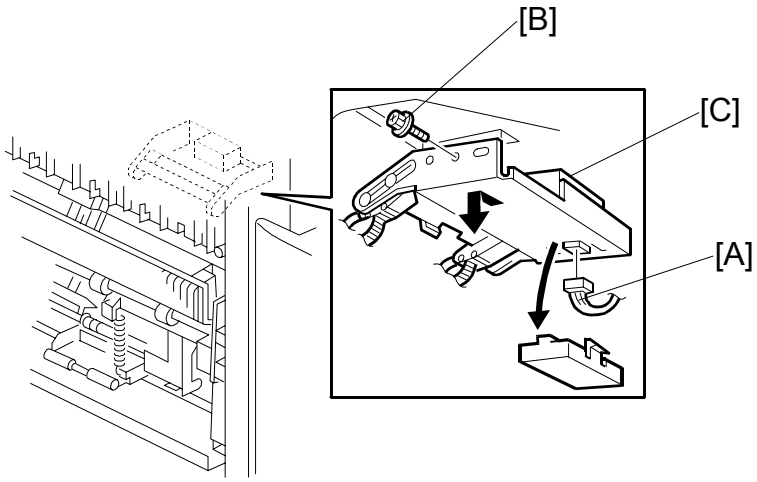
1. Remove the slide guide and shift the shift tray unit down by releasing the clutch gear of the tray lift motor (see Shift Tray Unit Removal).
2. Remove the upper shift guide [A] (x 6 (5 x M4, 1 x M3)).

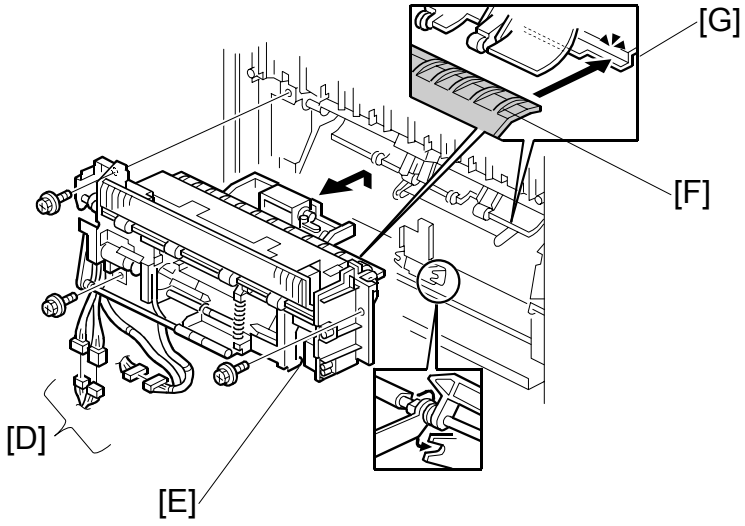
3.1.8 LOWER SHIFT GUIDE



1. Remove the shift tray unit.
2. Remove the lower shift guide [A] (x 2, x 6 (3 x M4, 3 x M3)).

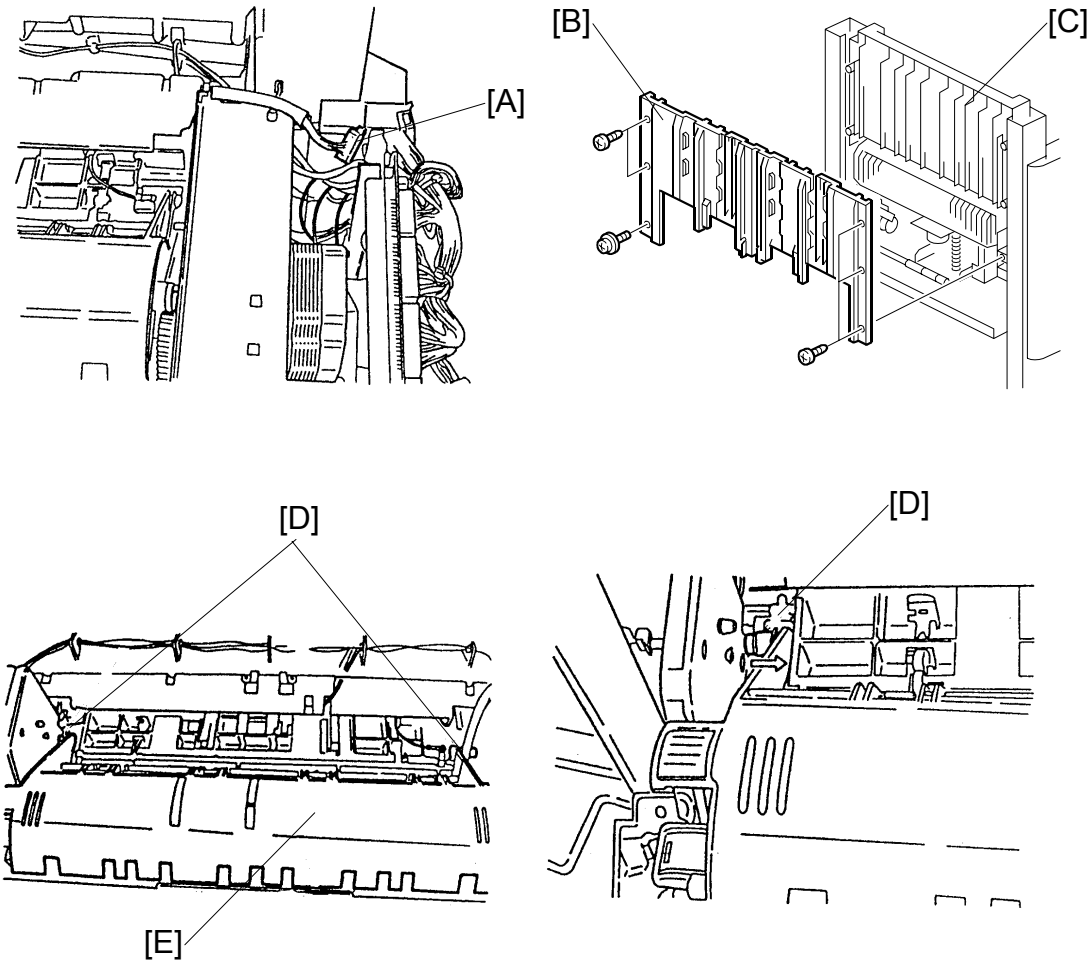
3.1.9 EXIT UNIT





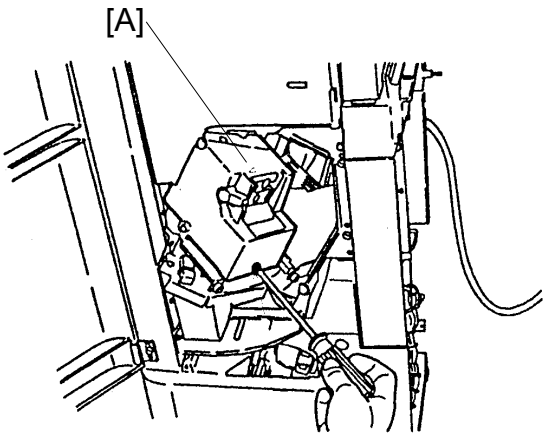
1. Remove the shift tray unit, and the upper and lower shift guides.
2. Disconnect the connector [A] and remove the screw [B] that secures the transport belt unit [C].
3. Disconnect [D] (x4).
4. Hold up the exit unit [E] and remove it with the transport belt unit (x 3, 1 clamp).
   NOTE: When installing the exit unit, make sure to position the exit unit guide plate (black) [F] over the transport guide plate [G].

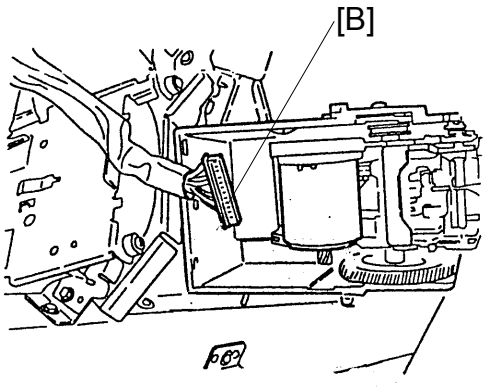
3.1.10 BUFFER ROLLER UNIT

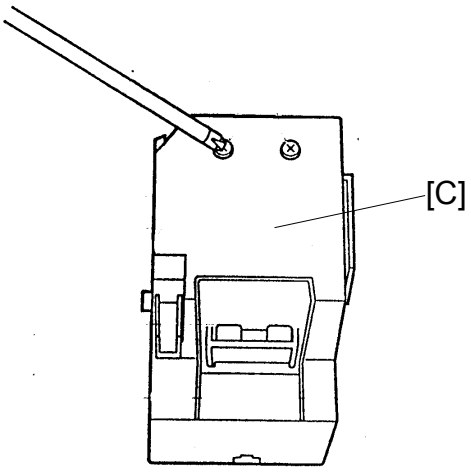


1. Remove the upper rear cover and the top cover.
2. Disconnect the connector [A].
3. Remove the upper shift guide [B] (☞ x 6) and the guide holder [C] (☞ x 2).
4. Unhook the shafts [D], and remove the buffer roller unit [E] (2 clamps).

3.1.11 STAPLER

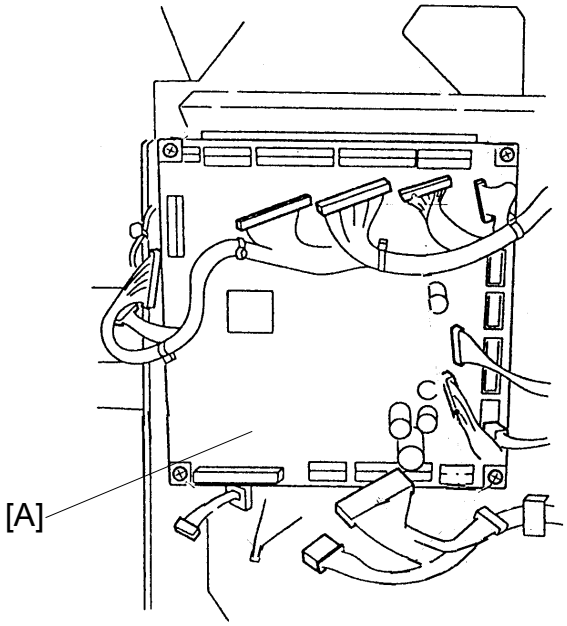






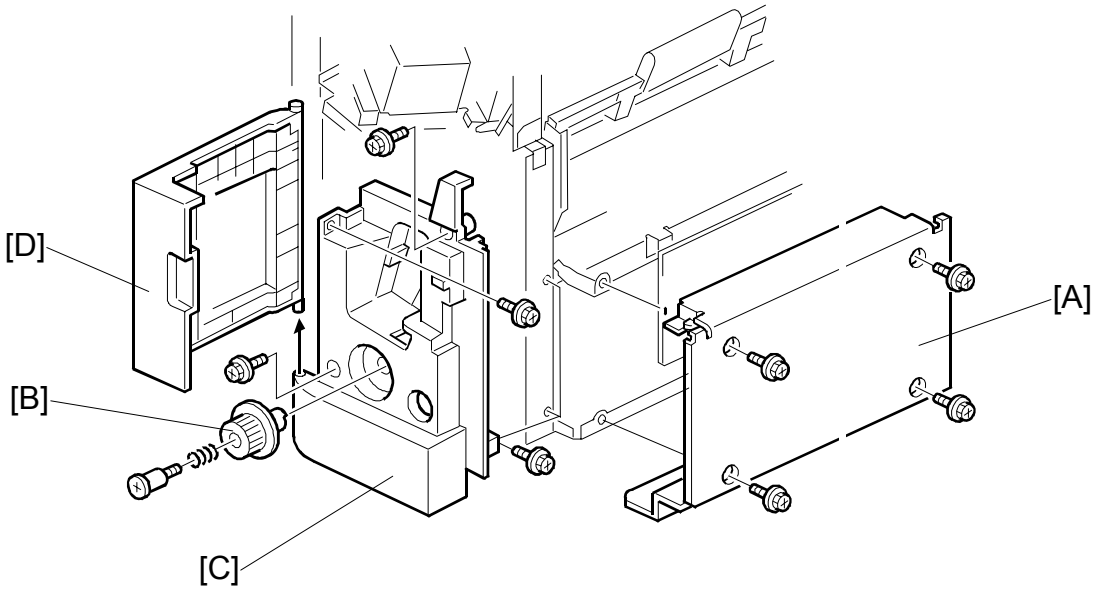
1. Open the upper front door.
2. Slide the stapler [A] towards the front.
3. Remove the stapler (x 1, x 1 [B]).
4. Remove the cover [C] from the stapler (x 2).

3.1.12 FINISHER BOARD

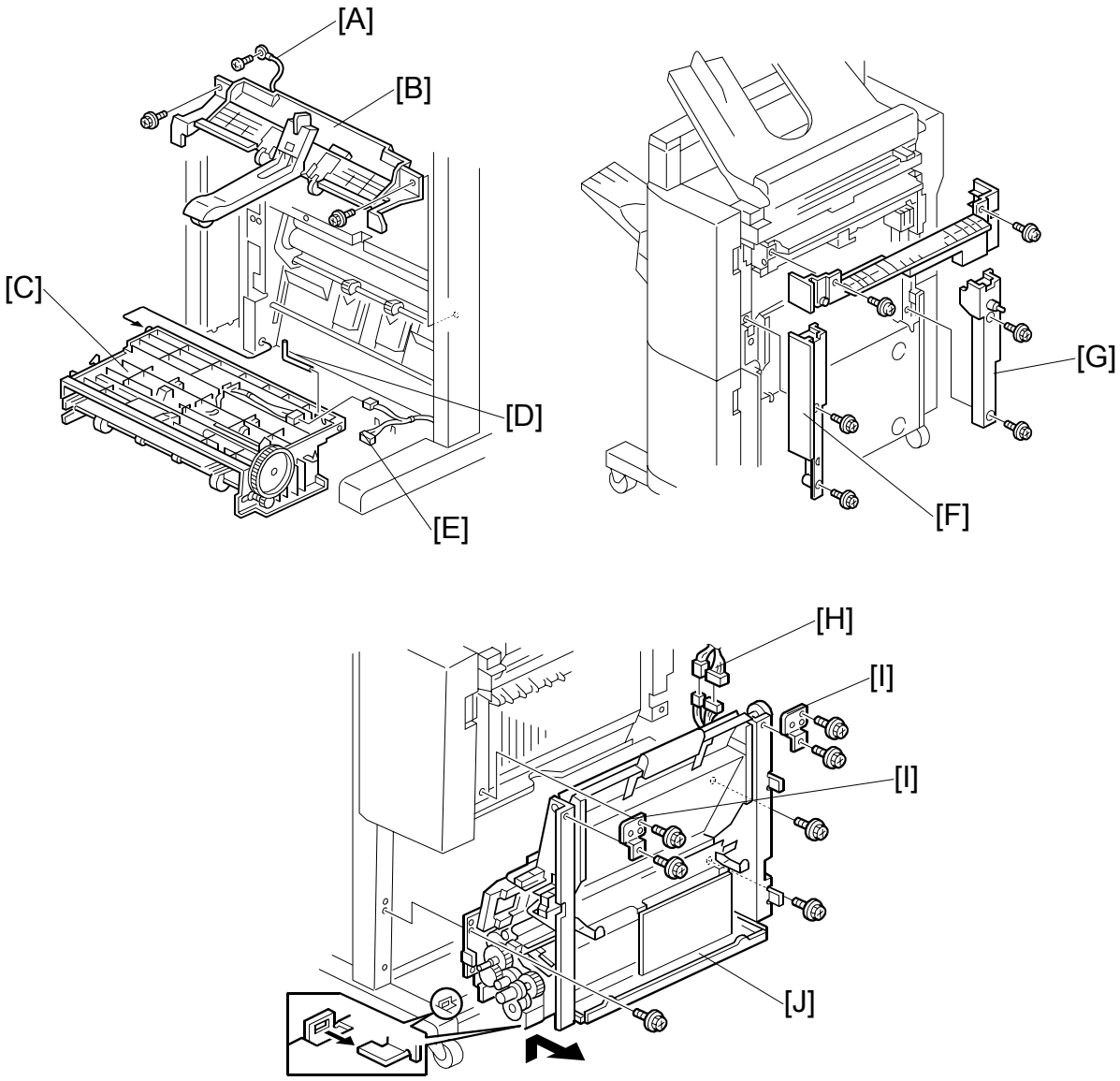


1. Remove the upper rear cover.
2. Remove the finisher board [A] (x 4, x 19).
3. Do the following adjustments after replacing the board:
   - Shift tray height
   - Jogger fence position
   - Stapling position
4. If you need to release the setting for the maximum number of stacks allowed on the shift tray in the staple mode, set DIP S3 No.5 to ON.

3.1.13 BOOKLET UNIT

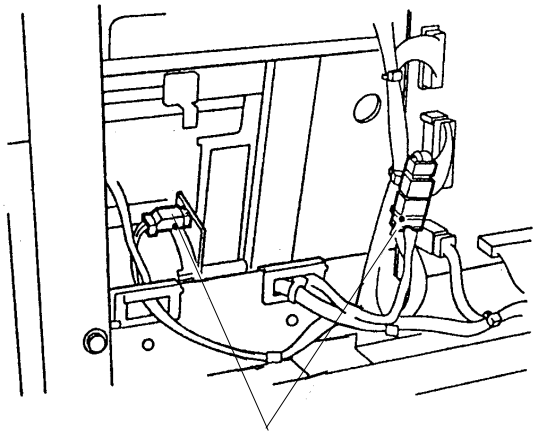


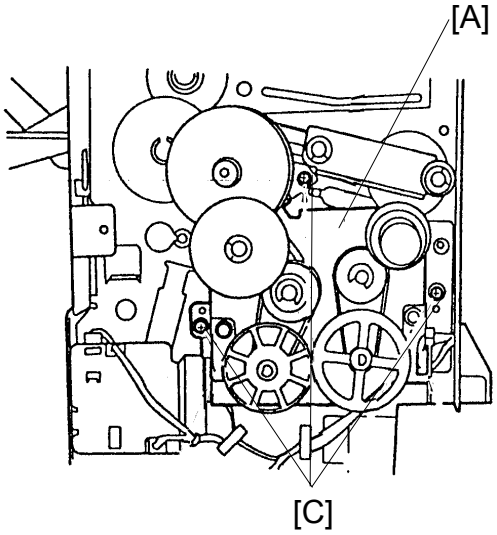
1. Remove the following items.
   - Upper and lower rear covers.
   - Shift tray unit.
   - Lower shift guide.
2. Remove the lower right cover [A] (x 4).
3. Remove the folder roller knob [B] (x 1 stepped).
4. Remove the lower inner cover [C] and lower door [D] (x 5).

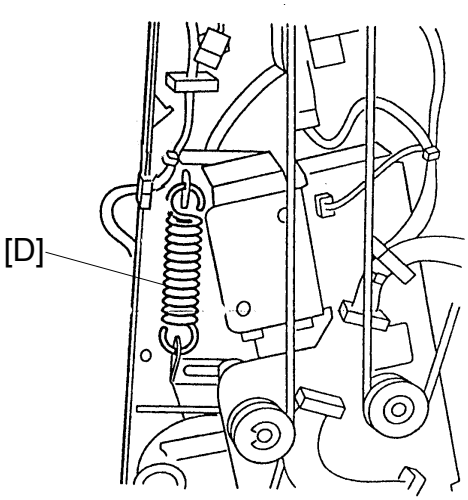


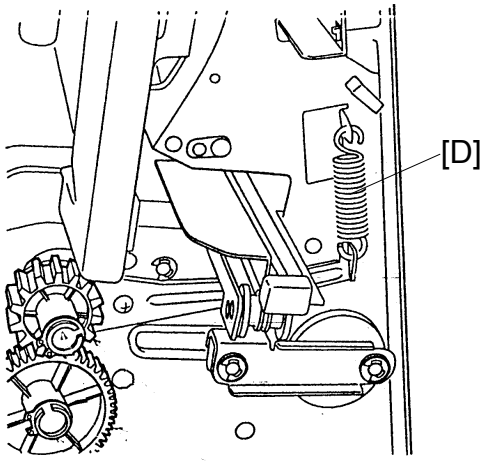
5. Remove the grounding wire [A] (☞ x 1) and upper booklet exit guide [B] (☞ x 2).
6. Open the lower booklet exit guide [C] and remove it (1 L-pin [D], ☞ x 2 [E]).
7. Remove the right front and right rear covers [F, G] (☞ x 2 ea.).
8. Disconnect the two connectors [H].
9. Remove the two joints [I] and then pull out the booklet unit [J] from the right side (☞ x 3).

3.1.14 FOLDER ROLLERS

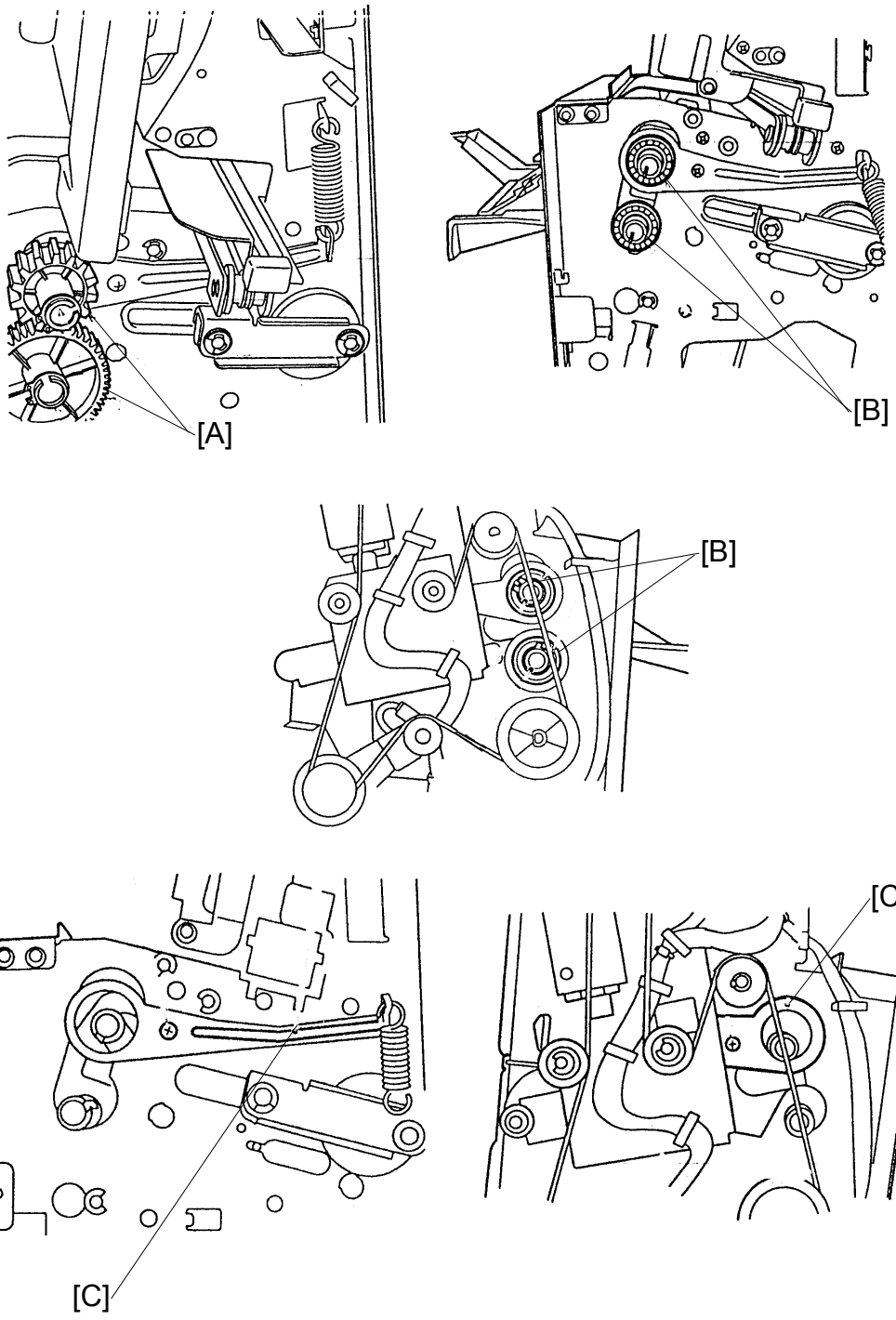




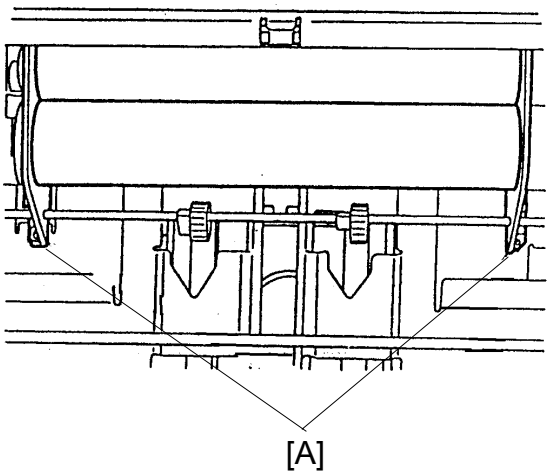


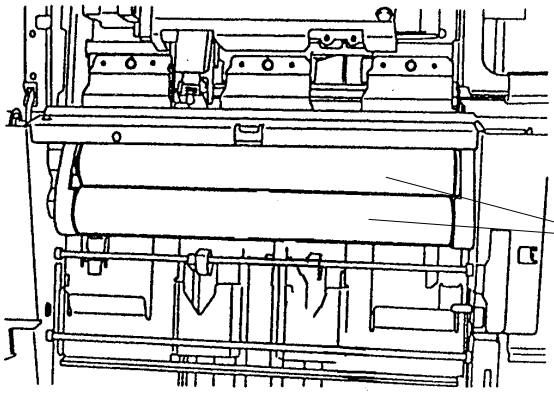


1. Remove the booklet unit
2. Remove the drive unit [A] (x 4) [B], (x 3), [C]).
3. Remove the front and rear tension springs [D].



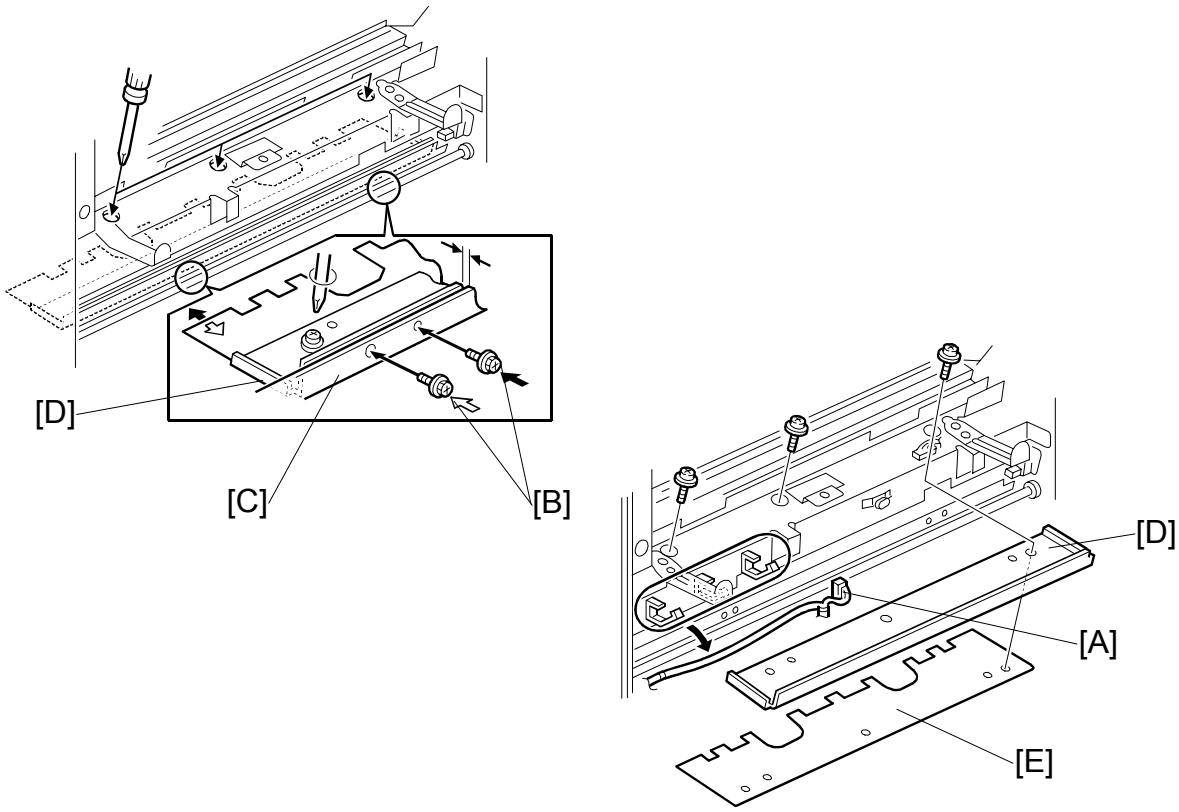
4. Remove the gears [A] and ball bearings [B] (4 C-rings).
5. Remove the front and rear tighteners [C] (🔩 x 1 stepped ea.).





6. Remove the jogger plates [A] (🔩 x 1 ea.).
7. Slide the folder rollers [B] to the front and remove them.

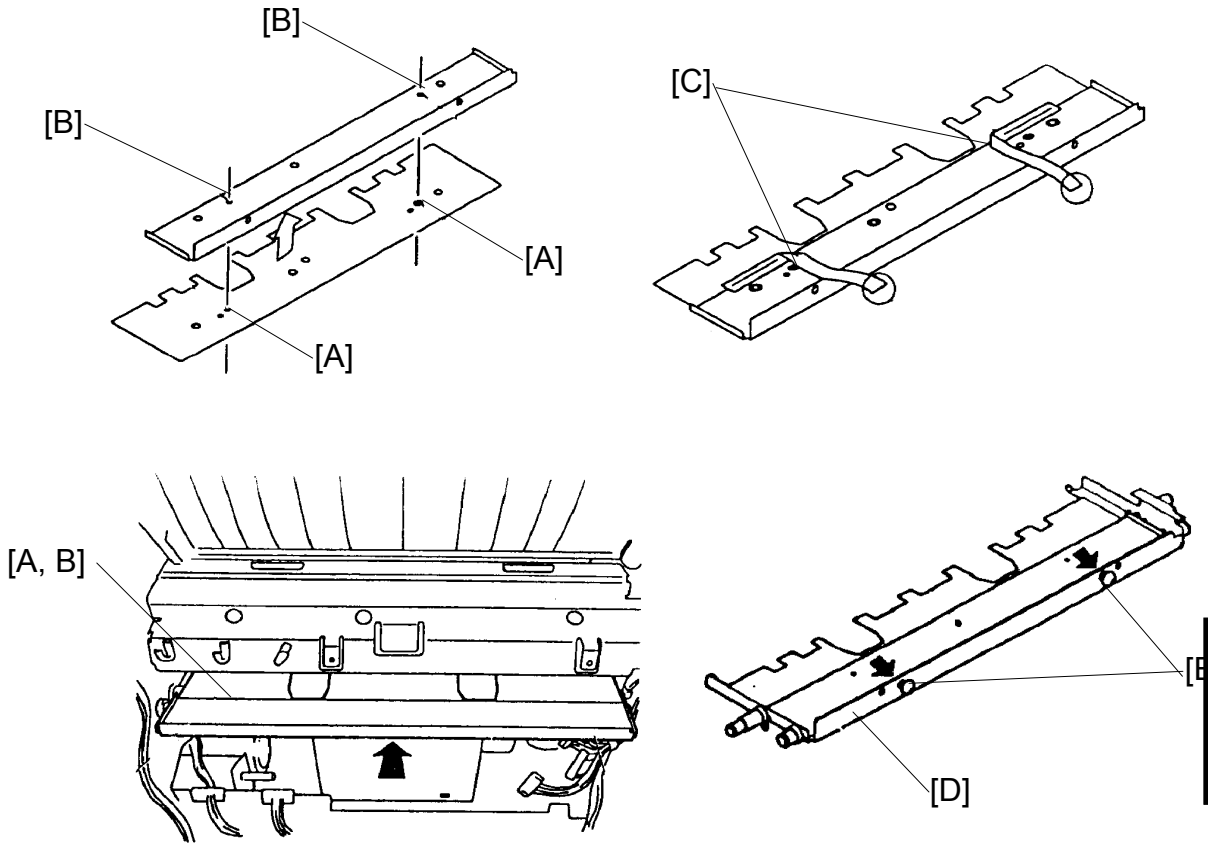
3.1.15 FOLDER PLATE



Removal

1. Remove the following items
   - Lower right cover (see “Booklet Unit Removal”)
   - Folder roller knob (see “Booklet Unit Removal”)
   - Lower door and lower inner cover (see “Booklet Unit Removal”)
   - Booklet board
2. Release the harness [A] from the clamps.
3. Insert two positioning screws [B] in the holes provided in the folder table [C].
4. Tighten the screws until the ends touch the securing plate [D] for the folder plate.
5. Remove the folder plate [E] and the securing plate (x 3).

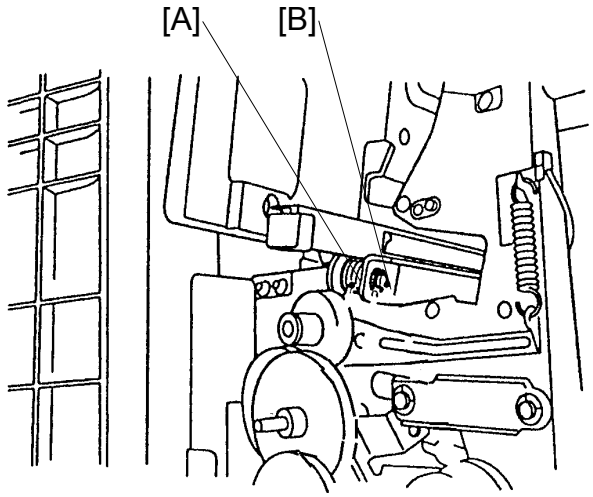
Reinstalling

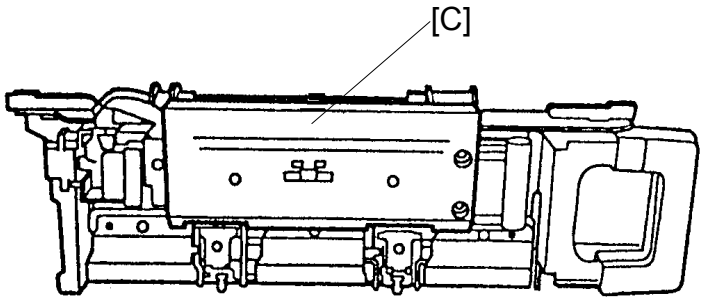


1. Line up the two small holes [A] in the folder plate with the two small protrusions on the bottom of the securing plate [B]. Then, push the two protrusions through the holes.
   Note: Be sure that the three screw holes are also lined up.
2. Temporarily fix the two plates together by attaching two strips of electrical tape [C] along the line where they meet (see the illustration).
   NOTE: 1) Be sure to fold the two strips back toward you so that they can easily be removed.
   2) Be careful not to attach the tape too close to the three screw holes.
3. Reattach the two plates [A, B] to the folder table [D] (🔩 x 3).
   NOTE: Tighten these three screws while holding the securing plate against the two positioning screws [E] that were installed in step 3 of the "Removal" procedure.
4. Remove the two strips of tape.

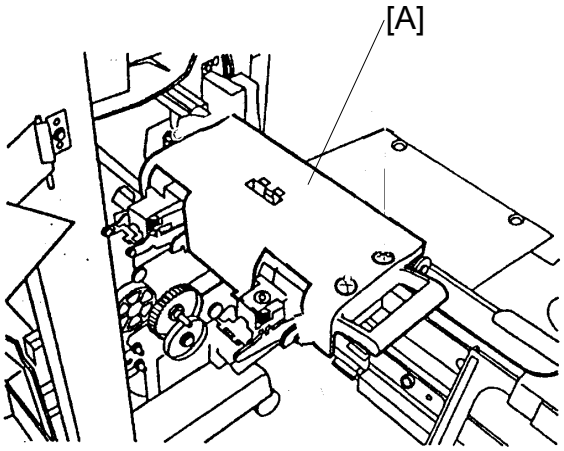
3.1.16 BOOKLET STAPLER UNIT

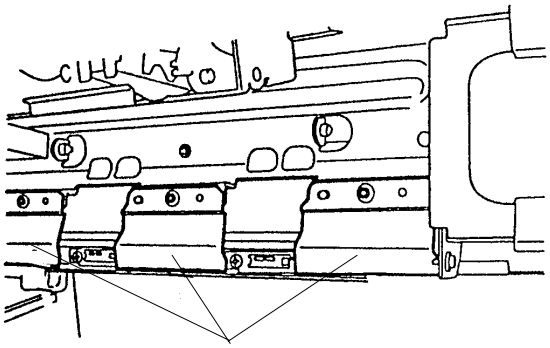
Removal

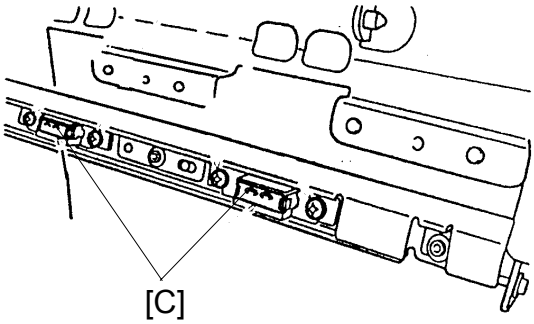




1. Remove the lower door and inner cover (see “Booklet Unit Removal”).
2. Remove the guide roller [A] and shaft [B] (1 E-ring).
3. Pull out the booklet stapler unit [C].

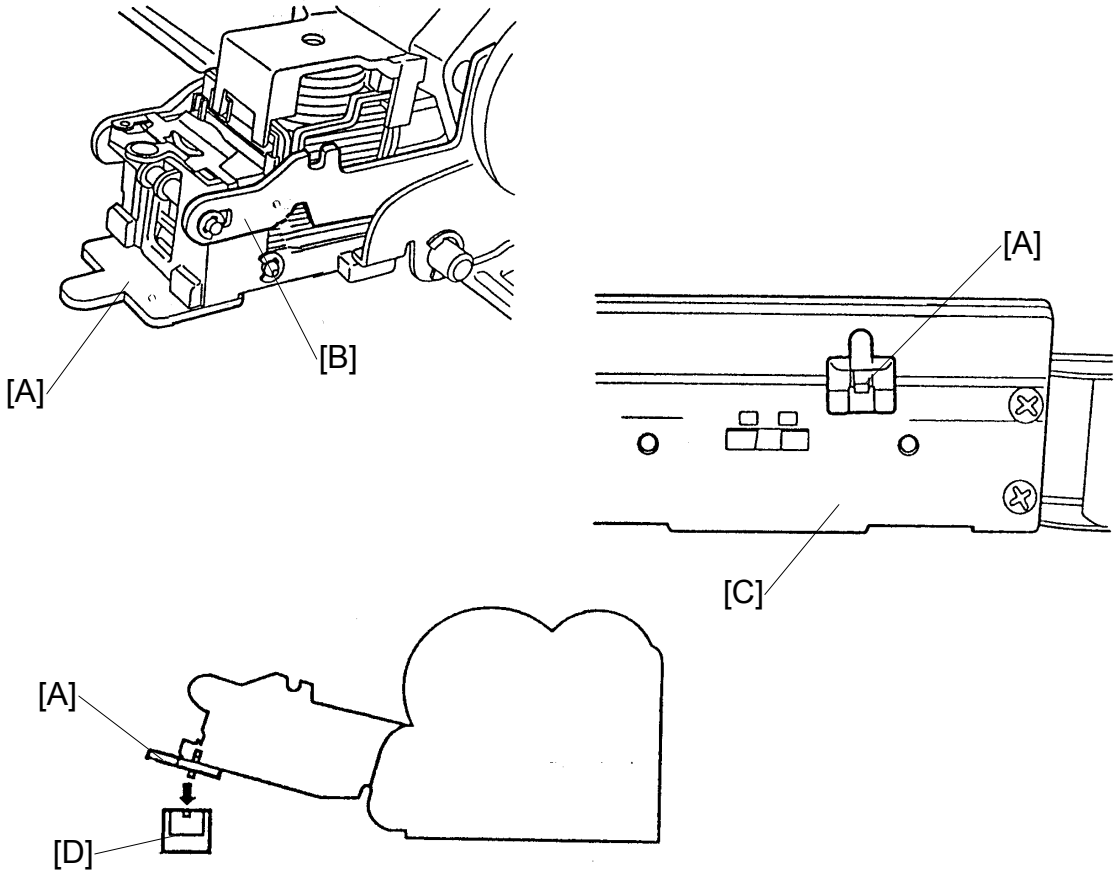






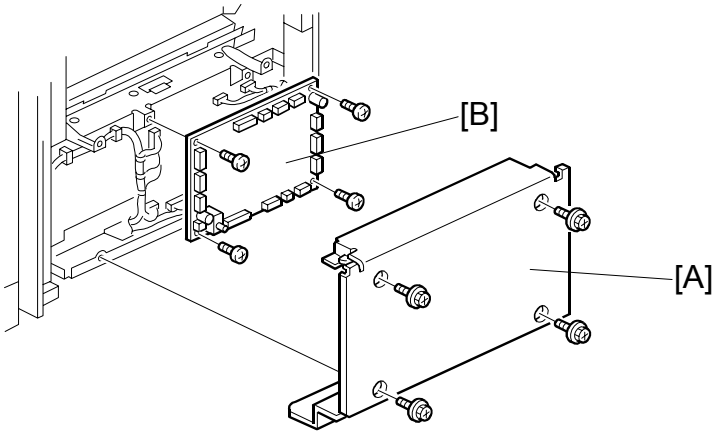
Adjustment

1. Remove the booklet stapler cover [A] (☞ x 3).
2. Remove the three paper guides [B] (☞ x 1 ea.).
3. Loosen the two screws on each of the anvils [C].



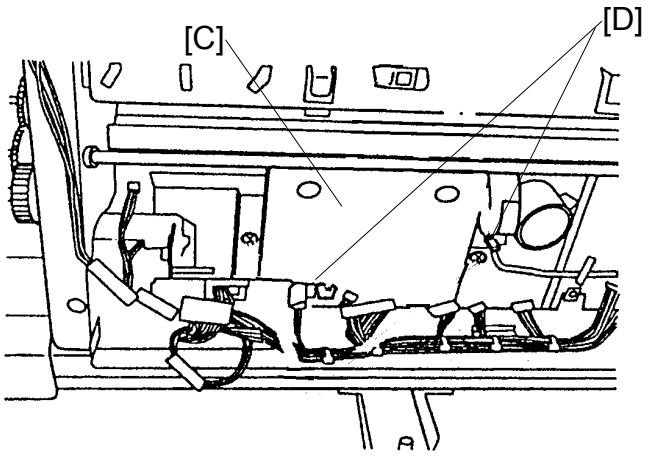
4. Insert the anvil positioning plate [A] into the staple slot of the stapler [B].
   NOTE: The anvil positioning plate is stored in the booklet stapler cover [C].
5. Rotate the gear to move down the stapler. Then align the anvil positioning plate and the anvil [D]. Then secure the anvils (🔩 x 2 ea.).

3.1.17 BOOKLET BOARD



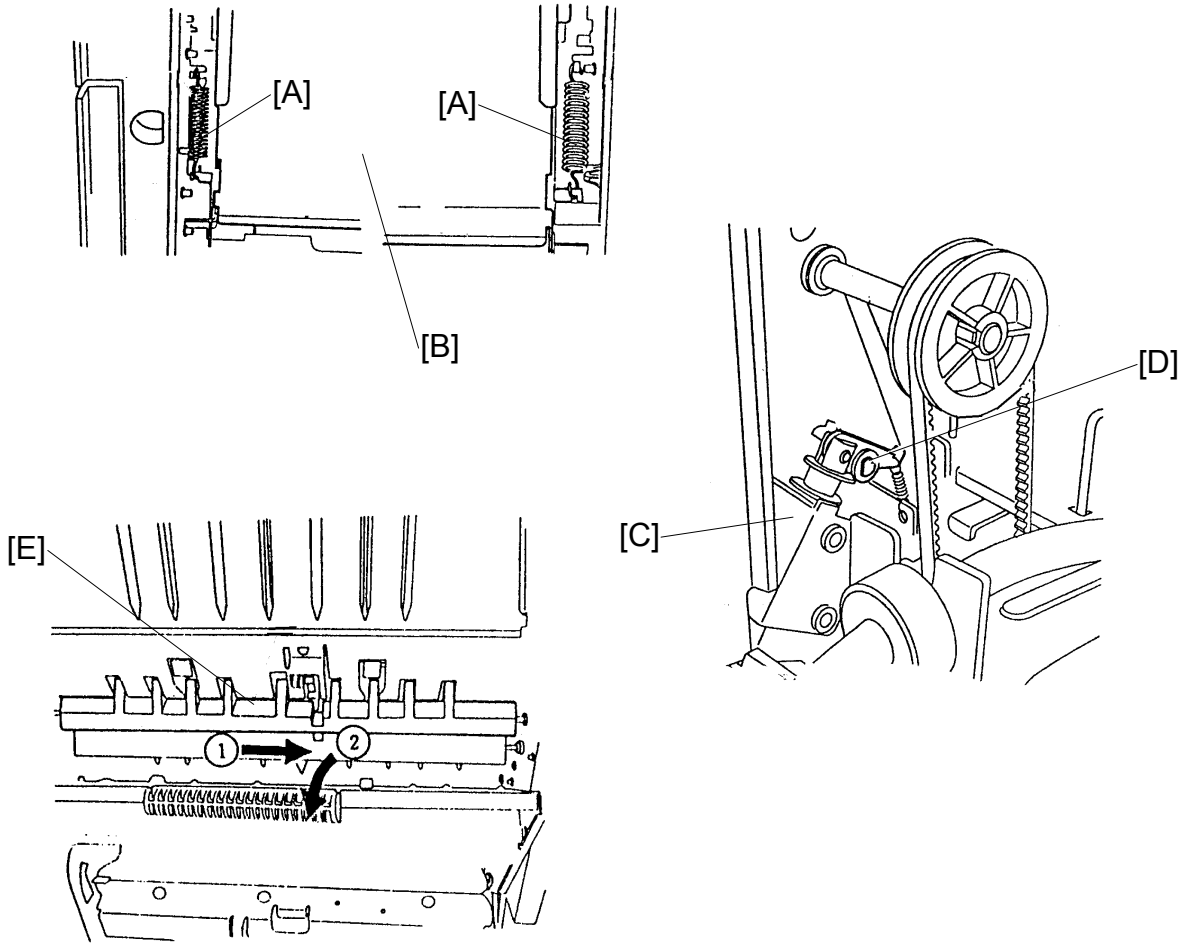
1. Remove the lower right cover [A] (x 4).
2. Remove the booklet board [B] (x 4, x 14).
   NOTE: After replacing the board, adjust the booklet stapling position.

3.1.18 POSITIONING PLATE UNIT



1. Remove the booklet board (x 4, x 14).
2. Slide the paper positioning unit [C] to the right and remove it (x 2, x 2 [D]).

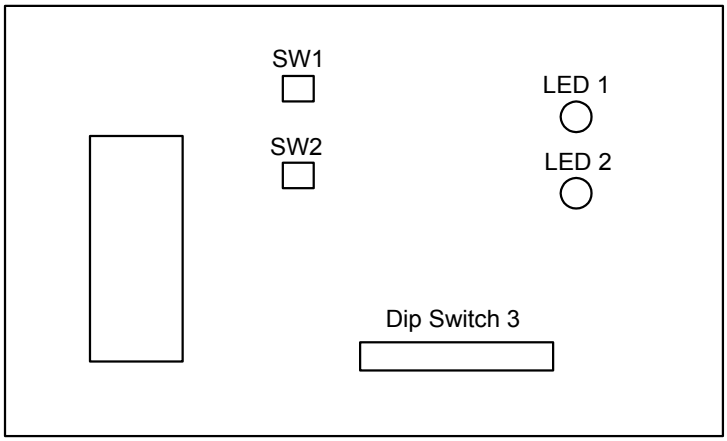
3.1.19 1ST AND 2ND BOOKLET UNIT GATES

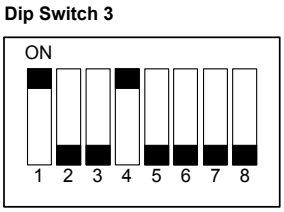


1. Remove the upper and lower rear covers.
2. Release the two tension springs [A] of the booklet entrance guide [B].
3. Remove the booklet unit gate solenoids [C] (☞ x 1, 1 spring each).
4. Pull out the link of the solenoid [D].
5. Remove the booklet unit gates [E].

3.2 ADJUSTMENT

3.2.1 SHIFT TRAY HEIGHT

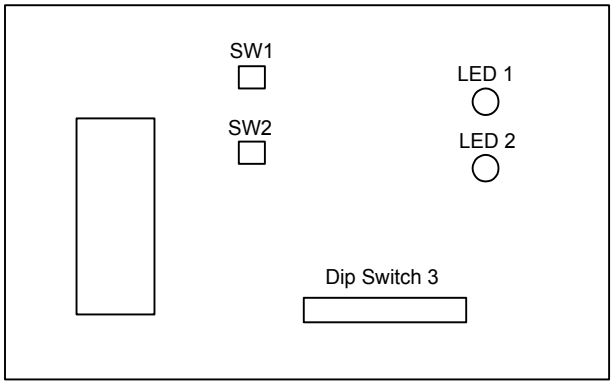


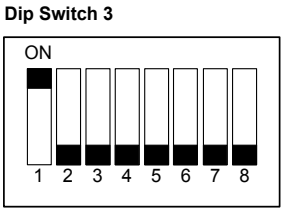


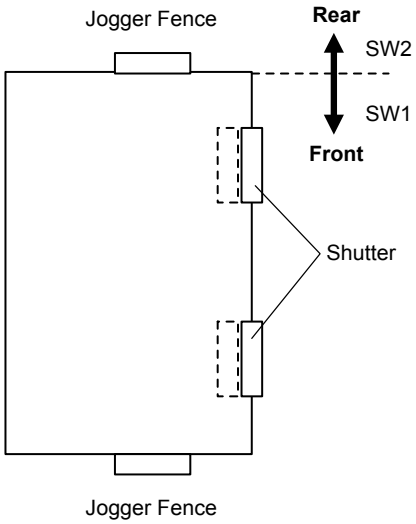
After replacing the finisher board or shift tray height sensor, always do this adjustment.

1. Remove the upper rear cover.
2. Turn on dip switches 3 -1 and -4 on the finisher board.
3. Put blank paper (A4/8 1/2" x 11") on the shift tray.
4. Press switch 1 (SW1) on the finisher board.
   The finisher automatically adjusts the shift tray height when switch 1 is pressed.
   - After performing the adjustment, the shift tray will return to home position.
   - During the adjustment, LED 1 flashes. After performing the adjustment, LED 1 turns on and remains on.
   - If the automatic adjustment fails, the finisher stops and LED 1 turns off.
5. Turn off dip switches 3 -1 and -4, then turn off the copier main switch.

3.2.2 JOGGER FENCE POSITION





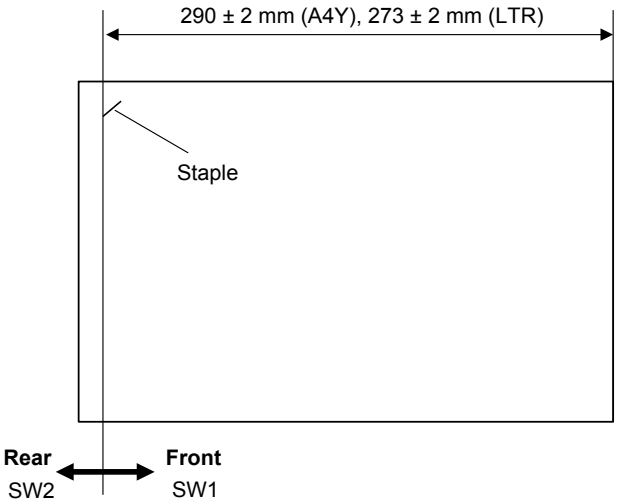


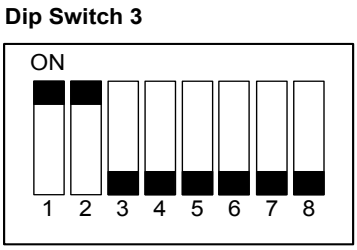
After replacing the finisher board or if a paper alignment fault occurs, do this adjustment.

Doing this adjustment once will affect all paper sizes.

1. Remove the upper rear cover.
2. Turn on dip switch 3-1 on the finisher board.
3. Press the following switch on the finisher board.
   Using A4: Switch 1 (SW1)
   Using 8 1/2" x 11": Switch 2 (SW2)
   - After pressing the switch, the upper exit unit will open and the jogger fences will move to the A4 or 8 1/2" x 11" position.
4. Place 10 sheets of A4/8 1/2" x 11" paper between the jogger fences and push them until they touch the shutters.
5. Adjust the jogger fence position by pressing switch 1 or 2.
   - Switch 1: Move to the front (0.35 mm/press)
   - Switch 2: Move to the rear (0.35 mm/press)
6. Press switches 1 and 2 simultaneously to store the adjustment data.
   - After pressing the switches, the upper exit unit will close.
7. Turn off dip switch 3-1, then turn off the copier main switch.

3.2.3 STAPLING POSITION

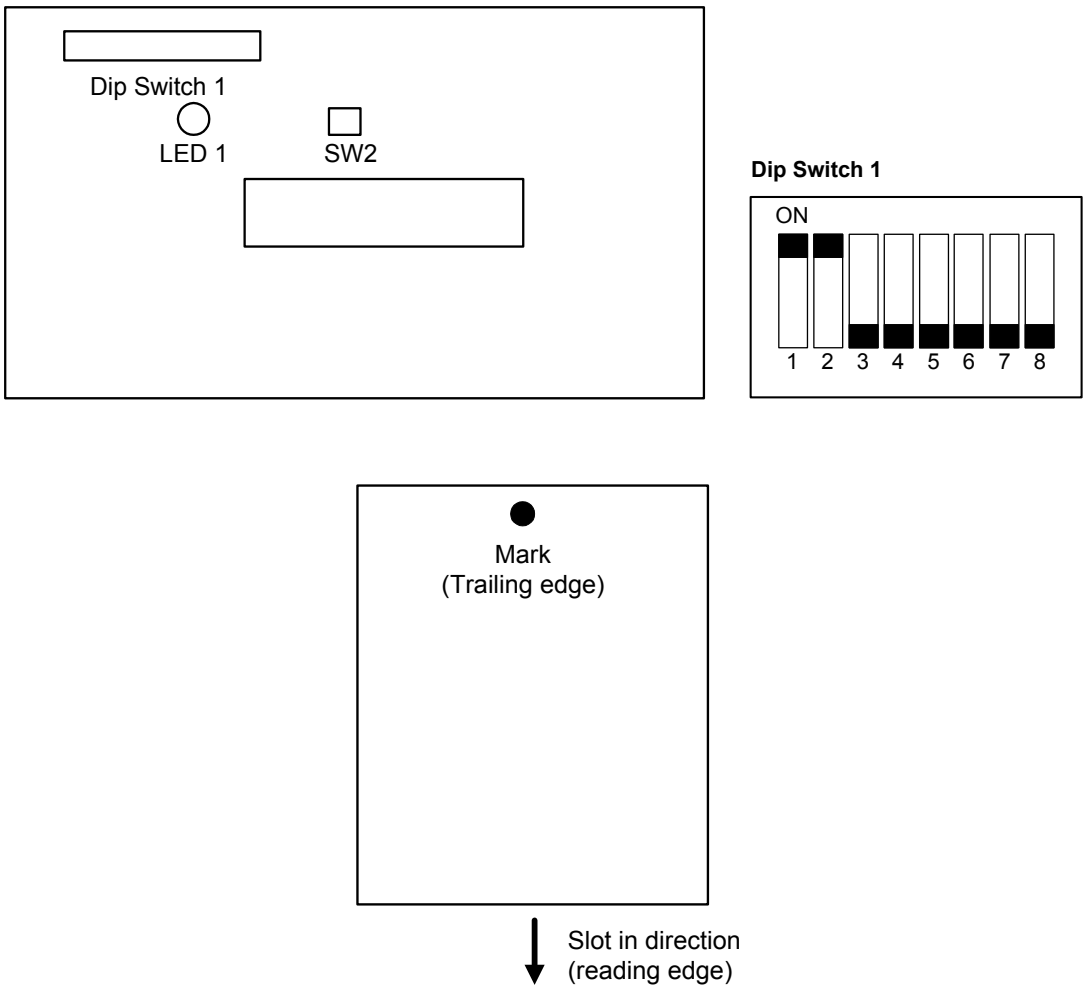




After replacing the finisher board, do this adjustment. Doing this adjustment will affect all paper sizes and all stapling positions.

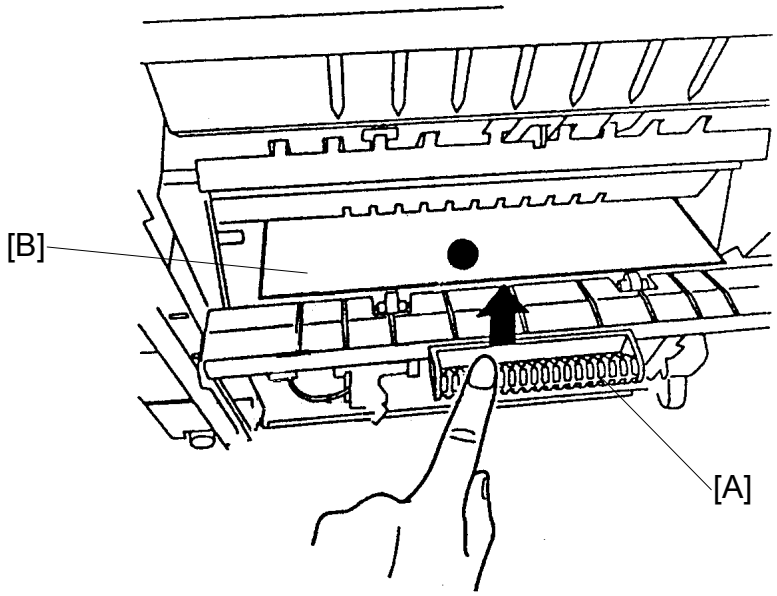
1. Remove the upper rear cover.
2. Turn on dip switches 3 -1 and -2 on the finisher board.
3. Press the following switch on the finisher board.
   Using A4: Switch 1 (SW1)
   Using 8 1/2" x 11": Switch 2 (SW2)
   - After pressing the switch, the upper exit unit will open and the transport belt will rotate.
4. Within five seconds after pressing the switch, place one sheet of A4/8 1/2" x 11" paper between the jogger fences and push it until it touches the shutter. When the staple tray paper sensor detects the paper, the stapler will staple (rear, 1 point).
5. Take out the stapled paper manually and check the staple position.
   Staple position: Good → Turn off dip switches 3 -1 and -2 to end the procedure.
   Staple position: No good → Change the staple position by doing the following steps.
6. Adjust the staple position by pressing switch 1 or 2.
   Switch 1: Move the front (0.3 mm/press)
   Switch 2: Move to the rear (0.3 mm/press)
7. Press switches 1 and 2 simultaneously to store the adjustment data. After pressing the switches, check the staple position again.
8. Turn off dip switches 3 -1 and -2, then turn off the copier main switch.

3.2.4 BOOKLET STAPLING POSITION

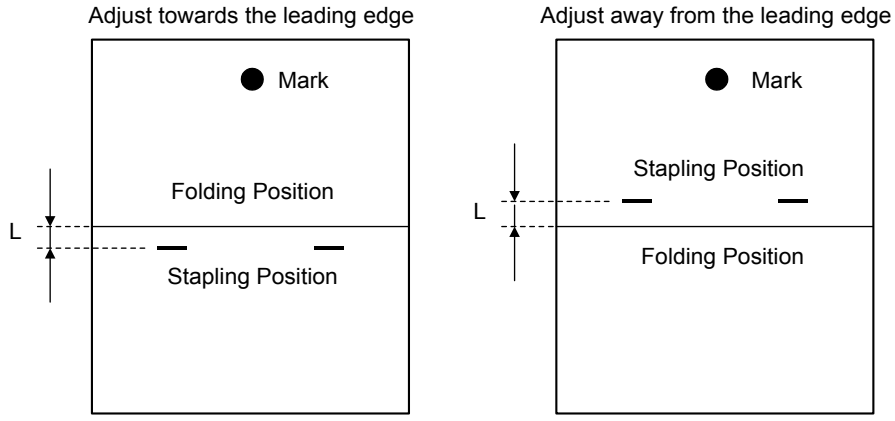


After replacing the booklet board, dip switches 1 -6, -7, -8 on the new board must be set up the same way as on the old board.

1. Remove the lower right cover (see “Booklet Unit Removal”) and lower rear cover.
2. Turn on dip switches 1 -1 and -2 on the booklet board.
3. Tape the actuators of the booklet entrance guide sensor (S42) and the booklet entrance guide safety switch (SW11), so that S42 and SW11 remain actuated.
4. Press switch 2 (SW2) on the booklet board.
   - After pressing the switch, the booklet transport motor (M10) will start to rotate.
5. Put a mark on the trailing edge of some A3/11" x 17" paper (two sheets).



6. Open the booklet entrance guide [A], then slide in the two sheets of paper [B] until their leading edges touch the positioning plate.
7. Press switch 2 on the booklet board.
   - The booklet finisher makes a booklet automatically.



Example 1: L= 1 mm

Example 2: L= 0.75 mm

Dip switch 1 -6, -7, -8 setting			Adjustment (0.25 mm/ step)
-6	-7	-8	
OFF	ON	ON	+3
OFF	ON	OFF	+2
OFF	OFF	ON	+1
OFF	OFF	OFF	0
ON	OFF	ON	-1
ON	ON	OFF	-2
ON	ON	ON	-3
ON	OFF	OFF	Do not use

8. Measure the distance (L) between the stapling position and the folder position.
9. Adjust the stapling position with dip switches 1 -6, -7, -8.
   Inputting a lower value than the current setting moves the stapling position towards the leading edge. Adjusting by 1 step moves the stapling position 0.25 mm.

   Example 1:
   To move the stapling position 1 mm towards the leading edge.
   If dip switch 1 is currently set to +2, set the dip switch to reflect -2 (this moves the stapling position 4 steps towards the leading edge).
   Example 2:
   To move the stapling position 0.75 mm away from the leading edge.
   If dip switch 1 is currently set to -1, set the dip switch to reflect +2 (this moves the stapling position 3 steps away from the leading edge).
10. Turn off dip switched 1-1 and -2, then turn off the copier main switch.

B654
PRINTER/SCANNER

PRINTER/SCANNER B654

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1. INSTALLATION

1.1 ACCESSORY CHECK

Check the accessories in the box against the following list:

No.	Description	Q'ty	Note
1	Paper Sensor	1	
2	Key Tops - Printer	2	English (1 set), Universal (1 set)
3	Key Tops - Scanner	2	English (1 set), Universal (1 set)
4	Paper Limit Sensor Unit	1	
5	Tapping Screw - M3x8	2	To secure the paper limit sensor unit
6	Pan Head Screw - M3x8	1	To secure the paper sensor
7	NIB	1	Option
8	Printer/Scanner DIMM	1	
9	Ferrite Core	1	For LAN cable

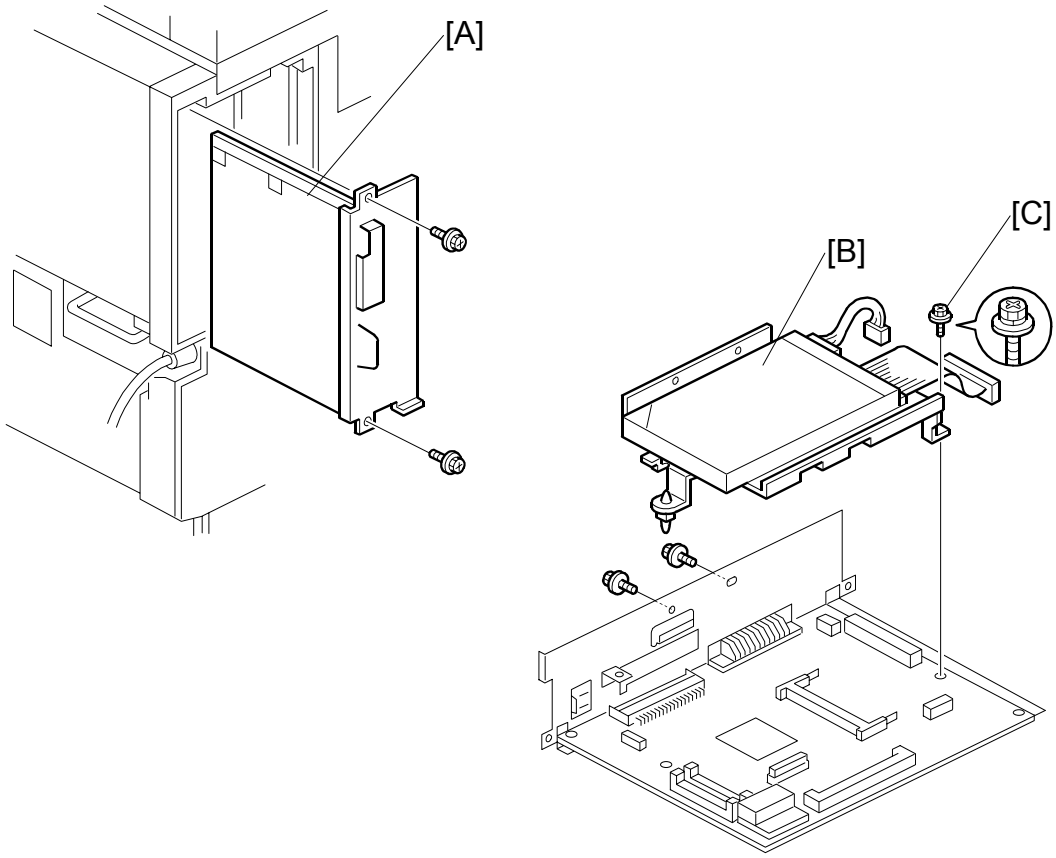
1.2 PRINTER INSTALLATION PROCEDURE

All procedures require removal of the controller board from the machine. Some procedures also require removal of the hard drive.

⚠CAUTION

Switch the main machine off and unplug the main machine power cord before starting any procedure described in these instructions.

1.2.1 CONTROLLER BOARD AND HDD REMOVAL

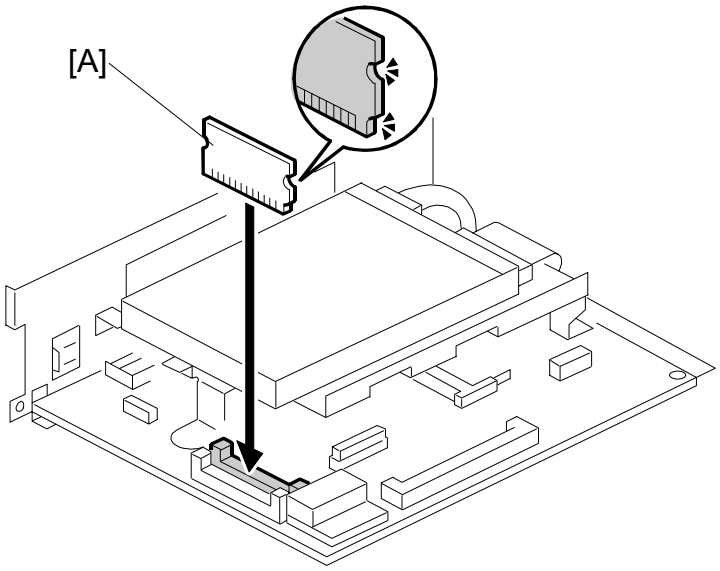


1. Remove the controller board [A] (🔩 x 2).
2. Remove the HDD [B] (🔩 x 3, 🖐 x 2).
   NOTE: Re-attach the screw with the washer at [C].

1.2.2 PRINTER CONTROLLER INSTALLATION

⚠CAUTION

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

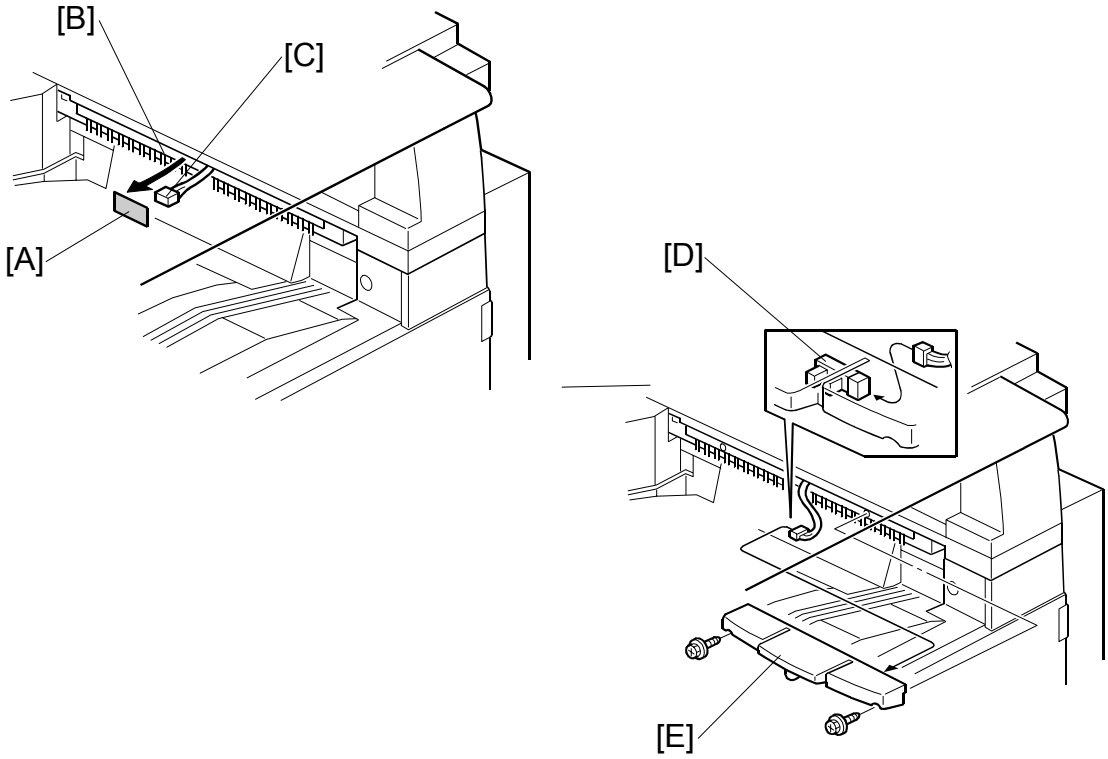


1. Remove the controller board. (☛1.2.1)
2. Install the printer ROM DIMM [A] in the inside slot of the controller board.
3. Install the NIB packed with the printer/scanner option. (☛1.5)

   If one or more of the following options are to be installed, you must remove the HDD and install them before proceeding to the next step:

   - Postscript Kit (G354-17)
   - 128 Memory Card (G331)
   - IEEE 1394 Interface (G336)
   - USB 2.0 (B525-01)
   - IEEE 802.11b Wireless LAN (B515)
   - Bluetooth (G354-04)

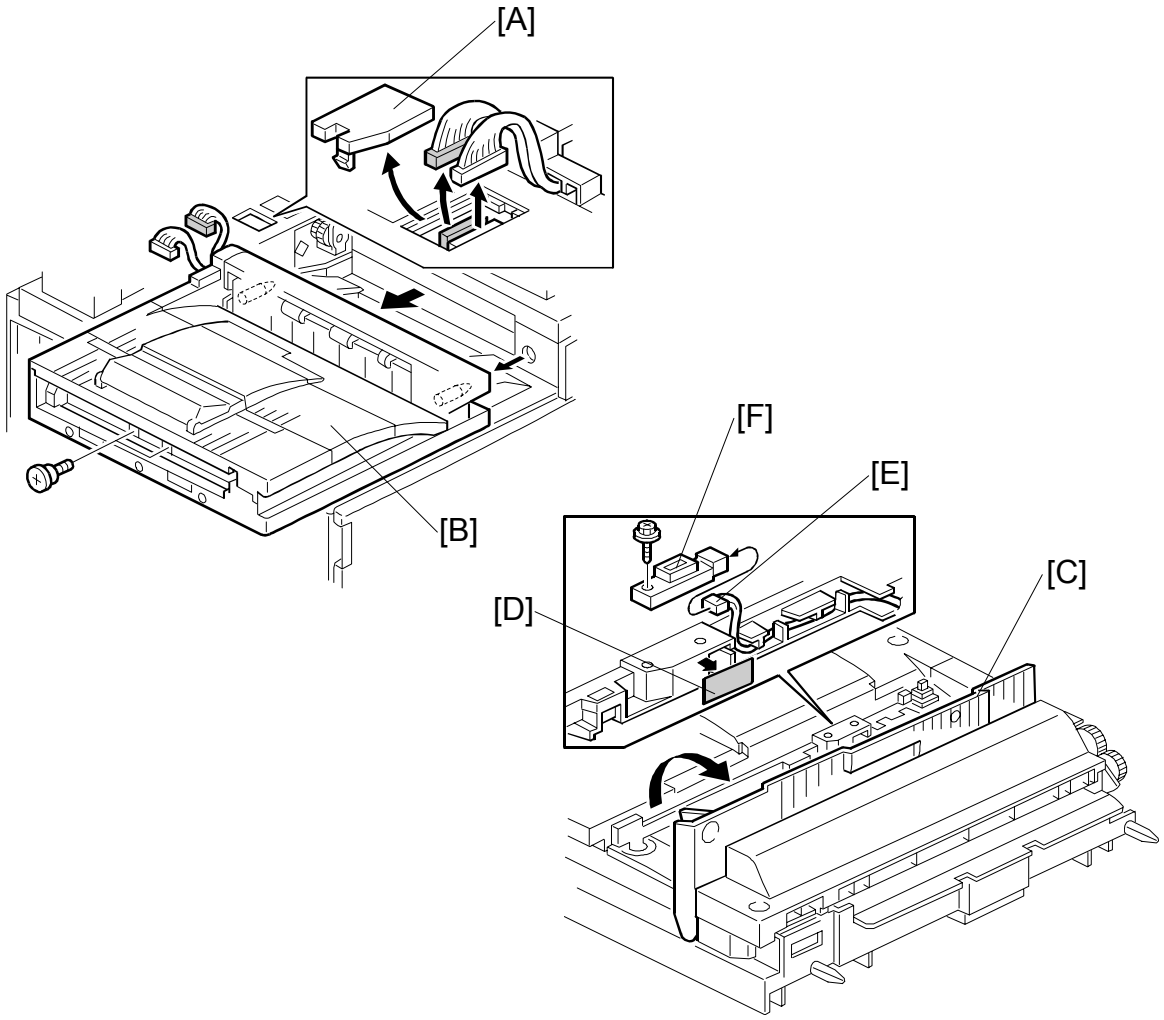
Paper Limit Sensor Installation



NOTE: If the optional bridge unit is installed, you cannot install the paper limit sensor. Go to the next section.

1. Peel off the black tape [A] from the anti-static brush [B], then pull out the cable [C].
2. Connect the cable to the sensor [D].
   NOTE: Push the connector into the hole so it is not visible.
3. Install the paper limit sensor unit [E] (x 2).

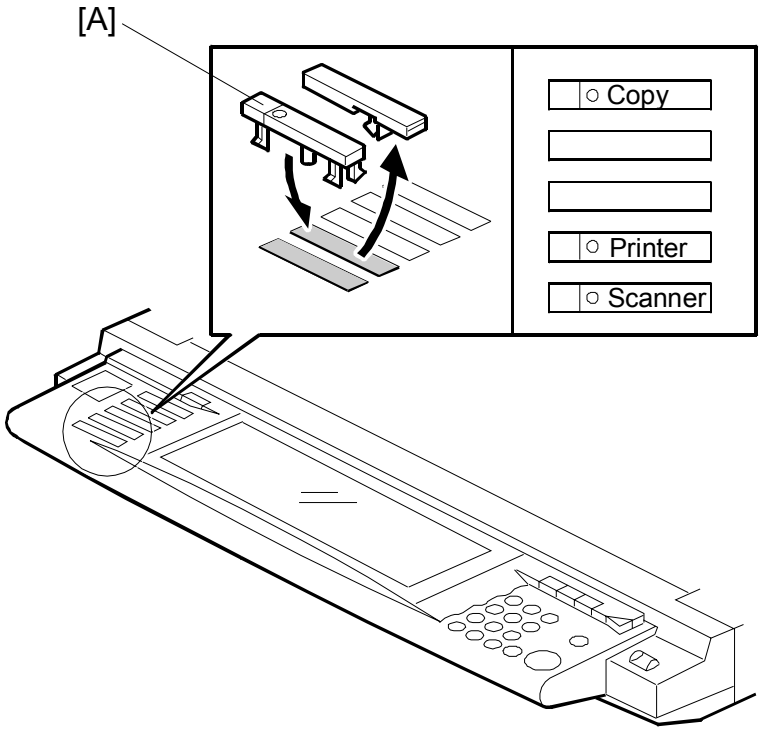
Paper Sensor Installation



NOTE: Install the paper sensor only if the optional Bridge Unit has been installed. If the bridge unit is not installed, go to the next section.

1. Remove the connector cover [A] and bridge unit [B] (x 2, x 2).
2. Open the right cover [C] of the bridge unit and peel off the black tape [D]
3. Pull out the connector [E].
4. Install the paper sensor [F] (x 1, x 1) then reinstall the bridge unit.

Operation Panel Keytops

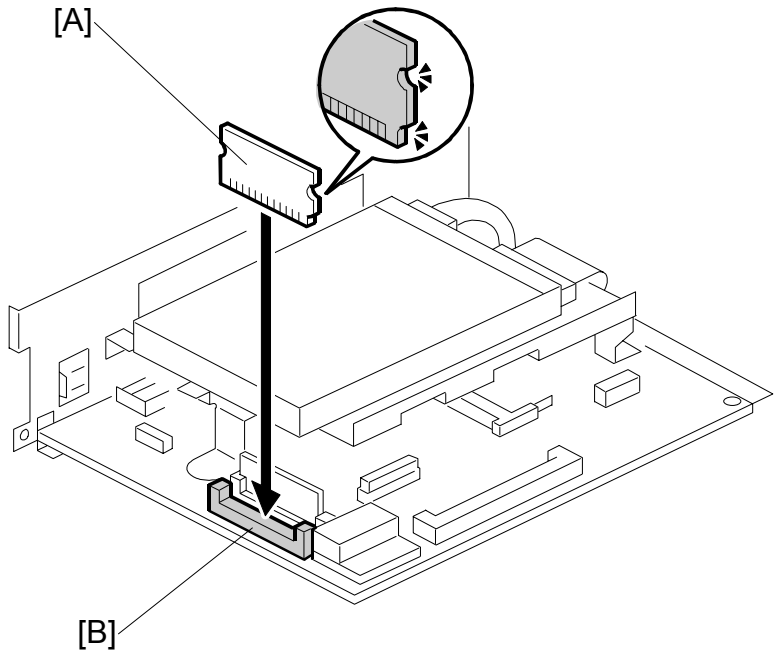


1. Remove the bottom cap [A].
2. Install the “Printer” and “Scanner” keys in the 4th and 5th slots.
   NOTE: Correct order, reading from top to bottom:
   - Copy
   - Document Server
   - Facsimile
   - Printer
   - Scanner
3. Do not connect the parallel cable now. Turn the machine on and check Copier SP mode SP5-907: Plug & Play Name
4. Print out the configuration page to confirm correct installation of the printer controller (User Tools> Printer Settings> List Test Print> Config. Page)
5. To connect the parallel cable, switch the machine off, connect the cable, then switch the machine on again.
6. Execute SP5801 10 (Net File Memory Clear).

1.3 POSTSCRIPT 3 (G354-17)

⚠CAUTION

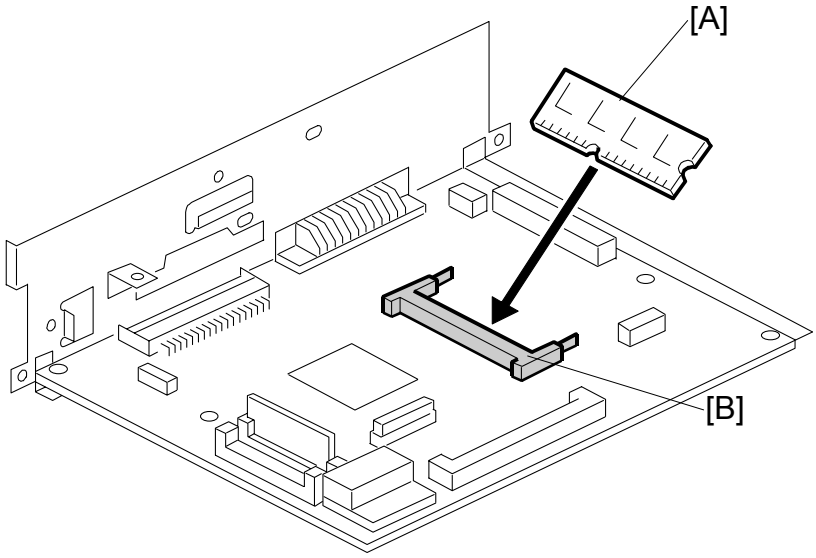
Unplug the main machine power cord before starting the following procedure.



NOTE: To install the Postscript 3 option, the Printer Option must be installed first. (☛1.2.2)

1. Remove the controller board. (☛1.2.1)
2. Install the Postscript DIMM [A] in slot [B] of the controller board.
3. Re-install the controller board in the main machine.

1.4 128 MB MEMORY (G331)



⚠CAUTION

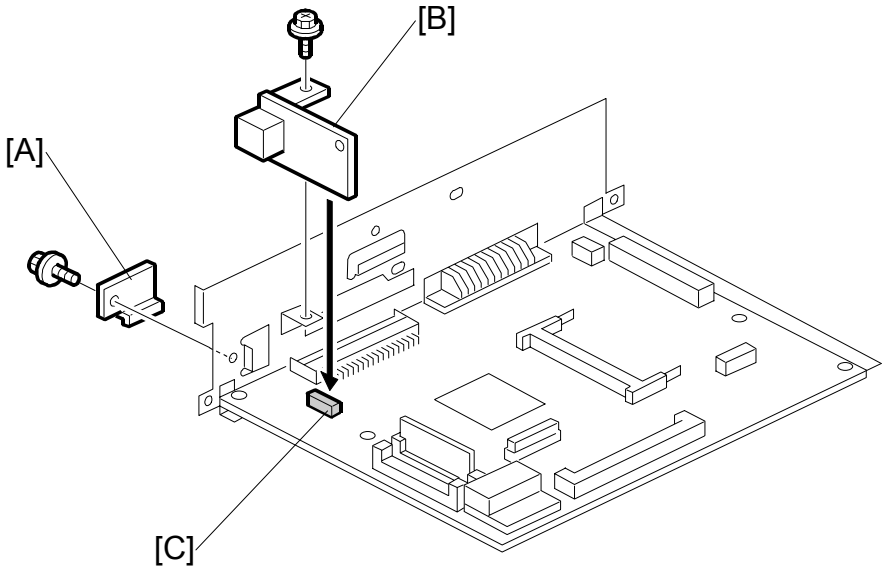
Unplug the main machine power cord before starting the following procedure.

NOTE: Only one optional memory DIMMs are available: 128 MB (G331). It can be installed in the one available slot (only one can be installed).

1. Remove the controller board and HDD unit (☛1.2.1).
2. Install the memory DIMM [A] in the slot [B] of the controller board.
   - Set the edge connector in the slot at a 30 degree angle.
   - Push in slightly until you hear it click.
   - Push down slowly until it snaps in place.

   NOTE: To remove the memory DIMM, pull out the plastic arms on either side of the slot to release it.

1.5 NIB (B525)



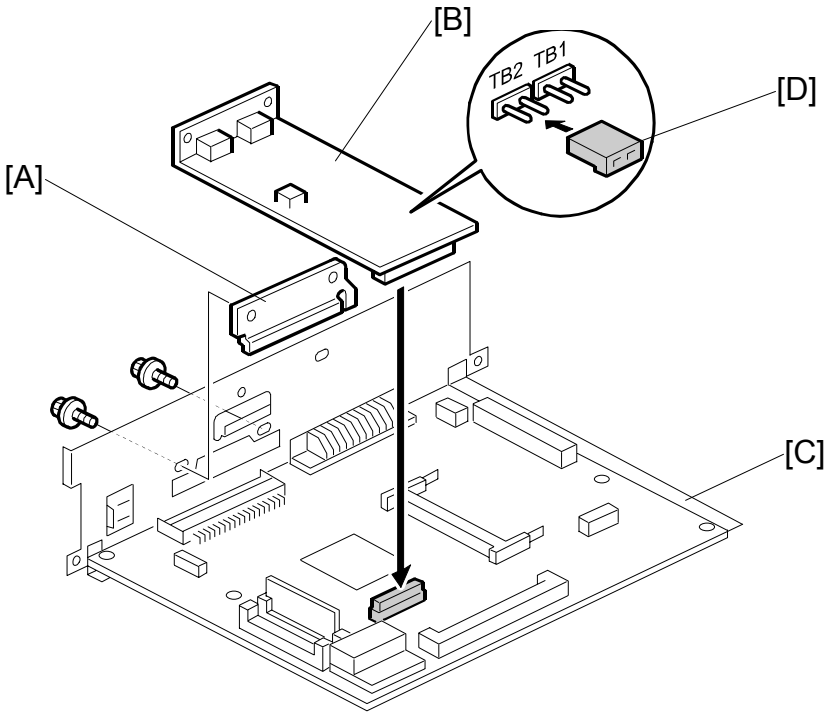
⚠CAUTION

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

NOTE: To install the NIB option, the Printer Option must be installed first. (☛1.2.2)

1. Remove the controller board and HDD unit (☛ 1.2.1).
2. Remove the NIB slot cover [A]. Save this screw.
3. Attach the NIB [B] to the slot [C] on the controller board (🔩 x 2).
   NOTE: Use the screw removed from the NIB slot cover and one provided screw.
4. Re-install the HDD and re-install the controller board.

1.6 IEEE 1394 FIREWIRE (G336)



⚠CAUTION

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

NOTE: To install the IEEE1394 option, the Printer Option must be installed first. (☛1.2.2) Only one slot is available for the interface option. You can install only one printer interface option at a time: IEEE 1394, USB 2.0, IEEE 802.11b, or Bluetooth.

1. Remove the controller board and HDD unit (☛ 1.2.1).
2. Remove the cover [A] (🔩 x 2). Save these screws.
3. Attach the USB 2.0 board [B] to the controller board [C] (🔩 x 2). Use the screws you removed in Step 2.
4. Make sure that the jumper [D] is set on “TB2”.
5. Re-install the HDD and re-install the controller board.

UP Mode Settings for IEEE 1394

Enter the UP mode and follow the procedure below to perform the initial interface settings for IEEE 1394. These settings take effect every time the machine is powered on.

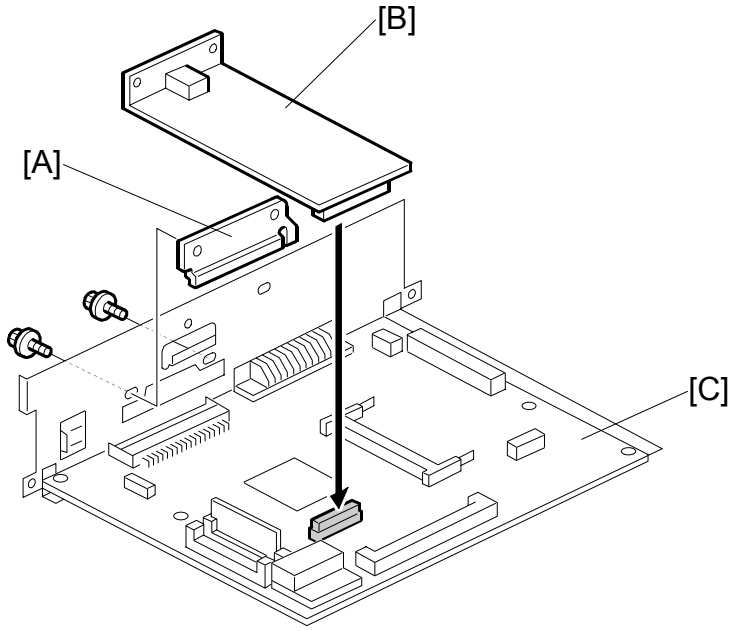
1. Press User Tools/Counter.
2. On the touch panel, press System Settings.
3. Press Interface Settings.
4. Press the key and enter the following settings:
   - IP Address
   - Subnet Mask
   - IP Over 1394. Enable or disable this setting as required. This setting enables IP Over 1394 as the default setting for the printing method.
   - SCSI Print. Enable or disable this setting as required. This setting enables SCSI Print as the default setting for the printing method.
   - SCSI Print Bi-directional. Switch bi-directional printing on or off for SCSI print.

SP Mode Settings for IEEE 1394

The following SP commands can be set for IEEE 1394.

SP No.	Name	Function
5839 004	Device Name	Sets the names for all the physical devices connected to the IEEE 1394 firewire network.
5839 007	Cycle Master	Enables or disables cycle master function of the IEEE 1394 standard bus.
5839 008	BCR Mode	Sets the BCR (Broadcast Channel Register) setting for the Auto Node operation for the standard IEEE1394 bus for when IRM is not in use. Three settings are available: 00, 01, 11.
5839 009	IRM 1394a Check	Determines whether an IRM check for IEEE 1394 is conducted for the Auto Node when IRM is not used.
5839 010	Unique ID	Enables the “Node_Unique_Id” setting for enumeration on the standard IEEE 1394 bus.
5839 011	Logout	Determines how successive initiator login in requests are handled during login in for SBP-2.
5839 012	Login	Enables or disables exclusive login for SBP-2.
5839 013	Login MAX	Sets the limit for the number of logins for SBP-2. Range: 1 ~ 62.

1.7 USB 2.0 (B525)



⚠CAUTION

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

NOTE: To install the USB 2.0 option, the Printer Option must be installed first. (☛1.2.2) Only one slot is available for the interface option. You can install only one printer interface option at a time: IEEE 1394, USB 2.0, IEEE 802.11b, or Bluetooth.

1. Remove the controller board and HDD unit (☛1.2.1).
2. Remove the cover [A] (🔩 x 2). Save these screws.
3. Attach the IEEE 1394 board [B] to the controller board [C] (🔩 x 2). Use the screws you removed in Step 2.
4. Re-install the HDD and re-install the controller board.
5. Execute SP5990 5 to print a Self-Diagnostic Report with the system settings and confirm that the machine correctly recognizes the interface.

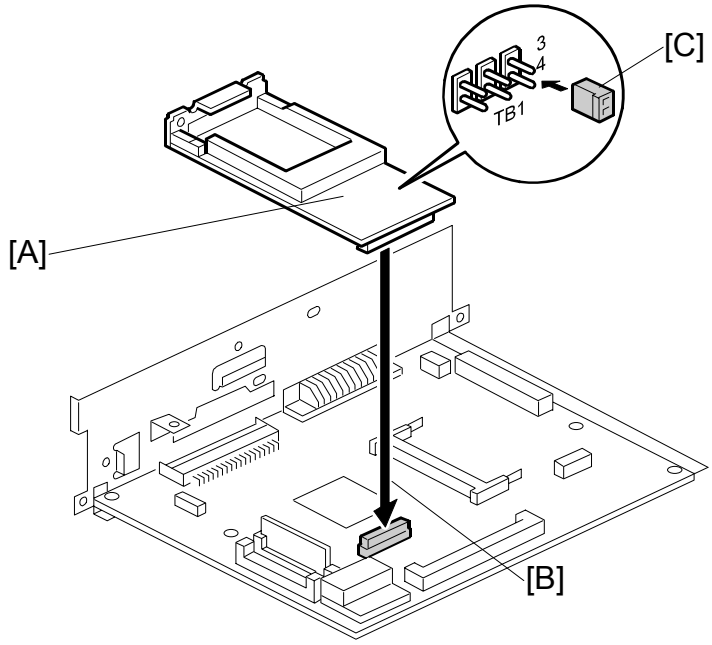
USB SP Settings

The following SP commands are available. However, only one setting may require adjustment and this setting should be performed only if the customer is experiencing USB data transmission errors.

NOTE: Do not change the settings marked “DFU”. These settings are for design and factory use only.

SP No.	Name	Function	
5844 001	Transfer Rate	Adjusts the USB transfer rate. Do not change the setting unless there is a data transfer error using the USB high speed mode.	
		HS/FS:	High speed/Full speed auto adjust (480Mbps/12Mbps)
		FS:	Full speed (12Mbps fixed)
5844 002	Vendor ID	Displays the vendor ID. **DFU**	
5844 003	Product ID	Displays the product ID. **DFU**	
5844 004	Dev. Release Num	Displays the development release version number. **DFU**	

1.8 IEEE 802.11B B515 (WIRELESS LAN)

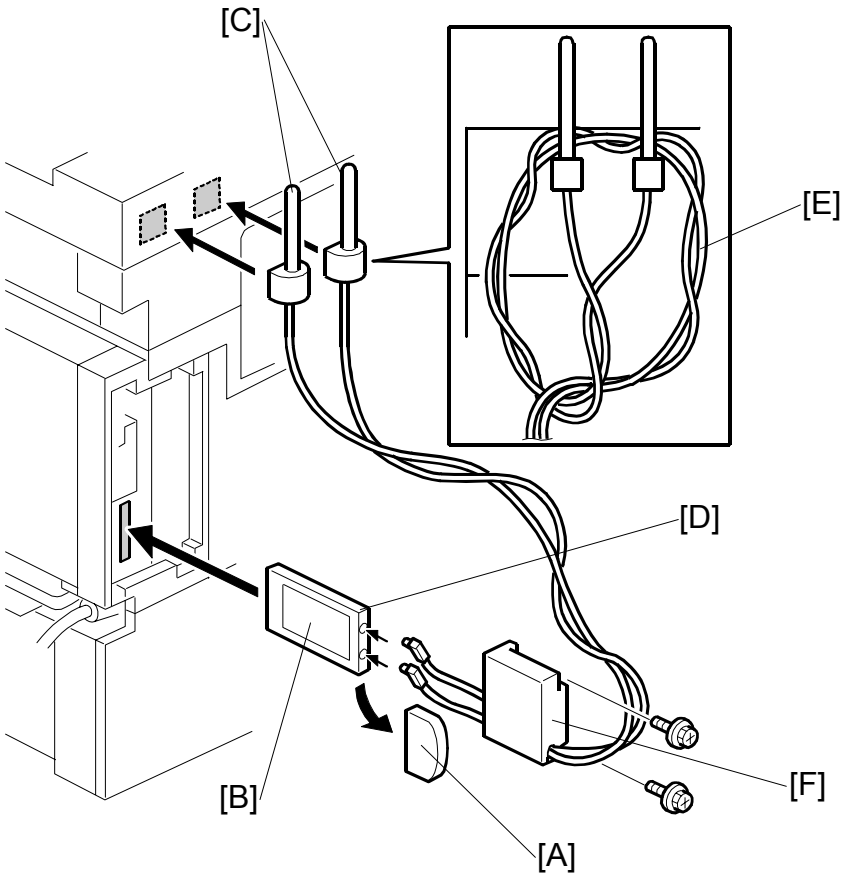


⚠CAUTION

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

NOTE: To install the IEEE 801.11b option, the Printer Option B548 must be installed first. (☛1.2.2) Only one slot is available for the interface option. You can install only one printer interface option at a time: IEEE 1394, USB 2.0, or IEEE 802.11b.

1. Remove the controller board and HDD unit (☛1.2.1).
2. Remove the slot cover (🔩 x 2). Save these screws.
3. Attach the IEEE 801.11b board [A] to the controller board [B] (🔩 x 2). Use the screws you removed in Step 2.
4. Set the jumper [C] between pins 3 and 4.
5. Re-install the HDD and re-install the controller board.



6. Pull off the edge connector protector [A] off the card and discard it.
7. With the card label facing left, insert the card [B] into the PCI slot.
8. Use the Velcro pads to install the antennas [C] on the left rear corner of the machine.
   NOTE: The antennas should be separated by at least 40 ~ 60 mm (1.5~2.5”). Always detach the antennas from the corners of the machine and disconnect them before moving the machine.
9. Connect the antennas to the terminals [D].
10. Coil the cables [E] and hang them over the antennas as shown.
11. Attach the cover [F] (🔩 x2).
12. If reception is poor, you may need to move the machine:
    - Make sure that the machine is not located near an appliance or any type of equipment that can generate a strong magnetic field.
    - Position the machine as close as possible to the access point.

UP Mode Settings for Wireless LAN

Enter the UP mode and follow the procedure below to perform the initial interface settings for IEEE 802.11b. These settings take effect every time the machine is powered on.

NOTE: The wireless LAN cannot be used if Ethernet is being used.

1. Press the User Tools/Counter key.
2. On the touch panel, press System Settings.
   NOTE: The Network I/F (default: Ethernet) must be set for either Ethernet or wireless LAN.
3. Select Interface Settings → Network (tab) → Network I/F Settting
4. Select either “Ethernet” or “IEEE 802.11b”.
5. Press IEEE 802.11b. Only the wireless LAN options are displayed.
6. **Transmission Mode**. Select either “Ad Hoc Mode” or “Infrastructure Mode”.
7. **SSID Setting**. Enter the SSID setting. (The setting is case sensitive.)
8. **Channel**. This setting is required when Ad Hoc Mode is selected.
   Range: 1 ~ 14 (default: 11)
   NOTE: The allowed range for the channel settings may vary for different countries.
9. **WEP (Privacy) Setting**. The WEP (Wired Equivalent Privacy) setting is designed to protect wireless data transmission. In order to unlock encoded data, the same WEP key is required on the receiving side. There are 64 bit and 128 bit WEP keys.

   Range of Allowed Settings:

64 bit	10 characters
128 bit	26 characters

10. **Bandwidth Status**. This setting is enabled only for the Infrastructure Mode. Press here to display the current status of the bandwidth. One of the following is displayed to reflect the reception status of the wireless LAN:

Good	76 ~ 100%
Fair	41 ~ 75%
Poor	21 ~ 40%
Unavailable	0 ~ 20%

11. **Transmission Speed**. Press the Next button to display more settings, then select the transmission speed for the mode: Auto, 11 Mbps, 5.5 Mbps, 2 Mbps, 1 Mbps (default: Auto). This setting should match the distance between the closest machine or access point, depending on which mode is selected.
    NOTE: For the Ad Hoc Mode, this is the distance between the machine and the closest PC in the network. For the Infrastructure Mode, this is the distance between the machine and the closest access point.

11 Mbps	140 m (153 yd.)
5.5 Mbps	200 m (219 yd.)
2 Mbps	270 m (295 yd.)
1 Mbps	400 m (437 yd.)

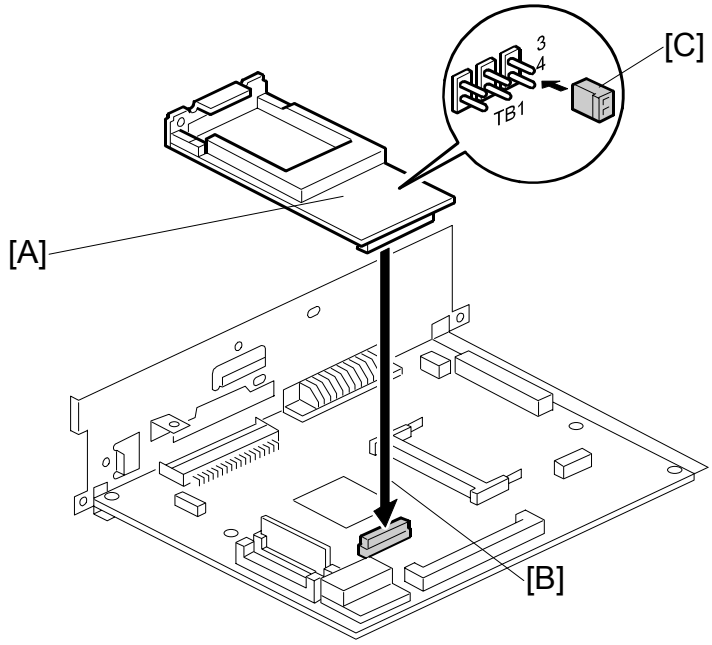
12. To initialize the wireless LAN settings, use page 2/2. Press Execute to initialize the following settings:
    - Transmission mode
    - Channel
    - Transmission Speed
    - WEP
    - SSID
    - WEP Key

SP Mode Settings for IEEE 802.11b Wireless LAN

The following SP commands can be set for IEEE 802.11b

SP No.	Name	Function
5840 004	SSID	Used to confirm the current SSID setting.
5840 006	Channel MAX	Sets the maximum range of the channel settings for the country.
5840 007	Channel MIN	Sets the minimum range of the channels settings allowed for your country.
5840 010	WEP Key	Used to confirm the current WEP key setting.
5840 011	WEP Key Select	Used to select the WEP key (Default: 00).
5840 020	WEP Mode	Used to display the maximum length of the string that can be used for the WEP Key entry.

1.9 BLUETOOTH (G354-04)

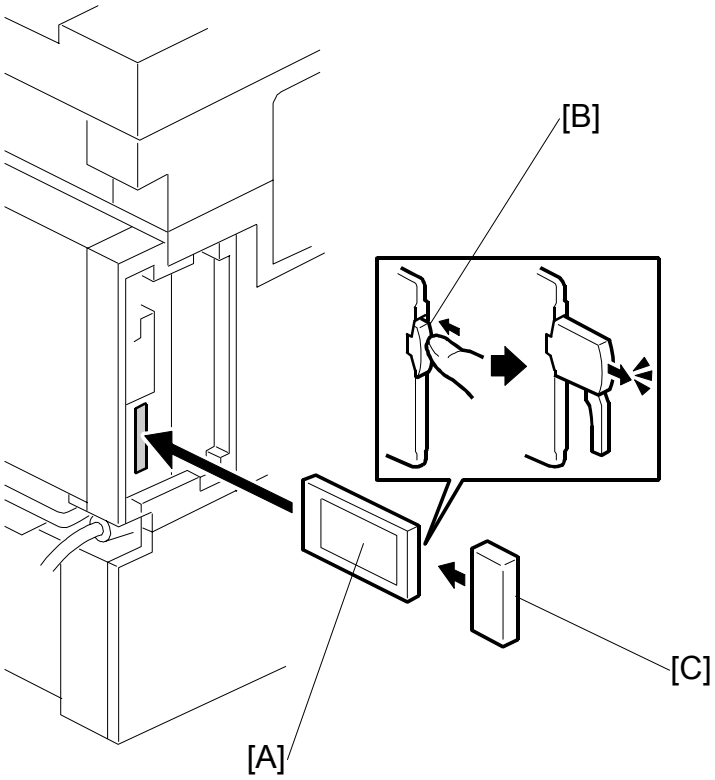


⚠CAUTION

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

NOTE: To install the Bluetooth option, the Printer Option B548 must be installed first. (☛1.2.2) Only one slot is available for the interface option. You can install only one printer interface option at a time: IEEE 1394, USB 2.0, or IEEE 802.11b, or Bluetooth.

1. Remove the controller board and HDD unit (☛1.2.1).
2. Remove the slot cover (🖉 x 2). Save these screws.
3. Attach the Bluetooth board [A] to the controller board [B] (🖉 x 2). Use the screws you removed in Step 2.
4. Set the jumper [C] between pins 3 and 4.
5. Re-install the HDD and re-install the controller board.



6. Insert the Bluetooth card [A] into the slot.
7. Press the antenna [B] to extend it.
8. Attach the antenna cap [C].

1.10 CHECK ALL CONNECTIONS

1. Plug in the power cord and turn on the main switch.
2. Enter the printer user mode and print the configuration page.

   User Tools> Printer Settings> List Test Print> Config. Page

   NOTE: The same data can also be printed by executing SP1-004 – Print Summary. All installed options are listed in the “System Reference” column.

2. SERVICE TABLES

2.1 SCANNER SERVICE MODE

2.1.1 SCANNER PROGRAM MODE TABLE

Service Table Key

Notation:	What it means
[range / **default** / step]:	Example: [-9 ~ +9 / **+3.0** / 0.1 mm step]. The setting can be adjusted in the range ±9, value reset to +3.0 after an NVRAM reset, and the value can be changed in 0.1 mm steps with each key press.
Italics:	Comments added for your reference.
*:	This value is stored in NVRAM. After a RAM reset, the default value (factory setting) is restored.
DFU:	Denotes "Design or Factory Use". Do not change this value.

SP1	Mode Number		Function and [Setting]
1001	1	Model Name	Displays the model name.
	2	Scanner Firmware Version	Displays the scanner firmware version.
	3	Scanner Firmware Number	Displays the firmware's part number.
	4	Detail Model Name	Displays the detail model name.
1002		Error Log Display	Displays the error log data.
1004*		Compression Type	Selects the compression type for binary picture processing. [1: **MH**, 2: MR, 3: MMR]
1005*		Erase Margin	Creates an erase margin for all edges of the scanned image. *If the machine has scanned the edge of the original, create a margin.* [0 – 5 / **0mm** / 1mm step]
1006*		Auto Reset Timer	Adjusts the auto reset timer for the scanner function. *If this is "0", the auto reset function is disabled.* [0, 10 – 999 / **60s** / 1s step]
1007		Store Priority	**1: Send** 2:Store Only 3: Send & Store

SP2	Mode Number		Function and [Setting]
2002	**[Text (Print) Mode Settings]**		
	1*	MTF Filter Coefficient (Main scan)	Selects the MTF filter coefficient in the main scan direction for Text mode. *Select a higher number for a stronger filter.* *If this is "0", the MTF filter is not applied.* [0-13 / **8** / 1 step]
	2*	MTF Filter Coefficient (Sub scan)	As above, for sub scan [0-13 / **8** / 1 step]
	3*	MTF Filter Strength (Main scan)	Selects the MTF filter strength in the main scan direction for Text mode. *Select a higher number for a stronger filter.* [0-7 / **3** / 1 step]
	4*	MTF Filter Strength (Sub scan)	As above, for sub scan [0-7 / **3** / 1 step]
	5*	Smoothing Filter	Selects the smoothing pattern for Text mode when using binary picture processing mode. *A larger value could cause moiré to appear in the image.* [0-7 / **0** / 1 step]
	6*	Scanner Gamma	Selects the scanner gamma type for Text mode when using binary picture processing mode. [0-11 / **4** / 1 step]
	7*	Brightness – Notch 7	Adjusts the image density for each image density level for Text mode when using binary picture processing mode. [0-255 / **128** / 1 step]
	8*	Contrast – Notch 7	[0-255 / **128** / 1 step]
	9*	Threshold Level – Notch 7	[0-255 / **128** / 1 step]
	10*	Brightness – Notch 6	[0-255 / **128** / 1 step]
	11*	Contrast – Notch 6	[0-255 / **128** / 1 step]
	12*	Threshold Level – Notch 6	[0-255 / **128** / 1 step]
	13*	Brightness – Notch 5	[0-255 / **128** / 1 step]
	14*	Contrast – Notch 5	[0-255 / **128** / 1 step]
	15*	Threshold Level – Notch 5	[0-255 / **128** / 1 step]
	16*	Brightness – Notch 4	[0-255 / **128** / 1 step]
	17*	Contrast – Notch 4	[0-255 / **128** / 1 step]
	18*	Threshold Level – Notch 4	[0-255 / **128** / 1 step]
	19*	Brightness – Notch 3	[0-255 / **128** / 1 step]
	20*	Contrast – Notch 3	Adjusts the image density for each image density level for Text mode when using binary picture processing mode. [0-255 / **128** / 1 step]
	21*	Threshold Level – Notch 3	[0-255 / **128** / 1 step]
	22*	Brightness – Notch 2	[0-255 / **128** / 1 step]
	23*	Contrast – Notch 2	[0-255 / **128** / 1 step]
	24*	Threshold Level – Notch 2	[0-255 / **128** / 1 step]
	25*	Brightness – Notch 1	[0-255 / **128** / 1 step]
	26*	Contrast – Notch 1	[0-255 / **128** / 1 step]
	27*	Threshold Level – Notch 1	[0-255 / **128** / 1 step]

SP2	Mode Number		Function and [Setting]
2002	28*	Independent Dot Erase	Selects the independent dot erase level. *With a larger SP setting, more dots are detected as independent dots and erased.* *If this is "0", independent dot erase is disabled.* [0-7 / **0** / 1 step]
	29*	Unevenness correction	Selects whether the unevenness correction is done. *This function is like an FCI function. If this is "1", the edges of characters in scanned images will be smoothed.* [**0: OFF**, 1: ON]
2003	**[Text (OCR) Mode Settings]**		
	1*	MTF Filter Coefficient (Main scan)	Selects the MTF filter coefficient in the main scan direction for Text (OCR) mode. *Select a higher number for a stronger filter.* *If this is "0", the MTF filter is not applied.* [0-13 / **3** / 1 step]
	2*	MTF Filter Coefficient (Sub scan)	As above, for sub scan [0-13 / **3** / 1 step]
	3*	MTF Filter Strength (Main scan)	Selects the MTF filter strength in the main scan direction for Text (OCR) mode. *Select a higher number for a stronger filter.* [0-7 / **0** / 1 step]
	4*	MTF Filter Strength (Sub scan)	As above, for sub scan [0-7 / **4** / 1 step]
	5*	Smoothing Filter	Selects the smoothing pattern for Text (OCR) mode when using binary picture processing mode. *A larger value could cause moiré to appear in the image.* [0-7 / **0** / 1 step]
	6*	Scanner Gamma	Selects the scanner gamma type for Text (OCR) mode when using binary picture processing mode. [0-11 / **5** / 1 step]
	7*	Brightness – Notch 7	Adjusts the image density for each image density level for Text (OCR) mode when using binary picture processing mode. [0-255 / **128** / 1 step]
	8*	Contrast – Notch 7	[0-255 / **128** / 1 step]
	9*	Threshold Level – Notch 7	[0-255 / **240** / 1 step]
	10*	Brightness – Notch 6	[0-255 / **128** / 1 step]
	11*	Contrast – Notch 6	[0-255 / **128** / 1 step]
	12*	Threshold Level – Notch 6	[0-255 / **150** / 1 step]
	13*	Brightness – Notch 5	[0-255 / **128** / 1 step]
	14*	Contrast – Notch 5	[0-255 / **128** / 1 step]
	15*	Threshold Level – Notch 5	[0-255 / **65** / 1 step]
	16*	Brightness – Notch 4	[0-255 / **128** / 1 step]
	17*	Contrast – Notch 4	[0-255 / **128** / 1 step]
	18*	Threshold Level – Notch 4	[0-255 / **30** / 1 step]

SP2	Mode Number		Function and [Setting]
2003	19*	Brightness – Notch 3	[0-255 / **128** / 1 step]
	20*	Contrast – Notch 3	Adjusts the image density for each image density level for Text (OCR) mode when using binary picture processing mode. [0-255 / **128** / 1 step]
	21*	Threshold Level – Notch 3	[0-255 / **17** / 1 step]
	22*	Brightness – Notch 2	[0-255 / **128** / 1 step]
	23*	Contrast – Notch 2	[0-255 / **10** / 1 step]
	24*	Threshold Level – Notch 2	[0-255 / **128** / 1 step]
	25*	Brightness – Notch 1	[0-255 / **128** / 1 step]
	26*	Contrast – Notch 1	[0-255 / **128** / 1 step]
	27*	Threshold Level – Notch 1	[0-255 / **2** / 1 step]
	28*	Independent Dot Erase	Selects the independent dot erase level. *With a larger SP setting, more dots are detected as independent dots and erased.* *If this is "0", independent dot erase is disabled.* [0-7 / **4** / 1 step]
	29*	Unevenness correction	Selects whether the unevenness correction is done. *This function is like an FCI function. If this is "1", the edges of characters in scanned images will be smoothed.* [**0: OFF**, 1: ON]
2004	**[Text/Photo Mode Settings]**		
	1*	MTF Filter Coefficient (Main Scan)	Selects the MTF filter coefficient in the main scan direction for Text/Photo mode. *Select a higher number for a stronger filter.* *If this is "0", the MTF filter is not applied.* [0-13 / **2** / 1 step]
	2*	MTF Filter Coefficient (Sub Scan)	As above, for sub scan [0-13 / **2** / 1 step]
	3*	MTF Filter Strength (Main Scan)	Selects the MTF filter strength in the main scan direction for Text/Photo mode. *Select a higher number for a stronger filter.* [0-7 / **4** / 1 step]
	4*	MTF Filter Strength (Sub Scan)	As above, for sub scan [0-7 / **4** / 1 step]
	5*	Smoothing Filter	Selects the smoothing pattern for Text/Photo mode when using binary picture processing mode. *A larger value could cause moiré to appear in the image.* [0-7 / **0** / 1 step]
	6*	Scanner Gamma	Selects the scanner gamma type for Text/Photo mode when using binary picture processing mode. [0-11 / **6** / 1 step]
	7*	Brightness – Notch 7	Adjusts the image density for each image density level for Text/Photo mode when using binary picture processing mode. [0-255 / **128** / 1 step]

SP2	Mode Number		Function and [Setting]
2004	8*	Contrast – Notch 7	[0-255 / **128** / 1 step]
	9*	Threshold Level – Notch 7	[0-255 / **128** / 1 step]
	10*	Brightness – Notch 6	[0-255 / **128** / 1 step]
	11*	Contrast – Notch 6	[0-255 / **128** / 1 step]
	12*	Threshold Level – Notch 6	[0-255 / **128** / 1 step]
	13*	Brightness – Notch 5	[0-255 / **128** / 1 step]
	14*	Contrast – Notch 5	[0-255 / **128** / 1 step]
	15*	Threshold Level – Notch 5	[0-255 / **128** / 1 step]
	16*	Brightness – Notch 4	[0-255 / **128** / 1 step]
	17*	Contrast – Notch 4	[0-255 / **128** / 1 step]
	18*	Threshold Level – Notch 4	[0-255 / **128** / 1 step]
	19*	Brightness – Notch 3	[0-255 / **128** / 1 step]
	20*	Contrast – Notch 3	[0-255 / **128** / 1 step]
	21*	Threshold Level – Notch 3	[0-255 / **128** / 1 step]
	22*	Brightness – Notch 2	[0-255 / **128** / 1 step]
	23*	Contrast – Notch 2	[0-255 / **128** / 1 step]
	24*	Threshold Level – Notch 2	[0-255 / **128** / 1 step]
	25*	Brightness – Notch 1	[0-255 / **128** / 1 step]
	26*	Contrast – Notch 1	[0-255 / **128** / 1 step]
	27*	Threshold Level – Notch 1	[0-255 / **128** / 1 step]
2005	**[Photo Mode Settings]**		
	1*	MTF Filter Coefficient (Main Scan)	Selects the MTF filter coefficient in the main scan direction for Photo mode. *Select a higher number for a stronger filter.* *If this is "0", the MTF filter is not applied.* [0-13 / **0** / 1 step]
	2*	MTF Filter Coefficient (Sub Scan)	As above, for sub scan [0-13 / **0** / 1 step]
	3*	MTF Filter Strength (Main Scan)	Selects the MTF filter strength in the main scan direction for Photo mode. *Select a higher number for a stronger filter.* [0-7 / **0** / 1 step]
	4*	MTF Filter Strength (Sub Scan)	As above, for sub scan [0-7 / **0** / 1 step]
	5*	Smoothing Filter	Selects the smoothing pattern for Photo mode when using binary picture processing mode. *A larger value could cause moiré to appear in the image.* [0-7 / **7** / 1 step]
	6*	Scanner Gamma	Selects the scanner gamma type for Photo mode when using binary picture processing mode. [0-11 / **7** / 1 step]
	7*	Dither Matrix Filter	Selects the dither matrix type for Photo mode when using binary picture processing mode. [1-11 / **5** / 1 step]
	8*	Brightness – Notch 7	Adjusts the image density for each image density level for Photo mode when using binary picture processing mode. [0-255 / **128** / 1 step]

SP2	Mode Number		Function and [Setting]
2005	9*	Contrast – Notch 7	[0-255 / **128** / 1 step]
	10*	Threshold Level – Notch 7	[0-255 / **128** / 1 step]
	11*	Brightness – Notch 6	[0-255 / **128** / 1 step]
	12*	Contrast – Notch 6	[0-255 / **128** / 1 step]
	13*	Threshold Level – Notch 6	[0-255 / **128** / 1 step]
	14*	Brightness – Notch 5	[0-255 / **128** / 1 step]
	15*	Contrast – Notch 5	[0-255 / **128** / 1 step]
	16*	Threshold Level – Notch	**Not available.** [0-255 / **128** / 1 step]
	17*	Brightness – Notch 4	[0-255 / **128** / 1 step]
	18*	Contrast – Notch 4	Adjusts the image density for each image density level for Photo mode when using binary picture processing mode. [0-255 / **128** / 1 step]
	19*	Threshold Level – Notch 4	[0-255 / **128** / 1 step]
	20*	Brightness – Notch 3	[0-255 / **128** / 1 step]
	21*	Contrast – Notch 3	[0-255 / **128** / 1 step]
	22*	Threshold Level – Notch 3	[0-255 / **128** / 1 step]
	23*	Brightness – Notch 2	[0-255 / **128** / 1 step]
	24*	Contrast – Notch 2	[0-255 / **128** / 1 step]
	25*	Threshold Level – Notch 2	[0-255 / **128** / 1 step]
	26*	Brightness – Notch 1	[0-255 / **128** / 1 step]
	27*	Contrast – Notch 1	[0-255 / **128** / 1 step]
	28*	Threshold Level – Notch 1	[0-255 / **128** / 1 step]
2006	**[Grayscale Mode Settings]**		
	1*	MTF Filter Coefficient	Selects the MTF filter coefficient in the main scan direction when using grayscale processing mode. *Select a higher number for a stronger filter.* *If this is "0", the MTF filter is not applied* [0-15 / **0** / 1 step]
	2*	MTF Filter Coefficient	As above, for sub scan [0-13 / **0** / 1 step]
	3*	MTF Filter Strength (Main Scan)	Selects the MTF filter strength in the main scan direction when using grayscale processing mode. *Select a higher number for a stronger filter.* [0-7 / **0** / 1 step]
	4*	MTF Filter Strength (Sub scan)	As above, for sub scan [0-7 / **0** / 1 step]
	5*	Smoothing Filter	Selects the smoothing pattern when using grayscale processing mode. *A larger value could cause moiré to appear in the image.* [0-7 / **0** / 1 step]
	6*	Scanner Gamma	Selects the scanner gamma type when using grayscale processing mode. [0-6 / **3** / 1 step]

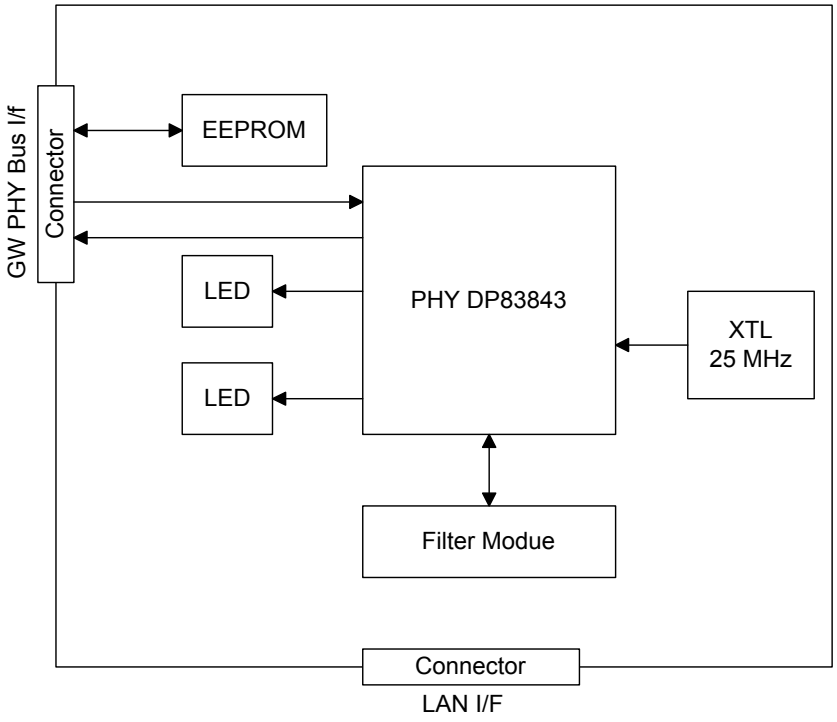
SP2	Mode Number		Function and [Setting]
2006	7*	Brightness – Notch 7	Adjusts the image density for each image density level when using the grayscale processing mode. [0-255 / **98** / 1 step]
	8*	Contrast – Notch 7	[0-255 / **98** / 1 step]
	9*	Threshold Level – Notch 7	**Not available.** [0-255 / **98** / 1 step]
	10*	Brightness – Notch 6	[0-255 / **108** / 1 step]
	11*	Contrast – Notch 6	[0-255 / **108** / 1 step]
	12*	Threshold Level – Notch 6	**Not available.** [0-255 / **108** / 1 step]
	13*	Brightness – Notch 5	[0-255 / **118** / 1 step]
	14*	Contrast – Notch 5	[0-255 / **118** / 1 step]
	15*	Threshold Level – Notch 5	**Not available.** [0-255 / **118** / 1 step]
	16*	Brightness – Notch 4	[0-255 / **128** / 1 step]
	17*	Contrast – Notch 4	[0-255 / **128** / 1 step]
	18*	Threshold Level – Notch 4	**Not available.** [0-255 / **128** / 1 step]
	19*	Brightness – Notch 3	[0-255 / **138** / 1 step]
	20*	Contrast – Notch 3	[0-255 / **138** / 1 step]
	21*	Threshold Level – Notch 3	**Not available.** [0-255 / **138** / 1 step]
	22*	Brightness – Notch 2	[0-255 / **148** / 1 step]
	23*	Contrast – Notch 2	[0-255 / **148** / 1 step]
	24*	Threshold Level – Notch 2	**Not available.** [0-255 / **148** / 1 step]
	25*	Brightness – Notch 1	[0-255 / **158** / 1 step]
	26*	Contrast – Notch 1	[0-255 / **158** / 1 step]
	27*	Threshold Level – Notch 1	**Not available.** [0-255 / **158** / 1 step]
2007	1*	Compression Ratio (Normal image)	Selects the compression ratio for grayscale processing mode. *For a lower compression rate, input a smaller value.* [5-95 / **50** / 1 step]
	2*	Compression Ratio (High Quality image)	[5-95 / **60** / 1 step]
	3*	Compression Ratio (Low Quality image)	[5-95 / **40** / 1 step]

SP9	Mode Number		Function and [Setting]
9001	1	Sysop	Bit switches for debugging. **DFU**
	2	Dapp	
	3	Rapp	
	4	Ui	
	5	Nas	
	6	Miw	
	7	Djm	
	8	Hpim	
	9	mib	

3. DETAILS

3.1 ETHERNET BOARD

3.1.1 ETHERNET BOARD LAYOUT



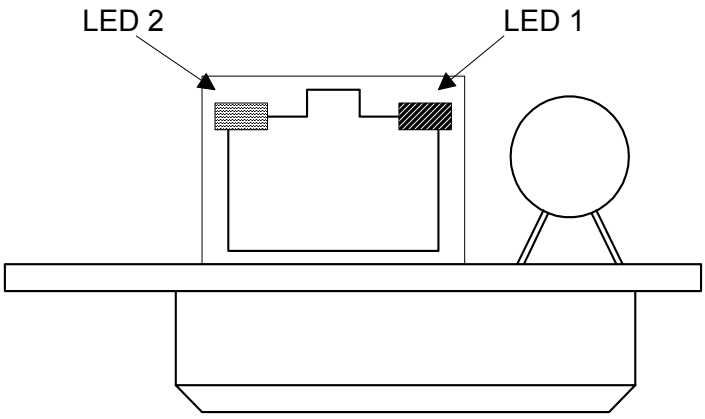
The Ethernet board is provided as a standard feature of this machine.

Function Blocks	Description
PHY (Physical Layer Device)	Completely standardized physical layer device for the functions of each device in the network.
EEPROM	Stores the MAC address.

The physical layer device, the lowest layer of the OSI reference model, refers to the physical components of the network: cables, connectors, and so on. OSI, the *Operating Standard Interface*, is a framework upon which networking standards are arranged. It is commonly diagramed as a layered cake.

3.1.2 ETHERNET BOARD OPERATION

The NIB is a standard IEEE802.3u type which implements 10/100Mbps auto negotiation. System initialization sets the network for 10Mbps/100Mbps.



LED 1 (Green)	Indicates the link status: ON Link Safe OFF Link Fail
LED 2 (Orange)	Indicates the operation mode: ON 100 Mbps mode OFF 10 Mbps mode

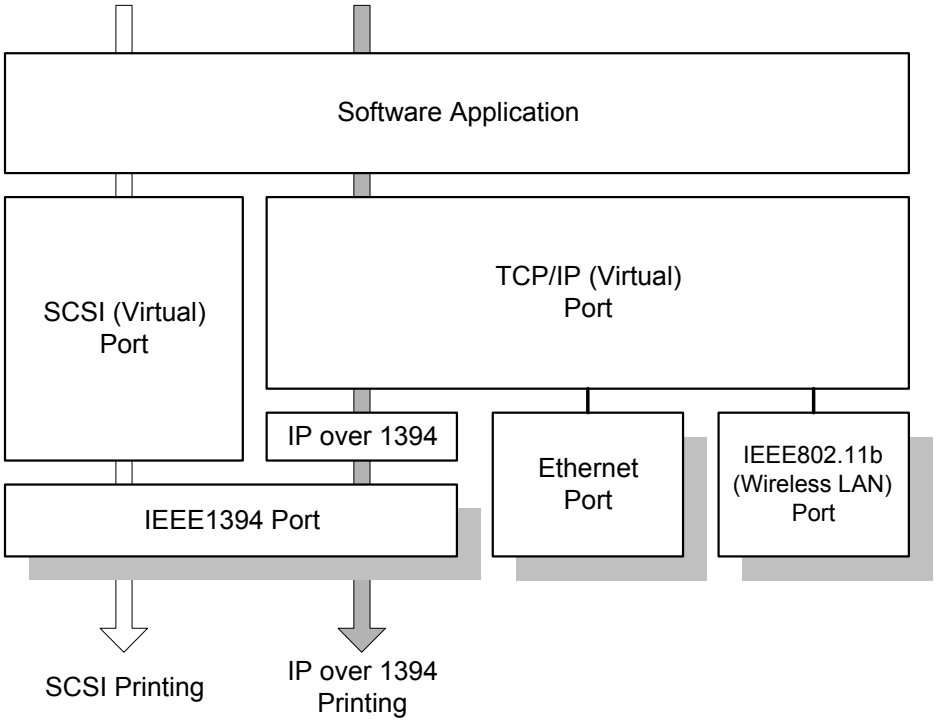
3.2 IEEE1394 BOARD (FIREWIRE)

3.2.1 OVERVIEW

An IEEE1394 interface board is available as an option for this machine to provide high speed connectivity through what is commonly called Firewire or i.LINK (Sony). Some important advantages of Firewire are:

- High speed data transmission at 400 Mbps.
- Easier connectivity (many devices can be connected without a host).
- Devices in a computer can be connected to external devices on a shared bus.

IEEE1394 supports two printing methods: 1) SCSI Print, and 2) IP Over 1394. IP Over 1394 supports printing by setting an IP address, and SCSI supports printing without an IP address.



NOTE: 1) Windows Me and Windows XP support IP over 1394.
2) Windows XP and 2000 support IEEE1394 SCSI printing.

When the host computer powers up, it queries all the devices connected to the bus and assigns each one an address, a process called enumeration. Here are some general features of Firewire:

- Firewire is Plug-and-Play.
- Firewire devices are hot pluggable (they can be plugged while the system is operating).
- Firewire uses 64-bit fixed addressing, based on the IEEE 1212 standard. There are three parts to each packet of information sent by a device over FireWire:
  - 10-bit Bus ID. Used to determine the Firewire bus where the data came from.
  - 6-bit Physical ID. Used to identify the device that sent the data.
  - 48-bit Storage Area. Capable of addressing 256 terabytes of information for each node
- The Bus ID and Physical ID comprise the 16-bit Node ID. 64,000 nodes are allowed on each system.
- Up to 16 hops are allowed (4.5 m/hop) for a total of 72 meters devices are daisy-chained.
- Firewire allows its devices to draw power from the Firewire connection. Two power connectors in the cable can supply power (8 to 40 V, 1.5 amp max.)
- An important element of Firewire is its support of isochronous devices. When isochronous devices are in the isochronous mode, data streams between the device and the host in real time with guaranteed bandwidth and no error correction. Essentially, this means that a device like a digital camcorder can request that the host computer allocate enough bandwidth for the camcorder to send uncompressed video in real time to the computer. The camera can sent data via the Firewire connection in a steady flow to the computer without anything disrupting the process. This is one of the main reasons why 1394 has been widely adopted by the consumer electronics industry.

3.3 USB

3.3.1 SPECIFICATIONS

USB connectivity is provided as an option for this machine.

Interface:	USB 1.1, USB 2.0
Data rates:	480 Mbps (high speed), 12 Mbps (full speed), 1.5 Mbps (low speed) High speed mode is only supported by USB 2.0.

3.3.2 USB 1.1/2.0

USB (Universal Serial Bus) offers simple connectivity for computers, printers, keyboards, and other peripherals. In a USB environment, terminators, device IDs (like SCSI), and DIP switch settings are not necessary.

USB 1.1 provides the following features:

- Plug & Play. As soon as a new device is connected via USB, the operating system recognizes it, and the appropriate driver is installed for it automatically if the driver is available. If the driver is not available, a message prompts the user for the driver disk for immediate installation.
- Hot swapping (cables can be connected and disconnected while the computer and other devices are switched on)
- No terminator or device ID required
- Data rates of 12 Mbps (full speed), and 1.5 Mbps (low speed)
- Common connectors for different devices
- Bi-directional data communication between device and host computer via a 4-byte header and DEVICE ID.

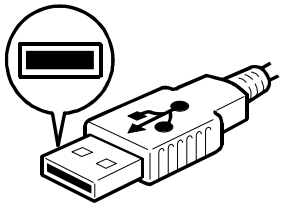
USB 2.0 is an evolution of the USB 1.1 specification. It uses the same cables, connectors, and software interfaces so the user will see no change. It provides an easy-to-use connection to a wide range of products with a maximum data rate of 480Mbps (high speed).

Up to 127 devices can be connected and 6 cascade connections are allowed. Power is supplied from the computer and the maximum cable length is 5 m.

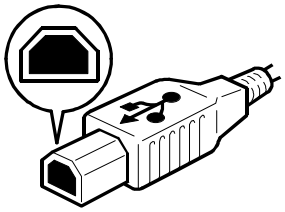
3.3.3 USB CONNECTORS

USB is a serial protocol and a physical link, which transmits all data on a single pair of wires. Another pair provides power to downstream peripherals. The USB standard specifies two types of connectors, type “A” connectors for upstream connection to the host system, and type “B” connectors for downstream connection to the USB device.

Type “A” connector

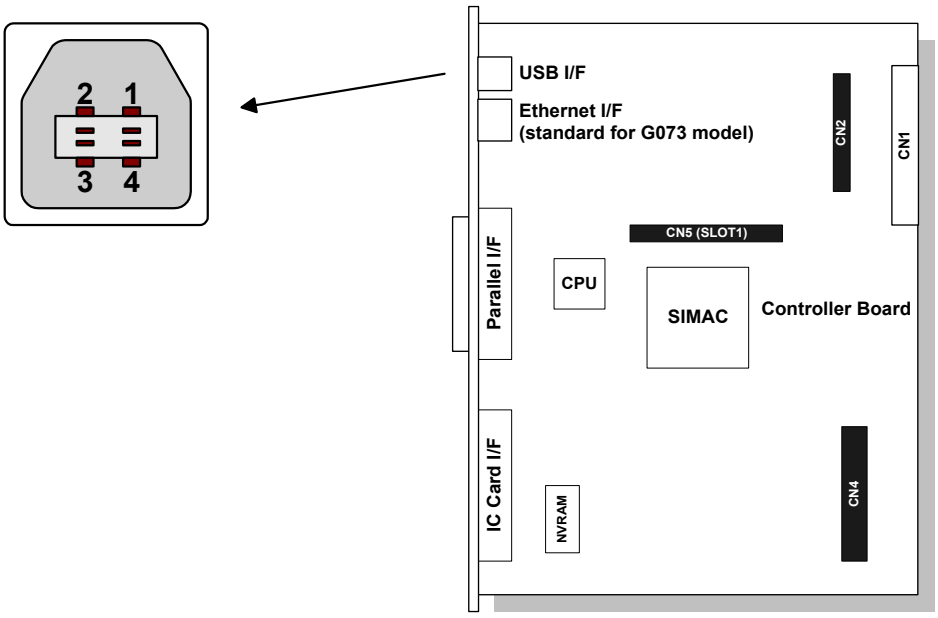


Type “A” connector



3.3.4 PIN ASSIGNMENT

The controller has a type “B” receptacle (CN10).



Pin No.	Signal Description	Wiring Assignment
1	Power	Red
2	Data –	White
3	Data +	Green
4	Power GND	White

3.3.5 REMARKS ABOUT USB

- The machine does not print reports specifically for USB.
- Only one host computer is allowed for the USB connection.
- After starting a job using USB, do not switch the printer off until the job has been completed. When a user cancels a print job, if data transmitted to the printer has not been printed at the time of cancellation, the job will continue to print up to the page where the print job was cancelled
- When the controller board is replaced, the host computer will recognize the machine as a different device.

Related SP Mode

“USB Settings” in the printer engine service mode. Data rates can be adjusted to full speed fixed (12 Mbps). This switch may be used for troubleshooting if there is a data transfer error using the high speed mode (480Mbps).

Data rates can also be adjusted using the UP mode “USB Setting” in the Host Interface in the System menu. This mode can be accessed only when the “Enter”, “Escape”, then “Menu” keys are pressed to enter the UP mode.

3.4 IEEE 802.11B (WIRELESS LAN)

3.4.1 SPECIFICATIONS

The IEEE 802.11b wireless LAN interface card is available as an option for this machine.

A wireless LAN is a flexible data communication system used to extend or replace a wired LAN. Wireless LAN employs radio frequency technology to transmit and receive data over the air and minimize the need for wired connections.

- With wireless LANs, users can access information on a network without looking for a place to plug into the network.
- Network managers can set up or expand networks without installing or moving wires.
- Most wireless LANs can be integrated into existing wired networks. Once installed, the network treats wireless nodes like any other physically wired network component.
- Flexibility and mobility make wireless LANs both effective extensions of and attractive alternatives to wired networks.

Standard applied:	IEEE802.11b	
Data transmission rates:	Speed	Distance
	11 Mbps	140 m (153 yd.)
	5.5 Mbps	200 m (219 yd.)
	2 Mbps	270 m (295 yd.)
	1 Mbps	400 m (437 yd.)
Network protocols:	TCP/IP, Apple Talk, NetBEUI, IPX/SPX	
Bandwidth:	2.4GHz (divided over 14 channels, 2400 to 2497 MHz for each channel)	

NOTE: The wireless LAN cannot be active at the same time as the Ethernet LAN. The following user tool setting determines which LAN is active: System Settings – Interface Settings – Network - LAN Type.

LED Indicators

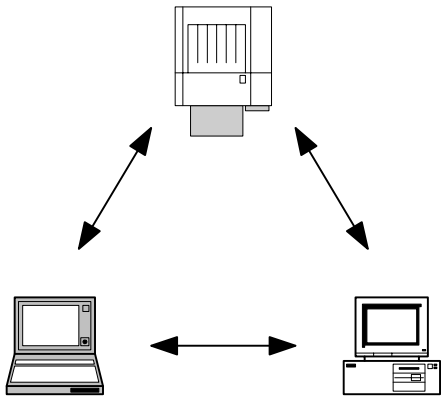
LED	Description	ON	OFF
LED 1 (Green)	Link Status	Linked	No Link
LED 2 (Orange)	Power Distribution	Power On	Power Off

3.4.2 TRANSMISSION MODES

Wireless communication has two modes: 1) ad hoc mode, and 2) infrastructure mode.

Ad Hoc Mode

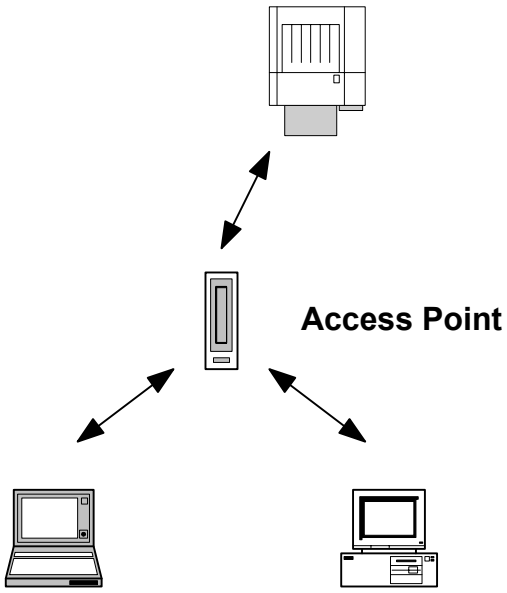
The ad hoc mode allows communication between each device (station) in a simple peer-to-peer network. In this mode, all devices must use the same channel to communicate. In this machine, the default transmission mode is ad hoc mode and the default channel is 11. First, set up the machine in ad hoc mode and program the necessary settings, even if the machine will be used in the infrastructure mode.



To switch between ad hoc and infrastructure modes, use the following user tool: Host Interface Menu - IEEE802.11b - Comm Mode

Infrastructure Mode

The infrastructure mode allows communication between each computer and the printer via an access point equipped with an antenna and wired into the network. This arrangement is used in more complex topologies. The wireless LAN client must use the same SSID (Service Set ID) as the access point in order to communicate.



3.4.3 SECURITY FEATURES

SSID (Service Set ID)
The SSID is used by the access point to recognize the client and allow access to the network. Only clients that share the same SSID with the access point can access the network.

NOTE: 1) If the SSID is not set, clients connect to the nearest access point.
2) The SSID can be set using the web status monitor or telnet.

Using the SSID in Ad hoc mode

When the SSID is used in ad hoc mode and nothing is set, the machine automatically uses “ASSID” as the SSID. In such a case, “ASSID” must also be set at the client.

NOTE: SSID in ad hoc mode is sometimes called “Network Name.”

Some devices automatically change from ad hoc mode to infrastructure mode when the same SSID is used in ad hoc mode and infrastructure mode. In such a case, to use the device in ad hoc mode, use a specified SSID in infrastructure mode and use “ASSID” in the ad hoc mode.

WEP (Wired Equivalent Privacy)
WEP is a coding system designed to protect wireless data transmission. In order to unlock encoded data, the same WEP key is required on the receiving side. There are 64 bit and 128 bit WEP keys. However, this machine supports only 64 bit WEP.

NOTE: The WEP key can be set using the Web Status Monitor or Telnet.

MAC Address
When the infrastructure mode is used, access to the network can also be limited at the access points using the MAC address. This setting may not be available with some types of access points.

3.4.4 WIRELESS LAN TROUBLESHOOTING NOTES

Communication Status

Wireless LAN communication status can be checked with the UP mode “W.LAN Signal” in the Maintenance menu. This can also be checked using the Web Status Monitor or Telnet.
The status is described on a simple number scale.

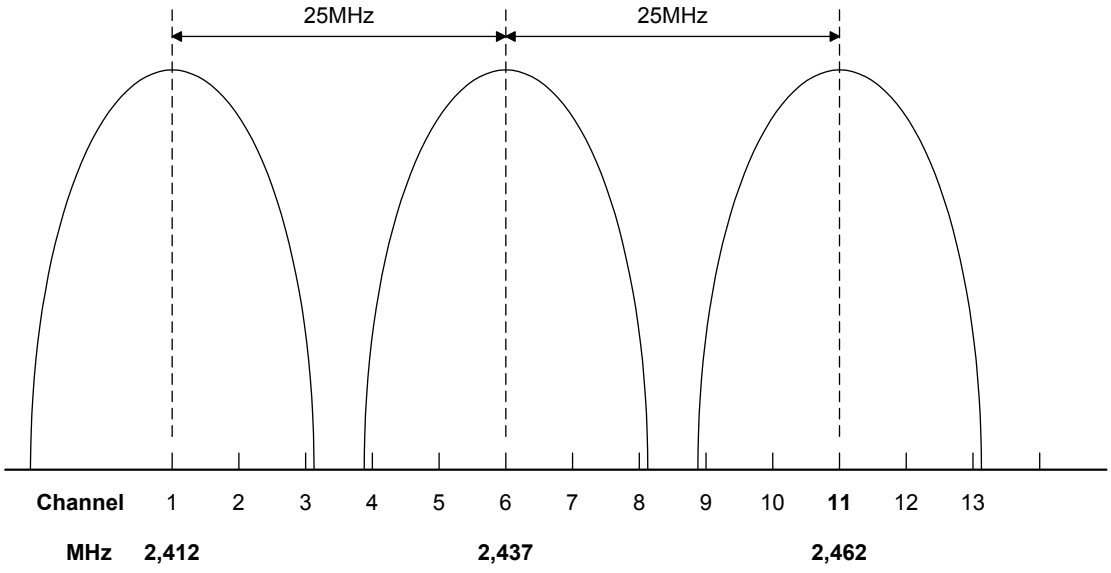
Status Display	Communication Status
Good	76 ~ 100
Fair	41 ~ 75
Poor	21 ~ 40
Unavailable	0 ~ 20

NOTE: Communication status can be measured only when the infrastructure mode is being used.

Channel Settings

If a communication error occurs because of electrical noise, interference with other electrical devices, etc., you may have to change the channel settings.

To avoid interference with neighboring channels, it is recommended to change by 3 channels. For example, if there are problems using channel 11 (default), try using channel 8.



Troubleshooting Procedure

If there are problems using the wireless LAN, check the following.

1) Check the LED indicator on the wireless LAN card.
2) Check if “IEEE802.11b” is selected in the following user tool: Host Interface menu - Network Setup - LAN Type.
3) Check if the channel settings are correct.
4) Check if the SSID and WEP are correctly set.

If infrastructure mode is being used,

1) Check if the MAC address is properly set.
2) Check the communication status.
   If the communication status is poor, bring the machine closer to the access point, or check for any obstructions between the machine and the access point.
   If the problem cannot be solved, try changing the channel setting.

3.5 BLUETOOTH

3.5.1 SPECIFICATIONS

Bluetooth wireless provides radio links between mobile computers, mobile phones and other portable handheld devices.

Bluetooth contains the following features.

- Cheaper compared to the IEEE802.11b wireless LAN.
- Many protocols for infrared transmission (IrDA) can be used with Bluetooth.
- A Bluetooth device can connect to other Bluetooth devices without any settings.

Standard applied: Bluetooth 1.1 (Bluetooth Special Interest Group)
Data transfer rates: 1 Mbps
Bandwidth: 2.4GHz Frequency Hopping Spread Spectrum (FHSS)

Piconet. Bluetooth devices communicate with each other device in the ad hoc mode. This network is called a "Piconet". A Piconet may contain a maximum of 8 Bluetooth devices.

There is one master device and seven slave devices in a Piconet. The master device controls the hopping frequency and timing, as well as storing the ID codes of the slave devices. The master and slave devices can be swapped. Once the master device leaves the Piconet, a slave device becomes the new master.

Machines with the Bluetooth option become potential slave devices to connect to the PC.

FHSS (Frequency Hopping Spread Spectrum). The Bluetooth device divides 2402 to 2480 MHz into 79 channels of 1 MHz width, and changes the channel 1600 times per second. If other devices in the LAN are using the same radio band, Bluetooth can avoid interference from the other devices.

3.5.2 BLUETOOTH PROFILES

A Bluetooth device will not operate if it is located to close another Bluetooth device. However, the Bluetooth device should support the protocols to communicate with each other. There are many types of Bluetooth and service protocols. These are listed below.

Here are 14 profiles for Bluetooth as follows.

- Generic Access Profile
- Service Discovery Profile
- Cordless Telephony Profile
- Intercom Profile
- Serial Port Profile
- Headset Profile
- Dial-up Networking Profile
- Fax Profile
- LAN Access Profile
- Generic Object Exchange Profile
- Object Push Profile
- File Transfer Profile
- Synchronization Profile
- Hardcopy Cable Replacement Profile

Serial Port Profile (SPP) and Hardcopy Cable Replacement Profile (HCRP) are used for the printer products.

SPP is used is place of the serial port, while HCRP is used in place of the parallel port.

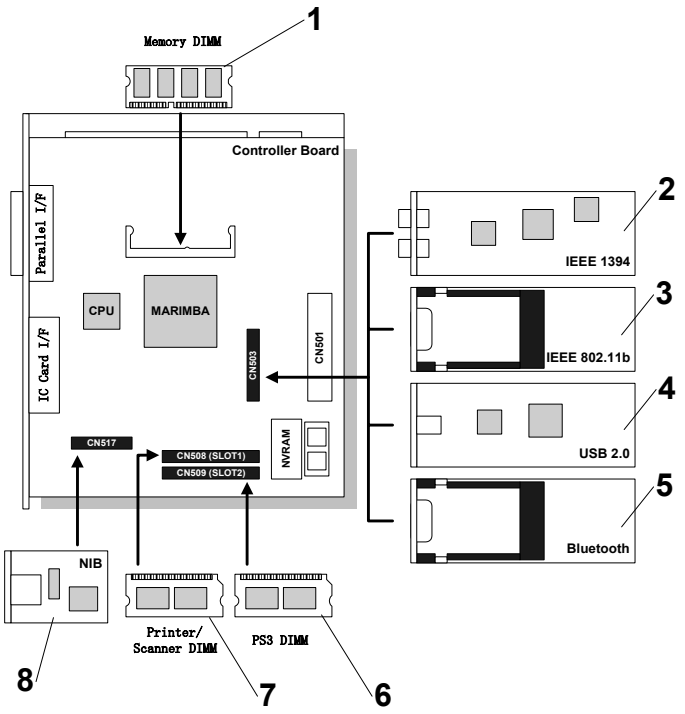
3.5.3 BLUETOOTH SECURITY FEATURES

Public and Private Mode. The PC can browse Bluetooth devices. The machine's default is public mode. The PC cannot browse the machine if it has been changed to private mode.

PIN Code (Personal Identification Number). When the PIN code is used, the PC connects to the device that sent the PIN code. The PIN code is a 4 digit number. This machine uses the last four digits of the machine's serial number. It cannot be changed.

SPECIFICATIONS

1. SYSTEM COMPONENTS



No.	Item	Machine Code	Remarks
1	Memory 128 MB	G331	
2	IEEE 1394	G336	Used with machines
3	IEEE 802.11b Wireless LAN	B515	Used with machines
4	USB 2.0	B525-01	
5	Bluetooth	G354-04	Used with machines
6	PostScript3	G354-17	
7	Printer/Scanner Module (ROM DIMM)	B654	Provided with NIB
8	NIB	B525-03	

NOTE: Of the optional host interface cards (2, 3, 4, and 5) only one can be installed.

2. LED INDICATORS

LED	Description	On	Off
LED1 (Green)	Link status	Link success	Link failure
LED2 (Orange)	Power distribution	Power on	Power off

3. PRINTER SPECIFICATIONS

Printing Speed:	Maximum 35 ppm (A4/LT LEF): B135 model Maximum 45 ppm (A4/LT LEF): B138 model
Printer Languages:	PCL6/PCL5e PostScript 3 (option) RPCS (Refined Printing Command Stream) - an original Ricoh PDL)
Resolution:	600 dpi (PCL 6/PCL5e/PS3/RPCS) 300 dpi (PCL5e/PS3/RPCS) 200 dpi (RPCS)
Resident Fonts:	PCL: 35 Intellifonts 10 True Type fonts PS3: 136 fonts (24 Type 2 fonts, 112 Type 14 fonts)
Host Interfaces:	Bi-directional IEEE1284 parallel x 1 (Standard) Ethernet (100 Base-TX/10 Base-T) (Option) IEEE1394 with SCSI Print and IP Over 1394 (Option) IEEE 802.11b Wireless LAN (Option) Bluetooth (Option) USB 2.0 (Option)
Network Protocols:	TCP/IP, IPX/SPX, NetBEUI, Apple Talk
Memory:	Maximum 192 MB (Standard 64 MB + 128 MB optional DIMM)

4. USB SPECIFICATIONS

USB connectivity is provided as an option for this machine.

Interface	USB 1.1, USB 2.0
Data rates	480 Mbps (high speed), 12 Mbps (full speed), 1.5 Mbps (low speed)
	High speed mode is only supported by USB 2.0.

5. IEEE 802.11B SPECIFICATIONS

Standard applied	IEEE802.11b	
Data transmission rates	Speed	Distance
	11 Mbps	140 m (153 yd.)
	5.5 Mbps	200 m (219 yd.)
	2 Mbps	270 m (295 yd.)
	1 Mbps	400 m (437 yd.)
Network protocols	TCP/IP, Apple Talk, NetBEUI, IPX/SPX	
Bandwidth	2.4GHz (divided over 14 channels, 2400 to 2497 MHz for each channel)	

6. SCANNER SPECIFICATIONS

Standard Scanner Resolution:	Main scan/Sub scan 600 dpi	
Available scanning Resolution Range:	100 ~ 1200 dpi;	When used as a Network TWAIN scanner.
	100, 200, 300, 400, 600 dpi;	When used as a network delivery scanner or for sending e-mail
Grayscales:	8 bits/pixel	
Scanning Speed Throughput:	0.8 sec./sheet (A4 LEF, 200 dpi without binary compression) 49 spm (A4 LEF, 200 dpi binary, MH)	
Interface:	Ethernet (100 Base-TX/10 Base-T for TCP/IP) IEEE 1394/IP Over IEEE 802.11b Wireless LAN	
Compression Method:	MH, MR, MMR (Binary Picture Processing) JPEG (Grayscale Processing)	
Video Memory Capacity:	36.6 MB	
Image Storage Capacity:	Number of originals per file: Maximum 2,000 pages Maximum of files: 3000 files	

7. SOFTWARE ACCESSORIES

7.1 PRINTER

The printer drivers and utility software are provided on one CD-ROM. An auto-run installer allows you to select which components to install.

Printer Drivers

Printer Language	Windows 95/98/ME	Windows NT4.0	Windows 2000	Windows XP	Macintosh
PCL 6	Yes	Yes	Yes	Yes	No
PCL 5e	Yes	Yes	Yes	Yes	No
PS3	Yes	Yes	Yes	Yes	Yes
RPCS	Yes	Yes	Yes	Yes	No

NOTE: 1) The printer drivers for Windows NT 4.0 are only for the Intel x86 platform. There is no Windows NT 4.0 printer driver for the PowerPC, Alpha, or MIPS platforms.
2) The PS3 drivers are all genuine AdobePS drivers, except for Windows 2000, which uses Microsoft PS. A PPD file for each operating system is provided with the driver.

Utility Software

Software	Description
Agfa Monotype Font Manager 2000 (Win 95/98/ME, NT4, 2000)	A font management utility with screen fonts for the printer.
SmartNetMonitor for Admin (Win 95/98/ME, NT4, 2000, XP)	A printer management utility for network administrators. NIB setup utilities are also available.
SmartNetMonitor for Client (Win 95/98/ME, NT4, 2000, XP)	A printer management utility for client users. Peer-to-peer printing utility and parallel/recovery printing functions are included.
1394 Utility (Win 2000)	A utility for removal IEEE 1394 printers.
LAN-Fax M3 Driver (Win 95/98/ME, NT4, 2000, XP)	This driver allows use of the LAN-Fax functions by installing the LAN-Fax driver, Address Book, and LAN-Fax Cover Sheet Editor.
Printer Utility for Mac	This software provides several convenient functions for printing from Macintosh clients.
USB Printing Support	A utility for the USB 2.0 board. A computer running Windows 98 SE or Windows ME requires installation of this utility.
Acrobat Reader	A utility that allows reading PDF files.

7.2 SCANNER

The scanner driver and utility software are provided on one CD-ROM.

Scanner Driver

- Network Twain Driver for Win95/98/ME/NT3.51/NT4.0/2000/XP

Scanner Utilities

- Scan Router V2 Lite for Win95/98/ME/NT4.0/2000/XP
- Desk Top Binder V2 Lite for Win95/98/ME/NT4.0/2000/XP

B653
FAX OPTION

FAX OPTION B653

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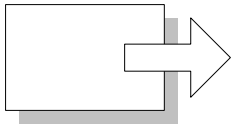
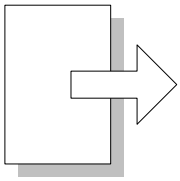
Conventions in this Manual

This manual uses several symbols.

Symbol	What it means
☛	Refer to section number
CT	See Core Tech Manual for details
	Screw
	Connector
	E-ring
	Clip ring



Short Edge Feed (SEF)



Long Edge Feed (LEF)

1. INSTALLATION

1.1 CAUTIONS AND WARNINGS

⚠WARNING

1. **Never install telephone writing during a lightning storm.**
2. **Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.**
3. **Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.**
4. **Use caution when installing or modifying telephone lines.**
5. **Avoid using a telephone (other than a cordless type) during an electrical storm. There may be remote risk of electric shock from lightning.**
6. **Do not use a telephone or cellular phone to report a gas leak in the vicinity of the leak.**

⚠CAUTION

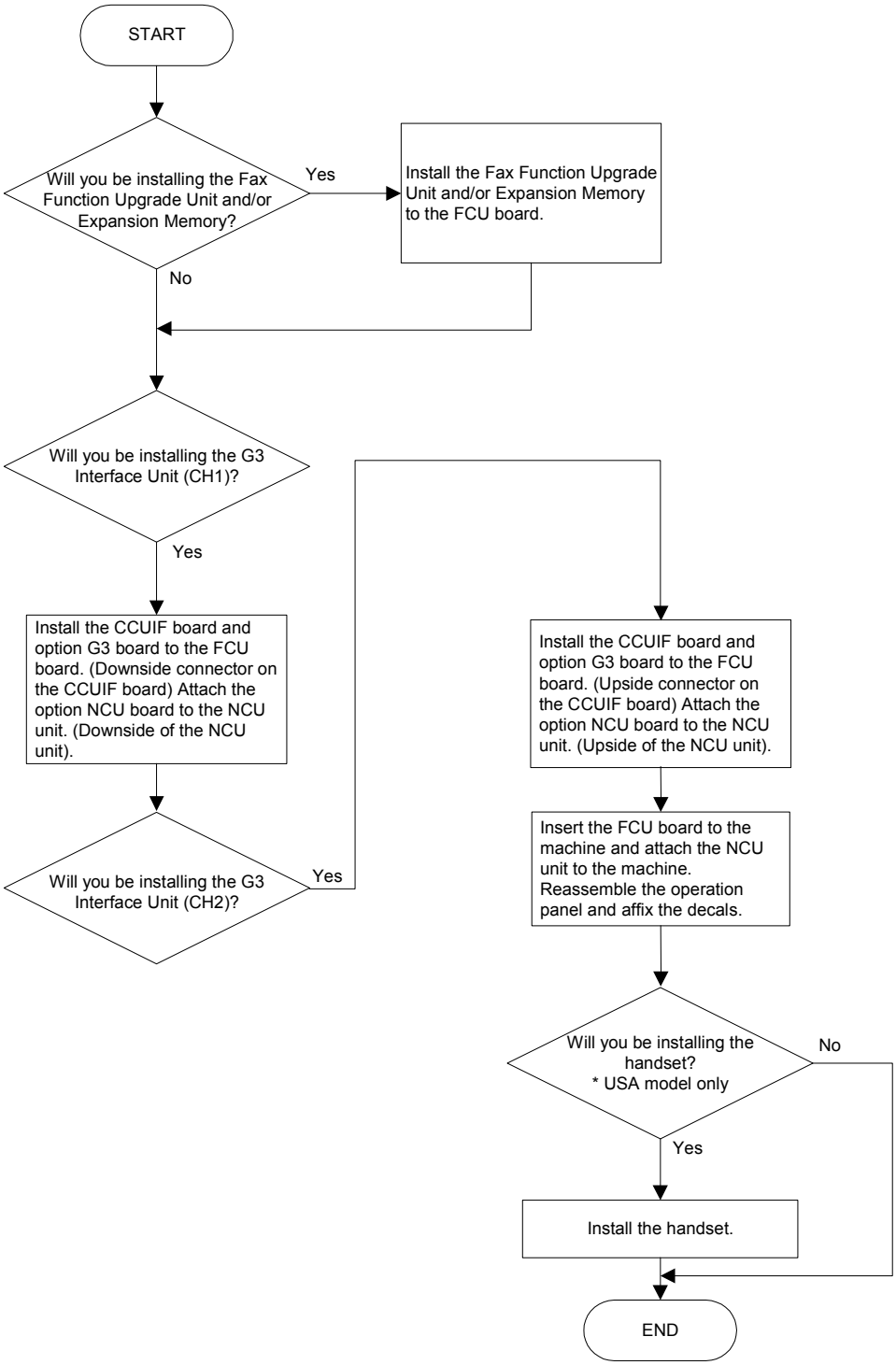
1. **Before installing the fax unit, switch off the main switch, and disconnect the power cord.**
2. **The fax unit contains a lithium battery. The danger of explosion exists if a battery of this type is incorrectly replaced. Replace only with the same or an equivalent type recommended by the manufacture. Discard batteries in accordance with the manufacture's instructions and local regulations.**

NOTE FOR AUSTRALIA

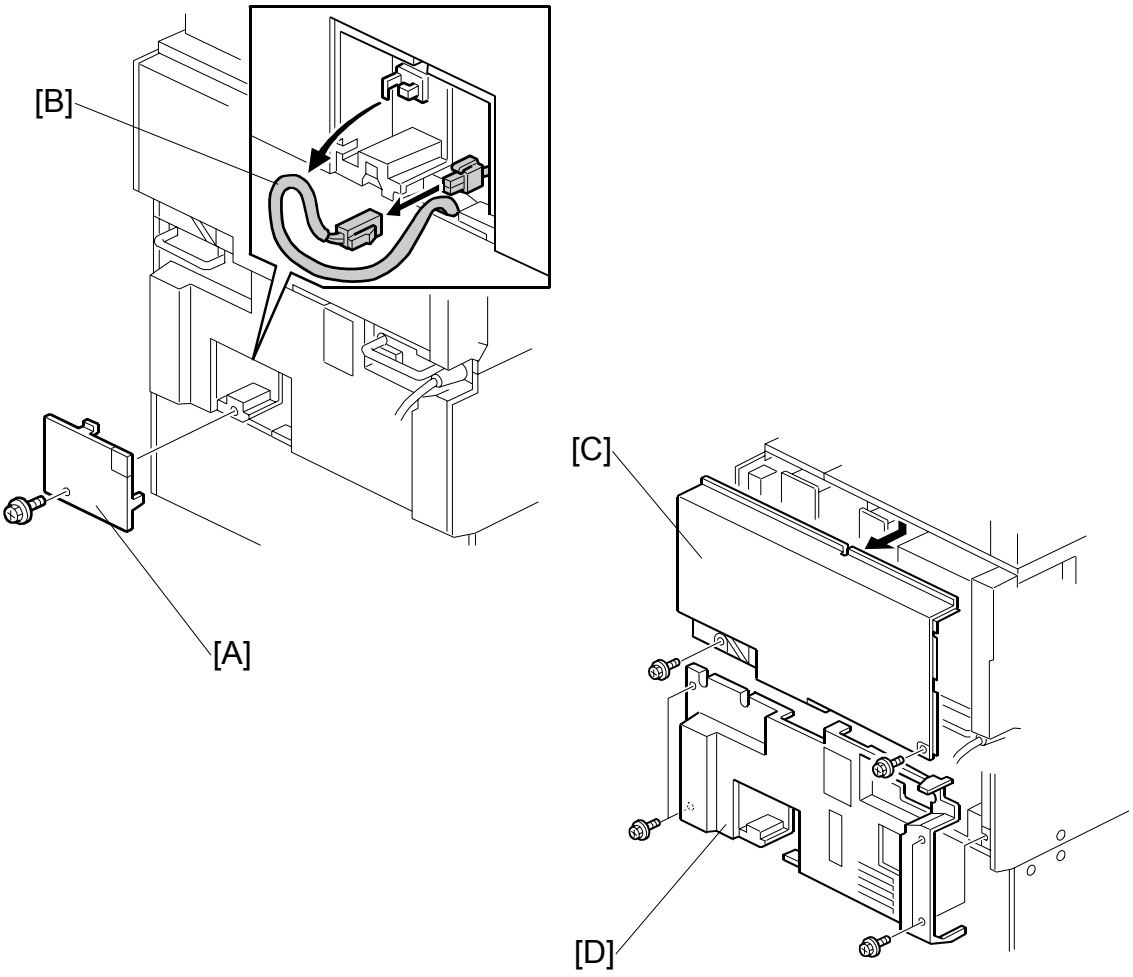
Unit must be connected to Telecommunication Network through a line cord which meets the requirements of ACA Technical Standard TS008.

1.2 PROCEDURE FLOWCHART

Before installing the fax unit and/or fax options, refer to the following flow chart.



1.3 FAX OPTION TYPE 2045

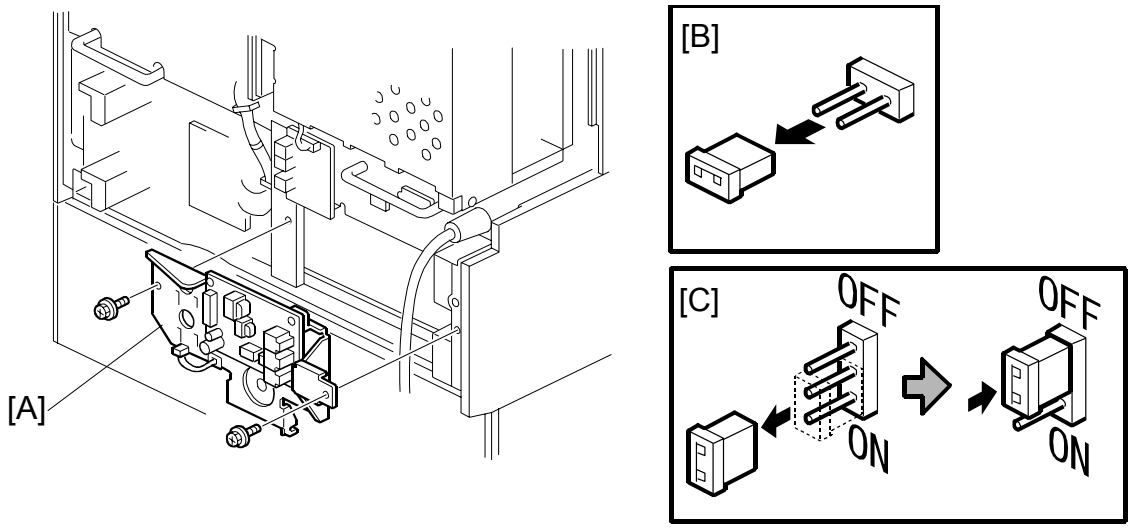


⚠CAUTION

Before installing this option, do the following:

1. **If there is a printer option in the machine, print out all data in the printer buffer.**
2. **Press the operation switch to be the standby mode. Make sure the power LED is not lit then, turn off the main switch and disconnect the power cord and the network cable.**

1. Remove the small cover [A] (🖉 x 1) and connector [B].
2. Remove the rear upper cover [C] (🖉 x 2).
3. Remove the rear lower cover [D] (🖉 x 4).

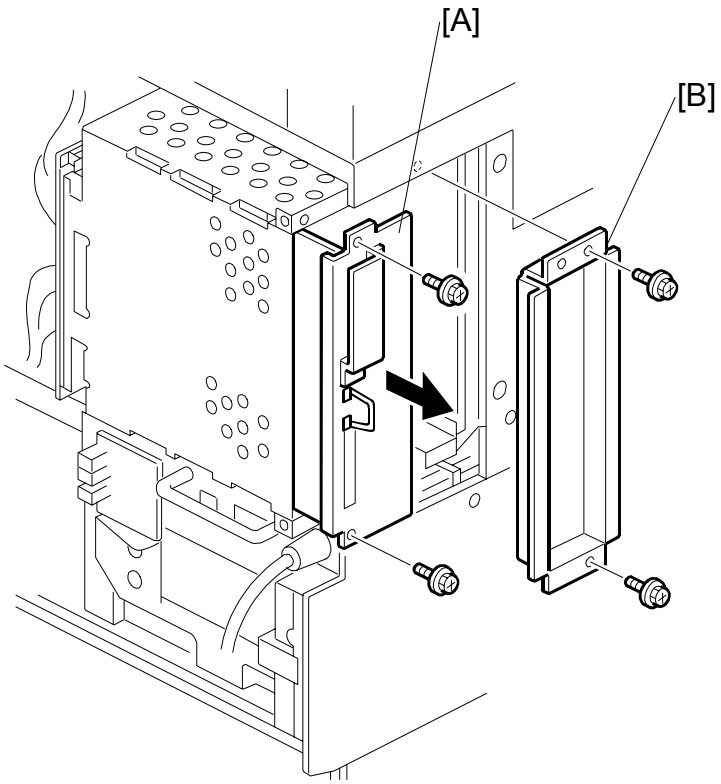


4. Attach the NCU unit [A] (☞ x 2).
   NOTE: If a G3 Interface Unit type 2045 has to been installed, attach the additional NCU boards to the NCU unit before attaching the NCU unit to the machine. Refer to the Installation Procedure for the G3 Interface Unit Type 2045.
5. Set up the jumper switches [B and C] on the NCU.
   NOTE: European/Asian models only (non-U.S. version: B547-27)

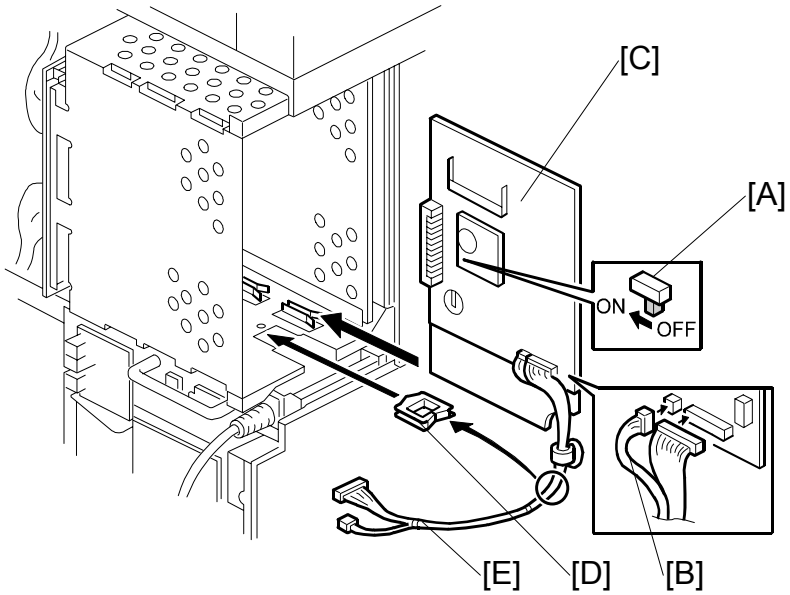
Region/Country	**TB1** [B]	**TB2** [C]
Hong Kong	OFF	OFF
Hungary	ON	ON
Poland	ON	OFF
Czech Republic	ON	OFF
Israel	ON	ON
South Africa	ON	ON
Regions/countries where the CTR21 standard is valid	ON	ON
Other	ON	OFF

TB1 ON: Keep the jumper attached. OFF: Remove the jumper.
TB2 ON: Keep the jumper at ON. OFF: Move the jumper to OFF.

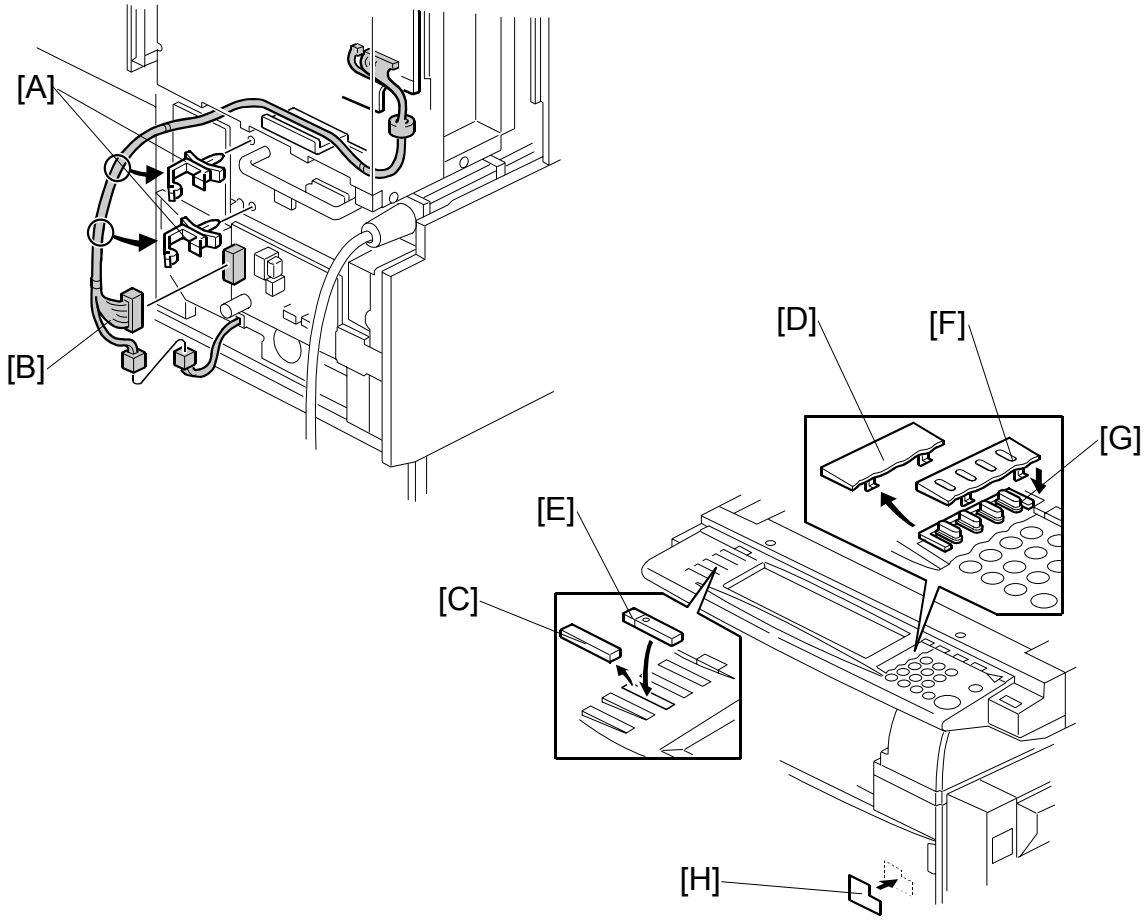
NOTE: You must change the country code in both system switch 0F and NCU parameter CC (service function 08-0).



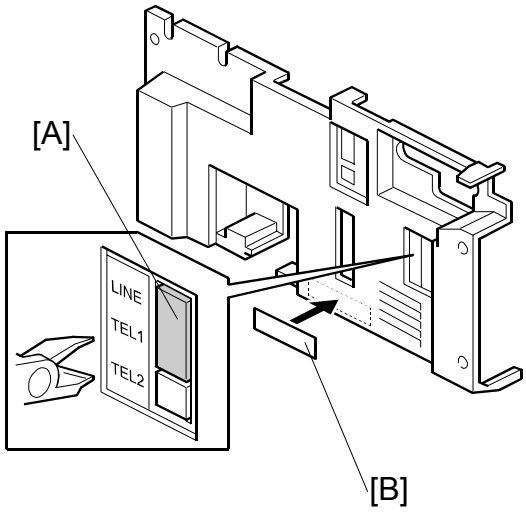
6. Remove the controller unit [A] (☞ x 2)
7. Remove the FCU cover [B] (☞ x 2)

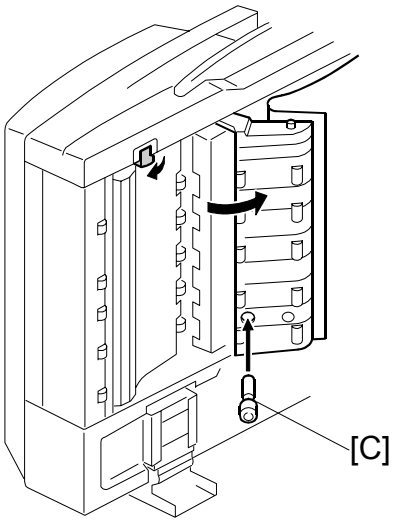


8. Turn on the battery switch (SW1) [A] On the MBU board.
9. Connect harness [B] to the FCU board (☞ x 2).
10. Slide the FCU board [C] into the right slot of the expansion box.
    If any following options will be installed at the same time, connect the option board to the FCU board before sliding the FCU board into the expansion box. Refer to the Installation Procedure of each option.
    - Fax Function Upgrade Option Type 185 unit.)
    - G3 Interface Unit Type 2045
11. Attach the edge clamp [D] to the bottom of the expansion box, then clamp the FCU harness [E].



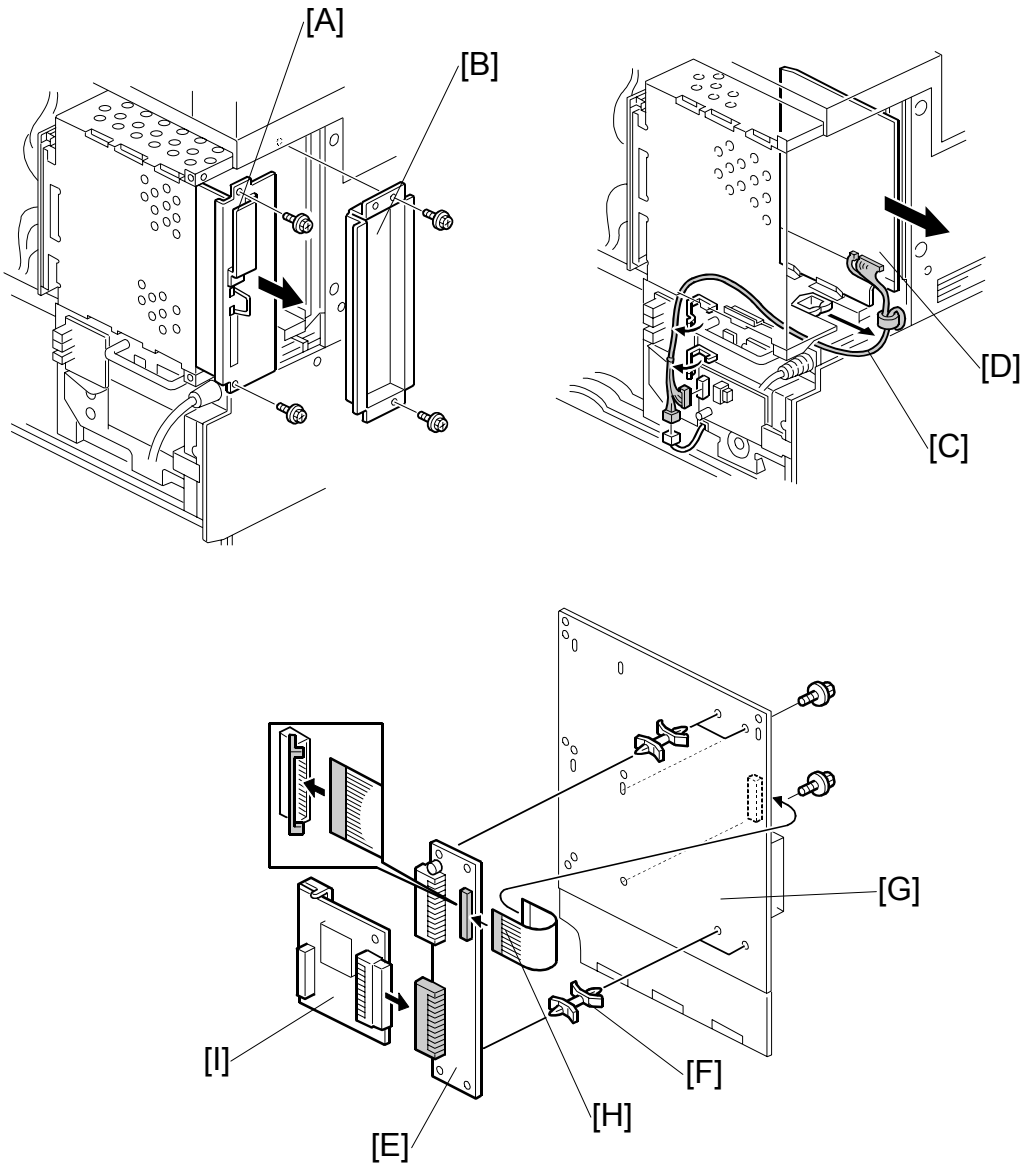
12. Attach the harness clamps [A] and connect the FCU harness [B] to the NCU board. Then clamp the harness as shown.
13. Reattach the FCU cover and the controller unit.
14. Remove parts [C] and [D], then install parts [E], [F] and [G]. Affix the super G3 decal [H] on the front cover as shown.



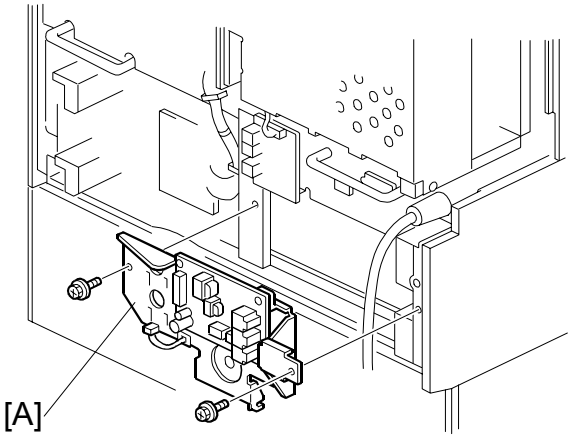


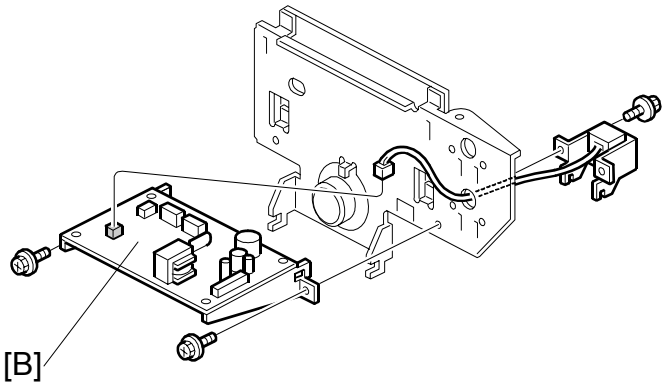
15. Cut away the telephone connector cover [A].
16. Attach the FCC decal and the serial number decal [B] to the rear cover as shown.
17. Reattach the covers.
18. If the ARDF is installed, raise the ARDF and insert the stamp cartridge [C].
19. Connect the telephone line to the “LINE” jack at the rear of the machine.
    NOTE: The copier must be connected to a properly - grounded socket outlet.
20. Plug in the machine and turn on the main power switch.
21. When you switch on the machine for the first time with the new fax option installed, a message will tell you that a fax function error has occurred and prompt you to initialize the data. Press “Execute” to initialize the data.
22. Be sure to set the clock (date and time).
23. Enter service mode and program the serial number into the fax unit (SP-3-102-000). The serial number can be found on the serial number label (attached to the machine in step 16).

1.4 G3 INTERFACE UNIT TYPE 2045

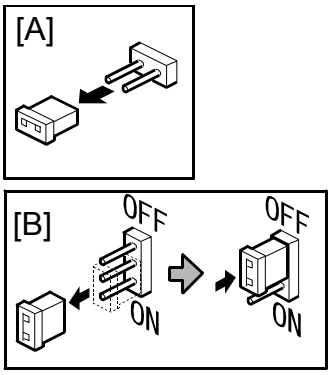


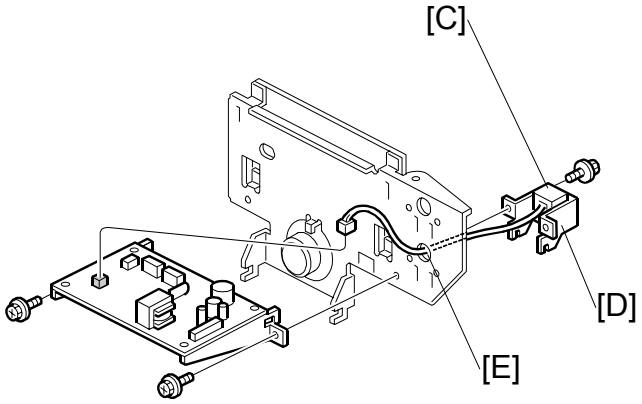
1. Remove the covers. (☛1.3)
2. Remove the controller unit [A] (☞ x 2).
3. Remove the FCU cover [B] (☞ x 2).
4. Remove the FCU harness [C] and slide out the FCU board [D].
5. Attach the four standoffs [F] to the CCUIF board [E].
6. Attach the CCUIF board to the FCU board [G].
7. Attach the flat cable [H] to the FCU board and the CCUIF board.
8. Attach the option G3 board [I] to the lower connector of the CCUIF board (☞ x 2).





9. Remove the NCU unit [A] (☞ x 2).
10. Attach the Option NCU unit [B] to the lower of the reverse side of the NCU unit (☞ x 2) as shown.





11. Set up the jumper switches [A and B] on the NCU.

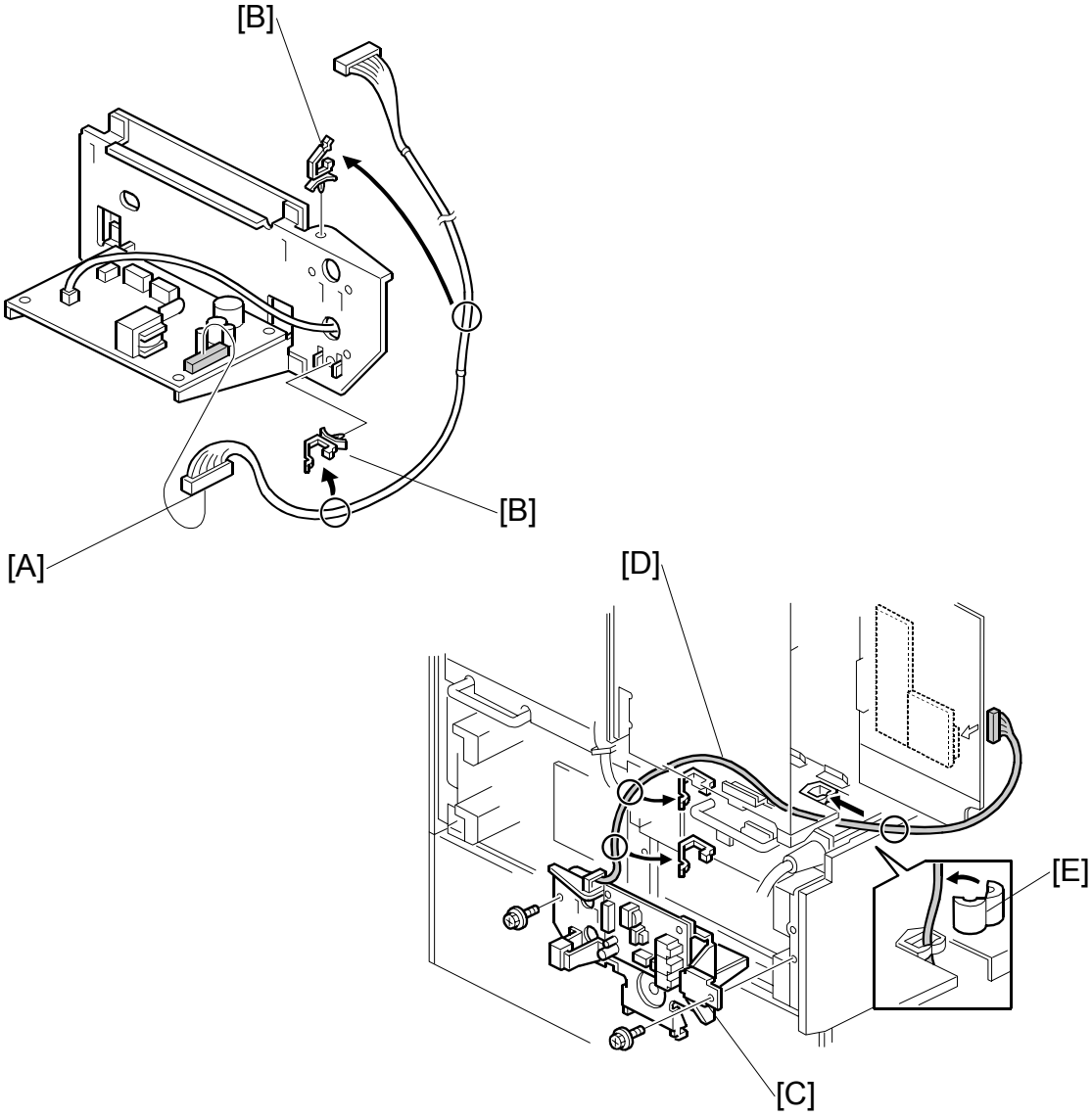
NOTE: European/Asian models only (non-U.S. version: B591-27)

Region/Country	**TB1** [A]	**TB2** [B]
Hong Kong	OFF	OFF
Hungary	ON	ON
Poland	ON	OFF
Czech Republic	ON	OFF
Israel	ON	ON
South Africa	ON	ON
Regions/countries where the CTR21 standard is valid	ON	ON
Other	ON	OFF

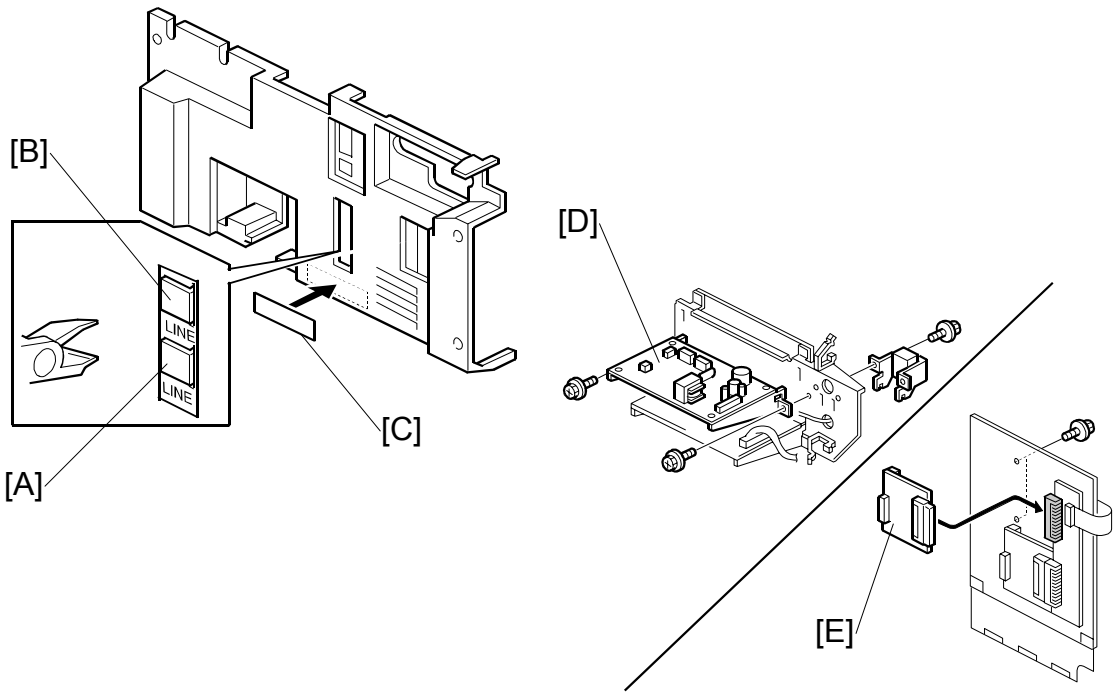
TB1 ON: Keep the jumper attached. OFF: Remove the jumper.
TB2 ON: Keep the jumper at ON. OFF: Move the jumper to OFF.

NOTE: You must change the country code in both system switch 0F and NCU parameter CC (service function 08-0).

12. Attach the telephone jack [C] to the bracket [D]
13. Run the harness through the lower hole [E] in the NCU bracket, then secure the telephone jack bracket to the NCU unit (🔩 x 1).



14. Connect harness [A] to the option NCU board
15. Attach the harness clamps [B] (x2) then clamp the harness.
16. Attach the NCU unit [C] to the machine (🔩 x 2), and slide the FCU board into the machine.
17. Run harness [D] through the holes.
18. Attach the ferrite core [E] to the harness.



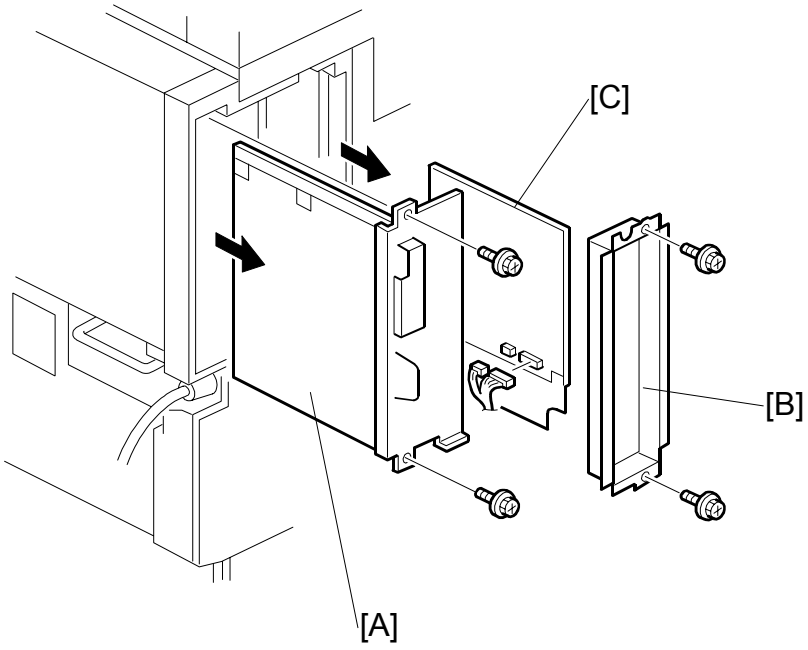
19. Cut away the small cover [A] for the first option G3 unit.
    NOTE: If there is another G3 option unit, cut away the upper small cover [B].
20. Attach the FCC decal [C] to the rear cover.
21. Reattach the covers.
    NOTE: Attach the second option NCU board [D] and the second option G3 board [E] to the upper side as shown.
22. Connect the telephone line to the LINE2 jack, then plug in the machine and turn the main switch on.
    NOTE: The copier must be connected to a properly - grounded socket outlet.
23. Enter service mode. Set bit 1 of communication switch 16 to “1” for the first option G3 unit. Set bit 3 of communication switch 16 to “1” for the second option G3 unit. After that turn the main switch off and on.
24. Print the system parameter list and ensure that “SG3-V34” is listed as an option.
25. Set up and program the items required for PSTN-2 communications.

1.4.1 FAX FUNCTION UPGRADE BOARD A892

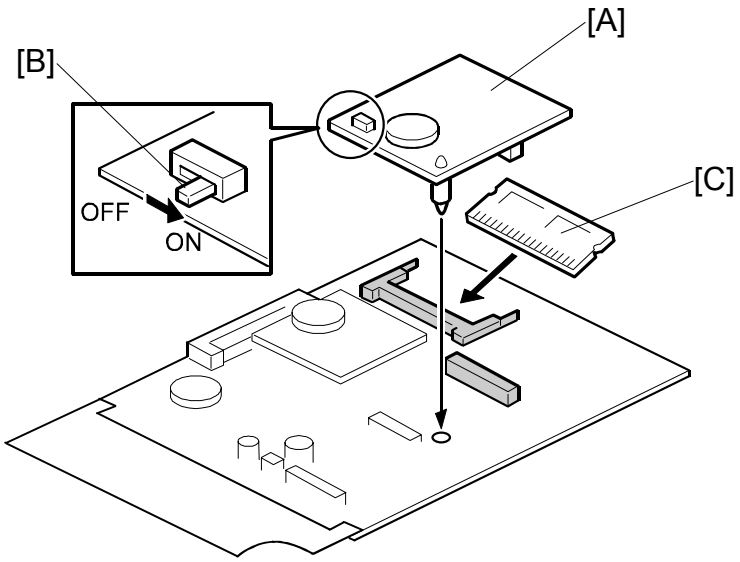
⚠CAUTION

Before installing this option, do the following:

1. **Print out all messages stored in the memory, the lists of user-programmed items, and the system parameter list.**
2. **If there is a printer option in the machine, print out all data in the printer buffer.**
3. **Turn off the main switch and disconnect the power cord, the telephone line, and the STP cable.**



1. Remove the controller unit [A] (☞ x 2).
2. Remove the FCU cover [B] (☞ x 2).
3. Remove the FCU harness and slide out the FCU board [C]



1. Attach the FAX function upgrade board [A].
2. Turn on the battery switch [B].
   NOTE: If installing the FAX unit at the same time, be sure to turn on the FCU board battery switch.
6. Install the memory [C].
7. Re-install the FCU assembly into the expansion box.
8. Plug in the machine and turn on the main switch.
9. When you switch on the machine for the first time with the new fax option installed, a message will tell you that a fax function error has occurred and prompt you to initialize the data. Press “Execute” to initialize the data.
10. Press the “Fax” key and ensure the Fax LED lights.
    At this time, the following message appears;
    “SC1207 - Adding FAX Feature Expander causes data loss. Turn main power switch off remove it to avoid loss. To continue press “Yes”.
11. Press “Yes” to initialize the SRAM.
    NOTE: Whenever installing the FAX FUNCTION UPGRADE board at the first time, the machine displays SC1207. Ignore this SC code. This is not a problem.
12. Enter the service mode, and set bit 7 of system switch 1E to “1”.
13. Print the system parameter list and make sure that “EXFUNC” is listed as an option.
14. Confirm that the memory indicator shows “100%” in standby mode.
15. Connect the telephone cable.

2. SERVICE TABLES

⚠CAUTION

Never turn off the main power switch when the power LED is lit or flashing. To avoid damaging the hard disk or memory, press the operation power switch to switch the power off, wait for the power LED to go off, and then switch the main power switch off.

NOTE: The main power LED lights or flashes while the platen cover or ARDF is open, while the main machine is communicating with a facsimile or the network server, or while the machine is accessing the hard disk or memory for reading or writing data.

2.1 SERVICE PROGRAM MODE

2.1.1 SERVICE PROGRAM MODE OPERATION

The service program (SP) mode is used to check electrical data, change modes, and adjust values.

Entering and Exiting SP mode

	1	Press the Clear Mode key.
① ⓪ ⑦	2	Use the keypad to enter “107”.
	3	Hold down Clear/Stop for at least 3 seconds.
Fax SP	4	On the touch-panel, press Fax SP.
Exit	5	Press Exit twice to return to the copy window.

SP1-XXX (Bit Switches) ☛ Section 3.2 Bit Switches

1	Mode No.		Function
101	System Switch		
	001 – 032	00 – 1F	Change the bit switches for system settings for the fax option ☛ Section 3.2 Bit Switches
103	Printer Switch		
	001 – 016	00 – 0F	Change the bit switches for printer settings for the fax option ☛ Section 3.2 Bit Switches
104	Communication Switch		
	001 – 032	00 – 1F	Change the bit switches for communication settings for the fax option ☛ Section 3.2 Bit Switches
105	G3-1 Switch		
	001 – 016	00 – 0F	Change the bit switches for the protocol settings of the standard G3 board ☛ Section 3.2 Bit Switches
106	G3-2 Switch		
	001 – 016	00 – 0F	Change the bit switches for the protocol settings of the optional G3 board ☛ Section 3.2 Bit Switches
107	G3-3 Switch		
	001 – 016	00 – 0F	Change the bit switches for the protocol settings of the optional G3 board ☛ Section 3.2 Bit Switches
108	G4 Internal Switch		
	001 – 032	00 – 1F	Change the bit switches for the optional ISDN settings ☛ Section 3.2 Bit Switches **(Japan Only)**
109	G4 Parameter Switch		
	001 – 016	00 – 0F	Change the bit switches for optional ISDN parameters ☛ Section 3.2 Bit Switches **(Japan Only)**

SP2-XXX (RAM Data)

2	Mode No.		Function
101	RAM Read/Write		
	001		Change RAM data for the fax board directly. ☛ Section 3.5 Service RAM Addresses
102	Memory Dump		
	001	G3-1 Memory Dump	Print out RAM data for the fax board. ☛ Section 3.5 Service RAM Addresses
	002	G3-2 Memory Dump	Print out RAM data for the SG3-1 board.
	003	G3-3 Memory Dump	Print out RAM data for the SG3-2 board.
	004	G4 Memory Dump	Print out RAM data for the SiG4 board. **(Japan Only)**
103	G3-1 NCU Parameters		
	001 – 023	CC, 01 – 22	NCU parameter settings for the standard G3 board. ☛ Section 3.3 NCU Parameters
104	G3-2 NCU Parameters		
	001 – 023	CC, 01 – 22	NCU parameter settings for the optional G3 board. ☛ Section 3.3 NCU Parameters
105	G3-3 NCU Parameters		
	001 – 023	CC, 01 – 22	NCU parameter settings for the optional G3 board. ☛ Section 3.3 NCU Parameters

SP3-XXX (Tel Line Settings)

3	Mode No.		Function
101	Service Station		
	001	Fax Number	Enter the fax number of the service station.
	002	Select Line	Select the line type.
102	Serial Number		
	000		Enter the fax unit's serial number.
103	PSTN-1 Port Settings		
	001	Select Line	Select the line type setting for the G3-1 line. If the machine is installed on a PABX line, select "PABX", "PABX(GND)" or "PABX(FLASH)".
	002	PSTN Access Number	Enter the PSTN access number for the G3-1 line.
	003	Memory Lock Disabled	If the customer does not want to receive transmissions using Memory Lock on this line, turn this SP on.
	004	Transmission Disabled	If you turn this SP on, the machine does not send any fax messages on the G3-1 line.
104	PSTN-2 Port Settings		
	001	Select Line	Select the line setting for the G3-2 line. If the machine is installed on a PABX line, select "PABX", "PABX(GND)" or "PABX(FLASH)".
	002	PSTN Access Number	Enter the PSTN access number for the G3-2 line.

3	Mode No.		Function
104	003	Memory Lock Disabled	If the customer does not want to receive transmissions using Memory Lock on this line, change this SP to on.
	004	Transmission Disabled	If you turn this SP on, the machine does not send any fax messages on the G3-2 line.
105	PSTN-3 Port settings		
	001	Select Line	Select the line setting for the G3-3 line. If the machine is installed on a PABX line, select “PABX”, “PABX(GND)” or “PABX(FLASH)”.
	002	PSTN Access Number	Enter the PSTN access number for the G3-3 line.
	003	Memory Lock Disabled	If the customer does not want to receive transmissions using Memory Lock on this line, change this SP to on
	004	Transmission Disabled	If you turn this SP on, the machine does not send any fax messages on the G3-3 line.
106	ISDN Port Settings		
	001	Select Line	Select the line setting for the ISDN line. If the machine is installed to the PABX line, select “PABX”. **(Japan Only)**
	002	PSTN Access Number	Enter the PSTN access number for ISDN line. **(Japan Only)**
	003	Memory Lock Disabled	If the customer does not want to receive transmissions using Memory Lock on this line, change this SP to on. **(Japan Only)**
	004	Transmission Disabled	If you turn this SP on, the machine does not send any fax messages on the ISDN line. **(Japan Only)**
201	FAX Switches		
	001 – 032	00 – 1F	Change the bit switches for scanner settings for the fax option ☛ Section 3.2.2 Fax Switches

SP4-XXX (ROM Versions)

4	Mode No.		Function
101	001	FCU ROM Version	Displays the FCU ROM version.
102	001	Error Codes	Displays the latest 64 fax error codes.
103	001	G3-1 ROM Version	Displays the G3-1 modem version.
104	001	G3-2 ROM Version	Displays the G3-2 modem version.
105	001	G3-3 ROM Version	Displays the G3-3 modem version.
106	001	G4 ROM Version	Displays the G4 (ISDN) ROM version. **(Japan Only)**
107	001	Charge ROM Version	Not used.

SP5-XXX (Initializing)

5	Mode No.		Function
101	Initialize SRAM		
	000		Initializes the bit switches and user parameters, user data in the SRAM, files in the SAF memory, and clock.
102	Erase All Files		
	000		Erases all files stored in the SAF memory.
103	Reset Bit Switches		
	000		Resets the bit switches and user parameters.
104	Factory setting		
	000		Resets the bit switches and user parameters, user data in the SRAM and files in the SAF memory.

SP6-XXX (Reports)

6	Mode No.		Function
101	System Parameter List		
	000		Touch the “ON” button to print the system parameter list.
102	Service Monitor Report		
	000		Touch the “ON” button to print the service monitor report.
103	G3 Protocol Dump List		
	001	G3 All Communications	Prints the protocol dump list of all communications for all G3 lines.
	002	G3-1 (All Communications)	Prints the protocol dump list of all communications for the G3-1 line.
	003	G3-1 (1 Communication)	Prints the protocol dump list of the last communication for the G3-1 line.
	004	G3-2 (All Communications)	Prints the protocol dump list of all communications for the G3-2 line.
	005	G3-2 (1 Communication)	Prints the protocol dump list of the last communication for the G3-2 line.
	006	G3-3 (All Communications)	Prints the protocol dump list of all communications for the G3-3 line.
	007	G3-3 (1 Communication)	Prints the protocol dump list of the last communication for the G3-3 line.
104	G4 Protocol Dump List		
	001	Dch + Bch 1	Prints the protocol dump lists for the G4 line. **(Japan Only)**
	002	Dch	
	003	Bch 1 Link Layer	
	004	Dch Link Layer	
	005	Dch +Bch 2	
	006	Bch 2 Link Layer	
105	All Files print out		
	000		Prints out all the user files in the SAF memory, including confidential messages. **NOTE:** Do not use this function, unless the customer is having trouble printing confidential messages or recovering files stored using the memory lock feature.
106	Journal Print out		
	001	All Journals	The machine prints all the communication records on the report.
	002	Specified Date	The machine prints all communication records after the specified date.
107	Log List Print out		
	001	All log files	These log print out functions are for designer use only.
	002	APIP	
	003	Mail Box	
	004	Operation	

6	Mode No.		Function
107	005	Printer APIP	These log print out functions are for designer use only.
	006	SC/TRAP Stored	
	007	Scanner	
	008	JOB/SAF	
	009	Decompression	
	010	Reconstruction	
	011	JBIG	
	012	Fax Driver	
	013	G3CCU	
	014	Fax Job	

SP7-XXX (Test Modes)

These are the test modes for PTT approval.

7	Function
101	G3-1 Modem Tests
102	G3-1 DTMF Tests
103	Ringer Test
104	G3-1 V34 (S2400baud)
105	G3-1 V34 (S2800baud)
106	G3-1 V34 (S3000baud)
107	G3-1 V34 (S3200baud)
108	G3-1 V34 (S3429baud)
109	Recorded Message Test
110	G3-2 Modem Tests
111	G3-2 DTMF Tests
112	G3-2 V34 (S2400baud)
113	G3-2 V34 (S2800baud)
114	G3-2 V34 (S3000baud)
115	G3-2 V34 (S3200baud)
116	G3-2 V34 (S3429baud)
117	G3-3 Modem Tests
118	G3-3 DTMF Tests
119	G3-3 V34 (S2400baud)
120	G3-3 V34 (S2800baud)
121	G3-3 V34 (S3000baud)
122	G3-3 V34 (S3200baud)
123	G3-3 V34 (S3429baud)
124	IG3-1 Modem Tests
125	IG3-1 DTMF Tests
126	IG3-1 V34 (S2400baud)
127	IG3-1 V34 (S2800baud)
128	IG3-1 V34 (S3000baud)
129	IG3-1 V34 (S3200baud)
130	IG3-1 V34 (S3429baud)
131	IG3-2 Modem Tests
132	IG3-2 DTMF Tests
133	IG3-2 V34 (S2400baud)
134	IG3-2 V34 (S2800baud)
135	IG3-2 V34 (S3000baud)
136	IG3-2 V34 (S3200baud)
137	IG3-2 V34 (S3429baud)

2.2 BIT SWITCHES

⚠WARNING

Do not adjust a bit switch or use a setting that is described as "Not used", as this may cause the machine to malfunction or to operate in a manner that is not accepted by local regulations. Such bits are for use only in other areas, such as Japan.

NOTE: Default settings for bit switches are not listed in this manual. Refer to the System Parameter List printed by the machine.

2.2.1 SYSTEM SWITCHES

System Switch 00		**SP No. 1-101-001**
No	**FUNCTION**	**COMMENTS**
0	Dedicated transmission parameter programming **0:** Disabled **1:** Enabled	Set this bit to 1 before changing any dedicated transmission parameters. Reset this bit to 0 after programming dedicated transmission parameters.
1	Not used	Do not change the setting.
2	Technical data printout on the Journal **0:** Disabled **1:** Enabled	**1**: Instead of the personal name, the following data are listed on the Journal for each G3 communication.
	e.g. **0000 32V34 288/264 L0100 03 04** (1) (2)(3) (4) (5) (6) (7) (8) **(1):** EQM value (Line quality data). A larger number means more errors. **(2):** Symbol rate (V.34 only) **(3):** Final modem type used **(4):** Starting data rate (for example, 288 means 28.8 kbps) **(5):** Final data rate **(6):** Rx revel (refer to the note after this table for how to read the rx level) **(7):** Total number of error lines that occurred during non-ECM reception. **(8):** Total number of burst error lines that occurred during non-ECM reception. **Note:** EQM and rx level are fixed at "FFFF" in tx mode. The seventh and eighth numbers are fixed at "00" for transmission records and ECM reception records.	

System Switch 00		SP No. 1-101-001
No	**FUNCTION**	**COMMENTS**
2	**Rx level calculation** **Example:** 0000 32 V34 288/264 **L 01 00** 03 04 The four-digit hexadecimal value (N) after "L" indicates the rx level. The high byte is given first, followed by the low byte. Divide the decimal value of N by -16 to get the rx level. In the above example, the decimal value of N (= 0100 [H]) is 256. So, the actual rx level is 256/-16 = -16 dB	
3	Not used	Do not change the settings.
4	Line error mark on the received page **0**: Disabled **1**: Enabled	If this bit is 1, a mark will be printed on the left edge of the page at any place where a line error occurred in the data. Such errors are caused by a noisy line for example.
5	G3/G4 communication parameter display **0:** Disabled **1:** Enabled	This is a fault-finding aid. The LCD shows the key parameters (see below). This is normally disabled because it cancels the CSI display for the user. Be sure to reset this bit to 0 after testing.
6	Protocol dump list output after each communication **0:** Off **1:** On	This is only used for communication troubleshooting. It shows the content of the transmitted facsimile protocol signals. Always reset this bit to 0 after finishing testing. If system switch 09 bit 6 is at "1", the list is only printed if there was an error during the communication.
7	Not used	Do not change the setting.

G3 Communication Parameters

Modem rate	336: 33600 bps 168: 16800 bps 312: 31200 bps 144: 14400 bps 288: 28800 bps 120: 12000 bps 264: 26400 bps 96: 9600 bps 240: 24000 bps 72: 7200 bps 216: 21600 bps 48: 4800 bps 192: 19200 bps 24: 2400 bps
Resolution	S: Standard (8 x 3.85 dots/mm) D: Detail (8 x 7.7 dots/mm) F: Fine (8 x 15.4 dots/mm) SF: Superfine (16 x 15.4 dots/mm) 21: Standard (200 x 100 dpi) 22: Detail (200 x 200 dpi) 44: Superfine (400 x 400 dpi)
Compression mode	MMR: MMR compression MR: MR compression MH: MH compression JBO: JBIG compression (Optional mode) JBB: JBIG compression (Basic mode)
Communication mode	ECM: With ECM NML: With no ECM

Width and reduction	A4: A4 (8.3"), no reduction B4: B4 (10.1"), no reduction A3: A3 (11.7"), no reduction
I/O rate	0: 0 ms/line 10: 10 ms/line 25: 2.5 ms/line 20: 20 ms/line 5: 5 ms/line 40: 40 ms/line **Note:** "40" is displayed while receiving a fax message using AI short protocol.

System Switch 01 - Not used (Do not change the factory settings.)

System Switch 02		**SP No. 1-101-003**
No	**FUNCTION**	**COMMENTS**
0-3	Not used	Do not change the settings.
4	File retention time **0:** Depends on User Parameter 24 [18(H)] **1:** No limit	**1:** A file that had a communication error will not be erased unless the communication is successful.
5	Not used	Do not change the setting.
6 to 7	Memory read/write by RDS **Bit 7 6 Setting** 0 0 Always disabled 0 1 User selectable 1 0 User selectable 1 1 Always enabled	**(0,0):** All RDS systems are always locked out. **(0,1), (1,0):** Normally, RDS systems are locked out, but the user can temporarily switch RDS on to allow RDS operations to take place. RDS will automatically be locked out again after a certain time, which is stored in System Switch 03. Note that if an RDS operation takes place, RDS will not switch off until this time limit has expired. **(1,1):** At any time, an RDS system can access the machine.

System Switch 03		**SP No. 1-101-004**
No	**FUNCTION**	**COMMENTS**
0 to 7	Length of time that RDS is temporarily switched on when bits 6 and 7 of System Switch 02 are set to "User selectable"	00 - 99 hours (BCD). This setting is only valid if bits 6 and 7 of System Switch 02 are set to "User selectable". The default setting is 24 hours.

System Switch 04		**SP No. 1-101-005**
No	**FUNCTION**	**COMMENTS**
0	Program registration list output key display selection	This setting determines whether the key to print the program registration list is displayed on the screen.
1-2	Not used	Do not change the settings.

System Switch 04		SP No. 1-101-005
No	**FUNCTION**	**COMMENTS**
3	Printing dedicated tx parameters on Quick/Speed Dial Lists **0:** Disabled **1:** Enabled	**1:** Each Quick/Speed dial number on the list is printed with the dedicated tx parameters (10 bytes each). The first 10 bytes of data are the programmed dedicated tx parameters; 34 bytes of data are printed (the other 24 bytes have no use for service technicians).
4-7	Not used	Do not change the settings.

System Switch 05 - Not used (Do not change the factory settings.)
System Switch 06 - Not used (Do not change the factory settings.)
System Switch 07 - Not used (Do not change the factory settings.)
System Switch 08 - Not used (Do not change the factory settings.)

System Switch 09		SP No. 1-101-010
No	**FUNCTION**	**COMMENTS**
0	Addition of image data from confidential transmissions on the transmission result report **0:** Disabled **1:** Enabled	If this feature is enabled, the top half of the first page of confidential messages will be printed on transmission result reports.
1	Inclusion of communications on the Journal when no image data was exchanged. **0:** Disabled **1:** Enabled	**0:** Communications that reached phase C (message tx/rx) of the T.30 protocol are listed on the Journal. **1:** Communications that reached phase A (call setup) of T.30 protocol are listed on the Journal. This will include telephone calls.
2	Automatic error report printout **0:** Disabled **1:** Enabled	**0:** Error reports will not be printed. **1:** Error reports will be printed automatically after failed communications.
3	Printing of the error code on the error report **0:** No **1:** Yes	**1:** Error codes are printed on the error reports.
4	Not used	Do not change the setting.
5	Power failure report **0:** Disabled **1:** Enabled	**1:** A power failure report will be automatically printed after the power is switched on if a fax message disappeared from the memory when the power was turned off last.
6	Conditions for printing the protocol dump list **0:** Print for all communications **1:** Print only when there is a communication error	This switch becomes effective only when system switch 00 bit 6 is set to 1. **1:** Set this bit to 1 when you wish to print a protocol dump list only for communications with errors.
7	Priority given to various types of remote terminal ID when printing reports **0:** RTI > CSI > Dial label > Tel. number **1:** Dial label > Tel. number > RTI > CSI	This bit determines which set of priorities the machine uses when listing remote terminal names on reports. **Dial Label:** The name stored, by the user, for the Quick/Speed Dial number.

System Switch 0A		SP No. 1-101-011
No	**FUNCTION**	**COMMENTS**
0-2	Not used	Do not change the settings.
3	Continuous polling reception **0:** Disabled **1:** Enabled	This feature allows a series of stations to be polled in a continuous cycle. This will continue until the polling reception file is erased. The dialing interval is the same as memory transmission.
4	Dialing on the ten-key pad when the external telephone is off-hook **0:** Disabled **1:** Enabled	**0:** Prevents dialing from the ten-key pad while the external telephone is off-hook. Use this setting when the external telephone is not by the machine, or if a wireless telephone is connected as an external telephone. **1:** The user can dial on the machine's ten-key pad when the handset is off-hook.
5	On hook dial **0:** Disabled **1:** Enabled	**0:** On hook dial is disabled.
6	Not used	Do not change the setting.
7	Line used when the machine falls back to G3 from G4 if the other end is not a G4 machine **0:** PSTN **1:** ISDN **((Japan Only))**	This bit switch has no effect if Communication Switch 07 bit 0 is set to 0.

System Switch 0B - Not used (Do not change the factory settings.)
System Switch 0C - Not used (Do not change the factory settings.)
System Switch 0D - Not used (Do not change the factory settings.)

System Switch 0E		SP No. 1-101-015
No	**FUNCTION**	**COMMENTS**
0-2	Not used	Do not change the settings.
3	Action when the external handset goes off-hook **0:** Manual tx and rx operation **1:** Memory tx and rx operation (the display remains the same)	**0:** Manual tx and rx are possible while the external handset is off-hook. However, memory tx is not possible. **1:** The display stays in standby mode even when the external handset is used, so that other people can use the machine for memory tx operation. Note that manual tx and rx are not possible with this setting.
4-7	Not used	Do not change the settings.

System Switch 0F		SP No. 1-101-016
No	**FUNCTION**	**COMMENTS**
0 to 7	Country/area code for functional settings (Hex) 00: France 11: USA 01: Germany 12: Asia 02: UK 13: Japan 03: Italy 14: Hong Kong 04: Austria 15: South Africa 05: Belgium 16: Australia 06: Denmark 17: New Zealand 07: Finland 18: Singapore 08: Ireland 19: Malaysia 09: Norway 1A: China 0A: Sweden 1B: Taiwan 0B: Switz. 1C: Korea 0C: Portugal 20: Turkey 0D: Holland 21: Greece 0E: Spain 22: Hungary 0F: Israel 23: Czech 10: Canada 24: Poland	This country/area code determines the factory settings of bit switches and RAM addresses. However, it has no effect on the NCU parameter settings and communication parameter RAM addresses. **Cross reference** NCU country code: Function 06, parameter C.C.

System Switch 10 - Not used (Do not change the factory settings.)

System Switch 11		SP No. 1-101-018
No	**FUNCTION**	**COMMENTS**
0	TTI printing position **0:** Superimposed on the page data **1:** Printed before the data leading edge	Change this bit to 1 if the TTI overprints information that the customer considers to be important (G3 transmissions).
1	TSI (G3) or CIL/TID (G4) printing position **0:** Superimposed on the page data **1:** Printed before the data leading edge	Change this bit to 1 if the TSI (G3) or CIL/TID (G4) overprints information that the customer considers to be important. CIL: Command Information Line (Group 4)
2-6	Not used	Do not change the factory settings.
7	Use of parallel memory transmission with G4 transmission **0:** Disabled **1:** Enabled **(Japan Only)**	This determines whether parallel transmission can be used with a G4 transmission or not. Note that this bit is only effective if Parallel Memory transmission is enabled (User Parameter 07 - bit 2).

System Switch 12		SP No. 1-101-019
No	**FUNCTION**	**COMMENTS**
0 to 7	TTI/CIL printing position in the main scan direction	TTI/CIL: 08 to 92 (BCD) mm Input even numbers only. This setting determines the print start position for the TTI and CIL from the left edge of the paper. If the TTI is moved too far to the right, it may overwrite the file number which is on the top right of the page. On an A4 page, if the CIL is moved over by more than 50 mm, it may overwrite the page number.

System Switch 13 - Not used (do not change the settings)
System Switch 14 - Not used (do not change the settings)

System Switch 15		SP No. 1-101-022
No	**FUNCTION**	**COMMENTS**
0	Not used	Do not change the setting.
1	Going into the Energy Saver mode automatically **0**: Enabled **1**: Disabled	**1:** The machine will restart from the Energy Saver mode quickly, because the +5V power supply is active even in the Energy Saver mode.
2-7	Not used	Do not change the settings.

System Switch 16 - Not used (do not change the settings)
System Switch 17 - Not used (do not change the settings)
System Switch 18 - Not used (do not change the settings)

System Switch 19		SP No. 1-101-026
No	**FUNCTION**	**COMMENTS**
0-2	Not used	Do not change the setting.
3	Selects a temporary address for the number PC-FAX #.	0: When prefixed by #, handled only as a stored address. 1: When prefixed by #, when a digit exists that prevents handling the transaction as a Coded, One-Touch, or Group dialing, handles temporarily.
4	Number of jobs controlled for PC-FAX TX 0: 64 Jobs 1: No limitations (but conforms to device limitations)	Sets the number of jobs controlled for PC-FAX transactions. If “1” is selected (no limitations), control is relinquished to the device (standard 400, expandable to 800).
6	Not used	Do not change the setting.
7	Special Original mode **0:** Disabled **1:** Enabled	**1:** If the customer frequently wishes to transmit a form or letterhead which has a colored or printed background, change this bit to “1”. “Original 1” and “Original 2” can be selected in addition to the “Text”, “Text/Photo” and “Photo” modes.

System Switch 1A		SP No. 1-101-026
No	**FUNCTION**	**COMMENTS**
0 to 7	LS RX memory remaining refresh value setting	Sets a value of 4K. If the amount of memory remaining falls below 4K, documents received in memory are printed to create more space in memory. Initial value: 0x80 (512K) 00-FF (0-1020 KB: Hex)

System Switch 1B - Not used (do not change the settings)
System Switch 1C - Not used (do not change the settings)

System Switch 1D		SP No. 1-101-030
No	**FUNCTION**	**COMMENTS**
0	RTI/CSI/CPS display **0:** Disabled **1:** Enabled	**1:** RTI/CSI/CPS is displayed on the top line of the LCD panel during communication.
1-7	Not used	Do not change the settings.

System Switch 1E		SP No. 1-101-031
No	**FUNCTION**	**COMMENTS**
0	Communication after the Journal data storage area has become full **0:** Impossible **1:** Possible	This setting is effective only when Automatic Journal printout is enabled but the machine cannot print the report (e.g., no paper). **0:** If the buffer memory of the communication records for the Journal has become full, fax communications will become impossible, to prevent overwriting the communication records before the machine prints them out. **1:** If the buffer memory of the communication records for the Journal is full, fax communications are still possible. But the machine will overwrite the oldest communication records. **Cross Reference** ❑ Automatic Journal output - User switch 03 bit 7 ❑ Number of communication records for the Journal: 200 records (standard) 1000 records (with the Function Upgrade unit installed)
1	Action when the SAF memory has become full during scanning **0:** The current page is erased. **1:** The entire file is erased.	**0:** If the SAF memory becomes full during scanning, the successfully scanned pages are transmitted. **1:** If the SAF memory becomes full during scanning, the file is erased and no pages are transmitted. This bit switch is ignored for parallel memory transmission.

System Switch 1E		SP No. 1-101-031
No	**FUNCTION**	**COMMENTS**
2	RTI/CSI display priority 0: RTI 1: CSI	This bit determines which identifier, RTI or CSI, is displayed on the LCD while the machine is communicating in G3 non-standard mode.
3	File No. printing **0**: Enabled **1**: Disabled	**1:** File numbers are not printed on any reports.
4	Action when authorized reception is enabled but authorized RTIs/CSIs are **not yet** programmed **0**: All fax reception is disabled **1**: Faxes can be received if the sender has an RTI or CSI	If authorized reception is enabled but the user has stored no acceptable sender RTIs or CSIs, the machine will not be able to receive any fax messages. If the customer wishes to receive messages from any sender that includes an RTI or CSI, and to block messages from senders that do not include an RTI or CSI, change this bit to "1", then enable Authorized Reception. Otherwise, keep this bit at "0 (default setting)".
5-6	Not used	Do not change the settings.
7	RAM initialization after the optional Function Upgrade unit is installed or removed **0:** Enabled **1:** Disabled	When the machine detects that a Function Upgrade unit has been installed or removed, the machine shows the following message on the display for the customer. *"Adding/Removing FAX Feature Expander causes data loss. Turn Main Power Switch off and remove/replace it to avoid loss. To continue, press Yes."* If Yes is pressed, the machine initializes the RAM to the "with" or "without card" configuration. However, changing this bit to "1" disables this initialization, even if Yes is pressed. Change this bit to 1 after installing the Function Upgrade unit. **0:** When the above message is displayed, the machine initializes the RAM if Yes is pressed. The amount of data lost depends on whether the board is in or out. To avoid losing data, the user must switch off immediately and put the Function Upgrade unit back in. **1:** When the above message is displayed, the machine does not initialize the RAM even if Yes is pressed. However, the fax unit cannot be used until the user switches off, puts the Function Upgrade unit back in, then switches back on. No data is lost.

System Switch 1F		SP No. 1-101-032
No	**FUNCTION**	**COMMENTS**
0	Not used	Do not change the setting.
1	Report printout after an original jam during SAF storage or if the SAF memory fills up **0:** Enabled **1:** Disabled	**0:** When an original jams, or the SAF memory overflows during scanning, a report will be printed. Change this bit to "1" if the customer does not want to have a report in these cases. Memory tx – Memory storage report Parallel memory tx – Transmission result report
2	Not used	Do not change the setting.
3	Received fax print start timing (G3 reception) **0:** After receiving each page **1:** After receiving all pages	**0:** The machine prints each page immediately after the machine receives it. **1:** The machine prints the complete message after the machine receives all the pages in the memory.
4	Received fax print start timing (G4 reception) **(Japan Only)** **0:** After receiving each page **1:** After receiving all pages	
5-6	Not used	Do not change the factory settings.
7	Action when a fax SC has occurred **0:** Automatic reset **1:** Fax unit stops	**0:** When the fax unit detects a fax SC code other than SC1201 and SC1207, the fax unit automatically resets itself. **1:** When the fax unit detects any fax SC code, the fax unit stops. **Cross Reference** Fax SC codes - See "Troubleshooting"

2.2.2 FAX SWITCHES

FAX Switch 00 - Not used (do not change the settings)

FAX Switch 01		**SP No. 3-201-002**
No	**FUNCTION**	**COMMENTS**
0 to 7	Scan density step value (Text mode)	When scan density is adjusted manually away from the Normal setting, the threshold value for binary picture processing changes for each step from the value specified by Scanner Switch 02, by the amount programmed here. For example, with the default setting (14), the threshold value changes as follows. +3 (Darkest) : 71 (= 85 – 14) +2 : 85 (= 99 – 14) +1 : 99 (= 113 – 14) 0 (Normal) : 113 (Scanner Switch 02 setting) -1 : 127 (= 113 + 14) -2 : 141 (= 127 + 14) -3 (Lightest) : 155 (= 141 + 14) For smaller steps, input a lower value.

FAX Switch 02		**SP No. 3-201-003**
No	**FUNCTION**	**COMMENTS**
0 to 7	Binary picture processing: Threshold for Text mode - Normal setting (center position)	This setting determines the threshold value for binary picture processing in Text mode (when the scan density setting is at the center). The value can be between 01 and FF. For a darker threshold, input a lower value. Default setting: 71(H) = 113(D)

FAX Switch 03 - Not used (do not change the settings)

FAX Switch 04		**SP No. 3-201-005**
No	**FUNCTION**	**COMMENTS**
0 to 7	Binary picture processing: Threshold for monotone background special original 1 mode - Normal setting (center position)	This setting determines the threshold value for binary picture processing in monotone background special original 1 mode (when the scan density setting is at the center). The value can be between 01 and FF. For a darker threshold, input a lower value. Default setting: A4(H) = 164(D)

FAX Switch 05		SP No. 3-201-006
No	**FUNCTION**	**COMMENTS**
0 to 7	Binary picture processing: Threshold for colored background special original 2 mode - Normal setting (center position)	This setting determines the threshold value for binary picture processing in colored background special original 2 mode (when the scan density setting is at the center). The value can be between 01 and FF. For a darker threshold, input a lower value. Default setting: 28(H) = 40(D)

FAX Switch 06		SP No. 3-201-007
No	**FUNCTION**	**COMMENTS**
0 to 3	MTF filter level (Text mode) The value can be between 0(Off) and F. For a weaker threshold, input a lower value. Default setting: 7 This setting is independent from the threshold specified by the copier SP modes.	
4 to 7	MTF filter level (Text/Photo mode) The value can be between 0(Off) and F. For a weaker threshold, input a lower value. Default setting: 7 This setting is independent from the threshold specified by the copier SP modes.	

FAX Switch 07		SP No. 3-201-008
No	**FUNCTION**	**COMMENTS**
0 to 2	Smoothing filter level (Photo mode)	The value can be between 0(Off) and 7. For a weaker threshold, input a lower value. Default setting: 2 This setting is independent from the threshold setting specified by the copier SP modes.
3-7	Not used	Do not change the settings.

FAX Switch 08 – Not used (do not change the settings)	SP No. 3-201-009

FAX Switch 09 – Not used (do not change the settings)	SP No. 3-201-010

FAX Switch 0A		SP No. 3-201-011
No	**FUNCTION**	**COMMENTS**
0-3	Not used	Do not change the settings.
4 to 7	MTF filter level (Colored background special original mode) The value can be between 0 (Off) and F. For a weaker threshold, input a lower value. Default setting: 7 This setting is independent from the threshold specified by the copier SP modes.	

FAX Switch 0B		SP No. 3-201-012
No	**FUNCTION**	**COMMENTS**
0 to 3	Scan margin setting (right and left margin in book scan and ADF mode) The setting can be between 0 and F (H) (unit 0.5 mm). Default setting: 2 mm	
4 to 7	Scan margin setting (top and bottom margin in book scan and ADF mode) The setting can be between 0 and 7 (H) (unit 0.5 mm). Default setting: 3 mm	

FAX Switch 0C		SP No. 3-201-013
No	**FUNCTION**	**COMMENTS**
0	Action when an original jam has occurred while scanning the original into memory for memory tx **0:** Continues scanning after recovery **1:** Stops scanning and erases all scanned pages for that job	This bit is only effective when parallel memory tx is disabled (user parameter 07 - bit 2). If parallel memory tx is enabled, the machine always erases the scanned pages when an original jam occurs. The machine then asks the user to retry from the first page, even if the parallel memory tx is not actually used. **0:** The machine displays a message asking the user to put the jammed page back into the original stack, and continues scanning. The message is displayed for the time period specified by scanner switch 0E, bit 2. **1:** The machine erases all the scanned pages and asks the user to retry from the first page.
1 to 2	Setting when an original size cannot be recognized **Bit 2 1 Setting** 0 0 No original 0 1 A5 ▯ 1 0 A5 ▭ 1 1 No original	
3-7	Not used	Do not change the settings.

FAX Switch 0D		SP No. 3-201-014
No	**FUNCTION**	**COMMENTS**
0-6	Not used	Do not change the settings.
7	Scan width for A5 lengthwise or B5 lengthwise originals **0:** 210 mm (8.5") **1:** Original width	**0:** The machine scans the original as 210 mm (8.5") width. The transmitted image has a blank area on the right. **1:** The machine scans 148 mm (A5) or 182 mm (B5) and centers the scanned data on a 216 mm width transmitted image.

FAX Switch 0E		SP No. 3-201-015
No	**FUNCTION**	**COMMENTS**
0	Not used	Do not change the setting.
1	Scan resolution unit **0:** mm **1:** inches	This bit determines which resolution unit will be used for scanning a fax message. Default setting: mm
2-7	Not used	Do not change the settings.

FAX Switch 10 ~ 1F - Not used (do not change the settings)	**SP No. 3-201-016**

2.2.3 PRINTER SWITCHES

Printer Switch 00		SP No. 1-103-001
No	**FUNCTION**	**COMMENTS**
0	Page separation mark **0:** Disabled **1:** Enabled	**0:** No marks are printed. **1**: If a received page has to be printed out on two sheets, an asterisk inside square brackets is printed at the bottom right hand corner of the first sheet, and a “2” inside a small box is printed at the top right hand corner of the second sheet. This helps the user to identify pages that have been split.
1	Repetition of data when the received page is longer than the printer paper **0:** Disabled **1:** Enabled	**0:** The next page continues from where the previous page left off. **1:** The final few mm of the previous page are repeated at the top of the next page. The amount of repeated data depends on printer switch 04, bits 5 and 6.
2	Prints the date and time on received fax messages **0:** Disabled **1:** Enabled	This switch is only effective when user parameter 02 - bit 2 (printing the received date and time on received fax messages) is enabled. **1:** The machine prints the received and printed date and time at the bottom of each received page.
3-7	Not used	Do not change the settings.

Printer Switch 01		SP No. 1-103-002
No	**FUNCTION**	**COMMENTS**
0-2	Not used	Do not change the settings.
3-4	Maximum print width used in the setup protocol **Bit 4 3 Setting** 0 0 Not used 0 1 A3 1 0 B4 1 1 A4	These bits are only effective when bit 7 of printer switch 01 is “1”.
5-6	Not used	Do not change the settings.
7	Received message width restriction in the protocol signal to the sender **0:** Disabled **1:** Enabled	**0:** The machine informs the transmitting machine of the print width depending on the paper size available from the paper feed stations. Refer to the table on the next page for how the machine chooses the paper width used in the setup protocol (NSF/DIS). **1:** The machine informs the transmitting machine of the fixed paper width which is specified by bits 3 and 4 above.

Relationship between available paper sizes and printer width used in the setup protocol

Available Paper Size	Printer width used in the Protocol (NSF/DIS)
A4 or 8.5" x 11"	297 mm width
B5	256 mm width
A5 or 8.5" x 5.5"	216 mm width
No paper available (Paper end)	216 mm width

Printer Switch 02		SP No. 1-103-003
No	**FUNCTION**	**COMMENTS**
0	1st paper feed station usage for fax printing **0:** Enabled **1:** Disabled	**0:** The paper feed station can be used to print fax messages and reports. **1**: The specified paper feed station will not be used for printing fax messages and reports. **Note:** Do not disable usage for a paper feed station which has been specified by User Parameter Switch 0F (15), or which is used for the Specified Cassette Selection feature.
1	2nd paper feed station usage for fax printing **0:** Enabled **1:** Disabled	
2	3rd paper feed station usage for fax printing **0:** Enabled **1:** Disabled	
3	4th paper feed station usage for fax printing **0:** Enabled **1:** Disabled	
4	LCT usage for fax printing **0:** Enabled **1:** Disabled	
5-7	Not used	Do not change the settings.

Printer Switch 03		SP No. 1-103-004
No	**FUNCTION**	**COMMENTS**
0	Length reduction of received data **0:** Disabled **1:** Enabled	**0:** Incoming pages are printed without length reduction. (Page separation threshold: Printer Switch 03, bits 4 to 7) **1:** Incoming page length is reduced when printing. (Maximum reducible length: Printer Switches 04, bits 0 to 4)
1-3	Not used	Do not change the settings

Printer Switch 03		SP No. 1-103-004
No	**FUNCTION**	**COMMENTS**
4 to 7	Page separation threshold (with reduction disabled with switch 03-0 above) If the incoming page is up to x mm longer than the length of copy paper, the excess portion will not be printed. If the incoming page is more than x mm longer than the length of copy paper, the excess portion will be printed on the next page. The value of x is determined by these four bits. Hex value of bits 4 to 7 x (mm) 0 0 1 1 and so on until F 15 Default setting: 6 mm **Cross reference** Length reduction On/Off: Printer Switch 03, Bit 0	

Printer Switch 04		SP No. 1-103-005
No	**FUNCTION**	**COMMENTS**
0 to 4	Maximum reducible length when length reduction is enabled with switch 03-0 above. <Maximum reducible length> = <Paper length> + (N x 5mm) "N" is the decimal value of the binary setting of bits 0 to 4. Bit 4 3 2 1 0 Setting 0 0 0 0 0 0 mm 0 0 0 0 1 5 mm 0 0 1 0 0 20 mm (default setting) 1 1 1 1 1 155 mm For A5 sideways and B5 sideways paper <Maximum reducible length> = <Paper length> + 0.75 x (N x 5mm)	
5 to 6	Length of the duplicated image on the next page, when page separation has taken place. $\binom{0}{0}$=4 mm $\binom{1}{0}$=10 mm $\binom{0}{1}$=15 mm $\binom{1}{1}$=Not used	
7	Not used.	Do not change the setting.

Printer Switch 05 - Not used (do not change the settings)

Printer Switch 06		SP No. 1-103-007
No	**FUNCTION**	**COMMENTS**
0	Printing while a paper cassette is pulled out, when the Just Size Printing feature is enabled. **0**: Printing will not start **1**: Printing will start if another cassette has a suitable size of paper, based on the paper size selection priority tables.	**Cross reference** Just size printing on/off – User switch 05, bit 5
1-7	Not used.	Do not change the settings.

Printer Switch 07		SP No. 1-103-008
No	**FUNCTION**	**COMMENTS**
0	Reduction for Journal printing **0:** Off **1:** On	**1:** The Journal is reduced to 91% to ensure that there is enough space in the left margin for punch holes or staples.
2-3	Not used.	Do not change the settings.
4	List of destinations in the Communication Failure Report for broadcasting **0**: All destinations **1**: Only destinations where communication failure occurred	**1:** Only destinations where communication failure occurred are printed on the Communication Failure Report.
5-7	Not used.	Do not change the settings.

Printer Switch 08 - Not used (do not change the settings)
Printer Switch 09 - Not used (do not change the settings)
Printer Switch 0A - Not used (do not change the settings)
Printer Switch 0B - Not used (do not change the settings)
Printer Switch 0C - Not used (do not change the settings)
Printer Switch 0D - Not used (do not change the settings)

Printer Switch 0E		SP No. 1-103-015
No	**FUNCTION**	**COMMENTS**
0	Paper size selection priority **0:** Width **1:** Length	**0:** A paper size that has the same width as the received data is selected first. **1:** A paper size which has enough length to print all the received lines without reduction is selected first.
1	Paper size selected for printing A4 width fax data **0:** 8.5" x 11" size **1:** A4 size	This switch determines which paper size is selected for printing A4 width fax data, when the machine has both A4 and 8.5" x 11" size paper.

Printer Switch 0E		SP No. 1-103-015
No	**FUNCTION**	**COMMENTS**
2	Page separation **0:** Enabled **1:** Disabled	**1:** If all paper sizes in the machine require page separation to print a received fax message, the machine does not print the message (Substitute Reception is used). After a larger size of paper is set in a cassette, the machine automatically prints the fax message.
3 to 4	Printing the sample image on reports **Bit 4 Bit 3 Setting** 0 0 The upper half only 0 1 50% reduction in sub-scan only 1 0 Same size 1 1 Not used	"Same size" means the sample image is printed at 100%, even if page separation occurs. User Parameter Switch 19 (13H) bit 4 must be set to "0" to enable this switch. Refer to Detailed Section Descriptions for more on this feature.
5-6	Not used	Do not change the settings.
7	Equalizing the reduction ratio among separated pages (Page Separation) **0:** Enabled **1:** Disabled	**0:** When page separation has taken place, all the pages are reduced with the same reduction ratio. **1:** Only the last page is reduced to fit the selected paper size when page separation has taken place. Other pages are printed without reduction.

Printer Switch 0F		SP No. 1-103-016
No	**FUNCTION**	**COMMENTS**
0 to 1	Smoothing feature **Bit 1 Bit 0 Setting** 0 0 Disabled 0 1 Disabled 1 0 Enabled 1 1 Not used	**(0, 0) (0, 1):** Disable smoothing if the machine receives halftone images from other manufacturers fax machines frequently.
2	Duplex printing **0:** Disabled **1:** Enabled	**1:** The machine always prints received fax messages in duplex printing mode:
3	Binding direction for Duplex printing **0:** Left binding **1:** Top binding	
4	Printing fax messages in user code mode **0:** Enabled **1:** Disabled	**1:** The machine holds the received fax messages until the machine exits the restricted access mode (user code or key counter). If the machine enters the restricted access mode again while printing fax messages, the machine stops printing the machine exits the mode again.
5-7	Not used	Do not change the settings.

2.2.4 COMMUNICATION SWITCHES

Communication Switch 00		SP No. 1-104-001
No	**FUNCTION**	**COMMENTS**
0 to 1	Compression modes available in receive mode **Bit 1 0 Modes** 0 0 MH only 0 1 MH/MR 1 0 MH/MR/MMR 1 1 MH/MR/MMR/ JBIG	These bits determine the compression capabilities to be declared in phase B (handshaking) of the T.30 protocol.
2 to 3	Compression modes available in transmit mode **Bit 3 2 Modes** 0 0 MH only 0 1 MH/MR 1 0 MH/MR/MMR 1 1 MH/MR/MMR/ JBIG	These bits determine the compression capabilities to be used in the transmission and to be declared in phase B (handshaking) of the T.30 protocol.
4	Not used	Do not change the setting.
5	JBIG compression method: Reception **0**: Only basic supported **1**: Basic and optional both supported	Change the setting when communication problems occur using JBIG compression.
6	JBIG compression method: Transmission **0**: Basic mode priority **1**: Optional mode priority	Change the setting when communication problems occur using JBIG compression.
7	Closed network (reception) **0:** Disabled **1:** Enabled	**1:** Reception will not go ahead if the ID code of the other terminal does not match the ID code of this terminal. This function is only available in NSF/NSS mode.

Communication Switch 01		SP No. 1-104-002
No	**FUNCTION**	**COMMENTS**
0	ECM **0:** Off **1:** On	If this bit is set to 0, ECM is switched off for all communications. In addition, V.8 protocol and JBIG compression are switched off automatically.
1	Not used	Do not change the setting.
2 to 3	Wrong connection prevention method **Bit 3 Bit 2 Setting** 0 0 None 0 1 8 digit CSI 1 0 4 digit CSI 1 1 CSI/RTI	**(0,1) -** The machine will disconnect the line without sending a fax message, if the last 8 digits of the received CSI do not match the last 8 digits of the dialed telephone number. This does not work when manually dialed. **(1,0) -** The same as above, except that only the last 4 digits are compared. **(1,1) -** The machine will disconnect the line without sending a fax message, if the other end does not identify itself with an RTI or CSI. **(0,0) -** Nothing is checked; transmission will always go ahead. **Note:** This function does not work when dialing is done from the external telephone.
4-5	Not used	Do not change the settings.
6 to 7	Maximum printable page length available **Bit 7 6 Setting** 0 0 No limit 0 1 B4 (364 mm) 1 0 A4 (297 mm) 1 1 Not used	The setting determined by these bits is informed to the transmitting terminal in the pre-message protocol exchange (in the DIS/NSF frames).

Communication Switch 02		SP No. 1-104-003
No	**FUNCTION**	**COMMENTS**
0	Burst error threshold **0:** Low **1:** High	If there are more consecutive error lines in the received page than the threshold, the machine will send a negative response. The Low and High threshold values depend on the sub-scan resolution, and are as follows. **Resolution 100 dpi 200 dpi 400 dpi** **3.85 l/mm 7.7 l/mm 15.4 l/mm** Low settings 6 12 24 High settings 12 24 48
1	Acceptable total error line ratio **0:** 5% **1:** 10%	If the error line ratio for a page exceeds the acceptable ratio, RTN will be sent to the other end.
2	Treatment of pages received with errors during G3 reception **0:** Deleted from memory without printing **1:** Printed	**0:** Pages received with errors are not printed.

Communication Switch 02		SP No. 1-104-003
No	**FUNCTION**	**COMMENTS**
3	Hang-up decision when a negative code (RTN or PIN) is received during G3 immediate transmission **0:** No hang-up, **1:** Hang-up	**0:** The next page will be sent even if RTN or PIN is received. **1:** The machine will send DCN and hang up if it receives RTN or PIN. This bit is ignored for memory transmissions or if ECM is being used.
4-6	Not used	Do not change the settings.
7	Method of total error rate calculation **0:** Normal method **1:** French PTT requirement	**0:** Error rate is calculated by dividing the number of total lines by the number of error lines. **1:** Error rate is calculated by dividing the number of total plus error lines by the number of error lines.

Communication Switch 03		SP No. 1-104-004
No	**FUNCTION**	**COMMENTS**
0 to 7	Maximum number of page retransmissions in a G3 memory transmission	00 - FF (Hex) times. This setting is not used if ECM is switched on. Default setting - 03(H)

Communication Switch 04 - Not used (do not change the settings)
Communication Switch 05 - Not used (do not change the settings)
Communication Switch 06 - Not used (do not change the settings)

Communication Switch 07		SP No. 1-104-008
No	**FUNCTION**	**COMMENTS**
0	Fallback from G4 to G3 if the other terminal is not a G4 terminal **0:** Disabled **1:** Enabled **(Japan Only)**	Also see system switch 0A bit 7. Refer to the ISDN G4 option service manual (G4 Internal Switches 17, 18, 1A, 1B, and 1C) for the CPS code set (Cause Value set) that determines G4 to G3 fallback.
1	Not used	Do not change the setting.
2	Not used	Do not change the setting.
3	Fallback from G4 to G3 reflected in programmed Quick/Speed dials **0:** Fallback enabled **1:** Always start with G4 **(Japan Only)**	**0:** If a communication falls back from G4 to G3, the machine will always start transmission with G3 from the next communication. **1:** The machine will always start to transmit with G4.
4	Fallback from G4 to G3 when G4 communication fails on the ISDN B-channel **0:** Fallback disabled **1:** Fallback enabled **(Japan Only)**	**1:** Enable this switch only when G4 communication errors occur because the exchanger connects G4 calls to the PSTN. This problem occurs with some types of exchanger.
5	Not used	Do not change the setting.
6	Not used	Do not change the setting.
7	Not used	Do not change the setting.

Communication Switch 08 - Not used (do not change the settings)
Communication Switch 09 - Not used (do not change the settings)

Communication Switch 0A		SP No. 1-104-011
No	**FUNCTION**	**COMMENTS**
0	Point of resumption of memory transmission upon redialing **0:** From the error page **1:** From page 1	**0:** The transmission begins from the page where transmission failed the previous time. **1:** Transmission begins from the first page, using normal memory transmission.
1-6	Not used	Do not change the settings.
7	Emergency calls using 999 **0:** Enabled **1:** Disabled	If this bit is at 1, the machine will not allow you to dial 999 at the auto-dialer. This is a PTT requirement in the Hong Kong.

Communication Switch 0B		SP No. 1-104-012
No	**FUNCTION**	**COMMENTS**
0	Use of Economy Transmission during a Transfer operation to end receivers **0:** Disabled **1:** Enabled	These bits determine whether the machine uses the Economy Transmission feature when it is carrying out a Transfer operation as a Transfer Station.
1	Use of Economy Transmission during a Transfer operation to the Next Transfer Stations **0:** Disabled **1:** Enabled	
2	Use of Label Insertion for the End Receivers in a Transfer operation **0:** Disabled **1:** Enabled	This bit determines whether the machine uses the Label Insertion feature when it is carrying out a Transfer operation as a Transfer Station.
3	Conditions required for Transfer Result Report transmission **0:** Always transmitted **1:** Only transmitted if there was an error	**0:** When acting as a Transfer Station, the machine will always send a Transfer Result Report back to the Requesting Station after completing the Transfer Request, even if there were no problems. **1:** The machine will only send back a Transfer Result Report if there were errors during communication, meaning one or more of the End Receivers could not be contacted.
4	Printout of the message when acting as a Transfer Station **0:** Disabled **1:** Enabled	When the machine is acting as a Transfer Station, this bit determines whether the machine prints the fax message coming in from the Requesting Terminal.
5	Action when there is no fax number in the programmed Quick/Speed dials which meets the requesting terminal's own fax number **0:** Transfer is disabled **1:** Transfer is enabled	After the machine receives a transfer request, the machine compares the last N digits of the requesting terminal's own fax number with all the Quick/Speed dials programmed in the machine. (N is the number programmed in communication switch 0C.) **0:** If there is no matching number programmed in the machine, the machine rejects the transfer request. **1:** Even if there is no matching number programmed in the machine, the machine accepts the transfer request. The result report will be printed at the transfer terminal, but will not be sent back to the requesting terminal.
6-7	Not used	Do not change the settings.

Communication Switch 0C		SP No. 1-104-013
No	**FUNCTION**	**COMMENTS**
0 to 4	Number of digits compared to find the requester's fax number from the programmed Quick/Speed Dials when acting as a Transfer Station	00 - 1F (0 to 31 digits) After the machine receives a transfer request, the machine compares the own telephone number sent from the Requesting Terminal with all Quick/Speed Dials programmed in the machine, starting from Quick Dial 01 to the end of the Speed Dials. This number determines how many digits from the end of the telephone numbers the machine compares. If it is set to 00, the machine will send the report to the first Quick/Speed Dial that the machine compared. If Quick Dial 01 is programmed, the machine will send the report to Quick 01. If Quick Dial 01 through 04 are not programmed and Quick Dial 05 is programmed, the machine will send the report to Quick 05. Default setting - 05(H) = 5 digits
5-7	Not used	Do not change the settings.

Communication Switch 0D		SP No. 1-104-014
No	**FUNCTION**	**COMMENTS**
0 to 7	The available memory threshold, below which ringing detection (and therefore reception into memory) is disabled	00 to FF (Hex), unit = 4 kbytes (e.g., 06(H) = 24 kbytes) One page is about 24 kbytes. The machine refers to this setting before each fax reception. If the amount of remaining memory is below this threshold, the machine cannot receive any fax messages. If this setting is kept at 0, the machine will detect ringing signals and go into receive mode even if there is no memory available. This will result in communication failure.

Communication Switch 0E		SP No. 1-104-015
No	**FUNCTION**	**COMMENTS**
0 to 7	Minimum interval between automatic dialing attempts	06 to FF (Hex), unit = 2 s (e.g., 06(H) = 12 s) This value is the minimum time that the machine waits before it dials the next destination.

Communication Switch 0F - Not used (do not change the settings.)

Communication Switch 10		**SP No. 1-104-017**
No	**FUNCTION**	**COMMENTS**
0 to 7	Memory transmission: Maximum number of dialing attempts to the same destination	01 - FE (Hex) times

Communication Switch 11 - Not used (do not change the settings.)

Communication Switch 12		**SP No. 1-104-019**
No	**FUNCTION**	**COMMENTS**
0 to 7	Memory transmission: Interval between dialing attempts to the same destination	01 - FF (Hex) minutes

Communication Switch 13 - Not used (do not change the settings.)

Communication Switch 14		**SP No. 1-104-021**
No	**FUNCTION**	**COMMENTS**
0	Inch-to-mm conversion during transmission **0:** Disabled **1:** Enabled	**0:** In immediate transmission, data scanned in inch format are transmitted without conversion. In memory transmission, data stored in the SAF memory in mm format are transmitted without conversion. **Note:** When storing the scanned data into SAF memory, the fax unit always converts the data into mm format. **1:** The machine converts the scanned data or stored data in the SAF memory to the format which was specified in the set-up protocol (DIS/NSF) before transmission.
1-5	Not used	Do not change the factory settings.
6 to 7	Available unit of resolution in which fax messages are received **Bit 7** **Bit 6** **Unit** 0 0 mm 0 1 inch 1 0 mm and inch (default) 1 1 Not used	For the best performance, do not change the factory settings. The setting determined by these bits is informed to the transmitting terminal in the pre-message protocol exchange (in the DIS/NSF frames).

Communication Switch 15 - Not used (do not change the settings)

Communication Switch 16		**SP No. 1-104-023**
No	**FUNCTION**	**COMMENTS**
0	Standard G3 unit **0:** Disabled **1:** Enabled **(Japan Only)**	Set this bit to 0 if the user wants to use only the ISDN line (option G4 unit), even for G3 communications. However, for ISDN on hook dialing, bit 7 of user parameter 30 must be set to 1. **Note:** If the optional G4 unit is not installed, but this bit is changed to 'disabled', no document can be transmitted.
1	Optional G3 unit (G3-2) **0:** Not installed **1:** Installed	Change this bit to 1 when installing the first optional G3 unit.
2	Optional ISDN unit **0:** Not installed **1:** Installed	Change this bit to 1 when installing the optional ISDN unit.
3	Optional G3 unit (G3-3) **0:** Not installed **1:** Installed	Change this bit to 1 when installing the second optional G3 unit.
4	Not used	Do not change the setting.
5	Not used	Do not change the setting.
6	Use of the I-G3 line **0:** Tx or rx **1:** Tx only	Change this bit to 1 when the customer requires.
7	G4 Dual communication **0:** Enabled **1:** Disabled **(Japan Only)**	**1:** The machine uses only one B channel for communication. This enables a customer to occupy another B channel for other purposes such as internet communication.

Communication Switch 17		**SP No. 1-104-024**
No	**FUNCTION**	**COMMENTS**
0	SEP reception **0:** Disabled **1:** Enabled	**0:** Polling transmission to another maker's machine using the SEP (Selective Polling) signal is disabled.
1	SUB reception **0:** Disabled **1:** Enabled	**0:** Confidential reception to another maker's machine using the SUB (Sub-address) signal is disabled.
2	PWD reception **0:** Disabled **1:** Enabled	**0:** Disables features that require PWD (Password) signal reception.
3-6	Not used	Do not change the settings.
7	Action when there is no box with an F-code that matches the received SUB code **0:** Disconnect the line **1:** Receive the message (using normal reception mode)	Change this setting when the customer requires.

Communication Switch 18 - Not used (do not change the settings)
Communication Switch 19 - Not used (do not change the settings)
Communication Switch 1A - Not used (do not change the settings)

Communication Switch 1B		**SP No. 1-104-028**
No	**FUNCTION**	**COMMENTS**
0 to 7	Extension access code (0 to 7) to turn V.8 protocol On/Off **0:** On **1:** Off	If the PABX does not support V.8/V.34 protocol procedure, set this bit to "1" to disable V.8. **Example:** If "0" is the PSTN access code, set bit 0 to 1. When the machine detects "0" as the first dialed number, it automatically disables V.8 protocol. (Alternatively, if "3" is the PSTN access code, set bit 3 to 1.)

Communication Switch 1C		**SP No. 1-104-029**
No	**FUNCTION**	**COMMENTS**
0 to 1	Extension access code (8 and 9) to turn V.8 protocol On/Off **0:** On **1:** Off	Refer to communication switch 1E. **Example:** If "8" is the PSTN access code, set bit 0 to 1. When the machine detects "8" as the first dialed number, it automatically disables V.8 protocol. (If "9" is the PSTN access code, use bit 1.)
2-7	Not used	Do not change the settings.

Communication Switch 1D - Not used (do not change the settings)
Communication Switch 1E - Not used (do not change the settings)
Communication Switch 1F - Not used (do not change the settings)

2.2.5 G3-1 SWITCHES

G3-1 Switch 00		SP No. 1-105-001
No	**FUNCTION**	**COMMENTS**
0 to 1	Monitor speaker during communication (tx and rx) **Bit 1** **Bit 0** **Setting** 0 0 Disabled 0 1 Up to Phase B 1 0 All the time 1 1 Not used	**(0, 0):** The monitor speaker is disabled all through the communication. **(0, 1):** The monitor speaker is on up to phase B in the T.30 protocol. **(1, 0):** Used for testing. The monitor speaker is on all through the communication. Make sure that you reset these bits after testing.
2	Monitor speaker during memory transmission 0: Disabled 1: Enabled	**1:** The monitor speaker is enabled during memory transmission.
3-7	Not used	Do not change the settings.

G3-1 Switch 01		SP No. 1-105-002
No	**FUNCTION**	**COMMENTS**
0-3	Not used	Do not change the settings.
4	DIS frame length **0:** 10 bytes **1:** 4 bytes	**1:** The bytes in the DIS frame after the 4th byte will not be transmitted (set to 1 if there are communication problems with PC-based faxes which cannot receive the extended DIS frames).
5	Not used	Do not change the setting.
6	CED/ANSam transmission **0:** Disabled **1:** Enabled	Do not change this setting, unless the communication problem is caused by the CED/ANSam transmission.
7	Not used	Do not change the setting.

G3-1 Switch 02		SP No. 1-105-003
No	**FUNCTION**	**COMMENTS**
0	G3 protocol mode used **0:** Standard and non-standard **1:** Standard only	Change this bit to 1 only when the other end can only communicate with machines that send T.30-standard frames only. **1:** Disables NSF/NSS signals (these are used in non-standard mode communication)
1-4	Not used	Do not change the settings.
5	Use of modem rate history for transmission using Quick/Speed Dials **0:** Disabled **1:** Enabled	**0:** Communications using Quick/Speed Dials always start from the highest modem rate. **1:** The machine refers to the modem rate history for communications with the same machine when determining the most suitable rate for the current communication.
6	AI short protocol (transmission and reception) **0:** Disabled **1:** Enabled	Refer to Appendix B in the Group 3 Facsimile Manual for details about AI Short Protocol.
7	Short preamble **0:** Disabled **1:** Enabled	Refer to Appendix B in the Group 3 Facsimile Manual for details about Short Preamble.

G3-1 Switch 03		SP No. 1-105-004
No	**FUNCTION**	**COMMENTS**
0	DIS detection number (Echo countermeasure) **0:** 1 **1:** 2	**0:** The machine will hang up if it receives the same DIS frame twice. **1:** Before sending DCS, the machine will wait for the second DIS which is caused by echo on the line.
1	V.8 protocol in manual reception **0:** Disabled **1:** Enabled	**0:** The machine sends CED instead of ANSam when starting a manual reception. **1:** The machine sends ANSam during manual reception.
2	V.8 protocol **0:** Disabled **1:** Enabled	**0:** V.8/V.34 communications will not be possible. **Note:** Do not set to 0 unless the line condition is always bad enough to slow down the data rate to 14.4 kbps or lower.
3	ECM frame size **0:** 256 bytes **1:** 64 bytes	Keep this bit at “0” in most cases.
4	CTC transmission conditions **0:** After one PPR signal received **1:** After four PPR signals received (ITU-T standard)	**0:** When using ECM in non-standard (NSF/NSS) mode, the machine sends a CTC to drop back the modem rate after receiving a PPR, if the following condition is met in communications at 14.4, 12.0, 9.6, and 7.2 kbps. $\sqrt{N\,Transmit \leq NRe\,send}$ $N_{Transmit}$- Number of transmitted frames N_{Resend}- Number of frames to be retransmitted **1:** When using ECM, the machine sends a CTC to drop back the modem rate after receiving four PPRs. PPR, CTC: These are ECM protocol signals. This bit is not effective in V.34 communications.
5	Modem rate used for the next page after receiving a negative code (RTN or PIN) **0:** No change **1:** Fallback	**1:** The machine’s tx modem rate will fall back before sending the next page if a negative code is received. This bit is ignored if ECM is being used.
6	V.8 protocol in manual transmission **0:** Disabled **1:** Enabled	**1:** The machine detects either ANSam or CED during manual transmission.
7	Not used	Do not change the setting.

G3-1 Switch 04		SP No. 1-105-005
No	**FUNCTION**	**COMMENTS**
0 to 3	Training error detection threshold	0 - F (Hex); 0 - 15 bits If the number of error bits in the received TCF is below this threshold, the machine informs the sender that training has succeeded.
4-7	Not used	Do not change the settings.

G3-1 Switch 05		SP No. 1-105-006
No	**FUNCTION**	**COMMENTS**
0 to 3	Initial Tx modem rate **Bit 3 2 1 0 Setting (bps)** 0 0 0 1 2.4 k 0 0 1 0 4.8 k 0 0 1 1 7.2 k 0 1 0 0 9.6 k 0 1 0 1 12.0 k 0 1 1 0 14.4 k 0 1 1 1 16.8 k 1 0 0 0 19.2 k 1 0 0 1 21.6 k 1 0 1 0 24.0 k 1 0 1 1 26.4 k 1 1 0 0 28.8 k 1 1 0 1 31.2 k 1 1 1 0 33.6 k Other settings - Not used	These bits set the initial starting modem rate for transmission. Use the dedicated transmission parameters if you need to change this for specific receivers. If a modem rate 14.4 kbps or slower is selected, V.8 protocol should be disabled manually. **Cross reference** V.8 protocol on/off - G3 switch 03, bit2
4 to 5	Initial modem type for 9.6 k or 7.2 kbps. **Bit 5 Bit 4 Setting** 0 0 V.29 0 1 V.17 1 0 V.34 1 1 Not used	These bits set the initial modem type for 9.6 and 7.2 kbps, if the initial modem rate is set at these speeds.
6-7	Not used	Do not change the settings.

G3-1 Switch 06		SP No. 1-105-007
No	**FUNCTION**	**COMMENTS**
0 to 3	Initial Rx modem rate **Bit 3 2 1 0 Setting (bps)** 0 0 0 1 2.4 k 0 0 1 0 4.8 k 0 0 1 1 7.2 k 0 1 0 0 9.6 k 0 1 0 1 12.0 k 0 1 1 0 14.4 k 0 1 1 1 16.8 k 1 0 0 0 19.2 k 1 0 0 1 21.6 k 1 0 1 0 24.0 k 1 0 1 1 26.4 k 1 1 0 0 28.8 k 1 1 0 1 31.2 k 1 1 1 0 33.6 k Other settings - Not used	These bits set the initial starting modem rate for reception. Use a lower setting if high speeds pose problems during reception. If a modem rate 14.4 kbps or slower is selected, V.8 protocol should be disabled manually. **Cross reference** V.8 protocol on/off - G3 switch 03, bit2
4 to 7	Modem types available for reception **Bit 7 6 5 4 Setting** 0 0 0 1 V.27ter 0 0 1 0 V.27ter, V.29 0 0 1 1 V.27ter, V.29 V.33 0 1 0 0 V.27ter, V.29, V.17/V.33 0 1 0 1 V.27ter, V.29, V.17/V33, V.34 Other settings - Not used	The setting of these bits is used to inform the transmitting terminal of the available modem type for the machine in receive mode. If V.34 is not selected, V.8 protocol must be disabled manually. **Cross reference** V.8 protocol on/off - G3 switch 03, bit2

G3-1 Switch 07		SP No. 1-105-008
No	**FUNCTION**	**COMMENTS**
0 to 1	PSTN cable equalizer (tx mode: Internal) **Bit 1 Bit 0 Setting** 0 0 None 0 1 Low 1 0 Medium 1 1 High	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Use the dedicated transmission parameters for specific receivers. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error • Modem rate fallback occurs frequently. **Note:** This setting is not effective in V.34 communications.

G3-1 Switch 07		SP No. 1-105-008
No	**FUNCTION**	**COMMENTS**
2 to 3	PSTN cable equalizer (rx mode: Internal) **Bit 3 Bit 2 Setting** 0 0 None 0 1 Low 1 0 Medium 1 1 High	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error with error codes such as 0-20, 0-23, etc. • Modem rate fallback occurs frequently. **Note:** This setting is not effective in V.34 communications.
4	PSTN cable equalizer (V.8/V.17 rx mode: External) **0**: Disabled **1**: Enabled	Keep this bit at "1".
5	PSTN cable equalizer (V.34 rx mode; External)	Keep this bit at "1".
6-7	Not used	Do not change the settings.

G3-1 Switch 08 - Not used (do not change the settings)

G3-1 Switch 09		SP No. 1-105-010
No	**FUNCTION**	**COMMENTS**
0 to 1	ISDN cable equalizer (tx mode: Internal) **Bit 1 Bit 0 Setting** 0 0 None 0 1 Low 1 0 Medium 1 1 High **(Japan Only)**	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Use the dedicated transmission parameters for specific receivers. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error • Modem rate fallback occurs frequently. **Note:** This setting is not effective in V.34 communications.

G3-1 Switch 09		SP No. 1-105-010
No	**FUNCTION**	**COMMENTS**
2 to 3	ISDN cable equalizer (rx mode: Internal) **Bit 3 Bit 2 Setting** 0 0 None 0 1 Low 1 0 Medium 1 1 High **(Japan Only)**	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error with error codes such as 0-20, 0-23, etc. • Modem rate fallback occurs frequently. **Note:** This setting is not effective in V.34 communications.
4	ISDN cable equalizer (V.8/V.17 rx mode: External) **0**: Disabled **1**: Enabled **(Japan Only)**	Keep this bit at "0" in most cases.
5	ISDN cable equalizer (V.34 rx mode: External) **0**: Disabled **1**: Enabled **(Japan Only)**	Keep this bit at "0" in most cases.
6-7	Not used	Do not change the settings.

G3-1 Switch 0A		SP No. 1-105-011
No	**FUNCTION**	**COMMENTS**
0 **1**	Maximum allowable carrier drop during image data reception **Bit 1 Bit 0 Value (ms)** 0 0 200 0 1 400 1 0 800 1 1 Not used	These bits set the acceptable modem carrier drop time. Try using a longer setting if error code 0-22 is frequent.
2-3	Not used	Do not change the settings.
4	Maximum allowable frame interval during image data reception. **0:** 5 s **1:** 13 s	This bit set the maximum interval between EOL (end-of-line) signals and the maximum interval between ECM frames from the other end. Try using a longer setting if error code 0-21 is frequent.
5	Not used	Do not change the setting.
6	Reconstruction time for the first line in receive mode **0:** 6 s **1:** 12 s	When the sending terminal is controlled by a computer, there may be a delay in receiving page data after the local machine accepts set-up data and sends CFR. This is outside the T.30 recommendation. But, if this delay occurs, set this bit to 1 to give the sending machine more time to send data. Refer to error code 0-20. ITU-T T.30 recommendation: The first line should come within 5 s of CFR.

7	Not used	Do not change the setting.

G3-1 Switch 0B		**SP No. 1-105-012**
No	**FUNCTION**	**COMMENTS**
0	Protocol requirements: Europe **0:** Disabled **1:** Enabled	The machine does not automatically reset these bits for each country after a country code (System Switch 0F) is programmed. Change the required bits manually at installation.
1	Protocol requirements: Spain **0:** Disabled **1:** Enabled	
2	Protocol requirements: Germany **0:** Disabled **1:** Enabled	
3	Protocol requirements: France **0:** Disabled **1:** Enabled	
4	PTT requirements: Germany **0:** Disabled **1:** Enabled	
5	PTT requirements: France **0:** Disabled **1:** Enabled	
6	Not used	Do not change the setting.
7	DTS requirements : Germany **0:** Disabled **1:** Enabled	Change this bit manually if required.

G3-1 Switch 0C		**SP No. 1-105-013**
No	**FUNCTION**	**COMMENTS**
0 **1**	Pulse dialing method **Bit 1 Bit 0 Setting** 0 0 Normal(P=N) 0 1 Oslo (P=10 - N) 1 0 Sweden (N+1) 1 1 Not used	P = Number of pulses sent out, N = Number dialed.
2-7	Not used	Do not change the settings.

G3-1 Switch 0D		**SP No. 1-105-014**
No	**FUNCTION**	**COMMENTS**
0-1	Not used	Do not change the settings.
2 to 5	Data rate threshold during V.34 reception **Bit 5 4 3 2 Setting** 0 0 0 0 Normal 0 1 1 1 Lower by one step 1 1 1 1 Lower by two steps	The machine changes the modulation parameters in the MPh signal to lower the initial modem rate during V.34 reception. If this switch is set to “0111”, the machine lowers the initial speed one step, for example, from 28,800 to 26,400 bps. This switch reduces transmission time if the machine frequently sends PPR signals during V.34 reception.
6	Not used	Do not change the setting.
7	B signal detection time for V.34 polling transmission **0:** 75 ms (default setting) **1:** 65 ms	Change this switch only when there are communication errors during V.34 polling transmission to a machine with a Panasonic modem.

G3-1 Switch 0E - Not used (do not change the settings)

G3-1 Switch 0F		**SP No. 1-105-016**
No	**FUNCTION**	**COMMENTS**
0	Alarm when an error occurred in Phase C or later **0**: Disabled **1**: Enabled	If the customer wants to hear an alarm after each error communication, change this bit to “1”.
1	Alarm when the handset is off-hook at the end of communication **0**: Disabled **1**: Enabled	If the customer wants to hear an alarm if the handset is off-hook at the end of fax communication, change this bit to “1”.
2-7	Not used	Do not change the settings.

2.2.6 G3-2 SWITCHES

These switches require an optional G3 interface unit.

G3-2 Switch 00		SP No. 1-106-001
No	**FUNCTION**	**COMMENTS**
0-1	Monitor speaker during communication (tx and rx) **Bit 1** **Bit 0** **Setting** 0 0 Disabled 0 1 Up to Phase B 1 0 All the time 1 1 Not used	**(0, 0):** The monitor speaker is disabled all through the communication. **(0, 1):** The monitor speaker is on up to phase B in the T.30 protocol. **(1, 0):** Used for testing. The monitor speaker is on all through the communication. Make sure that you reset these bits after testing.
2	Monitor speaker during memory transmission 0: Disabled 1: Enabled	**1:** The monitor speaker is enabled during memory transmission.
3-6	Not used	Do not change the settings.

G3-2 Switch 01		SP No. 1-106-002
No	**FUNCTION**	**COMMENTS**
0-3	Not used	Do not change the settings.
4	DIS frame length **0:** 10 bytes **1:** 4 bytes	**1:** The bytes in the DIS frame after the 4th byte will not be transmitted (set to 1 if there are communication problems with PC-based faxes which cannot receive the extended DIS frames).
5	Not used	Do not change the setting.
6	CED/ANSam transmission **0:** Disabled **1:** Enabled	Do not change this setting, unless the communication problem is caused by the CED/ANSam transmission.
7	Not used	Do not change the setting.

G3-2 Switch 02		SP No. 1-106-003
No	**FUNCTION**	**COMMENTS**
0	G3 protocol mode used **0:** Standard and non-standard **1:** Standard only	Change this bit to 1 only when the other end can only communicate with machines that send T.30-standard frames only. **1:** Disables NSF/NSS signals (these are used in non-standard mode communication)
1-4	Not used	Do not change the settings.
5	Use of modem rate history for transmission using Quick/Speed Dials **0:** Disabled **1:** Enabled	**0:** Communications using Quick/Speed Dials always start from the highest modem rate. **1:** The machine refers to the modem rate history for communications with the same machine when determining the most suitable rate for the current communication.
6	AI short protocol (transmission and reception) **0:** Disabled **1:** Enabled	Refer to Appendix B in the Group 3 Facsimile Manual for details about AI Short Protocol.
7	Short preamble **0:** Disabled **1:** Enabled	Refer to Appendix B in the Group 3 Facsimile Manual for details about Short Preamble.

G3-2 Switch 03		SP No. 1-106-004
No	**FUNCTION**	**COMMENTS**
0	DIS detection number (Echo countermeasure) **0:** 1 **1:** 2	**0:** The machine will hang up if it receives the same DIS frame twice. **1:** Before sending DCS, the machine will wait for the second DIS which is caused by echo on the line.
1	Not used	Do not change the setting.
2	V.8 protocol **0:** Disabled **1:** Enabled	**0:** V.8/V.34 communications will not be possible. **Note:** Do not set to 0 unless the line condition is always bad enough to slow down the data rate to 14.4 kbps or lower.
3	ECM frame size **0:** 256 bytes **1:** 64 bytes	Keep this bit at "0" in most cases.
4	CTC transmission conditions **0:** After one PPR signal received **1:** After four PPR signals received (ITU-T standard)	**0:** When using ECM in non-standard (NSF/NSS) mode, the machine sends a CTC to drop back the modem rate after receiving a PPR, if the following condition is met in communications at 14.4, 12.0, 9.6, and 7.2 kbps. $\sqrt{N\,\text{Transmit} \le N\,\text{Resend}}$ $N_{Transmit}$- Number of transmitted frames N_{Resend}- Number of frames to be retransmitted **1:** When using ECM, the machine sends a CTC to drop back the modem rate after receiving four PPRs. PPR, CTC: These are ECM protocol signals. This bit is not effective in V.34 communications.
5	Modem rate used for the next page after receiving a negative code (RTN or PIN) **0:** No change **1:** Fallback	**1:** The machine's tx modem rate will fall back before sending the next page if a negative code is received. This bit is ignored if ECM is being used.
6	Not used	Do not change the setting.
7	Not used	Do not change the setting.

G3-2 Switch 04		SP No. 1-106-005
No	**FUNCTION**	**COMMENTS**
0 to 3	Training error detection threshold	0 - F (Hex); 0 - 15 bits If the number of error bits in the received TCF is below this threshold, the machine informs the sender that training has succeeded.
4-7	Not used	Do not change the settings.

G3-2 Switch 05		SP No. 1-106-006
No	**FUNCTION**	**COMMENTS**
0 to 3	Initial Tx modem rate **Bit 3 2 1 0 Setting (bps)** 0 0 0 1 2.4 k 0 0 1 0 4.8 k 0 0 1 1 7.2 k 0 1 0 0 9.6 k 0 1 0 1 12.0 k 0 1 1 0 14.4 k 0 1 1 1 16.8 k 1 0 0 0 19.2 k 1 0 0 1 21.6 k 1 0 1 0 24.0 k 1 0 1 1 26.4 k 1 1 0 0 28.8 k 1 1 0 1 31.2 k 1 1 1 0 33.6 k Other settings - Not used	These bits set the initial starting modem rate for transmission. Use the dedicated transmission parameters if you need to change this for specific receivers. If a modem rate 14.4 kbps or slower is selected, V.8 protocol should be disabled manually. **Cross reference** V.8 protocol on/off - SG3 switch 03, bit 2
4 to 5	Initial modem type for 9.6 k or 7.2 kbps. **Bit 5 Bit 4 Setting** 0 0 V.29 0 1 V.17 1 0 V.34 1 1 Not used	These bits set the initial modem type for 9.6 and 7.2 kbps, if the initial modem rate is set at these speeds.
6-7	Not used	Do not change the settings.

G3-2 Switch 06		SP No. 1-106-007
No	**FUNCTION**	**COMMENTS**
0 to 3	Initial Rx modem rate **Bit 3 2 1 0 Setting (bps)** 0 0 0 1 2.4 k 0 0 1 0 4.8 k 0 0 1 1 7.2 k 0 1 0 0 9.6 k 0 1 0 1 12.0 k 0 1 1 0 14.4 k 0 1 1 1 16.8 k 1 0 0 0 19.2 k 1 0 0 1 21.6 k 1 0 1 0 24.0 k 1 0 1 1 26.4 k 1 1 0 0 28.8 k 1 1 0 1 31.2 k 1 1 1 0 33.6 k Other settings - Not used	These bits set the initial starting modem rate for reception. Use a lower setting if high speeds pose problems during reception. If a modem rate 14.4 kbps or slower is selected, V.8 protocol should be disabled manually. **Cross reference** V.8 protocol on/off - SG3 switch 03, bit 2

G3-2 Switch 06		SP No. 1-106-007
No	**FUNCTION**	**COMMENTS**
4 to 7	Modem types available for reception **Bit 7 6 5 4 Setting** 0 0 0 1 V.27ter 0 0 1 0 V.27ter, V.29 0 0 1 1 V.27ter, V.29 V.33 0 1 0 0 V.27ter, V.29, V.17/V.33 0 1 0 1 V.27ter, V.29, V.17/V33, V.34 Other settings - Not used	The setting of these bits is used to inform the transmitting terminal of the available modem type for the machine in receive mode. If V.34 is not selected, V.8 protocol must be disabled manually. **Cross reference** V.8 protocol on/off - SG3 switch 03, bit 2

G3-2 Switch 07		SP No. 1-106-008
No	**FUNCTION**	**COMMENTS**
0 to 1	PSTN cable equalizer (tx mode: Internal) **Bit 1 Bit 0 Setting** 0 0 None 0 1 Low 1 0 Medium 1 1 High	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Use the dedicated transmission parameters for specific receivers. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error • Modem rate fallback occurs frequently. Note: This setting is not effective in V.34 communications.
2 to 3	PSTN cable equalizer (rx mode: Internal) **Bit 3 Bit 2 Setting** 0 0 None 0 1 Low 1 0 Medium 1 1 High	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error with error codes such as 0-20, 0-23, etc. • Modem rate fallback occurs frequently. Note: This setting is not effective in V.34 communications.
4	PSTN cable equalizer (V.8/V.17 rx mode: External) **0**: Disabled **1**: Enabled	Keep this bit at “1”.
5	PSTN cable equalizer (V.34 rx mode; External)	Keep this bit at “1”.
6-7	Not used	Do not change the settings.

G3-2 Switch 08 - Not used (do not change the settings)
G3-2 Switch 09 - Not used (do not change the settings)

G3-2 Switch 0A		**SP No. 1-106-011**
No	**FUNCTION**	**COMMENTS**
0 **1**	Maximum allowable carrier drop during image data reception **Bit 1** **Bit 0** **Value (ms)** 0 0 200 0 1 400 1 0 800 1 1 Not used	These bits set the acceptable modem carrier drop time. Try using a longer setting if error code 0-22 is frequent.
2-3	Not used	Do not change the settings.
4	Maximum allowable frame interval during image data reception. **0:** 5 s **1:** 13 s	This bit set the maximum interval between EOL (end-of-line) signals and the maximum interval between ECM frames from the other end. Try using a longer setting if error code 0-21 is frequent.
5	Not used	Do not change the setting.
6	Reconstruction time for the first line in receive mode **0:** 6 s **1:** 12 s	When the sending terminal is controlled by a computer, there may be a delay in receiving page data after the local machine accepts set-up data and sends CFR. This is outside the T.30 recommendation. But, if this delay occurs, set this bit to 1 to give the sending machine more time to send data. Refer to error code 0-20. ITU-T T.30 recommendation: The first line should come within 5 s of CFR.
7	Not used	Do not change the setting.

G3-2 Switch 0B		**SP No. 1-106-012**
No	**FUNCTION**	**COMMENTS**
0	Protocol requirements: Europe **0:** Disabled **1:** Enabled	The machine does not automatically reset these bits for each country after a country code (System Switch 0F) is programmed. Change the required bits manually at installation.
1	Protocol requirements: Spain **0:** Disabled **1:** Enabled	
2	Protocol requirements: Germany **0:** Disabled **1:** Enabled	
3	Protocol requirements: France **0:** Disabled **1:** Enabled	
4	PTT requirements: Germany **0:** Disabled **1:** Enabled	
5	PTT requirements: France **0:** Disabled **1:** Enabled	
6	Not used	Do not change the setting.
7	Not used	Do not change the setting.

G3-2 Switch 0C				SP No. 1-106-013
No	**FUNCTION**			**COMMENTS**
0 **1**	Pulse dialing method **Bit 1** **Bit 0** **Setting** 0 0 Normal(P=N) 0 1 Oslo (P=10 - N) 1 0 Sweden (N+1) 1 1 Not used			P = Number of pulses sent out, N = Number dialed.
2-7	Not used			Do not change the settings.

G3-2 Switch 0D - Not used (do not change the settings)
G3-2 Switch 0E - Not used (do not change the settings)
G3-2 Switch 0F - Not used (do not change the settings)

2.2.7 G3-3 SWITCHES

These switches require the second optional G3 interface unit.

The contents of the G3-3 switches are similar to the G3-2.

2.3 NCU PARAMETERS

The following tables give the RAM addresses and the parameter calculation units that the machine uses for ringing signal detection and automatic dialing. The factory settings for each country are also given. Most of these must be changed by RAM read/write (SP2-102), but some can be changed using NCU Parameter programming (SP2-103, 104 and 105); if SP2-103, 104 and 105 can be used, this will be indicated in the Remarks column. The RAM is programmed in hex code unless (BCD) is included in the Unit column.

NOTE: The following addresses describe settings for the standard NCU.
Change the fourth digit from “5” to “6” (e.g. 680500 to 680600) for the settings for the first optional G3 interface unit.
Change the fourth digit from “5” to “7” (e.g. 680500 to 680700) for the settings for the second optional G3 interface unit.

<table>
<tr><th>Address</th><th>Function</th><th>Unit</th><th>Remarks</th></tr>
<tr><td>680500</td><td>Country/Area code for NCU parameters</td><td colspan="2">Use the Hex value to program the country/area code directly into this address, or use the decimal value to program it using SP2-103-001

Country/Area Decimal Hex
France 00 00
Germany 01 01
UK 02 02
Italy 03 03
Austria 04 04
Belgium 05 05
Denmark 06 06
Finland 07 07
Ireland 08 08
Norway 09 09
Sweden 10 0A
Switzerland 11 0B
Portugal 12 0C
Holland 13 0D
Spain 14 0E
Israel 15 0F
USA 17 11
Asia 18 12
Hong Kong 20 14
South Africa 21 15
Australia 22 16
New Zealand 23 17
Singapore 24 18
Malaysia 25 19
China 26 1A
Taiwan 27 1B
Korea 28 1C
Greece 33 21
Hungary 34 22
Czech 35 23
Poland 36 24</td></tr>
<tr><td>680501</td><td>Line current detection time</td><td rowspan="3">20 ms</td><td rowspan="3">Line current detection is disabled.
Line current is not detected if 680501 contains FF.</td></tr>
<tr><td>680502</td><td>Line current wait time</td></tr>
<tr><td>680503</td><td>Line current drop detect time</td></tr>
<tr><td>680504</td><td>PSTN dial tone frequency upper limit (high byte)</td><td rowspan="2">Hz (BCD)</td><td rowspan="2">If both addresses contain FF(H), tone detection is disabled.</td></tr>
<tr><td>680505</td><td>PSTN dial tone frequency upper limit (low byte)</td></tr>
<tr><td>680506</td><td>PSTN dial tone frequency lower limit (high byte)</td><td rowspan="2">Hz (BCD)</td><td rowspan="2">If both addresses contain FF(H), tone detection is disabled.</td></tr>
<tr><td>680507</td><td>PSTN dial tone frequency lower limit (low byte)</td></tr>
</table>

Address	Function	Unit	Remarks
680508	PSTN dial tone detection time	20 ms	If 680508 contains FF(H), the machine pauses for the pause time (address 68050D / 68050E). Italy: See Note 2.
680509	PSTN dial tone reset time (LOW)		
68050A	PSTN dial tone reset time (HIGH)		
68050B	PSTN dial tone continuous tone time		
68050C	PSTN dial tone permissible drop time		
68050D	PSTN wait interval (LOW)		
68050E	PSTN wait interval (HIGH)		
68050F	PSTN ring-back tone detection time	20 ms	Detection is disabled if this contains FF.
680510	PSTN ring-back tone off detection time	20 ms	
680511	PSTN detection time for silent period after ring-back tone detected (LOW)	20 ms	
680512	PSTN detection time for silent period after ring-back tone detected (HIGH)	20 ms	
680513	PSTN busy tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
680514	PSTN busy tone frequency upper limit (low byte)		
680515	PSTN busy tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
680516	PSTN busy tone frequency lower limit (low byte)		
680517	PABX dial tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
680518	PABX dial tone frequency upper limit (low byte)		
680519	PABX dial tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
68051A	PABX dial tone frequency lower limit (low byte)		
68051B	PABX dial tone detection time	20 ms	If 68051B contains FF, the machine pauses for the pause time (680520 / 680521).
68051C	PABX dial tone reset time (LOW)		
68051D	PABX dial tone reset time (HIGH)		
68051E	PABX dial tone continuous tone time		
68051F	PABX dial tone permissible drop time		
680520	PABX wait interval (LOW)		
680521	PABX wait interval (HIGH)		
680522	PABX ringback tone detection time	20 ms	If both addresses contain FF(H), tone detection is disabled.
680523	PABX ringback tone off detection time	20 ms	
680524	PABX detection time for silent period after ringback tone detected (LOW)	20 ms	If both addresses contain FF(H), tone detection is disabled.
680525	PABX detection time for silent period after ringback tone detected (HIGH)	20 ms	

Address	Function	Unit	Remarks
680526	PABX busy tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
680527	PABX busy tone frequency upper limit (low byte)		
680528	PABX busy tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
680529	PABX busy tone frequency lower limit (low byte)		
68052A	Busy tone ON time: range 1	20 ms	
68052B	Busy tone OFF time: range 1		
68052C	Busy tone ON time: range 2		
68052D	Busy tone OFF time: range 2		
68052E	Busy tone ON time: range 3		
68052F	Busy tone OFF time: range 3		
680530	Busy tone ON time: range 4		
680531	Busy tone OFF time: range 4		
680532	Busy tone continuous tone detection time		
680533	Busy tone signal state time tolerance for all ranges, and number of cycles required for detection (a setting of 4 cycles means that ON-OFF-ON or OFF-ON-OFF must be detected twice). Tolerance (±) **Bit 1 0** 0 0 75% Bits 2 and 3 must always 0 1 50% be kept at 0. 1 0 25% 1 1 12.5% Bits 7, 6, 5, 4 - number of cycles required for cadence detection		
680534	International dial tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
680535	International dial tone frequency upper limit (low byte)		
680536	International dial tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
680537	International dial tone frequency lower limit (low byte)		
680538	International dial tone detection time	20 ms	If 680538 contains FF, the machine pauses for the pause time (68053D / 68053E). Belgium: See Note 2.
680539	International dial tone reset time (LOW)		
68053A	International dial tone reset time (HIGH)		
68053B	International dial tone continuous tone time		
68053C	International dial tone permissible drop time		
68053D	International dial wait interval (LOW)		
68053E	International dial wait interval (HIGH)		

Address	Function	Unit	Remarks
68053F	Country dial tone upper frequency limit (HIGH)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
680540	Country dial tone upper frequency limit (LOW)		
680541	Country dial tone lower frequency limit (HIGH)		If both addresses contain FF(H), tone detection is disabled.
680542	Country dial tone lower frequency limit (LOW)		
680543	Country dial tone detection time	20 ms	If 680543 contains FF, the machine pauses for the pause time (680548 / 680549).
680544	Country dial tone reset time (LOW)		
680545	Country dial tone reset time (HIGH)		
680546	Country dial tone continuous tone time		
680547	Country dial tone permissible drop time		
680548	Country dial wait interval (LOW)		
680549	Country dial wait interval (HIGH)		
68054A	Time between opening or closing the DO relay and opening the OHDI relay	1 ms	See Notes 3, 6 and 8. Function 06-2 (parameter 11).
68054B	Break time for pulse dialing	1 ms	See Note 3. Function 06-2 (parameter 12).
68054C	Make time for pulse dialing	1 ms	See Note 3. Function 06-2 (parameter 13).
68054D	Time between final OHDI relay closure and DO relay opening or closing	1 ms	See Notes 3, 6 and 8. Function 06-2 (parameter 14). This parameter is only valid in Europe.
68054E	Minimum pause between dialed digits (pulse dial mode)	20 ms	See Note 3 and 8. Function 06-2 (parameter 15).
68054F	Time waited when a pause is entered at the operation panel		Function 06-2 (parameter 16). See Note 3.
680550	DTMF tone on time	1 ms	Function 06-2 (parameter 17).
680551	DTMF tone off time		Function 06-2 (parameter 18).
680552	Tone attenuation level of DTMF signals while dialing	-N x 0.5 –3.5 dBm	Function 06-2 (parameter 19). See Note 5.
680553	Tone attenuation value difference between high frequency tone and low frequency tone in DTMF signals	-dBm x 0.5	Function 06-2 (parameter 20). The setting must be less than –5dBm, and should not exceed the setting at 680552h above. See Note 5.

Address	Function	Unit	Remarks
680554	PSTN: DTMF tone attenuation level after dialing	-N x 0.5 –3.5 dBm	Function 06-2 (parameter 21). See Note 5.
680555	ISDN: DTMF tone attenuation level after dialing	-dBm x 0.5	See Note 5
680556	Not used		Do not change the settings.
680557	Time between 68054Dh (NCU parameter 14) and 68054Eh (NCU parameter 15)	1 ms	This parameter takes effect when the country code is set to France.
680558	Not used		Do not change the setting.
680559	Grounding time (ground start mode)	20 ms	The Gs relay is closed for this interval.
68055A	Break time (flash start mode)	1 ms	The OHDI relay is open for this interval.
68055B	International dial access code (High)	BCD	For a code of 100: 68055B - F1 68055C - 00
68055C	International dial access code (Low)		
68055D	PSTN access pause time	20 ms	This time is waited for each pause input after the PSTN access code. If this address contains FF[H], the pause time stored in address 68054F is used. Do not set a number more than 7 in the UK.
68055E	Progress tone detection level, and cadence detection enable flags	Bit 7 Bit 6 Bit 5 dBm 0 0 0 -25.0 0 0 1 -35.0 0 1 0 -30.0 1 0 0 -40.0 1 1 0 -49.0 Bits 2, 0 - See Note 2.	
68055F to 680564	Not used		Do not change the settings.
680565	Long distance call prefix (HIGH)	BCD	For a code of 0: 680565 - FF 680566 - F0
680566	Long distance call prefix (LOW)	BCD	
680567 to 680571	Not used		Do not change the settings.
680572	Acceptable ringing signal frequency: range 1, upper limit	1000/ N (Hz).	Function 06-2 (parameter 02).
680573	Acceptable ringing signal frequency: range 1, lower limit		Function 06-2 (parameter 03).
680574	Acceptable ringing signal frequency: range 2, upper limit		Function 06-2 (parameter 04).
680575	Acceptable ringing signal frequency: range 2, lower limit		Function 06-2 (parameter 05).

Address	Function	Unit	Remarks
680576	Number of rings until a call is detected	1	Function 06-2 (parameter 06). The setting must not be zero.
680577	Minimum required length of the first ring	20 ms	See Note 4. Function 06-2 (parameter 07).
680578	Minimum required length of the second and subsequent rings	20 ms	Function 06-2 (parameter 06-2).
680579	Ringing signal detection reset time (LOW)	20 ms	Function 06-2 (parameter 09).
68057A	Ringing signal detection reset time (HIGH)		Function 06-2 (parameter 10).
68057B to 680580	Not used		Do not change the settings.
680581	Interval between dialing the last digit and switching the Oh relay over to the external telephone when dialing from the operation panel in handset mode.	20 ms	Factory setting: 500 ms
680582	Bits 0 and 1 - Handset off-hook detection time **Bit 1 0 Setting** 0 0 200 ms 0 1 800 ms Other Not used Bits 2 and 3 - Handset on-hook detection time **Bit 3 2 Setting** 0 0 200 ms 0 1 800 ms Other Not used Bits 4 to 7 - Not used		
680583 to 6805A0	Not used		Do not change the settings.
6805A1	Acceptable CED detection frequency upper limit (high byte)	BCD (Hz)	If both addresses contain FF(H), tone detection is disabled.
6805A2	Acceptable CED detection frequency upper limit (low byte)		
6805A3	Acceptable CED detection frequency lower limit (high byte)	BCD (Hz)	If both addresses contain FF(H), tone detection is disabled.
6805A4	Acceptable CED detection frequency lower limit (low byte)		
6805A5	CED detection time	20 ms ± 20 ms	Factory setting: 200 ms
6805A6	Acceptable CNG detection frequency upper limit (high byte)	BCD (Hz)	If both addresses contain FF(H), tone detection is disabled.
6805A7	Acceptable CNG detection frequency upper limit (low byte)		

Address	Function	Unit	Remarks
6805A8	Acceptable CNG detection frequency lower limit (high byte)	BCD (Hz)	If both addresses contain FF(H), tone detection is disabled.
6805A9	Acceptable CNG detection frequency lower limit (low byte)		
6805AA	Not used		Do not change the setting.
6805AB	CNG on time	20 ms	Factory setting: 500 ms
6805AC	CNG off time	20 ms	Factory setting: 200 ms
6805AD	Number of CNG cycles required for detection		The data is coded in the same way as address 680533.
6805AE	Not used		Do not change the settings.
6805AF	Acceptable AI short protocol tone (800Hz) detection frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
6805B0	Acceptable AI short protocol tone (800Hz) detection frequency upper limit (low byte)		
6805B1	Acceptable AI short protocol tone (800Hz) detection frequency lower limit (high byte)	Hz(BCD)	If both addresses contain FF(H), tone detection is disabled.
6805B2	Acceptable AI short protocol tone (800Hz) detection frequency lower limit (low byte)		
6805B3	Detection time for 800 Hz AI short protocol tone	20 ms	Factory setting: 360 ms
6805B4	PSTN: Tx level from the modem	-N – 3 dBm	Function 06-2 (parameter 01).
6805B5	PSTN: 1100 Hz tone transmission level	- N 6805B4 - 0.5N 6805B5 –3.5 (dB) See Note 7.	
6805B6	PSTN: 2100 Hz tone transmission level	- N6805B4 - 0.5N 6805B6 –3 (dB) See Note 7.	
6805B7	PABX: Tx level from the modem	- dBm	
6805B8	PABX: 1100 Hz tone transmission level	- N 6805B7 - 0.5N 6805B8 (dB)	
6805B9	PABX: 2100 Hz tone transmission level	- N 6805B7 - 0.5N 6805B9 (dB)	
6805BA	ISDN: Tx level from the modem **(Japan Only)**	- dBm	The setting must be between -12dBm and -15dBm.
6805BB	ISDN: 1100 Hz tone transmission level **(Japan Only)**	- N 6805BA - 0.5N 6805BB (dB)	
6805BC	ISDN: 2100 Hz tone transmission level **(Japan Only)**	- N 6805BA - 0.5N 6805BC (dB)	
6805BD	Modem turn-on level (incoming signal detection level)	-37-0.5N (dBm)	

Address	Function	Unit	Remarks
6805BE to 6805C6	Not used		Do not change the settings.
6805C7	Bits 0 to 3 – Not used. Bit 4 – V.34 protocol dump **0:** Simple, **1:** Detailed (default) Bits 5 to 7 – Not used.		
6805C8 to 6805D9	Not used		Do not change the settings.
6805DA	T.30 T1 timer	1 s	
6805E0 bit 3	Maximum wait time for post message	**0:** 12 s **1:** 30 s	**1:** Maximum wait time for post message (EOP/EOM/MPS) can be changed to 30 s. Change this bit to "1" if communication errors occur frequently during V.17 reception.

NOTES:

1. If a setting is not required, store FF in the address.
2. Italy and Belgium only

   RAM address 68055E: the lower four bits have the following meaning.
   Bit 2 - 1: International dial tone cadence detection enabled (Belgium)
   Bit 1 - Not used
   Bit 0 - 1: PSTN dial tone cadence detection enabled (Italy)

   If bit 0 or bit 2 is set to 1, the functions of the following RAM addresses are changed.
   680508 (if bit 0 = 1) or 680538 (if bit 2 = 1): tolerance for on or off state duration (%), and number of cycles required for detection, coded as in address 680533.
   68050B (if bit 0 = 1) or 68053B (if bit 2 = 1): on time, hex code (unit = 20 ms)
   68050C (if bit 0 = 1) or 68053C (if bit 2 = 1): off time, hex code (unit = 20 ms)
3. Pulse dial parameters (addresses 68054A to 68054F) are the values for 10 pps. If 20 pps is used, the machine automatically compensates.
4. The first ring may not be detected until 1 to 2.5 wavelengths after the time specified by this parameter.
5. The calculated level must be between 0 and 10.
   The attenuation levels calculated from RAM data are:
   High frequency tone: – 0.5 x $N_{680552/680554}$–3.5 dBm
   – 0.5 x N_{680555} dBm
   Low frequency tone: – 0.5 x ($N_{680552/680554}$ + N_{680553}) –3.5 dBm
   – 0.5 x (N_{680555} + N_{680553}) dBm
   NOTE: N_{680552}, for example, means the value stored in address 680552(H)

6. 68054A: Europe - Between Ds opening and Di opening, France - Between Ds closing and Di opening
   68054D: Europe - Between Ds closing and Di closing, France - Between Ds opening and Di closing
7. Tone signals which frequency is lower than 1500Hz (e.g., 800Hz tone for AI short protocol) refer to the setting at 6805B5h. Tones which frequency is higher than 1500Hz refer to the setting at 6805B6h.
8. 68054A, 68054D, 68054E: The actual inter-digit pause (pulse dial mode) is the sum of the period specified by the RAM addresses 68054A, 68054D, and 68054E.

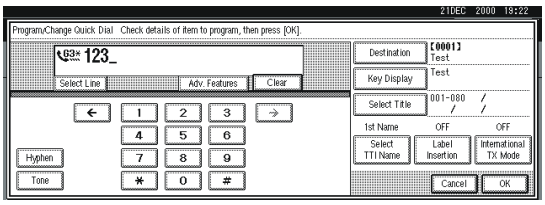
2.4 DEDICATED TRANSMISSION PARAMETERS

Each Quick Dial Key and Speed Dial Code has eight bytes of programmable parameters allocated to it. If transmissions to a particular machine often experience problems, store that terminal's fax number as a Quick Dial or Speed Dial, and adjust the parameters allocated to that number.

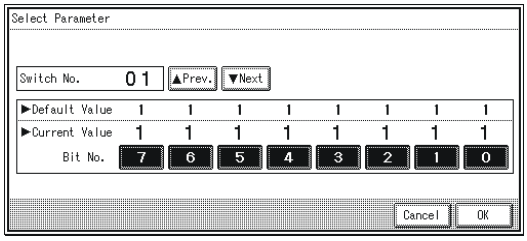
The programming procedure will be explained first. Then, the eight bytes will be described.

2.4.1 PROGRAMMING PROCEDURE

1. Set the bit 0 of System Bit Switch 00 to 1.
2. Press "Dest. Management" in the facsimile standby mode.
3. Press "Program/Change/Delete Quick Dial".
4. Select the destination key you want to program.
5. When the programmed dial number is displayed, press "Start".
   Make sure that the LED of the Start button is lit as green.



6. The settings for the switch 01 are now displayed. Press the bit number that you wish to change.
7. To scroll through the parameter switches, either:
8. Select the next switch: press "Next"
   or
   Select the previous switch: "Prev." until the correct switch is displayed.
   Then go back to step 6.



9. After the setting is changed, press "OK".
10. After finishing, reset bit 0 of System Bit Switch 00 to 0.

2.4.2 PARAMETERS

The initial settings of the following parameters are all FF(H) - all the parameters are disabled.

Switch 01
FUNCTION AND COMMENTS
ITU-T T1 time (for PSTN G3 mode) If the connection time to a particular terminal is longer than the NCU parameter setting, adjust this byte. The T1 time is the value stored in this byte (in hex code), multiplied by 1 second. **Range:** 0 to 120 s (00h to 78h) FFh - The local NCU parameter factory setting is used. Do not program a value between 79h and FEh.

Switch 02		
No	**FUNCTION**	**COMMENTS**
0 to 4	Tx level **Bit 4 3 2 1 0 Setting** 0 0 0 0 0 0 0 0 0 0 1 -1 0 0 0 1 0 -2 0 0 0 1 1 -3 0 0 1 0 0 -4 : : 0 1 1 1 1 -15 1 1 1 1 1 Disabled	If communication with a particular remote terminal often contains errors, the signal level may be inappropriate. Adjust the Tx level for communications with that terminal until the results are better. If the setting is “Disabled”, the NCU parameter 01 setting is used. **Note:** Do not use settings other than listed on the left.
5 to 7	Cable equalizer **Bit 7 6 5 Setting** 0 0 0 None 0 0 1 Low 0 1 0 Medium 0 1 1 High 1 1 1 Disabled	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange when calling the number stored in this Quick/Speed Dial. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error with error codes such as 0-20, 0-23, etc. • Modem rate fallback occurs frequently. **Note:** Do not use settings other than listed on the left. If the setting is “Disabled”, the bit switch setting is used.

Switch 03		
No	**FUNCTION**	**COMMENTS**
0 to 3	Initial Tx modem rate **Bit3 2 1 0 Setting (bps)** 0 0 0 0 Not used 0 0 0 1 2,400 0 0 1 0 4,800 0 0 1 1 7,200 0 1 0 0 9,600 0 1 0 1 12,000 0 1 1 0 14,400 0 1 1 1 16,800 1 0 0 0 19,200 1 0 0 1 21,600 1 0 1 0 24,000 1 0 1 1 26,400 1 1 0 0 28,800 1 1 0 1 31,200 1 1 1 0 33,600 1 1 1 1 Disabled Other settings: Not used	If training with a particular remote terminal always takes too long, the initial modem rate may be too high. Reduce the initial Tx modem rate using these bits. For the settings 14.4 or kbps slower, Switch 04 bit 4 must be changed to 0. **Note:** Do not use settings other than listed on the left. If the setting is “Disabled”, the bit switch setting is used.
4-5	Not used	Do not change the settings.
6	AI short protocol **0:** Off **1:** Disabled	Refer to Appendix B in the Group 3 Facsimile Manual for details about AI Short Protocol. If the setting is “Disabled”, the bit switch setting is used.
7	Not used	Do not change the settings.

Switch 04		
No	**FUNCTION**	**COMMENTS**
0 to 1	Inch-mm conversion before tx **Bit 1 Bit 0 Setting** 0 0 Inch-mm conversion available 0 1 Inch only 1 0 Not used 1 1 Disabled	The machine uses inch-based resolutions for scanning. If “inch only” is selected, the printed copy may be slightly distorted at the other end if that machine uses mm-based resolutions. If the setting is “Disabled”, the bit switch setting is used.
2 to 3	DIS/NSF detection method **Bit 3 Bit 2 Setting** 0 0 First DIS or NSF 0 1 Second DIS or NSF 1 0 Not used 1 1 Disabled	**(0, 1):** Use this setting if echoes on the line are interfering with the set-up protocol at the start of transmission. The machine will then wait for the second DIS or NSF before sending DCS or NSS. If the setting is “Disabled”, the bit switch setting is used.

Switch 04		
No	**FUNCTION**	**COMMENTS**
4	V.8 protocol **0**: Off **1**: Disabled	If transmissions to a specific destination always end at a lower modem rate (14,400 bps or lower), disable V.8 protocol so as not to use V.34 protocol. **0:** V.34 communication will not be possible. If the setting is “Disabled”, the bit switch setting is used.
5	Compression modes available in transmit mode **0:** MH only **1:** Disabled	This bit determines the capabilities that are informed to the other terminal during transmission. If the setting is “Disabled”, the bit switch setting is used.
6 to 7	ECM during transmission **Bit 7 Bit 6 Setting** 0 0 Off 0 1 On 1 0 Not used 1 1 Disabled	For example, if ECM is switched on but is not wanted when sending to a particular terminal, use the (0, 0) setting. Note that V.8/V.34 protocol and JBIG compression are automatically disabled if ECM is disabled. If the setting is “Disabled”, the bit switch setting is used.

Switch 05 - Not used (do not change the settings)
Switch 06 - Not used (do not change the settings)

Switch 07 - Optional ISDN G4 kit required - (Japan Only)		
No	**FUNCTION**	**COMMENTS**
0 to 3	Data rate **Bits 3 2 1 0 Setting** 0 0 0 0 64 kbps 0 0 0 1 56 kbps 1 1 1 1 Disabled	If the setting is “Disabled”, the current setting of G4 parameter switch 2 (bits 0 and 1) is used.
4-7	Not used	Do not change the settings.

Switch 08 - Not used

Switch 09 - Optional ISDN G4 kit required - (Japan Only)		
No	**FUNCTION**	**COMMENTS**
0 to 3	Layer 3 protocol **Bits 3 2 1 0 Setting** 0 0 0 0 ISO 8208 0 0 0 1 T.70 NULL 1 1 1 1 Disabled	If the setting is “Disabled”, the current setting of G4 parameter switch 6 (bit 0) is used.
4 to 7	Packet modulus **Bits 3 2 1 0 Setting** 0 0 0 0 Modulo 8 0 0 0 1 Modulo 128 1 1 1 1 Disabled	If the setting is “Disabled”, the current setting of G4 parameter switch 6 (bit 4) is used.

Switch 10 - Optional ISDN G4 kit required - (Japan Only)		
No	**FUNCTION**	**COMMENTS**
0	Attachment of the Higher Layer Capabilities	This bit determines whether Higher Layer Capabilities are informed in the [SETUP] signal or not.
1	Not used	Do not change the setting.
2	ISDN G3 information transfer capability **0:** 3.1 kHz audio **1:** Speech	In tx mode, this determines the information transfer capability informed in the [SETUP] messages. In rx mode, this determines the information transfer capability that the machine can use to receive a call. Set this bit to 1 if the ISDN does not support 3.1 kHz audio.
3-7	Not used	Do not change the settings.

2.5 SERVICE RAM ADDRESSES

⚠CAUTION
Do not change the settings which are marked as "Not used" or "Read only."

680001 to 680004(H) - ROM version (Read only)
680001(H) - Revision number (BCD)
680002(H) - Year (BCD)
680003(H) - Month (BCD)
680004(H) - Day (BCD)

680006 to 680015(H) - Machine's serial number (16 digits - ASCII)

680018(H) - Total program checksum (low)
680019(H) - Total program checksum (high)

680020 to 68003F(H) - System bit switches
680040 to 68004F(H) - Scanner bit switches
680050 to 68005F(H) - Printer bit switches
680060 to 68007F(H) - Communication bit switches
680080 to 68008F(H) - G3 bit switches
680090 to 68009F(H) - G3-2 bit switches
6800A0 to 6800AF(H) - G3-3 bit switches

6800D0(H) - User parameter switch 00 (SWUER_00) : Not used
6800D1(H) - User parameter switch 01 (SWUSR_01) : Not used

6800D2(H) - User parameter switch 02 (SWUSR_02)
Bit 0: Forwarding mark printing on forwarded messages 0: Disabled, 1: Enabled
Bit 1: Center mark printing on received copies
(This switch is not printed on the user parameter list.)
0: Disabled, 1: Enabled
Bit 2: Reception time printing
(This switch is not printed on the user parameter list.)
0: Disabled, 1: Enabled
Bit 3: TSI print on received messages 0: Disabled, 1: Enabled
Bit 4: Checkered mark printing
(This switch is not printed on the user parameter list.)
0: Disabled, 1: Enabled
Bit 5: CIL printing (G4) 0: Disabled, 1: Enabled **(Japan Only)**
Bit 6: TID printing (G4) 0: Disabled, 1: Enabled **(Japan Only)**
Bit 7: Not used

6800D3(H) - User parameter switch 03 (SWUSR_03: Automatic report printout)

Bit 0: Transmission result report (memory transmissions) 0: Off, 1: On
Bit 1: Not used
Bit 2: Memory storage report 0: Off, 1: On
Bit 3: Polling reserve report (polling reception) 0: Off, 1: On
Bit 4: Polling result report (polling reception) 0: Off, 1: On
Bit 5: Transmission result report (immediate transmissions) 0: Off, 1: On
Bit 6: Polling clear report 0: Off, 1: On
Bit 7: Journal 0: Off, 1: On

6800D4(H) - User parameter switch 04 (SWUSR_04: Automatic report printout)

Bit 0: Automatic confidential reception report output 0: Off, 1: On
Bits 1 to 6: Not used
Bit 7: Inclusion of a sample image on reports 0: Off, 1: On

6800D5(H) - User parameter switch 05 (SWUSR_05)

Bit 0: Substitute reception when the base copier is in an SC condition
0: Enabled, 1: Disabled
Bits 1 and 2: Condition for substitute rx when the machine cannot print messages (Paper end, toner end, jam, and during night mode)

Bit 2	1	Setting
0	0	The machine receives all the fax messages.
0	1	The machine receives the fax messages with RTI or CSI.
1	0	The machine receives the fax messages with the same ID code.
1	1	The machine does not receive anything.

Bit 3: Not used
Bit 4: Not used
Bit 5: Just size printing 0: Off, 1: On
Bit 6: Not used
Bit 7: Add paper display when a cassette is empty 0: Off, 1: On

6800D6(H) - User parameter switch 06 (SWUSR_06)

Bits 0 to 5: Not used
Bit 6: Scan sequence in Book transmission
0: Left page then right page, 1: Right page then left page
Bit 7: Not used

6800D7(H) - User parameter switch 07 (SWUSR_07)

Bits 0 and 1: Not used
Bit 2: Parallel memory transmission 0: Off, 1: On
Bits 3 to 7: Not used

6800D8(H) - User parameter switch 08 (SWUSR_08)
Bits 0 and 1: Not used.
Bit 2: Authorized reception
0: Only faxes from senders whose RTIs/CSIs are specified for this feature are accepted.
1: Only faxes from senders whose RTIs/CSIs are not specified for this feature are accepted.
Bits 3 to 7: Not used.

6800D9(H) - User parameter switch 09 (SWUSR_09) : Not used

6800DA(H) - User parameter switch 10 (SWUSR_0A)
Bit 0: Not used
Bit 1: 2 into 1 0: Off, 1: On
Bit 2: Not used
Bit 3: Page reduction 0: Off, 1: On
Bits 4 to 7: Not used

6800DB(H) - User parameter switch 11 (SWUSR_0B)
Bit 0: Not used
Bit 1: Method of transmitting numbers after the “Tone” mark over an ISDN line
0: UUI, 1: Tone **(Japan Only)**
Bits 2 to 5: Not used
Bit 6: Printout of messages received while acting as a forwarding station
0: Off, 1: On
Bit 7: Polling Standby duration 0: Once, 1: No limit

6800DC(H) - User parameter switch 12 (SWUSR_0C): Not used

6800DD(H) - **User parameter switch 13 (SWUSR_0D) (Japan Only)**
(This switch is not printed on the user parameter list.)
Bits 0 to 4: Not used
Bit 5: Action when receiving a SETUP signal containing no called number and the G4 subscriber number was programmed in this machine.
0: Respond to the call, 1: Do not respond to the call
Bit 6: Action when the received HLC (Higher Level Capabilities) is Tel or BC (Bearer Capabilities) is Speech.
0: Do not respond to the call, 1: Respond to the call
This switch determines which information transfer capabilities the machine can accept when receiving a call.
1: When the received HLC is Tel (digital telephone) or BC is Speech (voice), the machine responds to the call. In short, the machine receives every call.
This switch is useful for communication problems when the other terminal informs the above transfer capabilities although it is a fax machine.
Bit 7: ISDN SPID programming (used only in the USA)

6800DE(H) - User parameter switch 14 (SWUSR_0E)
Bit 0: Message printout while the machine is in Night Printing mode 0: On, 1: Off
Bit 1: Maximum document length detection
0: Double letter, 1: Longer than double-letter (well log) – up to 1,200 mm
Bit 2: Batch transmission 0: Off, 1: On
Bit 3: Fax mode settings, such as resolution, before a mode key (Copy/Fax/Printer /Scanner) is pressed
0: Not cleared, 1: Cleared
Bits 4 to 6: Not used
Bit 7: Manual service call (sends the system parameter list to the service station)
0: Off, 1: On

6800DF(H) - User parameter switch 15 (SWUSR_0F)
Bits 0, 1 and 2: Cassette for fax printout

Bit 2	1	0	Setting
0	0	1	1st paper feed station
0	1	0	2nd paper feed station
0	1	1	3rd paper feed station
1	0	0	4th paper feed station
1	0	1	LCT

Other settings Not used
Bits 3 and 4: Not used
Bit 5: Using the cassette specified by bits 0, 1 and 2 above only 0: On, 1: Off
Bits 6 and 7: Not used

6800E0(H) – User parameter switch 16 (SWUSR_10)
(This switch is not printed on the user parameter list.)
Bits 0 and 1: Not used
Bit 2: Paper size selection priority for an A4 size fax message when A4/LT size paper is not available.
0: A3 has priority, 1: B4 has priority
Bits 3 to 7: Not used

6800E1(H) – User parameter switch 17 (SWUSR_11)
Bits 0 and 1: Not used
Bit 2: Inclusion of the “Add” button when a sequence of Quick/Speed dials is selected for broadcasting
0:Not needed, 1: Needed
Bits 3 to 6: Not used
Bit 7: Press “Start” key without an original when using the on hook dial or the external telephone,
0: displays “Cannot detect original size”.
1: Receives fax messages.

6800E2(H) - User parameter switch 18 (SWUSR_12)
Bit 0: TTI date 0: Off, 1: On
Bit 1: TTI sender 0: Off, 1: On
Bit 2: TTI file number 0: Off, 1: On
Bit 3: TTI page number 0: Off, 1: On
Bit 4 to 7: Not used

6800E3(H) - User parameter switch 19 (SWUSR_13)
Bit 0: Offset sort function for the fax (only using the shift tray on the 1,000 sheet finisher)
0: Disabled, 1: Enabled
Bit 1: Journal format
0: The Journal is separated into transmissions and receptions
1: The Journal is separated into G3-1, G3-2, and G3-3 communications
Bit 2: Action when the paper cassette that was selected by the specified cassette selection feature becomes empty.
(This switch is not printed on the user parameter list.)
0: The machine will not print any received files until paper is added.
1: The machine will use other cassettes to print received files that are not specified by this feature.
Bit 3: 90° image rotation during B5 portrait Tx
(This switch is not printed on the user parameter list.)
0: Off, 1: On
Bit 4: Reduction of sample images on reports to 50% in the main scan and sub-scan directions. (This switch is not printed on the user parameter list.)
0: Technician adjustment (printer switch 0E bits 3 and 4), 1: 50% reduction
Bit 5: Use of A5 size paper for reports
(This switch is not printed on the user parameter list.)
0: Off, 1: On
Bits 6 and 7: Not used

6800E4(H) - User parameter switch 20 (SWUSR_14)
Bit 0: Automatic printing of the PC FAX error report
0: Off, 1: On
Bit 1: Reprint the documents fail to print from PC Fax driver
0: Off, 1: On
Bits 2 to 5: Store documents in memory which could not be printed from PC Fax driver

Bit 5	4	3	2	Setting
0	0	0	0	0 min.
0	0	0	1	1 min.
		⇩		⇩
1	1	1	0	14 min.
1	1	1	1	15 min.

Bits 6 and 7: Not used.

6800E5(H) - User parameter switch 21 (SWUSR_15) : Not used
6800E6(H) - User parameter switch 22 (SWUSR_16): Not used
6800E7(H) – User Parameter switch 23 (SWUSR_17) : Not used

6800E8(H) - User parameter switch 24 (SWUSR_18)
Bits 0 and 1: File retention time (Cross reference: System switch 02 bit 4)

Bit 1	0	Setting
0	0	File retention impossible
0	1	24 hours
1	0	File retention impossible
1	1	72 hours

Bits 2 to 7: Not used

6800E9(H) - User parameter switch 25 (SWUSR_19)
Bits 0 to 3: Not used
Bit 4: RDS operation
0: Not acceptable
1: Acceptable for the limit specified by system switch 03
Note: This bit is only effective when RDS operation can be selected by the user (see system switch 02).
Bits 5 to 7: Not used

6800EA to 6800ED(H) - User parameter switch 26 to 29 (SWUSR_1A to 1D)
: Not used

680EE(H) - User parameter switch 30 (SWUSR_1E)
Bits 0 to 6: Not used
Bit7: On hook dialing
0: PSTN, 1: ISDN **(Japan Only)**

NOTE: **Note:** If this bit set to 1, the on hook dialing is available on the ISDN line. But, the machine cannot use the G3 standard analog line for detecting the ringing and on hook dialing.

6800F0 to 6800FF(H) - G4 Parameter Switches **(Japan Only)**
680100 to 68011F(H) - G4 Internal Switches **(Japan Only)**

680180 to 68019F(H) - Service station's fax number (SP3-101)
See 68036C(H) for the type of network used for this number**.**

6801A0 to 6801A3(H) - Own fax PABX extension number
6801AA to 6801B3(H) - Own fax number (PSTN)
6801B4 to 6801C7(H) - Own fax number (ISDN G4) **(Japan Only)**
6801C8 to 6801D3(H) - The first subscriber number (ISDN G3) **(Japan Only)**
6801D4 to 6801DF(H) - The second subscriber number (ISDN G3) **(Japan Only)**
6801E0 to 6801EB(H) - The first subscriber number (ISDN G4) **(Japan Only)**
6801EC to 6801F7(H) - The second subscriber number (ISDN G4) **(Japan Only)**

6801F8 to 68020B(H) - PSTN-1 RTI (Max. 20 characters - ASCII) - See the following note.
68020C to 68021F(H) - PSTN-2 RTI (Max. 20 characters - ASCII) - See the following note.
680220 to 680233(H) - PSTN-3 RTI (Max. 20 characters - ASCII) - See the following note.
680237 to 680276(H) - TTI 1 (Max. 64 characters - ASCII) - See the following note.
680277 to 6802B6(H) - TTI 2 (Max. 64 characters - ASCII) - See the following

note.

6802B7 to 6802F6(H) - TTI 3 (Max. 64 characters - ASCII) - See the following

6802F7 to 68030A(H) - PSTN-1 CSI (Max. 20 characters - ASCII)
68030B to 68031E(H) - PSTN-2 CSI (Max.20 characters - ASCII)
68031F to 680332(H) – PSTN-3 CSI (Max. 20 characters - ASCII)
680333(H) - Number of PSTN-1 CSI characters (Hex)
680334(H) - Number of PSTN-2 CSI characters (Hex)
680335(H) - Number of PSTN-3 CSI characters (Hex)

NOTE: If the number of characters is less than the maximum (20 for RTI, 64 for TTI), add a stop code (FF[H]) after the last character.

680340 to 680342(H) - PSTN-1 line settings

680340

Bits 0 and 1: PSTN access method from behind a PABX.

Bit	1	0	Setting
	0	0	Loop start
	0	1	Ground start
	1	0	Flash start
	1	1	Not used

Bit 2: Telephone line type.
0: PSTN, 1: PABX

Bits 3 and 4: Dialing type.

Bit	4	3	Setting
	0	0	Pulse dialing
	0	1	Not used
	1	0	Tone dialing
	1	1	Not used

Bits 4 to 7: Not used

680341: PSTN access number for loop start

Access number	Hex value to program (BCD)
0	F0
⇩	⇩
9	F9
00	00
⇩	⇩
99	99

680342

Bit 0: Transmission disabled
0: Tx and Rx, 1: Rx only

Bit 1: Memory Lock reception
0: Enabled, 1: Disabled

Bits 2 to 7: Not used

680348 to 68034A(H) - PSTN-2 line settings
680350 to 680352(H) - PSTN-3 line settings
680358 to 68035A(H) - ISDN line settings **(Japan Only)**

680360(H) - ID code (low - Hex)
680361(H) - ID code (high - Hex)

680362(H) - Confidential ID (low - BCD)
680363(H) - Confidential ID (high - BCD)

680364(H) - Memory Lock ID (low - BCD)
680365(H) - Memory Lock ID (high - BCD)

68036C(H) - Network type used for the service station number
0 1 (H) - PSTN-1
0 2 (H) - PSTN-2
0 3 (H) - PSTN-3
1 0 (H) - G4
0 7 (H) - G3 auto selection

680370 to 680377(H) - Last power off time (Read only)
680370(H) - 01(H) - 24-hour clock, 00(H) - 12-hour clock (AM),
02(H) - 12-hour clock (PM)
680371(H) - Year (BCD)
680372(H) - Month (BCD)
680373(H) - Day (BCD)
680374(H) - Hour
680375(H) - Minute
680376(H) - Second
680377(H) - 00: Monday, 01: Tuesday, 02: Wednesday, ... , 06: Sunday

680384(H) - Optional equipment (Read only – Do not change the settings)
Bit 0 to 3: Not used
Bit 4: Function Upgrade unit 0: Not installed, 1: Installed
Bit 5 to 7: Not used

680385(H) - Optional equipment (Read only – Do not change the settings)
Bit 0: Function Upgrade unit 0: Not installed, 1: Installed
Bit 1 to 3: Not used
Bit 4: G3-2 0: Not installed, 1: Installed
Bit 5: G3-3 0: Not installed, 1: Installed
Bit 6: ISDN unit 0: Not installed, 1: Installed **(Japan Only)**
Bit 7: Not used

6803B8 to 6803CF(H) - G4 terminal ID (ASCII - Max. 24 characters) **(Japan Only)**
6803D0 to 6803E3(H) - ISDN CSI **(Japan Only)**
6803E4(H) - Number of ISDN CSI characters (Hex) **(Japan Only)**
6803E9 to 6803EC(H) - ISDN G3 sub-address **(Japan Only)**
6803ED to 6803F0(H) - ISDN G4 sub-address **(Japan Only)**
6803F1 to 6803F5(H) - SiG4 board ROM information (Read only) **(Japan Only)**
6803F1(H) - Suffix
6803F2(H) - Version (BCD)
6803F3(H) - Year (BCD)
6803F4(H) - Month (BCD)
6803F5(H) - Day (BCD)

6803F6 to 6803FA(H) – Option G3 board (G3-2) ROM information (Read only)
6803F6(H) - Suffix (BCD)
6803F7(H) - Version (BCD)
6803F8(H) - Year (BCD)

6803F9(H) - Month (BCD)
6803FA(H) - Day (BCD)

6803FB to 6803FF(H) – Option G3 board (G3-3) ROM information (Read only)
6803FB(H) - Suffix (BCD)
6803FC(H) - Version (BCD)
6803FD(H) - Year (BCD)
6803FE(H) - Month (BCD)
6803FF(H) - Day (BCD)

680402(H) - Option G3 board (G3-2) modem ROM version (Read only)

680404(H) - Option G3 board (G3-3) modem ROM version (Read only)

680406 to 68040B(H) - Modem ROM version (Read only)
680406(H) - Part number (low)
680407(H) - Part number (high)
680408(H) - Control (low)
680409(H) - Control (high)
68040A(H) - DSP (low)
68040B(H) - DSP (high)

680464(H) - Time for economy transmission (hour in 24h clock format - BCD)
680465(H) - Time for economy transmission (minute - BCD)

680482(H) - Transmission monitor volume 00 - 07(H)
680483(H) - Reception monitor volume 00 - 07(H)
680484(H) - On-hook monitor volume 00 - 07(H)
680485(H) - Dialing monitor volume 00 - 07(H)
680486(H) - Buzzer volume 00 - 07(H)

6BA000 – 6BA1FF(H) – Latest 64 error codes (Read only)

6BE988 – 6BF35F(H) – Latest 20 error communication records

3. DETAILED SECTION DESCRIPTIONS

3.1 ADDRESS BOOK

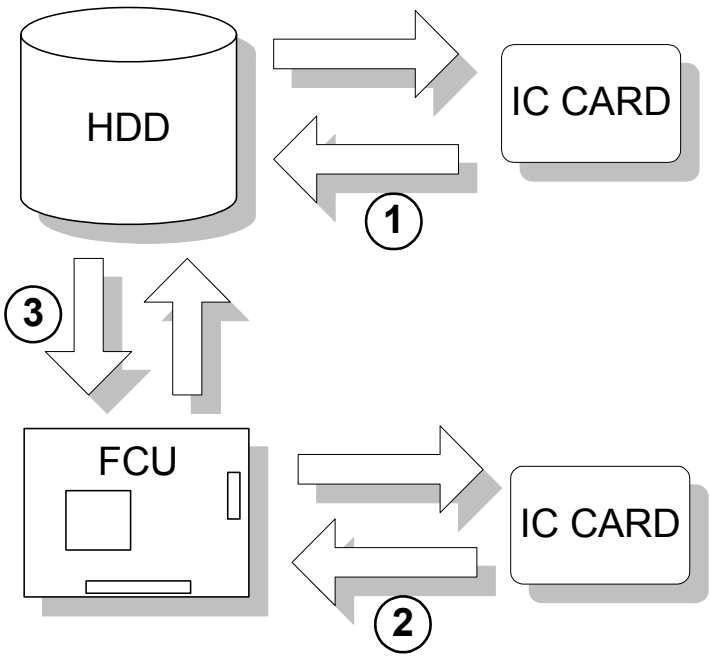
The address book (directory) for this machine combines under one user name, the fax address and mail address.

All the address data is stored on the HDD. Up to a maximum of 2,000 items can be stored for addresses.

3.1.1 ADDRESS BOOK BACKUP

The address data can be backed up, and frequently backing up the address book data is recommended. If for any reason data can no longer be read from the HDD, you can use the backed up data to restore the address book.

Overview of Data Backup



There are three methods you can use to back up address book data:

- HDD ←→ IC Card
- FCU (MBU) ←→ IC Card
- HDD ←→ FCU

Each is described below.

1. HDD ←→ IC Card

Address data stored on the HDD can be uploaded to an IC card with SP5846 51 (UCS Settings - All Directory Info. Upload), or address data backed up on the IC card can be downloaded to the HDD with SP5846 52 (UCS Settings – All Directory Info. Download).

2. FCU (MBU) ←→ IC Card

Address data stored in the FCU (MBU) can be uploaded to an IC card with SP5846 51 (UCS Settings - All Directory Info. Upload), or address data backed up on the IC card can be downloaded to the FCU with SP5846 52 (UCS Settings – All Directory Info. Download).

3. HDD ←→ FCU

Address data stored on the HDD can be uploaded to the FCU (MBU) with SP5846 80 (UCS Settings - FCU Backup), or when there is address data in the FCU and the HDD has just been replaced, this data is downloaded automatically to the new HDD.

SP Modes

1. SP5846 051 UCS Settings - All Directory Info. Upload

This SP mode is used to upload address data to an IC card. The machine automatically detects where the address data is stored. If there is address data on the HDD, the address data from the HDD is uploaded to the IC card. If the HDD is not present, then the address data from the FCU is uploaded. If one IC card is not large enough to hold all the address data, as many IC cards as needed can be used to hold all of the address data.

2. SP5846 052 UCS Settings – All Directory Info. Download

This SP mode downloads address data from an IC card. The machine automatically determines where to store the address data. If there is address data on the HDD, then the data is downloaded to the HDD. If HDD is not present, then the address data is downloaded to the FCU.

3. SP5846 080 UCS Settings - FCU Backup

This SP mode is used to take fax address data from among the address data on the HDD and upload it to the FCU. However, the FCU is capable of holding only up to 500 items for address data, so if more than 500 address items are stored on the HDD, only the first and oldest 500 address on the HDD are backed up. If FAX Function Upgrade Unit (Option) is installed, up to 1200 address items can be backed up.

NOTE: In preparation for the possibility that data can no longer be read from the HDD, we recommend that the CE back up the address data to the FCU when visiting the customer. However, when address data is backed up to the FCU, only the fax data in the address book is backed up, and the other data (e-mail address, etc.) are not backed up. For this reason, the customer should be instructed about how to frequently back up the address book data using SmartNet – Monitor Admin.

SPECIFICATIONS

1. GENERAL SPECIFICATIONS

Type:	Desktop type transceiver
Circuit:	PSTN (max. 3ch.) PABX
Connection:	Direct couple
Original Size:	Book (Face down) Maximum Length: 432 mm [17 ins] Maximum Width: 297 mm [11.7 ins] ARDF (Face up) (single sided document) Length: 128 - 1200 mm [5.0 - 47.2 ins] Width: 105 - 297 mm [4.1 - 11.7 inch] (double sided document) Length: 128 - 432 mm [5.0 - 17 inch] Width: 105 - 297 mm [4.1 - 11.7 inch]
Scanning Method:	Flat bed, with CCD
Resolution:	G3 8 x 3.85 lines/mm (Standard) 8 x 7.7 lines/mm (Detail) 8 x 15.4 line/mm (Fine) Note1 16 x15.4 line/mm (Super Fine) See Note 1 200 x 100 dpi (Standard) 200 x 200 dpi (Detail) 400 x 400 dpi (Super Fine) See Note 1 **NOTE:** 1. Optional Expansion Memory required
Transmission Time:	G3: 3 s at 28800 bps; Measured with G3 ECM using memory for an ITU-T #1 test document (Slerexe letter) at standard resolution
Data Compression:	MH, MR, MMR JBIG (optional Fax Function Upgrade Unit required)
Protocol:	Group 3 with ECM
Modulation:	V.34, V.33, V.17 (TCM), V.29 (QAM), V.27ter (PHM), V.8, V.21 (FM)
Data Rate:	G3: 33600/31200/28800/26400/24000/21600/ 19200/16800/14400/12000/9600/7200/4800/2400 bps Automatic fallback
I/O Rate:	With ECM: 0 ms/line Without ECM: 2.5, 5, 10, 20, or 40 ms/line

Memory Capacity: ECM: 128 KB

SAF
Standard: 4 MB
With optional Expansion Memory: 32 MB (4 MB+ 28 MB)

Page Memory
Standard: 4 MB (Print: 2 MB + Scanner: 2 MB)
With optional Expansion Memory: 12 MB (4 MB + 8 MB)
(Print 8 MB + Scanner: 4 MB)

2. CAPABILITIES OF PROGRAMMABLE ITEMS

The following table shows how the capabilities of each programmable item will change after the optional Fax Function Upgrade Unit is installed.

Item	Standard	With Fax Function Upgrade Unit
Quick Dial	500	1200 (2000*)
Groups	64	64
Destination per Group	500	500
Boxes (Information/Personal/Transfer)	150	400
Destinations dialed from the ten-key pad overall	100	1000
Programs	100	200
Auto Document	6	18
Communication records for Journal stored in the memory	200	1000
Specific Senders	30	50

***:** With the Printer/Scanner Option

The following table shows how the capabilities of the document memory will change after the optional Fax Function Upgrade Unit and the Expansion Memory are installed.

		Without the Expansion Memory	With the Expansion Memory
Memory Transmission file	**Without the Fax Function Upgrade Unit**	320	400
Maximum number of page for memory transmission		400	1000
Memory capacity for memory transmission (**Note1**)		160	1000
Memory Transmission file	**With the Fax Function Upgrade Unit**	800	800
Maximum number of page for memory transmission		400	3000
Memory capacity for memory transmission (**Note1**)		160	2080

NOTE: 1) Measured using an ITU-T #1 test document (Slerexe letter) at the standard resolution, the auto image density mode and the Text mode.

3. MACHINE CONFIGURATION

Item	Machine Code	Remarks
Fax Option Type 2045	B653	
G3 Interface Unit Type 2045	B591	Up to two options can be installed. You can install either two optional G3 units or one optional G3 and one optional G4 unit.
Fax Function Upgrade Type 185	A892	Used with machines
Handset Type 450	A646	USA only
Marker Type 30	H903	Refill ink for stamp
Expansion Memory	-	Used with machines

INTERNET FAX (IFAX)

IFAX

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1. INSTALLATION

1.1 IFAX INSTALLATION

IFAX requires the installation of the Fax Unit and the Printer/Scanner Controllers. For details about installation, please refer to the Fax Unit and the Printer/Scanner option manuals for the machine.

1.2 INITIAL SETTINGS

Users can set the IFAX initial settings. Please refer to the Network Guide Operating Instructions.

Make sure that the following items are registered in the mail server before machine installation.

- IP address
- Host name
- Mail account and the password

CAUTION: The initial settings include items related to user security, such as the login password and IP addresses. So, please ask the user to input the initial settings of the IFAX. If the user asks you to input the initial settings, be sure to keep the settings confidential.

To enable IFAX functions, do the following procedure in the User Tools mode:

User Tools> Facsimile Features> E-Mail Settings> Internet Fax Settings> Internet Fax> OFF → ON

2. TROUBLESHOOTING

2.1 ERROR CODES FOR LAN COMMUNICATION

If an error code occurs, retry the communication. If the same problem occurs, try to solve the problem as suggested below.

Code	Meaning	Cause	Action
14-00	SMTP Send Error	Error occurred during sending to the SMTP server. Occurs for any error other than 14-01 to 16. For example, the mail address of the system administrator is not registered.	• Register the address of the system administrator. • Set the User Parameter Switch 21 (15[H]) Bit 4 to “Off”.
14-01	SMTP Connection Failed	Failed to connect to the SMTP server (timeout) because the server could not be found. • The IP address for the SMTP server is not stored in the machine. • The DNS IP address is not registered. • Network not operating correctly.	• Check the IP address of the SMTP/DNS server. • Check the traffic on the LAN. • Check the machine settings such as the SMTP port setting, DNS server setting, and so on.
14-02	No Service by SMTP Service (421)	SMTP server operating incorrectly.	Contact the network administrator. Confirm correct SMTP server settings and operation.
14-03	Access to SMTP Server Denied (450)	SMTP server operating incorrectly	Contact the network administrator. Confirm correct SMTP server settings and operation.
14-04	Access to SMTP Server Denied (550)	SMTP server operating incorrectly	Contact the network administrator. Confirm correct SMTP server settings and operation.
14-05	SMTP Server HDD Full (452)	SMTP Server hard disk full.	Contact the network administrator. Free space on the HDD of the SMTP server.
14-06	User Not Found on SMTP Server (551)	The user does not exist locally.	• Check that the mail address is correct. • Contact the network administrator. Check that the e-mail the user intended to send exists on the SMTP server.
14-07	Data Send to SMTP Server Failed (4XX)	SMTP server operating incorrectly	Contact the network administrator. Confirm correct SMTP server settings and operation.
14-08	Data Send to SMTP Server Failed (5XX)	SMTP server operating incorrectly	Contact the network administrator. Confirm correct SMTP server settings and operation.

Code	Meaning	Cause	Action
14-09	Authorization Failed for Sending to SMTP Server	POP-Before-SMTP or SMTP authorization failed.	POP-Before-SMTP: • Check the IFAX user name and password. • Check that POP server is set correctly. • Check the SMTP server settings. SMTP Authorization: • Check the SMTP server user name and password. • Check the encryption settings. • Check the SMTP server settings.
14-10	Addresses Exceeded	Number of broadcast addresses exceeded the limit for the SMTP server.	The maximum number of addresses depends on the SMTP server.
14-11	Buffer Full	The send buffer is full so the transmission could not be completed. Buffer is full due to using Scan-to-Email while the buffer is being used send mail at the same time.	No action required. The transmission will be recalled and sent as soon as buffer space is available.
14-12	Data Size Too Large	Transmission was cancelled because the detected size of the file was too large.	• Divide the original into sections and send as separate files. • Use G3 to send the original. • Reduce the TX mail size.
14-13	Send Cancelled	Processing is interrupted because the user pressed Stop.	No action required.
14-30	MCS File Creation Failed	Failed to create the MCS file because: • The number of files created with other applications on the Document Server has exceeded the limit. • HDD is full or not operating correctly. • Software error.	• Delete unneeded files from the Document Server. • Initialize the HDD. • If initialization fails to correct the problem, replace the HDD. • Update the software.
14-31	UFS File Creation Failed	UFS file could not be created: • Not enough space in UFS area to handle both Scan-to-Email and IFAX transmission. • HDD full or not operating correctly. • Software error.	No action required. Once the job currently using the UFS area is finished sufficient space will become available. If this does not solve the problem: • Initialize the HDD. • If initialization fails to correct the problem, replace the HDD. • Update the software.
14-32	Cancelled the Mail Due to Error Detected by NFAX	Error detected with NFAX and send was cancelled due to a software error.	Update the software.
14-33	No Mail Address For the Machine	Neither the mail address of the machine nor the mail address of the network administrator is registered.	Contact the network administrator. Check that these e-mail addresses are registered correctly.
14-50	Mail Job Task Error	Due to an FCU mail job task error, the send was cancelled: • Address book was being edited during creation of the notification mail. • Software error.	No action required. If the problem persists, update the firmware.

ERROR CODES FOR LAN COMMUNICATION

Code	Meaning	Cause	Action
14-51	UCS Destination Download Error	Not even one return notification can be downloaded: • The address book was being edited. • The number for the specified destination does not exist (it was deleted or edited after the job was created).	Check the address in the address book.
14-60	Send Cancel Failed	The cancel operation by the user failed to cancel the send operation.	No action required.
14-61	Notification Mail Send Failed for All Destinations	All addresses for return notification mail failed.	• Correct the mail address for the PC. • Contact the network administrator. Check the other error codes to determine if other errors occur at the same time.
15-01	POP3/IMAP4 Server Not Registered	At startup, the system detected that the IP address of the POP3/IMAP4 server has not been registered in the machine.	Register the name of the POP3/IMAP4 server.
15-02	POP3/IMAP4 Mail Account Information Not Registered	The POP3/IMAP4 mail account has not been registered.	Register the e-mail account, user name, and password.
15-03	Mail Address Not Registered	The mail address has not been registered.	Register the e-mail account and e-mail address.
15-10	DCS Mail Receive Error	Error other than 15-11 to 15-18.	Update the firmware, update the server software.
15-11	Connection Error	The DNS or POP3/IMAP4 server could not be found: • The IP address for DNS or POP3/IMAP4 server is not stored in the machine. • The DNS IP address is not registered. • Network not operating correctly.	Contact the network administrator. • Check that the DNS address is correct. • Check that the POP3/IMAP4 IP addresses are correct. • Confirm correct operation of the network.
15-12	Authorization Error	POP3/IMAP4 send authorization failed: • Incorrect IFAX user name or password. • Access was attempted by another device, such as the PC. • POP3/IMAP4 settings incorrect.	Contact the network administrator: • Check that the IFAX user name and password are correct. • Determine whether another device of the same account attempted access at same time. • Check that the POP/IMAP4 settings are correct.
15-13	Receive Buffer Full	Occurs only during manual reception. Transmission cannot be received due to insufficient buffer space. The buffer is being used for mail send or Scan-to-Email.	No action required. The next transmission can be received as soon as the other application releases the buffer area.
15-14	Mail Header Format Error	The mail header is not standard format. For example, the Date line description is incorrect.	Advise the sender to send e-mails in the standard format.
15-15	Mail Divide Error	The e-mail is not in standard format. There is no boundary between parts of the e-mail, including the header.	Advise the sender to send e-mails in the standard format.

Code	Meaning	Cause	Action
15-16	Mail Size Receive Error	The mail cannot be received because it is too large.	• Increase the setting that limits the size of e-mail that can be received (in the User Tools> System Settings> File Transfer menu). • Ask the sender to break the e-mail into smaller parts and send them separately.
15-17	Receive Timeout	May occur during manual receiving only because the network is not operating correctly.	Contact the network administrator and check that the network is operating correctly.
15-18	Incomplete Mail Received	Only one portion of the mail was received.	Ask the sender to send as one transmission.
15-31	Final Destination for Transfer Request Reception Format Error	The format of the final destination for the transfer request was incorrect.	Ask the sender to check the final destination.
15-39	Send/Delivery Destination Error	The transmission cannot be delivered to the final destination: • Destination file format is incorrect. • Could not create the destination for the file transmission.	• Delete the destination file to enable receiving. • Ask the sender to check the transfer destination and final destination.
15-41	SMTP Receive Error	Reception rejected because the transaction exceeded the limit for the “Auth. E-mail RX” setting.	• Check the content of the “From” entry in the mail header. • Check the “Auth. E-mail RX” setting.
15-42	Off Ramp Gateway Error	The delivery destination address was specified with Off Ramp Gateway OFF.	• Enable the Off Ramp Gateway function. • Ask the sender not to specify the Off Ramp Gateway address.
15-43	Address Format Error	Format error in the address of the Off Ramp Gateway.	Ask the sender to check the mail destination.
15-44	Addresses Over	The number of addresses for the Off Ramp Gateway exceeded the limit of 30.	Ask the sender to check the mail destination.
15-61	Attachment File Format Error	The attached file is not TIFF format.	Try to check the format of the sent mail, then ask the user to use TIFF format.
15-62	TIFF File Compatibility Error	Could not receive transmission due to: Resolution error • Image of resolution greater than 200 dpi without extended memory. • Resolution is not supported. Page size error • The page size was larger than A3. Compression error • File was compressed with other than MH, MR, or MMR.	Ask the sender to check the following: • File was sent in TIFF format. • Compatibility of the resolution setting. • Size of the page. • Method used to compress the file.
15-63	TIFF Parameter Error	The TIFF file sent as the attachment could not be received because the TIFF header is incorrect: • The TIFF file attachment is a type not supported. • The TIFF file attachment is corrupted. • Software error.	• Ask the sender to check that the attachment was sent in correctTIFF format. • If the problem persists, update the software.

ERROR CODES FOR LAN COMMUNICATION

Code	Meaning	Cause	Action
15-64	TIFF Decompression Error	The file received as an attachment caused the TIFF decompression error: • The TIFF format of the attachment is corrupted. • Software error.	• Ask the sender to check that the attachment was sent in correct TIFF format. • If the problem persists, update the software.
15-71	Not Binary Image Data	The file could not be received because the attachment was not binary image data.	Ask the sender to check the content of the attachment.
15-73	MDN Status Error	Could not find the Disposition line in the header of the Return Receipt, or there is a problem with the firmware.	Ask the sender to resend the mail. If the problem persists, update the firmware.
15-74	MSDN Message ID Error	Could not find the Original Message ID line in the header of the Return Receipt, or there is a problem with the firmware.	Ask the sender to resend the mail. If the problem persists, update the firmware.
15-80	Mail Job Task Read Error	Could not receive the transmission because the destination buffer is full and the destination could not be created (this error may occur when receiving a transfer request or a request for notification of reception).	No action required. When destinations are used and a space opens in the buffer, the transmission will be received.
15-81	Repeated Destination Registration Error	Could not repeat receive the transmission because the destination buffer is full and the destination could not be created (this error may occur when receiving a transfer request or a request for notification of reception).	No action required. When destinations are used and a space opens in the buffer, the transmission will be received.
15-91	Send Registration Error	Could not receive the file for transfer to the final destination: • The format of the final destination or the transfer destination is incorrect. • Destinations are full so the final and transfer destinations could not be created.	• As the send to check both the transfer destination and the final destination. • When destinations open, the transmission will be received.
15-92	Memory Overflow	Transmission could not be received because memory overflowed during the transaction.	• Expand SAF memory. • Ask the sender to break up the file and send the parts separately.
15-93	Memory Access Error	Transaction could not complete due to a malfunction of SAF memory.	Initialize memory. If the problem persists, replace the MBU.
15-94	Incorrect ID Code	The machine rejected an incoming e-mail for transfer request, because the ID code in the incoming e-mail did not match the ID code registered in the machine.	• Ask the sender to correct the ID code. • Set IFAX SW03 Bit 3 to “1”.
15-95	Transfer Station Function	The machine rejected an incoming e-mail for transfer because the transfer function was unavailable.	Inform the transfer requester that this machine does not support the transfer station function.

2.2 TROUBLESHOOTING PROCEDURES

Use the following procedures to determine whether the machine or another part of the network is causing the problem.

Communication Route	Item	Action	Remarks
General LAN	1. Connection with the LAN	• Check that the LAN cable is connected to the machine. • Check that the LEDs on the hub are lit.	
	2. LAN activity	• Check that other devices connected to the LAN can communicate through the LAN.	
Between IFAX and PC	1. Network settings on the PC	• Check the network settings on the PC.	• Is the IP address registered in the TCP/IP properties in the network setup correct? Check the IP address with the administrator of the network.
	2. Check that PC can connect with the machine	• Use the “ping” command on the PC to contact the machine.	• At the MS-DOS prompt, type ping then the IP address of the machine, then press Enter.
	3. LAN settings in the machine	• Check the LAN parameters • Check if there is an IP address conflict with other PCs.	• Use the “Network” function in the User Tools. • If there is an IP address conflict, inform the administrator.
Between machine and e-mail server	1. LAN settings in the machine	• Check the LAN parameters • Check if there is an IP address conflict with other PCs.	• Use the “Network” function in the User Tools. • If there is an IP address conflict, inform the administrator.
	2. E-mail account on the server	• Make sure that the machine can log into the e-mail server. • Check that the account and password stored in the server are the same as in the machine.	• Ask the administrator to check.
	3. E-mail server	• Make sure that the client devices which have an account in the server can send/receive e-mail.	• Ask the administrator to check. • Send a test e-mail with the machine’s own number as the destination. The machine receives the returned e-mail if the communication is performed successfully.
Between e-mail server and internet	1. E-mail account on the Server	• Make sure that the PC can log into the e-mail server. • Check that the account and password stored in the server are the same as in the machine.	• Ask the administrator to check.

Communication Route	Item	Action	Remarks
	2. E-mail server	• Make sure that the client devices which have an account in the server can send/receive e-mail.	• Ask the administrator to check. • Send a test e-mail with the machine's own number as the destination. The machine receives the returned e-mail if the communication is performed successfully.
	3. Destination e-mail address	Make sure that the e-mail address is actually used. Check that the e-mail address contains no incorrect characters such as spaces.	
	4. Router settings	Use the "ping" command to contact the router. Check that other devices connected to the router can sent data over the router.	• Ask the administrator of the server to check.
	5. Error message by e-mail from the network of the destination.	• Check whether e-mail can be sent to another address on the same network, using the application e-mail software. • Check the error e-mail message.	• Inform the administrator of the LAN.

3. SERVICE TABLES AND PROCEDURES

3.1 ACCESSING IFAX BIT SWITCHES

1. Ensure that the machine is in standby mode.
2. Press ⌧, enter ① ⓪ ⑦ with the 10-key pad, then hold down C/⊘ for more than 3 seconds. The SP mode main menu opens.
3. Touch “Fax SPs” on the touch-panel to enter the fax service mode.
4. Use SP1102 1~16 to set the bit switches for IFAX. For details, refer to the Service Tables on the following pages.

⚠WARNING

Never adjust a bit switched marked “DFU” or “Japan Only," as this may cause the machine to malfunction or to operate in a manner that is not accepted by local regulations. Such bits are for use only in other areas, such as Japan.

NOTE: Default settings for bit switches are not listed in this manual. Refer to the System Parameter List print out.

3.2 SP1102 IFAX SWITCH

Only one SP number is used to access IFAX bit switches. These bit switches are described in the tables below.

<table>
<tr><th>SP</th><th colspan="7">IFAX SW</th></tr>
<tr><td>1102 1</td><td colspan="7">00</td></tr>
<tr><td rowspan="5"></td><td colspan="7">Bits 0~6: Original Width of TX Attachment File</td></tr>
<tr><td colspan="7">This setting sets the maximum size of the original that the destination can receive. (Bits 3~7 are reserved for future use or not used.)
0: On
1: Off
Note: If more than one of these three bits is set to “1”, the larger size has priority. For example, if both Bit 2 and Bit 1 are set to “1” then the maximum size is “A3” (Bit 2).</td></tr>
<tr><td>Bit 6</td><td>Bit 5</td><td>Bit 4</td><td>Bit 3</td><td>Bit 2</td><td>Bit 1</td><td>Bit 0</td></tr>
<tr><td>Reserved</td><td>Reserved</td><td>Reserved</td><td>Reserved</td><td>A3</td><td>B4</td><td>A4</td></tr>
<tr><td colspan="7">When mail is sent, there is no negotiation with the receiving machine at the destination, so the sending machine cannot make a selection for the receiving capabilities (original width setting) of the receiving machine. The original width selected with this switch is used as the RX machine’s original width setting, and the original is reduced to this size before sending. The default is A4.
If the width selected with this switch is higher than the receiving machine can accept, the machine detects this and this causes an error.</td></tr>
<tr><td></td><td colspan="7">Bit 7: Not Used.</td></tr>
</table>

<table>
<tr><td>SP</td><td>IFAX SW</td></tr>
<tr><td>1102 2</td><td>01</td></tr>
<tr><td></td><td>Bits 0~ 6: Original Line Resolution of TX Attachment File
This setting sets the maximum resolution of the original that the destination can receive.
0: Not selected
1: Selected
Note: If more than one of these three bits is set to “1”, the higher resolution has priority. For example, if both Bit 3 and Bit 2 are set to “1” then the resolution is set for “300 x 300” (Bit 3).
<table>
<tr><th>Bit 6</th><th>Bit 5</th><th>Bit 4</th><th>Bit 3</th><th>Bit 2</th><th>Bit 1</th><th>Bit 0</th></tr>
<tr><td>Reserved</td><td>Reserved</td><td>400 x 400
Super Fine</td><td>Reserved</td><td>200x400
Fine</td><td>200x200
Detail</td><td>200x100
Standard</td></tr>
</table>
When mail is sent, there is no negotiation with the receiving machine at the destination, so the sending machine cannot make a selection for the receiving capabilities (resolution setting) of the receiving machine.
The resolution selected with this switch is used as the RX machine’s resolution setting, and the original resolution is converted before sending.
The default is both 200 x 100 and 200 x 200 are selected.
If the resolution set with this switch is higher than the receiving fax can accept, the machine detects this and this causes an error.
Bit 7: mm/inch
This setting selects mm/inch conversion for mail transmission.
0: Off (No conversion)
1: On (Conversion)
When on (set to “1”), the machine converts millimeters to inches for sending mail. There is no switch for converting inches to millimeters.
Note: Unlike G3 fax transmissions which can negotiate between sender and receiver to determine the setting, mail cannot negotiate between terminals; the mm/inch selection is determined by the sender fax.
Only two choices are available for transmission: inch statements and inch images, or inch statements and mm images.
When this switch is Off (0):
• Images scanned in inches are sent in inches.
• Images scanned in mm are sent in mm.
• Images received in inches are transmitted in inches.
• Images received in mm are transmitted in mm.
When this switch is On (1):
• Images scanned in inches are sent in inches.
• Images scanned in mm are converted to inches.
• Images received in inches are transmitted in inches.
• Images received in mm are converted to inches.</td></tr>
</table>

SP	IFAX SW
1102 3	02
	Bit 0: RX Text Mail Header Processing
	This setting determines whether the header information is printed with text e-mails when they are received. 0: Prints only text mail. 1: Prints mail header information attached to text mail. • When a text mail is received with this switch On (1), the "From" address and "Subject" address are printed as header information. • When a mail with only binary data is received (a TIFF-F file, for example), this setting is ignored and no header is printed.
	Bit 1: Output from Attached Document at E-mail TX Error
	This setting determines whether only the first page or all pages of an e-mail attachment are printed at the sending station when a transmission error occurs. This allows the customer to see which documents have not reached their intended destinations if sent to the wrong e-mail addresses, for example. 0: Prints 1st page only. 1: Prints all pages.
	Bits 2~3: Text String for Return Receipt
	This setting determines the text string output for the Return Receipt that confirms the transmission was received normally at the destination. 00: "Dispatched" Sends from PC mail a request for a Return Receipt. Receives the Return Receipt with "dispatched" in the 2nd part: **Disposition: Automatic-action/MDN-send automatically; dispatched** The "dispatched" string is included in the Subject string. 01: "Displayed" Sends from PC mail a request for a Return Receipt. Receives the Return Receipt with "displayed" in the 2nd part: **Disposition: Automatic-action/MDN-send automatically; displayed** The "displayed" string is included in the Subject string. 10: Reserved 11: Reserved **Note**: A mail requesting a Return Receipt sent from an IFAX with this switch set to "00" (for "dispatched") received by Microsoft Outlook 2000 may cause an error. If any setting other than "displayed" (01) causes a problem, change the setting to "01" to enable normal sending of the Return Receipt.
	Bits 4~6: Not Used.
	Bit 7: Image Resolution of RX Text Mail
	This setting determines the image resolution of the received mail. 0: 200 x 200 1: 400 x 400 **Note**: The "1" setting requires installation of the Function Upgrade Card in order to have enough SAF (Store and Forward) memory to receive images at 400 x 400 resolution.

SP	IFAX SW
1102 4	03
	Bit 0: Original Output at Transfer Station
	This setting determines whether the original is output at the transfer station when it is received from the sender that initiated the transfer transmission. This feature is the same as for G3 transfer transmissions. 0: Received original not output at the transfer station. 1: Received original output. The original is printed after the transfer station has transferred it to the destinations, so its output confirms that the original has been transferred.
	Bit 1: Transfer Result Report
	This setting determines when a Transfer Result Report is generated and returned to the transfer requestor. 0: Returns the report after each transfer. 1: Returns the report only if an error occurred during transfer.
	Bit 2: Destination Error Handling for Reception Transfer Request
	This setting restricts transfer transmission based on whether the final destinations are correct or not. 0: The transfer station transmits to correct destinations only (addresses with no errors in them). 1: If any address has an error in it, the transfer station transfers no transmissions and returns a transfer transmission failure report to the requestor that initiated the transfer. There is no negotiation between the transfer initiator and the transfer station to determine whether the final destination addresses are correct or not. This setting determines whether or not the transfer station transfers the transmissions if there is a mistake in even one of the final destination addresses.
	Bit 3: Polling ID Check for Reception of Transfer Request
	This setting determines whether the polling IDs of incoming transmissions are checked to ensure that the polling IDs match. 0: Receives and transfers only messages that have matching polling IDs. 1: Receives and transfers all messages, even if the polling IDs do not match.
	Bits 4~7: Not Used

SP	IFAX SW
1102 5	04
	Bit 0: Subject for Delivery TX/Memory Transfer
	This setting determines whether the RTI/CSI registered on this machine or the RTI/CSI of the originator is used in the subject lines of transferred documents. 0: Puts the RTI/CSI of the originator in the Subject line. If this is used, either the RTI or CSI is used. Only one of these can be received for use in the subject line. 1: Puts the RTI/CSI registered on this machine in the Subject line. When this switch is used to transfer and deliver mail to a PC, the information in the Subject line that indicates where the transmission originated can be used to determine automatically the destination folder for each e-mail.
	Bits 1~7: Not Used

SP	IFAX SW
1102 6	05
	Bit 0: Mail Addresses of SMTP Broadcast Recipients
	Determines whether the e-mail addresses of the destinations that receive transmissions broadcasted using SMTP protocol are recorded in the Journal. For example: '1st destination + Total number of destinations: 9' in the Journal indicates a broadcast to 9 destinations. 0: Not recorded 1: Recorded
	Bits 1~7: Not Used

SP	IFAX SW
1102 7	06
	Not Used

SP	IFAX SW
1102 8	07
	Not Used

SP	IFAX SW
1102 9	08
	Bits 0~7: Memory Threshold for POP Mail Reception
	This setting determines the amount of SAF (Store and Forward) memory. (SAF stores fax messages to send later for transmission to more than one location, and also holds incoming messages if they cannot be printed.) When the amount of SAF memory available falls below this setting, mail can no longer be received; received mail is then stored on the mail server. 00-FF (0 to 1024 KB: HEX) **Note**: The hexadecimal number you enter is multiplied by 4 KB to determine the amount of memory.

SP	IFAX SW
1102 10	09
	Bits 0~3: Not Used
	Bits 4~7: Restrict TX Retries
	This setting determines the number of retries when connection and transmission fails due to errors. 01-F (1-15 Hex)

SP	IFAX SW
1102 11	0A
	Not Used.

SP	IFAX SW
1102 12	0B
	Not Used.

SP	IFAX SW
1102 13	0C
	Not Used.

SP	IFAX SW
1102 14	0D
	Not Used

SP	IFAX SW
1102 15	0E
	Not Used

SP	IFAX SW
1102 16	0F
	Bit 0: Delivery Method for SMTP RX Files
	This setting determines whether files received with SMTP protocol are delivered or output immediately. 0: Off. Files received via SMTP are output immediately without delivery. 1: On. Files received via SMTP are delivered immediately to their destinations.
	Bits 1~7: Not Used

3.3 FIRMWARE UPDATE PROCEDURE

When you need to update the firmware for IFAX, follow the firmware update procedures described in the main machine Service Manual.

3.4 IFAX RAM ADDRESSES

Parameter	Function	Data Format	Address	Comments
Mail Address	Mail address of the fax account.	ASC: 128 bytes	69FEAE	128 x 3 area provided, but only the first is used.
User Name	User name of the fax account.	ASC: 64 bytes	6A002E	64 x 3 area provided, but only the first is used.
Password	Password of the fax account.	ASC: 64 bytes	6A00EE	64 x 3 area provided, but only the first is used.
RX Mail Capacity	---	4 Bytes	6A01AE	64-1024 Kbytes
SMTP RX Permission Address	Address or partial address that is used to limit access to mail delivery (see pg. 4-11, “Auth E-Mail Rx”).	ASC: 128 bytes	6A01B2	
Doc. Svr. RX Notification No	Number of RX Notification Mails that have been sent in order to notify receipt of a fax message on the document server.	2 bytes	6A0232	

SPECIFICATIONS

1. IFAX SPECIFICATIONS

Type
Fax Unit and Printer/Scanner Unit

Connectivity
Local area network
Ethernet 100base-Tx/10base-T

Connection
100base-Tx/10base-T direct connection

Resolution
Main scan: 200 dpi
Sub scan: 400 dpi, 200 dpi, 100 dpi

NOTE: To use 400 dpi, IFAX SW01 Bit 4 must be set to “1”.

Transmission Time
1 s (through a LAN to the server)
Condition: ITU-T #1 test document (Selerexe Letter)
MTF correction: OFF
TTI: None
Resolution: 200 x 100 dpi
Communication speed: 10 Mbps
Correspondent device: E-mail server
Line conditions: No terminal access

Document Size
Maximum message width is A4/LT.
Note: To use B4 and A3 width, IFAX SW00 Bit 1 (B4) and/or Bit 2 (A3) must be set to “1”.

E-mail File Format
Single/multi-part
MIME conversion
Image: TIFF-F (MH) format only

Protocol
(Supported by TCP/IP protocol)
Transmission:
IETF RFC821 SMTP procedure
Reception:
IETF RFC1725 POP3 procedure
IETF RFC2026 IMAP4 procedure

Data rate
100 Mbps(100base-Tx)
10 Mbps (10base-T)

Remark
The machine must be set up as an e-mail client before installation. Any client PCs connected to the machine through a LAN must also be e-mail clients, or some features will not work (e.g. Autorouting).

DataOverwriteSecurity Unit

Type A/B694-01
Type B/B692-01

DataOverwriteSecurityUnit B692/B694

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⚠IMPORTANT SAFETY NOTICES

PREVENTION OF PHYSICAL INJURY

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

HEALTH SAFETY CONDITIONS

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

OBSERVANCE OF ELECTRICAL SAFETY STANDARDS

1. The copier and its peripherals must be installed and maintained by a customer service representative who has completed the training course on the machines.
2. The NVRAM has a lithium battery which can explode if replaced incorrectly. Replace the NVRAM only with an identical one. The manufacturer recommends replacing the entire NVRAM. Never attempt to recharge or incinerate this battery. Used NVRAMs must be handled in accordance with local regulations regarding the disposal of such items.s

SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

1. Never incinerate toner bottles or used toner. Toner dust may ignite suddenly when exposed to an open flame.
2. Dispose of used toner, developer, and organic photoconductors in accordance with local regulations. (These are non-toxic supplies.)
3. Dispose of replaced parts in accordance with local regulations.
4. When keeping used lithium batteries in order to dispose of them later, do not put more than 100 batteries per sealed box. Storing larger numbers or not sealing them apart may lead to chemical reactions and heat build-up.

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

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:

What This Manual Contains

This manual describes the DataOverwriteSecurity (DOS) Unit Type A/B for:

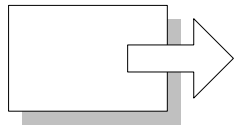
- B147/B149
- B135/B138
- B089/B093.

The DOS unit is an optional DIMM (or SD card) that contains special firmware. At the end of every job, this special firmware overwrites every cluster in temporary storage on the HDD twice with random data. Then each cluster is once again overwritten with a zero. This erases sensitive data on the disk which could be retrieved secretly.

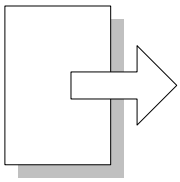
Conventions in this Manual

This manual uses several symbols.

Symbol	What it means
☛	Refer to section number
CT	See Core Tech Manual for details
	Screw
	Connector
	E-ring
	Clip ring



Short Edge Feed (SEF)



Long Edge Feed (LEF)

1. INSTALLATION

1.1 ACCESSORY CHECK

Check the accessories and their quantities against the following list:

DataOverwriteSecurity (DOS) Unit Type A

This module is for B135/B138 and B089/B093.

Description	Q'ty
1. DIMM	1
2. Keytops for B089/B093 (Blank Covers)	2
3. Keytops for B135/B138 (Blank Covers)	2
4. Operation Instructions	1

DataOverwriteSecurity (DOS) Unit Type B

This module is for B147/B149.

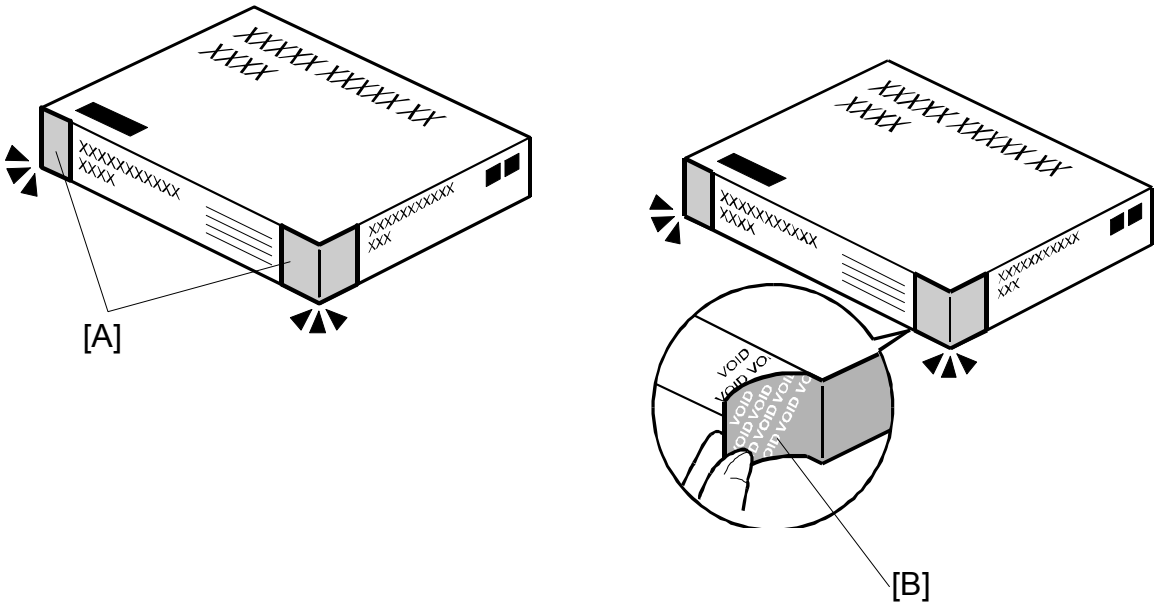
Description	Q'ty
1. SD Card	1
2. Keytop (Blank Covers)	2
3. Operation Instructions	1

⚠CAUTION

The machine should always be switched off and its power cord disconnected before doing any of the following procedures.

1.2 BEFORE YOU BEGIN

1.2.1 SEAL CHECK AND REMOVAL



⚠CAUTION

Before you start the installation, you must check the box seals to confirm that they have not been removed since the items were sealed in the box at the factory.

1. Check the box seals [A] on each corner of the box.
   - Confirm that a tape is attached to each corner.
   - The surfaces of the tapes should be blank. If you see “VOID” on the tapes **STOP, do not install the components, contact your superviser.**
2. If the surfaces of the tapes are unmarked, remove from the corners of the box.
3. As you remove each seal, the “VOID” marks [B] appear. This prevents the tape from being reattached to the box.
4. Make sure that you have the correct security module for the machine. The machine model requires either the DIMM type or the SD Card type.

Model	Security Module Required
B135/B138 e/f	DOS Unit Type A (DIMM)
B089/B093	DOS Unit Type A (DIMM)
B147/B149	DOS Unit Type B (SD Card)

1.3 INSTALLATION PROCEDURE

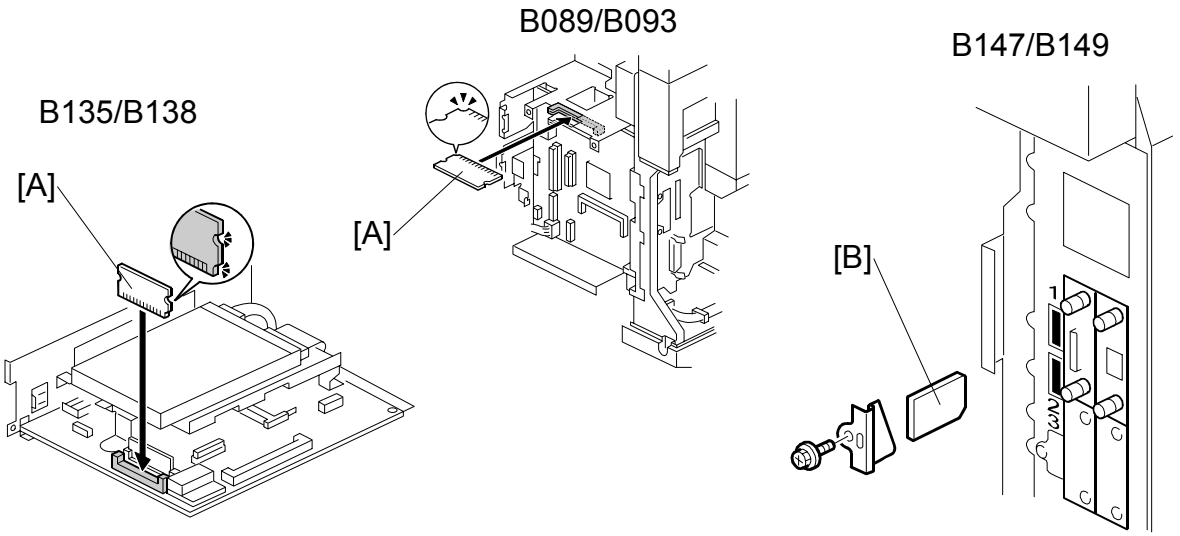
1. If the machine is on, switch off the main power switch.
2. Disconnect the Network cable if the NIB is installed.
3. Disconnect the Fax module cable if the fax option is installed.
4. Switch the main power switch on.
5. Check that the following “Copy SPs” are set as indicated below:

SP No.	SP Name	Set To:
5871 001	HDD Function Disable	1 (On)
5967 001	Document Server Set Function	1 (Off)
5846 090	USC Settings - Plain Data Forbidden	1 (Check)
5836 001	Capture Settings – Capture Function	0 (Off)
5832 001	HDD Formatting (ALL)	
	• B089/B093 OR B135/B138	Press # to Execute
	• B147/B149	Press “Execute” key

6. Check that the following “Printer SPs” are set as indicated below:

SP No.	SP Name	Set To:
1006 001	Sample/Proof Print	1 (On)

7. Turn off the operation switch.
8. Turn off the main switch.
9. Disconnect the Fax cable (RJ11 connection) if installed
10. Disconnect the Network cable (RJ45 connection) if NIB is installed



11. Install either the DIMM [A] or the SD Card [B]:
    - The DIMM is installed for B135/B138 or B089/B093.
    - The SD Card is installed for B147/B149.

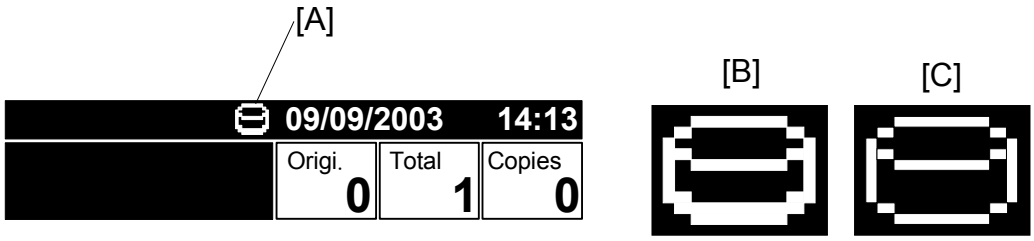
Model B147/B149

- If the PostScript 3 option is not installed, install the DOS option SD card in Slot 2.
- If the PostScript 3 option is installed, remove the Printer/Scanner card from Slot 1 and install the DOS option SD card in Slot 1.
- Follow the procedure in the B147/B149 Service Manual, section 5.7 SD Card Appli Move, to move the Printer/Scanner application data to the DOS option card. ***(The Printer/Scanner software is now on the SD card with the DOS option.)***
- Remove Printer/Scanner card from Slot 3

NOTE: After the SD Card Appli Move procedure is completed the Printer/Scanner card will no longer function

- After the procedure is completed, the DOS card, with Printer/Scanner application data, will be in Slot 1. The PS3 card will be in Slot 2 and Slot 3 will be empty

12. Connect the network cable if the NIB option is installed.
13. Connect the Fax cable if the fax option is installed.
14. Switch the main power switch on.



15. Check the display and make sure that the overwrite erase icon [A] is displayed.
16. Make a Sample Copy.
17. Watch the overwrite erase icon.
    - The bottom of the icon becomes thicker [B].
    - “Next Copy” is displayed briefly below the icon.
    - The icon returns to its normal appearance [C].
18. Remove the Document Server and Scanner keytops and replace them with the blank keytops provided.

2. PREVENTIVE MAINTENANCE

There are no preventive maintenance checks or procedures for the DataOverwriteSecurity Unit.

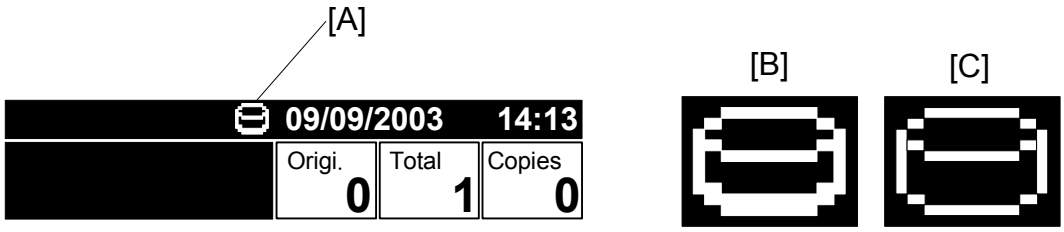
3. REPLACEMENT AND ADJUSTMENT

3.1 HDD

1. Switch the operation power switch off.
2. Switch the main power switch off.
3. Disconnect the power cord from the power supply.
4. Replace the HDD. (Refer to the section “3. Replacement and Adjustment” in the Service Manual of the appropriate machine.
5. Discard the used HDD

> **⚠CAUTION**
> **The customer engineer must consult with the key operator or system administrator to decide how to handle the old HDD.**

6. Connect the power cord to the power supply.
7. Switch on the main power switch.
8. Make a Sample Copy.



9. Check the overwrite erase icon [A] in front of the date in the upper right corner of the operation panel display.
10. Confirm that the icon has changed from the display for data on disk [B] to no data on disk [C]

NOTE: No SP settings are required for replacement of a defective HDD.

3.2 NVRAM

1. Switch the operation power switch off.
2. Switch the main power switch off.
3. Disconnect the power cord from the power supply.
4. Disconnect the network cable if the NIB option is installed.
5. Disconnect the fax cable if the fax option is installed.
6. Insert a blank IC card or SD card into the controller slot:
   - B135/B138, B089/B093 require the IC card.
   - B147/B149 requires the SD card.
7. Connect the power cord to the power supply.
8. Switch the main switch on.
9. Enter the SP mode.
10. Do the following SPs.

SP No.	Name	Comment
5990 003	SMC Printout – SP	Prints a list of all the current User Tool settings
5990 002	SMC Printout – User Programs	Prints a list of all User Tool settings.
5824	NVRAM Data Upload	Uploads all SP and UT settings to the card.

11. When the upload is finished, switch the main power switch off.
12. Disconnect the power cord from the power supply, and remove the card.
13. Replace the NVRAM. (For more details about how the replace the NVRAM, refer to section “3. Replacement and Adjustment” in the Service Manual for the appropriate machine.
14. Switch on the main power switch.
15. Do the following SPs:

SP No.	Name	Comment
5801 001	Memory Clear – All Clear	Clears entire memory.
5832 002	HDD Formatting – IMH	Initializes documents stored on the document server, stamp print data, scanner delivery images, fax delivery images.

16. Switch the main power switch off, then switch it on again.
17. Insert the IC card or SD card with the uploaded NVRAM data into the controller slot.
18. Enter the SP mode and do SP5825 (NVRAM Data Download).
19. In the “Copy SP” mode, confirm the correct settings of the following SPs:

SP No.	SP Name	Correct Setting
5871 001	HDD Function Disable	1 (On)
5967 001	Copy Server Set Function	1 (Disable)
5846 090	USC Settings - Plain Data Forbidden	1 (Check)
5836 001	Capture Settings – Capture Function	0 (Disable)

20. Exit the “Copy SP” mode and enter the “Print SP” mode.
21. Confirm the correct setting of SP1006.

SP No.	SP Name	Correct Setting
1006 001	Sample/Locked Print	1 (Enable)

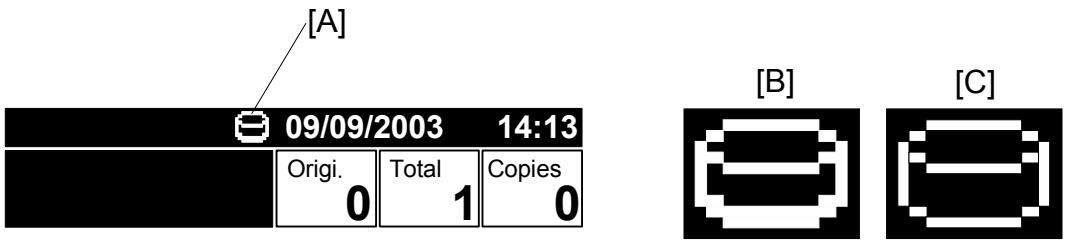
22. Connect the network cable if the NIB option is installed.
23. Connect the fax cable if the fax option is installed.

3.3 DIMM OR SD CARD

1. Switch the operation switch off.
2. Switch the main switch off.
3. Disconnect the power cord from the power supply.
4. Disconnect the network cable if the NIB option is installed.
5. Disconnect the fax cable if the fax option is installed.
6. Make sure that you have the correct DOS unit for the machine.
7. The machine model requires the DIMM or the SD Card.

Model	Security Module Required
B135/B138	DOS Unit Type A (DIMM)
B089/B093	DOS Unit Type A (DIMM)
B147/B149	DOS Unit Type B (SD card)

8. Install either the DIMM or the SD Card in the controller slot:
   - B135/B138, B089/B093 require the DIMM.
   - B147/B149 requires the SD card.
9. Connect the network cable if the NIB option is installed.
10. Connect the Fax cable if the fax option is installed.
11. Switch the main power switch on.
12. Make a Sample Copy.



13. Check the overwrite erase icon [A] in front of the date in the upper right corner of the operation panel display.
14. Confirm that the icon has changed from the display for data on disk [B] to no data on disk [C].

4. TROUBLESHOOTING

⚠CAUTION

Never turn off the main power switch when the power LED is lit or flashing. To avoid damaging the hard disk or memory, press the operation power switch to switch the power off, wait for the power LED to go off, and then switch the main power switch off.

NOTE: The main power LED lights or flashes while the platen cover or ARDF is open, while the main machine is communicating with a facsimile or the network server, or while the machine is accessing the hard disk or memory for reading or writing data.

4.1 SERVICE CALL CONDITIONS

4.1.1 SUMMARY

There are 4 levels of service call conditions.

Level	Definition	Reset Procedure
A	The LCD shows the SC code. The customer cannot continue to use the machine. The customer must call for service.	The customer engineer must: • Enter the SP mode. • Switch the main power switch off and on. • Troubleshoot the problem by following the procedures described in this section.
B	The LCD shows the SC code. The customer cannot continue to use the machine. This is a machine error.	The customer must: • Switch the operation switch off and on. • If the error occurs again, switch the main switch off and on. • If the error occurs again, user must call for service.
C	The LCD shows the SC code. However, only the unit that generated the error is disabled.	The customer must: • Switch the operation switch off and on. • If the error occurs again, switch the main switch off and on. • After recovery, the user can continue to use any feature other than the disabled function. For example, if an error occurs in Tray 1, the user can use other paper feed trays. • Customer should call for service if the affected function continues to return errors.
D	The LCD shows no SC code. The customer can continue to use the machine.	No action required. The machine updates the SC history.

4.1.2 SC CODE DESCRIPTIONS

SC828	B	Copy Countermeasure Error	B135/B138, B089/B093 Only
		A special chip on the ROM-DIMM installed in the machine is designed to prevent copying. After the command was sent to this chip, the chip generated an unexpected response.	• ROM-DIMM

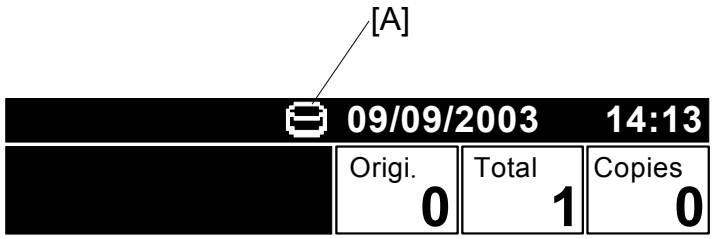
SC865	B	HDD Access Error	B135/B138, B089/B093, B147/B149
		During operation, the HDD generated an error.	Hard Disk Failure • Do SP5832 001 (HDD Formatting - All) • Do SP5832 002 (HDD Formatting - IMH) • If normal operation of the HDD cannot be recovered after doing these two SPs, replace the HDD.

SC866	B	SD Card Recognition Error	B147/B149 Only
		The machine generated an error when it attempted to detect the electronic recognition license. An illegal program is on the SD card.	• Use an approved SD card.

SC867	B	SD Card Removal Error	B147/B149 Only
		The SD card was removed from its slot while an application was executing.	• Never remove an SD card from the controller slot while a program is executing. • Switch the main power switch off and on, then start again.

SC868	B	SD Card Access Error	B147/B149 Only
		The SC card controller returned an error because the SD card is defective or the SC card controller is defective.	• Replace the SD card. • Replace the SD card controller.

4.2 OVERWRITE ERASE ICON NOT DISPLAYED



If the overwrite erase icon [A] is not displayed, check the following SPs and make sure that they are set correctly.

Copy SPs

SP No.	SP Name	Set To:
5871 001	HDD Function Disable	1 (On)
5967 001	Copy Server Set Function	1 (Disable)
5846 090	USC Settings - Plain Data Forbidden	1 (Check)
5836 001	Capture Settings – Capture Function	0 (Disable)

Print SP

SP No.	SP Name	Set To:
1006 001	Sample/Locked Print	1 (Enable)

5. SERVICE TABLES

Service Table Key

Notation	What it means
[range / **default** / step]	Example: [-9 ~ +9 / **+3.0** / 0.1 mm step]. The setting can be adjusted in the range ±9, value reset to +3.0 after an NVRAM reset, and the value can be changed in 0.1 mm steps with each key press.
*	Value stored in NVRAM. After a RAM reset, this default value (factory setting) is restored.
1111	An SP number set in bold-italics denotes a "Special Service Program" mode setting. To display the SSPs: 1. Enter the SP mode. 2. On the touch panel, press "Copy SP" and # together.
DFU	Denotes "Design or Factory Use". Do not change this value.
Japan only	The feature or item is for Japan only. Do not change this value.
LEF	Long Edge Feed
SEF	Short Edge Feed
(☛6.2 Image Processing)	Refer to "6.2 Image Processing" in "6. Details". Due to fundamental changes in how image processing adjustment is done with Group 4 SP codes, more details are provided in Section 6.

5.1 COPY SP SERVICE TABLES

5801 1	Memory Clear - All Clear
	Resets all data for process control and all software counters, and restores all modes and adjustments to their default values. To execute, hold down ① for over 3 seconds, and then turn the copier off and on again. Use this SP only after replacing the NVRAM, or after the copier has malfunctioned due to a damaged NVRAM.

5801 014	Clear DCS Settings
	Initializes SP setting related to DCS. DCS (Delivery Control Service) manages the Scan Router connection. To execute, hold down ① for over 3 seconds, and then turn the copier off and on again.

5824	NVRAM Data Upload
	Uploads the UP and SP mode data (except for counters and the serial number) from NVRAM on the control board to a flash memory card. *While using this SP mode, always keep the front cover open. This prevents a software module accessing the NVRAM during the upload.*

5825	NVRAM Data Download
	Downloads the content of a flash memory card to the NVRAM on the control board.

5832	HDD Formatting	
	Enter the SP number for the partition to initialize, then press #. When execution ends, cycle the machine off and on.	
5832 1	ALL	Initializes entire content of the HDD.
5832 2	IMH	Initializes 1) documents stored on the document server, 2) stamp print data, 3) scanner delivery images, 4) fax delivery images.

5836*	Capture Settings	
5836 1*	Capture Function (0:Off 1:On)	**0**: Disable, 1: Enable
	0: With this function disabled, the settings related to the capture feature cannot be initialized, displayed, or selected. 1: With this function enabled, the settings screen for the capture features an be displayed.	

5846	UCS Settings	
	UCS (User Control Service) is the software that manages user codes, the fax address book, the scan-to-email address book, and the scan-to-folder address book.	
5846 50*	Initialize All Directory Info.	Clears all directory information managed by UCS, including all user codes

5871	HDD Function Disable	[0~1 / **0** / 1] (0: OFF, 1: ON)
	Disables the HDD functions by suppressing all functions that write data to the HDD. After this SP is executed, the machine must be switched off and on to enable the setting. This SP is used after the optional Security Module Type A has been installed on the machine. For more details about this installation, see "1. Installation".	

5872	HDD Overwrite Status Check
	Determines whether the content of the hard disk has been overwritten. Range: 0 to 65535

5967*	Copy Server Set Function
	Allows or denies access to the document server screen. After changing this setting, you must switch the main switch off and on to enable the new setting. **0**: Function enable. Pressing the Document Server button opens the Document Server screen. 1: Function disable. Pressing the Document Server button does not display the Document Server screen. Free access to the document server is denied. However, files on the document server can still be accessed with the printer driver.

5990	SP Print Mode (SMC Printout)	
5990 1	All (Data List)	Execute to print a list of the settings for the selected item.
5990 2	SP (Mode Data List)	
5990 3	User Program	
5990 5	Diagnostic Report	

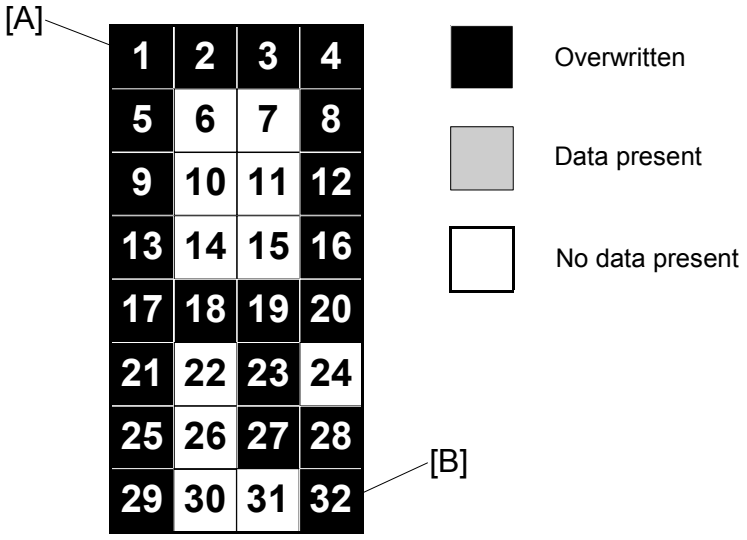
5.2 PRINT SERVICE TABLE

1006 001	Sample/Locked Print
	[0~1/**0**/1] **0: Linked**, 1: On Enables and disables the document server. When you select "0", the document server is enabled according to the Copy Service Mode SP5967. If you select "1", the document server is enabled regardless of Copy Service Mode SP5967. **Note**: Set to "1" (On) for use of the Sample Copy and Locked Print features.

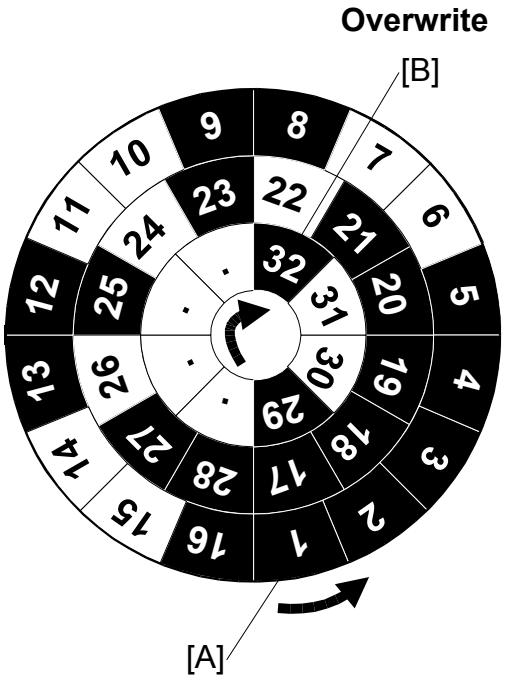
6. DETAILS

When an original is scanned or printed, the data for the job is stored temporarily on the hard disk for jam recovery. After the copy or print job finishes, some of this temporary data remains on the HDD at random locations until it is overwritten by the next job.

At the end of every copy and print job, the DataOverwriteSecurity Unit automatically writes over unneeded temporary data with random data twice and with a zero (0) once. This is the method recommended by NSA.



Original Data



A copy or print job always starts writing data to disk, starting with the clusters at the outer edge [A] and progressing toward the center.

The overwrite, on the other hand, always begins at the center cluster [B] and progresses toward the edge.

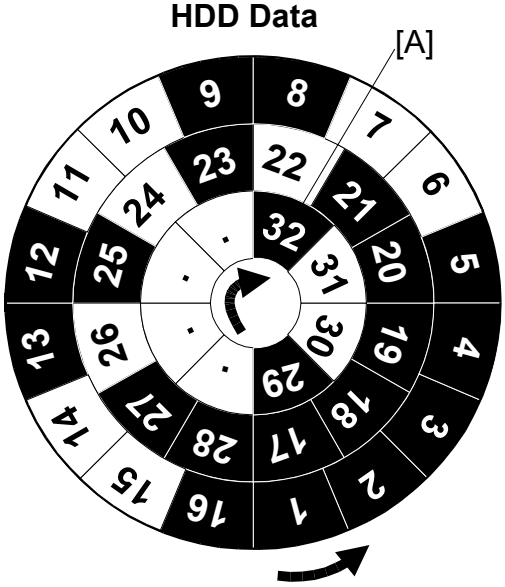
Taking the first square as cluster 1 on the outermost track:

- A job starts writing from 1, 2, 3, and continues toward 32.
- At the end of the job , the Security module overwrite erase proceeds from the opposite direction, starting from 32, 31, 30 on the innermost track and continues to 1.

NOTE: Each number in the illustration represents 1 cluster, the smallest unit the operating system uses to handle data on the HDD.

If a copy or print job starts during data overwrite, the job has priority and the overwriting stops, and the copy or print job begins.

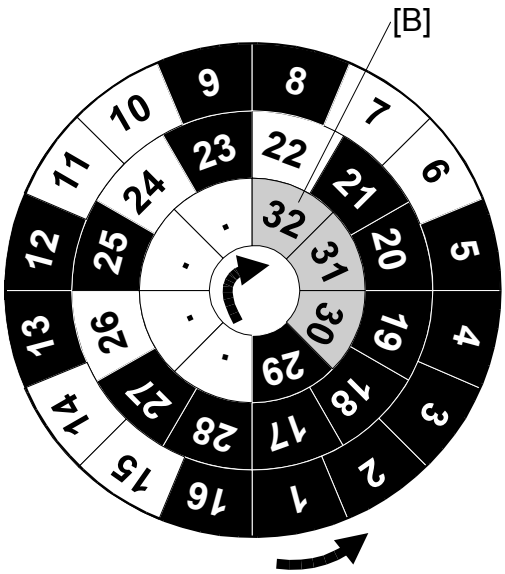
HDD Data



Original Data

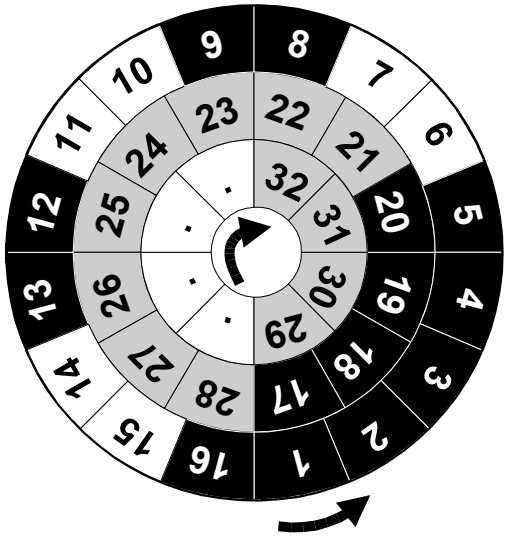
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32

1. A copy job writes data to the HDD as far as cluster 32 [A].



1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32

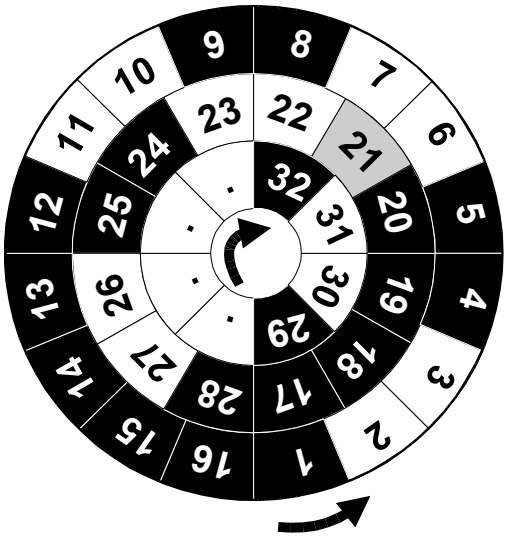
2. When the copy job is finished, the data overwrite starts at cluster 32 [B] can continues to overwrite each cluster twice with random data and once with a “0”.



1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32

[C]

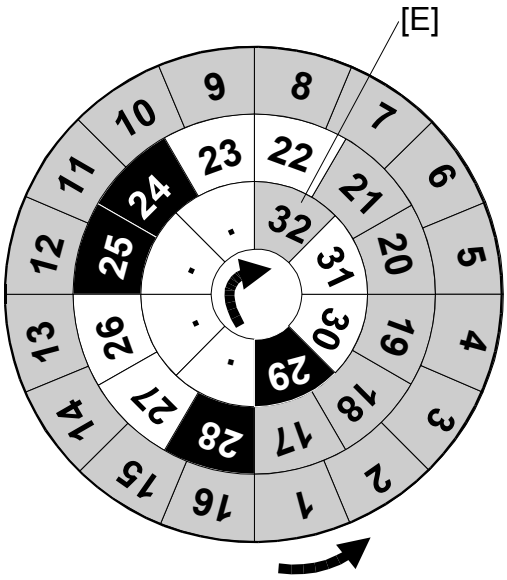
3. In this example, a copy job starts when the overwrite reaches cluster 21 [C] and overwriting stops.



1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32

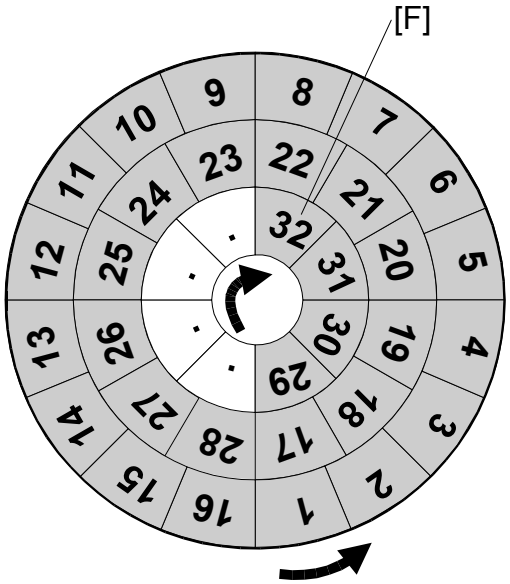
[D]

4. Next, the job writes data to the disk as far as cluster 32. When the job finishes, the overwrite restarts, starting with cluster 21 [D].



1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32

5. As soon as the overwrite progresses as far as cluster 1, it starts again from cluster [E] and continues through 32, 31, and so on.



1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32

6. When overwriting reaches cluster 22 (in this example), the overwrite is finished.

SPECIFICATIONS

1. HARDWARE

SD Card	B147/B149	Either the DIMM or SD card is required.
DIMM	B135/B138, B089/B093	

2. SOFTWARE

The table below describes:

- The types of data overwritten automatically.
- Compatibility of the data overwrite function with other functions of the machine.

Types of temporary data that are overwritten	Copy jobs
	Print jobs
	Sample print/locked print jobs *1
	LAN fax printing
Types of temporary data that are not overwritten	Document server functions
	Scanner functions (except TWAIN)
	Internet fax
	Paperless/serverless fax
	PS3 (only for Type A) *2
	Spool printing
	SDK applications (Global Scan, Doc Mail, etc.)
	File format converter functions
Types of temporary data that are not originally stored on the HDD	Normal fax functions (except I-Fax, paperless/serverless fax)
	TWAIN scanner

***1** A sample print or locked print job can be overwritten after execution.

***2** The PS3 function cannot be used with the Type A DIMM because the Type A DIMM is inserted in the PS3 slot. However, B147/B149 is provided with an SD card merge function, so the PS3 function can be used with the Type B.

***3** User stamps are not overwritten and erased.

***4** Printer fonts, overlay forms, and RTIFF data are not overwritten.

- If the fax option is installed, the address book data is stored in the FCU (500 addresses maximum). If the Function Upgrade Kit is installed, up to 1200 addresses can be stored. The number of addresses that can be stored is determined by the capacity of the FCU and Function Upgrade Kit. The HDD does not store address book data.

TECHNICAL SERVICE BULLETINS

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: B135/B138 – 001 **03/29/2004**

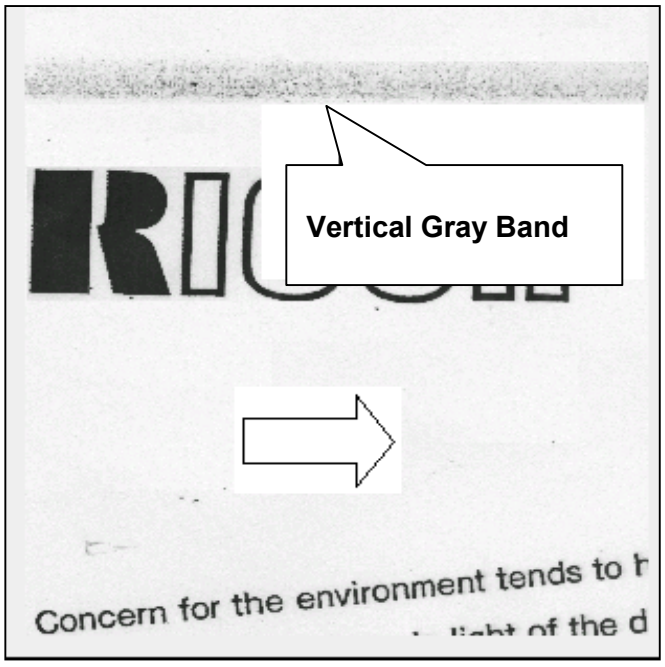
APPLICABLE MODEL:

GESTETNER – DSm635/DSm645
LANIER – LD135/LD145
RICOH – AFICIO 2035e/2045e
SAVIN – 4035E/4045E

SUBJECT: RANDOM GRAY BANDS

SYMPTOM:

Random gray band(s) (on both sides of paper) or fusing wrap-around jams due to cleaning roller toner melting, mostly on the 45 cpm model.



CAUSE:

The surface temperature of the cleaning roller exceeds the maximum melting point of the toner collected on the roller, allowing the re-melted toner to be transferred back to the paper via the pressure and hot rollers.

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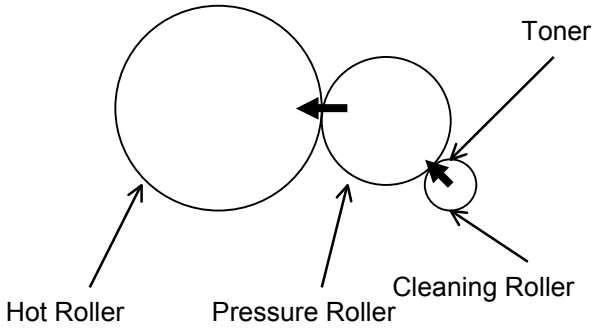
Factors for high roller temperature:

- Since the default fusing temperature is higher on the 45 cpm model, the fusing unit internal temperature and therefore cleaning roller temperature is generally higher.
- The fusing temperature on both the 35/45 cpm models is sometimes set higher as part of a solution for cold offset.
- The fusing unit internal temperature rises when high-volume, continuous duplex jobs of 1-to-15 or more are performed.



SOLUTION:

1. Replace the cleaning roller (P/N AE042054). See General for parts information.

2. If the fusing temperature (SP1105-001, -002) had been set higher than default, return it to its default value.
   - However if the fusing temperature is being set above default as a solution to cold offset, simply make sure this temperature does not exceed the following:
     - 35 cpm: Maximum increase of +10°C from default setting
     - 45 cpm: Maximum increase of +5°C from default setting

3. Check the lot number printed on the toner bottle being used in the machine, and replace the bottle if it is older than the following.
   - **New toner:**
     - Lot **3**xx**269**xx or later, Or
     - Lot **4**xxxxxxx or later
     - **Important:** "Or later" = equal to or higher to the underlined numbers.
       3: Last digit of production year
       269: Day of production, i.e. number of days since Jan. 1

   - After installing the new toner, since there will still be some old toner left inside the PCU, ***toner supply unit*** and development unit, please be sure to remove this by either vacuuming out ***each unit,*** or taking 50 A3/DLT solid-black sky-shot copies.

GENERAL:

			REFERENCE	
PART NUMBER	**DESCRIPTION**	**QTY**	**PAGE**	**ITEM**
AE042054	Fusing Cleaning Roller; Ass'y	1	49	17

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: B135/B138 – 002 **03/29/2004**

APPLICABLE MODEL:

GESTETNER – DSm635/DSm645
LANIER – LD135/LD145
RICOH – AFICIO 2035e/2045e
SAVIN – 4035E/4045E

SUBJECT: SERVICE MANUAL - INSERT

SERVICE MANUAL

The Service Manual pages listed below must be replaced with the pages supplied.

The revised areas have been highlighted by an arrow ⇒.

PAGES:

- Legend Updated Information (Legend page)

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LEGEND

PRODUCT CODE	COMPANY			
	GESTETNER	LANIER	RICOH	SAVIN
B135	DSm635	LD135	Aficio 2035e	4035e
B138	DSm645	LD145	Aficio 2045e	4045e

DOCUMENTATION HISTORY

REV. NO.	DATE	COMMENTS
*	2/2004	Original Printing

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: B135/B138 – 003 **03/31/2004**

APPLICABLE MODEL:

GESTETNER – DSm635/DSm645
LANIER – LD135/LD145
RICOH – AFICIO 2035e/2045e
SAVIN – 4035E/4045E

SUBJECT: SERVICE MANUAL - INSERT

SERVICE MANUAL

The Service Manual pages listed below must be replaced with the pages supplied.

The revised areas have been highlighted by an arrow ⇒.

PAGES:

- 5-54 Updated Information (SP7-504)

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⇒ 7504*	Paper Jam Counter by Jam Location		Display range: 0000~9999	
	Displays the total number of copy jams by location. *A "Paper Late" error occurs when the paper fails to activate the sensor at the precise time. A "Paper Lag" paper jam occurs when the paper remains at the sensor for longer than the prescribed time.*			
	Paper Late Error No.	**Paper Lag Error No.**	**Error**	
	1*		At Power On	
	3*		Tray 1: On	
	4*		Tray 2: On	
	5*		Tray 3: LCT On	
	6*		Tray 4: On	
	7*	57*	External Tray: On	LCT Tray
	8*	58*	Transport Sensor 1	Transport Sensor 1
	9*	59*	Transport Sensor 2	Transport Sensor 2
	10*	60*	Transport Sensor 3	Transport Sensor 3
		61*		Transport Sensor 4
	13*	63*	Registration Sensor	Registration Sensor
	14*	64*	Fusing Exit Sensor	Fusing Exit Sensor
	16*	66*	Exit 1: Off	Entrance Sensor
	17*	67*	Bridge Unit: Off	Relay Sensor 1 (option)
	18*	68*	Bridge Unit 2: Off	Relay Sensor 2 (option)
	19*	69*	Ent. Duplex 1: Off	Duplex Entrance Sensor
	23*	73*	Exit Duplex: Off	Exit Duplex: On
	24*	74*	1-Bin Tray: Check-in Error	1-Bin Tray: Check-out Error
	25*		Finisher Entrance	
	26*		Finisher Proof Tray	
	27*		Finisher Shift Tray	
	28*		Finisher Stapler	
	29*		Finisher Exit	
	30*		Mailbox Entrance	
	31*		Mailbox Proof Tray	
	32*		Mailbox Relay	
	33*		Mailbox MBX	
	35*		Booklet FIN Entrance	
	36*		Booklet FIN Transport	
	37*		Booklet FIN Early	
	38*		Booklet FIN Staple	
	39*		Booklet FIN Late Saddle Stitch	
	40*		Ent. FIN Off	
	41*		Exit FIN Off	

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: B135/B138 – 004 **03/31/2004**

APPLICABLE MODEL:

GESTETNER – DSm635/DSm645
LANIER – LD135/LD145
RICOH – AFICIO 2035e/2045e
SAVIN – 4035E/4045E

COPY QUALITY

SUBJECT: OFFSET WITH 128 MM PITCH

SYMPTOM:

Ghost images appear in solid image and highlight areas at a pitch of approximately 128 mm (circumference of the fusing roller). Use the image samples below and on the next page to identify which of the three main types of offset is occurring.

SOLUTIONS:

Take the action prescribed in the table below, as the solutions **differ depending on the type of image and timing of occurrence**. More than one type of offset can occur at the same time, so if the image does not show significant improvement after the first action is performed, please return to the table and try the other relevant actions suggested.

1. Identifying the Specific Type of Offset

1. Offset from high toner concentration in developer
Lines on the original appear as blurred ghost images, especially along the feed direction on SMC report printouts.

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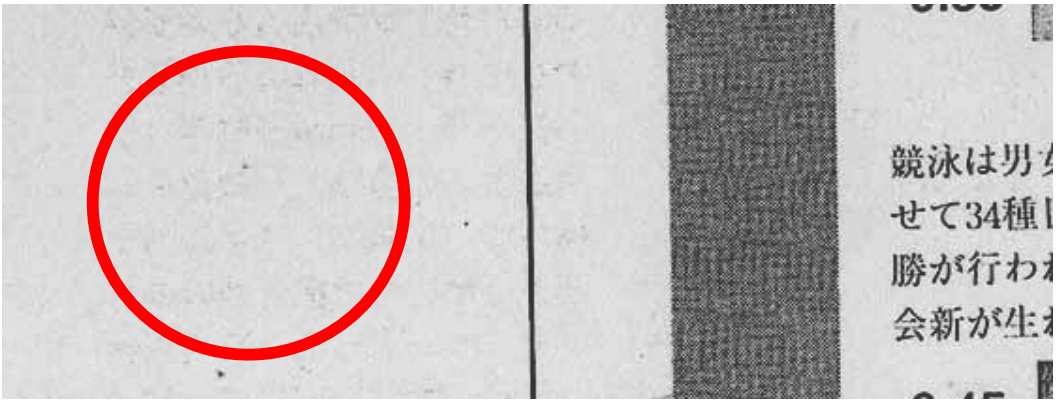
2. Cold offset
Black dots are clearly visible on the image.

3. Low-charging offset
Most noticeable on the rear side, along the feed direction.



2. Important Notes Before Taking Action

- If it seems like more than one type of offset are occurring at the same time, or it is unclear which one is occurring, there is a special solution that can be applied for all three at once. ***(See #4 in the table "A Guide to What Action to Take and When")***

- **Reading the toner lot number mentioned in the table below:**
  - The 8-digit lot number printed on the toner bottle is read in the following way.

    Example: **3** 2 5 **2 6 9** 8 1
    - **3**: Last digit of year of production
    - *25: (not relevant)*
    - **269**: Day of production, i.e. the number of days since Jan. 1
    - *81: (not relevant)*

  - Therefore, "**269** or later" in the table below would mean:
    - Lot No. **3**xx**269**xx or higher, or
    - Lot No. **4**xxxxxxx or higher.

3. A Guide to What Action to Take and When

This table is the main guide to determining what action is required, so please be sure to follow the instructions in the ACTION column below, in the order listed.

Notes/Key:

- "At developer replacement" below refers to cases in which offset occurs just after the developer is replaced. The developer does not need to be replaced in any of the actions below.
- A "warm-up event" refers to when the machine is brought on line such as when the main power SW is turned ON, or the machine recovers from Energy Saver mode.
- To perform Action B ***and Action I***, you will need toner from lot 3xx**269xx** or later.

	Symptom	Timing of Occurrence	Toner Being Used in the Machine	ACTION: (In the order listed)
1	Offset from high toner concentration in developer	• At or just after installation • At developer replacement	N/A	- Action **A** - If not effective: Action **H**
2	Cold offset	• At or just after installation • At developer replacement	Toner from any lot	- Action **F**, then Action **B**
		• A while after installation: At warm-up event	Lot **268** or older:	- Action **F**, then Action **B**
			Lot **269** or later:	- Action **C**
		• A while after installation: During machine operation	Lot **268** or older:	- Action **F**, then Action **B**
			Lot **269** or later:	- Action **D**
3	Low-charging offset	• At or just after installation • At developer replacement • A while after installation	Lot **268** or older:	- Action **E**, Action **F**, then Action **B** - ***If this decreases the ID as a result: Action G***
			Lot **269** or later:	- Action **E**, then Action **A** - ***If this decreases the ID as a result: Action G***
4	More than one of the above is occurring, or it is not clear which one is occurring	• At or just after installation • At developer replacement • A while after installation	Toner from any lot	- Action **F**, then Action **I** - ***If this decreases the ID as a result: Action G*** - If the image still shows offset, try Action **C**.

4. Actions A – I

(Perform only as prescribed in the table on page 3)

Action A

Lower the toner concentration in developer and then increase the toner charge by additional toner churning.

1. Remove the toner bottle installed in the machine.
2. Execute SP2801.
3. Load LT LEF paper in the paper tray.
4. Set SP2902-3 to pattern 15.
5. Set SP5802 to Enabled, then directly access "Copier Window" from inside SP mode.
6. Select LT LEF as the paper type, set the number of copies at 120 and begin the copy job.
   - The machine will stop once the 120-sheet free-run is completed (paper will not be exited to the tray).
7. Set SP5802 to Disabled, then exit SP mode.
8. Set SP2902-3 to pattern 0 (None).
9. Close the black cap on the toner bottle firmly, then shake the bottle well. Next, remove the black cap and set the bottle in the toner supply unit.

NOTE: *Be sure and close the cap firmly before shaking to prevent any toner spillage from the bottle.*

10. Execute SP2801.
11. Access SP2802-01 and input a value of 3.70.
    - The value displayed after input will be in the range of 3.70+/- 0.02, however this is normal.

Action B

Replacing the toner inside the developer.

IMPORTANT: When installing the new toner bottle below, make sure to use a bottle from lots **3xx269xx** or later or **4xxxxxxx** or later (i.e. equal to or newer than the underlined portions).

1. Remove the toner bottle installed in the machine.
2. Access SP2220-01 and input a value of 4.70.
   - This will make it more difficult for the Toner End condition to be triggered when the toner concentration is lowered.
   - The value displayed after input will be in the range of 4.70+/- 0.02, however this is normal.
3. Access the "Copier Window" from inside SP mode, then take 50 simplex sky-shot copies (completely black) onto LT paper.
4. Close the black cap on the toner bottle firmly, then shake the bottle well. Next, remove the black cap and set the bottle in the toner supply unit.

NOTE: *Be sure and close the cap firmly before shaking to prevent any toner spillage from the bottle.*

5. Access SP2220-01 and input a value of 2.00 to trigger Toner End.
6. Note: The value displayed after input will be in the range of 2.00+/- 0.02, however this is normal.
7. Access the "Copier Window" from inside SP mode and take one copy. This will trigger the Toner End condition.
8. Initiate Toner End Recovery by opening the front cover, waiting at least 10 seconds, and then closing the cover.
9. Exit SP Mode, and then take some copies and check to see if there has been sufficient improvement.

NOTE: *Initially, this may cause the image density to decrease, however it will gradually return to normal levels.*

Action C

Changing the fusing parameters to improve images showing cold offset at warm-up.
- Disabling forced fusing reload
- Increasing the reload temperature
- Enabling fusing idling at warm-up

1. Set SP1-103-001 to a value of 1 and SP1-103-002 to a value of 0, which will disable fusing reload.
    - With this change, the machine will not trigger the Ready condition based on time, but rather based on actual roller temperature. This helps to ensure the proper fusing temperature with prints made just after a warm-up event.
    - Side effects: Warm-up time is increased

2. Set SP1-105-005/006 both to a value of 0.
    - Increasing the reload temperature to the actual target fusing temperature improves fusibility.
    - Side effects: Warm-up time is increased

3. Check the effectiveness with copies made just after a warm-up event.
    - If there is no significant improvement, access SP1-103-002 and input a value between 15-30 seconds.
        - This will add a fusing idling routine at every warm-up event (e.g. power on, recovery from Energy Saver).
        - This heats up the pressure roller and prevents a temperature drop with prints made at warm-up events.
        - Side effects: Warm-up time is increased

Action D

Changing the fusing parameters to improve images showing cold offset after the machine has reached Ready status.
- Adding a Copier idling routine for the 1st print
- Increasing the target fusing temperature

1. Set SP5-959 to a value between 5-10 seconds (which is equal to the Copier idling time for the first print).
    - This heats up the pressure roller and prevents a temperature drop with prints made at warm-up events.
    - Side effects: 1st print time is increased

2. Check the effectiveness by making copies.
    - If there is no significant improvement, increase the setting of SP5-959.
        - Side effects: This makes it easier for toner melting (gray bands) to occur.
    - If increasing the above setting still does not have enough of an effect, increase the settings of both SP1-105-001 and -002 (maximums below). These maximums are to help prevent toner melting (gray bands).
        - 35 cpm: Maximum increase of +10°C
        - 45 cpm: Maximum increase of +5°C

Action E

Lowering the toner concentration by increasing the development bias.

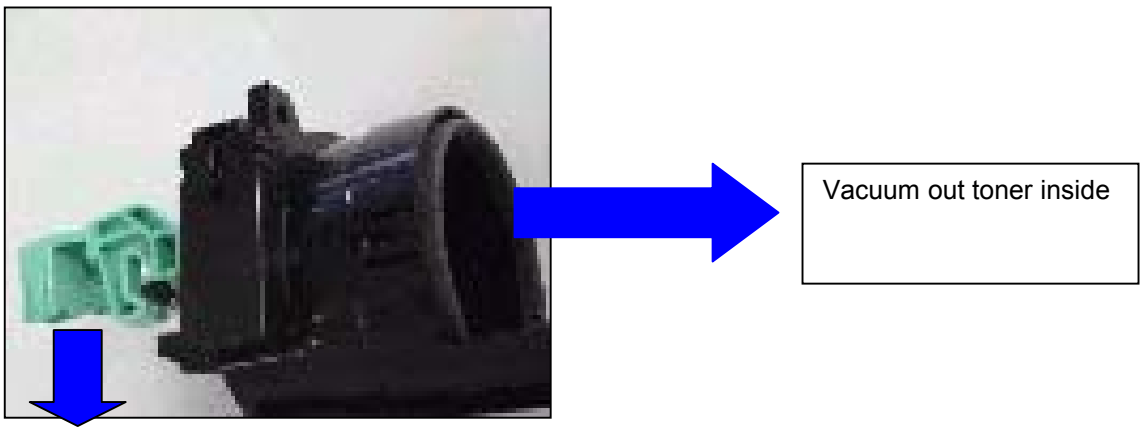
1. Access SP mode.
2. Increase SP2201-2 (development bias) by 100v, i.e. 380 to 480.

NOTE: *Initially, this may cause the image density to decrease, however it will gradually return to normal levels.*

Action F

Preventing old/new toner mixing in the development unit.

1. Lower the green lever of the toner supply unit.
2. Clean the unit by vacuuming out the toner inside.



Action G

Raising the image density.

1. Perform several copy jobs in a row of about 10 sheets each, using a text-based original (do not use test charts).

If the image density is still low:

2. Access Special SP Mode:
   - Access general Service Mode, then hold down the "#" key and select "Copy SP."
3. Change the following settings.
   - SP2001-01 1450 → 1500
   - SP2005-03 1450 → 1500
   - SP2201-01 510 → 560
4. Exit SP Mode and turn the main power OFF/ON.

Action H

Increase the toner charge by performing additional developer agitation.

1. Access SP mode.
2. Execute SP2801 (developer initialization) an additional 3 times.
3. Access SP2802-01 and input a value of 3.70.

Action I

Combined solution for all 3 types of offset:

NOTE: *This will add approximately 11 minutes to machine installation time.*

1. Remove the toner bottle installed in the machine.
2. Access SP Mode, and then increase SP2201-2 (development bias) by 100v, i.e. 380 to 480.
3. Access SP2220-01 and input a value of 4.70.
   - This will make it more difficult for the Toner End condition to be triggered when the toner concentration is lowered.
   - The value displayed after input will be in the range of 4.70+/- 0.02, however this is normal.
4. Access the "Copier Window" from inside SP mode, then take 50 simplex sky-shot copies (completely black) onto LT paper.
5. Close the black cap on the toner bottle firmly, then shake the bottle well. Next, remove the black cap and set the bottle in the toner supply unit.

   IMPORTANT:
   - Be sure and close the cap firmly before shaking to prevent any toner spillage from the bottle.
   - When installing the new toner bottle, make sure to use a bottle from lots **3**xx**269**xx or later or **4**xxxxxxx or later (i.e. equal to or newer than the underlined portions).
6. Access SP2220-01 and input a value of 2.00 to trigger Toner End.
   - The value displayed after input will be in the range of 2.00+/- 0.02, however this is normal.
7. Access the "Copier Window" from inside SP mode and take one copy. This will trigger the Toner End condition.
8. Initiate Toner End Recovery by opening the front cover, waiting at least 10 seconds, and then closing the cover.
9. Exit SP Mode, and then take some copies and check to see if there has been sufficient improvement.

NOTE: *Initially, this may cause the image density to decrease, however it will gradually return to normal levels.*

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: B135/B138 - 005 **04/16/2004**

APPLICABLE MODEL:

GESTETNER – DSm635/DSm645
LANIER – LD135/LD145
RICOH – AFICIO 2035e/2045e
SAVIN – 4035e/4045e

SUBJECT: SERVICE MANUAL - INSERT

SERVICE MANUAL

The Service Manual pages listed below must be replaced with the pages supplied.

An arrow has highlighted the revised areas ⇒.

PAGES:

- iii Updated Information (Table Of Contents)
- 4-14 Updated Information (SC740/741 DATA MOVED)
- 4-15 through 4-22 Updated Information (only page numbers changed)
- 4-23 Updated Information (READING SC740/741 ERRORS FROM LED2)
- 4-24 through 4-28 Updated Information (SC740/741 NEW LOCATION)

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TROUBLESHOOTING

4. TROUBLESHOOTING 4-1
4.1 SERVICE CALL CONDITIONS 4-1
4.1.1 SUMMARY 4-1
4.1.2 SC CODE DESCRIPTIONS 4-2
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⟹ **NOTE:** SC740/741 (Booklet Finisher-related errors) are in the following section: **4.6 Reading SC 740/741 Errors from LED2. (Page 4-23)** The section describes the method for using the LED to read the details for SC740/741, as this information is not displayed on the machine operation panel.

800	B	Startup without video output end error (K) Video transfer to the engine is started, but a video transmission end command was not issued by the engine within the specified time.	• Control board defective
804	B	Startup without video input end (K) A video transmission was requested from the scanner, but a video transmission end command was not issued by the scanner within the specified time.	• Control board defective

Code No.		Symptom	Possible Cause
818	B	Watch Dog Error	
		While the system program is running, a bus hold or interrupt program goes into an eternal loop, preventing any other programs from executing.	• System program defective • Controller board defective • Peripheral device malfunction
819	B	Kernel mismatch error	• Software application error
820	B	Self-Diagnostic Error: CPU	• Controller board defective • Software defective
		The central processing unit returned an error during the self-diagnostic test.	
821	B	Self-Diagnostic Error: ASIC	• Controller board defective
		The ASIC returned an error during the self-diagnostic test because the ASIC and CPU timer interrupts were compared and determined to be out of range.	
822	B	Self-Diagnostic Error: HDD	• HDD defective • HDD connector defective • Controller board defective
		The hard disk drive returned an error during the self-diagnostic test.	
823	B	Self-diagnostic Error: NIB	• Network interface board defective • Controller board defective
		The network interface board returned an error during the self-diagnostic test.	
824	B	Self-diagnostic Error: NVRAM	• NVRAM damaged or abnormal • Backup battery has discharged • NVRAM socket damaged
		The resident non-volatile RAM returned an error during the self-diagnostic test.	
826	B	Self-diagnostic Error: NVRAM/Optional NVRAM	• NVRAM defective
		The NVRAM or optional NVRAM returned an error during the self-diagnostic test.	
827	B	Self-diagnostic Error: RAM	• Memory malfunction
		The resident RAM returned a verify error during the self-diagnostic test.	
828	B	Self-diagnostic Error: ROM	• Controller board defective • Firmware defective
		The resident read-only memory returned an error during the self-diagnostic test.	
829	B	Self-diagnostic Error: Optional RAM	• RAM DIMM defective • Controller board defective
		The optional RAM returned an error during the self-diagnostic test.	
835	B	Self-Diagnostic Error: Parallel Interface	• Loopback connector not detected • IEEE1284 connector defective • Controller board defective

Code No.	Symptom		Possible Cause
836	**B**	Self-diagnostic Error: Resident Font ROM	• Font ROM defective
		The resident font ROM returned an error during the self-diagnostic test.	
837	**B**	Self-diagnostic Error: Optional Font ROM	• Font ROM defective
		The optional font ROM returned an error during the self-diagnostic test.	
840	**C**	Self-Diagnostic Error 1: EEPROM Access Error	• EEPROM defective • EEPROM worn out
		During input/output with the EEPROM, one of the following errors occurred: • A read error occurred, then continued after 3 retries. • Write error occurred.	
841	C	Self-Diagnostic Error 2: EEPROM Read/Write Data Error	• The data is being written into the 3 designated errors differently
		The values of the data written and “mirrored” in 3 errors are all detected as not matching..	
850	**B**	Network I/F Abnormal	• NIB defective • Controller board defective
		NIB interface error.	
851	**B**	IEEE 1394 I/F Abnormal	• IEEE1384 interface board defective Controller board defective
		IEEE1394 interface error.	
853	B	Wireless LAN Error: Card Error 1	• Wireless LAN card not inserted into the wireless LAN board
		The wireless LAN board can be accessed, but the wireless LAN card (IEEE 802.11b or Bluetooth) cannot access the board.	
854	B	Wireless LAN Error Card Error 2	• Wireless LAN card has been removed
		The board that holds the wireless LAN card can be accessed, but the wireless LAN card (802.11b/Bluetooth) itself cannot be accessed while the machine is operating	
855	B	Wireless LAN Error 3: Card Error 3	• Wireless LAN card defective • Wireless card connection not tight
		An error is detected for the wireless LAN card (802.11b or Bluetooth).	
856		Wireless LAN Error 4: Board	• Wireless LAN card board defective • PCI connector loose
		An error is detected for the wireless LAN card (802.11b or Bluetooth).	
857	B	USB I/F Error	• The USB driver can generate three types of errors: RX, CRC, and STALL errors. Only the STALL error can generate this SC code.
		The USB driver is unstable and generated an error. The USB I/F cannot be used.	

Code No.	Symptom		Possible Cause
860	**C**	Startup without HD connection at main power on The hard disk connection is not detected.	• Cable between HDC and HD loose or defective • HD power connector loose or defective • HD defective • HDC defective
861	**C**	Startup without HD detection at power key on The hard disk connection is not detected.	• Cable between HDC and HD loose or defective • HD power connector loose or defective • HD defective • HDC defective
862	**A**	Maximum number of bad sectors detected on HD Up to 101 bad sectors have appeared in the area on the hard disk where image data is archived, and the hard disk may require replacement.	• SC863 returned while reading data from the HD and the number of registered bad sectors reached 101.
863	**B**	Startup without HD data lead Data stored on the hard disk is not read correctly.	• A bad sector occurred during operation of the HD
864	**B**	HD data CRC error During operation of the HD, the HD responded with a CRC error.	• Data transfer was abnormal in the data read from the HD.
865	**B**	HD access error The hard disk detected an error.	• Error detected other that the bad sectors error (SC863) or the CRC error (SC864)
870	B	Address Book Data Error Address book data stored on the hard disk was detected as abnormal when it was accessed from either the operation panel or the network.	• Software defective • HDD defective
871	B	FCU Flash ROM Error The address book written into the flash ROM mounted on the FCU is detected as defective.	• Flash ROM device defective • Replace flash ROM on the MBU
880	B	MLB Error A request for access to the MLB (Media Link Board) was not answered within the specified time.	• MLB defective
900	B	Electronic total counter error The value of the total counter has already exceeded 9,999,999	• NVRAM defective
901	B	SC901 Mechanical total count error The IO board cannot receive the mechanical total count data.	• Mechanical total counter defective

CodeNo.		Symptom	Possible Cause
920	B	Printer Error 1 An internal application error was detected and operation cannot continue.	• Software defective • Insufficient memory
925	**B**	Network File Error NIA	• NIA
951	**C**	F-gate error at write request After the IPU receives an F-gate signal, it receives another F-gate signal.	• Software defective • BICU defective
953	**C**	Scanner setting error During scanned image processing, another command to start scanning was received.	• Software defective
954	B	Printer setting error The IPU does not respond with the settings that are required to start image processing by the printer.	• Software defective
955	**C**	Memory setting error The IPU does not respond with the settings that are required to start image processing using the memory.	• Software defective
964	**C**	Scanner Start Error During scanned image processing, another command to start scanning was received.	• Software defective
984	**B**	Print image data transfer error The image transfer from the controller to the engine via the PCI bus does not end within 15 s after starting.	• Controller board defective • BICU defective Connectors between BICU and controller loose or defective
985	**B**	Scanner image data transfer error The image transfer from the engine to the controller via the PCI bus does not end within 3 s after starting.	• Controller board defective • BICU defective • Connectors between BICU and controller loose or defective • SIB defective
986	**C**	Software write parameter setting error An unstable area at the storage destination in the settings table is set NULL for the parameter received by the write module.	• Software defective

CodeNo.	Symptom		Possible Cause
990	**B**	Software performance error The software attempted to perform an unexpected operation.	• Software defective • Internal parameter incorrect • Insufficient working memory When this SC occurs, the file name, address, and data will be stored in NVRAM. This information can be checked by using SP7-403. Note the above data and the situation in which this SC occurs. Then report the data and conditions to your technical control center.
992	**A**	Unexpected Software Error Software encountered an unexpected operation not defined under any SC code.	• Software defective • An error undetectable by any other SC code occurred
995	**A**	Machine Type Information Error After the machine is powered on, a mismatch is detected between the CPM information sent from the controller to the engine and the CPM information specified by the DIP SW settings.	• The B135 (35 cpm) and B138 (45 cpm) use the same controller board, but the DIP SW settings must be set correctly for the machine speed. For details, see Section "3. Replace and Adjustment".
996	B	FCU board error FCU board is connected but not ready.	• FCU board defective and requires replacement • Firmware incorrect
997	B	Application function selection error The application selected by a key press on operation panel does not start or ends abnormally.	• Software defective • An option required by the application (RAM, DIMM, board) is not installed
998	B	Application start error After power on the application does not start within 60 s. (All applications neither start nor end normally.)	• Software defective • An option required by the application (RAM, DIMM, board) is not installed
999	B	Program download error The download (program, print data, language data) from the IC card does not execute normally.	• Board installed incorrectly • BICU 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 controller board or the PCB targeted for the download and prevent subsequent downloading. If this problem occurs, the damaged PCB must be replaced.

Trouble shooting

4.2 ELECTRICAL COMPONENT DEFECTS

4.2.1 SENSORS

Component (Symbol)	CN	Condition	Symptom
Scanner Home Position (S1)	504-5(SIB)	Open	SC121 is displayed.
		Shorted	SC120 is displayed.
Platen Cover (S2)	504-8 (SIB)	Open	APS and ARE do not function properly.
		Shorted	No symptom.
Original Width (S3)	505-3, 4 (SIB)	Open	CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
Original Length-1 (S4)	505-8,9 (SIB)	Open	CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
Original Length-2 (S5)	505-13 (SIB)	Open	CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
LD Unit Home Position (S6)	204-B2 (IOB)	Open	SC328 is displayed when the laser beam pitch is changed.
		Shorted	SC327 is displayed when the laser beam pitch is changed.
Toner Density (TD) (S7)	222-5 (IOB)	Open	The add toner indicator blinks even if there is toner in the development unit.
		Shorted	SC390-01 is displayed.
Paper Exit (S8)	202-B2 (IOB)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Registration (S9)	224-B2 (IOB)	Open	The Paper Jam indicator lights even if there is no paper.
		Shorted	The Paper Jam indicator will light whenever a copy is made.
Image Density (ID) (S10)	203-5 (IOB)	Open	SC350-03 is displayed after copying.
		Shorted	SC350-01 is displayed after copying.
Upper Paper Height (S11)	220-2 (IOB)	Open	Add Paper is displayed even if there is paper. If this condition occurred four times, SC501-02 will be displayed.
		Shorted	SC501-01 is displayed.
Lower Paper Height (S12)	214-2 (IOB)	Open	Add Paper is displayed even if there is paper. If this condition occurred four times, SC502-02 will be displayed.
		Shorted	SC502-01 is displayed.
Upper Paper End (S13)	220-8 (IOB)	Open	The Paper End indicator lights even if paper is placed in the upper paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the upper paper tray.

Component (Symbol)	CN	Condition	Symptom
Lower Paper End (S14)	214-8 (IOB)	Open	The Paper End indicator lights even if paper is placed in the lower paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the lower paper tray.
Upper Relay (S15)	220-5 (IOB)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Lower Relay (S16)	214-5 (IOB)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Transfer Belt Position (S19)	202-A10 (IOB)	Open	No symptom
		Shorted	SC403 is displayed

4.2.2 SWITCHES

Component (Symbol)	CN	Condition	Symptom
Right Lower Cover (SW1)	216-4 (IOB)	Open	“Doors/Covers Open” is displayed even if the right lower cover is closed.
		Shorted	The LCD goes blank when the lower cover is opened.
Main (SW3)	102-1~4 (PSU) 107-1	Open	The machine does not turn on.
		Shorted	The machine does not turn off.
Front Cover Safety (SW4)	107-1 (PSU)	Open	“Doors/Covers Open” is displayed even if the front cover is closed.
		Shorted	“Doors/Covers” Open is not displayed even if the front cover is opened.

4.3 BLOWN FUSE CONDITIONS

Fuse	Rating		Symptom at power on
	115V	210 ~ 230V	
Power Supply Board			
FU1	6.3A / 125V	6.3A / 250V	“Doors/Covers Open” is displayed
FU2	6.3A / 125V	6.3A / 250V	“Doors/Covers Open” for the finisher is displayed
FU3	6.3A / 125V	6.3A / 250V	Paper end condition
FU5	6.3A / 125V	6.3A / 250V	SC302, or SC403, or SC405 displayed
FU6	3.15A/125V	3.15A/250V	
FU9	4A/125V	4A/250V	
FU101	15A / 125V	---	No response
FU102	10A / 125V	5A / 250V	No response
FU103	2A / 125V	1A / 250V	Normal operation (optional heaters do not work)

4.4 LEDS

BICU LED Sequences

	LED 101 (Green)	LED 102 (Red)	LED 103 (Orange)
Normal Operation	Flashes	Off	Flashes
System Startup	Flashes	On (1~2s) then Off	Flashes
Firmware Update: Normal Execution	Flashes	On	Flashes
Firmware Update: Error	Flashes	Flashes	Flashes
Firmware Update: Normal End	Flashes	Off	Flashes
Energy Save Mode	Off	Off	Off

Controller LED Sequences

	LED 1 (Red)	LED 2 (Red)
System Startup (including Self-Diagnostics)	On	Off
Self-Diagnostic Error	On	On
Normal Operation	Flashes	Off
Firmware Update: Normal Execution	Flashes	Flashes
Firmware Update: Error	Off	Off
Firmware Update: Normal End	On	On

NOTE: LED 1 monitors Data Bus Bit 14, LED 2 monitors Data Bus Bit 15.

4.5 TEST POINTS

Controller Board

Number	Monitored Signal
TP1	GND
TP3	GND
TP6	GND
TP8	DB0 RXD
TP9	DB0 TXD
TP10	GND
TP11	+5VE
TP12	GND
TP13	+5V
TP14	+5VE
TP15	GND
TP16	R_FGATE
TP17	W_FGATE

⇒ 4.6 READING SC740/741 DETAILS FROM LED2:

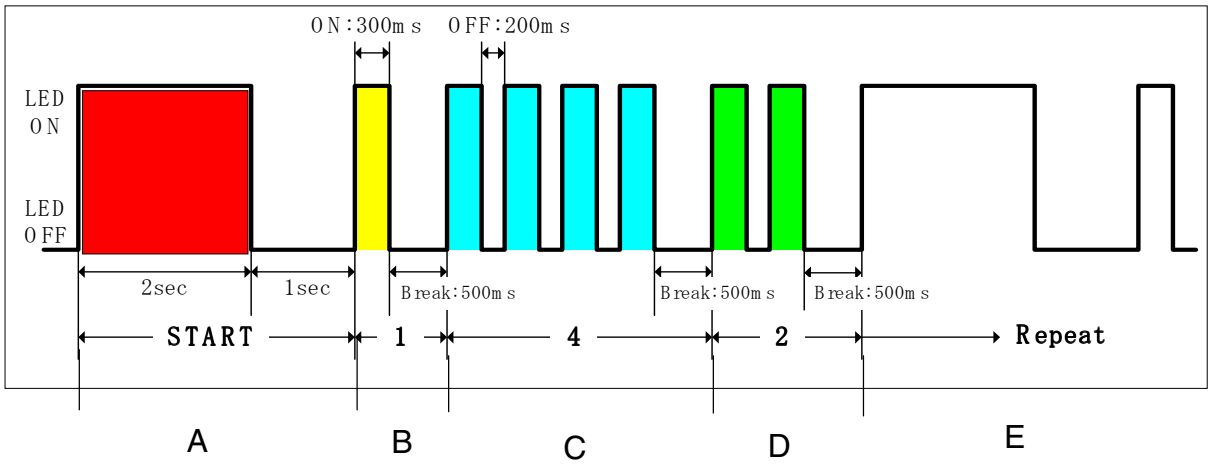
The following describes the method for using the LED to read the details for SC740/741 (Booklet Finisher-related errors), as this information is not displayed on the machine operation panel.

1. Remove the upper rear cover.
2. It is possible to determine which SC740/741 error is occurring by observing the number of flashes and flashing intervals of LED2.

2-1 Flashing pattern when Finisher is operating normally:
Repetition of 500ms ON, 500ms OFF.

2-2 Flashing pattern when an SC has occurred:
Example: Error code 1-4-2. (Jogger Motor Error)

⇒ Flashing intervals of LED2 for SC 740/741 error.



A. START : 2 sec ON, 1 sec OFF
B. **:** 3010ms ON → 500ms Break (OFF)
C. 4**:** 300ms ON, 200ms OFF (repeat 3 times) → 300ms ON → 500ms Break
D. 2**:** 300ms ON, 200ms OFF → 300ms ON → 500ms Break
E. Return to START and repeat.

Error Type	Error Code	Description	Status	Possible Cause
SC	1-1-1	Shutter movement error	The shutter position switch does not turn on within 1 second after the transport motor starts to turn in reverse.	• Transport motor defective • Shutter position switch defective • Shift tray safety switch defective
	1-1-2		The shutter sensor does not deactivate within 1 second after the transport motor starts to turn in reverse.	
	1-1-3		The shutter position switch is off when the shift tray safety switch is off.	
	1-2-1	Exit motor error	After the exit motor turns on, the exit motor sensor does not send the proper signal to the finisher board.	• Exit motor defective • Exit motor sensor defective
	1-2-2		The exit motor sensor does not send the clock signal to the finisher board for certain period while the exit motor is on.	
	1-3-1	Upper exit plate movement error	The upper exit guide 2 switch does not turn on within 1sec. after the guide plate motor turns on.	• Guide plate motor defective • Upper exit guide 2 switch defective • Upper exit guide sensor defective • Shift tray safety switch defective
	1-3-2		The upper exit guide sensor does not activate within 1sec. after the guide plate motor turns on.	
	1-3-3		The upper exit guide 2 switch does not turn on when the shift tray safety switch is off.	
	1-3-4		The guide plate motor sensor does not send the clock signal to the finisher board for certain period while the exit motor is on.	
	1-4-1	Jogger motor error	After the jogger motor turns on to move the jogger fence from its home position, the jogger HP sensor does not deactivate within 2secs.	• Jogger motor defective • Jogger HP sensor defective
	1-4-2		After the jogger motor turns on to return the jogger fence to its home position, the jogger HP sensor does not activate within 2secs.	

Error Type	Error Code	Description	Status	Possible Cause
SC	1-5-1	Stapler motor	After the stapler motor turns on to After the stapler motor turns on to return the stapler unit to its home position, the stapler unit HP sensor does not activate within 4secs.	• Stapler motor defective • Stapler unit HP sensor defective
	1-5-2			
	1-6-1	Staple hammer motor error	The staple hammer HP sensor does not deactivate within 0.5secs. after the staple hammer motor turns on.	• Staple hammer motor defective • Staple hammer HP sensor defective
	1-6-2		The staple hammer HP sensor does not activate within 0.5secs. after the staple hammer motor turns on.	
	1-7-1	Tray lift motor error	The tray lift motor does not stop within 15secs. after being turned on. The shift tray HP sensor does not activate within 15secs. after the tray lift motor turns on.	• Tray lift motor defective • Lift motor sensor 1 defective • Lift motor sensor 2 defective • Shift tray HP sensor defective • Shift tray upper limit switch defective
	1-7-2		The shift tray upper limit switch turns on while the shift tray is being raised.	
	1-7-3		Lift motor sensors 1 & 2 do not send the clock signals to the finisher board every 200ms while the tray lift motor is on.	
	1-8-1	Shift tray height sensor error	Abnormal communication data between finisher board and shift tray height sensor.	• Shift tray height sensor defective • Finisher board defective
	1-8-2		No communication between finisher board and shift tray height sensor for a certain period.	
	1-8-3		The finisher board detects a connection error with the connector for the shift tray height sensor.	
	1-8-4		Adjustment error during shift tray height sensor adjustment.	
	1-9-1	Back-up RAM error	The check sum is abnormal when the main switch is turned on.	• Finisher board defective
	1-10-1	Communication error	Communication error between finisher board and copier mainframe.	• Finisher board defective • Booklet unit board defective • Poor connection of the interface
	1-10-2		Communication error between finisher board and booklet unit board.	

Error Type	Error Code	Description	Status	Possible Cause
SC	1-11-1	Positioning plate motor error	After the positioning plate motor turns on to move the positioning plate from its home position, the positioning plate HP sensor does not deactivate within 1.25s.	• Positioning plate motor defective • Positioning plate HP sensor defective
	1-11-2		After the positioning plate motor turns on to return the positioning plate to its home position, the positioning plate HP sensor does activate within 1sec.	
	1-12-2	Folder roller motor error	The folder roller motor sensor doesn't send the clock pulse to the booklet unit board within a certain period after the folder roller motor turns on.	• Folder roller motor defective • Folder roller motor sensor defective
	1-13-1	Shutter guide motor error	After the shutter guide motor turns on to move the shutter guide from its home position, the shutter guide HP sensor does not deactivate within 0.4s.	• Shutter guide motor defective • Shutter guide HP sensor defective
	1-13-2		After the shutter guide motor turns on to return the shutter guide to its home position, the shutter guide HP sensor does not activate within 1s.	
	1-14-1	Booklet jogger motor error	After the booklet jogger motor turns on to move the booklet jogger plate from its home position, the booklet jogger HP sensor does not deactivate within 0.5s.	• Booklet jogger motor defective • Booklet jogger HP sensor defective
	1-14-2		After the booklet jogger motor turns on to return the booklet jogger plate to its home position, the booklet jogger HP sensor does not activate within 1s.	
	1-15-1	Front stapler motor error	The front staple hammer HP switch does not turn off within 0.5s after the front stapler motor turns on.	• Front stapler motor defective • Front staple hammer HP switch defective
	1-15-2		The front staple hammer HP switch does not turn on within 0.5s after the front stapler motor turns on during jam recovery.	
	1-16-1	Rear stapler motor error	The rear staple hammer HP switch does not turn off within 0.5s after the rear stapler motor turns on.	• Rear stapler motor defective • Rear staple hammer HP switch defective
	1-16-2		The rear staple hammer HP switch does not turn on within 0.5s after the rear stapler motor turns on during jam recovery.	

Error Type	Error Code	Description	Status	Possible Cause
SC	1-17-1	Folder plate motor error	After the folder plate motor turns on to return the folder plate to its home position, the folder plate HP sensor does not activate within 0.3s.	• Folder plate motor defective • Folder plate HP sensor defective • Folder plate return sensor defective • Folder plate motor sensor defective
	1-17-2		After the folder plate motor turns on to move the folder plate from its home position, the folder plate HP sensor does not deactivate within 0.3s.	
	1-17-3		After the folder plate motor turns on to return the folder plate to its home position, the folder plate return sensor does not deactivate within 0.3s.	
	1-17-4		The pulse count from the folder plate motor sensor is lower than the target minimum.	
	1-18-1	Connector error	The connector of the shutter guide HP sensor is not connected.	• Poor connection or no connection of the shutter guide HP sensor connector • Poor connection or no connection of the folder plate HP sensor connector • Poor connection or no connection of the folder plate return sensor connector
	1-18-2		The connector of the folder plate HP sensor is not connected.	
	1-18-3		The connector of the folder plate return sensor is not connected.	

Error Type	Error Code	Description	Status	Possible Cause
SC	1-19-1	Switch error	When the booklet entrance guide sensor, lower door sensor and booklet exit cover sensor are all activated (doors closed), the lower door safety switch does not turn on within 1s after a copy job or warm-up idling begins.	• Booklet entrance guide safety switch defective • Lower door safety switch defective • Booklet exit cover safety switch defective
	1-19-2			
	1-19-3		When the booklet entrance guide sensor, lower door sensor and booklet exit cover sensor are all activated (doors closed), the booklet exit cover safety switch does not turn on within 1s after a copy job or warm-up idling begins.	

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: B135/B138 – 006 **05/13/2004**

APPLICABLE MODEL:
GESTETNER – DSm635/DSm645
LANIER – LD135/LD145
RICOH – AFICIO 2035e/2045e
SAVIN – 4035E/4045E

SUBJECT: SERVICE MANUAL - INSERT

SERVICE MANUAL

The Service Manual pages listed below must be replaced with the pages supplied.

The revised areas have been highlighted by an arrow ⇒.

PAGES:

- vi — Updated Information (Table of Contents)
- Tab Page — Updated Information (Bleeding Tab Page)
- 1 through 21 — New Information (B692/B695 DataOverwriteSecurity Unit)

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BOOKLET FINISHER B546

SEE SECTION B546 FOR DETAILED TABLE OF CONTENTS

PRINTER/SCANNER CONTROLLER B654

SEE SECTION B654 FOR DETAILED TABLE OF CONTENTS

FAX UNIT B653

SEE SECTION B653 FOR DETAILED TABLE OF CONTENTS

INTERNET FAX IFAX

SEE SECTION IFAX FOR DETAILED TABLE OF CONTENTS

DATAOVERWRITESECURITY UNIT B692/B694

SEE SECTION B692/B694 FOR DETAILED TABLE OF CONTENTS

INSTALLATION
AUTO REVERSE DOCUMENT FEEDER B541
FAX OPTION B653

PREVENTIVE MAINTENANCE
PAPER TRAY UNIT B542
PRINTER OPTION B654

REPLACEMENT AND ADJUSTMENT
LARGE CAPACITY TRAY B543

TROUBLESHOOTING
BOOKLET FINISHER B546
1000 SHEET FINISHER B408
2-TRAY FINISHER B545

SERVICE TABLES

DETAILED DESCRIPTIONS

SPECIFICATIONS
1-BIN TRAY B544

BRIDGE UNIT B538
DATAOVERWRITESECURITY Unit B692/B694

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: B135/B138 – 007 **06/02/2004**

APPLICABLE MODEL:

GESTETNER – DSm635/DSm645
LANIER – LD135/LD145
RICOH – AFICIO 2035e/2045e
SAVIN – 4035E/4045E

SUBJECT: SERVICE MANUAL - INSERT

SERVICE MANUAL

The Service Manual pages listed below must be replaced with the pages supplied.

The revised areas have been highlighted by an arrow ⇒.

PAGES:

- 5-9 Updated Information (SP2-XXX: Drum)
- 5-11 Updated Information (SP2201)
- 5-54 Updated Information (SP7504)

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SP2-xxx: Drum

2001*	Charge Roller Bias Adjustment		
⇒ 2001 1*	Copying	[–1000 ~ –2000 / **–1500V** / 10V step] See NOTE.	
	Adjusts the voltage applied to the charge roller for copying.		
⇒ 2001 2*	ID Sensor Pattern	[0 ~ 700 / **250V** / 10V step] See NOTE.	
	Adjusts the voltage applied to the charge roller when making the VSDP ID sensor pattern (for charge roller voltage correction). The actual charge roller voltage is this value plus the value of SP2001 1.		

2005*	Charge Roller Bias Correction	
2005 1*	Charge Roller Voltage Correction 1	[0.1 ~ 1.0 / **0.85** / 0.05 step]
	Adjusts the lower threshold value for the charge roller correction. *When the value of VSP/VSG is greater than this value, the charge roller voltage increases by 30 V (e.g., from –500 to –530).*	
2005 2*	Charge Roller Voltage Correction 2	[0.1 ~ 1.0 / **0.90** / 0.05 step]
	Adjusts the upper threshold value for the charge roller correction. *When the value of VSP/VSG is greater than this value, the charge roller voltage decreases by 30 V (absolute value).*	
⇒ ***2005 3****	Charge Roller Voltage Adjustment 1	[–1000 ~ **–**2000 / **1500V** / 10V step]
	Adjusts the lower limit value for charge roller voltage correction. See NOTE.	
2005 4*	Charge Roller Voltage Adjustment 2	[–1000 ~ **–**2000 / **2000V** / 10V step]
	Adjusts the upper limit value for charge roller voltage correction.	
2005 5*	Charge Roller Voltage Step	[0 ~ 100V / **30V** / 10V step]
	Adjusts the correction voltage adjustment step size.	

2101*	Printing Erase Margin	
	Adjusts the leading edge (top), trailing edge (bottom), left, and right margins	
2101 1*	Leading Edge (Top)	[0.9 ~ 9.0 / **3** / 0.1 mm step] Spec: ±2 mm
2101 2*	Trailing Edge (Bottom)	[0.9 ~ 9.0 / **3** / 0.1 mm step] Spec: ±2 mm
2101 3*	Left Edge	[0.9 ~ 9.0 / **2** / 0.1 mm step] Spec: ±1.5 mm
2101 4*	Right Edge	[0.9 ~ 9.0 / **2** / 0.1 mm step] Spec: ±1.5 mm
2101 5*	Trailing Edge - Back side	[0.0 ~ 4.0 / **1.2** / 0.1 mm step] *Recommended: 2 ±1.5 mm*
2101 6*	Back Side - Right	[0.0 ~ 9.0 / **0.3** / 0.1 mm step] *Recommended: 2 ±1.5 mm*
2101 7*	Back Side - Left	[0.0 ~ 9.0 / **0.3** / 0.1 mm step] *Recommended: 2 +2.5/-1.5 mm*

2103*	LD Power Adjustment	**DFU**
	Adjusts the intensity of the laser for the copier, printer, and fax unit. The Copier and Printer/Fax settings can be adjusted separately.	
2103 1*	LD1 (Copier)	[–55 ~ +64 / **–5** /1 LSB step] *Approx. 50/128 = .4%*
2103 2*	LD2 (Copier)	[–55 ~ +64 / **–20** /1 LSB step] *Approx. 50/128 = .4%*
2103 3*	LD1 (Printer, FAX)	[–50 ~ –35 / **–25** /1 LSB step]
2103 4*	LD2 (Printer, FAX)	[–50 ~ –35 / **–25** /1 LSB step]
2103 5*	LD1 Adjustment Start/End	OFF/ON
2103 6*	LD2 Adjustment Start/End	OFF/ON

⇒ **NOTE:** Must update the firmware for the Controller to version 2.40 or later and the BICU to version 2.11b or later for the new default settings.

Service Tables

2201*	Development Bias Adjustment		
⇒ 2201 1*	Development Bias	[-200 ~ -700 / **-560V** / 10V step]	
	Adjusts the development bias for copying. *Use as a temporary measure to correct faint copies from an aging drum.*		
⇒ 2201 2*	ID Sensor Pattern	[- 200 ~ -700 / **-480V** / 10V step]	
	Adjusts the development bias for the ID sensor pattern for VSP		

2207	Forced Toner Supply
	Forces the toner bottle to supply toner at 1-second intervals for up to 30 seconds. To start, press #.

2208*	Toner Supply Mode	[**0**: Sensor control, 1: Image pixel count]
	Selects the toner mode. *If you select 1, SP2-209-002 should be set to its default value. Use image pixel count modes only as a temporary measure if the ID or TD sensor is defective.*	

2209*	Toner Supply Rate	
2209 1*	Toner Rate	[10 ~ 800 mg/s / **60 mg/s** / 5 mg/s step]
	Sets the amount of toner supplied every second by the toner supply motor. *Increasing this value reduces the toner supply clutch on time. Use a lower value if the user tends to make lots of copies that have a high proportion of black.*	
2209 2*	Toner Supply Correction Data	[25 ~ 300 / **300** / 25 step]
	Displays the toner supply correction coefficient (K). It can also be used to adjust K, but the value is changed again when VT is measured for the next copy. *The toner supply rate depends on the amount of toner in the toner bottle. This change is corrected using this coefficient. This SP can be used to check the toner supply condition. The lower the value of K, the lower the toner density*	

2210*	ID Sensor Pattern Interval	
	Sets the interval between ID sensor pattern prints.	
2210 1*	Job Page Count	[0 ~ 200 / **10** / 1]
	Sets the interval between ID sensor pattern printing. For users that do not make many copies daily, set a smaller interval to compensate for the effects of seasonal and weather changes.	
2210 2*	Forced Page Count	[2 ~ 999 / **200** / 1]
	Forces creation of the ID sensor pattern to prevent low density copies for customers who use the copier for long copy jobs.	

2213*	Copies After Toner Near-End	[**0**: 90 copies, 1: No copies, 2: 10 copies]
	Selects the number of copies that can be printed once the copier has detected toner near-end. Select 1 or 2 if the customer normally makes copies of high density	

⇒ **NOTE:** Must update the firmware for the Controller to version 2.40 or later and the BICU to version 2.11b or later for the new default settings.

⇒ 7504*	Paper Jam Counter by Jam Location		Display range: 0000~9999	
	Displays the total number of copy jams by location. *A "Paper Late" error occurs when the paper fails to activate the sensor at the precise time. A "Paper Lag" paper jam occurs when the paper remains at the sensor for longer than the prescribed time.*			
	Paper Late Error No.	**Paper Lag Error No.**	**Error**	
	1*		At Power On	
	3*		1st Paper Feed Sensor	
	4*		2nd Paper Feed Sensor	
	5*		3rd Paper Feed Sensor	
	6*		4th Paper Feed Sensor	
	7*	57*	LCT Tray Relay Sensor	LCT Tray Relay Sensor .OFF
	8*	58*	Transport Sensor 1	Transport Sensor 1.OFF
	9*	59*	Transport Sensor 2	Transport Sensor 2.OFF
	10*	60*	Transport Sensor 3	Transport Sensor 3.OFF
		61*		Transport Sensor 4.OFF
	13*	63*	Registration Sensor	Registration Sensor.OFF
	14*	64*	Fusing Exit Sensor	Fusing Exit Sensor
	16*	66*	Exit Entrance Sensor	Fusing Exit Sensor.OFF
	17*	67*	Relay Sensor 1 (option)	Relay Sensor 1 .OFF
	18*	68*	Relay Sensor 2 (option)	Relay Sensor 2 .OFF
	19*	69*	Duplex Entrance Sensor	Duplex Entrance Sensor.OFF
	23*	73*	Duplex Exit Sensor	Duplex Exit Sensor.OFF
	24*	74*	1-Bin Tray: Sensor	1-Bin Tray: Sensor.OFF
	25*		Finisher Entrance	
	26*		Finisher Proof Tray	
	27*		Finisher Shift Tray	
	28*		Finisher Staple Tray	
	29*		Finisher Tray	
	30*		Mailbox Entrance	
	31*		Mailbox Proof Tray	
	32*		Mailbox Relay	
	33*		Mailbox MBX	
	35*		Booklet FIN Entrance	
	36*		Booklet FIN Transport	
	37*		Booklet FIN Early	
	38*		Booklet FIN Staple	
	39*		Booklet FIN Late Saddle Stitch	
	40*		Ent. FIN Off	
	41*		Exit FIN Off	

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: B135/B138 – 008 **07/02/2004**

APPLICABLE MODEL:

GESTETNER – DSm635/DSm645
LANIER – LD135/LD145
RICOH – AFICIO 2035e/2045e
SAVIN – 4035E/4045E

SUBJECT: SERVICE MANUAL - INSERT

SERVICE MANUAL

The Service Manual pages listed below must be replaced with the pages supplied.

The revised areas have been highlighted by an arrow ⇒.

PAGES:

- iii through vi — Updated Information (Table of Contents)
- 3-29 — Updated Information (Photoconductor Unit)
- 5-14 — Updated Information (SP2805)
- 5-111 through 5-113 — Updated Information (Software Download)
- 5-121 through 5-125 — Updated Information (Using the Debug Log)
- Remove pages 5-126 through 5-129 from the B135/B138 Service Manual. Section “5.8 Using the Debug Log” was incorrectly added to the manual. Replacement pages 5-121 through 5-125 contain the correct information.

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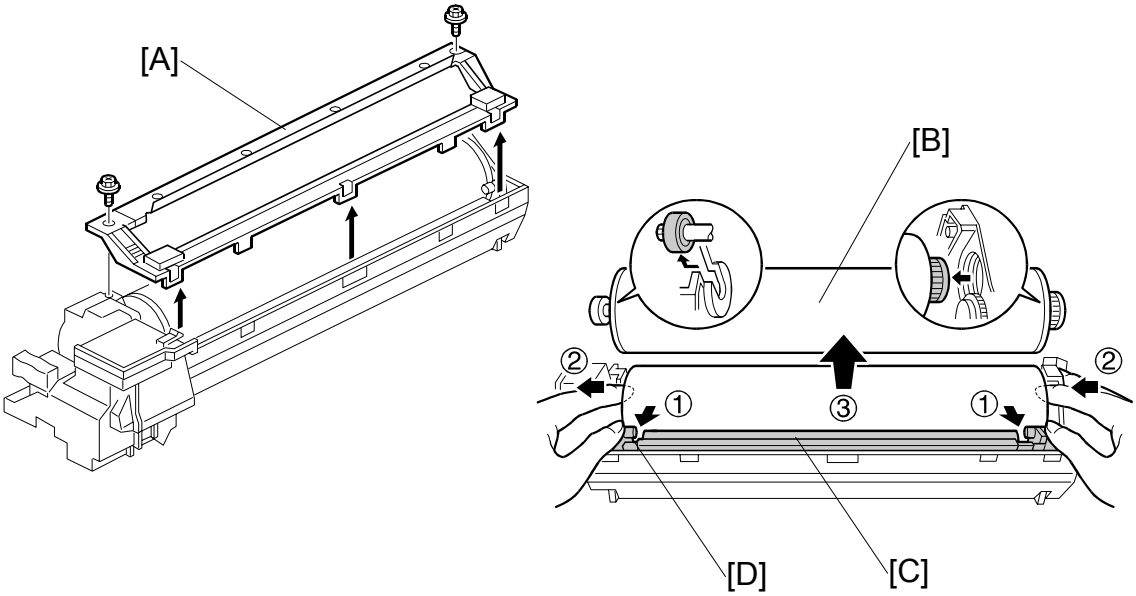
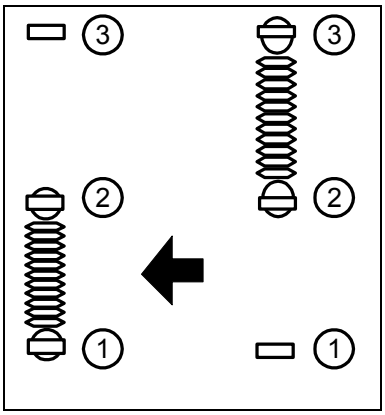


6. Turn the PCU upside-down, and remove lower PCU cover [A] (☞ x 2, 3 pawls).
7. Pull the drum [B] towards the front ② (the left side in the illustration) while releasing the charge roller [C] using the release lever ① [D], and then remove the drum ③.
   CAUTION: Never touch the drum surface with bare hands.
8. Replace the drum and re-attach the lower PCU cover.
9. Detach the spring from ②, ③and re-attach to ①, ②.

   CAUTION: You must re-attach the spring to ①, ② in order for the cleaning blade to operate correctly.

   If you fail to re-attach the spring to ①, ② the movable cleaning blade will not contact the drum for cleaning, but the machine will operate without generating an error. However, copies will gradually become dirty due to toner collecting on the drum.



10. Re-attach the spring on the left side of the PCU.
11. After replacing the drum, perform the ID sensor initial setting using SP3001 002.

⇒12. Do the developer initialization procedure (SP2805).

2309*	Transfer Current Correction	
2309 1	Paper Lower Width (a)	[0 ~ 297 / **150** / 1 mm step]
	Adjusts the lower paper width threshold for the transfer current, charge voltage, and development bias corrections. *Use this SP when an image problem (e.g., insufficient toner transfer) occurs with a small width paper. If the paper width is smaller than this value, the transfer current will be multiplied by the factor in SP2-309-3 (paper tray) or SP2-309-5 (by-pass).*	
2309 2	Paper Upper Width (b)	[0 ~ 297 / **216** / 1 mm step]
	Adjusts the upper paper width threshold for the transfer current, charge voltage, and development bias corrections. *As for SP2-309-1, but the factors are in SP2-309-4 (paper tray) and SP2-309-6 (by-pass).*	
2309 3	Paper Tray (alpha)	[1.0 ~ 3 / **1.2** / 0.1 mm step]
	Adjusts the transfer current correction coefficient used if the paper width is less than the setting of SP2-309-1.	
2309 4	Paper Tray (beta)	[1.0 ~ 3 / **1.2** / 0.1 mm step]
	Adjusts the transfer current correction coefficient used if the paper width is less than the setting of SP2-309-2.	
2309 5	By-Pass Feed (gamma)	[1.0 ~ 3 / **1.5** / 0.1 mm step]
	Adjusts the transfer current correction coefficient used if the paper width is less than the setting of SP2-309-1.	
***2309** 6*	By-Pass Feed (delta)	[1.0 ~ 3 / **1.5** / 0.1 mm step]
	Adjusts the transfer current correction coefficient used if the paper width is less than the setting of SP2-309-2.	

2801*****	TD Sensor Initial Setting
	Performs the TD sensor initial setting. This SP mode controls the voltage applied to the TD sensor to make the TD sensor output about 4.0 V. Press “Execute” to start. After finishing this, the TD sensor output voltage is displayed. *Use this mode only after installing the machine, changing the TD sensor, or adding new developer.*

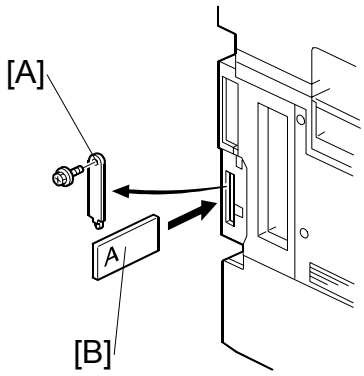
2802*****	TD Sensor Manual Setting	
	Allows you to adjust the TD sensor output manually for the following.	
2802 1	VTS	[1.00 ~ 5.00V / **4.78V** / 0.02V step]
	Adjusts the TD sensor output (VT). *Change this value after replacing the development unit with another one that already contains toner. For example, when using a development unit from another machine for test purposes. To adjust VT, use a similar procedure as for SP2-220.*	
2802 2	VTMAX	[1.00 ~ 5.00V / **4.78**V / 0.02V step]
	Adjusts the maximum value for SP2802 1.	
2802 3	VTMIN	[1.00 ~ 5.00V / **1.00V** / 0.02V step]
	Adjusts the minimum value for SP2802 1.	

⇒

2805*****	Developer Initialization
	Performs the developer initialization. Press “Execute” to start. This SP should be performed after doing SP2801-01 at installation and after replacing the drum.

⇒5.2 SOFTWARE DOWNLOAD

1. Turn OFF the main power switch.
2. Disconnect all external interfaces:
   - Network connection. Including: Wireless Card, USB, Parallel Printer Cable and FireWire.
   - All Fax line connections.
   - Copy Connect Kit.
   - External Auditing devices.
   - Any Remote Monitor Systems.
3. Remove the IC card [A] cover.
4. Insert the IC card [B] containing the software you wish to download into the card slot of the controller.
5. Turn ON the main power.
6. Follow the instructions displayed on the LCD panel
7. Monitor the downloading status on the operation panel.
   - While downloading is in progress, the LCD will display “Writing”. When downloading has been completed, the panel will display “OK”.
   - For operation panel software, the Start key lights red while downloading is in progress, and then lights green again after downloading is completed.



⚠CAUTION

Never switch OFF the power while downloading. Switching OFF the power while the new software is being downloaded will damage the boot files in the controller.

8. After confirming that downloading is completed, turn off the main power and remove the IC card.
9. The following firmware can be recovered if download fails. Follow the firmware download recovery procedure 5.2.1.
   - Controller
   - BICU
   - LCDC
10. If more software needs to be downloaded, repeat steps 1 to 7.
11. Turn the main power ON and confirm that the new software loads and that the machine starts normally.
12. Reconnect any external interfaces removed previous.

⇒5.2.1 SOFTWARE DOWNLOAD RECOVERY PROCEDURE

Controller

1. Turn OFF the main power switch.
2. Remove the Controller PCB.
3. Turn On DIP SW2, #1 (IC Card Boot).
4. Re-install the Controller PCB.
5. Insert the Controller firmware IC Card.
6. Power On machine. Firmware recovery will start automatically. Follow instructions on LCD panel.
7. After the firmware download is complete, power OFF the machine, remove the IC card, remove the Controller PCB and turn OFF DIP SW2, #1. Re-install the Controller PCB and test machine operation.

BICU

1. Turn OFF the main power switch.
2. Remove the lower rear cover.
3. Turn ON DIP SW101, #3 (Engine Program Recovery).
4. Insert the BICU firmware IC Card.
5. Power ON machine. Firmware recovery will start automatically. Follow instructions on LCD panel.
6. After the firmware download is complete, power OFF the machine, remove the IC card and turn OFF DIP SW101, #3. Test machine operation.

LCDC

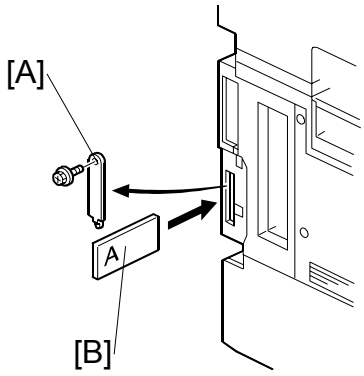
1. Leave LCDC firmware card installed.
2. Power the main power OFF and ON. Recovery will start automatically.

⇒5.3 UPLOADING/DOWNLOADING NVRAM DATA

The content of the NVRAM can be uploaded to and downloaded from a flash memory card.

5.3.1 UPLOADING NVRAM DATA (SP5-824)

1. Turn off the main switch.
2. Remove the IC card cover [A].
3. Plug the flash memory card [B] into the card slot.
4. Turn on the main switch.
5. Execute SP5-824.
6. Press ① to start uploading the NVRAM data.

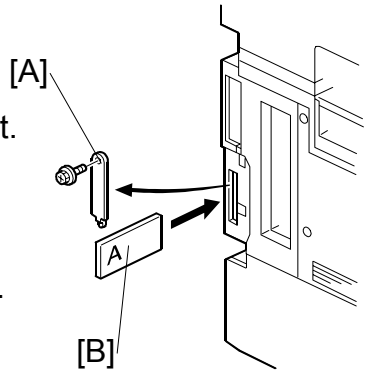


5.3.2 DOWNLOADING NVRAM DATA (SP5-825)

The following data are not downloaded from the flash card:

- Total count categories (SP7-003-*** Copy Counter)
- C/O, P/O Counter (SP7-006-*** C/O, P/O Count Display)
- Dupelx, A3/DLT/Over 420 mm, Staple and Scanner application scanning counters (system settings).

1. Turn off the main switch.
2. Remove the IC card cover [A].
3. Plug the flash memory card [B] into the card slot.
4. Turn on the main switch.
5. Execute SP5-825.
6. Press ① to start downloading the NVRAM data.



Note that the following errors could occur during downloading:

- If a card is not installed in the card slot and a message tells you that downloading cannot proceed, you cannot execute downloading, even by pressing ①.
- If the correct card for the NVRAM data is not inserted in the card slot, after you press ① a message will tell you that downloading cannot proceed because the card is abnormal and the execution will halt.

⇒5.7 USING THE DEBUG LOG

This machine provides a Save Debug Log feature that allows the Customer Engineer to save and retrieve error information for analysis.

Every time an error occurs, debug information is recorded in volatile memory but this information is lost when the machine is switched off and on.

The Save Debug Log feature provides two main features:

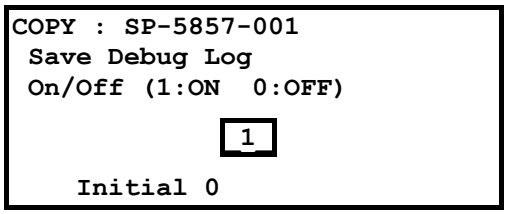
- Switching on the debug feature so error information is saved directly to the HDD for later retrieval.
- Copying the error information from the HDD to an IC card.

When a user is experiencing problems with the machine, follow the procedure below to set up the machine so the error information is saved automatically to the HDD.

5.7.1 SWITCHING ON AND SETTING UP SAVE DEBUG LOG

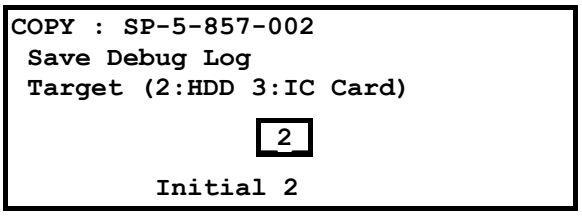
The debug information cannot be saved the until the “Save Debug Log” function has been switched on and a target has been selected.

1. Enter the SP mode.
   - Press [Clear Modes] then use the 10-key pad to enter ①⓪⑦.
   - Press and hold down [C/Stop] (Clear/Stop) for more than 3 seconds.
   - Press “Copy SP” on the touch-panel.
   - Enter ⑤⑧⑤⑦ then press ⓗ.
2. Under “5857 Save Debug Log”, press ①.



3. On the control panel keypad, press “1” then press ⓗ. This switches the Save Debug Log feature on.
   NOTE: The default setting is “0” (OFF). This feature must be switched on in order for the debug information to be saved.

⇒ 4. Next, select the target destination where the debug information will be saved. Under “5857 Save Debug Log”, touch “2 Target”, enter “2” with the operation panel key to select the hard disk as the target destination, then press #.



NOTE: Select “3 IC Card” to save the debug information directly to the IC card if it is inserted in the service slot.

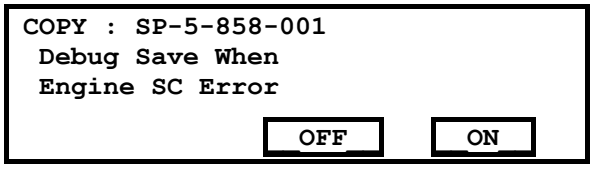
5. Now touch “5858” and specify the events that you want to record in the debug log. SP5858 (Debug Save When) provides the following items for selection.

1	Engine SC Error	Saves data when an engine-related SC code is generated.
2	Controller SC Error	Saves debug data when a controller-related SC Code is generated.
3	Any SC Error	Saves data only for the SC code that you specify by entering code number.
4	Jam	Saves data for jams.

NOTE: More than one event can be selected.

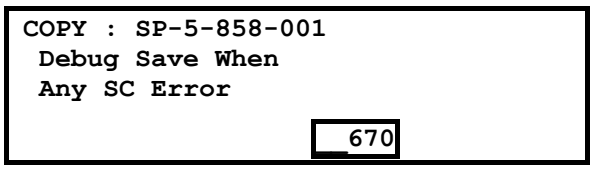
Example 1: To Select Items 1, 2, 4

Touch the appropriate items(s). Press “ON” for each selection. This example shows “Engine SC Error” selected.



Example 2: To Specify an SC Code

Touch “3 Any SC Error”, enter the 3-digit SC code number with the control panel number keys, then press #. This example shows an entry for SC670.



NOTE: For details about SC code numbers, please refer to the SC tables in Section “4. Troubleshooting”.

⇒ 6. Next, select the one or more memory modules for reading and recording debug information. Touch “5859”.

Under “5859” press the appropriate key item for the module that you want to record.

Enter the appropriate 4-digit number, then press #.

NOTE: Refer to the two tables below for the 4-digit numbers to enter for each key.

The example below shows “Key 1” with “2222” entered.

```
COPY : SP-5-859-001
 Debug Save Key No.
 Key 1

              2222
```

The following keys can be set with the corresponding numbers. (The initials in parentheses indicate the names of the modules.)

4-Digit Entries for Keys 1 to 10

KEY NO.	COPY	PRINTER	SCANNER	WEB
1	2222 (SCS)			
2	2223 (SRM)			
3	256 (IMH)			
4	1000 (ECS)			
5	1025 (MCS)			
6	4848 (COPY)	4400 (GPS)	5375 (Scan)	5682 (NFA)
7	2224 (BCU)	4500 (PDL)	5682 (NFA)	6600 (WebDB)
8		4600 (GPS-PM)	3000 (NCS)	3300 (PTS)
9		2000 (NCS)	2000 (NCS)	6666 (WebSys)
10		2224 (BCU)		2000 (NCS)

NOTE: The default settings for Keys 1 to 10 are all zero (“0”).

Key to Acronyms

Acronym	Meaning	Acronym	Meaning
ECS	Engine Control Service	NFA	Net File Application
GPS	GW Print Service	PDL	Printer Design Language
GSP-PM	GW Print Service – Print Module	PTS	Print Server
IMH	Image Memory Handler	SCS	System Control Service
MCS	Memory Control Service	SRM	System Resource Management
NCS	Network Control Service	WebDB	Web Document Box (Document Server)

The machine is now set to record the debugging information automatically on the HDD (the target selected with SP5-857-002) for the events that you selected SP5-858 and the memory modules selected with SP5-859.

⟹ Please keep the following important points in mind when you are doing this setting:

- Note that the number entries for Keys 1 to 5 are the same for the Copy, Printer, Scanner, and Web memory modules.
- The initial settings are all zero.
- These settings remain in effect until you change them. Be sure to check all the settings, especially the settings for Keys 6 to 10. To switch off a key setting, enter a zero for that key.
- You can select any number of keys from 1 to 10 (or all) by entering the corresponding 4-digit numbers from the table.
- You cannot mix settings for the groups (COPY, PRINTER, etc.) for 006~010. For example, if you want to create a PRINTER debug log you must select the settings from the 9 available selections for the “PRINTER” column only.
- One area of the disk is reserved to store the debug log. The size of this area is limited to 4 MB.

⇒5.7.2 RETRIEVING THE DEBUG LOG FROM THE HDD

1. Insert the IC card into the copier.
2. Enter the SP mode and execute SP5857 007 (Copy HDD to IC Card (Latest 4 MB) to write the debugging data to the IC card.
   NOTE: The IC card can hold up to 4MB of data. If the debugging data is larger than 4MB, you can switch to another IC card.
3. After you return to the service center, use a card reader to copy the file and send it for analysis to Ricoh by email, or just send the IC card by mail.

5.7.3 RECORDING ERRORS MANUALLY

Since only SC errors and jams are recorded to the debug log automatically, for any other errors that occur while the customer engineer is not on site, please instruct customers to perform the following immediately after occurrence to save the debug data. Such problems would include a controller or panel freeze.

NOTE: In order to use this feature, the customer engineer must have previously switched on the Save Debug Feature (SP5857-001) and selected the hard disk as the save destination (SP5857-002).

1. When the error occurs, on the operation panel, press (Clear Modes).
2. On the control panel, enter “01” then hold down C/ for at least 3 sec. until the machine beeps then release. This saves the debug log to the hard disk for later retrieval with an IC card by the service representatives.
3. Switch the machine off and on to resume operation.

   The debug information for the error is saved on the hard disk so the service representatives can retrieve it on their next visit by copying it from the HDD to an IC card.

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: B135/B138 – 009 **07/07/2004**

APPLICABLE MODEL:

GESTETNER – DSm635/DSm645
LANIER – LD135/LD145
RICOH – AFICIO 2035e/2045e
SAVIN – 4035E/4045E

SUBJECT: SERVICE MANUAL - INSERT

SERVICE MANUAL

The Service Manual page listed below must be replaced with the page supplied.

PAGES:

- Legend Updated Information (Legend)

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LEGEND

PRODUCT CODE	COMPANY			
	GESTETNER	LANIER	RICOH	SAVIN
B135/B182*	DSm635	LD135	Aficio 2035e	4035e
B138/B183*	DSm645	LD145	Aficio 2045e	4045e

* Machines pre-configured with the Printer/Scanner option (B654) will use the B182/B183 product codes.

DOCUMENTATION HISTORY

REV. NO.	DATE	COMMENTS
*	2/2004	Original Printing

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: B135/B138 – 010 **07/15/2003**

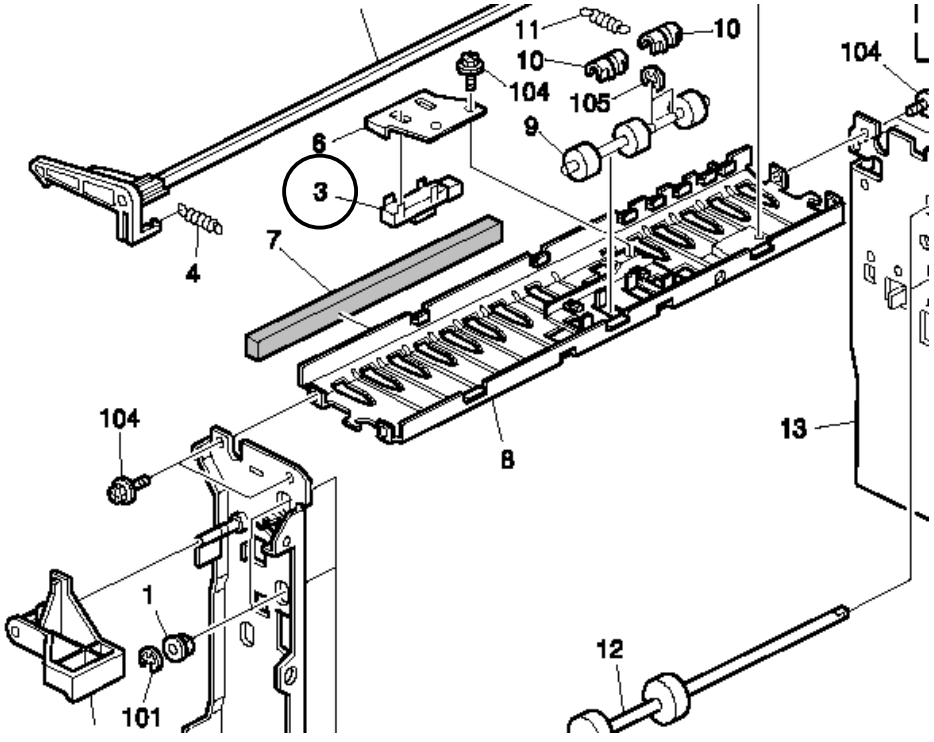
APPLICABLE MODEL:

GESTETNER – DSm635/DSm645
LANIER – LD135/LD145
RICOH – AFICIO 2035e/2045e
SAVIN – 4035E/4045E

SUBJECT: PHOTOSENSOR

GENERAL:

The following part update is being issued for all B135/B138 Parts Catalogs.



				REFERENCE	
OLD PART NO.	NEW PART NO.	DESCRIPTION	QTY	PAGE	ITEM
AW010048	AW010049	Photosensor – GP2A28N1	1	59	3

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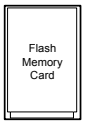
FIRMWARE HISTORY

FIRMWARE HISTORY

PUBLISHED DATE: 05/28/2004

PRODUCT CODE: B135/B138
APPLICABLE MODEL:
GESTETNER – DSm635/DSm645
LANIER – LD135/LD145
RICOH – AFICIO 2035e/2045e
SAVIN – 4035E/4045E



GENERAL:

The latest firmware version can be downloaded at the Technology Solutions Center FTP Site at http://tsc.ricohcorp.com. Be sure to check the README file for important notes and explanations.

Refer to Facts Line Bulletin # FL002 and Publication Bulletin #023 for more information about the FTP Internet Web Site and EPROM/Flash Card Exchange program.

The revised areas have been highlighted by an arrow ⇒.

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1. BICU FIRMWARE:

CARD VERSION	PART NUMBER	CHECK SUM	PRODUCTION DATE
2.09	B1385162A	8959	June 2003 production
2.11	B1385162B	70C0	November 2003 production
2.11a	B1385162C	F00B	January 2004 production
⇒ 2.11b	B1385162D	8016	May 2004 production

1.1 BICU FIRMWARE HISTORY:

SYMPTOM CORRECTED	CARD VERSION
Initial Production Release	2.09
Corrects the following: • Backgrounding (toner oversupply) caused by fluctuating TD sensor output when taking a large number of copies first thing in the morning with Toner Recovery activated. • Vertical white lines appear on copies when the shading plate is dirty. • Significant drop in image quality with FAX and Scanner binary scanning at a sub scan resolution setting of 64-95.9dpi or 96-191.9dpi	2.11
Corrects the following: • Duplex jam with odd-numbered print jobs.	2.11a
⇒ Corrects the following: • In conjunction with the engine modifications for high toner concentration in developer and low-charging offset: 1. The default values fro the following SP modes has been changed for offset (High toner concentration in Developer and Low-charging Offset) as follows: **SP # / Old / New** **2001-01** 1450 1500 **2001-02** 200 250 **2005-03** 1450 1500 **2201-01** 510 560 **2201-02** 380 480 2. The toner agitation time has been increased from 30□90 seconds. **NOTE:** *For the last two corrections listed above, it is also necessary to update the controller firmware to version 2.40 or later.* *Enter SP Mode and manually change the SP Modes listed in the table above to the "New" values. ☛ SM 5-1 for SP Mode Access.* • Staple jam with the SR880.	2.11b

2. LCDC (LCD CONTROLLER) FIRMWARE:

CARD VERSION	PART NUMBER	CHECK SUM	PRODUCTION DATE
3.05	B1385211	977D	1st mass production

2.1 LCDC FIRMWARE HISTORY:

SYMPTOM CORRECTED	CARD VERSION
Initial Production Release	3.05

3. MFP SERVICE CARD FIRMWARE:

CARD VERSION	PART NUMBER	CHECK SUM	PRODUCTION DATE
1.00	B6545935	C7E1	July 2003 production
1.01	B6545935A	3044	October 2003 production
1.02	B6545935B	3643	December 2003 production
⇒ 1.03	B6545935C	EF40	February 2004 production

3.1 MFP SERVICE CARD CONTENTS:

Card Version	FIRMWARE PART NUMBER/VERSION					
	PRINTER		SCANNER		NRS	
	Version	Part Number	Version	Part Number	Version	Part Number
1.00	1.00	B6545931	1.07	B6545932	2.36	B5775384
1.01	1.00	B6545931	2.00	B6545932A	2.37	B5775384A
1.02	1.01	B6545931A	2.01	B6545932B	2.38	B5775384B
⇒ 1.03	1.02	B6545931B	2.02	B6545932C	2.39	B5775384C

3.2 PRINTER FIRMWARE HISTORY:

SYMPTOM CORRECTED	FIRMWARE VERSION
Initial Production Release	1.00
Corrects the following: • Minor changes applied to improve reliability.	1.00
Corrects the following: • When releasing a secure/locked print job with the ID code, an error message appears and it is not possible to print the job. • The form overlay and the text in a PCL job are printed separately. • Overlay printing problem, vector lines are shifted slightly to the side (PCL 5c 1.4.0.0). • Font size settings will be wrong when printing a multi-page document in PCL format. • Cell shading specified using "pattern" settings is not printed using Excel (For Win2K or WinXP).	1.01
⇒ Corrects the following: • Minor changes applied to improve reliability.	1.02

3.3 SCANNER FIRMWARE HISTORY:

SYMPTOM CORRECTED	FIRMWARE VERSION
Initial Production Release	1.07
Corrects the following: • Minor changes applied to improve reliability.	2.00
Corrects the following: • When a blank fax number is input for an advanced search using the LDAP search function, information for the previous user will be displayed instead. • SP1007 "Store Priority" doesn't work.	2.01
⇒ Corrects the following: • VRAM memory-full error after multiple Scanner transmission jobs. • Network PC stations registered under a given workgroup are not displayed when the workgroup name consists only of numerical characters (SMB transmission Network screen).	2.02

3.4 NRS FIRMWARE HISTORY:

SYMPTOM CORRECTED	FIRMWARE VERSION
Initial Production Release	2.36
Corrects the following: • Minor changes applied to improve reliability.	2.37
Corrects the following: • Minor changes applied to improve reliability.	2.38
⇒ Corrects the following: • Minor changes applied to improve reliability.	2.39

4. NET SERVICE CARD FIRMWARE:

CARD VERSION	PART NUMBER	CHECK SUM	PRODUCTION DATE
2.36	B6545936A	CFA3	July 2003 production
⇒ 2.38	B6545936B	BB4F	December 2003 production

4.1 NET SERVICE CARD CONTENTS:

Card Version	FIRMWARE PART NUMBER/VERSION					
	NCS		NFA		WebSys	
	Version	Part Number	Version	Part Number	Version	Part Number
2.36	4.05	B1385933B	2.01	B1385934A	1.01	B1355935A
⇒ 2.38	4.12	B1385933C	2.01	B1385934A	1.03	B1385935C

4.2 NCS (NIB) FIRMWARE HISTORY:

SYMPTOM CORRECTED	FIRMWARE VERSION
Initial Production Release	4.05
⇒ Corrects the following: • The SC990 error occurring under the following conditions has been fixed: 1) Stored IP address is enabled via telnet (msh> dhcp save ether on) 2) An IP address conflict occurs 3) The network interface type is changed from Ethernet to Wireless(IEEE 802.11b) **NOTE**: These conditions must occur in the order that they appear here. • Fixed: Slow USB2.0 printing.	4.12

4.3 NFA (NETFILE) FIRMWARE HISTORY:

SYMPTOM CORRECTED	FIRMWARE VERSION
Initial Production Release	2.01

4.4 WebSys FIRMWARE HISTORY:

SYMPTOM CORRECTED	FIRMWARE VERSION
Initial Production Release	1.01
Corrects the following: • A Javascript error occurred when opening Web Image Monitor with NetScape 4.7.x. (This did not affect Web Image Monitor functions). • Some hint popups, were displayed in English even if another language had been selected. • When adding a user to the address book using the Korean language setting of Web Image Monitor, an error occurred if a specific setting was chosen for "2nd Line" in "Label Insertion".	1.03

5. CONTROLLER FIRMWARE:

CARD VERSION	PART NUMBER	CHECK SUM	PRODUCTION DATE
2.36.2	B1385931B	8299/BAC9	August 2003 production
2.36.2.1	B1385931C	9399/D2C2	September 2003 production
2.37.1	B1385931D	7594/4B65	October 2003 production
2.38	B1385931E	A93D/855D	December 2003 production
⇒ 2.39	B1385931F	1225/9E69	Feburary 2004 production
2.40	B1385931G	E4AF/048E	May 2004 production

NOTE: *The firmware will be released as two BIN files.*
- Therefore, first insert IC card #1 into the machine slot and initiate the download.
- When this download is successfully completed, the machine will prompt the operator for card #2 to be inserted.
- Please turn the main power off, replace IC card #1 with #2, then turn the main power back on and continue the download.

5.1 CONTROLLER FIRMWARE HISTORY:

SYMPTOM CORRECTED	CARD VERSION
Initial Production Release	2.36.2
Corrects the following: • The date on the following reports is printed out garbled on the China, Taiwan, and Korea models: - SP5-990-*** - Counter sheet - Counter table arranged by user code - Address list - Scanner transmission log	2.36.2.1

SYMPTOM CORRECTED	CARD VERSION
Corrects the following: • After backing up the current user information to an IC card by SP5846-51 and restoring Address management information by SP5846-52, the value of some parameters might be changed. • SC955 might occur when attempting to print out a Document Server file from the HDD using the Booklet function without "do not print blank pages" (This is the default setting). • The LADP search engine might ignore a search attribute such as "cn", "ou" or "mail" stored in SP5846-70/SP5846-71. • SC870 might occur when SDM for Admin's address management tool is accessed. The steps for reproduction are: All directory information is initialized by SP5846-50. Turn the machine's main power switch On/Off. This can occur when any user information is referred to by SDM for Admin. • Scan to Folder: Shared folders located on a PC that has more than one Network Board with an IP address might not be browsed. • Modified to support Bluetooth Card version 3, as version 2 has been discontinued. New Bluetooth Option: G354-06/EDP402062, Bluetooth Interface Unit Type C. New Bluetooth Card and I/F Board Supported from version 2.37. How to distinguish between version 2 and 3: If the number in the top-left of the backside of the Bluetooth Card ends with a 'B', you are using version 3. E.g. 3CRWB6096B. • The system might stall with the message "Now Connecting" when the following is accessed: LDAP server register/change → Connecting test	2.37.1
Corrects the following: • The system might stall with the message "Now Connecting" when the following is accessed: LDAP server register/change → Connecting test	2.38
⇒ Corrects the following: • Network PC stations registered under a given workgroup are not displayed when the workgroup name consists only of numerical characters (SMB transmission Network screen). • Unable to send with Scan-to-Folder to an SMB-connected Win98 PC with shared security settings enabled when all of the following conditions are satisfied: - The destination folder is selected from a registered entry in the Address Book. - A New Password has been set but the User Name has not in the Address Book Mgmt→New Program→Folder screen. - Neither the SMB Default User Name nor Default Password has been set in the File Transfer→Default Username/Password (Send) screen.	2.39

<table>
<tr><th>SYMPTOM CORRECTED</th><th>CARD VERSION</th></tr>
<tr><td>⇒ Corrects the following:
• In conjunction with the engine modifications for high toner concentration in developer and low-charging offset:
1. The default values fro the following SP modes has been changed for offset (High toner concentration in Developer and Low-charging Offset) as follows:
<table><tr><th>SP #</th><th>Old</th><th>New</th></tr><tr><td>2001-01</td><td>1450</td><td>1500</td></tr><tr><td>2001-02</td><td>200</td><td>250</td></tr><tr><td>2005-03</td><td>1450</td><td>1500</td></tr><tr><td>2201-01</td><td>510</td><td>560</td></tr><tr><td>2201-02</td><td>380</td><td>480</td></tr></table>2. The toner agitation time has been increased from 30□90 seconds.
NOTE: For the two corrections listed above, it is also necessary to update the BICU firmware to version 2.11b or later.
Enter SP Mode and manually change the SP Modes listed in the table above to the “New” values. ☛ SM 5-1 for SP Mode Access.
• Correct the naming for SP7504.
• Controller stalls if receiving a FAX Tx/Rx request while switching over to Sleep Mode.</td><td>2.40</td></tr>
</table>

6. FAX SERVICE CARD FIRMWARE:

CARD VERSION	PART NUMBER	CHECK SUM	PRODUCTION DATE
1.00	B6545933	DD59	July 2003 production
1.01	B6545933A	B943	August 2003 production
1.02	B6545933B	5B60	October 2003 production
1.03	B6545933C	F6D3	December 2003 production
⇒ 1.04	B6545933D	E10A	February 2004 production

6.1 FAX SERVICE CARD CONTENTS:

Card Version	FIRMWARE PART NUMBER/VERSION					
	Fax Application		FCU		WEBDOCBOX	
	Version	Part Number	Version	Part Number	Version	Part Number
1.00	1.01	B1385932A	3.01	B1345770A	1.05	B1385936A
1.01	1.01	B1385932A	4.00	B1345770B	1.05	B1385936A
1.02	2.00	B1385932B	5.00	B1345770C	1.05	B1385936A
1.03	3.01	B1385932C	6.01	B1345770D	1.05	B1385936A
⇒ 1.04	3.01	B1385932C	7.00	B1345770E	1.05	B1385936A

6.2 FAX APPLICATION FIRMWARE HISTORY:

SYMPTOM CORRECTED	FIRMWARE VERSION
Initial Production Release	1.01
Corrects the following: • Destination lists are printed out garbled on China, Taiwan and Korea models.	2.00
Corrects the following: • Minor changes applied to improve reliability.	3.01

6.3 FCU FIRMWARE HISTORY:

SYMPTOM CORRECTED	FIRMWARE VERSION
Initial Production Release	3.01
Corrects the following: • Modified for acquisition of FAX communication standards certification (Korea).	4.00
Corrects the following: • Minor changes applied to improve reliability.	5.00
Corrects the following: • Minor changes applied to improve reliability.	6.01
⇒ Corrects the following: • Communication error sometimes occurs when receiving a PC Fax from a non-Ricoh machine. • The setting of User Parameter SW05 bit 0 has no effect, allowing the machine to try and receive incoming transmissions while in an SC condition. • Unable to disable the reception complete beep using “Adjust Sound Volume.”	7.00

6.4 WEBDOCBOX FIRMWARE HISTORY:

SYMPTOM CORRECTED	FIRMWARE VERSION
Initial Production Release	1.05

7. LANGUAGE KIT CARD:

Language 1

CARD VERSION	PART NUMBER	CHECK SUM	PRODUCTION DATE
3.19	B1385220	CB2E	1st mass production

Language 2

CARD VERSION	PART NUMBER	CHECK SUM	PRODUCTION DATE
3.16	B1385221	972C	1st mass production
3.17	B1385221A	FF9B	December 2003 production

Using the Language Kit.
1. Insert the IC card containing the firmware into the controller IC card slot.
2. Turn ON the main power. Then, chose either the First or Second display language for the update.

   It is also possible to write to both the First and Second languages.
3. Start the update.
4. Select the appropriate display language in User Tools.

As shown in the table below, there are some cases where certain languages cannot be displayed, depending on the type of operation panel software:

Possible Display Languages for Operation Panel Software

Key:
✓: Can be displayed.
∆: Can be displayed, but printer application window is not displayed correctly.
--: Cannot be displayed.

B1385220: Language1

LCDC Software: / ***Language:***	B1385211 (NA)	B1385212 □EU□	B1385213 □Asia/TWN□	B1385214 (China)	B1385215 (Korea)
English-NA	✓	✓	✓	✓	✓
English-UK	✓	✓	✓	✓	✓
French	✓	✓	✓	✓	✓
German	✓	✓	✓	✓	✓
Italian	✓	✓	✓	✓	✓
Spanish	✓	✓	✓	✓	✓
Dutch	✓	✓	✓	✓	✓
Norwegian	✓	✓	✓	✓	✓
Danish	✓	✓	✓	✓	✓
Swedish	✓	✓	✓	✓	✓
Portuguese	✓	✓	✓	✓	✓
Czech	✓	✓	✓	✓	✓

B1385221: Language2

LCDC Software: / Language:	B1385211 (NA)	B1385212 □EU□	B1385213 □Asia/TWN□	B1385214 (China)	B1385215 (Korea)
Japanese	✔	✓	--	--	--
English-NA	✔	✓	✓	✓	✓
English-UK	✔	✓	✓	✓	✓
French	✔	✓	✓	✓	✓
German	✔	✓	✓	✓	✓
Italian	✔	✓	✓	✓	✓
Spanish	✔	✓	✓	✓	✓
Polish	✔	✓	✓	✓	✓
Hungarian	✔	✓	✓	✓	✓
Finnish	✔	✓	✓	✓	✓
Russian	✔	✓	✓	✓	✓

7.1 B1385220 FIRMWARE HISTORY:

SYMPTOM CORRECTED	FIRMWARE VERSION
Initial Production Release	3.19

7.2 B1385221 FIRMWARE HISTORY:

SYMPTOM CORRECTED	FIRMWARE VERSION
Initial Production Release	3.16
Corrects the following: • Minor changes applied to improve reliability.	3.17