MODEL U-C1
(Machine Code: B051/B052)
SERVICE MANUAL

⚠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. 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.
4. If a job has started before the copier completes the warm-up or initializing period, keep hands away from the mechanical and electrical components because the starts making copies as soon as the warm-up period is completed.
5. The inside and the metal parts of the fusing unit become extremely hot while the copier is operating. Be careful to avoid touching those components with your bare hands.

HEALTH SAFETY CONDITIONS

Toner is non-toxic, but if you get it 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 Controller board has a lithium battery which can explode if replaced incorrectly. Replace the NVRAM only with an identical one. Do not recharge or burn this battery. Used NVRAM must be handled in accordance with local regulations.
3. The danger of explosion exists if batteries on the FCU, MBU and JBIG are incorrectly replaced. Replace only with the same or an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions.

SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

1. Do not incinerate toner bottles or used toner. Toner dust may ignite suddenly when exposed to an open flame.
2. Dispose of used toner, the maintenance unit which includes developer or the organic photoconductor in accordance with local regulations. (These are non-toxic supplies.)
3. Dispose of replaced parts in accordance with local regulations.
   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 Optics Housing Unit section. Laser beams can seriously damage your eyes.

CAUTION MARKING:

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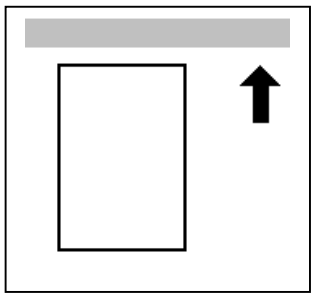
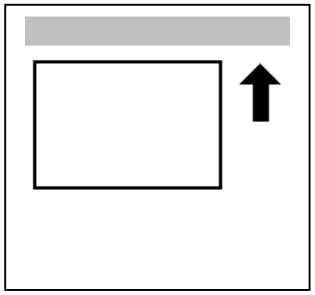
Conventions in this Manual

This manual uses several symbols.

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



Lengthwise, SEF (Short Edge Feed)



Sideways, LEF (Long Edge Feed)

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PERIPHERALS

PAPER TRAY UNIT (B456)

LCT (B457)

BY-PASS TRAY UNIT (B490)

DUPLEX UNIT (B509)

BRIDGE UNIT (B482)

500-SHEET FINISHER (B458)

SPECIFICATIONS

1. INSTALLATION

1.1 INSTALLATION REQUIREMENTS

1.1.1 ENVIRONMENT

1. Temperature Range: 10°C to 32°C (50°F to 89.6°F) (humidity to be 54% at 32°C, 89.6°F)
2. Humidity Range: 15% to 80% Rh (temperature to be 27°C, 80.6°F at 80%)
3. Ambient Illumination: Less than 1,500 lux (keep the machine out of direct sunlight.)
4. Ventilation: Air turnover of more than 30 m^3/hr/person or more
5. Ambient Dust: Less than 0.10 mg/m^3 (2.7 x 10^{-6} oz/yd^3)
6. Avoid exposing the machine to sudden temperature changes, which include:
   1) Direct cool air from an air conditioner
   2) Direct heat from a heater
7. Avoid installing the machine in areas that may be exposed to corrosive gas.
8. Install the machine at a location lower than 2,000 m (6,500 ft.) above sea level.
9. Install the machine on a strong, level base.
10. Avoid installing the machine in areas that may be subjected to strong vibration.

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

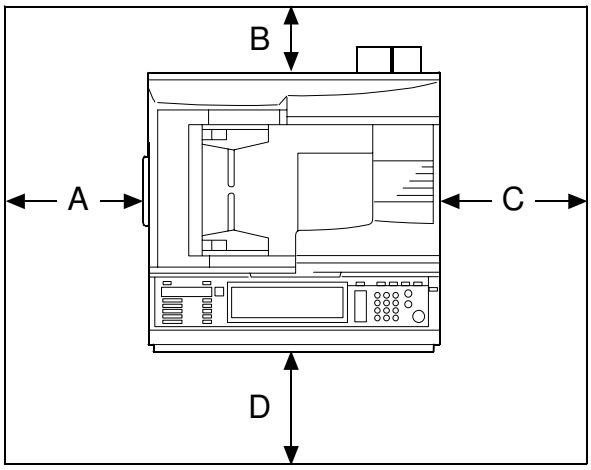
1.1.3 POWER REQUIREMENTS

⚠CAUTION

1. **Insert the plug firmly in the outlet.**
2. **Avoid using an outlet extension plug or cord.**
3. **Ground the machine.**

1. Input voltage level: 120 V, 60 Hz, More than 12 A
   220 ~ 240 V, 50/60 Hz, More than 8 A
   110 V, 50/60 Hz, More than 13A
2. Permissible voltage fluctuation: ±10%
3. Do not put or place anything on the power cord.

1.1.4 SPACE REQUIREMENTS



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A: Over 100 mm (4")
B: Over 100 mm (4")
C: Over 550 mm (22")
D: Over 750 mm (29.6")

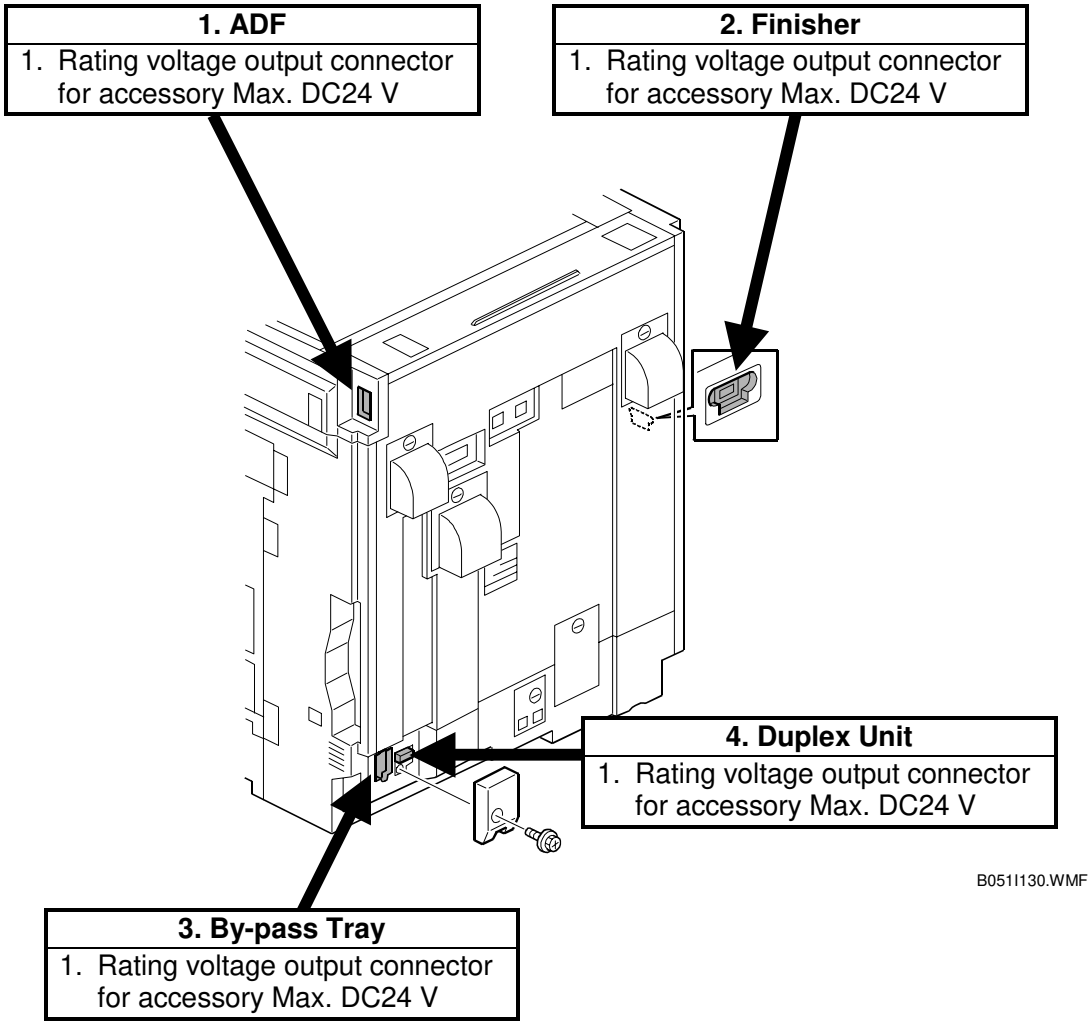
1.2 COPIER (B051/B052)

1.2.1 POWER SOCKETS FOR PERIPHERALS

⚠CAUTION

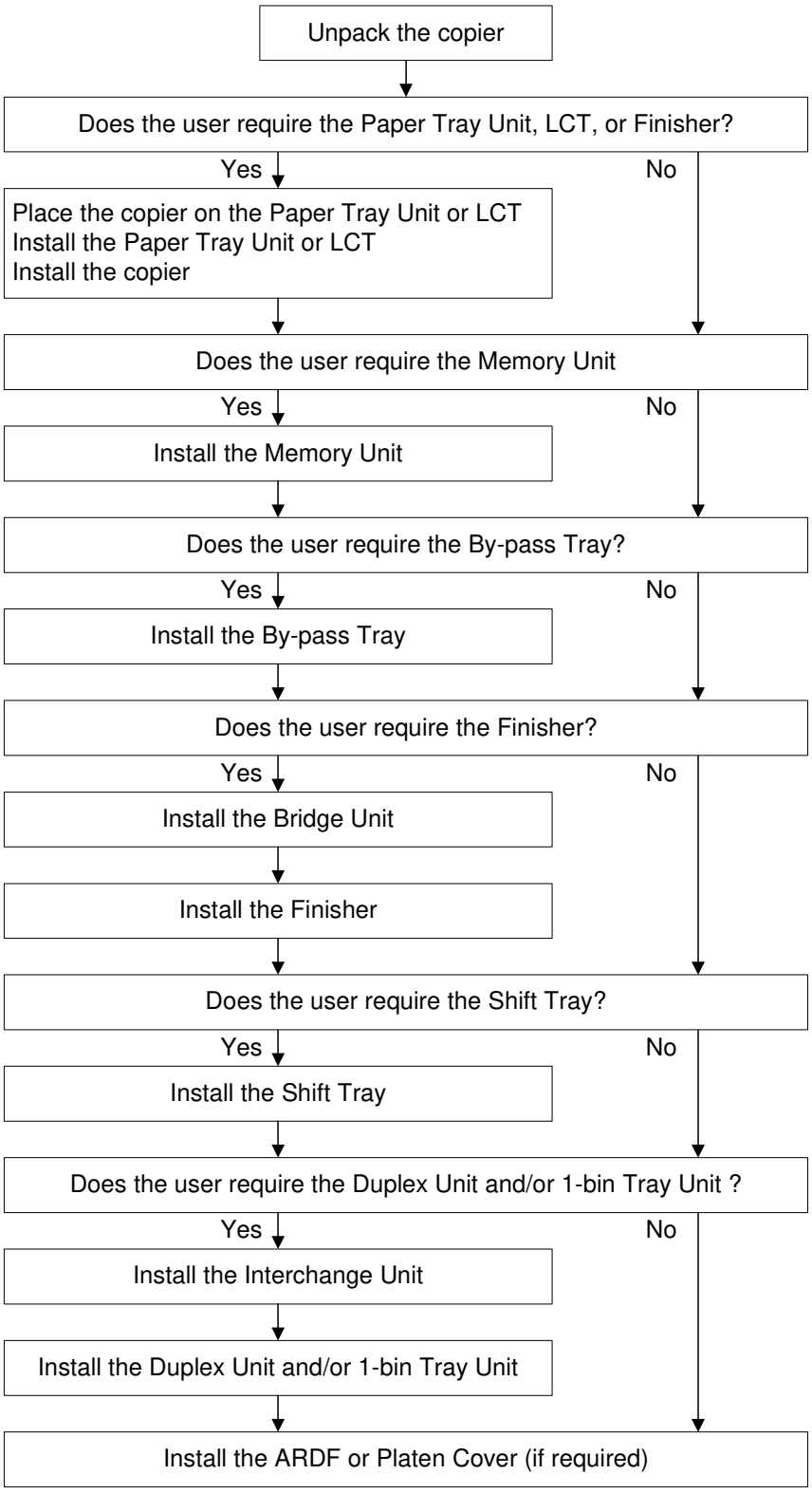
Rating voltage for peripherals.

Make sure to plug the cables into the correct sockets.



1.2.2 INSTALLATION FLOW CHART

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



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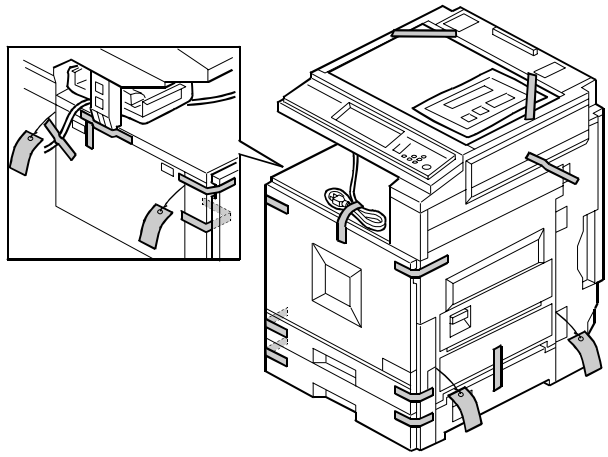
1.2.3 ACCESSORY CHECK

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

No.	Description	Q'ty
1	Paper Tray Decal	1
2	Model Name Decal	1
3	NECR	1
4	Factory Data Sheet	1
5	Filter Duct	3
6	Filter	3
7	Caution Decal – Power/Paper	1
8	Decal – Copy prohibition	1
9	Manual Holder	1
10	Operating Instructions – System Setting	1
11	Operating Instructions – Copy Reference	1

1.2.4 INSTALLATION PROCEDURE



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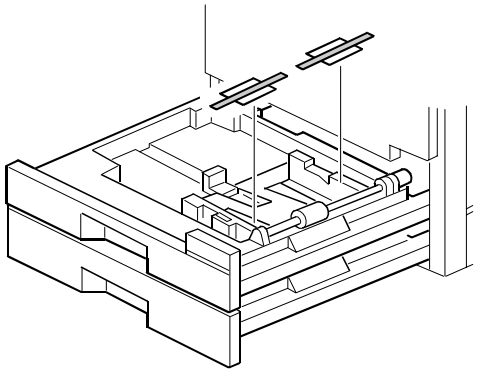

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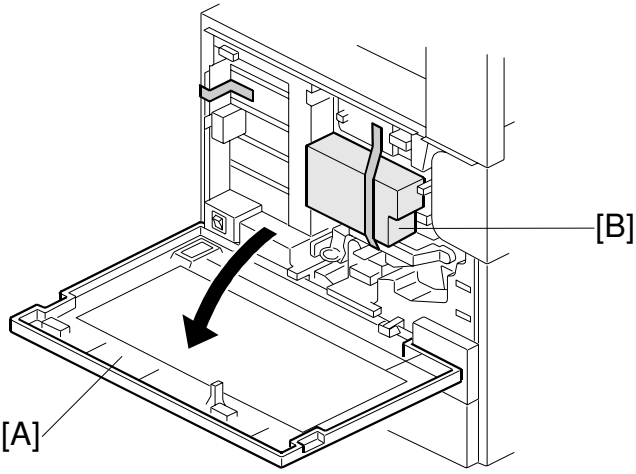

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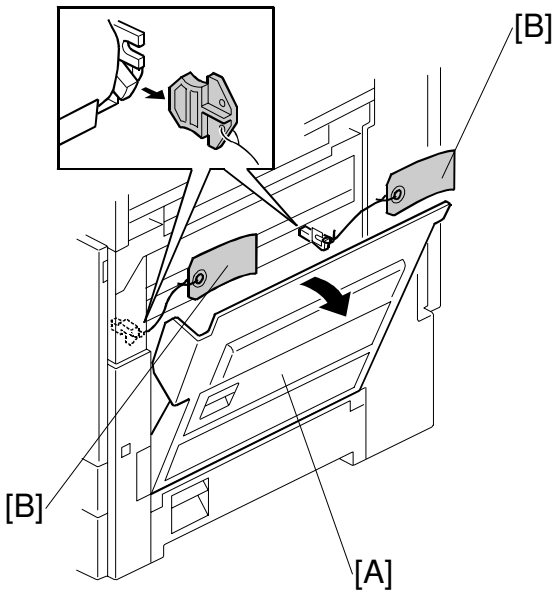
⚠CAUTION

Unplug the machine power cord before starting the following procedure.

If the optional paper tray or the optional LCT will be installed at the same time, place the copier on the paper tray unit or the LCT first, then install the copier and the other options.

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

1. Remove the tapes.
2. Open the front cover [A] and remove the shipping retainer [B].



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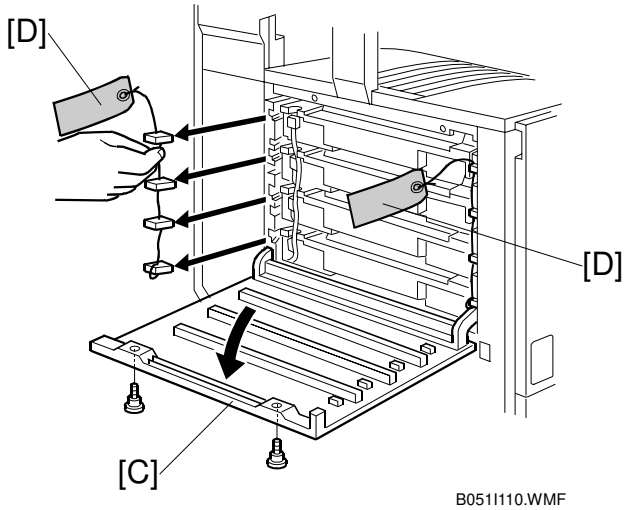

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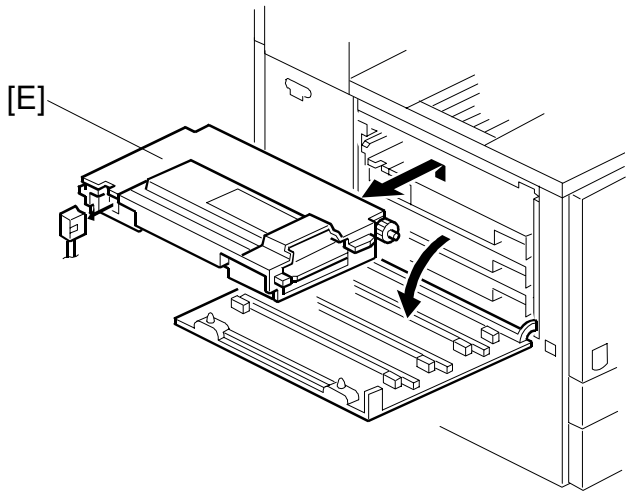

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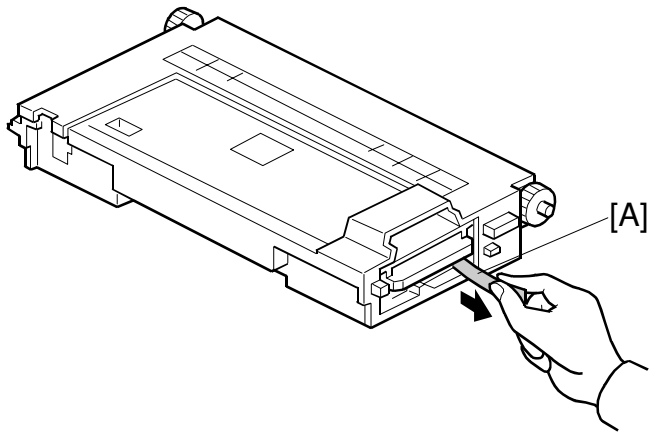
3. Open the right cover [A], and remove the red tags [B].
4. Open the left cover [C] (x 2), and remove the red tags [D].
5. Pull out all development units [E] (x 1 each).



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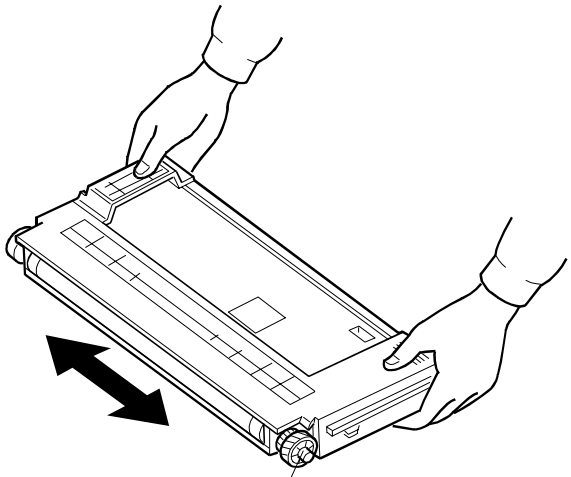
6. Peel off the toner cartridge seal [A].
7. Reinstall the toner cartridge in the development unit.



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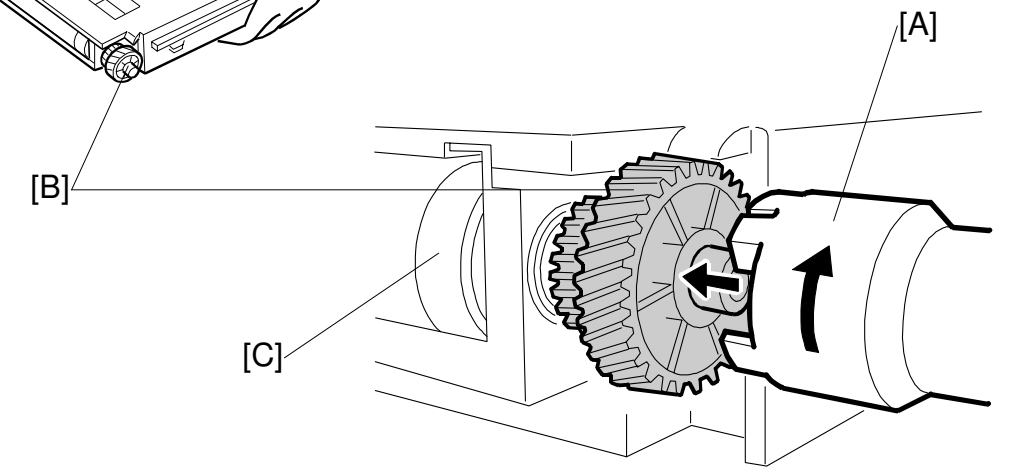

Rear view

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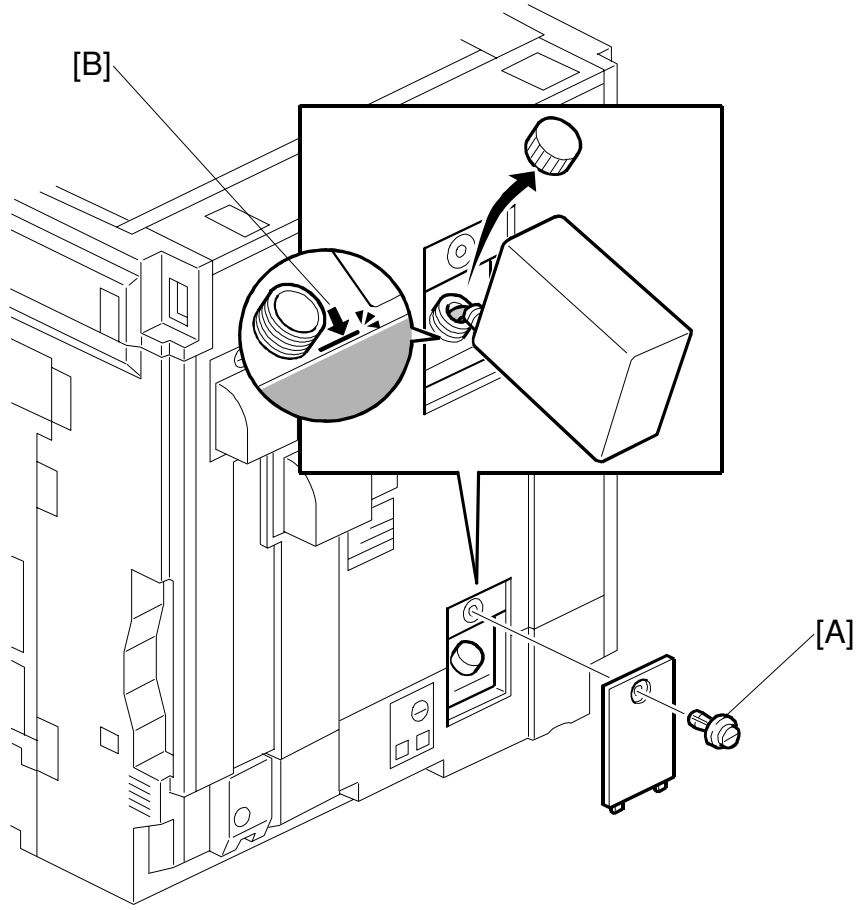
8. Keep the development unit level and shake the development unit about 10 times from side to side.
   NOTE: 1) Do not touch the development roller or the development roller gear.
   2) Use caution not to drop the cartridge or to damage it.
   3) If the cartridge has not been shaken well, the machine takes a longer time to initialize the development unit, or an error message or SC350 is displayed. When either of them is displayed, turn the main switch off and on.
9. Engage the special tool [A] (distributed with the machine) with the development roller gear at the rear [B].
10. Turn the tool clockwise (approximately 5 times) until the toner covers the whole area of the development roller [C].
    NOTE: If the toner does not cover the whole area of the development roller, redo step 8 to 10.



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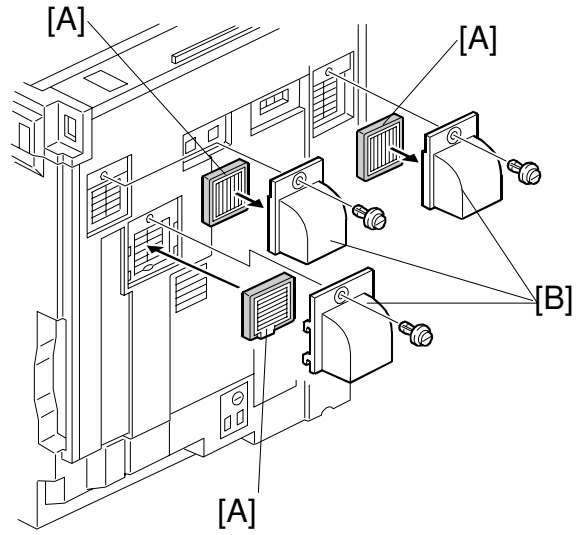
11. Reinstall the development units, and close the left cover.
    NOTE: A white line or band may appear on one end of the paper if a development is incorrectly installed. To correct this, pull out the development unit partially (about 30 mm) and slowly reinstall it.
12. Remove the oil tank cover [A] (1 clip), and fill the oil tank to the maximum line.
    NOTE: Do not fill the oil tank past the arrow [B].



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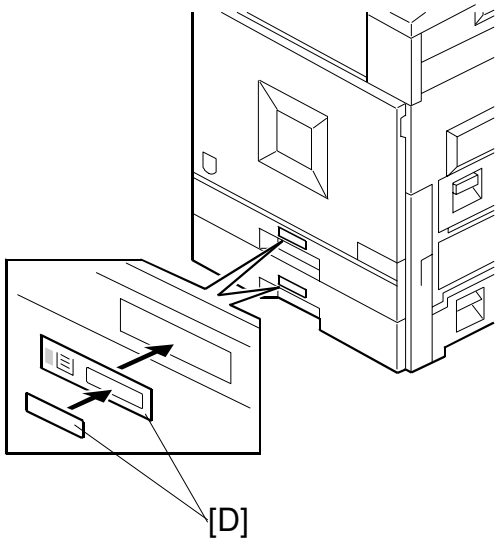

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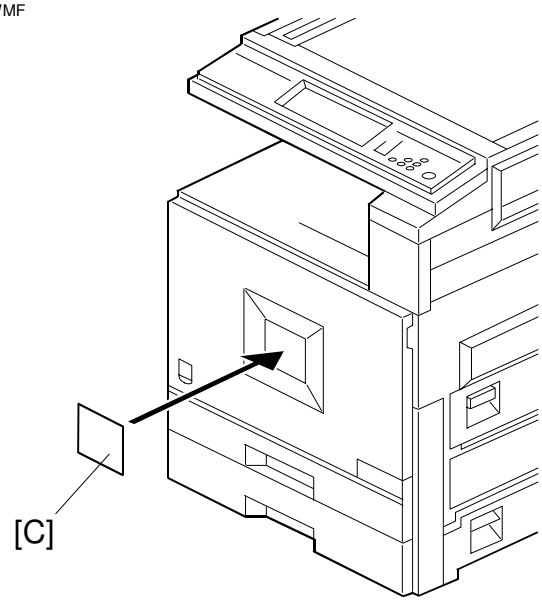

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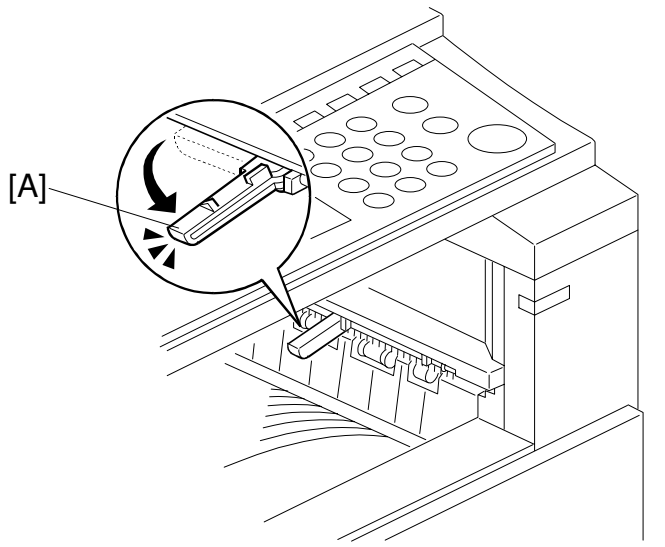
13. Install the filters [A] and ducts [B] as shown.
14. Attach the appropriate model name decal [C] to the front cover.
15. Pull the paper tray out, and adjust the side guides and end guide to match the paper size.
    NOTE: To move the side guides, first pull out the tray fully, then push down the green lock at the rear inside the tray.
16. Attach the appropriate paper tray number decals [D] to the paper trays.
    NOTE: Paper tray number decals are also used for the optional paper tray or the optional LCT. Keep any remaining decals for use with these optional units.



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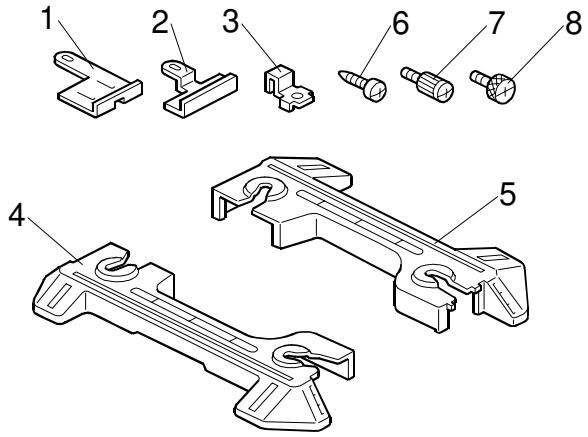
17. **If the optional bridge unit will not be installed:** Swing the sensor feeler [A] out.
18. Install the optional ARDF or the optional platen cover (see ARDF Installation or Platen Cover Installation).
19. Plug in the machine and turn the main power switch on. The machine automatically performs the initialization procedure. After this has finished, the Start button LED turns green.
20. Make copies of image samples (text, photo, and text/photo modes).
21. Perform Automatic Color Calibration (ACC).
    NOTE: Since this machine has been subject to color adjustment using Automatic Color Calibration (ACC) at the factory, there is no need to make automatic color calibration again if the customer is satisfied with the image sample. If the customer is not satisfied, do the following.
    1) Print the ACC test pattern (UP mode – Maintenance – ACC – Start).
    2) Place the printout on the exposure glass.
    3) Place 10 sheets of white paper on top of the test chart. Then, close the ADF or platen cover.
    4) Press “Start Scanning” on the LCD panel. The machine performs the ACC.
22. Make sure that the sample image has been copied normally.
23. After installing the machine and all options, and making all test copies, initialize the total counter (SP 7-825) if required by the service contract.

1.3 PAPER TRAY UNIT (B456)

1.3.1 ACCESSORY CHECK

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

No.	Description	Q'ty
1	Right Stand Bracket	1
2	Left Stand Bracket	1
3	Securing Bracket	2
4	Front Stand	1
5	Rear Stand	1
6	Screw - M4x10	4
7	Knob Screw	2
8	Stepped Screw	2



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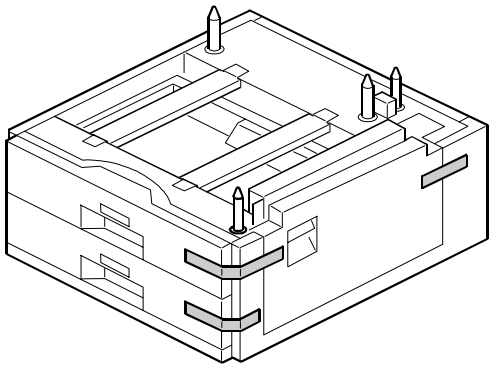
1.3.2 INSTALLATION PROCEDURE



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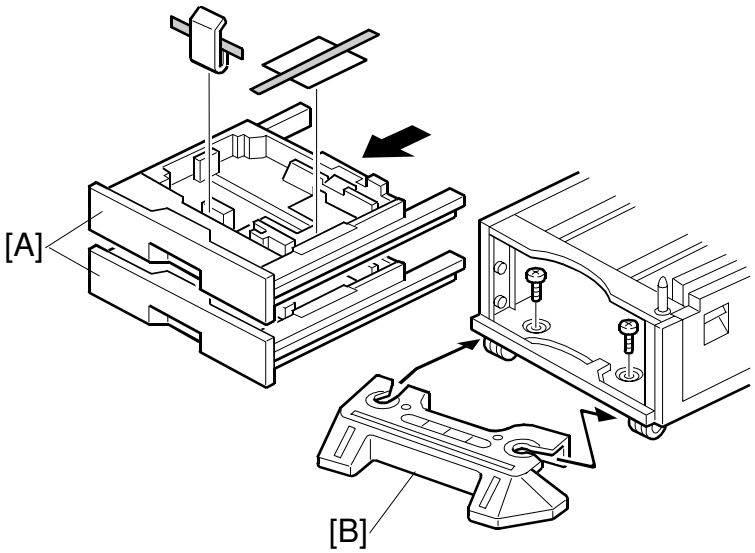
⚠CAUTION

Unplug the machine power cord before starting the following procedure.

1. Remove the strips of tape.



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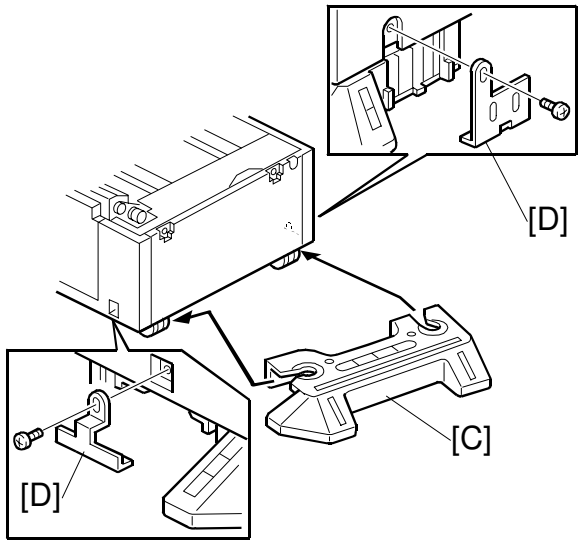

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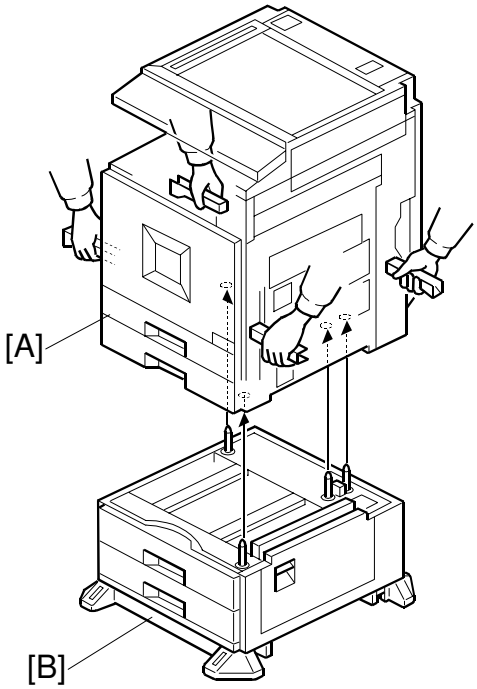
2. Remove the paper trays [A] from the paper tray unit and remove the shipping retainers.
3. Install the front stand [B] (☞ x 2).
4. Install the rear stand [C].
5. Attach two stand brackets [D] (☞ x 1 each).



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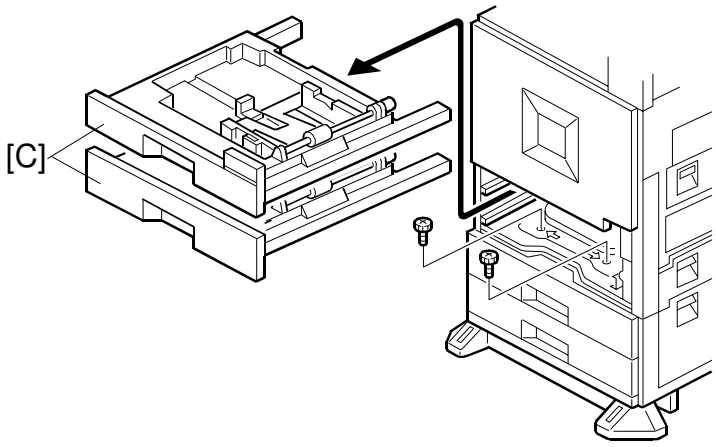

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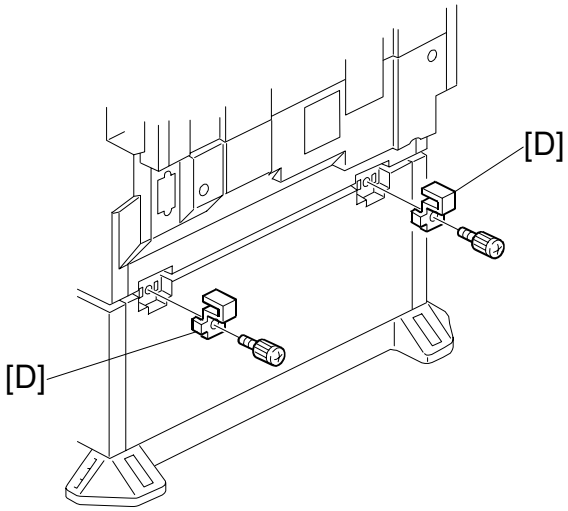

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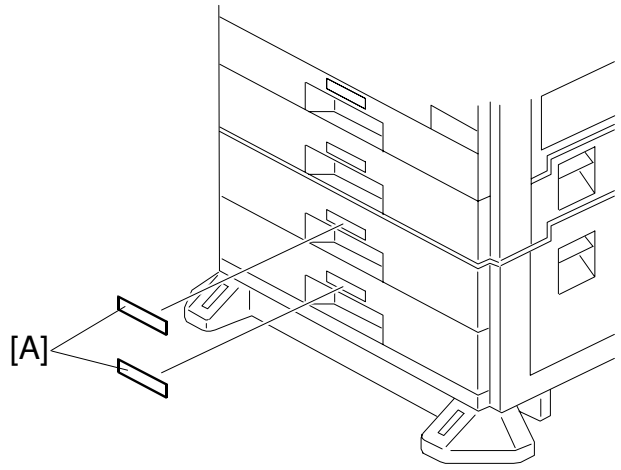
6. Set the copier [A] on the paper tray unit [B].
7. Remove the paper trays [C] from the copier and secure the paper tray unit (x 2).
8. Attach a securing bracket [D] to each side of the paper tray unit (x 1 each).



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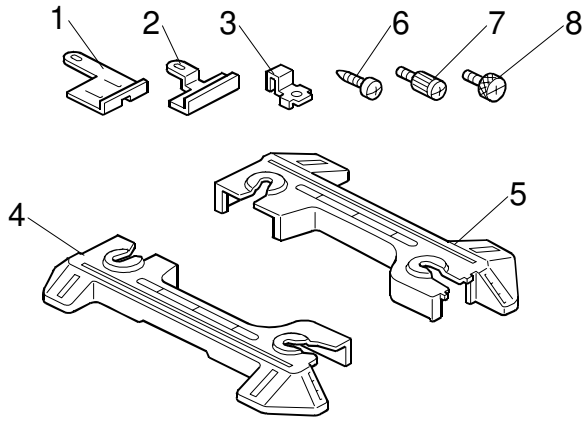
9. Reinstall the paper trays and attach the appropriate paper tray number decal [A] to the paper tray.
   NOTE: The paper tray number decal is in the accessory box for the main copier.
10. Load paper into the paper trays.
11. Turn on the main switch.
12. Check the machine's operation and copy quality.

1.4 LCT (B457)

1.4.1 ACCESSORY CHECK

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

No.	Description	Q'ty
1	Right Stand Bracket	1
2	Left Stand Bracket	1
3	Securing Bracket	2
4	Front Stand	1
5	Rear Stand	1
6	Screw - M4x10	4
7	Knob Screw	2
8	Stepped Screw	2



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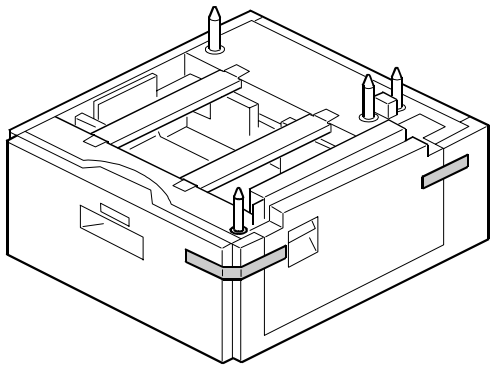
1.4.2 INSTALLATION PROCEDURE



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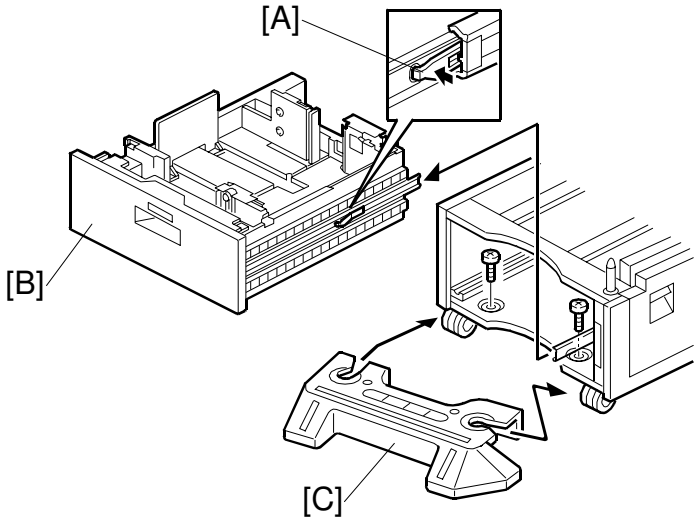
⚠CAUTION

Unplug the machine power cord before starting the following procedure.

1. Remove the strips of tape.



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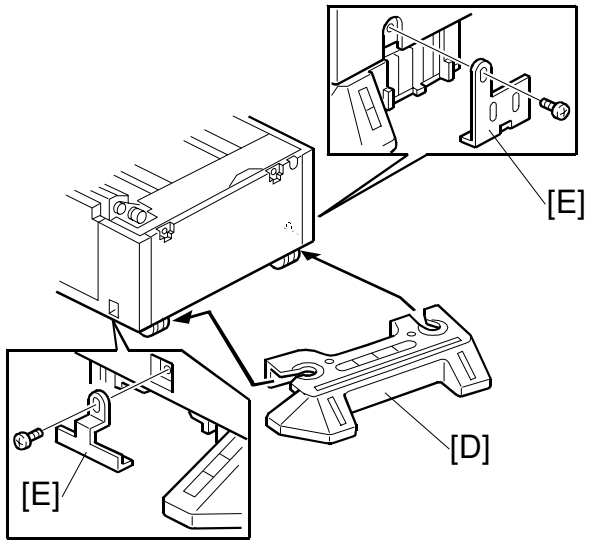

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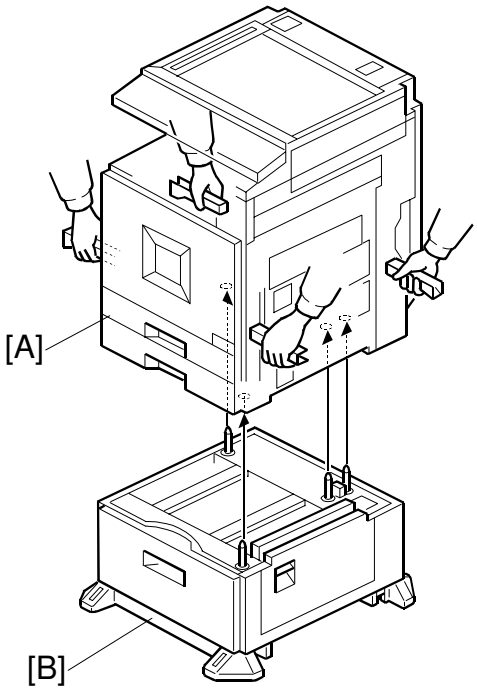
2. While pressing the stopper [A] attached to the guide rail, pull out the large capacity tray [B].
3. Install the front stand [C] (x 2).
4. Install the rear stand [D].
5. Attach two stand brackets [E] (x 1 each).



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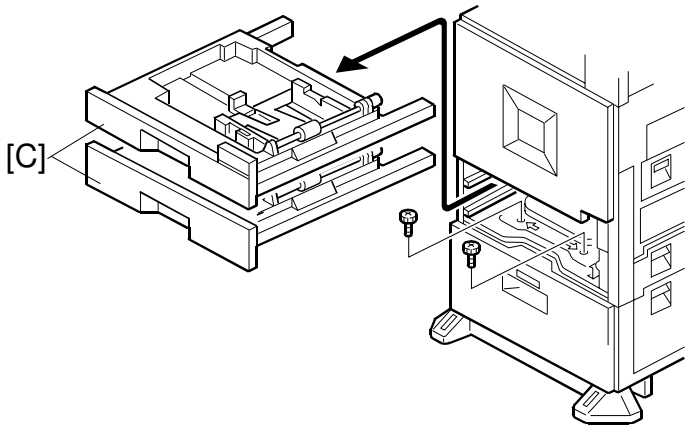
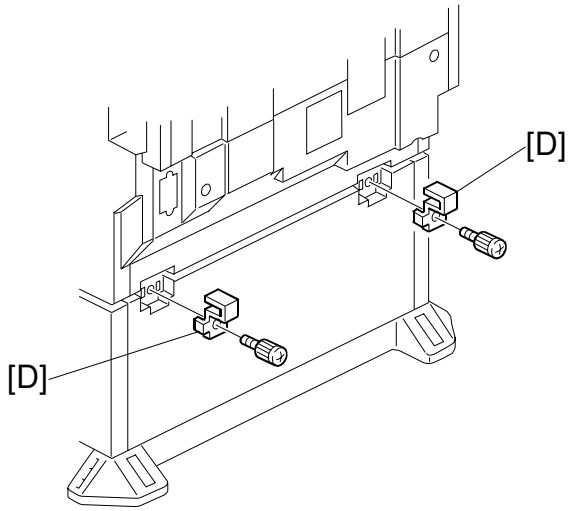
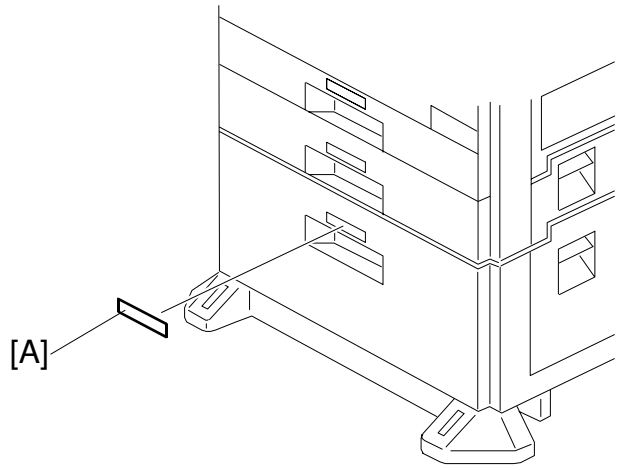


B457I006.WMF



B457I156.WMF

6. Set the copier [A] on the LCT [B].
7. Remove the paper trays [C] from the copier and secure the LCT (x 2).
8. Attach a securing bracket [D] to each side of the LCT (x 1 each).



B457I005.WMF

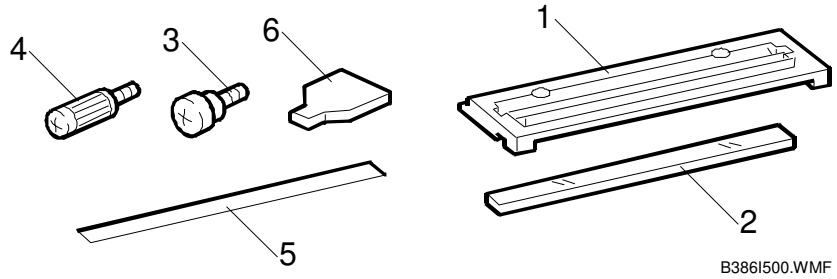
9. Reinstall the paper trays and attach the appropriate paper tray number decal [A] to the LCT.
   NOTE: The paper tray number decal is in the accessory box for the main copier.
10. Load paper into the LCT.
11. Turn on the main switch.
12. Check the machine's operation and copy quality.

1.5 AUTO REVERSE DOCUMENT FEEDER (B386)

1.5.1 ACCESSORY CHECK

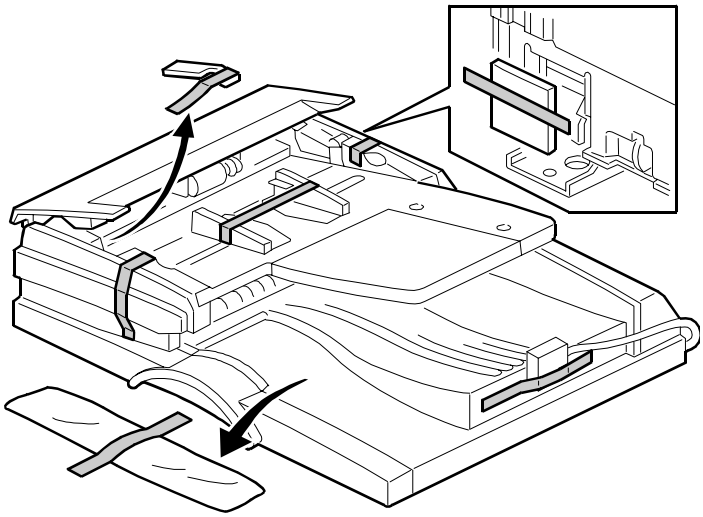
Check the quantity and condition of the accessories against the following list.

No.	Description	Q'ty
1	Scale Guide	1
2	DF Exposure Glass	1
3	Stud Screw	2
4	Knob Screw	2
5	Original Size Decal	2
6	Screwdriver Tool	1



B386I500.WMF

1.5.2 INSTALLATION PROCEDURE

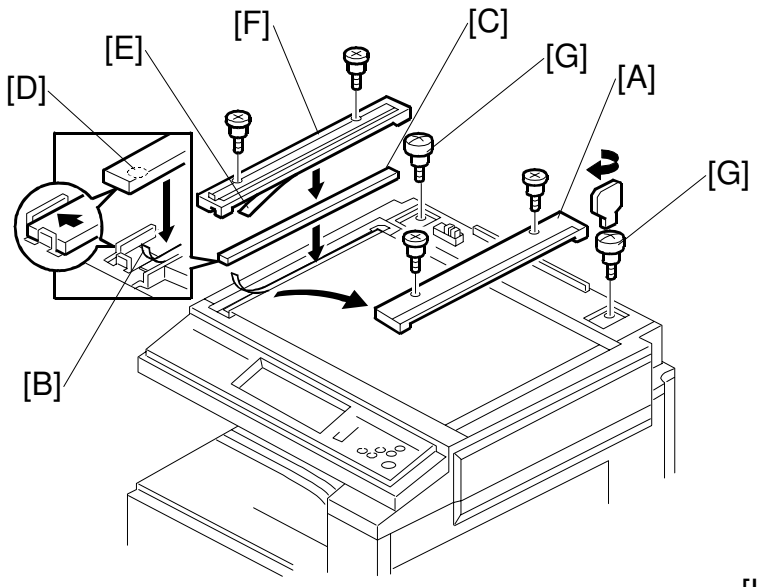


B386I101.WMF

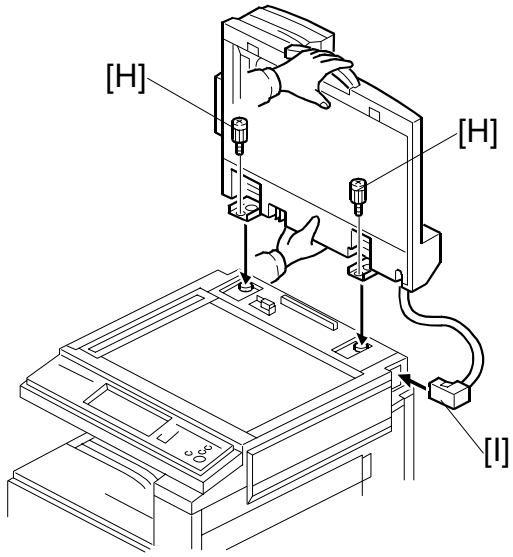
⚠CAUTION

Unplug the copier power cord before starting the following procedure.

1. Remove the strips of tape.

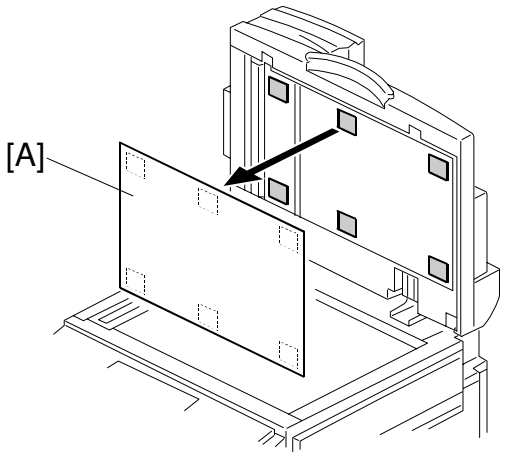


B386I107.WMF

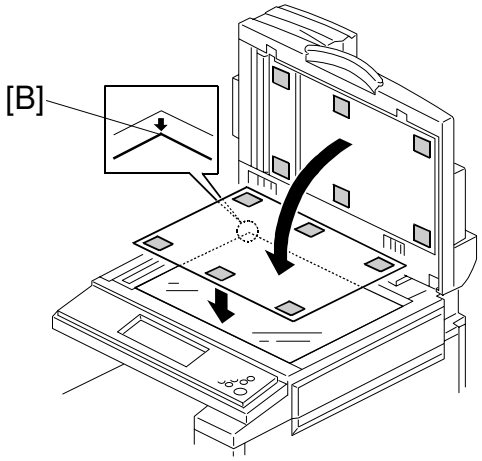


B386I108.WMF

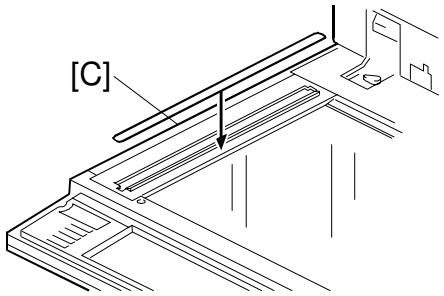
2. Remove the left scale [A] (☞ x 2).
3. Peel off the backing [B] of the double-sided tape attached to the glass holder.
4. Place the DF exposure glass [C] on the glass holder.
   NOTE: When installing the DF exposure glass, make sure that the white point [D] is on the lower front side of the glass, as shown.
5. Peel off the backing [E] of the double-sided tape attached to the rear side of the scale guide [F], then install the scale guide [F] (☞ x 2 removed in step 2).
6. Install two stud screws [G].
7. Mount the DF on the copier, then slide the DF to the front as shown.
8. Secure the DF unit with two screws [H].
9. Connect the cable [I] to the copier.



B386I110.WMF



B386I111.WMF



B386I501.WMF

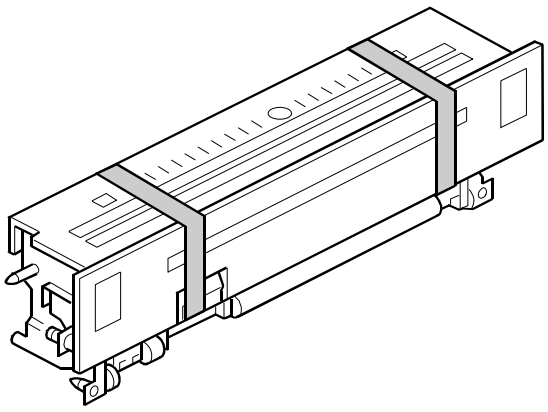
10. Peel off the platen sheet [A] and place it on the exposure glass.
11. Line up the rear left corner of the platen sheet flush against corner [B] on the exposure glass.
12. Close the ARDF.
13. Attach the appropriate scale decal [C] as shown.
14. Turn the main power switch on. Then check if the document feeder works properly.
15. Make a full size copy. Check that the registrations (side-to-side and leading edge) and image skew are correct. If they are not, adjust the registrations and image skew (refer to Replacements and Adjustments – Copy Adjustments).

1.6 INTERCHANGE UNIT (B481)

1.6.1 ACCESSORY CHECK

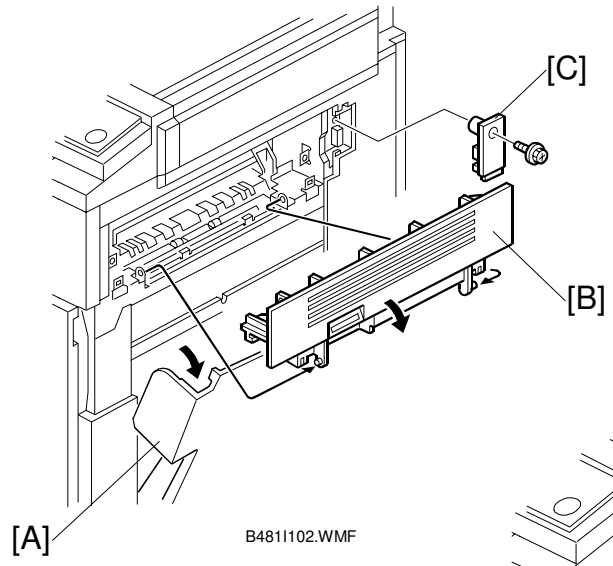
Check the quantity and condition of the components against the following list.

No.	Description	Q'ty
1	Interchange Unit	1

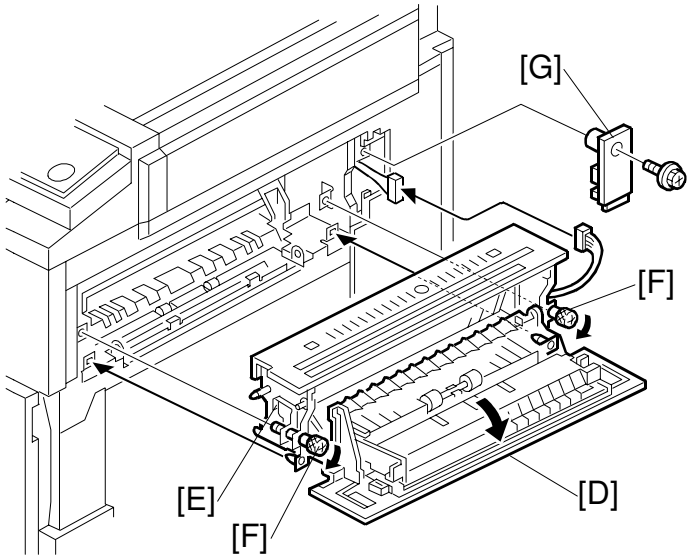


B481I101.WMF

1.6.2 INSTALLATION PROCEDURE



B481I102.WMF



B481I103.WMF

⚠CAUTION

Unplug the copier power cord before starting the following procedure.

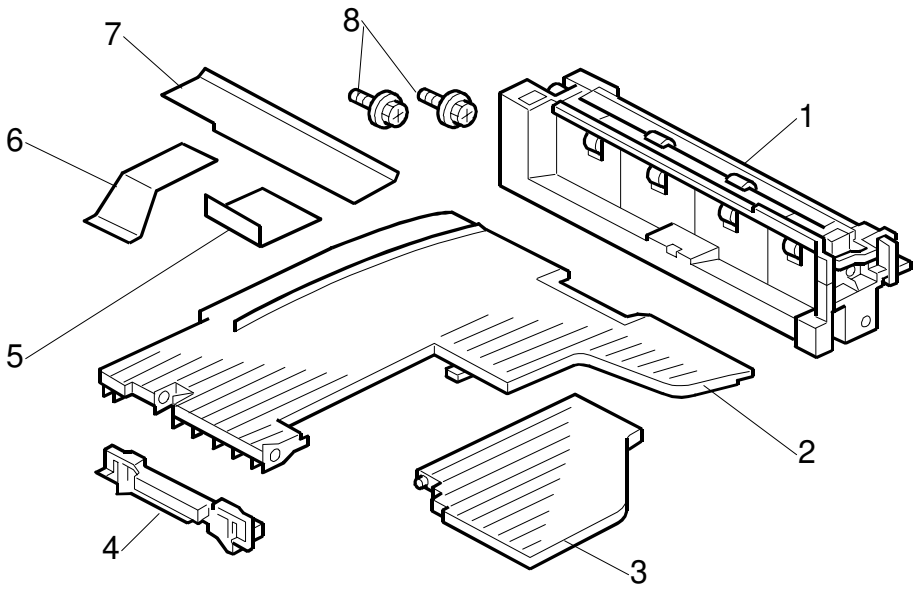
1. Remove all tapes.
2. Open the right cover [A] of the copier.
3. Open cover [B] and remove it.
   NOTE: Pull down in the direction of the arrow. Do not pull directly outwards.
4. Remove the connector cover [C] (🔩 x 1)
5. Open the cover [D] of the interchange unit.
6. Install the interchange unit [E] (✋ x 1).
   NOTE: Take care not to pinch the harness at the front side (near [E] in the drawing). This harness is not used in this procedure, but is used when installing another option.
7. Secure the interchange unit with the knob screws [F].
8. Reinstall the connector cover [G] which was removed in step 4.

1.7 1-BIN TRAY UNIT (B480)

1.7.1 ACCESORY CHECK

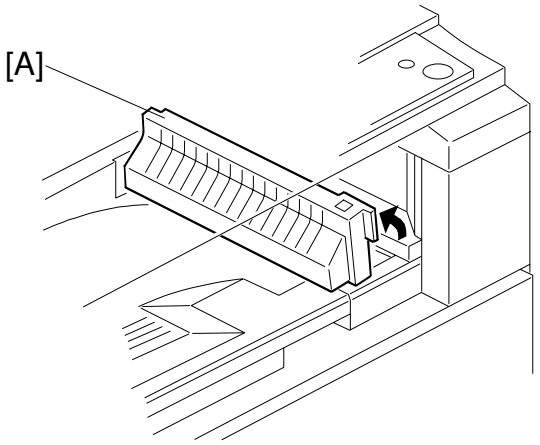
Check the quantity and condition of the components against the following list.

No.	Description	Q'ty
1	1-Bin Tray Unit	1
2	Tray	1
3	Sub-Tray	1
4	Tray Guide	1
5	Shield Mylar	1
6	Sub Paper Guide	1
7	Paper Guide	1
8	Tapping Screw M3x8	2



B480I101.WMF

1.7.2 INSTALLATION PROCEDURE



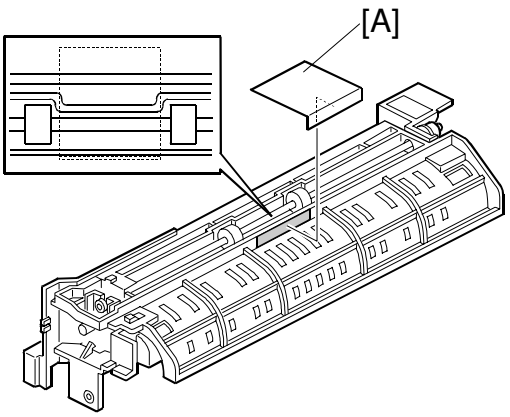
B480I107.WMF

⚠CAUTION

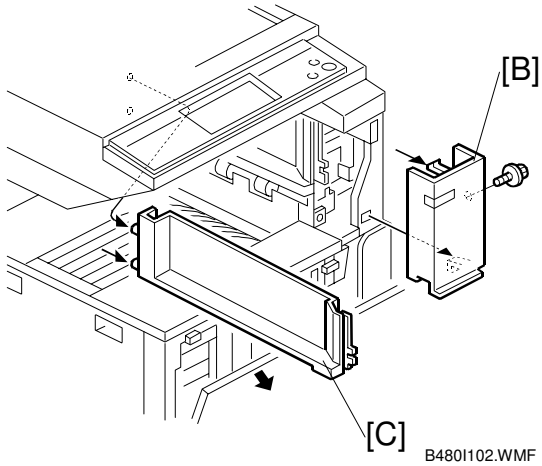
Unplug the copier power cord before starting the following procedure.

NOTE: Before installing this 1-bin tray unit, the optional interchange unit (B416) must be installed.

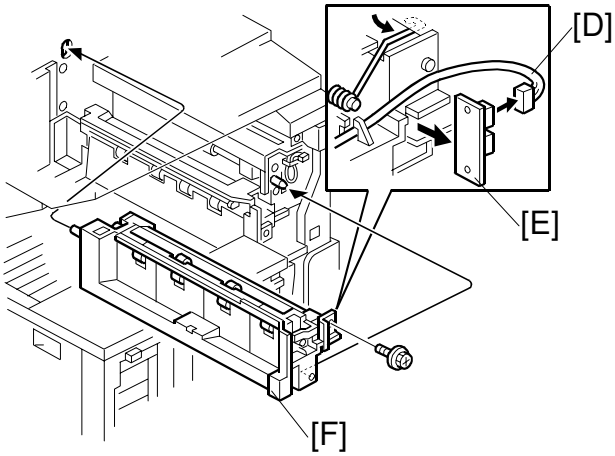
1. Remove all tapes.
2. If the optional bridge unit has been installed, open the right jam removal cover [A] of the bridge unit.
   If the optional bridge unit is not installed, skip this step.



B480I108.WMF

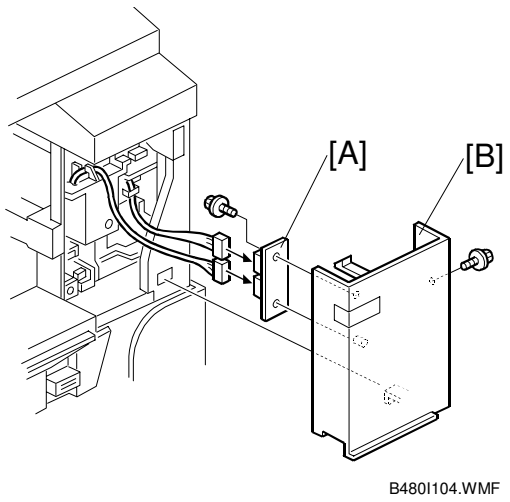


B480I102.WMF

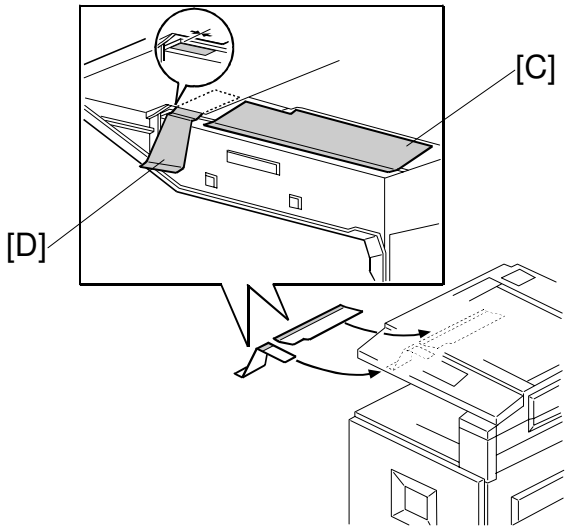


B480I103.WMF

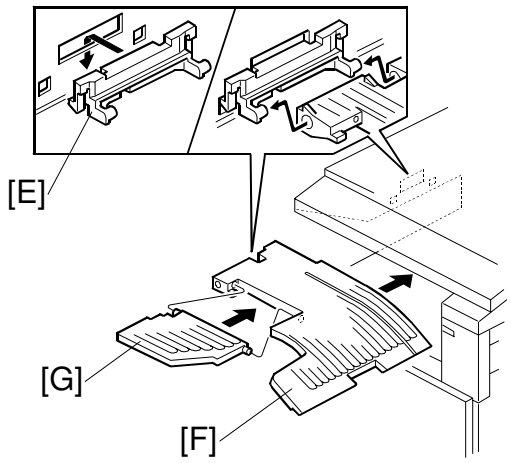
3. Peel off the backing of the double-sided tape attached to the shield mylar [A]. Then attach the shield mylar to the 1-bin unit.
4. If the front right cover [B] is installed, remove it (☞ x 1).
5. Remove the cover [C].
6. Disconnect the connector [D] and remove the LED board [E].
7. Install the 1-bin tray unit [F] (☞ x 1).



B480I104.WMF



B480I109.WMF



B480I106.WMF

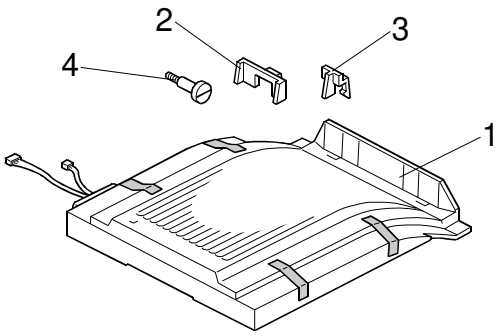
8. Install the LED board [A] on the front right cover (🔩 x 1).
9. Reinstall the front right cover [B] (✋ x 2, 🔩 x 1).
10. Peel off the backing of the double-sided tape attached to the paper guide [C]. Then attach the paper guide to the underside of the scanner unit as shown.
11. Peel off the backing of the double-sided tape attached to the sub paper guide [D]. Then attach the sub paper guide to the underside of the scanner unit as shown.
12. Install the tray guide [E].
13. Install the tray [F].
14. Install the sub-tray [G].
15. Turn on the main power switch and check the 1-bin tray unit operation.

1.8 SHIFT TRAY

1.8.1 COMPONENT CHECK

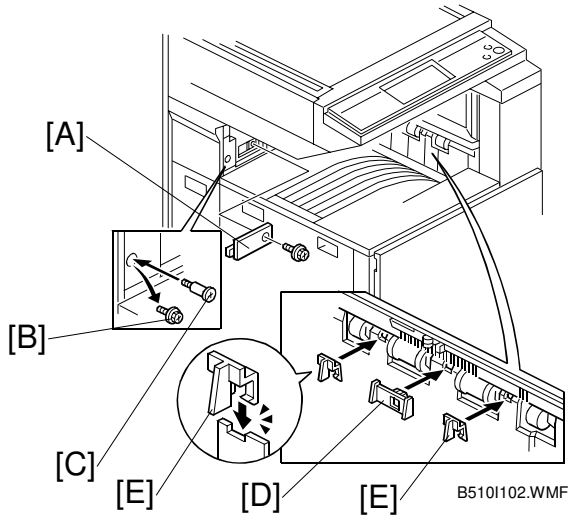
Check the quantity and condition of the components against the following list.

No.	Description	Q'ty
1	Shift Tray Unit	1
2	Paper Guide - Large	1
3	Paper Guide - Small	2
4	Stepped Screw	1



B510I101.WMF

1.8.2 INSTALLATION PROCEDURE

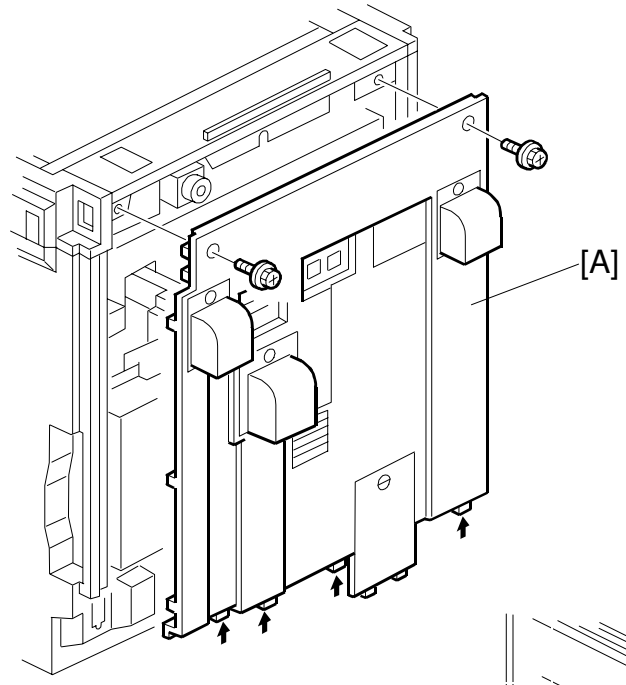


B510I102.WMF

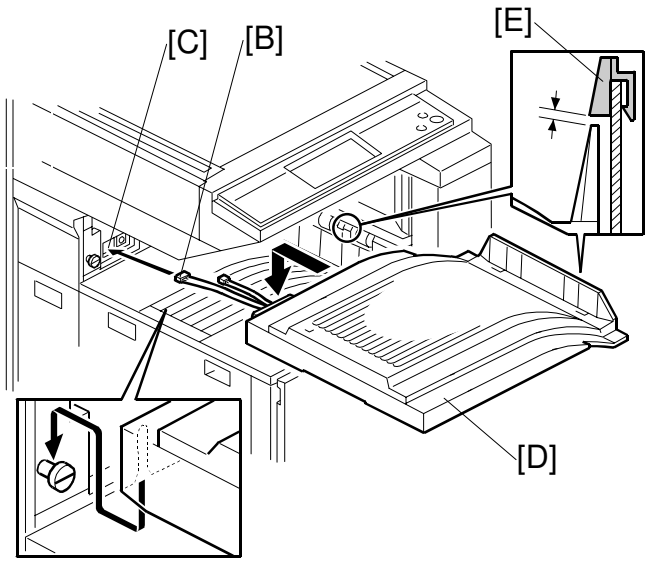
⚠CAUTION

Unplug the copier power cord before starting the following procedure.

1. Remove all tapes (see the diagram at the top of the page).
2. Remove the covers [A] (🔩 x 1).
3. Replace screw [B] with a stepped screw [C].
4. Install the large paper guide [D] and two small paper guides [E].

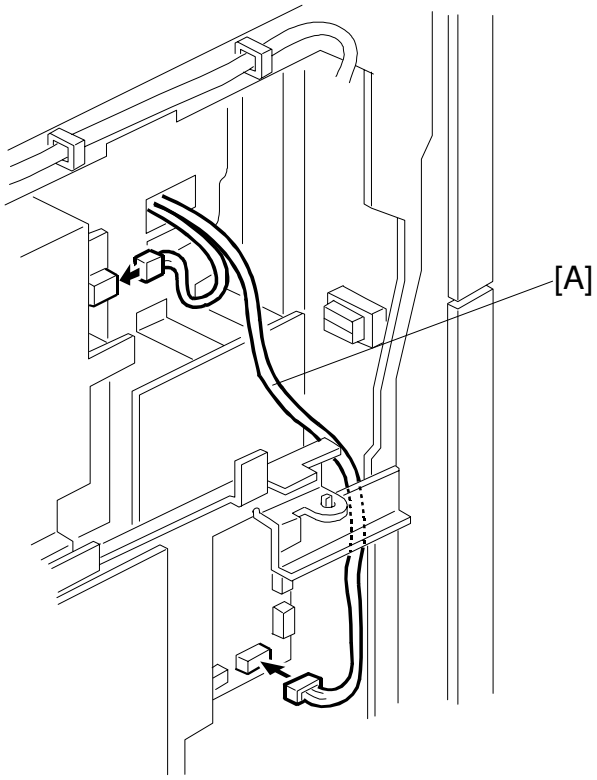


B510I110.WMF



B510I103.WMF

5. Remove the rear cover [A] (☞ x 2).
6. Pass the harnesses [B] through the opening [C], and install the shift tray unit [D], as shown.
   NOTE: 1) Set the shift tray on the stepped screw.
   2) The shift tray must be installed under the paper guides [E] installed in step 4.



B510I104.WMF

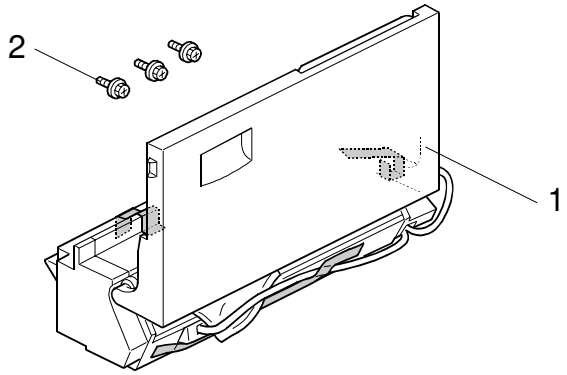
7. Connect the harnesses [A], as shown.
8. Turn on the main power switch.
9. Check the shift tray operation.

1.9 BY-PASS FEED UNIT (B490)

1.9.1 ACCESSORY CHECK

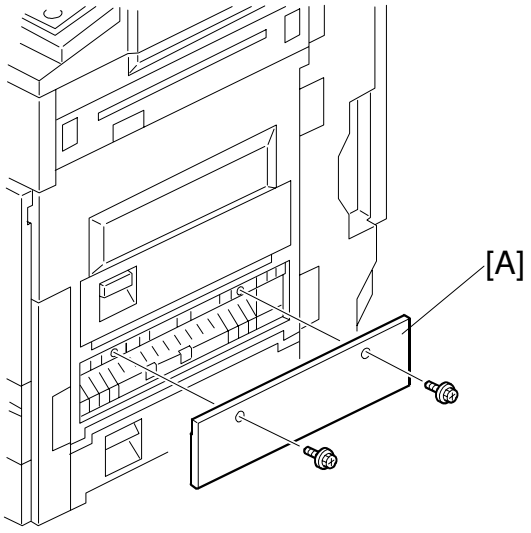
Check the quantity and condition of the components against the following list.

No.	Description	Q'ty
1	By-pass Tray Unit	1
2	Tapping Screw	3



B490I001.WMF

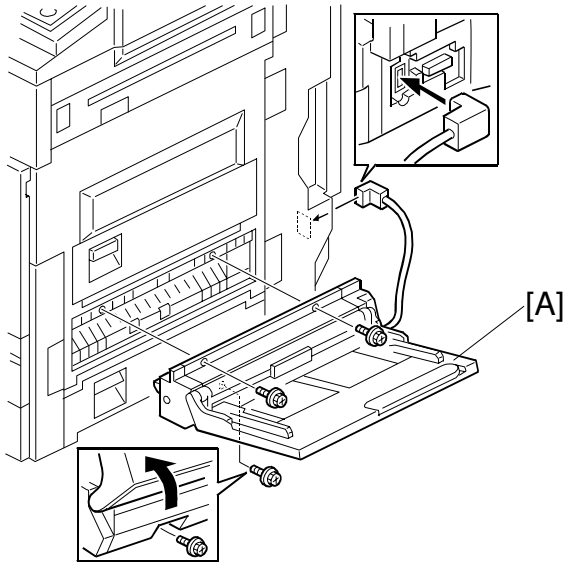
1.9.2 INSTALLATION PROCEDURE



B490I113.WMF

⚠CAUTION
Unplug the copier power cord before starting the following procedure.

1. Remove all tapes (see the diagram at the top of the page).
2. Remove the entrance cover [A] (x 2).



B490I114.WMF

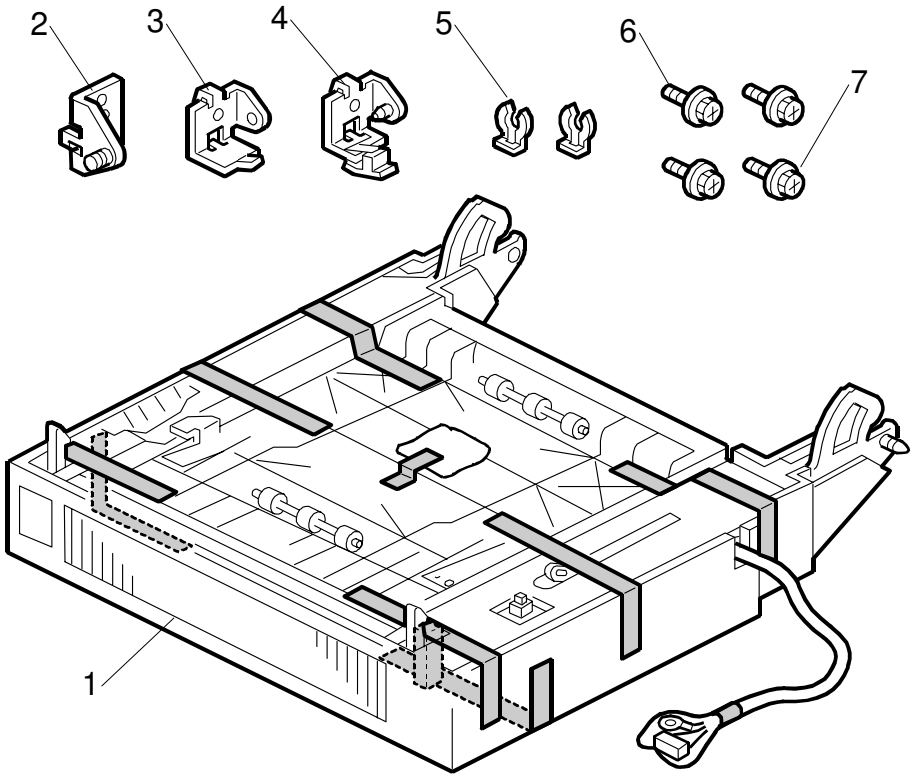
3. Install the by-pass tray unit [A] (x 3, x 1).
4. Turn the main power switch on and check the by-pass tray function.
5. Make a copy from the by-pass tray. Then check the registration.

1.10 DUPLEX UNIT (B509)

1.10.1 ACCESSORY CHECK

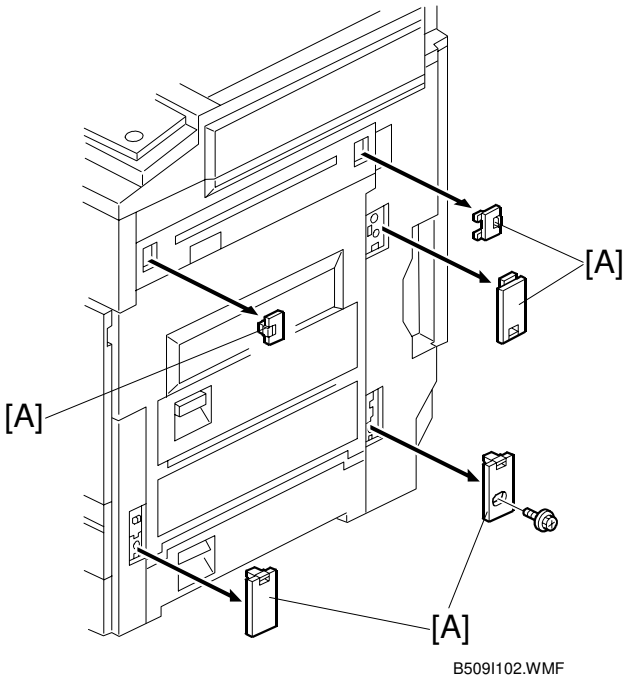
Check the quantity and condition of the accessories against the following list.

No.	Description	Q'ty
1	Duplex Unit	1
2	Upper Bracket	1
3	Rear Holder Bracket	1
4	Front Holder Bracket	1
5	Clip	2
6	Tapping Screw - M4x6	3
7	Tapping Screw - M3x6	1

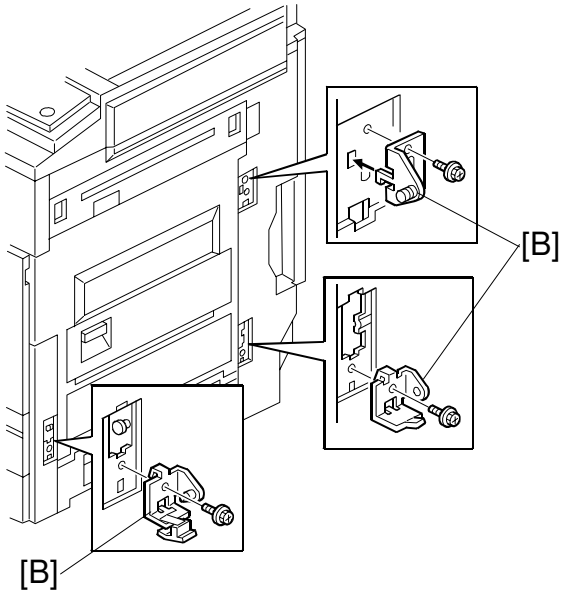


B509I101.WMF

1.10.2 INSTALLATION PROCEDURE



B509I102.WMF



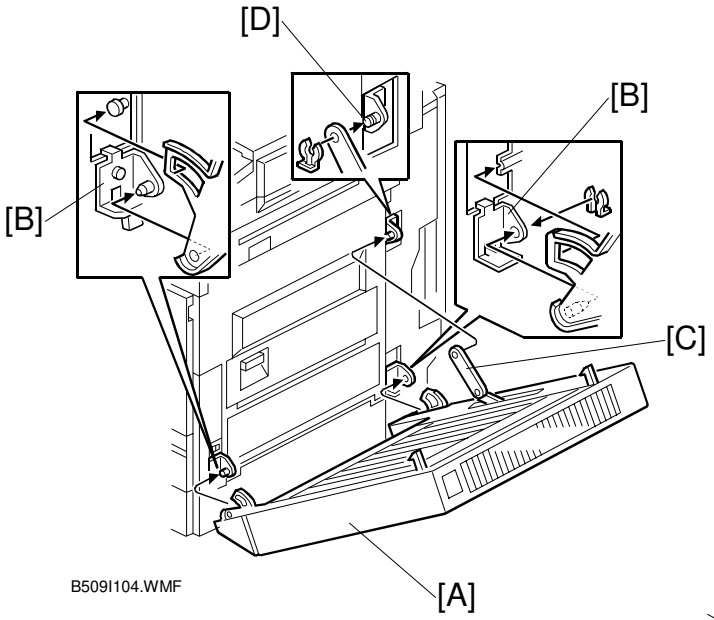
B509I103.WMF

⚠CAUTION

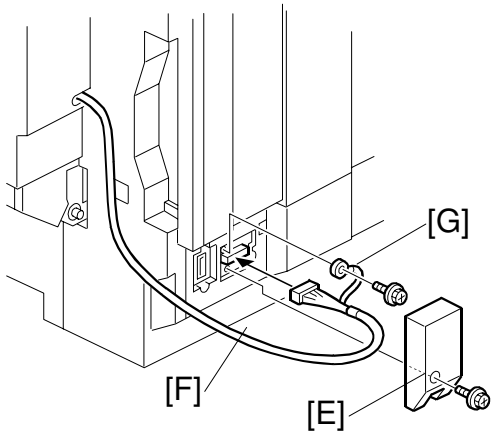
Unplug the copier power cord before starting the following procedure.

NOTE: Before installing the duplex unit, the optional interchange unit (B481) must be installed.

1. Remove all tapes (see the previous page).
2. Remove five covers [A] (🖉 x 1).
3. Install three brackets [B] (🖉 x 1 each - M4x6).



B509I104.WMF



B509I105.WMF

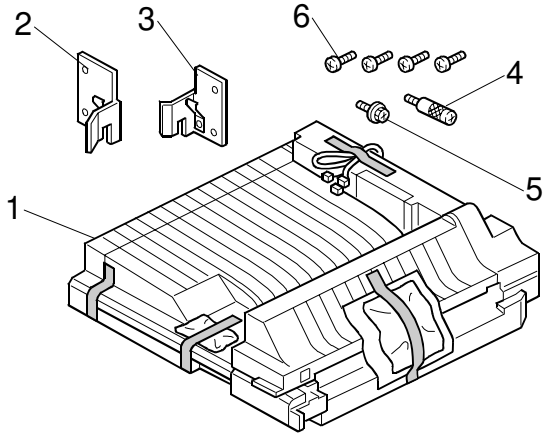
4. Set the duplex unit [A] on the brackets [B] (1 clip).
5. Attach the link [C] to the shaft [D] and secure it with the clip.
6. Remove the connector cover [E] (🔩 x 1).
7. Connect the cable [F] and secure the grounding wire [G] (🔩 x 1).
8. Install the connector cover.
9. Turn on the main power switch and check the duplex unit function.

1.11 BRIDGE UNIT (B482)

1.11.1 ACCESSORY CHECK

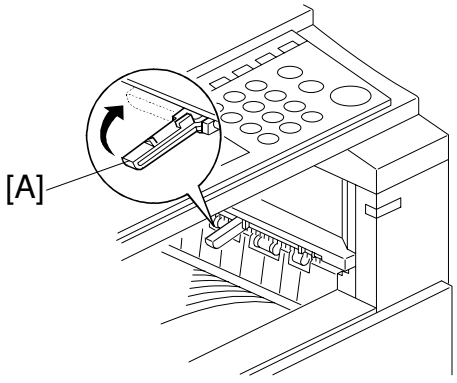
Check the quantity and condition of the accessories against the following list.

No.	Description	Q'ty
1	Bridge Unit	1
2	Rear Joint Bracket	1
3	Front Joint Bracket	1
4	Knob Screw	1
5	Screw - M3x6	1
6	Screw - M4x14	4



B482I101.WMF

1.11.2 INSTALLATION PROCEDURE

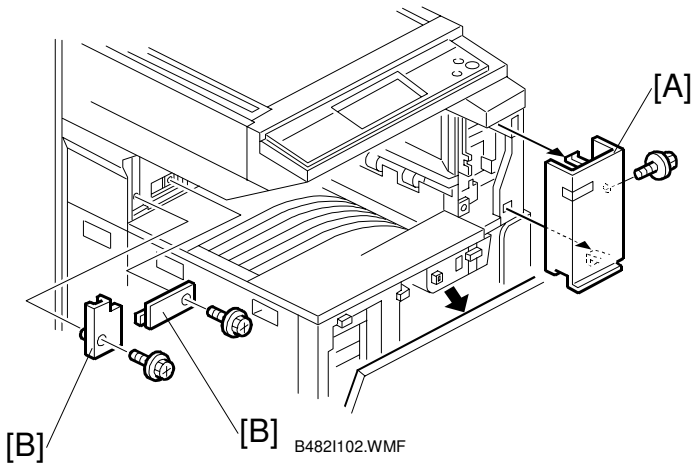


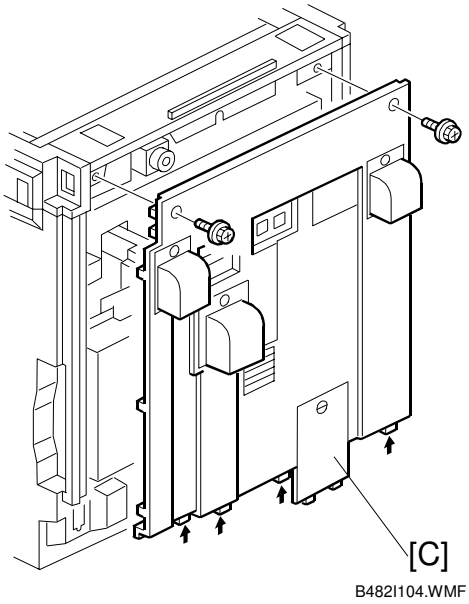
B482I500.WMF

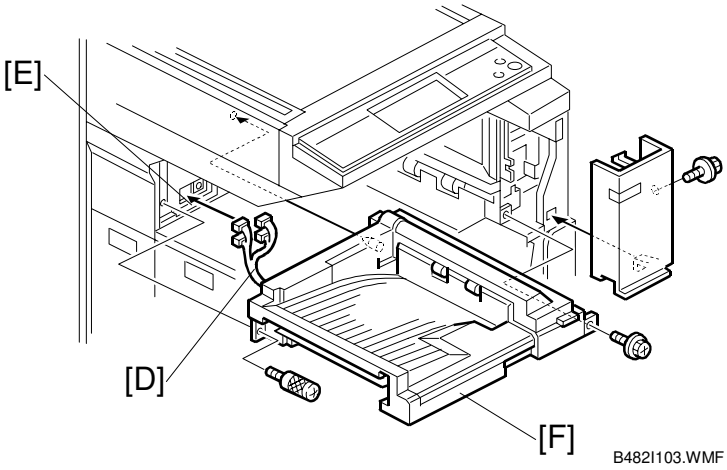
⚠CAUTION

Unplug the copier power cord before starting the following procedure.

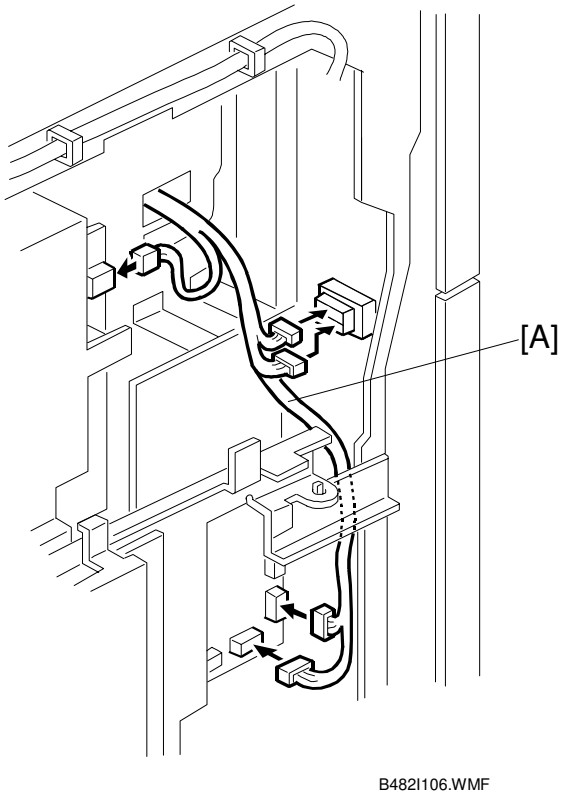
1. Remove all tapes.
2. If the sensor feeler [A] is out, fold it away into the machine.

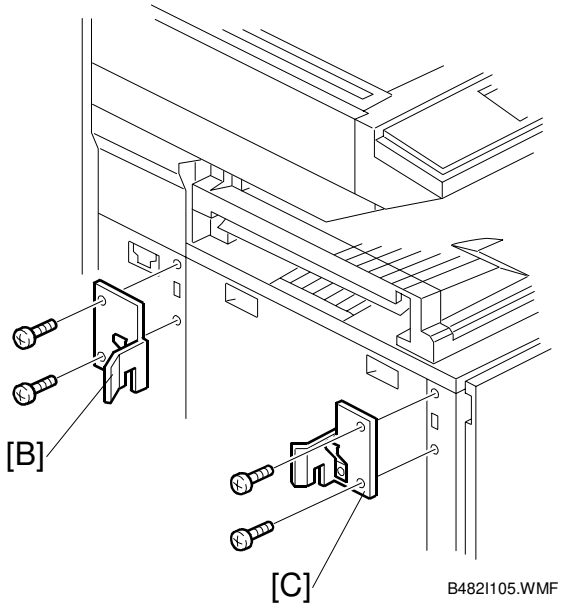






3. Remove the front right cover [A] (☞ x 1).
4. Remove two covers [B] (☞ x 1 each).
5. Remove the rear cover [C] (☞ x 2).
6. Pass the harnesses [D] through the opening [E], and install the bridge unit [F] (☞ x 2).
7. Reinstall the front right cover.





8. Connect the harnesses [A], as shown.
9. Reinstall the rear cover.
10. **When the 1,000-sheet finisher (Machine code: B408) will be installed**, attach the front joint bracket [B] and rear joint bracket [C] (x 2 each).
11. Install the optional finisher (refer to the finisher installation procedure).

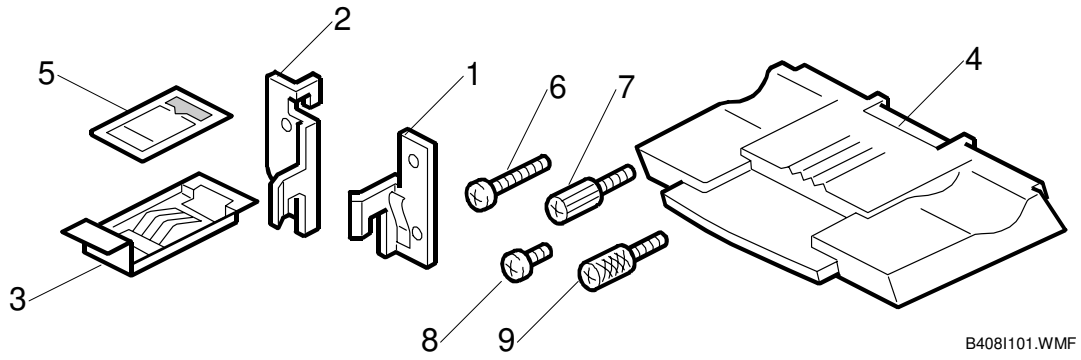
1.12 1000-SHEET FINISHER (B408)

1.12.1 ACCESSORY CHECK

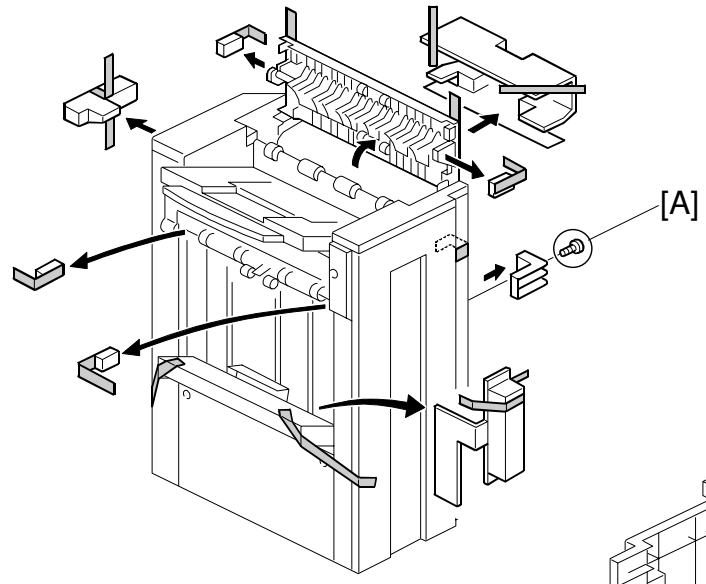
Check the quantity and condition of the accessories against the following list.

No.	Description	Q'ty	For B022/B027/B031	For B051/B052
1	Front Joint Bracket	1	O	X
2	Rear Joint Bracket	1	O	X
3	Grounding Plate	1	O	X
4	Copy Tray	1	O	O
5	Staple Position Decal	1	O	O
6	Screw - M4x17	3	O	X
7	Knob Screw - M4x10	1	O	O
8	Screw - M3x8	1	O	X
9	Knob Screw - M3x8	1	O	O

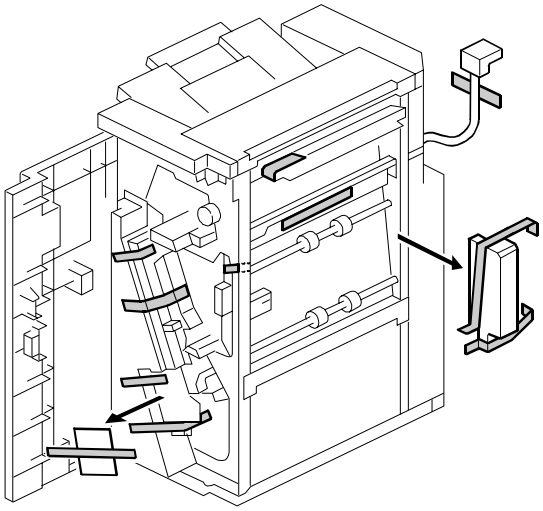
O = Necessary, X = Not necessary



1.12.2 INSTALLATION PROCEDURE



B408I102.WMF



B408I103.WMF

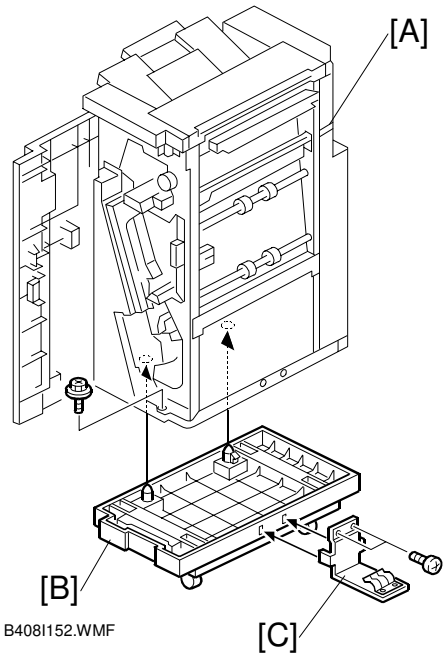
⚠CAUTION

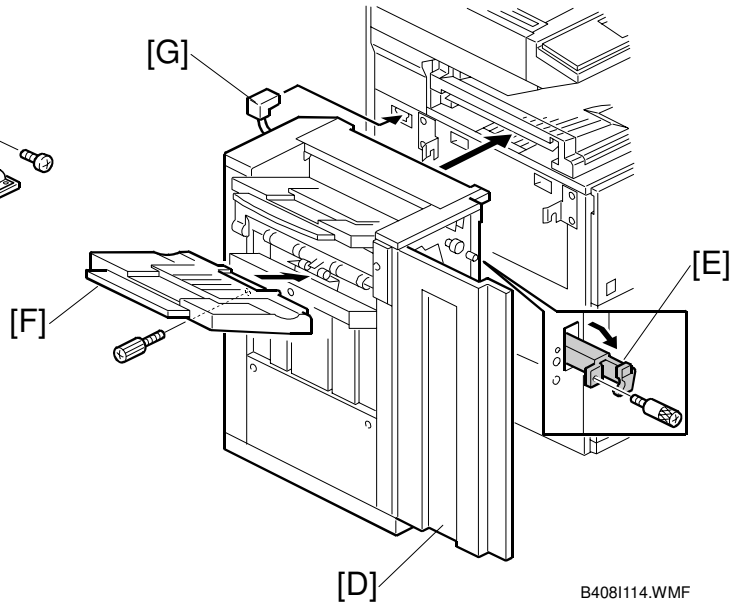
Unplug the main machine power cord before starting the following procedure.

NOTE: The following options must be installed before installing this finisher.
- Bridge Unit (B482)
- Paper Tray Unit (B456) or LCT (B457)

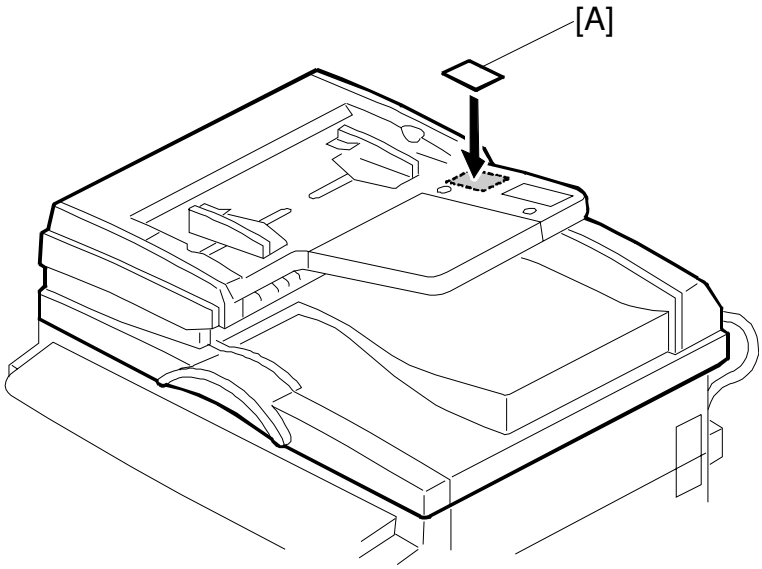
Also, the optional adjustment table (B488) is required.

1. Unpack the finisher and remove the tapes.





2. Unpack the adjustment table (B488).
3. Set the finisher [A] on the adjustment table [B] and secure the finisher (x 1).
4. Install the grounding plate [C], which is in the accessory box for the adjustment table (x 2).
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 (1 knob screw - M3x8) and close the front door.
8. Install the copy tray [F] (1 knob screw - M4x10).
9. Connect the finisher cable [G] to the main machine.



B408I501.WMF

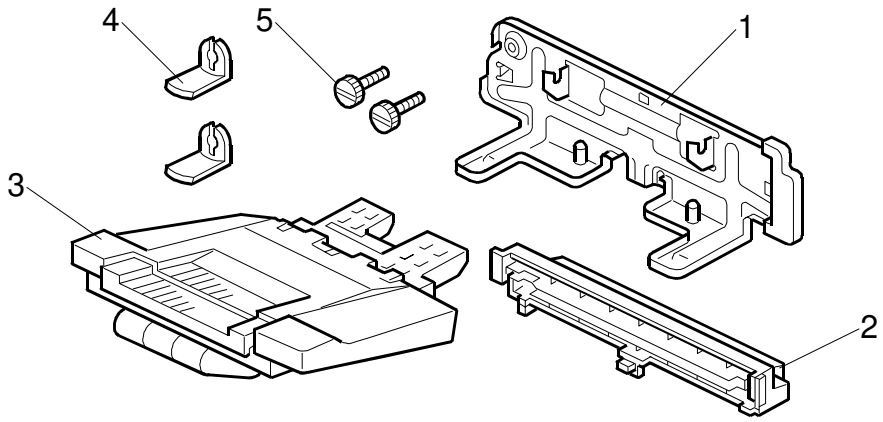
10. Attach the staple position decal [A] to the ARDF as shown.
11. Turn on the main power switch and check the finisher operation.

1.13 500-SHEET FINISHER (B458)

1.13.1 ACCESSORY CHECK

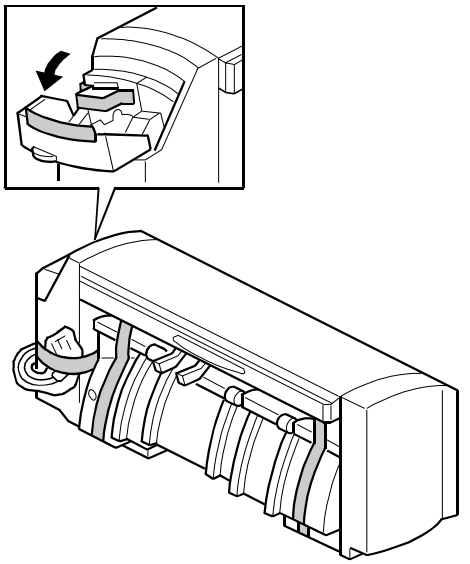
Check the quantity and condition of the accessories against the following list.

No.	Description	Q'ty
1	Unit Holder	1
2	Entrance Guide	1
3	Shift Tray	1
4	Snap Ring	2
5	Knob Screw	2

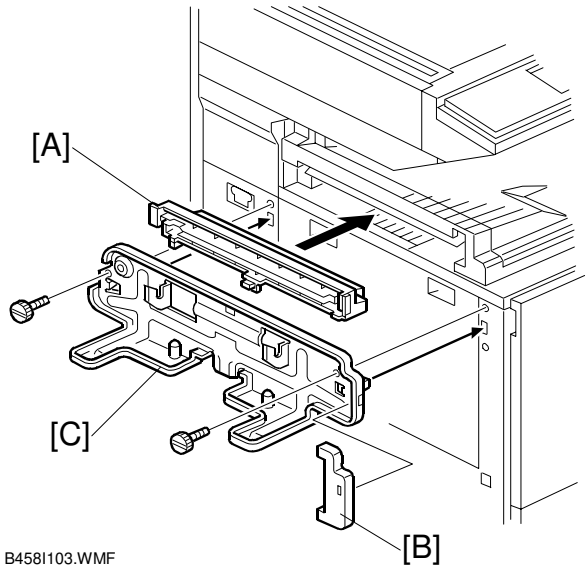


B458I102.WMF

1.13.2 INSTALLATION PROCEDURE



B458I101.WMF



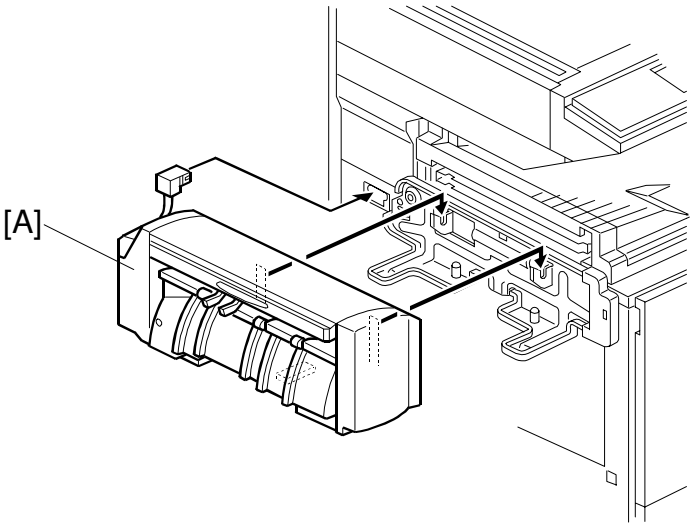
B458I103.WMF

⚠CAUTION

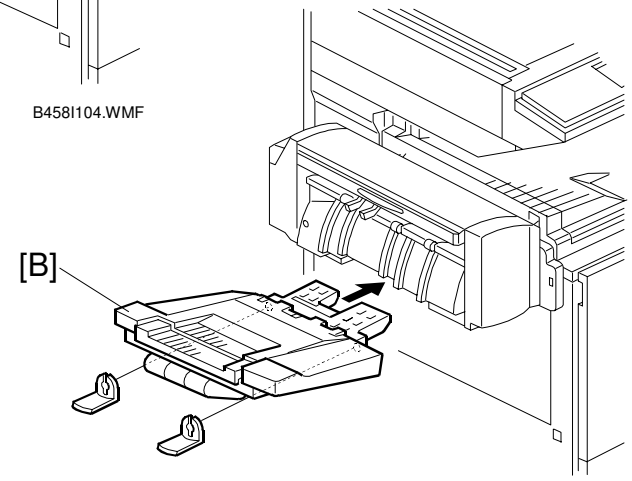
Unplug the main machine power cord before starting the following procedure.

NOTE: Before installing the 500-sheet finisher, the optional bridge unit (B482) must be installed.

1. Unpack the finisher and remove the tapes.
2. Install the entrance guide [A].
3. Remove the holder cover [B]. Then install the unit holder [C] (2 screws).
4. Re-install the holder cover [B].



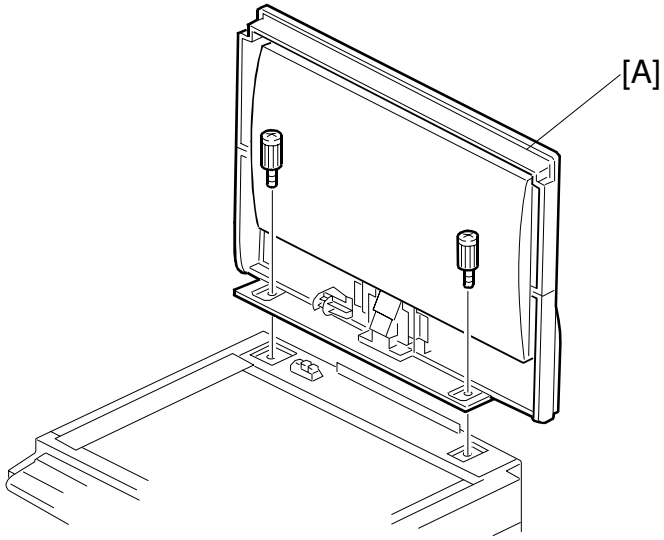
B458I104.WMF



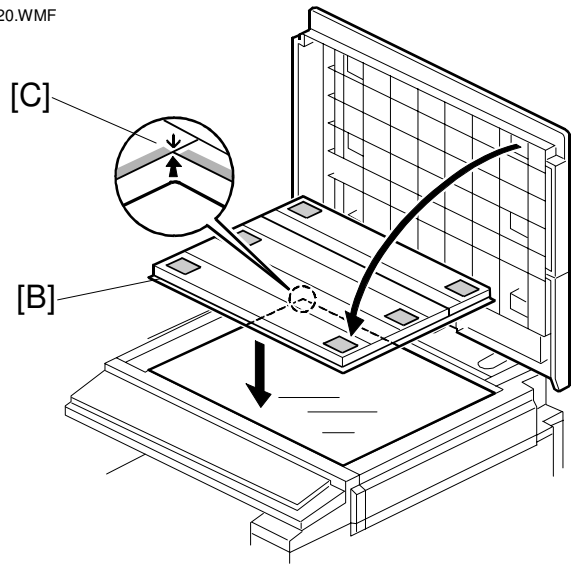
B458I105.WMF

5. Install the 500-sheet finisher [A] (☞ x 1).
6. Install the output tray [B] as shown (2 snap rings).
7. Turn on the main power switch and check the finisher operation.

1.14 PLATEN COVER INSTALLATION



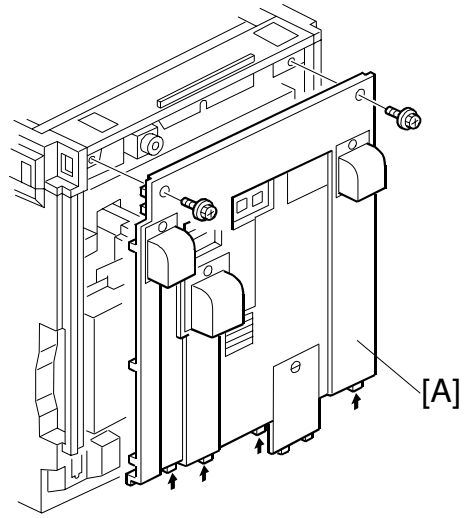
B051I520.WMF



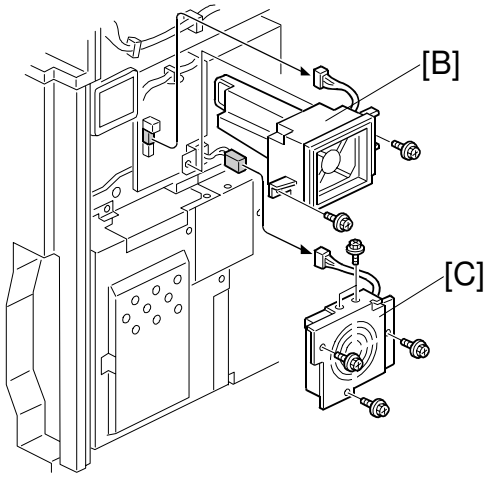
B051I408.WMF

1. Install the platen cover [A] (☞ x 2).
2. Peel off the platen sheet [B] and place it on the exposure glass.
3. Line up the rear left corner of the platen sheet flush against corner [C] on the exposure glass.
4. Gently close the platen cover.

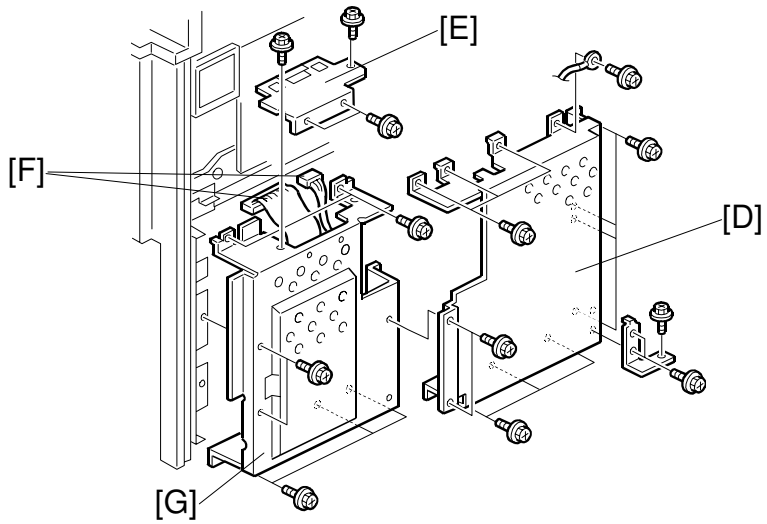
1.15 MEMORY



B051I554.WMF



B051I504.WMF

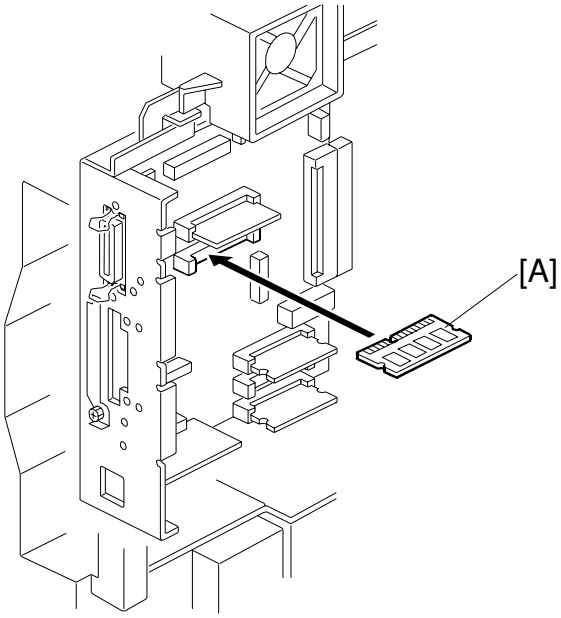


B051I505.WMF

⚠CAUTION

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

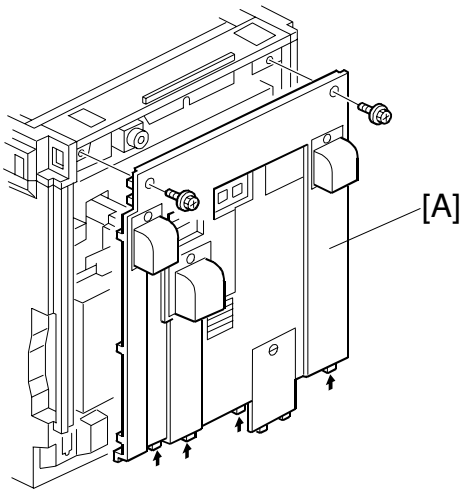
1. Remove the rear cover [A] (☞ x 2).
2. Remove the cooling fan [B] (☞ x 2).
3. Remove the PCB fan [C] (☞ x3, ☞ x 1).
4. Remove the BICU cover [D] (☞ x 16).
5. Remove the HDD connector cover [E] (☞ x 4).
6. Disconnect two HDD harnesses [F].
7. Remove the controller board cover [G] (☞ x 7).



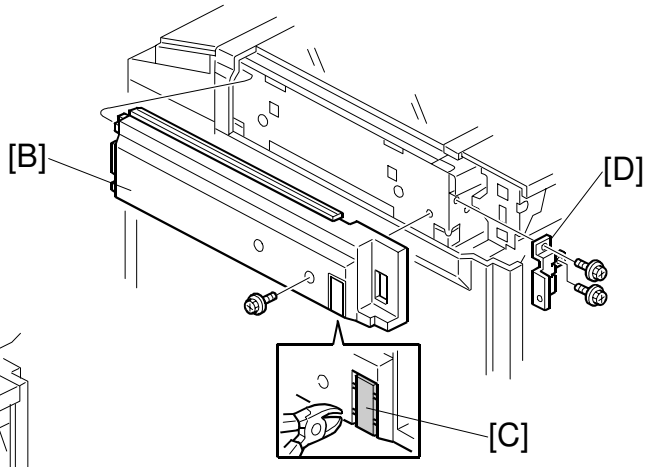
B051I308.WMF

8. Install the memory DIMM [A] on the controller board.
9. Replace the controller board cover and rear cover.

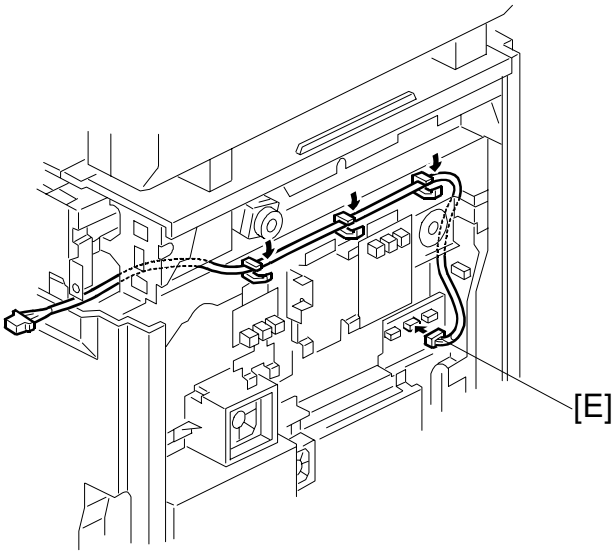
1.16 KEY COUNTER INSTALLATION



B051I554.WMF



B051I119.WMF

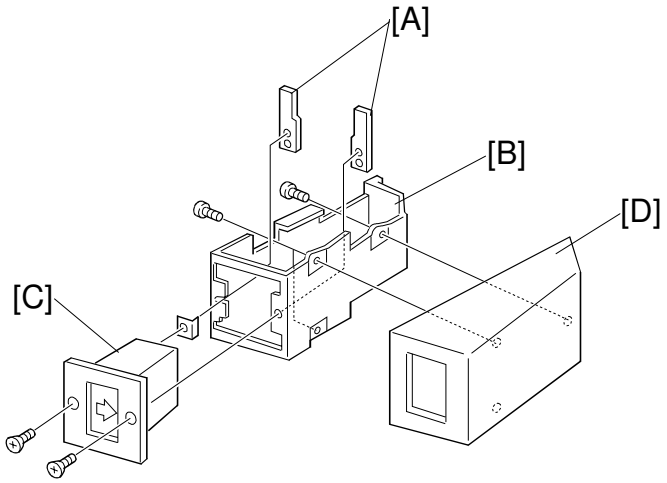


B051I120.WMF

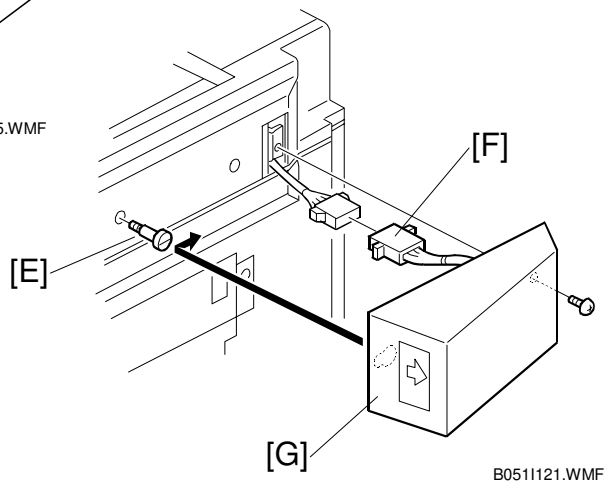
⚠CAUTION

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

1. Remove the rear cover [A] (🔩 x 2).
2. Remove the upper right cover [B] (🔩 x 1).
3. Remove the cap [C].
4. Install the bracket [D] (🔩 x 2).
5. Connect the cable [E] to the BICU board and route it as shown.



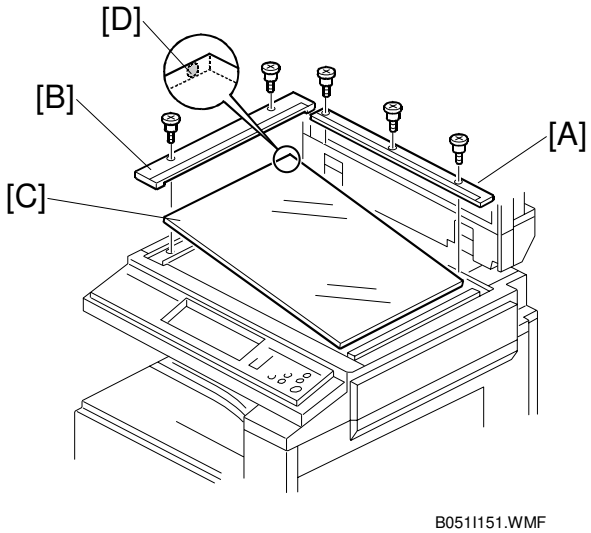
B051I515.WMF



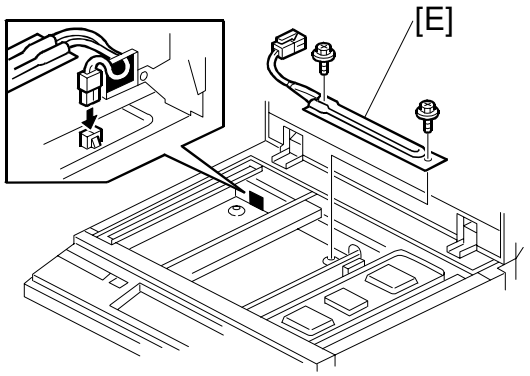
B051I121.WMF

6. Hold the key counter plate nuts [A] on the inside of the key counter bracket [B] and insert the key counter holder [C].
7. Secure the key counter holder to the bracket (☞ x 2).
8. Install the key counter cover [D] (☞ x 2).
9. Install the stepped screw [E].
1. Connect the cable [F].
10. Hook the key counter holder assembly [G] onto the stepped screw and secure it (☞ x 1).
11. The restricted access control for the key counter is enabled by the Copier UP mode.

1.17 ANTI-CONDENSATION HEATER



B051I151.WMF



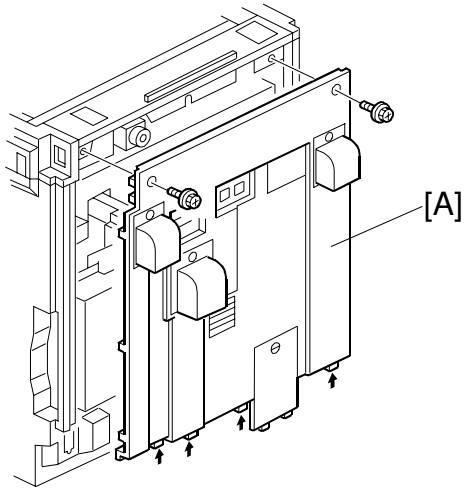
B051I139.WMF

⚠CAUTION

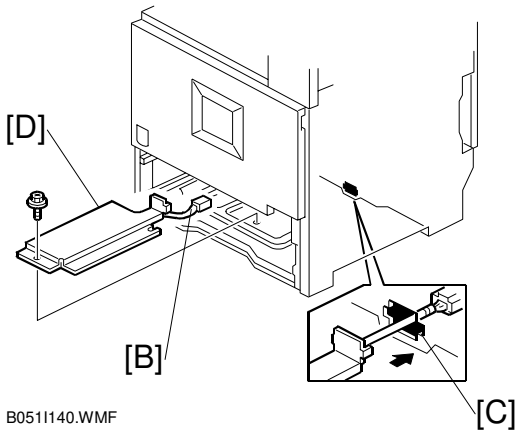
Unplug the main machine power cord before starting the following procedure.

1. Remove the rear scale [A] (🔩 x 3), left scale [B] (🔩 x 2), and exposure glass [C].
   NOTE: When installing the exposure glass, make sure that the mark [D] is positioned at the rear left corner, as shown.
2. Install the anti-condensation heater [E] (🔩 x 2, ✋ x 1).
3. Reinstall the exposure glass and the scales.

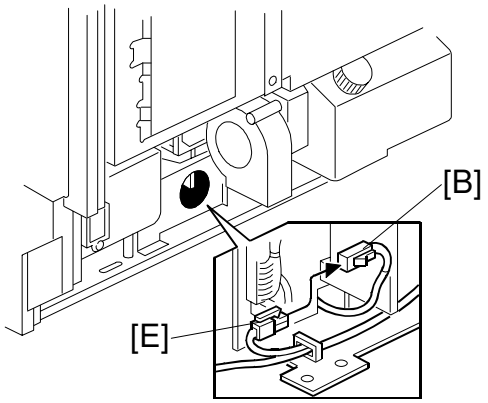
1.18 TRAY HEATER



B051I554.WMF



B051I140.WMF



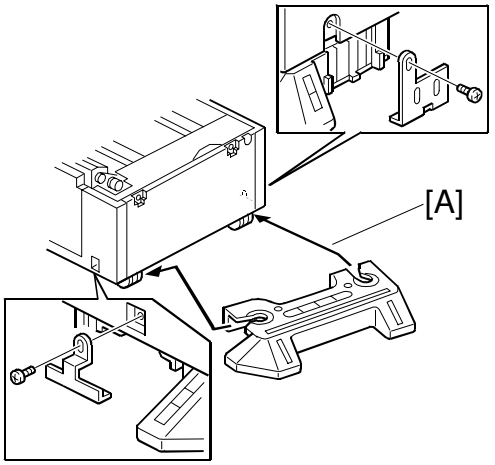
B051I141.WMF

⚠CAUTION

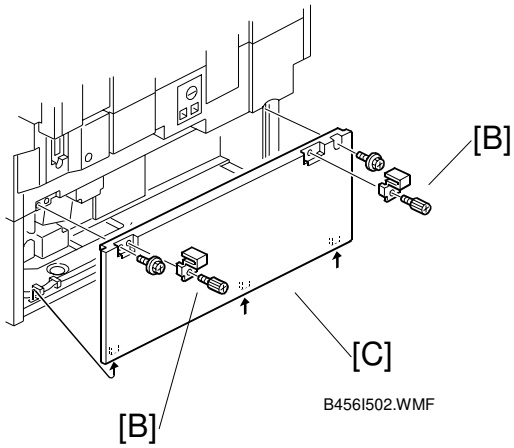
Unplug the main machine power cord before starting the following procedure.

1. Remove the rear cover [A] (🔩 x 2).
2. Slide out the 1st and 2nd paper trays.
3. Pass the connector [B] through the opening [C].
4. Install the tray heater assembly [D] (🔩 x 1).
5. Connect the heater cable to the ac cable [E].
6. Reassemble the machine.

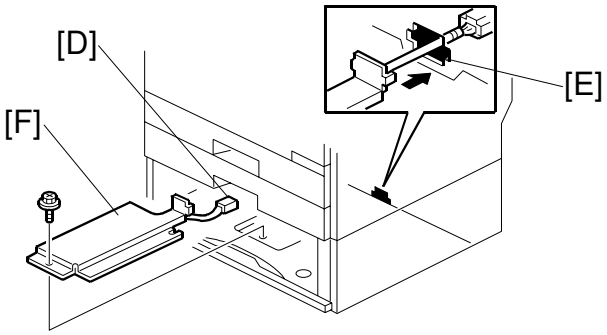
1.19 TRAY HEATER (OPTIONAL PAPER TRAY UNIT)



B456I104.WMF



B456I502.WMF

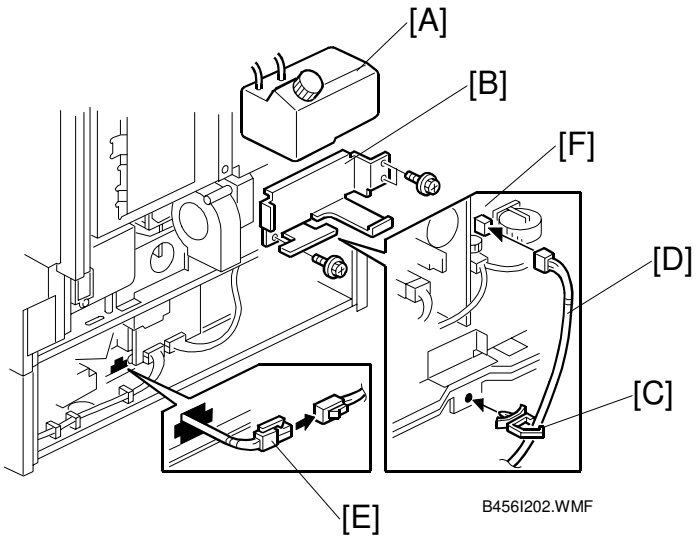


B456I201.WMF

⚠CAUTION

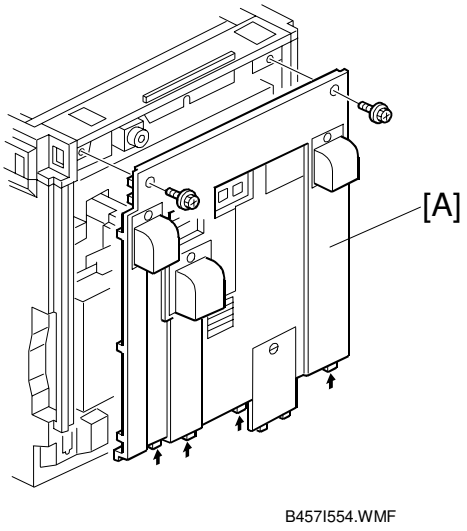
Unplug the main machine power cord before starting the following procedure.

1. Remove the rear cover for the main machine [A] (🔩 x 2).
2. Remove the joint brackets [B] (🔩 x 1 each).
3. Remove the rear cover for the optional paper tray unit [C] (🔩 x 2).
4. Slide out the paper trays from the optional paper tray unit.
5. Pass the connector [D] through the opening [E].
6. Install the tray heater [F] (🔩 x 1).

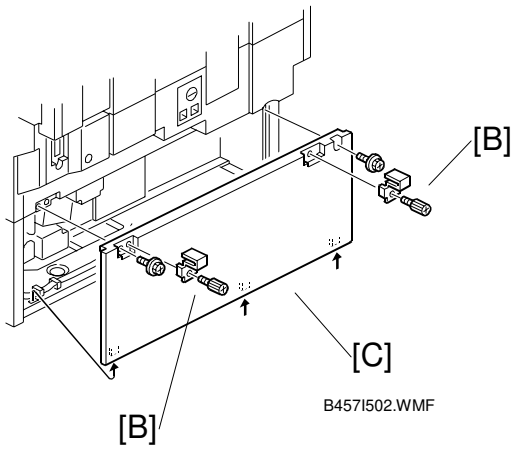


7. Remove the oil bottle [A] and the oil bottle bracket [B] (☞ x 3).
8. Install the clamp [C].
9. Connect the cable [D] to the heater cable [E] and the PSU [F]. Then clamp the cable.
10. Reinstall the rear covers.

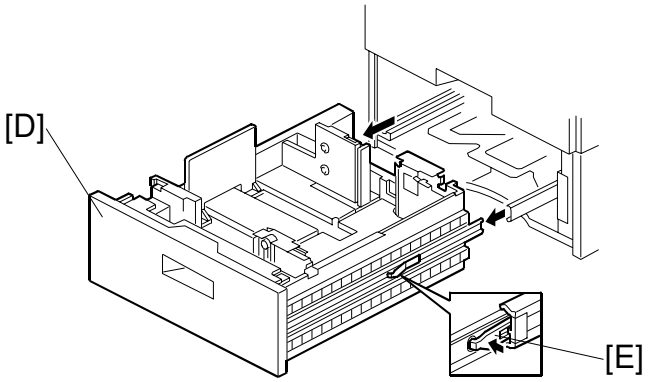
1.20 TRAY HEATER (OPTIONAL LCT)



B457I554.WMF



B457I502.WMF

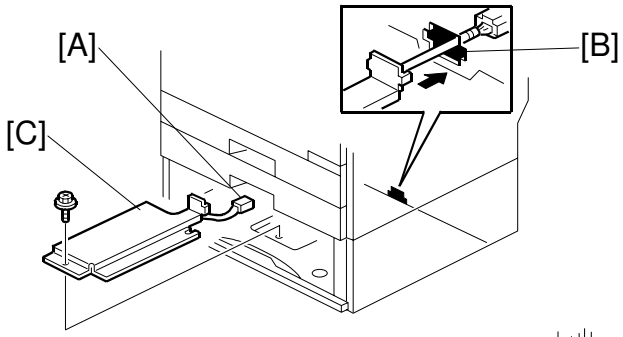


B457I501.WMF

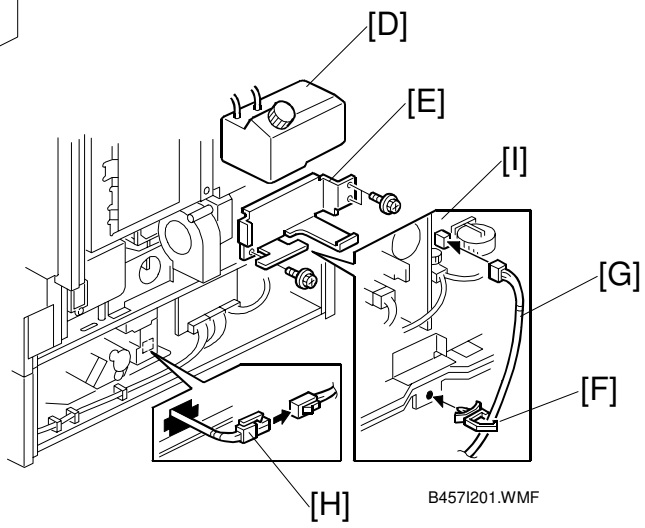
⚠CAUTION

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

1. Remove the rear cover for the main machine [A] (🔩 x 2).
2. Remove the joint brackets [B] (🔩 x 1 each).
3. Remove the rear cover for the optional LCT [C] (🔩 x 2).
4. Slide out the paper tray [D] from the optional LCT.
5. Push stopper [E] on the right slide rail and remove the paper tray.



B457I251.WMF



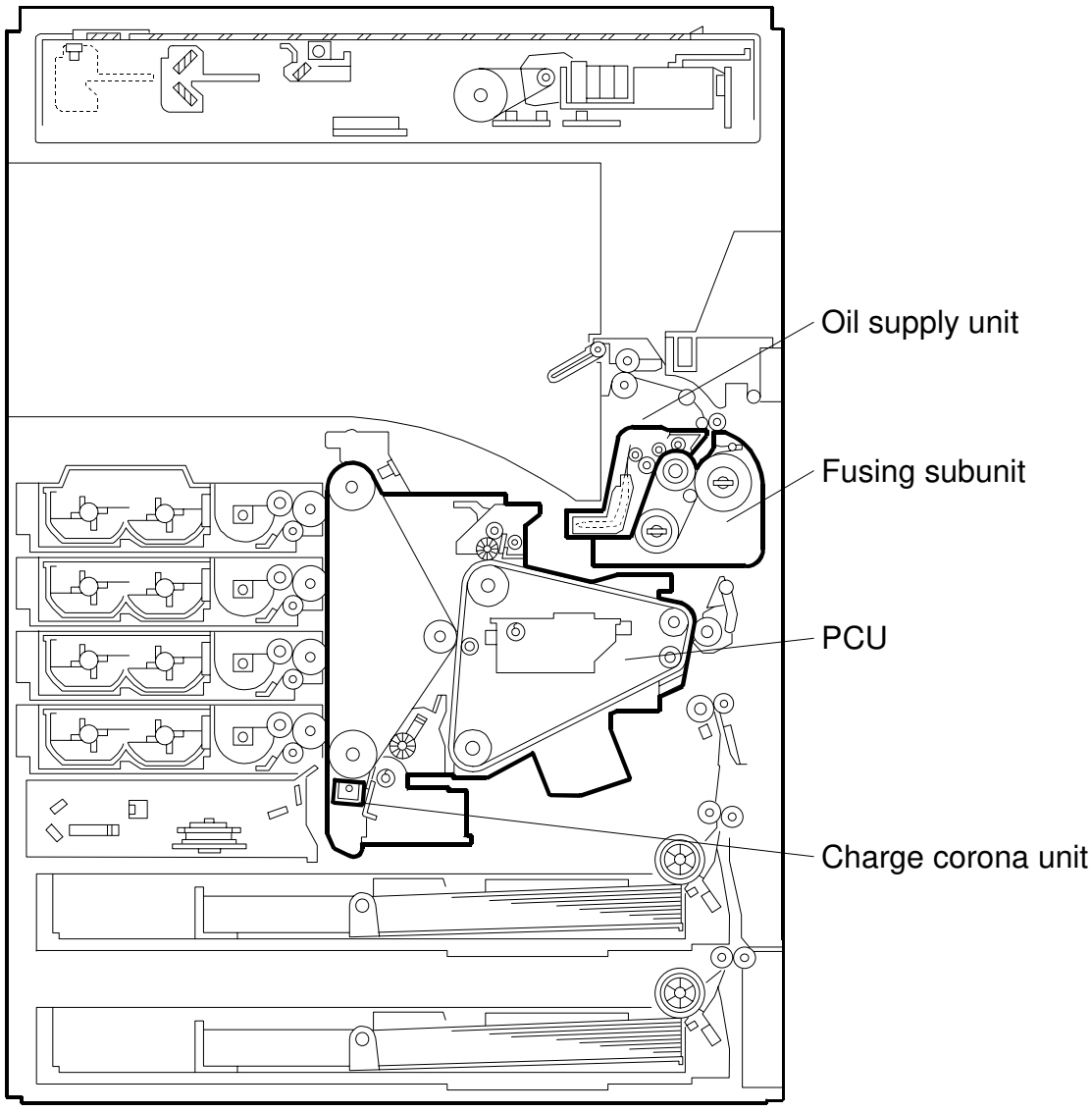
B457I201.WMF

6. Pass the connector [A] through the opening [B].
7. Install the tray heater [C] (☞ x 1).
8. Remove the oil bottle [D] and the oil bottle bracket [E] (☞ x 3).
9. Install the clamp [F].
10. Connect the cable [G] to the heater cable [H] and the PSU [I]. Then clamp the cable.
11. Reinstall the rear covers.

2. PREVENTIVE MAINTENANCE

2.1 MAIN UNIT

2.1.1 OVERVIEW



B051P112.WMF

2.1.2 PM TABLE

After replacing a part, reset the PM counter for that part (SP 7-804).

Abbreviations: Clean, **I**nspect, **O**il replenishment, **R**eplace, **E**mergency **M**aintenance

Optical System

	Prints			Developments			EM	Remarks
	70K	80K	120K	70K	120K	240K		
White plate			C					Optical cloth
1st mirror			C					Optical cloth
2nd mirror			C					Optical cloth
3rd mirror			C					Optical cloth
Front/rear rails			C					Damp/dry cloth
Exposure glass			C				C	Glass cleaner
Dust shield glass (laser optics unit)			C				C	Optical cloth and dry cloth
APS sensors			C					Dry cloth

Around the PCU

	Prints			Developments			EM	Remarks
	70K	80K	120K	50K	120K	240K		
Charge corona unit					R			Replace as whole units or individual parts (listed below).
PCU					R			
T/B waste toner bottle					R		C	Empty the bottle
ID sensor							C	Blower brush
O/B waste toner bottle				C		R	C	Empty the bottle

.Components Parts of the Charge Corona Unit

	Prints			Developments			EM	Remarks
	70K	80K	120K	50K	120K	240K		
Charge Corona Wire					R			
Charge Corona Grid					R			
Charge Corona Cleaner					R			

Development Unit

	Prints			Developments			EM	Remarks
	70K	80K	120K	60K	120K	240K		
Development unit-C				R				Refer to the PM counter for each unit (Not reclaimed at the reclamation center)
Development unit-M				R				
Development unit-Y				R				
Development unit-K					R			

Paper feed System

	Prints			Developments			EM	Remarks
	70K	80K	120K	75K	120K	240K		
Idle roller (registration)			C					Damp/dry cloth
Registration sensor			C					Damp/dry cloth
Transport guide			C					Damp/dry cloth
Feed roller (main unit)			R					
Vertical transport roller			C					Damp/dry cloth
Friction pad (main unit)			R					

Fusing Unit

	Prints			Developments			EM	Remarks
	60K	80K	120K	75K	120K	240K		
Fusing subunit			R					Replace as whole units or individual parts (listed below).
Oil supply unit	R							
Thermistor			I					
Fusing oil			O					

.Components Parts of the Fusing Sub Unit and Oil Supply Unit

	Prints			Developments			EM	Remarks
	60K	80K	120K	75K	120K	240K		
Oil supply pad	R							
Sponge roller	R							
Fusing cleaning roller	R							
Rear oil absorber			R					
Front oil absorber			R					
Front oil tank absorber			R					
Long oil tank absorber			R					
Rear oil tank absorber			R					
Fusing cover absorber			R					
Oil supply roller			R					
Oiling roller			R					
Pressure cleaning roller			R					
Fusing belt unit			R					
Pressure roller			R					
Pressure roller strippers			R					
Idle gear – 28Z/35Z			R					
Gear – 47Z			R					
Front spring plate			R					
Rear spring plate			R					

Filters

	Prints			Developments			EM	Remarks
	70K	80K	120K	75K	120K	240K		
Exhaust filters					R			
Ozone filter					R			

By-pass Tray Unit

	Prints			Developments			EM	Remarks
	70K	80K	120K	75K	120K	240K		
Feed roller			R					
Pickup roller			R					
Separation roller			R					
Friction pad							C	Damp cloth

2.2 OPTIONAL UNIT PM TABLE

Abbreviations: **C**lean, **I**nspect, **O**il replenishment, **R**eplace, **E**mergency **M**aintenance

Duplex Unit

	Prints			Developments			EM	Remarks
	70K	80K	120K	75K	120K	240K		
Idle roller (inverter)			C					Damp/dry cloth
Idle roller (vertical transport)			C					Damp/dry cloth

Auto-reverse Document Feeder

	Prints			Developments			EM	Remarks
	70K	80K	120K	75K	120K	240K		
Pickup roller		R						
Feed belt		R						
Separation roller		R						
Stamp			I					
ADF exposure glass			C				C	Damp/dry cloth
Platen cover			C				C	Damp/dry cloth

Paper Tray Unit

	Prints			Developments			EM	Remarks
	70K	80K	120K	75K	120K	240K		
Pickup roller			R					
Feed roller			R					
Separation roller			R					

Large Capacity Tray

	Prints			Developments			EM	Remarks
	70K	80K	120K	75K	120K	240K		
Pickup roller			R					
Feed roller			R					
Separation roller			R					

3. REPLACEMENT AND ADJUSTMENT

⚠CAUTION

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

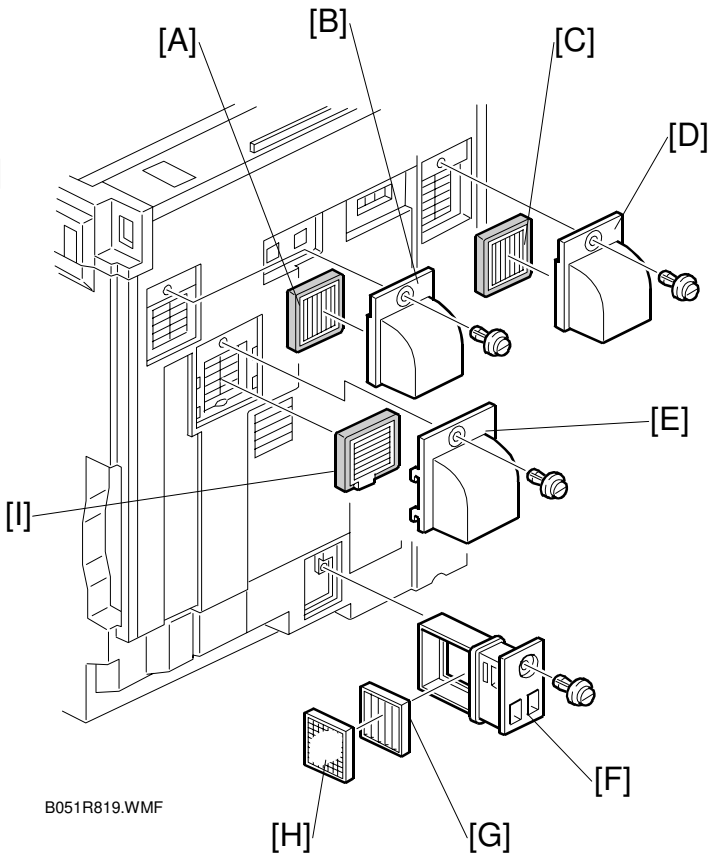
NOTE: This manual uses the following symbols.
☛ : See or Refer to : Screws : Connector : Clip ring
 : E-ring

3.1 SPECIAL TOOLS

Part Number	Description	Q'ty
A0069104	Scanner Positioning Pin (4 pcs/set)	1
N8036701	Flash Memory Card - 4MB	1
A0929503	C4 Color Test Chart (3 pcs/set)	1
C4019503	20X Magnification Scope	1

3.2 FILTERS

1. Filter covers [B, D, and E]
2. Exhaust filters [A, C, G, and I]
3. Filter holder [F]
4. Ozone filter [H]

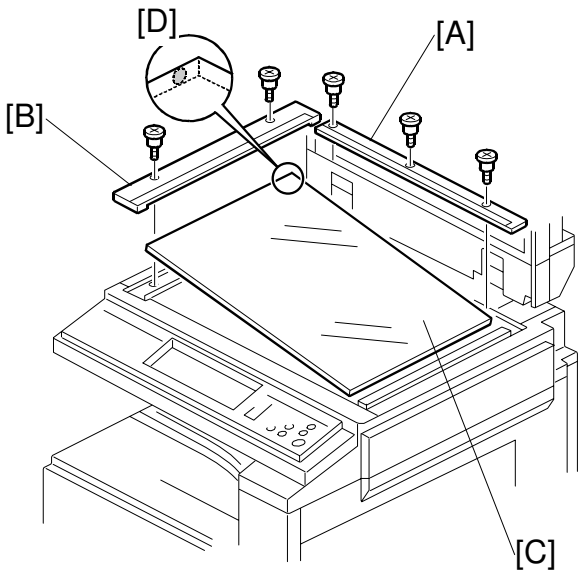


3.3 SCANNER UNIT

3.3.1 EXPOSURE GLASS

1. Rear scale [A] (☞ x 3)
2. Left scale [B] (☞ x 2)
   NOTE: After replacing the left scale, adjust the scanner white level (☛ 3.14).
3. Exposure glass [C]

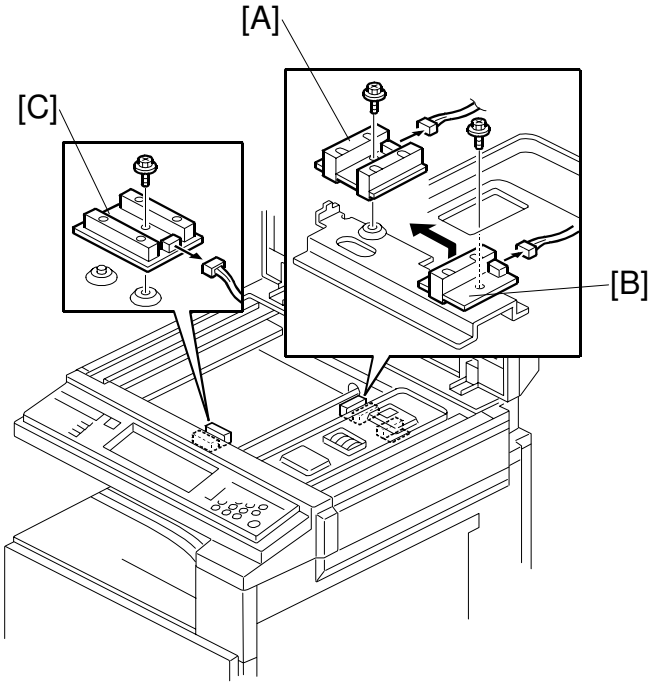
NOTE: When reassembling, position the glass marker [D] at the rear-left corner.



B051R001.WMF

3.3.2 APS SENSORS

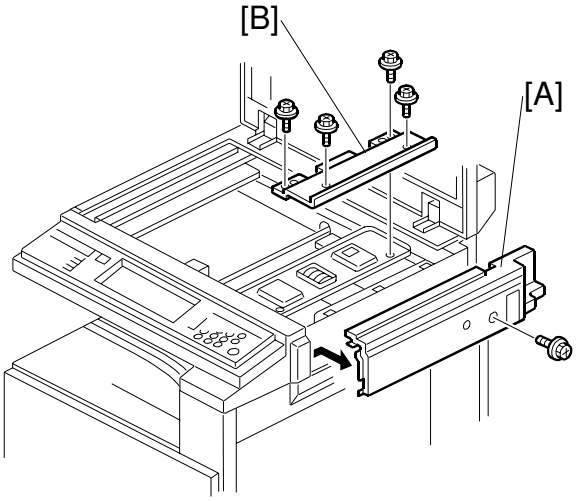
1. Exposure glass (☛ 3.3.1)
2. Original length sensor 1 [A] (☞ x 1, ☞ x 1)
3. Original length sensor 2 [B] (☞ x 1, ☞ x 1)
4. Original width sensor [C] (☞ x 1, ☞ x1)



B051R003.WMF

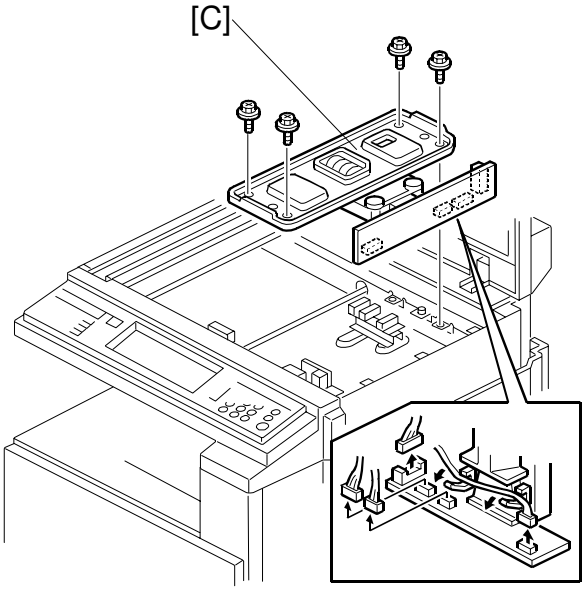
3.3.3 LENS BLOCK ASSEMBLY

1. Exposure glass (☛ 3.3.1)
2. Rear cover (☛ 3.4.2)
3. Scanner right cover [A] (☞ x 1)
4. Inner cover [B] (☞ x 4)



B051R004.WMF

5. Lens block assembly [C]
   (☞ x 4, ✋ x 4)
   NOTE: Do not remove the paint-locked screws.



B051R005.WMF

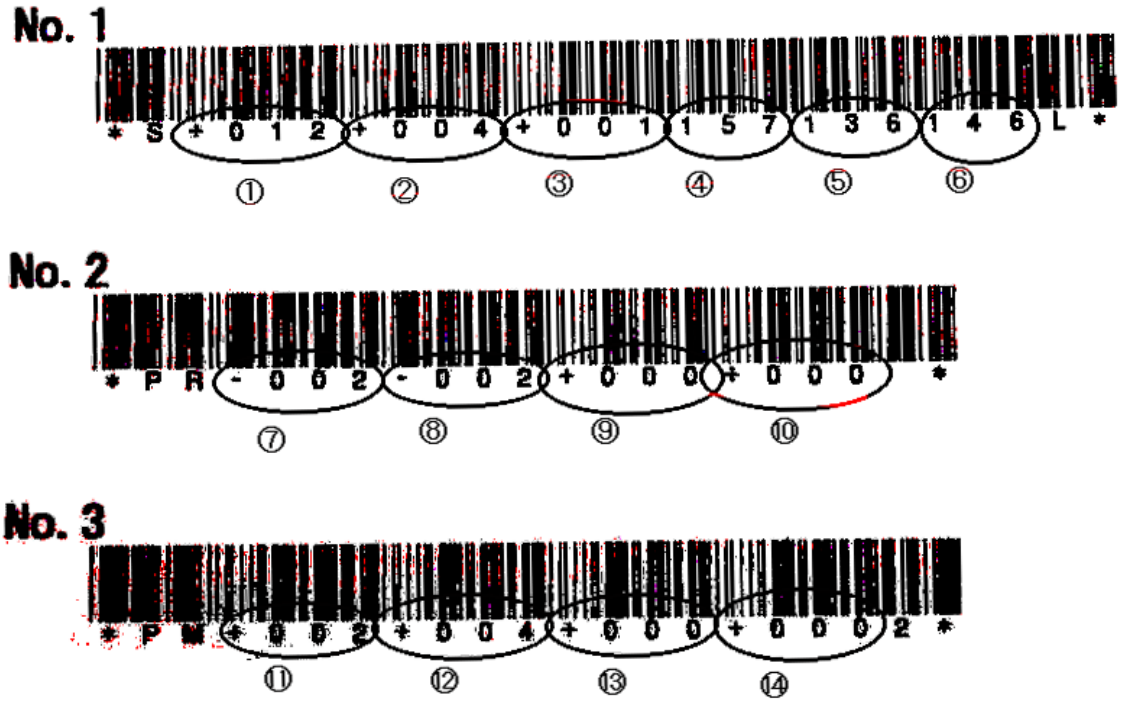
6. After reassembling, input the data in accordance with the data sheet included in the spare SBU unit (☛ SP4-540).

   Refer to the diagram on the next page.

   - Row No. 1: Numbers 1 to 6 – please ignore
   - Row No. 2: Numbers 7 to 10 – please store in the following SP modes
     7: SP 4-540-001
     8: SP 4-540-002
     9: SP 4-540-003
     10: SP 4-540-004
   - Row No. 3: Numbers 11 to 14 – please store in the following SP modes
     11: SP 4-540-021
     12: SP 4-540-022
     13: SP 4-540-023
     14: SP 4-540-024
   - Before inputting the number, check whether it is + or – (look at the data sheet), then input a +ve or –ve number accordingly.

7. Check the registrations (☛ SP4-010/011 Chapter 3, Copy adjustments)

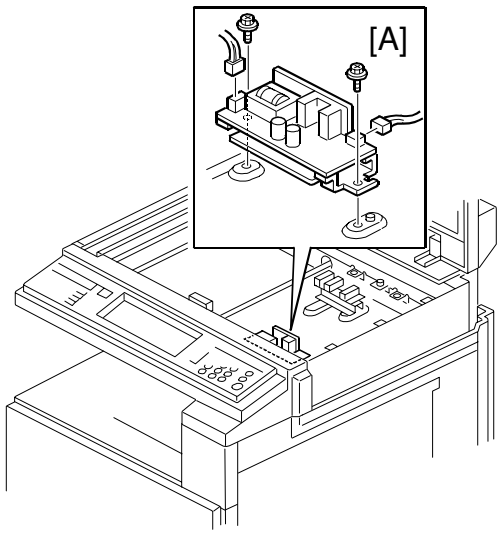
NOTE: After replacing the left scale, adjust the scanner white level (☛ 3.14).



B051S999.PCX

3.3.4 EXPOSURE LAMP STABILIZER

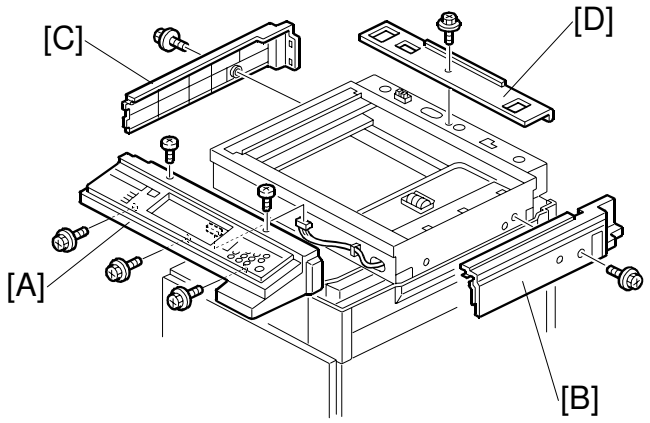
1. Lens block assembly (☛ 3.3.3)
2. Exposure lamp stabilizer [A] (☞ x 2, ☞ x 2)



B051R006.WMF

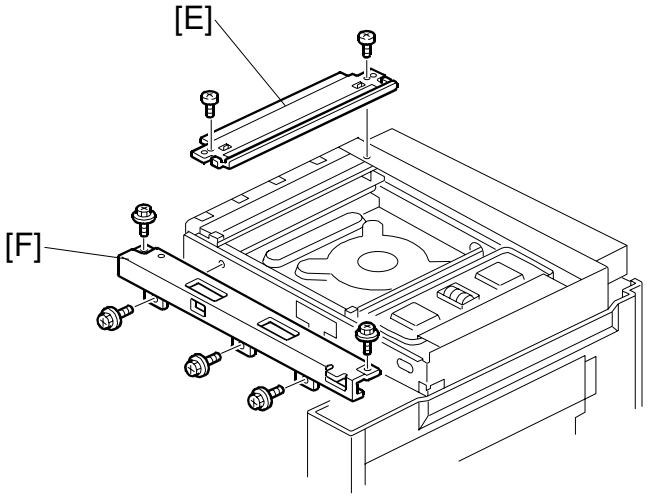
3.3.5 SCANNER LAMP

1. Exposure glass (☛ 3.3.1)
2. Rear cover (☛ 3.4.2)
3. Operation panel [A] (☞ x 5, ☞ x 1)
4. Scanner right cover [B] (☞ x 1)
5. Scanner left cover [C] (☞ x 1)
6. Scanner rear cover [D] (☞ x 1)



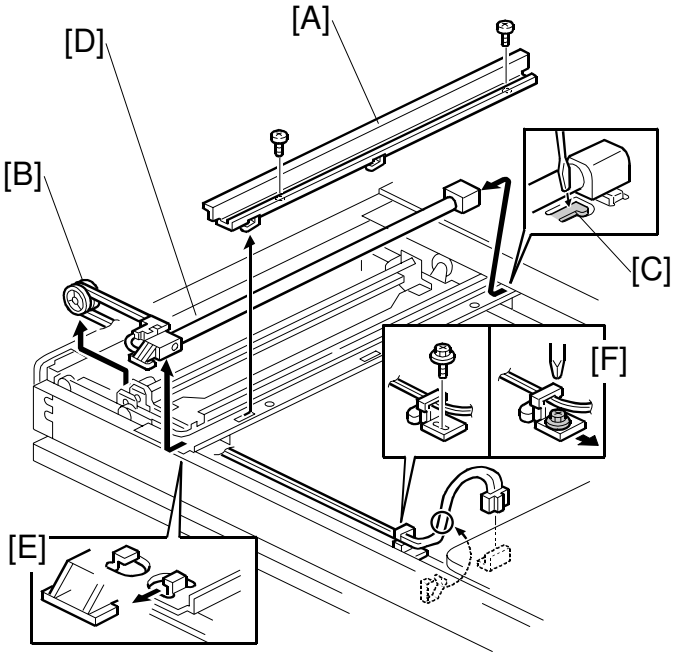
B051R002.WMF

7. Left frame [E] (☞ x 2)
8. Front frame [F] (☞ x 5)



B051R009.WMF

9. Lamp guard [A] (☞ x 2)
10. Pulley [B]
    NOTE: Use caution not to bend the pulley guides.
11. Push down the part [C], then slide out the scanner lamp.
12. Slide out the scanner lamp [D] and unhook it from the clamps [E].
    NOTE: After replacing the scanner lamp, adjust the scanner white level (☛ 3.14).



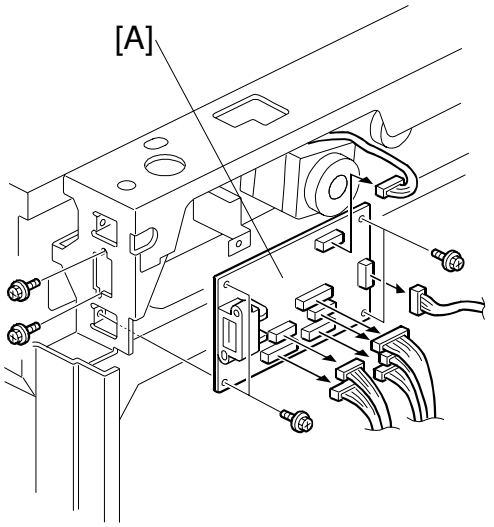
B051R012.WMF

Reassembling

1. Take up the cable slack.
   NOTE: Make sure the cable is not dangling and the wires are not crossed.
2. Adjust the cable clamp position [F] if necessary.
   NOTE: Do not open the clamp.

3.3.6 SCANNER I/O BOARD

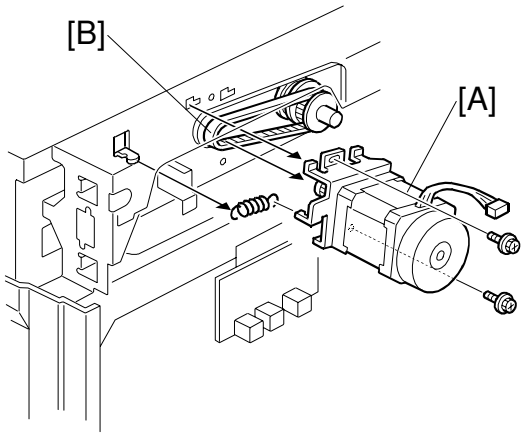
1. Scanner right cover and scanner rear cover (☛ 3.3.5)
2. Scanner I/O board [A] (x 6, x 7)



B051R007.WMF

3.3.7 SCANNER MOTOR

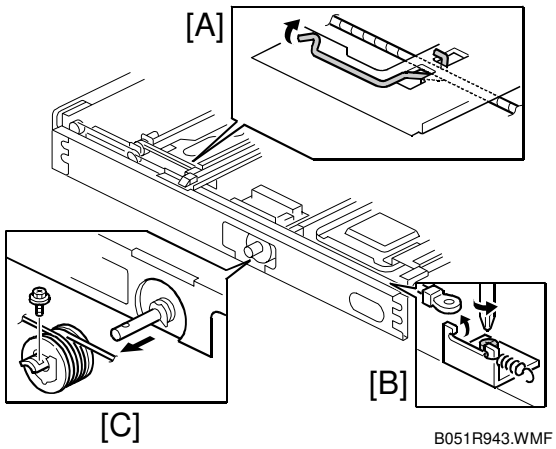
1. Scanner I/O board (☛ 3.3.6)
2. Scanner motor [A] (x 2, Spring x 1)
3. Timing belt [B]



B051R008.WMF

3.3.8 FRONT SCANNER WIRE

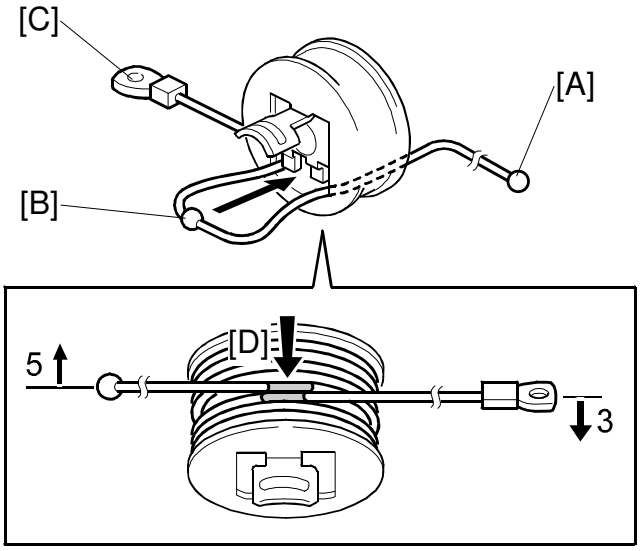
1. Front frame (☛ 3.3.5)
2. To make reassembly easy, slide the first scanner to the right (☛ Reassembling the Front Scanner Wire).
3. Front scanner wire clamp [A]
4. Front scanner wire bracket [B] (x 1)
5. Front scanner wire and scanner drive pulley [C] (x 1)



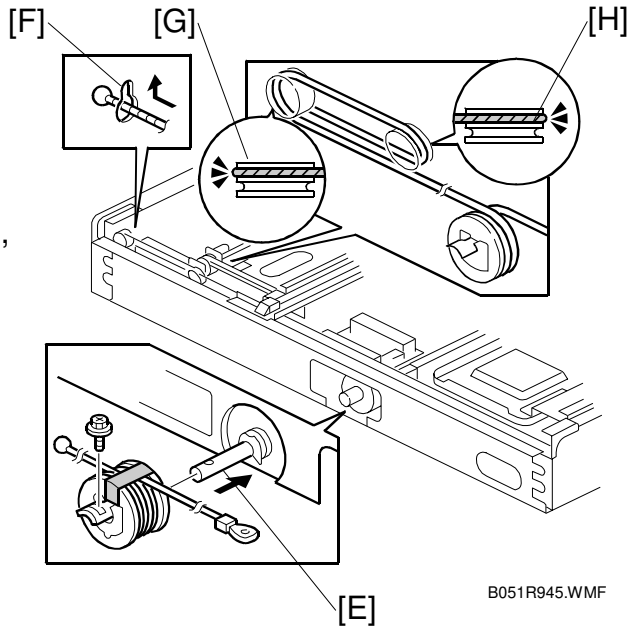
B051R943.WMF

Reassembling the Front Scanner Wire

1. Pass the end with the ball [A] through the left square hole from the front.
2. Position the center ball [B] in the middle of the notch, as shown by the arrow.
3. Pass the ball end [A] through the notch on the right.
4. Wind the end with the ring [C] clockwise three times; wind the ball end [A] counterclockwise five times.
   NOTE: The two red marks [D] should meet when you have done this.
5. Stick the wire to the pulley with tape, so you can easily handle the pulley and wire during installation.
6. Install the drive pulley on the shaft [E].
   NOTE: Do not screw the pulley onto the shaft yet.
7. Insert the ball end into the slit [F], with the end going via the rear track of the left pulley [G] and the rear track of the movable pulley [H].

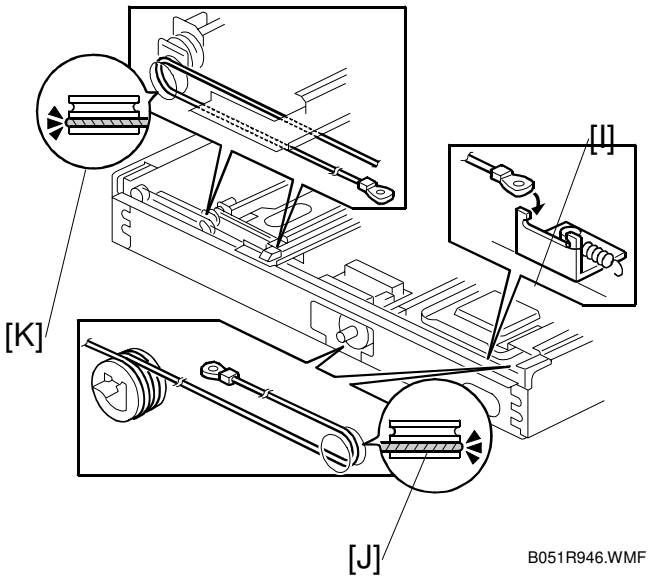


B051R944.WMF

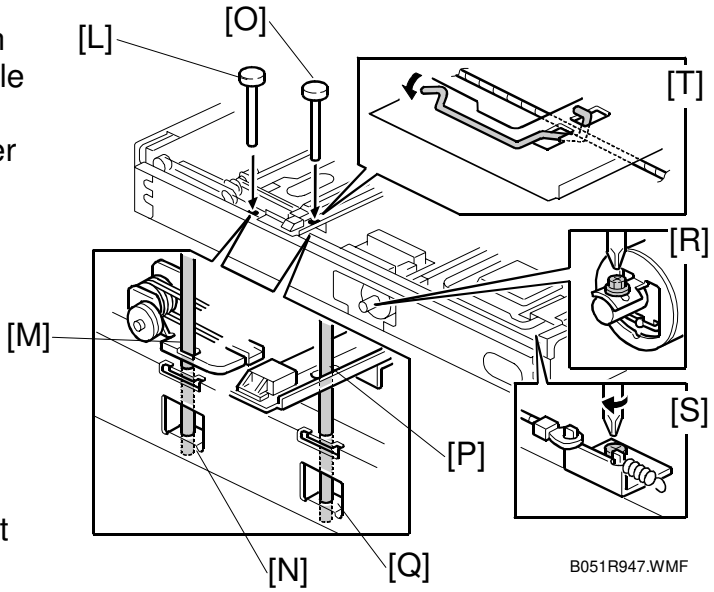


B051R945.WMF

8. Hook the ring end onto the front scanner wire bracket [I], with the end going via the front track of the right pulley [J] and the front track of the movable pulley [K].
   NOTE: Do not screw the scanner wire bracket in place yet.
9. Remove the tape from the drive pulley.



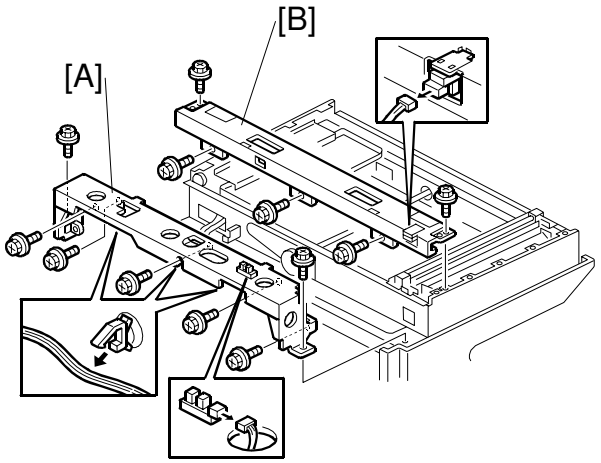
10. Insert a scanner positioning pin [L] through the 2nd carriage hole [M] and the left holes [N] in the front rail. Insert another scanner positioning pin [O] through the 1st carriage hole [P] and the right holes in the front rail [Q].
11. Insert two more scanner positioning pins through the holes in the rear rail.
12. Screw the drive pulley to the shaft [R].
13. Screw the scanner wire bracket to the front rail [S].
14. Install the scanner wire clamp [T].
15. Pull out the positioning pins.



NOTE: 1) After removing the positioning pins, make sure the 1st and 2nd carriages move smoothly. If they do not, repeat steps 10 through 15.
2) After replacing the carriage, adjust the scanner white level (☛ 3.14).

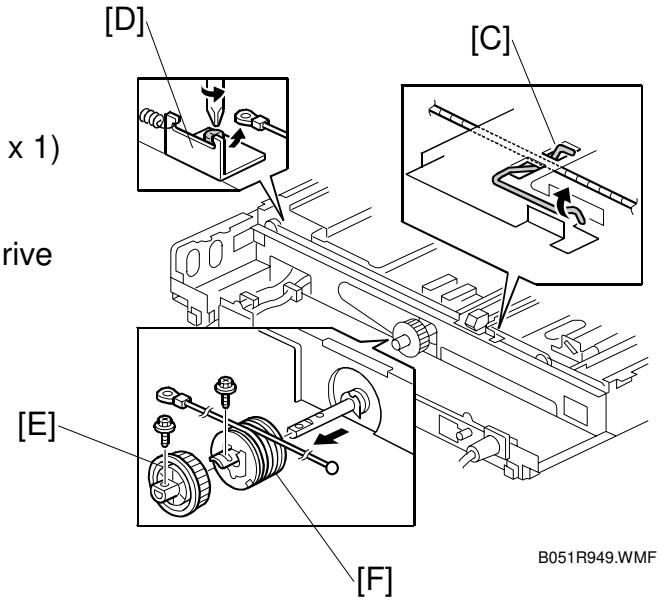
3.3.9 REAR SCANNER WIRE

1. Exposure glass (☛ 3.3.1)
2. Scanner motor (☛ 3.3.7)
3. Left frame (☛ 3.3.5)
4. Rear frame [A] (x 7, x 1)
5. Rear rail frame [B] (x 5, x 1)
6. To make reassembly easy, slide to the right (☛ Reassembling the Rear Scanner Wire).



B051R010.WMF

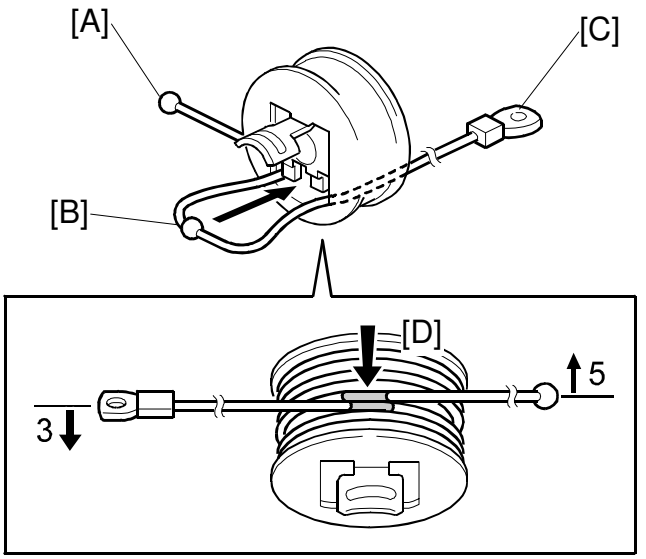
7. Rear scanner wire clamp [C]
8. Rear scanner wire bracket [D] (x 1)
9. Scanner motor gear [E] (x 1)
10. Rear scanner wire and scanner drive pulley [F] (x 1)



B051R949.WMF

Reassembling the Rear Scanner Wire

1. Pass the end with the ball [A] through the right square hole from the front.
2. Position the center ball [B] in the middle of the notch, as shown by the arrow.
3. Pass the ball end [A] through the drive pulley notch.
4. Wind the end with the ring [C] counterclockwise five times; wind the ball end clockwise three times.
   NOTE: The two red marks [D] should meet when you have done this.



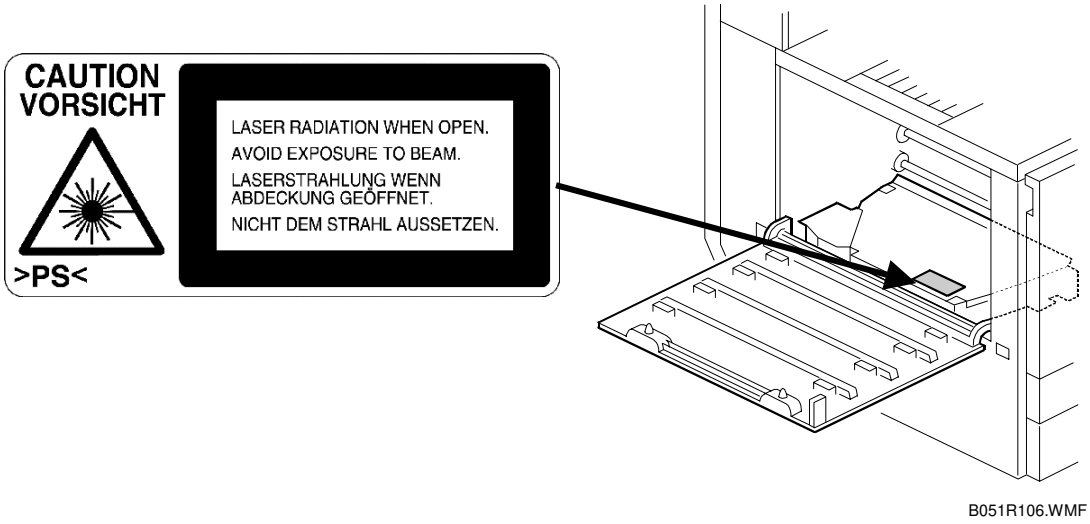
B051R940.WMF

5. Stick the wire to the pulley with tape, so you can easily handle the pulley and wire during installation.
6. Install the drive pulley on the shaft.
   NOTE: Do not screw the pulley onto the shaft yet.
7. Install the wire.
   NOTE: The winding pattern is a mirror image of that of the front scanner wire.
8. Perform steps 10 through 15 in “Reassembling the Front Scanner Wire”.

3.4 LASER UNIT

⚠WARNING
Turn off the main switch and unplug the machine before beginning any of the procedures in this section. Laser beams can cause serious eye injury.

3.4.1 CAUTION DECAL LOCATION

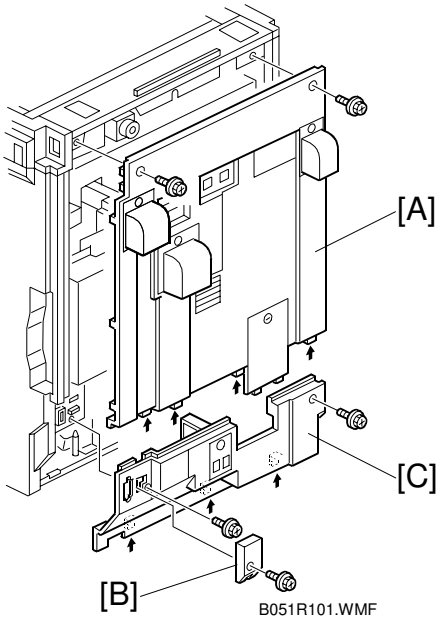


B051R106.WMF

⚠DANGER
Turn off the main switch and disconnect the power plug from the power outlet before beginning any disassembly or adjustment of the laser unit. This printer uses a class-1 laser beam with a wavelength of 650 nm and an output of 7 mW. The laser can cause serious eye injury.

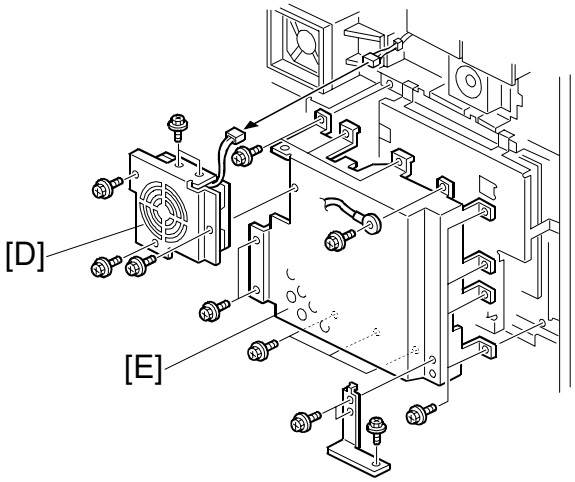
3.4.2 LASER UNIT

1. Rear cover [A] (x 2)
2. Connector cover [B] (x 1)
3. Lower rear cover [C] (x 2)



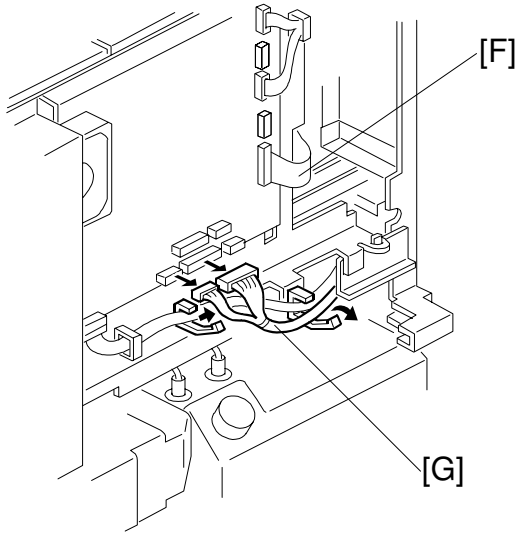
B051R101.WMF

4. Fan [D] (x 5)
5. BICU cover [E] (x 11)



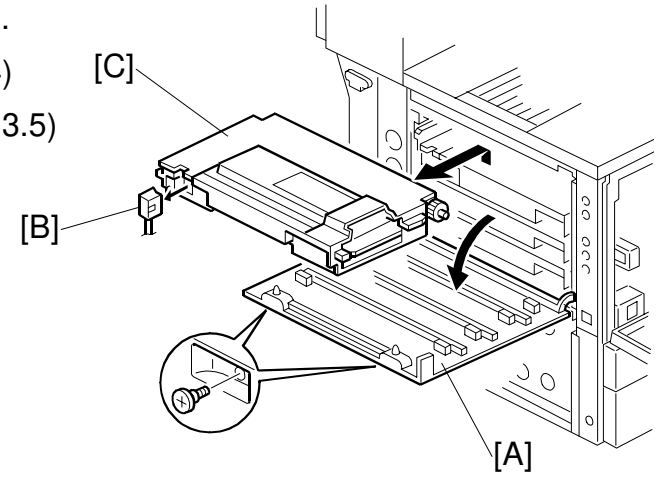
B051R924.WMF

6. Flat cable [F]
7. LD unit cables [G] (x 2)



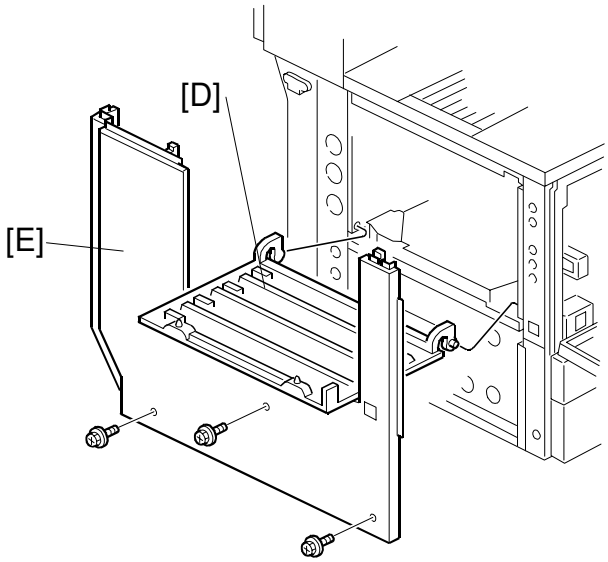
B051R102.WMF

8. Open the left cover [A] (x 2).
9. ID chip connectors [B] (x 4)
10. Development units [C] x 4 (☛ 3.5)



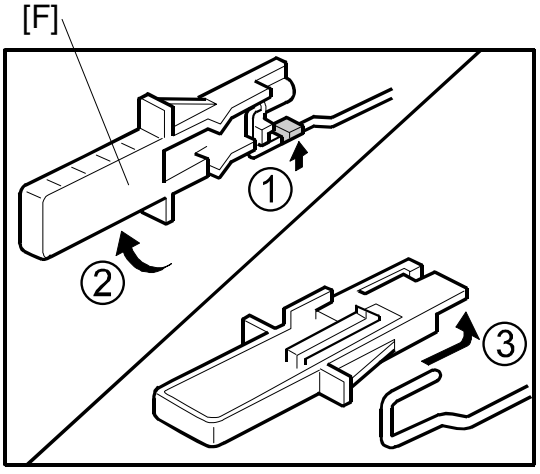
B051R103.WMF

11. Left cover [D]
12. Lower left cover [E] (x 3)



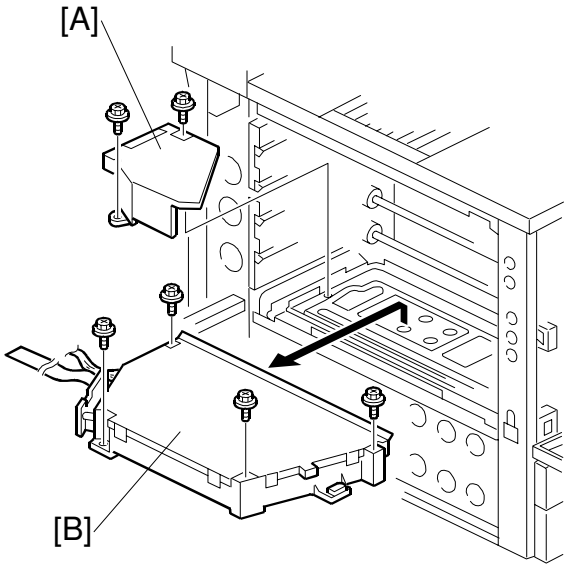
B051R104.WMF

13. Open the front cover.
14. Dust shield glass cleaner lever [F]
    NOTE: The dust shield glass cleaner lever is the blue lever at the left side of the charge corona unit (☛ 3.6.3).



B051R909.WMF

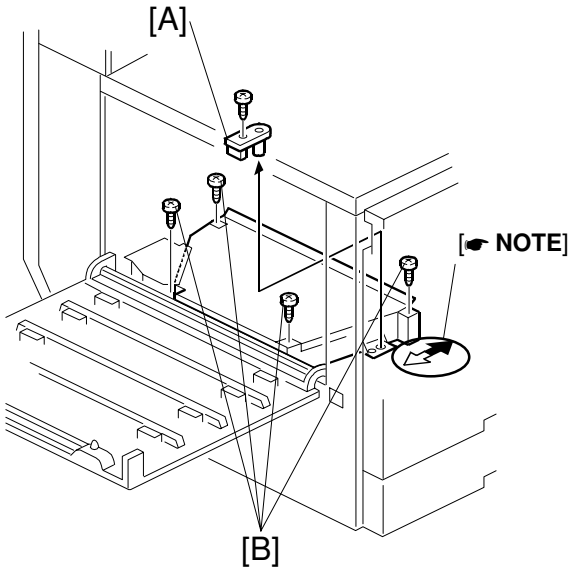
15. LD cover [A] (☞ x 2)
16. Laser unit [B] (☞ x 5, Flat cable x 1)
    NOTE: When reassembling, connect the flat cable with the blue side down.



B051R105.WMF

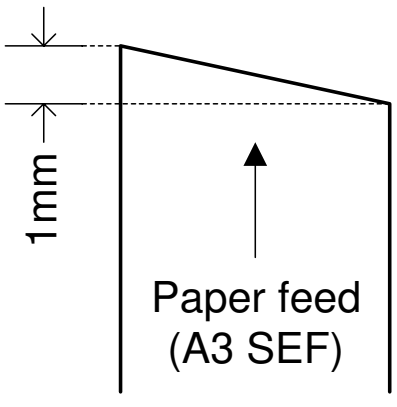
Adjusting for Image Skew

1. Positioning pin [A] (☞ x 1)
2. Loosen ☞ (x 4) [B].
3. Adjust the position of the laser optics housing unit (☛ Adjustment).
4. Fasten ☞ (x 4) [B].
   NOTE: After changing the position of the laser optics housing unit, do not reinstall the positioning pin. Keep the pin in a safe place.



B051R107.WMF

NOTE: When the image skews as shown on the right, move the unit 1 mm in the direction of the black arrow as shown in the diagram **above and to the right**.



B051R901.WMF

D-Phase Adjustment

This adjustment corrects the difference in density on the left and right sides of the paper. The data sheet (distributed with the laser unit) is necessary for this adjustment. After replacing the laser unit, do the following adjustment.

NOTE: 1) If the D-phase adjustment is not made, a difference in the density may be seen. This difference can be conspicuous when the gray scale in the Color Chart C-4 is copied or when an original is repeatedly copied.
2) The D-phase adjustment is necessary whenever a difference in the density is seen. Keep the data sheet inside the front cover for future use.

1. Print out the test pattern with SP5-955-6 (☛ 5.1.3).

2. Check if horizontal black stripes can be seen.
   a) If stripes cannot be seen (Figure 2), the D-phase adjustment is not required.
   b) If stripes can be seen (Figure 1), the D-phase adjustment is required. Go on to the next step.

3. See the value of "Mag. Shift Error: LD1-2" below the bar code on the data sheet, and find the range in Table 1 which includes the value.

4. Find the corresponding values of "Adjustment" in Table 1, and input them in SP2-951-1 and SP2-951-2 respectively.

   For example, when the value of "Mag. Shift Error: LD1-2" on the data sheet is "–4.0", enter "3" in SP2-951-1 and enter "0" in SP2-951-2.

5. Print out the test pattern with SP5-955-6.

6. Check if vertical black stripes can be seen.

Feed direction ➡

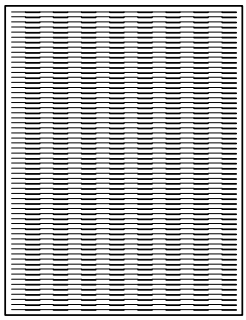


Figure 1

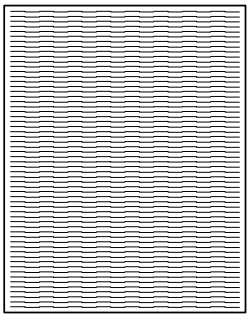


Figure 2

B051R902.WMF

Mag. Shift Error: LD1-2	Adjustment	
	SP2-951-1	SP2-951-2
–11.8 ~ –10.4	8	0
–10.3 ~ –9.0	7	0
–8.9 ~ –7.6	6	0
–7.5 ~ –6.2	5	0
–6.1 ~ –4.8	4	0
–4.7 ~ –3.4	3	0
–3.3 ~ –2.0	2	0
–1.9 ~ –1.0	1	0
–0.9 ~ 1.0	0	0
1.1 ~ 2.0	0	1
2.1 ~ 3.4	0	2
3.5 ~ 4.8	0	3
4.9 ~ 6.2	0	4
6.3 ~ 7.6	0	5
7.7 ~ 9.0	0	6
9.1 ~ 10.4	0	7
10.5 ~ 11.8	0	8

Table 1

Laser Beam Pitch Adjustment

1. Print out the test pattern with SP5-955-1, then select pattern 15 (☛ 5.1.3).
2. Check if vertical black stripes can be seen.
   a) If stripes cannot be seen (Figure 2), laser beam pitch adjustment is not required.
   b) If stripes can be seen (Figure 1), laser beam pitch adjustment is required. Go on to the next step.

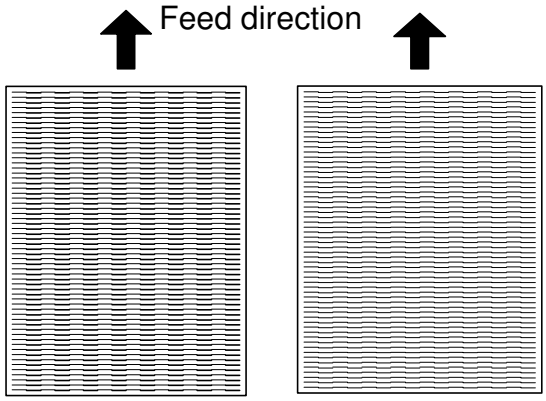
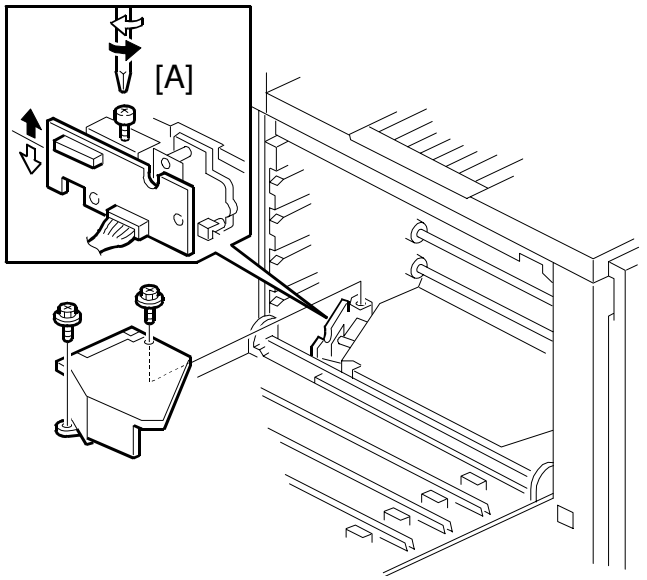


Figure 1 Figure 2

B051R902.WMF

3. To adjust the laser beam pitch, tighten or loosen the screw [A] on the LD unit holder.
4. Print out the test pattern with SP5-955-1.
5. Repeat steps 2 through 4 until the black stripes disappear (Figure 2).



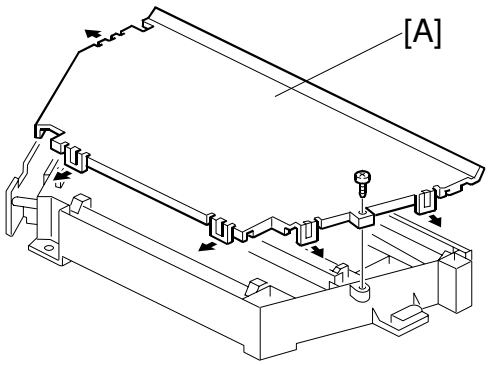
B051R820.WMF

3.4.3 POLYGONAL MIRROR MOTOR AND LSD

⚠WARNING

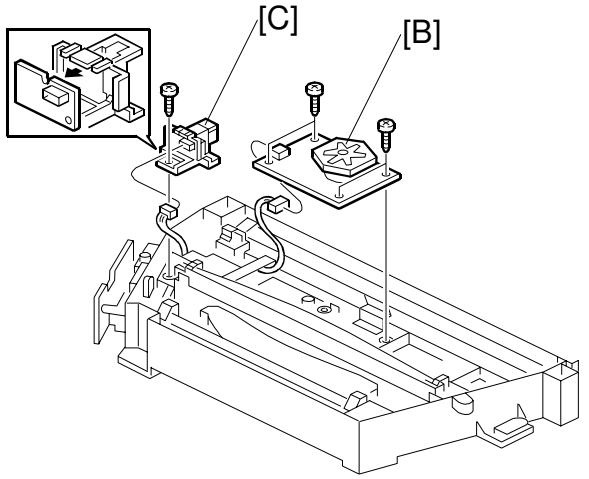
Do not touch any edges of the polygon mirror, spring, or bracket. These edges can cause serious injury.

1. Development units, LD cover (☛ 3.4.2)
2. Cover [A] (🔩 x 1)
   NOTE: Before removing the cover, clean the cover to prevent toner from entering into the unit.



B051R904.WMF

3. Polygonal mirror motor [B]
   (🔌 x 1, 🔩 x 4)
   NOTE: Do not touch the mirror surface.
4. Synch. detection board (LSD) [C]
   (🔌 x 1, 🔩 x 1)



B051R905.WMF

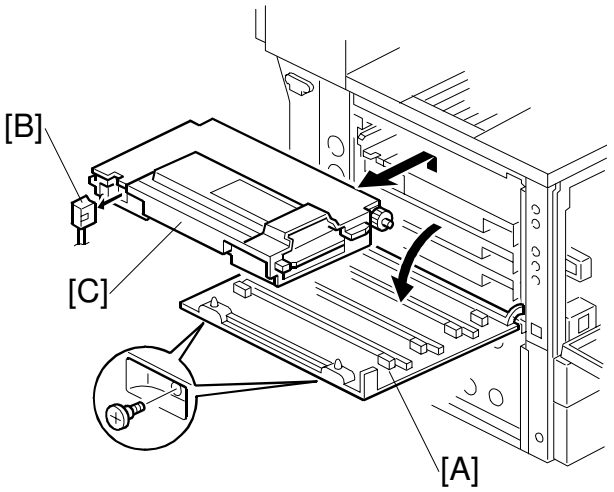
3.5 DEVELOPMENT UNIT

⚠CAUTION
Do not touch the development unit sleeves or ID chip terminals.

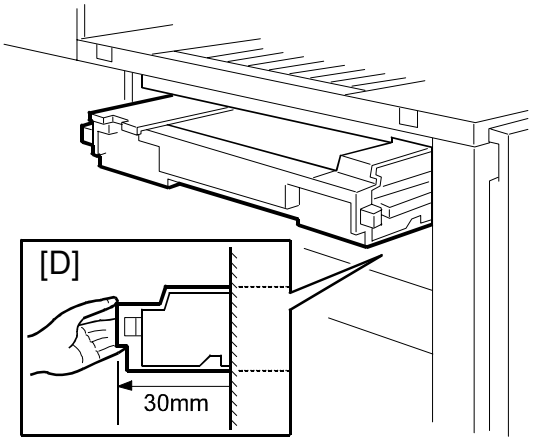
1. Open the left cover [A] (🔩 x 2)
2. ID chip connector [B]
3. Lift up the development unit [C], and pull it out of the machine.

NOTE: Remove the units in the order K, Y, C, M. For example, before removing the M unit, remove the K, Y, and C units first.

4. Peel off the toner cartridge seal [D].
5. Take out the toner cartridge from the new development unit.
6. Shake the toner cartridge well, as shown.
   NOTE: Hold the center of the cartridge, at the other side from the toner shutter, and shake it about 10 times.
7. Reinstall the toner cartridge in the development unit.
8. Shake the development unit well.
9. Tilt the unit about 90 degrees, and shake it about 10 times.
10. Install the development unit to the machine.
    NOTE: A white line or band may appear on one end of the paper if a development is incorrectly installed. To correct this, pull out the development unit partially (about 30 mm) [D] and slowly reinstall it.



B051R103.WMF

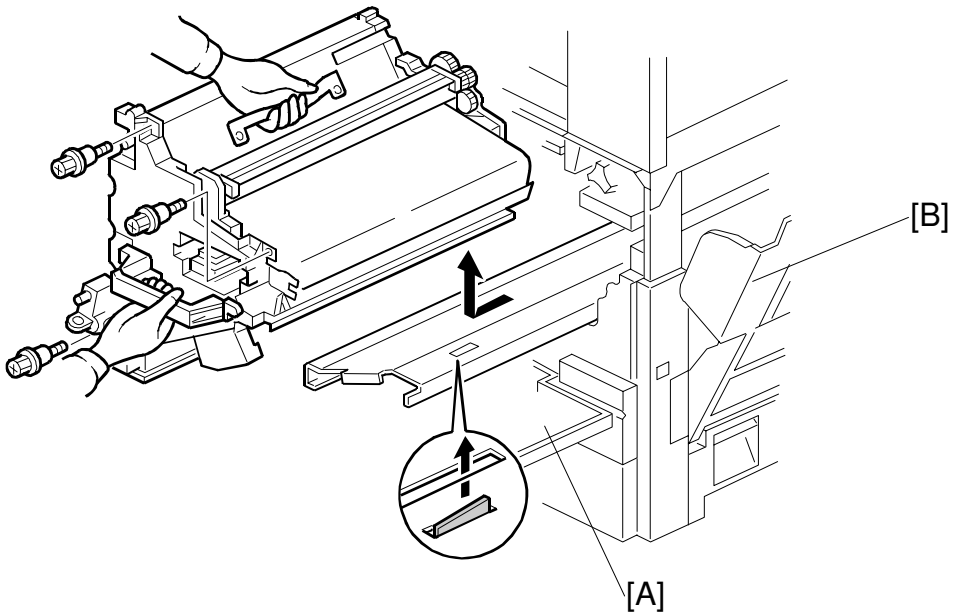


B051I407.WMF

3.6 PHOTOCONDUCTOR UNIT (PCU)

3.6.1 PCU ASSEMBLY

NOTE: 1) Before replacing any of the parts or consumables in this section, cover the floor with cloth or some sheets of paper.
2) Never tilt the unit. The toner may come out of the unit.
3) When handling the unit, grasp the brown (front) and green (top) grips. Never touch the OPC (left) or transfer (right) belts.
4) After removing the photoconductor unit, cover it with a light-proof sheet. Keep it in a dark place.

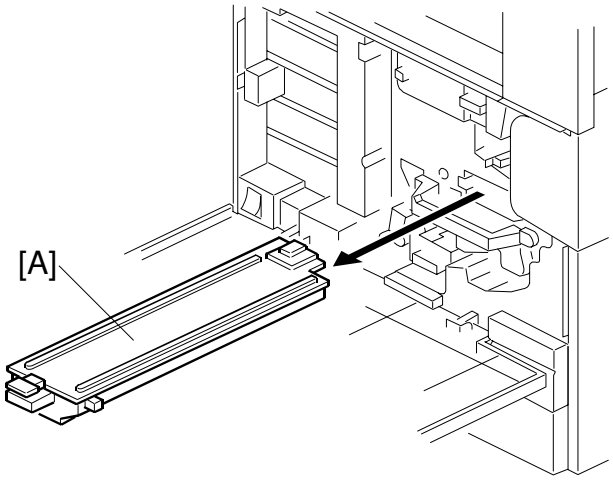


B051R210.WMF

1. Open the front cover [A].
2. Open the right cover [B].
3. Pull the unit out of the machine (x 3).
4. Grasp the brown and green grips.
5. Lift the unit and remove it.

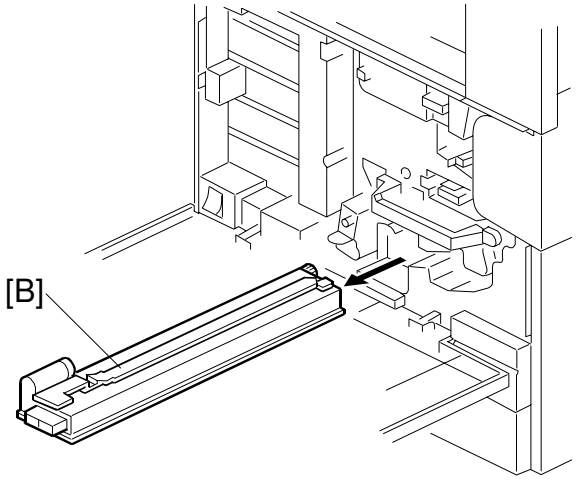
3.6.2 WASTE TONER BOTTLES

1. T/B waste toner bottle [A]



B051R205.WMF

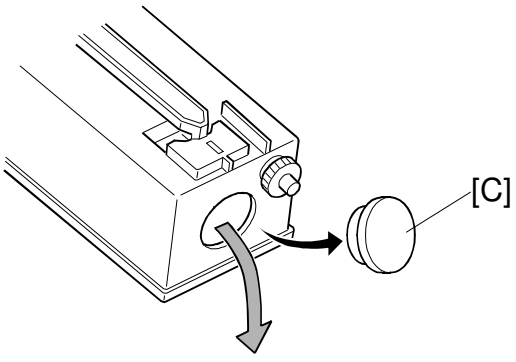
2. O/B waste toner bottle [B]
   NOTE: There is much more O/B waste toner than T/B waste toner. Dispose of the O/B waste toner whenever you work on the machine.



B051R204.WMF

Toner Disposal

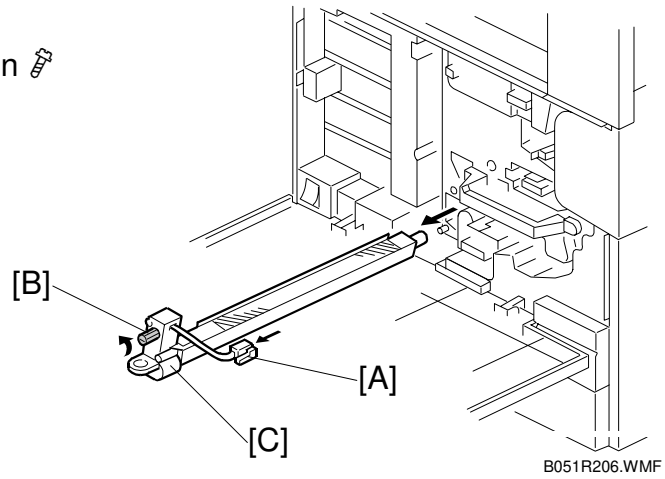
1) Remove the cap [C].
2) Dispose of the toner according to local regulations.



B051R212.WMF

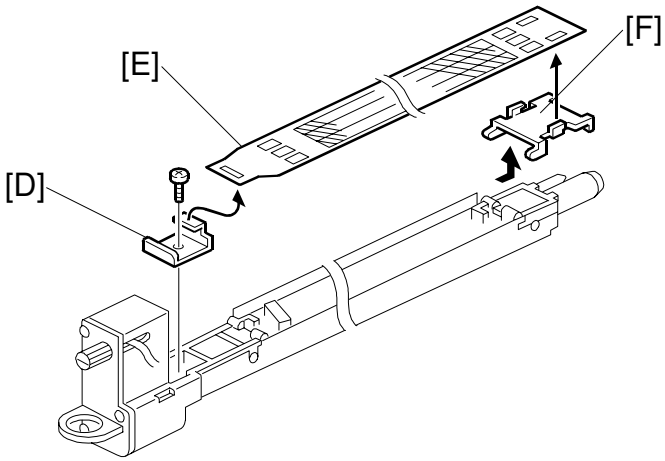
3.6.3 CHARGE CORONA UNIT, GRID, WIRE, AND CLEANER

1. Modular cable [A]
2. Charge corona unit [C] (Loosen [B], x 1)



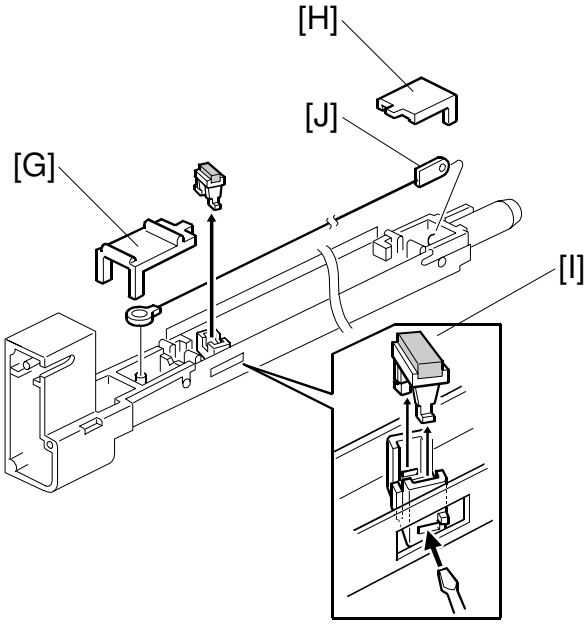
B051R206.WMF

3. Front bracket (x 1) [D]
4. Grid [E]
5. Rear bracket [F]



B051R207.WMF

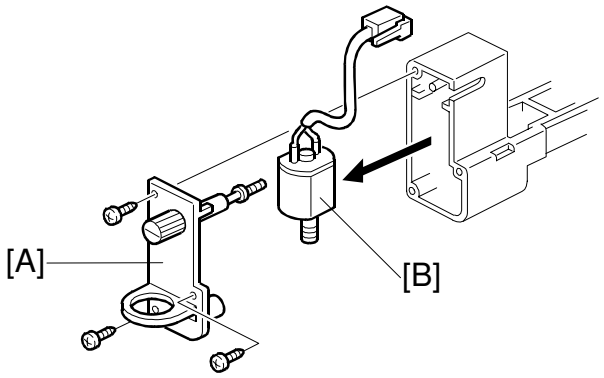
6. Front wire cover [G]
7. Rear wire cover [H]
8. Wire cleaner [I]
9. Unhook the corona wire [J].



B051R209.WMF

3.6.4 CHARGE CORONA WIRE CLEANER MOTOR

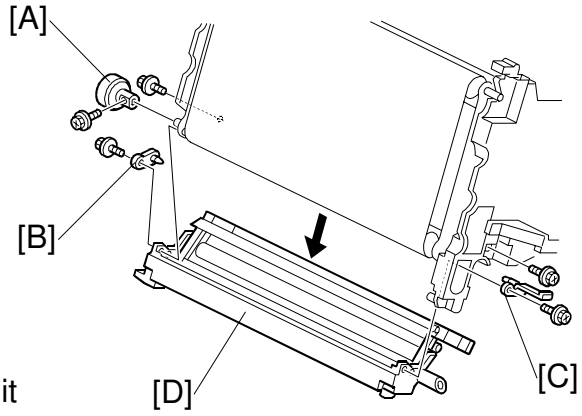
1. Charge corona unit (☛ 3.6.3)
2. Front cover [A] (☞ x 3)
3. Motor [B]



B051R208.WMF

3.6.5 OPC BELT CLEANING UNIT

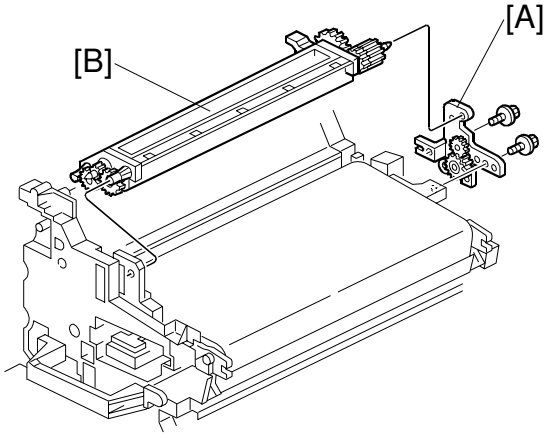
1. O/B waste toner bottle (☛ 3.6.2)
2. Photoconductor unit (☛ 3.6.1)
3. Charge corona unit (☛ 3.6.3)
4. Drive gear [A] (☞ x 1)
5. Rear brace [B] (☞ x 1)
6. Front brace [C] (☞ x 1)
7. OPC belt cleaning unit [D] (☞ x 2)
   NOTE: Hold up the photoconductor unit while removing the OPC belt cleaning unit.



B051R915.WMF

3.6.6 IMAGE TRANSFER BELT CLEANING UNIT

1. Photoconductor unit (☛ 3.6.1)
2. Bracket [A] (☞ x 2)
3. Image transfer belt cleaning unit [B]

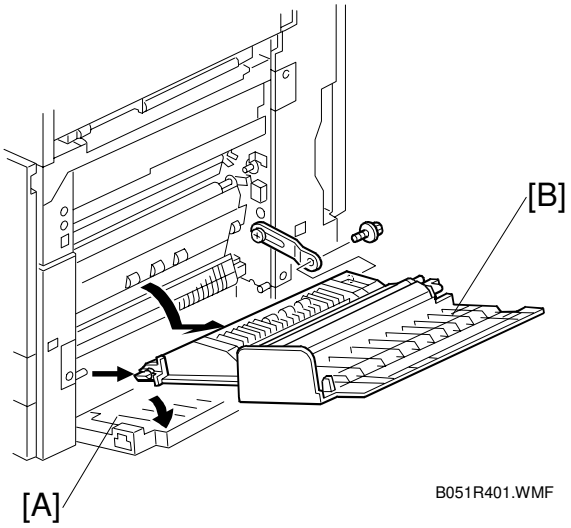


B051R919.WMF

3.7 PAPER TRANSFER UNIT

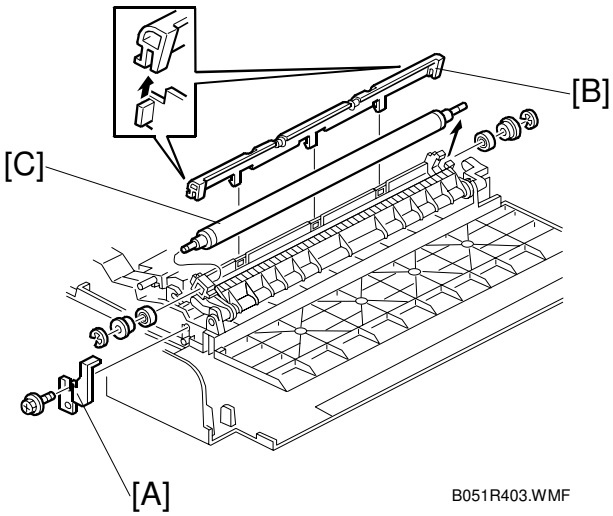
3.7.1 VERTICAL TRANSPORT UNIT

1. Open the right lower cover [A].
2. Right cover [B] (x 1)



3.7.2 TRANSFER ROLLER

1. Brace [A] (x 1)
2. Guide [B]
   NOTE: To remove the screws, turn the roller unit on its pivot.
3. Transfer roller [C]
   (x 2, Bushing x 2, Bearing x 2)



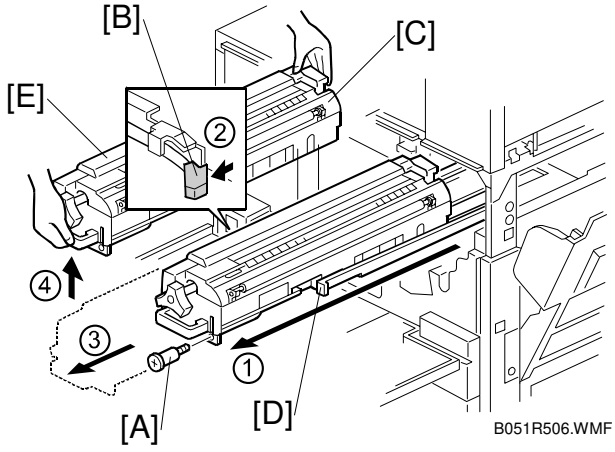
3.8 FUSING/PAPER EXIT

⚠CAUTION
Turn off the main switch and wait until the fusing unit cools down before beginning any of the procedures in this section. The fusing unit can cause serious burns.

3.8.1 FUSING UNIT

NOTE: 1) After removing the fusing unit, see if oil drips from the exit of the oil pipe.
2) Do not turn the main power on with the fusing unit out of the machine if an oil end condition exists. This will clear the oil end counter, and the machine incorrectly detects oil.

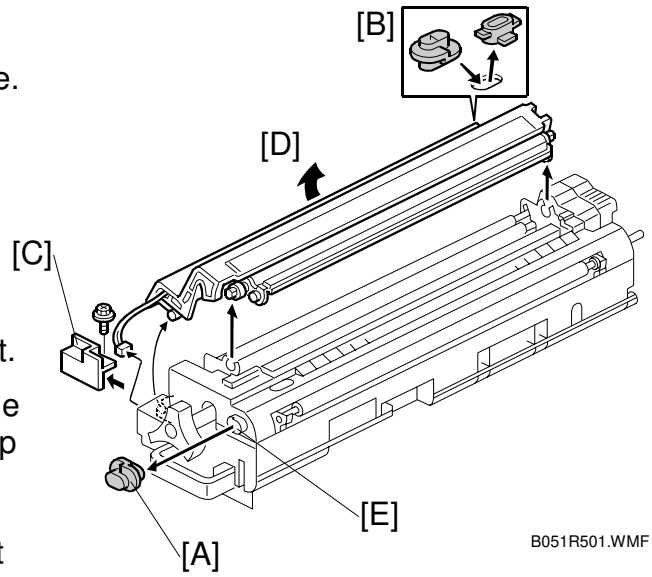
1. Remove the screw [A], and pull out the unit out of the machine.
2. Unhook the bottom stopper [B], and grasp the rear end [C] of the unit.
3. Slide the unit to the end of the base plate [D].
4. Release the unit [E].



3.8.2 OIL SUPPLY UNIT

1. Fusing unit (☛ 3.8.1)
2. Put the fusing unit on a level place.
3. Remove the cap [A] from the fusing unit cover, and put it in the oil supply opening [B].
4. Connector cover [C] (🔩 x 1)
5. Oil supply unit [D] (✋ x 1)
   NOTE: Do not touch the oiling felt.

NOTE: When reassembling, install the oil supply unit, remove the cap from the oil supply opening, wipe the cap and the cap holder [E] with waste, and put it on the holder.

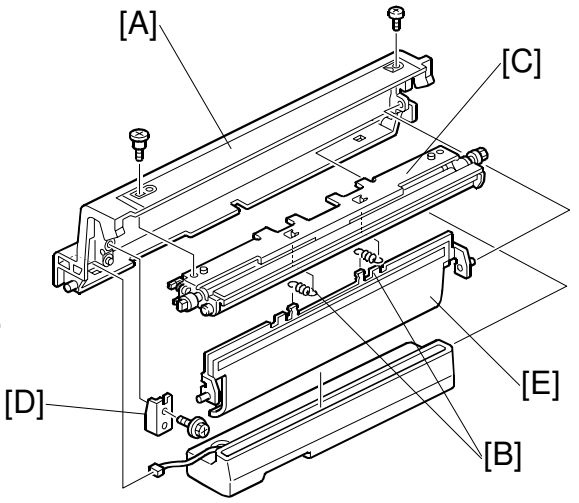


3.8.3 OIL SUPPLY PAD

CAUTION: Empty silicone oil out of the oil supply unit into a vessel or container before beginning the following steps.

1. Oil supply unit [A] (☛ 3.8.2)
2. Springs [B] x 2
3. Cleaning roller assembly [C] (☞ x 1, Shoulder screw x 1)
4. Stay [D] (☞ x 1)
5. Slide the pad [E] and pull it out.

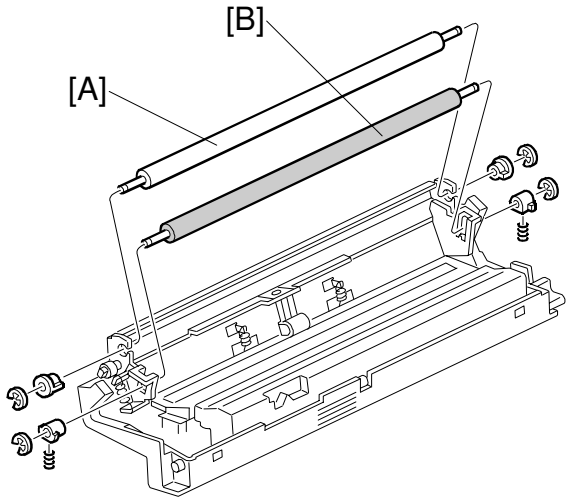
NOTE: If you cannot put the springs in the places, remove the cleaning roller (☛ 3.8.4).



B051R503.WMF

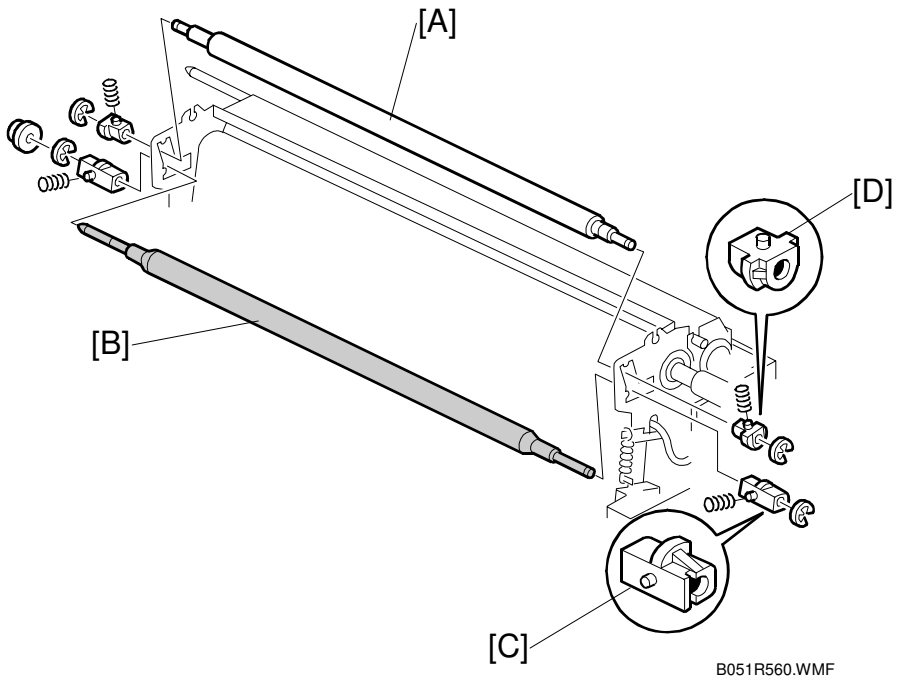
3.8.4 CLEANING ROLLER AND FUSING SPONGE ROLLER

1. Oil supply unit (☛ 3.8.2)
2. Cleaning roller [A] (Bushing x 2, ℂ x 2)
3. Fusing sponge roller [B] (Bushing x 2, ℂ x 2, Spring x 2)



B051R504.WMF

3.8.5 OILING ROLLER AND OIL SUPPLY ROLLER

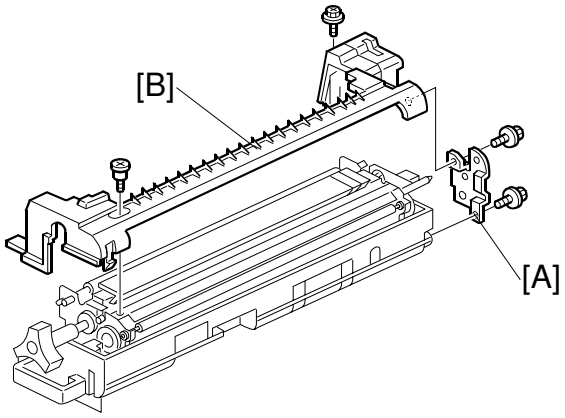


1. Oil supply unit (☛ 3.8.2)
2. Upper cover (☛ 3.8.6)
3. Oil supply roller [A] (Spring x 2, Bushing x 2)
4. Oiling roller [B] (Spring x 2, Bushing x 2)

NOTE: The bushings on the oiling roller [C] are different from those on the oil supply roller [D].

3.8.6 FUSING LAMPS

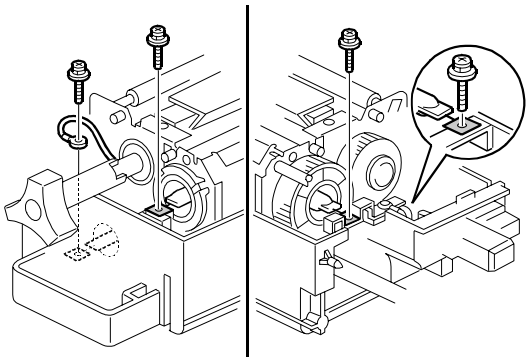
1. Oil supply unit (☛ 3.8.2)
2. Gear bracket [A] (☞ x 2)
3. Upper cover [B] (☞ x 1, shoulder screw x 1)



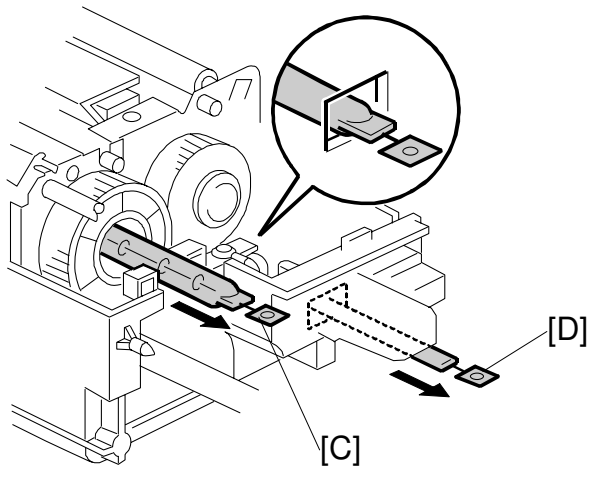
B051R510.WMF

4. Pull out the lamp (350W) [C] (☞ x 2).
5. Pull out the lamp (770W) [D] (☞ x 2, Cable x 1).

NOTE: "350W" and "770W" are printed on the respective terminals.



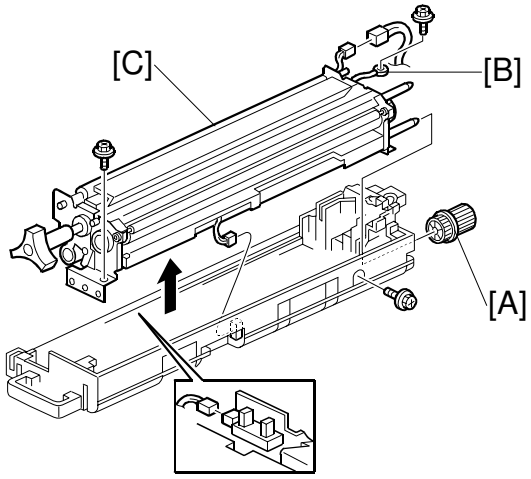
B051R954.WMF



B051R950.WMF

3.8.7 FUSING INNER UNIT

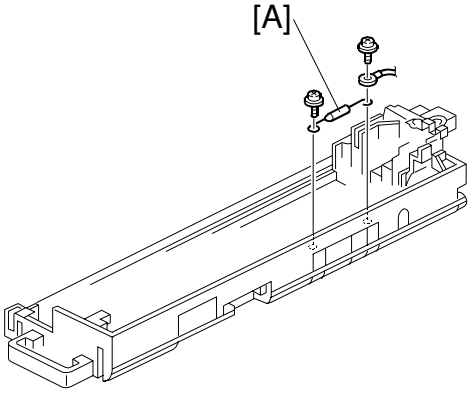
1. Lamps (☛ 3.8.6)
2. Drive gear [A]
3. Hot roller lamp harness terminal [B] (🔩 x 1)
4. Fusing inner unit [C] (🔩 x 2, 🖐 x 3)



B051R512.WMF

3.8.8 PRESSURE ROLLER THERMOFUSE

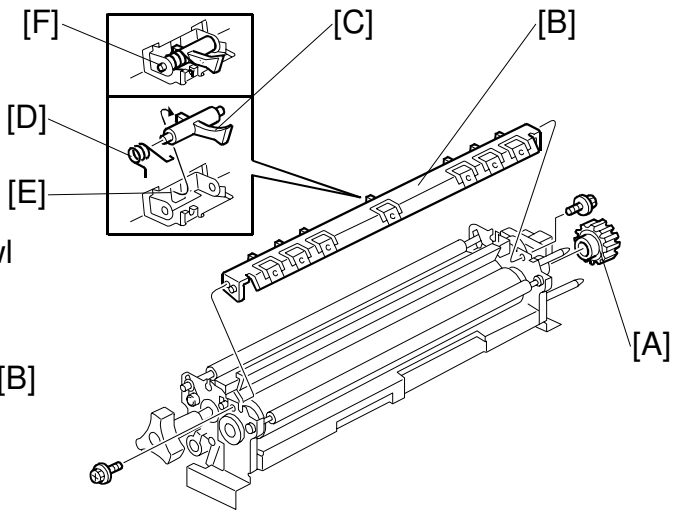
1. Fusing inner unit (☛ 3.8.7)
2. Pressure roller thermofuse [A] (🔩 x 2)



B051R958.WMF

3.8.9 HOT ROLLER STRIPPERS

1. Oil supply unit (☛ 3.8.2)
2. Fusing lamps (☛ 3.8.6)
3. Fusing inner unit (☛ 3.8.7)
4. Gear [A]
   NOTE: Remove the gear before removing the stripper pawl assembly; otherwise, the gear may be damaged.
5. Hot roller stripper pawl assembly [B] (Spring x 1, 🔩 x 2)
6. Hot roller stripper pawl [C]



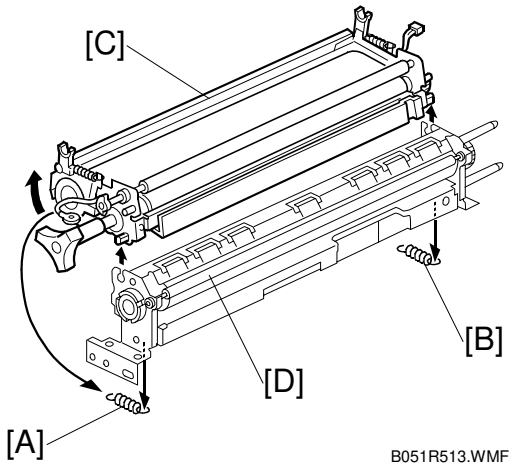
B051R502.WMF

Reassembling

1. Put the spring [D] on the pawl.
2. Put the left end of the pawl in the square opening [E].
3. Put the front and rear ends of the pawl in the holder [F].
4. Confirm that the pawl moves correctly.

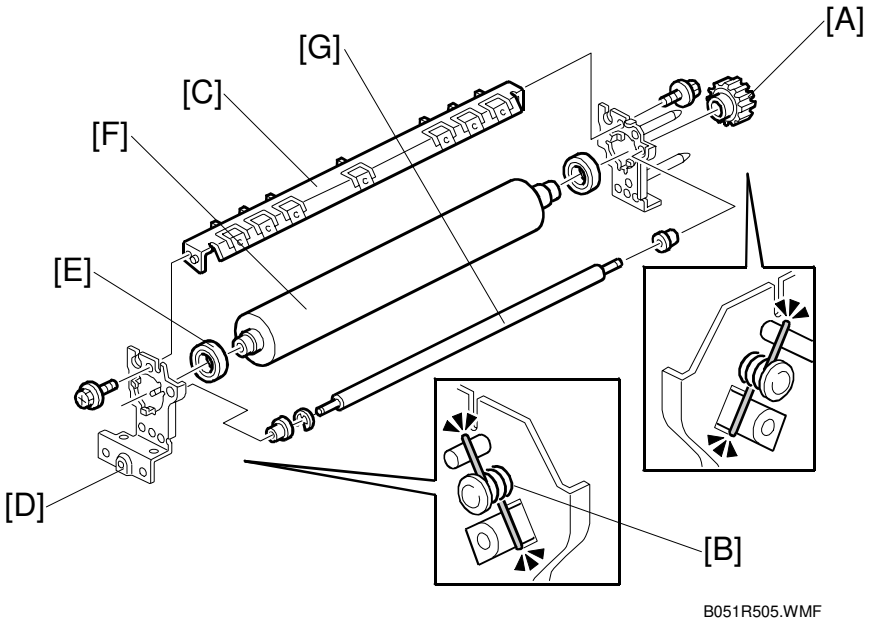
3.8.10 FUSING BELT UNIT AND PRESSURE ROLLER UNIT

1. Fusing inner unit (☛ 3.8.7)
2. Springs [A] [B]
3. Separate the fusing belt unit [C] and the pressure roller unit [D].



B051R513.WMF

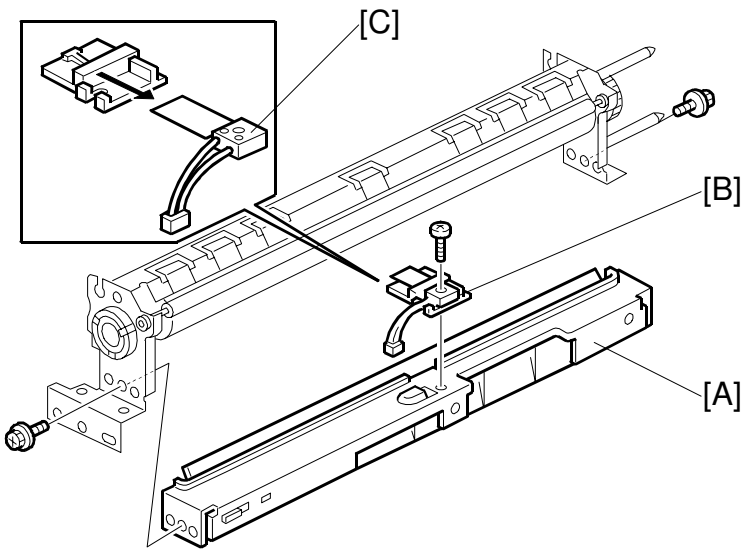
3.8.11 PRESSURE ROLLER, PRESSURE ROLLER GEAR, AND CLEANING ROLLER



B051R505.WMF

1. Pressure roller unit (☛ 3.8.10)
2. Gear [A]
3. Spring [B] (ℂ x 1)
4. Hot roller stripper assembly [C] (x 2)
5. Front bracket [D] (x 1)
6. Bearing [E]
7. Pressure roller [F]
8. Cleaning roller [G]

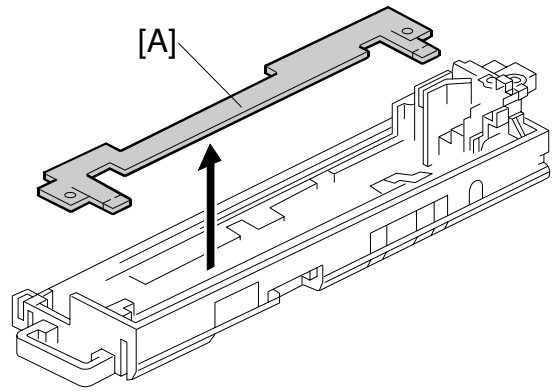
3.8.12 PRESSURE ROLLER THERMISTOR



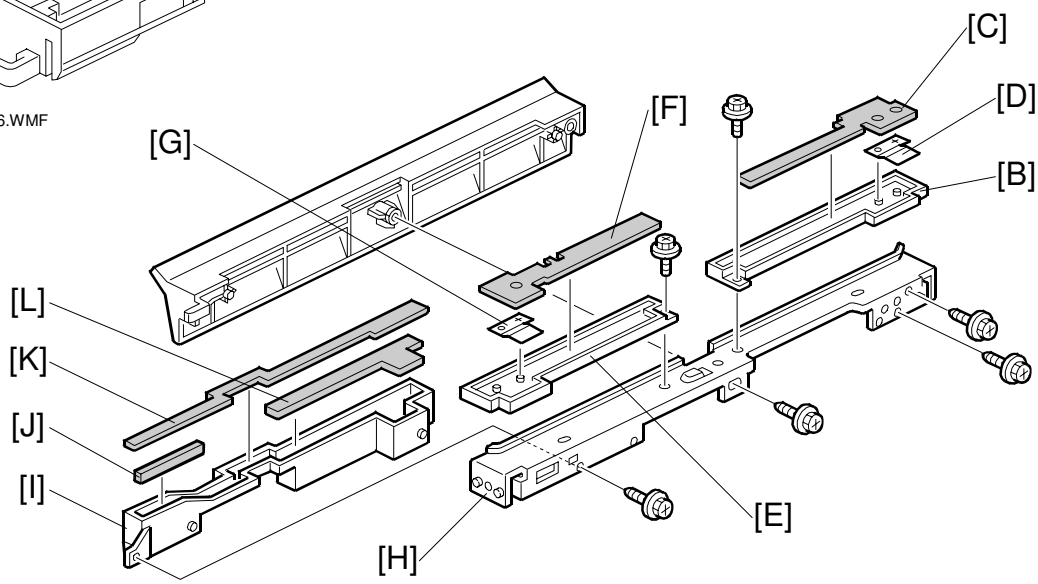
B051R514.WMF

1. Pressure roller unit (☛ 3.8.9)
2. Pressure roller lower stay [A] (☞ x 2)
3. Pressure roller thermistor holder [B] (☞ x 1)
4. Pressure roller thermistor [C]

3.8.13 OIL ABSORBERS



B051R516.WMF



B051R825.WMF

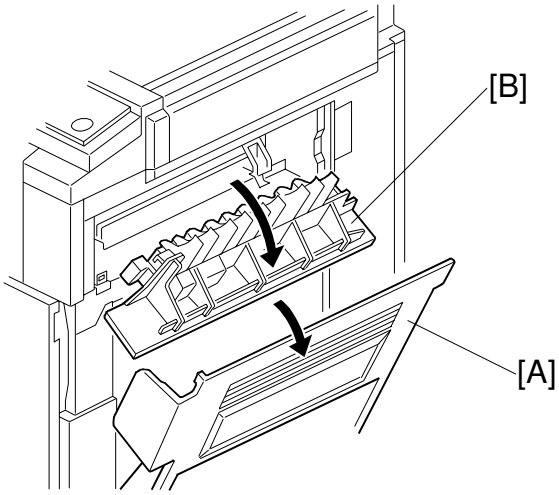
1. Fusing inner unit (☛ 3.8.7)
2. Absorber 1 [A]
3. Pressure roller unit (☛ 3.8.10)
4. Absorber holder [B] (☞ x 1)
5. Absorber 2 [C]
6. Spring [D]
7. Absorber holder [E] (☞ x 1)
8. Absorber 3 [F]
9. Spring [G]
10. Base bracket [H] (☞ x 2)
11. Absorber holder [I] (☞ x 1)
12. Absorber 4 [J]
13. Absorber 5 [K]
14. Absorber 6 [L]

3.8.14 PAPER EXIT/OVERFLOW SENSORS

⚠CAUTION

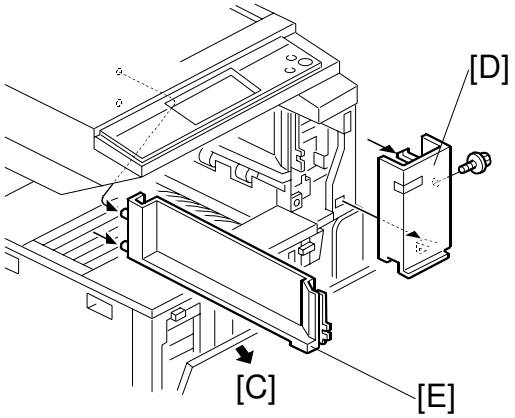
Turn off the main switch and wait until the paper exit unit cools down before beginning any of the procedures in this section. The paper exit unit can cause serious burns.

1. Open the right cover [A]
2. Upper right cover [B]



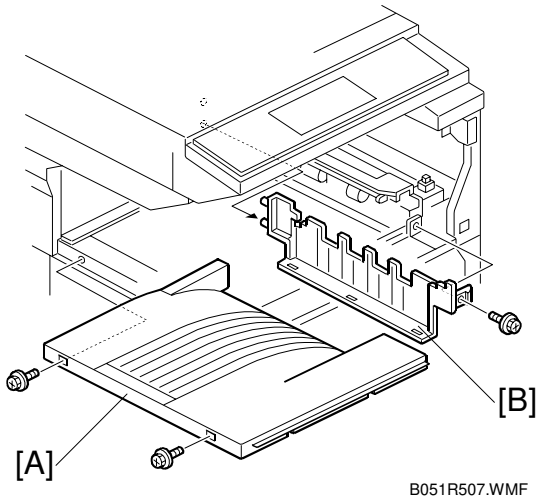
B051R509.WMF

3. Open the front cover [C].
4. Upper front cover [D] (🔩 x 1)
5. Paper exit upper cover [E]



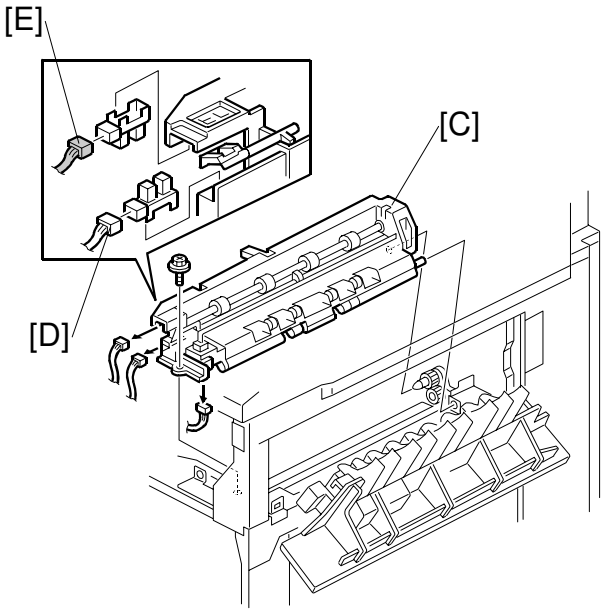
B051R922.WMF

6. Paper exit tray [A] (☞ x 2)
7. Paper exit lower cover [B] (☞ x 1)



B051R507.WMF

8. Paper exit unit [C] (✋ x 3, ☞ x 1)
   NOTE: Remove 2 connectors before removing the unit. To remove the last connector, remove the unit and turn it over. The connector is on the bottom.
9. Paper exit sensor [D]
10. Paper overflow sensor [E]

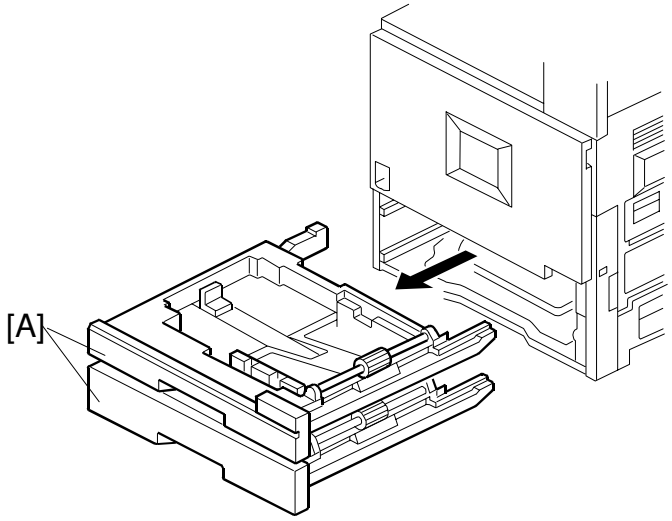


B051R508.WMF

3.9 PAPER FEED AND TRANSPORT

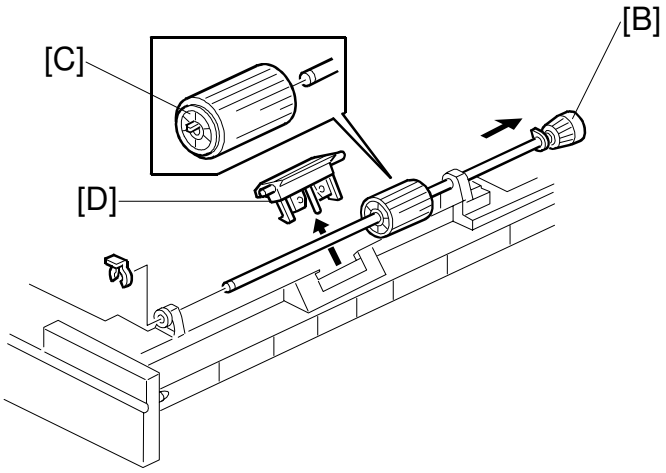
3.9.1 FEED ROLLER AND FRICTION PAD

1. Paper trays [A]



B051R601.WMF

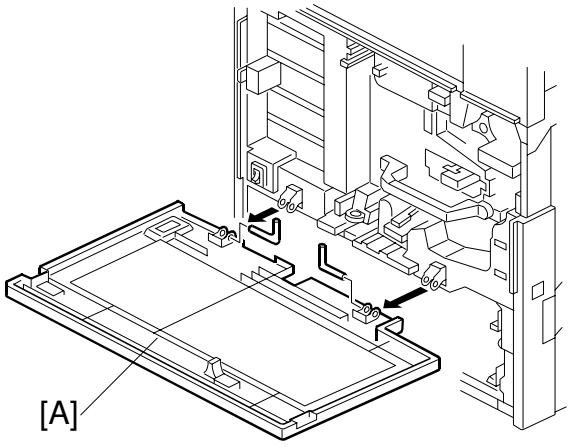
2. Slide out the shaft [B] (⌀ x 1).
3. Feed roller [C] (1 hook)
4. Friction pad [D] (2 hooks)



B051R952.WMF

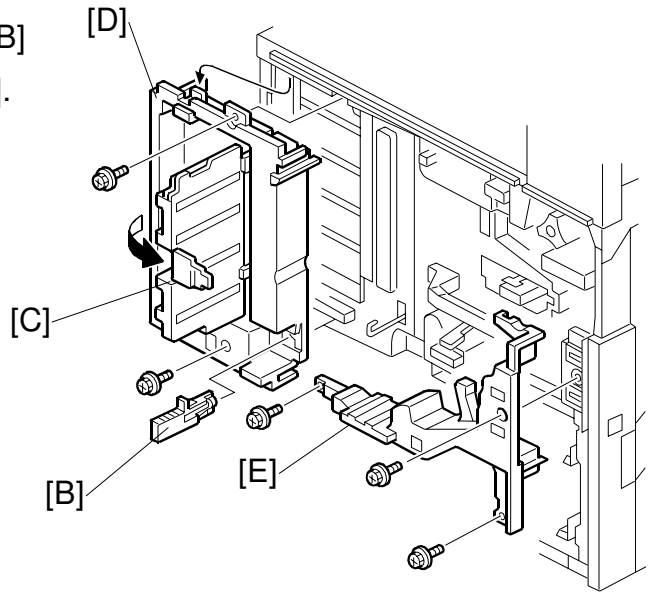
3.9.2 REGISTRATION SENSOR

1. Front cover [A] (L-shaped pin x 2)
2. Remove the upper tray.
3. Rear cover, lower rear cover, and lower left cover (☛ 3.4.2)
4. Right cover (☛ 3.7.1)
5. Paper exit tray (☛ 3.8.14)
6. Charge corona unit (☛ 3.6.3)



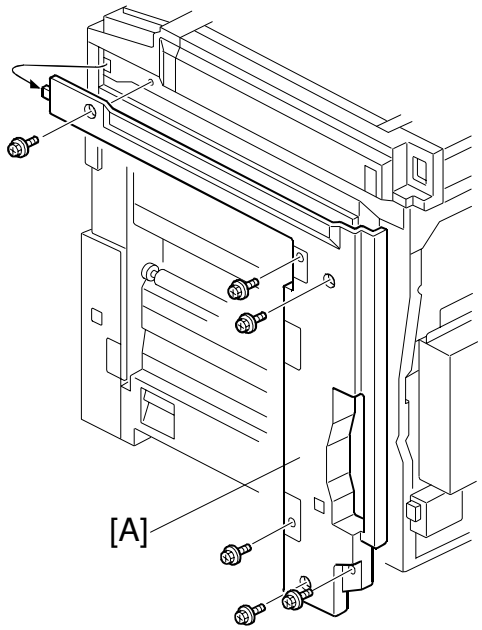
B051R602.WMF

7. Dust shield glass cleaning lever [B]
8. Open the left inner cover door [C].
9. Left inner cover [D] (🔩 x 2)
10. Right inner cover [E] (🔩 x 3)
    NOTE: Pull out the PCU when removing the right inner cover.



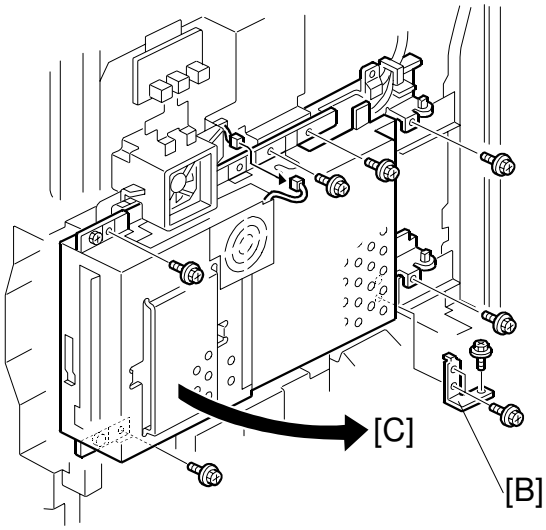
B051R603.WMF

11. Rear right cover [A] (x 6)



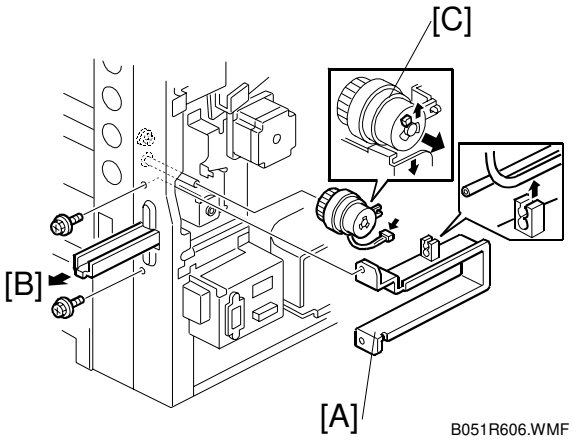
B051R604.WMF

12. Bracket [B] (x 3)
13. Open the controller box [C] (x 1, x 6)



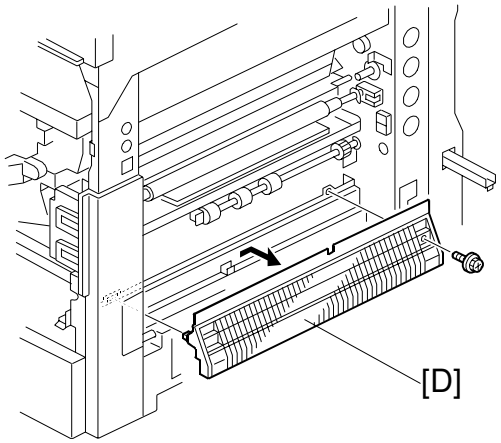
B051R605.WMF

14. Handle guard [A] (☞ x 2)
15. Pull out the handle [B].
16. Loosen the two screws on the paper feed clutch bracket (☛ 3.11.6).
17. Vertical transport clutch [C] (☞ x 1)



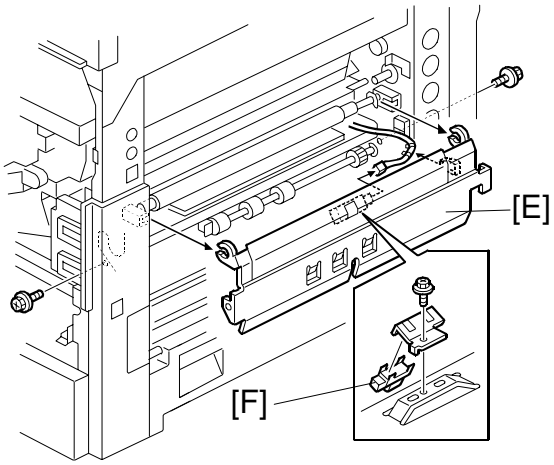
B051R606.WMF

18. Transport guide [D] (☞ x 1)



B051R607.WMF

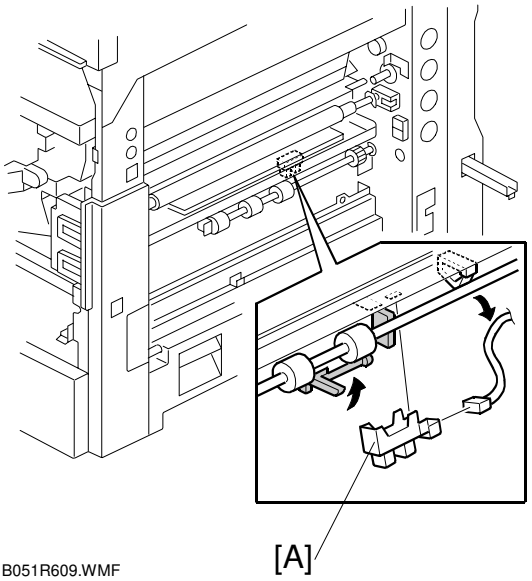
19. While releasing the wire, remove the transport stay [E] (☞ x 2).
    NOTE: You can see the wire clip from the rear of the machine.
20. Registration sensor [F] (☞ x 1, ☞ x 1)



B051R608.WMF

3.9.3 PAPER FEED SENSOR 1

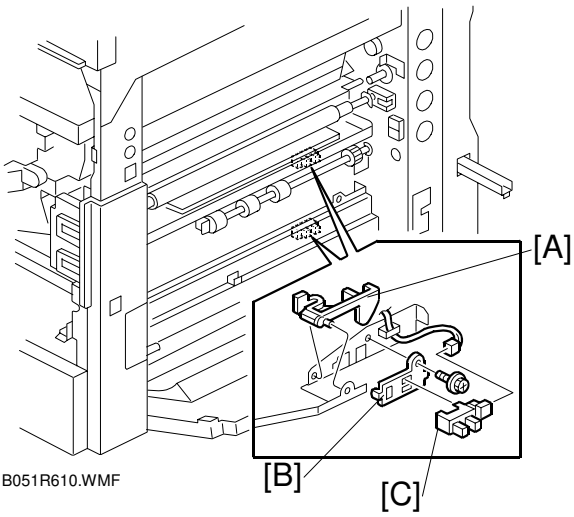
1. Transport stay (☛ 3.9.2)
2. Paper feed sensor 1 [A] (✋ x 1)
   NOTE: Unhook the rear two pawls first, move the feeler, and unhook the front pawl.



B051R609.WMF

3.9.4 PAPER NEAR-END SENSORS

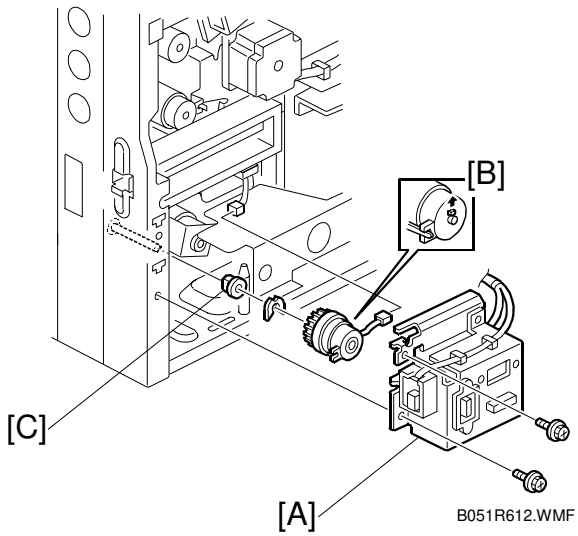
1. Transport stay (☛ 3.9.2)
2. Feeler [A]
3. Sensor bracket [B] (🔩 x 1)
4. Paper near-end sensor [C] (✋ x 1 each)



B051R610.WMF

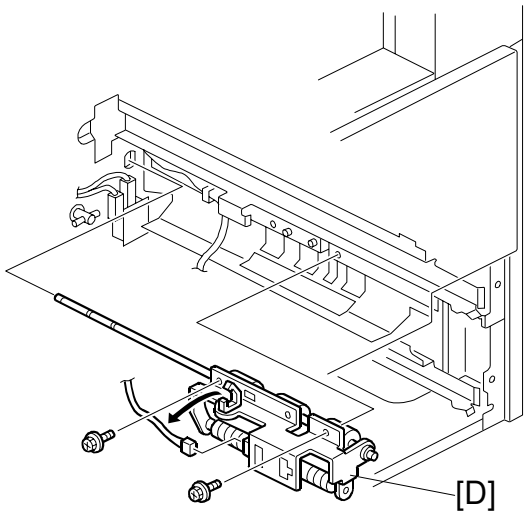
3.9.5 PAPER FEED SENSOR 2

1. Controller box (☛ 3.9.2).
2. Paper trays (☛ 3.9.1)
3. Connector bracket [A] (x 2)
4. Vertical transport clutch [B] (x 1)
5. Bushing [C] (x 1)



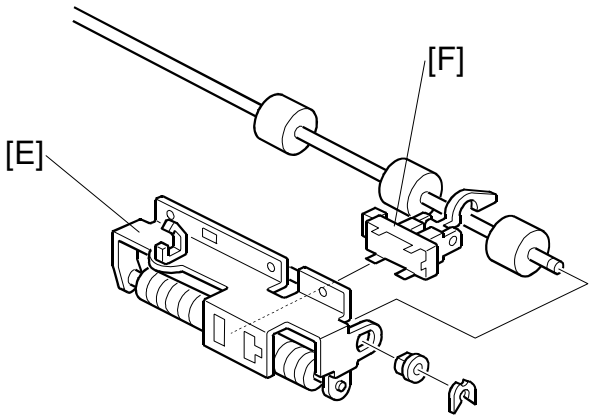
B051R612.WMF

6. Roller unit [D] (x 1, x 2)



B051R613.WMF

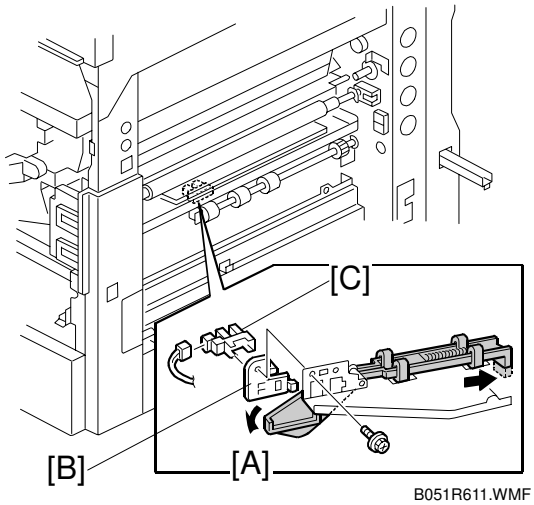
7. Roller bracket [E] (x 1, Bushing x 1)
8. Paper feed sensor 2 [F]



B051R614.WMF

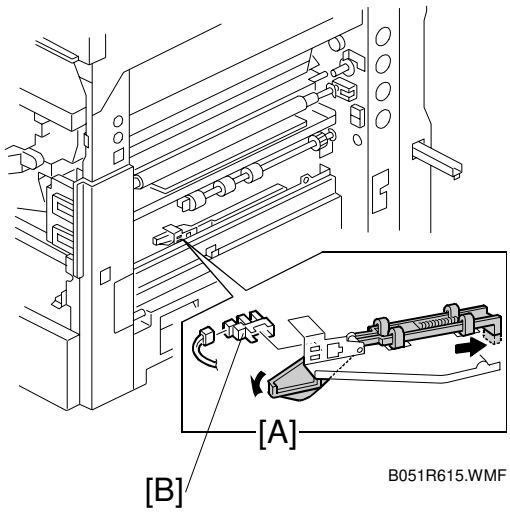
3.9.6 PAPER END SENSOR 1

1. Transport stay (☛ 3.9.2)
2. Lower the feeler [A].
3. Sensor bracket [B] (🔩 x 1)
4. Paper end sensor 1 [C] (✋ x 1)



3.9.7 PAPER END SENSOR 2

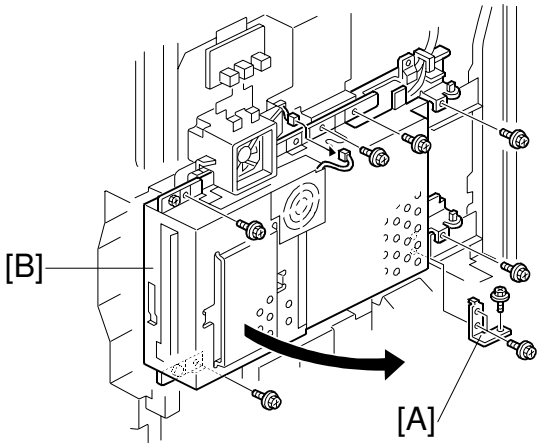
1. Transport stay (☛ 3.9.2)
2. Lower the feeler [A].
3. Paper end sensor 2 [B] (✋ x 1)



3.10 ELECTRICAL COMPONENTS

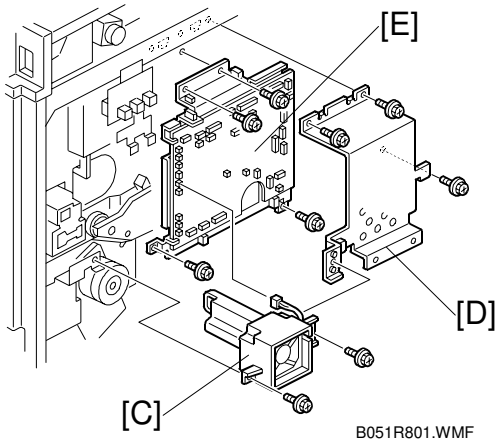
3.10.1 EXHAUST FAN AND I/O BOARD

1. Rear cover (☛ 3.4.2)
2. Bracket [A] (☞ x 3)
3. Open the controller box [B] (☞ x 6)



B051R605.WMF

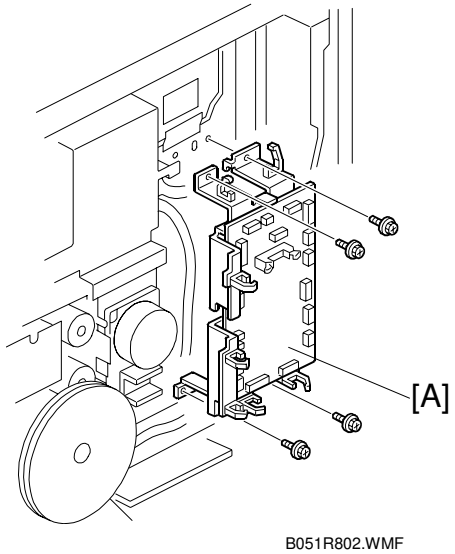
4. Exhaust fan [C] (☞ x 2)
5. I/O board cover [D] (☞ x 3)
6. I/O board [E] (☞ x 29, ☞ x 4)



B051R801.WMF

3.10.2 EX I/O BOARD

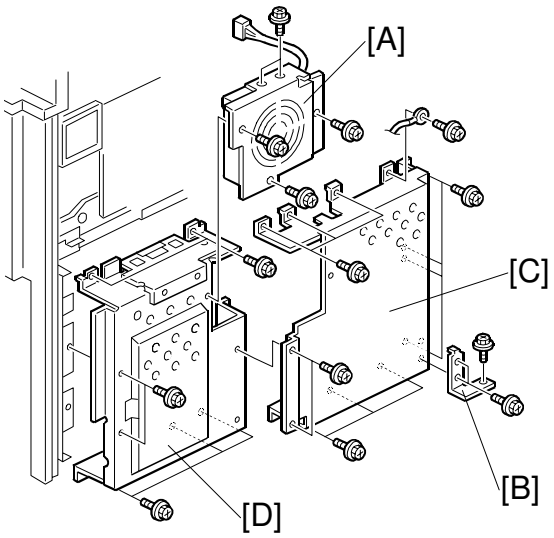
1. Open the controller box (☛ 3.9.2)
2. Ex I/O board [A] (☞ x 14, ☞ x 4)



B051R802.WMF

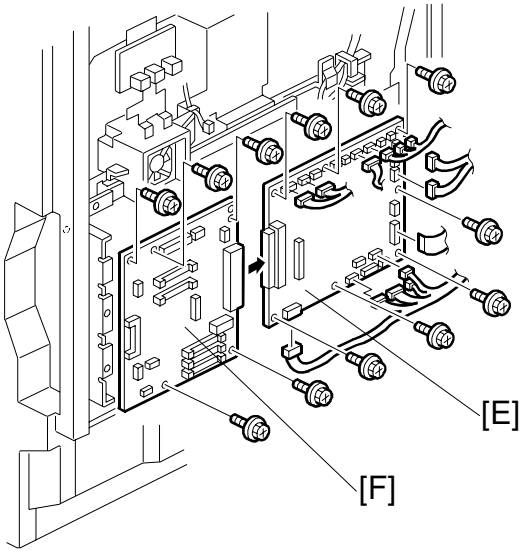
3.10.3 BICU BOARD AND CONTROLLER BOARD

1. Rear cover (☛ 3.4.2)
2. Fan [A] (✋ x 1, 🔩 x 5)
3. Bracket [B] (🔩 x 2)
4. BICU board cover [C] (🔩 x 11)
5. Option component cover [D]



B051R821.WMF

6. BICU board [E] (✋ x 15, 🔩 x 7)
   NOTE: 1) Compare the settings of the dip switches on the old board with the settings on the new board. If they are different, change the settings on the new board to make them identical.
   2) When replacing the controller board only; leave the 15 connectors connected, remove the seven screws, and disconnect the BICU board from the controller board.
7. Controller board [F] (🔩 x 6)
   NOTE: Remove the NVRAM, DIMM, and optional boards from the old controller board and install them on the new one.

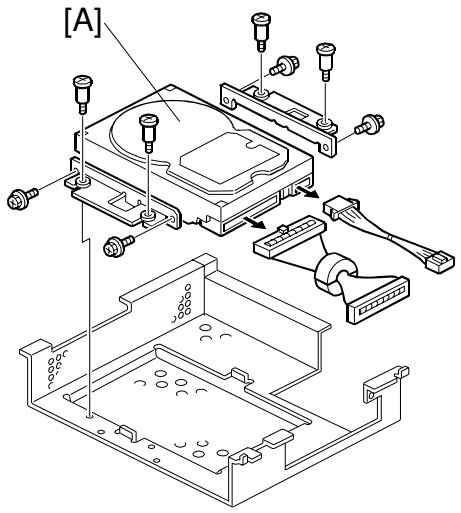


B051R817.WMF

3.10.4 HDD

1. Optional component cover (☛ 3.10.3)
2. HDD [A] (🖐 x 2, 🔩 x 8)

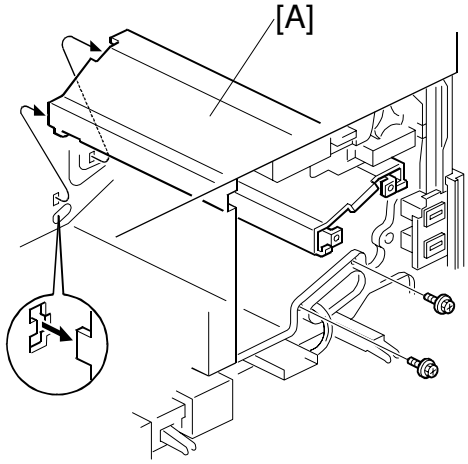
After replacing the hard disk, download the preset stamp data from an IC card.



B051R823.WMF

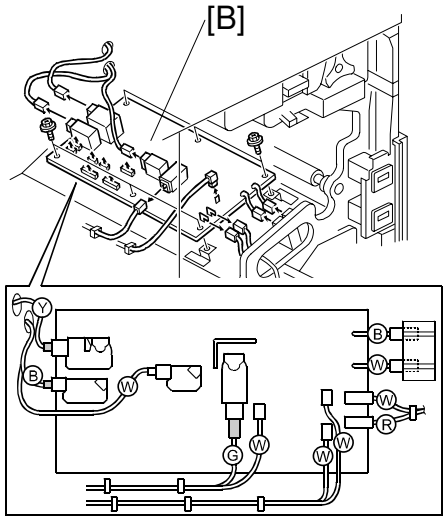
3.10.5 HIGH VOLTAGE SUPPLY BOARD

1. Photoconductor unit (☛ 3.6)
2. Right inner cover (☛ 3.9.2)
3. Photoconductor unit rail [A] (🔩 x 2)



B051R816.WMF

4. High voltage supply board [B] (🖐 x 17, 🔩 x 6)
   NOTE: When reassembling, check that the connectors are correctly set.

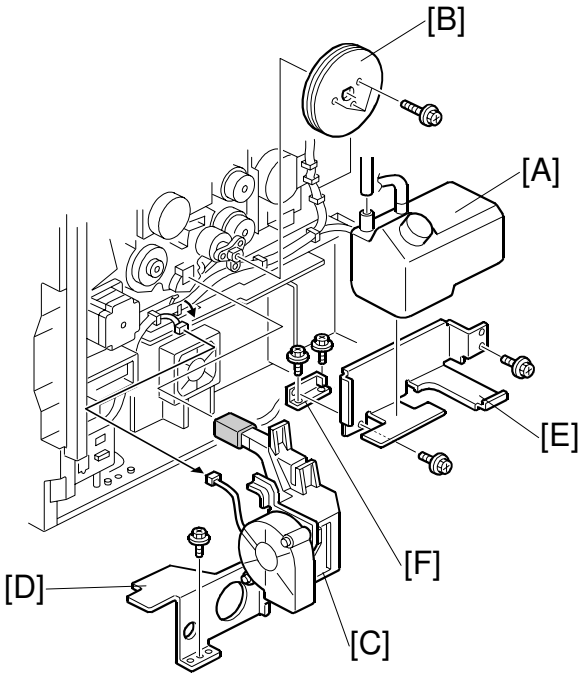


B051R824.WMF

3.10.6 POWER SUPPLY UNIT

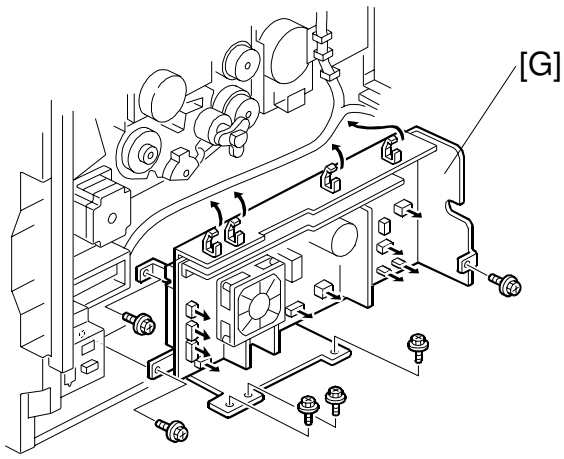
NOTE: When having removed the oil pipe from the oil tank, lift the end of the pipe and stick it to the right side of the machine with tape. See if oil does not drip from the pipe.

1. Open the controller box (☛ 3.9.2).
2. Oil tank [A]
3. Flywheel [B] (x 3)
4. Duct [C] with bracket [D] (x 1, x 1)
5. Oil tank holder [E] (x 2)
6. Bracket [F] (x 2)



B051R814.WMF

7. Power supply unit [G] (x 10, x 6)



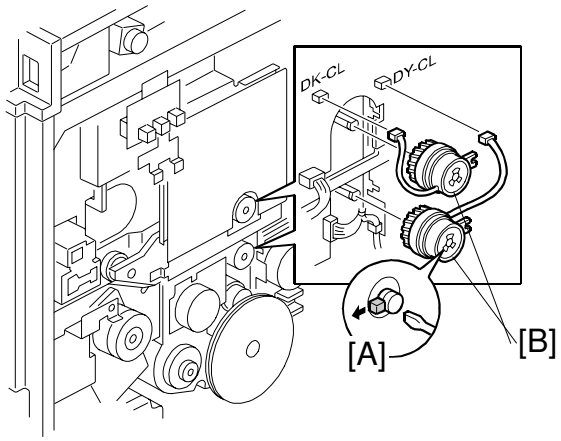
B051R815.WMF

3.11 DRIVE UNITS

3.11.1 DEVELOPMENT CLUTCHES

K and Y Development Units

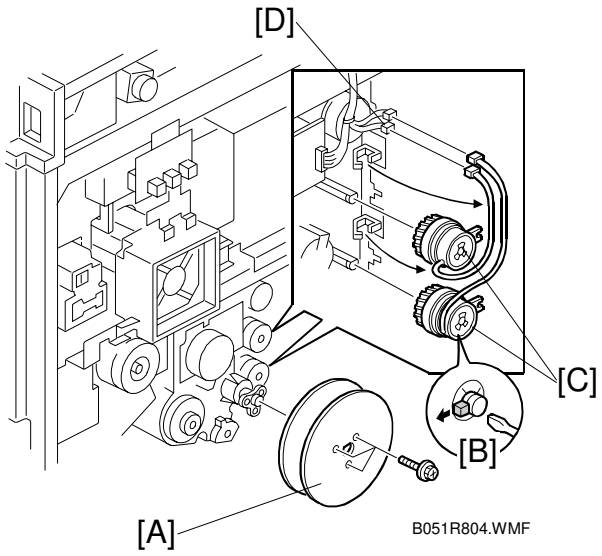
1. Open the controller box (☛ 3.9.2).
2. I/O board cover (☛ 3.10.1)
3. Unhook the locks [A] and pull out the clutches [B] (✋ x 1).
   NOTE: When reassembling, connect the black clutch connector to the DK-CL coupler and the yellow clutch connector to the DY-CL coupler.



B051R803.WMF

C and M Development Units

1. Flywheel [A] (🔧 x 3)
2. Unhook the locks [B] and pull out the clutches [C] (✋ x 1).
   NOTE: When reassembling, connect the cyan clutch connector to the blue coupler [D].

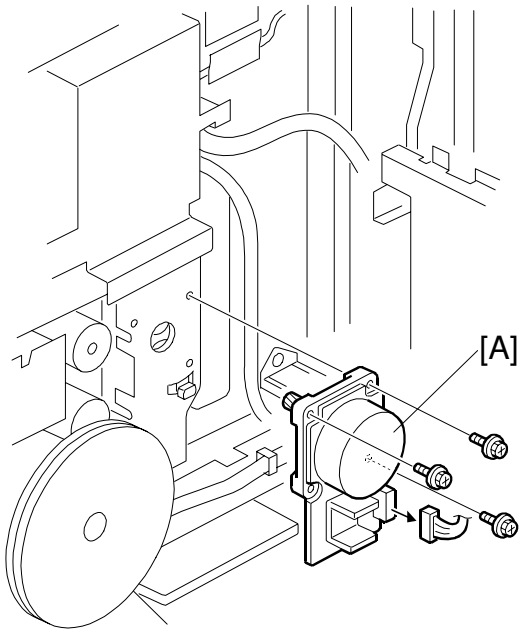


B051R804.WMF

Replacement Adjustment

3.11.2 DEVELOPMENT MOTOR

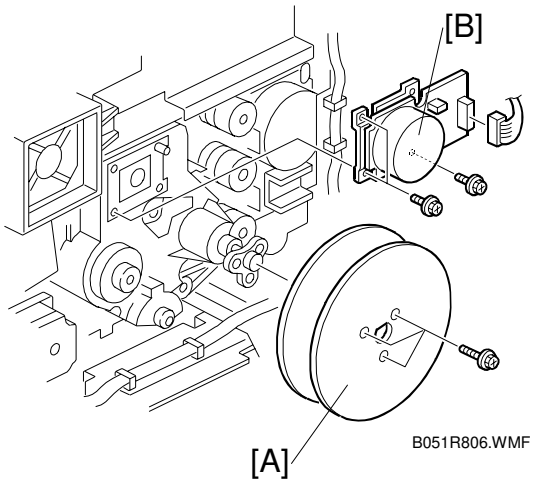
1. Open the controller box (☛ 3.9.2).
2. Remove the screws from the EX I/O board (☛ 3.10.2).
   NOTE: You need not remove the connectors.
3. Development motor [A] (x 1, x 3)



B051R805.WMF

3.11.3 MAIN MOTOR

1. Open the controller box (☛ 3.9.2).
2. Flywheel [A] (x 3)
3. Main motor [B] (x 1, x 3)

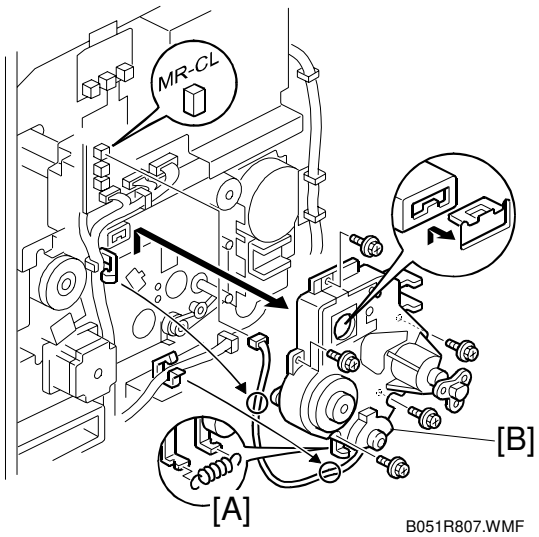


B051R806.WMF

3.11.4 PCU GEAR BOX

1. Open the controller box (☛ 3.9.2).
2. Main motor (☛ 3.11.3)
3. C and M development unit clutches (☛ 3.11.1)
4. Tension spring [A]
5. PCU gear box assembly [B] (✋ x 1, 🔩 x 5)

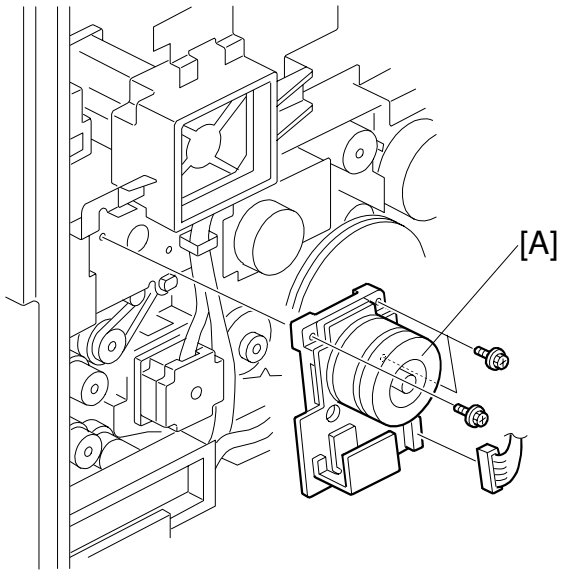
NOTE: When reassembling, make sure the tension spring [A] is correctly installed. The spring maintains the tension of the timing belt that transfers the drive power to the gear box.



B051R807.WMF

3.11.5 FUSING UNIT MOTOR

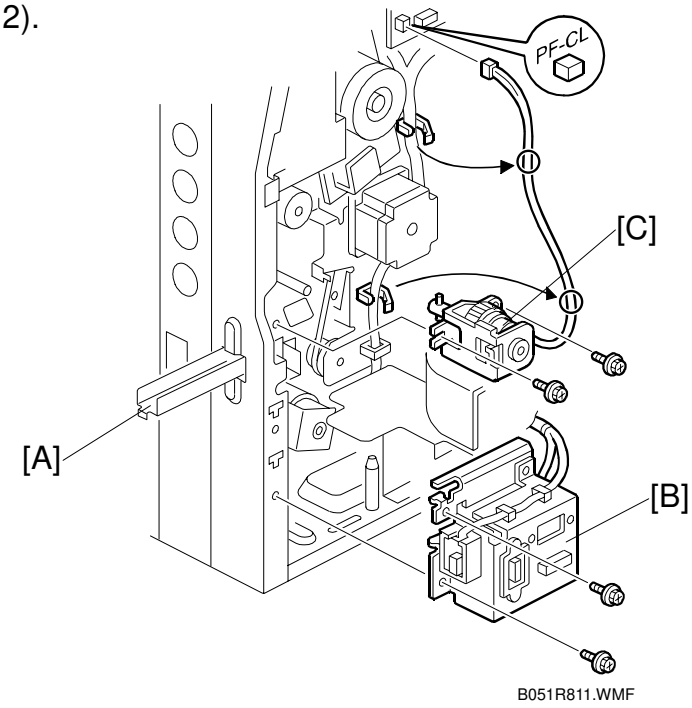
1. Open the controller box (☛ 3.9.2).
2. Fusing unit motor [A] (✋ x 1, 🔩 x 3)



B051R808.WMF

3.11.6 PAPER FEED CLUTCH 1

1. Open the controller box (☛ 3.9.2).
2. Handle guard (☛ 3.9.2)
3. Pull out the handle [A].
4. Connector bracket [B] (x 2)
5. Paper feed clutch 1 [C] (x 1, x 2)

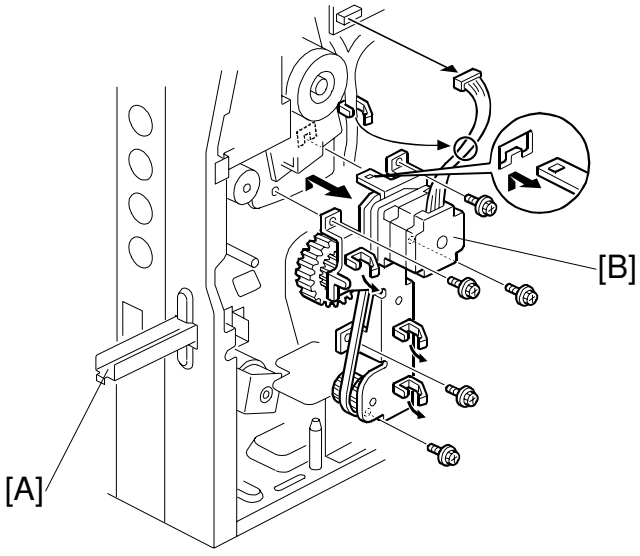


B051R811.WMF

3.11.7 PAPER FEED MOTOR

1. Rear cover (☛ 3.4.2)
2. Open the controller box (☛ 3.9.2).
3. Handle guard (☛ 3.9.2)
4. Pull out the handle [A].
5. Connector bracket (☛ 3.11.6)
6. Paper feed motor [B] with gears (x 1, x 5)

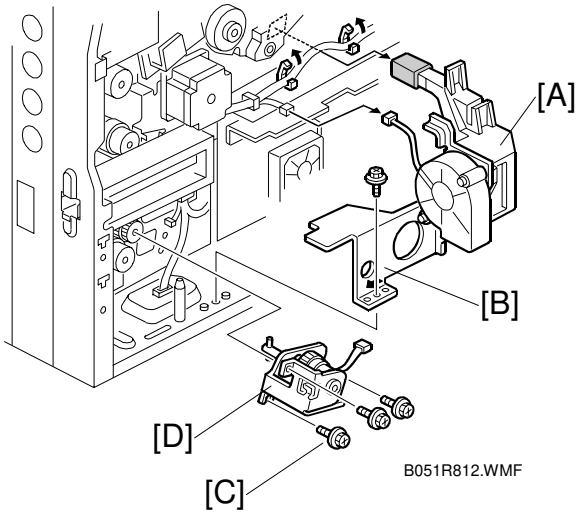
NOTE: When reassembling, make sure the vertical transport clutch is in position.



B051R810.WMF

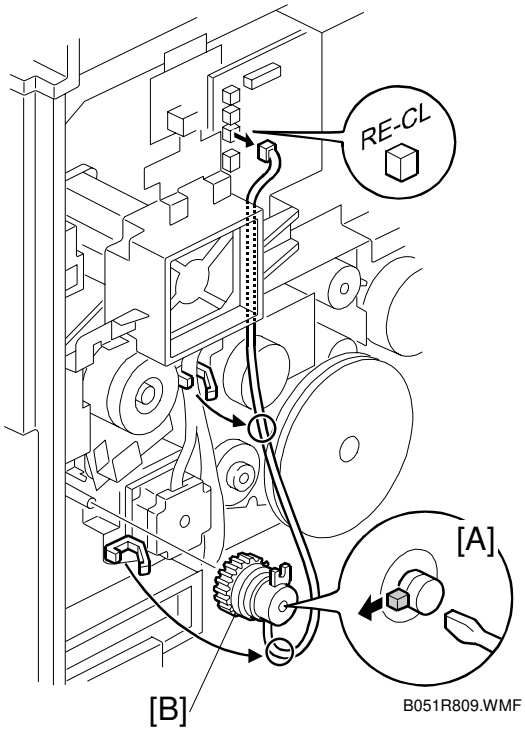
3.11.8 PAPER FEED CLUTCH 2

1. Open the controller box (☛ 3.9.2).
2. Flywheel (☞ x 3)
3. Duct [A] with bracket [B] (✍ x 1, ☞ x 1)
4. Pull out the lower tray.
5. Loosen the lower-left screw [C] on the paper feed clutch.
6. Paper feed clutch [D] (✍ x 1, ☞ x 2)

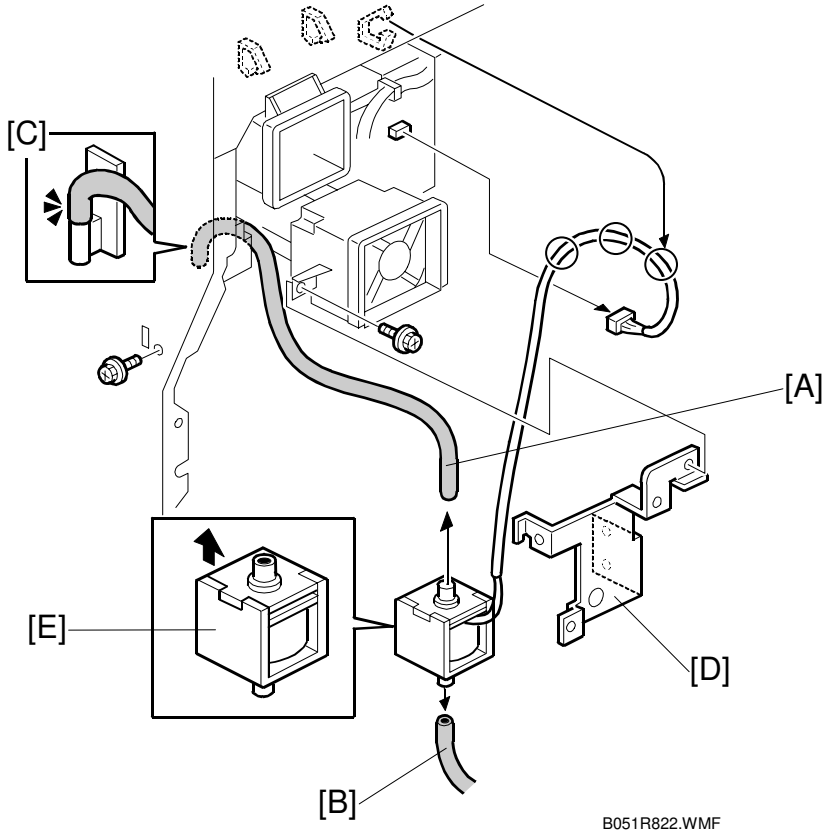


3.11.9 REGISTRATION CLUTCH

1. Loosen the screws on the paper feed clutch 1 (☛ 3.11.6).
2. Unhook the lock [A] and pull the clutch out [B] (✍ x 1).



3.11.10 OIL PUMP



1. Open the control box (☛ 3.9.2)
2. Pipes [A, B]
   NOTE: 1) Keep a piece of waste cloth at hand. Oil may drip from the pipe.
   2) When reinstalling the pump, make sure to attach the upper tube correctly to the oil exit [C]. If not, oil may leak inside the machine.
3. Oil pump bracket [D] (☞ x 3)
4. Oil pump [E] (☞ x 2, ☜ x 1)
   Install the correct way up. There are two tabs at the top of the pump.

3.12 COPY ADJUSTMENT

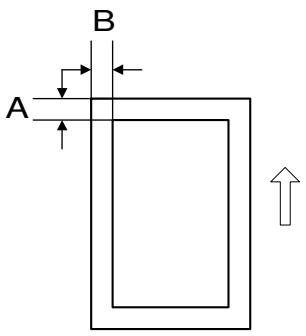
3.12.1 PRINTING

NOTE: 1) Make sure the paper is installed correctly in each paper tray before you start these adjustments.
2) Use the Trimming Area Pattern (SP5-955-1, No.11) to print the test pattern for the following procedures.
3) Set SP 5-955-1 to 0 again after completing these printing adjustments.

Registration - Leading Edge/Side-to-Side

1. Check the leading edge registration for each paper feed station, and adjust them using SP1-001.
2. Check the side-to-side registration for each paper feed station, and adjust them using SP1-002.

Tray	SP mode	Specification
Any paper tray	SP1-001-1	3 ± 2 mm
By-pass feed	SP1-001-9	
Duplex	SP1-001-12	
1st paper tray	SP1-002-2	2 ± 1.5 mm
2nd paper tray	SP1-002-3	
3rd paper tray (optional paper tray 1), or LCT	SP1-002-4	
4th paper tray (optional paper tray 2)	SP1-002-5	
By-pass feed	SP1-002-1	
Duplex, side 2	SP1-002-6	



B051R558.WMF

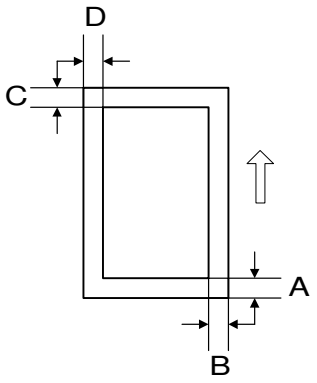
A: Leading Edge Registration
B: Side-to-side Registration

Blank Margin

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

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

	SP mode	Specification
Trailing edge	SP2-101-4	3 ± 2 mm
Front edge	SP2-101-1	2 +2.5/-1.5 mm
Leading edge	SP2-101-3	3 ± 2 mm
Back edge	SP2-101-2	2 ± 1.5 mm



B051R559.WMF

A: Trailing Edge Blank Margin
B: Right Edge Blank Margin
C: Leading Edge Blank Margin
D: Left Edge Blank Margin

Main Scan Magnification

1. Print the single-dot grid pattern (SP5-955-1, No.5).
2. Check the magnification, and adjust the magnification using SP2-100-1 if necessary. The specification is ±1%.

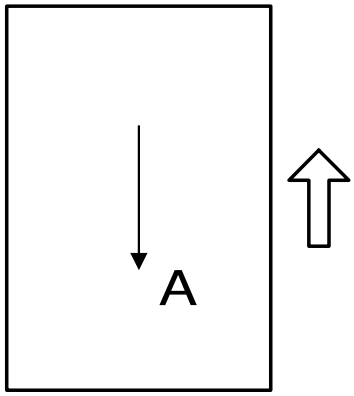
3.12.2 SCANNING

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

NOTE: Use a C4 test chart to perform the following adjustments.

Scanner 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 to adjust if necessary.
   Standard: ±1.0%.



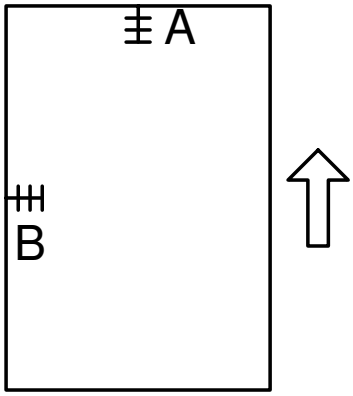
A: Sub-scan magnification

B051R920.WMF

Scanner Leading Edge and Side-to-Side Registration

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. Standard: 0 ± 2 mm.

	SP mode
Sub-scan	SP4-010
Main-scan	SP4-011



B051R928.WMF

Main Scan Dot Position Correction

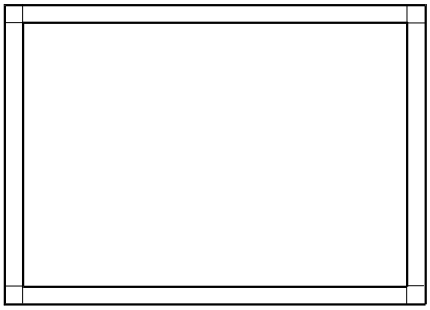
NOTE: Before adjusting the scanner, adjust the printer registration.

1. Enter the Copy SP mode and open SP4-932.
2. Check that each value corresponds to the factory-set value.
3. Touch the *COPY Window* key and copy the C-4 chart in the full-color photo mode.
   NOTE: Be sure to copy in the photo mode. This is because color displacement cannot be checked properly in text mode.
4. Check the yellow and cyan vertical lines. (Use a Magnification Scope to do this.) If they exactly overwrite the black line at the edges of the copy, exit the SP mode to end the adjustment. If the yellow and cyan lines significantly extend beyond the black line, proceed to the next step.
5. Press the *SP Mode* to return to the SP mode. Adjust the SP settings until the output is acceptable.

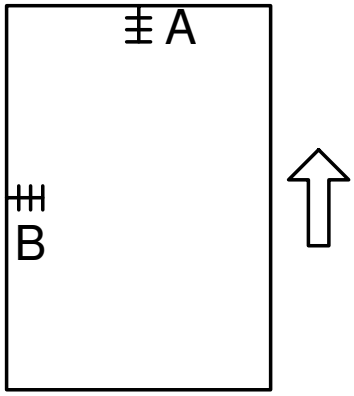
SP4-932-1	Picture element correction red left edge
SP4-932-2	Picture element correction red right edge
SP4-932-3	Picture element correction blue left edge
SP4-932-4	Picture element correction blue right edge

3.12.3 ARDF IMAGE ADJUSTMENT

ARDF Side-to-Side and Leading Edge Registration



B051R921.WMF



B051R928.WMF

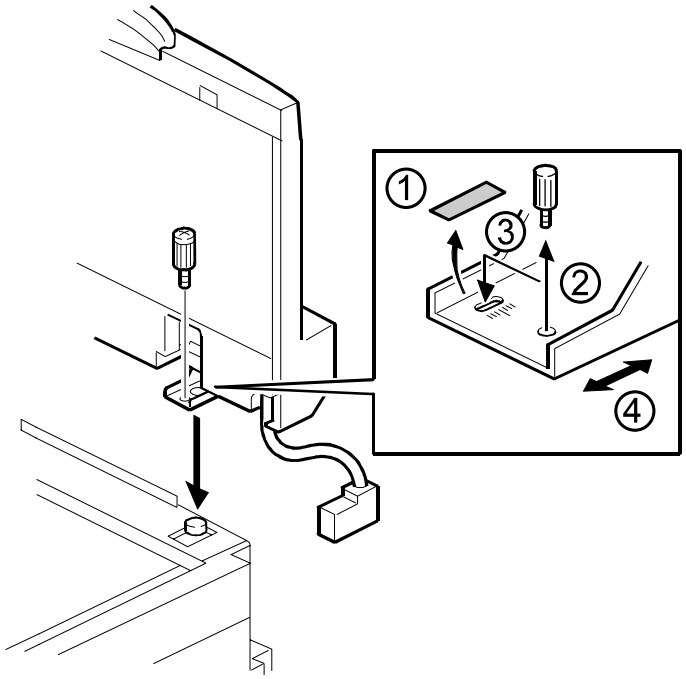
A: Sub-registration
B: Main registration

Make a temporary test chart as shown above using A3/DLT paper.

1. Place the temporary test chart on the ARDF and make a copy from one of the feed stations.
2. Check the registration, and adjust using the following SP modes if necessary.

SP Code	What It Does	Adjustment Range
SP6-006-1	Main Scan Registration	± 10 mm
SP6-006-2	Sub-Scan Registration (Simplex)	± 10 mm
SP6-006-4	Main Scan Registration (Duplex)	± 10 mm

ARDF Skew Adjustment



B051T500.WMF

When making a copy using the ADF and the image is skewed, do the following to fix the skewed image.

NOTE: Before doing the following step, make sure to confirm whether or not the copy images made in platen mode and test patterns are not skewed.

1. Peel off the black tape on the right hinge of the ADF.
2. Loosen the screw that secures the left hinge.
3. Change the position of the screw that secures the right hinge to the long hole.
   NOTE: Do not tighten the screw at this moment.
4. Move the right hinge position to correct the skewed image.
5. Tighten both screws and check the copy image.
6. If it is not fixed, repeat steps 2 to 5.

3.13 COLOR ADJUSTMENT

3.13.1 AUTO COLOR CALIBRATION (ACC)

The machine automatically calibrates the printer gamma curve. the ACC Test Pattern is printed by the UP mode. The machine scans the test pattern and corrects the printer gamma by comparing the ideal setting with the current image density.

The ACC should be performed any time when the customer is not satisfied with the image quality.

The previous settings of the ACC can be loaded with SP5-610-6.

3.13.2 PRINTER GAMMA CORRECTION

NOTE: Normally, the ACC is enough to adjust the color balance to achieve the optimum print output. The printer gamma correction is only required for fine-tuning to meet user requirements.

The printer gamma curve created during ACC can be modified using SP modes. The SP value will be applied to the gamma curve created during ACC.

The gamma data for highlight, middle, shadow areas, and IDmax can be adjusted. The adjustable range is from 0 to 30 (31 steps).

Copy Mode

KCMY Color Balance Adjustment

Adjust only the “Offset” values.

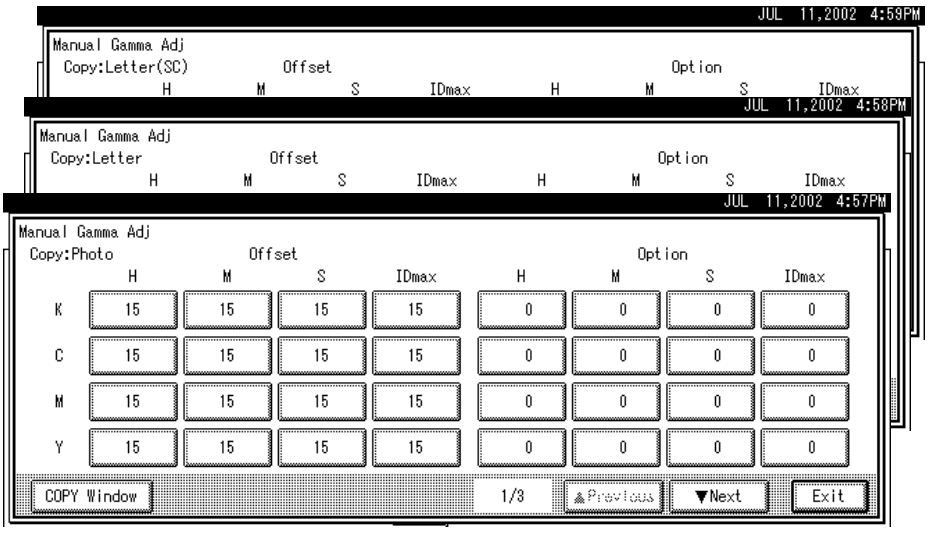
NOTE: Never change the “Option” values (default values are 0).

Highlight (Low ID)	Levels 2 through 5 in the C4 chart 10-level scale
Middle (Middle ID)	Levels 3 through 7 in the C4 chart 10-level scale
Shadow (High ID)	Levels 6 through 9 in the C4 chart 10-level scale
ID max	Level 10 in the C4 chart 10-level scale (affects the entire image density.)
Offset	The higher the number in the range associated with the low ID, middle ID, high ID, and ID max, the greater the density.

There are four adjustable modes:

- Text (Letter) mode: full colour
- Photo mode: full colour
- Text (Letter) mode: single color (SC)
- Photo mode: single color (SC)

SP 4-918 screen: The screen with SC on it is for single colour mode settings. The other two screens are for full colour mode settings.



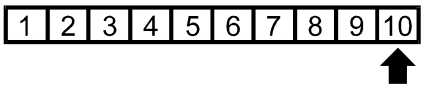
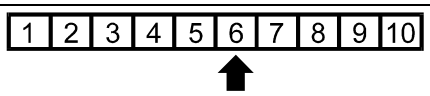
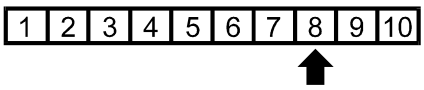
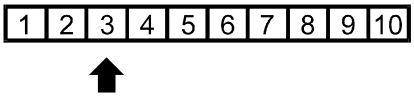
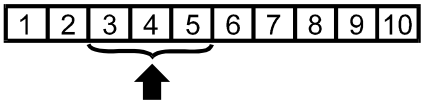
B502R500.WMF

Adjustment Procedure

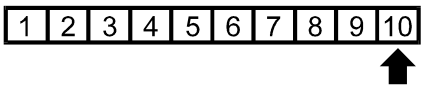
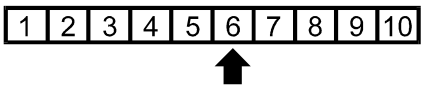
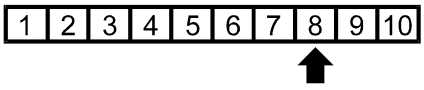
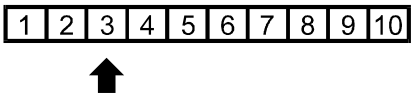
1. Copy the C-4 chart in mode that you are going to adjust.
2. Enter the SP mode.
3. Select “Copy SP”.
4. Enter SP4-918 and select the screen that you are going to adjust.
5. Adjust the offset values until the copy quality conforms to the standard (☛ the tables below).

NOTE: 1) Never change an “Option” value (default value is 0).
2) Adjust the density in order from “ID Max”, “Middle (M)”, “Shadow (S)”, and then “Highlight (H)”.

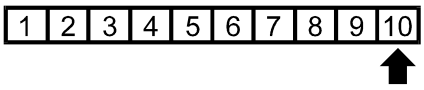
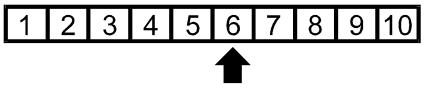
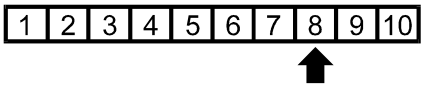
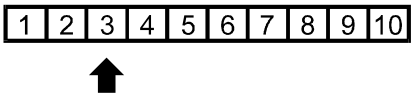
- Photo Mode, Full Colour -

Step	Item to Adjust	Level on the C-4 chart	Adjustment Standard
1	ID max: (K, C, M, and Y)		Adjust the offset value so that the density of level 10 matches that of level 10 on the C-4 chart.
2	Middle (Middle ID) (K, C, M, and Y)		Adjust the offset value so that the density of level 6 matches that of level 6 on the C-4 chart.
3	Shadow (High ID) (K, C, M, and Y)		Adjust the offset value so that the density of level 8 matches that of level 8 on the C-4 chart.
4	Highlight (Low ID) (K, C, M, and Y)		Adjust the offset value so that dirty background is not visible on the copy and the density of level 3 is slightly lighter that of level 3 on the C-4 chart.
5	K Highlight (Low ID) (C,M, and Y) <on the full color copy>		Adjust the offset value so that the color balance of black scale levels 3 through 5 in the copy is seen as gray (no C, M, or Y should be visible). If the black scale contains C, M, or Y, redo step 1 to 4.

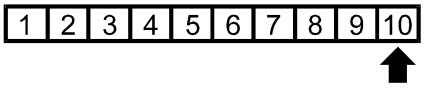
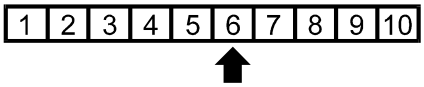
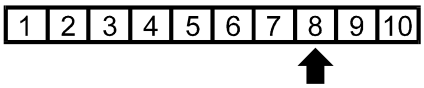
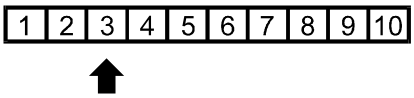
- Photo Mode, Single Colour -

Step	Item to Adjust	Level on the C-4 chart	Adjustment Standard
1	ID max: (K)		Adjust the offset value so that the density of level 10 matches that of level 10 on the C-4 chart.
2	Middle (Middle ID) (K)		Adjust the offset value so that the density of level 6 matches that of level 6 on the C-4 chart.
3	Shadow (High ID) (K)		Adjust the offset value so that the density of level 8 matches that of level 8 on the C-4 chart.
4	Highlight (Low ID) (K)		Adjust the offset value so that dirty background is not visible on the copy and the density of level 3 is slightly lighter that of level 3 on the C-4 chart.

- Text (Letter) Mode, Full Colour -

Step	Item to Adjust	Level on the C-4 chart (K)	Adjustment Standard
1	ID max: (K, C, M, and Y)		Adjust the offset value so that the density of level 10 matches that of level 10 on the C-4 chart.
2	Middle (Middle ID) (K, C, M, and Y)		Adjust the offset value so that the density of level 6 matches that of level 6 on the C-4 chart.
3	Shadow (High ID) (K, C, M, and Y)		Adjust the offset value so that the density of level 8 matches that of level 8 on the C-4 chart.
4	Highlight (Low ID) (K, C, M, and Y)		Adjust the offset value so that dirty background is not visible on the copy and the density of level 3 is slightly lighter that of level 3 on the C-4 chart.

- Text (Letter) Mode, Single Colour -

Step	Item to Adjust	Level on the C-4 chart (K)	Adjustment Standard
1	ID max: (K)		Adjust the offset value so that the density of level 10 matches that of level 10 on the C-4 chart.
2	Middle (Middle ID) (K)		Adjust the offset value so that the density of level 6 matches that of level 6 on the C-4 chart.
3	Shadow (High ID) (K)		Adjust the offset value so that the density of level 8 matches that of level 8 on the C-4 chart.
4	Highlight (Low ID) (K)		Adjust the offset value so that dirty background is not visible on the copy and the density of level 3 is slightly lighter that of level 3 on the C-4 chart.

NOTE: After adjusting 'shadow' as explained above, text parts of the test pattern may not be printed clearly. If this happens, check whether the 5 line/mm pattern at each corner is printed clearly. If it is not, adjust the offset value of 'shadow' again until it is.

Printer Mode

There are five adjustable modes selected by printer SP1-102:

- 1800 x 1200 photo mode
- 1800 x 600 text mode
- 1800 x 600 graph mode
- 600 x 600 photo mode
- 600 x 600 text mode

	K	C	M	Y
Highlight	SP1-104-1	SP1-104-21	SP1-104-41	SP1-104-61
Middle	SP1-104-2	SP1-104-22	SP1-104-42	SP1-104-62
Shadow	SP1-104-3	SP1-104-23	SP1-104-43	SP1-104-63
IDmax	SP1-104-4	SP1-104-24	SP1-104-44	SP1-104-64

Adjustment Procedure

1. Do ACC for the printer mode.
2. Turn the main power off and on.
3. Enter SP mode.
4. Select “Printer SP”.
5. Select SP1-102 and select the print mode that you are going to adjust.
6. To review the image quality for these settings, choose SP1-103-1 to print out a tone control test sheet.
7. Adjust the color density with SP1-104 as shown below comparing the tone control test sheet with the C4 test chart.
   NOTE: Adjust the density in order from “ID Max”, “Shadow”, “Middle”, and then “Highlight”.
8. Save the adjusted settings with SP1-105.

Adjustment Reference For Gamma Correction

The following tables show the adjustment reference for gamma correction. The tables show the level of the color scale on the C4 test chart and on the tone control test sheet printed in the printer SP mode.

For example, for K at text mode, grade 12 on the tone control test sheet should be the same as grade 7 on the C4 chart.

Normally, it is not necessary to adjust the gamma data as shown in the table since ACC adjusts the gamma curve automatically. The fine-tuning of color balance by gamma data adjustment will be required only when the result from ACC and Color Calibration does not meet the customer's requirements.

K	**C4 test chart**		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	Test sheet	**Text**	-	1	2	5	6	9	12	13	16	-
		Photo/Graph	-	1	2	5	6	9	11	13	16	-

C	**C4 test chart**		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	Test sheet	**Text**	-	1	2	3	4	7	9	10	12/ 13	15
		Photo/Graph	-	1	2	3	5	8	9	11	12	14

M	**C4 test chart**		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	Test sheet	**Text**	-	1	2	4	5	7	10	12	16	-
		Photo/Graph	-	1	2	5	6	9	11	13	16	-

Y	**C4 test chart**		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	Test sheet	**Text**	-	1	3	6	8	10	12/ 13	16	-	-
		Photo/Graph	-	1	4	7	8	10	13	16	-	-

3.14 SCANNER WHITE LEVEL ADJUSTMENT

Check the scanner white level after the left scale (with the white reference plate), scanner lamp, 1st or 2nd scanner (carriage), or the lens block assembly is replaced. If the white level is not correct, adjust the level.

White Level Check

1. Load the following paper (referred to as “standard paper” in this section) into the paper tray.
   - Hammermill Copy Plus, 20 lbs. (North America)
   - Ricoh Copy paper for Aficio Color, 100 g (Europe)
2. Print out the ACC test pattern (User Tools – Maintenance – ACC).
3. Put the ACC test pattern on the exposure glass.
4. Stack 250 sheets or more of the standard paper on the ACC test pattern.
5. Scan the ACC pattern.
6. Remove the stack of the standard paper and the ACC test pattern from the exposure glass.
7. Put Color Chart C-4 on the exposure glass.
8. Activate the full color, text/photo mode.
9. Copy Color Chart C-4.
10. Check whether any of the coloured patches in column 2 (in the gradation pattern area right below the caption “COLOR CHART C-4”) are printed. Also, check that yellow patch 10 does not contain any other colours.
11. If any of the patches in column 2 is printed, or if yellow patch 10 contains other colours, adjust the white level (☛ White Level Adjustment). If not, adjustment is not required.

White Level Adjustment

1. Perform as instructed in “White Level Check”.
2. Activate the SP mode.
3. Select SP5-990-002 and print out the SP mode data list.
4. Select SP4-902-002 (G_DATA1) and read the value.
5. Compare the value with the values in table 1 (when Hammermill Copy Plus is used) or 2 (when Ricoh Copy paper for Aficio Color is used).
6. Increase or decrease the values in SP4-685-1, 686-1, and 687-1 if necessary.
7. Check the white level as instructed in “White Level Check”.

NOTE: The machine may have some other trouble when this adjustment causes abnormal outputs or when this adjustment is not effective.

Table 1: Hammermill Copy Plus, 20 lbs. (North America)

SP4-902-2 (G_DATA1)	SP4-685-001 (Reference Adjustment: R)	SP4-686-001 (Reference Adjustment: G)	SP4-687-001 (Reference Adjustment: B)	Necessary adjustment
255	+17	+13	+17	Increase the values in SP4-685-1, 686-1, and 687-1.
254	+15	+12	+16	
253	+14	+11	+15	
252	+13	+10	+13	
251	+12	+9	+12	
250	+10	+8	+11	
249	+9	+7	+9	
248	+8	+6	+8	
247 : : 237	±0	±0	±0	No adjustment is required.
236	-8	-6	-8	Decrease the values in SP4-685-1, 686-1, and 687-1.
235	-10	-7	-10	
234	-11	-8	-11	
233	-13	-10	-13	
232	-14	-11	-14	
231	-15	-12	-16	
230	-17	-13	-17	
229	-18	-14	-19	
228	-20	-15	-20	
227	-21	-16	-22	
226	-23	-17	-23	
225	-24	-19	-25	
224	-26	-20	-27	
223	-28	-21	-28	
222	-29	-22	-30	
221	-31	-23	-31	
220	-32	-24	-33	
219	-34	-26	-35	
218	-35	-27	-36	
217	-37	-28	-38	
216	-39	-29	-40	
215	-40	-30	-41	

Example 1: When the value in SP4-902-2 is “255”, add 17 to the value in SP4-685-001, 13 to the value in SP4-686-001, and 17 to the value in SP4-687-001.

Example 2: When the value in SP4-902-2 is “247”, do not change any values in SP4-685-001, SP4-686-001, and SP4-687-001.

Example 3: When the value in SP4-902-2 is “236”, subtract 8 from the value in SP4-685-001, 6 from the value in SP4-686-001, and 8 from the value in SP4-687-001.

Table 2: Ricoh Copy paper for Aficio Color, 100 g (Europe)

SP4-902-2 (G_DATA1)	SP4-685-001 (Reference Adjustment: R)	SP4-686-001 (Reference Adjustment: G)	SP4-687-001 (Reference Adjustment: B)	Remarks
255	+23	+18	+23	Increase the values in SP4-685-1, 686-1, and 687-1.
254	+22	+17	+21	
253	+21	+16	+20	
252	+20	+15	+19	
251	+19	+14	+18	
250	+17	+13	+17	
249	+16	+12	+15	
248	+15	+11	+14	
247	+13	+10	+13	
246	+12	+9	+12	
245	+11	+8	+11	
244	+10	+7	+9	
243	+8	+6	+8	
242 : : 232	±0	±0	±0	No adjustment is required.
231	-9	-7	-8	Decrease the values in SP4-685-1, 686-1, and 687-1.
230	-10	-8	-10	
229	-12	-9	-11	
228	-13	-10	-13	
227	-15	-11	-14	
226	-16	-12	-16	
225	-18	-13	-17	
224	-19	-14	-19	
223	-21	-16	-20	
222	-22	-17	-22	
221	-24	-18	-23	
220	-25	-19	-25	
219	-27	-20	-26	
218	-29	-22	-28	
217	-30	-23	-30	
216	-32	-24	-31	
215	-34	-25	-33	

Example 1: When the value in SP4-902-2 is “255”, add 23 to the value in SP4-685-001, 18 to the value in SP4-686-001, and 23 to the value in SP4-687-001.

Example 2: When the value in SP4-902-2 is “242”, do not change any values in SP4-685-001, SP4-686-001, and SP4-687-001.

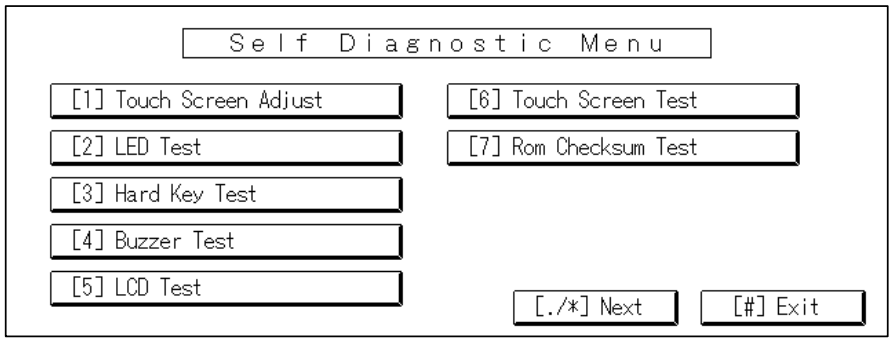
Example 3: When the value in SP4-902-2 is “231”, subtract 9 from the value in SP4-685-001, 7 from the value in SP4-686-001, and 8 from the value in SP4-687-001.

3.15 TOUCH SCREEN CALIBRATION

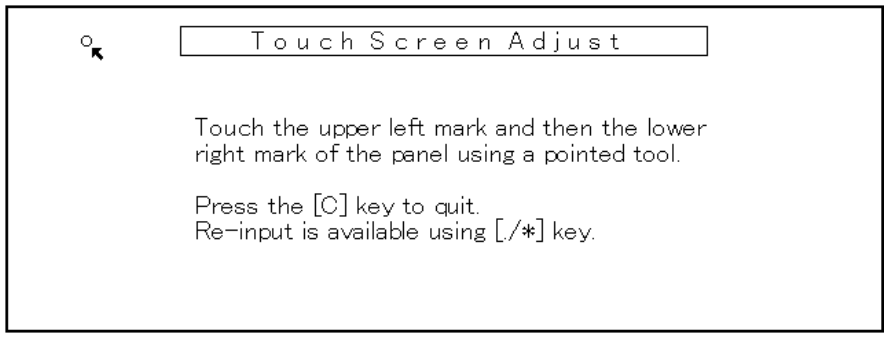
After clearing the memory, or if the touch screen detection function is not working correctly, follow this procedure to calibrate the touch screen.

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 (1)(9)(9)(3), and then press (C/©) 5 times to open the Self-Diagnostics menu.



B051R533.WMF



B051R554.WMF

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 screen 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.

4. TROUBLESHOOTING

4.1 SERVICE CALL

4.1.1 SERVICE CALL CONDITIONS

Level	Definition	Reset Procedure
A	Fusing unit SCs displayed on the operation panel. The machine is disabled. The user cannot reset the SC.	Turn the main power switch off then on before entering SP mode. Reset the SC (set SP5-810 to 1), then turn the main switch off then on again.
B	SCs to disable only the features that use the defective item. Although these SCs are not shown to the user under normal conditions, they are displayed on the operation panel only when the defective feature is selected.	Turn the main power switch off and on.
C	SCs that are not shown on the operation panel. They are internally logged.	Logging only
D	The SC is displayed on the operation panel. Turning the operation switch or main power switch off then on resets the SC. The SC is redisplayed if it occurs after the main power switch is turned on again.	Turn the main power switch off and on.

NOTE: 1) All SCs are logged.
2) When an electrical circuit board has a problem, check the connections before replacing the PCBs.
3) When a motor has a problem, check the mechanical load before replacing the motor or sensor.

4.1.2 SC TABLE

No.	Definition	Symptom	Possible Cause
101	D	Exposure lamp error	
		The standard white level is not properly detected when scanning the shading plate. (The shading data peak does not reach the specified threshold.)	• 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	D	Scanner home position error 1	
		The scanner home position sensor does not detect the on condition during scanning.	• Scanner I/O board or SBU defective • Scanner motor defective • Harness between scanner I/O board and scanner motor disconnected • Scanner HP sensor defective • Harness between SBU and HP sensor disconnected • Scanner wire, timing belt, pulley, or carriage defective
121	D	Scanner home position error 2	
		The scanner home position sensor does not detect the off condition during scanning.	• Scanner I/O board or SBU defective • Scanner motor defective • Harness between scanner I/O board and scanner motor disconnected • Scanner HP sensor defective • Harness between SBU and HP sensor disconnected • Scanner wire, timing belt, pulley, or carriage defective
122	D	Scanner home position error 3	
		The scanner home position sensor does not detect the home position during initialization.	• Scanner I/O board or SBU defective • Scanner motor defective • Harness between scanner I/O board and scanner motor disconnected • Scanner HP sensor defective • Harness between SBU and HP sensor disconnected • Scanner wire, timing belt, pulley, or carriage defective
142	D	White level detection error	
		The white level cannot be adjusted within the target during auto gain control.	• Dirty exposure glass or optics section • SBU board defective • BICU board defective • Exposure lamp defective • Lamp stabilizer defective
161	D	BICU error	
		• The correct value is not input into ASIC1 on the BICU board when the main switch is turned on. • ASICs on the BICU board are not recognized during scanning operation.	• BICU board defective (defective connection between ASICs)

No.	Definition	Symptom	Possible Cause
195	D	Serial number mismatch	
		Serial number stored in the memory is not correct. **NOTE:** Check the serial number with SP5-811-002. If the stored serial number is incorrect, contact your product specialist for details of how to solve the problem.	• NVRAM defective • BICU replaced without original NVRAM
201	D	Polygon motor error	
		• The polygon motor starts operating. → The lock signal is not detected within 20 seconds. • The polygon motor starts operating. → The lock signal is detected within 20 seconds. → After a 3-second waiting time, no lock signal is detected within 20 seconds. • The polygon motor stops operating. → The lock signal is not detected within 20 seconds. • The polygon motor is operating. → The lock signal remains undetected for 0.5 seconds.	• Defective polygon motor • Defective harness
220	D	1st beam synchronization error	
		A polygon motor lock is detected; the LD door is closed; and the LD remains on. → The LD error (1st beam synchronization error) continues for 0.5 seconds.	• Disconnected synchronization detector board • Defective LD unit • Defective BICU
221	D	2nd beam synchronization error	
		A polygon motor lock is detected; the LD door is closed; and the LD remains on. → The LD error (2nd beam synchronization error) continues for 0.5 seconds.	• Disconnected synchronization detector board • Defective LD unit • Defective BICU
230	D	FGATE on error	
		A transfer belt mark is detected. → No FGATE on signal is detected within 1 second.	• Defective BICU
231	D	FGATE off error	
		An FGATE assert signal is detected. → The FGATE negate signal is not detected within 30 seconds.	• Defective BICU
241	D	LD error	
		An LD error continues for 0.5 seconds. (After an LD error is detected, an LD error release is written to the GAVD chip during monitoring.)	• Defective LD unit

No.	Definition	Symptom	Possible Cause
280	D	Image transfer belt mark detection error	
		• An imaging process starts. → No belt mark is detected within 1 revolution. • A color imaging process starts. → A mono color image is transferred. → FGATE becomes active. → No belt mark is detected within 1 revolution. • Thick paper or OHP film is used. → The belt slows down. → No belt mark is detected within 1 revolution.	• Defective BICU • Poor electrical connection between sensor and BICU
282	D	GAVD communication error	
		Data is transferred. → The CPU does not detect the communication signal from GAVD.	• Defective BICU
300	D	Charge corona unit electrical leak	
		The supply to the charge corona unit is continuously output, and the unit is operating at the minimum PWM duty value. → 4.5 Volts (or more) returns for 60 milliseconds.	• Short circuit in the charge corona unit • Defective high voltage supply board • Defective harness (BICU - high voltage supply board)
301	D	Charge corona unit disconnection	
		The supply to the charge corona unit is continuously output. → The unit operates at the maximum PWM duty value for 60 milliseconds.	• Defective PCU installation (OPC belt) • Defective high voltage supply board • Defective harness (BICU - high voltage supply board)
302	D	Charge grid electrical leak	
		The supply to the charge grid is continuously output. → The returning voltage exceeds the target by 0.5 Volt or more for 120 milliseconds.	• Defective PCU installation (OPC belt) • Short circuit in the charge grid • Defective high voltage supply board • Defective harness (BICU - high voltage supply board)
305	D	Charge corona unit cleaner error	
		• Cleaning starts. → The lock signal is not detected within 30 seconds. • Cleaning starts. → The cleaner starts to turn. → The lock signal is detected within 6 seconds. • The lock signal is detected while the unit is moving away from the home position. → The next lock signal is detected within 6 seconds after the unit has turned toward the home position.	• Defective PCU installation (OPC belt) • Defective cleaner • Incorrect charge corona unit installation • Toner fallen into the cleaner drive mechanism
350	D	Development error 1 (K/Y)	
		A development process starts. → The returning voltage exceeds the target by 0.5 Volt or more for 60 milliseconds.	• Short circuit in the development unit • Defective high voltage supply board • Defective harness (BICU - high voltage supply board)

No.	Definition	Symptom	Possible Cause
351	D	Development error 2 (C/M)	
		A development process starts. → The returning voltage exceeds the target by 0.5 Volt or more for 60 milliseconds.	• Short circuit in the development unit • Defective high voltage supply board • Defective harness (BICU - high voltage supply board)
352	D	Development motor error	
		• The development motor starts or changes speed. → The motor does not detect a 1-second lock signal within 3 seconds. • The development motor starts. → The lock signal is detected during normal operation. → The lock signal is interrupted for 1 second or more.	• Defective development motor
400	D	1st transfer (image transfer) electric leakage (+)	
		Image transfer starts. → The process operates at the minimum PWM duty value. The returned current exceeds 1.8 V for 180 milliseconds.	• Short circuit in the image transfer unit • Defective image transfer belt • Defective high voltage supply board • Defective harness (BICU - high voltage supply board)
401	D	1st transfer (image transfer) electric leakage (–)	
		Image transfer starts. → The negative (–) output is at the maximum PWM duty value for 60 milliseconds.	• Short circuit in the image transfer belt • Defective high voltage supply board • Defective harness (BICU - high voltage supply board)
410	D	2nd transfer (paper transfer) electric leakage (+)	
		Paper transfer starts. → The positive (+) output is at the minimum PWM duty value. → The returning voltage stays at 2.7 V or more for 60 milliseconds.	• Short circuit in the paper transfer unit • Defective high voltage supply board • Defective harness (BICU - high voltage supply board)
411	D	2nd transfer (paper transfer) electric leakage (–)	
		Paper transfer starts. → The negative (–) output is at the minimum PWM duty value. → The returning voltage stays at 4.5 V or more for 60 milliseconds.	• Short circuit in the paper transfer unit • Defective high voltage supply board • Defective harness (BICU - high voltage supply board)
412	D	2nd transfer (paper transfer) disconnection (+)	
		Paper transfer starts. → The positive (+) output is at the maximum PWM duty value for 60 milliseconds.	• Right cover not closed • Defective transfer roller contact mechanism • Defective high voltage supply board • Defective harness (BICU - high voltage supply board)
420	D	Discharge error (fusing bias)	
		The discharge circuit is operating at the maximum PWM duty value for 60 milliseconds.	• Fusing bias short circuit • Scratched fusing belt • Defective high voltage supply board • Defective harness (BICU - high voltage supply board)

No.	Definition	Symptom	Possible Cause
421		Discharge plate error	
		During discharging, the leakage detection signal is low for 60 milliseconds.	• Short circuit in the discharge plate • Defective high voltage supply board • Defective harness (BICU - high voltage supply board)
430	D	Transfer belt cleaning error	
		• Cleaning is operating at the maximum PWM duty value for 60 milliseconds.	• Short circuit in the transfer belt cleaning unit • Defective high voltage supply board • Defective harness (BICU - high voltage supply board)
440	D	Main motor error	
		• The main motor starts or changes speed. → The lock signal does not continue for 1 second within 3 seconds. • The main motor starts. → The lock signal is detected and operation proceeds normally. → The lock signal is interrupted for 1 second.	• Defective main motor • Too much load of the main motor drive
460	D	Temperature sensor error	
		The output is 4.5 V (or higher) or 0.3 V (or lower) for 12 seconds.	• Defective temp./ humidity sensor • Defective circuit • Defective connector
461	D	Humidity sensor error	
		The output is 4.5 V (or higher) or 0.3 V (or lower) for 12 seconds.	• Defective temp./ humidity sensor • Defective circuit • Defective connector
480	D	ID sensor error	
		The ID sensor is being calibrated (process control, step 1) → While the LED is off, the output voltage is 0.5 V or lower.	• Defective ID sensor • Defective connector
481	D	Transfer belt mark detection error	
		• The main motor is operating; and the lock signal is detected. → The belt mark sensor signal does not change for 120 milliseconds.	• Defective main motor • Image transfer belt out of position • Belt mark blurred or absent
503	B	3rd tray error	
		• The tray lift motor turns on. → The top of the paper stack is not detected for 18 seconds. • The tray is set. → The top of the paper stack is detected. → The bottom plate is lowered. → The stack detection is not cleared within 7 seconds. → These steps are repeated 4 times.	• Defective paper height sensor • Defective tray lift motor

No.	Definition	Symptom	Possible Cause
504	B	4th tray error	
		• The tray lift motor turns on. → The top of the paper stack is not detected for 18 seconds. • The tray is set. → The top of the paper stack is detected. → The bottom plate is lowered. → The stack detection is not cleared within 7 seconds. → These steps are repeated 4 times.	• Defective paper height sensor • Defective tray lift motor
515	D	Duplex unit communication error	
		• A connection error occurs. • The signal is sent from the copier to the duplex unit every 3 seconds while paper is not transported by the unit. However, the duplex unit does not respond within 5 seconds.	• Defective duplex unit board • Defective BICU • Defective Ex-IOB • Defective connection (Main unit - Duplex unit)
520	D	Fusing unit motor	
		• The motor starts or changes speed. → The lock signal does not continue for 1 second within a 3-second interval. • The motor starts. → The lock signal is detected and operation proceeds normally. → The lock signal is interrupted for 1 second.	• Defective fusing unit motor
521	D	Paper feed motor error	
		• The motor starts or changes speed. → The lock signal does not continue for 1 second within a 3-second interval. • The motor starts. → The lock signal is detected and operation proceeds normally. → The lock signal is interrupted for 1 second.	• Defective paper feed motor
541	A	Thermistor disconnection (heating roller)	
		The fusing unit starts warm up to the print ready temperature. → The temperature does not reach 7°C for 10 seconds.	• Defective thermistor • Thermistor loose connection • Defective connector
542	A	Fusing warm-up timeout (heating roller)	
		The main switch is turned on or a cover is closed. → The heating roller does not reach the warm-up temperature within 50 seconds.	• Defective lamp (loose connection, thermostat failure, PSU, thermostat) • Incorrect detection (loose thermistor connection, fusing - drawer loose connection)
543	A	Overheat error (heating roller)	
		The heating roller thermistor detects 220°C for 5 seconds.	• Short circuit • Defective BICU board • Defective PSU

No.	Definition	Symptom	Possible Cause
544	A	Low temperature error (heating roller)	
		During standby or operation, the heating roller thermistor detects 100 °C or less for 5 seconds.	• Defective lamp (loose connection, thermostat failure, PSU, thermostat) • Incorrect detection (loose thermistor connection, fusing - drawer loose connection)
545	A	Full power error (heating roller)	
		Fusing unit warm-up is complete. → The heating roller stops turning. → The heating roller lamp keeps outputting the maximum power for 30 seconds.	• Thermistor loose connection • Fusing - drawer loose connection
546	A	Unstable temperature (heating roller)	
		The heating roller thermistor detects unstable temperature increases or decreases within 60 seconds.	• Thermistor loose connection • Fusing - drawer loose connection
551	A	Thermistor disconnection (pressure roller)	
		The pressure roller thermistor detects 7°C or lower for 30 seconds.	• Thermistor loose connection • Defective harness • Defective connector
552	A	Warm-up time over (pressure roller)	
		The main switch is turned on or a cover is closed. → The fusing pressure roller does not reach the ready temperature within 200 seconds.	• Defective lamp (loose connection, thermostat failure, PSU, thermostat) • Incorrect detection (thermistor loose connection, fusing - drawer loose connection)
553	A	Overheat error (pressure roller)	
		The pressure roller thermistor detects 165°C for 5 seconds.	• Loose connection • Defective BICU board • Defective PSU
554	A	Low temperature error (pressure roller)	
		During standby or operation, the pressure roller thermistor detects 60°C or less for 5 seconds.	• Defective lamp (loose connection, thermostat failure, PSU, thermostat) • Incorrect detection (thermistor loose connection, fusing - drawer loose connection)
555	A	Full power error (pressure roller)	
		Fusing unit warm-up is complete.→ The fusing pressure roller stops turning. → The pressure roller lamp keeps outputting the maximum power for 200 seconds.	• Thermistor loose connection • Fusing - drawer loose connection
556	A	Unstable temperature (pressure roller)	
		The pressure roller thermistor detects unstable temperature increases or decreases within 60 seconds.	• Thermistor loose connection • Fusing - drawer loose connection
560	D	Zero cross error	
		The main switch is turned on; the fusing relay turns on. → 50 Hz or 60 Hz is not detected within 5 seconds.	• Defective PSU • Incorrect power supply

No.	Definition	Symptom	Possible Cause
570	A	Fusing oil end	
		500 sheets of paper have been output since oil end was detected.	• Insufficient oil (the oil tank in the rear of the machine) • Defective oil pipe • Defective oil pump • Defective oil end sensor
571	A	Fusing oil overflow	
		• The oil overflow sensor detects oil. • When the machine covers are closed, the oil supply unit is not detected. • When the machine covers are closed, the fusing unit is not detected.	• Defective oil end sensor • Defective oil overflow sensor • Defective sensor cable • Oil supply unit not installed
620	D	ADF communication error	
		The ADF has been detected. → A communication error has occurred.	• Loose connection • Defective ADF • Defective BICU board • Defective scanner I/O board • External noise
630	C	CSS communication error	
		The machine tries to communicate with one of the terminals of a relevant service center. → An error signal returns.	• Communication error on the public telephone network (logged only; the machine can still operate)
632	D	MF accounting device error 1	
		The machine sends a data frame. → No normal end signal returns. → This symptom happens three times.	• Defective or broken line between machine and device
633	D	MF accounting device error 2	
		The machine is communicating with the accounting device. → The break signal returns.	• Defective or broken line between machine and device
634	D	MF accounting device error 3	
		A backup RAM error is reported from the accounting device.	• Defective accounting device controller • Defective battery in the accounting device
635	D	MF accounting device error 4	
		A battery voltage error is reported from the accounting device.	• Defective accounting device controller • Defective battery in the accounting device
640	C	Engine-to-controller communication checksum error	
		While the BICU and controller are communicating, a checksum error has occurred.	• Logged only; the machine can still operate
641	D	Engine-to-controller response error	
		The controller has sent a frame with the RAPI protocol, but the engine does not respond.	• Defective controller board • External noise

Trouble-shooting

No.	Definition	Symptom	Possible Cause
670	D	Engine startup error	
		Just after the main power is turned on or the machine is recovering from auto off mode, the engine ready signal assertion fails. Just after the main power is turned on, the engine does not respond.	• Defective controller board
672	D	Controller-to-operation panel communication error at startup	
		After powering on the machine, communication between the controller and operation panel does not begin, or the communication is interrupted after a normal startup.	• Controller stalled • Controller board installed incorrectly • Defective controller board • Operation panel connector loose or defective • Poor connection of DIMM and optional boards on the controller board
685	D	SBU/IPU communication error	
		While data is sent between the scanner and BICU board, a communication error has occurred.	• Defective scanner unit cable • Defective SBU board • Defective BICU board
687	D	PER command error	
		Some image data is transferred. → The controller does not report the necessary memory address.	• Poor connection between BICU and controller • Defective BICU • Defective controller
720	B	Finisher jogger motor error (500-sheet finisher)	
		• The finisher jogger H.P sensor remains de-activated for a certain time when returning to home position. • The finisher jogger H.P sensor remains activated for a certain time when moving away from home position.	• Jogger HP sensor defective • Jogger motor defective • Defective finisher control board • Defective BICU • Defective Ex-IOB • Incorrect installation
722	B	Finisher jogger motor error (1000-sheet finisher)	
		The finisher jogger H.P sensor remains de-activated for a certain time when returning to home position. The finisher jogger H.P sensor remains activated for a certain time when moving away from home position.	• Jogger HP sensor defective • Jogger motor defective • Defective finisher control board • Defective BICU • Defective Ex-IOB • Incorrect installation
724	B	Finisher staple hammer motor error (1000-sheet finisher)	
		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 • Defective finisher control board • Defective BICU • Defective Ex-IOB • Incorrect installation

No.	Definition	Symptom	Possible Cause
725	B	Finisher stack feed-out motor error (1000-sheet finisher)	
		The stack feed-out belt H.P 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 defective • Defective finisher control board • Defective BICU • Defective Ex-IOB • Incorrect installation
726	B	Finisher tray lift motor error (1000-sheet finisher)	
		The stack height sensor does not activate within a certain time after the tray lift motor turned on.	• Tray lift motor defective • Stack height sensor defective • Defective finisher control board • Defective BICU • Defective Ex-IOB • Incorrect installation
727	B	Finisher stapler motor error (500-sheet finisher)	
		Stapling does not finish within a certain time after the stapler motor turned on.	• Staple jam • Stapler overload caused by trying to staple too many sheets • Stapler motor defective • Defective finisher control board • Defective BICU • Defective Ex-IOB • Incorrect installation
728	B	Finisher paper stack height error (500-sheet finisher)	
		The stack height detection lever does not return to its home position before going to detect the stack height.	• Stack height lever solenoid defective • Stack height sensor defective • Lever sensor defective • Main control board defective • Defective finisher control board • Defective BICU • Defective IOB • Incorrect installation
730	B	Finisher stapler motor error (1000-sheet finisher)	
		The stapler does not return to its home position within a certain time after the stapler motor turned on. The stapler H.P sensor does not activate within a certain time after the stapler motor turned on.	• Stapler motor defective • Stapler HP sensor defective • Poor stapler motor connection • Defective finisher control board • Defective board • Defective BICU • Defective Ex-IOB • Incorrect installation

No.	Definition	Symptom	Possible Cause
731	B	• Output tray motor error (500-sheet finisher) • Exit guide plate motor error (1000-sheet finisher)	
		The tray upper limit sensor does not activate within a certain time after the tray motor turned on (500-sheet finisher). The exit guide plate HP sensor does not activate within a certain time after the exit guide plate motor turned on (1000-sheet finisher).	• Defective finisher control board • Defective BICU • Defective Ex-IOB • Incorrect installation 500-sheet finisher • Output tray motor defective • Tray upper limit sensor defective 1000-sheet finisher • Exit guide plate motor defective • Exit guide plate HP sensor defective
732	B	Finisher shift motor error (1000-sheet finisher)	
		Roller shift does not finish within a certain time after the shift motor turned on.	• Shift motor defective • Shift HP sensor defective • Defective finisher control board • Defective BICU • Defective Ex-IOB • Incorrect installation
740	D	Finisher communication error	
		• A connection error occurs. • The UART reports a communication error. • In cases other than paper transport, after an every-3-second command is sent, the finisher does not respond within 5 seconds.	• Defective finisher control board • Defective BICU • Defective Ex-IOB • Incorrect installation
750	D	1st paper tray unit communication error	
		• A connection error occurs. • The UART reports a communication error. • In cases other than paper transport, after an every-3-second command is sent, the paper tray unit does not respond within 5 seconds.	• Defective paper tray unit control board • Defective BICU • Defective Ex-IOB • Defective connection (Paper tray - main unit)
770	D	Shift tray unit motor error	
		• The machine starts. → The tray motor operates for 2.2 seconds. → The sensor does not detect the operation. • The machine is printing. → The tray motor operates for 2.2 seconds. → The sensor does not detect the operation.	• Defective tray motor • Defective sensor • Defective shift tray connector
791	D	Bridge unit error	
		The machine recognizes the finisher, but does not recognize the bridge unit.	• Defective connector • Defective cable
792	D	Finisher error	
		The machine does not recognize the finisher, but recognizes the relay unit.	• Defective connector • Defective cable • Incorrect installation

No.	Definition	Symptom	Possible Cause
793	D	Interchange unit error	
		The machine recognizes the duplex unit/1-bin tray unit, but does not recognize the interchange unit.	• Incorrect installation • Defective connector • Defective cable
800	B	Startup without video output end error (K)	
		Video transfer to the engine is started, but a video transmission end command is not issued by the engine within the specified time.	• Defective controller board
801	B	Startup without video output end error (Y)	
		Video transfer to the engine is started, but a video transmission end command is not issued by the engine within the specified time.	• Defective controller board
802	B	Startup without video output end error (M)	
		Video transfer to the engine is started, but a video transmission end command is not issued by the engine within the specified time.	• Defective controller board
803	B	Startup without video output end error (C)	
		Video transfer to the engine is started, but a video transmission end command is not issued by the engine within the specified time.	• Defective controller board
804	B	Startup without video input end error (K)	
		Video transfer to the engine is started, but a video transmission end command is not issued by the scanner within the specified time.	• Defective controller board
805	B	Startup without video input end error (Y)	
		Video transfer to the engine is started, but a video transmission end command is not issued by the scanner within the specified time.	• Defective controller board
806	B	Startup without video input end error (M)	
		Video transfer to the engine is started, but a video transmission end command is not issued by the scanner within the specified time.	• Defective controller board
807	B	Startup without video input end error (C)	
		Video transfer to the engine is started, but a video transmission end command is not issued by the scanner within the specified time.	• Defective controller board
808	B	Startup without video input end error (R)	
		Video transfer to the engine is started, but a video transmission end command is not issued by the scanner within the specified time.	• Defective controller board
809	B	Startup without video input end error (G)	
		Video transfer to the engine is started, but a video transmission end command is not issued by the engine within the specified time.	• Defective controller board

No.	Definition	Symptom	Possible Cause
810	B	Startup without video input end error (B)	
		Video transfer to the engine is started, but a video transmission end command is not issued by the engine within the specified time.	• Defective controller board
818	B	Watchdog error	
		While the system program is running, no other programs can run (due to a bus hold or endless loop).	• Defective controller board
819	B	Kernel abnormal end error	
		A HDD error or a software error has occurred, terminating the SCS process, gwinit process, and finally the kernel program. A system process has exhausted the RAM.	• HDD error • Software application error • RAM shortage
820	B	Self-Diagnostic Error: CPU	
		An unexpected exception or interruption has occurred.	• Defective controller board • Software defective
821	B	Self-Diagnostic Error: ASIC	
		The ASIC returned an error during the self-diagnostic test, because the ASIC and CPU timer interrupts are compared and determined to be out of range.	• Defective controller board
822	B	Self-Diagnostic Error: HDD	
		The hard disk drive returned an error during the self-diagnostic test.	• HDD defective • HDD connector defective • Defective controller board
823	B	Self-diagnostic Error: NIB	
		The network interface board returned an error during the self-diagnostic test.	• Network interface board defective • Defective controller board
824	B	Self-diagnostic Error: NVRAM	
		The resident non-volatile RAM returned an error during the self-diagnostic test.	• NVRAM damaged or abnormal • Backup battery has discharged • NVRAM socket damaged
826	B	Self-diagnostic Error: RTC/Optional NVRAM	
		The RTC (real time clock) or optional NVRAM returned an error during the self-diagnostic test.	• RTC defective • NVRAM defective
827	B	Self-diagnostic Error: RAM	
		The resident RAM returned a verify error during the self-diagnostic test.	• Memory malfunction
828	B	Self-diagnostic Error: ROM	
		The resident read-only memory returned an error during the self-diagnostic test.	• Defective controller board • Firmware defective
829	B	Self-diagnostic Error: Optional RAM	
		The optional RAM returned an error during the self-diagnostic test.	• RAM DIMM defective • Defective controller board

No.	Definition	Symptom	Possible Cause
835	B	Self-Diagnostic Error: Parallel Interface	
		A loopback test error occurred.	• Loopback connector not detected • IEEE1284 connector defective • Defective controller board
836	B	Self-diagnostic Error: Resident Font ROM	
		The resident font ROM returned an error during the self-diagnostic test.	• Font ROM defective
837	B	Self-diagnostic Error: Optional Font ROM	
		The optional font ROM returned an error during the self-diagnostic test.	• Font ROM defective
838	D	Verification error	
		The verification data of the clock generator is read via the communication bus. → The data contradicts the normal value.	• Defective controller board
850	B	Network I/F abnormal	
		The IP address is incorrect, or the controller cannot accesses the network due to a driver error.	• Incorrect network setting • Defective controller board
851	B	IEEE1394 I/F abnormal	
		The IEEE1394 interface cannot be used, due to a driver error.	• IEEE1394 interface board defective • Defective controller board
853	D	IEEE802 11b card startup error	
		The machine starts up. → The IEEE802 11b card connection board is recognized. → The IEEE802 11b card is not recognized.	• Loose connection between the card and the connection board
854	D	IEEE802 11b card access error	
		The machine has been reading the data from the card. → The machine loses access to the card; the IEEE802 11b card connection board is still recognized.	• Loose connection between the card and the connection board
855	D	IEEE802 11b card error	
		Some illegal data is found in the card.	• Defective card
856	D	IEEE802 11b card connection board error	
		An error is detected in the IEEE802 11b card connection board.	• Defective card connection board
860	C	Startup without HD connection at main power on	
		The hard disk is not detected. (The hard disk is not formatted.)	• Cable between controller and HD loose or defective • HD power connector loose or defective • HD defective • Controller defective
861	C	Startup without HD detection when the power key was pressed	
		The hard disk is not detected.	• Cable between controller and HD loose or defective • HD power connector loose or defective • HD defective • Controller defective

No.	Definition	Symptom	Possible Cause
862	D	Bad sector count at the maximum	
		The hard disk has 100 bad sectors in the image storage area. → More data is read from the hard disk. → SC863 occurs. → The number of bad sectors exceeds the maximum value. **NOTE:** To format the hard disk, use SP5-832-1. Bad sectors may affect quality or reduce productivity. The hard disk should be replaced when it contains bad sectors.	• Data corruption • Defective hard disk
863	B	Startup without HD data lead	
		Data stored on the hard disk is not read correctly.	• Bad sector detected 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 from the HD was abnormal.
865	B	HD access error	
		The hard disk returned an error.	• Error detected other that a bad sector error (SC863) or a CRC error (SC864)
870	D	Address book data error	
		The address book in the hard disk is accessed. → An error is detected in the address book data; address book data is not read; or data is not written into the address book. **NOTE:** To recover from the error, do any of the following countermeasures: • Format the address book by using SP5-832-008 (all data in the address book–including the user codes and counters–is initialized) • Initialize the user data by using SP5-832-006 and -007 (the user codes and counters are recovered when the main switch is turned on) Replace the hard disk (the user codes and counters are recovered when the main switch is turned on).	• Data corruption • Defective hard disk • Defective software
900	B	Electronic total counter error	
		The value of the total counter is out of the normal range.	• Defective NVRAM
901	B	Mechanical total counter error 1	
		Mechanical counter 1 is not initialized, or not detected.	• Defective connection • Defective counter
902	B	Mechanical total counter error 2	
		Mechanical counter 2 is not initialized, or not detected.	• Defective connection • Defective counter

No.	Definition	Symptom	Possible Cause
925	D	Net file error	
		The management file for net files is corrupted; net files are not normally read. Netfiles: Jobs to be printed from the document server using a PC and the DeskTopBinder software	• Defective hardware • Data corruption • Defective software
990	B	Software performance error	
		The software attempted to perform an unexpected operation. **NOTE:** When this error occurs, the file name, address, and data will be stored in NVRAM. This information can be checked by using SP7-403. See the data and the situation in which this SC occurs. Then report the data and conditions to your technical control center.	• Software defective • Internal parameter incorrect • Insufficient working memory
991	C	Software continuity error	
		The software attempted to perform an unexpected operation. However, unlike SC990, the process can keep on running.	• Logged only; the machine can continue to operate
992	D	Other system SCs	
		The controller received an unknown SC code from the engine.	• Contact your product specialist.
997	B	Application function selection error	
		The application selected by a key press on the 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 switching the machine on, the application does not start within 60 s. (No applications start or 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. Important Notes About SC999 • This SC is not logged, because it operates primarily in the download mode. • 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.	• Software defective • An option required by the application (RAM, DIMM, board) is not installed • Board installed incorrectly • BICU defective • Controller defective • IC card defective • NVRAM defective • Loss of power during downloading

Trouble-shooting

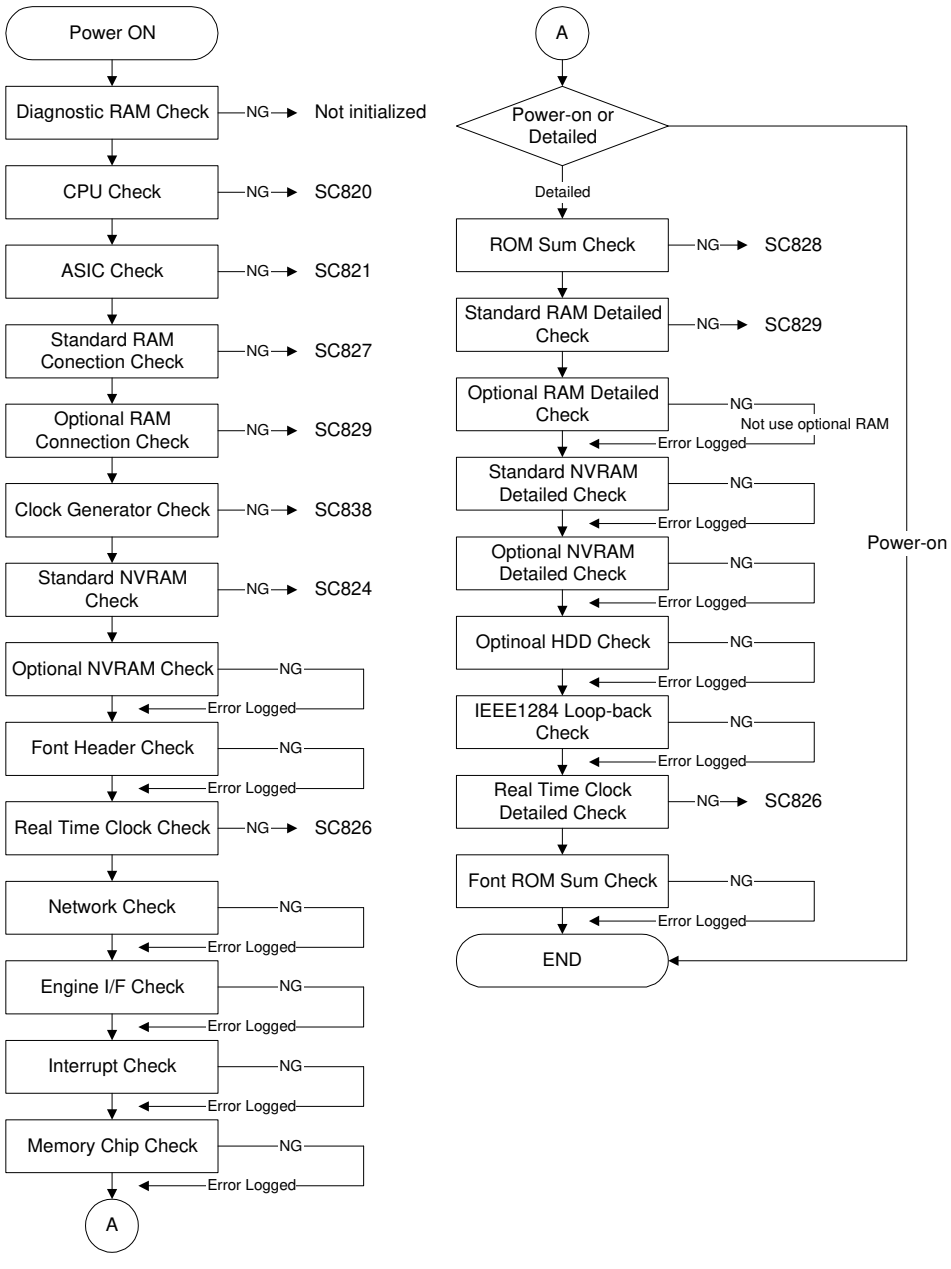
4.2 SELF-DIAGNOSTIC MODE

4.2.1 OVERVIEW

There are three types of self-diagnostics for the controller.

- Power-on self-diagnostics: The machine automatically starts the self-diagnostics just after the power has been turned on.
- Detailed self-diagnostics: The machine does the detailed self-diagnostics by using a loop-back connector (P/N G0219350)
- SC detection: The machine automatically detects SC conditions at power-on or during operation.

The following shows the workflow of the power-on and detailed self-diagnostics.



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4.2.2 DETAILED SELF-DIAGNOSTICS

This detailed self-diagnostic test requires a loop-back connector (P/N: G0219350).

1. Turn off the machine and attach the loop-back connector to the parallel interface.
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 prints the diagnostic report after completing the test.
   - Refer to the diagnostics report for the detected errors. The errors detected during self-diagnostics can be checked with SP7-832-001 (Diag. Result).
   - Refer to section 4.2 for details about the error codes.

4.3 IMAGE TEST MODE

4.3.1 OVERVIEW

The SBU, BICU, and LD board have the function that prints out their test pattern. It is useful to find the defective board when the image data problem is occurred.

4.3.2 VPU TEST

The SBU has the VPU test pattern. To make sure the scanner VPU control is functioning, output the VPU test pattern with SP4-907.

SP4-907-1: VPU Test Pattern: R

SP4-907-2: VPU Test Pattern: G

SP4-907-3: VPU Test Pattern: B

4.3.3 IPU TEST

The BICU board has the IPU test pattern. To make sure the image processing is functioning, output the IPU test pattern with SP4-417.

The BICU board also has the self-check mode with SP4-904-1 or 2.

If no error is detected, the test ends, and the completion code appears in the operation panel display. If an error is detected, the test is interrupted and an error code is displayed. The table below lists the completion and error codes.

SP4-904-1 Register Write/Read Check Result

	Code
Normal end	00
Abnormal end	11 ~ 15

SP4-904-2 Image Path Check Result

	Code
Normal end	00
Abnormal end	21 ~ 24

4.3.4 GAVD TEST

The LD board has the GAVD test pattern. To make sure the printing control is functioning, output the GAVD test pattern with SP5-955 (Test Pattern is displayed).

This test pattern includes the pattern for image adjustment such as registration, blank margin, laser beam pitch, etc.

4.4 ELECTRICAL COMPONENT DEFECTS

4.4.1 SENSORS

Component (Symbol)	CN	Condition	Symptom
Fusing exit sensor	324 (I/O board)	Open	A paper jam is detected when paper is fed; and the paper jam is cleared when the paper is removed
		Shorted	A paper jam is detected when paper is not fed.
ID sensor	258 (BICU)	Open	No immediate symptom is seen. (☛ NOTE)
		Shorted	• The machine does not respond. • No immediate symptom is seen. (☛ NOTE)
Image transfer belt mark sensor	307 (I/O board)	Open	SC481 is displayed.
		Shorted	SC481 is displayed.
O/B waste toner bottle full sensor	307 (I/O board)	Open	Bottle full is not detected when the bottle is full.
		Shorted	No symptom is seen.
Oil end sensor	259 (BICU)	Open	No immediate symptom is seen.
		Shorted	The oil pump turns on to pump oil up when there is enough oil.
Oil overflow sensor	259 (BICU)	Open	SC571 is displayed.
		Shorted	SC571 is displayed.
Original length sensor 1	104 (SBU)	Open	The original size is not correctly detected. Output images are blurred.
		Shorted	The original size is not correctly detected. Output images are blurred.
Original length sensor 2	104 (SBU)	Open	The original size is not correctly detected. Output images are blurred.
		Shorted	The original size is not correctly detected. Output images are blurred.
Original width sensor	104 (SBU)	Open	The original size is not correctly detected. Output images are blurred.
		Shorted	The original size is not correctly detected. Output images are blurred.
Paper end sensor 1	406 (High voltage supply)	Open	Paper end is not detected when the tray is empty.
		Shorted	Paper end is detected when the tray is not empty.
Paper end sensor 2	340 (I/O board)	Open	Paper end is not detected when the tray is empty.
		Shorted	Paper end is detected when the tray is not empty.
Paper exit sensor	324 (I/O board)	Open	A paper jam is detected when paper is fed.
		Shorted	A paper jam is detected when no paper is fed.
Paper feed sensor 1	324 (I/O board)	Open	A paper jam is detected when paper is fed; and the paper jam is not cleared when the paper is removed.
		Shorted	A paper jam is detected when paper is fed; and the paper jam is not cleared when the paper is removed. Or, a paper jam is detected before paper is fed.

Component (Symbol)	CN	Condition	Symptom
Paper feed sensor 2	340 (I/O board)	Open	A paper jam is detected when paper is fed; and the paper jam is not cleared when the paper is removed.
		Shorted	A paper jam is detected when paper is fed; and the paper jam is not cleared when the paper is removed. Or, a paper jam is detected before paper is fed.
Paper near-end sensor 1	406 (High voltage supply)	Open	Paper near end is detected when the tray is full.
		Shorted	Paper full is detected when the tray is almost emptily.
Paper near-end sensor 2	406 (High voltage supply)	Open	Paper end is detected when the tray is not empty.
		Shorted	• Paper full is detected when the tray is almost empty. • Paper near-end is detected when the tray is full.
Paper overflow sensor	324 (I/O board)	Open	Paper overflow is not detected when the paper exit tray is full.
		Shorted	Paper overflow is detected when the paper exit tray is not full.
Platen cover sensor	324 (I/O board)	Open	The original size is not correctly detected.
		Shorted	No symptom
Registration sensor	405 (High voltage supply)	Open	A paper jam is detected when paper is fed; and the paper jam is not cleared when the paper is removed.
		Shorted	• A paper jam is detected when paper is fed; and the paper jam is not cleared when the paper is removed. • A paper jam is detected before paper is fed.
Scanner HP sensor	104 (SBU)	Open	SC120 is displayed.
		Shorted	The scanner motor tries to operate for about 40 seconds before SC122 is displayed.
Synchronization detector	502 (LDB)	Open	SC220 is displayed.
		Shorted	The machine does not respond. SC220 is displayed.
T/B waste toner bottle full sensor	307 (I/O board)	Open	Bottle full is not detected when the bottle is full.
		Shorted	Bottle full is detected when the bottle is not full.
Temperature/humidity sensor	257 (BICU)	Open	SC460 is displayed.
		Shorted	SC460 is displayed.

NOTE: An SC condition occurs only when a new PCU is being installed in the machine. During copying, if the ID sensor fails, the image density will be changed.

4.4.2 SWITCHES

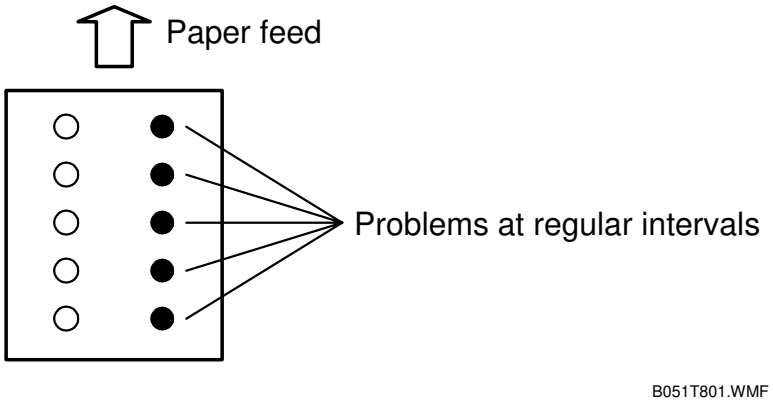
Component (Symbol)	CN	Condition	Symptom
Exit cover switch	324 (I/O board)	Open	The user is prompted to close the exit cover.
		Shorted	No symptom is seen.
Front cover switch	324 (I/O board)	Open	The user is prompted to close the front cover.
		Shorted	No symptom is seen.
Interlock switch	312 (I/O board)	Open	The user is prompted to close the front cover.
		Shorted	No symptom is seen.
O/B waste toner bottle switch	307 (I/O board)	Open	The bottle is not detected when it is installed.
		Shorted	The bottle is detected when it is not installed.
Tray set/paper size switch (tray 1)	308 (I/O board)	Open	The tray is not detected when it is installed.
		Shorted	• The paper tray is detected when it is not installed. • The paper size is incorrectly detected (a paper jam may occur).
Tray set/paper size switch (tray 2)	308 (I/O board)	Open	The tray is not detected when it is installed.
		Shorted	• The paper tray is detected when it is not installed. • The paper size is incorrectly detected (a paper jam may occur).
Right cover switch	324 (I/O board)	Open	The user is prompted to close the right cover.
		Shorted	No symptom
T/B waste toner bottle switch	307 (I/O board)	Open	The bottle is not detected when it is installed.
		Shorted	Bottle full is detected when the bottle is not installed.

4.4.3 BLOWN FUSE CONDITIONS

Fuse	Rating		Symptom when turning on the main switch
	115V	220 ~ 240V	
Power Supply Board			
FU1 (N.A.)	15A/125V	—	No response
FU2	10A/250V	5A/250V	No response
FU8	4A/125V	4A/250V	The machine starts initialization (the sound is heard), but nothing appears on the operation panel.
FU9	6.3A/250V	6.3A/250V	The machine starts program loading, and "Functional Problems" appears on the operation panel with the code "SC901."

4.5 CHECK POINTS FOR IMAGE PROBLEMS AT REGULAR INTERVALS

Image problems may appear at regular intervals that depend on the circumference of certain components. The following diagram shows the possible symptoms (black or white dots at regular intervals).



Colored spots at 54-mm intervals: Development roller
Abnormal image at 68-mm intervals: Transfer roller
Abnormal image at 188-mm intervals: Fusing belt
Abnormal image at 125-mm intervals: Pressure roller in the fusing unit

5. SERVICE TABLES

5.1 SERVICE PROGRAM MODE

⚠CAUTION

Do not turn off the main power switch while the power LED (☀) lights or flashes. Doing so may severely damage the hard disk or the memory of the copier. Before turning off the main power switch, press the operation power switch, and wait for the power LED to go out.

NOTE: The main power LED lights or flashes when:
1) the platen cover or ARDF is open
2) the hard disk or memory is accessed
3) the copier is communicating with another device

5.1.1 SERVICE PROGRAM MODE OPERATION

Starting the SP mode

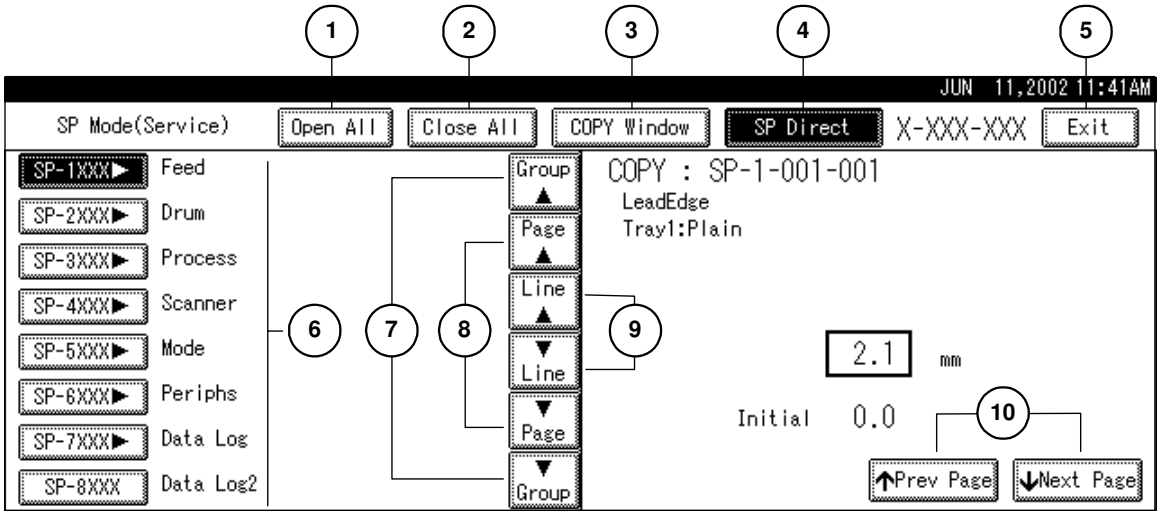
1. Press the clear modes key. 
2. Type “107” at the numeric keypad. 
3. Press the clear/stop key and hold it down until the screen display changes (for about 3 seconds). 
4. Touch “Copy Sp” on the touch screen. **Copy SP**

Quitting the SP mode

1. Touch “Exit” on the touch screen until the screen display changes. **Exit**
2. Touch “Exit” on the touch screen until the screen display changes. **Exit**

SP Mode Touch Screen

For details on the SP modes, see section 5.1.2.



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① Expands all SP mode menus.

② Collapses all SP mode menus.

③ Opens the copy window (☛ Copy Window for Test Printing).

④ Enables numeric keypad inputs for specifying a SP mode menu.
(Type a menu number at the numeric keypad, and press the # key.)

⑤ Quits the SP mode.

⑥ Expands or collapses the menu list of each group.

⑦ Scrolls up or down through the groups.

⑧ Scrolls up or down to the previous or next page.

⑨ Scrolls up or down to the previous or next line.

⑩ Selects the previous or next menu.

Copy Window for Test Printing

1) Touch the "Copy Window" button (☛ SP Mode Touch Screen). The copy window is displayed.
2) Adjust the settings if necessary, and press the ⓢ (start) key to make the test print.
3) Touch the "SP Mode" button (highlighted on the touch screen). The SP mode screen is displayed.

Working on SP Mode Menus

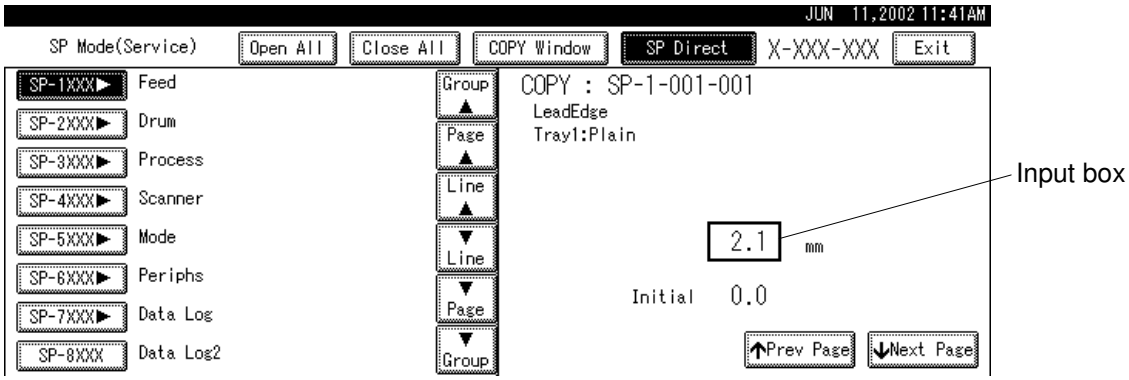
The SP mode menus are classified in three levels.

1. Find the necessary SP mode menu from the "SP Mode Table" (☛ 5.1.2).
2. Select an SP using either of the following two operations:

   1) Using the numeric key pad
      a) Make sure the "SP Direct" button is highlighted. (If not, touch the button.)
      b) Type the SP mode menu number at the numeric key pad.

   2) Using the touch screen
      a) Touch the "Open All" button or the "Group #" button (where the # indicates the group number which the necessary menu belongs to).
      b) Scroll the menu if necessary (☛ SP Mode Touch Screen).
      c) Touch the necessary menu, or touch the "Prev Page" or "Next Page" button to select the menu.

3. Type the necessary values at the numeric key pad. The value in the input box is overwritten.



B051S501.WMF

NOTE: 1) "Initial" indicates the default value.
2) To toggle plus/minus, press the ⓒ (clear/stop) key.

4. Press the # key. If an out-of-range value has been input in the box, the value is ignored.
   NOTE: If you are prompted to complete the setting, touch "Yes".
5. Quit the SP mode (☛ Quitting the SP mode).

Service Tables

5.1.2 SP MODE TABLE

In the "Function/[Setting]" column:

- The related pop-up screen name and function name (if any) appear in parenthesis following the function description.
- Comments are in *italics*.
- The setting range is enclosed in brackets, with the default setting written in **bold**.
- An asterisk (*) after the mode number means that this mode's value is stored in the NVRAM. If you do a RAM reset, all these SP modes will be returned to their factory settings.
- **DFU** stands for **D**esign/**F**actory **U**se only. Values marked **DFU** should not be changed.

NOTE: The Service Program Mode is for use by service representatives only, so that they can properly maintain product quality. If this mode is used by anyone other than service representatives for any reason, data might be deleted or settings might be changed. In such case, product quality cannot be guaranteed any more.

SP1-XXX: (Feed)

1	Mode No. (Class 1, 2, and 3)		Function / [Setting]
001*	Lead Edge		
	1	Tray 1: Plain	Adjusts the leading edge registration by changing the registration clutch operation timing for each mode. [–9.0 ~ 9.0 / **0.0** / 0.1 mm/step] *The user mode cannot adjust the settings for thick paper or OHP sheets.* ***NOTE:*** *When adjusting SP1-001-2 or 3, check SP1-001-1 first. SP1-001-2 and 3 adjust the differences between the leading edge registration positions for the following paper types:* *1: Plain paper and thick paper* *2: Plain paper and OHP* *In the same manner, when adjusting SP1-001-5 or 6, check SP1-001-4 first; and when adjusting SP1-001-10 or 11, check SP1-001-9 first.*
	2	Tray 1: Thick	
	3	Tray 1: OHP	
	4	Tray 2: Plain	
	5	Tray 2: Thick	
	6	Tray 2: OHP	
	7	Tray 3	
	8	Tray 4	
	9	By-pass: Plain	
	10	By-pass: Thick	
	11	By-pass: OHP	
	12	Duplex	
002*	Side-to-Side		
	1	By-pass	Adjusts the side-to-side registration by changing the laser main scan start position for each mode. [–4.0 ~ 4.0 / **0.0** / 0.1 mm/step] ***NOTE:*** *When adjusting SP1-002-1, 3, 4, 5, or 6, check SP1-002-2 first. SP1-002-1, 3, 4, 5, and 6 adjust the differences in the side-to-side registrations between each paper tray and tray 1.*
	2	Tray 1	
	3	Tray 2	
	4	Tray 3	
	5	Tray 4	
	6	Duplex	
003*	Paper Buckle		
	1	Tray: Plain	Adjusts the amount of paper buckle at the registration roller by changing the paper feed timing. [–4 ~ 6 / **0** / 1 mm/step]
	2	Tray: Thick	[–4 ~ 6 / **–2** / 1 mm/step]
	3	Tray: OHP	[–4 ~ 6 / **–2** / 1 mm/step]

1	Mode No. (Class 1, 2, and 3)		Function / [Setting]
003*	4	Tray: Small Size	[–4 ~ 6 / **0** / 1 mm/step] *Small Size includes LT long edge feed and smaller.*
	5	By-pass: Plain	[–4 ~ 6 / **0** / 1 mm/step]
	6	By-pass: Thick	[–4 ~ 6 / **–2** / 1 mm/step]
	7	By-pass: OHP	[–4 ~ 6 / **–2** / 1 mm/step]
	8	Duplex	[–4 ~ 6 / **0** / 1 mm/step]
105*	Fusing Temperature		
	1	Heating: Idling	Sets the temperature at which the heating roller starts idling. [100 ~ 180 / **145** / 1°C/step]
	2	Heating: Ready	Sets the temperature at which the heating roller enters the print ready condition. [100 ~ 180 / **165** / 1°C/step]
	3	Heating: Standby	Sets the heating roller temperature for the ready (standby) condition. After the main switch has been turned on, the machine enters this condition when the heating roller temperature reaches the temperature specified in this SP mode. When the machine is recovering from energy saver or auto off mode, the machine becomes ready when both heat and pressure roller temperatures reach the specified temperature. Pressure roller: SP1-105-16 [100 ~ 180 / **175** / 1°C/step]
	4	Heating: Plain/1 Color	Sets the heating roller temperature for thin paper in single-color mode. [120 ~ 190 / **160** / 1°C/step]
	5	Heating: Plain/Full Color	Sets the heating roller temperature for thin paper in full-color mode. [120 ~ 190 / **170** / 1°C/step]
	6	Heating: Middle Thick/1 Color	Sets the heating roller temperature for normal plain paper in single-color mode. [120 ~ 190 / **170** / 1°C/step]
	7	Heating: Middle Thick/Full Color	Sets the heating roller temperature for normal plain paper in full-color mode. [120 ~ 190 / **180** / 1°C/step]
	8	Heating: Thick/1 Color	Sets the heating roller temperature for thick paper in single-color mode. [120 ~ 190 / **170** / 1°C/step]
	9	Heating: Thick/Full Color	Sets the heating roller temperature for thick paper in full-color mode. [120 ~ 190 / **175** / 1°C/step]
	10	Heating: OHP/1 Color	Sets the heating roller temperature for OHP sheets in single-color mode. [120 ~ 190 / **170** / 1°C/step]
	11	Heating: OHP/Full Color	Sets the heating roller temperature for the OHP sheets in full-color mode. [120 ~ 190 / **180** / 1°C/step]
	12	Heating: Duplex/1 Color	Sets the heating roller temperature for duplex printing (both sides) in single-color mode. [120 ~ 190 / **155** / 1°C/step]

1	Mode No. (Class 1, 2, and 3)		Function / [Setting]
105*	13	Heating: Duplex/Full Color	Sets the heating roller temperature for duplex printing (both sides) in full-color mode. [120 ~ 190 / **165** / 1°C/step]
	14	Pressure: Idling	Sets the temperature at which the pressure roller starts idling. [30 ~ 100 / **10** / 1°C/step]
	15	Pressure: Ready	Sets the temperature at which the pressure roller becomes ready for printing. [60 ~ 150 / **70** / 1°C/step]
	16	Pressure: Standby	Sets the pressure roller temperature for the ready (standby) condition. After the main switch has been turned on, the machine enters this condition when the pressure roller temperature reaches the temperature specified in this SP mode. When the machine is recovering from energy saver or auto off mode, the machine becomes ready when both heat and pressure roller temperatures reach the specified temperature. Heating roller: SP1-105-3 [60 ~ 150 / **120** / 1°C/step]
	27	Heating: OFFSET +	Sets the heating roller temperature correction for when room temperature is 15°C or lower. [0 ~ 20 / **5** / 1°C/step]
	28	Pressure: OFFSET +	Sets the pressure roller temperature correction for when room temperature is 15°C or lower. [0 ~ 20 / **0** / 1°C/step]
	29	Heat: OFFSET –	Sets the heating roller temperature correction for when room temperature is 30°C or higher. [0 ~ 20 / **5** / 1°C/step]
	30	Pressure: OFFSET –	Sets the pressure roller temperature correction for when room temperature is 30°C or higher. [0 ~ 20 / **0** / 1°C/step]
106	Temperature Display		
	1	Heating Roller	Displays the current temperature of the heating and pressure rollers.
	2	Pressure Roller	
109	Fusing Nip		
	1	Execute Mode	Checks the fusing nip width using an OHP sheet. • *The OHP sheet stops in the fusing unit for the specified time (☛ SP1-109-2).* • *The nip width should be 9 ± 0.5 mm at front and rear. If this requirement is not met, change the fusing unit.*
	2	Stop Duration	Adjusts the stoppage time for the OHP sheet in the fusing unit (☛ SP1-109-1). [0 ~ 100 / **10** / 1 s/step]
920	Exit Full Timer		
	1	Exit Full Timer	[10 ~ 60 / **10** / 1 s/step] **DFU**
930	Fusing Oil Add		
	1	Fusing oil add	Forces the oil pump to supply silicone oil up from the oil tank to the tank in the oil supply unit. If the oil end sensor detects oil in the oil supply unit, this SP will not start the pump.

1	Mode No. (Class 1, 2, and 3)		Function / [Setting]
940	LEF Priority–Bypass		
	1	LEF Priority–Bypass	Selects the default paper feed direction of the by-pass tray. [0 ~ 1 / **0** / 1 /step] • *0: SEF* • *1: LEF* *The machine detects only the width, but detects the size based on this information.* *If the setting is 0 (SEF): When A4 LEF is placed in the bypass tray, the machine detects this as A3. A4 SEF will be detected as A4.* *If the setting is 1 (LEF): The machine will detect A4LEF as A4. However, if A4 SEF is placed in the bypass tray, it will be detected as A5.*

SP2-XXX: (Drum)

2	Mode No. (Class 1, 2, and 3)		Function / [Setting]
001*	Charge Bias		
	1	[M]	Adjusts the charge corona unit grid voltage. [300 ~ 800 / **500** / 1 Volt/step] Only effective is SP3-003 is set to 0.
	2	[C]	
	3	[Y]	
	4	[K]	
	5	No Image Area	
	6	Charger Current	Adjusts the charge corona unit current. [400 ~ 800 / **500** / 1 μA/step]
100*	Magnification Adjustment		
	1	Main Scan	Adjusts the magnification in each scan direction. [–12.8 ~ 12.7 / **0** / 0.01%/step]
	2	Sub Scan	
101*	Trim Adjustment		
	1	front	Adjusts the width of the white margin. [0.0 ~ 9.0 / **4.0** / 0.1 mm/step]
	2	back	[0.0 ~ 9.0 / **2.0** / 0.1 mm/step]
	3	lead	
	4	trail	
201*	Develop Bias Adjustment		
	1	[M]	Adjusts the development bias. [0 ~ 500 / **250** / 1 Volt/step] Only effective is SP3-003 is set to 0.
	2	[C]	
	3	[Y]	
	4	[K]	
208	Forced Toner		
	1	[K]	Forcefully supplies toner to the development unit.
	2	[C]	
	3	[M]	
	4	[Y]	
	5	All Color	
213	Toner End Set		
	1	Toner End Set	Specifies how many sheets can be printed after the toner near end message. [0 ~ 255 / **50** / 1 /step] **DFU**
301	Trans Belt Bias		
	1	1 Color: Front	Adjusts the transfer belt current. [30 ~ 140 / **80** / 10 μA/step] *The front side image for 1-color printing*
	2	1 Color: Rear	[30 ~ 140 / **80** / 10 μA/step] *The rear side image for 1-color duplex printing*
	3	2 Colors: First color	[30 ~ 140 / **130** / 10 μA/step] *The first color toner image of 2-color printing*
	4	3 Colors: First color	[30 ~ 140 / **130** / 10 μA/step] *The first color toner image of 3-color printing*
	5	4 Colors: First color	[30 ~ 140 / **75** / 10 μA/step] *The first color toner image of 4-color printing*
	6	2 Colors: 2nd color	[30 ~ 140 / **130** / 10 μA/step] *The second color toner mage of 2-color printing*
	7	3 Colors: 2nd color	[30 ~ 140 / **130** / 10 μA/step] *The second color toner image of 3-color printing*

2	Mode No. (Class 1, 2, and 3)		Function / [Setting]
301	8	4 Colors: 2nd color	[30 ~ 140 / **130** / 10 μA/step] *The second color toner image of 4-color printing*
	9	3 Colors: 3rd color	[30 ~ 140 / **130** / 10 μA/step] *The third color toner image of 3-color printing*
	10	4 Colors: 3rd color	[30 ~ 140 / **130** / 10 μA/step] *The third color toner image of 4-color printing*
	11	4 Colors: 4th color	[30 ~ 140 / **130** / 10 μA/step] *The fourth color toner image of 4-color printing*
	12	Print start	[30 ~ 140 / **70** / 10 μA/step] *After the first color toner image*
	13	Print end	[30 ~ 140 / **70** / 10 μA/step] *After the second color toner image*
	14	After 1st Color	[30 ~ 140 / **70** / 10 μA/step] *After the third color toner image*
	15	After 2nd Color	[30 ~ 140 / **70** / 10 μA/step] *After the final color toner image*
	16	After 3rd Color	[30 ~ 140 / **70** / 10 μA/step] *Development start*
	17	After 4th Color	[30 ~ 140 / **70** / 10 μA/step] *Development end*
	18	1 Color: Front: Idling	[30 ~ 140 / **70** / 10 μA/step] *Waiting for thick paper or OHP before creating the front side image for 1-color printing*
	19	1 Color: Rear: Idling	[30 ~ 140 / **70** / 10 μA/step] *Waiting for thick paper or OHP before creating the rear side image for 1-color duplex printing*
	20	2 Colors: Idling	[30 ~ 140 / **70** / 10 μA/step] *Waiting for thick paper or OHP before creating an image for 2-color printing*
	21	3 Colors: Idling	[30 ~ 140 / **70** / 10 μA/step] *Waiting for thick paper or OHP before creating an image for 3-color printing*
	22	4 Colors: Idling	[30 ~ 140 / **70** / 10 μA/step] *Waiting for the thick paper or OHP before creating an image for 4-color printing*
	23	Power On Recovery	[30 ~ 140 / **70** / 10 μA/step] *Machine start and jam recovery*
303*	Transfer Belt Environment		
	1	Threshold 1	Adjusts the environmental threshold for the transfer belt. [0 ~ 100.0 / **3.5** / 0.1 g/m^3/step] **DFU**
	2	Threshold 2	[0 ~ 100.0 / **19.0** / 0.1 g/m^3/step] **DFU**
304	Transfer Belt Environment		
	1	LL/Image/1 Color/1st	[50 ~ 200 / **85** / 1 %/step] **DFU**
	2	LL/Image/1 Color/1st	[50 ~ 200 / **85** / 1 %/step] **DFU**
	3	LL/Image/1 Color/1st	[50 ~ 200 / **100** / 1 %/step] **DFU**
	4	LL/Image/1 Color/1st	[50 ~ 200 / **100** / 1 %/step] **DFU**
	5	LL/Image/1 Color/1st	[50 ~ 200 / **100** / 1 %/step] **DFU**
	6	LL/Image/1 Color/1st	[50 ~ 200 / **100** / 1 %/step] **DFU**
	7	LL/Image/1 Color/1st	[50 ~ 200 / **100** / 1 %/step] **DFU**
	8	LL/Image/1 Color/1st	[50 ~ 200 / **100** / 1 %/step] **DFU**

2	Mode No. (Class 1, 2, and 3)		Function / [Setting]
305*	Transfer Belt Start		
	1	Bias On Off	Sets the bias for the image transfer start to on or off. [0 ~ 1 / 1 / 1/step] **DFU** • *0: Bias off* • *1: Bias on*
306	Trans Belt First		
	1	1 Color	Adds the transfer current to the first page to improve insufficient transfer of the whole solid image. [3.0 ~ 14.0 / **9.0** / 1/step]
	2	2/3/4 Colors	[3.0 ~ 14.0 / **13.0** / 1/step]
310*	1Paper Trans_LL1 (Paper Transfer LL1) LL1: Absolute humidity AH (g/m^3) is $0 < AH \leq 3.5$ The display indicates: Paper Weight/Side 1 or 2/Paper Width (mm) Nrml: Thin paper, Mid: Normal plain paper, Thk: Thick paper		
	1	Normal/1st/-297	Sets the paper transfer current for the 'LL1' humidity range (Note: The current for the LL1 range is also affected by SP2-903.) Adjust only if there are problems with insufficient transfer in the image area of the copy for a particular paper type or mode, or in response to field problems as directed by technical support staff. [0 ~ 70.0 / **32.0** / 0.1 µA/step]
	2	Normal/1st/257-296	[0 ~ 70.0 / **34.0** / 0.1 µA/step]
	3	Normal/1st/210-256	[0 ~ 70.0 / **36.0** / 0.1 µA/step]
	4	Normal/1st/129-209	[0 ~ 70.0 / **39.0** / 0.1 µA/step]
	5	Normal/1st/-128	[0 ~ 70.0 / **42.0** / 0.1 µA/step]
	6	Middle/1st/-297	[0 ~ 70.0 / **33.0** / 0.1 µA/step]
	7	Middle/1st/257-296	[0 ~ 70.0 / **35.0** / 0.1 µA/step]
	8	Middle/1st/210-256	[0 ~ 70.0 / **37.0** / 0.1 µA/step]
	9	Middle/1st/129-209	[0 ~ 70.0 / **40.0** / 0.1 µA/step]
	10	Middle/1st/-128	[0 ~ 70.0 / **43.0** / 0.1 µA/step]
	11	Thick/1st/-297	[0 ~ 70.0 / **16.0** / 0.1 µA/step]
	12	Thick/1st/257-296	[0 ~ 70.0 / **19.0** / 0.1 µA/step]
	13	Thick/1st/210-256	[0 ~ 70.0 / **21.0** / 0.1 µA/step]
	14	Thick/1st/129-209	[0 ~ 70.0 / **24.0** / 0.1 µA/step]
	15	Thick/1st/-128	[0 ~ 70.0 / **27.0** / 0.1 µA/step]
	16	Normla/2nd/-297	[0 ~ 70.0 / **38.0** / 0.1 µA/step]
	17	Normal/2nd/257-296	[0 ~ 70.0 / **40.0** / 0.1 µA/step]
	18	Normal/2nd/210-256	[0 ~ 70.0 / **42.0** / 0.1 µA/step]
	19	Normal/2nd/129-209	[0 ~ 70.0 / **43.0** / 0.1 µA/step]
	20	Normal/2nd/-128	[0 ~ 70.0 / **44.0** / 0.1 µA/step]
	21	Middle/2nd/-297	[0 ~ 70.0 / **39.0** / 0.1 µA/step]
	22	Middle/2nd/257-296	[0 ~ 70.0 / **41.0** / 0.1 µA/step]
	23	Middle/2nd/210-256	[0 ~ 70.0 / **43.0** / 0.1 µA/step]
	24	Middle/2nd/129-209	[0 ~ 70.0 / **44.0** / 0.1 µA/step]
	25	Middle/2nd/-128	[0 ~ 70.0 / **45.0** / 0.1 µA/step]
	26	Thick/2nd/-297	[0 ~ 70.0 / **16.0** / 0.1 µA/step]
	27	Thick/2nd/257-296	[0 ~ 70.0 / **19.0** / 0.1 µA/step]
	28	Thick/2nd/210-256	[0 ~ 70.0 / **21.0** / 0.1 µA/step]

2	Mode No. (Class 1, 2, and 3)		Function / [Setting]
310*	29	Thick/2nd/129-209	[0 ~ 70.0 / **24.0** / 0.1 µA/step]
	30	Thick/2nd/-128	[0 ~ 70.0 / **26.0** / 0.1 µA/step]
	31	OHP/297	[0 ~ 70.0 / **16.0** / 0.1 µA/step]
	32	OHP/210	[0 ~ 70.0 / **22.0** / 0.1 µA/step]
311*	Paper Trans_LL2 (Paper Transfer LL2) LL2: Absolute humidity AH (g/m^3) is 3.5 < AH ≤ 8.0 The display indicates: Paper Weight/Side 1 or 2/Paper Width (mm) Nrml: Thin paper, Mid: Normal plain paper, Thk: Thick paper		
	1	Normal/1st/-297	Sets the paper transfer current for the 'LL2' humidity range. See SP2-310 for comments. [0 ~ 70.0 / **36.0** / 0.1 µA/step]
	2	Normal/1st/257-296	[0 ~ 70.0 / **38.0** / 0.1 µA/step]
	3	Normal/1st/210-256	[0 ~ 70.0 / **40.0** / 0.1 µA/step]
	4	Normal/1st/129-209	[0 ~ 70.0 / **43.0** / 0.1 µA/step]
	5	Normal/1st/-128	[0 ~ 70.0 / **46.0** / 0.1 µA/step]
	6	Middle/1st/-297	[0 ~ 70.0 / **37.0** / 0.1 µA/step]
	7	Middle/1st/257-296	[0 ~ 70.0 / **39.0** / 0.1 µA/step]
	8	Middle/1st/210-256	[0 ~ 70.0 / **41.0** / 0.1 µA/step]
	9	Middle/1st/129-209	[0 ~ 70.0 / **44.0** / 0.1 µA/step]
	10	Middle/1st/-128	[0 ~ 70.0 / **47.0** / 0.1 µA/step]
	11	Thick/1st/-297	[0 ~ 70.0 / **20.0** / 0.1 µA/step]
	12	Thick/1st/257-296	[0 ~ 70.0 / **21.0** / 0.1 µA/step]
	13	Thick/1st/210-256	[0 ~ 70.0 / **23.0** / 0.1 µA/step]
	14	Thick/1st/129-209	[0 ~ 70.0 / **24.0** / 0.1 µA/step]
	15	Thick/1st/-128	[0 ~ 70.0 / **26.0** / 0.1 µA/step]
	16	Normal/2nd/-297	[0 ~ 70.0 / **40.0** / 0.1 µA/step]
	17	Normal/2nd/257-296	[0 ~ 70.0 / **43.0** / 0.1 µA/step]
	18	Normal/2nd/210-256	[0 ~ 70.0 / **45.0** / 0.1 µA/step]
	19	Normal/2nd/129-209	[0 ~ 70.0 / **47.0** / 0.1 µA/step]
	20	Normal/2nd/-128	[0 ~ 70.0 / **50.0** / 0.1 µA/step]
	21	Middle/2nd/-297	[0 ~ 70.0 / **41.0** / 0.1 µA/step]
	22	Middle/2nd/257-296	[0 ~ 70.0 / **44.0** / 0.1 µA/step]
	23	Middle/2nd/210-256	[0 ~ 70.0 / **46.0** / 0.1 µA/step]
	24	Middle/2nd/129-209	[0 ~ 70.0 / **48.0** / 0.1 µA/step]
	25	Middle/2nd/-128	[0 ~ 70.0 / **51.0** / 0.1 µA/step]
	26	Thick/2nd/-297	[0 ~ 70.0 / **20.0** / 0.1 µA/step]
	27	Thick/2nd/257-296	[0 ~ 70.0 / **24.0** / 0.1 µA/step]
	28	Thick/2nd/210-256	[0 ~ 70.0 / **27.0** / 0.1 µA/step]
	29	Thick/2nd/129-209	[0 ~ 70.0 / **31.0** / 0.1 µA/step]
	30	Thick/2nd/-128	[0 ~ 70.0 / **34.0** / 0.1 µA/step]
	31	OHP/297	[0 ~ 70.0 / **19.0** / 0.1 µA/step]
	32	OHP/210	[0 ~ 70.0 / **26.0** / 0.1 µA/step]

2	Mode No. (Class 1, 2, and 3)		Function / [Setting]
312*	Paper Trans_NN1 (Paper Transfer NN1) NN1: Absolute humidity AH (g/m^3) is 8.0 < AH ≤ 14 The display indicates: Paper Weight/Side 1 or 2/Paper Width (mm) Nrml: Thin paper, Mid: Normal plain paper, Thk: Thick paper		
	1	Normal/1st/-297	Sets the paper transfer current for the 'NN1' humidity range. See SP2-310 for comments. [0 ~ 70.0 / **40.0** / 0.1 µA/step]
	2	Normal/1st/257-296	[0 ~ 70.0 / **42.0** / 0.1 µA/step]
	3	Normal/1st/210-256	[0 ~ 70.0 / **44.0** / 0.1 µA/step]
	4	Normal/1st/129-209	[0 ~ 70.0 / **47.0** / 0.1 µA/step]
	5	Normal/1st/-128	[0 ~ 70.0 / **50.0** / 0.1 µA/step]
	6	Middle/1st/-297	[0 ~ 70.0 / **41.0** / 0.1 µA/step]
	7	Middle/1st/257-296	[0 ~ 70.0 / **43.0** / 0.1 µA/step]
	8	Middle/1st/210-256	[0 ~ 70.0 / **45.0** / 0.1 µA/step]
	9	Middle/1st/129-209	[0 ~ 70.0 / **47.0** / 0.1 µA/step]
	10	Middle/1st/-128	[0 ~ 70.0 / **51.0** / 0.1 µA/step]
	11	Thick/1st/-297	[0 ~ 70.0 / **23.0** / 0.1 µA/step]
	12	Thick/1st/257-296	[0 ~ 70.0 / **23.0** / 0.1 µA/step]
	13	Thick/1st/210-256	[0 ~ 70.0 / **24.0** / 0.1 µA/step]
	14	Thick/1st/129-209	[0 ~ 70.0 / **24.0** / 0.1 µA/step]
	15	Thick/1st/-128	[0 ~ 70.0 / **24.0** / 0.1 µA/step]
	16	Normal/2nd/-297	[0 ~ 70.0 / **42.0** / 0.1 µA/step]
	17	Normal/2nd/257-296	[0 ~ 70.0 / **45.0** / 0.1 µA/step]
	18	Normal/2nd/210-256	[0 ~ 70.0 / **48.0** / 0.1 µA/step]
	19	Normal/2nd/129-209	[0 ~ 70.0 / **51.0** / 0.1 µA/step]
	20	Normal/2nd/-128	[0 ~ 70.0 / **55.0** / 0.1 µA/step]
	21	Middle/2nd/-297	[0 ~ 70.0 / **43.0** / 0.1 µA/step]
	22	Middle/2nd/257-296	[0 ~ 70.0 / **46.0** / 0.1 µA/step]
	23	Middle/2nd/210-256	[0 ~ 70.0 / **49.0** / 0.1 µA/step]
	24	Middle/2nd/129-209	[0 ~ 70.0 / **52.0** / 0.1 µA/step]
	25	Middle/2nd/-128	[0 ~ 70.0 / **56.0** / 0.1 µA/step]
	26	Thick/2nd/-297	[0 ~ 70.0 / **23.0** / 0.1 µA/step]
	27	Thick/2nd/257-296	[0 ~ 70.0 / **28.0** / 0.1 µA/step]
	28	Thick/2nd/210-256	[0 ~ 70.0 / **32.0** / 0.1 µA/step]
	29	Thick/2nd/129-209	[0 ~ 70.0 / **37.0** / 0.1 µA/step]
	30	Thick/2nd/-128	[0 ~ 70.0 / **42.0** / 0.1 µA/step]
	31	OHP/297	[0 ~ 70.0 / **22.0** / 0.1 µA/step]
	32	OHP/210	[0 ~ 70.0 / **30.0** / 0.1 µA/step]
313*	Paper Trans_NN2 (Paper Transfer NN2) NN2: Absolute humidity AH (g/m^3) is 14 < AH ≤ 19 The display indicates: Paper Weight/Side 1 or 2/Paper Width (mm) Nrml: Thin paper, Mid: Normal plain paper, Thk: Thick paper		
	1	Normal/1st/-297	Sets the paper transfer current for the 'NN2' humidity range. See SP2-310 for comments. [0 ~ 70.0 / **36.0** / 0.1 µA/step]
	2	Normal/1st/257-296	[0 ~ 70.0 / **38.0** / 0.1 µA/step]
	3	Normal/1st/210-256	[0 ~ 70.0 / **39.0** / 0.1 µA/step]
	4	Normal/1st/129-209	[0 ~ 70.0 / **40.0** / 0.1 µA/step]

2	Mode No. (Class 1, 2, and 3)		Function / [Setting]
313*	5	Normal/1st/-128	[0 ~ 70.0 / **42.0** / 0.1 µA/step]
	6	Middle/1st/-297	[0 ~ 70.0 / **37.0** / 0.1 µA/step]
	7	Middle/1st/257-296	[0 ~ 70.0 / **39.0** / 0.1 µA/step]
	8	Middle/1st/210-256	[0 ~ 70.0 / **40.0** / 0.1 µA/step]
	9	Middle/1st/129-209	[0 ~ 70.0 / **41.0** / 0.1 µA/step]
	10	Middle/1st/-128	[0 ~ 70.0 / **43.0** / 0.1 µA/step]
	11	Thick/1st/-297	[0 ~ 70.0 / **25.0** / 0.1 µA/step]
	12	Thick/1st/257-296	[0 ~ 70.0 / **25.0** / 0.1 µA/step]
	13	Thick/1st/210-256	[0 ~ 70.0 / **24.0** / 0.1 µA/step]
	14	Thick/1st/129-209	[0 ~ 70.0 / **24.0** / 0.1 µA/step]
	15	Thick/1st/-128	[0 ~ 70.0 / **24.0** / 0.1 µA/step]
	16	Normal/2nd/-297	[0 ~ 70.0 / **43.0** / 0.1 µA/step]
	17	Normal/2nd/257-296	[0 ~ 70.0 / **45.0** / 0.1 µA/step]
	18	Normal/2nd/210-256	[0 ~ 70.0 / **46.0** / 0.1 µA/step]
	19	Normal/2nd/129-209	[0 ~ 70.0 / **48.0** / 0.1 µA/step]
	20	Normal/2nd/-128	[0 ~ 70.0 / **50.0** / 0.1 µA/step]
	21	Middle/2nd/-297	[0 ~ 70.0 / **44.0** / 0.1 µA/step]
	22	Middle/2nd/257-296	[0 ~ 70.0 / **46.0** / 0.1 µA/step]
	23	Middle/2nd/210-256	[0 ~ 70.0 / **47.0** / 0.1 µA/step]
	24	Middle/2nd/129-209	[0 ~ 70.0 / **49.0** / 0.1 µA/step]
	25	Middle/2nd/-128	[0 ~ 70.0 / **51.0** / 0.1 µA/step]
	26	Thick/2nd/-297	[0 ~ 70.0 / **28.0** / 0.1 µA/step]
	27	Thick/2nd/257-296	[0 ~ 70.0 / **32.0** / 0.1 µA/step]
	28	Thick/2nd/210-256	[0 ~ 70.0 / **36.0** / 0.1 µA/step]
	29	Thick/2nd/129-209	[0 ~ 70.0 / **41.0** / 0.1 µA/step]
	30	Thick/2nd/-128	[0 ~ 70.0 / **45.0** / 0.1 µA/step]
	31	OHP/297	[0 ~ 70.0 / **23.0** / 0.1 µA/step]
	32	OHP/210	[0 ~ 70.0 / **33.0** / 0.1 µA/step]
314*	Paper Trans_HH (Paper Transfer HH). HH: Absolute humidity AH (g/m^3) is > 19 The display indicates: Paper Weight/Side 1 or 2/Paper Width (mm) Nrml: Thin paper, Mid: Normal plain paper, Thk: Thick paper		
	1	Normal/1st/-297	Sets the paper transfer current for the 'HH' humidity range. See SP2-310 for comments. [0 ~ 70.0 / **32.0** / 0.1 µA/step]
	2	Normal/1st/257-296	[0 ~ 70.0 / **33.0** / 0.1 µA/step]
	3	Normal/1st/210-256	[0 ~ 70.0 / **33.0** / 0.1 µA/step]
	4	Normal/1st/129-209	[0 ~ 70.0 / **34.0** / 0.1 µA/step]
	5	Normal/1st/-128	[0 ~ 70.0 / **34.0** / 0.1 µA/step]
	6	Middle/1st/-297	[0 ~ 70.0 / **33.0** / 0.1 µA/step]
	7	Middle/1st/257-296	[0 ~ 70.0 / **34.0** / 0.1 µA/step]
	8	Middle/1st/210-256	[0 ~ 70.0 / **34.0** / 0.1 µA/step]
	9	Middle/1st/129-209	[0 ~ 70.0 / **35.0** / 0.1 µA/step]
	10	Middle/1st/-128	[0 ~ 70.0 / **35.0** / 0.1 µA/step]
	11	Thick/1st/-297	[0 ~ 70.0 / **26.0** / 0.1 µA/step]
	12	Thick/1st/257-296	[0 ~ 70.0 / **25.0** / 0.1 µA/step]
	13	Thick/1st/210-256	[0 ~ 70.0 / **25.0** / 0.1 µA/step]
	14	Thick/1st/129-209	[0 ~ 70.0 / **24.0** / 0.1 µA/step]

2	Mode No. (Class 1, 2, and 3)		Function / [Setting]
314*	15	Thick/1st/-128	[0 ~ 70.0 / **24.0** / 0.1 μA/step]
	16	Normal/2nd/-297	[0 ~ 70.0 / **44.0** / 0.1 μA/step]
	17	Normal/2nd/257-296	[0 ~ 70.0 / **44.0** / 0.1 μA/step]
	18	Normal/2nd/210-256	[0 ~ 70.0 / **44.0** / 0.1 μA/step]
	19	Normal/2nd/129-209	[0 ~ 70.0 / **44.0** / 0.1 μA/step]
	20	Normal/2nd/-128	[0 ~ 70.0 / **44.0** / 0.1 μA/step]
	21	Middle/2nd/-297	[0 ~ 70.0 / **45.0** / 0.1 μA/step]
	22	Middle/2nd/257-296	[0 ~ 70.0 / **45.0** / 0.1 μA/step]
	23	Middle/2nd/210-256	[0 ~ 70.0 / **45.0** / 0.1 μA/step]
	24	Middle/2nd/129-209	[0 ~ 70.0 / **45.0** / 0.1 μA/step]
	25	Middle/2nd/-128	[0 ~ 70.0 / **45.0** / 0.1 μA/step]
	26	Thick/2nd/-297	[0 ~ 70.0 / **28.0** / 0.1 μA/step]
	27	Thick/2nd/257-296	[0 ~ 70.0 / **32.0** / 0.1 μA/step]
	28	Thick/2nd/210-256	[0 ~ 70.0 / **36.0** / 0.1 μA/step]
	29	Thick/2nd/129-209	[0 ~ 70.0 / **40.0** / 0.1 μA/step]
	30	Thick/2nd/-128	[0 ~ 70.0 / **44.0** / 0.1 μA/step]
	31	OHP/297	[0 ~ 70.0 / **24.0** / 0.1 μA/step]
	32	OHP/210	[0 ~ 70.0 / **36.0** / 0.1 μA/step]
320*	Paper Trans_Col (Paper Transfer Correction) The display indicates: Paper Type/Side 1 or 2/Printing mode		
	1	Normal/1st/1 Color	Corrects the electric current for paper transfer. **DFU** [0 ~ 100 / **45** / 1%/step]
	2	Normal/1st/2 Colors	[0 ~ 100 / **90** / 1%/step]
	3	Normal/1st/3 Colors	[0 ~ 100 / **100** / 1%/step]
	4	Normal/2nd/1 Color	[0 ~ 100 / **45** / 1%/step]
	5	Normal/2nd/2 Colors	[0 ~ 100 / **90** / 1%/step]
	6	Normal/2nd/3 Colors	[0 ~ 100 / **100** / 1%/step]
	7	Thick/1st/1 Color	[0 ~ 100 / **45** / 1%/step]
	8	Thick/1st/2 Colors	[0 ~ 100 / **90** / 1%/step]
	9	Thick/1st/3 Colors	[0 ~ 100 / **100** / 1%/step]
	10	Thick/2nd/1 Color	[0 ~ 100 / **45** / 1%/step]
	11	Thick/2nd/2 Colors	[0 ~ 100 / **90** / 1%/step]
	12	Thick/2nd/3 Colors	[0 ~ 100 / **100** / 1%/step]
	13	OHP/1 Color	[0 ~ 100 / **60** / 1%/step]
	14	OHP/2 Colors	[0 ~ 100 / **90** / 1%/step]
	15	OHP/3 Colors	[0 ~ 100 / **100** / 1%/step]
321	Paper Transfer Bias of Edge		
	1	Normal/1st/Leading edge	Adjusts the paper transfer current at the paper edges. [10.0 ~ 20.0 / **10.0** / 0.1 times/step] **DFU** *The specified values indicate how many times larger the current at the edge is.*
	2	Normal/2nd/Leading edge	
	3	Thick/1st/Leading edge	
	4	Thick/2nd/Leading edge	
	5	OHP/Leading edge	
	6	Normal/1st/Trailing edge	

2	Mode No. (Class 1, 2, and 3)		Function / [Setting]
321	7	Normal/2nd/Trailing edge	Adjusts the paper transfer current at the paper edges. [10.0 ~ 20.0 / **10.0** / 0.1 times/step] **DFU** *The specified values indicate how many times larger the current at the edge is.*
	8	Thick/1st/Trailing edge	
	9	Thick/2nd/Trailing edge	
	10	OHP/Trailing edge	
322	Paper Transfer Charge		
	1	Leading edge	Adjusts the width at the paper edges where the current specified with SP2–321 is applied. [0 ~ 30 / **30** / 1 mm/step] **DFU** *The values indicate the distance from the paper edges.*
	2	Trailing Edge	
323	Paper Transfer Cleaning		
	1	Cleaning Negative	Adjusts the transfer belt cleaning current. The current is applied before and after printing jobs and during jam recovery. [0 ~ 255 / **150** / 0.1 μA/step] **DFU**
	2	Cleaning Positive	[0 ~ 255 / **150** / 0.1 μA/step] **DFU**
	3	Cleaning Negative Lubrication	[0 ~ 255 / **50** / 0.1 μA/step] **DFU**
331	Print Start Cleaning		
	1	Print Start Cleaning	Enables/disables cleaning before printing jobs. [0 ~ 1 / **0** / 1 /step] **DFU** • *0: Disables* • *1: Enables*
400*	Cleaning Bias LL1		
	1	1 Color	Adjusts the transfer belt cleaning voltage when absolute humidity AH (g/m^3) is in the following range: 0 < AH ≤ 3.5 (this is the 'LL1' humidity range) **DFU** [0 ~ 2000 / **1200** / 10 Volt/step]
	2	2 Colors-4 Colors	[0 ~ 2000 / **1200** / 10 Volt/step]
	3	Half Speed/1 Color	[0 ~ 2000 / **1200** / 10 Volt/step]
	4	Half Speed/2 Colors-4 Colors	[0 ~ 2000 / **1200** / 10 Volt/step]
	5	ID pattern	[0 ~ 2000 / **1600** / 10 Volt/step]
	6	No Image Area	[0 ~ 2000 / **1400** / 10 Volt/step]
	7	Jam Recovery	[0 ~ 2000 / **1600** / 10 Volt/step]
401*	Cleaning Bias LL2		
	1	1 Color	Adjusts the transfer belt cleaning voltage when absolute humidity AH (g/m^3) is in the following range: 3.5 < AH ≤ 8.0 (this is the 'LL2' humidity range) **DFU** [0 ~ 2000 / **1600** / 10 Volt/step]
	2	2 Colors-4 Colors	[0 ~ 2000 / **1600** / 10 Volt/step]
	3	Half Speed/1 Color	[0 ~ 2000 / **1600** / 10 Volt/step]
	4	Half Speed/2 Colors-4 Colors	[0 ~ 2000 / **1600** / 10 Volt/step]
	5	ID pattern	[0 ~ 2000 / **1600** / 10 Volt/step]
	6	No Image Area	[0 ~ 2000 / **1400** / 10 Volt/step]
	7	Jam Recovery	[0 ~ 2000 / **1600** / 10 Volt/step]

2	Mode No. (Class 1, 2, and 3)		Function / [Setting]
402*	Cleaning Bias NN1		
	1	1 Color	Adjusts the transfer belt cleaning voltage when absolute humidity AH (g/m^3) is in the following range: 8.0 < AH ≤ 14 (this is the 'NN1' humidity range) **DFU** [0 ~ 2000 / **1700** / 10 Volt/step]
	2	2 Colors-4 Colors	[0 ~ 2000 / **1700** / 10 Volt/step]
	3	Half Speed/1 Color	[0 ~ 2000 / **1700** / 10 Volt/step]
	4	Half Speed/2 Colors-4 Colors	[0 ~ 2000 / **1700** / 10 Volt/step]
	5	ID pattern	[0 ~ 2000 / **1600** / 10 Volt/step]
	6	No Image Area	[0 ~ 2000 / **1400** / 10 Volt/step]
	7	Jam Recovery	[0 ~ 2000 / **1600** / 10 Volt/step]
403*	Cleaning Bias NN2		
	1	1 Color	Adjusts the transfer belt cleaning voltage when absolute humidity AH (g/m^3) is in the following range: 14 < AH ≤ 19 (this is the 'NN2' humidity range) **DFU** [0 ~ 2000 / **1700** / 10 Volt/step]
	2	2 Colors-4 Colors	[0 ~ 2000 / **1700** / 10 Volt/step]
	3	Half Speed/1 Color	[0 ~ 2000 / **1700** / 10 Volt/step]
	4	Half Speed/2 Colors-4 Colors	[0 ~ 2000 / **1700** / 10 Volt/step]
	5	ID pattern	[0 ~ 2000 / **1600** / 10 Volt/step]
	6	No Image Area	[0 ~ 2000 / **1400** / 10 Volt/step]
	7	Jam Recovery	[0 ~ 2000 / **1600** / 10 Volt/step]
404*	Cleaning Bias HH		
	1	1 Color	Adjusts the transfer belt cleaning voltage when absolute humidity AH (g/m^3) is in the following range: 19 < AH (this is the 'HH' humidity range) **DFU** [0 ~ 2000 / **1700** / 10 Volt/step]
	2	2 Colors-4 Colors	[0 ~ 2000 / **1700** / 10 Volt/step]
	3	Half Speed/1 Color	[0 ~ 2000 / **1700** / 10 Volt/step]
	4	Half Speed/2 Colors-4 Colors	[0 ~ 2000 / **1700** / 10 Volt/step]
	5	ID pattern	[0 ~ 2000 / **1600** / 10 Volt/step]
	6	No Image Area	[0 ~ 2000 / **1400** / 10 Volt/step]
	7	Jam Recovery	[0 ~ 2000 / **1600** / 10 Volt/step]
500*	Fusing Bias		
	1	Normal/1 Color/1st	Adjusts the fusing bias voltage. **DFU** [1000 ~ 4000 / **3000** / 100 Volt/step]
	2	Normal/1 Color/2nd	[1000 ~ 4000 / **3000** / 100 Volt/step]
	3	Normal/Full Color/1st	[1000 ~ 4000 / **2500** / 100 Volt/step]
	4	Normal/Full Color/2nd	[1000 ~ 4000 / **2500** / 100 Volt/step]
	5	Thick/1 Color/1st	[1000 ~ 4000 / **3000** / 100 Volt/step]
	6	Thick/1 Color/2nd	[1000 ~ 4000 / **3000** / 100 Volt/step]
	7	Thick/Full Color/1st	[1000 ~ 4000 / **2500** / 100 Volt/step]
	8	Thick/Full Color/2nd	[1000 ~ 4000 / **2500** / 100 Volt/step]

2	Mode No. (Class 1, 2, and 3)		Function / [Setting]
501*	Fusing Bias Switch		
	1	Fusing Bias Switch	Switches the fusing and discharge pin bias control on or off. [0 ~ 1 / **1** / 1/step] **DFU** • *0: Control off* • *1: Control on*
502	Discharge Bias		
	1	H	Adjusts the discharge plate voltage (paper separation from transfer belt). [–4000 ~ –1000 / **–2500** / 100 Volt/step]
	2	L	
801*	Charge Cleaning Interval		
	1	Charge Cleaning Interval	Sets the charge corona unit cleaning interval. [0 ~ 5000 / **600** / 100 counts/step] *See section 6 for details. SP7-925 displays the number of counts since the last cleaning.*
802	Charger Cleaning		
	1	Charger Cleaning	Executes a forced charge corona unit cleaning. Set to 1 to start cleaning.
901*	Environment Control		
	1	Environment Control	Switches environment control on or off. [0 ~ 1 / **1** / 1/step] **DFU** • *0: Control off (The paper transfer and cleaning bias environments are set to NN1. The image transfer bias environment is set to MM.)* • *1: Control on*
902	Charge Cleaning Status		
	1	Charge Cleaning Status	[0 ~ 9 / **0** / 1/step] 0: Cleaner has stopped 1: Cleaner moving from front to rear 3: Cleaner moving from rear to front (back to the home position)
903	Paper Transfer Adjustment		
	1	LL1: Plain	Specifies the difference from the LL1 paper transfer current (SP2-310). [0 ~ 7.0 / **8.0** / 1 µA/step] *The specified value is subtracted from the value specified by SP2-310 under the following conditions:* • *The machine is in the LL1 environment.* • *400 images or less are created after the machine starts.*
904	1C Bias Adjustment		
	1	M	Default 50V **DFU**
	2	C	Default 0V **DFU**
	3	Y	Default 0V **DFU**
	4	K	Default 0V **DFU**
912*	Temperature Humidity Display		
	1	Temperature	Displays the temperature measured by the temperature sensor inside the machine. [–127 ~ 127 / **0** / 1°C/step]
	2	Humidity 1	Displays the humidity measured by the humidity sensor inside the machine. [0 ~ 255 / **0** / 1%/step]

Service Tables

2	Mode No. (Class 1, 2, and 3)		Function / [Setting]
912*	3	Humidity 2	Displays the absolute humidity calculated from the temperature/humidity sensor readings. [0 ~ 65535 / **0** / 0.1 g/m^3/step]
	4	Environment Level	Displays the current humidity level calculated from the absolute humidity. [0 ~ 1 / **0** / 1/step] • *LL1: 0 < AH ≤ 3.5* • *LL2: 3.5 < AH ≤ 8.0* • *NN1: 8.0 < AH ≤ 14* • *NN2: 14 < AH ≤ 19* • *HH: 19 < AH* ** AH = absolute humidity*
939	OPC lubricant interruption (Forced OPC lubrication)		
	1		Enables/disables forced OPC lubrication at a certain interval. **DFU** [0 ~ 1 / **0** / 1 /step] • *0: Disabled* • *1: Enabled* *The OPC lubrication interval is specified with SP2-942-1.*
940	OPC Lubricant Mode		
	1	OPC Lubricant Mode	Executes a forced OPC lubrication to reduce the friction on the OPC belt. **DFU** *The OPC belt and the lubricant brush operate for 2 minutes.*
941	OPC Lubricant Time		
	1	Interrupt	Determines how long the OPC belt is lubricated for after the end of every job (☛ SP3–940). [0 ~ 30 / **20** / 1 s/step]
	2	No Interrupt	Determines how long the OPC belt is lubricated at the forced lubrication. [0 ~ 60 / **10** / 1 s/step]
942	OPC Lubricant Interval		
	1	OPC Lubricant Interval	The machine lubricates the OPC belt and image transfer belt at the interval (number of prints) set with this SP. Incoming print jobs do not interrupt the lubrication. [10 ~ 65535 / **50** / 10/step] **DFU** *Set SP2-939-1 to 1 to execute the forced OPC lubrication.*
944	OPC Lubrication: High Coverage		
	1	Setting	Enables/disables OPC lubrication after a certain amount of images are printed. The lubrication timing depends on SP2-944-2 to -5. [0 ~ 1 / **1** / 1 /step] • *0: Disables* • *1: Enables* *When high coverage images are continuously printed, cleaning of the OPC may not be enough. To correct this, OPC lubrication is carried out during printing (lubrication time: around 34 seconds).*

2	Mode No. (Class 1, 2, and 3)		Function / [Setting]
944	2	Image Coverage–1	Specifies standard average coverage condition 1. [50 ~ 800 / **300** / 10 units/step] *OPC lubrication is executed under the following conditions.* • *After the previous OPC lubrication, the number of output pages reaches the value specified with SP2-944-4.* • *The average coverage of the outputs after the previous OPC lubrication exceeds standard average coverage condition 1.*
	3	Image Coverage–2	Specifies standard average coverage condition 2. [50 ~ 800 / **200** / 10 units/step] *OPC lubrication is executed under the following conditions.* • *After the previous OPC lubrication, the number of output pages reaches the value specified with SP2-944-5.* • *The average coverage of the outputs after the previous OPC lubrication exceeds standard average coverage condition 2.*
	4	Sheets–1	[10 ~ 80 / **20** / 1 sheet/step]
	5	Sheets–2	[10 ~ 80 / **40** / 1 sheet/step]
950	Start Registration Adjustment		
	1	Start Registration Adjustment 1–K	Color registration adjustment: Adjusts the start timing of imaging for each color. [–3 ~ 3 / **0** / 1 line/step] **DFU** 2 lines = 0.047566 ms (about 85 µm) • *+: Delays the start timing.* • *–: Advances the start timing.* • *The start timing is adjusted only in plain paper mode, and when one of the following conditions is satisfied:* *1) Between the two images on the transfer belt (when two images are developed on the OPC at the same time (☛ 6.2))* *2) B4 SEF or larger (multi-print job)*
	2	Start Registration Adjustment 1–M	[–3 ~ 3 / **–1** / 1 line/step]
	3	Start Registration Adjustment 1–C	[–3 ~ 3 / **0** / 1 line/step]
	4	Start Registration Adjustment 1–Y	[–3 ~ 3 / **0** / 1 line/step]
	5	Start Registration Adjustment 2–K	[–3 ~ 3 / **0** / 1 line/step]
	6	Start Registration Adjustment 2–M	[–3 ~ 3 / **–1** / 1 line/step]
	7	Start Registration Adjustment 2–C	[–3 ~ 3 / **0** / 1 line/step]
	8	Start Registration Adjustment 2–Y	[–3 ~ 3 / **0** / 1 line/step]

2	Mode No. (Class 1, 2, and 3)		Function / [Setting]
951	Clock Phase Control		
	1	LD 1	Adjusts the clock phase of the LD to reduce the density difference between the left and right sides of the printout when the color misalignment correction (SP2–952–1) is enabled. [0 ~ 8 / **0** / 1 /step] *Do this after installing a new laser unit; see Replacement and Adjustment for details.*
	2	LD 2	
952	Color Misalignment Correction		
	1	Color Misalignment Correction	Selects either color misalignment correction or reduction in density difference between the left and right sides of pages. [0 ~ 1 / **1** / 1 /step] • *1: on* *The data for LD1 and LD2 are switched between the left and right sides of each page. This is done because of the difference in the output of each LD. However, in some cases this correction may cause density differences between sides.* • *0: off* *Use this setting if there are density differences between sides.*
970	Oil Removal Mode		
	1	Oil Removal	Enables/disables the settings of SP2–970–2 through 4. [0 ~ 1 / **1** / 1 /step] • *0: Disables* • *1: Enables* Oil on duplex copies gets on the transfer belt, and this can cause uneven image density. To remove this oil, printing stops, the PCU turns, and the cleaning unit removes the oil.
	2	Print Interruption	Enables/disables interruption of the oil removal process. [0 ~ 1 / **0** / 1 /step] • *0: Disables* • *1: Enables* *If interruption is enabled, the user does not need to wait until the oil removal process ends, but the output image may be poor.*
	3	Number of Continuation	Specifies how many times the oil removal process is repeated. [1 ~ 20 / **5** / 1 /step] *The more times the oil removal is repeated, the better the output images are; but the longer it takes.*
	4	Number of Duplex	Specifies how often the oil removal process is done. The unit is the number of duplex prints. The counter counts down once every narrow (A4 SEF or less) duplex sheet, and counts back up 1 for every other type of sheet. [1 ~ 50 / **10** / 1 /step]

SP3-XXX: (Process)

3	Mode No. (Class 1, 2, and 3)		Function / [Setting]
001	Process Control		
	1	Execute	Does a forced process control, and displays the result as one of the following codes.
	2	Display	Displays the completion code. • *0: Normal termination* • *103: Error (ID sensor inactive → Defective ID sensor, Defective circuit, Defective BCU board)* • *104: Error (ID sensor unable to receive light → Defective OPC belt, Dirty OPC belt, Defective ID sensor, Defective circuit, Defective BCU board)* • *105: Error (ID sensor unable to receive reflection from OPC → Same as "104")* • *110: Error (Cyan: ID sensor unable to detect correct image)* • *111: Error (Magenta: ID sensor unable to detect correct image)* • *112: Error (Yellow: ID sensor unable to detect correct image)* • *113: Error (Cyan: ID sensor unable to detect correct image)* • *114: Error (Magenta: ID sensor unable to detect correct image)* • *115: Error (Yellow: ID sensor unable to detect correct image)* • *116: Error (Black: ID sensor unable to detect correct image)* • *118: Error (Black image not detected)* • *123: Error (Development bias error; Black ID sensor unable to detect correct image)* *Solutions for codes 110 to 123:* • *Poor connection to the development unit* • *Dirty development bias terminal* • *Abnormal development bias* • *PCU not installed correctly* • *LD unit defective* • *Abnormal charge corona voltage* • *Defective BICU*
002	Process Control **DFU**		
	1	LED	[0 ~ 255 / **150** / 1 /step]
	2	Bk Out	[0 ~ 0xFFFF / **0** / 1 /step]
	3	Bk Led Off Out	[0 ~ 0xFFFF / **0** / 1 /step]
	4	Color Out	[0 ~ 0xFFFF / **0** / 1 /step]
	5	Color Led Off Out	[0 ~ 0xFFFF / **0** / 1 /step]
	6	ID Sensor Target	[0 ~ 5000 / **1500** / 1 /step]
	7	ID sensor Out Adjustment	[800 ~ 12000 / **1000** / 1 /step]
	10	Bk Vg Control	[0 ~ 1000 / **250** / 1 /step]
	11	Color Vg Control	[0 ~ 1000 / **400** / 1 /step]
	12	Color Vd Control	[0 ~ 1000 / **150** / 1 /step]
	13	gamma M	[–30000 ~ 30000 / **2000** / 1 /step]
	14	gamma C	[–30000 ~ 30000 / **2000** / 1 /step]

3	Mode No. (Class 1, 2, and 3)		Function / [Setting]
002	15	gamma Y	[–30000 ~ 30000 / **2000** / 1 /step]
	16	Gamma K	[–30000 ~ 30000 / **5000** / 1 /step]
	17	Invariable-M	[–3000 ~ 3000 / **150** / 1 /step]
	18	Invariable-C	[–3000 ~ 3000 / **150** / 1 /step]
	19	Invariable-Y	[–3000 ~ 3000 / **150** / 1 /step]
	20	Invariable-K	[–3000 ~ 3000 / **0** / 1 /step]
	21	OPC Target M	[400 ~ 2000 / **600** / 1 /step]
	22	OPC Target C	[400 ~ 2000 / **620** / 1 /step]
	23	OPC Target Y	[400 ~ 2000 / **570** / 1 /step]
	24	OPC Target K	[400 ~ 2000 / **850** / 1 /step]
	25	Charge V Offset M	[100 ~ 600 / **280** / 1 /step]
	26	Charge V Offset C	[100 ~ 600 / **280** / 1 /step]
	27	Charge V Offset Y	[100 ~ 600 / **280** / 1 /step]
	28	Charge V Offset K	[100 ~ 600 / **280** / 1 /step]
	29	ID sensor Target 1M	[0 ~ 5000 / **1400** / 1 /step]
	30	ID sensor Target 1 Color	[0 ~ 5000 / **1400** / 1 /step]
	31	ID sensor Target 1Y	[0 ~ 5000 / **1400** / 1 /step]
	32	ID sensor Target 2M	[0 ~ 1000 / **200** / 1 /step]
	33	ID sensor Target 2 Colors	[0 ~ 1000 / **200** / 1 /step]
	34	ID sensor Target 2Y	[0 ~ 1000 / **200** / 1 /step]
	35	ID sensor Target 2K	[0 ~ 2000 / **1200** / 1 /step]
	36	Color Development Bias	[50 ~ 300 / **100** / 1 /step]
	37	Bk Development Bias	[50 ~ 300 / **50** / 1 /step]
	38	Bias Charge	[0 ~ 1000 / **20** / 1 /step]
	52	Absolute Temperature	[0 ~ 200 / **150** / 1 /step]
	53	Previous Temperature	[0 ~ 100 / **15** / 1 /step]
	54	Timer Counter	[0 ~ 5000 / **1440** / 1 /step]
003*	Lubricant Interval		
	1	Lubricant Interval	Sets the process control interval. [0 ~ 1000 / **200** / 10 sheet/step] • *0: Disables automatic process control*
004*	Environment Change		
	1	Temperature	Sets the temperature/humidity change that triggers process control (process control is done if temperature or humidity has changed by this amount since the previous process control). [0 ~ 100 / **15** / 1°C/step]
	2	Humidity	[0 ~ 100 / **150** / 1 g/m^3/step]
005*	Process control Pre-Rotate		
	1	Process control Pre-Rotate	PCU and development unit idling is done before process control. This value determines the amount of idling rotation. [1 ~ 5 / **1** / 1 turn/step] • 1 turn: A3 length

3	Mode No. (Class 1, 2, and 3)		Function / [Setting]
006*	Density Adjustment		
	1	M/A Correction	Select the toner density compensation level for process control. If prints are not dark enough when making multi-print jobs, increasing this value ensures that prints will be darker after the next process control. The default (0) is for no correction. SP3-006-1: Use this one if the density of solid areas is not satisfactory. SP3-006-2: Use this one if the density of highlight areas is not satisfactory. [0 ~ 3 / **0** / 1/step] • *0: None* • *1: Weak* • *2: Medium* • *3: Strong* The higher the value, the darker the prints will be.
	2	Highlight Correction	
125	Process control/LD: Pre-ACC self-check setting		
	1	ACC self-check setting	Enables/disables process control execution before ACC. [0 ~ 1 / **1** / 1/step] • *0: Disabled* • *1: Enabled*
901	LD-POWER		
	1	LD 1	Specifies the LD power. **DFU** [0 ~ 65535 / **716** / 1 /step]
	2	LD 2	
910*	Doctor Interval		
	1	Color	If the number of pages in a job exceeds this number, the doctor roller rotates in reverse at the end of the job. [0 ~ 50 / **50** / 1 sheet/step] • *The value indicates how many sheets are output before the doctor roller is reversed. (Sheet counts are converted into equivalent A4-LEF sheet counts.)* • *The roller is reversed for 16 seconds* • *Reversing the roller removes toner blockages.* • *The sheet count is reset after reverse rotation.* • *The machine waits until the end of the job before reversing the doctor roller.* • *Decrease the value when vertical white lines appear on prints.*
	2	Black	[0 ~ 65535 / **50** / 1 sheet/step]
	3	Job end	If at the end of a job, the roller has not been reversed since more than this number of pages, the roller is reversed at the end of the job. [0 ~ 65535 / **20** / 1 sheet/step]
920*	Lubrication Cleaning Time		
	1	Lubrication Cleaning Time	Sets the OPC belt lubrication period. **DFU** [0 ~ 100 / **100** / 1%/step] • *When 100 is specified, the OPC belt cleaning clutch is always on whenever the OPC is turning, so the OPC gets lubricated. When 50 is specified, the clutch is only on half the time that the motor is on.*

3	Mode No. (Class 1, 2, and 3)		Function / [Setting]
921*	Lubricant time		
	1	Job end	Specifies the duration of lubrication at the end of jobs. [0 ~ 30 / **20** / 1 /step] **DFU**
	2	Doctor roller reverse operation	Specifies the duration of lubrication during reverse doctor roller rotation. [0 ~ 30 / **20** / 1 /step] **DFU**
940	Job End Interruption		
	1	Job End Interruption	The OPC belt is lubricated after the end of every job (SP2–941–1). This SP determines whether the lubrication is interrupted when a job arrives at the printer. [0 ~ 1 / **0** / 1 /step] • *0: Interrupted* • *1: Not interrupted*
970	Image Area Rate		
	1	M	Specifies the minimum image area (expressed as a percentage of an A4 page) required to maintain optimum development unit condition (☛ Toner Revitalization: SP3–971). [0 ~ 10.0 / **2.0** / 0.1 %/step] *After 20 sheets over a number of small jobs (or after 50 sheets in one job), if the developed area is less than the value of this SP mode, toner is transferred to the image transfer belt and cleaned off. This is performed during the doctor roller reverse rotation.*
	2	C	[0 ~ 10.0 / **2.0** / 0.1 %/step]
	3	Y	[0 ~ 10.0 / **2.0** / 0.1 %/step]
	4	Bk	[0 ~ 10.0 / **3.0** / 0.1 %/step]
971	Toner Revitalization		
	1	Toner Revitalization	Enables/disables the toner revitalization. [0 ~ 1 / **0**/ 1 /step] • *0: Disables* • *1: Enables* *Continuous printing with a relatively low coverage ratio (CMYK less than 5% each) tends to reduce the charge potential of the toner, because the toner remains in the hopper for a long time. This can lead to spots on the copy. Toner revitalization removes this defective toner periodically.*
980	1C Idling		
	1	1C Idling	Enables/disables 1-color idling after paper transfer. [0 ~ 1 / **0** / 1 /step] • *0: Disables* • *1: Enables* *Set this to 1 if the user complains about diagonal lines in solid areas of prints that only use one toner color (M, C, or Y).*

SP4-XXX: (Scanner)

4	Mode No. (Class 1, 2, and 3)		Function / [Setting]
008*	Scanner Sub Scan Magnification		
	1	Scanner Sub Scan Magnification	Adjusts the magnification in the sub scan direction for scanning. [0.0 ~ 1.0 / **0.0** / 0.1 %/step] *Use the key to toggle between + and – before entering the value. The specification is ± 1%. See "Replacement and Adjustment – Copy Adjustment" for details.*
010	Scanner Leading Edge Registration		
	1	Scanner Leading Edge Registration	Adjusts the leading edge registration for scanning in platen mode. [–3.0 ~ 3.0 / **0.0** / 0.1 mm/step] *(–): The image moves in the direction of the leading edge.* *Use the key to toggle between + and – before entering the value. The specification is 2 ± 1.5 mm. See "Replacement and Adjustment – Copy Adjustment" for details.*
011*	Scanner Side-to-side Registration		
	1	Scanner Side-to-side Registration	Adjusts the side-to-side registration for scanning in platen mode. [–6.0 ~ +6.0 / **0.0** / 0.1 mm step] *(–): The image disappears at the left side.* *(+): The image appears.* *Use the key to toggle between + and – before entering the value. The specification is 2 ± 1.5 mm. See "Replacement and Adjustment – Copy Adjustment" for details.*
012*	Scanner Blank Margin		
	1	Leading Edge	Adjusts the erase margin at each side for scanning. [0.0 ~ 3.0 / **0.0** / 0.1 mm/step] *Do not adjust this unless the user wishes to have a scanner margin that is greater than the printer margin.*
	2	Trailing Edge	
	3	Left	
	4	Right	
013	Scanner Free Run		
	1	Lamp: OFF	Performs a scanner free run with the exposure lamp on or off. *Press ON on the touch panel to start this feature. Press OFF on the touch panel to stop.*
	2	Lamp: ON	
017	Scan		
	1	Shading ON	Performs a scanner free run with shading on or off. Only one scan is made. *Press ON on the touch panel to start this feature. Press OFF on the touch panel to stop.*
	2	Shading OFF	
205	Black ADS Level		
	1	Black ADS Level	Adjusts the erased background level for black-&-white ADS. [0 ~ 128 / **64** / 1 /step]
301	APS Data Confirmation		
	1	APS Data Confirmation	Displays the status of the APS sensors and platen/DF cover sensor.

4	Mode No. (Class 1, 2, and 3)		Function / [Setting]
303	APS Minimum Size Setting		
	1		Selects whether the copier determines that the original is A5 size when the APS sensor cannot detect the size. [0 ~ 1 / **0** / 1 /step] *If "A5 lengthwise" is selected, paper sizes that cannot be detected by the APS sensors are regarded as A5 lengthwise. If "Not detected" is selected, "Cannot detect original size" will be displayed.*
417	IPU Test Pattern		
	1		Prints test patterns from the IPU video data outputs. • *0: Scanning Image* • *1: Checker* • *2: Oblique Checker* • *3: Horizontal Gray Scale* • *4: Vertical Gray Scale* • *5: RGB YMCK Scale* • *6: UCR Gray Scale* • *7: Color Patch 16 Steps 1* • *8: Color Patch 16 Steps 2* • *9: Color Patch 64 Steps* • *10: Checker (YMCK)* • *11: Patch (YMCK)* • *12: Banding 1 (Gray)* • *13: Banding 2 (Gray)* • *14: Horizontal Gray Scale 2* • *15: Scanning Image + Checker* • *16: Scanning Image + Gray Scale* *Change to the copy mode display by pressing the Interrupt key, then print the test pattern.*
440	Saturation Adjustment		
	1		Adjusts the colour chroma for the scanner. [0 ~ 5 / **3** / 1 /step] **DFU**
540	Printer Vector		
	1	R:K	Adjust the vector correction of the filter in the CCD on the SBU unit. [–128 ~ 127 / **0** / 1 /step] *When replacing the SBU, input the data from the data sheet that is included with the spare SBU unit.*
	2	R:C	
	3	R:M	
	4	R:Y	
	5	Y:K	
	6	Y:C	
	7	Y:M	
	8	Y:Y	
	9	G:K	
	10	G:C	
	11	G:M	
	12	G:Y	
	13	C:K	
	14	C:C	
	15	C:M	
	16	C:Y	
	17	B:K	
	18	B:C	

4	Mode No. (Class 1, 2, and 3)		Function / [Setting]
540	19	B:M	Adjust the vector correction of the filter in the CCD on the SBU unit. [–128 ~ 127 / **0** / 1 /step] *When replacing the SBU, input the data from the data sheet that is included with the spare SBU unit.*
	20	B:Y	
	21	M:K	
	22	M:C	
	23	M:M	
	24	M:Y	
628	Gain Adjustment: R		
	1	R EVEN	Displays the values of the even and odd gain adjustment.
	2	R ODD	
629	Gain Adjustment: G		
	1	R EVEN	Displays the values of the even and odd gain adjustment.
	2	R ODD	
630	Gain Adjustment: B		
	1	R EVEN	Displays the values of the even and odd gain adjustment.
	2	R ODD	
685	Reference Adjustment: R		
	1	Reference Adjustment: R	Adjusts the ADC reference voltage. Details are in Replacement and Adjustment. [0 ~ 255 / **136** / 1 /step]
686	Reference Adjustment: G		
	1	Reference Adjustment: G	Adjusts the ADC reference voltage. [0 ~ 255 / **136** / 1 /step]
687	Reference Adjustment: B		
	1	Reference Adjustment: B	Adjusts the ADC reference voltage. [0 ~ 255 / **136** / 1 /step]
688	DF: Density Adjustment		
	1	DF: Density Adjustment	Adjusts the brightness for scanning using the ARDF. [83 ~ 100 / **86** / 1 %/step] *The density when scanning from the DF exposure glass tends to be higher than the density from the main exposure glass. SP4-688 adjusts the density on the DF exposure glass.*
800	DF: Density Correction		
	1	DF: Density Correction: R	Adjusts the red density when scanning with the ARDF [–20 ~ 20 / **0** / 1 %/step]
	2	DF: Density Correction: G	Adjusts the green density when scanning with the ARDF [–20 ~ 20 / **0** / 1 %/step]
	3	DF: Density Correction: B	Adjusts the blue density when scanning with the ARDF [–20 ~ 20 / **0** / 1 %/step]
902	ACC Data Display		
	1	R DATA 1	Displays ACC data. [0 ~ 255 / **0** / 1 /step]
	2	G DATA 1	
	3	B DATA 1	
	4	R DATA 2	
	5	G DATA 2	
	6	B DATA 2	

4	Mode No. (Class 1, 2, and 3)		Function / [Setting]
903	Vertical Line Correction		
	1	Vertical Line Correction	Adjusts the strength of the vertical line's correction with sheet through DF. [0 ~ 4 / **0** / 1 /step] • *0: No adjustment* • *1: Low level adjustment* • *2: Middle-low level adjustment* • *3: Middle-high level adjustment* • *4: High level adjustment*
904	BICU Board Test		
	1	test 1: register access test	Tests the BICU board *The following are completion codes:* *00: Normal end* *11: JTONE (DFID) error* *12: CPR (DFID) error* *13: IDU (DFID) error* *14: Separation ASIC error* *15: MaCKY error*
	2	test 2: image path test	*The following are completion codes:* *00: Normal end* *21: JTONE (DFID) error, Field memory error* *22: CPR (DFID) error, MaCKY, DFID, Field memory error* *23: JTONE (DFID), Separation error* *24: Separation error, CPR error, MaCKY error, DFID error, Field memory error*
905*	Dither selection		
	1	Dither selection	[0 ~ 255 / **1** / 1 /step] **DFU**
906	Binary Threshold		
	1	Binary Threshold	Specifies the black/white threshold for binary image processing. [0 ~ 255 / **128** / 1 /step] *Lower values increase the proportion of black in the image.*
907	VPU Test Pattern Selection		
	1	select any test pattern: R	[0 ~ 4 / **1** / 1 /step] • *0: CCD* • *1: Black* • *2: White* • *3: 15-grade gray scale* • *4: Vertical line*
	2	select any test pattern: G	
	3	select any test pattern: B	
918	Manual Gamma Adjustment		
			Please refer to section 3.13.2
932*	Picture Element Correction		
	1	R: Left	Corrects the left or right side alignment of the red or blue filter on the CCD. [0 ~ 9 / **5** / 1 /step]
	2	R: Right	
	3	B: Left	
	4	B: Right	

SP5-XXX: (Mode)

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
009	Set Display Language		
	1	Set Display Language	Selects the language on the display. [1 ~ 16 / **1** / 1 /step] • *1: Japanese* • *2: English (British)* • *3: English (American)* • *4: French* • *5: German* • *6: Italian* • *7: Spanish* • *8: Dutch* • *9: Norwegian* • *10: Danish* • *11: Swedish* • *12: Polish* • *13: Portuguese* • *14: Hungarian* • *15: Czech* • *16: Finnish* *Turn off and on the main power switch to validate SP5-009.*
024	mm/inch Display Selection		
	1	mm/inch Display Selection	Selects a unit system. North America: [0 ~ 1 / **1** / 1 /step] Europe: [0 ~ 1 / **0** / 0 /step] • *0: Millimeters* • *1: Inches*
045*	Charge Counter Display		
	1	Charge Counter Display	Changes the counter method. The setting can only be changed once. [0 ~ 1 / **0** / 1 /step] • *0: Developments* • *1: Prints*
046*	ROM Update Display		
	1	ROM Update	Enables or disables the ROM Update utility. When enabled, this utility will be displayed in the user program mode. **DFU** [0 or 1 / **1** / –] • *0: Enabled* • *1: Disabled*
104*	A3/11x17 count		
	1	A3/11x17 count	The counters count double for A3/11" x 17". [0 ~ 1 / **0** / 1/step] • *0: Normal count* • *1: Double count*
112	Custom size Setting		
	1	Custom size Setting	Allows/does not allow custom paper sizes. [0 ~ 1 / **1** / 1 /step] • *0: Not allowed* • *1: Allowed*

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
113	Optional Counter Type		
	1	Optional Counter Type	Determines the type of accounting device. [0 ~ 9 / **0** / 1 /step] • *0: None* • *1: Key card (RK2, RK3, RK4)* • *2: Key card (subtracting)* • *3: Prepaid card* • *4: Coin lock* • *5: MF key card* • *6: (not used)* • *7: (not used)* • *8: Key counter (excluding vendors)* • *9: Barcode printer*
118	Disable copying		
			[0 ~ 1 / **1** / 1 /step] *0: Copying enabled* *1: Copying disabled*
121	Counter Up Timing		
	1	Counter Up Timing	Selects the accounting timing. [0 ~ 1 / **0** / 1 /step] • *0: Paper feed* • *1: Paper exit* *SP5-121 affects only the timing for sending signals to the accounting device. The counters for other units or devices are not affected.*
126	F Original Size		
	1	F Original Size	Specifies the type of F-size paper. [0 ~ 2 / **0** / 1 /step] • *0: 8 1/2" x 13" SEF* • *1: 8 1/4" x 13" SEF* • *2: 8" x 13" SEF*
127	APS Mode		
	1	APS Mode	Enables or disables the APS (Auto Paper Selection) mode. [0 ~ 1 / **0** / 1 /step] • *0: Enables* • *1: Disables*
128	Combination (Op. Counter)		
	1	Combination (Op. Counter)	[0 ~ 1 / **0** / 1 /step] **DFU** • *0:* • *1:*
212	Page Numbering		
	3	Duplex Printout Right/Left Position	Adjusts the positions of page numbers. [–99 ~ 99 / **0** / 1 mm/step]
	4	Duplex Printout High/Low Position	

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
302	Setting Time		
	1	Setting Time	Sets the clock.
	2	Time zone	Sets the time zone. North America: [–1440 ~ 1440 / **–300** / 1 minute/step] Europe: [–1440 ~ 1440 / **60** / 1 minute/step] *Values indicate the time difference from the Greenwich Mean Time (GMT). "–300" indicates the eastern standard time of Canada and the United States of America. "60" indicates the standard time of the French Republic.*
305	Auto Off Set		
	1	ON/OFF	Determines the auto-off timer adjustment range that is available for SP5-305-2. [0 ~ 1 / **0** / 1/step] • *0: 10 minutes to 240 minutes* • *1: 0 minutes to 240 minutes*
	2	Set Timer	Specifies the auto-off timer value. [0 ~ 14400 / **3600** / 1 second/step] *When SP5-305-1 is set to 1, SP5-305-2 has a range of 0 minutes to 240 minutes. 0 means AOF is disabled (the machine never switches itself off).*
401*	Access Control		
	1	Copy: User Code (UC)	Activates/inactivates copy mode access control using user codes. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the users must input their user codes to use copy mode. To select 1, one or more user codes must be registered.*
	2	Copy: Key Counter (KC)	Activates/inactivates the key counter for copy mode. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the key counter logs copy mode operations.*
	3	Copy: Coin Lock (CL)	Activates/inactivates the accounting device for copy mode. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the accounting device logs copy mode operations.*

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
401*	11	DS: User Code (UC)	Activates/inactivates document server access control using user codes. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the users must input their user codes to use document server mode. To select 1, one or more user codes must be registered.*
	12	DS: Key Counter (KC)	Activates/inactivates the key counter for document server mode. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the key counter logs document server operations.*
	13	DS: Coin Lock (CL)	Activates/inactivates the accounting device for document server mode. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the accounting device logs document server operations.*
	21	Fax: User Code (UC)	Activates/inactivates fax mode access control using user codes. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the users must input their user codes to use fax mode. To select 1, one or more user codes must be registered..*
	22	Fax: Key Counter (KC)	Activates/inactivates the key counter for fax mode. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the key counter logs fax mode operations.*
	23	Fax: Coin Lock (CL)	Activates/inactivates the accounting device for fax mode. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the accounting device logs the fax mode operations.*

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
401*	31	Scanner: User Code (UC)	Activates/inactivates scanner mode access control using user codes [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the users must input their user codes to use scanner mode. To select 1, one or more user codes must be registered.*
	32	Scanner: Key Counter (KC)	Activates/inactivates the key counter for scanner mode. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the key counter logs scanner mode operations.*
	33	Scanner: Coin Lock (CL)	Activates/inactivates the accounting device for scanner mode. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the accounting device logs the scanner mode operations.*
	41	Printer: User Code (UC)	Activates/inactivates printer mode access control using user codes. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the users must input their user codes to use printer mode. To select 1, one or more user codes must be registered.* *If SP5-401-44 is activated, the user codes can be automatically registered.*
	42	Printer: Key Counter (KC)	Activates/inactivates the key counter for printer mode. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the key counter logs printer mode operations.*
	43	Printer: Coin Lock (CL)	Activates/inactivates the accounting device for printer mode. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the accounting device logs the printer mode operations.*

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
401*	44	Printer: UC Auto	Activates the auto user code registration function (prints are counted and logged for each user code and the counts can be viewed with SmartNetMonitor). [0 ~ 1 / **1** / 1/step]*0: Inactivated* • *1: Activated*
	51	Copy: UC Mono color	Activates/inactivates mono color copying access control using user codes. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the users must input their user codes to make mono color copies. To select 1, one or more user codes must be registered.*
	52	Copy: KC Mono color	Activates/inactivates the key counter for mono color copying. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the key counter logs mono color copy operations.*
	53	Copy: LC Mono color	Activates/inactivates the accounting device for mono color copying. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the accounting device logs mono color copy mode operations.*
	54	Copy: UC Twin color	Activates/inactivates two-color copying access control using user codes [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the users must input their user codes to make two-color copies. To select 1, one or more user codes must be registered.*
	55	Copy: KC Twin Color	Activates/inactivates the key counter for two-color copying. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the key counter logs two-color copy operations..*
	56	Copy: CL Twin Color	Activates/inactivates the accounting device for two-color copying. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the accounting device logs two-color copy mode operations.*

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
401*	57	Copy: UC Full Color	Activates/inactivates full color copying access control using user codes. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the users must input their user codes to make full color copies. To select 1, one or more user codes must be registered.*
	58	Copy: KC Full Color	Activates/inactivates the key counter for full color copying. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the key counter logs full color copy operations.*
	59	Copy: CL Full Color	Activates/inactivates the accounting device for full color copying. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the accounting device logs full color copy mode operations.*
	61	Printer: UC Color	Activates/inactivates full color printing access control using user codes. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the users must input their user codes to make full color prints. To select 1, one or more user codes must be registered.*
	62	Printer: KC Color	Activates/inactivates the key counter for full color printing. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the key counter logs full color printing operations.*
	63	Printer: CL Color	Activates/inactivates the accounting device for full color printing. [0 ~ 1 / **0** / 1 /step] • *0: Inactivates* • *1: Activates* *When 1 (activates) is selected, the accounting device logs full color print mode operations*
404	User Code Counter Clear		
	1	User Code Counter Clear	Clears the user code counter.

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
409	Access code		
	1	Password	Registers/changes the password for the key operator. [0 ~ 99999999 / **0** / 1 /step] *"0" indicates no code has been registered. SP7-810 can be used to clear the key operator password.*
	2	Access Area	Decides which programs require key operator codes. [0 ~ 2 / **0** / 1 /step] • *0: None* • *1: Some key operator user tool settings* • *2: All user tool programs*
501	PM Alarm		
	1	PM Alarm Level	Specifies the PM alarm level. [0 ~ 255 / **0** / 1 /step] • *0: Disables the PM alarm* • *1 ~ 255: Specifies the PM alarm level.* *The PM alarm occurs when L x 1000 >= C, where L is the specified level and C is the current PM counter value.*
	2	Original Count Alarm	
504	Jam alarm **Japan Only**		
	1	Jam Alarm	Selects the jam alarm level. [0 ~ 3 / **3** / 1 /step] • *0: Z (none)* • *1: L (6K x 1/4)* • *2: M (6K x 1/2)* • *3: H (6K)*
	2	Error Alarm	Enables/disables the control call when an unremoved jam occurs. [0 ~ 1 / **0** / 1 /step] • *0: Disabled* • *1: Enabled* *An "unremoved jam" is a paper jam that remains unremoved for 15 minutes. If 1 is selected, the machine beeps if an unremoved jam has occurred.*
505	Error Alarm **Japan Only**		
	1	Error Alarm	[0 ~ 255 / **40** / 1 /step]
507	Supply Alarm **Japan Only**		
	1	Paper Supply Alarm	Turns the supply alarm on or off. [0 ~ 1 / **0** / 1 /step] • *0: Off* • *1: On*
	2	Staple Supply Alarm	
	3	Toner Supply Alarm	
	128	Interval: Others	The machine issues the control call when the number of paper sheets reaches the specified value. [00250 ~ 10000 / **1000** / 1 sheet/step]
	132	Interval: A3	
	133	Interval: A4	
	134	Interval: A5	
	141	Interval: B4	
	142	Interval: B5	
	160	Interval: DLT	
	164	Interval: LG	
	166	Interval: LT	
	172	Interval: HLT	

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
508	CC call **Japan Only**		
	1	CC201 ON/OFF (Remain of Jam)	Enables/disables alarms for unremoved jams. [0 ~ 1 / **0** / 1 /step] • *0: Disabled* • *1: Enabled*
	2	CC101 ON/OFF (Continuous jam Occurrence)	Enables/disables alarms for consecutive jams. [0 ~ 1 / **0** / 1 /step] • *0: Disabled* • *1: Enabled*
	3	CC202 ON/OFF (Continuous Door Open)	Enables/disables alarms when a cover remains open continuously. [0 ~ 1 / **0** / 1 /step] • *0: Disabled* • *1: Enabled*
	4	CC Call Screening ON/OFF (Low Call Mode)	Selects the alarm mode. [0 ~ 1 / **0** / 1 /step] • *0: Normal Mode (CC Auto Call)* • *1: Reduce Mode (CC Manual Call)* *When selecting 1 (reduce mode), SP5-508-011 through -023 specify parameters (referred to as "P" in the following descriptions). Alarms occur under the following conditions:* • *Continuous jam:* *When paper jams occur P times consecutively, where P can be between 2 and 10. The default for P is 5 (☛ SP5-508-012).* • *Continuous door open:* *When a door is left open for P minutes, where P can be between 3 and 30. The default for P is 10 (☛ SP5-508-013).* • *Unremoved jam:* *When a paper jam is left unremoved for P minutes, where P can be between 3 and 30. The default for P is 10 (☛ SP5-508-011).*
	11	CC201 Interval (Jam Detection: Time Length)	Specifies the unremoved jam timer (☛ SP5-508-004). [3 ~ 30 / **10** / 1 minute/step]
	12	CC101 Frequency (Jam Detection: Time Length)	Specifies the number of consecutive jams (☛ SP5-508-004). [2 ~ 10 / **5** / 1 time/step]
	13	CC202 Interval (Door Open: Time Length)	Specifies the continuous door open timer (☛ SP5-508-004). [3 ~ 30 / **10** / 1 minute/step]
	21	CC201 Beeper Ope (Jam Operation: Time Length)	Selects how the machine handles the unremoved jam alarm. [0 ~ 1 / **1** / 1 /step] • *0: Auto call* • *1: Beeper* *If an unremoved jam occurs, a phone call is automatically made when 0 (auto call) is selected. To enable SP5-508-21 through -23, SP5-508-4 must be set to 1.*

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
508	22	CC101 Manual Call ON/OFF (Jam Operation: Time Length)	Selects how the machine handles the consecutive jam alarm. [0 ~ 1 / **1** / 1 /step] • *0: Auto call* • *1: Manual Call*
	23	CC202 Manual Call ON/OFF (Door Operation: Time Length)	Selects how the machine handles the continuous door open alarm. [0 ~ 1 / **1** / 1 /step] • *0: Auto call* • *1: Manual Call*
610	ACC Factory Setting		
	4	Recall	Recalls the ACC factory settings.
	5	Overwrite	Overwrites the ACC factory settings with the current settings.
	6	Previous Setting	Recalls the previous ACC settings.
611	2nd. Single Color Adj.		
	1	B–C	[0 ~ 100 / **90** / 1 %/step]
	2	B–M	[0 ~ 100 / **60** / 1 %/step]
	3	G–C	[0 ~ 100 / **85** / 1 %/step]
	4	G–Y	[0 ~ 100 / **80** / 1 %/step]
	5	R–M	[0 ~ 100 / **95** / 1 %/step]
	6	R–Y	[0 ~ 100 / **65** / 1 %/step]
801	Memory Clear – Refer to section 5.1.9 for how to use this SP		
	1	All modules	Clears the settings from the NVRAM and initializes the settings. [0 ~ 0 / **0** / 0/step]
	2	Engine Clear	Clears the engine settings. [0 ~ 1 / **0** / 1/step]
	3	SCS/SRM	Clears the system settings. [0 ~ 0 / **0** / 0/step]
	4	IMH Memory Clear	Clears IMH data. **DFU** [0 ~ 0 / **0** / 0/step]
	5	MCS	Clears MCS data. **DFU** [0 ~ 1 / **0** / 0/step] • *0: Does not execute* • *1: Executes*
	6	Copier application	Clears the copy settings. [0 ~ 1 / 0 / 1/step]
	7	Fax application	Clears the fax settings. [0 ~ 1 / 0 / 1/step]
	8	Printer application	Clears the user tool settings. [0 ~ 0 / **0** / 0/step]
	9	Scanner application	Clears the scanner settings. *This SP must be performed after installing the printer/scanner option or updating the scanner software.* [0 ~ 1 / 0 / 1/step]
	10	Network application	Clears the net file settings. [0 ~ 1 / 0 / 1/step]
	11	NCS	Clears the network settings. [0 ~ 0 / **0** / 0/step]

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
801	12	IPU	Clears the IPU settings. [0 ~ 1 / 0 / 1/step]
	14	DCS Memory Clear	Clears the DCS settings. [0 ~ 1 / 0 / 1/step]
	15	UCS Memory Clear	Clears the UCS settings. [0 ~ 1 / 0 / 1/step]
802	Free Run		
	1	A4: BANK 2: Bk	Makes a free run test. All mode: Goes through tests 1 to 4. [0 ~ 1 / 0 / 1/step] • *0: No free run* *1: Start a free run test*
	2	A4: TRAY 1: Bk	
	3	A4: By-pass: Bk	
	4	A4: BANK 2: Full Color	
	5	All Mode	
803	Input Check (See section 5.1.4, "Input Check")		
804	Output Check (See section 5.1.5, "Output Check".)		
810	SC Reset		
	1	SC Reset	Resets a fusing-related SC. [0 ~ 1 / **0** / 1/step] *Resets a type A service call condition.* ***NOTE:*** *Turn the main switch off and on after using this SP.*
811	Serial Number Display		
	2	Serial Number Display	Displays the machine serial number. [0 ~ 1 / **0** / 1/step]
812*	Service Telephone No. Setting		
	1	Telephone	5-812-1: Service representative telephone number 5-812-2: Service representative fax number 5-812-3: Number for ordering consumables 5-812-4: Telephone number of the sales representative [0 ~ 0 / **0** / 0/step] • *Both numbers and alphabetic characters can be input.*
	2	Facsimile	
	3	Supply	
	4	Operation	
813*	High Voltage SC Sensor		
	1	High Voltage SC Sensor	Activates/deactivates detection of SC conditions for the high voltage power supplies. [0 ~ 1 / **0** / 1/step] • *0: Activated* • *1: Deactivated* • *The following SCs are affected:* SC300, 301, 302, 350, 351, 400, 410, 411, 412, 413, 420, 421, 430
816	CSS Function **DFU**		
	1	Function Setting	[0 ~ 1 / **0** / 1 /step] • *0: Off* • *1: On*
	2	CE Call	
821	CSS-PI Device Code **DFU**		
	1	CSS-PI device code	Selects the PI device code. [0 ~ 4 / **0** / 1 /step] *To validate the setting, turn off and on the main power switch.*
822	Document All Clear		
	1	Document All Clear	Clears the management information on stored fax files.

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
824	NVRAM Data Upload		
	1	NVRAM Data Upload	Use this to copy NVRAM data from the machine to a flash card.
825	NVRAM Data Download		
	1	NVRAM Data Download	Imports data from a flash card to the NVRAM. *When data has been normally imported into the NVRAM, a message appears on the operation panel. After reading the message, turn the main power switch off and on. The data of SP7-007 are not imported through SP5-825.*
828	Network Setting		
	74	Delete Password	Deletes the password.
	75	DNS Server From DHCP	[0 ~ 1 / **0** / 1 /step]
	76	DNS Server 1	Server address
	77	DNS Server 2	Server address
	78	DNS Server 3	Server address
	79	Domain Name (Ethernet)	Domain name
	80	Host Name (Ethernet)	Host name
832	HDD		
	1	HDD Formatting (ALL)	Initializes the hard disk. [0 ~ 0 / **0** / 0 /step] • *Use this SP mode only for hard disk error recovery.*
	2	HDD Formatting (IMH)	
	3	HDD Formatting (Thumbnail)	
	4	HDD Formatting (Job Log)	
	5	HDD Formatting (Printer Fonts)	
	6	HDD Formatting (User Info 1)	
	7	HDD Formatting (User Info 2)	
	8	HDD Formatting (Scanner Mail)	
	9	HDD Formatting (Data for a Design)	
	11	HDD Formatting (Ridoc interface)	
833*	Job Log Transfer		
	7	Job Log Transfer	Saves the results of jobs in the job log. [0 ~ 1 / **0** / 1 /step] • *If this mode is enabled, the results of jobs are written on the HDD.* • *0: Disabled* • *1: Enabled*

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
835	File Transfer		
	1	Capture server IP address	Displays/specifies the capture server IP address. [00000000000h ~ FFFFFFFFFF1 / **0** / 1 /step]
	10	Archive: Copier	Validates/invalidates auto-store functions. [0 ~ 1 / **0** / 1 /step] • *0: Invalidates* • *1: Validates*
	11	Archive: Fax Send	
	12	Archive: Fax: Receive	
	13	Archive: Printer	
	14	Archive: Scanner	
835	20	Server: Copier	Transfers or does not transfer data to servers. [0 ~ 1 / **0** / 1 /step] • *0: Not transferred* • *1: Transferred*
	21	Server: Fax Send	
	22	Server Transfer: Fax: Receive	
	23	Server: Printer	
	24	Server: Scanner	
	30	List File: Copier	Selects lists or files. [0 ~ 1 / **0** / 1 /step] • *0: Lists* • *1: Files*
	31	List File: Fax: Send	
	32	List File: Fax: Receive	
	33	List File: Printer	
	34	List File: Scanner	
836	Capture Setting		
	1	Function setting	Validates/invalidates the capture function. [0 ~ 1 / **0** / 1 /step] • *0: Invalidates* • *1: Validates*
	2	Panel Setting	Displays or does not display the capture function buttons. [0 ~ 1 / **0** / 1 /step] • *0: Displayed* • *1: Not displayed*
	51	Cancel Document	Cancels the documents waiting for capturing.
	61	Capture Transfer	Allows/disallows captured documents to be transferred. [0 ~ 1 / **0** / 1 /step] • *0: Machine transfers captured files to the server* • *1: Machine transfers captured files to the server twice (the second overwrites the first)*
839	IEEE1394		
	4	Device Name	Displays the 1394 device name. [Text up to 13 bytes / **NULL** / – /step]
	7	Cycle Master	Validates/invalidates the cycle master function. [0 ~ 1 / **1** / 1 /step] • *0: Invalidates* • *1: Validates*
	8	BCR mode	Select either ‘Standard’, 'IRM color copy', or 'Always effective'.
	9	IRM 1394a Check	[bit 0 ~ bit 1 / **0** / 1 /step] • *bit 0: off* • *bit 1: on*
	10	Unique ID	[bit 0 ~ bit 1 / **0** / 1 /step] • *bit 0: off* • *bit 1: on*

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
839	11	Logout	Prevents initiators from logging on or makes initiators log off. [0 ~ 1 / **0** / 1 /step] • *0: Prevents the initiators (having already logged on) to log on if they try to log on* • *1: Makes initiators (having already logged on) to log off if they try to log on*
	12	Login	Allows/disallows an initiator to exclusively log on. [0 ~ 1 / **0** / 1 /step] • *0: Disallows* • *1: Allows*
	13	Login MAX	Specifies the maximum initiators able to log on. [0 ~ 63 / **8** / 1 /step]
840	IEEE 802.11b		
	6	Channel MAX	Specifies the maximum number of IEEE 802.11b channels. North America: [1 ~ 14 / **11** / 1 /step] Europe: [1 ~ 14 / **13** / 1 /step]
	7	Channel MIN	Specifies the minimum number of IEEE 802.11b channels. [1 ~ 14 / **1** / 1 /step]
	11	WEP Key Select	Selects the WEP key. [00, 01, 10, 11 / **00** / – /step] • *00: 1st key* • *01: 2nd key* • *10: 3rd key* • *11: 4th key*
841	Toner Name Setting		
	1	Black	Specifies supply names. These appear on the screen when the user presses the Inquiry button in the user tools screen.
	2	Cyan	
	3	Yellow	
	4	Magenta	
842	Net File Analysis Mode Setting		
	1	Net File Analysis Mode Setting	**DFU** Default: 00111111 – do not change Netfiles: Jobs to be printed from the document server using a PC and the DeskTopBinder software
843	Input Check (Controller)		
	1	Input Check (Controller)	[0x00 ~ 0x07 / **–** / 1 /step] **DFU** Default: 00000001 – do not change
845	Delivery Server		
	1	FTP Port No.	Specifies the FTP port number. [0 ~ 65535 / **3670** / 1 /step]
	2	IP address	Specifies the distribution server IP address. [0 ~ 0xffffffff / **0x00** / – /step]
	3	Retry Timer	Specifies the distribution retry time. [60 ~ 900 / **300** / 1 /step]
	4	Retry Times	Specifies the distribution retry count. [0 ~ 99 / **3** / 1 /step]
	5	IP (Capture Server)	Specifies the distribution server address. [0 ~ 0xffffffff / **0x00** / 1 /step]

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
845	6	Error Display Time	Specifies the display time of the distribution error. [0 ~ 999 / **300** / 1 /step]
	7	Delivery Option	Selects the distribution option. [0 ~ 1 / **0** / 1 /step] • *0: Data goes directly to the connected PC* • *1: Data goes to the Scan Router server*
846	UCS		
	1	Machine ID (Delivery Server)	Specifies the machine ID of the distribution server.
	2	Machine ID Clear (Delivery Server)	Clears the machine ID of the distribution server.
	3	Max Entry	Specifies the maximum entry count. [2000 ~ 5000 / **2000** / 1 /step]
	4	Delivery Server Model	Selects the distribution server model. [0 ~ 4 / **0** / 1 /step] • *0: Unknown* • *1: SG1 (distributed with the copier)* • *2: SG1 (distributed as a package)* • *3: SG2 (distributed with the copier)* • *4: SG2 (distributed as a package)*
	5	Delivery Server Capability	Specifies the distribution capability. [0 ~ 255 / **0** / 2 /step]
	6	Delivery Server Retry Timer	[0 ~ 255 / **0** / 1 /step]
	50	All Directory Clear	Initializes all directories.
847	NFA page-Magnification		
	1	Copy: Color	Selects the net file page magnification (copy, color) [0 ~ 2 / **0** / 1 /step] Netfiles: Jobs to be printed from the document server using a PC and the DeskTopBinder software
	2	Copy: B & W Letter	Selects the net file page magnification (copy, black & white, text) [0 ~ 2 / **0** / 1 /step]
	3	Copy B & W	Selects the net file page magnification (copy, black & white, others) [0 ~ 2 / **0** / 1 /step]
	4	Printer Color	Selects the net file page magnification (printer, color) [0 ~ 2 / **0** / 1 /step]
	5	Printer GW (1 bit)	Selects the net file page magnification (printer, black & white [0 ~ 2 / **0** / 1 /step]
	6	Printer GW (2 bit)	Selects the net file page magnification (printer, black & white) [0 ~ 2 / **0** / 1 /step]
848	JPEG Quality Setting		
	1	JPEG Quality Setting	This is for Netfiles: Jobs to be printed from the document server using a PC and the DeskTopBinder software [5 ~ 95 / **50** / 2 /step]

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
849	Counter Clear Day		
	1	Indication	Displays the date when the electrical counter was reset to zero.
	2	Display of Counter Clear Day	Allows or does not allow printing the counter clear day on the user counter list. [0 ~ 1 / **1** / 1 /step] • *0: Printed* • *1: Not printed*
850	Address Book Function		
	1	Switch Module	Selects which module is responsible for user information management. [0 ~ 1 / **1** / 1 /step] **DFU** • *0: SCS* • *1: UCS* *Having changed the setting, turn the main switch off and on to validate it.*
	2	Select Title	Selects the address book index style. [2 ~ 4 / **2** / 1 /step] • *2: Style 1* • *3: Style 2* • *4: Style 3*
852	SMTP		
	1	Server Name	
	2	Port Number	[0 ~ 65535 / **25** / 1 /step]
907	Plug and Play		
	1	Plug and Play	Specifies the Plug and Play setting. [0 ~ 11 / **0** / 1 /step] *Select the required setting from the menu.*
913	Switchover Permission Time		
	1	Indication Application	Specifies the switching time from the default application to another application. [3 ~ 30 / **3** / 1 /step] *The value indicates how long the next application waits before being given control by the default application.*
	2	Print Application	Specifies the switching time from one application to another. [3 ~ 30 / **3** / 1 /step] *The value indicates how long the next application waits before being given control by the running application.*
914	Counter Display		
			Allows/does not allow applications to display their counters. [0 ~ 1 / **0** / 1 /step] • *0: Allows* • *1: Does not allow*
919	ACS Mode		
	1	ACS Mode	Selects the ACS mode. **DFU** [0 ~ 1 / **0** / 1 /step] • *0: Standard mode* • 1: High performance mode

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
954	CSV Password Check		
	1	CSV Password Check	CSV: Copy server (document server) When a document is stored with a password on the copy server, and this document is selected later at the operation panel, this SP determines whether the password is displayed or greyed out. 0: Not displayed 1: Displayed [0 ~ 1 / **0** / 1 /step]
955	Test Pattern		
	1	Pattern	[0 ~ 255 / **0** / 1 /step] See section 5.1.3. for how to use.
	2	Density	[0 ~ 255 / **255** / 1 /step]
966	Document Clear Time		
	1	Document Clear Time	Specifies how many days the document server stores files. [0 ~ 180 / **3** / 1 /step]
970	Debug Serial		
	1	Debug Serial	**DFU**
971	Touch Panel Correction		
	1	Touch Panel Correction	Displays if the operation panel has been calibrated after an SP5-801 execution. [0 ~ 1 / **0** / 1 /step] • *0: Not calibrated* • *1: Calibrated*
974	Cherry Server Setting		
		Cherry Server Setting	Selects the Scan Router server light or full version. [0 ~ 1 / **0** / 1 /step] • *0: Light version* • *1: Professional version*
989	Loop Back Test		
	1	Duplex	Executes a loop back test. [0 ~ 1 / **0** / 1 /step] • *0: Does not execute* • *1: Executes*
	2	Bank	
	3	Exit Option	
	4	ARDF	
	5	Interchange Unit	
	6	By-pass Tray	
	7	1 Bin Tray	
990*	SMC Print		
	1	All (Data List)	[0 ~ 0xff / **0x00** / 0 /step] Prints SP setting data. [0 ~ 255 / **0** / 0 /step] • SP all print: All items printed out with SP5-990-2, 3, 4, 6, and 7. • All: All SP mode settings • Non-Default: SP settings that have been changed from the defaults
	2	SP (Mode Data List)	
	3	User Program	
	4	Logging Data	
	5	Diagnosis Report	
	6	Non-Default	
	7	NIB Summary (Configuration page, system log page NVRAM log page)	
	8	Net File Log	

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
990*	21	Copier UP Data (Copy Management Report)	[0 ~ 0xff / **0x00** / 0 /step] Prints SP setting data. [0 ~ 255 / **0** / 0 /step] • SP all print: All items printed out with SP5-990-2, 3, 4, 6, and 7. • All: All SP mode settings • Non-Default: SP settings that have been changed from the defaults
	22	Scanner SP	
	23	Scanner UP (Scanner Management Report)	
996	Density Adjustment		
	1	Bk	Adjusts the density. [–3 ~ 3 / **0** / 1 /step] –3: Image becomes lighter 3: Image becomes darker This setting changes the development bias and charge corona voltage to adjust the image density.
	2	Y	
	3	M	
	4	C	

SP6-XXX: (Peripherals)

6	Mode No. (Class 1, 2, and 3)		Function / [Setting]
006*	ADF Adjustment		
	1	S-to-S Registration	Adjusts the side-to-side registration of the optional ADF. [–5.0 ~ 5.0 / **0** / 0.1 mm/step] *The main scan registration of the ADF cannot be adjusted. Adjust the copier registration if necessary.*
	2	Leading Edge Registration	Adjusts the sub-scan registration of the optional ADF. [–5.0 ~ 5.0 / **0** / 0.1 mm/step]
	3	Trailing Edge Erase	Adjusts the trail edge erase of the optional ADF. [–5.0 ~ 5.0 / **0** / 0.1 mm/step]
	4	S-to-S Registration (Rear)	Adjusts the rear-side side-to-side registration of the optional ADF. [–5.0 ~ 5.0 / **0** / 0.1 mm/step] *The main scan registration of the ADF cannot be adjusted. Adjust the copier registration if necessary.*
	5	Sub-san Magnification	Adjusts the sub-scan magnification of the optional ADF. [–5.0 ~ 5.0 / **0** / 0.1 %/step]
	6	Orig. Buckling	Enables/disables original buckling during rear side scanning. Disable if the customer is scanning fragile originals. [0 ~ 1 / **1** / 1 /step] • *0: Disabled* • *1: Enabled*
	7	Buckle Adjustment	Adjusts original buckling for rear side scanning. [–5.0 ~ 5.0 / **0** / 0.1 mm/step]
007	DF Input Check		
	1	Original Set	Displays the signals received from sensors and switches of the ARDF. See section 5.1.4 *Do not check another item before the result is returned.*
	2	Original Width 1	
	3	Original Width 2	
	4	Original Length 1	
	5	Original Length 2	
	6	Orig. Trailing Edge	
	7	Cover Open	
	8	DF Position	
	9	Registration	
	10	Original Exit	
	11	Original Reverse	
008	DF Output Check		
	1	Feed Motor (Forward)	Switches on each electrical component of the ARDF for testing. See section 5.1.5 *Do not start to check another item before ending the test that is in progress.*
	2	Feed Motor (Reverse)	
	3	Trans. Motor (Forward)	
	4	Feed Clutch	
	5	Pick-up Solenoid	
	6	Junction Gate Solenoid	
	7	Stamp Solenoid	

6	Mode No. (Class 1, 2, and 3)		Function / [Setting]
009	ADF Free Run		
	1	ADF Free Run	Executes an ADF free run. [0 ~ 1 / **0** / 1 /step] • *0: End* • *1: Start*
010	ADF Stamp Position		
	1	ADF Stamp Position	Adjusts the stamp position of the optional ADF. [–5.0 ~ 5.0 / **0** / 0.1 mm/step]
016	ADF Size Change		
	1	ADF Size Change	Selects the paper size detected by the optional ADF original sensors. North America: [0 ~ 1 / **0** / 1 /step] Others: [0 ~ 2 / **0** / 1 /step] • *0: Regular* • *1: A4/LT* • *2: 8K/16K* *Number 2, "8K/16K", is valid for the models of the following regions: Europe, Asia. When number 2 is selected, the following paper sizes are not detected: A3, B4, A4, B5.*
050	Staple Position		
	1	Staple Position	Adjusts the staple position of the optional finisher. [–3.5 ~ 3.5 / **0.0** / 0.5 mm/step]
117	Finisher Input Check		
	1	Entrance	Displays the signals received from sensors and switches in the finisher. See section 5.1.4
	2	Tray Exit	
	4	Staple Entrance	
	5	Stapler Home Position	
	6	Jogger Fence Home Position	
	8	Feed-out Belt Home Position	
	9	Stapler Tray Paper	
	10	Stapler Rotation Home Position	
	11	Staple	
	14	Staple Sheet	
	17	Exit Plate Home Position	
	18	Tray Shift Home Position	
	21	Stack Height	
	23	Tray Lower Limit	
	35	Paper Limit	
	101	500 Fin Entrance	
	102	500 Fin Exit	
	103	500 Fin Jogger Home Position	
	104	500 Fin Top Cover	
	105	500 Fin Height	
	106	500 Fin Lever	

6	Mode No. (Class 1, 2, and 3)		Function / [Setting]
117	107	500 Fin Upper Limit	Displays the signals received from sensors and switches in the finisher. See section 5.1.4
	108	500 Fin Near Limit	
	109	500 Fin Staple Cover	
	110	500 Fin Stapler Home Position	
	111	500 Fin Staple End	
	112	500 Fin Staple	
	113	500 Fin Stapler Lock	
118	Output Check		
	1	Fin All Off	Switches on each electrical component of the finisher. See section 5.1.5
	2	Upper Transfer Motor	
	3	Lower Transfer Motor	
	4	Exit Motor	
	5	Tray Gate Sol	
	6	Tray Lift Motor	
	7	Jogger Motor	
	12	Stapler Motor	
	13	Staple Hummer	
	15	Stapler Gate Sol	
	16	Pos. Roller Sol	
	18	Feed-out Motor	
	19	Shift Motor	
	22	Guide Plate Motor	
	23	Fin Free Run 1	
	24	Fin Free Run 2	
	101	500 Fin All Off	
	102	500 Fin Main Motor	
	103	500 Fin Jogger Motor	
	104	500 Fin Paddle Sol	
	105	500 Fin Gear Sol	
	106	500 Fin Lever Sol	
	107	500 Fin Tray Motor	
	108	500 Fin Stapler Motor	
	109	500 Fin Free Run 1	
	110	500 Fin Free Run 2	
990	ADF Read Position Adjustment		
	1	ADF Read Position Adjustment	Adjusts the reading position of the ADF. Moves the scanner under the glass to a different position. Use this if there is a scratch on the glass. [–10 ~ 10 / 0 / 0.1 mm/step]

SP7-XXX: (Data Log)

7	Mode No. (Class 1, 2, and 3)		Function / [Setting]
001*	Operation Time		
	1	Operation Time	Displays the main motor operation time. [0000000 ~ 9999999 / **0** / 1 minute/step] *Logging this operation time helps identify the cause of a difficulty by analyzing the correlation between the printing count and the OPC-belt operation time.*
002	Original Counter		
	1	Total Counter	Displays the original counters. [0000000 ~ 9999999 / **0** / 1 /step]
	2	Copier	
	3	Fax	
	4	Document Box	
	5	Scanner	
	6	Others	
003*	Print Counter		
	1	Total	Displays the color counters. [–9999 to 9999999 / **0** / 1/step]
	2	Copy: Black	
	4	Copy: Full Color	
	5	FAX: Black	
	6	FAX: Single Color	
	7	Print: Black	
	8	Print: Full Color	
	10	Development: CMY	• *10, 11: These SP modes are development counters.*
	11	Development: K	
	12	CPY: Single Color	
	13	CPY: Twin Color	
	20	Total Full color	• *These SP modes are used for the Japanese market only.*
	21	Total B/W Single Color	
	22	Total Single Color	
	23	Total B/W	
	24	Copy: Full Color	
	25	Print: Full Color	
	26	Copy: Color	
	27	Copy: B/W	
	28	Print: Color (except for B/W)	• *These SP modes are print counters.* • *These SP modes are used in all markets.*
	29	Print: B/W	
	30	Total: Color	
007*	Other Counter		
	1	Duplex	Displays other counter values. [–9999 ~ 9999999 / **0** / 0 sheet/step]
	2	A3/DLT	
	3	Staple	
101*	Paper Size Counter		
	4	A3	Displays the counter values for each paper size. [0 ~ 9999999 / **0** / 0 sheet/step]
	5	A4	
	6	A5	
	13	B4	
	14	B5	
	32	DLT (11" x 17")	

7	Mode No. (Class 1, 2, and 3)		Function / [Setting]
101*	36	LG (8 1/2" x 14")	Displays the counter values for each paper size. [0 ~ 9999999 / **0** / 0 sheet/step]
	38	LT (8 1/2" x 11")	
	44	HLT (5 1/2" x 8 1/2")	
	47	12 x 18	
	128	Other	
105	Paper type Counter		
	1	Normal	Displays the output counter for each paper type. [0 ~ 999999999 / **0** / 1 /step]
	2	Recycled	
	3	Special	
	4	Color	
	5	Letter head	
	6	Label	
	7	Thick	
	8	OHP	
	9	Others	
106*	Waste Toner Full		
	1	OPC	Displays the waste toner bottle counters. [0 ~ 65535 / **0** / 1 /step]
	2	Belt	[0 ~ 65535 / **0** / 1 /step]
201	Total Scan Counter		
	1	Total Scan Counter	
204*	Paper Tray Counter		
	1	Tray 1	Displays the number of sheets fed from each paper feed station. [0 ~ 9999999 / **0** / 0 sheet/step]
	2	Tray 2	
	3	Tray 3	
	4	Tray 4	
	5	Bypass Tray	
	6	Duplex	
205	ADF Total Counter		
	1	ADF Total Counter	Displays the ARDF original count. [0000000 ~ 9999999 / **0** / 1 /step]
206	Staple Counter		
	1	Staple Counter	Displays the stapling count. [0000000 ~ 9999999 / **0** / 1 /step]
209	Punch Counter		
	1	Punch Counter	Displays the punching count. [0 ~ 9999999 / **0** / 1 /step]
301	Copy Counter: Magnification		
	1	Reduce 25% <-->49 %	Displays the copy count for each magnification ratio. [0 ~ 9999999 / **0** / 1 /step]
	2	Reduce 50% <-->99 %	
	3	Full Size	
	4	Enlarge 101% <--> 200%	
	5	Enlarge 201% <--> 400%	
	6	Direct Magnification	
	7	Direct Size Magnification mm (inch)	
	8	Auto Reduce/Enlarge	

Service Tables

7	Mode No. (Class 1, 2, and 3)		Function / [Setting]
304	Copy Counter: Copy Mode		
	1	Text	Displays the copy count for each mode. [0 ~ 9999999 / **0** / 1 /step]
	2	T/P (Glossy Photo)	
	3	T/P (Printed Photo)	
	4	T/P (Copied Photo)	
	5	Photo (Glossy Photo)	
	6	Photo (Printed Photo)	
	7	Photo (Copied Photo)	
	8	Generation Copy	
	9	Pale	
	10	Map	
	12	Repeat	
	13	Sort	
	14	Staple	
	15	Series	
	16	Erase	
	17	Duplex	
	18	ADF	
	19	Double Copy	
	20	Duplex Original	
	21	Interrupt Copy	
	22	Combine 1 Side	
	23	Combine 2 Side	
	26	Batch	
	27	SADF	
	28	Mixed Sizes	
	29	Stamp	
	30	Cover Page	
	31	Chapter Page	
	32	Color Balance Adjustment	
	33	Adjust Color	
	34	Copy Quality	
	35	Erase Color	
	36	Convert Color	
	37	Color Background	
305	Copy Counter–Set number		
	1	1 to 1	Displays the multi-page job copy counters. [0 ~ 9999999 / **0** / 1 /step]
	2	1 to 2<-->5	
	3	1 to 6<-->10	
	4	1 to 11<-->20	
	5	1 to 21<-->50	
	6	1 to 51<-->100	
	7	1 to 101<-->300	
	8	1 to 301<-->over	
306	Job Counter–Copy Mode		
	1	Sort	Displays the job count for each mode. [0 ~ 9999999 / **0** / 1 /step]
	2	Staple	
	4	Reserve Copy	
	5	Check Copy	

7	Mode No. (Class 1, 2, and 3)		Function / [Setting]
320	Document Server–Scan Counter		
	1	Document Server–Scan Counter	Displays the number of pages scanned into the document server. [0 ~ 9999999 / **0** / 1 /step]
321	Document Server–Original Size		
	4	A3	Displays the original count for each paper size when using the document server. [0 ~ 9999999 / **0** / 1 /step]
	5	A4	
	6	A5	
	13	B4	
	14	B5	
	32	DLT	
	36	LG	
	38	LT	
	44	HLT	
	128	Others	
323	Document Server–Print Size		
	5	A4 (sideways)	Displays the document server printing count for each paper size. [0 ~ 9999999 / **0** / 1 /step]
	6	A5 (sideways)	
	14	B5 (sideways)	
	38	LT (sideways)	
	44	HLT (sideways)	
	128	Other	
	132	A3 (lengthwise)	
	133	A4 (lengthwise)	
	134	A5 (lengthwise)	
	141	B4 (lengthwise)	
	142	B5 (lengthwise)	
	160	DLT (lengthwise)	
	164	LG (lengthwise)	
	166	HT (lengthwise)	
	172	HLT (lengthwise)	
324	Document Server–Print Job Counter		
	1	Duplex	Displays the document server printing job count for each mode. [0 ~ 9999999 / **0** / 1 /step]
	2	Sort	
	3	Staple	
	5	Check Copy	
	6	Print 1st Page	
325	Document Server–Job Count (Page No)		
	1	1-page	Displays document server printing job counts for multi-page jobs.
	2	2-page	
	3	3<-->5 page	
	4	6<-->10 page	
	5	over 11 pages	
326	Document Server–Job Count (File No)		
	1	1 file	Displays document server printing job counts classified by mode. [0 ~ 9999999 / **0** / 1 /step]
	2	2<-->5 files	
	3	6<-->10 files	
	4	over 11 files	

7	Mode No. (Class 1, 2, and 3)		Function / [Setting]
327	Document Server–Job Count (Set No)		
	1	1 to 1	Displays document server printing job counts classified by number of outputs. [0 ~ 9999999 / **0** / 1 /step]
	2	1 to 2<-->5	
	3	1 to 6<-->10	
	4	1 to 11<-->20	
	5	1 to 21<-->50	
	6	1 to 51<-->100	
	7	1 to 101<-->300	
	8	1 to 301<-->over	
328	Document Server–Job Count (Print Mode)		
	8	Sort	Displays document server printing count classified by mode. [0 ~ 9999999 / **0** / 1 /step]
	9	Staple	
	12	Duplex	
	24	Stamp	
	25	Cover Page	
	26	Slip Sheet	
401*	Total SC Counter		
	1	SC Counter	Displays how many times SC codes have been output. [0 ~ 9999 / **0** / 0 time/step]
403	Latest 10 SC Log		
	1	Latest	Displays the latest ten SC codes.
	2	Latest 1	
	3	Latest 2	
	4	Latest 3	
	5	Latest 4	
	6	Latest 5	
	7	Latest 6	
	8	Latest 7	
	9	Latest 8	
	10	Latest 9	
502*	Paper Jam Counter		
	1	Paper Jam Counter	Displays the total number of jams detected. [0 ~ 9999 / **0** / 0 /step]
503	Original Jam Counter		
	1	Original Jam Counter	Displays the total original jam count. [0 ~ 9999 / **0** / 0 /step]
504*	Jam by Location		
	1	At Power On	
	3	Tray 1: ON	Displays the number of jams according to the location where they were detected. [0 ~ 9999 / **0** / 0 /step]
	4	Tray 2: Non Feed	
	5	Tray 3: Non Feed	
	6	Tray 4: Non Feed	
	7	Bypass: Non Feed	
	8	1st Relay ON	
	9	2nd Relay: ON	
	10	3rd Relay: ON	
	12	Registration (From Tray)	

7	Mode No. (Class 1, 2, and 3)		Function / [Setting]
504*	13	Registration (From Duplex)	
	14	Duplex Exit	
	15	Interchange Exit:: ON	
	16	Paper Exit: On	
	17	Bridge Exit: On	
	18	Bridge Relay: On	
	19	Duplex Entrance 1: On	
	20	Duplex Entrance 2: On	
	23	Duplex Exit: On	
	40	Finisher Entrance: On	
	41	Finisher Exit: On	
	58	1st Relay: Off	
	59	2nd Relay: Off	
	60	3rd Relay: Off	
	61	4th Relay: Off	
	63	Registration: Off	
	64	Fusing Exit	
	65	Interchange Exit: Off	
	66	Paper Exit: Off	
	67	Bridge Exit: Off	
	68	Bridge Relay: Off	
	69	Duplex Entrance 1: Off	
	70	Duplex Entrance 2: Off	
	73	Duplex Exit: Off	
	100	Finisher Entrance: Off	
	101	Finisher Exit: Off	
	103	Finisher Staple	
	104	Finisher Stack Feed-out	
	105	Finisher Paper Taking out	
	107	Finisher Drive Error	
	108	Finisher Tray Lift Error	
	109	Finisher Jogger Error	
	110	Finisher Tray Shift Error	
	111	Finisher Stapler Error	
	112	Finisher Stack Feed-out	
	114	Finisher Feed out Error	
	115	Finisher No Response	
505	Original Tray by Location		
	5	Registration Sensor (On Check)	
	6	Relay Sensor (On Check)	Relay Sensor = Original Trailing Edge Sensor (S9)
	7	Inverter Sensor (On Check)	Inverter Sensor = Original Reverse Sensor (S10)

7	Mode No. (Class 1, 2, and 3)		Function / [Setting]
505	55	Registration Sensor (Off Check)	
	56	Relay Sensor (Off Check)	Relay Sensor = Original Trailing Edge Sensor (S9)
	57	Inverter Sensor (Off Check)	Inverter Sensor = Original Reverse Sensor (S10)
506*	Jam by Paper Size		
	4	A3	Displays the number of jams according to paper size. [0 ~ 9999 / **0** / 1 /step]
	5	A4	
	6	A5	
	13	B4	
	14	B5	
	32	DLT	
	36	LG	
	38	LT	
	44	HLT	
	47	12" x 18"	
	128	Other	
507*	Copy Jam History		
	1	Latest	Displays the latest 10 paper jams. *The information contains the following four lines:* • *Location code (☛ SP7-504)* • *Paper size (in the ASAP code)* • *Total counter (as of the jam)* • *Date*
	2	Latest 1	
	3	Latest 2	
	4	Latest 3	
	5	Latest 4	
	6	Latest 5	
	7	Latest 6	
	8	Latest 7	
	9	Latest 8	
	10	Latest 9	
508	Original Jam History		
	1	Latest	Displays the logs of the latest 10 original jams. *The logs are composed of the following four lines:* • *Location code (☛ SP7-505)* • *Paper size (in the ASAP code)* • *Total counter (as of the jam)* • *Date*
	2	Latest 1	
	3	Latest 2	
	4	Latest 3	
	5	Latest 4	
	6	Latest 5	
	7	Latest 6	
	8	Latest 7	
	9	Latest 8	
	10	Latest 9	
801	Firmware Version		
			Displays the firmware versions and part numbers if available.
803*	PM Counter		
	1	Number of Development	Displays the number of sheets printed for each current unit. [0 ~ 9999999 / **0** / 1 sheet/step] • *For clearing the counters, see SP7-804.*
	2	PCU	
	3	Development: M	
	4	Development: C	

7	Mode No. (Class 1, 2, and 3)		Function / [Setting]
803*	5	Development: Y	Displays the number of sheets printed for each current unit. [0 ~ 9999999 / **0** / 1 sheet/step] *For clearing the counters, see SP7-804.*
	6	Development: Bk	
	7	Fusing Unit	
	8	Charger	
	9	Waste Toner: OPC	
	10	Waste Toner: Belt	
	11	Oil	
	12	Filter 1	
	13	Filter 2	
	14	Bank 1 Feed	
	15	Bank 2 Feed	
	16	Bank 3 Feed	
	17	Bank 4 Feed	
	18	Manual Feed	
	19	Paper transfer unit	
	20	ADF	
804	PM Counter Reset		
	1	Number of Development	Clears the PM counters. [0 ~ 1 / **0** / 1 /step] • *For displaying the counter, see SP7-803.*
	2	PCU	
	3	Development: M	
	4	Development: C	
	5	Development: Y	
	6	Development: Bk	
	7	Fusing Unit	
	8	Charger	
	9	Waste Toner: OPC	
	10	Waste Toner: Belt	
	11	Oil	
	12	Filter 1	
	13	Filter 2	
	14	Tray 1 Roller	
	15	Tray 2 Roller	
	16	Tray 3 Roller	
	17	Tray 4 Roller	
	18	By-pass Feed	
	19	Paper Transfer Unit	
	20	ADF	
	100	All	
807	SC JAM Counter Clear		
	1	SC Jam Counter Clear	Clears the counters related to SC codes and paper jams. [0 ~ 1 / **0** / 0 /step]
808	Counter All Clear (except total)		
	1	Counter All Clear (except total)	Clears all counters except for SP7-003 and –007. [0 ~ 1 / **0** / 0 /step]

7	Mode No. (Class 1, 2, and 3)		Function / [Setting]
810	Access code clear		
	1	Access code clear	Clears the key operator password. *SP7-810 clears the key operator password. After clearing this code, stored data can be accessed without using it.* *To register a new key operator password, use SP5-409-1.*
811	Original Counter Clear		
	1	Original Counter Clear	Clears the original counter.
816	Tray Counter Clear		
	1	Tray 1	Clears the tray counters (SP7-204). [0 ~ 1 / **0** / 0 /step]
	2	Tray 2	
	3	Tray 3	
	4	Tray 4	
	5	Bypass Tray	
	6	Tray Duplex	
822	Memory Clear		
	1	Copy Cunter: Magnification Clear	Clears the copy counter (classified by magnification)
825	Electrical Counter Reset		
	1	Electrical Counter Reset	Sets the total counter to “0”. [0 ~ 0 / **0** / 0 /step]
826	MF Error Counter		
	1	Error Total	Displays the MF error counters.
	2	Error Staple	
827	MF Error Counter Clear		
	1	MF Error Counter Clear	Clears the MF error counter.
832*	Diagnostic result		
	1	Diagnostic Result	Displays the result of the diagnostics. Refer to section 4.2 for the error codes. [0 ~ 0 / **0** / 0 /step]
833	Coverage		
	1	Last: M	Displays coverage ratios. [0.00 ~ 100.0 / **0.00** / 0.01 %step] *This SP mode displays the “coverage ratio” of the output, i.e. the ratio of the total pixel area of the image data to the total printable area on the paper.* *Do not use this counter for billing purposes. This is because 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.* *Last: This is the coverage for the previous sheet.* *Average: This is the average coverage for each sheet.*
	2	Last: C	
	3	Last: Y	
	4	Last: Bk	
	5	Average: M	
	6	Average: C	
	7	Average: Y	
	8	Average: Bk	

7	Mode No. (Class 1, 2, and 3)		Function / [Setting]
834	Toner Consume		
	5	M	Displays the coverage ratios, including toner revitalization mode. [0 ~ 9999999 / **0** / 1 /step] *This displays the average coverage ratio, including toner consumed during printing and toner consumed during toner revitalization mode (SP3-971).* *Do not use this counter for billing purposes.*
	6	C	
	7	Y	
	8	Bk	
835	ACC Counter		
	1	M	Displays the number of times ACC has been done. [0 ~ 9999999 / **0** / 1 /step]
	2	Y	
	3	C	
	4	Bk	
836	Total Memory Size		
	1	Total Memory Size	Displays the memory capacity.
837	Memory Clear		
	1	Memory Clear	Clears the SP7-304 counter (copy count classified by mode).
838	Memory Clear		
	1	Memory Clear	Clears the SP7-305 counter (job count classified by output count).
839	Memory Clear		
	1	Memory Clear	Clears the SP7-306 counter (job count classified by job count).
840	Memory Clear		
	1	Memory Clear	Clears the SP7-320 counter (document box count).
841	Memory Clear		
	1	Memory Clear	Clears the SP7-321 counter (original count classified by paper size).
842	Memory Clear		
	1	Memory Clear	Clears the SP7-323 counter (print count classified by paper size).
843	Memory Clear		
	1	Memory Clear	Clears the SP7-324 counter.
844	Memory Clear		
	1	Memory Clear	Clears the SP7-325 counter.
845	Memory Clear		
	1	Memory Clear	Clears the SP7-326 counter.
846	Memory Clear		
	1	Memory Clear	Clears the SP7-327 counter.
847	Memory Clear		
	1	Memory Clear	Clears the SP7-328 counter.
848	Memory Clear		
	1	Memory Clear	Clears all the document server counters, which include: • *SP7-301* • *SP7-304* • *SP7-305* • *SP7-306* • *SP7-320* • *SP7-321* • *SP7-323* • *SP7-324* • SP7-325 • SP7-326 • SP7-327 • SP7-328

7	Mode No. (Class 1, 2, and 3)		Function / [Setting]
850	High Duty Counter		
	1	M	Used for the toner revitalization process (SP3-971). Counts the number of developments made during the past 12 hours.
	2	C	
	3	Y	
	4	Bk	
901	Assert Information (Assert Information)		
	1	File Name	Records the location where the last problem (SC990) was detected in the program. The data stored in this SP is used for problem analysis. [0 ~ 0 / **0** / 0 /step]
	2	# of Lines	
	3	Location	
904	Waste Toner Full Clear		
	1	OPC	Clears the waste toner bottle full counters. [0 ~ 1 / **0** / 0 /step] • *0: Not clears* • *1: Clears*
	2	Belt	
	100	All	
906*	PM Counter-Previous		
	1	PCU	Displays the previous PM counters. [0 ~ 9999999 / **0** / 0 /step]
	2	Development: M	
	3	Development: C	
	4	Development: Y	
	5	Development: Bk	
	6	Fusing Unit	
	7	Charger	
	8	Waste Toner: OPC	
	9	Waste Toner: Belt	
	10	Oil	
	11	Filter 1	
	12	Filter 2	
	13	Tray 1 Roller	
	14	Tray 2 Roller	
	15	Tray 3 Roller	
	16	Tray 4 Roller	
	17	By-pass Feed	
	18	Paper Transfer Unit	
	19	ADF	
907	Replace counter		
	1	PCU	[0 ~ 255 / **0** / 1 /step]
	2	Development: M	
	3	Development: C	
	4	Development: Y	
	5	Development: Bk	
	6	Fusing Unit	
	7	Charger	
	8	Waste Toner: OPC	
	9	Waste Toner: Belt	
	10	Oil	
	11	Filter 1	
	12	Filter 2	
	13	Tray 1 Roller	

7	Mode No. (Class 1, 2, and 3)		Function / [Setting]
907	14	Tray 2 Roller	[0 ~ 255 / **0** / 1 /step]
	15	Tray 3 Roller	
	16	Tray 4 Roller	
	17	By-pass Feed	
	18	Paper Transfer Unit	
	19	Toner: M	
	20	Toner: C	
	21	Toner: Y	
	22	Toner: Bk	
	23	ADF	
908	Process Control Counter		
	1	Process Control Counter	Displays the process control counter. [0 ~ 9999999 / **0** / 1 sheet/step]
909	Process Control Reset		
	1	Process Control Reset	Resets the process control counter.
913	Oil Counter		
	1	Oil Counter	Displays the oil supply unit counter. [0 ~ 65535 / **0** / 1 sheet/step]
914	Oil Clean Counter Reset		
	1	Oil Clean Counter Reset	Resets the oil cleaner counter.
915	Process Error Log		
	1	Log 1	Displays the latest three process control error logs. *The following are the error codes:* *Development unit initial settings errors:* • *110: Incorrect image detected by cyan ID sensor* • *116: Incorrect image detected by magenta ID sensor* • *118: No black image* *Development bias settings errors:* • *113: Incorrect image detected by cyan ID sensor* • *114: Incorrect image detected by magenta ID sensor* • *115: Incorrect image detected by yellow ID sensor* • *123: Incorrect image detected by black ID sensor* *ID sensor errors:* • *103: ID sensor error* • *104: ID sensor unable to detect image* • *105: OPC belt not detected*
	2	Log 2	
	3	Log 3	
920	Machine Counter		
	1	Machine Counter	[0 ~ 0xFFFFFFF / **0** / 1 /step]
921	Machine Counter Clear		
	1	Machine Counter Clear	Clears the machine counter.
922	Toner End Counter		
	1	K Toner	Displays the toner end counter, which indicates the possible print count after a toner near end.
	2	C Toner	
	3	M Toner	
	4	Y Toner	

7	Mode No. (Class 1, 2, and 3)		Function / [Setting]
923	Toner End Counter Clear		
	1	K Toner	Clears the toner end counter (SP7-922). *The machine goes back to the normal operation mode if the toner end counter is cleared.*
	2	C Toner	
	3	M Toner	
	4	Y Toner	
	100	All	
924	Charger Clean Counter		
	1	Charger Clean Counter	Displays how many times the charge corona wire has been cleaned. [0 ~ 9999999 / **0** / 1 sheet/step] *SP7-926 resets the counter.*
925	Time Counter Display		
	1	Time Counter Display	Displays the current counter of the charge corona unit cleaning interval. *SP2-801 specifies the charge corona unit cleaning interval.*
926	Charger Cleaner Counter Reset		
	1	Charger Cleaner Counter Reset	Resets the charge wire cleaner counter (SP7-924).
927	Timer Counter Clear		
	1		Clears the counter of the charge corona unit cleaning interval. *SP7-927 clears the counter displayed by SP7-925, but does not clear the value specified with SP2-801.*
928	Previous PM Counter Clear		
	1	Previous PM Counter Clear	Clears the previous PM counter (SP7-906).
929	Replace Counter Clear		
	1	Replace Counter Clear	Clears the replace counter.
930	Counter For Designer		
	1	Counter 1 For Designer	**DFU**
	2	Counter 2 For Designer	

SP9-XXX: (Etc.)

9	Mode No. (Class 1, 2, and 3)		Function / [Setting]
904	Discharge Threshold		
	1	Discharge Threshold	[90 ~ 220 / **150** / 0.1 g/m^3/step]

5.1.3 TEST PATTERN PRINTING (SP5-955-1)

1. Enter the SP mode and select SP5-955-1.
2. Enter the number for the test pattern that you want to print and press #. (See the tables below.)
3. Press Copy Window to open the copy window and then select the settings for the test print (paper size, etc.)
4. Press Start to start the test print.
5. Press SP Mode (highlighted) to return to the SP mode display.

No.	Test Pattern	No.	Test Pattern
0	None	23	1 dot Grid Pattern (Reverse order of LD1/2 on)
1	Vertical Line (1-dot)	24	3 lines Grayscale
2	Horizontal Line (1-dot)	25	Horizontal Grayscale – 1
3	Vertical Line (2-dot)	26	Vertical Grayscale – 1
4	Horizontal Line (2 dot)	29	Horizontal Grayscale – 2
5	1 dot Grid Pattern0 – 1	30	Vertical Grayscale – 2
6	1 dot pair Grid Pattern – 1	31	Horizontal Grayscale (600 dpi)
7	Alternating Dot Pattern (1 dot)	32	Vertical Grayscale (600 dpi)
8	Alternating Dot Pattern (2 dot)	35	Horizontal Grayscale with White Line – 1
9	Full Dot Pattern	36	Vertical Grayscale with White Line – 1
10	Black band	38	Horizontal Grayscale with White Line – 2
11	Trimming Area (1 dot)	39	Vertical Grayscale with White Line – 2
12	Trimming Area (2 dot)	40	Horizontal Grayscale with White Line (600 dpi)
13	Argyle Pattern (1 dot)	41	Vertical Grayscale with White Line (600 dpi)
14	Argyle Pattern (2 dot)	43	Blank image
15	Horizontal Cross Stitch	50	Vertical Cross Stitch
16	Checker Flag	51	2 beam
19	Alternating Dot Pattern (4 dot)	52	Trimming Area with Crossed Lines
20	1 dot Horizontal Line (Reverse order of LD1/2 on)	53	1 dot Grid Pattern – 2
21	1 dot Grid Pattern (Reverse order of LD1/2 on)	54	1 dot pair Grid Pattern – 2
22	1 dot pair Grid Pattern (Reverse order of LD1/2 on)		

After finishing your tests, reset SP 5-955-1 to 0.

5.1.4 INPUT CHECK

Main Machine Input Check (SP5-803)

1. Enter the SP mode and select SP5-803.
2. Select an 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.

SP5-803 -XXX		Description	Reading	
			0	1
1	Tray 1 Set	Tray 1 set (standard tray)	Set	Not set
2	Tray 1 Paper End	Tray 1 paper end sensor (standard tray)	Paper End	Paper is present
3	Tray 1 Paper Height	Tray 1 paper near-end sensor (standard tray)	Not near end	Near end
4	Tray 1 Paper Size	Tray 1 paper size sensor (standard tray)	(See table 1.)	
5	Tray 2 Set	Tray 2 set (standard tray)	Set	Not set
6	Tray 2 Paper End	Tray 2 paper end sensor (standard tray)	Paper End	Paper is present
7	Tray 2 Paper Height	Tray 2 paper near-end sensor (standard tray)	Not near end	Near end
8	Tray 2 Paper Size	Tray 2 paper size sensor (standard tray)		
9	Registration Sensor		Detected	Not detected
10	Upper Relay	Paper feed sensor	Detected	Not detected
11	Lower Relay	Paper feed sensor	Detected	Not detected
12	Right Cover SW		Closed	Open
13	Exit Sensor		Detected	Not detected
14	Paper Overflow		Full	Not full
15	Exit Cover Switch		Closed	Open
16	Interchange Unit Set		Set	Not set
17	Interchange Exit		Detected	Not detected
18	By-pass Tray Set		Not set	Set
19	By-pass Paper End		Paper End	Paper is present
20	By-pass Paper Size			
21	Fusing Unit Set		Set	Not set
22	Fusing Exit		Paper End	Paper is present
23	Fusing Oil End			
24	Fusing High Temperature			

SP5-803 -XXX		Description	Reading	
			0	1
25	Discharge Bias Leak			
30	Toner End: M	Toner end sensor: M	Not end	End
31	Toner End: C	Toner end sensor: C	Not end	End
32	Toner End: Y	Toner end sensor: Y	Not end	End
33	Toner End: K	Toner end sensor: K	Not end	End
34	Toner Unit: M	Toner cartridge memory chip: M	Not set	Set
35	Toner Unit: C	Toner cartridge memory chip: C	Not set	Set
36	Toner Unit: Y	Toner cartridge memory chip: Y	Not set	Set
37	Toner Unit: K	Toner cartridge memory chip: K	Not set	Set
38	O/B Waste Toner Sensor	OPC belt waste toner sensor	Full	Not full
39	O/B Waste Toner Switch	OPC belt waste toner bottle switch	Set	Not set
40	Belt Mark	Belt mark sensor	Not detected	Detected
41	New PCU Sensor	Not used	-	-
42	T/B Waste Toner Sensor	Transfer belt waste toner sensor	Full	Not full
43	T/B Waste Toner Switch	Transfer belt waste toner bottle switch	Set	Not set
44	LD 5V Cover	Interlock switch	Closed	Open
45	Left Cover		Closed	Open
46	Right Upper Cover		Closed	Open
47	Front Cover		Closed	Open
48	Development Motor Lock	Development motor lock	Locked	Not locked
49	Main Motor Lock	Main motor lock	Locked	Not locked
50	Paper Feed Motor Lock	Paper feed motor lock	Locked	Not locked
51	Polygon Motor Lock	Polygon motor lock	Locked	Not locked
52	1 Bin Set		Set	Not set
53	1 Bin Paper Sensor		Detected	Not detected
60	Duplex Connection	Duplex unit	Not connected	Connected
61	Bank 1 Connection	1st optional paper tray	Not connected	Connected
62	Bank 2 Connection	2nd optional paper tray	Not connected	Connected
63	Finisher Connection	Finisher Connection	Not connected	Connected
64	Bridge Exit		Detected	Not detected
65	Bridge Relay		Detected	Not detected
66	Bridge Set		Set	Not set
67	Bridge Right Cover		Closed	Open
68	Bridge Left Cover		Closed	Open
69	Bank Upper Relay	Relay Sensor 3 (optional paper tray unit)	No paper	Paper present
70	Bank Lower Relay	Relay Sensor 4 (optional paper tray unit)	No paper	Paper present

SP5-803 -XXX		Description	Reading	
			0	1
71	Bank Cover 1	Right cover (vertical guide switch)	Closed	Open
72	Bank Cover 2	2nd optional tray: Right cover (vertical guide switch)	Closed	Open
73	Bank Tray 1 Set	1st optional tray: Set	Not set	Set
74	Bank Tray 2 Set	2nd optional tray: Set	Not set	Set
75	Bank Tray 1 Paper End	1st optional tray: Paper end	Not end	End
76	Bank Tray 2 Paper End	2nd optional tray: Paper end	Not end	End
77	Bank Tray 1 Paper Size	1st optional tray: Paper size	(See table 2.)	
78	Bank Tray 2 Paper Size	2nd optional tray: Paper size		
79	Bank Tray 1 Paper Height	1st optional tray: Paper height	(See table 3.)	
80	Bank Tray 2 Paper Height	2nd optional tray: Paper height		
81	Duplex Entrance	Duplex: Entrance sensor	Not detected	Detected
82	Duplex Exit	Duplex: Exit sensor	Detected	Not detected
83	Duplex Open	Duplex unit open switch	Closed	Open
84	Duplex Cover	Duplex cover sensor	Open	Closed
86	Scanner Home Position	Scanner HP sensor	Detected	Not detected
87	Recycle Counter	Mechanical Counter Set	Set	Not set
88	Counter Set		Set	Not set
89	Key Counter Set		Set	Not set
90	Shift Tray Home Position Sensor		Detected	Not detected
91	Platen Cover Sensor		Detected	Not detected

Table 1: Tray 1 and 2 Paper Size

Switch	North America	Europe/Asia	Value
1000	8 1/2" x 11" SEF	8 1/2" x 11" SEF	00001110
1001	B5 SEF	B5 SEF	00000110
1010	5 1/2" x 8 1/2" LEF	A5 LEF	00001010
1011	11" x 17" SEF	A3 SEF	00000010
1100	A4 SEF	A4 SEF	00001100
1101	B5 LEF	B5 LEF	00000100
1110	8 1/2" x 11" LEF	A4 LEF	00001000
1111	8 1/2" x 14" SEF	B4 SEF	00000000

0: pushed
1: not pushed

Table 2: By-pass Tray Paper Size

Paper Width	Value	Paper Width	Value
A3/11"/12"	01110000	B5/8"	10010000
B4	00110000	A5/5.5"	11010000
A4/8.5"	10110000	B6	11000000

Table 3: Optional Paper Tray Unit Paper Size

Size	North America	Europe/Asia	Code
A3 SEF	Detected	Detected	10000100
B4 SEF	None	Detected	10001101
A4 SEF	None	Detected	10000101
A4 LEF	Detected	Detected	00000101
B5 LEF	Detected	Detected	00001110
A5 LEF	None	Detected	00000110
DLT SEF	Detected	Detected	10100000
LG SEF	Detected	None	10001101
LT SEF	Detected	None	10000101
LT LEF	Detected	Detected	00100110
HLT LEF	Detected	None	00000110

Table 4: Optional Paper Tray Unit Paper Near End

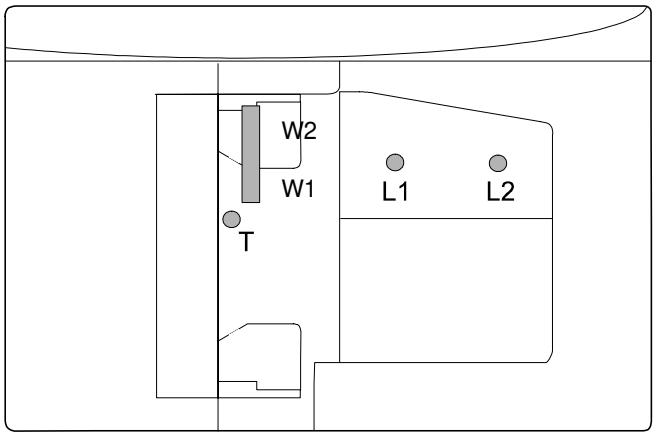
Remaining paper	Paper height sensor 2	Paper height sensor 1	Code
Full	ON	ON	11111111
Nearly full	OFF	ON	11111110
	On	OFF	11111101
Near end	OFF	OFF	11111100

ARDF Input Check (SP6-007)

1. Enter the SP mode and select SP6-007.
2. Enter the number (1 – 11) 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, as shown below. However, only bit 0 at the right side of the screen is valid.

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

3. Check the status of bit 0 for the required item listed in the table below.



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No.	Description	Reading	
		0	1
1	Original set sensor	Paper not detected	Paper detected
2	Original width sensor 1 (W1)	Paper not detected	Paper detected
3	Original width sensor 2 (W2)	Paper not detected	Paper detected
4	Original length sensor 1 (L1)	Paper not detected	Paper detected
5	Original length sensor 2 (L2)	Paper not detected	Paper detected
6	Original trailing edge sensor	Paper not detected	Paper detected
7	ADF cover sensor	Cover closed	Cover opened
8	DF position sensor	ADF closed	ADF opened
9	Registration sensor	Paper not detected	Paper detected
10	Exit sensor	Paper not detected	Paper detected
11	Inverter sensor	Paper not detected	Paper detected

Finisher Input Check (SP6-117)

1. Enter the SP mode and select SP6-117.
2. Enter the number (1 – 113) 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, as shown below. However, only bit) at the right side of the screen is valid.

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.

No.	Description	Reading	
		0	1
1	Entrance Sensor	Activated	Deactivated
2	Tray Exit Sensor	Activated	Deactivated
4	Staple Entrance Sensor	Activated	Deactivated
5	Stapler Home Position Sensor	Activated	Deactivated
6	Jogger Fence Home Position Sensor	Activated	Deactivated
8	Feed-out Belt Home Position Sensor	Activated	Deactivated
9	Stapler Tray Paper	Activated	Deactivated
10	Stapler Rotation Home Position	Activated	Deactivated
11	Staple Sensor	Activated	Deactivated
14	Staple Sheet Sensor	Activated	Deactivated
17	Exit Plate Home Position Sensor	Activated	Deactivated
18	Tray Shift Home Position Sensor	Activated	Deactivated
21	Stack Height Sensor	Activated	Deactivated
23	Tray Lower Limit Sensor	Activated	Deactivated
101	500 Fin Entrance Sensor	Activated	Deactivated
102	500 Fin Exit Sensor	Activated	Deactivated
103	500 Fin Jogger Home Position Sensor	Activated	Deactivated
104	500 Fin Top Cover Sensor	Closed	Opened
105	500 Fin Height Sensor	Activated	Deactivated
106	500 Fin Lever Sensor	Activated	Deactivated
107	500 Fin Upper Limit Sensor	Activated	Deactivated
108	500 Fin Near Limit Sensor	Activated	Deactivated
109	500 Fin Staple Cover Sensor	Closed	Opened
110	500 Fin Stapler Home Position Sensor	Activated	Deactivated
111	500 Fin Staple End Sensor	Activated	Deactivated
112	500 Fin Staple Sensor	Activated	Deactivated
113	500 Fin Stapler Lock Sensor	Locked	Not Locked

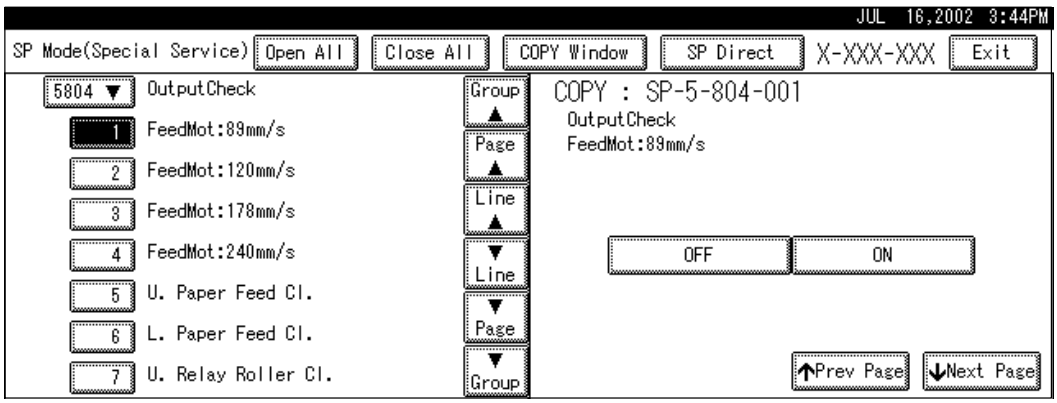
5.1.5 OUTPUT CHECK

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 SP5-804.
2. Select the SP number that corresponds to the component you wish to check. (Refer to the table below.)
3. Touch *ON* to test the selected item. Press *OFF* to end the test.

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



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Output Check Table

SP5-804 -XXX		Description
1	Feed Mot: 89 mm/s	Paper feed motor: 89 mm/s
2	Feed Mot: 120 mm/s	Paper feed motor: 120 mm/s
3	Feed Mot: 178 mm/s	Paper feed motor: 178 mm/s
4	Feed Mot: 240 mm/s	Paper feed motor: 240 mm/s
5	Upper Paper Feed Clutch	Tray 1 paper feed clutch
6	Lower Paper Feed Clutch	Tray 2 paper feed clutch
7	Upper Relay Roller Clutch	Tray 1 vertical transport clutch
8	Lower Relay Roller Clutch	Tray 2 vertical transport clutch
9	Transfer Motor: Half Speed	Main motor: 178 mm/s

SP5-804 -XXX		Description
10	Transfer Motor: Low Speed	Main motor: 89 mm/s
11	Regist Clutch	Registration clutch
12	Interchange Upper Gate	Interchange Junction Gate Solenoid 1
13	Interchange Lower Gate	Interchange Junction Gate Solenoid 2
14	By-pass Feed Clutch	By-pass paper feed clutch
15	By-pass Pick-Up Solenoid	By-pass pick-up solenoid
16	Development Clutch: M	Development clutch: M
17	Development Clutch: C	Development clutch: C
18	Development Clutch: Y	Development clutch: Y
19	Development Clutch: K	Development clutch: K
20	Development Motor (Forward)	Development motor
21	Development Motor Half Speed (Forward)	Development motor: Half Speed
22	Development Motor (Reverse)	Development motor: Reverse
23	Development Motor Half Speed (Reverse)	Development motor: Reverse Half Speed
24	Lubricant Clutch	OPC belt cleaning clutch
25	Main Motor (Forward)	Main motor: Regular Speed
26	Main Motor Half Speed (Forward)	Main motor: Half Speed
27	Main Motor (Reverse)	Main motor: Reverse
28	Main Motor Half Speed (Reverse)	Main motor: Reverse Half Speed
29	Polygon Motor	Polygon motor
30	LD On	LD
31	Polygon Motor + LD	Polygon Motor + LD
32	Transfer 2nd Solenoid	Paper Transfer Solenoid
33	T/B Cleaning Clutch	Image transfer belt cleaning clutch
34	T/B Cleaning Solenoid	Image transfer belt cleaning contact solenoid
40	Engine Ready Signal	Engine Ready Signal
41	ID sensor LED	
42	QL	
43	Toner End Led	Toner End LED
44	Charger Bias	Charge corona unit output
45	Development Bias 1	Development Bias: 1
46	Development Bias 2	Development Bias: 2
47	Belt Transfer	Image transfer power supply
48	Paper Transfer: +	Paper transfer bias: +
49	Paper Transfer: –	Paper transfer bias: –
50	T/B Cleaning: +	Image transfer belt cleaning bias: +
51	Discharge: H	Discharge plate power supply: H
52	Discharge: L	Discharge plate power supply: L

SP5-804 -XXX		Description
53	Fuser Main Relay	Fusing Main Relay
54	Fusing Bias	Fusing Bias
55	Scanner Lamp	
100	Bank Upper Feed	1st paper feed clutch (optional paper tray unit)
101	Bank Lower Feed	2nd paper feed clutch (optional paper tray unit)
102	Bank Feed Motor: L	1st paper feed motor (optional paper tray unit)
103	Bank Feed Motor: H	1st Paper feed motor – half speed (optional paper tray unit)
110	Shift Tray Motor: CW	Shift Tray Motor – continuous clockwise
111	Shift Tray Motor: CCW	Shift Tray Motor – continuous counter-clockwise
112	Shift Tray Motor: Run	Shift Tray Motor – shifts once
120	Duplex Reverse Motor (Forward)	Duplex: Inverter motor
121	Duplex Reverse Motor (Reverse)	Duplex: Inverter motor – reverse
122	Duplex Feed Motor (Forward)	Duplex: Transport motor
123	Duplex Feed Motor (Reverse)	Duplex: Transport motor – reverse
124	Duplex Solenoid	Duplex: Inverter gate solenoid
125	Duplex Free Run	Duplex: Free run
130	Bridge Motor: H	
131	Bridge Motor: L	
132	Bridge Gate Sol	
140	Fusing Fan: H	
141	Fusing Fan: L	
142	Dev Fan: H	Development Fan Motor: H
143	Dev. Fan: L	Development Fan Motor: L
144	Cooling Fan: H	Controller Fan Motor: H
145	Cooling Fan: L	Controller Fan Motor: L
146	Ozone Fan: Hi	
147	Ozone Fan: Low	
160	Bridge Cooling Fan: H	
161	Bridge Cooling Fan: L	
162	PSU Fan	
170	Forced Lubricant	The following parts are switched on. O/B cleaning contact clutch T/B cleaning solenoid T/B cleaning contact clutch

ARDF Output Check (SP6-008)

1. Open SP6-008.
2. Select the SP number that corresponds to the component you wish to check. (Refer to the table below.)
3. Touch *ON* to test the selected item. To end the test, touch *OFF*. You cannot exit and close this display until you touch *OFF* to switch off the output check currently executing.

No.	Description
1	Feed Motor (Forward)
2	Feed Motor (Reverse)
3	Transport Motor (Forward)
4	Feed Clutch
5	Pick-up Solenoid
6	Junction Gate Solenoid
7	Stamp Solenoid

Finisher Output Check (SP6-118)

1. Open SP6-118.
2. Select the SP number that corresponds to the component you wish to check. (Refer to the table below.)
3. Touch *ON* to test the selected item. To end the test, touch *OFF*. You cannot exit and close this display until you touch *OFF* to switch off the output check currently executing.

No.	Description	No.	Description
	1000-sheet finisher		**500-sheet finisher**
1	Fin All Off	101	500 Fin All Off
2	Upper Transfer Motor	102	500 Fin Main Motor
3	Lower Transfer Motor	103	500 Fin Jogger Motor
4	Exit Motor	104	500 Fin Paddle Sol
5	Tray Gate Sol	105	500 Fin Gear Sol
6	Tray Lift Motor	106	500 Fin Lever Sol
7	Jogger Motor	107	500 Fin Tray Motor
12	Stapler Motor	108	500 Fin Stapler Motor
13	Staple Hummer	109	500 Fin Free Run 1
15	Stapler Gate Sol	110	500 Fin Free Run 2
16	Pos. Roller Sol		
18	Feed-out Motor		
19	Shift Motor		
22	Guide Plate Motor		
23	Fin Free Run 1		
24	Fin Free Run 2		

5.1.6 SMC DATA 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	Logged data list
5	Self-diagnostics results list
6	Non-Default Data list
7	NIB summary
8	Net file log list (Jobs to be printed from the document server using a PC and the Desk Top Binder software)
21	Copy UP mode list
22	Scanner SP mode list
23	Scanner UP mode list

2. Touch *EXECUTE* on the touch panel
3. Operate according to the instructions on the display.
4. Check that the completion message appears, and touch *Exit.*

5.1.7 ORIGINAL JAM HISTORY DISPLAY

Total Count

SP7-503 displays the number of original jams having occurred in the optional ARDF.

Details on the Most Recent Jams

SP7-508 displays the detailed information on the latest 10 original jams having occurred in the optional ARDF.

SP7-508-		
1	Latest	Information on the latest original jam
2	Latest 1	Information on the 2nd latest original jam
3	Latest 2	Information on the 3rd latest original jam
:	:	:
:	:	:
8	Latest 7	Information on the 8th latest original jam
9	Latest 8	Information on the 9th latest original jam
10	Latest 9	Information on the 10th latest original jam

5.1.8 COPY JAM HISTORY DISPLAY

Total Count

SP7-502 displays the number of copy paper jams having occurred in all paper paths.

Details on the Most Recent Jams

SP7-507 displays the detailed information on the latest 10 copy paper jams having occurred in all paper paths.

SP7-507-		
1	Latest	Information on the latest paper jam
2	Latest 1	Information on the 2nd latest paper jam
3	Latest 2	Information on the 3rd latest paper jam
: :	: :	: :
8	Latest 7	Information on the 8th latest paper jam
9	Latest 8	Information on the 9th latest paper jam
10	Latest 9	Information on the 10th latest paper jam

5.1.9 MEMORY ALL 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	Print total counter value
SP5-811	Machine serial number
SP5-907	Plug & play brand name and production name setting

Normally, this SP mode should not be used. This procedure is necessary only after replacing the NVRAM, or when the copier malfunctions because the NVRAM is damaged.

Using a Flash Memory Card

1. Upload the NVRAM data to a flash memory card (☛ NVRAM Data Upload).
2. Print out all SMC data lists (SP5-990).
   NOTE: Be sure to print out all the lists. If the NVRAM data upload is not completed, it is necessary to manually change the SP mode settings.
3. Open SP5-801.
4. Press the number for the item that you want to initialize. The number you select determines which application software is initialized. Touch 1, for example, if you want to initialize all modules; or select the appropriate number from the table below.

No.	What It Initializes	Comments
1	All modules	Initializes items 2 ~ 15 below.
2	Engine	Initializes all registration settings for the engine and process settings.
3	SCS (System Control Service)/SRAM	Initializes default system settings, CSS settings, operation display coordinates, and ROM update information.
4	IMH (Image Memory handler)	Initializes the registration setting for the image memory handler. (Deletes all image files in the HDD).
5	MCS (Memory Control Service)	Initializes the automatic delete time setting for stored documents.
6	Copier application	Initializes all copier application settings.
7	Fax application	Initializes the fax reset time, job login ID, all TX/RX settings, local storage file numbers, and off-hook timer.
8	Printer application	Initializes the printer defaults, programs registered, the printer SP bit switches, and the printer CSS counter.
9	Scanner application	Initializes the scanner defaults for the scanner and all the scanner SP modes.
10	Network application	Deletes the network file application management files and thumbnails, and initializes the job login ID.

No.	What It Initializes	Comments
11	NCS (Network Control Service)	Initializes the system defaults and interface settings (IP addresses also), SmartNetMonitor for Admin, WebStatusMonitor settings, and the TELNET settings.
12	R-FAX	Initializes the job login ID, SmartNetMonitor for Admin, job history, and local storage file numbers.
14	DCS	Initializes the DCS (Delivery & Receive Control Server) settings
15	UCS	Initializes the UCS (User Directory Control Server) settings.

5. Touch *EXECUTE*, and turn the main switch off and on.
6. Download the NVRAM data from a flash memory card (☛ 5.2.2).

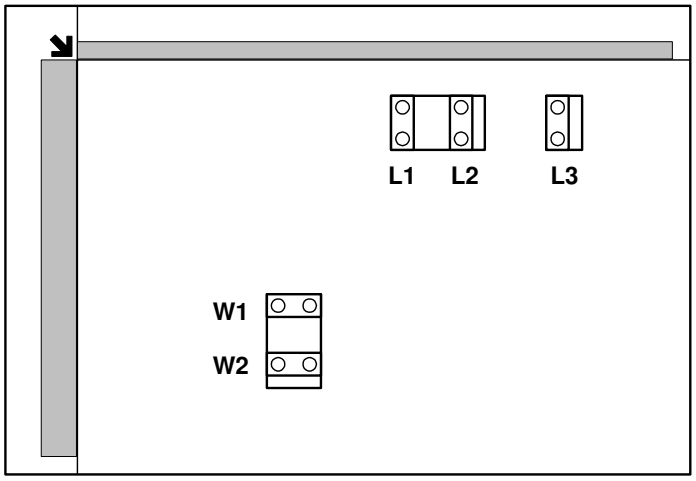
Without Using a Flash Memory Card

If there is no flash memory card, follow the steps below.

1. Execute SP5-990 to print out all SMC data lists.
2. Open SP5-801.
3. Select the number for the item that you want to initialize.
4. Press *EXECUTE* and turn the main switch off and on.
5. Make sure that you do the following:
   - Do the printer and scanner registration and magnification adjustments (☛ "Copy Adjustments" in chapter 3, "Replacement and Adjustment").
   - Do the touch screen calibration (☛ "Touch Screen Calibration" in chapter 3, "Replacement and Adjustment").
   - Referring to the SMC data lists, re-enter all values that have been changed from their factory settings.
   - Do the white level adjustment (☛ Section 3.14 Standard White Density Adjustment)
6. Check the copy quality and the paper paths, and do any necessary adjustments.

5.1.10 APS OUTPUT DISPLAY (SP4-301)

SP4-301 displays a code that indicates the current status of the APS sensors. The table lists the codes and the activated sensors.



B051S540.WMF

Code	Sensors				
	W1	W2	L1	L2	L3
38	❍	❍	—	—	—
160	❍	❍	❍	❍	❍
164	—	—	❍	❍	❍
166	—	—	❍	❍	—
128	Other combinations				

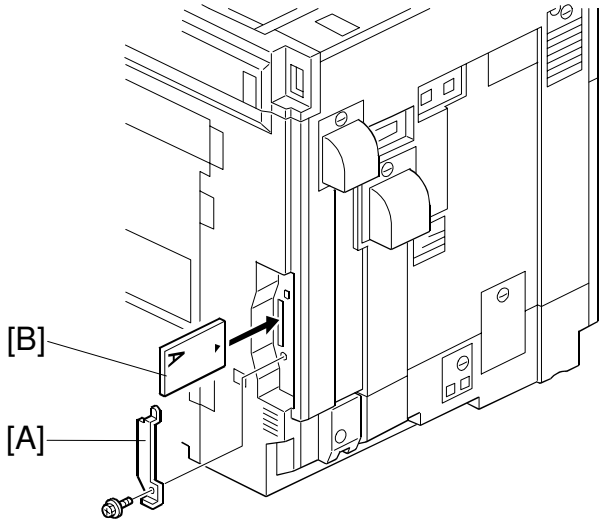
❍: Activated
—: Deactivated

5.2 PROGRAM DOWNLOAD

5.2.1 FIRMWARE

The procedure is the same for all firmware modules.

1. Turn off the main power switch.
2. Remove the cover [A].
3. Insert the IC card [B] containing the software you wish to download into the card slot of the controller.
4. Open the front cover.
5. Turn on the main power.
6. Follow the instructions displayed on the operation panel
7. Monitor the downloading status on the operation panel.
   - While downloading is in progress, the panel displays “Writing”. When downloading has been completed, the panel displays “Completed”.
   - The Start key lights red while downloading is in progress, and then lights green again after downloading is completed.



B051S136.WMF

⚠CAUTION

Never switch off the power while downloading. Switching off the power while the new software is being downloading 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. If more software needs to be downloaded, repeat steps 1 to 7.
10. Turn the main power on and confirm that the new software loads and that the machine starts normally.
11. After installing new scanner firmware, perform copier SP5-801-9 (Memory All Clear – Scanner Application).

NOTE: If the download failed, an error message appears on the panel. In this case, download the firmware again using the IC card.
In this condition, if the firmware cannot be downloaded again, do the following:
Controller firmware: Turn on dip switch 1 on the controller board, and switch on. The machine boots from the IC card. Download the new firmware.
Others: Replace the appropriate PCB.

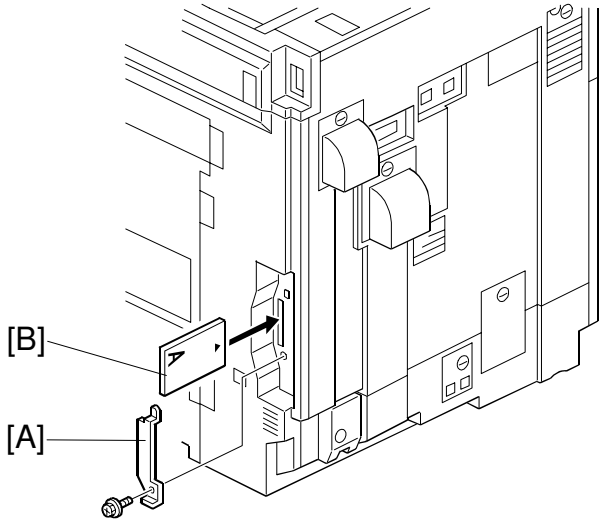
5.2.2 NVRAM DATA UPLOAD/DOWNLOAD

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

Uploading NVRAM Data (SP5-824)

The data in the NVRAM in the machine can be uploaded to a flash memory card.

1. Turn off the main switch.
2. Remove the cover [A].
3. Plug the flash memory card [B] into the card slot.
4. Turn on the main switch.
5. Open SP5-824.
6. Touch *EXECUTE* to start uploading the NVRAM data.
7. Turn off the main switch, and then remove the IC card.



B051S136.WMF

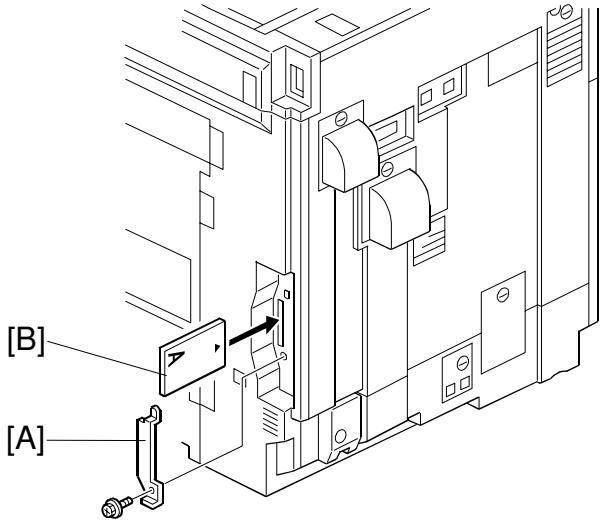
Downloading NVRAM Data (SP5-825)

SP5-825 downloads data from a flash card to the NVRAM inside the machine.

The following data are not downloaded from the flash card:

- Meter charge total counter (SP7-003-1)
- Duplex, A3/DLT/Over 420 mm, Staple and Scanner application scanning counters (SP7-007).

1. Turn off the main switch.
2. Remove the cover [A].
3. Plug the flash memory card [B] into the card slot.
4. Turn on the main switch.
8. Open SP5-825.
5. Touch *EXECUTE* to start download the NVRAM data.
6. Turn off the main switch, and then remove the IC card.



B051S136.WMF

Note that the following errors may 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 *EXECUTE.*
- If the correct card for the NVRAM data is not inserted in the card slot, after you press *EXECUTE* a message will tell you that downloading cannot proceed because the card is abnormal and the execution halts.

5.3 SOFTWARE RESET

The software can be rebooted when the machine hangs up. Use either of the following procedures.

Procedure 1

1. Turn the main power switch off and on.
2. Check that “Now loading. Please wait” is displayed and that the copy window opens.

Procedure 2

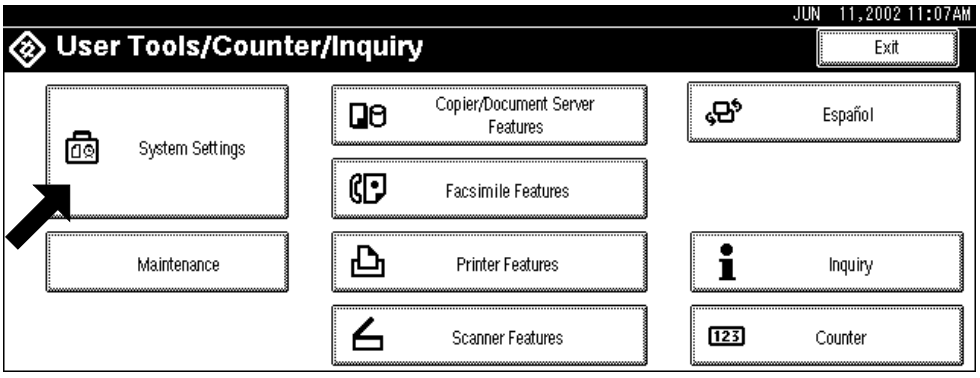
1. Press and hold down the ⊙/* and # keys together until the machine beeps (for about 10 seconds).
2. Release both buttons.
3. Check that “Now loading. Please wait” is displayed and that the copy window opens.

5.4 SYSTEM SETTINGS AND COPY SETTING RESET

5.4.1 SYSTEM SETTING RESET

To reset the system settings in the UP mode to their defaults. Use the following procedure.

1. Press the User Tools/Counter key (◈/123).
2. Hold down the # key and touch *System Settings*.
   NOTE: Hold down the # key before touching *System Settings*.



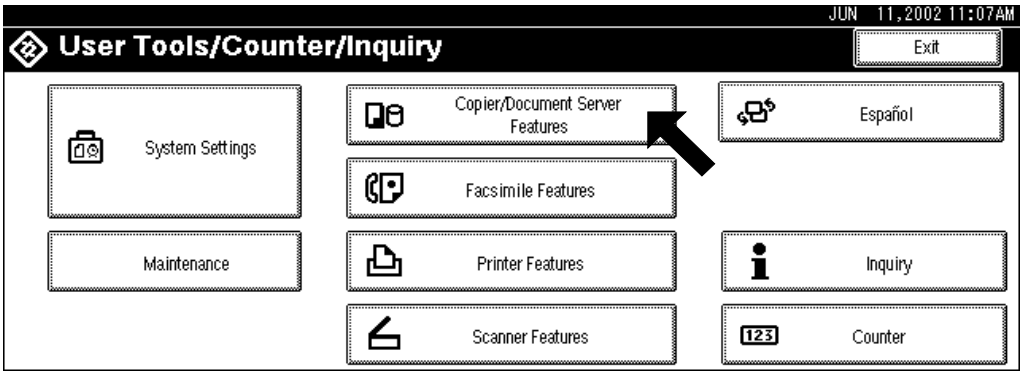
B051S503.WMF

3. When the display asks if you want to reset the system settings, touch *Yes*.
4. Check that the completion message appears, and touch *Exit*.

5.4.2 COPIER SETTING RESET

To reset the copy settings in the UP mode to their defaults, use the following procedure.

1. Press the User Tools/Counter key (◈/123).
2. Hold down the # key and then touch *Copier/Document Server Features*.
   NOTE: Hold down the # key before touching *Copier/Document Server Features*.



B051S504.WMF

3. When the display asks if you want to reset the Copier Document Server settings, touch *Yes*.
4. Check that the completion message appears, and touch *Exit*.

5.5 USER TOOLS

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

5.5.1 HOW TO ENTER USER TOOLS

UP Mode Initial Screen: User Tools/Counter Display

To enter the UP mode, press the User Tools/Counter key (◈/123).

System Settings

In the User Tools/Counter display, touch *System Settings*.

Touch a tab to display the settings. If the Next button is lit in the lower right corner, touch it to display more options. Specify the settings, touch *Exit* to return to the User Tools/Counter display, and then touch *Exit* to return to the copy window.

Copier/Document Server Features

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

Click a tab to display the settings. If the Next button is lit in the lower right corner, press it 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, touch Printer Settings, Facsimile, or Scanner Settings to open the appropriate screen and then touch the tab to display more settings. The screen below shows the Printer Features screen.

Inquiry

In the User/Tools Counter display, touch *Inquiry*.

The following SP mode settings will be displayed.

- Service Telephone Number (SP5-812-1)
- Service Facsimile Number (SP5-812-2)
- Telephone Number for ordering consumables (SP5-812-3)
- Sales Telephone Number (SP5-812-4)
- Toner Type (SP5-841-1~4)

Counter

In the User/Tools Counter display, touch *Counter*.

The following SP mode counters will be displayed.

- Copy Counter (SP5-914)

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

5.6 DIP SWITCHES

Controller Board: SW2

DIP SW No.	OFF	ON
1	Boot-up from machine	Boot-up from IC card
2	Not used (keep at OFF)	
3		
4		

If the controller firmware download attempt failed, you must boot the machine from the IC card. To do this, set DIP SW 1 on the controller board to ON.

BICU Board: SW2

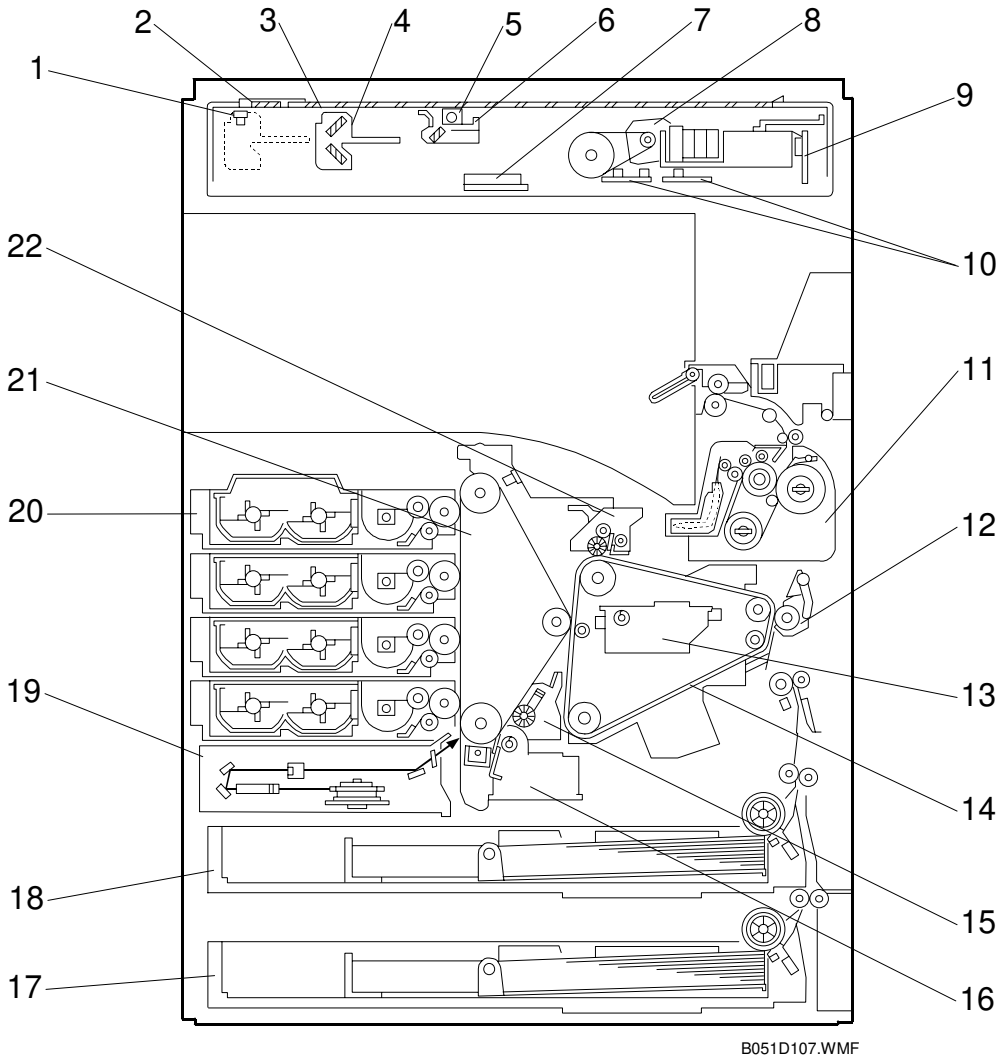
DIP SW No.	Function	OFF			ON		
1	Machine Type	U-C1b			U-C1a		
2	Destination	Off:	Off:	Off:	On:	On:	Off:
3		Off: JAN	On: NA	Off: EU	On: AA	Off: TWN	On: CHN
4		Off:	Off:	On:	Off:	Off:	On:
5	Not used	Keep at OFF					
6	Not used						

JAN: Japan, NA: North America, EU: Europe, AA: Asia, TWN: Taiwan, CHN: China

6. DETAILED SECTION DESCRIPTIONS

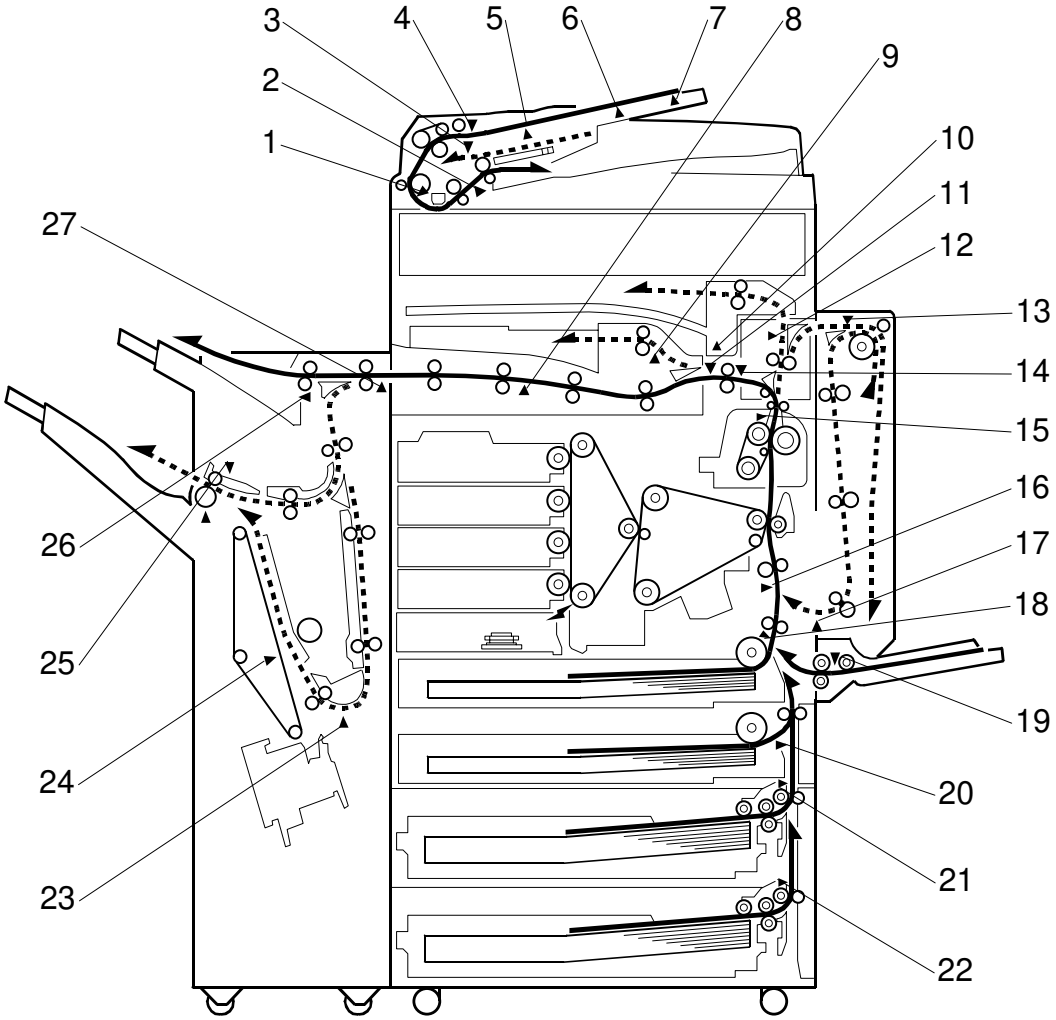
6.1 OVERVIEW

6.1.1 MECHANICAL COMPONENTS



1. Scanner HP sensor
2. ADF exposure glass
3. Exposure glass
4. 2nd carriage
5. Scanner lamp
6. 1st carriage
7. Original width sensor
8. Scanner motor
9. Sensor board unit
10. Original length sensors
11. Fusing unit
12. Paper transfer roller unit
13. Image transfer belt waste toner bottle
14. Image transfer belt unit
15. OPC belt cleaning unit
16. OPC belt waste toner bottle
17. Paper tray 2
18. Paper tray 1
19. Laser optics unit
20. Development unit
21. OPC belt unit
22. Image transfer belt cleaning unit

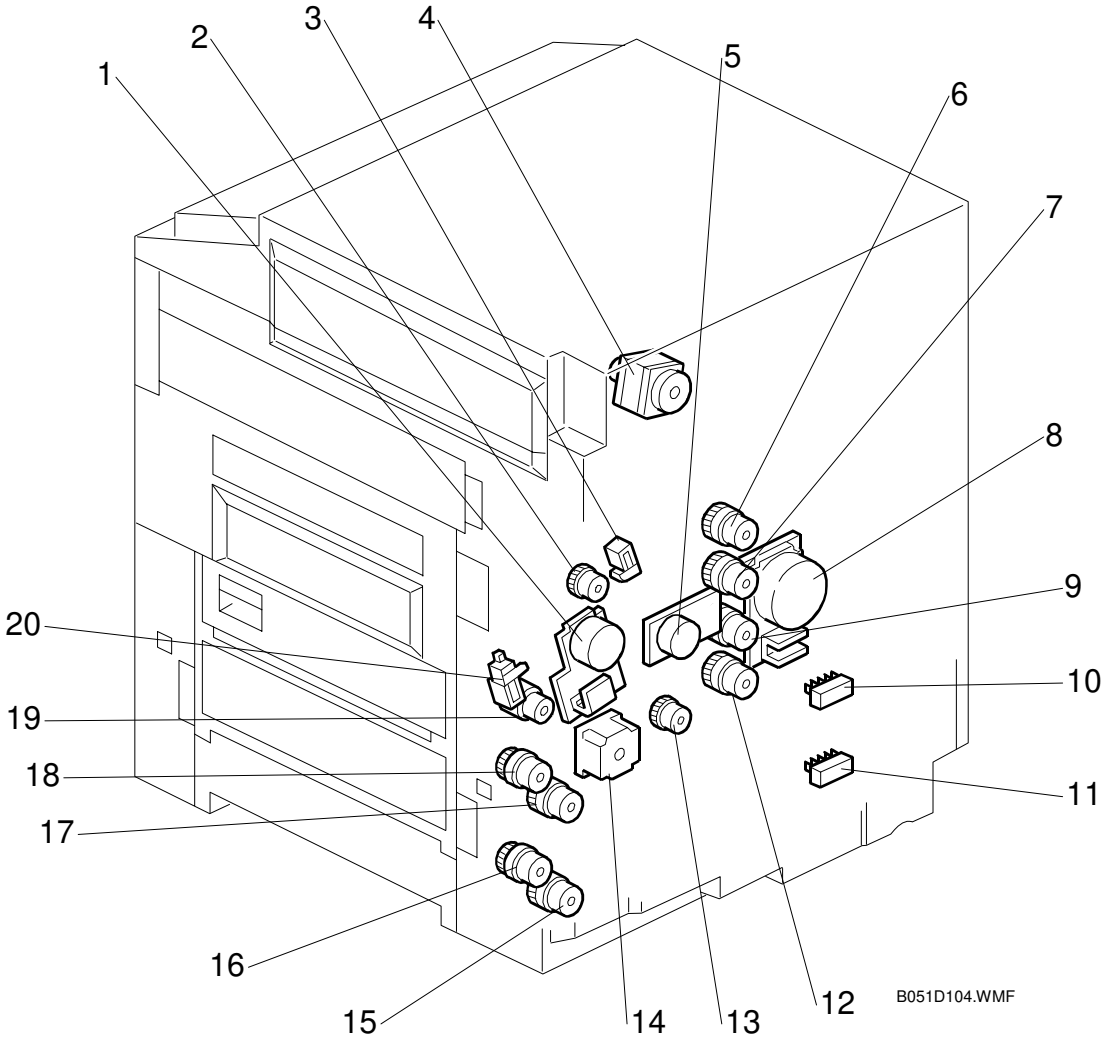
6.1.2 PAPER PATH



1. Registration sensor (ARDF)
2. Original exit sensor (ARDF)
3. Original set sensor (ARDF)
4. Original trailing edge sensor (ARDF)
5. Original width sensor board (ARDF)
6. Original length sensor 1 (ARDF)
7. Original length sensor 2 (ARDF)
8. Relay sensor (Bridge unit)
9. Tray exit sensor (Bridge unit)
10. Paper sensor (1-bin tray)
11. Paper overflow sensor
12. Exit sensor (Interchange unit)
13. Entrance sensor (Duplex unit)
14. Paper exit sensor
15. Fusing exit sensor
16. Registration sensor
17. Exit sensor (Duplex unit)
18. Paper feed sensor
19. Paper end sensor (By-pass tray)
20. Paper feed sensor
21. Relay sensor (Paper tray 3)
22. Relay sensor (Paper tray 4)
23. Stapler tray entrance sensor (Finisher)
24. Stack feed-out belt HP sensor (Finisher)
25. Lower tray exit sensor (Finisher)
26. Paper limit sensor (Finisher)
27. Entrance sensor (Finisher)

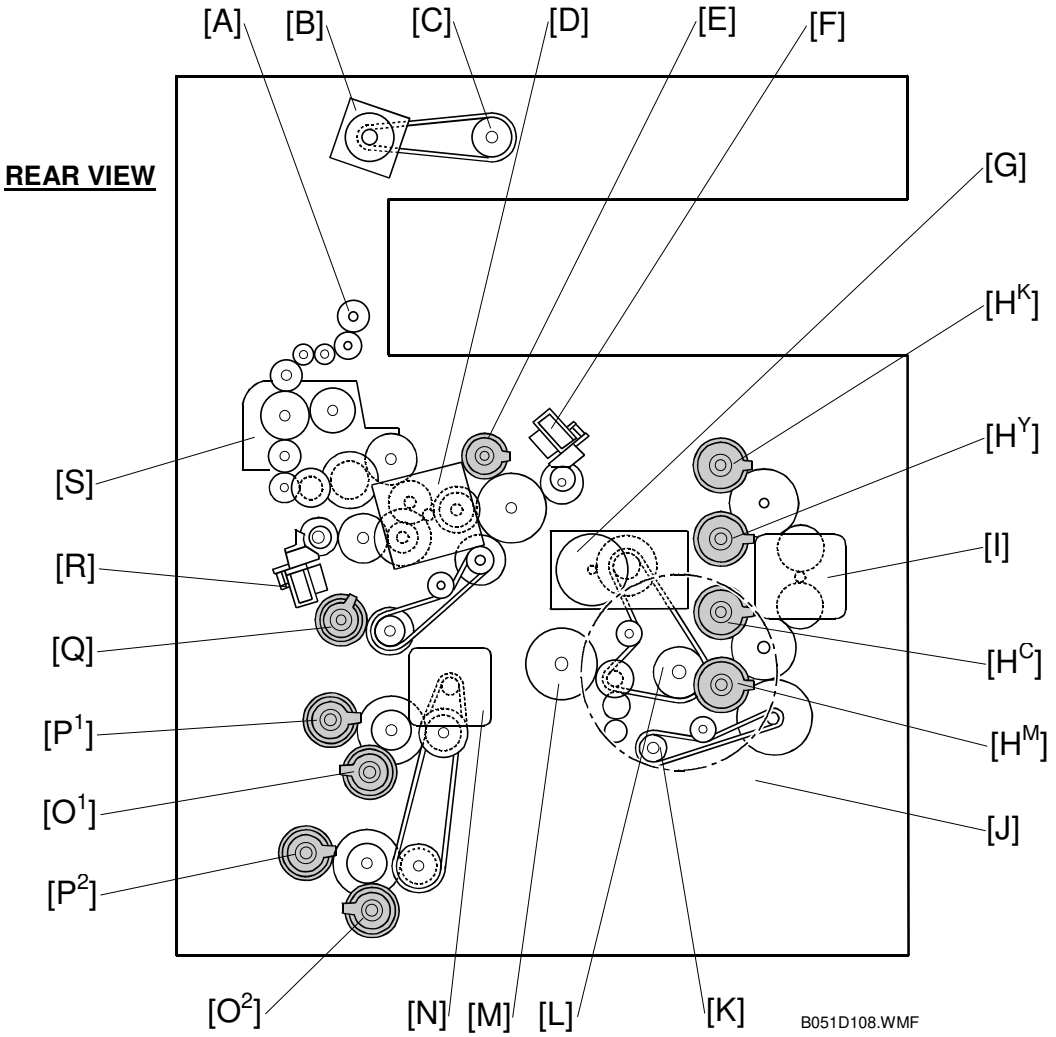
6.1.3 DRIVE COMPONENTS

Layout



1. Fusing unit motor
2. Image transfer belt cleaning clutch
3. Image transfer belt cleaning contact solenoid
4. Scanner motor
5. Main motor
6. Development clutch - K
7. Development clutch - Y
8. Development motor
9. Development clutch - C
10. Paper size switch 1
11. Paper size switch 2
12. Development clutch - M
13. OPC belt cleaning clutch
14. Paper feed motor
15. Paper feed clutch 2
16. Vertical transport clutch 2
17. Paper feed clutch 1
18. Vertical transport clutch 1
19. Registration clutch
20. Paper transfer solenoid

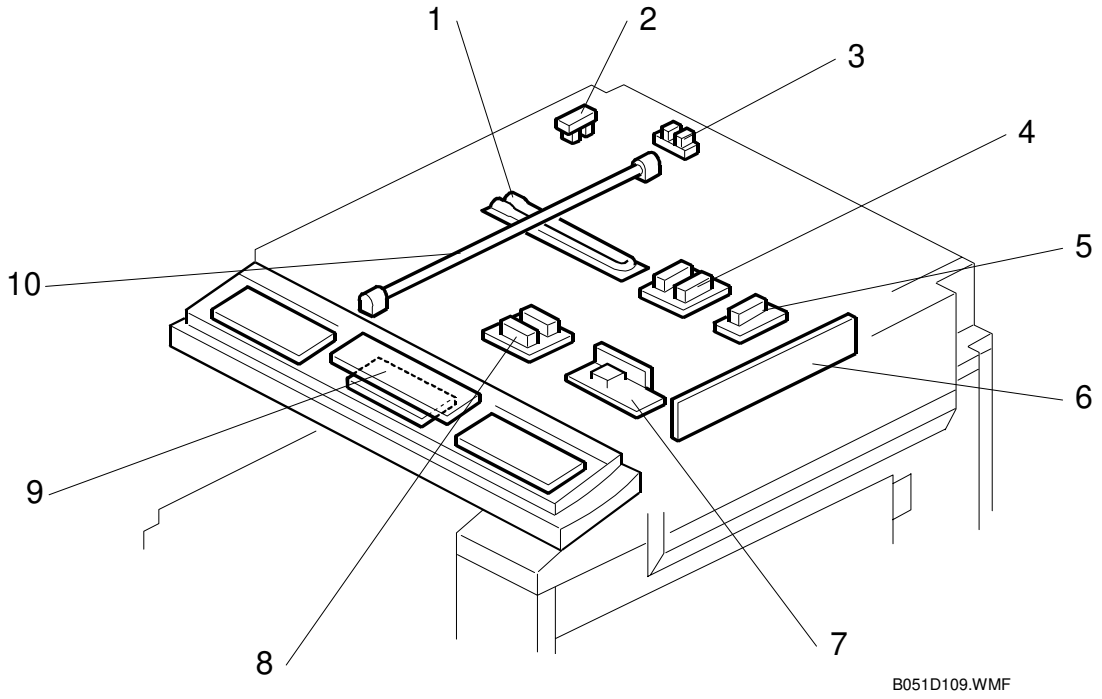
Drive Power Path



Motor (Type)	Drives ...
Scanner [B] (Stepper)	• Scanner motor gear [C]
Development [I] (DC brushless)	• Development clutches [$H^{K,Y,C,M}$] → Development units • OPC belt cleaning clutch → OPC belt cleaning unit
Main [G] (DC brushless)	• OPC belt [L] with the flywheel [J] • Image transfer belt [M]
Fusing Unit [D] (DC brushless)	• Fusing unit [S] • Paper exit unit [A] • Image transfer belt cleaning clutch [E] → Image transfer belt cleaning unit • Registration clutch [Q] → Registration roller • Paper transfer roller • Belt cleaning contact solenoid [F] → Image transfer belt cleaning unit contact mechanism • Paper transfer solenoid [R] → Paper transfer roller contact mechanism • Interchange unit and one-bin tray
Paper Feed [N] (Stepper)	• Paper feed clutch [$O^{1,2}$] → Paper pick-up roller • Vertical transport clutch [$P^{1,2}$]

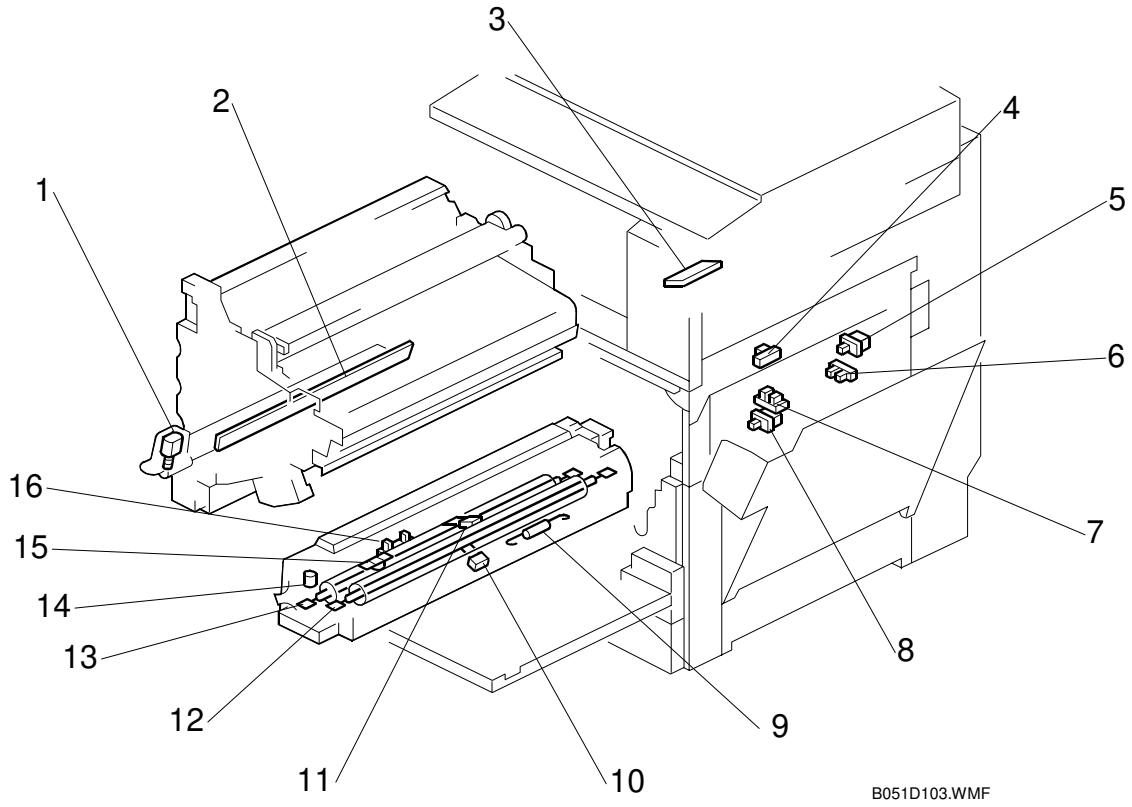
6.1.4 ELECTRICAL COMPONENTS

Scanner Unit



1. Anti-condensation heater
2. Scanner HP sensor
3. Platen cover sensor
4. Original length sensor 1
5. Original length sensor 2
6. SBU (sensor board unit)
7. Lamp stabilizer
8. Original width sensor
9. Operation panel
10. Exposure lamp

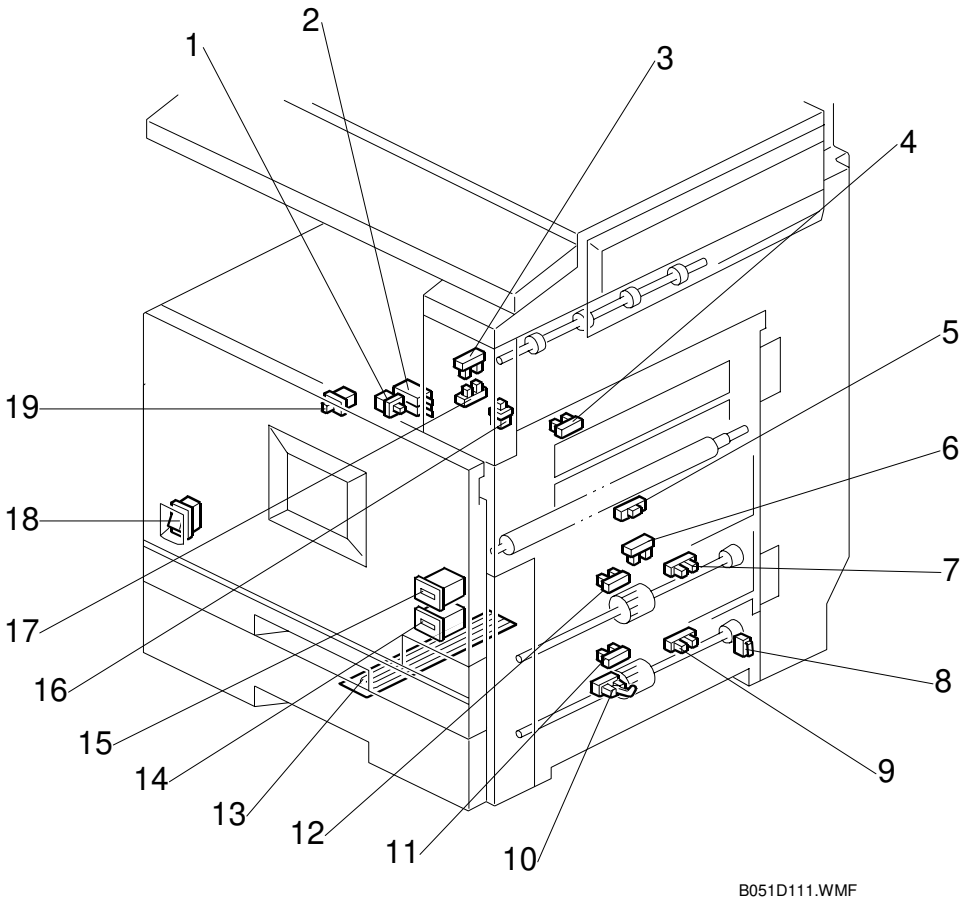
Image Transfer



1. Charge corona wire cleaner motor
2. Quenching lamp
3. ID sensor
4. Belt mark sensor
5. T/B waste toner bottle switch
6. T/B waste toner sensor
7. O/B waste toner sensor
8. O/B waste toner bottle switch
9. Pressure roller thermofuse
10. Pressure roller thermistor
11. Heating roller thermistor
12. Pressure roller fusing lamp
13. Heating roller fusing lamp
14. Oil overflow sensor
15. Heating roller thermostat
16. Oil end sensor

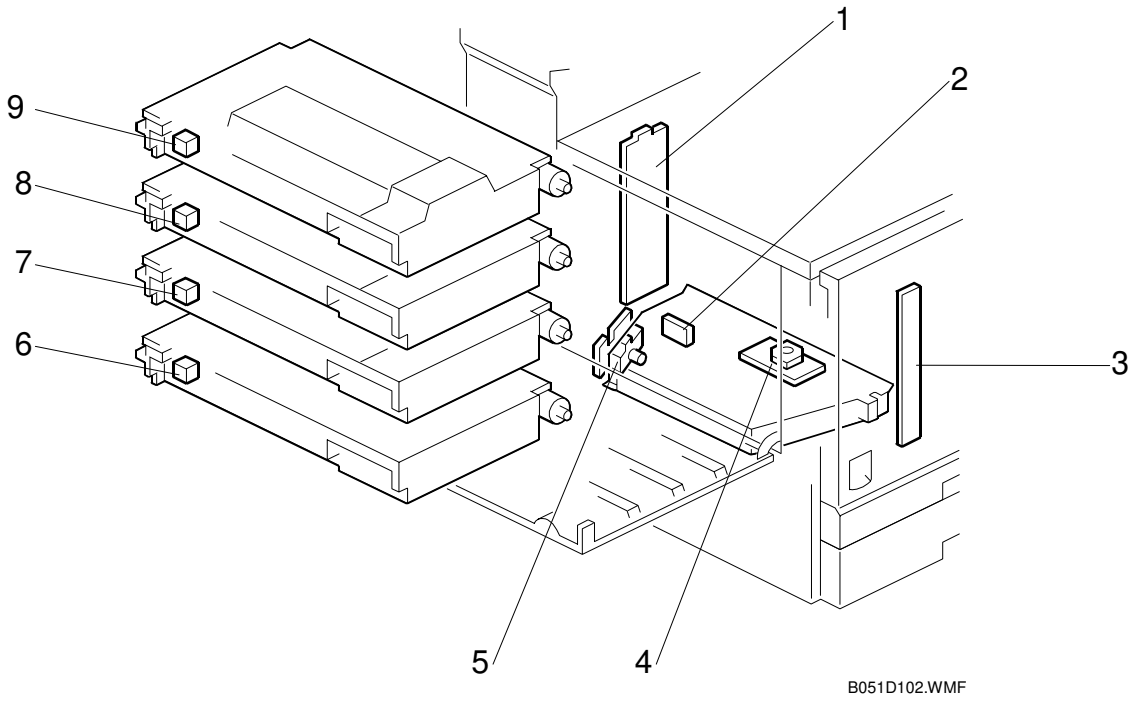
T/B: Image transfer belt
O/B: OPC belt

Paper Path



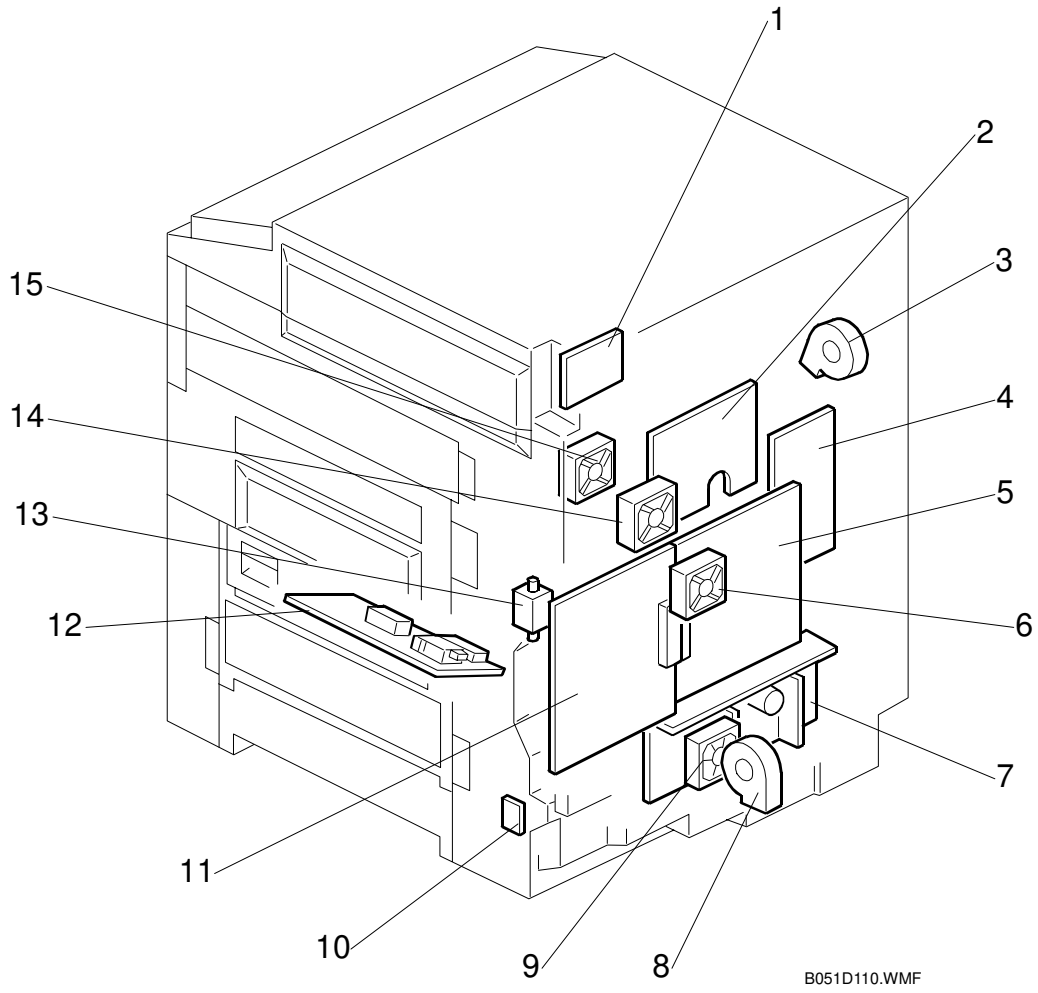
1. Right cover switch
2. Interlock switch
3. Paper overflow sensor
4. Fusing exit sensor
5. Registration sensor
6. Paper feed sensor
7. Paper near-end sensor 1
8. Right lower cover switch
9. Paper near-end sensor 2
10. Vertical transport sensor
11. Paper end sensor 2
12. Paper end sensor 1
13. Tray heater (optional)
14. Mechanical counter 2
15. Mechanical counter 1
16. Exit cover switch
17. Paper exit sensor
18. Main power switch
19. Front cover switch

Development Units



1. Rear development board
2. Laser synch. detection board
3. Front development board
4. Polygonal mirror motor
5. LD unit
6. Memory chip M
7. Memory chip C
8. Memory chip Y
9. Memory chip K

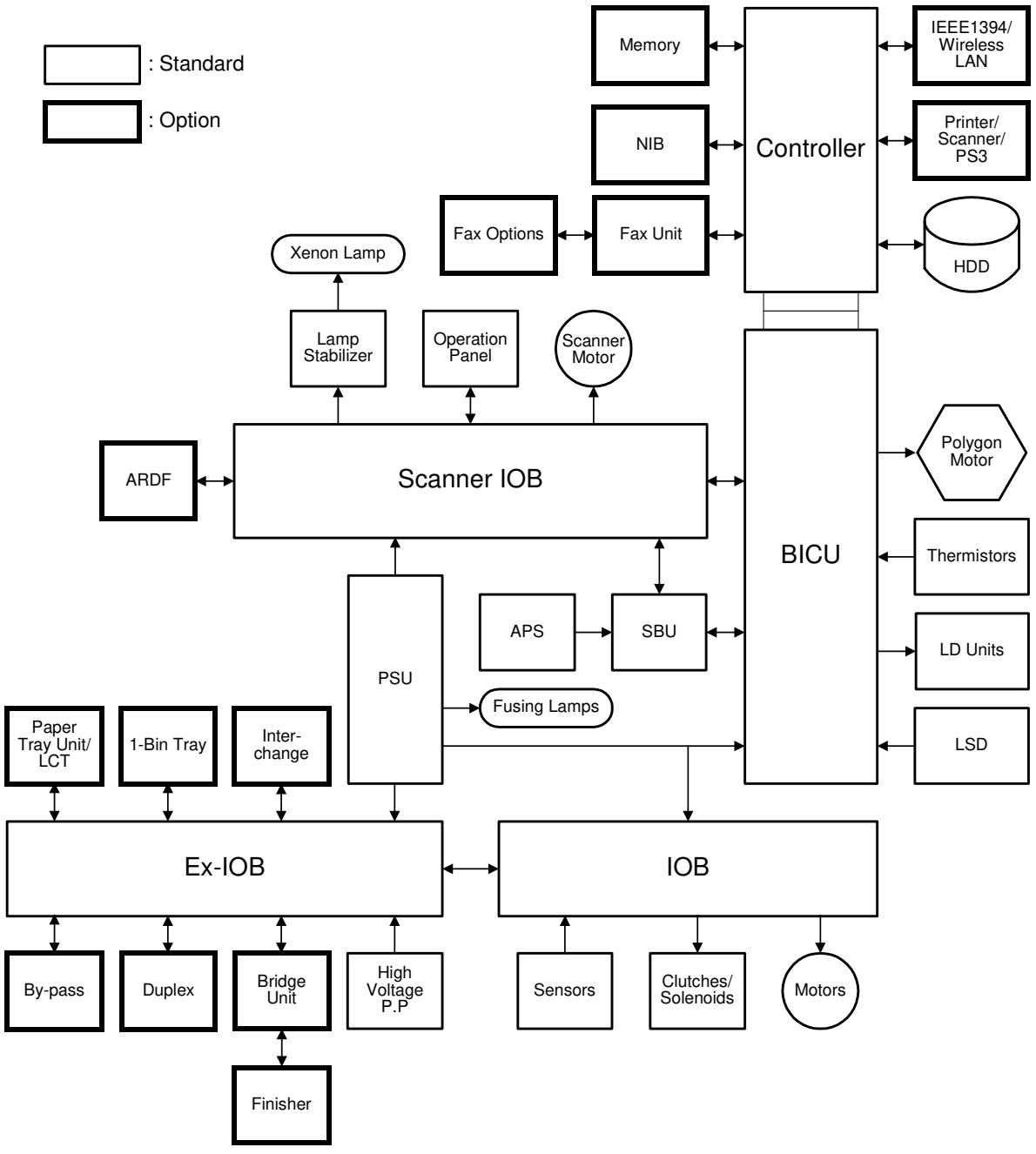
Boards



1. Scanner I/O board
2. I/O board
3. Development fan
4. EX I/O board
5. BICU board
6. Controller fan
7. Power supply unit
8. Ozone fan
9. PSU fan
10. Temperature/humidity sensor
11. Controller board
12. High voltage supply board
13. Oil pump
14. Fusing unit fan
15. Paper exit fan

6.2 BOARD STRUCTURE

6.2.1 BLOCK DIAGRAM



B051D554.WMF

1. **Controller (Main Board)**
   Controls the memory and the fax/scanner/printer options.

2. **BICU (Base Engine and Image Control Unit)**
   This is the scanner and engine control board. It controls the following functions:
   - Engine sequence
   - Timing control for peripherals
   - Image processing control and video control
   - Operation control
   - Drive control for the sensors, motors, and solenoids of the printer and scanner
   - High voltage supply board control
   - Fusing control

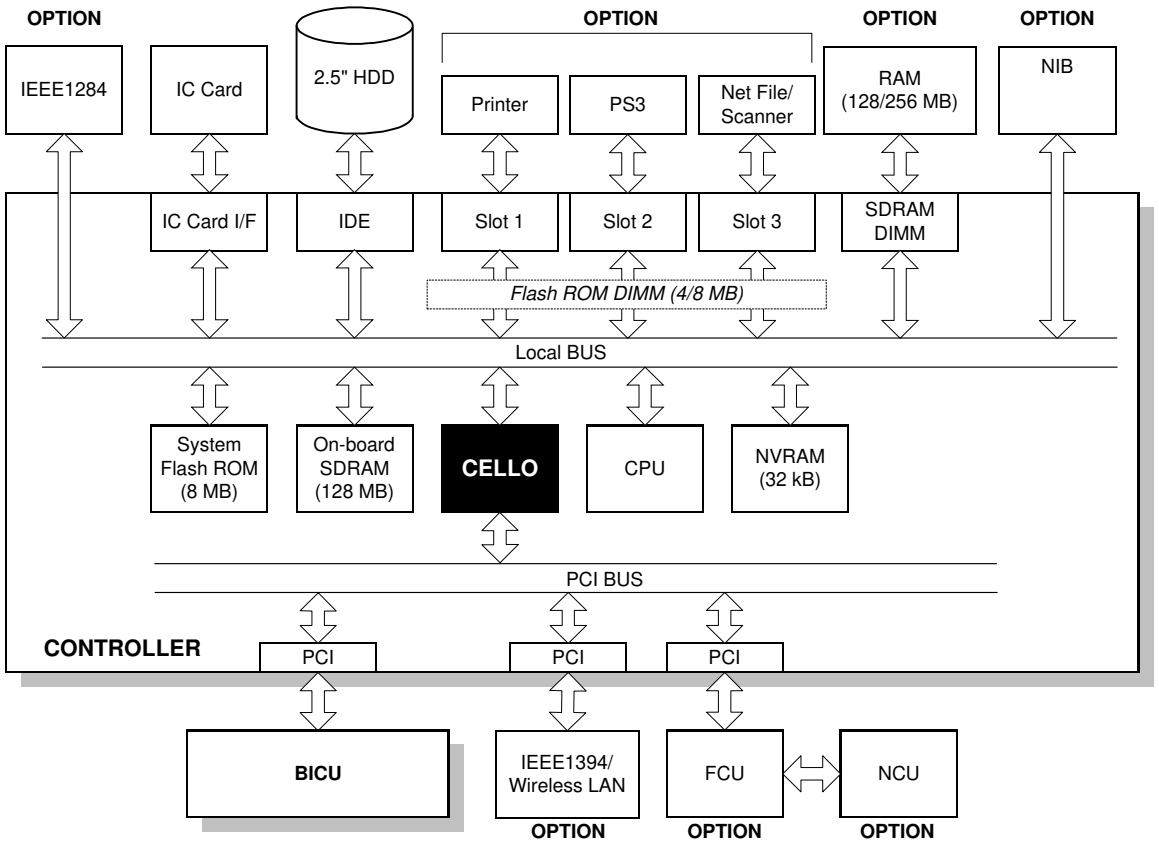
3. **IOB (Input/Output Board)**
   Controls the sensors, motors, clutches, and solenoids of the main unit.

4. **Ex-IOB (Extended Input/Output Board)**
   Handles the serial interfaces with peripherals.

5. **Scanner IOB (Scanner Input/Output Board)**
   Handles the following functions.
   - Serial interfaces with ARDF and operation panel
   - Scanner motor control

6. **SBU (Sensor Board Unit)**
   The SBU converts the analog signals from the CCD into digital signals.

6.2.2 CONTROLLER



B529D500.WMF

The controller uses GW (Ground Work) architecture, which allows the board to control all applications (copier, printer, scanner, and fax).

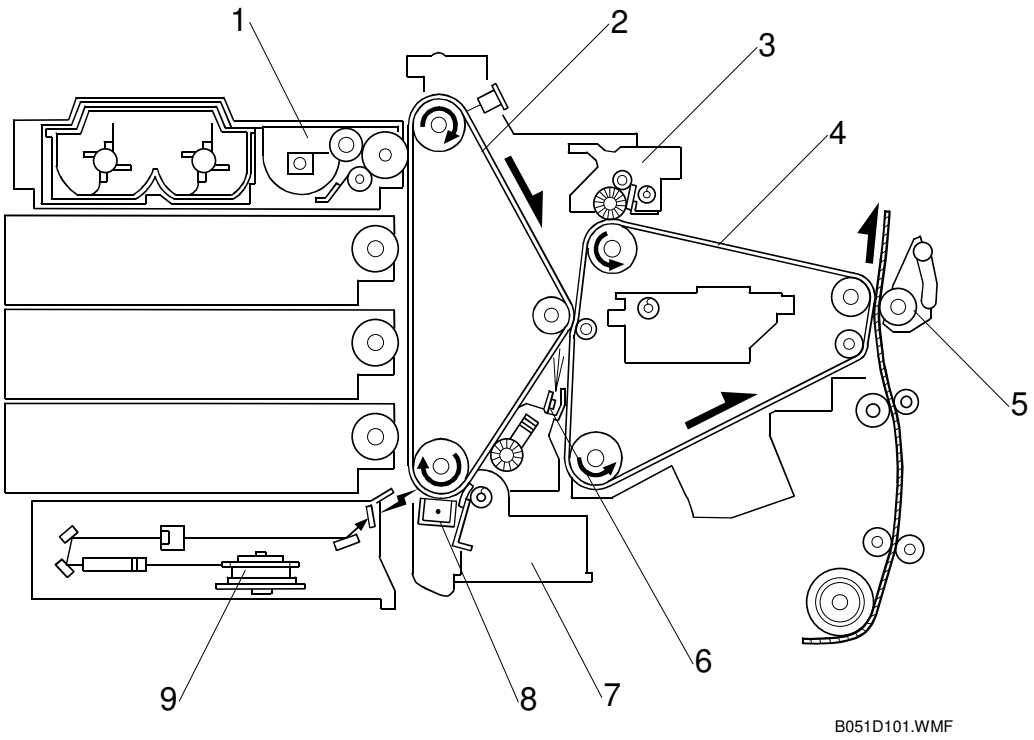
To add an optional printer, scanner, or fax application, install a ROM DIMM on the controller. The fax option, however, requires FCU and NCU installation also.

Systems and application software can be downloaded from the controller's IC Card slot. For details about how to download software from an IC card (☛ 5.2).

1. **CPU:**
   PMC RM526A-250 MHz
2. **CELLO ASIC:**
   This is a dedicated chip developed for use with GW architecture. It controls the following functions: memory, local bus, interrupts, PCI bus, video data, HDD, network, operation panel, IEEE1284, and image processing.
3. **Flash ROM:**
   8MB Flash ROM for the system program
4. **SDRAM (on-board):**
   128 MB SDRAM, expandable with 128 MB or 256 MB optional DRAM.
5. **Flash ROM DIMM Slots:**
   Three slots are provided for three ROM DIMMs. Expansion slots provided for the optional printer, scanner, facsimile, and PostScript 3 applications.
6. **NVRAM:**
   Stores the engine and controller settings
7. **PCI Interface:**
   For installing the FCU board, IEEE1394, and wireless LAN. The IEEE1394, and wireless LAN cannot both be installed on the same machine at the same time.
8. **HDD:**
   Used for the document server. Also used for collation, locked print, sample print, form overlay, and font storage. The hard disk is partitioned as shown below.

Partition	40GB HDD	Function	Comment
Image Local Storage	16,500 MB	Document server	Remains stored even after cycling power off/on.
File System 1	500 MB	Downloaded fonts, forms.	Remains stored even after cycling power off/on.
File System 2	1,000 MB	Job spooling area	Erased after power off.
File System 3	2,000 MB	Work data area	Remains stored even after cycling power off/on.
Image TMP	7,486 MB	Commonly used area for applications	Erased after power off.
	7,200 MB	Copier application	Erased after power off.
	3,440 MB	Printer application	Erased after power off.
	1,000 MB	Scanner application	Erased after power off.
Job Log	10 MB	Job log	Remains stored even after cycling power off/on.
Scanner	1024 MB	For mail	Erased after power off.
Others	840 MB	Debug	Erased after power off.
Total	4100 MB		

6.3 COPY PROCESS



1. Development unit
2. OPC belt
3. Image transfer belt cleaning unit
4. Image transfer belt
5. Paper transfer roller unit
6. Quenching lamp
7. OPC belt cleaning unit
8. Charge corona unit
9. Polygonal mirror

1. **Drum Charge**
   The corona wire gives the drum a negative charge.

2. **Black (K) Image Creation**
   a) Laser Exposure
   The laser diode (LD) emits two laser beams. The laser beams create a latent image on the OPC surface.
   b) Development
   The development roller transfers negatively charged toner to the latent image. The OPC belt surface holds only one toner color at one time.
   c) Image Transfer
   The OPC belt transfers the single-color toner image to the image transfer belt.
   d) Cleaning
   The OPC belt cleaning unit cleans the image transfer belt.

3. **Magenta (M) Image Creation**
   Same as 2 a) through 2 d) above.

4. **Cyan (C) Image Creation**
   Same as 2 a) through 2 d) above.

5. **Yellow (Y) Image Creation**
   Same as 2 a) through 2 d) above.

6. **Paper Transfer**
   The paper transfer roller transfers the combined CMYK toner image to the paper.
   The OPC belt and the image transfer belt can hold two A4-size LEF images on their surfaces. When printing on A4 LEF or smaller paper, the OPC and image transfer belts process two images in one cycle. At this time, two sheets of paper are consecutively output with little interval between them. This speeds up color print output.

7. **Separation**
   The paper is separated from the image transfer belt when the belt curves away from it. A discharge plate assists this process.

8. **Fusing**
   The fusing unit fuses the image to the paper.

9. **Cleaning**
   The image transfer belt cleaning unit cleans the belt.

10. **Quenching**
    The quenching lamp erases any remaining charge on the OPC belt.

6.4 PROCESS CONTROL

6.4.1 OVERVIEW

The copier adjusts the following process control parameters:

- Development bias (V_B)
- Charge corona grid voltage (V_G)

These 2 parameters maintain a consistent gamma for the engine.

NOTE: This copier uses only the ID sensor. (There is no TD or potential sensor.)

6.4.2 PROCESS CONTROL STEPS

Six Steps

Depending on the machine's condition, some or all of the following steps may occur:

①: ID sensor calibration
②: Color development bias initialization (M, then C, then Y)
③: K development bias initialization
④: M, C, Y, and K bias fine adjustment
⑤: Charge grid bias voltage adjustment
⑥: Process control interval counter reset

If the main power is turned off (or the cover opened) during a process control session, the session is aborted. Turning the power on (or closing the cover) restarts the process control session.

When is Process Control Done?

When an event arises, the specified steps are performed.

Event	Condition	Steps
Forced process control	When forced process control is done (engine SP mode 3-001-1)	① → ⑥
Process control regular interval	When more than 200 sheets have been printed upon completion of a job. (The interval can be changed with engine SP3-003-1.)	①, ④, ⑤, ⑥
Power on	When the fusing pressure roller temperature is 60°C or lower immediately after the power is turned on.	①, ④, ⑤, ⑥
Environmental change	When the change in the temperature/humidity sensor output since the previous process control exceeds a certain value. SP3-004 can be used to change the threshold temperature and humidity values.	①, ④, ⑤, ⑥

Event	Condition	Steps
K toner cartridge or K development unit replacement	This is done after clearing the K toner near-end state (i.e., when a new K development unit is added). The machine idles and when the development roller stops for 10 seconds, indicating that idling is over, process control occurs.	①, ③, ④, ⑤
Color development unit replacement	After the color toner end or near-end state is reset, the machine idles to transfer color toner to the development unit. After idling, process control occurs.	① → ⑥
Color toner cartridge replacement	After the color toner end or near-end state is reset, the machine idles to transfer color toner to the development unit. After idling, process control occurs.	①, ④, ⑤, ⑥
24 hours after previous process control	Same as 'power on' process control	①, ④, ⑤, ⑥
PCU replacement	After the PCU counter is reset, it is lubricated (new OPC belt lubricant application mode). Then process control occurs.	① → ⑥

Supplementary Information on Process Control

The following is a brief explanation of process control. This is for your reference. If the information is helpful for understanding the machine in the field, read the following explanation.

Step 1. ID Sensor Calibration

This calibration compensates for changes in the condition of the OPC belt or the ID sensor. The ID sensor detects the light reflected from the bare OPC belt. The LED current is adjusted until the sensor output is correct. The LED current for the color toner detection circuit is adjusted based on the adjustment made for the black toner detection circuit.

Step 2. Initializing Color Development Bias

For each color, the machine makes a solid patch (20x25) of toner on the OPC belt. The ID sensor detects the density of the patch. The laser power for the patch of toner is constant at about 210/255. Each color is calibrated separately (this step has three stages - one for each color). M/A must be the following for areas of maximum image density: 0.65 mg/cm^2, Range:0.40 to 0.90 mg/cm^2. If the detected M/A is different from the target M/A, the development bias is adjusted.

Colour development bias initialisation is not always done. This is to reduce the amount of time taken for process control. Also, in step 4, the current colour development bias values are fine-tuned to correct for any changes in the machine or temperature/humidity since the last full process control.

This step always has to be done when installing a new development unit. The toner amount carried by a development roller varies with each unit. (The toner amount used for a certain development bias is not the same.) Black development bias initialisation (step 3) has to be done more often, because tests have shown that process control errors occur more often if this is not done.

Step 3. Initialising K Development Bias

Similar to the process for color development bias. M/A must be 0.65 mg/cm^2 for areas of maximum image density. Range: 0.40 to 2.0 mg/cm^2

Step 4. Fine-tuning the YMCK Development Biases

The machine makes another solid pattern

Steps 2 and 3 for determining VB (development bias) are not done every process control (see the table: When is the process control done?). Because of this, the solid area density, based on the VB obtained during initialisation, may change as a result of changes inside the machine after a period of use, or because of environmental changes. To suppress these fluctuations, this step fine-tunes VB at regular intervals, or if the environmental conditions change.

The machine adjusts the development bias based on these results.

Step 5. Charge Grid Voltage Adjustment

The machine makes a very low image density pattern (20x25 mm), which consists of a replacing 3 x 3 matrix of pixels on the OPC belt. Two of these pixels are of high intensity (dark), and the others are at zero intensity (LD off, white). The two high intensity pixels are close together.

0	0	0
240	240	0
0	0	0

This is only to give you a rough idea - the exact pixel densities used by this machine are not shown here.

The net effect is to have two dark pixels surrounded by white pixels on all sides, repeated all over the paper.

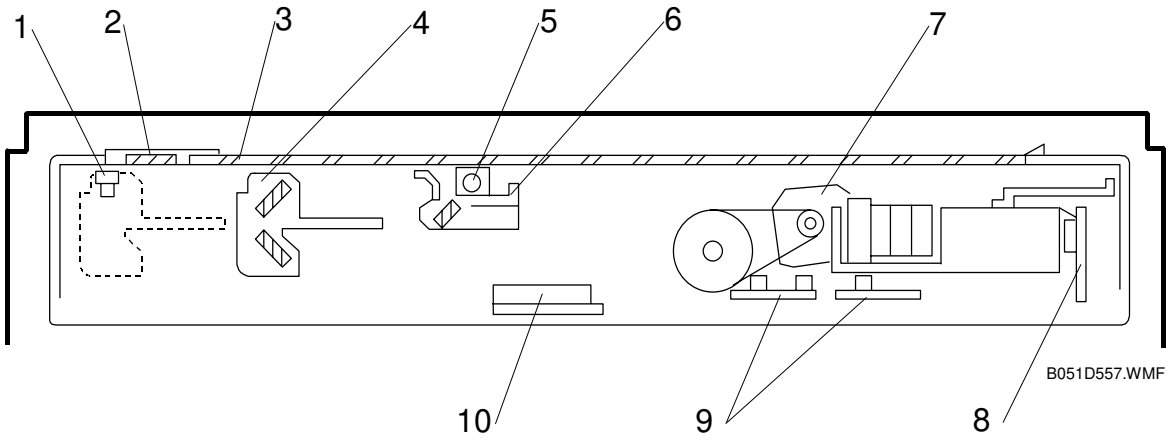
If there is a difference between the target M/A and the detected M/A, the grid voltage is adjusted.

Step 6. Resetting the Process Control Interval Counter

The counter is in the NVRAM on the controller board, and is reset after process control. The counter is not reset after black development unit or black toner cartridge replacement. This is because only a few of the process control steps are done after replacing these components.

6.5 SCANNING

6.5.1 OVERVIEW



1. Scanner HP sensor
2. ADF exposure glass
3. Exposure glass
4. 2nd scanner (2nd carriage)
5. Scanner lamp
6. 1st scanner (1st carriage)
7. Scanner motor
8. Sensor board unit (SBU)
9. Original length sensors
10. Original width sensor

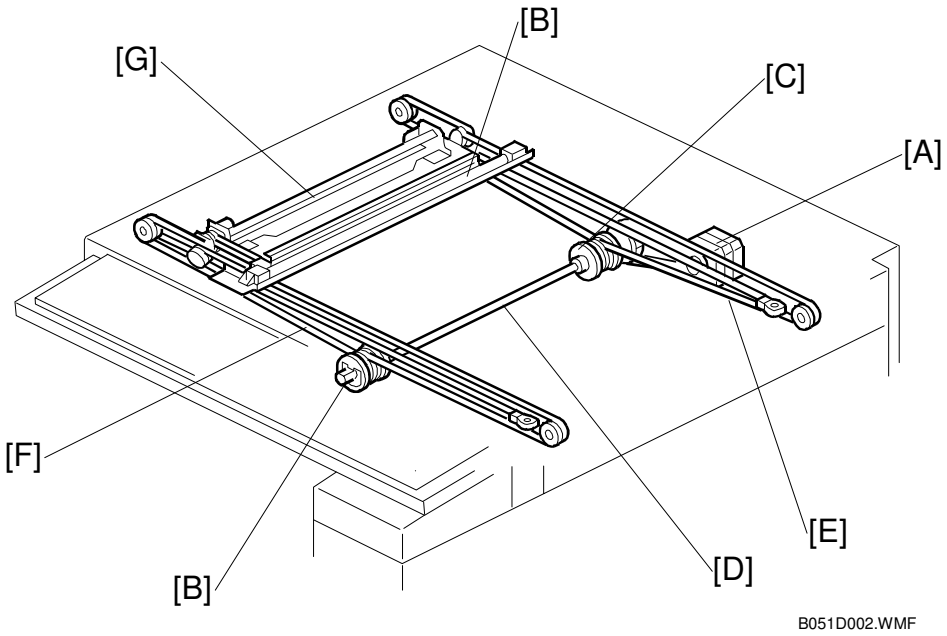
(☛ CT *Digital Processes – Digital scanning – Basic concepts*)

Book mode: The scanner motor drives the 1st and 2nd scanners. The original is scanned from left to right.

ADF mode: The ADF feeds the original past the ADF exposure glass. The 1st scanner moves under the ADF exposure glass. The original does not stay on the glass, but keeps going to the ADF exit.

Detailed Descriptions

6.5.2 SCANNER DRIVE



Scanner drive: Scanner motor [A] ➔ Scanner drive pulley [B and C], and scanner drive shaft [D] ➔ Scanner wires [E and F] ➔ 1st [G] and 2nd [H] scanners

Book Mode

The scanner I/O board controls the scanner motor.

The 1st scanner moves twice as fast as the 2nd scanner.

For reduction/enlargement, the scanning speed depends on the magnification ratio. The returning speed is always the same, regardless of magnification ratio.

Sub-scan magnification is controlled by the scanner motor speed. Main-scan magnification is controlled by image processing on the BICU board.

NOTE: Sub-scan magnification errors can be corrected by changing the scanner-motor speed (☛ SP4-008).

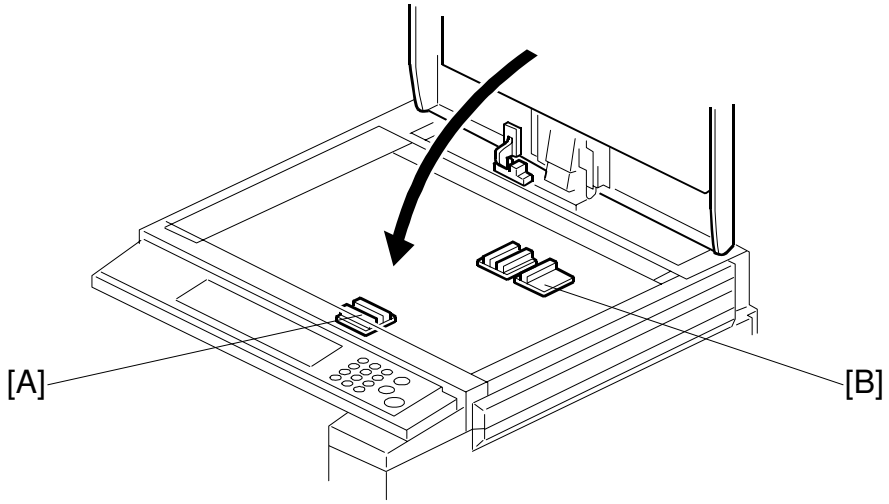
ARDF Mode

The 1st and 2nd scanners stay at their home positions; the scanner HP sensor detects the 1st scanner position, and the 2nd scanner position is linked with that of the 1st scanner.

Sub-scan magnification is controlled by the ADF feed speed. Main-scan magnification is controlled by image processing on the BICU board.

NOTE: Sub-scan magnification errors can be corrected by changing the ADF feed-speed (☛ SP6-006-5).

6.5.3 ORIGINAL SIZE DETECTION



B051D004.WMF

The original width sensors [A] detect the original width, and the original length sensors [B] detect the original length.

The on/off signals received from the sensors are used to detect the original size.

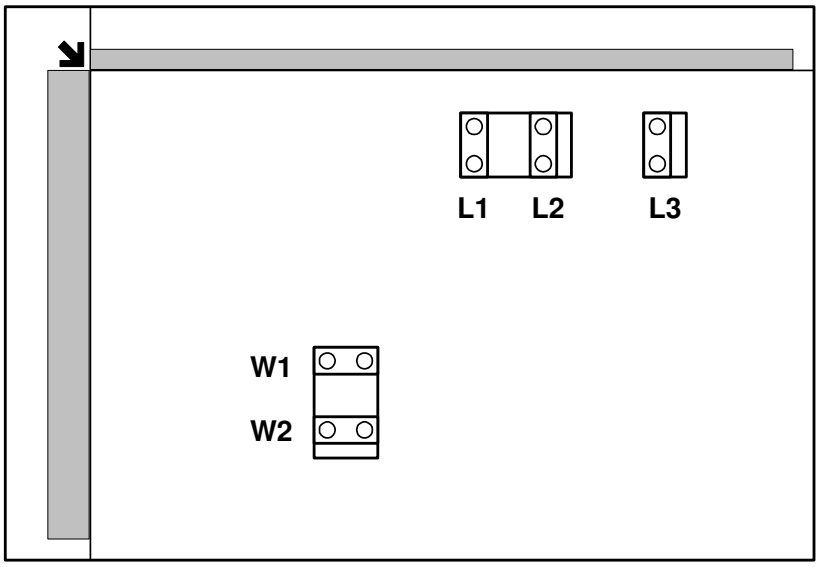
The SBU board checks each sensor signal at the following times:

- Just after the platen cover is closed
- When the start key is pushed, if the platen cover stays open.

When the by-pass tray is used, the machine assumes that the paper is set lengthwise. So, if A4 paper is set sideways on the by-pass tray, the machine assumes it is A3 paper (set lengthwise) and scans the whole A3 area, disregarding the original size sensors. However, when the registration sensor detects that the paper is not A3 but only A4 sideways, paper feed stops and a jam occurs. This is to prevent large amounts of toner transferring from the transfer belt to the transfer roller. (Also see SP 1-940.)

NOTE: Original size detection using the ARDF is described in the manual for the ARDF.

The table (next page) shows the sizes that are detected for various sensor outputs.



B051D540.WMF

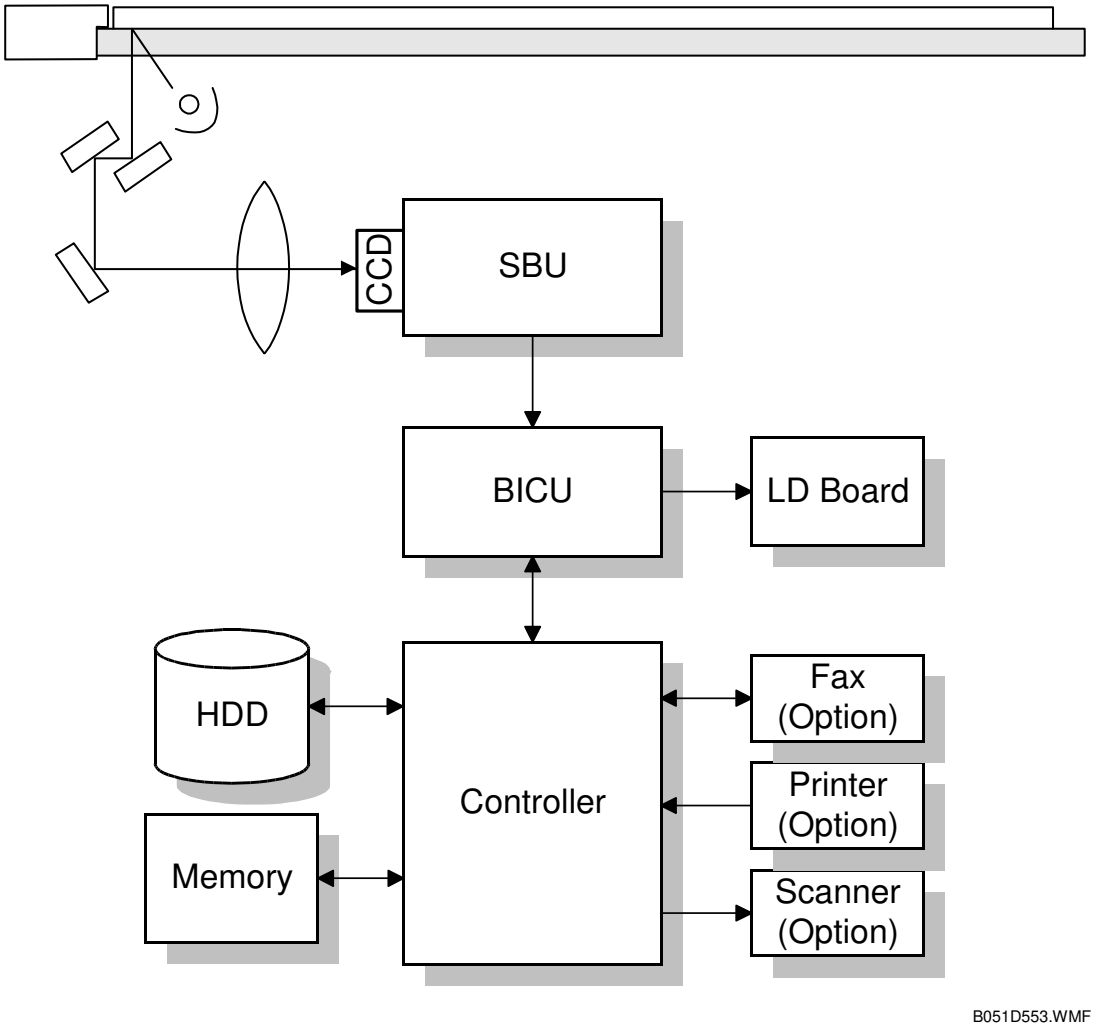
Original Size		Length Sensor			Width Sensor		SP4-301 display
Metric	**Inch**	L3	L2	L1	W2	W1	
A3	11" x 17"	O	O	O	O	O	132
B4	10" x 14"	O	O	O	X	O	141
F4	8.5" x 14" (8" x 13")	O	O	O	X	X	165
A4-L	8.5" x 11"	X	O	O	X	X	133
B5-L		X	X	O	X	X	142
A4-S	11" x 8.5"	X	X	X	O	O	5
B5-S		X	X	X	X	O	14
A5-L, A5-S	5.5" x 8.5", 8.5" x 5.5"	X	X	X	X	X	128

NOTE: L: Lengthwise, S: Sideways, O: Paper present, X: Paper not present

For other combinations, “Cannot detect original size.” is displayed on the operation panel.

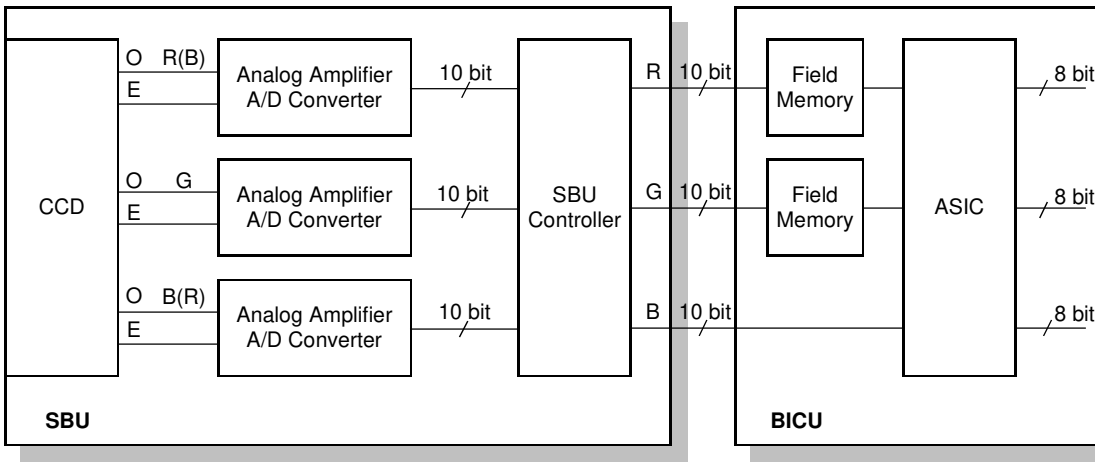
6.6 IMAGE PROCESSING

6.6.1 OVERVIEW



The CCD (Charge-Coupled Device) generates three analog video signals. The SBU (Sensor Board Unit) converts the three analog signals to 10-bit digital signals. It sends these signals to the BICU board. The BICU board processes the image, then the image data is sent to the LD unit.

6.6.2 SBU BLOCK DIAGRAM



B051D551.WMF

Signal Processing

1. Signal Amplification
   - Odd-pixel and even-pixel RGB analog signals from the CCD are amplified.
2. Signal Composition
   - The amplified signals are combined after A/D conversion.

A/D Conversion

- The analog signals (CCD output) are converted to 10-bit (1,024 gradations) digital signals.

White Level Correction

- A white reference plate is scanned before the original is scanned.
- Data is updated before the original is scanned.
- The differences in the white level across the page, including irregularities in the CCD and the optical parts across the main scan, are corrected.

Others

The SBU controller exchanges the R and B signals if originals are scanned through the ARDF.

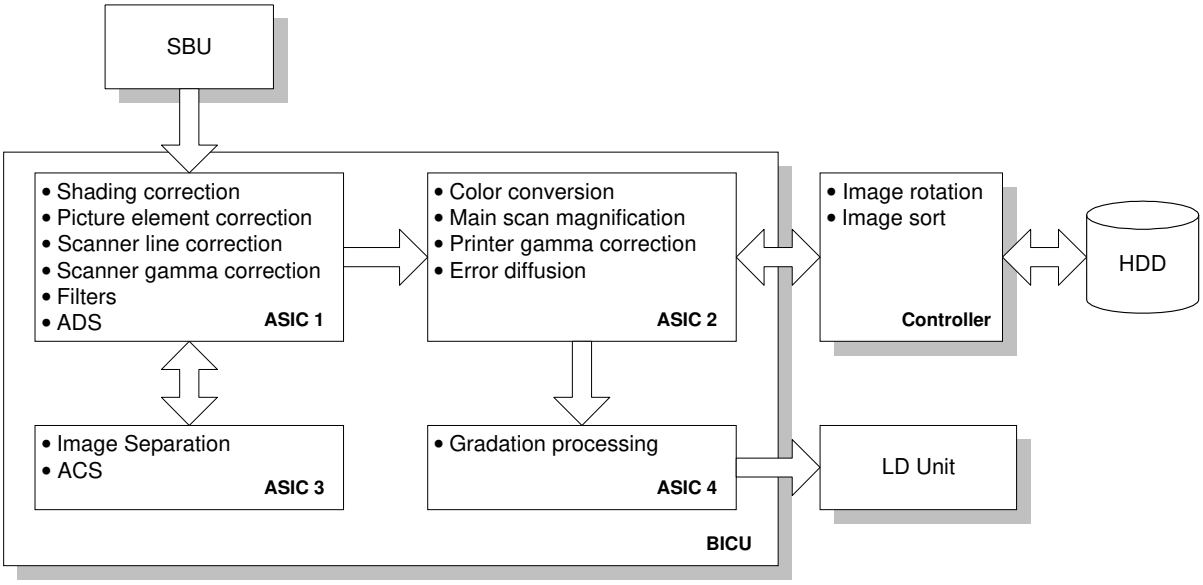
Black Level Correction

- Improves image reproduction for high-density areas.
- Reads the black video level at black elements on the CCD. These pixels are masked off, and should produce a pure black signal.
- This is subtracted from the value of each pixel.
- Calculated for each scan line.
- Corrects the image data for any changes in black level with time, as the machine scans down the page.

VPU Test Mode

To make sure the scanner VPU control is functioning, output the VPU test pattern with SP4-907 (for more details, see chapter 4, “Troubleshooting”).

6.6.3 IMAGE PROCESSING



Shading Correction

Auto shading compensates for the possible differences in the light emission level at the edge and center of a scanned image caused by the scanner lens, or the differences among the CCD pixels.

Picture Element (Dot Position) Correction

Picture element correction includes

1) the completion of the scan line correction process
2) the correction of the time when the CCD is not perpendicular to the light

- The green CCD line is taken as the standard.
- Both ends of the red and blue lines are adjusted to match the standard.

NOTE: To adjust the vertical line correction level, use SP4-932.

Scan Line Correction

R, G, and B CCD lines are spaced 4 scan lines apart (8 lines total) when 100% magnification is used.

- Scan line correction synchronizes these signals by storing each line in memory.
- The difference between the R, G and B signals depends on the magnification ratio.
- If this calculation does not result in an integer, the corrected data is set to the closest integer, but further correction is needed (☛ "Picture Element Correction").

Scanner Gamma Correction (RGB Gamma Correction)

The RGB video signals from the CCD are sent to the ASIC1 chip on the BICU board. This signal is proportional to the intensity of light reflected from the original image (Fig. 1). Scanner gamma correction inverts the video signals. The shading circuit converts the signal from 10-bit to 8-bit.

- The ASIC1 chip converts the signal levels as shown in Fig. 2.
- This improves the accuracy of RGB to CMY color conversion (conversion is done later in the image process).
- The same table is used for R, G, and B signals.

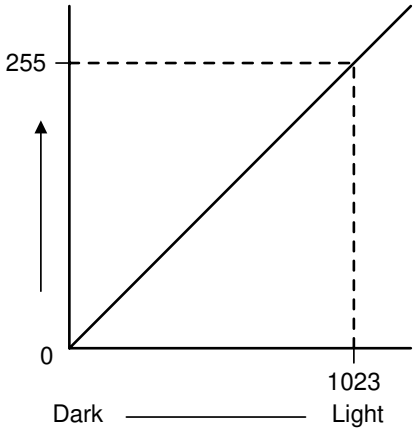


Fig. 1 B051D972.WMF

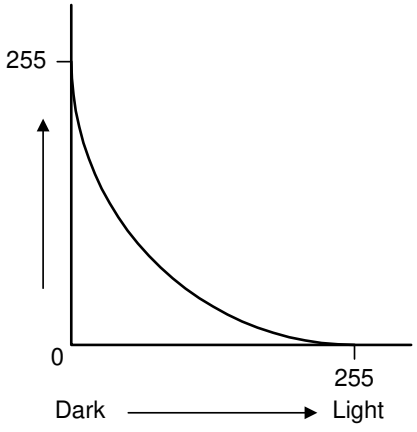


Fig. 2 B051D973.WMF

Filtering

Appropriate software filters are applied to the RGB video signals.

- Varies depending on the results of auto text/photo separation (or on the selected original mode).
- RGB smoothing is applied to photo areas
- Edge emphasis applied to text areas.

Background Density Control

- Removes low ID image signals (background) that are less than a certain threshold.
- The threshold depends on the color mode (single color or full color).

Users can select a different threshold for each mode.

ADS (Auto Image Density Selection)

- Full color mode
  1) Refers to the RGB data taken from the entire original.
  2) Calculates a threshold for removing the background based on this data.
- Black and white mode
  1) Determines the peak white level.
  2) Peak level data is taken for each scan line.
  3) Removes the peak white level from the image. This produces a white background.
  4) Also uses the peak white level to determine the white reference value for A/D conversion.
  5) Background density is adjusted before data is input to the A/D converter.

Image Separation

The original image is classified into the text and photo (dot screen) areas.

Edge Separation

- Used to locate text and line diagrams
- Locates areas of strong contrast.
- Looks for continuity of black or colored pixels.
- Looks for continuity of white pixels around black or colored pixels.
- Only uses data from the green CCD.

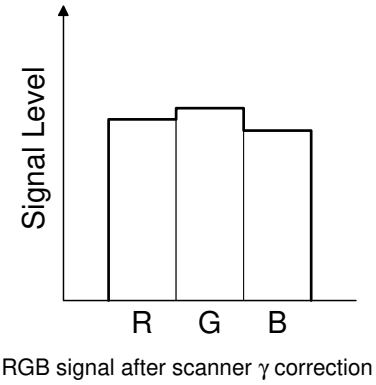
Dot Screen Separation

- If white pixels are not detected around non-white pixels, it is a dot screen area.

Colored Text Separation

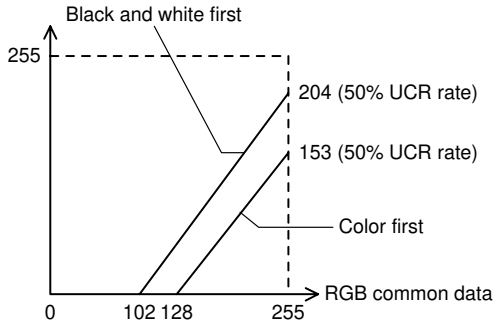
- Identifies whether the text area's pixels are black or color.
- Based on:
  1) Differences among the RGB maximum signal levels.
  2) Output levels of the RGB video signals.

ACS (Auto Color Selection)



RGB signal after scanner γ correction

B051D556.WMF



B051D555.WMF

The auto color selection function determines if an original is black/white or color. Black copy mode or full color mode is automatically selected.

Selection is made based on the difference between the RGB signal levels.

RGB video signals are compared.

If the maximum difference among RGB signals is within a certain range, the original is considered black and white.

Color Conversion

Transparency for each color toner is not ideal. Color conversion compensates for the differences between the ideal and actual characteristics. A matrix converts the RGB video signals into CMYK video signals while the original is scanned once.

Conversion Matrix

The following color conversion table is an example of the results from the matrix operation.

- Simple color copying.
- No special modes applied.
- To represent green, the yellow and cyan toners are used in a 1:1 ratio.

Color Conversion Table

Original Color / Toner	K	R	Y	G	C	B	M	W
Y	1	1	1	1	0	0	0	0
M	1	1	0	0	0	1	1	0
C	1	0	0	1	1	1	0	0
K	1	0	0	0	0	0	0	0

Main Scan Magnification

While the machine changes the scanner speed to reduce or enlarge the original in the sub-scan direction, the ASIC2 chip on the BICU board handles reduction and enlargement in the main scan direction.

- Scanning and laser writing are done at a fixed pitch (CCD elements cannot be squeezed or expanded).
- Imaginary points are calculated, corresponding to a physical enlargement or reduction.
- Image density is then calculated for each of the imaginary points based on the image data for the nearest two true points.
- The calculated data then becomes the new (reduced or enlarged) image data.

NOTE: The actual calculations for main scan magnification use the polynomial convolution method. This mathematical process is beyond the scope of a service manual and will not be covered here.

Printer Gamma Correction

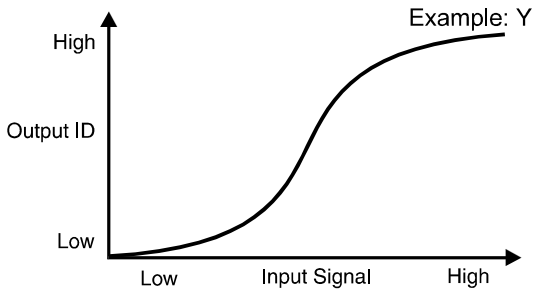


Fig. 1

B051D989.WMF

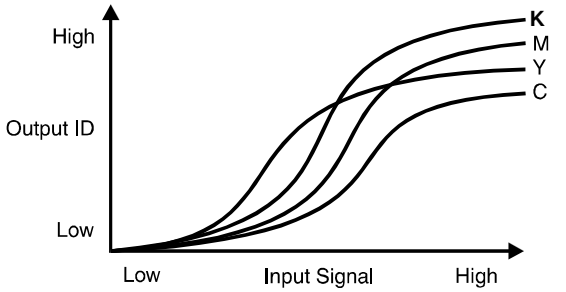


Fig. 2

B051D990.WMF

Ideally, the gamma curves for Yellow, Magenta, Cyan, and Black should be identical, as shown in figure 1. However, slight variations in the electrical components can result in varying gamma curves, as shown in figure 2.

- Printer characteristics are much more variable than the scanner. Printer gamma needs re-calibration and adjustment from time to time.
- The Auto Color Calibration (ACC) procedure compensates for any discrepancies in color reproduction.
- ACC makes new gamma curves for each color in each mode (text, photo, and black text).
- After ACC, the gamma curve for each color can be adjusted with service programs (SP4-909 to SP4-918).
- 4 different modes:
  1) ID max.
  2) Shadow (High ID)
  3) Middle (Middle ID)
  4) Highlight (Low ID)
- If the previous gamma curve was better, it can be recalled.
- Factory settings can be loaded using SP5-610-4.
  NOTE: If the factory settings have been overwritten, this will return the new values, not the actual settings made in the factory. This is deliberate, since some drift is expected. After a time, the original factory settings may no longer be suitable.
- Factory settings can be overwritten by the current gamma settings using SP5-610-5.

ID Max.
This mode adjusts the total image density as shown in figure 3.

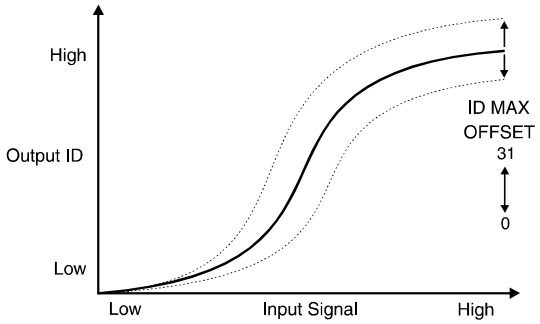


Fig. 3
B051D991.WMF

Shadow (High ID)
The High ID mode adjusts the image density between Level 6 and Level 9 of the color gradation scale on the C-4 test chart (figure 4).

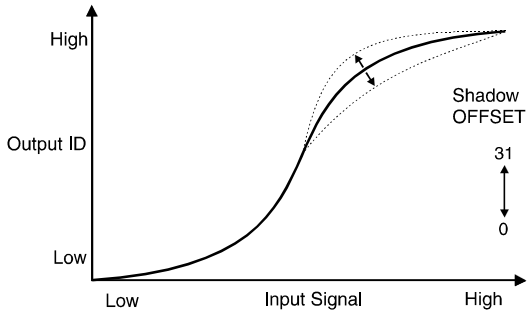


Fig. 4
B051D992.WMF

Middle (Middle ID)
The Middle ID mode adjusts the image density between Level 3 and Level 7 of the color gradation scale on the C-4 test chart (figure 5).

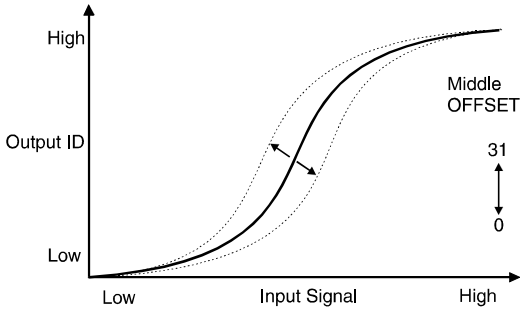


Fig. 5
B051D993.WMF

Highlight (Low ID)
The Low ID mode adjusts the image density between Level 2 and Level 5 of the color gradation scale on the C-4 test chart (figure 6).

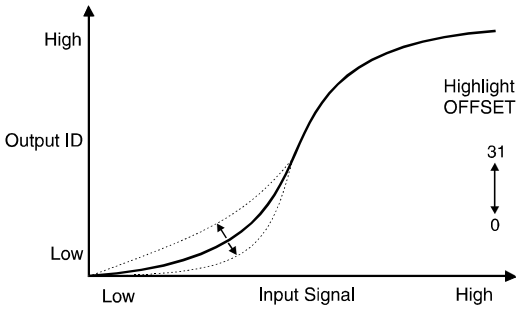
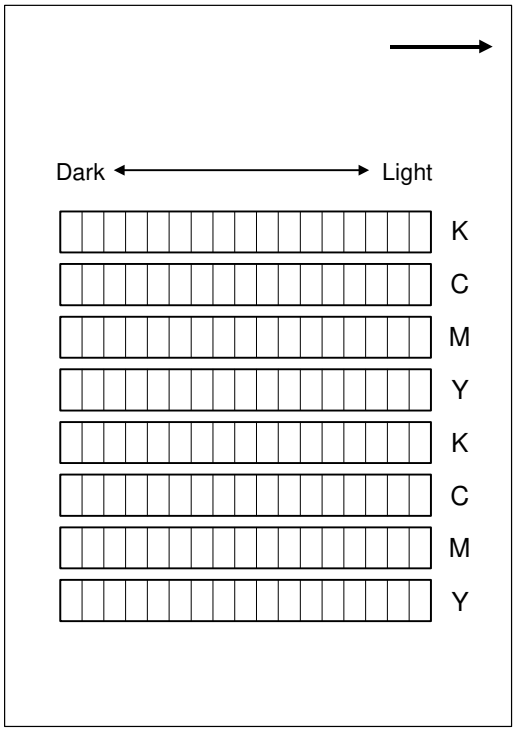


Fig. 6
B051D994.WMF

Auto Color Calibration Test Pattern

The test pattern has eight 17-step gradation scales for each color (CMYK), including background white, for Text and Photo modes.



B051D995.WMF

ACC automatically calibrates the printer gamma curve. The user starts the ACC process.

1. The user prints an ACC Test Pattern.
2. The user places the test pattern on the exposure glass.
3. The copier makes 8 scans to read each color scale.
4. The copier corrects the printer gamma by comparing the ideal settings with the current image density.
5. The copier combines the corrected gamma curve with the Shadow, Middle, and Highlight values currently in memory.
6. The copier then calculates the ID max (amplitude of the gamma curve) based on data from the ACC scan.
7. The corrected printer gamma curves can be adjusted further using SP modes (SP4-909 to SP4-918).

Error Diffusion

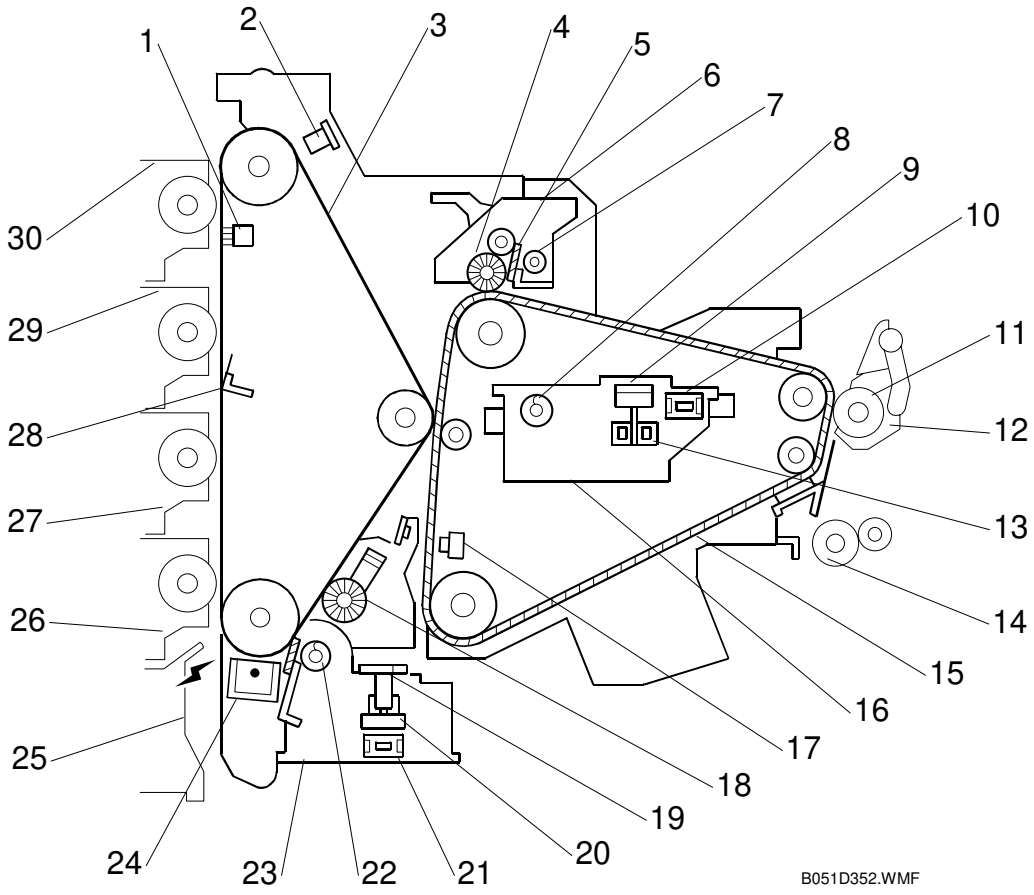
Error diffusion reduces the difference in contrast between light and dark areas of a halftone image. Each pixel is corrected using the difference between it and the surrounding pixels. The corrected pixels are then compared with an error diffusion matrix.

ASICs on the BICU Board Test

You can check the ASIC for the image processing on the BICU board with the SP mode menu, SP4-904-1 or 2.
(☛ “4. Troubleshooting” for details)

6.7 PHOTOCONDUCTOR UNIT (PCU)

6.7.1 OVERVIEW

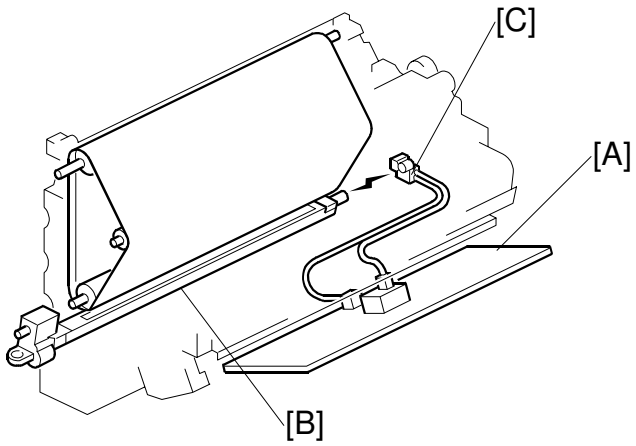


1. Ground brush
2. ID sensor
3. OPC belt
4. Bias brush
5. Image transfer belt cleaning blade
6. Image transfer belt cleaning unit
7. T/B toner collection auger 1
8. T/B toner collection auger 2
9. T/B waste toner sensor feeler
10. Waste toner bottle switch
11. Paper transfer roller
12. Paper transfer roller unit
13. T/B waste toner bottle full sensor
14. Registration roller
15. Image transfer belt
16. Image transfer belt cleaning unit
17. Image transfer belt mark sensor
18. OPC belt cleaning brush
19. O/B waste toner sensor feeler
20. O/B waste toner bottle full sensor
21. O/B waste toner bottle switch
22. O/B toner collection auger 1
23. OPC belt cleaning unit
24. Charge corona unit
25. Laser optics unit
26. M development unit
27. C development unit
28. OPC belt support
29. Y development unit
30. K development unit

6.7.2 CHARGE CORONA UNIT

Power Supply

[A]: High voltage supply
[B]: Charge corona unit
[C]: Harness

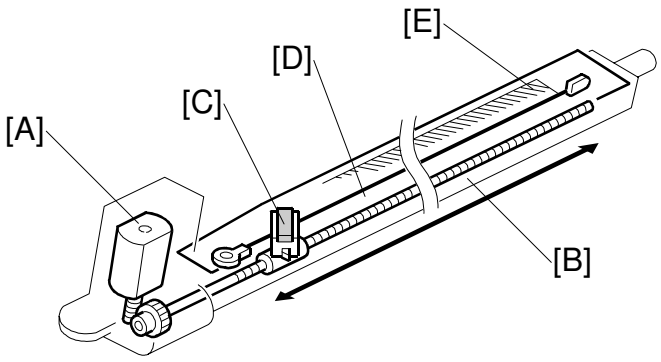


B051D311.WMF

High voltage supply [A] ➔ Harness [C] ➔ Charge corona unit [B] (negative charge)
(☛ CT Photocopying Processes – Charge – Corona Charge – Scorotron Method)

Grid and Wire Cleaning

[A]: Motor
[B]: Screw
[C]: Wire cleaner
[D]: Corona wire
[E]: Grid



B051D310.WMF

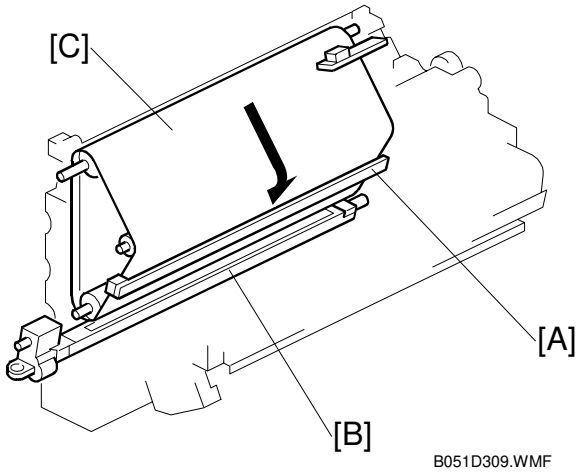
The motor [A] drives the bottom screw [B], which moves the wire cleaner [C] forward or backward. The cleaner cleans the grid [E] and corona wire [D].

The cleaning feature is activated after 600 development counts (default), at the end of the job. However, if 1000 counts is reached in the middle of a job, the printing process is interrupted and the wire is cleaned. The counter counts up as shown in the table.

	Black & White	Color
A4 (LT) LEF (or smaller)	1 count	4 counts
Others	2 counts	8 counts

NOTE: 1) The counter always increases as shown in the table. These values are not adjustable.
2) To set the counter, use SP2-801 (☛ 5.2.2).

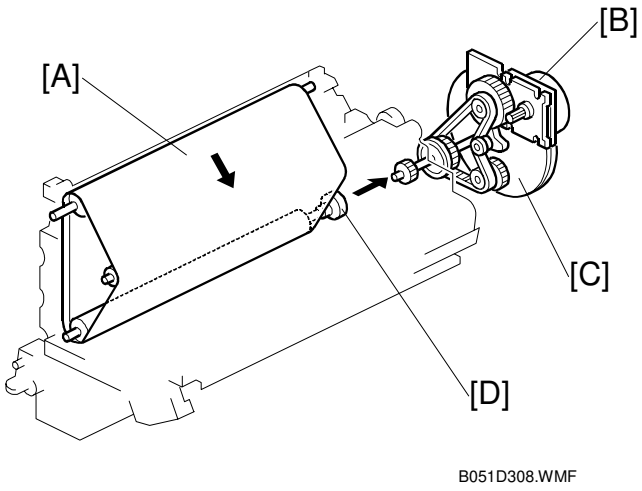
Quenching



[A]: Quenching lamp
[B]: Charge corona unit
[C]: OPC belt

(☛ CT Photocopying Processes – Quenching)

6.7.3 OPC BELT DRIVE



[A]: OPC belt
[B]: Main motor
[C]: Fly wheels
[D]: Bottom shaft

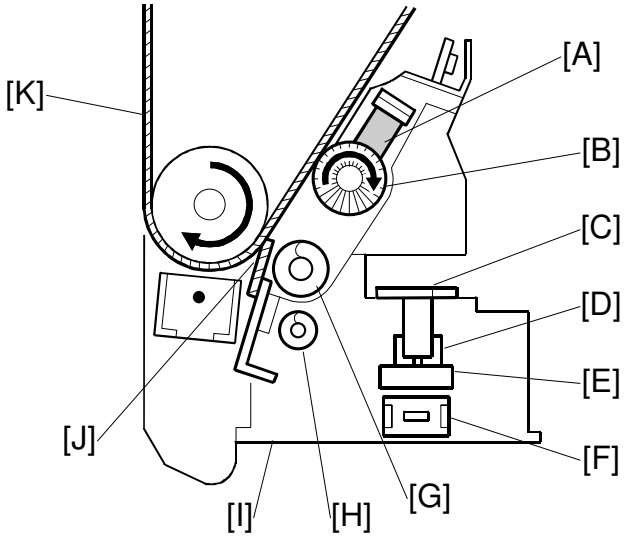
Main motor [B] ➔ Gear ➔ Timing belt ➔ Bottom shaft [D] ➔ OPC belt [A]

The flywheels [C] ensure that the OPC belt moves smoothly.

NOTE: The OPC belt and transfer belt contact each other. If you wish to inspect the OPC belt by turning it, you must also turn the transfer belt at the same time to avoid damaging the surfaces of the belts.

6.7.4 OPC BELT CLEANING UNIT

[A]: Lubricant bar
[B]: Cleaning brush
[C]: Feeler link (on the frame)
[D]: Waste toner bottle full sensor (on the frame)
[E]: Waste toner feeler
[F]: Waste toner bottle switch (on the frame)
[G]: Toner collection auger 1
[H]: Toner collection auger 2
[I]: Waste toner bottle
[J]: Cleaning blade
[K]: OPC belt



Bottle Detection

The waste toner bottle switch [F] is on the frame, behind the OPC belt cleaning unit. When the unit is installed, it pushes the switch, which indicates the bottle is in place.

Waste Toner Collection

The cleaning brush [B] and the cleaning blade [J] removes the toner remaining on the OPC belt [K] surface. (☛ CT Photocopying Processes – Cleaning – Counter Blade + Brush)

Toner collection auger 1 [G] moves this toner to the front side, where it is collected in the waste toner bottle [I].

Toner collection auger 2 [H] levels the toner in the bottle.

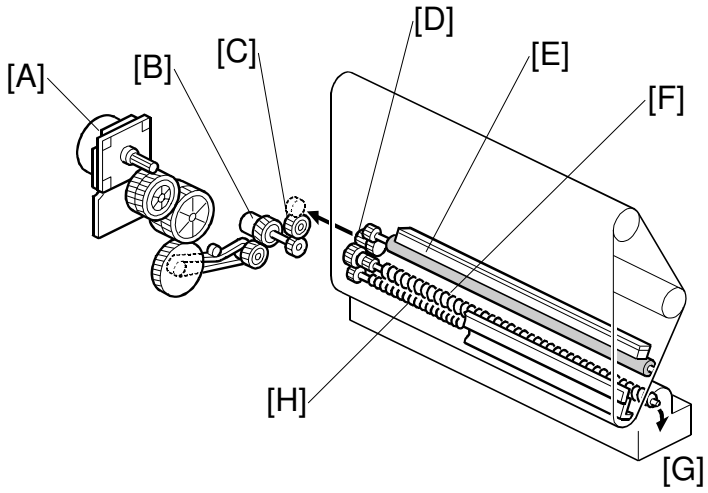
The waste toner feeler [E] at the rear of the bottle is gradually lifted as the toner level in the bottle rises. When the feeler pushes the feeler link [C], the waste toner full sensor [D] is activated and the machine detects that the bottle is full.

When the bottle becomes full, a message appears on the operation panel. The machine can make 100 more prints, then further printing is disabled.

The bottle has a cap on the waste toner outlet. Empty the bottle when you visit the customer.

Drive

[A]: Development motor
[B]: OPC belt cleaning clutch
[C]: Gear
[D]: Gear
[E]: Cleaning brush
[F]: Toner collection auger 1
[G]: Opening for waste toner
[H]: Toner collection auger 2



B051D312.WMF

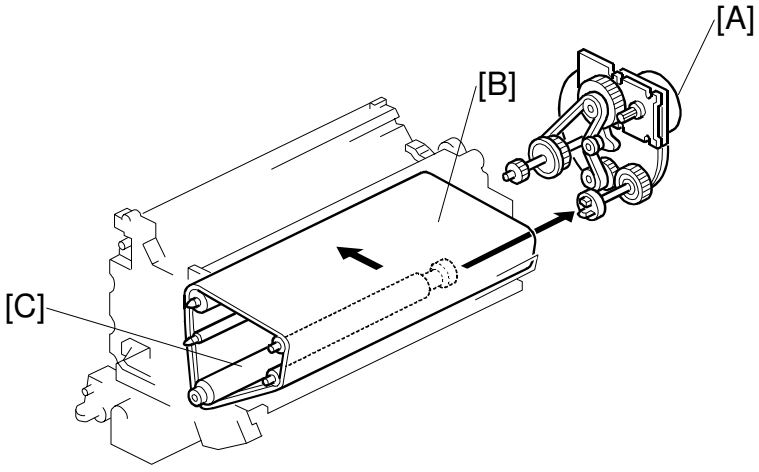
Development motor [A] ➔ Gear ➔ Timing belt ➔ OPC belt cleaning clutch [B] ➔ Gears [C, D] ➔ OPC belt cleaning unit (including the brush and toner collection augers)

The clutch cuts the drive to the cleaning unit when the development motor reverses (this is done at intervals to prevent toner blockages in the development unit).

6.7.5 IMAGE TRANSFER BELT UNIT

Drive

[A]: Main motor
[B]: Image transfer belt
[C]: Bottom shaft (rubber coated)



B051D314.WMF

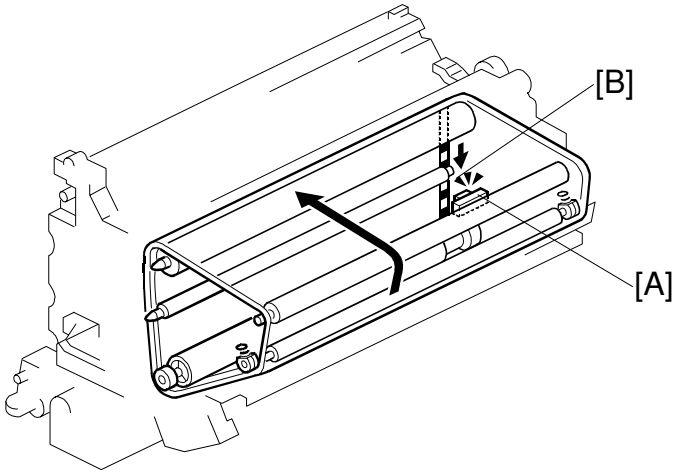
Main motor [A] ➔ Gears & timing belt ➔ Bottom shaft [C]

The bottom shaft can drive the transfer belt because of the friction between the belt [B] and the rubber coating on the shaft [C].

NOTE: The transfer belt and OPC belt contact each other. If you wish to inspect the transfer belt by turning it, you must also turn the OPC belt at the same time to avoid damaging the surfaces of the belts.

Belt Mark Detection

[A]: Belt mark sensor
[B]: Mark



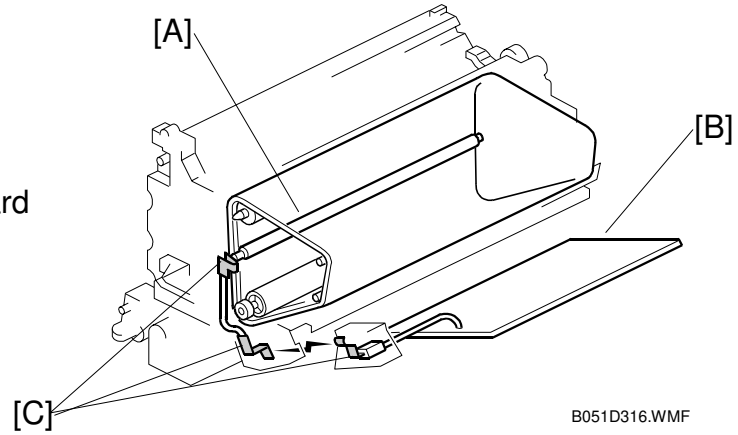
B051D315.WMF

The belt mark sensor is a reflective photosensor.

To exactly synchronize the four mono-color toner images on the image transfer belt, the belt mark sensor [A] monitors the belt speed. The sensor detects the light reflected by the marks [B] at the rear end of the belt (25 marks per rotation; mark frequency: 21 mm). The sensor output is used to control the belt speed.

Transfer Roller

[A]: Transfer roller
[B]: High voltage supply board
[C]: Terminal plates



B051D316.WMF

The transfer roller [A] attracts toner from the OPC belt to the image transfer belt by using a positive charge.

The terminal in the middle of the PCU contacts the terminal on the transfer roller shaft when the image transfer belt unit is installed in the PCU.

The current is adjusted based on environmental temperature and humidity.

6.7.6 IMAGE TRANSFER BELT CLEANING UNIT

[A]: Cleaning blade
[B]: Toner collection auger 1
[C]: Image transfer belt
[D]: Toner conduit
[E]: Waste toner sensor feeler
[F]: Waste toner bottle switch
[G]: Actuator
[H]: Waste toner full sensor
[I]: Waste toner bottle
[J]: Transfer roller
[K]: Toner collection auger 2
[L]: Cleaning brush
[M]: Lubricant bar
[N]: Cleaning roller

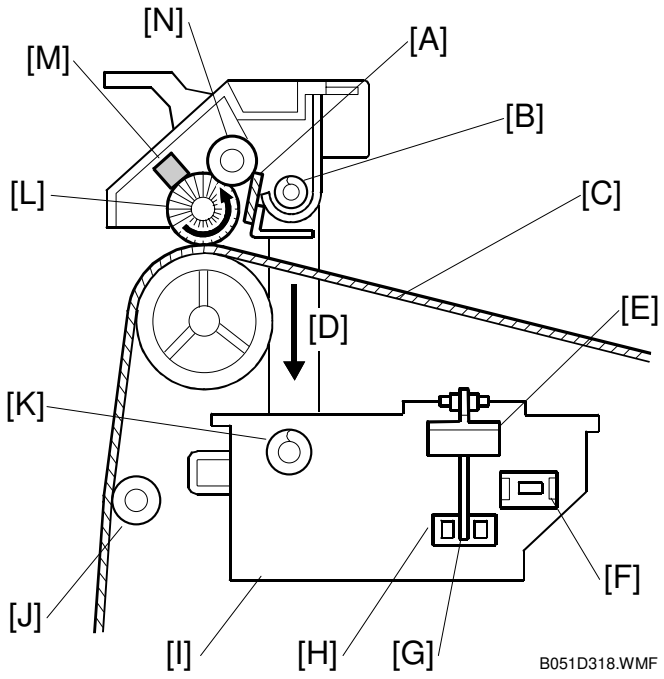


Image Transfer Belt Cleaning

Cleaning roller [N] is positively charged, and transfers this charge to the cleaning brush [L].

The cleaning brush attracts residual toner from the image transfer belt [C]. This toner is attracted to the cleaning roller, where it is removed by the cleaning blade [A].

Waste Toner Collection

The toner removed by the cleaning blade is transported by the toner collection auger 1 [B] to the rear, where it falls into the toner bottle [I] through the toner conduit [D].

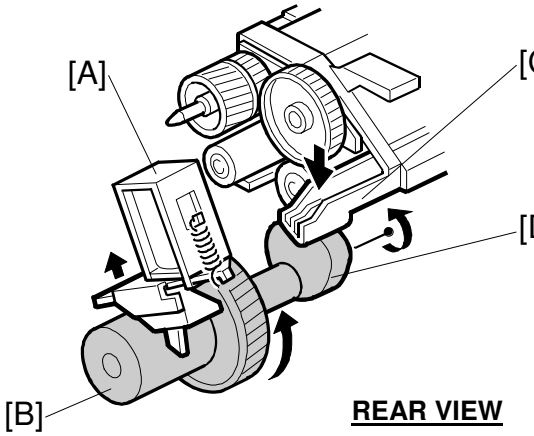
Toner collection auger 2 [K] levels the toner in the bottle.

There is a shutter on the top of the waste toner bottle. While out of the unit, the shutter is kept closed by a spring attached to it. When it is put back in the unit, a hook on top of the shutter is caught by the image transfer belt unit, and the shutter opens.

Set Switch and Full Sensor

When the bottle is full, a message appears on the operation panel. After this, 100 more prints can be output. Then the machine stops and printing is disabled.

Contact Mechanism



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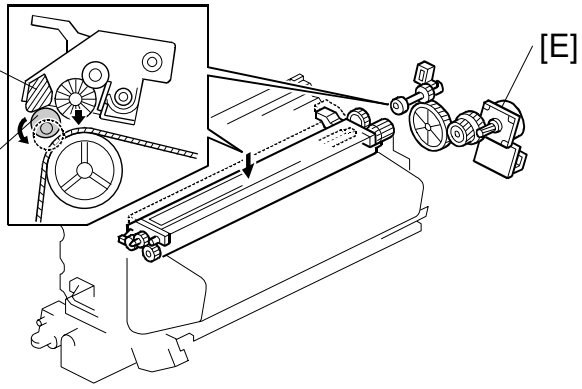


REAR VIEW

B051d320.WMF

[A]: Image transfer belt cleaning contact solenoid
[B]: Half-turn clutch
[C]: Lever
[D]: Cam
[E]: Fusing unit motor

The fusing unit motor [E] drives the image transfer belt cleaning unit and the contact mechanism.

When the toner images are being transferred from the OPC belt to the image transfer belt, the image transfer belt cleaning unit must be kept away from the belt. The unit contacts the belt only while cleaning the belt.

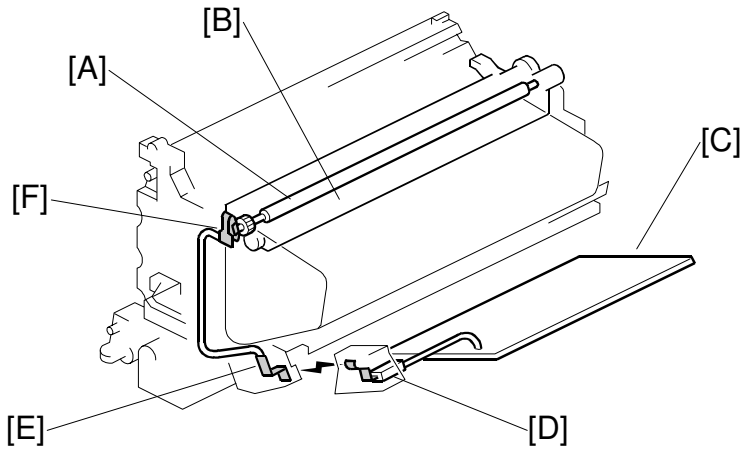
NOTE: During standby mode, the cleaning unit is away from the image transfer belt.

When the image transfer belt cleaning contact solenoid [A] is off, it catches a hook on the surface of the half-turn clutch [B]. As a result, the high point of the cam pushes the lever [C], and the cleaning unit is away from the transfer belt.

When the solenoid activates, the hook is released, drive from the motor is transferred from the gear to the clutch, the cam [D] makes half a turn, the lever drops, and the cleaning unit contacts the transfer belt

Power Supply

[A]: Cleaning brush
[B]: Cleaning roller
[C]: High voltage supply
[D]: Contact spring
[E]: Contact spring
[F]: Contact spring

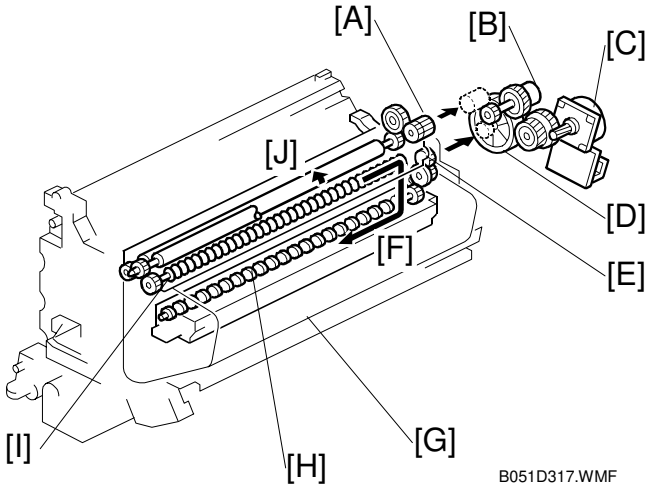


The cleaning roller [B] charges the cleaning brush, and attracts toner from it.

The high voltage supply [C] supplies positive charge to the cleaning roller via the harness and contact springs (leaf springs) [D, E, and F].

Drive

[A]: Gear 1
[B]: Image transfer belt cleaning clutch
[C]: Fusing unit motor
[D]: Drive gear
[E]: Gear 2
[F]: Toner path
[G]: Image transfer belt
[H]: Toner collection auger 1
[I]: Toner collection auger 2
[J]: Turning direction of the cleaning brush

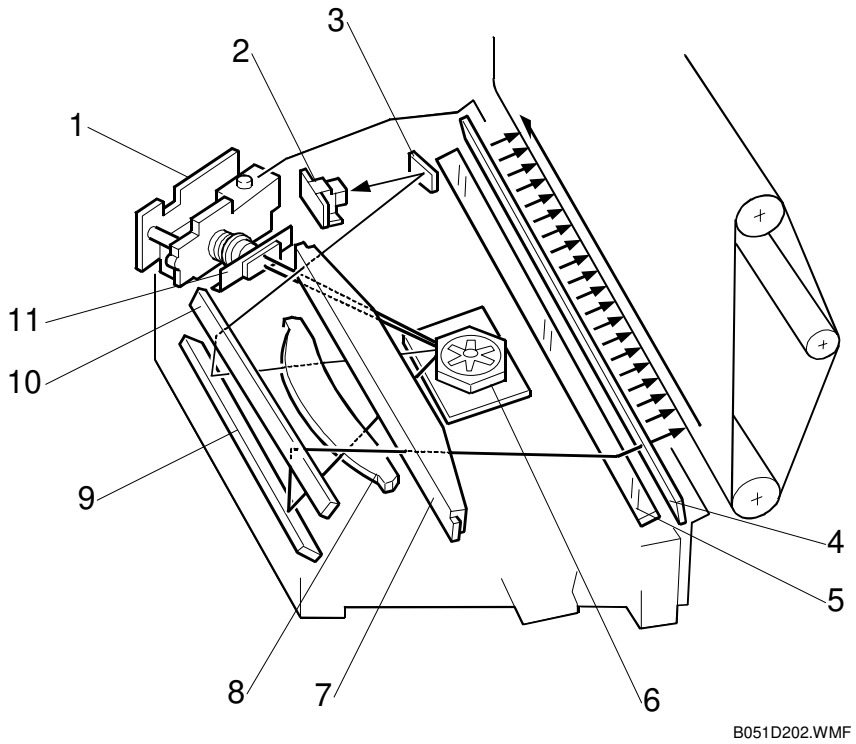


Fusing unit motor [C] ➔ drive gear [D] ➔ gears [A] and [E] ➔ cleaning brush [J] and toner collection augers [H and I]

The clutch [B] controls the on/off timing of the mechanism.

6.8 LASER EXPOSURE

6.8.1 OVERVIEW



1. LD Unit
2. Synchronization Detector
3. Synchronization Detector Mirror
4. Dust Shield Glass
5. 3rd Mirror
6. Polygon Mirror Motor Unit
7. W-Toroidal lens (WTL)
8. Fθ Lens
9. 1st Mirror
10. 2nd Mirror
11. Cylindrical Lens

6.8.2 POLYGON MIRROR MOTOR UNIT

Speed

The polygon mirror motor rotates at about 21,024 rpm.

6.8.3 SYNCHRONIZATION DETECTOR

The synchronization detector is on the rear side of the laser optics housing unit.

The synchronization detector simultaneously checks 2 laser beams.

6.8.4 LD UNIT

Two laser diodes in the LD unit emit 2 main-scan laser-beams. Having two lasers speeds up image creation. It also allows the polygon motor to operate at a lower speed, which cuts down noise emission and makes the motor last longer.

The LD unit does not need any adjustment when replaced.

6.8.5 LD SAFETY SWITCH

Front Door

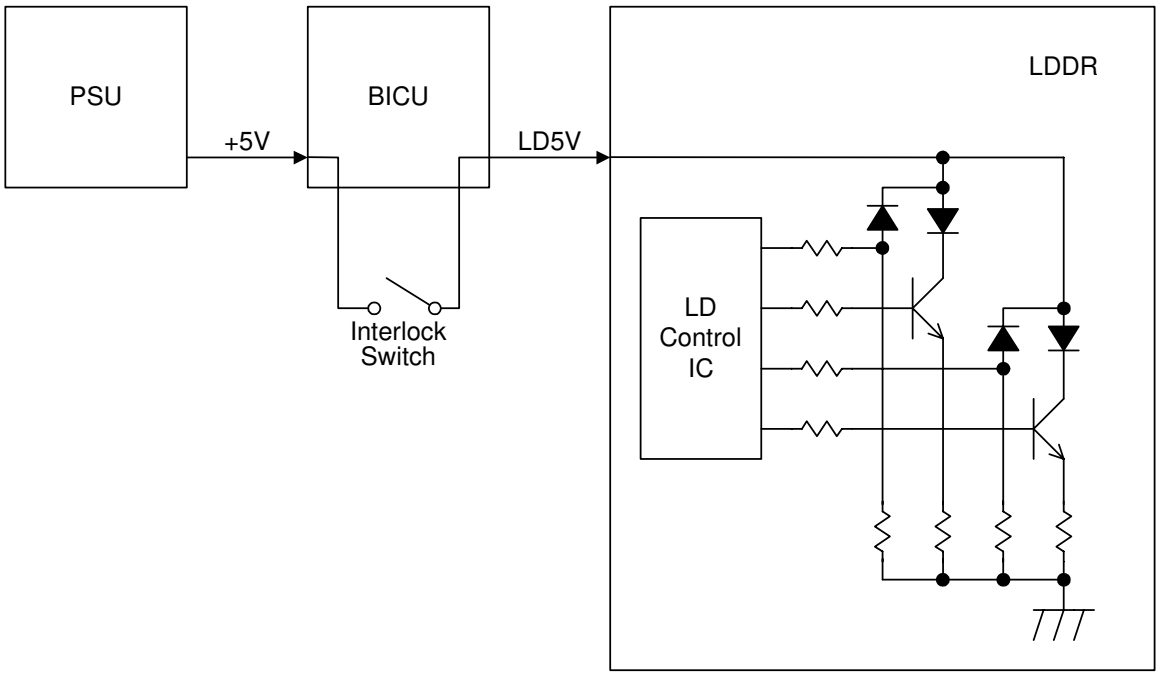
The LD safety switch is the interlock switch. This switch is on the upper end of the front cover. This switch is linked to the following covers:

Front cover
Right cover

The switch prevents laser emission if any of the above covers is opened.

Circuit

The LD safety switch is on the 5V circuit leading to the LD unit. Between the switch and the unit, the line has 2 contacts on the front door and on the right door (series circuit). When either of the covers is opened, the power supply is interrupted, preventing laser emission.



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Operation Panel Display and Switch Mechanism

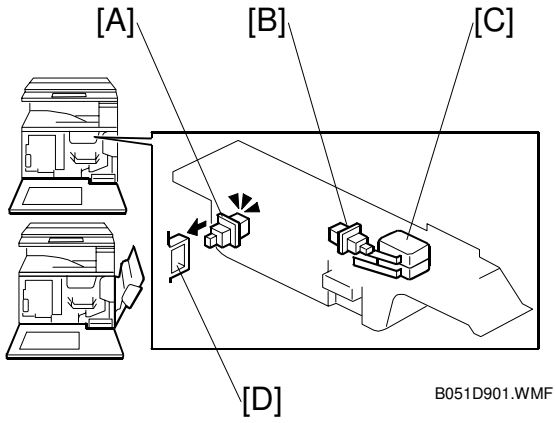
The front cover switch [A], right cover switch [B], and interlock switch [C] detect the positions of the front and right covers. When either or both covers are open, the message, “Open Cover”, appears with an illustration indicating which covers are open.

The tables show the switch patterns and detected cover positions.

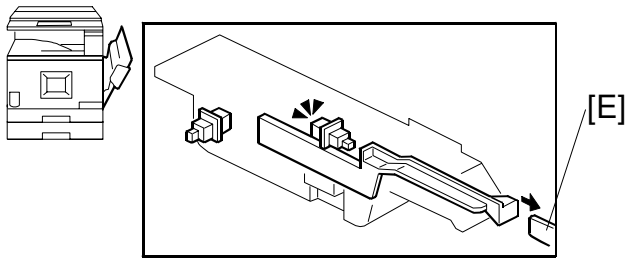
Front cover switch	Off
Right cover switch	On
Interlock switch	Off
→ Front cover open	

Front cover switch	Off
Right cover switch	Off
Interlock switch	Off
→ Front and right covers open	

Front cover switch	On
Right cover switch	Off
Interlock switch	Off
→ Right cover open	



B051D901.WMF

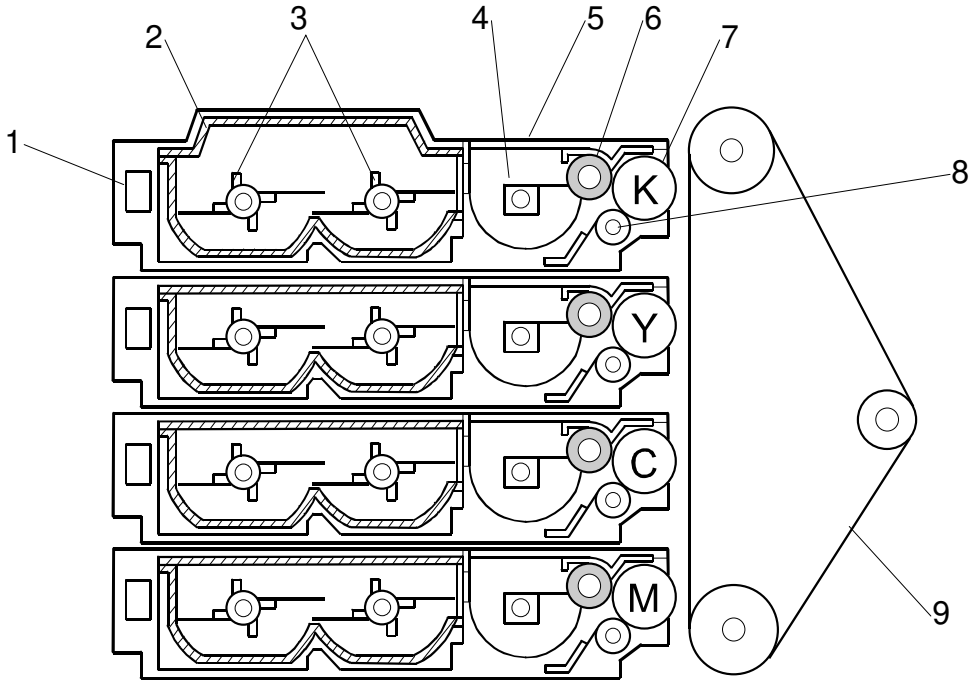


B051D902.WMF

[A]: Front cover switch
[B]: Right cover switch
[C]: Interlock switch
[D]: Actuator (front cover)
[E]: Actuator (right cover)

6.9 DEVELOPMENT

6.9.1 OVERVIEW



B051D351.WMF

K: black, **Y**: yellow, **C**: cyan, **M**: magenta

1. Memory chip
2. Toner cartridge
3. Toner cartridge agitators
4. Development agitator
5. Development unit
6. Toner supply roller
7. Development roller
8. Doctor roller
9. OPC belt

☛ CT: Development – Mono-component Development – Double Development Roller Process

The development units operate in the following order: K → M → C → Y

6.9.2 DEVELOPMENT UNIT

Replacing Units

Recovery: Each new development unit spare part contains a starter toner cartridge. When the machine detects the memory chip on the new starter cartridge, it will clear the development unit end condition. The memory chip on a normal toner cartridge cannot clear the development unit end condition.

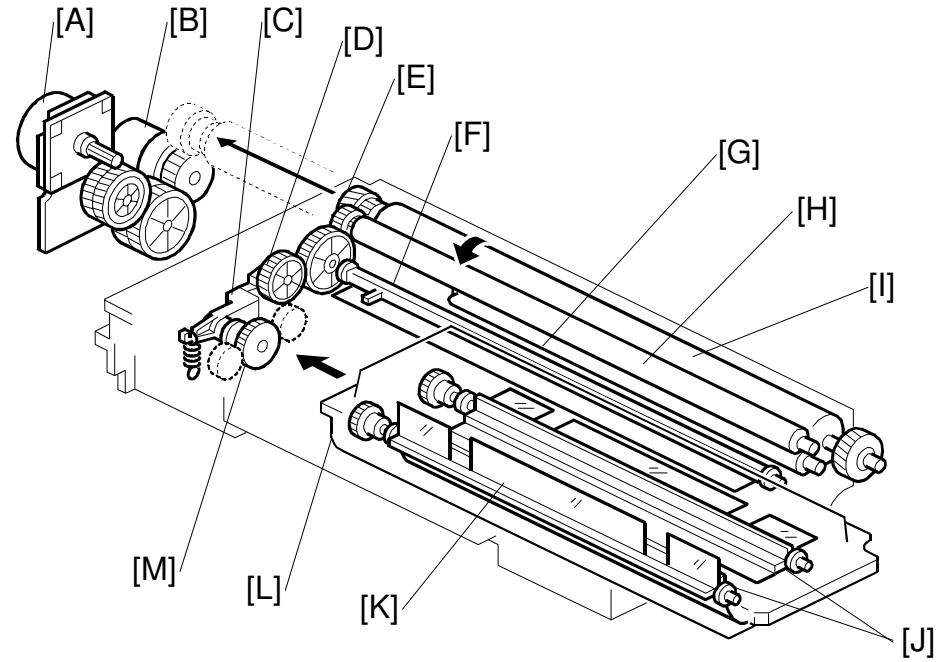
A starter toner cartridge has more paddles on the toner cartridge agitators than a normal toner cartridge does. This is to transport toner more quickly from the cartridge into the toner hopper.

When a development unit has to be replaced, use a starter toner cartridge in the development unit even if toner remains in the used normal toner cartridge. After the toner in the starter toner cartridge is all used up, the normal toner cartridge can be loaded into the development unit.

Memory Chip

Each toner cartridge contains a memory chip, which contains information on whether the cartridge is “new” or “not new”.

6.9.3 TONER SUPPLY MECHANISM



B051D301.WMF

[A]: Development motor
[B]: Development clutch
[C]: Lever
[D]: Cam (built into the gear)
[E]: Development roller gear
[F]: Development unit agitator
[G]: Doctor roller
[H]: Toner supply roller
[I]: Development roller
[J]: Toner cartridge agitators
[K]: Mylar sheet
[L]: Toner cartridge
[M]: Toner cartridge agitator gear

Drive

Development motor [A] → development clutch [B] → lever [C] → agitators [J].

Development motor [A] → development clutch [B] → development roller gear [E] → development roller [I]

Rollers and Agitators

Each toner cartridge contains two toner cartridge agitators [J]. They are equipped with several mylar sheets [K], which agitate the toner and send it to the development unit agitator [D]. The development unit agitator agitates the toner and sends it to the toner supply roller [H].

Toner cartridge agitators:	Evenly mixes the toner in the cartridge, and sends it to the development unit
Development agitator:	Evenly mixes the toner in the development unit, and sends it to the toner supply roller
Toner supply roller [H]:	Supplies the development roller with toner
Development roller:	Transfers the toner to the OPC
Doctor roller [G]:	Regulates the amount of the toner on the development roller

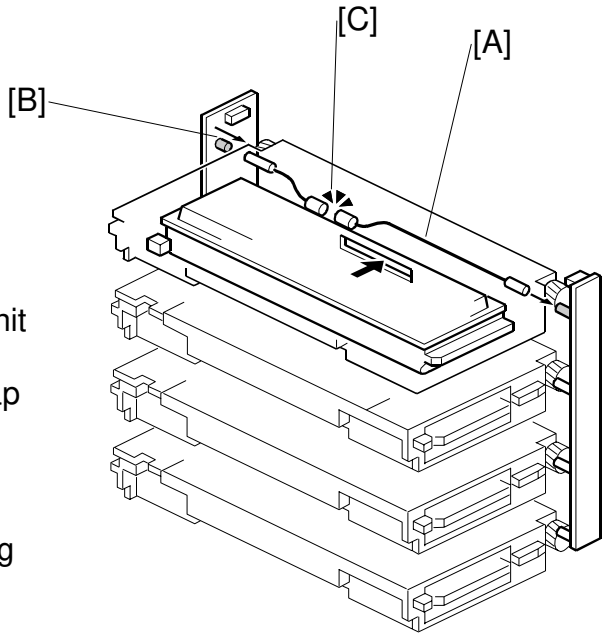
Shutter

Each toner cartridge has a shutter on its right side. The shutter is pushed open when the cartridge is installed in the development unit, and closed when removed from the unit.

6.9.4 TONER END DETECTION

Mechanism

[A]: Optic fiber
[B]: Light emission
[C]: Gap



B051D303.WMF

An optic fiber [A] in each development unit detects toner end. Light is emitted from the rear end [B] of the unit. There is a gap [C] in the optic fiber.

When the development unit is filled with toner, the toner breaks the light path through the gap. When the unit is running out of toner, the light path is not broken.

Toner Near-End Detection

The machine uses two methods simultaneously: pixel count, and toner end sensor. If either of these methods detects near-end, the machine indicates near-end.

Near-End by Pixel Count

The machine counts how many pixels have been printed with each toner cartridge. When there are 500 prints remaining until the estimated toner end condition, toner near-end is indicated.

Near-End by Toner End Sensor

- If the toner end sensor output drops to toner end level, counter 1 is set to 1.
- If the above condition (counter 1 is 1) is detected twice accumulated 14 seconds while the development clutch is activated, counter 2 is set to 1.
- If the above condition (counter 2 is 1) is detected twice continuously, the machine enters the toner supply mode after the job.

The above detection is carried out while the development clutch is activated.

Toner supply mode after the job:

- The development unit with the almost-empty cartridge idles for 40 s.
- Then, it idles again for another 20 s.
- During this 20 s period, the toner end sensor is checked every 10 ms. If a low toner condition is not detected during this 20 s period, the machine returns to standby mode after idling all development units for 90 s.
- However, if a low toner condition was detected during that 20 s period, the machine indicates toner near-end.

Toner End Detection

When any one of the following conditions occurs, toner end is indicated.

1. If near-end was detected by pixel count:
   The remaining pixel count reaches 0.
2. If near-end was detected by toner end sensor:
   Either 100 developments or 100 prints at 5% coverage are made since near-end was detected.
3. If near-end was detected by pixel count, and later it was detected by toner end sensor again before toner end:
   Either the remaining pixel count reaches 0, or 100 developments or 100 prints at 5% coverage are made since near-end by toner end sensor was detected.

Toner End Recovery

When the machine detects a new toner cartridge, it drives the development unit for that cartridge for about 3 minutes.

During this time, the development clutch is repeatedly activated for 10 s and deactivated for 1 s.

The machine checks the toner end condition every 20 s. The end and near-end conditions are cleared if the sensor detects sufficient toner. However, if the sensor does not detect sufficient toner after 5 minutes of development unit drive, the toner end condition remains and a new cartridge must be added.

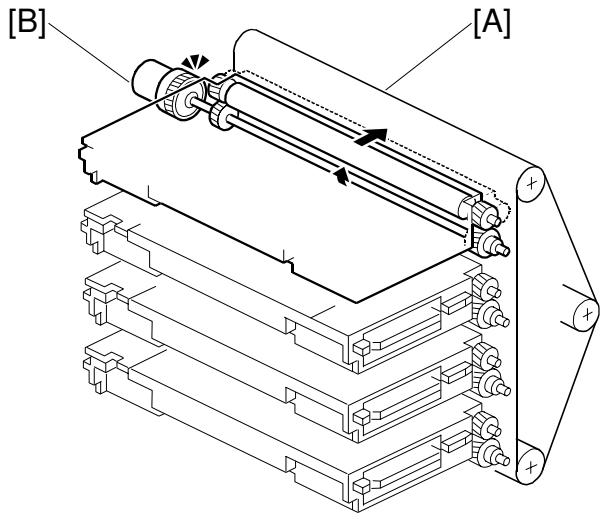
6.9.5 DEVELOPMENT UNIT CONTACT MECHANISM

Mechanism

Each development unit has an independent clutch. When a development clutch turns on, a gear under the development unit moves the development unit into contact with the OPC belt. When the clutch turns off, two springs (one at the front and one at the rear) detach the development unit from the OPC belt.

☛ CT Color Processes – Color Development – Fixed Position Development Systems – Similar to Example 2: Model G033

[A]: OPC belt
[B]: Development clutch



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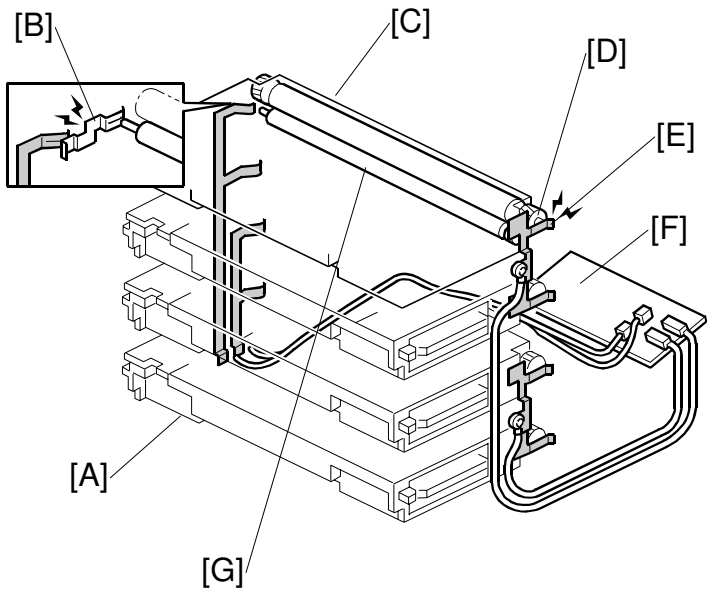
Reverse Rotation

The gears reverse at intervals to prevent toner from clumping.

6.9.6 POWER SOURCE

[A]: Development unit
[B]: Rear-side terminal
[C]: Development roller
[D]: Bias terminal
[E]: Harness terminal
[F]: High voltage supply
[G]: Doctor roller



Development, Toner Supply, and Doctor Rollers

When a development unit [A] comes into contact with the OPC belt, the bias terminal [D] comes into contact with the harness terminal [E]. Then, a negative charge is supplied to the unit.

The negative charge on the doctor roller is the same size as the charge on the development roller and toner supply roller.

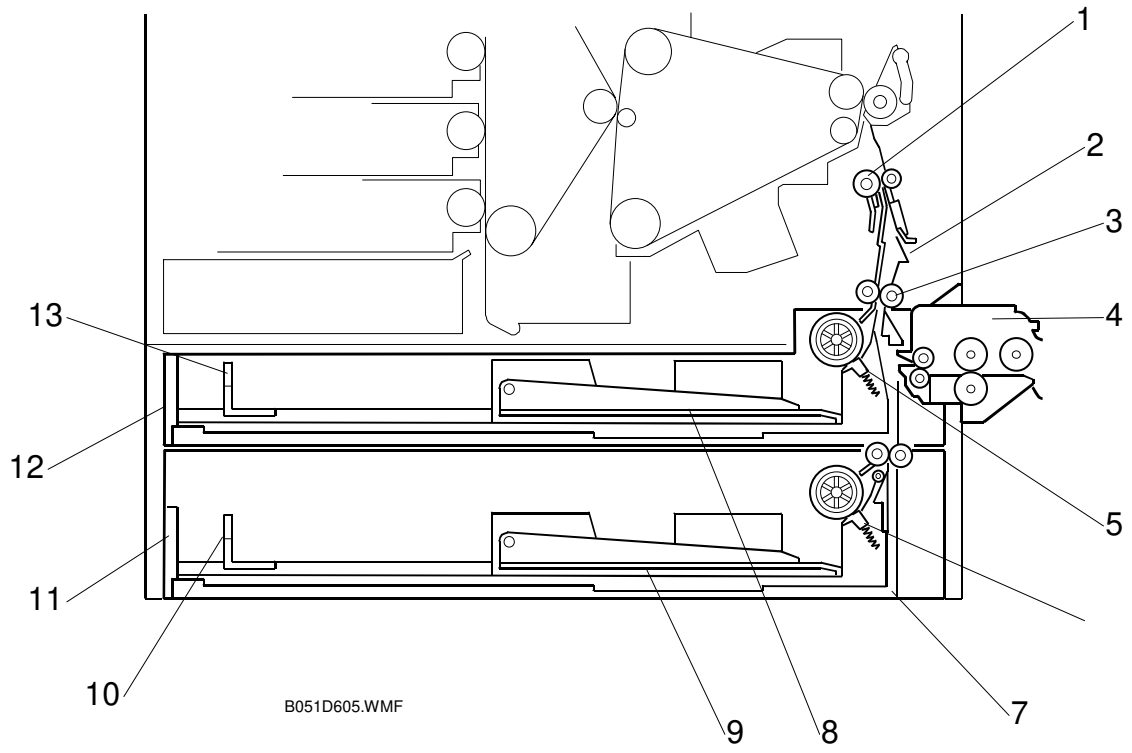
Doctor Roller

The doctor roller [G] restricts the amount of toner on the development roller [C]. The high voltage supply [F] applies a charge to the doctor roller through the rear-side terminal cable [B]. This charge is the same as the charge applied to the development roller. However, the development roller charge is applied through a different terminal [E].

☛ CT Mono-component Development – Toner Metering Blade (similar principle)

6.10 PAPER FEED

6.10.1 OVERVIEW



1. Registration roller
2. Path from duplex unit
3. Vertical transport roller
4. By-pass tray
5. Friction pad with spring (Tray 1)
6. Friction pad with spring (Tray 2)
7. Path from optional paper tray
8. Base plate (Tray 1)
9. Base plate (Tray 2)
10. Paper end fence (Tray 2)
11. Tray 2
12. Tray 1
13. Paper end fence (Tray 1)

The table lists the main and optional paper stations.

Tray	Number	Main/Optional
Standard tray	2	Main unit
By-pass tray	1	Optional unit
Paper tray unit	2	
LCT	1	

Transport Speed

Until the registration roller, the paper travels at 240 mm/s. This high initial speed ensures that the first output time is as short as possible.

From the registration roller to the exit, the paper travels at the following speeds:

178 mm/s (plain paper)
89 mm/s (thick paper or OHP films)

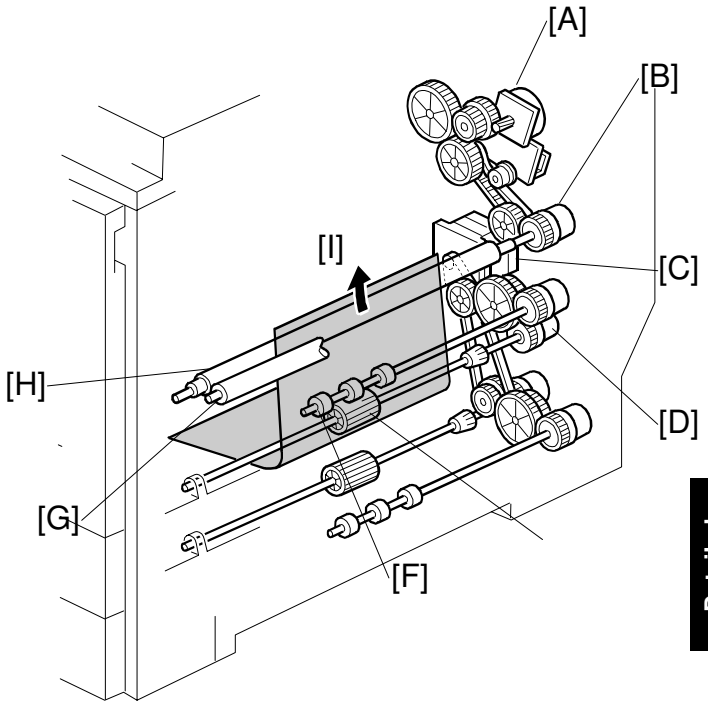
Friction Pad

☛ CT Handling Paper – Paper Feed – Paper Feed Methods – Friction Pad

NOTE: Replace the roller and pad as a unit (not separately).

6.10.2 DRIVE MECHANISM

[A]: Fusing unit motor
[B]: Registration clutch
[C]: Feed motor
[D]: Feed clutch
[E]: Feed roller
[F]: Vertical transport roller
[G]: Idle roller
[H]: Registration roller
[I]: Paper



B051D602.WMF

Feed and Vertical Transport

The feed motor [C] drives the feed roller [E] and the vertical transport roller [F].

The action of the feed roller is controlled by the feed clutch [D].

Registration

The fusing unit motor [A] drives the registration roller [H], under the control of the registration clutch [B].

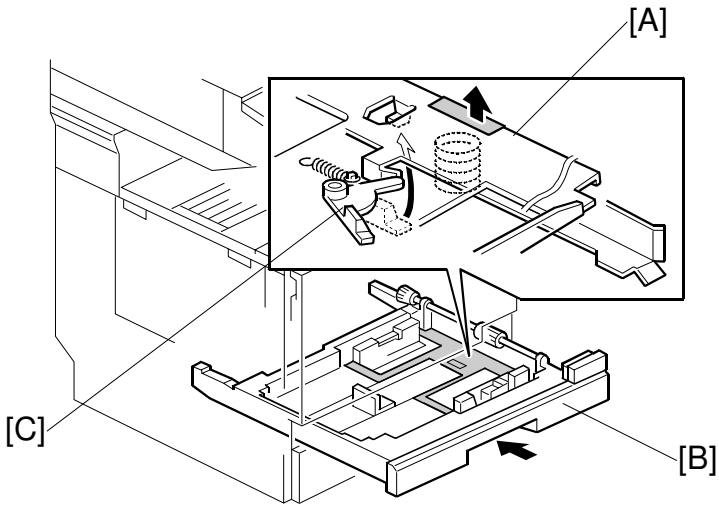
The idle roller [G] facing the registration roller does not have any drive gears. It turns with the paper [I].

6.10.3 PAPER LIFT

Lift Mechanism

The spring under the bottom plate [A] presses the plate upward. When you press the bottom plate as far down as possible, the hook on lever [C] holds the plate. The lever releases the bottom plate when it is pressed by the protruding part on the right tray rail; this happens when the tray [B] is completely pushed into the machine.

[A]: Bottom plate
[B]: Tray
[C]: Lever



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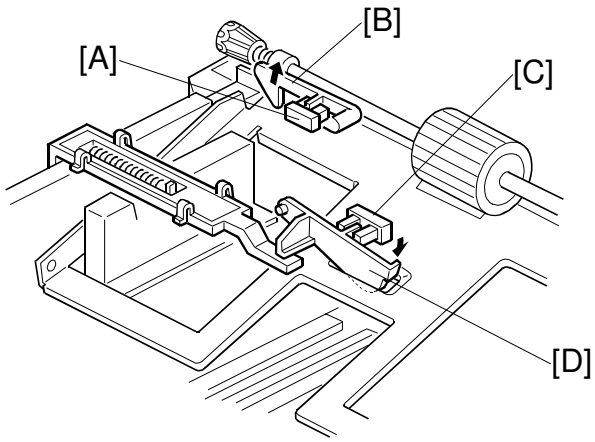
Paper End/Near-End Detection

[A]: Paper near-end sensor
[B]: Paper near-end sensor feeler
[C]: Paper end sensor
[D]: Paper end sensor feeler



B051D606.WMF

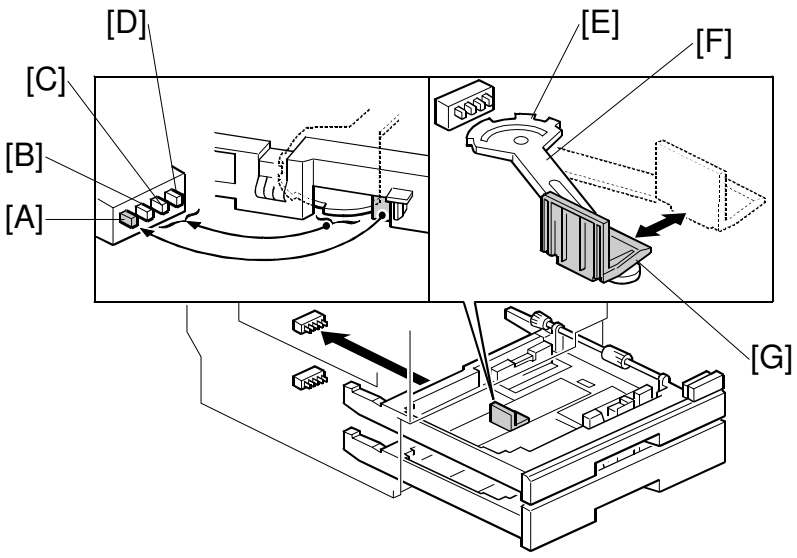
The bottom plate gradually rises as paper is fed. The bottom plate position is checked with the near-end sensor feeler [B]. The sensor [A] is actuated when about 50 sheets are left in the tray, and the paper near-end message appears on the operation panel.

When paper runs out, the paper end sensor feeler [D] drops into the cutout in the bottom plate. This actuates the sensor [C], and the paper end message appears on the operation panel.

6.10.4 PAPER SIZE DETECTION

Mechanism

[A]: Tray set switch
[B]: Paper size switch
[C]: Paper size switch
[D]: Paper size switch
[E]: Actuator
[F]: Lever
[G]: End fence



B051D604.WMF

The end fence [G] moves the lever [F], which moves a different set of notches on the actuator [E] into contact with the paper size switches [B]~[D].

When you put the tray in the main unit, the rear fence of the tray and the actuator activate the switches; from this the machine detects the presence of the tray, and the paper size.

Switch Pattern

When the tray is pushed into the machine, the leftmost switch [A] is always activated by the rear fence of the tray; this switch detects the presence of the tray. The combination of the other 3 switches [B]~[D] detects the paper size.

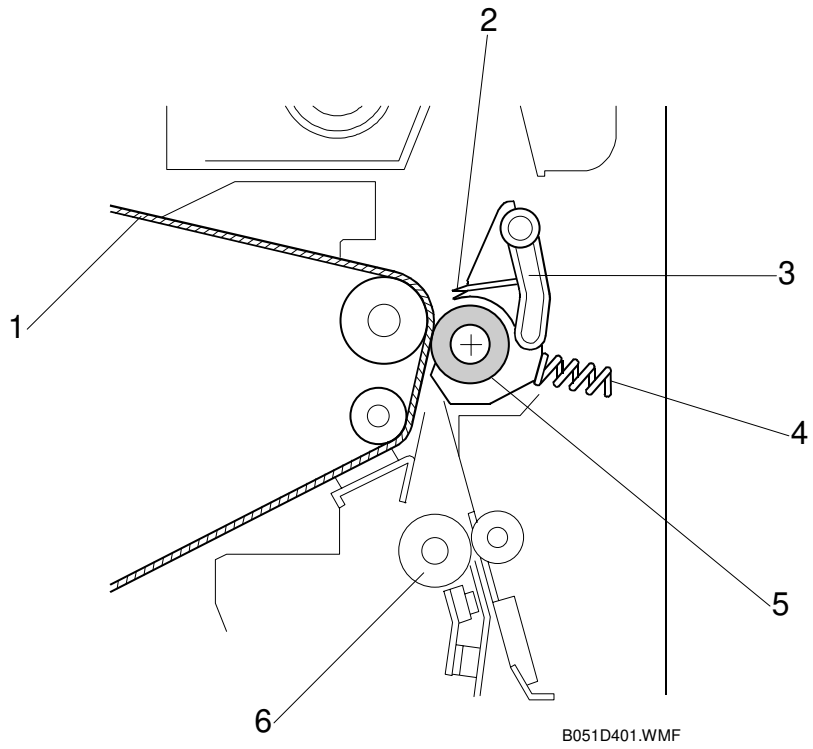
Auto Detection		Switch*			
North America	**Europe/Asia**	**[A]**	**[B]**	**[C]**	**[D]**
DLT SEF	A3 SEF	On	Off	On	On
LG SEF	B4 SEF	On	On	On	On
A4 SEF		On	On	Off	Off
LT SEF		On	Off	Off	Off
B5 SEF	10.5" x 7.25" SEF	On	Off	Off	On
LT LEF	A4 LEF	On	On	On	Off
B5 LEF		On	On	Off	On
—	A5 LEF	On	Off	On	Off
(No tray)		Off	Off	Off	Off

* On: Pushed Off: Not pushed

NOTE: 1) For the input check table, ☛ 5.2.2.
2) Other paper sizes are not detected. Use the System Settings - Tray Paper Settings - Tray Paper Size user tool to set paper sizes.

6.11 PAPER TRANSFER AND SEPARATION

6.11.1 OVERVIEW



1. Image transfer belt
2. Discharge plate
3. Separation lever
4. Spring
5. Paper transfer roller
6. Registration roller

Jammed Paper Release

When you open the right cover, the units release the paper. This mechanism helps quickly clear paper jams.

Image Transfer and Paper Separation

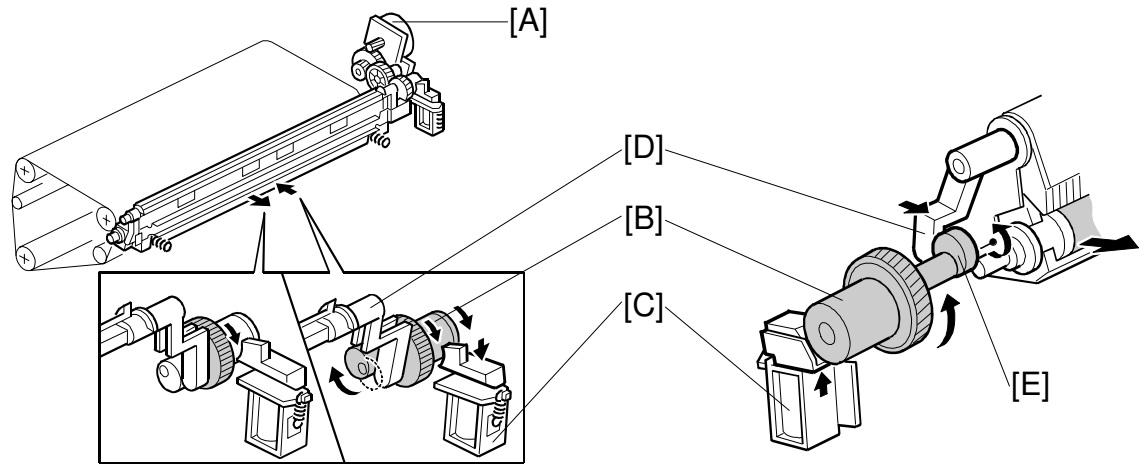
☛CT Photocopying Processes – Image Transfer and Paper Separation – Transfer Roller + Discharger – Example 2: Models A172/A199

The current is adjusted based on paper weight and environmental temperature and humidity.

A user tool specifies the paper weights. If “Plain” is selected, then another user tool defines when the paper is “normal” or “> 90 g/m^2, 24lb”.

- “Plain” means normal or > 90 g/m^2, 24lb.
- “Thick” means paper heavier than 105 g/m^2 (28 lb).

6.11.2 CONTACT/SEPARATION MECHANISM



B051D403.WMF B051D404.WMF

[A]: Fusing unit motor
[B]: Half-turn clutch
[C]: Paper transfer solenoid
[D]: Contact/separation lever
[E]: Cam

Timing

When transferring toner to paper, the paper transfer roller unit contacts the image transfer belt. At other times during printing, the unit stays away from the image transfer belt. After printing, the unit contacts the belt and stays there.

NOTE: During standby mode, the unit stays away from the image transfer belt.

Mechanism

Fusing unit motor [A] → Gear → Paper transfer solenoid [C] → Cam [E] → Contact/separation lever [D] → Paper transfer roller unit movement

The fusing unit motor [A] drives the mechanism. (It also drives the paper transfer roller).

The cam [E] is controlled by the half-turn clutch [B] and the paper transfer solenoid [C].

When the solenoid is off, it catches a hook on the surface of the half-turn clutch [B]. As a result, the high point of the cam pushes the contact/separation lever [D], and the paper transfer roller unit is away from the belt.

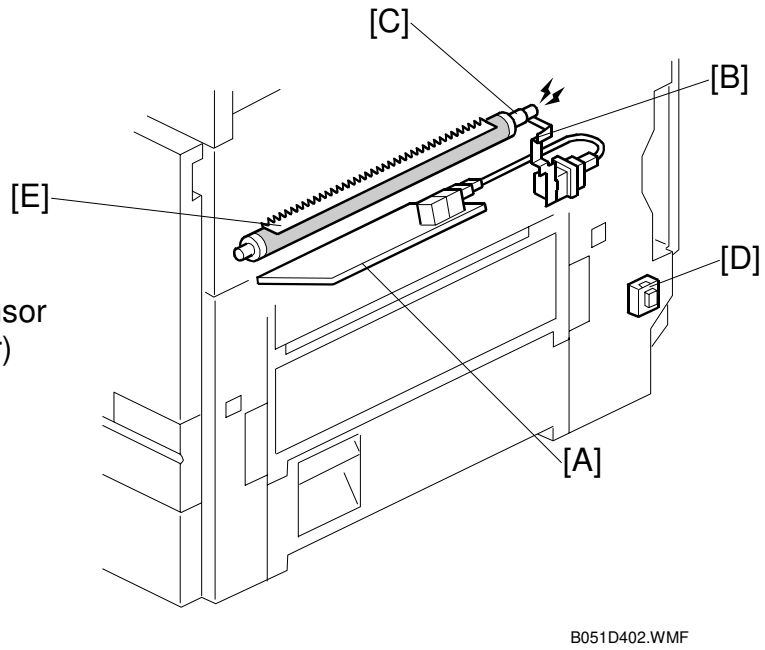
When the solenoid is activated, the hook is released, so the half-turn clutch makes a half-turn—the unit moves to the right and contacts the image transfer belt.

6.11.3 POWER SUPPLY

Circuit

High voltage supply [A] → Terminal [B] → Paper transfer roller shaft [C]

[A]: High voltage supply
[B]: Terminal
[C]: Paper transfer roller shaft
[D]: Temperature-humidity sensor (inside the rear-right cover)
[E]: Discharge plate (negative charge)



B051D402.WMF

Paper Transfer Roller Bias

Normally, a constant current is applied to the paper transfer roller shaft [C].

The current varies with paper type, size, and thickness as well as humidity.

Discharge Plate

The discharge plate [E] discharges the remaining charge on the paper going past the paper transfer roller. This helps the paper separate from the image transfer belt.

Temperature/Humidity Control

The temperature-humidity sensor [D] is inside the rear-right cover. The sensor output is used to control the current for the paper transfer roller.

The temperature and humidity can be read with SP2-912.

Roller Cleaning

The paper transfer roller is cleaned at the following times:

- After the user clears a paper jam
- After the user closes the front cover
- Just after the main power has been switched on
- While the doctor roller is reversing. This is done every 50 prints (SP3-910), to remove toner blockages in the development unit; if the 50-print interval expires in the middle of a job, it is done at the end of the job.

After paper passes the paper transfer roller, the paper transfer solenoid releases the paper transfer roller from the image transfer belt.

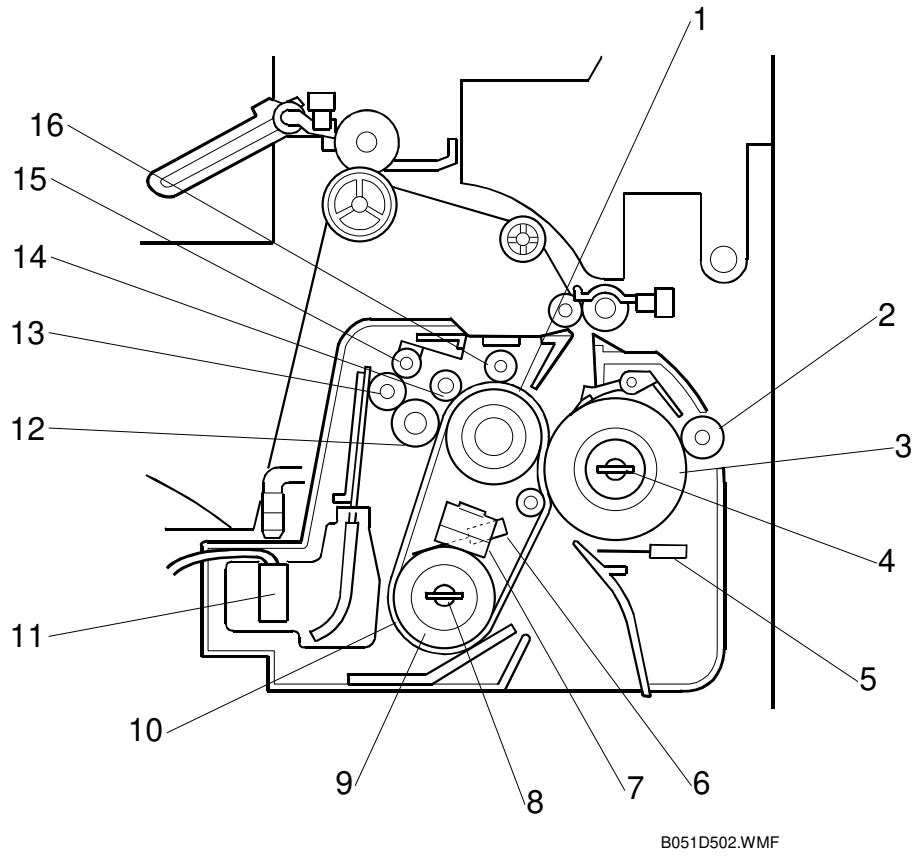
Then, a certain time after the trailing edge of the paper passes the registration sensor, the following steps occur:

1) The paper transfer solenoid turns on again, and the paper transfer roller contacts the image transfer belt.
2) A negative charge is applied to remove toner stuck to the paper transfer roller.
3) Positive and negative charge is applied alternately to remove any toner that is still stuck to the paper transfer roller.

Toner removed from the paper transfer roller goes back to the image transfer belt, where it is removed by the image transfer belt cleaning unit.

6.12 IMAGE FUSING AND PAPER EXIT

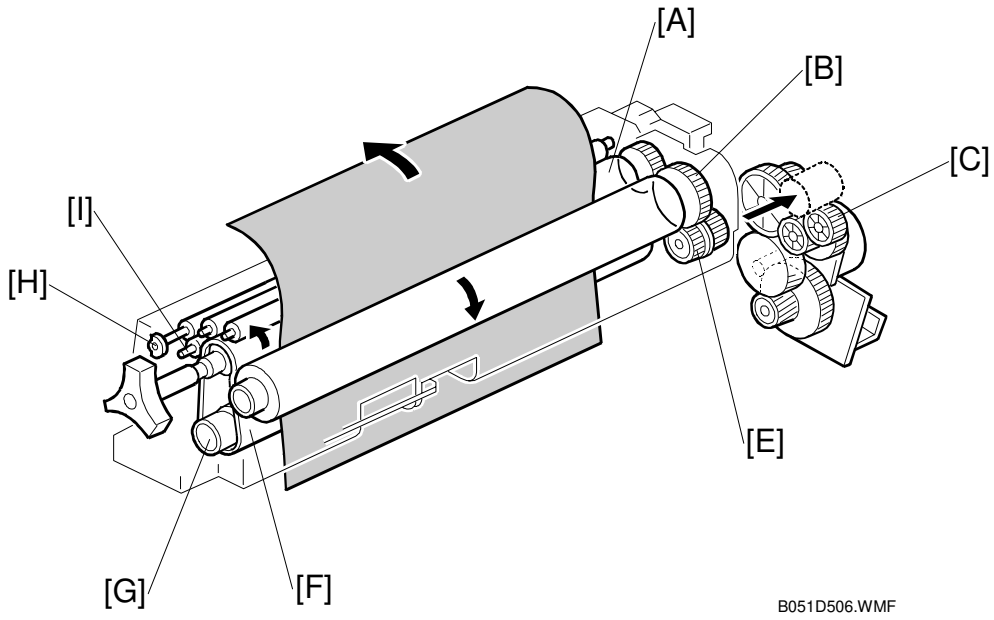
6.12.1 OVERVIEW



1. Hot roller
2. Metal cleaning roller
3. Pressure roller
4. Pressure roller fusing lamp
5. Pressure roller thermistor
6. Heating roller thermistor
7. Thermostat
8. Heating roller fusing lamp
9. Heating roller
10. Fusing belt
11. Oil overflow sensor
12. Oiling roller
13. Oil supply roller
14. Fusing sponge roller
15. Spring roller
16. Metal cleaning roller

The fusing unit divides into two subunits: the fusing subunit and the oil supply subunit.

6.12.2 DRIVE



[A]: Hot roller
[B]: Pressure roller gear
[C]: Cover disengage-ment gear
[D]: Fusing unit motor
[E]: Drive gear
[F]: Fusing belt
[G]: Heating roller
[H]: Oil supply roller
[I]: Oiling roller

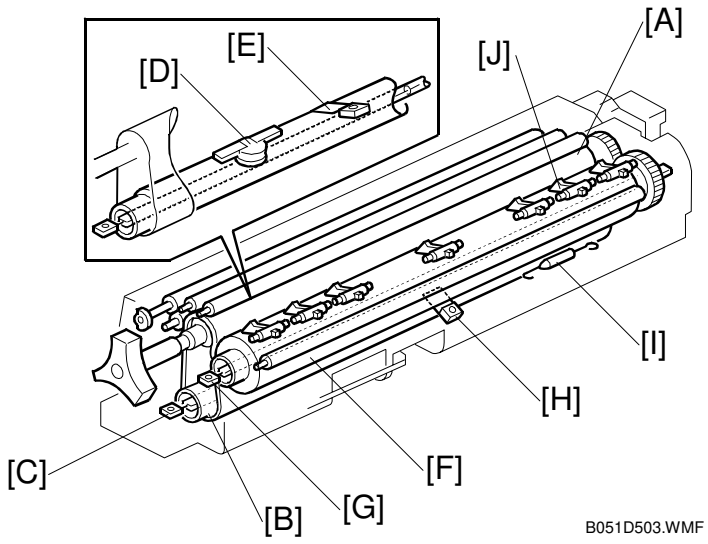
The fusing unit motor [D] drives the fusing unit through gears [C] and [E].

The hot roller [A] turns the fusing belt [F] as a result of the friction between the two.

When the right cover is open, gear [C] moves away, which allows jammed paper to be removed from the fusing unit and exit easily.

6.12.3 FUSING UNIT COMPONENTS

[A]: Fusing belt
[B]: Heating roller
[C]: Lamp (770 W)
[D]: Thermostat
[E]: Thermistor
[F]: Pressure roller
[G]: Lamp (350 W)
[H]: Thermistor
[I]: Thermofuse
[J]: Pawl



Fusing Belt

This machine uses a fusing belt [A]. The paper goes between the fusing belt and the pressure roller [F].

Heating Roller Lamp

The center of the heating roller [B] contains a lamp (770 W) [C]. The thermostat [D] and thermistor [E] control the temperature of the roller surface. The machine cuts power to the lamp when it detects 220°C. The thermostat cutoff point is 200°C.

Pressure Roller Lamp

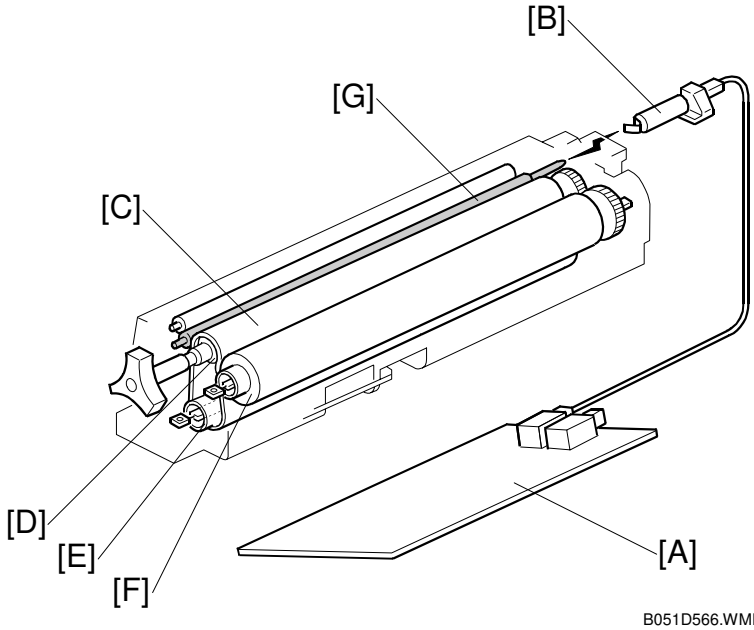
The center of the pressure roller [F] contains a lamp (350 W) [G]. The thermistor [H] and thermofuse [I] control the temperature of the roller surface.

The temperature of the surface of the pressure roller reaches to 250 °C when the pressure roller temperature rises gradually or it reaches 300 °C when it rises rapidly. Normally, the machine cuts the lamp power when the thermistor detects 220 °C.

Pressure Roller Pawls

The pawls [J] above the pressure roller help prevent paper jams.

[A]: High voltage supply
[B]: Terminal
[C]: Fusing belt
[D]: Hot roller
[E]: Heating roller
[F]: Pressure roller
[G]: Oiling roller



B051D566.WMF

Fusing Bias

The high voltage supply [A] provides the fusing bias. The fusing bias is a negative voltage that quenches static electricity created on the belt [C] and rollers [D]~[F] by the paper. This prevents the belt and rollers from attracting dust and dirt.

Fusing Unit SCs

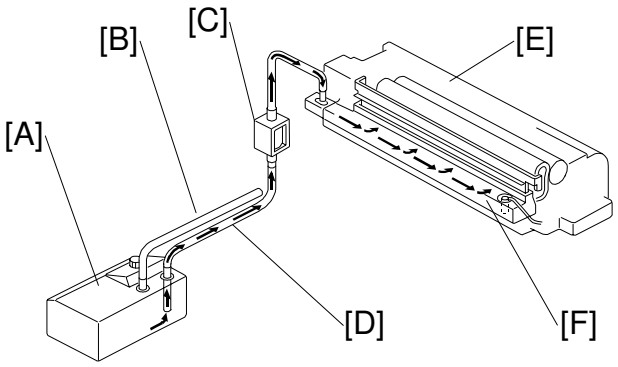
If a thermistor/thermostat problem occurs, a fusing unit SC may be displayed on the operation panel. Fusing unit SCs disable the machine (☛ 4.1.1). To reset fusing unit SCs, use SP5-810 (☛ 5.1.2).

6.12.4 OIL SUPPLY

Oil Supply

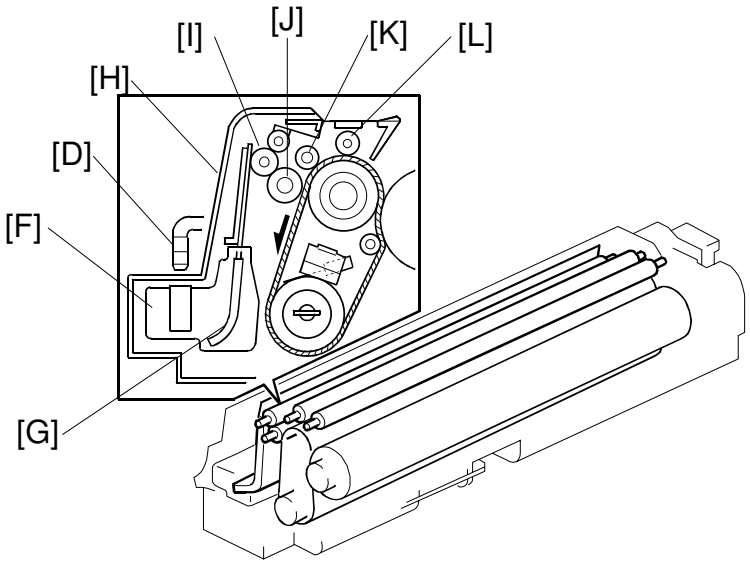
☛CT Photocopying Processes – Fusing – Oil Supply

[A]: Oil tank
[B]: Air inlet
[C]: Oil pump
[D]: Oil pipe
[E]: Fusing unit



B051D501.WMF

[F]: Oil reservoir
[G]: Felt
[H]: Oil supply unit
[I]: Oil supply roller
[J]: Oiling roller
[K]: Fusing sponge roller
[L]: Metal cleaning roller



B051D504.WMF

The technician adds oil to the oil tank [A] in the bottom-left corner inside the rear cover.

The oil pump [C] pumps oil along the oil pipe [D] to the oil reservoir [F] in the oil supply unit.

The air inlet [B] equalizes the pressure inside the oil tank [A].

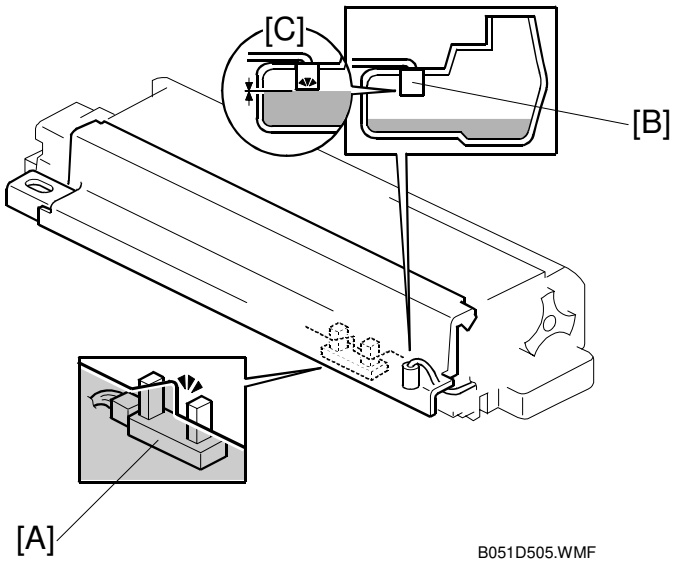
The oil goes to the fusing belt as follows:

- Oil tank [A] ➔ Oil pipe [D] (oil pump [C]) ➔ Oil reservoir [F] ➔ Felt [G] ➔ Oil supply roller [I] ➔ Oiling roller [J]

The fusing sponge roller [K] removes excess oil from the fusing belt. The metal cleaning roller [L] removes foreign substances from the belt.

Oil Supply

[A]: Oil end sensor
[B]: Oil overflow sensor



The oil end sensor [A] controls the supply of oil from the oil tank in the bottom of the machine, via the oil pump, to the reservoir in the oil supply unit.

The oil end sensor detects oil by emitting a beam through the protruding part of the tank bottom (the bottom is transparent).

When oil is detected, the pump does not supply oil up from the lower tank. So, the reservoir is normally less than half full (maximum capacity: 70 grams).

When oil has been used up so that the level in the reservoir falls below the sensor, the sensor detects oil end. Then, the oil pump turns on to pump oil up from the oil tank, until the oil end sensor detects oil.

- If the oil end sensor fails, the oil overflow sensor [B] detects when the reservoir is full [C], and the pump stops (SC571 will be generated, and the machine must be repaired). This failsafe measure prevents oil flooding inside the machine.

Oil End Detection and Recovery

If the oil tank at the bottom of the machine has no oil in it, the following occurs:

1) The oil pump operates for 50 milliseconds and waits for 150 milliseconds. If the oil end condition still exists, this step is repeated. If the sensor still does not detect oil, this step can be repeated up to 150 times (total maximum time taken: 30 seconds).
2) If oil is still not detected, the pump stops for 30 seconds.
3) The oil pump repeats steps 1 and 2 until oil is detected. The pump can repeat these steps up to 9 times. So, the machine can pump for up to 9 minutes if oil is not detected ([30 seconds + 30 seconds] x 9).
4) If oil is still not detected, the oil end counter starts. This counts the pages fed through the fusing unit. Every 100 pages, the oil pump operates again for 50 seconds to try to get oil into the fusing unit.
5) When the counter goes up to 50, the operation panel indicates oil near end (the counter is not reset).
6) When the counter goes up to 500, the code “SC 570” appears on the display, and printing stops.
7) To clear the oil end condition, a technician adds some oil to the oil tank in the bottom of the machine and clears the SC code (this is a Level A code). Then, the oil pump resumes steps 1 through 3.
   NOTE: Do not switch the machine on with the fusing unit out of the machine if an oil end condition exists. This will clear the oil end counter, and the machine incorrectly detects oil.
8) If the oil end condition is cleared, the procedure ends. If not, the code “SC 570” appears again.

6.12.5 TEMPERATURE CONTROL

The table lists default settings and variable ranges for temperature control.

<table>
<tr><td colspan="3">External temperature (*1)</td><td colspan="2">More than 15°C ~ less than 30°C</td><td colspan="2">15°C or lower</td><td colspan="2">30°C or higher</td></tr>
<tr><td colspan="3">Roller</td><td>Heating</td><td>Press.</td><td>Heat.</td><td>Press.</td><td>Heat.</td><td>Press.</td></tr>
<tr><td colspan="3">Fusing idling start (*2)</td><td>145</td><td>10</td><td>145</td><td>10</td><td>145</td><td>10</td></tr>
<tr><td colspan="3">Print ready (*3)</td><td>165</td><td>70</td><td rowspan="15" colspan="2">Heat.: +5
Adjustable with SP1-105-27
Press.: +0
Adjustable with SP1-105-28</td><td rowspan="15" colspan="2">Heat.: –5
Adjustable with SP1-105-29
Press.: +0
Adjustable with SP1-105-30</td></tr>
<tr><td colspan="3">Ready (standby mode)</td><td>175</td><td>120</td></tr>
<tr><td colspan="2" rowspan="4">Energy saver</td><td>Panel off 1</td><td>175</td><td>120</td></tr>
<tr><td>Panel off 2</td><td>165</td><td>115</td></tr>
<tr><td>Low power mode</td><td>140</td><td>100</td></tr>
<tr><td>Auto off mode</td><td>Room temp.</td><td>Room temp.</td></tr>
<tr><td rowspan="10">Printing</td><td rowspan="2">Normal paper</td><td>Mono color</td><td>150</td><td>Lamp off</td></tr>
<tr><td>Full color</td><td>170</td><td>Lamp off</td></tr>
<tr><td rowspan="2">‘>90 g/m2, 24 lb (*4)</td><td>Mono color</td><td>160</td><td>Lamp off</td></tr>
<tr><td>Full color</td><td>180</td><td>Lamp off</td></tr>
<tr><td rowspan="2">Thick</td><td>Mono color</td><td>170</td><td>Lamp off</td></tr>
<tr><td>Full color</td><td>175</td><td>Lamp off</td></tr>
<tr><td rowspan="2">OHP</td><td>Mono color</td><td>170</td><td>Lamp off</td></tr>
<tr><td>Full color</td><td>180</td><td>Lamp off</td></tr>
<tr><td rowspan="2">Duplex (*5)</td><td>Mono color</td><td>155</td><td>Lamp off</td></tr>
<tr><td>Full color</td><td>165</td><td>Lamp off</td></tr>
<tr><td colspan="3">Variable range (*6)</td><td>100 ~ 190</td><td>30 ~ 200</td><td colspan="2">0 ~ +20</td><td colspan="2">0 ~ –20</td></tr>
</table>

*1: External temperature is measured (temperature/humidity sensor) when the main switch is turned on and when a job start signal is received.

*2: The pressure and heating rollers start idling.

*3: Fusing idling stops when both roller temperatures reach the print ready condition. The printer can process jobs when the rollers reach this temperature during warm-up.

*4: A user tool specifies the paper type in each tray (plain, thick, or OHP). If ‘plain’ is selected, then another user tool defines whether the paper in the tray is ‘normal’ or ‘>90 g/m2, 24 lb’. (☛ 5.2.2). ‘>90 g/m2, 24 lb’ means ‘*greater than or equal to* 90 g/m2, 24 lb’.

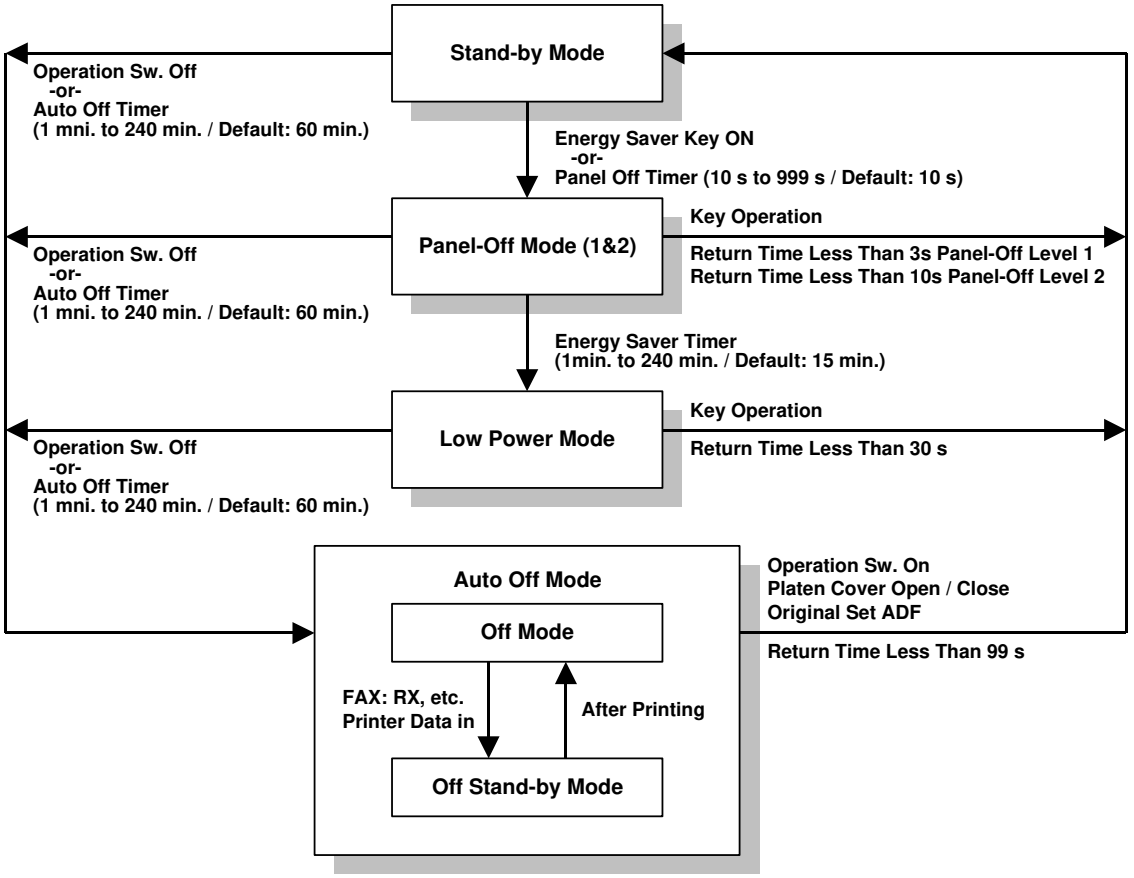
- ‘Thick’ means paper heavier than 105 g/m^2 (28 lb).

*5: Both sides of the paper are processed with the same roller temperatures.

*6: Use SP1-105 to adjust the default fusing temperatures (☛ 5.2.2).

6.12.6 ENERGY SAVER MODES

Overview



B051D903.WMF

When the machine is not being used, the energy saver function reduces power consumption by decreasing the fusing temperature.

This machine has three types of energy saver mode as follows.

1) Panel-off mode (1 & 2)
2) Low power mode
3) Auto Off mode

These modes are controlled by the following UP and SP modes.

- Panel off timer: User Tools – System Settings – Key Operator Tools – Panel Off Level
- Panel off level (1 or 2): User Tools – System Settings – Timer Setting – Panel Off Timer
- Energy saver timer: System Settings – Timer Setting – Energy Saver Timer
- Auto off timer: User Tools – System Settings – Timer Setting – Auto Off Timer
- Auto off disabling (SP mode): Set SP5-305 to "disable." This disables the auto off mode.

Panel Off Mode

Entering the panel off mode

The machine enters the panel off mode when one of the following is done.

- The panel off timer runs out.
- The Clear Mode/Energy Saver Key is held down for one second.

If the value specified in the panel off timer is larger than the value specified in the energy saver timer, the machine goes into the low power mode without going into the panel off mode. A similar thing happens when the value in the panel off timer is larger than that in the auto off timer. To make the panel off mode effective, specify a value smaller than the values in the energy saver timer and auto off timer.

What happens in panel off mode

Panel off mode has 2 levels. The operator can select level 1 or level 2 with a UP mode (default: level 2).

When the machine is in the panel off mode, each of the fusing lamps are kept at the temperatures indicated in the table at the bottom of the page, and the operation panel indicators are turned off except for the Energy Saver LED and the Power LED. The fusing lamp temperature for Panel Off Mode 1 is the same as for Stand-by Mode.

If the controller receives an image print out command from an application program (e.g. to print incoming fax data or to print data from a PC), the temperature of each fusing lamp 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 ADF
- The ADF is lifted
- A sheet of paper is placed in the by-pass feed table

The return time from the panel off mode is about 3 seconds (level 1) or 10 seconds (level 2).

Mode	Operation Switch	Energy Saver LED	Fusing Temperature	+24V	System +5V
Panel off	On	On	Level 1 Heating roller: 175°C Pressure roller: 120°C Level 2 Heating roller: 165°C Pressure roller: 115°C	On	On

Low Power Mode

Entering the low power mode

The machine enters the low power mode when the energy saver timer runs out.

What happens in low power mode

When the machine enters the low power mode, the fusing lamps are kept at the temperatures indicated in the table, and the operation panel indicators are turned off except for the Energy Saver LED and the Power LED.

If the controller receives an image print out command from an application program (e.g. to print incoming fax data or to print data from a PC), the temperature of each fusing lamp 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 ADF
- The ADF is lifted
- A sheet of paper is placed in the by-pass feed table

The return time from the low power mode is about 30 seconds.

Mode	Operation Switch	Energy Saver LED	Fusing Temperature	+24V	System +5V
Low power	On	On	Heating roller: 140°C Pressure roller: 100°C	On	On

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 it enters the 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 exists, the machine enters Off Stand-by mode. If none of these conditions exist, the machine enters the 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 ADF
- The ADF 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.

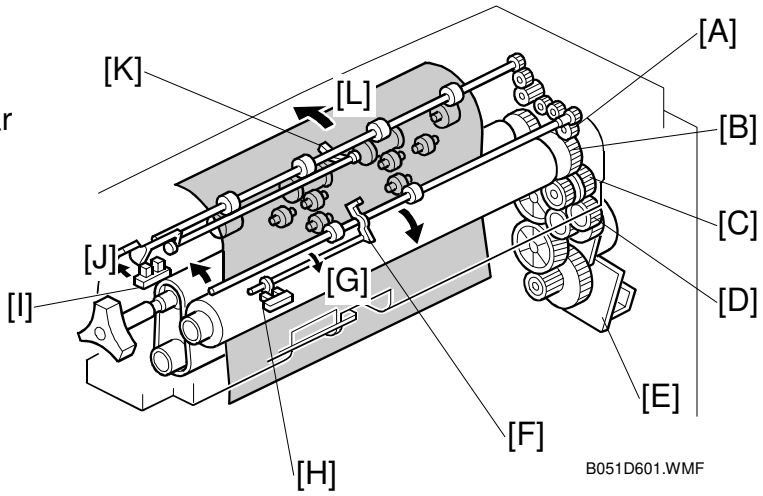
Returning to stand-by mode

The machine returns to stand-by mode when the operation switch is pressed. The return time is about 99 seconds.

Mode	Operation Switch	Energy Saver LED	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

6.12.7 PAPER EXIT

[A]: Interface gear
[B]: Pressure roller gear
[C]: Drive gear (fusing unit)
[D]: Cover disengagement gear
[E]: Fusing unit motor
[F]: Fusing exit sensor feeler
[G]: Turning direction of the fusing exit sensor feeler
[H]: Fusing exit sensor
[I]: Paper exit sensor
[J]: Turning direction of the paper exit sensor feeler
[K]: Paper exit sensor feeler
[L]: Paper



Drive

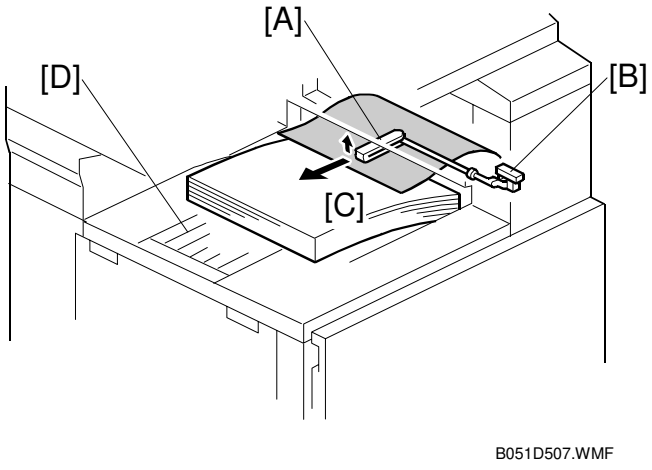
Fusing unit motor [E] ➔ gear [D] ➔ fusing unit drive gear [C] ➔ pressure roller gear [B] ➔ gear [A] ➔ exit rollers.

Paper Jam Detection

The fusing exit sensor [H] and the paper exit sensor [I] detect paper jams.

6.12.8 PAPER OVERFLOW DETECTION

[A]: Feeler
[B]: Paper overflow sensor
[C]: Paper
[D]: Tray



When the paper overflow sensor [B] is deactivated, the machine detects that the paper stack height exceeded the limit and stops printing.

SPECIFICATIONS

1. GENERAL SPECIFICATIONS (MAIN UNIT)

Configuration: Desktop

Print Process: 2 laser beam & dry electrostatic transfer system

Original Type: Sheet/Book/object

Original Size: Max: A3/11"x17"

Copy Paper Size:

Max:	A3/11" x 17"
Min:	A6 SEF (100 x 148 mm)/8.5" x 5.5"
Custom size:	Width: 100 ~ 297 mm (3.9" ~ 11.5") Length: 148 ~ 432 mm (5.8" ~ 17")

*Printable area is 297 x 432 mm (11.7" x 17").

Paper Weight (excluding by-pass tray): 64 to 105 g/m^2, 17 lb. to 28 lb.

Printing Speed (A4/8.5" x 11" LEF):

Model		Plain Paper	Thick	OHP
U-C1a	Color	8 cpm	4 cpm	2 cpm
	Black & White	24 cpm	6.5 cpm	3.2 cpm
U-C1b	Color	10 cpm	4 cpm	2 cpm
	Black & White	32 cpm	6.5 cpm	3.2 cpm

Paper Capacity:

Main	250 sheets x 2 tray
Paper tray unit (Option)	500 sheets x 2 trays
By-pass (Option)	100 sheets
LCT (Option)	1,000 sheets x 2

*Maximum capacity is 2,600 sheets.

Copy Tray Capacity:

A4/LT or smaller:	Up to 500 sheets
B4 or larger:	Up to 250 sheets

First Copy Time (A4/8.5" x 11" LEF):

Color:	18 seconds
Black & White:	7.8 seconds

Warming-up Time: Approx. 99 seconds

No. of Continuous Copies: 1 to 100

Memory: 128 MB, expandable with extra 128 MB or 256 MB

Hard Disk: 40 GB

Reproduction Ratios: 5 Enlargement & 7 Reduction

	A4/A3 version	LT/DLT Version
Enlargement	400, 200, 141, 122, 115%	400, 200 155, 129, 121%
Full Size	100%	100%
Reduction	93, 82, 75, 71, 65, 50, 25%	93, 85, 78, 73, 65, 50, 25%

Zoom: 25% to 400% in 1% steps (Platen mode)
25% to 200% in 1% steps (ADF mode)

Scanning System: 3-line 1-chip CCD sensor (600 dpi)

Light Source: 1 xenon lamp

Photoconductor: OPC belt

Charging: Corona wire with grid plate

Print System: Two laser beam, 600 dpi

Development System: Mono component toner

Transfer: Image transfer: Transfer belt with bias roller
Paper transfer: Roller

Separation: Discharge pin

Fusing: Heating rollers and fusing belt

Cleaning: OPC belt: Blade
Image transfer belt: Cleaning brush

Quenching: Lamp

Toner Supply: Cartridge

Power Source:

	Voltage	Frequency	Amperage
NA	120 V	60 Hz	12 A
EU & Asia	220 to 240 V	50/60 Hz	8 A

Power Consumption:

	Mainframe only	Full System
Maximum:	Less than 1.5 kW	Less than 1.5 kW
Copying:	Approx. 700 W	Approx. 900 W
Warm-up:	Less than 1.5 kW	Less than 1.5 kW
Stand-by:	Less than 200 W	Less than 200 W
Energy Saver/ Auto Off:	10 W	10 W

NOTE: Full system: ARDF + 1 bin tray + Paper Tray Unit + Duplex Unit + Bridge Unit +1000-sheet Finisher

Noise Emission:

	Mainframe only	Full System
Stand-by:	Less than 45 dB (A)	Less than 50 dB (A)
Copying:	Less than 67 dB (A)	Less than 70 dB (A)

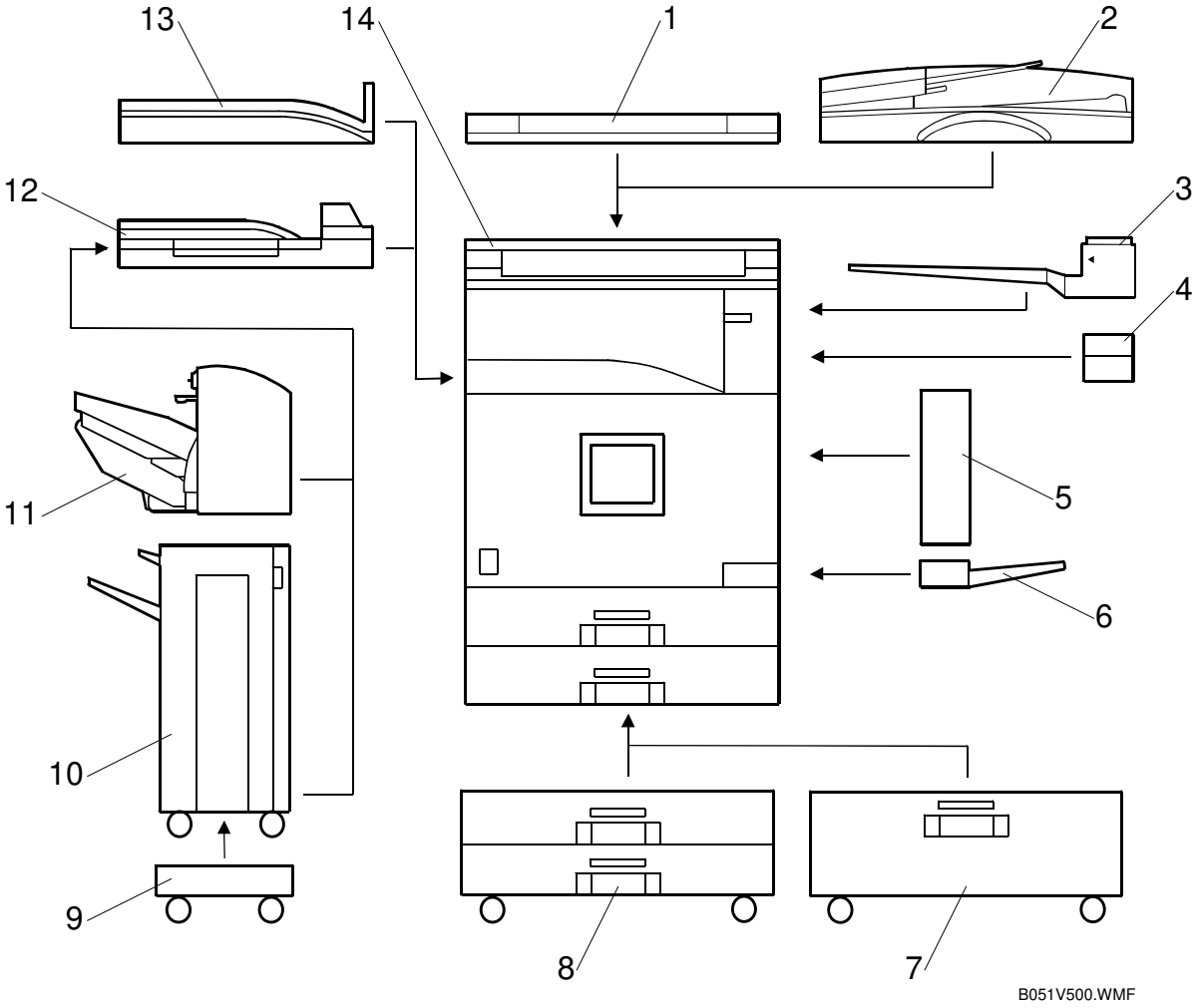
NOTE: Full system: ARDF + 1 bin tray + Paper Tray Unit + Duplex Unit + Bridge Unit +1000-sheet Finisher

Dimensions (W x D x H): 550 x 670 x 781 mm (21.65" x 26.37" x 30.74")

Weight: Less than 80 Kg (176 lb)

2. MACHINE CONFIGURATION

2.1 SYSTEM COMPONENTS



Version	Item	Machine Code	Common with	No.
Copier	U-C1a	B051		14
	U-C1b	B052		14
	ARDF (Optional)	B386	R-C2	2
	Platen Cover (Optional)	B484		1
	Paper Tray Unit (Optional)	B456		8
	LCT (Optional)	B457		7
	1-bin Tray (Optional)	B480		3
	Shift Tray (Optional)	B510		13
	Duplex Unit (Optional)	B509		5
	By-pass Tray (Optional)	B490		6
	Interchange Unit (Optional)	B481		4
	Bridge Unit (Optional)	B482		12
	1000-sheet Finisher (Optional)	B408	R-C2	10
	Adjustment Table (Optional)	B488		9
	500-sheet Finisher (Optional)	B458		11
	128 MB Memory (Optional)	G331	U-P	
	256 MB Memory (Optional)	G332	U-P	
	Key Counter Bracket (Optional)	B508		
Fax	Fax Option (Optional)	B502		
	G3 Interface Unit (Optional)	B506		
	ISDN (Optional)	B504		
	JBIG (Optional)	A892	R-C2	
	Handset (Optional)	B433	R-C2	
Printer/ Scanner	Printer Unit (Optional)	B463		
	Printer/Scanner Unit (Optional)	B529		
	PS3 (Optional)	B522		
	IEEE1394 (Optional)	G336		
	Wireless LAN (Optional)	B515		
	Media Link Board (Optional)	B519		

2.2 OPTIONAL EQUIPMENT

ARDF

Original Size:	Standard sizes Single-sided mode: A3 to A5, DLT to HLT Double-sided mode: A3 to A4, DLT to LT Non-standard sizes (Single-sided mode only) Max. width 297 mm Min. width 105 mm Max. length 1,260 mm Min. length 128 mm
Original Weight:	Single-sided mode: 52 to 128 g/m^2, 14 to 34 lb Double-sided mode: 52 to 105 g/m^2, 14 to 28 lb
Table Capacity:	30 sheets (80 g/m^2)
Original Position:	Center
Separation:	FRR with feed belt
Original Transport:	Roller transport
Original Feed Order:	From the top original
Reproduction Range:	25 to 200 % (Sub scan direction only)
Power Source:	DC 24 V, 5 V (from the copier)
Power Consumption:	50 W
Dimensions (W x D x H):	550 x 470 x 110 mm
Weight:	10 kg

Bridge Unit

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 to 135 g/m^2, 16 lb to 42 lb
Power Source:	DC 24 V, 5 V (form the copier/printer)
Dimensions (W x D x H):	413 x 435 x 126 mm
Weight	3.0 kg (6.6 lbs)

By-pass Tray Unit

Paper Size:	Standard sizes A6 lengthwise to A3 HLT to DLT Non-standard sizes Width: 90 to 305 mm (3" to 12") Length: 148 to 457.2 mm (5.83" to 18")
Paper Weight:	60 g/m^2 to 163 g/m^2, 16 lb to 43.6 lb
Dimensions (W x D x H):	310 x 380 x 275 mm
Weight:	3 kg (6.6 lbs)

Duplex Unit

Paper Size:	Standard sizes A5 lengthwise to A3 HLT to DLT Non-standard sizes Width: 140 to 297 mm Length: 182 to 432 mm
Paper Weight:	64 g/m^2 to 105 g/m^2, 20 lb to 28 lb
Tray Capacity:	1 sheet
Power Consumption:	40 W
Power Source:	DC 24 V, 5 V
Dimensions (W x D x H):	90 x 495 x 452 mm
Weight:	6 kg

Interchange Unit

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 to 135 g/m^2, 16 lb to 36 lb
Power Consumption:	10 W
Dimensions (W x D x H):	117 x 447 x 92 mm
Weight:	1.6 kg

LCT

Paper Size:	A4 sideways/LT sideways
Paper Weight:	60 g/m^2 to 128 g/m^2, 16 lb to 34 lb
Tray Capacity:	2,000 sheets (80 g/m^2, 20lb)
Remaining Paper Detection:	5 steps (100%, 75%, 50%, 25%, Near end)
Power Source:	DC 24 V, 5 V (from copier/printer)
Power Consumption:	30 W (Max.)/25 W (Ave.)
Weight:	25 kg (55 lbs)
Size (W x D x H):	540 x 600 x 270 mm

Paper Tray Unit

Paper Feed System:	FRR
Paper Height Detection:	4 steps (100%, 50%, Near End, and Empty)
Capacity:	500 sheets x 2 trays
Paper Weight:	60 to 128 g/m^2 (16 to 34 lb.)
Paper Size:	A3 SEF to A5, DLT SEF to HLT
Power Source:	DC 24V, 5V (from the main frame)
Power Consumption:	Less than 30 W
Dimensions (W x D x H):	540 x 600 x 270 mm
Weight:	25 kg (33 lb.)

Shift Tray Unit

Paper Size:	Standard Size: A5 lengthwise to A3 HLT lengthwise to DLT Non-standard Size: Paper Width: 90 to 297 mm Paper Length: 148 to 432 mm
Paper Weight:	60 to 105 g/m², 16 to 28 lbs.
Tray Capacity:	125 sheets (80 g/m², 20 lbs.): B4 or larger 250 sheets (80 g/m², 20 lbs.): A4 or smaller
Power Source:	DC 24 V, 5 V (from the copier)
Power Consumption:	17 W
Weight:	1.1 kg
Size (W x D x H):	530 mm x 410 mm x 120 mm

1-Bin Tray Unit

Paper Size:	Standard Size: A5 Lengthwise to A3 HLT Lengthwise to DLT Non-standard Size: Paper Width: 90 to 297 mm Paper Length: 148 to 432 mm
Paper Weight:	60 ~ 105 g/m², 16 ~ 28 lbs.
Tray Capacity:	125 sheets (80 g/m², 20 lbs.)
Power Source:	DC 24 V, 5 V (from the copier)
Power Consumption:	0.5 W
Weight:	1.1 kg
Size (W x D x H):	530 mm x 435 mm x 120 mm

500-Sheet Finisher

Paper Size:	A3, B4, A4, B5 sideways (Metric) DLT, LG, LT (Inch)
Paper Weight	52 to 128 g/m^2, 14 to 34 lb.
Staple Capacity:	30 sheets (80 g/m^2, 20 lb)
Stack Capacity (Maximum):	500 sheets (A4/LT or smaller: 80 g/m^2, 20 lb.) 250 sheets (A3, B4, DLT and LG: 80 g/m^2, 20 lb.)
Stapling Positions:	1
Staple Replenishment:	Cartridge (3,000 staples/cartridge)
Power Source:	DC 24 V, 5 V (from the copier/printer)
Power Consumption:	40 W
Weight:	8.3 kg (18.4 lbs.)
Dimensions (W x D x H):	350 x 490 x 230 mm

1000-sheet Finisher

Upper Tray

Paper Size: A3 to A6
DLT to HLT

Paper Weight: 60 to 157 g/m^2 (16 to 42 lb)

Paper Capacity: 250 sheets (A4 sideways/LT sideways or smaller: 80 g/m^2, 20lb)
50 sheets (A3, B4, DLT, LG: 80 g/m^2, 20 lb)

Lower Tray

Paper Size:
No staple mode:
A3 to B5
DLT to HLT
Staple mode:
A3, B4, A4, B5
DLT to LT

Paper Weight: No staple mode: 60 to 157 g/m^2 (16 ~ 42 lb)
Staple mode: 64 to 90 g/m^2 (17 ~ 24 lb)

Stapler Capacity: 30 sheets (A3, B4, DLT, LG)
50 sheets (A4, B5 sideways, LT)

Paper Capacity:
No staple mode:
1,000 sheets (A4/LT or smaller: 80 g/m^2, 20 lb)
500 sheets (A3, B4, DLT, LG: 80 g/m^2, 20 lb)
Staple mode:
(80 g/m^2, 20 lb, number of sets)

Set Size	**2 to 9**	**10 to 50**	
Size		10 to 30	31 to 50
A4/LT sideways B5 sideways	100	100 to 20	100 to 20
A4/LT Lengthwise	100	50 to 10	50 to 10
A3, B4, DLT, LG	50	50 to 10	—

Staple positions: 1 Staple: 2 positions (Front, Rear)
2 Staples: 2 positions (Upper, Left)

Staple Replenishment: Cartridge (5,000 staples/cartridge)

Power Source: DC 24 V, 5 V (from the copier/printer)

Power Consumption: 50 W

Weight: 25 kg (55.2 lbs)

Dimensions (W x D x H): 527 x 520 x 790 mm (20.8" x 20.5" x 31.1")