Model BL-P1
Machine Codes: M087/M088
Field Service Manual

3 Dec, 2010

Regulation

<For Europe and Other countries>

- Radio interference (220 to 240 volt model only)

  This machine follows EN55022 (CISPR Publication 22)/Class B.

- IEC 60825-1 specification (220 to 240 volt model only)

  This machine is a Class 1 laser product as defined in IEC 60825-1 specifications. The label shown below is attached in countries where it is needed.

  This machine has a Class 3B laser diode which produces invisible laser radiation in the laser unit. You should not open the laser unit under any circumstances.

  Caution

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

  For Finland and Sweden

  LUOKAN 1 LASERLAITE

  KLASS 1 LASER APPARAT

  Varoitus!

  Laitteen käyttäminen muulla kuin tässä käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.

  Varning

  Om apparaten används på annat sätt än i denna Bruksanvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass 1.

- Internal laser radiation

  Maximum radiation power: 10 mW

  Wave length: 780 - 800 nm

  Laser class: Class 3B

- EU Directive 2002/96/EC and EN50419

  (European Union only)

  This equipment is marked with the recycling symbol below. It means that at the end of the life of the equipment you must dispose of it separately at an appropriate collection point and not place it in the

normal domestic unsorted waste stream. This will benefit the environment for all. (European Union only)

<For USA and Canada>

- Federal Communications Commission (FCC) Declaration of Conformity

  (For USA)

  Responsible Party:

  Ricoh Americas Corporation

  5 Dedrick Place, West Caldwell, NJ 07006 USA
  Telephone: 973-882-2000

  declares, that the products

  Product name: Laser Printer

  Model number: SP 1210N

  complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

  This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the end user is encouraged to try to correct the interference by one or more of the following measures:

  - Reorient or relocate the receiving antenna.
  - Increase the separation between the equipment and receiver.
  - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

Important

- **A shielded interface cable should be used to ensure compliance with the limits for a Class B digital device. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.**

- Industry Canada Compliance Statement (For Canada)

  This Class B digital apparatus complies with Canadian ICES-003.

  Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

- Laser Safety (110 to 120 volt model only)

  This machine is certified as a Class 1 laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. This means that the machine does not produce hazardous laser radiation.

  Since radiation emitted inside the machine is completely confined within protective housings and external covers, the laser beam cannot escape from the machine during any phase of user operation.

- FDA Regulations (110 to 120 volt model only)

  The U.S. Food and Drug Administration (FDA) has implemented regulations for laser products manufactured on and after August 2, 1976. Compliance is mandatory for products marketed in the United States. The following label on the back of the machine indicates compliance with the FDA regulations and must be attached to laser products marketed in the United States.

MANUFACTURED:
RICOH COMPANY LTD, 3-6, Naka-magome 1-Chome Ohta-ku, Tokyo 143-8555, Japan
Complies with FDA performance standards for laser products except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007.

- Internal laser radiation

  Maximum radiation power: 10 mW

  Wave length: 780 - 800 nm

  Laser class: Class 3B

Safety Information

- Caution for Laser Product (WARNHINWEIS fur Laser drucker)

  CAUTION:

  When the machine during servicing is operated with the cover open, the regulations of VBG 93 and the performance instructions for VBG 93 are valid.

  CAUTION:

  In case of any trouble with the laser unit, replace the laser unit itself. To prevent direct exposure to the laser beam, do not try to open the enclosure of the laser unit.

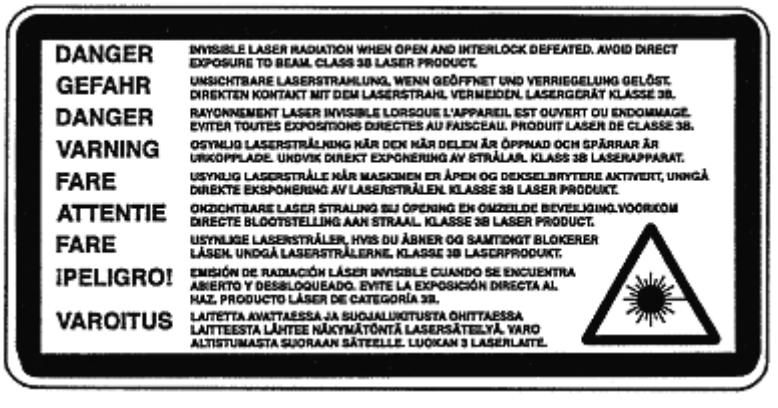
  ACHTUNG:

  Im Falle von Störungen der Lasereinheit muß diese ersetzt werden. Das Gehäuse der Lasereinheit darf nicht geöffnet werden, da sonst Laserstrahlen austreten können.

- Additional Information

  When servicing the optical system of the machine, be careful not to place a screwdriver or other reflective object in the path of the laser beam. Be sure to take off any personal accessories such as watches and rings before working on the machine. A reflected beam, though invisible, can permanently damage the eyes.

  Since the beam is invisible, the following caution label is attached on the laser unit.



- Definitions of Warnings, Cautions, and Notes

  The following conventions are used in this manual:

  ⚠WARNING

  Warnings tell you what to do to prevent possible personal injury.

  ⚠CAUTION

  Cautions specify procedures you must follow or avoid to prevent possible damage to the machine or other objects.

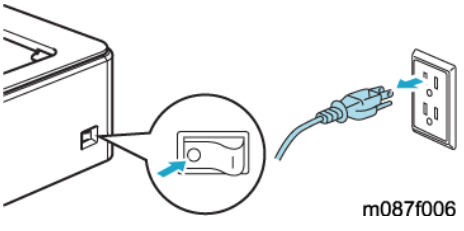
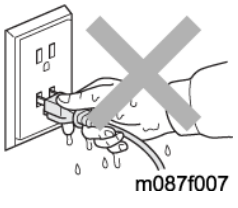
Note

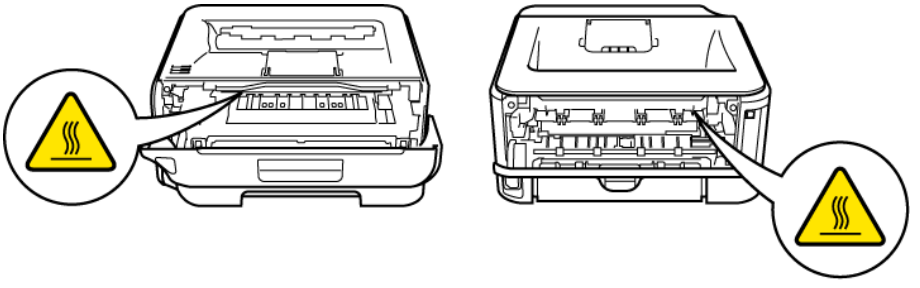
Notes tell you useful tips when servicing the machine and bits of knowledge to help understand the machine

Mark	Contents
	Electrical Hazard icons alert you to a possible electrical shock.
	Hot Surface icons warn you not to touch machine parts that are hot.

- Safety Precautions

  Listed below are the various kinds of "WARNING" messages included in this manual.

⚠WARNING
 There are high voltage electrodes inside the machine. Before you clean the inside of the machine or replace parts, make sure that you have turned off the power switch and unplugged the machine from the AC power outlet.  m087f006
 DO NOT handle the plug with wet hands. Doing this might cause an electrical shock.  m087f007

⚠WARNING
 The fuser unit becomes extremely hot during operation. Wait until it has cooled down sufficiently before replacing consumable items. DO NOT remove or damage the caution label located on or around the fuser.  m087f008
DO NOT use flammable substances such as alcohol, benzine, thinner or any type of spray to clean the inside or outside of the machine. Doing this may cause a fire or electrical shock. 
If the machine becomes hot, blows smoke, or generates obscure odor, immediately turn off the power switch and unplug the machine from the AC power outlet.
If metal objects, water or other liquids get inside the machine, immediately turn off the power switch and unplug the machine from the AC power outlet.

⚠CAUTION

- Lightning and power surges can damage this product! We recommend that you use a quality surge protection device on the AC power line, or unplug the machine during a lightning storm.

Acronyms and Technical Terms

In this manual, the manual specific acronyms and technical terms are used in addition to the generally used ones. The table below contains typical acronyms and technical terms that are used throughout these manuals.

ASIC	Application Specific Integrated Circuit
CN	Connector
CO	Collimate
CPU	Central Processing Unit
dB	decibel
DEV	Development
dpi	dots per inch
EEPROM	Electronically Erasable and Programmable Read Only Memory
HEX	Hexadecimal
HVPS	High Voltage Power Supply
IF	Interface
IPv4	Internet Protocol Version 4
IPv6	Internet Protocol Version 6
LD	Laser Diode
LED	Light Emitting Diode
LVPS	Low Voltage Power Supply
N/A	Not Applicable
NC*	Network Circuit
NVRAM	Nonvolatile Random Access Memory
ppm	pages per minute
RAM	Random Access Memory
SW	Switch

* Excluding the acronym shown on the wiring diagram or circuit diagram.

TABLE OF CONTENTS

5. Service Maintenance

6. Troubleshooting

7. Energy Saving

1. Product Information

Specifications

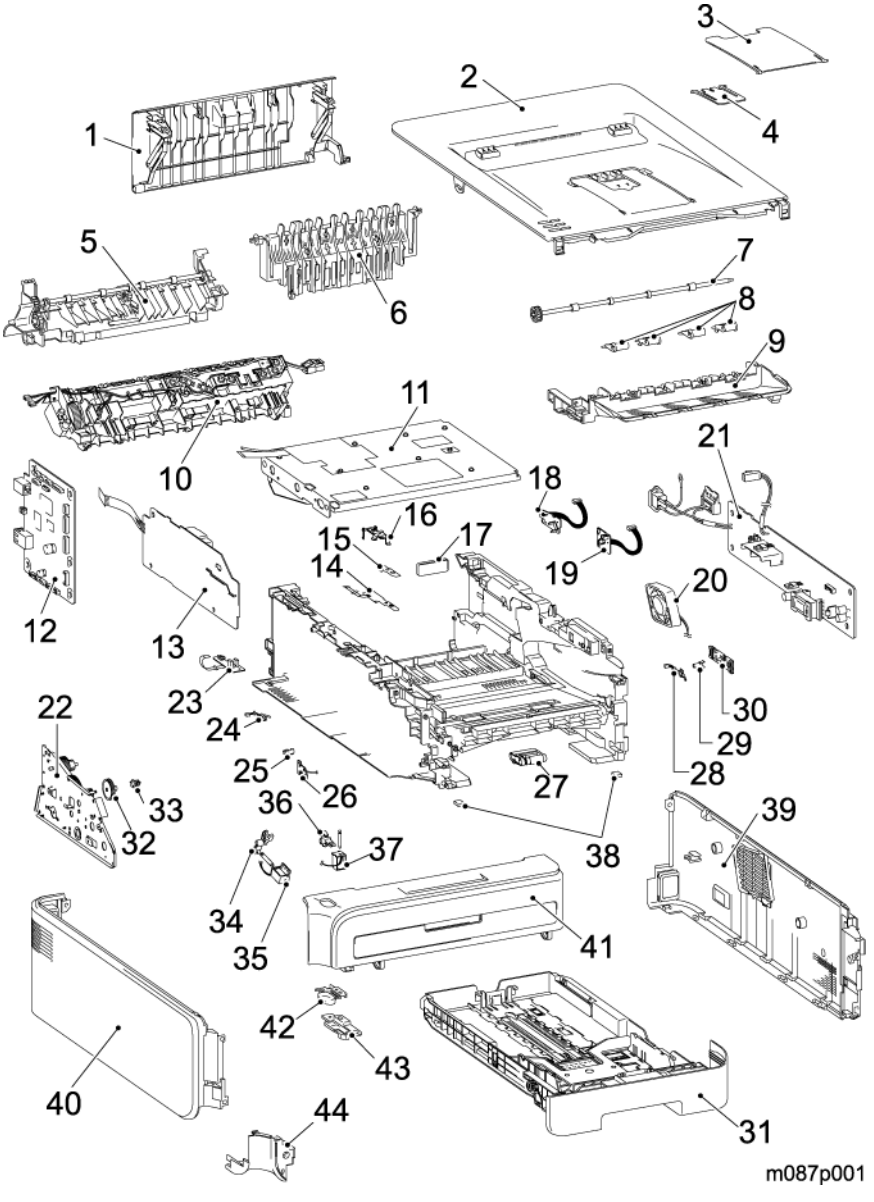
See “Appendices” for the following information:

- Specifications List

Overview

1

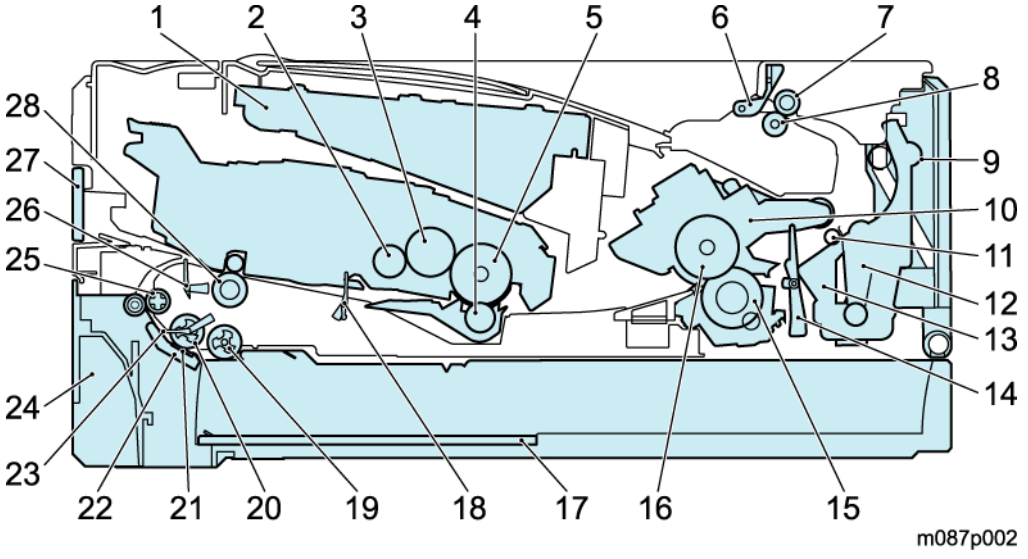
Part names



1. Back cover	23. Eject sensor PCB ASSY
2. Top cover ASSY	24. New toner sensor harness ASSY

3. Support flap 1	25. PT sensor holder
4. Support flap 2	26. Toner sensor PCB unit ASSY
5. Fuser cover ASSY	27. Roller holder ASSY
6. Outer chute ASSY	28. Cover sensor harness ASSY
7. Eject roller ASSY 2	29. LED holder
8. Inner chute ASSY	30. Toner LED PCB ASSY
9. Pinch roller ASSY	31. Paper tray unit
10. Fuser unit	32. DEV gear joint/53R
11. Laser unit	33. DEV joint
12. Main PCB ASSY	34. Registration solenoid lever
13. High-voltage PS PCB ASSY	35. Registration solenoid
14. Panel PCB ASSY	36. T1 solenoid lever
15. Panel film	37. T1 solenoid
16. Key supporter	38. Rubber foot
17. Filter ASSY	39. Side cover R ASSY
18. Registration rear sensor PCB ASSY	40. Side cover L ASSY
19. Registration front sensor PCB ASSY	41. Front cover ASSY
20. Fan motor 60 unit	42. SW key
21. PS PCB unit ASSY	43. Key stopper
22. Drive sub ASSY	44. Corner cover

Cross-section Drawing



1. Laser unit	15. Pressure roller
2. Supply roller	16. Heat roller
3. Develop roller	17. Plate
4. Transfer roller	18. Registration rear actuator
5. Exposure drum	19. Paper feed roller
6. Paper stack lever	20. Separation roller
7. Eject roller 2	21. Separation pad
8. Pinch roller	22. Separation pad ASSY
9. Back cover	23. Edge actuator
10. Fuser unit	24. Paper tray
11. Eject roller 1	25. Front feed roller
12. Outer chute	26. Registration front actuator
13. Fuser cover	27. Manual feed slot cover
14. Eject actuator	28. Registration roller

2. Installation

Installation Requirements

Operating Environment

1. Put your machine on a flat, stable surface such as a desk that is free of vibration and shocks.
2. Use the machine in a well-ventilated room; use the machine within the following ranges of temperature and humidity: temperature between 10 °C and 32.5 °C (50 °F to 90.5 °F), and the relative humidity is maintained between 20% and 80%.
3. The machine is not exposed to direct sunlight, excessive heat, moisture, or dust.
4. Condensation

   When the machine is moved from a cold place into a warm room, condensation may occur inside the machine, causing various problems as listed below.

   - Condensation on the optical surfaces such as the scanner window, lenses, the reflection mirror and the protection glass may cause the print image to be light.
   - If the exposure drum is cold, the electrical resistance of the photosensitive layer is increased, making it impossible to obtain the correct contrast when printing.
   - Condensation on the charge unit may cause corona charge leakage.
   - Condensation on the plate and separation pad may cause paper feed failures.

   If condensation has occurred, leave the machine for at least 2 hours to allow it to reach room temperature.

   If the drum unit is unpacked soon after it is moved from a cold place to a warm room, condensation may occur inside the unit which may cause incorrect images. Instruct the end user to allow the unit to come to room temperature before unpacking it. This will take one or two hours.

Power Supply

1. The AC input power supply described on the rating plate of the machine should be within ±10% of the rated voltage.
2. The AC input power supply is within the regulated value.
3. The cables and harnesses are connected correctly.
4. The fuses are not blown.

3. Preventive Maintenance

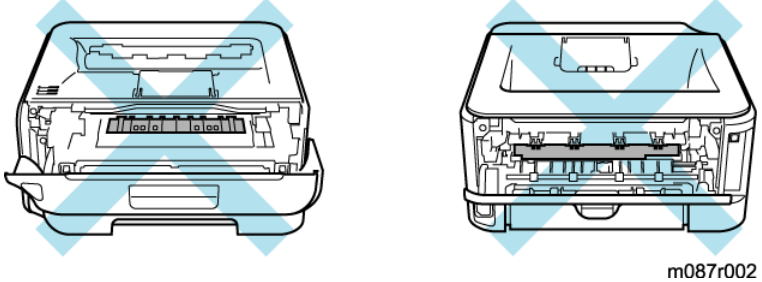
Periodical Replacement Parts

There are no parts to be replaced periodically.

4. Replacement and Adjustment

Safety Precautions

To avoid creating secondary problems by mishandling, follow the warnings and precautions below during maintenance work.

⚠WARNING
• Always turn off the power switch and unplug the power cord from the power outlet before accessing any parts inside the machine. • When opening the front cover or back cover to access any parts inside the machine, never touch the shaded parts shown in the following figures. • DO NOT use flammable substances such as alcohol, benzine, thinner or any type of spray to clean the inside or outside of the machine. Doing this may cause a fire or electrical shock.  m087r002

- Be careful not to lose screws, washers, or other parts removed.
- Be sure to apply grease to the gears and applicable positions specified in this chapter.
- When using soldering irons or other heat-generating tools, take care not to accidentally damage parts such as wires, PCBs and covers.
- Static electricity charged in your body may damage electronic parts. When transporting PCBs, be sure to wrap them in conductive sheets.
- When replacing the PCB and all the other related parts, put on a grounding wrist band and perform the job on a static mat. Also take care not to touch the conductor sections on the flat cables or on the wire harness.
- When connecting or disconnecting cable connectors, hold the connector body, not the cables. If the connector has a lock, release the connector lock first to release it.
- After a repair, check not only the repaired portion but also all connectors. Also check that other related portions are functioning properly before operational checks.
- After disconnecting flat cables, check that each cable is not damaged at its end or short-circuited.

- When connecting flat cables, do not insert them at an angle. After insertion, check that the cables are not at an angle.

Screw Torque List

Location of screw	Screw type	Q'ty	Tightening torque Nm (kgf·cm)
KEY STOPPER	Taptite cup B M3x8	2	0.4±0.05 (4±0.5)
INNER CHUTE ASSY	Taptite bind B M4x12	2	0.6±0.1 (6±1)
FUSER UNIT	Taptite pan B M4x14	2	0.8±0.1 (8±1)
SIDE COVER R ASSY	Taptite bind B M4x12	2	0.8±0.1 (8±1)
CORNER COVER	Taptite bind B M4x12	1	0.8±0.1 (8±1)
SIDE COVER L ASSY	Taptite bind B M4x12	2	0.8±0.1 (8±1)
MAIN SHIELD COVER PLATE	Taptite cup S M3x6 SR	2	0.55±0.05 (5.5±0.5) Left side
	Taptite cup S M3x6 SR	1	0.9±0.05 (9±0.5) Right side
MAIN PCB ASSY	Taptite cup S M3x6 SR	4(5)*	0.6±0.1 (6±1)
TOP COVER ASSY	Taptite bind B M4x12	2	0.8±0.1 (8±1)
PANEL PCB ASSY	Taptite cup B M3x8	1	0.5±0.1 (5±1)
HIGH-VOLTAGE PS PCB ASSY	Taptite cup S M3x6 SR	2	0.8±0.05 (8±0.5)
	Taptite bind B M4x12	2	0.8±0.05 (8±0.5)
LASER UNIT	Taptite cup S M3x6 SR	4(2)*	0.8±0.05 (8±0.5) Left side of Main frame
	Taptite pan (S/P washer) S M3x8	0(2)*	0.8±0.05 (8±0.5) Right side of Main frame
AIR DUCT	Taptite cup S M3x6 SR	2	0.8±0.05 (8±0.5)
LV SHIELD PLATE COVER	Screw pan (S/P washer) M3.5x6	1	0.5±0.05 (5±0.5)
	Taptite cup S M3x6 SR	2	0.5±0.05 (5±0.5)
SW HOLDER	Taptite bind B M4x12	1	0.8±0.1 (8±1)

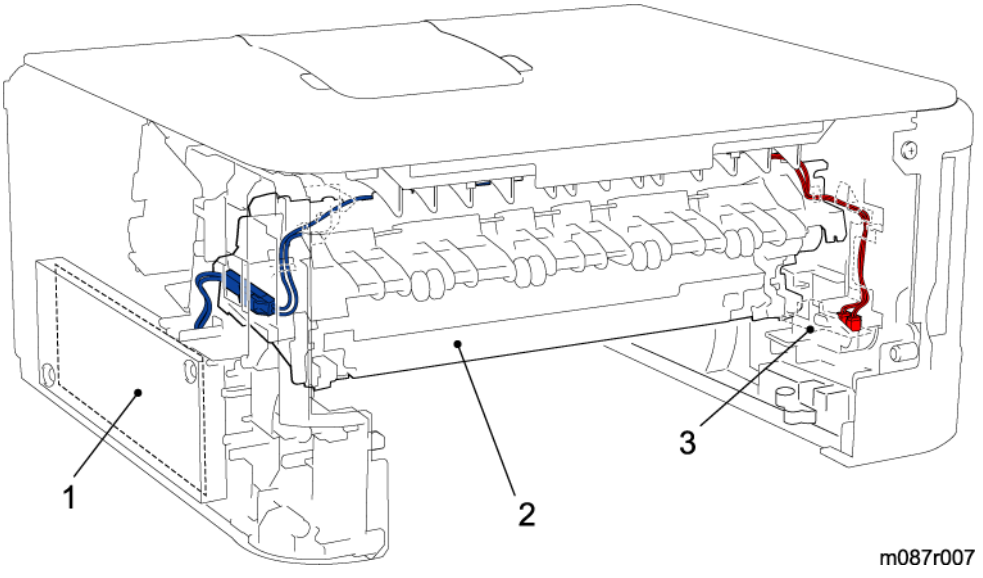
Location of screw	Screw type	Q'ty	Tightening torque Nm (kgf·cm)
INLET HARNESS ASSY	Screw pan (S/P washer) M3.5x6	1	0.5±0.05 (5±0.5)
	Taptite flat B M3x10	2	0.45±0.05 (4.5±0.5)
PS PCB UNIT	Taptite cup S M3x6 SR	2	0.5±0.05 (5±0.5)
LV SHIELD PLATE 2	Taptite bind B M4x12	2	0.8±0.1 (8±1)
	Taptite cup S M3x6 SR	1	0.6±0.1 (6±1) Back Side
	Taptite cup S M3x6 SR	1	0.5±0.05 (5±0.5) Front chute ground plate side
ACTUATOR HOLDER ASSY	Taptite bind B M3x10	2	0.5±0.1 (5±1)
REGISTRATION FRONT SENSOR PCB ASSY	Taptite bind B M3x10	1	0.5±0.1 (5±1)
REAR ACTUATOR HOLDER ASSY	Taptite bind B M3x10	2	0.5±0.1 (5±1)
REGISTRATION REAR SENSOR PCB ASSY	Taptite bind B M3x10	1	0.5±0.1 (5±1)
UNDER FG WIRE	Taptite bind B M4x12	1	0.8±0.1 (8±1)
	Taptite cup S M3x6 SR	1	0.8±0.05 (8±0.5)
DRIVE SUB ASSY	Taptite cup S M3x6 SR	1	0.6±0.1 (6±1)
	Taptite bind B M4x12	9	0.8±0.1 (8±1)
NEW TONER SENSOR HARNESS ASSY	Taptite bind B M3x10	1	0.5±0.1 (5±1)
REGISTRATION SOLENOID	Taptite bind B M3x10	1	0.5±0.1 (5±1)
T1 SOLENOID	Taptite bind B M3x10	1	0.5±0.1 (5±1)
FU FRONT PLATE GUIDE	Taptite bind B M3x10	3	0.5±0.1 (5±1)
CHUTE GROUND PLATE	Taptite cup S M3x6 SR	2	0.6±0.1 (6±1)

Location of screw	Screw type	Q'ty	Tightening torque Nm (kgf·cm)
MAIN SHIELD PLATE	Taptite bind B M4x12	3	0.8±0.1 (8±1)
MAIN FRAME L ASSY	Taptite bind B M4x12	4	0.8±0.1 (8±1)
	Taptite cup S M3x6 SR	2	0.7±0.1 (7±1)

* The parenthesis shows the number of screws for M087.

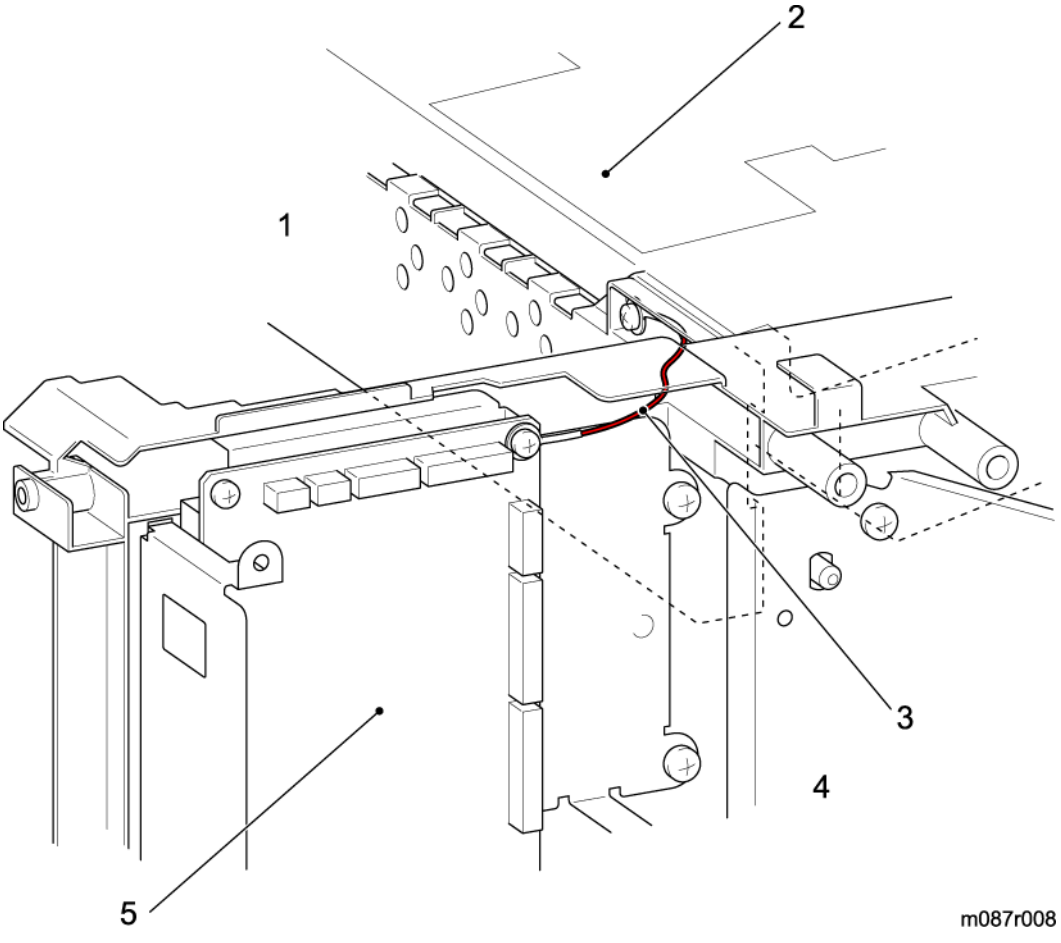
Harness Routing

Fuser Unit



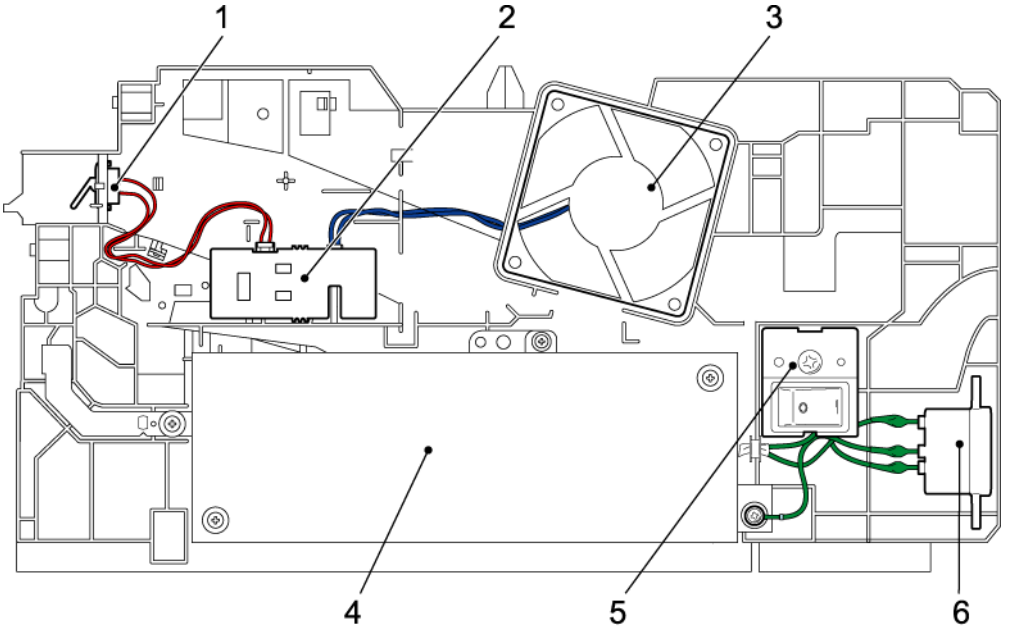
1. PS PCB unit	3. Eject sensor PCB ASSY
2. Fuser unit	

FG Harness



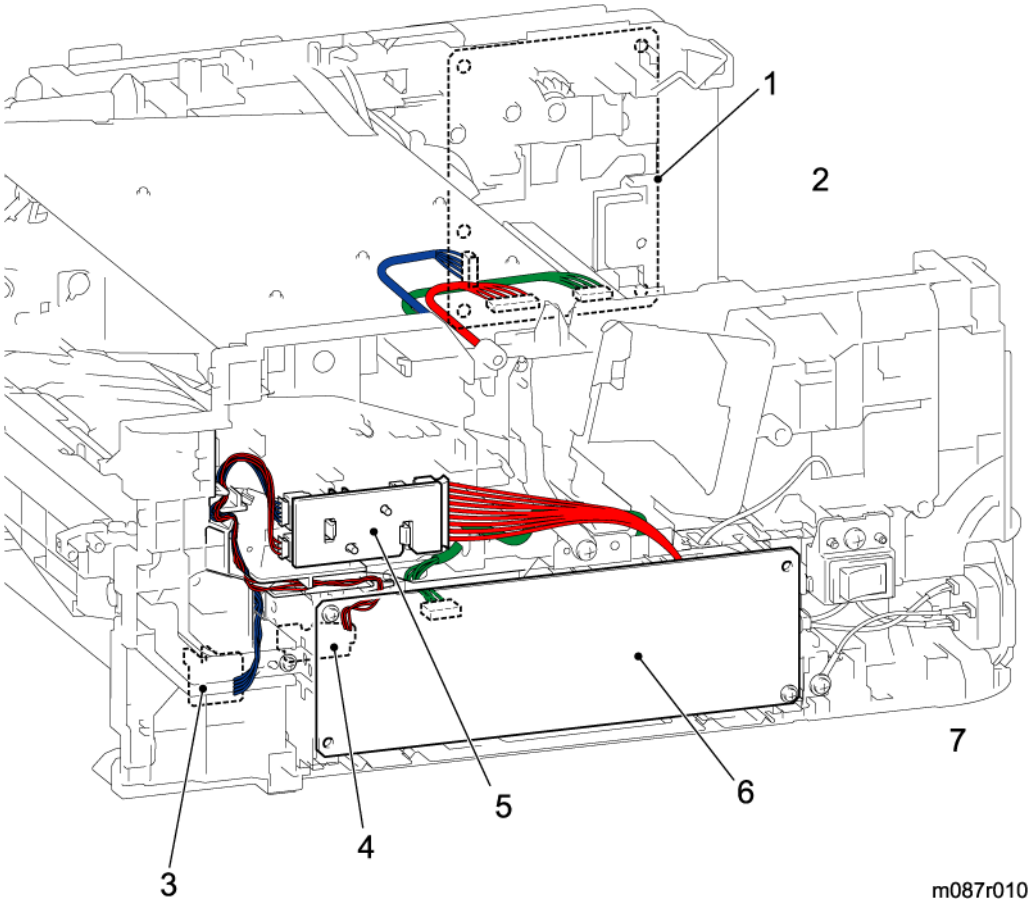
1. <Back side>	4. <Left side>
2. Laser unit	5. Main PCB ASSY
3. FG harness	

Main Frame R ASSY



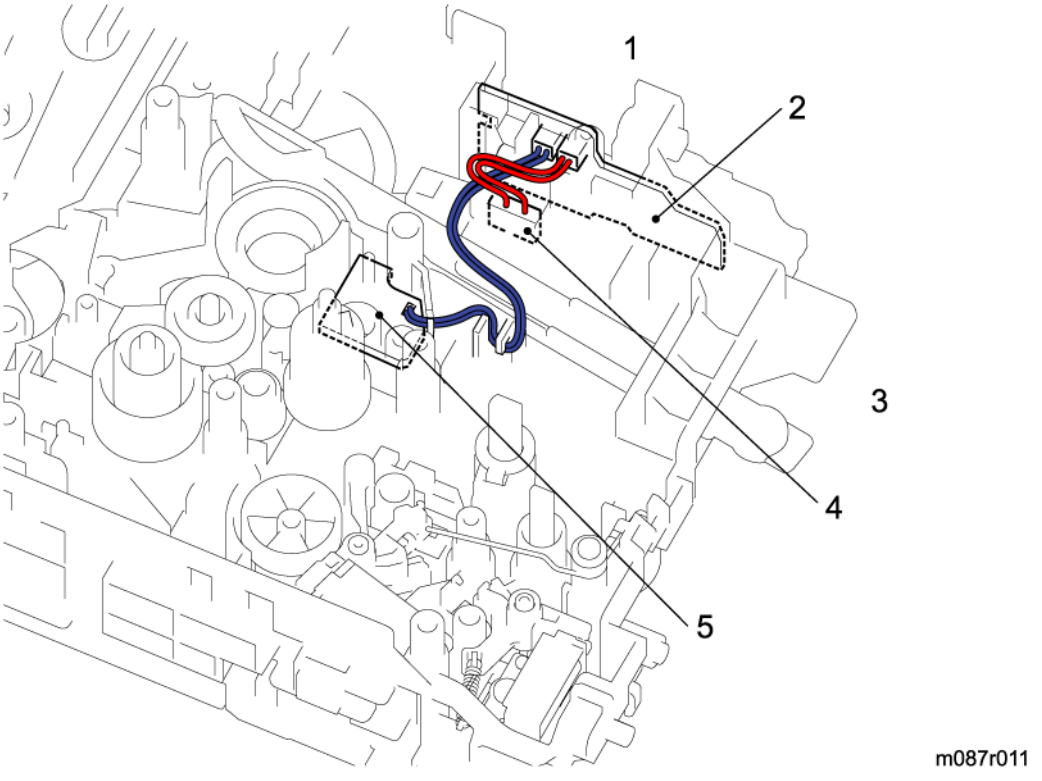
1. Front cover sensor	4. PS PCB unit
2. Toner LED PCB ASSY	5. SW holder
3. Fan motor 60 unit	6. Inlet harness ASSY

Toner LED PCB ASSY / PS PCB Unit / Main PCB ASSY/Registration Front Sensor PCB ASSY / Registration Rear Sensor PCB ASSY



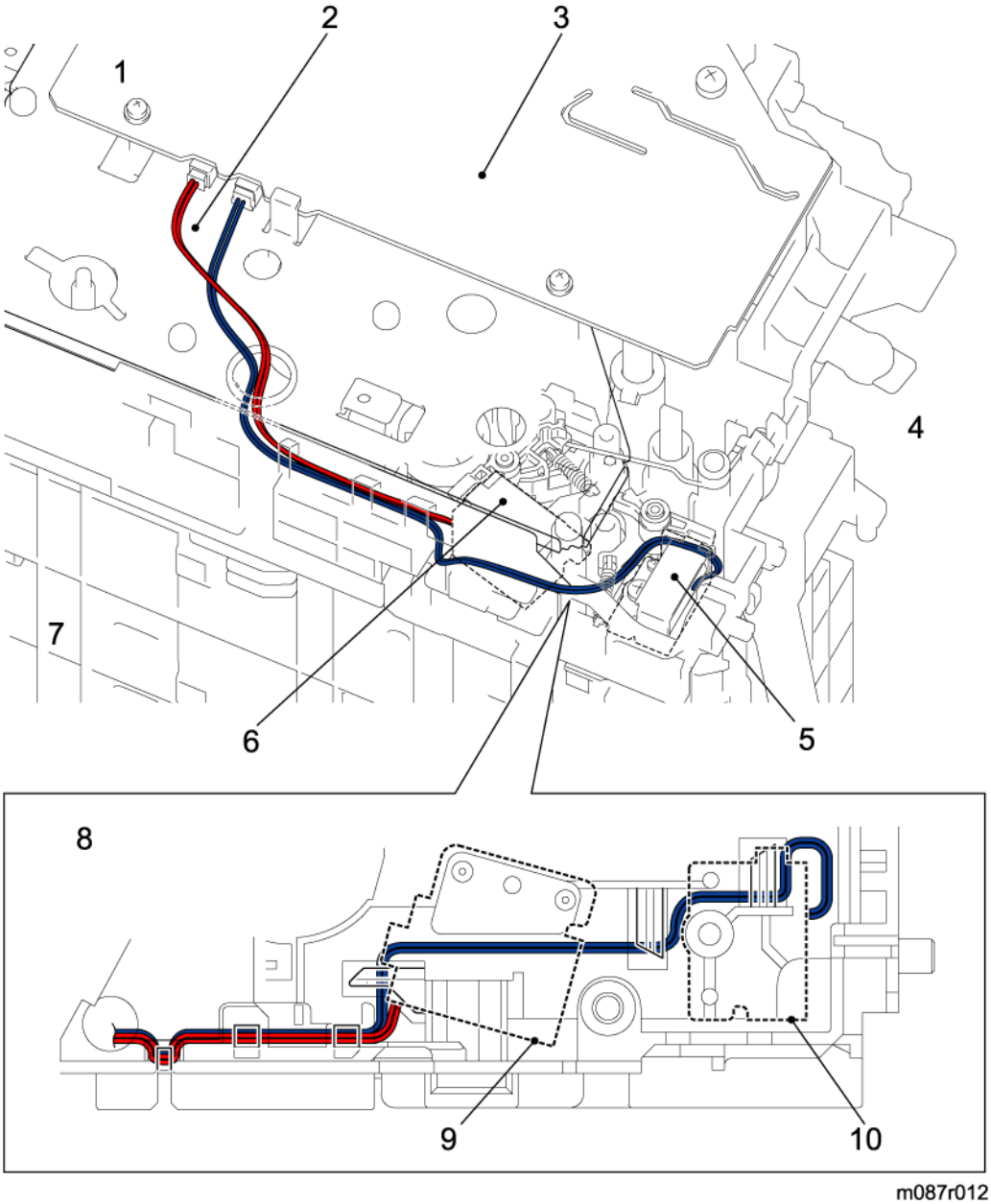
1. Main PCB ASSY (Main Frame L ASSY)	5. Toner LED PCB ASSY
2. <Back side>	6. PS PCB unit
3. Registration front sensor PCB ASSY	7. <Right side>
4. Registration rear sensor PCB ASSY	

Panel PCB ASSY / Toner Sensor PCB Unit ASSY / New Toner Sensor Harness ASSY



1. <Left side>	4. New toner sensor harness ASSY
2. Panel PCB ASSY	5. Toner sensor PCB unit ASSY
3. <Front side>	

High-Voltage PS PCB / Registration Solenoid / T1 Solenoid



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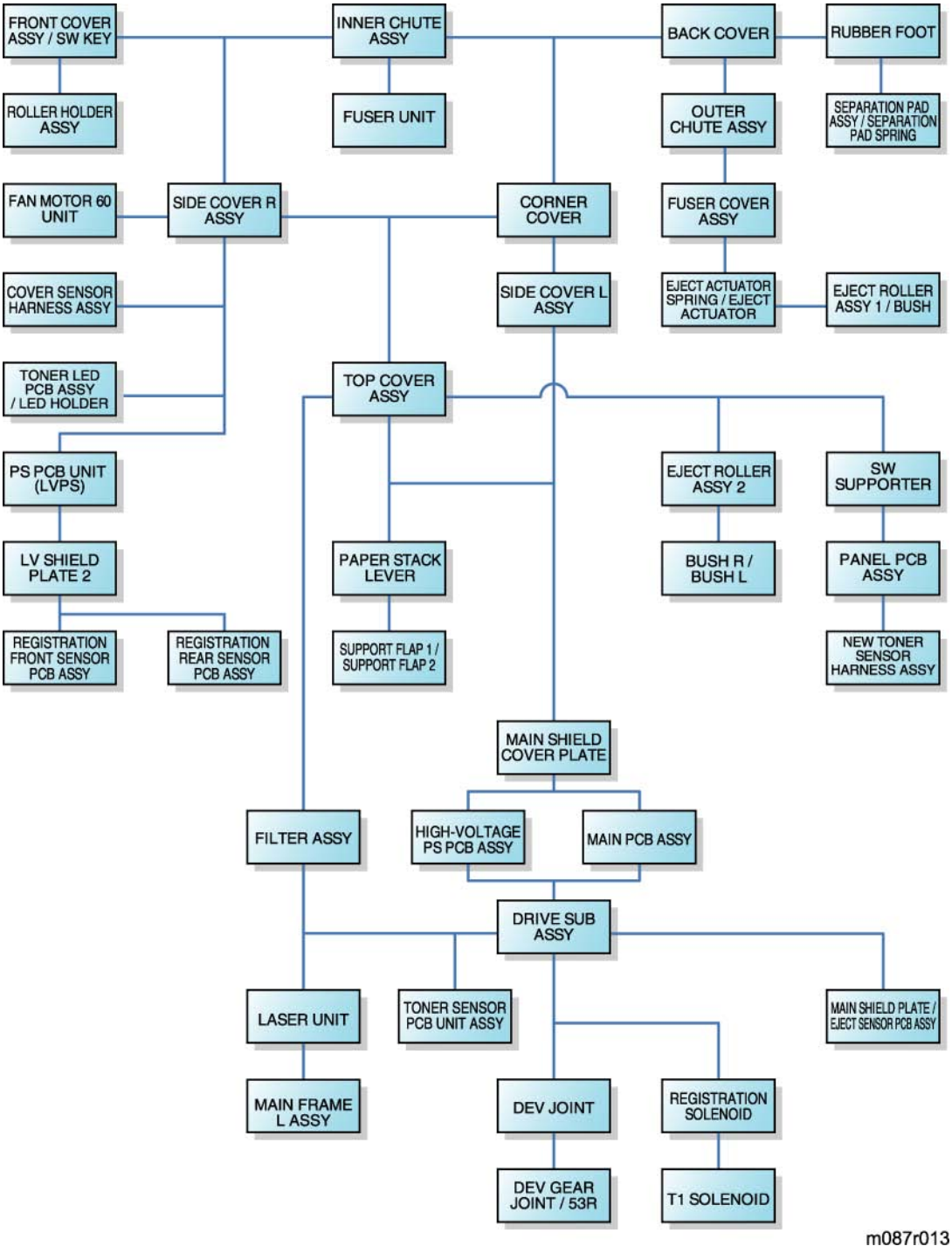
1. <Left side>	6. Registration solenoid
2. Drive sub ASSY	7. <Bottom side>
3. High-voltage PS PCB ASSY	8. <Left side>

4. <Front side>	9. Registration solenoid
5. T1 solenoid	10. T1 solenoid

Disassembly Flow



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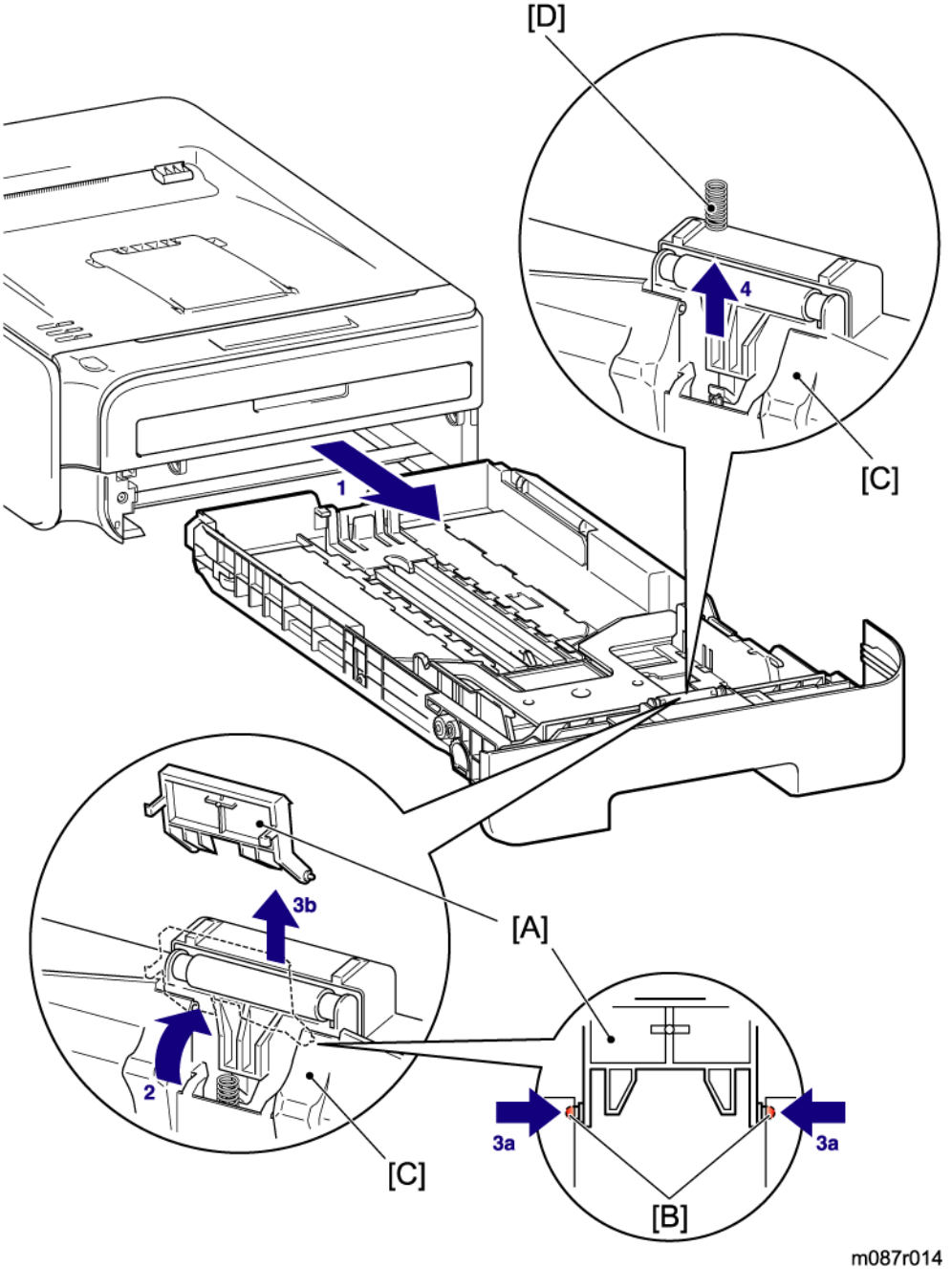
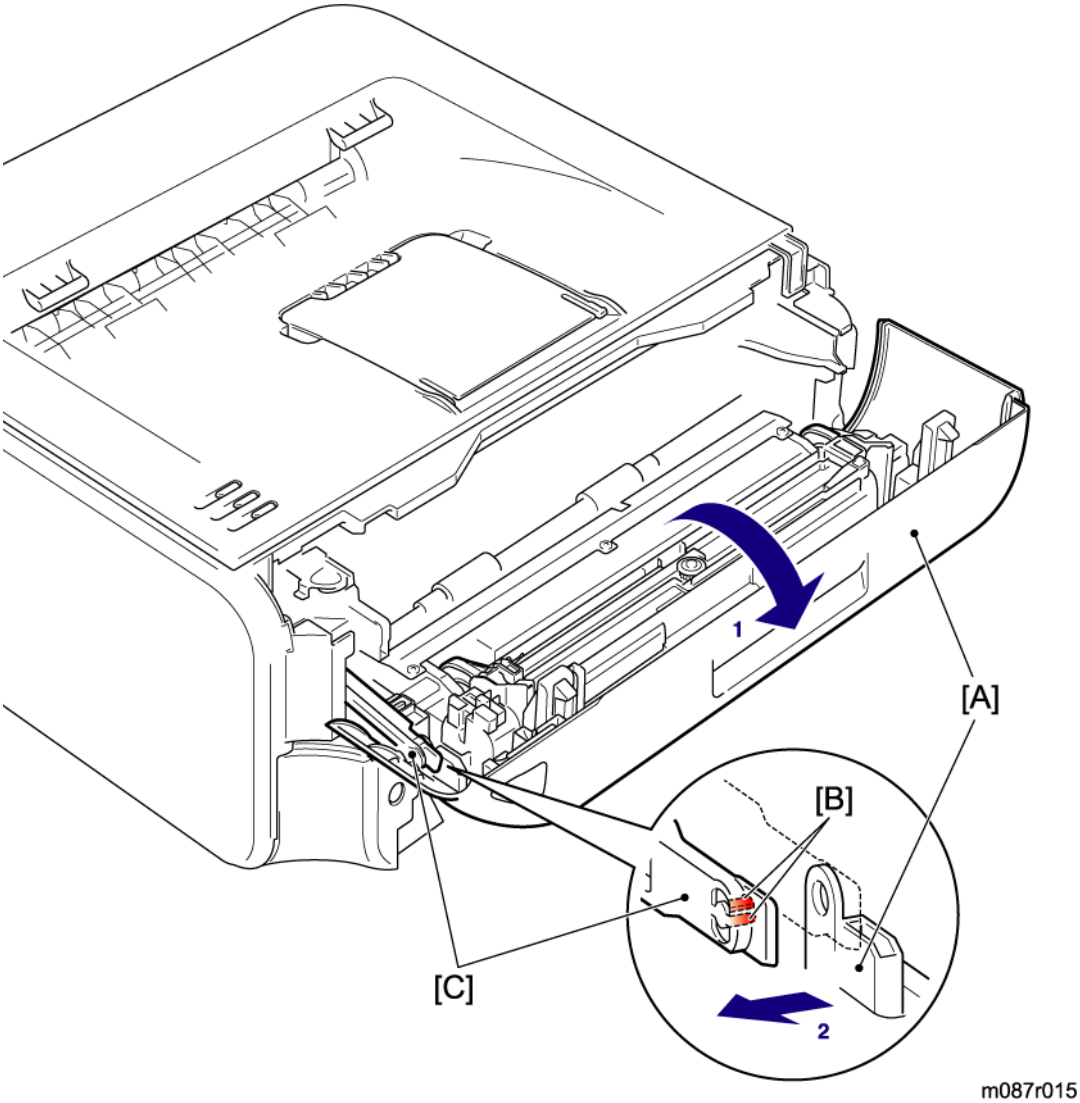
Disassemble Procedure

Paper Tray Unit / Separation Pad Assy



1. Pull out the Paper tray unit from the Main body.
2. Lift up the Separation pad ASSY [A].
3. Release the Boss [B] to remove the Separation pad ASSY [A] from the Paper tray unit [C].
4. Remove the Separation pad spring [D] from the Paper tray unit [C].

Front Cover Assy



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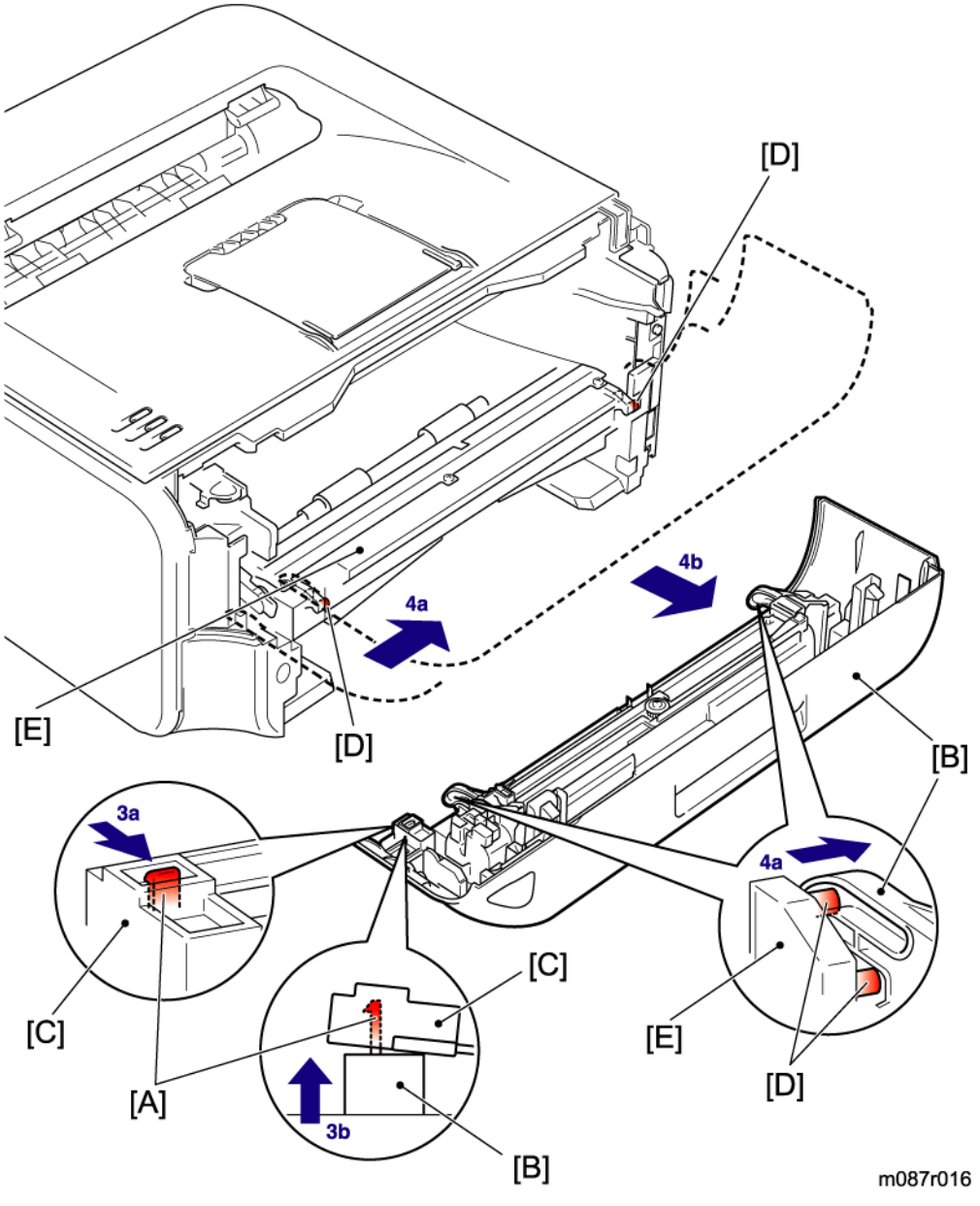
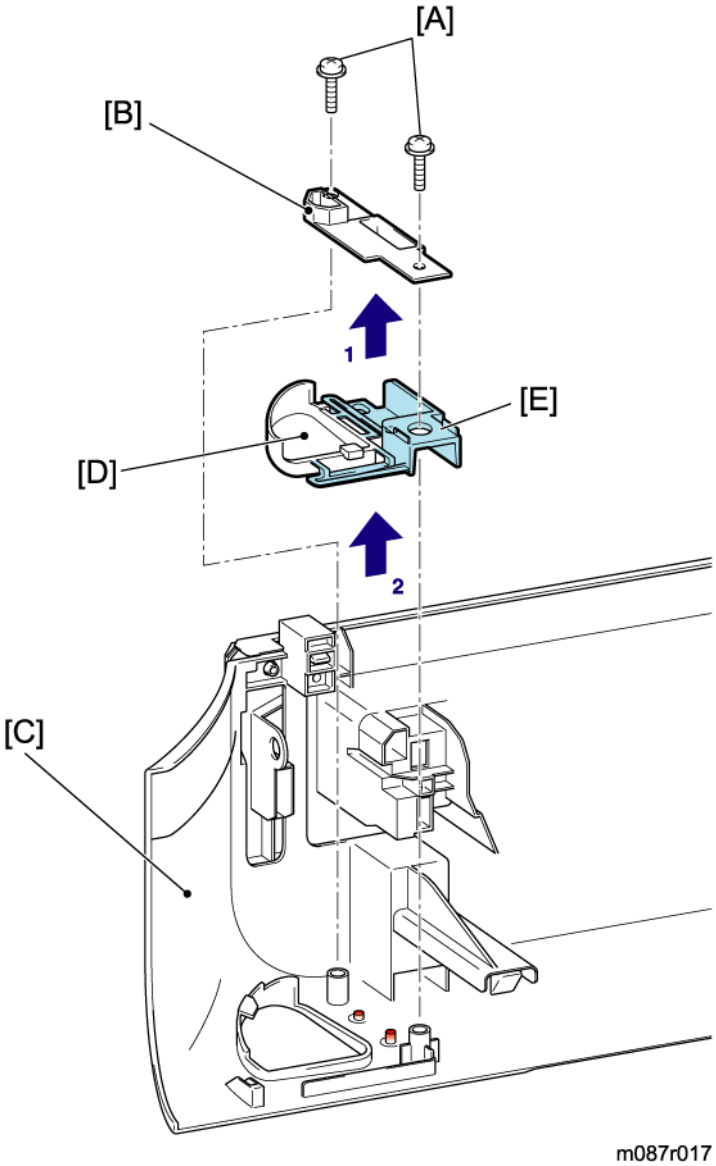
1. Open the Front cover ASSY [A].
2. Release the Hook [B] to remove the DEV joint link [C] from the Front cover ASSY [A].



3. Release the Hook [A] of the Front cover ASSY [B] from the Front cover top [C].
4. Remove the Boss [D] of the Front chute ASSY [E], and then remove the Front cover ASSY [B] from the Main body.

SW Key

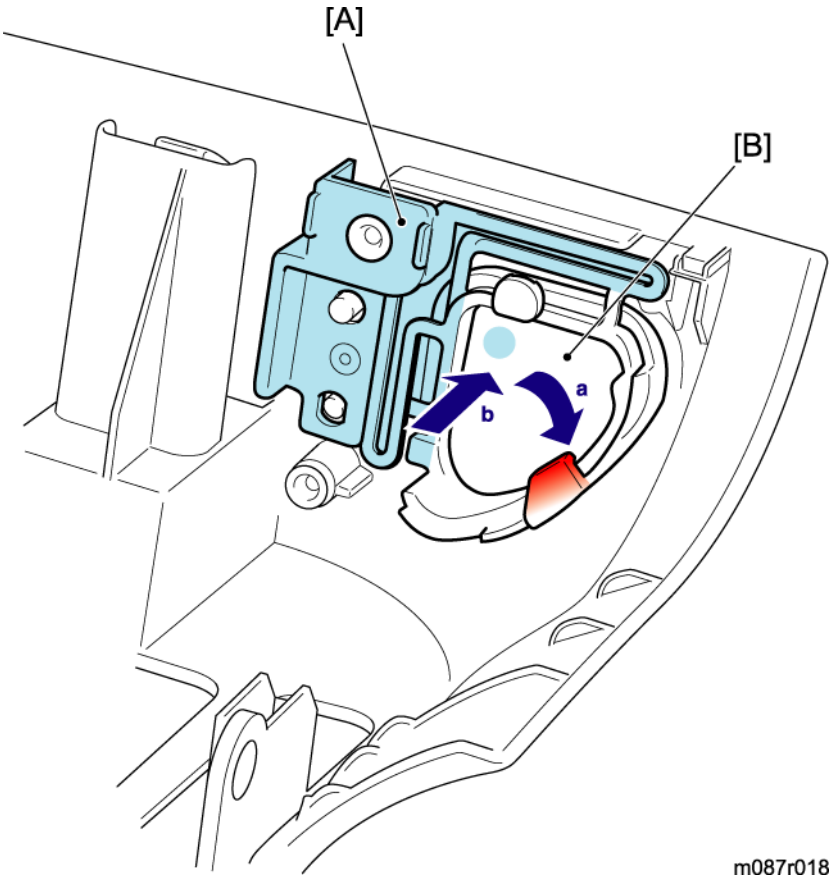


1. Remove the two Taptite cup B M3x8 screws [A], and then remove the Key stopper [B] from the Front cover ASSY [C].
2. Remove the SW key [D] from the Front cover ASSY [C].

Important

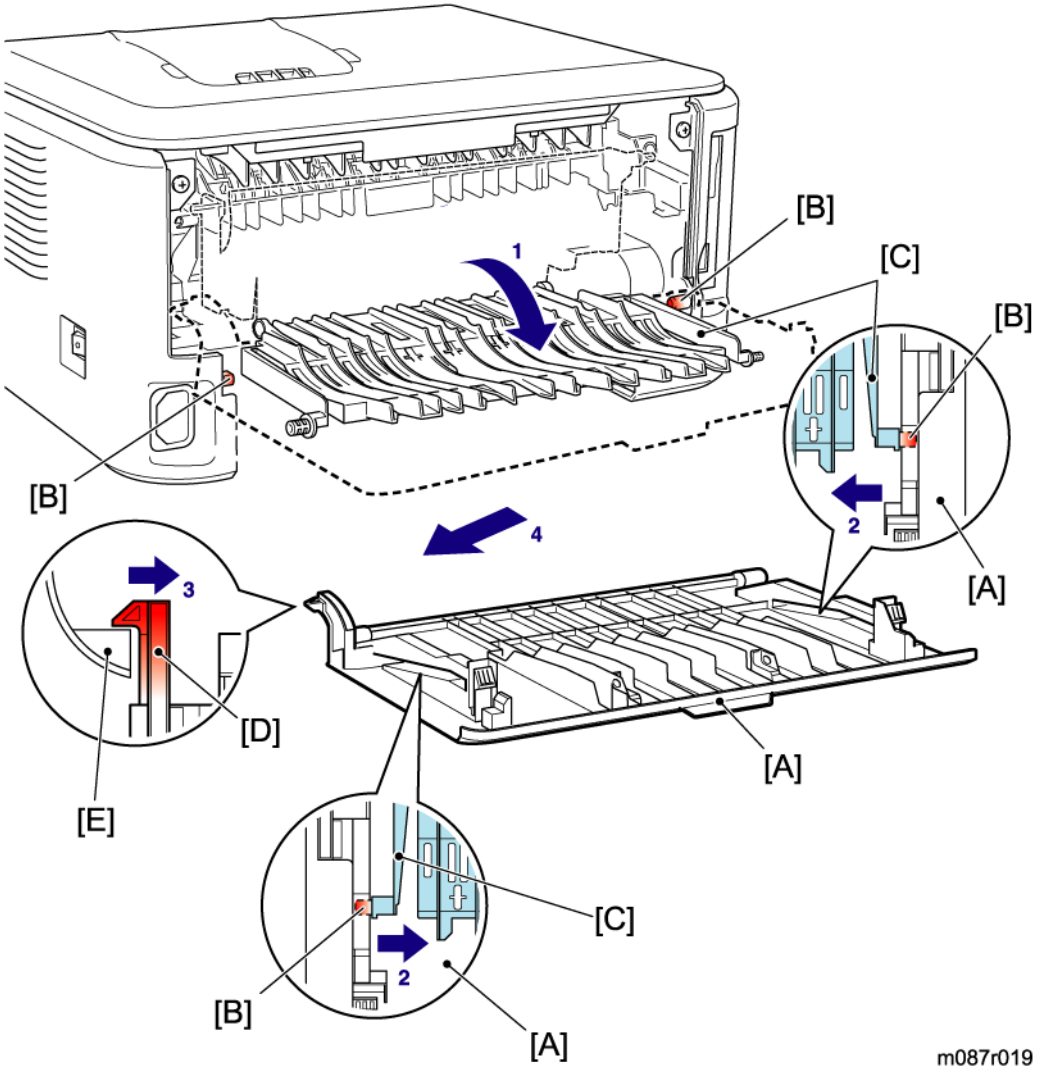
- **When handling the screw installation part [E] of the SW key [D], be careful not to damage it.**

Assembling Note:



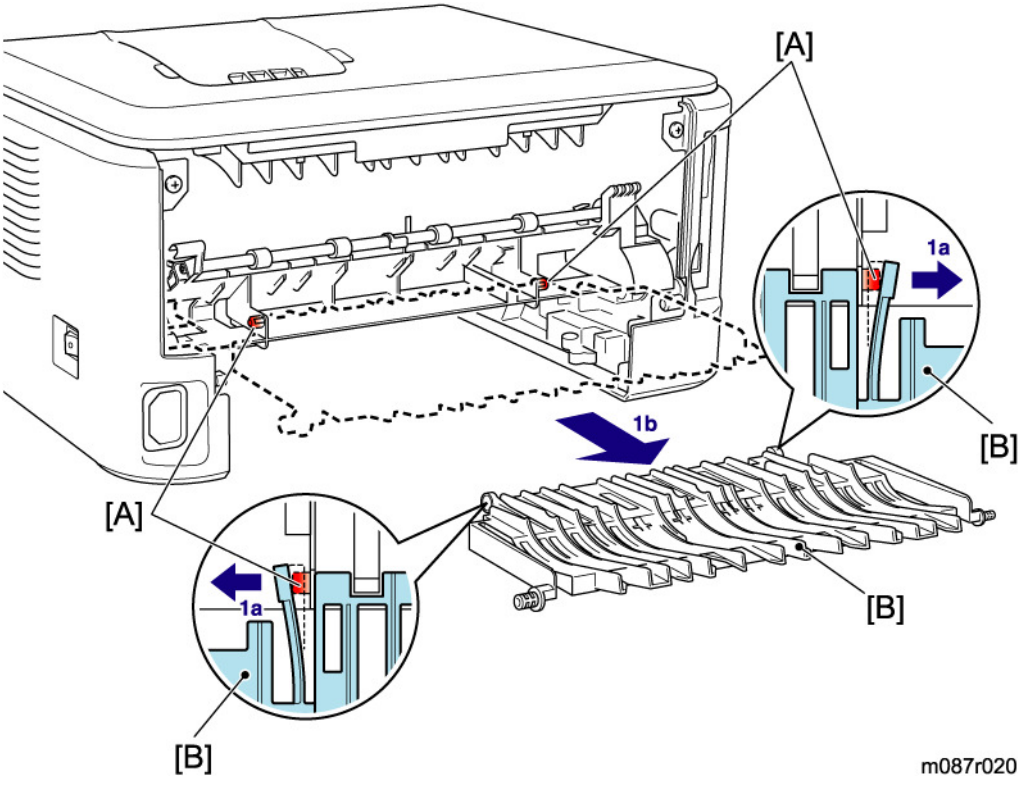
When handling the Screw installation part [A] of the SW key [B], be careful not to damage it.

Back Cover



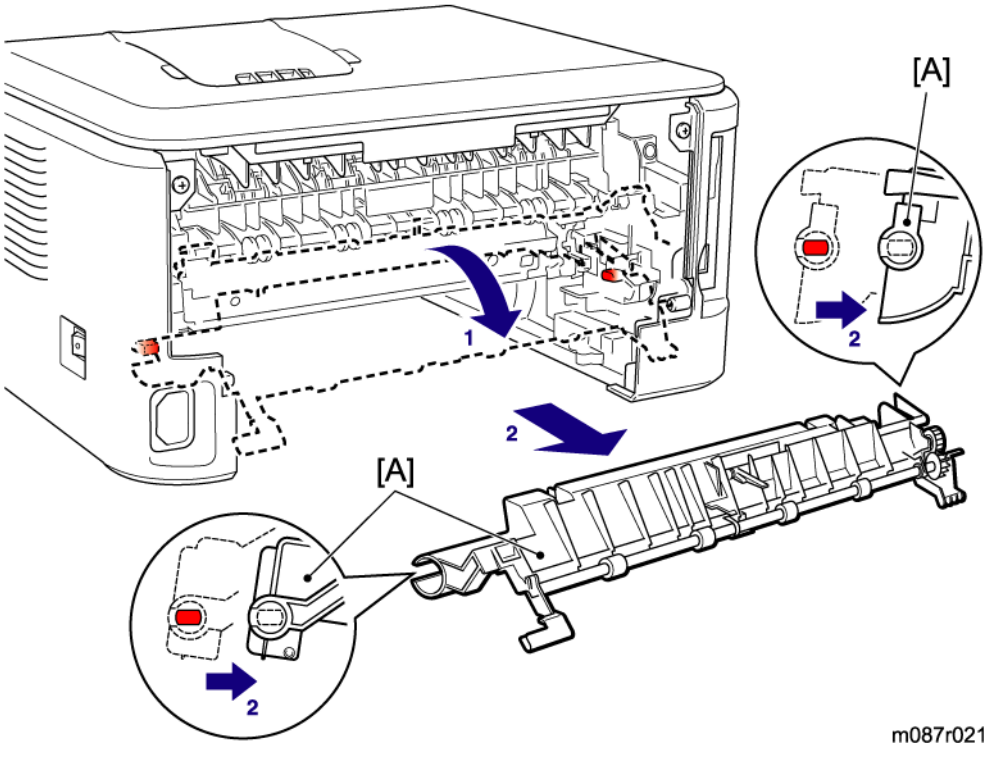
1. Open the Back cover [A].
2. Release the Boss [B] of the Outer chute ASSY [C] from the Back cover [A].
3. Release the Hook [D] from the Side cover R ASSY [E].
4. Slide the Back cover [A] from the Main body, and remove it.

Outer Chute Assy



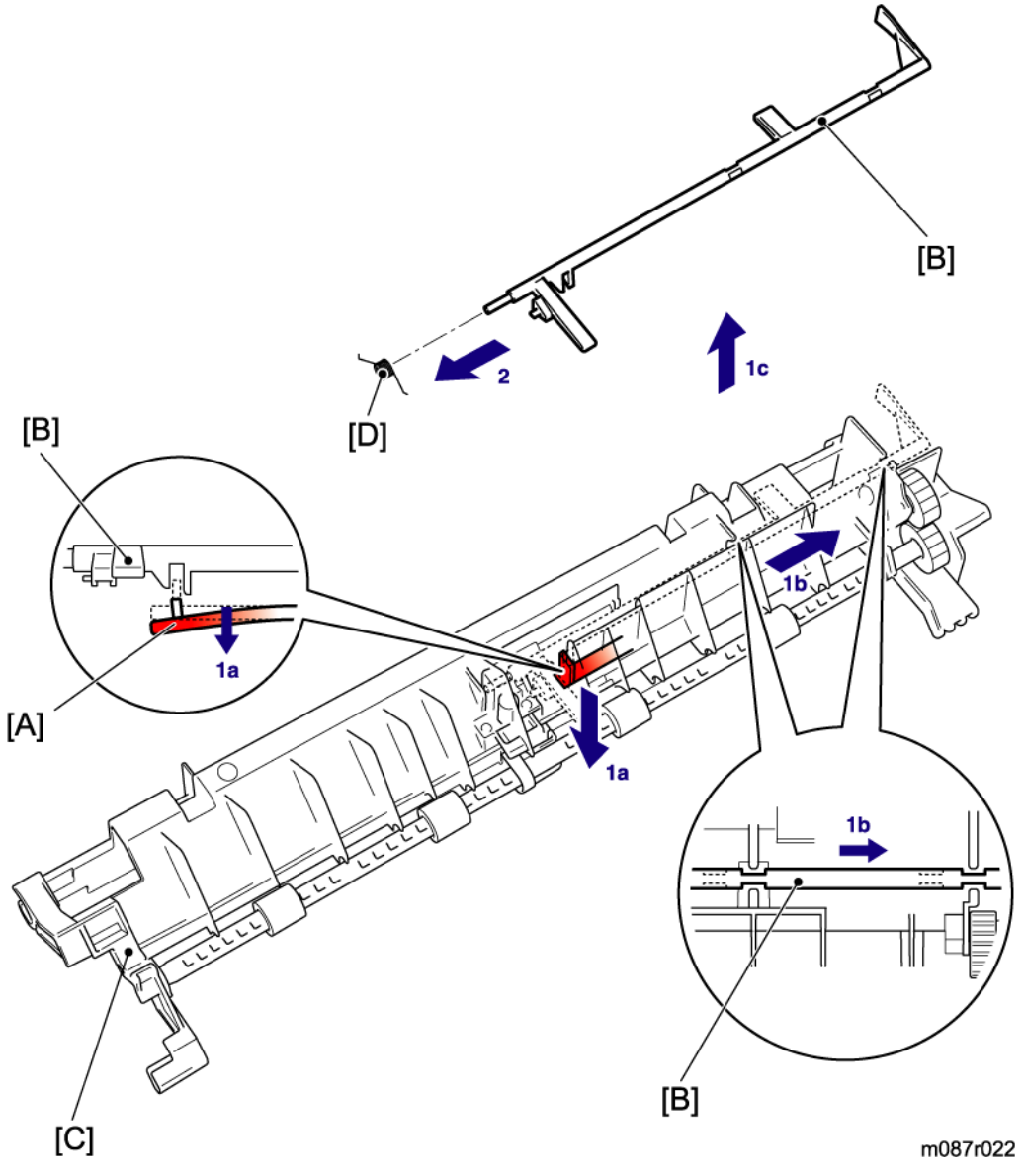
1. Release the Boss [A] to remove the Outer chute ASSY [B] from the Main body.

Fuser Cover Assy



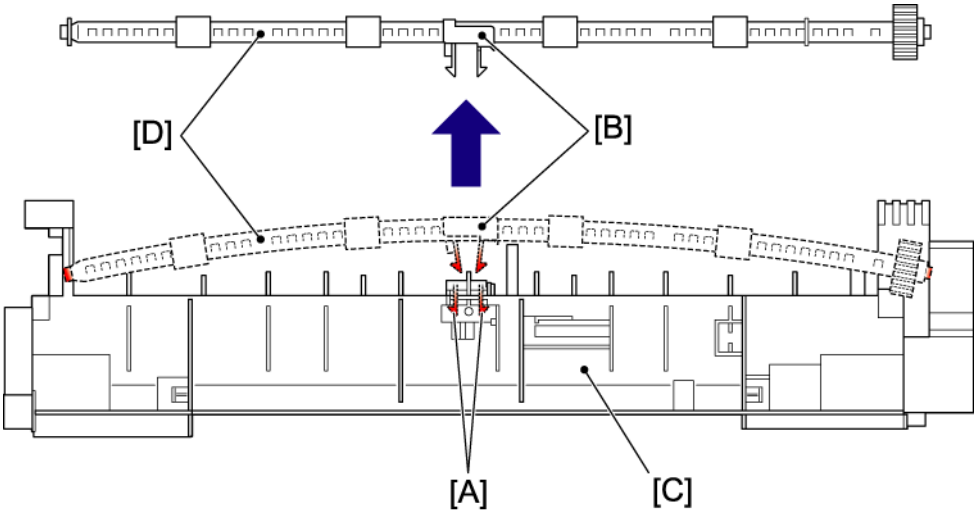
1. Take down the Fuser cover ASSY [A].
2. Remove the Fuser cover ASSY [A] from the Main body.

Eject Actuator / Eject Actuator Spring

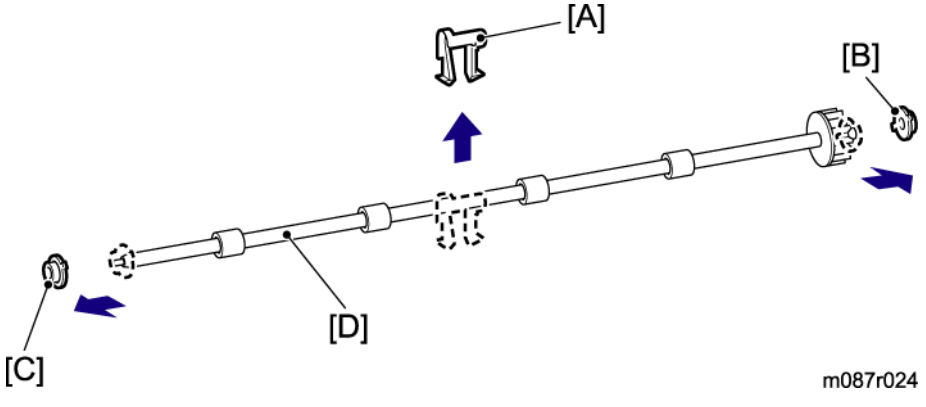


1. Release the Hook [A] to slide the Eject actuator [B], and then remove the Eject actuator [B] from the Fuser cover ASSY [C].
2. Remove the Eject actuator spring [D] from the Eject actuator [B].

Eject Roller Assy 1 / Bush C / Bush R / Bush L

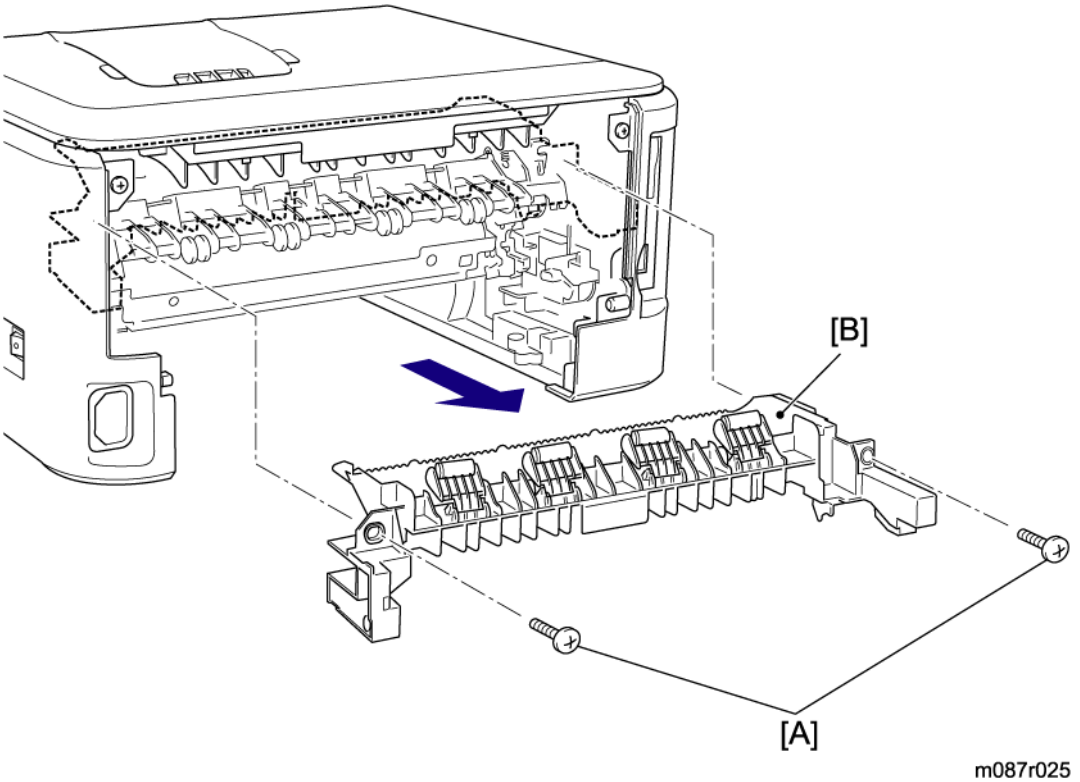


1. Release the Hook [A] of the Bush C [B] from the Fuser cover ASSY [C].
2. Remove the Eject roller ASSY 1 [D] from the Fuser cover ASSY [C].



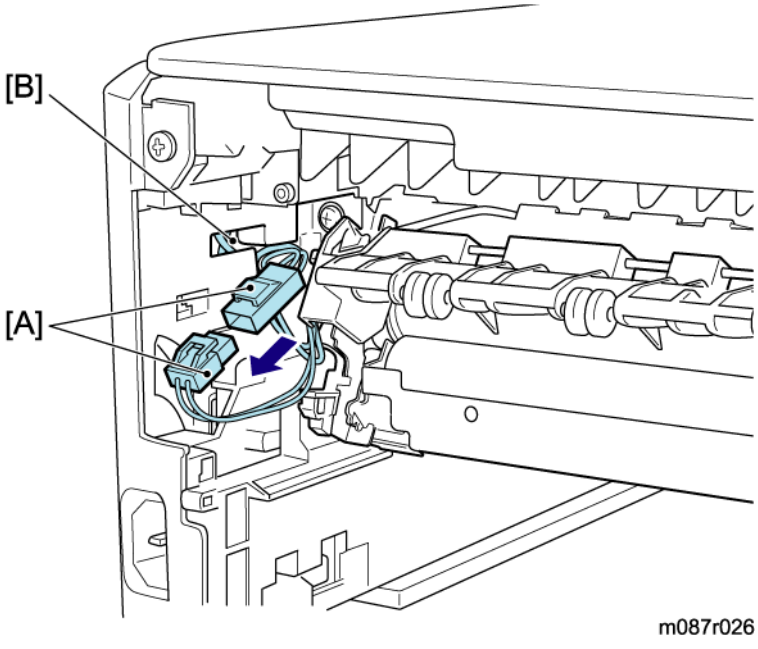
3. Remove the Bush C [A], the Bush R [B] and the Bush L [C] from the Eject roller ASSY 1 [D].

Inner Chute Assy



Remove the two Taptite bind B M4x12 screws [A], and then remove the Inner chute ASSY [B] from Main body.

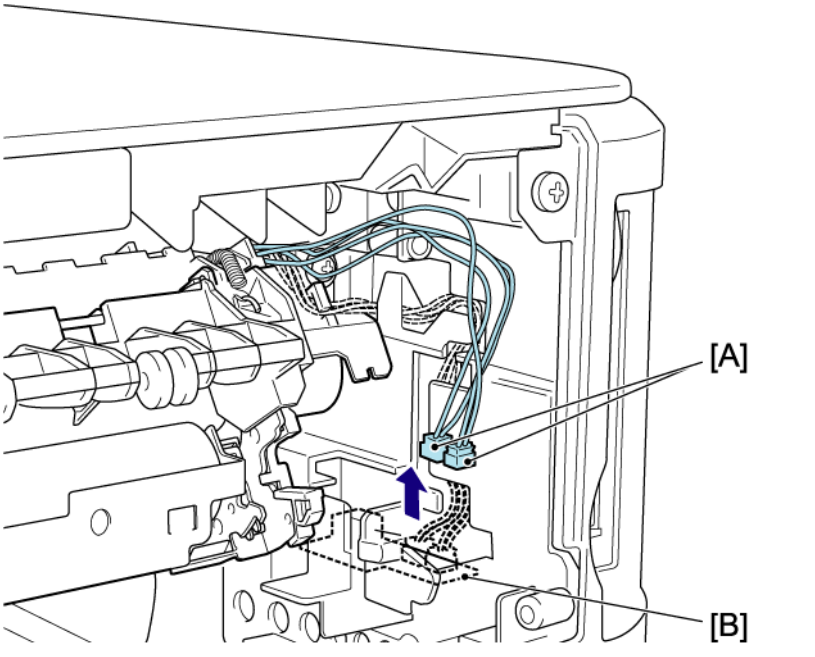
Fuser Unit



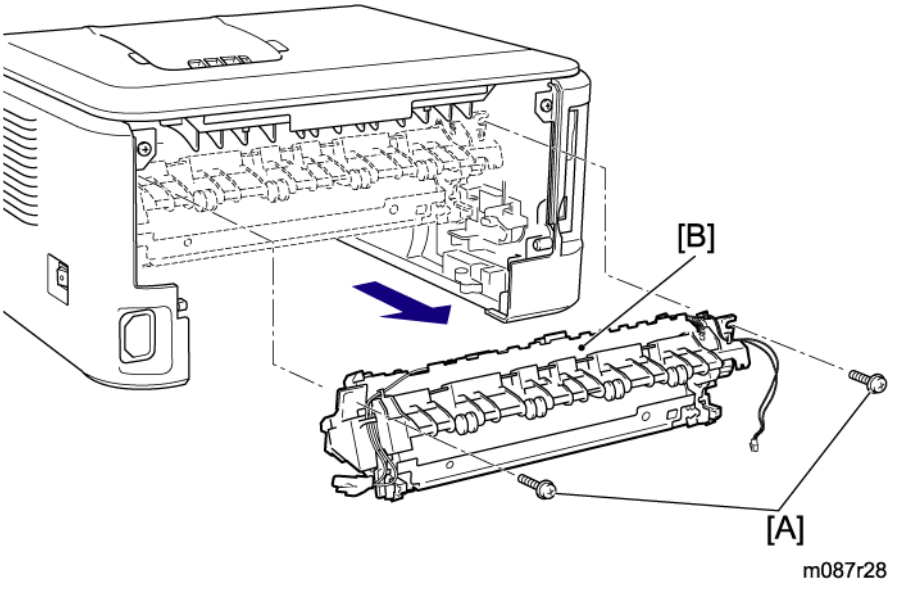
1. Disconnect the Connector [A].

Important

- **Pull out the Connector [A] from the Housing part [B] of the Main body left side.**

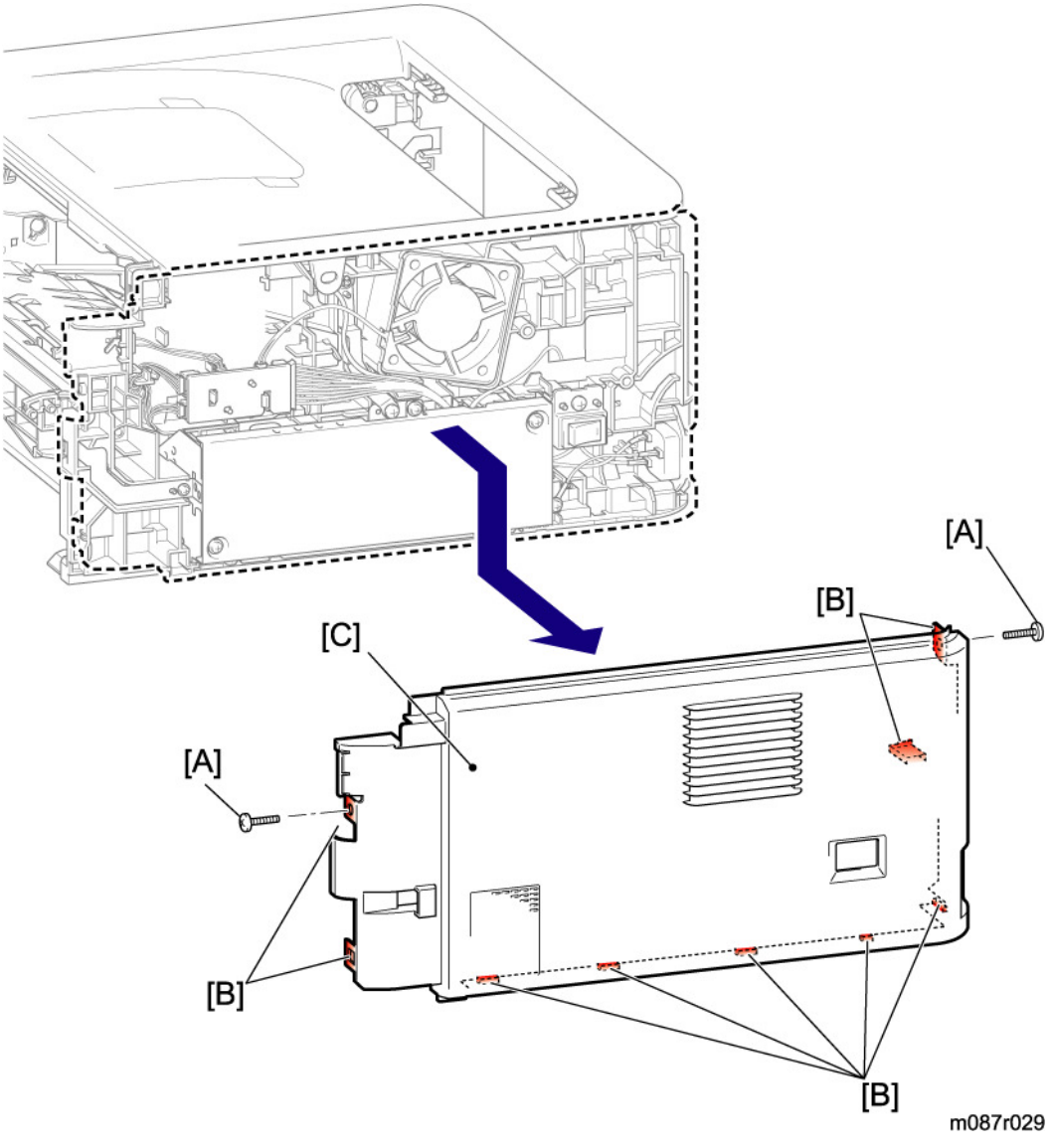


2. Disconnect the two Connectors [A] from the Eject sensor PCB ASSY [B].



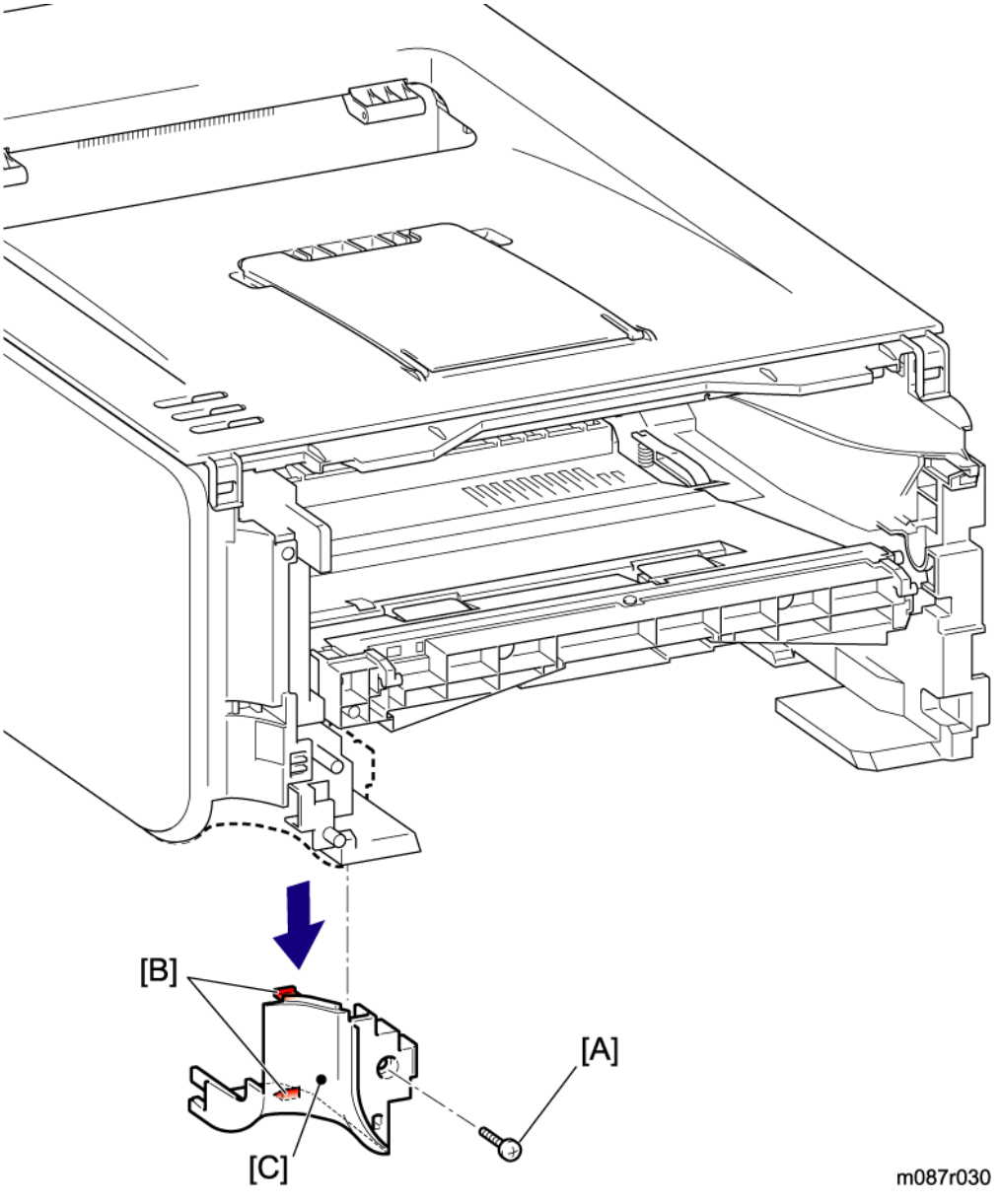
3. Remove the two Taptite pan B M4x14 screws [A], and then remove the Fuser unit [B] from the Main body.

Side Cover R Assy



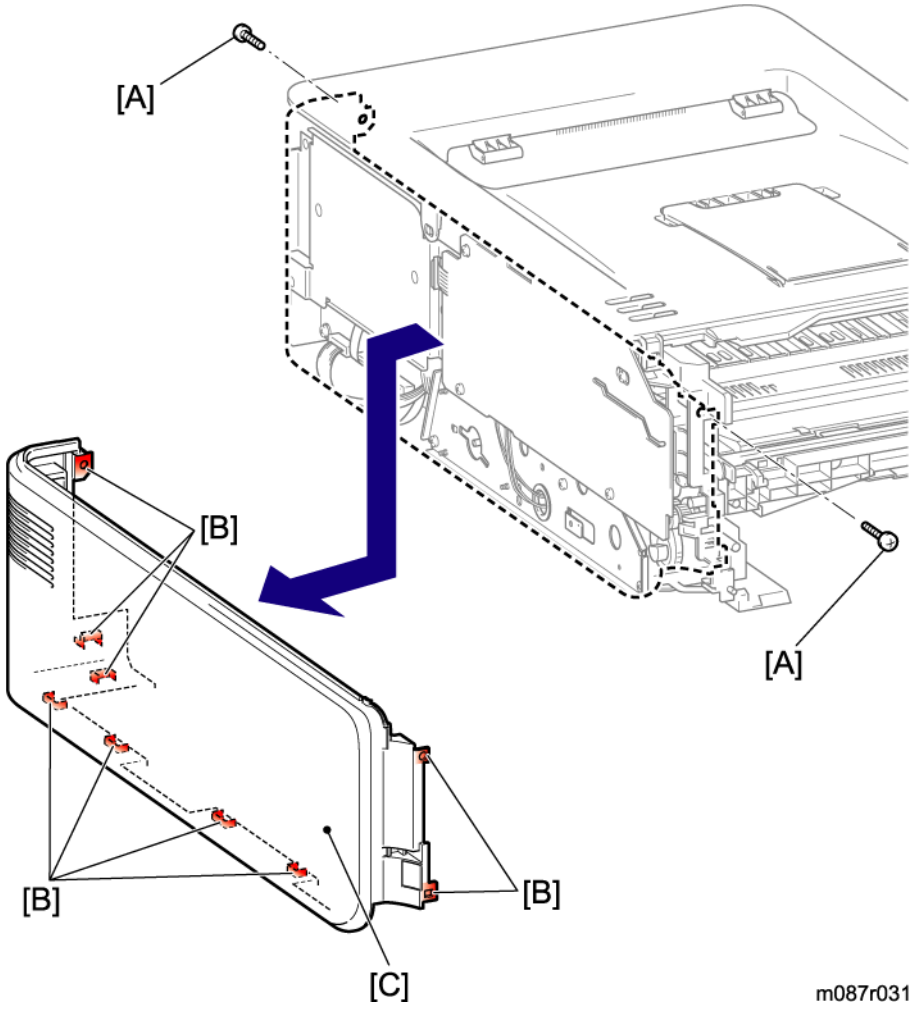
1. Remove the two Taptite bind B M4x12 screws [A].
2. Release the Hook [B] to remove the Side cover R ASSY [C] from the Main body.

Corner Cover



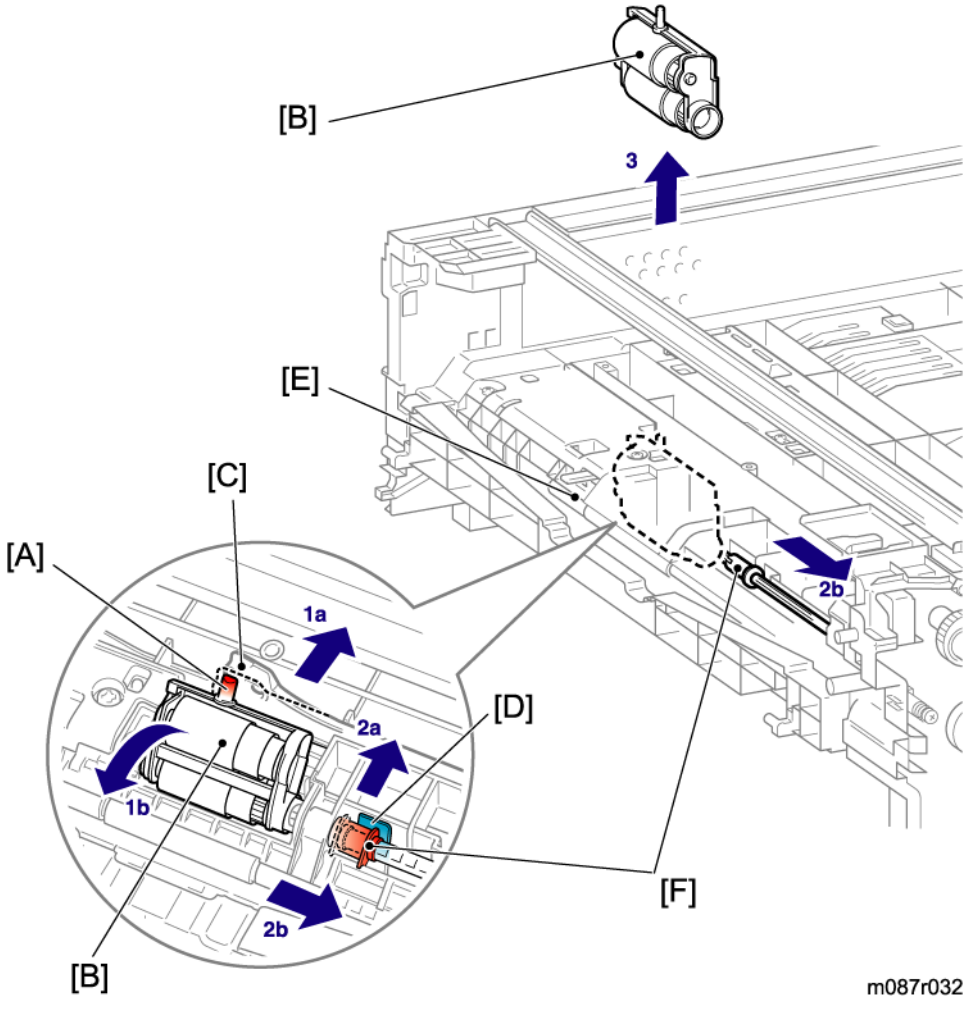
1. Remove the Taptite bind B M4x12 screw [A].
2. Release the Hook [B] to remove the Corner cover [C] from the Main body.

Side Cover L Assy



1. Remove the two Taptite bind B M4x12 screws [A].
2. Release the Hook [B] to remove Side cover L ASSY [C] from the Main body.

Roller Holder Assy



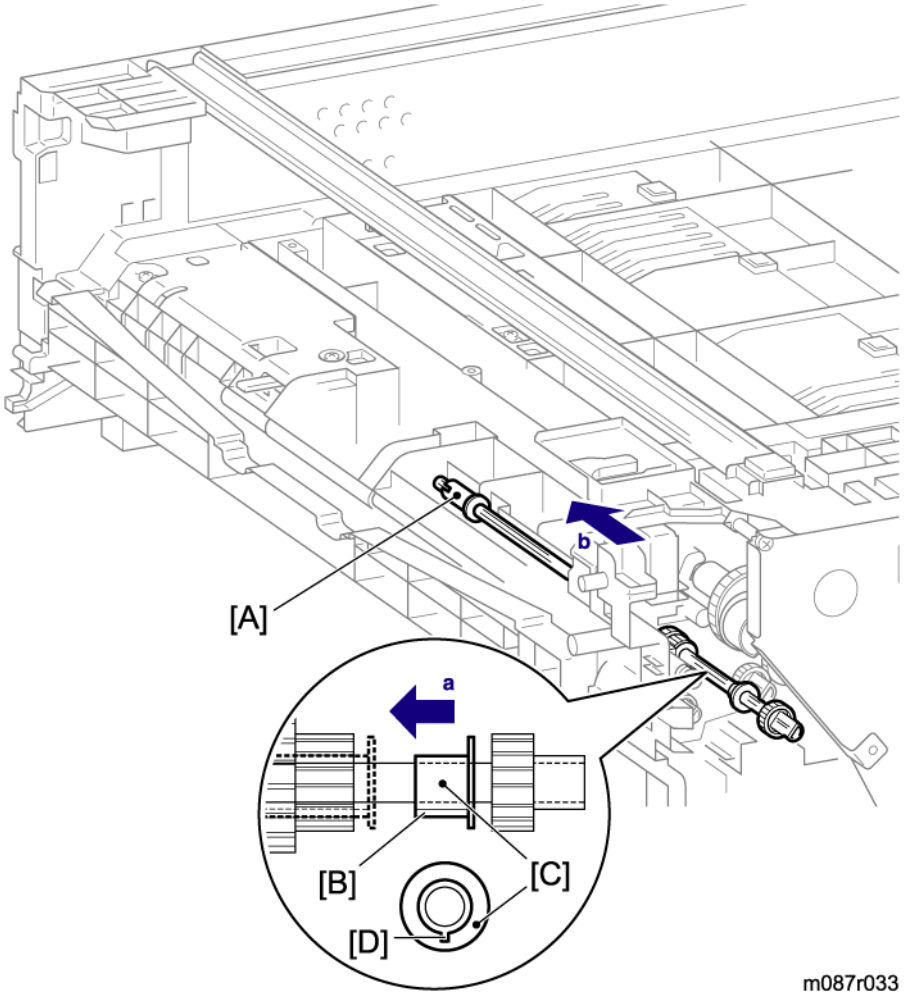
1. Release the Boss [A] of the Roller holder ASSY [B] from the Link arm [C].
2. Press the Rib [D] of the Paper feed frame [E], and the slide the Separation R shaft bush [F].
3. Remove the Roller holder ASSY [B] from the Main body.

Note

- When turning the printer upside down, be careful not to damage the Support flap 1 and Support flap 2.

Assembling Note:

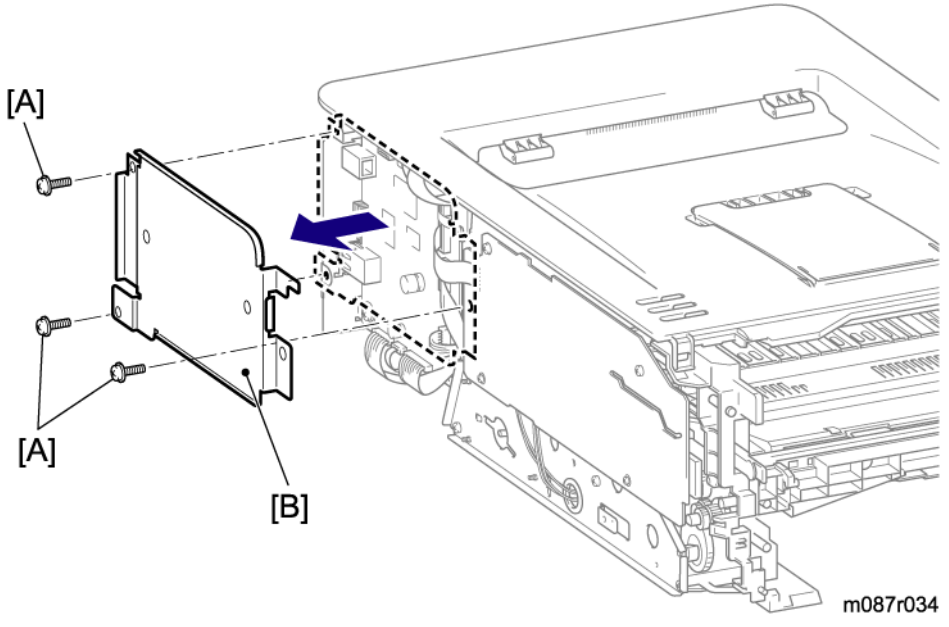
When assembling the Roller holder ASSY to the Main body, note the assembling method referring to the figure below.



Important

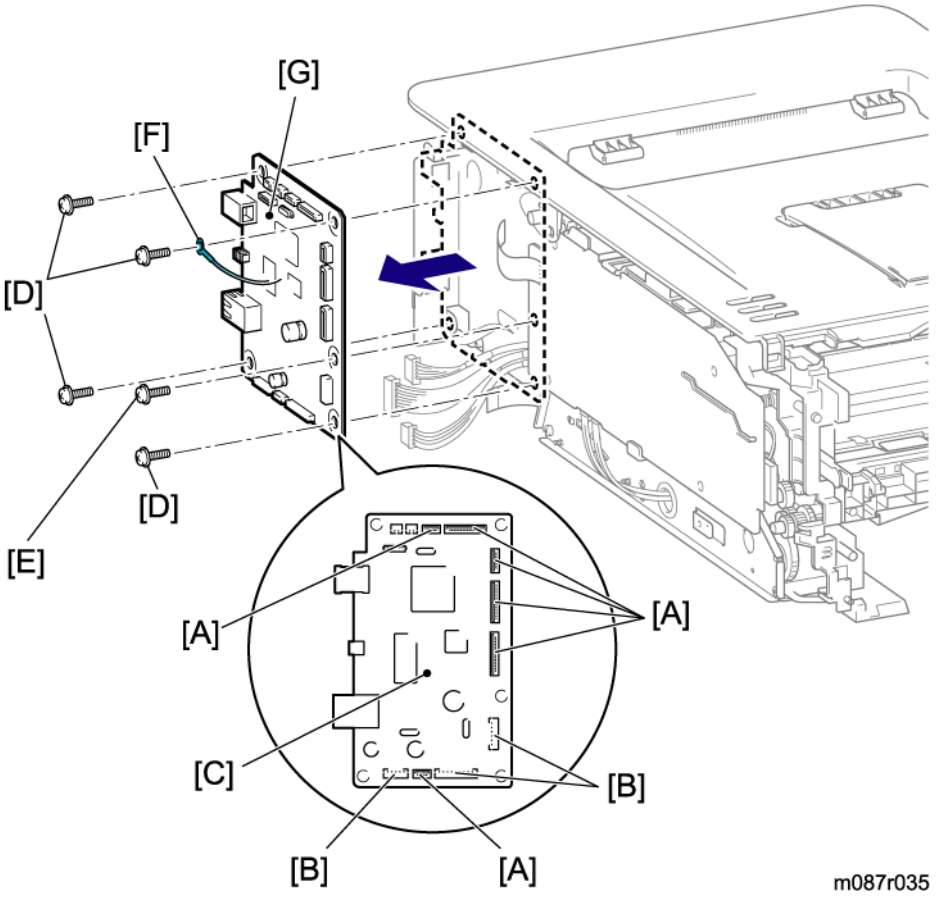
- When the Separation R shaft bush [A] does not slide, put the Rib [B] of the Bush 6 [C] while aligning the Groove [D] of the Main body shaft hole from the Main frame L ASSY side.

Main Shield Cover Plate



Remove the three Taptite cup S M3x6 SR screws [A], and then remove the Main shield cover plate [B] from the Main body.

Main PCB Assy



1. Disconnect the six FFCs [A] and the three Connectors [B] from the Main PCB ASSY [C].
2. Remove the four Taptite cup S M3x6 SR screws [D].
3. Remove the Taptite cup S M3x6 SR screw [E]. (M087 only)
4. Remove the FG harness ASSY [F] and Main PCB ASSY [G] from the Main body.

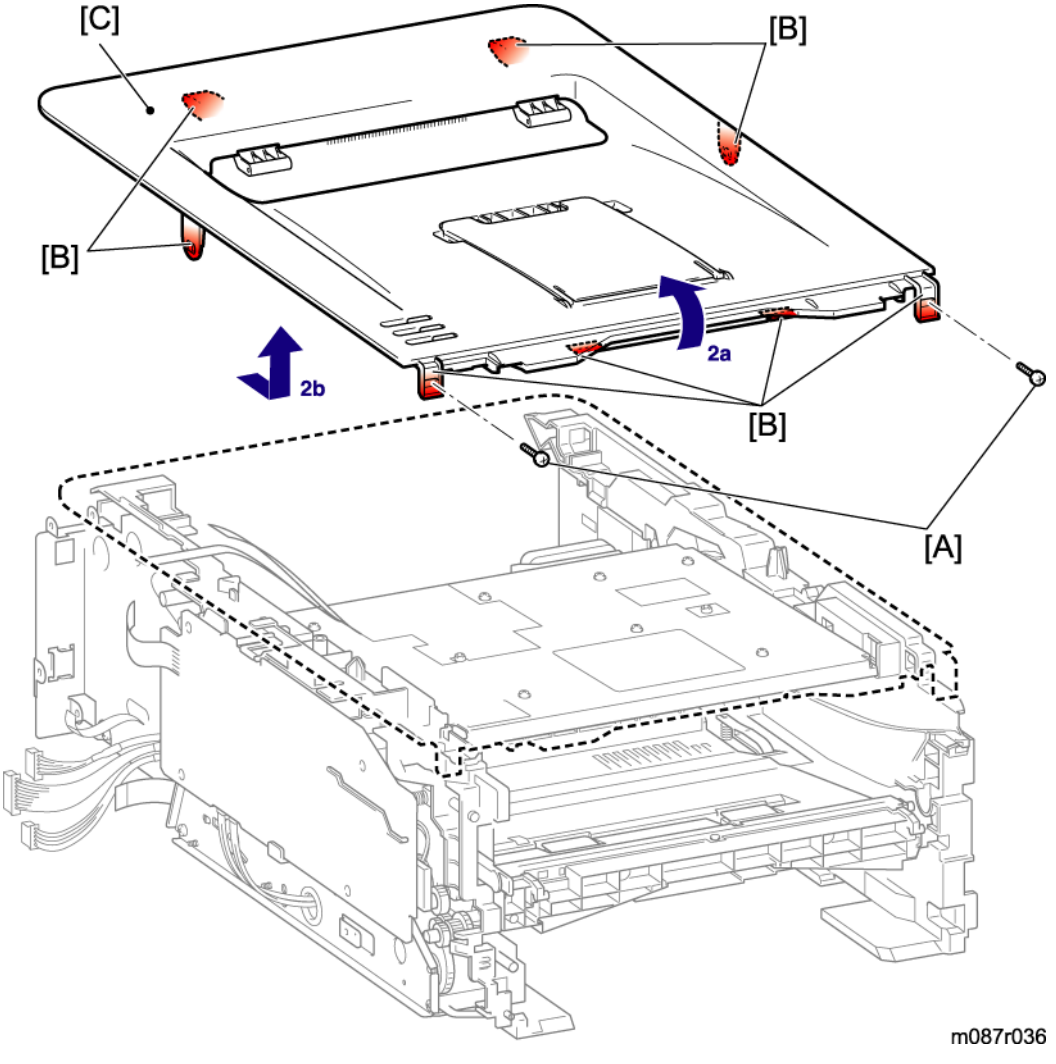
Note

- After disconnecting the flat cable(s), check that each cable is not damaged at its end or short-circuited.
- When connecting the flat cable(s), do not insert it at an angle. After insertion, check that the cable is not at an angle.

Assembling Note:

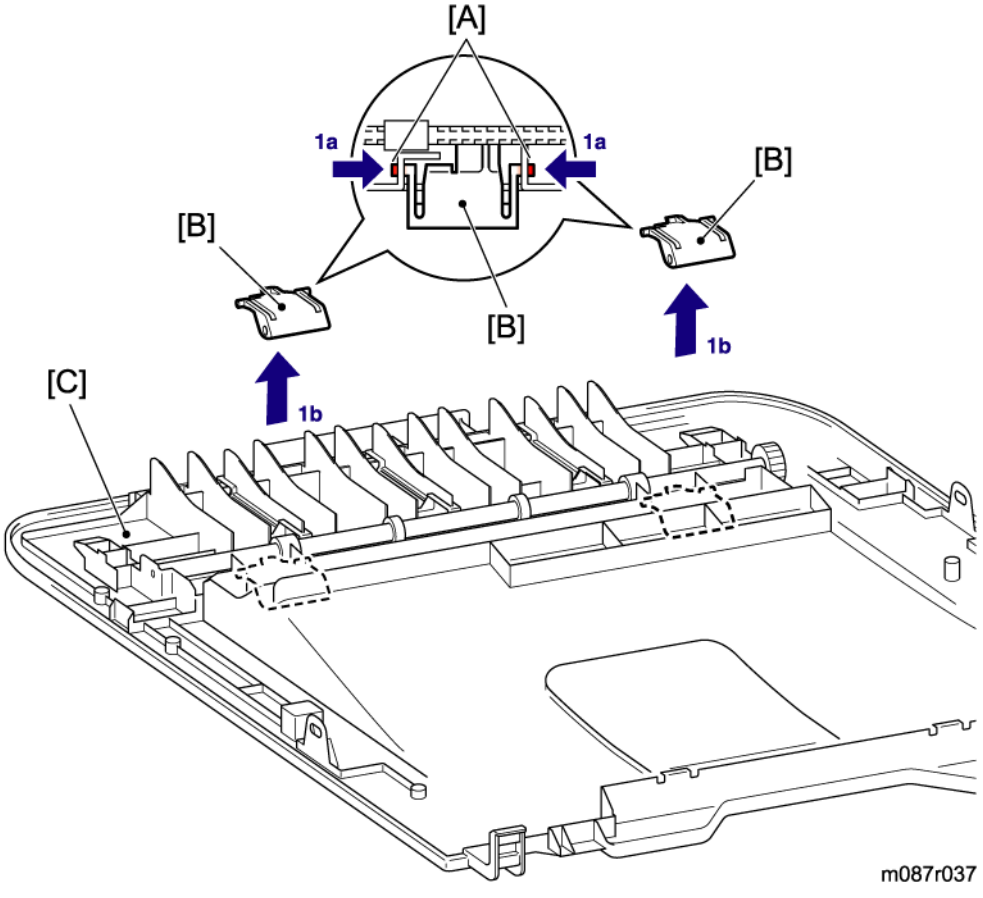
If the FG harness ASSY which comes from the Laser unit is not connected, the Laser unit break down.

Top Cover Assy



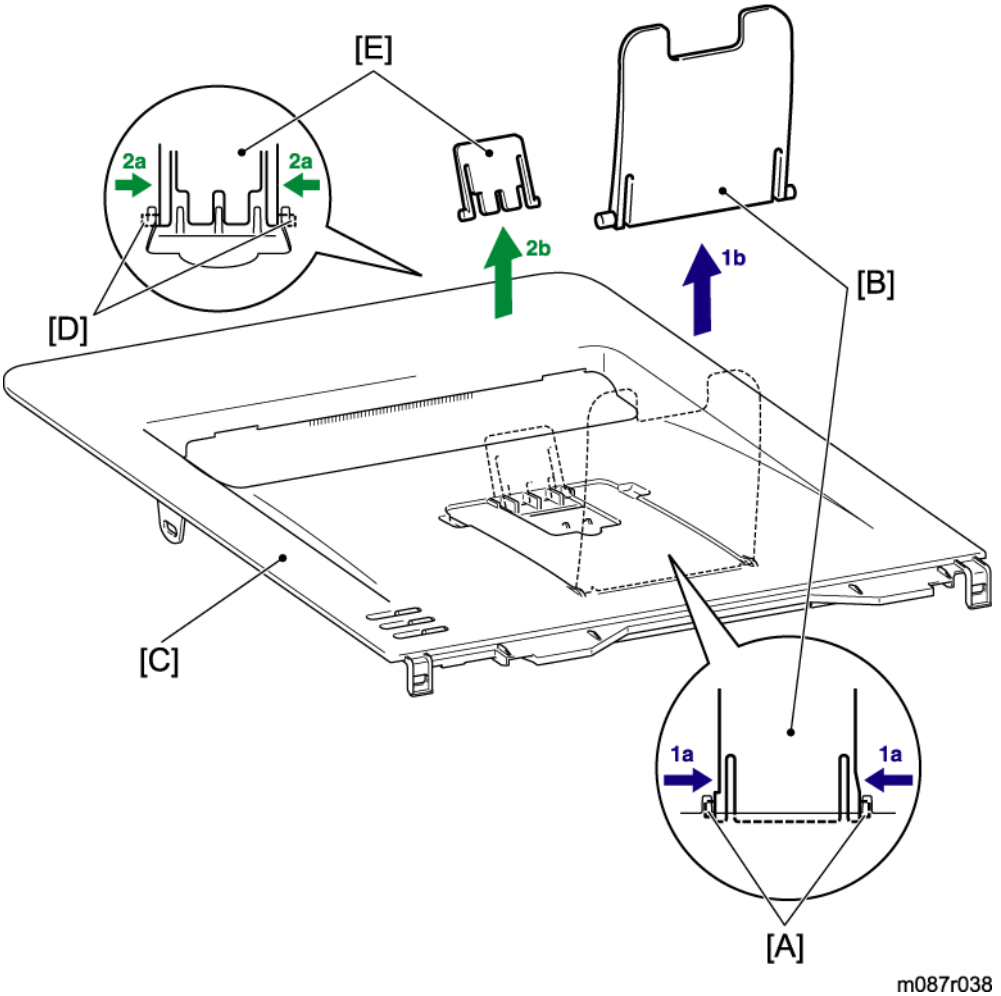
1. Remove the two Taptite bind B M4x12 screws [A].
2. Release the Hook [B] to remove the Top cover ASSY [C] from the Main body.

Paper Stack Lever



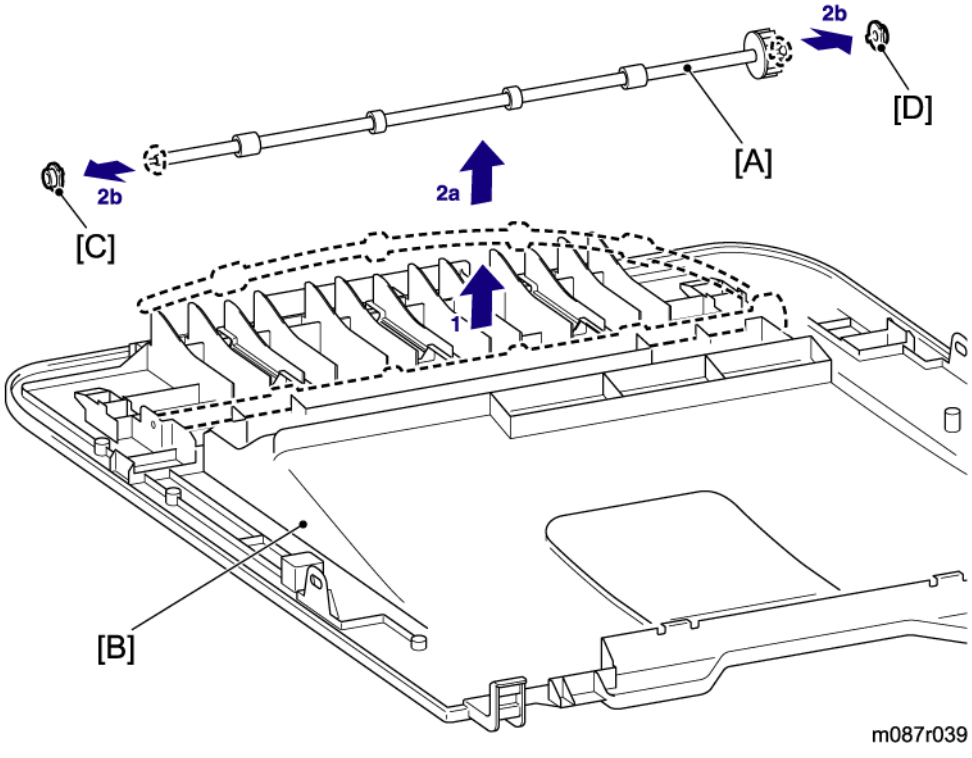
1. Release the Boss [A] to remove the two Paper stack levers [B] from the Top cover ASSY [C].

Support Flap 1 / Support Flap 2



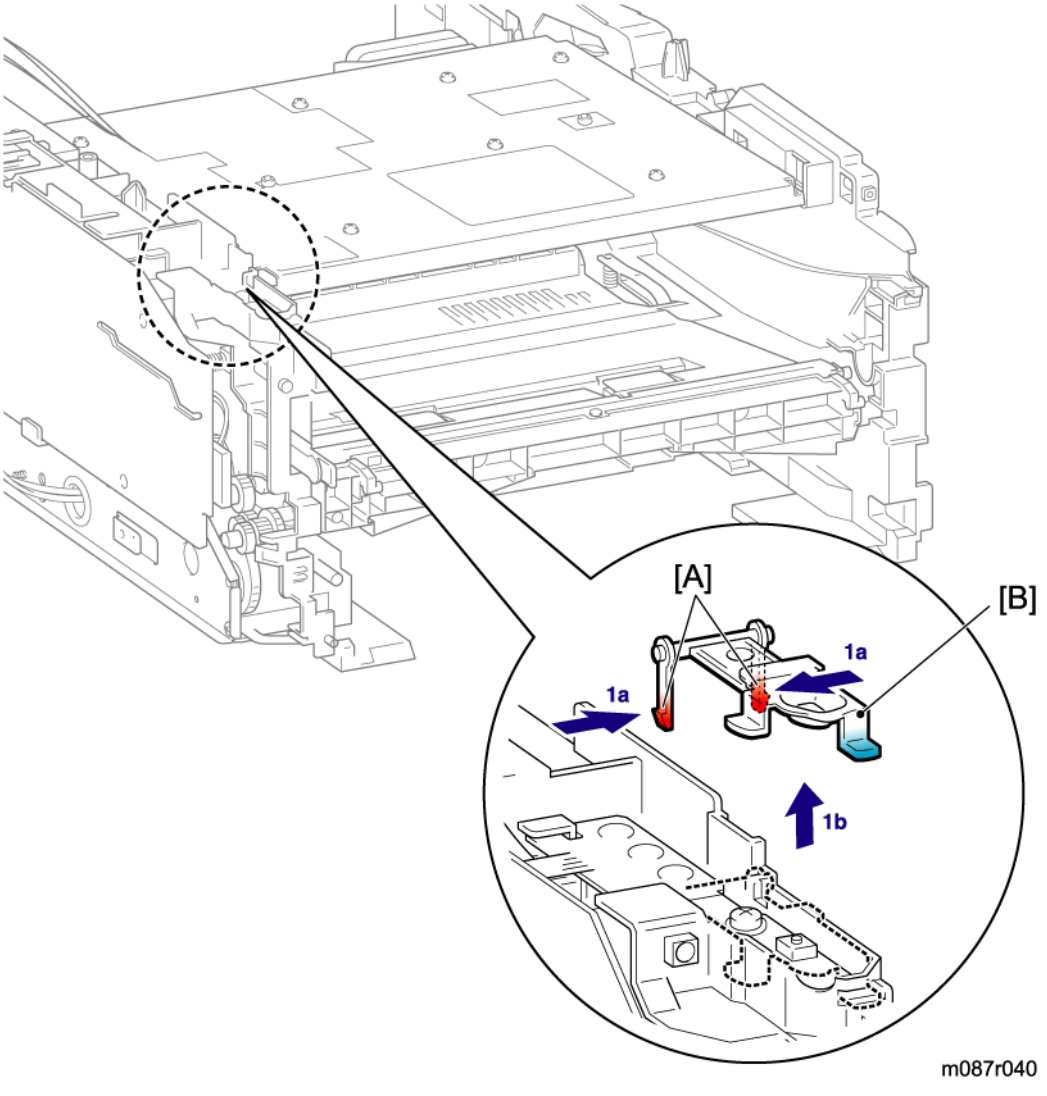
1. Release the Boss [A] to remove the Support flap 1 [B] from the Top cover ASSY [C].
2. Release the Boss [D] to remove the Support flap 2 [E] from the Top cover ASSY [C].

Eject Roller Assy 2 / Bush R / Bush L



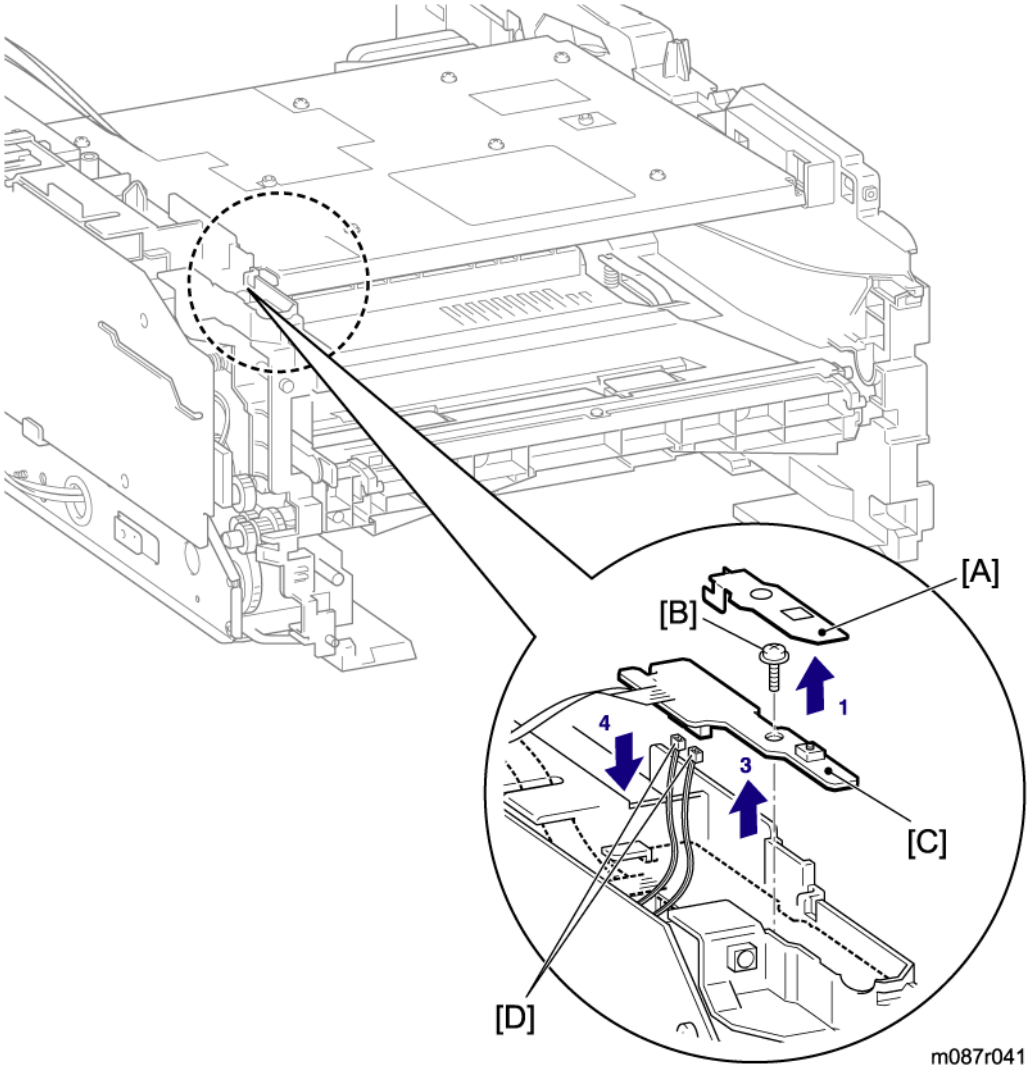
1. Remove the Eject roller ASSY 2 [A]from the Top cover ASSY [B].
2. Remove the Bush R [C] and the Bush L [D] from the Eject roller ASSY 2 [A].

SW Supporter



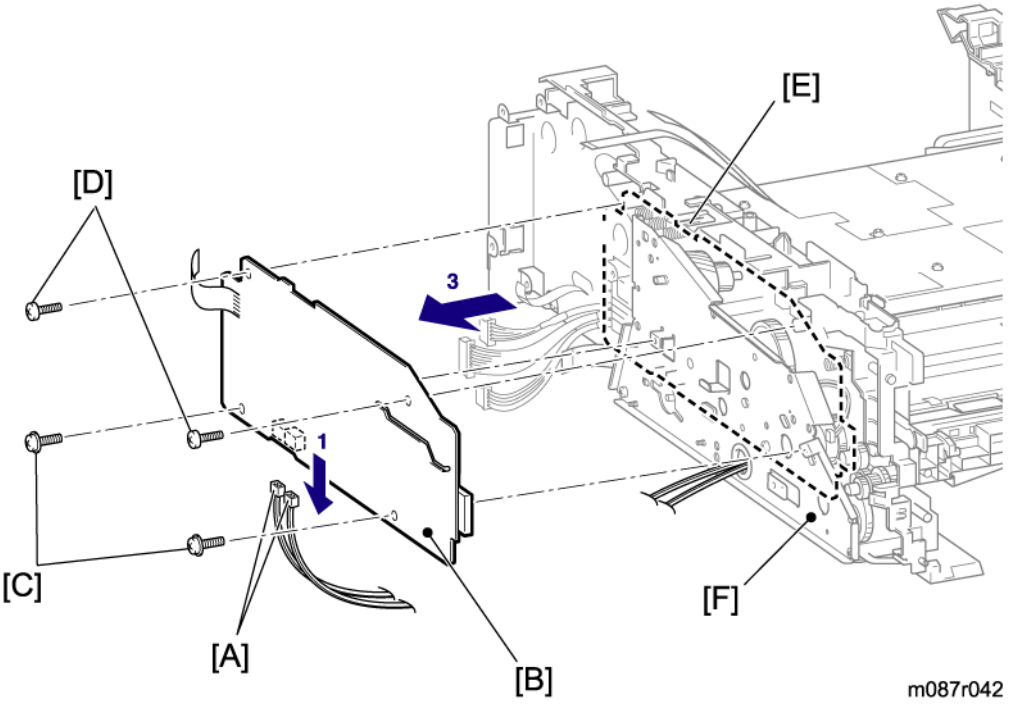
1. Release the Hook [A] to remove the SW supporter [B] from the Main body.

Panel PCB Assy



1. Remove the Panel film [A].
2. Remove the Taptite cup B M3x8 screw [B].
3. Remove the Panel PCB ASSY [C] from the Main body.
4. Disconnect the two connectors [D] from the Panel PCB ASSY [C].

High-Voltage PS PCB Assy

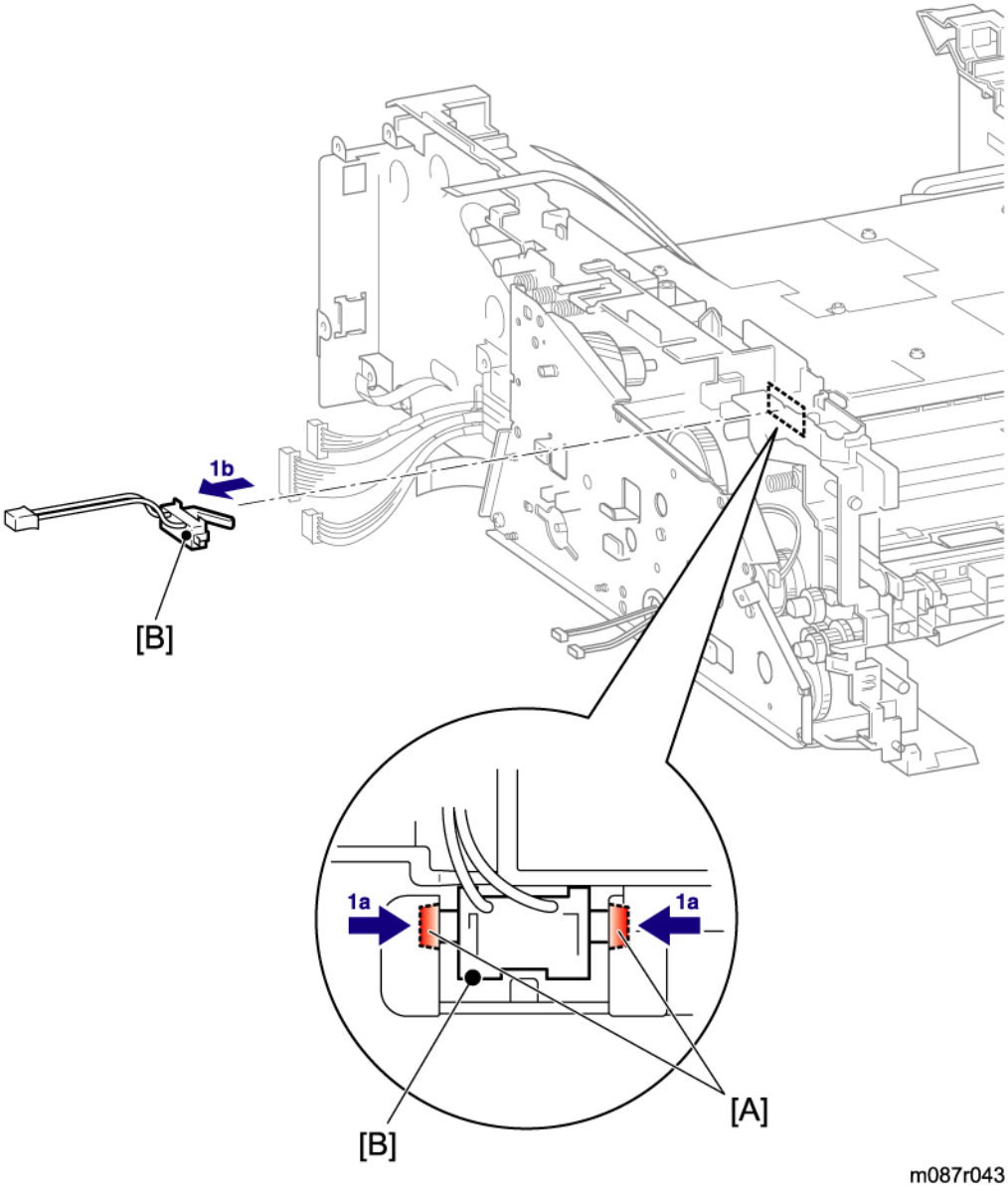


1. Disconnect the two connectors [A] from the High-voltage PS PCB ASSY [B].
2. Remove the two Taptite cup S M3x6 SR screws [C] and the two Taptite bind B M4x12 screws [D].
3. Release the Hook [E] to remove High-voltage PS PCB ASSY [B] from the Drive sub ASSY [F].

Note

- There are procedures for disassembling Main frame L ASSY after this procedure. (p.93 "Main Frame L Assy")

New Toner Sensor Harness Assy

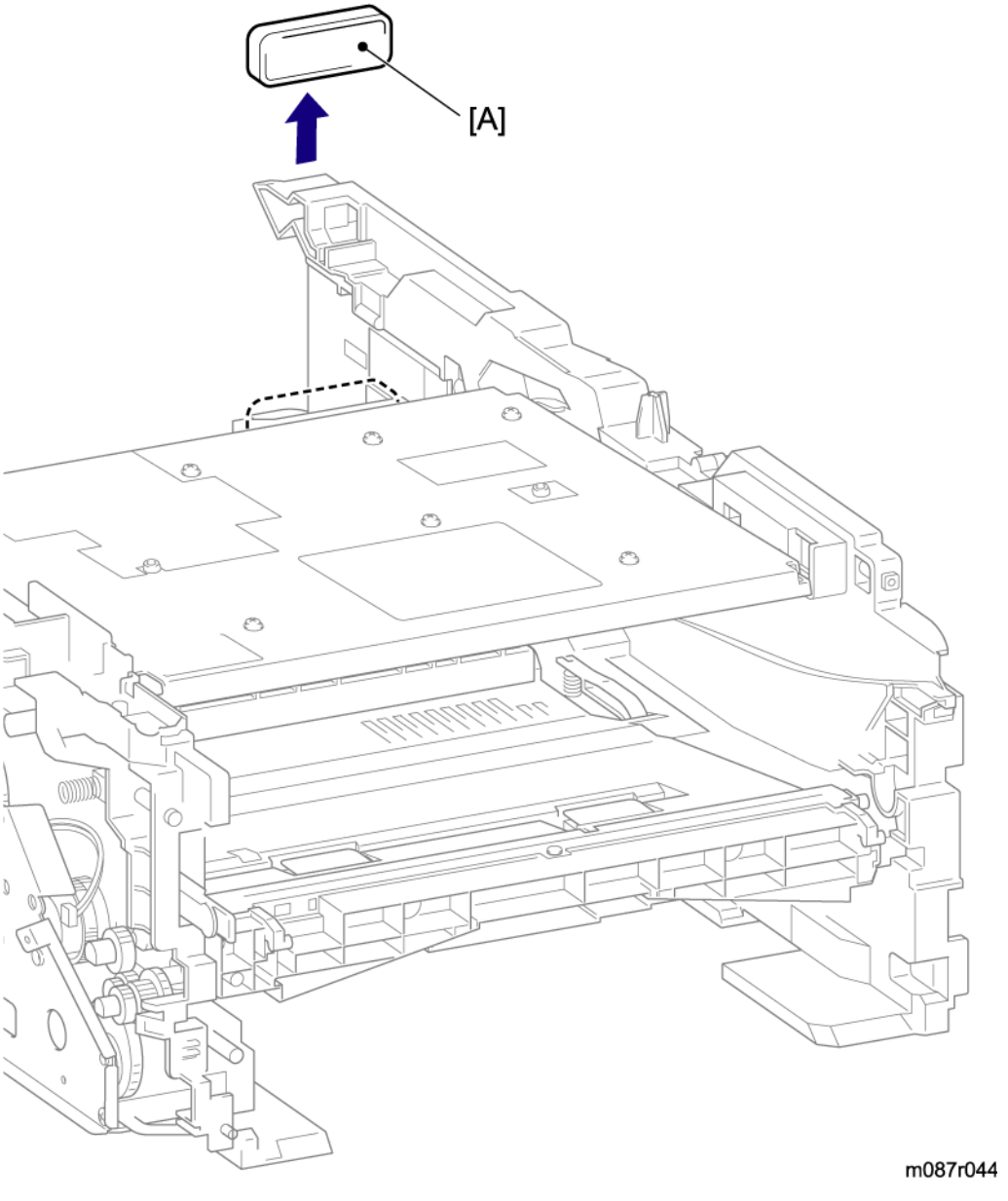


1. Release the Hook [A] to remove the New toner sensor harness ASSY [B] from the Main body.

Important

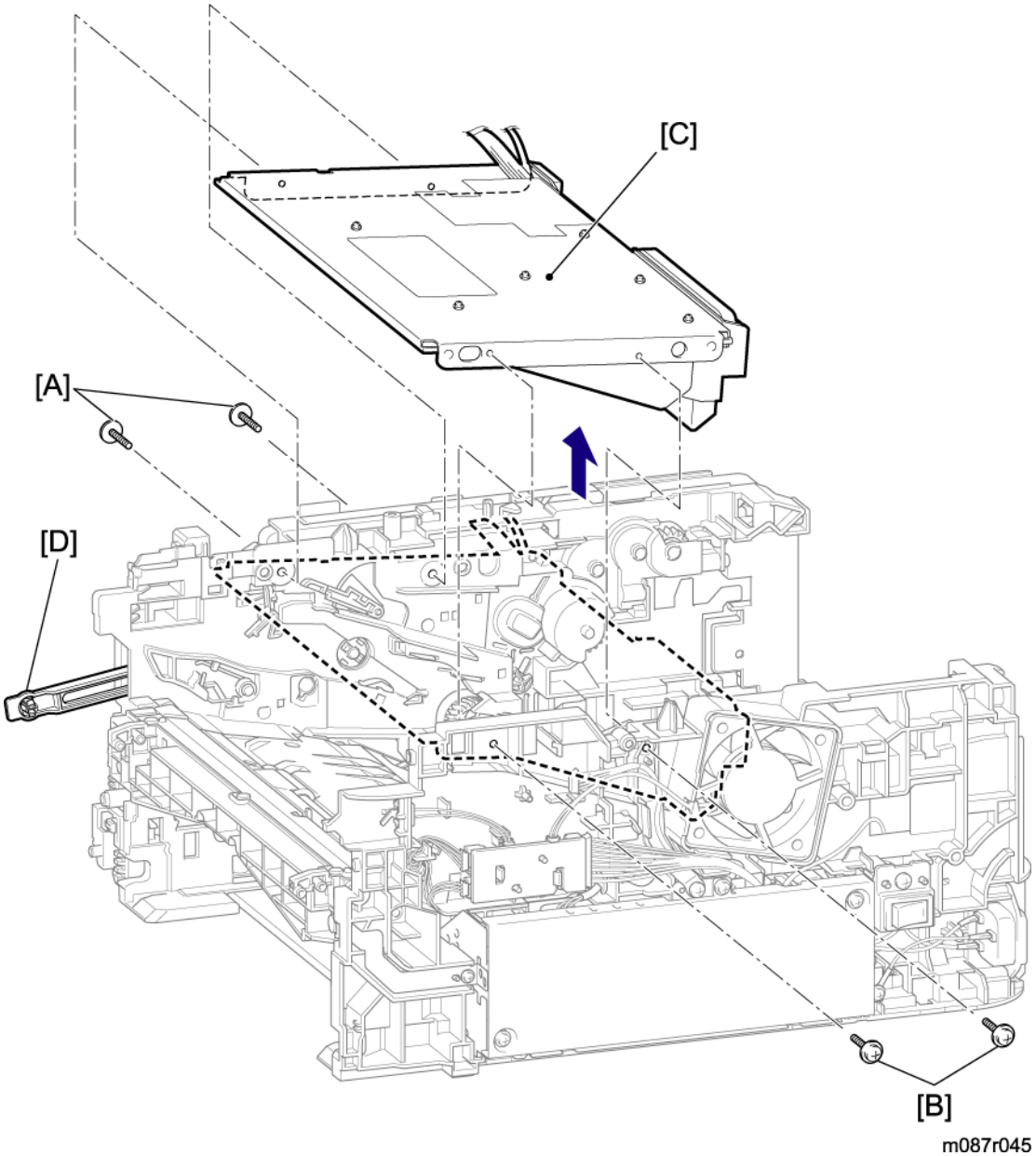
- **Be careful not to damage the Hook [A] of the New toner sensor harness ASSY [B].**

Filter Assy



1. Remove the Filter ASSY [A] from the Main body.

Laser Unit

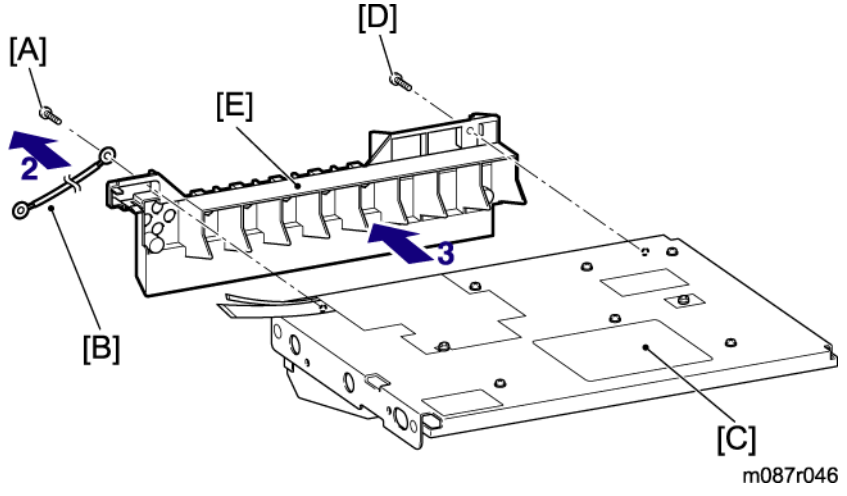


1. Remove the four Taptite cup S M3x6 SR screws [A][B], and then remove the Laser unit [C] from the Main body.

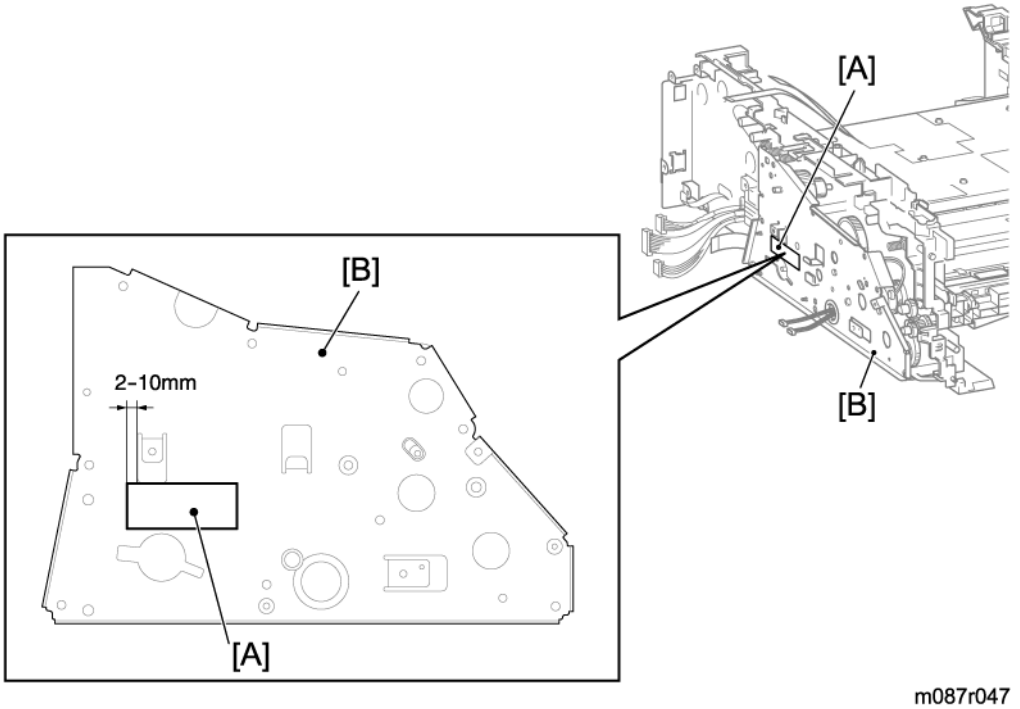
Note

- The two Taptite cup S M3x6 SR screws [A] and the two Taptite pan (S/P washer) S M3x8 screws [B]. (M087 only)

- Remove the Laser unit in the state that the DEV joint link [D] is pulled out.



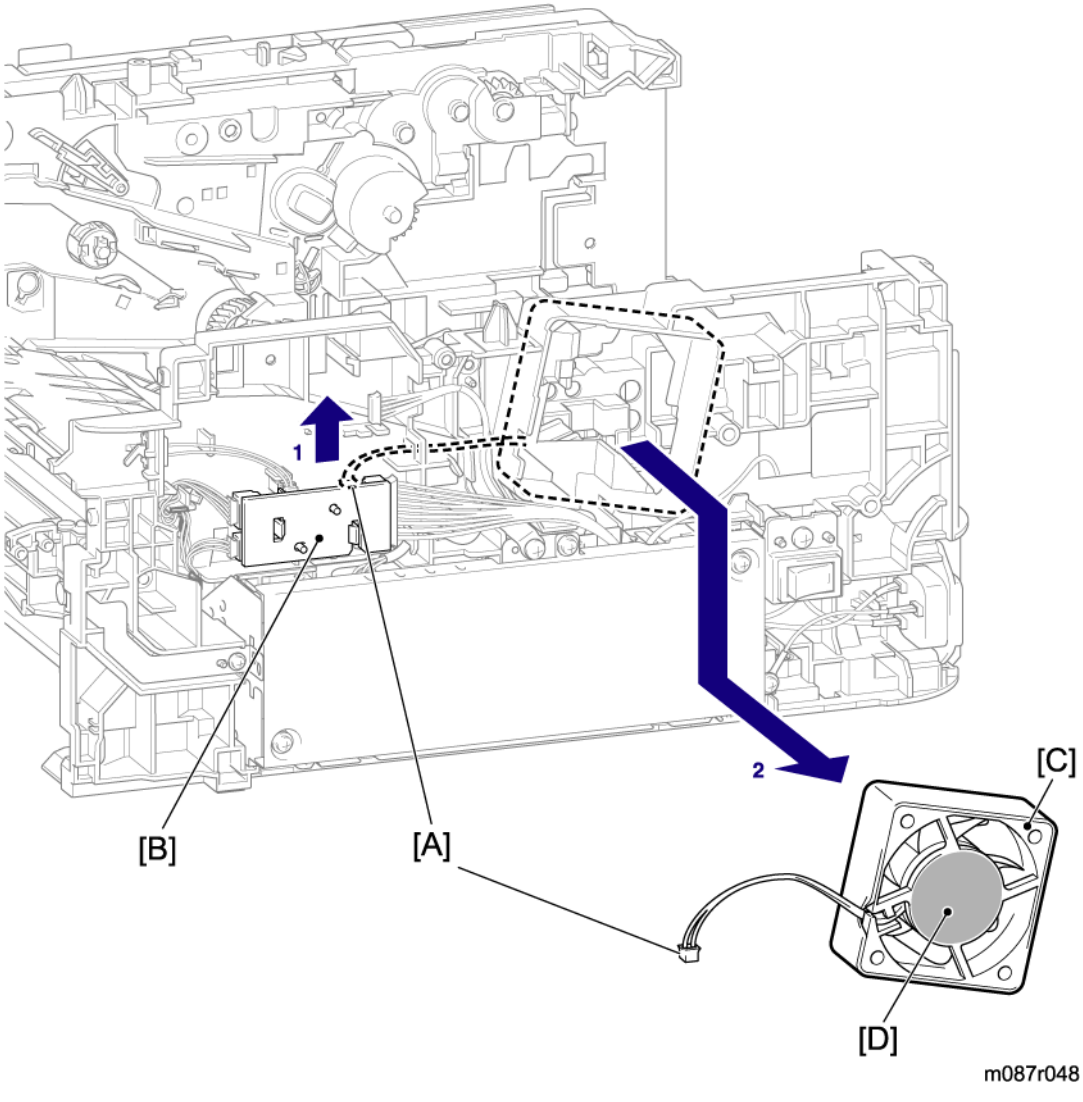
2. Remove the Taptite cup S M3x6 SR screw [A], and then remove the FG harness ASSY [B] from the Laser unit [C].
3. Remove the Taptite cup S M3x6 SR screw [D], and then remove the Air duct [E] from the Laser unit [C].



Important

- When replacing the Laser unit, replace the Serial label [A] attached on the Drive sub ASSY [B] with a new one supplied with a new unit. Another Serial label supplied with a new unit is spare. Make sure to throw it out. When replacing the Laser unit, it is necessary to input the characteristics information. (p.109 "If You Replace The Laser Unit")

Fan Motor 60 Unit

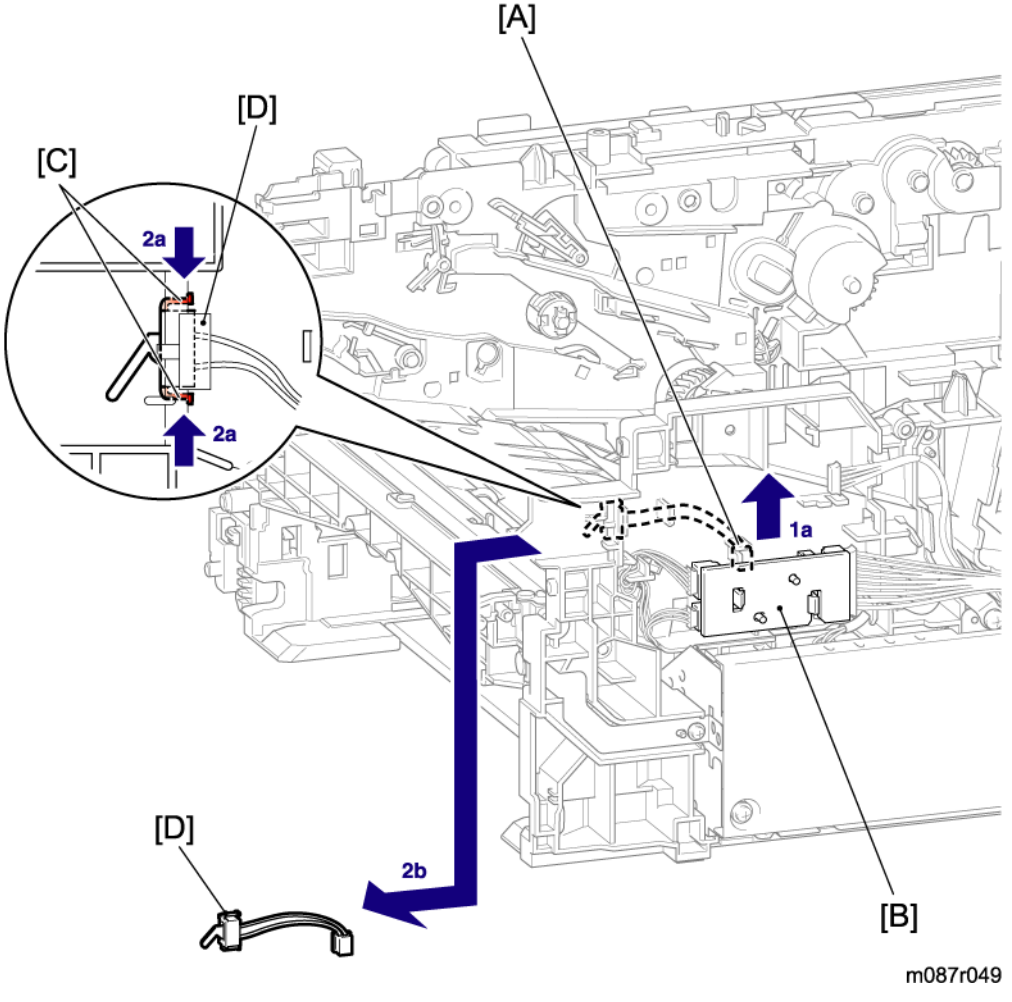


1. Disconnect the Connector [A] from the Toner LED PCB ASSY [B].
2. Remove the Fan motor 60 unit [C] from the Main body.

Assembling Note:

When assembling the Fan motor 60 unit [C], place it so that the attached Label [D] faces outwards.

Cover Sensor Harness Assy

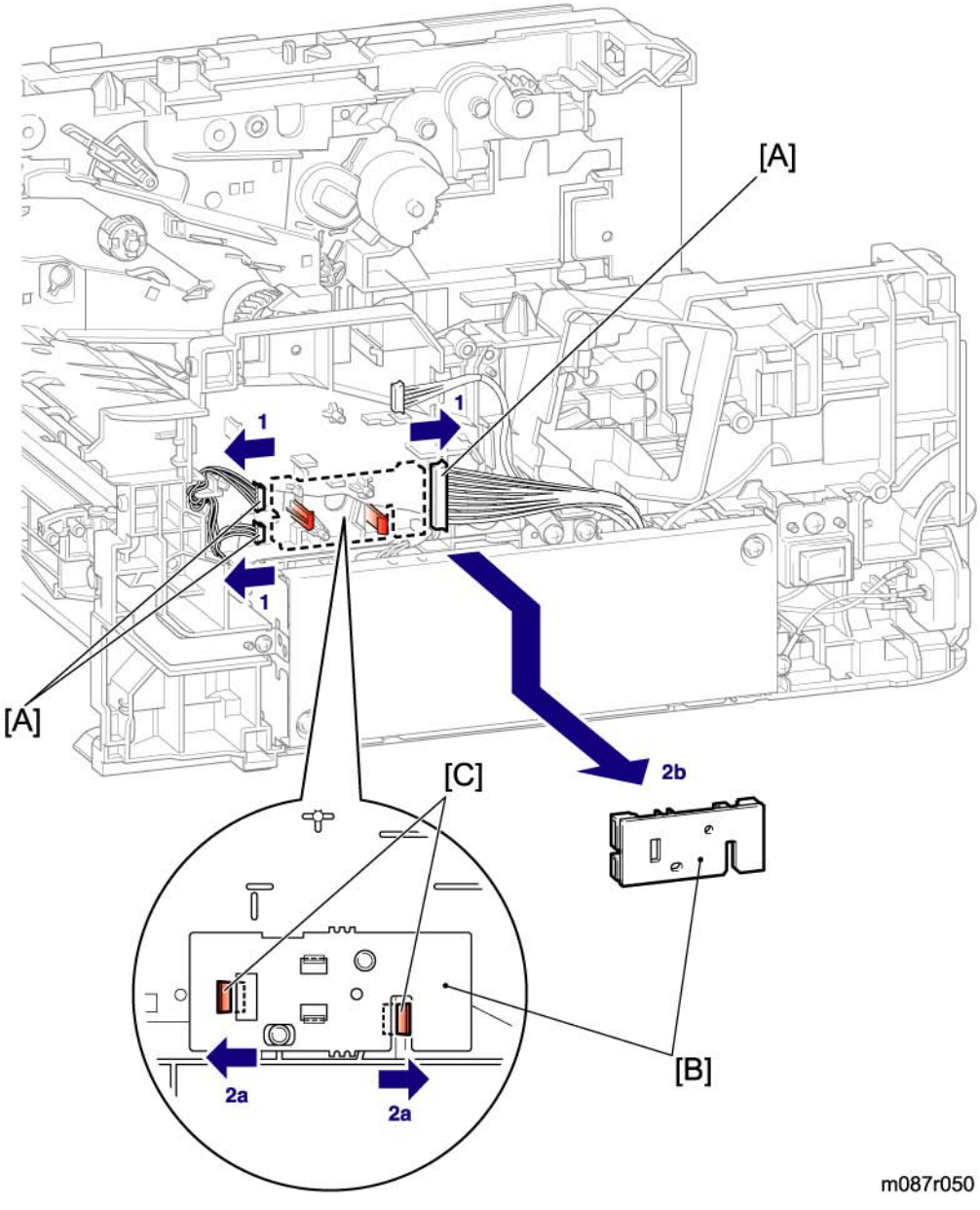


1. Disconnect the Connector [A] from the Toner LED PCB ASSY [B].
2. Release the Hook [C] to remove the Cover sensor harness ASSY [D] from the Main body.

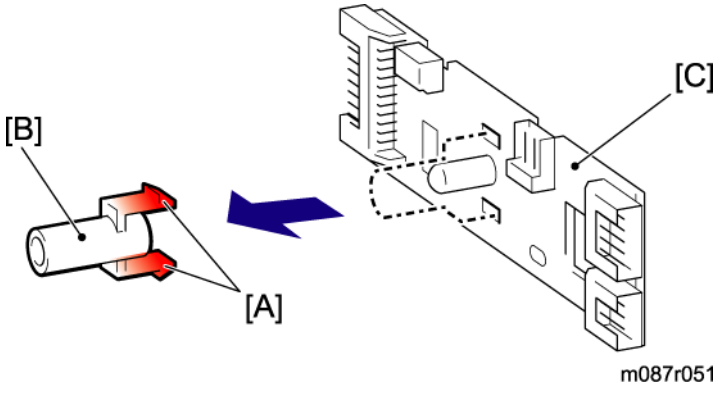
Important

- **When removing the Cover sensor harness ASSY [D], remove it as shown in the direction of the allow 2b. Be careful not to damage the Hook [C].**

Toner LED PCB Assy

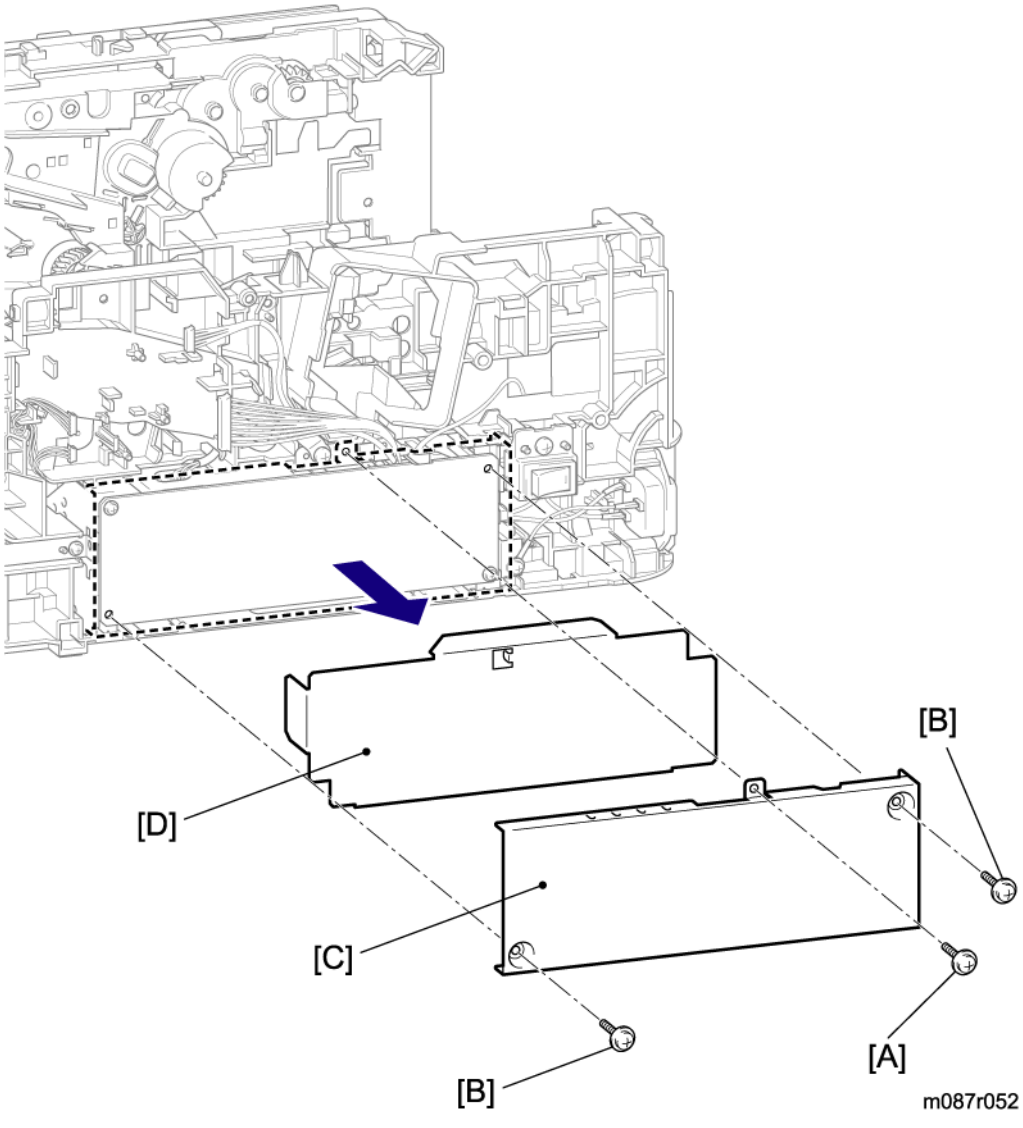


1. Disconnect the three connectors [A] from the Toner LED PCB ASSY [B].
2. Release the Hook [C] to remove the Toner LED PCB ASSY [B] from the Main body.

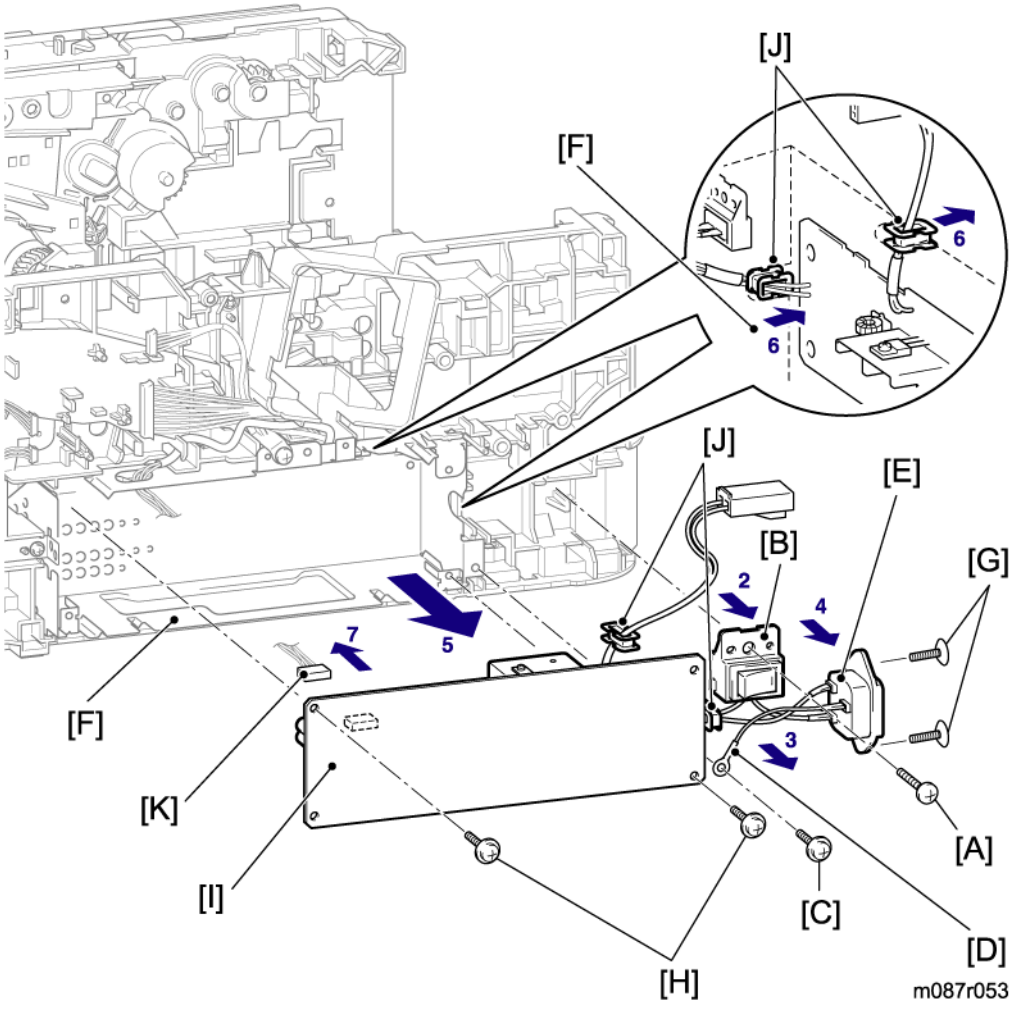


3. Release the Hook [A] to remove the LED holder [B] from the Toner LED PCB ASSY [C].

PS PCB Unit

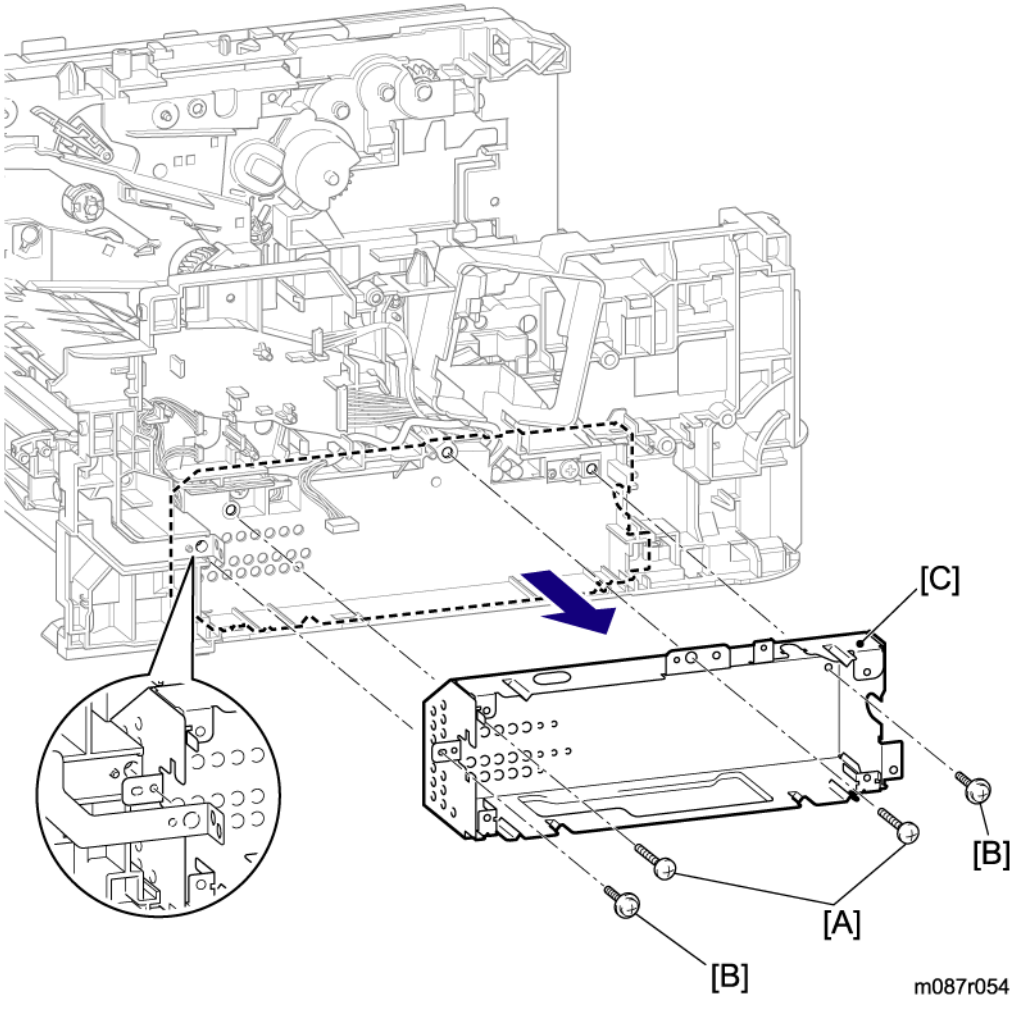


1. Remove the Taptite pan (S/P washer) M3.5x6 screw [A] and the two Taptite cup S M3x6 SR screws [B], and then remove the LV shield plate cover [C] and the LV insulation sheet [D] from LV Shield plate 2.



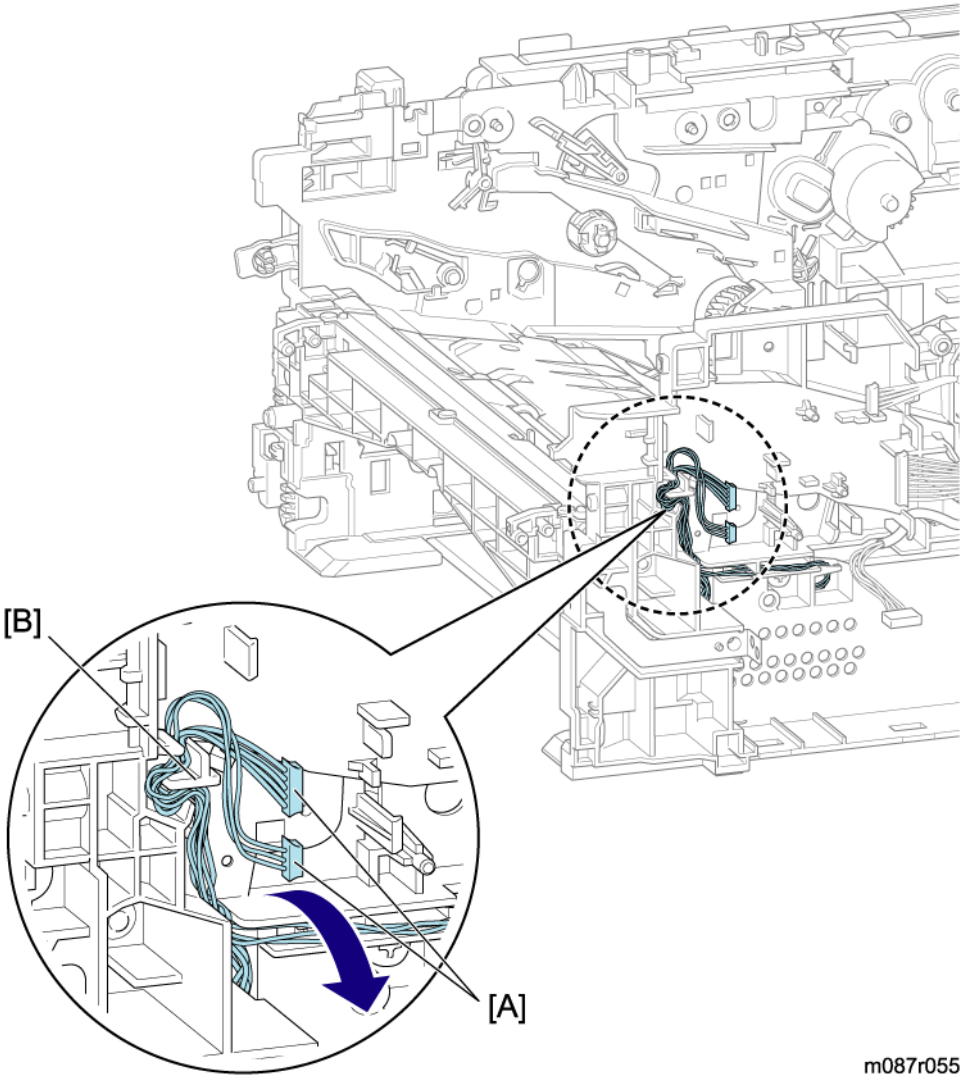
2. Remove the Taptite bind B M4x12 screw [A], and then remove the SW holder [B] from the Main body.
3. Remove the Taptite pan (S/P washer) M3.5x6 screw [C], and then remove the FG harness ASSY [D] of the Inlet harness ASSY [E] from the LV shield plate 2 [F].
4. Remove the two Taptite flat B M3x10 screws [G], and then remove the Inlet harness ASSY [E] from the Main body.
5. Remove the two Taptite cup S M3x6 SR screws [H], and then remove the PS PCB unit [I] from the LV shield plate 2 [F].
6. Remove the two Edge holder 3 [J] from the LV shield plate 2 [F].
7. Disconnect the Connector [K] from the PS PCB unit [I].

LV Shield Plate 2

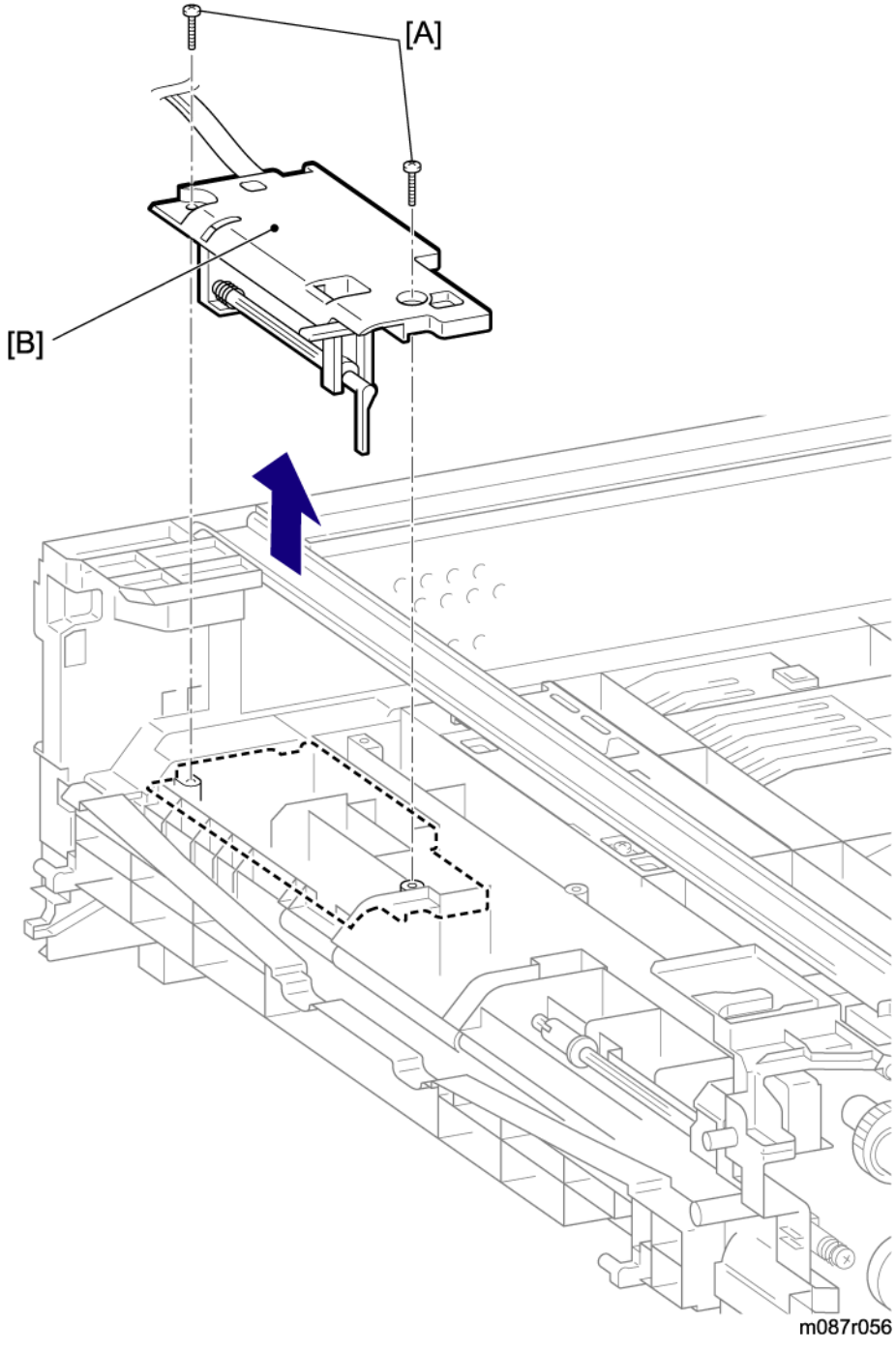


1. Remove the two Taptite bind B M4x12 screws [A] and the two Taptite cup S M3x6 SR screws [B], and then remove the LV shield plate 2 [C].

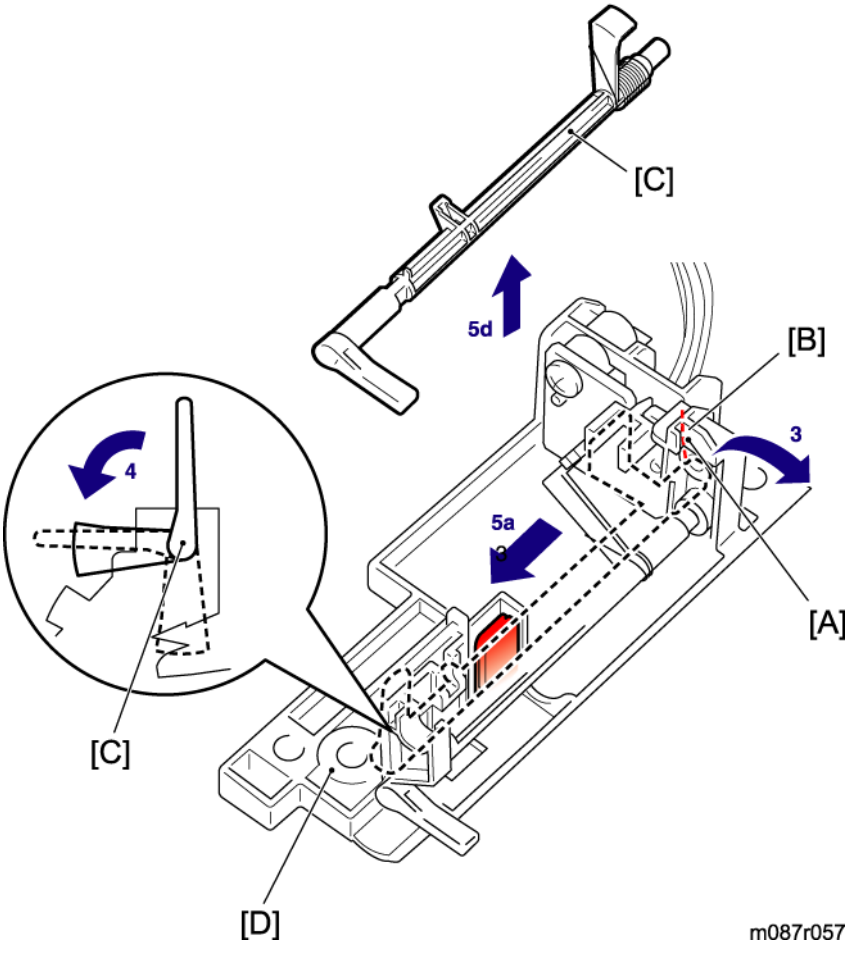
Registration Front Sensor PCB Assy



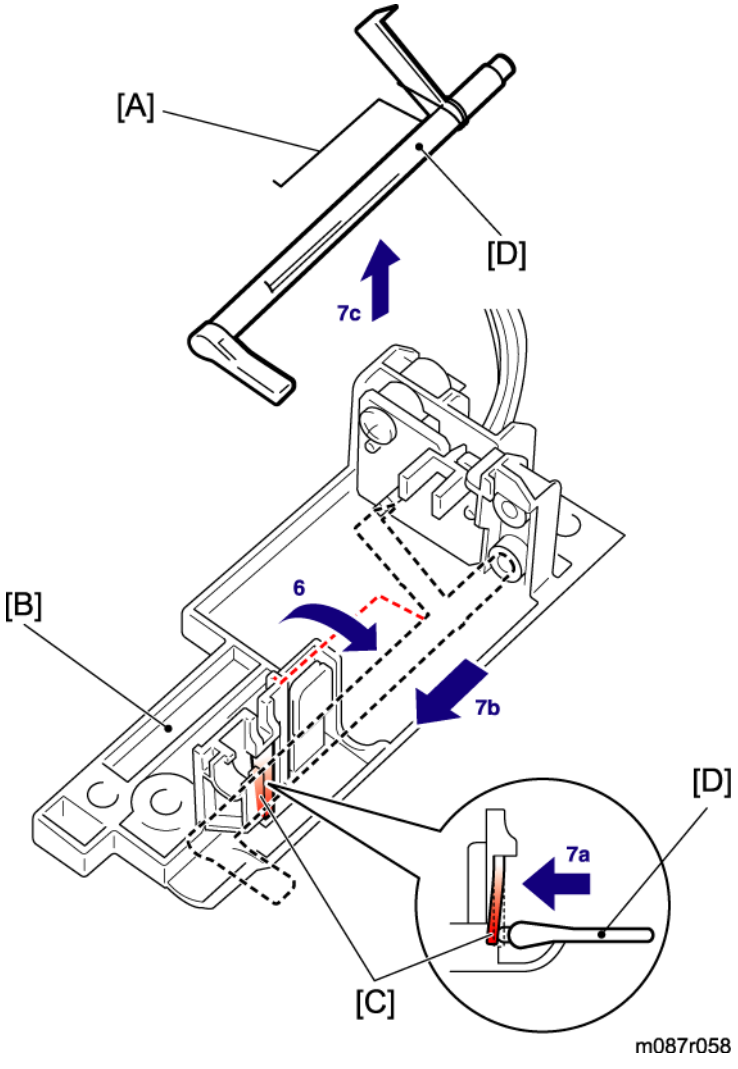
1. Remove the Harness [A] of the Registration front sensor PCB ASSY and Registration rear sensor PCB ASSY from the Guide part [B] of the Main body.



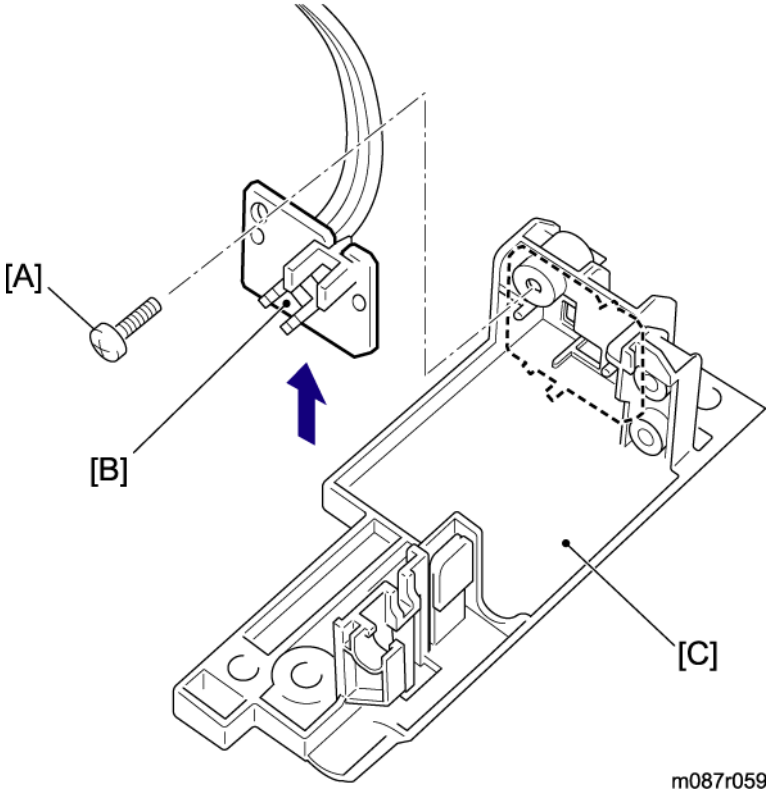
2. Remove the two Taptite bind B M3x10 screws [A], and then remove the Actuator holder ASSY [B] from the Main body.



3. Remove the Registration actuator spring [A] from the Hook part [B].
4. Turn the Registration front actuator [C] at 90 degrees in the direction of counterclockwise as the arrow 4.
5. Slide the Registration front actuator [C] to remove the Registration front actuator [C] from the Actuator holder ASSY [D].

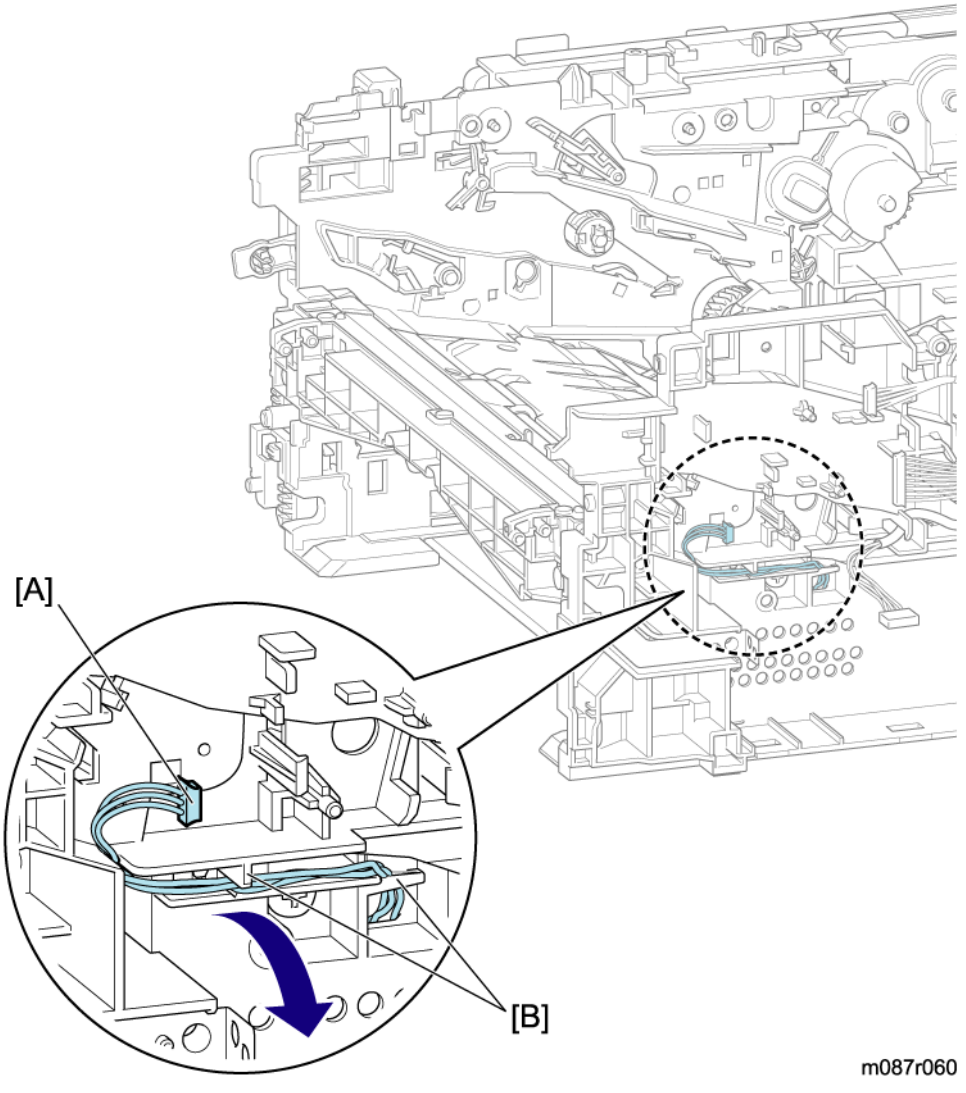


6. Loosen the tip of the Edge actuator spring [A] from the Actuator holder ASSY [B].
7. Release the Hook [C] and Slide the Edge actuator [D] to remove the Edge actuator [D] from the Actuator holder ASSY [B].

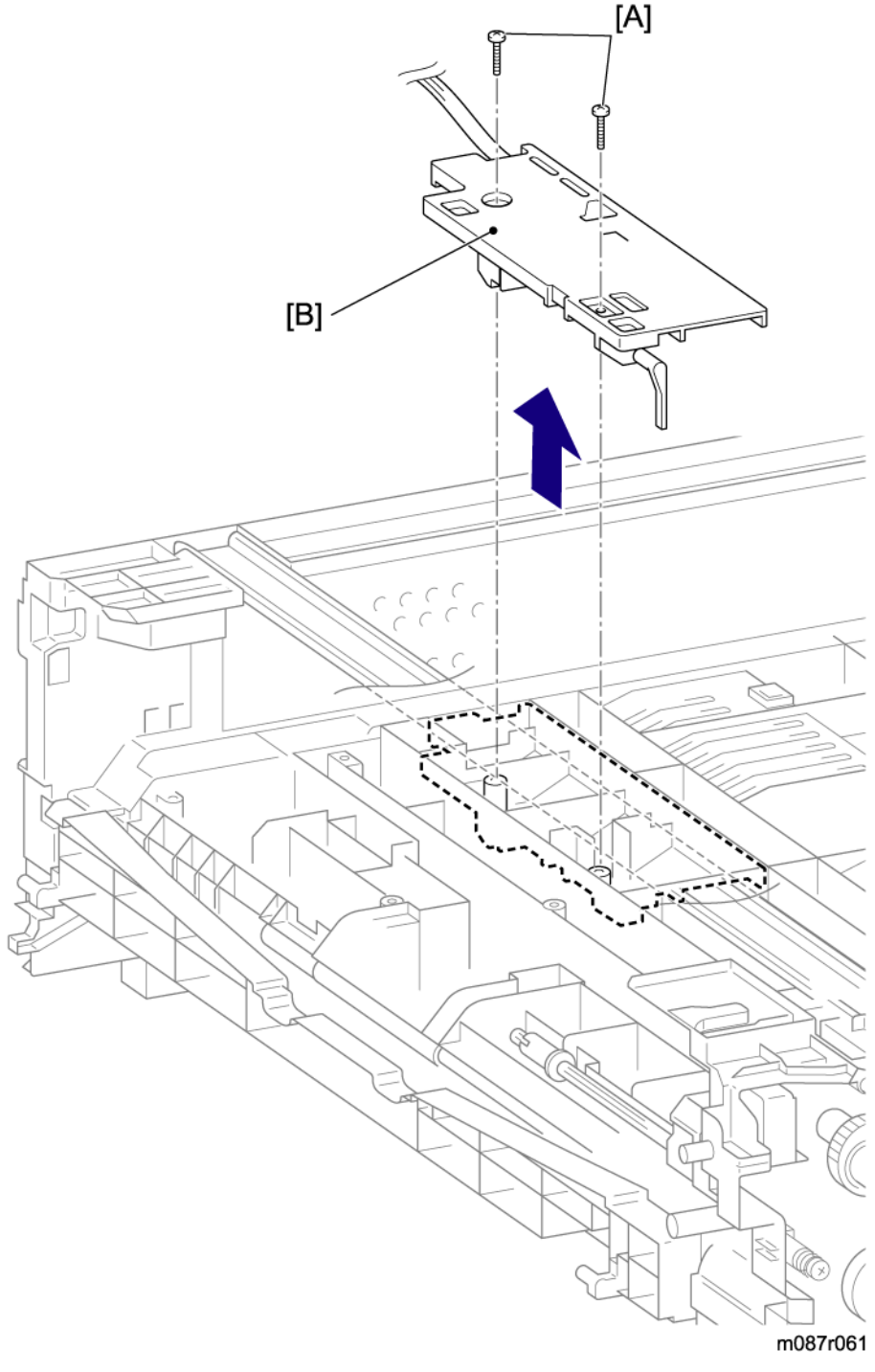


8. Remove the Taptite bind B M3x10 screw [A], and then remove the Registration front sensor PCB ASSY [B] from the Actuator holder ASSY [C].

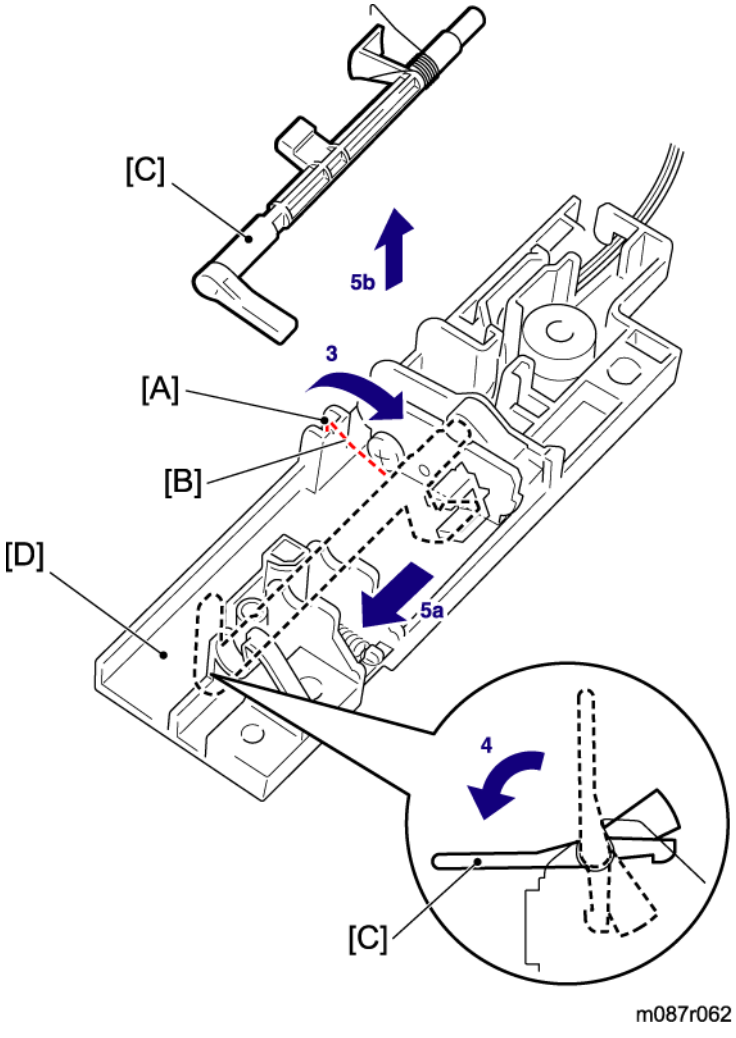
Registration Rear Sensor PCB Assy



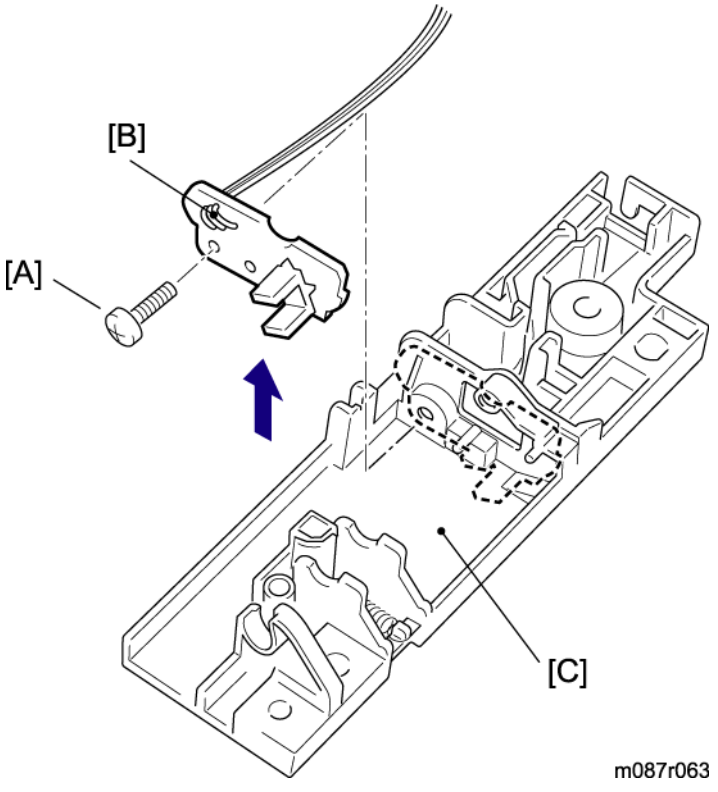
1. Remove the Harness [A] of the Registration rear sensor PCB ASSY from the Guide part [B] of Main body.



2. Remove the two Taptite bind B M3x10 screws [A], and then remove the Rear actuator holder ASSY [B] from the Main body.

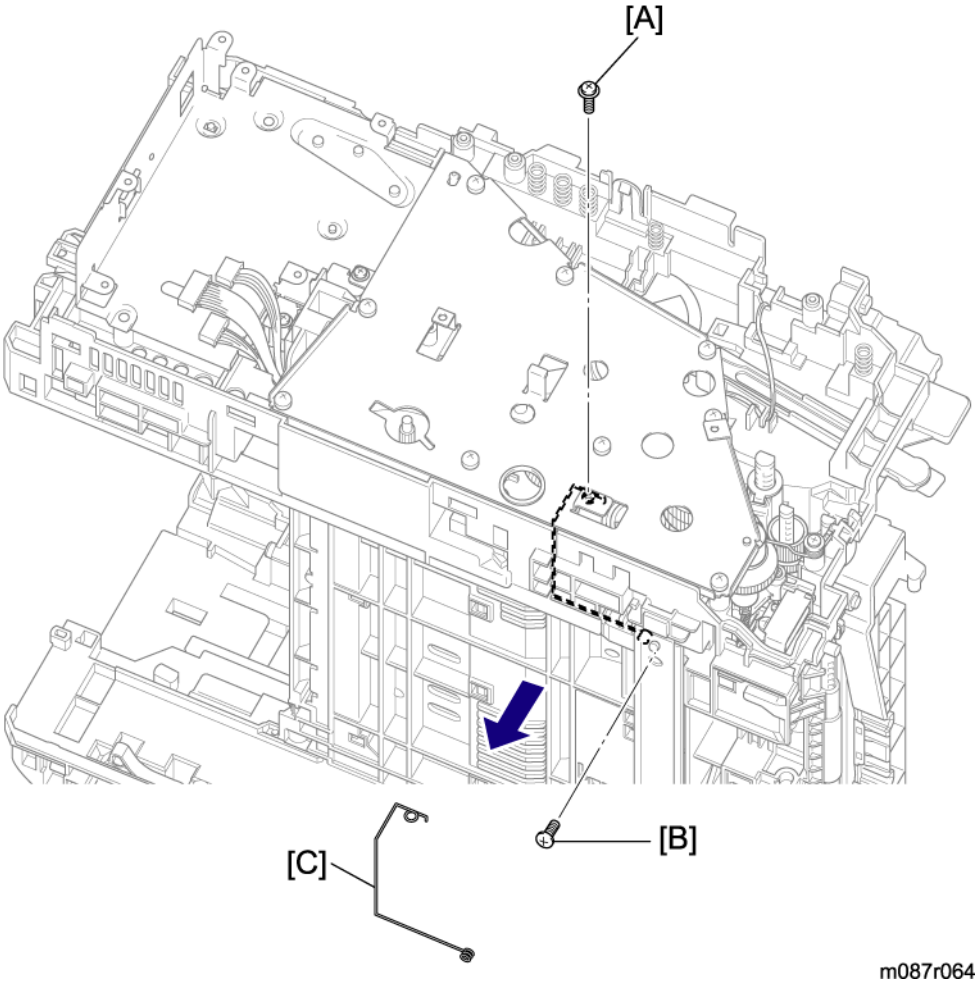


3. Remove the Actuator spring rear [A] from the Hook part [B].
4. Turn the Registration actuator rear [C].
5. Slide the Registration actuator rear [C] to remove the Registration actuator rear [C] from the Rear actuator holder ASSY [D].

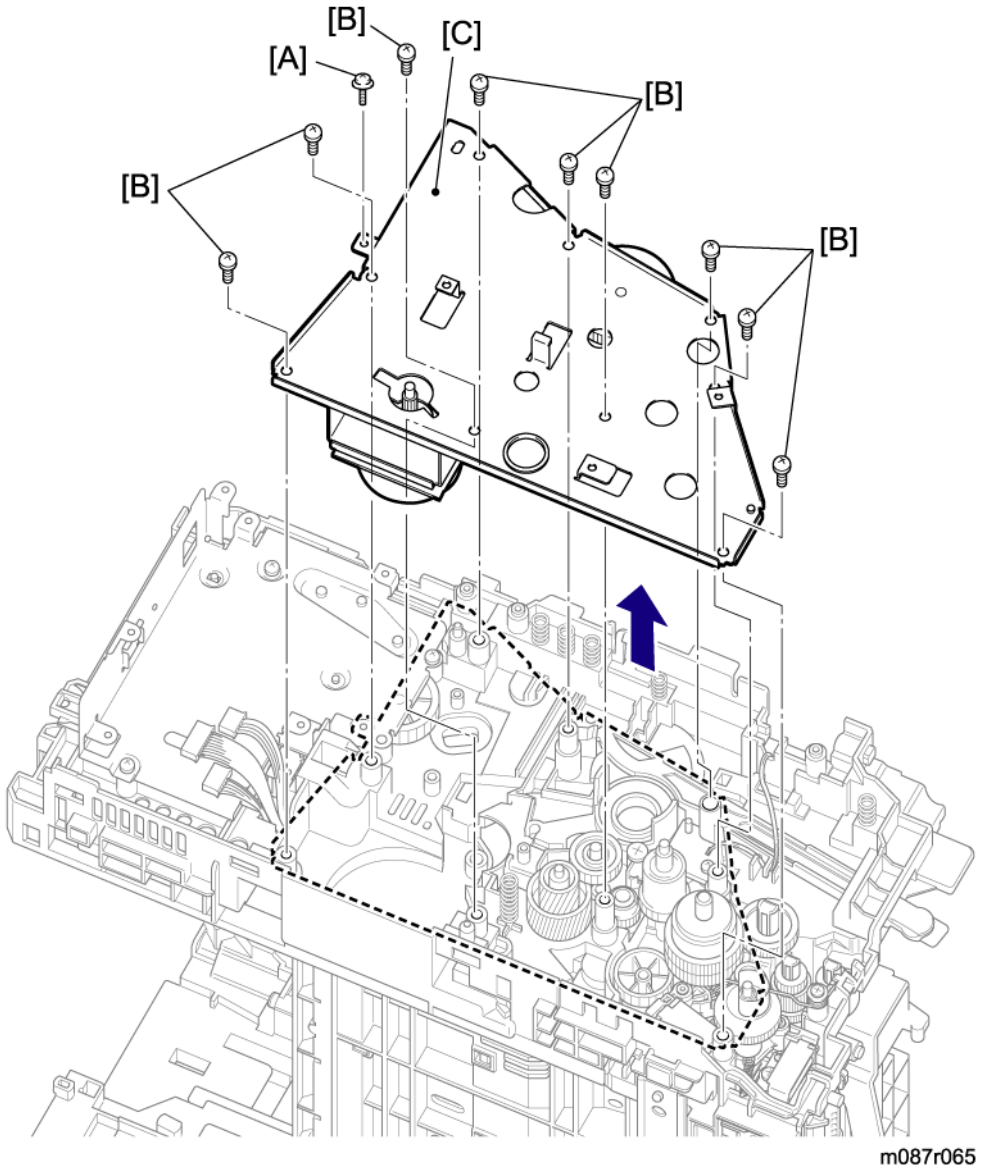


6. Remove the Taptite bind B M3x10 screw [A], and then remove the Registration rear sensor PCB ASSY [B] from the Rear actuator holder ASSY [C].

Drive Sub Assy



1. Remove the Taptite cup S M3x6 SR screw [A] and the Taptite bind B M4x12 screw [B] on the Main frame L ASSY, and then remove the Under FG wire [C] from the Main body.

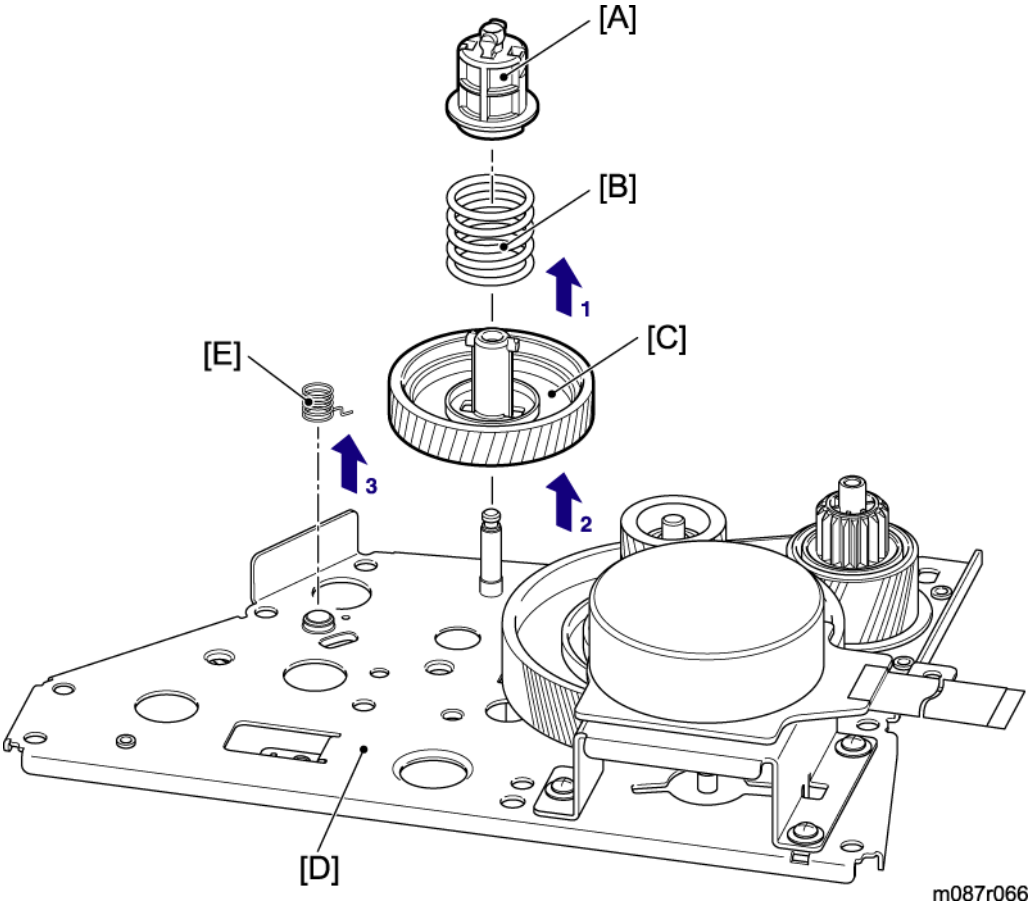


2. Remove the Taptite cup S M3x6 SR screw [A] and the nine Taptite bind B M4x12 screws [B], and then remove the Drive sub ASSY [C] from the Main body.

Important

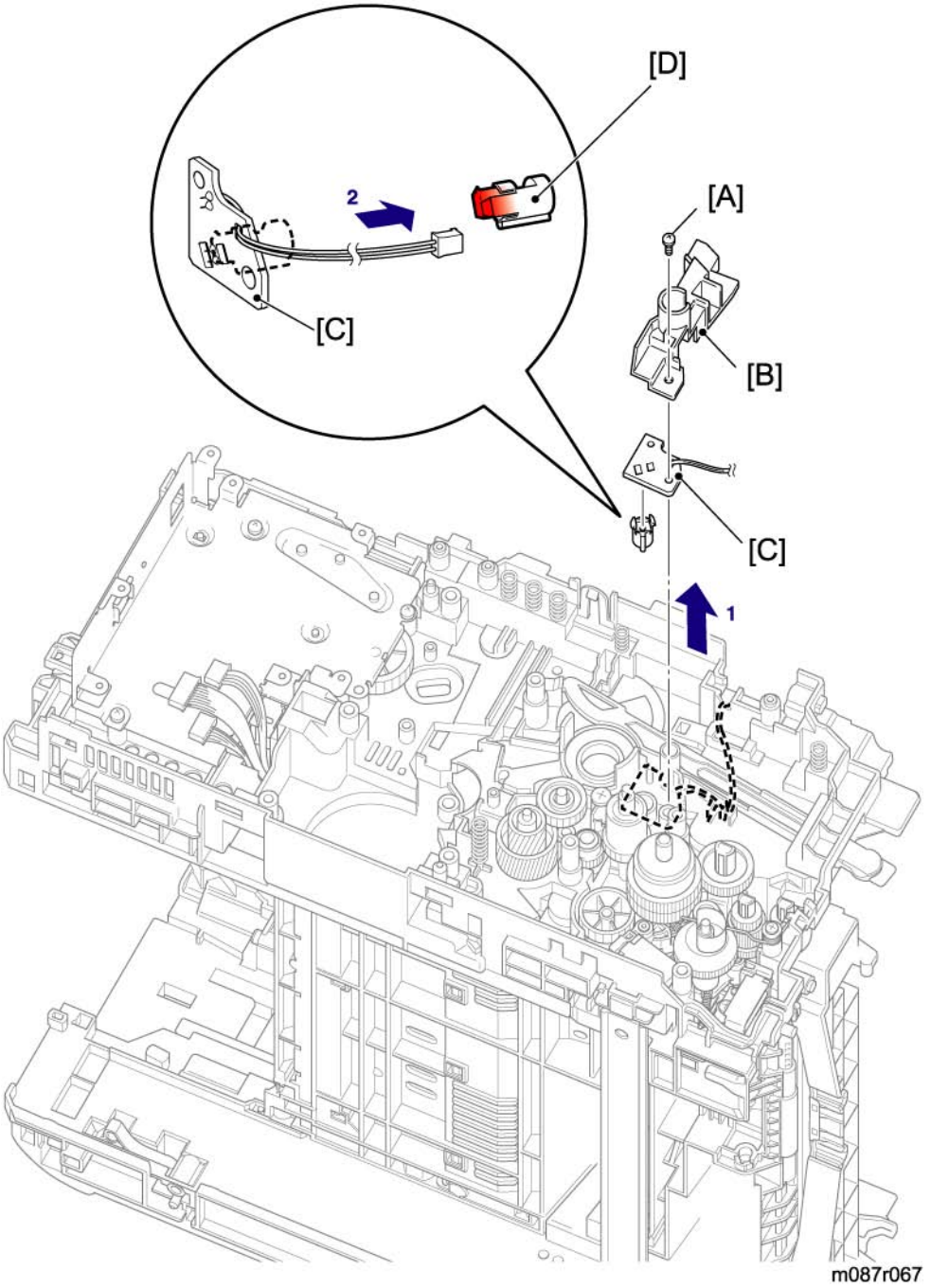
- **When removing the Drive sub ASSY, put the left side of the Main body as the top as shown in the above figure because there is risk of the fall of the gears.**

Dev Joint / Dev Gear Joint 53R / Registration Pendulum Gear Spring



1. Remove the DEV joint [A] and the DEV joint spring [B] from the DEV gear joint/53R [C].
2. Remove the DEV gear joint/53R [C] from the Drive sub ASSY [D].
3. Remove the Registration pendulum gear spring [E] from the Drive sub ASSY [D].

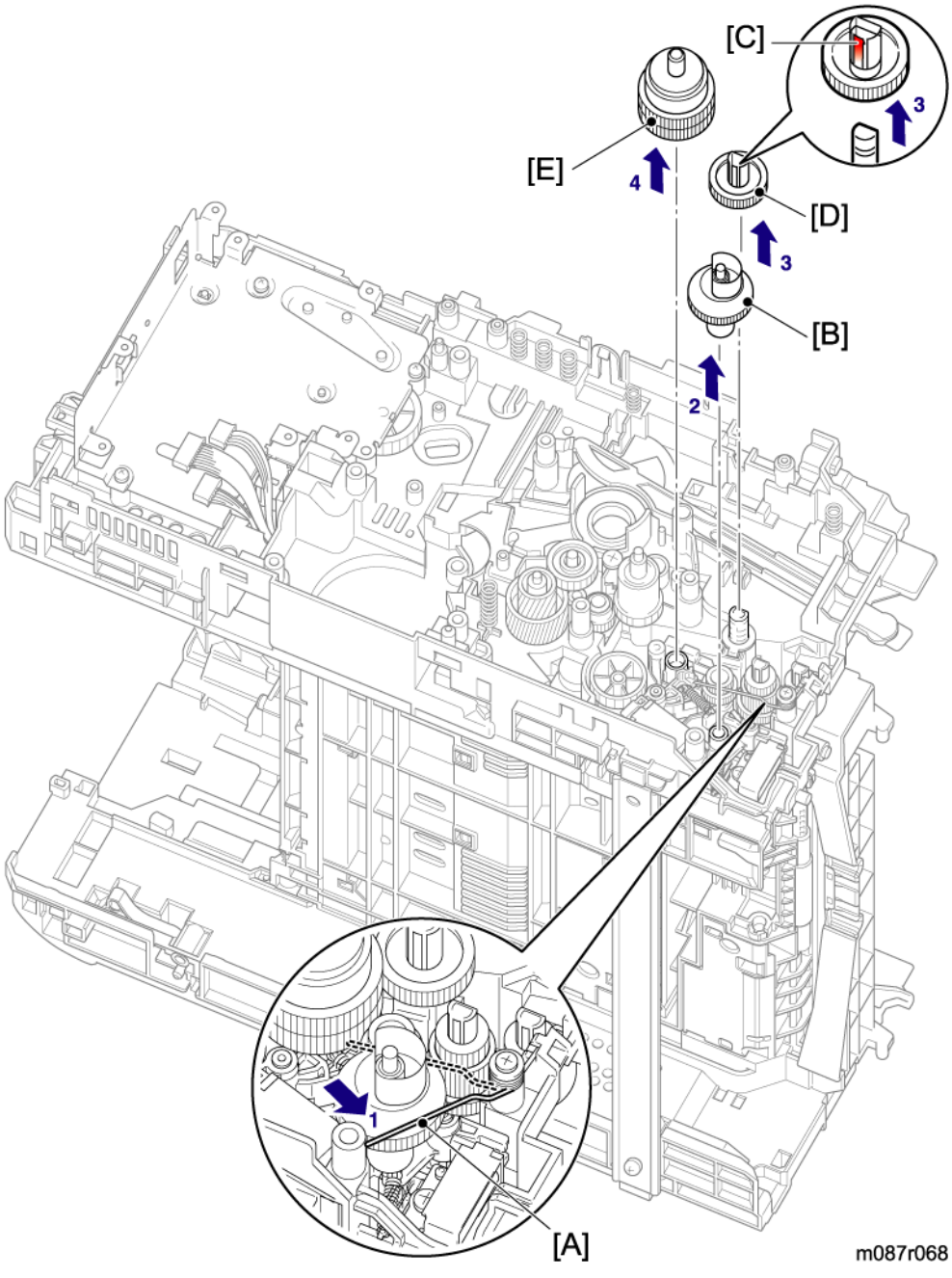
Toner Sensor PCB Unit Assy



1. Remove the Taptite bind B M3x10 screw [A], and then remove the Link stopper [B] and the Toner sensor PCB unit ASSY [C] from the Main body.

2. Remove the PT sensor holder [D] from the Toner sensor PCB unit ASSY [C].

Registration Solenoid

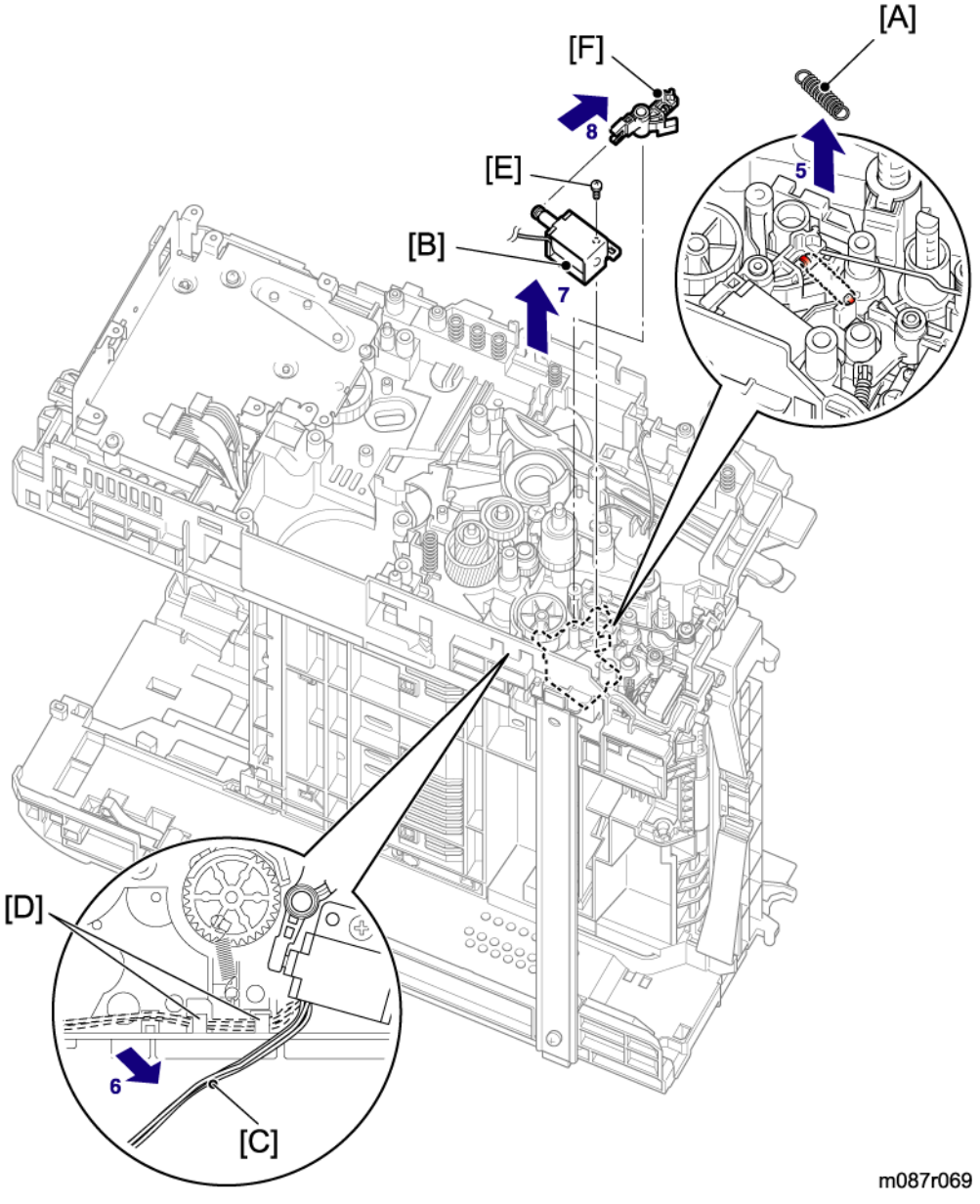


1. Remove the T1 sector gear spring [A] from the T1 gear 38/31 sector [B].

2. Remove the T1 gear 38/31 sector [B] from the Main body.
3. Release the Hook [C] to remove the Registration gear 25 terminal [D] from the Main body.
4. Remove the Registration differential gear ASSY [E] from the Main body.

Important

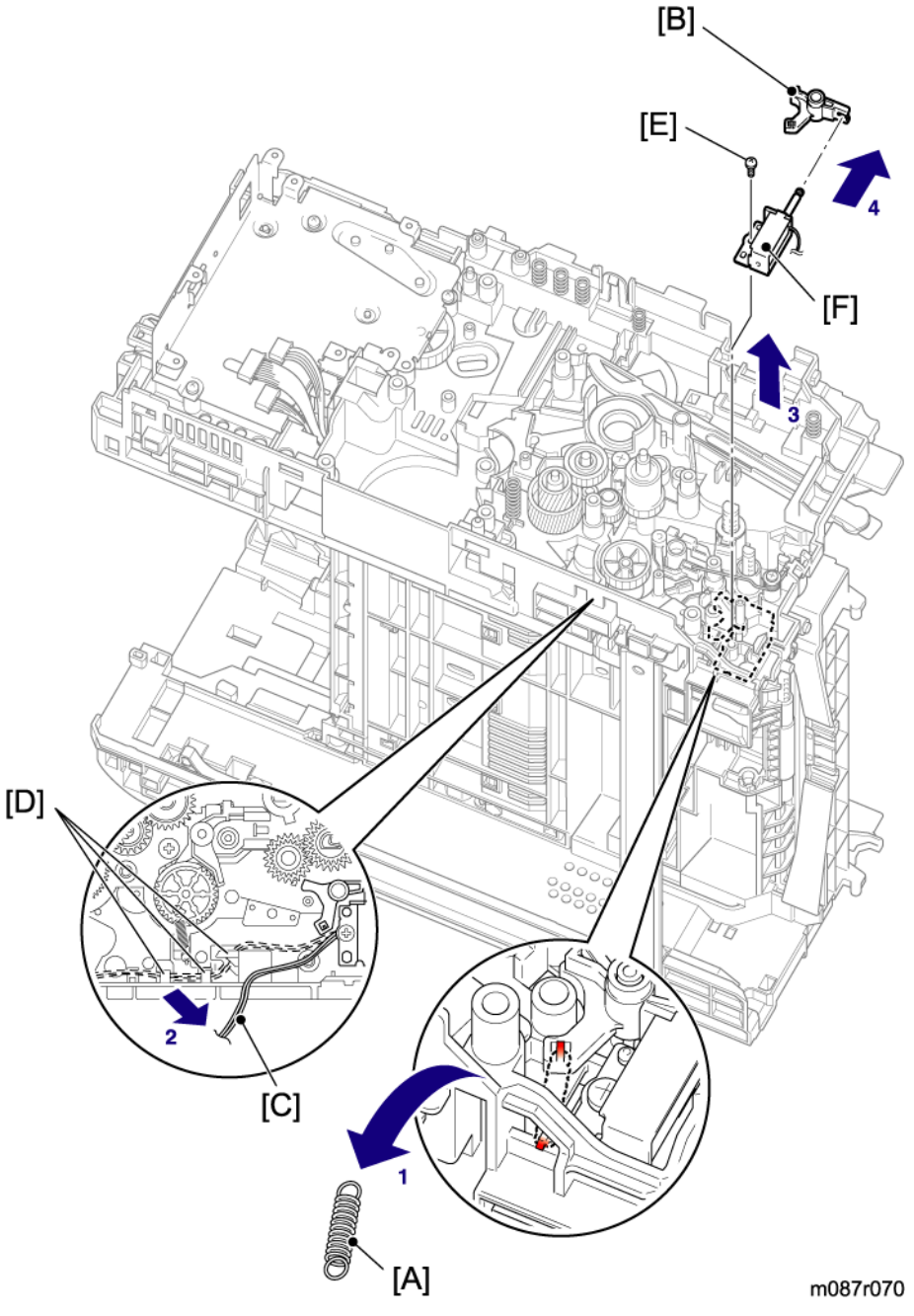
- **Be careful, because the inside gear of the Registration differential gear ASSY [E] is easy to fall.**



5. Remove the Registration solenoid lever spring [A] from the Main body and Registration solenoid lever [B].

6. Remove the Harness [C] from the guide part [D] of Main body.
7. Remove the Taptite bind B M3x10 screw [E], and then remove the Registration solenoid [F] from the Main body.
8. Remove the Registration solenoid lever [B] from the Registration solenoid [F].

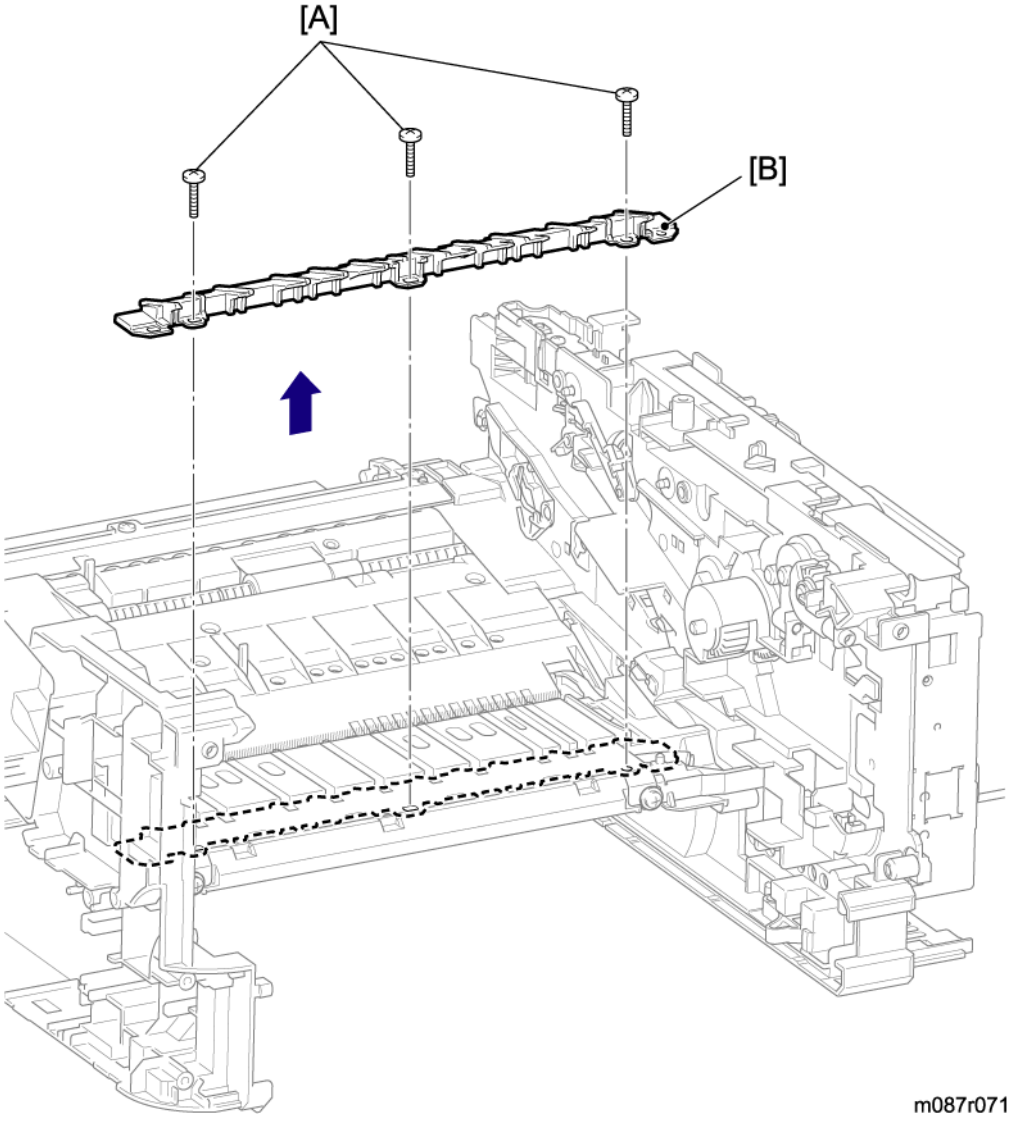
T1 Solenoid



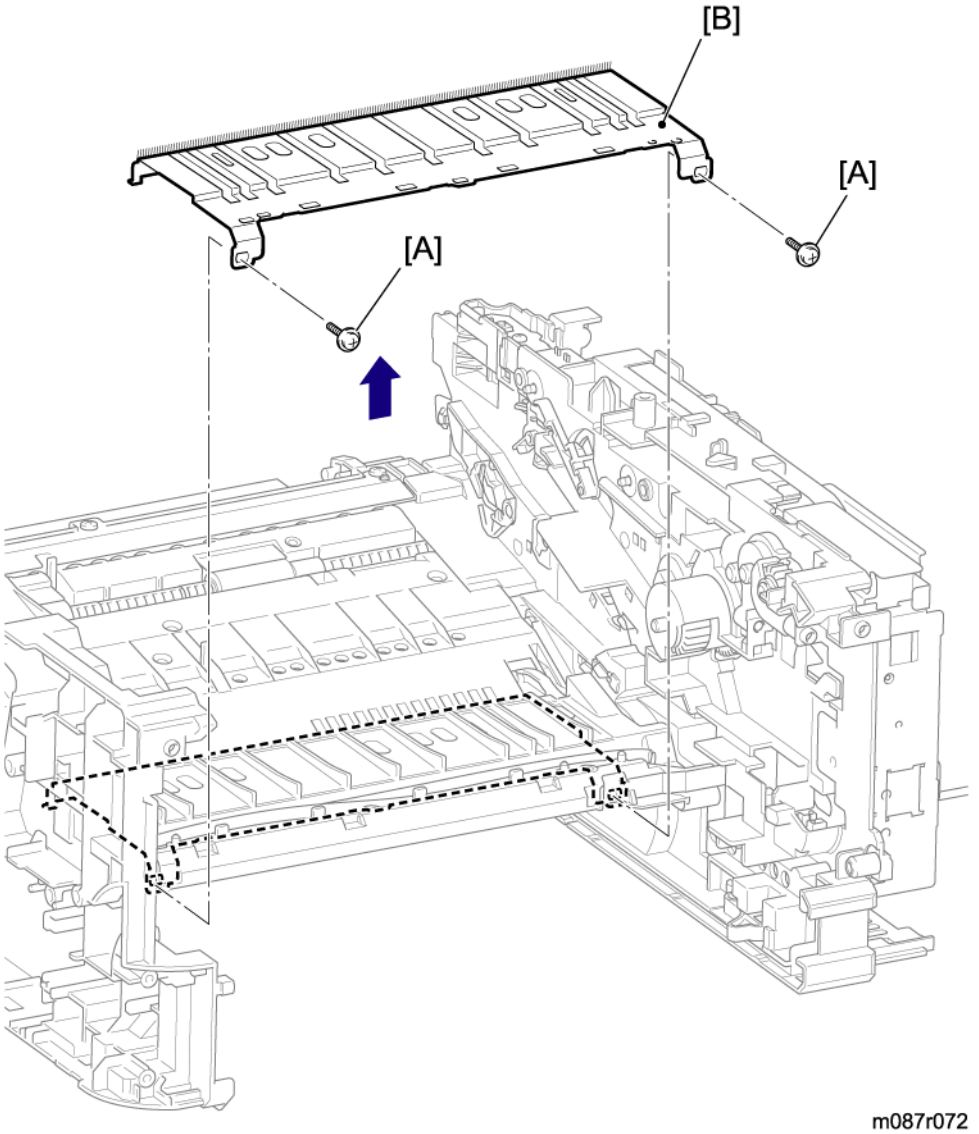
1. Remove the T1 solenoid lever spring [A] from the Main body and T1 solenoid lever [B].
2. Remove the Harness [C] from the Guide part [D] of the Main body.

3. Remove the Taptite bind B M3x10 screw [E], and then remove the T1 solenoid [F] from the Main body.
4. Remove the T1 solenoid lever [B] from the T1 solenoid [F].

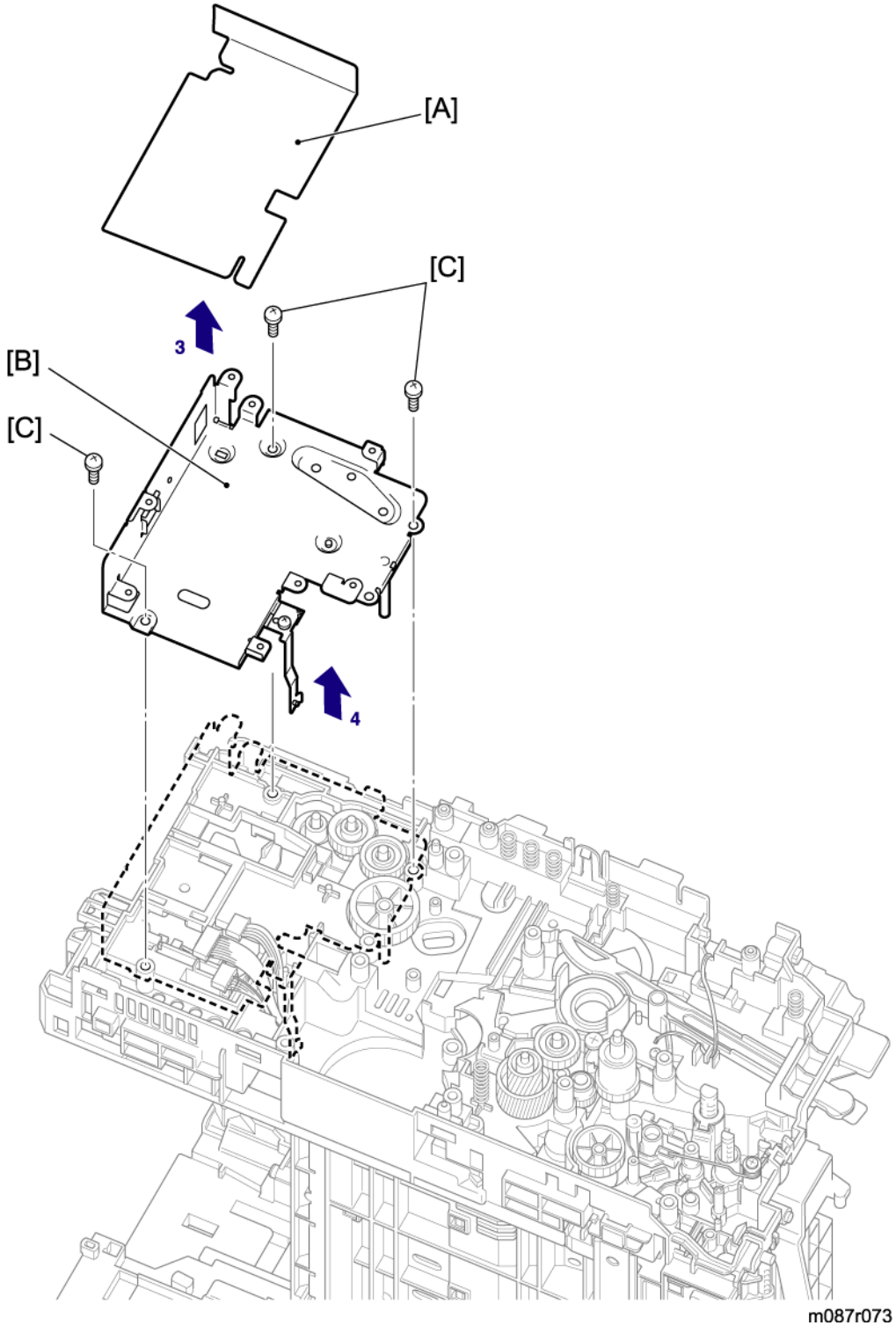
Main Shield Plate / Eject Sensor PCB Assy



1. Remove the three Taptite bind B M3x10 screws [A], and then remove the FU front paper guide [B] from the Main body.

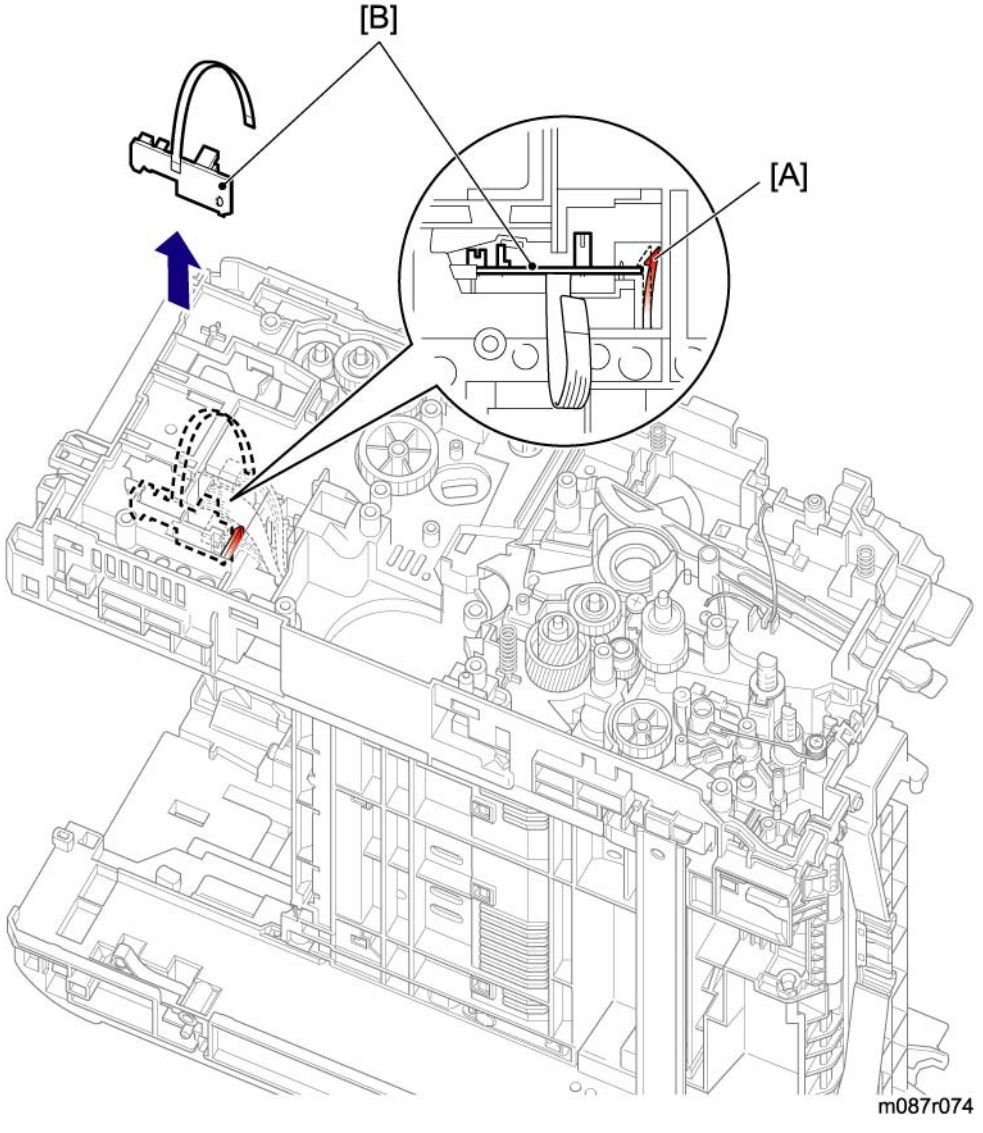


2. Remove the two Taptite cup S M3x6 SR screws [A], and then remove the Chute ground plate [B] from the Main body.



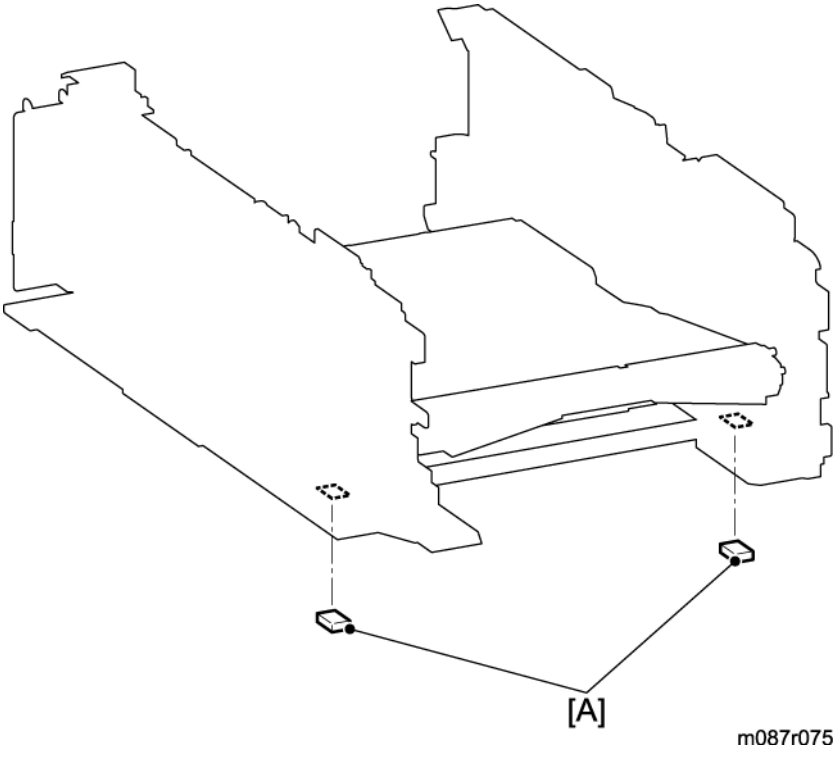
3. Remove the Main PCB sheet [A] from the Main shield plate [B].

4. Remove the three Taptite bind B M4x12 screws [C], and then remove the Main shield plate [B] from the Main body.



5. Release the Hook [A] to remove the Eject sensor PCB ASSY [B] from the Main body.

Rubber Foot

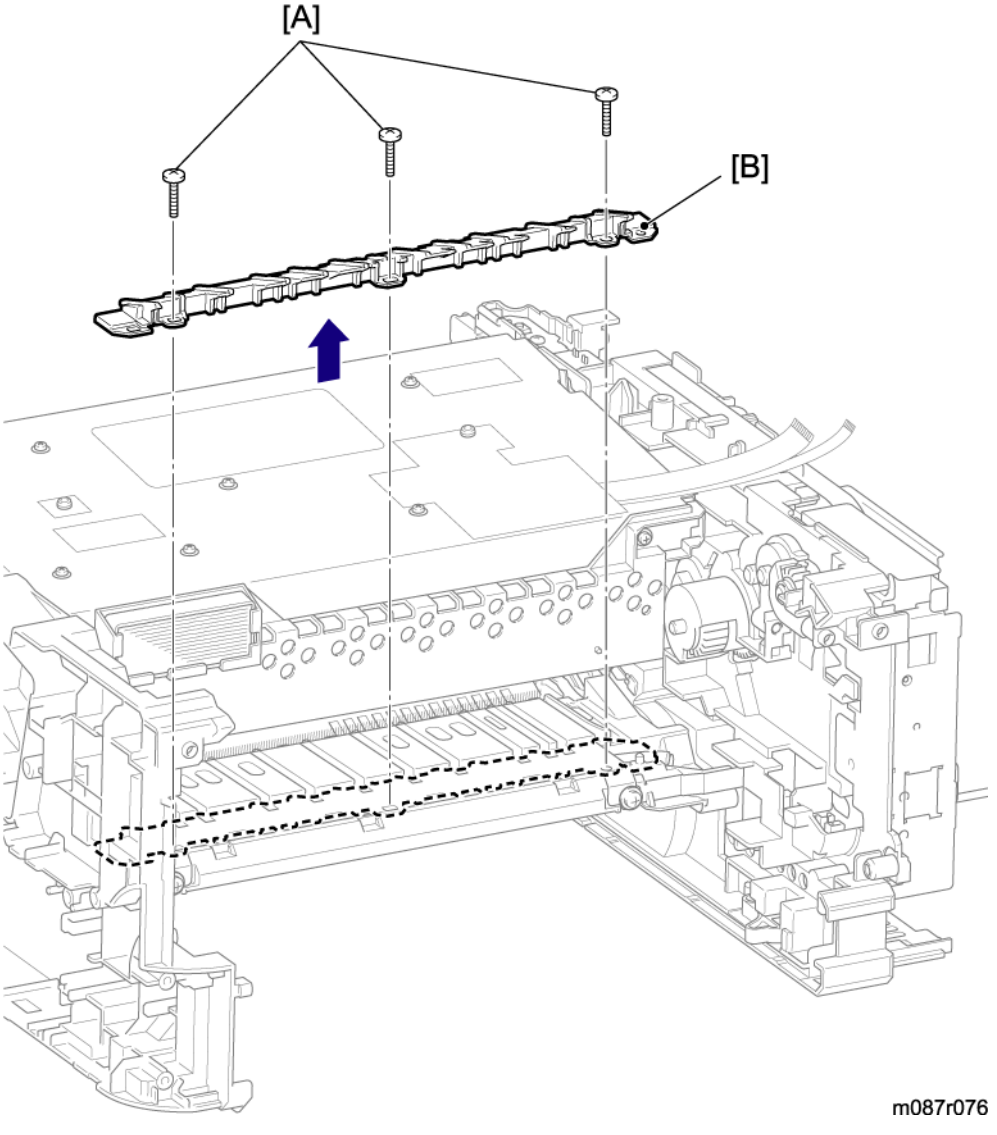


1. Remove the two Rubber feet [A] from the Main body.

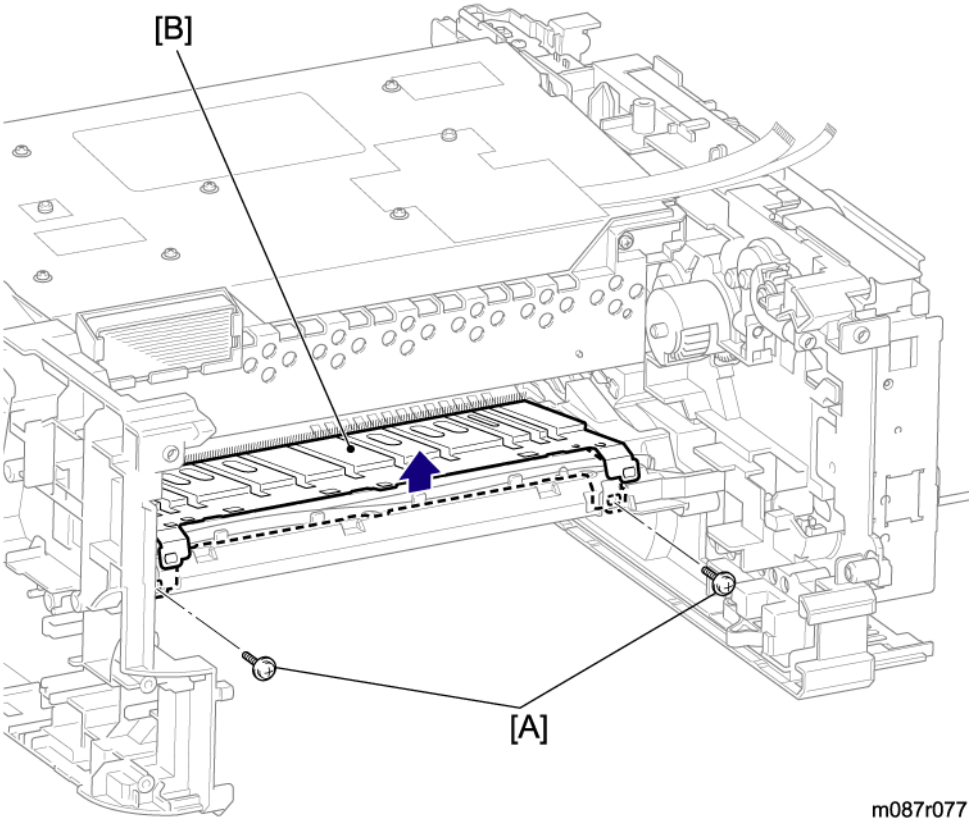
Main Frame L Assy

Note

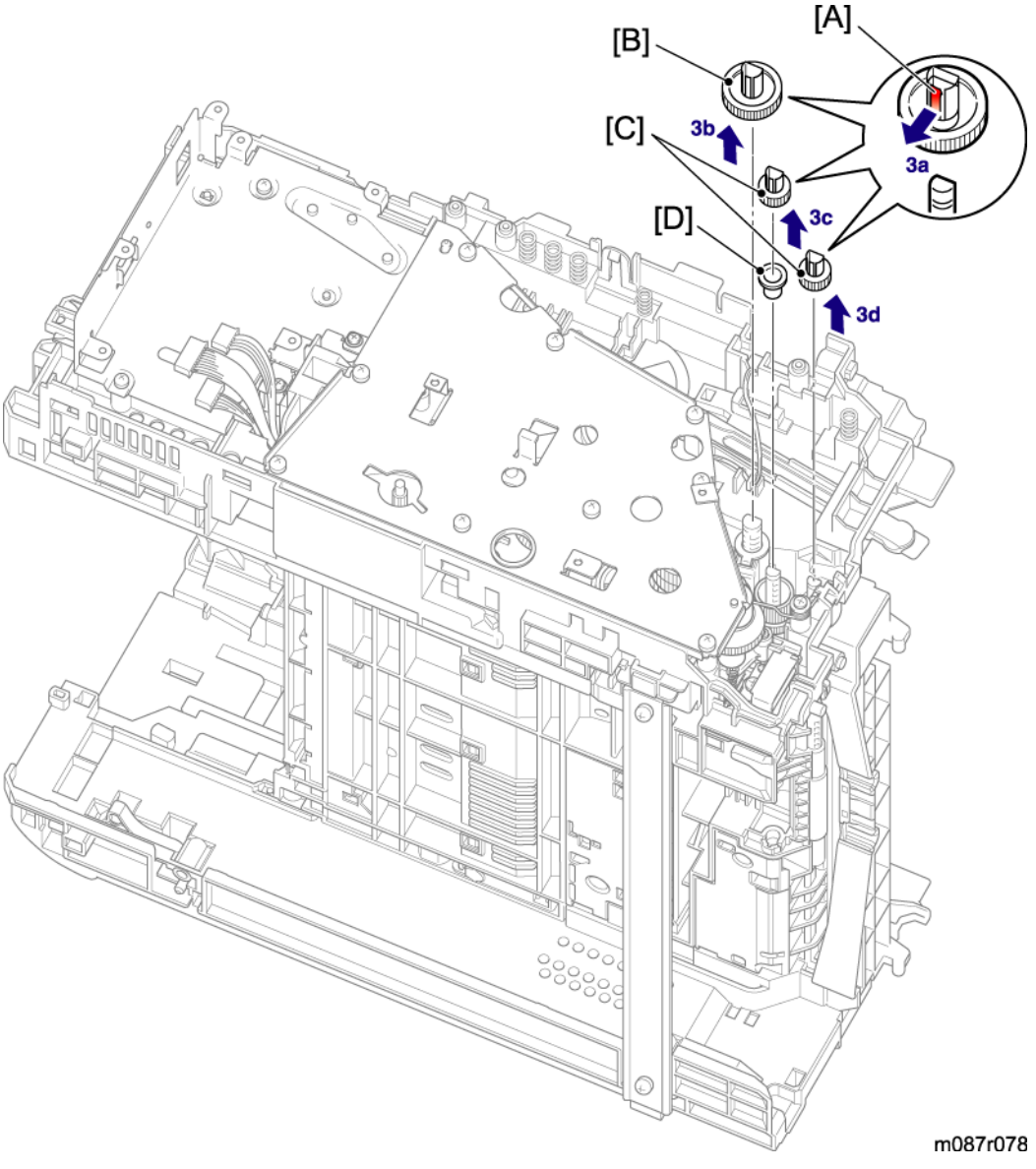
- The procedure for disassembling the Main frame L ASSY after High-Voltage PS PCB Assy p.60 "High-Voltage PS PCB Assy" is described below.



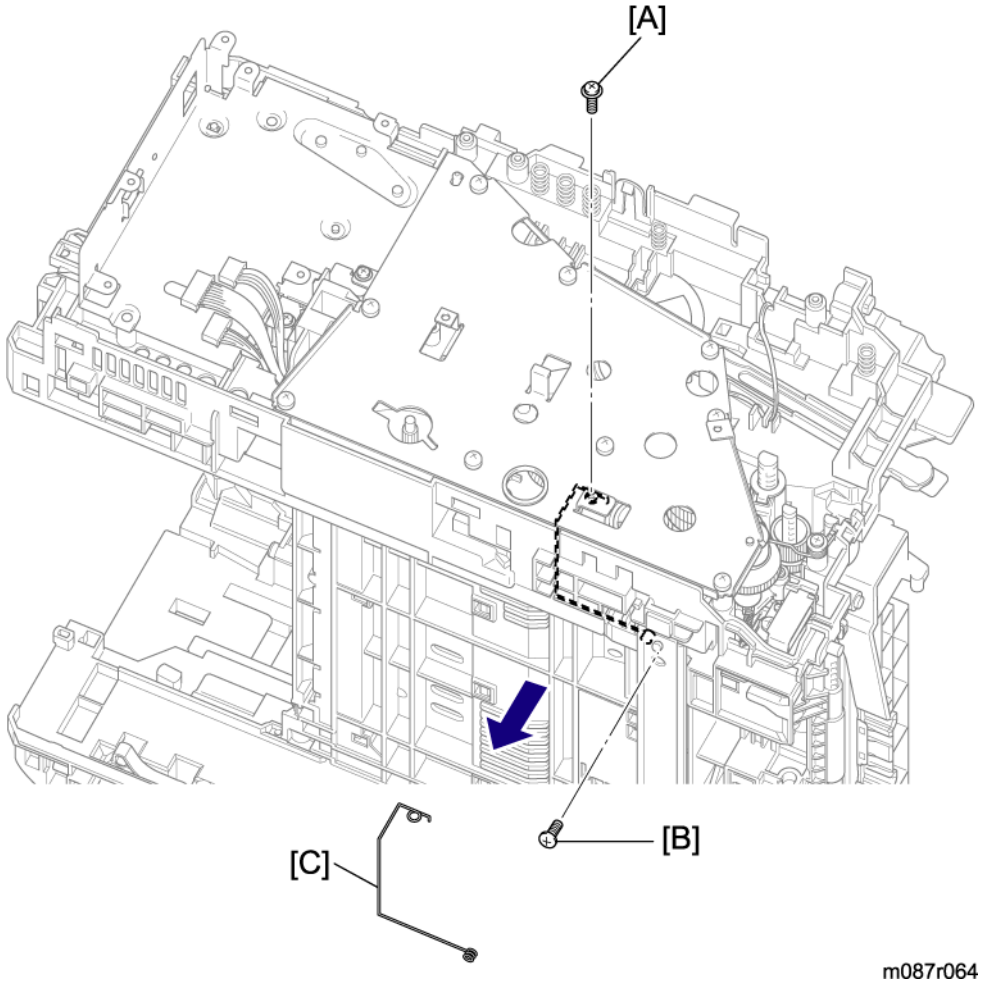
1. Remove the three Taptite bind B M3x10 screws [A], and then remove the FU front paper guide [B] from the Main body.



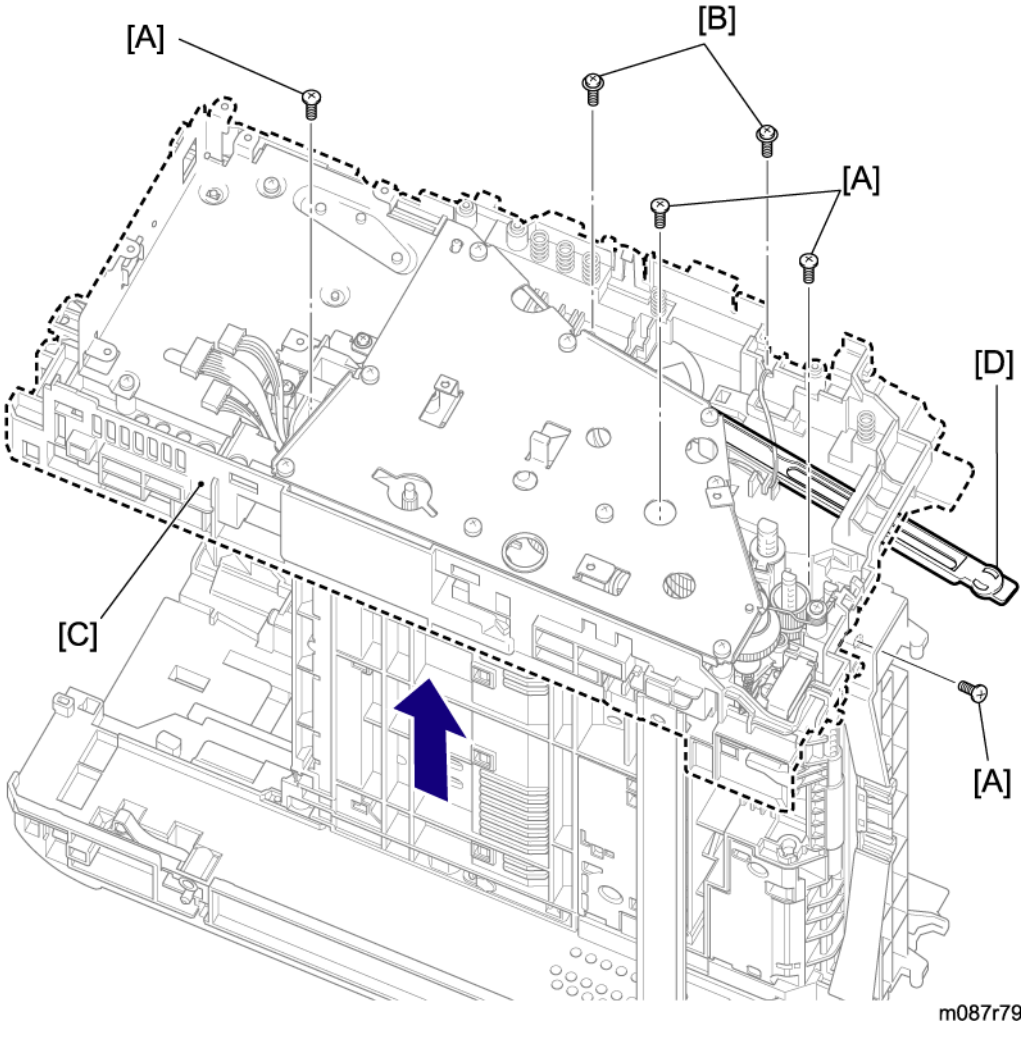
2. Remove the two Taptite cup S M3x6 SR screws [A], and then remove the Chute ground plate [B] from the Main body.



3. Release the Hook [A] to remove the Registration gear 25 terminal [B], the two Feeder gear 17 terminals [C] and the Bush 6 [D].



4. Remove the Taptite cup S M3x6 SR screw [A] and the Taptite bind B M4x12 screw [B] on the Main frame L ASSY, and then remove the Under FG wire [C] from the Main body.

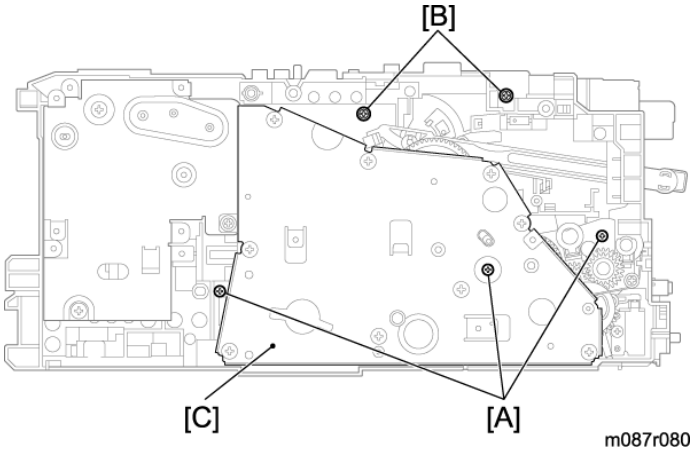


5. Remove the four Taptite bind B M4x12 screws [A] and the two Taptite cup S M3x6 SR screws [B], and then remove the Main frame L ASSY [C] from the Main body.

Note

- Remove the Main frame L ASSY [C] in the state that the DEV joint link [D] is pulled out.

<Upper surface of Main frame L ASSY>



[A] Taptite bind B M4x12 screws

[B] Taptite cup S M3x6 SR screws

[C] Drive sub ASSY

Adjustments and Updating of Settings, Required After Parts Replacement

If You Replace the Main PCB

<What to do when replacing the main PCB>

- Setting the default paper size
- Setting the serial number
- Inputting the adjusted value of the laser scanner

<What you need to prepare>

1. Computer (Windows® XP or later)

   Create the "hl2100" folder in the C drive, for example.
2. M087/M088 target machine
3. BrUsbSn.exe file

   Copy it into the “hl2100” folder that has been created in the C drive. Extract the copied file and run “BrUsbSn.exe” file by double-clicking.
4. USB cable (one piece)
5. Setting file of the default paper size

   s2100EUR.pjl (A4 size), s2100USA.pjl (Letter size)

   s2100ISR.pjl (A4 size, Israeli font for Israel)

   * No PJL file is required for China
6. Download Utility (FILEDG32.EXE)

   Copy it into the "hl2100" folder that has been created in the C drive.
7. Maintenance USB Printer Driver

   Copy it into the "hl2100" folder that has been created in the C drive. Extract the copied file.

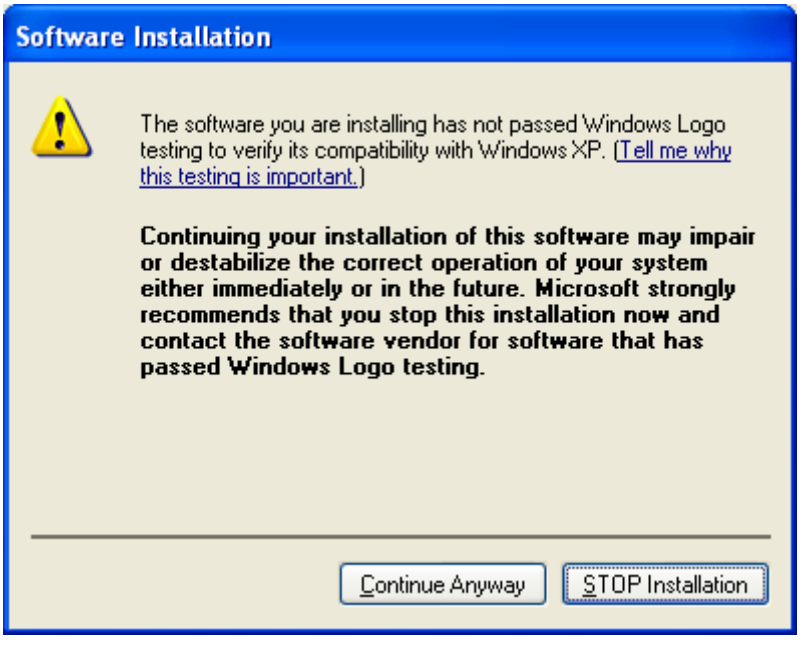
Installing the maintenance printer driver

To identify terminals connected via USB interface, the PC requires the corresponding virtual USB devices to be implemented by driver. If you connect any number of the machine to your PC, therefore, the same number of virtual USB devices will be automatically configured on your PC. To prevent virtual USB devices from being configured limitlessly, use the unique driver installation procedure described below that enables your PC to identify terminals via single virtual USB device.

1. Check that the power switch of the machine is turned off. Disconnect the USB cable that connects the machine with PC.

2. Turn on your PC.
3. Open the front cover, and then enter the "Service Mode".
4. Press the SW supporter for the 2 seconds, and the Error LED lights up.
5. Click the “DPInst.exe” of the Printer Maintenance Driver which has been copied in the “hl2100” folder to start.

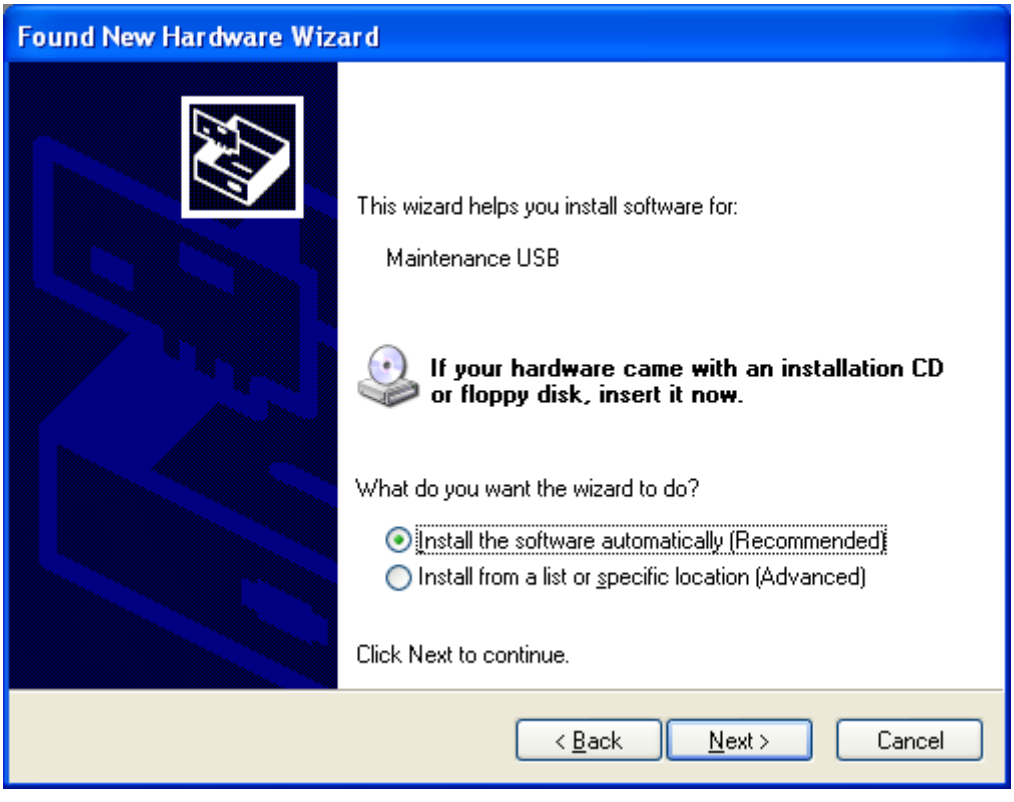
6. The screen above appears, indicating the detection of device installation wizard. Click Next to proceed.



7. Alert warning message of WHQL appears three times. Click Continue Anyway to proceed.

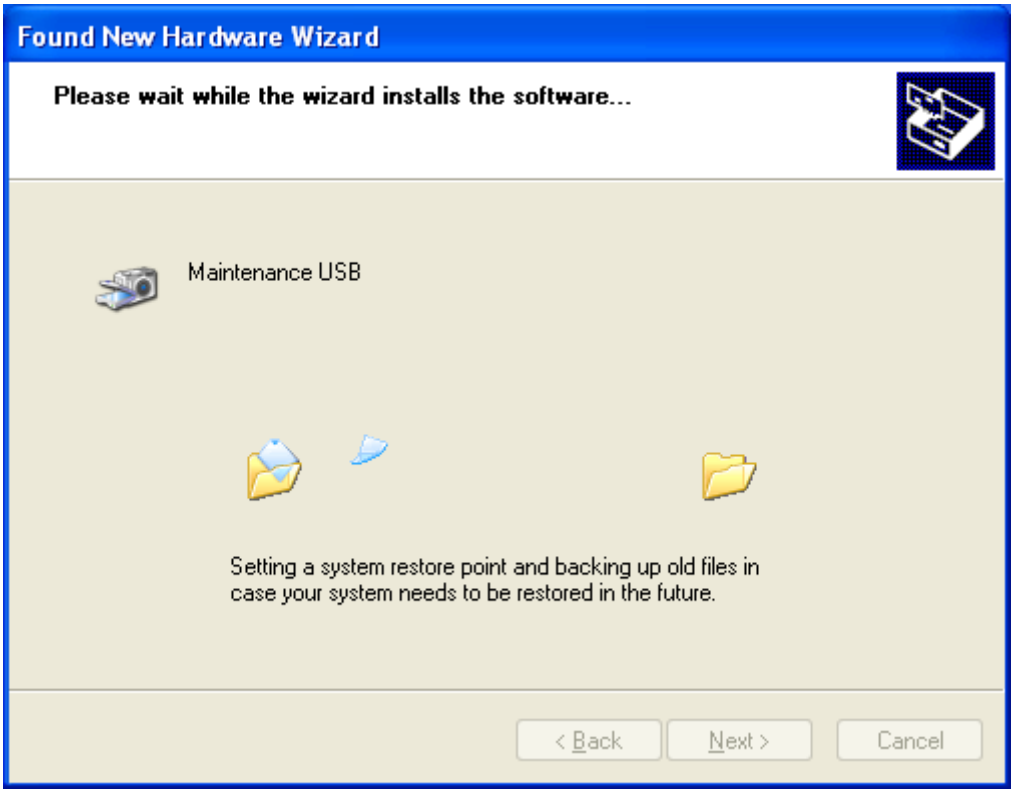
8. If the device driver is successfully installed, the message screen above appears. Click Finish to return.

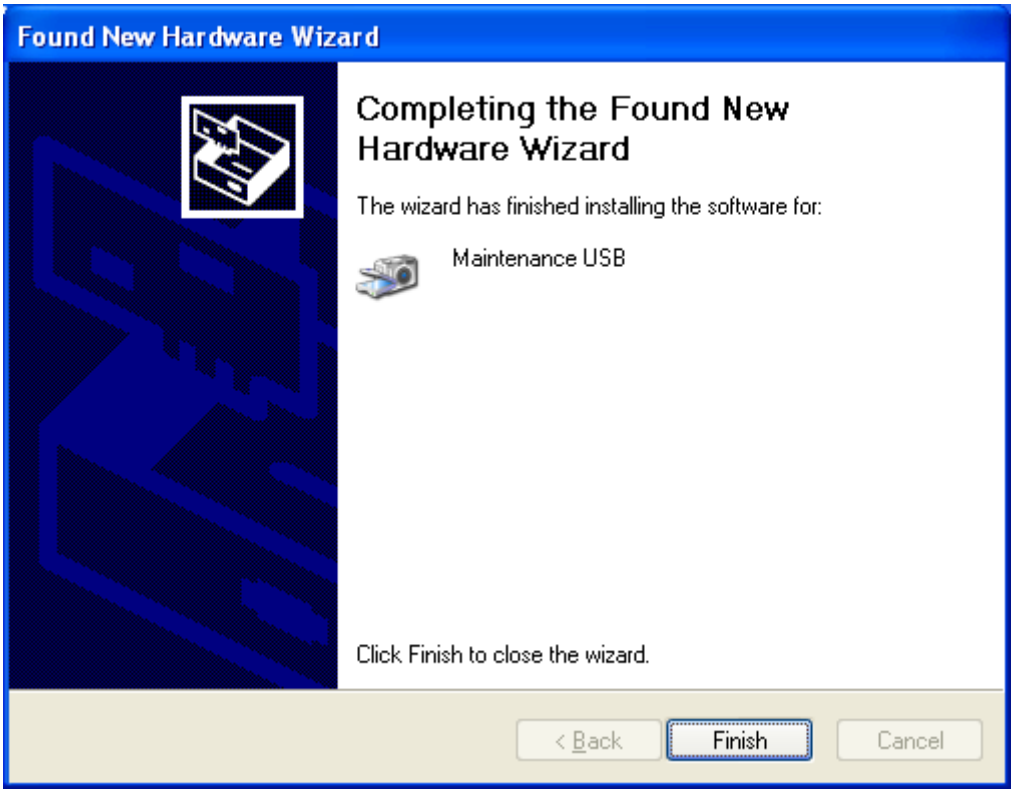
9. Connect the machine to your PC using the USB cable.



10. Select "Install the software automatically (Recommended)" and click Next.

11. Alert warning message of WHQL appears. Click Continue Anyway to proceed.





12. If the Maintenance USB Printer driver is successfully installed, the message screen above appears. Click Finish to return.

Setting the default paper size

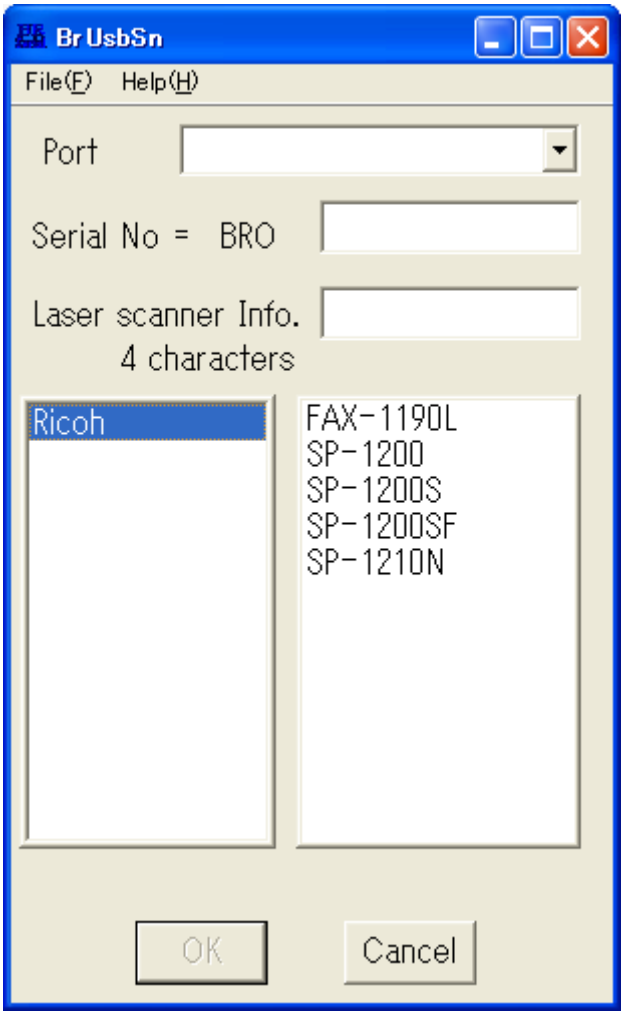
<Procedures>

1. Open the "hl2000" folder and double-click the FILEDG32.EXE icon to start. Select the applicable machine and click it. (Make sure that there is the icon of the connected machine and that no error occurs.)
2. Drag "s2100EUR" (A4 size), "s2100USA" (Letter size) or "s2100ISR" (A4 size, Israeli font for Israel) in the same folder and drop it onto the icon of the applicable model in FILEDG32. When the Ready LED of the machine lights up for an instant and goes off immediately after dropping it, the setting is completed. Then, set the serial number following the steps described in the next section.

Setting the serial number

<Procedures>

1. Connect the PC and machine with the USB cable.
2. Double-click the BrUsbSn.exe file which has been copied in the "ALL2" folder to start.



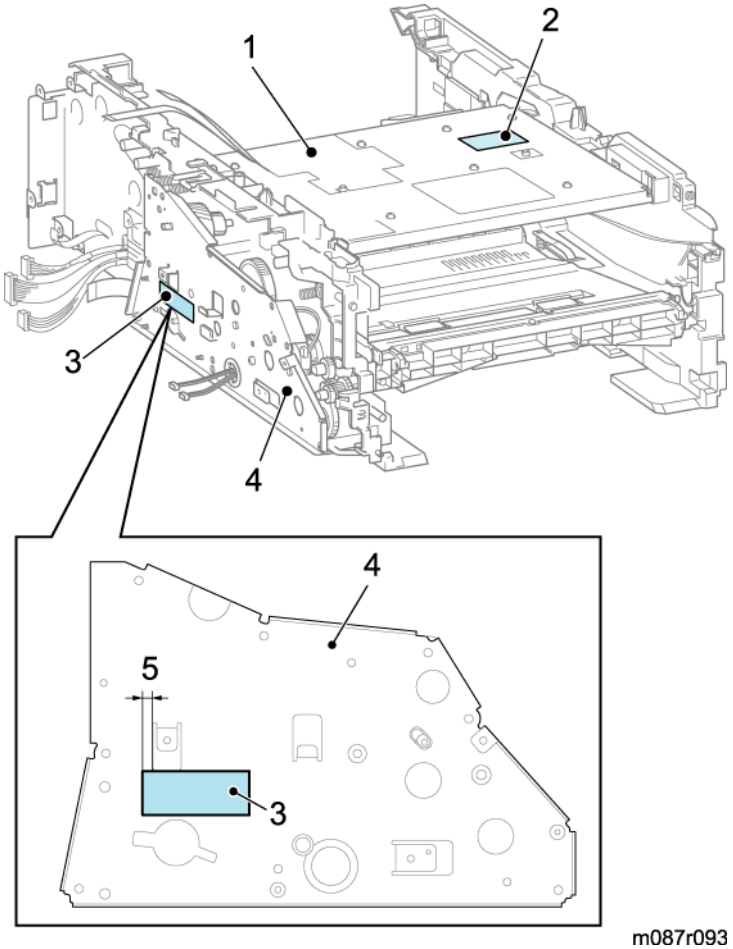
3. Click the "Ricoh" of the model menu.
4. In Port on the BrUsbSn screen, select the port number assigned to the Maintenance USB Printer. If the port number is unknown, check the Maintenance USB Printer Properties (p.113 "How to Select the Port Number").
5. Enter the serial number of the machine into the box on the "Serial No".
6. Click the OK button. The serial number is written in the machine.

Inputting the adjusted value of the laser scanner

Note

- When replace the laser unit, attach the serial label with the provided the new laser unit to the driver sub ASSY.

- The input of following the correction value of the laser unit enter the serial label number with the provided the new laser unit.

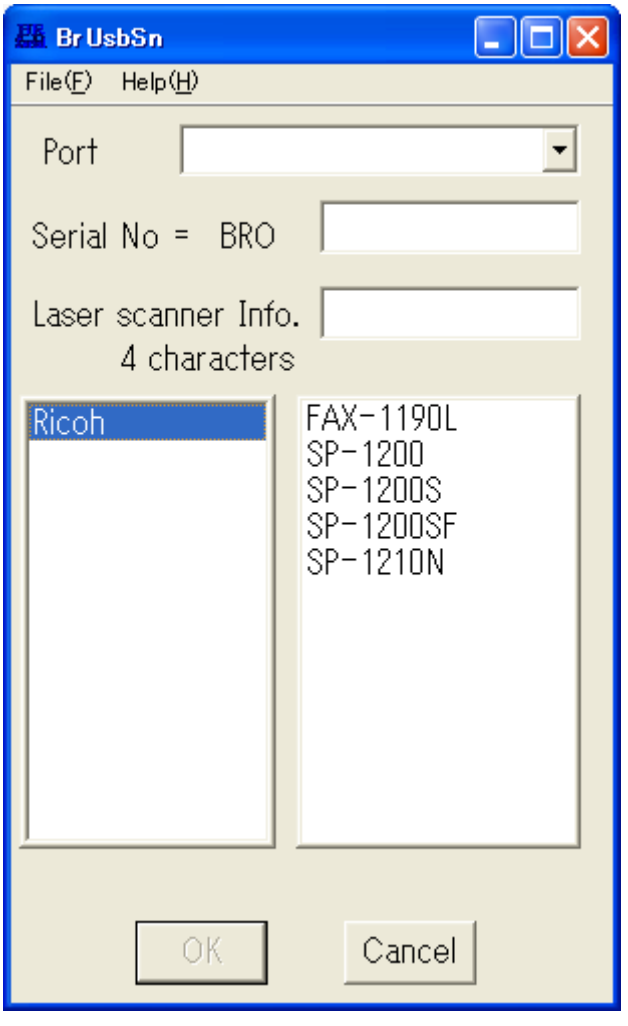


m087r093

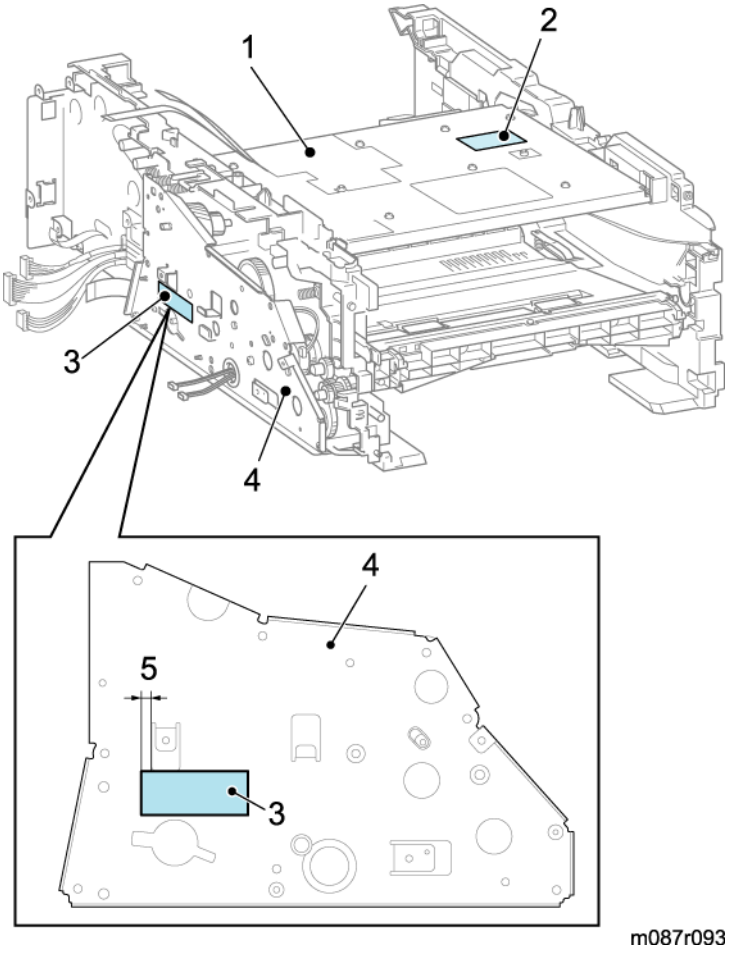
1. Laser unit
2. Laser serial label
3. Laser serial label
4. Drive sub ASSY
5. 2 to 10mm

<Procedures>

1. Double-click the BrUsbSn.exe file to start.



2. Click the "Ricoh" of the model menu.
3. In Port on the BrUsbSn screen, select the port number assigned to the Maintenance USB Printer. If the port number is unknown, check the Maintenance USB Printer Properties (p.113 "How to Select the Port Number").
4. Enter the serial number (the last four digits) into the box on the "Laser Scanner Info." as shown below.
5. Click the OK button. The corrected value of the laser unit is written in the machine.



m087r093

1. Laser unit
2. Laser serial label
3. Laser serial label
4. Drive sub ASSY
5. 2 to 10mm

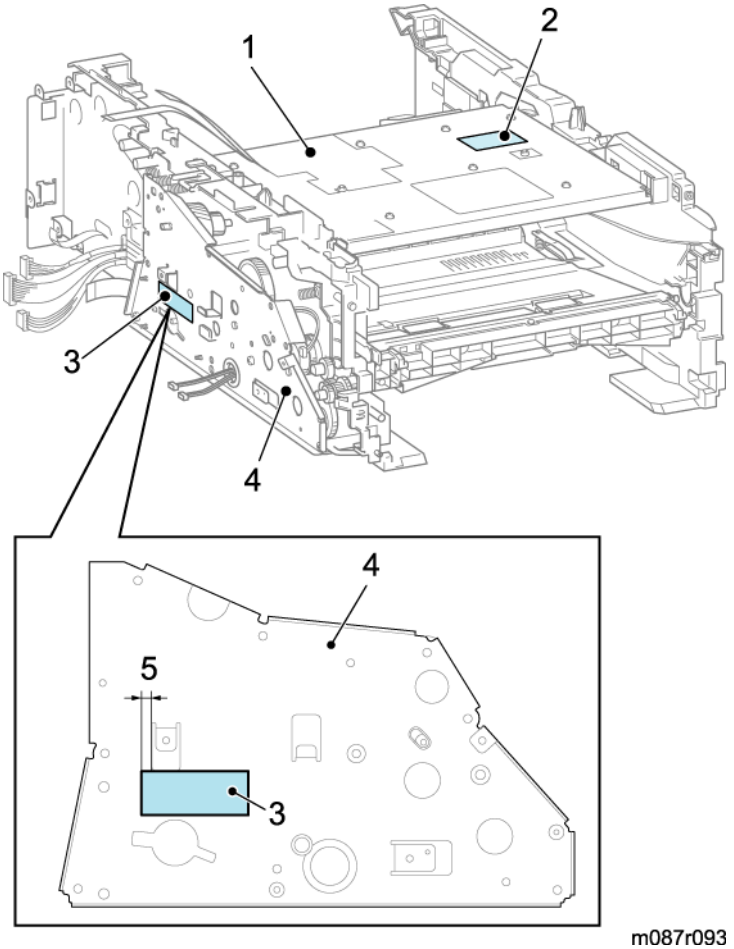
If You Replace The Laser Unit

Inputting the adjusted value of the laser scanner

Note

- When replace the laser unit, attach the serial label with the provided the new laser unit to the driver sub ASSY.

- The input of following the correction value of the laser unit enter the serial label number with the provided the new laser unit.

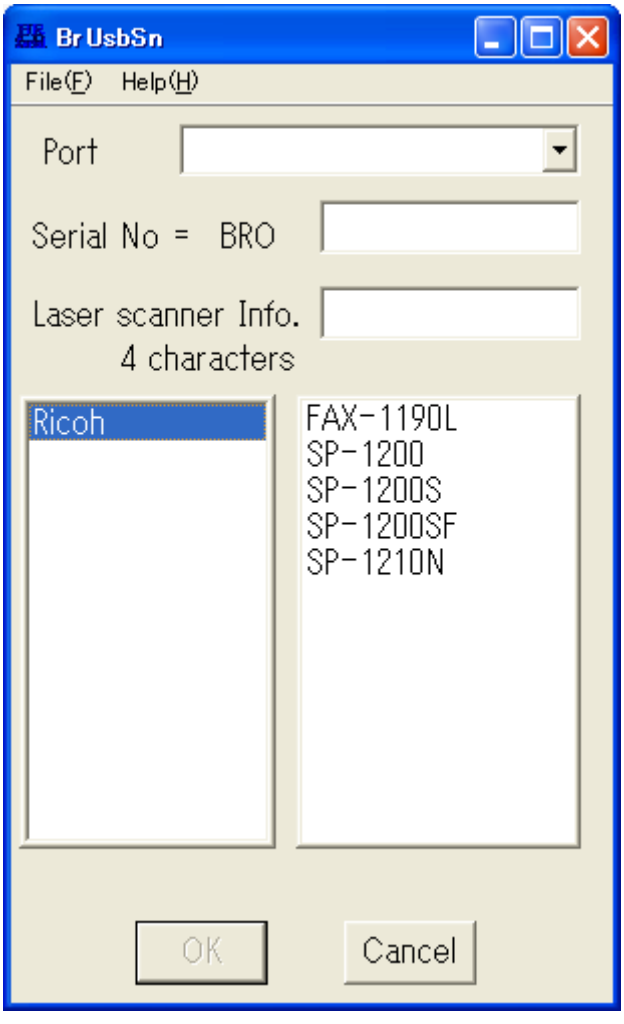


m087r093

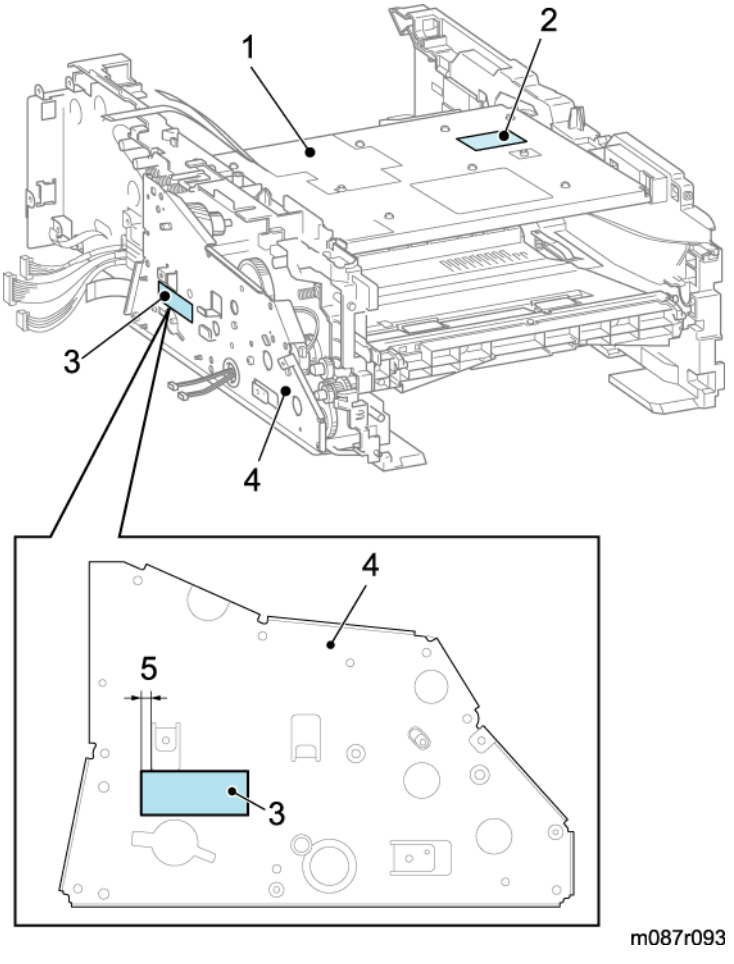
1. Laser unit
2. Laser serial label
3. Laser serial label
4. Drive sub ASSY
5. 2 to 10mm

<Procedures>

1. Double-click the BrUsbSn.exe file to start.



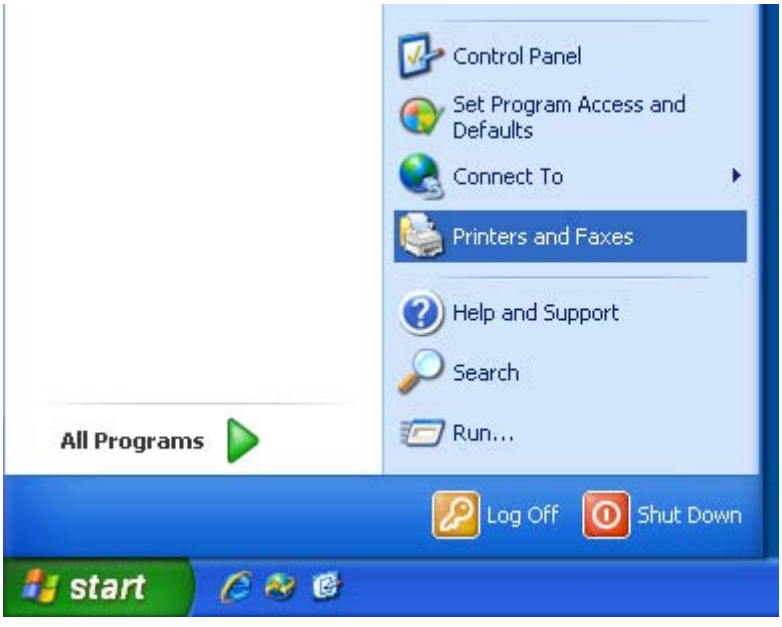
2. Click the "Ricoh" of the model menu.
3. In Port on the BrUsbSn screen, select the port number assigned to the Maintenance USB Printer. If the port number is unknown, check the Maintenance USB Printer Properties (p.113 "How to Select the Port Number")
4. Enter the serial number (the last four digits) into the box on the "Laser Scanner Info." as shown below.
5. Click the OK button. The corrected value of the laser unit is written in the machine.



m087r093

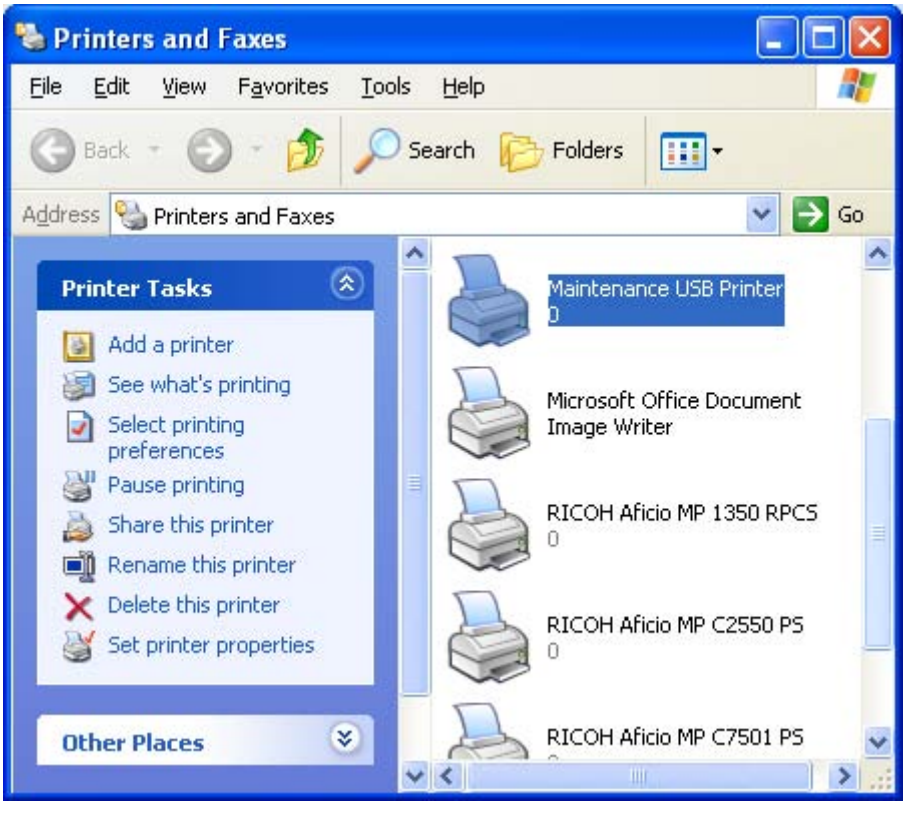
1. Laser unit
2. Laser serial label
3. Laser serial label
4. Drive sub ASSY
5. 2 to 10mm

How to Select the Port Number



1. Click Start | Printers and Faxes.

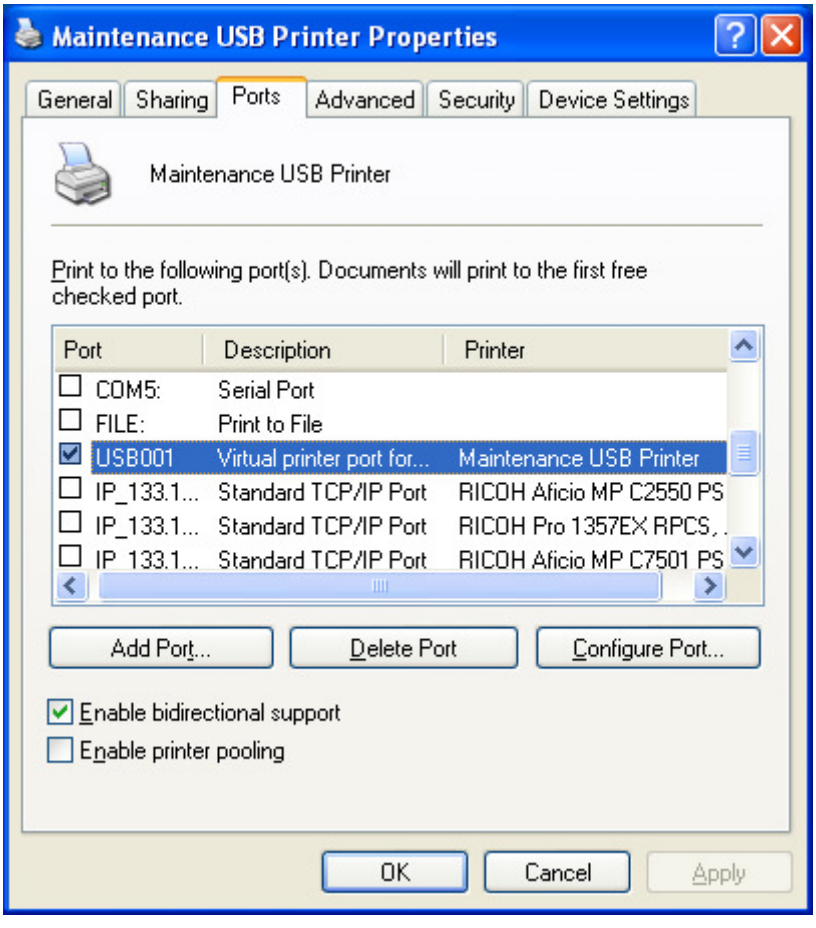
   The Printers and Faxes window appears as shown below.



2. Right-click the Maintenance USB Printer icon.

3. Click Properties.

   The Maintenance USB Printer Properties window appears as shown below.



4. Click the Ports tab.

   In this example, the port number assigned to the Maintenance USB Printer is USB001.

5. Service Maintenance

Control Panel

Various modes can be used if the power switch is set to ON while the [Go] button is held. There are two types of modes: User Mode and Service Mode. Three types of LED display are used to indicate that present setting.

- Toner/Drum/Error LEDs are lighted at the same time to show that transfer to thespecified mode is completed.
- Ready LED is lighted to show that the [Go] button is held when the mode or function is selected. Ready LED is out if the [Go] button is not held.
- All LEDs are lighted for 1 second at the same time to show that initialization or change of set values is completed.

List of Service Support Functions

Mode	Press the [Go] button or SW supporter when sifting the mode	Press the [Go] button or SW supporter when selecting the function	Function
User	-	Once	p.119 "1) Test Sample Page"
		Twice	p.120 "2) Print Fonts"
		Three times	p.120 "3) USB 2.0 FULL Serial Number Return Value Setting"
		Four times	p.120 "4) Hex Dump Mode"
		Five times	p.120 "5) PCB ONLY Mode"
		Six times	p.120 "6) 1push Printing Recovery Mode"
		Seven times	p.120 "7) Network Reset 1 (APIPA: ON)"
		Eight times	p.120 "8) NV-RAM Factory Reset"
		More than nine times	p.119 "1) Test Sample Page"

Mode	Press the [Go] button or SW supporter when sifting the mode	Press the [Go] button or SW supporter when selecting the function	Function
Service	Once	Once	p.122 "9) Factory Inspection Mode"
		Twice	p.124 "10) Continuous Grid Pattern Print Mode"
		Three times	p.124 "11) Fixing Unit Test Print"
		Four times	p.124 "12) NV-RAM Value Dump Mode"
		Five times	p.125 "13) RAM Check"
		Six times	p.125 "14) QA Test print"
		Seven times	p.125 "15) Paper Size Setting (A4/Letter)"
	Twice	Once	p.125 "16) Printing for Maintenance"
		Twice	p.128 "17) Printer Settings"
		Three times	p.132 "18) Sleep Mode Indication (OFF/Dimmed)"
		Four times	p.133 "19) Sleep Mode Setting (ON/OFF)"
		Five times	p.133 "20) Developer Roller Counter Reset 1 (For the starter toner cartridge)"
		Seven times	p.133 "21) Developer Roller Counter Reset 2 (For the standard toner cartridge)"

User Mode

Basically, user mode should be accessed by service personnel only. However, if there is demand, you can disclose to end users.

<Procedure>

1. Check that the front cover is closed.
2. Turn ON the power switch while holding down the [Go] button.

   Check that Toner/Drum/Error LEDs are lighted.

3. Release the [Go] button and check that all LEDs are out.
4. See accompanying table, press the [Go] button again depending on the necessary number of times. Each mode starts 2 seconds.

Press the [Go] button	Mode
Once	p.119 "1) Test Sample Page"
Twice	p.120 "2) Print Fonts"
Three times	p.120 "3) USB 2.0 FULL Serial Number Return Value Setting"
Four times	p.120 "4) Hex Dump Mode"
Five times	p.120 "5) PCB ONLY Mode"
Six times	p.120 "6) 1push Printing Recovery Mode" * Check that all LEDs are lighted for one second.
Seven times	p.120 "7) Network Reset 1 (APIPA: ON)" * Check that all LEDs are lighted for one second.
Eight times	p.120 "8) NV-RAM Factory Reset" * Check that all LEDs are lighted for one second.
More than nine times	p.119 "1) Test Sample Page"

Important

- **Each mode starts 2 seconds after pressing the [Go] button.**
- **If the [Go] button is pressed, the Ready LED is lighted. If the [Go] button is released, the LED is out.**
- **Pressing of the [Go] button 2 times (Print Fonts) and 7 times (Network Reset 1) is ineffective for M088, and pressing of the [Go] button 2 times or 7 times is printed the (Test Sample page).**

<Function>

Functions of each “User Mode”.

1) Test Sample Page

The machine prints a demo page. The machine returns to the ready status after printing.

2) Print Fonts

It is an effective function only for M087. The machine prints a list of the internal fonts. The machine returns to the ready status after printing.

3) USB 2.0 FULL Serial Number Return Value Setting

When the OS used the USB 2.0 FULL in Windows Vista®, do not recognize the serial number of USB device depending on a combination of PC and USB device. To avoid this, the return value of serial number can be switched to "0". It is switched to a set value opposite to a current set value, whenever switching.

The setting change of return value is distinguished by the LED display when the [Go] button is separated. When the Toner LED lights for one second, show that the return value was set from normal value to "0", and when the Drum LED lights for one second, show that the return value was set from "0" to normal value. The machine automatically goes back to ready state after the setting is completed.

4) Hex Dump Mode

This mode is printed as Hex data. without emulation processing the print data which received from the PC it is used for defectiveness analysis of the transmitted print data.

5) PCB ONLY Mode

Even when the engine error occurs and PCB exchange is required for recovery, the machine can be started, ignoring the engine error if this mode is used. NVRAM data can be obtained.

6) 1push Printing Recovery Mode

Demo page print is possible by pressing [Go] button after the power supply is turned on. The data for printing is cleared since the mode can be executed only once.
This mode enables to recover demo page printing. However, the design of printing is not demo page printing, but test printing.

7) Network Reset 1 (APIPA: ON)

It is an effective function only for M087. The network setting is reset to its factory setting. (APIPA is ON)

8) NV-RAM Factory Reset

The machine is restored to the factory setting and permanent fonts and macros are cleared.

Service Mode

The service mode is exclusively designed for the purpose of checks, settings and adjustments, and this function should be accessed by service personnel only. You can perform a print test and display the log information.

<Procedure>

1. Check that the front cover is open.
2. Enter the "Service Mode".
3. See accompanying table, press the SW supporter once, twice or for 2 seconds. (long push), and then shift to each mode.

Press the SW supporter once

Press the SW supporter again depending on the necessary number of times after check that Toner/Drum/Error LEDs are lighted.

Press the SW supporter	Mode
Once	p.122 "9) Factory Inspection Mode"
Twice	p.124 "10) Continuous Grid Pattern Print Mode"
Three times	p.124 "11) Fixing Unit Test Print"
Four times	p.124 "12) NV-RAM Value Dump Mode"
Five times	p.125 "13) RAM Check"
Six times	p.125 "14) QA Test print"
Seven times	p.125 "15) Paper Size Setting (A4/Letter)"
More than Eight times	Go back to Normal State

Press the SW supporter twice

Press the SW supporter again depending on the necessary number of times after check that Toner/Drum/Error LEDs are lighted.

Press the SW supporter	Mode
Once	p.125 "16) Printing for Maintenance" * Start printing when close the front cover.
Twice	p.128 "17) Printer Settings" * Start printing when close the front cover.

Press the SW supporter	Mode
Three times	p.132 "18) Sleep Mode Indication (OFF/Dimmed)"
Four times	p.133 "19) Sleep Mode Setting (ON/OFF)" * Check that all LEDs are lighted for one second.
Five times	p.133 "20) Developer Roller Counter Reset 1 (For the starter toner cartridge)" * Check that all LEDs are lighted for one second.
Seven times	p.133 "21) Developer Roller Counter Reset 2 (For the standard toner cartridge)" * Check that all LEDs are lighted for one second.
More than eight times	Go back to Normal State

<Function>

Functions of each “Service Mode”.

9) Factory Inspection Mode

This mode checks the operation of each sensor, solenoid, fan, scanner motor and main motor to check the point with the malfunction, when repair the machine.

- The machine goes into the inspection mode by a special operation when the power is turned on.
- In the inspection mode, the Ready LED blinks once when the state of a sensor or a switch is changed (from ON to OFF, or from OFF to ON).
- The Toner LED is lit when the state of all switches and sensor is detected.

<Sensor Inspection Check Procedure>

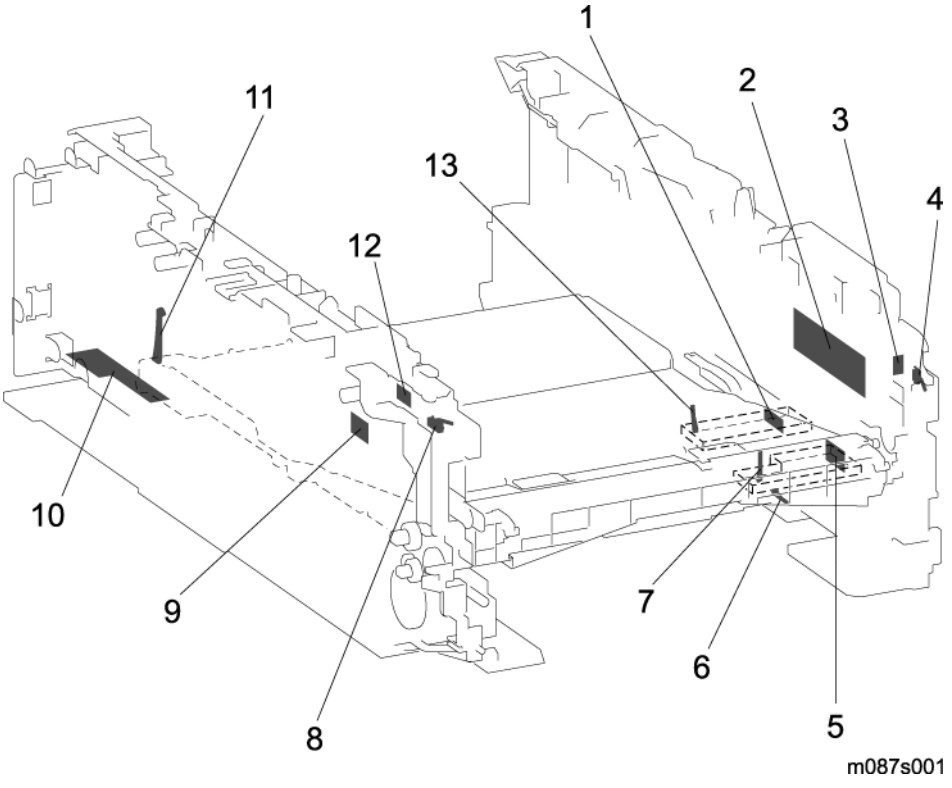
- Check sensors.

  Manually activate the sensors and the actuators listed below, and verify that the Ready LED is lit. (The toner sensor can be activated by blocking the light sensor with your hand.)

  (When the state is changed continuously, the Ready LED keeps blinking.)

  Cover sensor, New toner sensor, Registration rear sensor, Paper eject sensor, Registration front sensor, Toner sensor and Tail edge sensor.

  When the verification of all the sensors is completed the Toner LED becomes lit.



1. Registration rear sensor (Registration rear sensor PCB ASSY)
2. Toner sensor (Toner LED PCB ASSY)
3. Cover sensor
4. Cover sensor harness ASSY
5. Registration front sensor/Tail edge sensor (Registration front sensor PCB ASSY)
6. Edge actuator
7. Registration front actuator
8. New toner sensor harness ASSY
9. Toner sensor (Toner sensor PCB unit ASSY)
10. Paper eject sensor (Eject sensor PCB ASSY)
11. Eject actuator
12. New toner sensor
13. Registration rear actuator

- Check that the Toner LED goes out.

  Verify that the Ready LED is lit when pressing the [Go] button while the front cover is closed. (When you press the [Go] button while the front cover is closed, the Toner LED goes out.)

It remains off while the [Go] button is being pressed.

- Check the fan operation.

  Close the front cover and verify the fan operation. (Verify full- speed and half-speed rotations, and halt.)

  The fan must repeat the following operations whenever the cover sensor is pressed.

  Full-speed rotation - Half-speed rotation - Halt - Full-speed rotation.

- Check the Solenoid.

  Verify that the T1 solenoid is turned on when the new toner sensor is turned on.

  Verify that the registration solenoid is turned on when the registration front sensor is turned on.

- Check the scanner motor and the main motor.

  Open the back cover from a closed state as pressing the SW supporter while the front cover is open, and then close again. Release the SW supporter and close the front cover. The scanner motor starts rotating, and in two seconds the main motor starts rotating. When you open the front cover, the scanner motor and the main motor stop rotating.

- When the verification is completed, turn the power off.

10) Continuous Grid Pattern Print Mode

This mode is to continuously print a grid pattern with a serial number on it. The number of grid pattern prints is displayed at the same time. The machine does not go back to the ready state unless the power is turned off and on.

11) Fixing Unit Test Print

This is to print the following three patterns to check the fixing unit.

- Grid pattern with a serial number on it
- Gray pattern
- Black pattern

When this operation is completed, the machine automatically goes back to the waiting Service mode state.

12) NV-RAM Value Dump Mode

This is to collectively print the present state of the NV-RAM of all machines. When this operation is completed, the machine automatically goes back to the waiting Service mode state.

13) RAM Check

This is to execute a stricter RAM check than a standard one. If the result turns out unaccepted, it considers an error, and all the LEDs blink. If it turns out accepted, the Ready LED and Error LED keeps blinking in alternate shifts. The machine does not go back to the ready state unless the power is turned off and on.

14) QA Test print

This is to print four patterns to check the machine quality. When this operation is completed, the machine automatically goes back to the waiting Service mode state.

15) Paper Size Setting (A4/Letter)

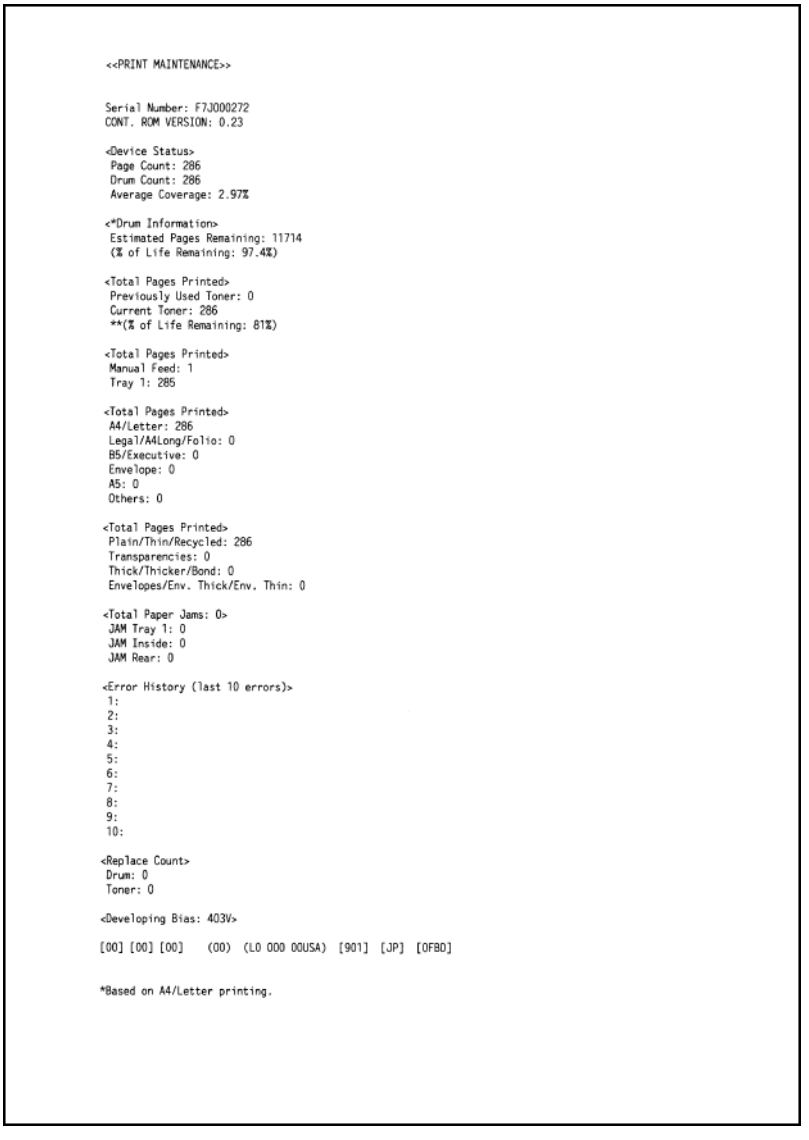
You can select the paper size setting (A4/Letter) of the machine body. Whenever you switch this mode, the setting is changed over from the present one to other.

You can verify the setting change by LEDs when releasing the SW supporter.

When the Toner and Drum LEDs light for 1 second, the paper size is set to Letter. When launched without LED lighting, the paper size is set to A4.

16) Printing for Maintenance

This is to print a list of all maintenance information including printer coverage information. (There is not the development of each national language, and only English.)

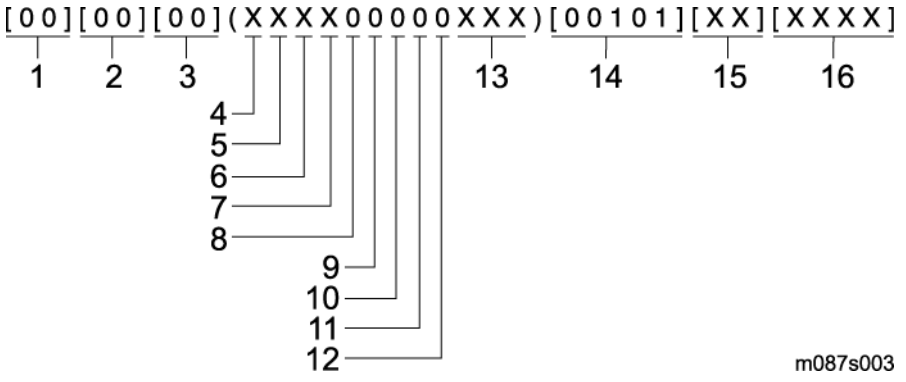


```
<<PRINT MAINTENANCE>>


Serial Number: F7J000272
CONT. ROM VERSION: 0.23

<Device Status>
 Page Count: 286
 Drum Count: 286
 Average Coverage: 2.97%

<*Drum Information>
 Estimated Pages Remaining: 11714
 (% of Life Remaining: 97.4%)

<Total Pages Printed>
 Previously Used Toner: 0
 Current Toner: 286
 **(% of Life Remaining: 81%)

<Total Pages Printed>
 Manual Feed: 1
 Tray 1: 285

<Total Pages Printed>
 A4/Letter: 286
 Legal/A4Long/Folio: 0
 B5/Executive: 0
 Envelope: 0
 A5: 0
 Others: 0

<Total Pages Printed>
 Plain/Thin/Recycled: 286
 Transparencies: 0
 Thick/Thicker/Bond: 0
 Envelopes/Env. Thick/Env. Thin: 0

<Total Paper Jams: 0>
 JAM Tray 1: 0
 JAM Inside: 0
 JAM Rear: 0

<Error History (last 10 errors)>
 1:
 2:
 3:
 4:
 5:
 6:
 7:
 8:
 9:
 10:

<Replace Count>
 Drum: 0
 Toner: 0

<Developing Bias: 403V>

[00] [00] [00]    (00)  (L0 000 00USA)  [901]  [JP]  [OFBD]


*Based on A4/Letter printing.
```

Display terms is as follows.

Item	Description
Series Name	Model name of machine
Serial Number	Serial number of machine
CONT. ROM VERSION	Rom version of machine
Device Status	Page Count, Drum Count, Average Coverage The maximum count for each item is 1 million times.

Item	Description
Drum Information	Estimated Pages Remaining, % of Life Remaining.
Total Pages Printed*	Previously Used Toner, Current Toner. The maximum value for each count is 65535. % of Toner Life Remaining.
Total Pages Printed	Total Pages Printed (Tray 1, Manual Feed). The maximum count for each item is 1 million times. The information above is not cleared when replacing the PF kit.
Total Pages Printed	The number of A4/Letter, A4Long/Legal/Folio, B5/Executive, Envelope, A5 and other paper types used. The maximum count for each item is 1 million times.
Total Pages Printed	The number of Plain/Thin/Recycled, Transparencies, Thick/Thicker/Band and Envelopes/Env. Thick/Env. Thin types used. The maximum count for each item is 1 million times.
Total Paper Jams	The number of paper jam occurrence in each of the Tray, Inside and Rear. The paper jam occurs when the machine is turned ON is not counted. The maximum count for each item is 255 times.
Error History	The error history including the latest 10 errors and the number of pages when these errors occur are indicated. However, the Cover Open error, No Paper and Manual Feed is excluded.
Replace Count	The number of replacement of DRUM and TONER The maximum count for each item is 65535 times.
Developing Bias*	Developing Bias of now



1. Number of Electrical Discharge Error Occurrence. Maximum Count is 255 Times (Hexadecimal Form)
2. Number of Fixing Error Occurrence. Maximum Count is 255 Times (Hexadecimal Form)
3. Number of Motor Lock Error Occurrence.Maximum Count is 255 Times (Hexadecimal Form)
4. PCB Inspection (0: OK, X: NG)
5. High-Voltage Inspection (0: OK, X: NG)
6. Paper Size (A: A4, L: Letter)
7. Toner Type (0: Starter, H: Standard)
8. Small Size Japan Control (0: OFF, J: ON)
9. ISR Font (0: OFF, I: ISR Font)
10. EWS CHN Setup (0: OFF, C: CHN Setup)
11. One Push Print (0: OFF, P: ON)
12. DEMO Function (0: OFF, D: ON)
13. Language (ENG/USA/CAN/FRA/GER/SPA/ITA/NOR)
14. Specification Cord
15. Not used
16. NVRAM CHECK SAM

Important

- *** is displayed only in maintenance information.**
- **Some margin of error must be taken into consideration because coverage for the printable area of A4-size paper is calculated using video signals.**

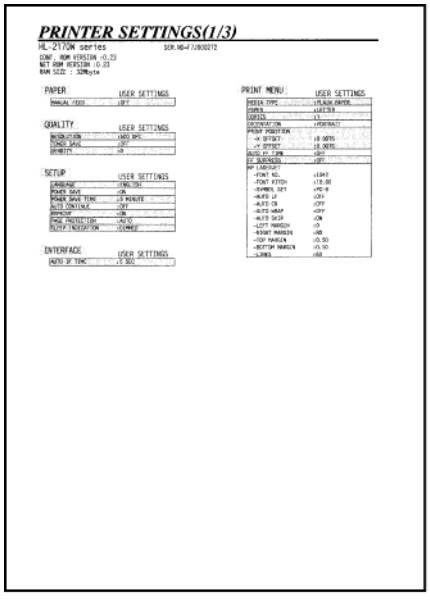
17) Printer Settings

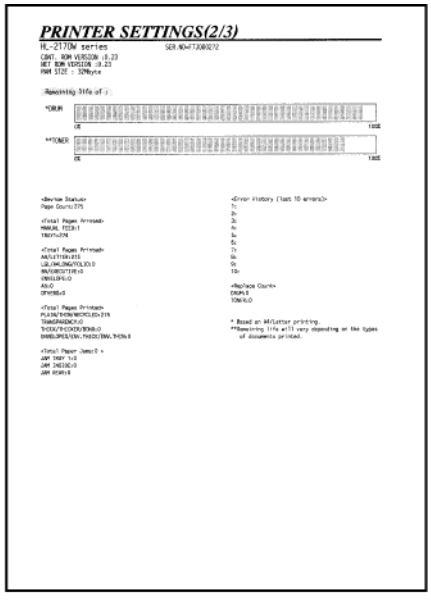
If you want to know the drum unit life or the number of printed pages, you should print out the Printer Settings. The "Printer Settings" is configured with one page for M088 and three pages for M087 (The wired LAN is set to ON). All pages have following terms in common, Title, Model name, Serial number.

The setting indication is the same as the LCD setting information, supporting the following 18 languages. (ENG/ FRE/ GER/ DUT/ ITA/ SPA/ NOR/ SWE/ DAN/ POR/ FIN/ CZE/ POL/ HUN/ RUS/ BUL/ ROM/ SLV)

Note

- It is also allowed you to print the "Printer Settings" by pressing the [Go] button three times continuously when the front cover is closed and when the machine is in the ready mode.
- The descriptions printed in Printer Settings vary depending on the countries.





m087s004

Page 1

This page includes various setting information of the machine.

- Printer information

  In the following order

  - Controller Version (CONT.ROM VERSION)
  - Net work Version (NET ROM VERSION)

    But, M088 is not indicated
  - RAM SIZE (Mbyte)
- Printer settings information

  Each term is indicated when if fulfills the condition, and HL-2140 is indicated the maintenance information to the Page 1.

Page 2

This page includes the printer information and the maintenance information in the following order.

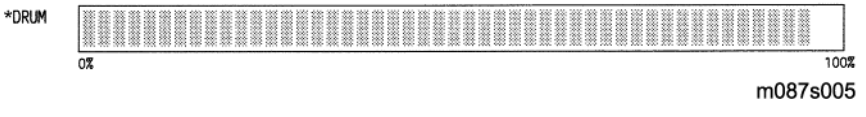
- Maintenance information

  1. Consumable information

     The printable pages remained for the consumable part is indicated. Also, the percentage of life remained over the total printable pages is indicated in numerical value and bar graph.

     Sample indication (DRUM) is as follows.

     From the top left, the consumable part name is indicated. The right column is a band graph separated into 50 scale marks.



m087s005

The consumable parts indicated are as follows.

- Drum Unit
- TONER

Important

- **The drum unit life is shown by the band graph at the center of Printer Settings.**

Drum Unit Life

How to Read the Drum Unit Life

- It initially indicates 100% and gradually decreases.
- It indicates 0% when the Drum LED is blinking.
- It stays at 0% even if further printing is done.

How to calculate the drum unit life

The drum unit life is based on the “drum counter” or the “number of drum rotations”.

The drum counter is based on the total printed pages on the drum unit. This total printed pages should be reset every time you replace the drum unit with a new one. (p.134 "Resetting the drum counter") Basically this amount is equal to the assured printable pages of the drum unit.

If a drum discharge is detected, toner life ends.

If under the situation with a little print number of sheets per one job, the “page counter based on the number of drum rotation” exceeds the “drum counter” based on the total printed page.

Refer to the calculation of the drum unit life based on the number of drum rotation below;

How to calculate the page counter

The number of drum rotations for the first page printed is about 15. The number of drum rotations per one page for the second or later page printed (continuous printing) is 4.3. Using these figures, the page counter is calculated as follows:

Page counter based on the number of drum rotations = (Number of drum rotations for the first page printed + (Number of drum rotations per one page for the second or later page printed x (Number of pages in continuous printing - 1)) / 15
(* The number of drum rotations per one page continuous printing.)

Example: Starts to print when the machine is in the Ready state.

Continuous printing	Page counter based on the number of drum rotations (Pages)
1 page/job	(15 + (4.3 x (1 - 1))) / 15 = 1
2 pages/job	(15 + (4.3 x (2 - 1))) / 15 = 1.29
18 pages/job	(15 + (4.3 x (18 - 1))) / 15 = 5.87

If you leave the machine without printing for a long time, the number of drum rotations is increasing. If you print one page per one job every time after leaving the machine without printing for a long time, the drum unit life is shorter than usual.

2. Counter information, history information

The counter and history information related to the following term are included. When it reaches the maximum count, each term is no longer counted.

Item	Description
Page Count	The total number of printed pages . The maximum count is 1 million pages.

Item	Description
Total Pages Printed	The number of times that each of the Tray1 and Manual Feed is used. The maximum count for each item is 1 million times. The information above is not cleared when replacing the PF kit.
Total Pages Printed	The number of A4/Letter, A4Long/Legal/Folio, B5/Executive, Envelope, and other paper types used. The maximum count for each item is 1 million times.
Total Pages Printed	The number of Plain/Thin/Recycled, Transparencies, Thick/Thicker/Band and Envelopes/Env. Thick/Env. Thin types used. The maximum count for each item is 1 million times.
Total Paper Jams	The number of paper jam occurrence in each of the Tray, Inside and Rear. The paper jam occurs when the machine is turned ON is not counted. The maximum count for each item is 255 times.
Error History	The error history including the latest 10 errors and the number of pages when these errors occur are indicated. The errors such as Cover Open, No Paper and Manual Feed is not included. When a paper is jammed by turning on the power or leaving covers open (JAM TRAY1, JAM INSIDE, or JAM REAR), a period will be printed at the beginning of error numbers.
Replace Count	The number of replacement of each of Drum and Toner Unit. The maximum count for each item is 65535 times.

Page 3

Wired Network Information

18) Sleep Mode Indication (OFF/Dimmed)

This is to select whether the Ready LED is turned off completely or lit in blue with low light intensity during the Sleep mode. Whenever you switch this mode, the setting is changed over from the present one to the other. When you take your finger off from the SW supporter, the Ready LED is lit in 100% light intensity or low light intensity according to the setting so that you can verify the present setting.

19) Sleep Mode Setting (ON/OFF)

This is to allow you to turn on and off the sleep mode of the machine. The default setting is ON. The machine automatically goes back to the waiting Service mode state after the operation is completed.

20) Developer Roller Counter Reset 1 (For the starter toner cartridge)

Since print density is likely to become darker as toner is getting older, the developing bias is lowered by degrees according to the number of prints so that an almost fixed density can be maintained from the start of the use of brand-new toner to the end of it.

The value of the developing bias is printed on the maintenance sheet. The developing bias is a parameter which depends on the developing assembly, so it needs to be reset when the developing assembly is replaced. At that time, the developing roller counter reading is also reset. This mode is to enable to execute these operations (equivalent to those done when the developing assembly is replaced) manually from the service mode.

21) Developer Roller Counter Reset 2 (For the standard toner cartridge)

Since print density is likely to become darker as toner is getting older, the developing bias is lowered by degrees according to the number of prints so that an almost fixed density can be maintained from the start of the use of brand-new toner to the end of it.

The value of the developing bias is printed on the maintenance sheet. The developing bias is a parameter which depends on the developing assembly, so it needs to be reset when the developing assembly is replaced. At that time, the developing roller counter reading is also reset. This mode is to enable to execute these operations (equivalent to those done when the developing assembly is replaced) manually from the service mode.

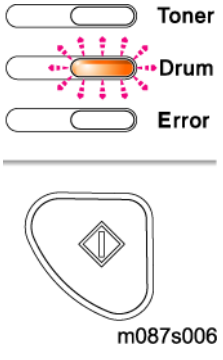
Other Service Functions

This section describes what the end user should do when replacing the consumable parts.

Resetting the drum counter

The printed image may deteriorate when using the drum unit to a certain degree. The machine detects how much the drum unit is used with the drum counter and the Drum LED blinks when the drum unit life is nearly at the end of its life to indicate to the end user that the drum unit life reaches the end of its life soon, in order to prevent the printed image defects due to drum unit deterioration.

The machine does not provide the function which resets the drum counter automatically when the drum unit is replaced with a new one. If replacing the drum unit with a new one without resetting the drum counter, the counted value of the old drum unit is used continuously so that the Drum LED is not off.



m087s006

When replacing the drum unit with a new one, it is required to reset the drum counter following the steps below:

<Procedure>

1. Open the front cover while the power supply of the machine is ON, after check the LED of the above-mentioned, and verify that the Error LED is lit.
2. Keep the SW supporter pressed down until all LEDs on the control panel light up. (approx. four seconds)
3. Release the SW supporter when all LEDs light up and take the old drum unit out of the machine.
4. Verify that Error LED is lit, and install a new drum unit into the machine.
5. Close the front cover.

Note

- If the drum counter is reset on condition that the machine has printed out 100 pages or more since the previous reset, the replace counter for the drum is updated.

Initializing the developing bias

When replacing the toner cartridge with a new one, the new toner sensor detects that the toner cartridge is replaced, and the developing bias is initialized automatically. Therefore, the end user is not necessary to initialize the developing bias.
If replacing the toner cartridge which contains enough toner with a used one, the new toner sensor cannot detect that the toner cartridge is replaced so that the developing bias is not initialized. In this case, the print density may be lighter than usual.

In such a case, initialize the developing bias forcedly following the steps below:

<Procedure>

- Standard toner cartridge
  1. Open the front cover.
  2. Take the drum unit out of the machine.
  3. Press the SW supporter.
  4. Install the drum unit into the machine.
  5. Press the SW supporter.
  6. Close the front cover.
- High-capacity toner cartridge
  1. Open the front cover.
  2. Take the drum unit out of the machine.
  3. Press the SW supporter.
  4. Install the drum unit into the machine.
  5. Press the SW supporter twice.
  6. Close the front cover.

6. Troubleshooting

Introduction

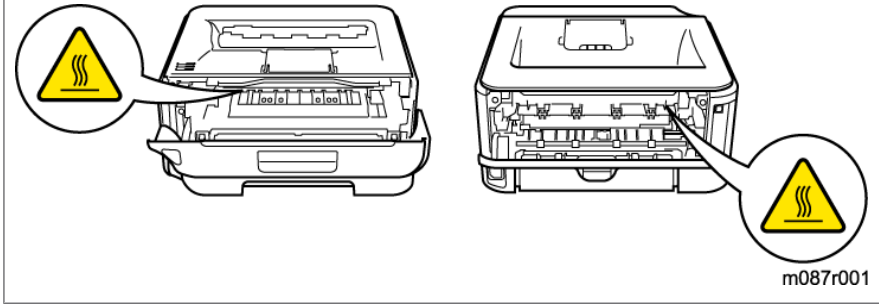
Troubleshooting is the countermeasure procedures that the service personnel should follow if an error or malfunction occurs with the machine. It is impossible to anticipate all of the possible troubles which may occur in future and determine the troubleshooting procedures, so this chapter covers some sample troubles. However, those samples will help the service personnel pinpoint and repair other defective elements.

Precautions

Be sure to observe and follow all the precautions to prevent any secondary problems from happening during troubleshooting.

1. Always turn off the power and unplug the power cable before removing any covers or PCBs, adjusting the machine and so on. If you need to take voltage measurements with the power switched on, take the greatest of care not to receive an electric shock.
2. When connecting or disconnecting cable connectors, make sure that you hold the connector body and not the cables.
3. Electronic devices are sensitive to static build up; make sure that you touch a metal portion of the machine to discharge yourself before accessing the PCBs.
   Handle PCBs with care when repairing them.
4. Follow the warning by all means.

The fuser unit becomes extremely hot during operation. Wait until it has cooled down sufficiently before replacing consumable items. DO NOT remove or damage the caution label located on or around the fuser.



5. Verify again that the repaired portion works properly.

Initial Check

Check the following items before attempting to repair the machine.

- Paper
  1. A recommended type of paper is being used.

     See “Appendices” for the following information:

     Paper
  2. The paper is not damp.
  3. The paper is not short-grained paper or acid paper.
- Consumable Parts
  1. The drum unit (including the toner cartridge) is installed correctly.
- Cleaning

  Use a soft dry cloth.

⚠CAUTION
DO NOT use flammable substances such as alcohol, benzine, thinner or any type of spray to clean the inside or outside of the machine. Doing this may cause a fire or electrical shock. 

Distinguish Error Cause

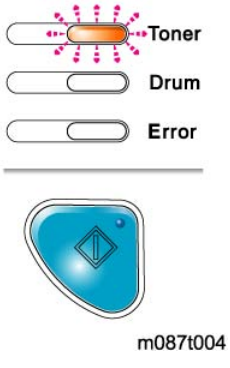
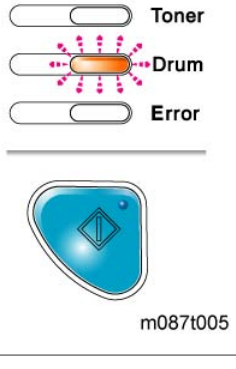
LED Indication

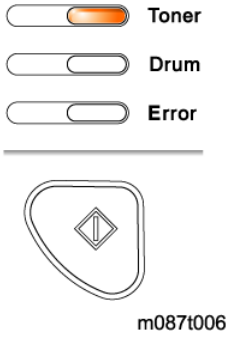
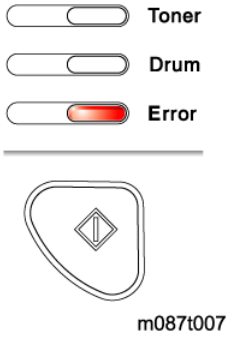
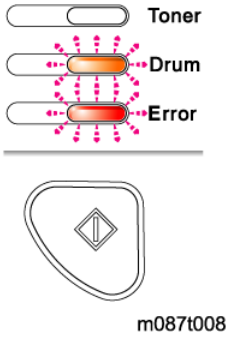
LED Indication at Operator Calls

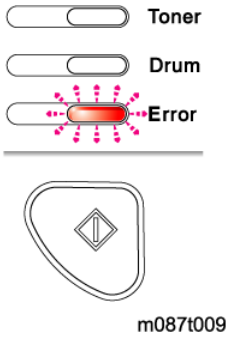
Distinguish the contents of message by LED indication in the control panel. See the reference page and take the corrective action described for each indication to correct it. when the red Error LED is ON or blinking to indicate it, the machine automatically recovers from most errors. But some of errors are necessary to reset the machine by holding down the [Go] button.

LED indication of the following table is that

LED is OFF, LED is ON and LED is blinking.

LED	Type of error	Error clearance by pressing the [Go] button
 m087t004	p.144 "1) Toner low"	N/A
 m087t005	p.145 "2) Drum life end soon"	N/A

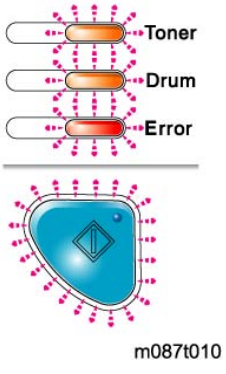
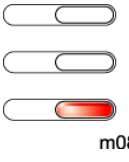
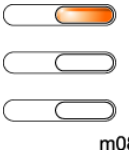
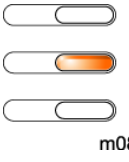
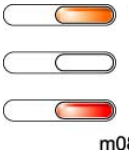
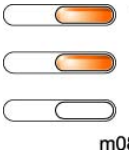
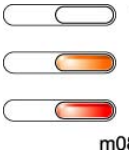
LED	Type of error	Error clearance by pressing the [Go] button
	p.145 "3) Toner cartridge is at the end of life"	N/A
	p.145 "4) Cartridge position error"	N/A
	p.146 "5) No paper fed tray 1"	N/A
	p.147 "6) No paper fed manual feed slot"	N/A
	p.147 "7) Drum error"	N/A

LED	Type of error	Error clearance by pressing the [Go] button
	p.149 "8) Front cover is open"	N/A
	p.150 "9) Fuser cover is open"	N/A
	p.150 "10) Paper jam" (JAM TRAY 1, JAM INSIDE/JAM REAR)	N/A
	p.152 "11) Memory full"	Yes
	p.153 "12) Print overrun"	Yes

LED indication at Service Calls

If service calls occur, all four LEDs blink on and off to notice it. And then when press the [Go] button, distinguish a fault from the specific combination of ON/OFF and status color of the LED.

When entering this state, instruct the end user to turn off the power switch, wait a few seconds and the same service call appears, see the reference page to take the corrective action.

LED	Pressing one time of the [Go] button		Type of error
 m087t010	 m087t011	 m087t012	p.153 "13) Main PCB failure"
		 m087t013	p.153 "14) Fuser unit failure"
		 m087t014	p.153 "15) Laser unit failure"
		 m087t015	p.154 "16) Main motor failure"
		 m087t016	p.154 "17) High-voltage power supply PCB failure"
		 m087t017	p.155 "18) Fan failure"

Message indication

Error indication at Service Calls

If LED indication does not operate when service calls occur, you can use a maintenance tool to distinguish the type of error.

Error indication (Printing of Printer Settings)	Error indication (Printing of Maintenance)	Type of error
ERROR S01	ERROR S01	p.153 "13) Main PCB failure"
ERROR S02	ERROR S02	
ERROR S03	ERROR S03	
ERROR S04	ERROR S04	
ERROR S05	ERROR S05	
ERROR S06	ERROR S06	
ERROR S07	ERROR S07	
ERROR S08	ERROR S08	
ERROR S09	ERROR S09	
ERROR S10	ERROR S10	
ERROR S11	ERROR S11	
ERROR S12	ERROR S12	
ERROR S13	ERROR S13	
ERROR E49	FUSER MALF 2	p.153 "14) Fuser unit failure"
ERROR E50	FUSER MALF	
ERROR FUSER	ERROR FUSER	
ERROR E51	LASER BD MALF	p.153 "15) Laser unit failure" (Laser beam detection error)
ERROR E52	SCANNER MALF	p.153 "15) Laser unit failure" (Scanner motor failure)
ERROR E54	MOTOR MALF	p.154 "16) Main motor failure"
ERROR E55	HIGH VOL MALF	p.154 "17) High-voltage power supply PCB failure"
ERROR E60	ERROR E60	p.155 "18) Fan failure"

Error indication (Printing of Printer Settings)	Error indication (Printing of Maintenance)	Type of error
ERROR H61	PROG ERROR	p.153 "13) Main PCB failure"
ERROR H63	ERROR H63	
ERROR H66	NV-W ERROR	
ERROR H67	NV-R ERROR	
ERROR H68	NV-B ERROR	

Error Cause and Remedy

Note

- The following troubleshooting sections contain both the actions which end users should take or check and the ones which service technicians should perform.

1) Toner low

Replacing of the toner cartridge

User Check

- Gently shake the toner cartridge from side to side and install it again.
- Replace the toner cartridge.

Step	Cause	Remedy
1	Harness connection failure of toner sensor PCB ASSY	Check the sensor performance (☛ p.122 "9) Factory Inspection Mode"). If any problem occurs, check the harness connection of the toner sensor PCB ASSY, then reconnect it.
2	Toner sensor PCB ASSY failure	Replace the toner sensor PCB ASSY.
3	Panel PCB ASSY failure	Replace the panel PCB ASSY.
4	Main PCB ASSY failure	Replace the main PCB ASSY.

2) Drum life end soon

Replacing of drum unit

User Check

- Replace the drum unit with a new one.
- Reset the counter. (p.134 "Resetting the drum counter".)

3) Toner cartridge is at the end of life

User Check

- Gently shake the toner cartridge from side to side and install it again.
- Replace the toner cartridge.

Step	Cause	Remedy
1	Harness connection failure of toner sensor PCB ASSY	Check the sensor performance. (p.122 "9) Factory Inspection Mode") If any problem occurs, check the harness connection of the toner sensor PCB ASSY, then reconnect it.
2	Toner sensor PCB ASSY failure	Replace the toner sensor PCB ASSY.
3	Panel PCB ASSY failure	Replace the panel PCB ASSY.
4	Main PCB ASSY failure	Replace the main PCB ASSY.

4) Cartridge position error

Identification failure for a new toner cartridge.

User Check

- Install the toner cartridges into the machine properly.

Step	Cause	Remedy
1	Power off or front cover opened while detecting a new toner cartridge.	Reset the developing bias voltage and develop roller counter. (p.133 "20) Developer Roller Counter Reset 1 (For the starter toner cartridge)", p.133 "21) Developer Roller Counter Reset 2 (For the standard toner cartridge)")

5) No paper fed tray 1

No paper in Tray (T1)

User Check

- Check if the paper is loaded into the paper tray correctly. Then press the [Go] button.

Step	Cause	Remedy
1	Registration front sensor failure	Check the sensor performance. (p.122 "9) Factory Inspection Mode") If any problem occurs, replace the registration front sensor PCB ASSY.
2	Lift arm and roller holder ASSY not assembled correctly	Be sure to put the boss of the roller holder ASSY into the hole on the lift arm securely.
3	Harness connection failure of registration front sensor PCB ASSY	Check the harness connections of the registration front sensor PCB ASSY, and reconnect it.
4	Harness connection failure of T1 solenoid	Check the harness connections of the T1 solenoid, and reconnect it.
5	Plate-up function malfunction	Replace the paper tray.
6	Toner LED PCB ASSY failure	Replace the toner LED PCB ASSY.
7	Main PCB ASSY failure	Replace the main PCB ASSY.

6) No paper fed manual feed slot

No paper in manual feeding

User Check

- Load the paper

Step	Cause	Remedy
1	Harness connection failure of registration front sensor PCB ASSY	Check the harness connection of the registration front sensor PCB ASSY.
2	Registration front sensor PCB failure	Check the sensor performance. (p.122 "9) Factory Inspection Mode") If any problem occurs, replace the registration front sensor PCB ASSY.
3	Toner LED PCB failure	Replace the toner LED PCB ASSY.
4	Main PCB failure	Replace the main PCB ASSY.

7) Drum error

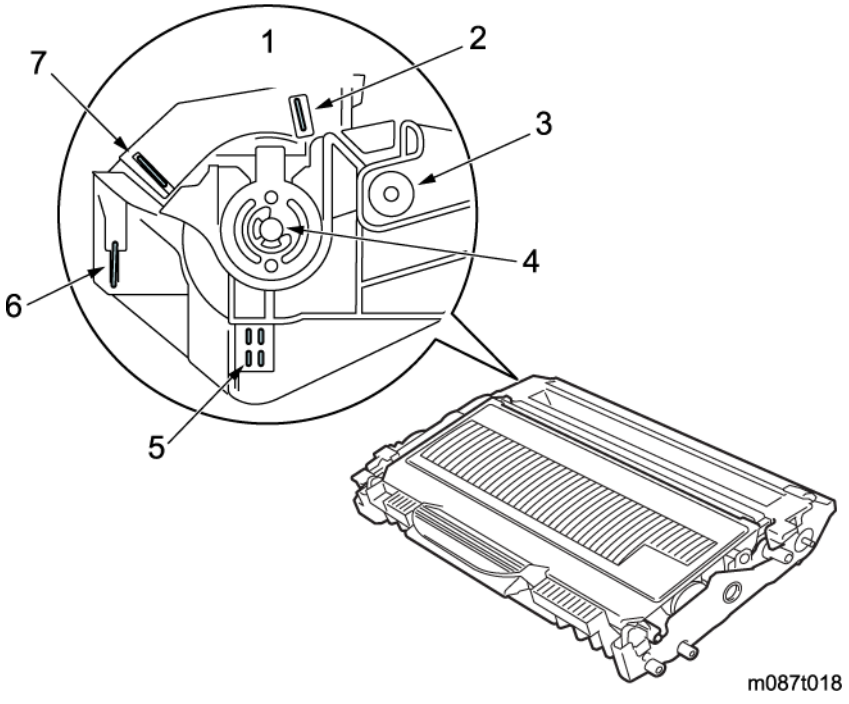
Dirt on drum unit

User Check

- Clean the corona wire in the drum unit.
- Replace the drum unit with a new one, and reset the drum counter.

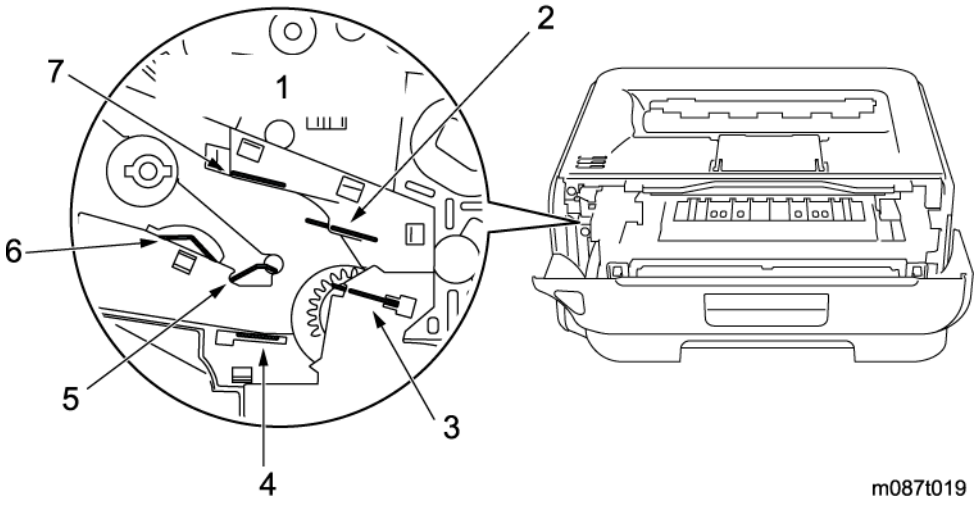
Step	Cause	Remedy
1	Dirt or dust on drum unit electrodes	Clean the electrodes on the drum unit and the machine body (Refer to figure below).
2	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB.
3	Main PCB ASSY failure	Replace the main PCB ASSY failure.

- Electrodes location of the drum unit



1. Side surface of Drum unit
2. Charged electrode
3. Develop roller
4. Exposure drum
5. Transfer roller
6. Cleaner
7. Grid

- Electrodes location of the machine



1. Side surface of Frame L ASSY inside
2. Grid
3. Cleaner
4. Transfer roller
5. Exposure drum
6. Develop roller
7. Charged electrode

<How to clean the electrodes>

Turn off the power switch. Unplug the machine from the AC power outlet, and leave the machine for a few minutes. Then, wipe the electrodes above carefully with a dry lint-free cloth. Be careful not to change the shapes of the electrodes.

8) Front cover is open

Front cover opened

User Check

- Check if the front cover is closed certainly.

Step	Cause	Remedy
1	Cover sensor harness ASSY failure	Check the sensor performance. (p.122 "9) Factory Inspection Mode") If any problem occurs, replace the Cover sensor harness ASSY.

Step	Cause	Remedy
2	Harness connection failure of Cover sensor harness ASSY	Check the harness connection of the Cover sensor harness ASSY and reconnect it.
3	Part pressing the Cover sensor harness ASSY is broken, which is provided at inside of front cover	Replace the front cover ASSY.
4	Toner LED PCB ASSY failure	Replace the toner LED PCB ASSY.
5	Main PCB ASSY failure	Replace the main PCB ASSY.

9) Fuser cover is open

Fuser cover opened

User Check

- Check if the front cover is closed certainly.

Step	Cause	Remedy
1	Paper eject actuator catching on some position	Correct catching of the paper eject actuator.
2	Paper eject actuator failure	Replace the paper eject actuator.
3	Eject sensor PCB ASSY failure	Replace the eject sensor PCB ASSY.
4	Main PCB ASSY failure	Replace the main PCB ASSY.

10) Paper jam

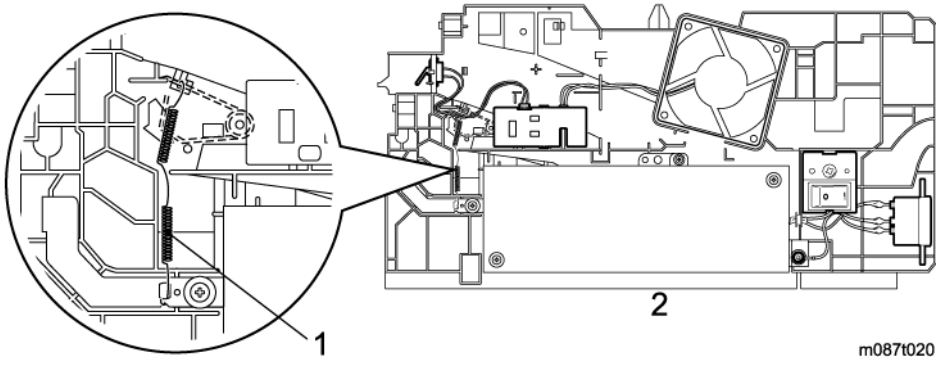
- JAM TRAY 1

  No paper in Tray 1 (T1)

  User Check

  - Check if the paper is jammed in the appropriate tray. If jammed, remove it.
  - Adjust the paper guide corresponding to the paper size.
  - Check if too much paper is loaded in the tray.

Step	Cause	Remedy
1	Edge actuator or registration front actuator catching on some position	Correct catching of the edge actuator or registration front actuator.
2	Paper feeding kit worn out	Replace the paper feeding kit.
3	Harness connection failure of registration front sensor PCB	Check the harness connections of the registration front sensor PCB, and reconnect it.
4	Registration front sensor PCB failure	Check the edge sensor and registration front sensor performance. (☞ p.122 "9) Factory Inspection Mode") If any problem occurs, replace the registration front sensor PCB ASSY.
5	Toner LED PCB failure	Replace the toner LED PCB ASSY.
6	Registration ground spring loose	Fit the registration ground spring correctly. (Refer to figure below.)
7	Main PCB failure	Replace the main PCB ASSY.



1. Registration ground spring
2. <Main frame R ASSY>

- JAM INSIDE/JAM REAR

  Paper jam inside the machine

  User Check

- Check if the paper is jammed. If jammed, remove it.
- Check if the fuser cover is closed certainly.

Step	Cause	Remedy
1	Harness connection failure of registration front sensor PCB ASSY, paper eject sensor PCB ASSY or registration rear sensor PCB ASSY	Check the harness connections of the registration front sensor PCB ASSY, paper eject sensor PCB ASSY or registration rear sensor PCB ASSY, and reconnect them.
2	Registration front actuator, registration rear actuator or paper eject actuator catching on some position	Correct catching of the registration front actuator, registration rear actuator or paper eject actuator.
3a	Paper eject sensor PCB failure	Check the sensor performance. (☛ p.122 "9) Factory Inspection Mode") If any problem occurs, replace the eject sensor PCB ASSY.
3b	Registration front sensor PCB failure	Check the sensor performance. (☛ p.122 "9) Factory Inspection Mode") If any problem occurs, replace the registration front sensor PCB ASSY.
3c	Registration rear sensor PCB failure	Check the sensor performance. (☛ p.122 "9) Factory Inspection Mode") If any problem occurs, replace the registration rear sensor PCB ASSY.
4	Toner LED PCB failure	Replace the toner LED PCB ASSY.
5	Main PCB failure	Replace the main PCB ASSY.

11) Memory full

Memory full

User Check

- Press the [Go] button, then print the stored data.
- Reduce the data capacity or reduce the print resolution.

12) Print overrun

Data expansion is not in time

User Check

- Reduce the complexity of data or reduce the print resolution.

13) Main PCB failure

User Check

- Turn the power off and on.

Step	Cause	Remedy
1	Main PCB failure	Replace the main PCB ASSY.

14) Fuser unit failure

Step	Cause	Remedy
1	Harness connection failure between fuser unit connector and eject sensor PCB ASSY	Check the harness connection between fuser unit connector and eject sensor PCB ASSY.
2	Fuser unit failure	Replace fuser unit.
3	Low-voltage power supply PCB failure	Replace the PS PCB unit.
4	Toner LED PCB failure	Replace the toner LED PCB ASSY.
5	Main PCB failure	Replace the main PCB ASSY.

Important

- **This problem will be cleared if leaving the machine power ON for ten minutes.**
- **Turn the power on while pressing the SW supporter, when the front cover is open. And check that Toner, Drum and Error LEDs light up, and then release the SW supporter.**
- **Check that all LEDs go off and press the SW supporter once, and then this problem may be cleared by that press the SW supporter once again after all LEDs light up.**

15) Laser unit failure

Laser diode failure

Step	Cause	Remedy
1	Laser unit harness connection failure	Check the two harness connections of the laser unit and reconnect them.
2	FG harness ASSY connection failure	Check the FG harness ASSY connection between the laser unit and main PCB ASSY. Then reconnect it.
3	Laser unit failure	Replace the laser unit.
4	Main PCB failure	Replace the main PCB ASSY.

16) Main motor failure

Step	Cause	Remedy
1	Main motor harness connection failure	Check the harness connection of the main motor and reconnect it.
2	Main motor failure	Replace the drive sub ASSY.
3	Low-voltage power supply PCB failure	Replace the PS PCB unit.
4	Main PCB failure	Replace the main PCB ASSY.

17) High-voltage power supply PCB failure

Step	Cause	Remedy
1	High-voltage power supply PCB ASSY harness connection failure	Check the harness connection between the high-voltage power supply PCB and main PCB. Then reconnect it.
2	High-voltage power supply PCB failure	Replace the high-voltage power supply PCB ASSY.
3	Low-voltage power supply PCB failure	Replace the PS PCB unit.
4	Main PCB failure	Replace the main PCB ASSY.

18) Fan failure

Step	Cause	Remedy
1	Fan harness connection failure	Check the harness connection of the fan motor 60 unit, and reconnect it.
2	Fan failure	Replace the fan motor 60 unit.
3	Toner LED PCB failure	Replace the toner LED PCB ASSY.
4	Main PCB failure	Replace the main PCB ASSY.

Paper Feeding Problems

Problems related to paper feeding are end user recoverable if following the User Check items. If the same problem occurs again, follow each procedure in the order of the number described in the Step column in the tables below.

No Feeding

Possible cause and Remedy

1. Edge actuator catching on some position
    - Does the edge actuator move smoothly?

      No: Re-assembly the edge actuator
2. Roller holder ASSY catching on some position
    - Does the roller holder ASSY move smoothly?

      Yes: Re-assembly the roller holder ASSY.
3. Registration front sensor failure
    - Is the problem solved after replacing the registration front sensor PCB ASSY?

      Yes: Replace the registration front sensor PCB ASSY.
4. Paper feeding kit failure
    - Is the surface of the separation pad or the pickup roller dirty or worn out?

      Yes: 1) Clean the surface of the separation pad or pickup roller. 2) Replace the separation pad or pickup roller.
5. Pressure plate gear damage
    - Is the pressure plate gear damaged?

      Yes: Replace the paper tray.
6. T1 solenoid failure
    - Does the T1 solenoid work correctly?

      No: Replace the T1 solenoid
7. T1 solenoid pathway of the high-voltage power supply PCB broken
    - Is the problem solved after replacing the high-voltage power supply PCB ASSY?

      Yes: Replace the high-voltage power supply PCB ASSY.
8. Main PCB failure
    - Is the problem solved after replacing the main PCB ASSY?

      Yes: Replace the main PCB ASSY.

9. Main motor failure
    - Is the problem solved after replacing the drive sub ASSY?

      Yes: Replace the drive sub ASSY.

Double Feeding

Possible cause and Remedy

1. Paper feeding kit failure
    - Is the surface of the separation pad worn out?

      Yes: Replace the paper feeding kit.

Paper Jam

Paper jam in the paper tray and front cover

Possible cause and Remedy

1. Registration front actuator/edge actuator catching on some position
    - Does the registration front actuator/edge actuator move smoothly?

      No: Re-assemble the registration front actuator/edge actuator.
2. Registration front sensor PCB (registration front actuator/edge actuator failure)
    - Does the registration front sensor move smoothly? (p.122 "9) Factory Inspection Mode")

      No: Replace the registration front sensor PCB ASSY.
3. Registration solenoid failure
    - Is the problem solved after replacing the registration solenoid?

      Yes: Replace the registration solenoid.
4. Toner LED PCB failure
    - Is the problem solved after replacing the toner LED PCB ASSY?

      Yes: Replace the toner LED PCB ASSY.
5. High-voltage power supply PCB failure
    - Is the problem solved after replacing the High-voltage power supply PCB ASSY?

      Yes: Replace the High-voltage power supply PCB ASSY.
6. Registration ground spring loose
    - Is the registration ground spring fitted correctly?

      No: Fit the registration ground spring correctly (p.150 "10) Paper jam").

7. Main PCB failure
    - Is the problem solved after replacing the Main PCB ASSY?

      Yes: Replace the Main PCB ASSY.

Paper jam in the back cover and paper eject section

Possible cause and Remedy

1. Foreign object around fuser unit
    - Is there a foreign object around the fuser unit?

      Yes: Remove the foreign object.
2. Paper eject actuator failure
    - Does the paper eject actuator move smoothly? Is it damaged?

      No: Replace the paper eject actuator.
3. Fuser cover ASSY loose
    - Is the fuser cover ASSY fitted correctly?

      No: Fit the fuser cover ASSY correctly.
4. Outer chute ASSY loose
    - Is the outer chute ASSY fitted correctly?

      No: Fit the outer chute ASSY fitted correctly.
5. Eject roller 2 malfunction
    - Is each pinch roller of the inner chute ASSY attached to each eject roller 2 of top cover ASSY properly?

      No: Replace the inner chute ASSY.
6. Paper eject sensor PCB failure
    - Is the problem solved after replacing the paper eject sensor PCB?

      Yes: Replace the paper eject sensor PCB ASSY.

Dirt on Paper

User Check

- Check if the paper is loaded into the paper tray correctly.
- Turn over the stack of paper in the paper tray, or try rotating the paper 180° in the paper tray.

Possible cause and Remedy

1. Fuser unit dirty

- Is there dirt around the entrance of the fuser unit?

  Yes: Clean the entrance of the fuser unit.
- Is the pressure roller ASSY dirty?

  Yes: Clean the pressure roller ASSY.

Wrinkles or Creases

User Check

- Check if the paper is loaded into the paper tray correctly.
- Turn over the stack of paper in the paper tray, or try rotating the paper 180° in the paper tray.

Possible cause and Remedy

1. Fuser unit dirty
   - Is there dirt around the entrance of the fuser unit?

     Yes: Clean the entrance of the fuser unit.
2. Fuser unit failure
   - Is the problem solved if new fuser unit is replaced?

     Yes: Replace the fuser unit.

Waves in the Paper / Folds in the Paper at the Eject Roller 2

User Check

- Check that the problem is solved if new paper is used.

Possible cause and Remedy

1. Foreign object around eject roller 2
   - Is there a foreign object around the eject roller 2?

     Yes: Remove the foreign object.
2. Eject roller 2 failure
   - Is the problem solved after replacing the new eject roller 2?

     Yes: Replace the top cover ASSY.

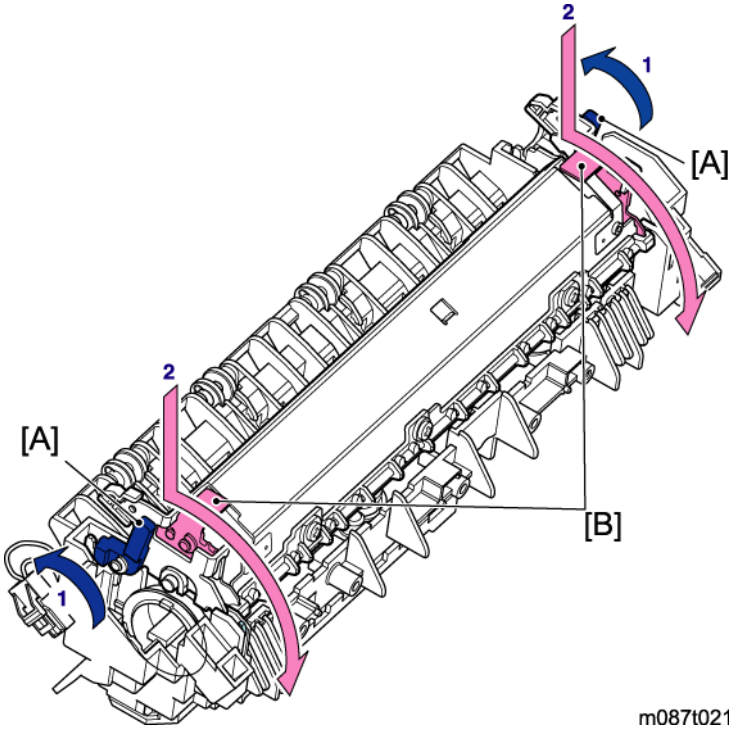
Curl in the Paper

Possible cause and Remedy

1. High pressure of pressure roller in the fuser unit

- Is the problem solved by changing the position of the pressure roller?

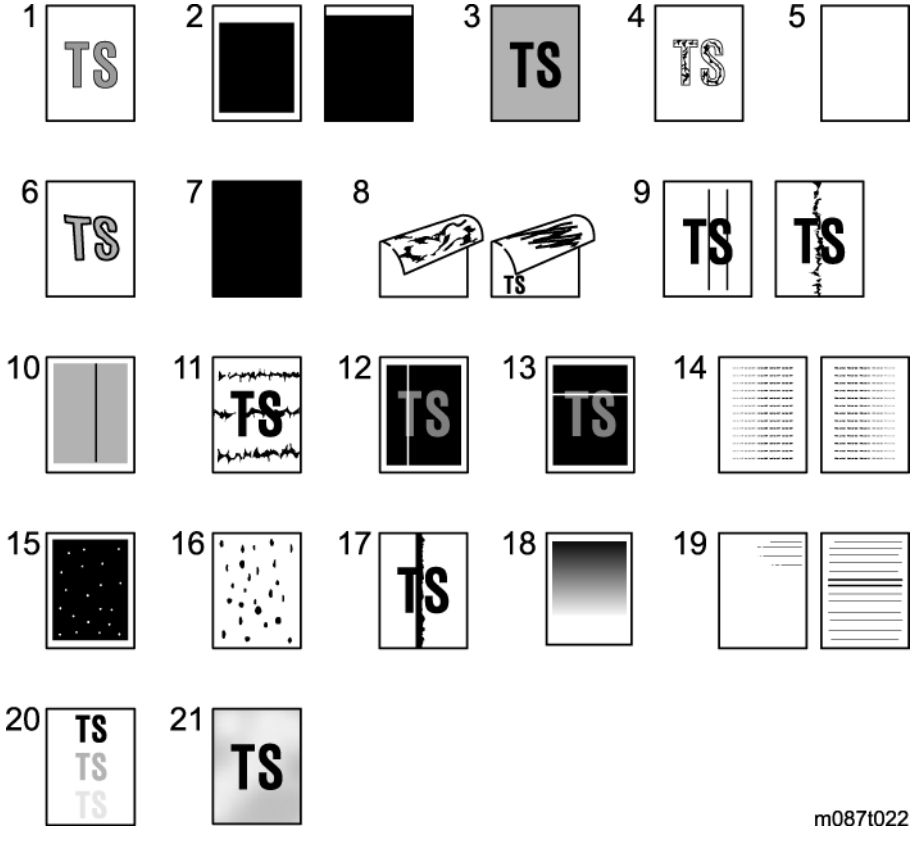
  Yes: Change the position of the pressure roller.



1. Turn the Nip release lever [A] of right and left to the direction of the arrow.
2. Hold and turn the PR stopper plate [B] of right and left.

Image Defect Troubleshooting

Image Defect Examples



1. Light	12. White vertical streaks
2. Faulty registration	13. White horizontal streaks
3. Dark	14. Faint print
4. Poor fixing	15. White spots
5. Completely blank	16. Black spots
6. Image distortion	17. Black band
7. All black	18. Downward fogging of solid color
8. Dirt on the back of paper	19. Horizontal lines

9. Vertical streaks	20. Ghost
10. Black vertical streaks in a light background	21. Fogging
11. Black horizontal stripes	

Diameter of Rollers

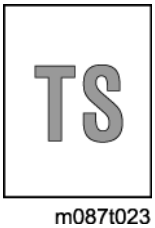
Image defects which appear periodically may be caused by failure of a roller. Specify the cause referring to the diameter of the rollers or pitch which appears in the image as shown in the table below.

No.	Parts name	Diameter	The pitch which appears in the image
1	Develop roller	Ø20.0 mm	40.6 mm
2	Exposure drum	Ø24.0 mm	75.0 mm
3	Heat roller in the fuser unit	Ø25.0 mm	78.5 mm
4	Pressure roller ASSY in the fuser unit	Ø25.0 mm	78.5 mm

Troubleshooting Image Defect

Image defect related problems are end user recoverable if following the User Check items. If the same problem occurs, follow each procedure in the order of the number described below.

1 Light



m087t023

User Check

1. Check the machine's environment. Low temperature and low humidity conditions can cause this problem.
2. If the whole page is light, toner save mode may be on.
3. Replace the toner cartridge or drum unit with a new one.

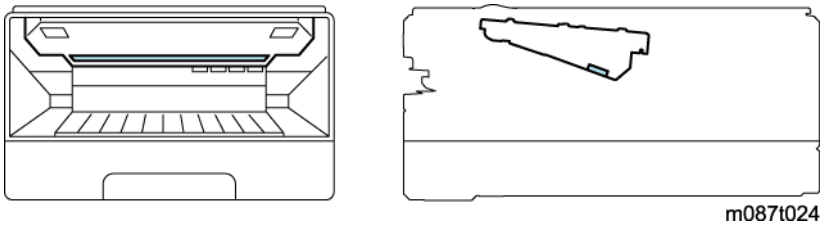
Possible cause and Remedy

1. Dirt on exposure drum electrode
   - Are the electrodes of the drum unit and machine body dirty?

     Yes: Clean both electrodes. (p.147 "7) Drum error")
2. Dirt on scanner windows of the laser unit
   - Is the scanner windows of the laser unit dirty?

     Yes: Wipe the dirt off with a soft, clean, lint free cloth. (Refer to figure below.)

     <Location of the laser beam window>



3. Toner sensor failure
   - After replacing the toner cartridge with a new one, does the same problem occur even after printing several pages?

     No: Replace the toner cartridge.
4. Toner sensor failure
   - Does the machine start printing even after removing the toner cartridge from the drum unit?

     Yes: Clean the toner sensor (receiving light side). Check the harness connection of the toner LED PCB ASSY (luminescence side). Replace the toner sensor PCB ASSY or toner LED PCB ASSY.
5. Between the HVPS PCB/Main PCB connection failure
   - Is the harness of the HVPS PCB ASSY and main PCB ASSY connected correctly?

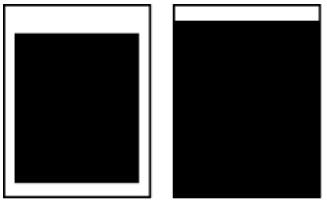
     Yes: Reconnect the harness of the HVPS PCB ASSY and main PCB ASSY.
6. HVPS PCB failure
   - Is the problem solved after replacing the HVPS PCB ASSY?

     Yes: Replace the HVPS PCB ASSY.
7. Main PCB failure
   - Is the problem solved after replacing the main PCB ASSY?

     Yes: Replace the main PCB ASSY.
8. Laser unit failure
   - Is the problem solved after replacing the laser unit?

     Yes: Replace the laser unit.

2 Faulty registration



m087t025

User Check

Check that the appropriate media type is selected in the printer driver.

Possible cause and Remedy

1. Registration rear actuator catching on some position
    - Does the registration rear actuator move smoothly?

      No: Re-assemble the registration rear actuator.

3 Dark

m087t026

User Check

1. Check the machine's environment. High temperature and high humidity conditions can cause this problem.
2. Replace the drum unit with a new one.
3. Replace the toner cartridge with a new one.

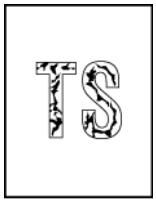
Possible cause and Remedy

1. HVPS PCB failure
    - Is the problem solved after replacing the HVPS PCB ASSY?

      Yes: Replace the HVPS PCB ASSY.
2. Main PCB failure
    - Is the problem solved after replacing the main PCB ASSY?

      Yes: Replace the main PCB ASSY.

4 Poor fixing



m087t027

User Check

1. Replace the drum unit with a new one.
2. Replace the toner cartridge with a new one.

Possible cause and Remedy

1. High pressure of pressure roller in the fuser unit
   - Is the problem solved by changing the position of the pressure roller?

     Yes: Change the position of the pressure roller. (p.159 "Curl in the Paper")
2. Fuser unit failure
   - Is the problem solved after replacing the fuser unit?

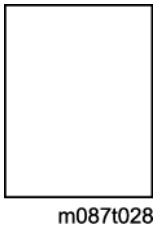
     Yes: Replace the fuser unit.
3. Low-voltage power supply PCB failure
   - Is the problem solved after replacing the PS PCB unit?

     Yes: Replace the PS PCB unit.
4. HVPS PCB failure
   - Is the problem solved after replacing the HVPS PCB ASSY?

     Yes: Replace the HVPS PCB ASSY.
5. Main PCB failure
   - Is the problem solved after replacing the main PCB ASSY?

     Yes: Replace the main PCB ASSY.

5 Completely blank



m087t028

User Check

1. Replace the drum unit with a new one.
2. Replace the toner cartridge with a new one.

Possible cause and Remedy

1. Developing bias voltage conduction failure
   - Are the electrodes on the drum unit and machine body dirty?

     Yes: Clean both electrodes. (p.147 "7) Drum error")
2. Scanner harness of the laser unit connection failure
   - Is the scanner harness of the laser unit connected securely?

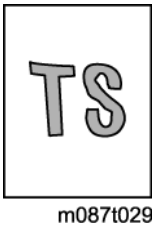
     No: Reconnect the scanner harness of the laser unit.
3. Laser unit failure
   - Is the problem solved after replacing the laser unit?

     Yes: Replace the laser unit.
4. HVPS PCB failure
   - Is the problem solved after replacing the HVPS PCB ASSY?

     Yes: Replace the HVPS PCB ASSY.
5. Main PCB failure
   - Is the problem solved after replacing the main PCB ASSY?

     Yes: Replace the main PCB ASSY.

6 Image distortion



m087t029

Possible cause and Remedy

1. Laser unit not assembled correctly
   - Is the laser unit assembled into the machine securely? (Check if there is no gap.)

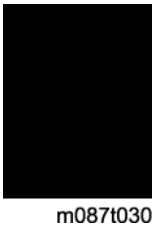
     Yes: Assemble the laser unit correctly and secure the screw.
2. Incorrect radiation angle of scanner diode of laser unit. Scanner motor rotation failure
   - Is the problem solved after replacing the laser unit?

     Yes: Replace the laser unit.

3. Main PCB failure
    - Is the problem solved after replacing the main PCB ASSY?

      Yes: Replace the main PCB ASSY.

7 All black



m087t030

Possible cause and Remedy

1. Corona wire failure
    - Are the electrodes on the drum unit and machine body dirty?

      Yes: Clean both electrodes. (p.147 "7) Drum error")
2. Corona wire failure
    - Is the corona wire damaged?

      Yes: Replace the drum unit.
3. Scanner harness of the laser unit connection failure
    - Is the scanner harness of the laser unit connected securely?

      No: Reconnect the scanner harness of the laser unit.
4. FG harness ASSY connection failure
    - Is the FG harness ASSY between the laser unit and main PCB ASSY connected securely?

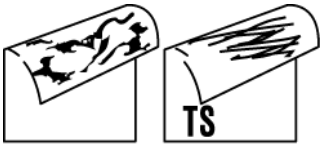
      No: Reconnect the FG harness ASSY between the laser unit and main PCB ASSY securely.
5. HVPS PCB failure
    - Is the problem solved after replacing the HVPS PCB ASSY?

      Yes: Replace the HVPS PCB ASSY.
6. Main PCB failure
    - Is the problem solved after replacing the main PCB ASSY?

      Yes: Replace the main PCB ASSY.
7. Laser unit failure
    - Is the problem solved after replacing the laser unit?

      Yes: Replace the laser unit.

8 Dirt on the back of paper



m087t031

Possible cause and Remedy

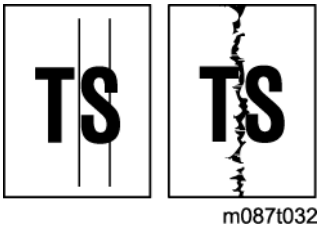
1. Scratch and Dirt on the fuser unit
   - Is the pressure roller ASSY dirty? Is any other area in the machine dirty?

     Yes: Print approximate 10 pages.

     No: Replace the fuser unit.
2. Scratch and Dirt in the paper feed system
   - Is the paper feed system dirty?

     Yes: Wipe dirt off.

9 Vertical streaks



m087t032

User Check

1. This problem may occur with noise which is caused by dirt on the corona wire in the drum unit. In this case, clean the corona wire with the wire cleaner.
2. Replace the drum unit with a new one.
3. Replace the toner cartridge with a new one.

Possible cause and Remedy

1. Scratch and Dirt in the paper feed system
   - Is the paper feed system dirty?

     Yes: Wipe dirt off.
2. Scratch and Dirt on the exposure drum
   - Are there scratch and dirt on the surface of the exposure drum?

     Yes: Replace the drum unit.

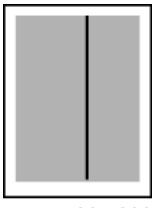
3. Scratch and Dirt on the heat roller
    - Are there scratch and dirt on the surface of the heat roller?

      Yes: Replace the fuser unit.

Important

- **If the machine prints the same pattern, especially including vertical streaks, continuously, black vertical streaks may appear on the paper since the electrostatic performance of the exposure drum is decreased temporally.**

10 Black vertical streaks in a light background



m087t033

User Check

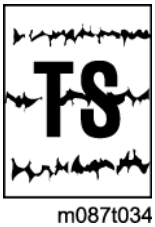
1. Clean the inside of the machine and the corona wire in the drum unit.
2. Replace the toner cartridge with a new one.

Possible cause and Remedy

1. Drum unit failure
    - Is the problem solved after replacing the drum unit?

      Yes: Replace the drum unit.

11 Black horizontal stripes



m087t034

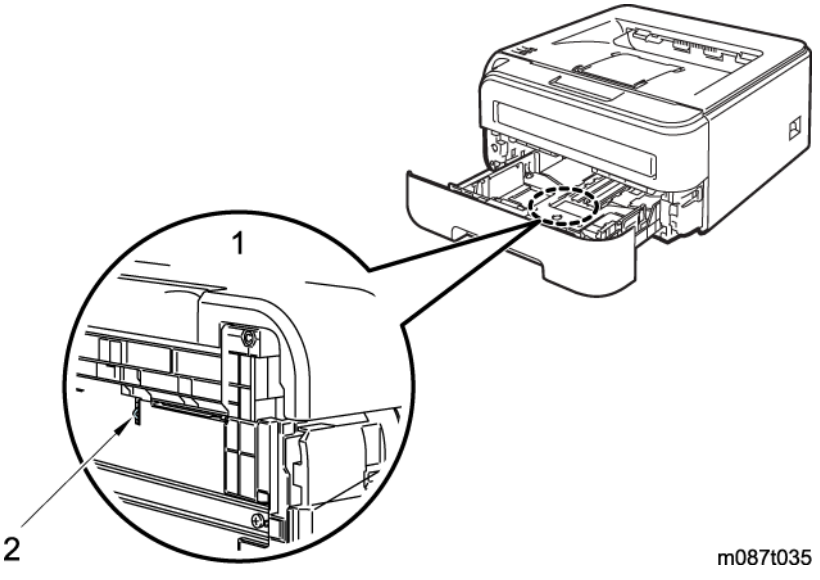
User Check

1. Clean the inside of the machine and the corona wire in the drum unit.
2. Replace the drum unit with a new one.

Possible cause and Remedy

1. Dirt on the charged electrode
    - Are the electrodes on the drum unit and machine body dirty?

      Yes: Clean both electrodes. (p.147 "7) Drum error")
2. Paper tray ground terminal provided in the machine body
    - Is the paper tray ground terminal bent, which is provided in the machine body? (Refer to figure below.)



1. Bottom surface of Paper tray
2. Paper tray ground terminal.

Yes: Correct bending of paper tray ground terminal.

3. Toner attached on the develop roller
    - Are the horizontal stripes at 40.6 mm (develop roller circumference) intervals?

      Yes: This problem will disappear by printing approximate 10 pages. If the same problem occurs, replace the toner cartridge.
4. Scratch and Dirt on the exposure drum
    - Are the horizontal stripes at 75.0 mm (exposure drum circumference) intervals?

      Yes: Replace the drum unit.
5. Scratch and Dirt on the heat roller
    - Are the horizontal stripes at 78.5 mm (heat roller circumference) intervals?

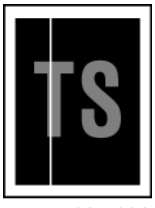
      Yes: Replace the fuser unit.
6. HVPS PCB failure
    - Is the problem solved after replacing the HVPS PCB ASSY?

Yes: Replace the HVPS PCB ASSY.

7. Main PCB failure
   - Is the problem solved after replacing the main PCB ASSY?

     Yes: Replace the main PCB ASSY.

12 White vertical streaks



m087t036

User Check

1. Clean the scanner windows of the laser unit with a soft lint-free cloth. (p.162 "1 Light")
2. Replace the toner cartridge with a new one.
3. Check the machine's environment. High temperature and high humidity conditions can cause this problem.
4. Damp (wet) paper might be used. Try to change to freshly unpacked paper.
5. Check if there is no dust in the gap between the toner cartridge and drum frame.

Possible cause and Remedy

1. Condensation
   - Has condensation occurred inside the machine?

     Yes: Try to print several pages or leave the machine 2 hours to allow it to reach room temperature.
2. Transfer failure
   - Is the transfer roller scratched?

     Yes: Replace the drum unit.
3. Scanner windows of laser unit failure
   - Is the problem solved after replacing the laser unit?

     Yes: Replace the laser unit.

13 White horizontal streaks

m087t037

User Check

1. Check that the appropriate media type is selected in the printer driver.
2. The problem may disappear by itself. Try printing multiple pages to clear this problem especially if the machine has not been used for a long time.
3. The drum unit may be damaged. Replace the drum unit with a new one.

Possible cause and Remedy

1. Toner cartridge electrode contact failure
   - Are the electrodes on the toner cartridge and machine body dirty?

     Yes: Clean both electrodes. (p.147 "7) Drum error")
2. Drum unit electrode contact failure
   - Are the electrodes on the drum unit and machine body dirty?

     Yes: Clean both electrodes. (p.147 "7) Drum error")

14 Faint print

m087t038

User Check

1. Check that the machine is installed on a level surface.
2. Replace the toner cartridge with a new one.
3. Clean the scanner windows of the toner unit with a soft cloth. (p.162 "1 Light")

Possible cause and Remedy

1. Main PCB failure
   - Is the problem solved after replacing the main PCB ASSY?

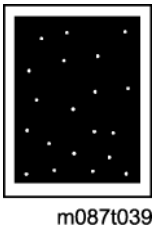
Yes: Replace the main PCB ASSY.

2. Laser unit failure
   - Is the problem solved after replacing the laser unit?

     Yes: Replace the laser unit.
3. Toner empty sensor failure
   - Is the "Toner Life End" message indicated on the LCD after replacing the current toner cartridge with a new one?

     No: Replace the toner sensor PCB ASSY.

15 White spots



m087t039

User Check

1. Toner may be empty. Replace the toner cartridge with a new one.
2. If the problem is not solved after printing a few pages, the drum unit may have glue from label stock on the exposure drum surface. Refer to the procedures below, and wipe it off gently with a cotton swab.
3. The drum unit may be damaged. Replace the drum unit with a new one.

Possible cause and Remedy

1. Toner attached on the develop roller
   - Are the horizontal stripes at 40.6 mm (develop roller circumference) intervals?

     Yes: This problem will disappear by printing approximate 10 pages. If the same problem occurs, replace the toner cartridge.
2. Scratch and Dirt on the exposure drum
   - Are the horizontal stripes at 75.0 mm (exposure drum circumference) intervals?

     Yes: Replace the drum unit.
3. Drum unit connection failure
   - Are the electrodes on the drum unit and machine body dirty?

     Yes: Clean both electrodes. (p.147 "7) Drum error")
4. HVPS PCB failure

- Is the problem solved after replacing the HVPS PCB ASSY?

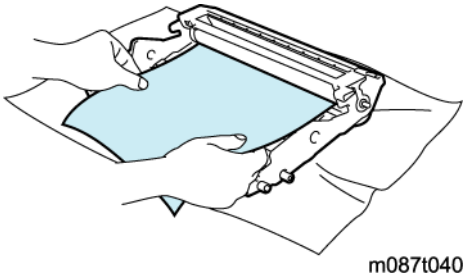
  Yes: Replace the HVPS PCB ASSY.

5. Main PCB failure
   - Is the problem solved after replacing the main PCB ASSY?

     Yes: Replace the main PCB ASSY.

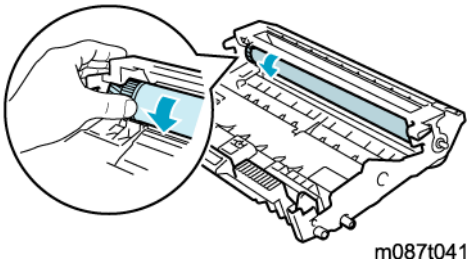
<Clean the drum unit as follows>

If you have print quality problems, clean the drum unit as follows:



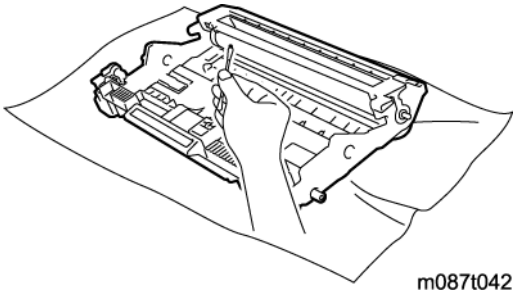
m087t040

1. Put the print sample in front of the drum unit, and find the exact position of the poor print.



m087t041

2. Turn the drum unit gear to the direction of the arrow of the figure by hand while looking at the surface of the exposure drum.



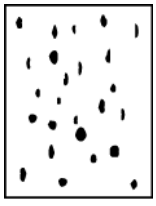
m087t042

3. When you have found the mark on the drum that matches the print sample, wipe the surface of the exposure drum with a dry cotton swab until the dust or glue on the surface comes off.

Important

- **DO NOT clean the surface of the photosensitive drum with a sharp object.**

16 Black spots



m087t043

User Check

1. Damp (wet) paper might be used. Try to change to freshly unpacked paper.
2. Toner may be empty. Replace the toner cartridge with a new one.
3. If the problem is not solved after printing a few pages, the drum unit may have glue from label stock on the exposure drum surface. Wipe it off gently with a cotton swab. (p.173 "15 White spots")
4. The drum unit may be damaged. Replace the drum unit with a new one.

Possible cause and Remedy

1. Toner attached on the develop roller
   - Are the horizontal stripes at 40.6 mm (develop roller circumference) intervals?

     Yes: This problem will disappear by printing approximate 10 pages. If the same problem occurs, replace the toner cartridge.
2. Scratch and Dirt on the exposure drum
   - Are the horizontal stripes at 75.0 mm (exposure drum circumference) intervals?

     Yes: Replace the drum unit.
3. Drum unit connection failure
   - Are the electrodes on the drum unit and machine body dirty?

     Yes: Clean both electrodes. (p.147 "7) Drum error")
4. Scratch and Dirt on the heat roller
   - Are the horizontal stripes at 78.5 mm (heat roller circumference) intervals?

     Yes: Replace the fuser unit.
5. HVPS PCB failure
   - Is the problem solved after replacing the HVPS PCB ASSY?

     Yes: Replace the HVPS PCB ASSY.
6. Main PCB failure
   - Is the problem solved after replacing the main PCB ASSY?

     Yes: Replace the main PCB ASSY.

17 Black band

m087t044

User Check

1. Clean the inside of the machine and the corona wire in the drum unit. If the same problem occurs after cleaning, replace the drum unit with a new one.
2. The paper tray ground terminal provided in the machine body may be dirty. Clean the contact with a dry cloth.

18 Downward fogging of solid color

m087t045

User Check

Toner may be empty. Replace the toner cartridge with a new one.

Possible cause and Remedy

1. HVPS PCB failure
   - Is the problem solved after replacing the HVPS PCB ASSY?

     Yes: Replace the HVPS PCB ASSY.
2. Main PCB failure
   - Is the problem solved after replacing the main PCB ASSY?

     Yes: Replace the main PCB ASSY.

19 Horizontal lines

m087t046

User Check

The paper tray ground terminal provided in the machine body may be dirty. Clean the contact with a dry cloth.

Possible cause and Remedy

1. Dirt on charged electrode
   - Are the electrodes on the drum unit and machine body dirty?

     Yes: Clean both electrodes. (p.147 "7) Drum error")
2. Paper tray ground terminal provided in machine body
   - Is the paper tray ground terminal bent, which is provided in the machine body?

     Yes: Correct bending of paper tray ground terminal.
3. Laser unit failure
   - Is the problem solved after replacing the laser unit?

     Yes: Replace the laser unit.

20 Ghost

m087t047

User Check

1. Check the machine's environment, conditions such as high or low humidity may cause this situation to occur.
2. Check that the appropriate media type or size is selected in the printer driver.
3. Replace the drum unit with a new one.

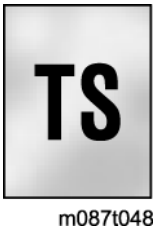
Possible cause and Remedy

1. HVPS PCB failure
   - Is the problem solved after replacing the HVPS PCB ASSY?

     Yes: Replace the HVPS PCB ASSY.
2. Main PCB failure
   - Is the problem solved after replacing the main PCB ASSY?

     Yes: Replace the main PCB ASSY.

21 Fogging



m087t048

User Check

1. Replace the toner cartridge with a new one.
2. Replace the drum unit with a new one.
3. Do not use acid paper.
4. Check if there is dust or paper powder in the machine.

Possible cause and Remedy

1. Toner sensor failure (Machine body)
   - Is the toner sensor performed normally by following the procedure in p.122 "9) Factory Inspection Mode"?

     No: Replace the toner sensor PCB unit ASSY and the toner LED PCB ASSY.
2. HVPS PCB failure
   - Is the problem solved after replacing the HVPS PCB ASSY?

     Yes: Replace the HVPS PCB ASSY.
3. Main PCB failure
   - Is the problem solved after replacing the main PCB ASSY?

     Yes: Replace the main PCB ASSY.

Important

- **This problem often occurs when the drum unit or toner cartridge is nearly at the end of life.**

Software Setting Problems

The machine may not print the data correctly if there are incorrect software settings.

User Check

1. Check that the USB cable and the network cable is not damaged or broken.
2. Check that the correct machine is selected if you have an interface switching device.
3. Check the descriptions on the software setting in the user's guide.
4. Try resetting the factory settings.

Possible cause and Remedy

1. Failure inside the machine
    - Does the machine print "Printer Settings" ? (☛ p.121 "Service Mode")

      No: Identify the error type, and then refer to the specified section of this chapter.
2. Main PCB failure
    - Is the problem solved after replacing the main PCB ASSY?

      Yes: Replace the main PCB ASSY.

Network Problems

User Check

1. Check the descriptions in the network user's guide.
2. Try resetting the factory settings.

Possible cause and Remedy

1. Main PCB failure
    - Is the problem solved after replacing the main PCB ASSY?

      Yes: Replace the main PCB ASSY.

Others Problems

The Machine Is Not Turned On, or the LED Indication Does Not Appear.

Possible cause and Remedy

1. Harness connection failure of panel PCB
   - Is the harness of the panel PCB ASSY connected correctly?

     No: Reconnect the panel PCB ASSY harness.
2. Panel PCB failure
   - Is the problem solved after replacing the panel PCB ASSY?

     Yes: Replace the panel PCB ASSY.
3. LVPS PCB failure
   - Is the problem solved after replacing the PS PCB unit?

     Yes: Replace the PS PCB unit.
4. Main PCB failure
   - Is the problem solved after replacing the main PCB ASSY?

     Yes: Replace the main PCB ASSY.

The fan does not work.

Possible cause and Remedy

1. Harness connection failure of the fan motor 60 ASSY.
   - Is the harness of the fan motor 60 ASSY connected correctly?

     No: Reconnect the harness of the fan motor 60 ASSY correctly.
2. Toner LED PCB ASSY failure
   - Is the problem solved after replacing the toner LED PCB ASSY?

     Yes: Replace the toner LED PCB ASSY.
3. Main PCB failure
   - Is the problem solved after replacing the main PCB ASSY?

     Yes: Replace the main PCB ASSY.

Pickup Function of Paper Tray Does Not Work.

Possible cause and Remedy

1. Link arm does not operate smoothly or keeps catching.

   Check whether the link arm operates correctly.
2. Pickup roller holder ASSY does not operate smoothly or keeps catching.

   Check whether the pickup roller holder ASSY operates correctly.
3. Roller holder ASSY failure

   Replace the roller holder ASSY.
4. Main motor failure

   Replace the main motor.
5. Main PCB failure

   Replace the main PCB ASSY.

A New Toner Cannot Be Detected.

Possible cause and Remedy

1. New toner actuator does not operate smoothly or keeps catching.

   Check whether the new toner actuator operates correctly.
2. New toner actuator is damaged.

   Replace the new toner actuator.
3. Main PCB failure

   Replace the main PCB ASSY.
4. New toner sensor harness ASSY failure

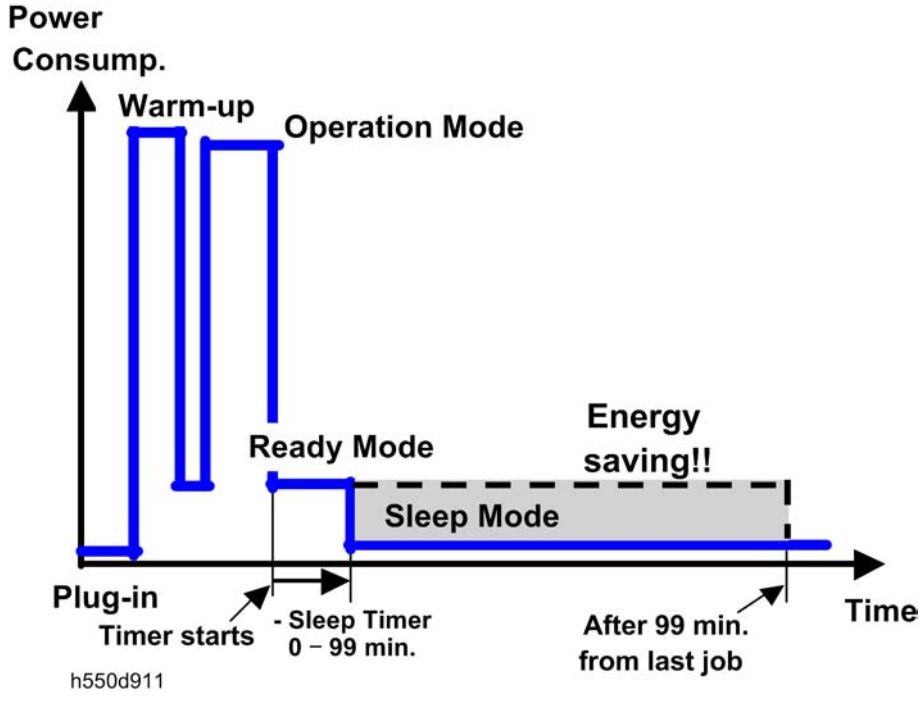
   Replace the new toner sensor harness ASSY.

7. Energy Saving

Energy Save

Sleep Modes

Customers should use the sleep mode properly, to save energy and protect the environment.



The area shaded in this diagram represents the amount of energy that is saved when the timer is at the default settings. If the timers are changed, then the energy saved will be different. For example, if the timers are all set to 99 min., the grey area will disappear, and no energy is saved before 99 min. expires.

Timer Settings

The user can set this timer with User Tools (Menu > Mode Timer > 2. Sleep Mode)

- Sleep timer (0 – 99 min): Default setting: 5 minutes

Return to Stand-by Mode

Sleep Mode

Recovery time.

- Max 18 sec.

Recommendation

We recommend that the default setting should be kept.

- If the customer requests that this setting should be changed, please explain that their energy costs could increase, and that they should consider the effects on the environment of extra energy use.
- If it is necessary to change the setting, please try to make sure that the Sleep timer is not too long. Try with a shorter setting first, such as 30 min., then go to a longer one (such as 60 min.) if the customer is not satisfied.
- If the timer is set to the maximum value, the machine will not begin saving energy until 99 minutes has expired after the last job. This means that after the customer has finished using the machine for the day, energy will be consumed that could otherwise be saved.

Paper Save

Effectiveness of Combine Function

Combine function reduces the amount of paper used. This means that less energy overall is used for paper production, which improves the environment.

1. Combine mode:

Reduce paper volume in half!

d062d100

To check the paper consumption, look at the total counter.

Total counters

This machine has total printed counters only. You can check the total counters on the "Printer Settings" or the "Print Maintenance".

- Total counters: Service Mode > "Printing for Maintenance" or "Printer Settings".

The following table shows paper savings and how the counters increase for some simple examples if combine mode is used.

2 in 1 mode

Originals	Paper Saved	Total counter
1	0	1
2	1	1
3	1	2
4	2	2

Originals	Paper Saved	Total counter
5	2	3
10	5	5
20	10	10

Model BL-P1
Machine Codes: M087/M088

Appendices

20 Jan, 2011

TABLE OF CONTENTS

1. Appendix: Specifications

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Specifications List

Printing

Item	Specification
Print method	Electrophotography by semiconductor laser beam scanning
Laser	Method: 1 polygon motor, 1 laser beam Wavelength: 780nm-800nm Output: 10mW (Max)
Resolution	HQ1200/600dpi/300dpi
Print mode	Normal printing mode Economy printing mode (Toner saving mode)
Print Speed *1	Up to 22 ppm (A4 size)*2, Up to 23 ppm (Letter size)*2
Warm-up time	Less than 18seconds at 23 °C(73.4 °F)
First print time	Less than 10seconds at 23 °C(73.4 °F)

*1 The printing speed may change depending on the type of document you print.

*2 From standard paper tray.

Consumables

Item	Specification
Toner cartridge	Life expectancy: Starter: 1,000pages/ cartridge Standard: 2,600pages/ cartridge When printing A4/ Letter-size paper in accordance with ISO/IEC 19752. Shelf life: 2years (5months after opening)
Drum unit	Life expectancy: 12,000pages/ drum unit (1page/job) Shelf life: 2years (5months after opening)

The shelf life mentioned above is guaranteed under the normal condition as below;

(Temperature)

Normal condition: 0 to 40 °C

* Storage condition at the temperature of 40 to 50 °C: Up to 5days

* Storage condition at the temperature of -20 to 0 °C: Up to 5days

(Humidity)

Normal condition: 35 to 85%

* Storage condition at the humidity of 85 to 95%: Up to 5days

* Storage condition at the humidity of 10 to 35%: Up to 5days

Note

- Print speed varies depending on the paper size or media type. For details, refer to "Print Speeds with Various Settings" in this Chapter.

Functions

<Controller>

Model		M088	M087
CPU		181MHz	
Memory		8MB	16 MB
Interface		Full-Speed USB 2.0	Full-Speed USB 2.0, 10BASE-T/100BASE-TX Ethernet
Emulation		GDI	PCL6
Network Connectivity	Protocols	N/A	TCP/IP (Standard 10/100BASE-TX Ethernet)*1
	Management tool	N/A	BRAdmin Light
Resident fonts	PCL	N/A	49 scalable fonts, 12 bitmap fonts, 11 bar codes*2

*1 See the Network User's Guide locator on the CD-ROM for details on the supported network protocols.

*2 Code39, Interleaved 2 of 5, EAN-8, EAN-13, UPC-A, UPC-E, EAN-128, Codabar, FIM (US-PostNet), ISBN, Code128

<Software>

Model	M088	M087
Printer driver	GDI printer driver for Windows® 2000 / XP / XP Professional x64 Edition, Windows Vista®, Windows Server® 2003/Windows Server® 2003 x64 Edition, Windows® 7	PCL printer driver for Windows® 2000 / XP / XP Professional x64 Edition, Windows Vista®, Windows Server® 2003/Windows Server® 2003 x64 Edition, Windows® 7
Utilities	Interactive Help*1	Interactive Help*1

*1 Instructional animations for problem solving.

1

<System requirements>

Computer Platform & Operating System Version		Processor Minimum Speed	Minimum RAM	Recommended RAM	Available Hard Disk Space
Windows®	2000 Professional	Intel® Pentium® II or equivalent	64MB	256MB	50MB
	XP Home Edition		128MB		
	XP Professional				
	XP Professional x64 Edition	64-bit (Intel® 64 or AMD64) supported CPU	256MB	512MB	
	Vista®	Intel® Pentium® 4 or equivalent 64-bit (Intel® 64 or AMD64) supported CPU	512MB	1GB	
	Server® 2003	Intel® Pentium® III or equivalent	256MB	512MB	
	Server® 2003 x64 Edition	64-bit (Intel® 64 or AMD64) supported CPU			
	7	Intel® Pentium® 4 or equivalent 64-bit (Intel® 64 or AMD64) supported CPU	1GB (32-bit) 2GB (64-bit)	1GB (32-bit) 2GB (64-bit)	

Electronics and Mechanics

Model		M088	M087
Power consumption	Printing	Average 460 W at 25 °C (77 °F)	
	Standby	Average 80 W at 25 °C (77 °F)	
	Sleep	Average 5W at 25 °C (77 °F)	Average 7W at 25 °C (77 °F)
Noise level	Sound Pressure	Printing: 51dB(A) Standby: 30dB(A)	
	Sound power	Printing: LWAd = 6.7Bell(A) Standby: LWAd = 4.5Bell(A)	
Temperature		10 to 32.5 °C (50 to 90.5 °F)	
Humidity		20 to 80% (without condensation)	
Dimensions (W × D × H)		368 × 361 × 170.5mm (14.5 × 14.2 × 6.7inch)	
Weights		Approx. 5.8kg (12.8lb)	

Network Connectivity

<Ethernet wired network>

Item	Specification	
Protocol support	TCP/IP: IPv4	ARP, RARP, BOOTP, DHCP, APIPA (Auto IP), WINS, NetBIOS name resolution, DNS resolver, mDNS, LPR/LPD, Custom Raw Port/Port9100, IPP, FTP Server, POP before SMTP, SMTP-AUTH, TELNET, SNMPv1, HTTP Server, TFTP client and server, SMTP Client, APOP, ICMP, LLTD responder, LLMNR responder, Web Services
	TCP/IP: IPv6	NDP, RA, DNS resolver, mDNS, LPR/LPD, Custom Raw Port/Port9100, IPP, FTP Server, POP before SMTP, SMTP-AUTH, TELNET, SNMPv1, HTTP Server, TFTP client and server, SMTP Client, APOP, ICMPv6, LLTD responder, LLMNR responder, Web Services

Item	Specification
Network type	10/100BASE-TX Ethernet network
Network printing	Windows® 2000 / XP, Windows Vista®, Windows Server® 2003 and Windows® 7 TCP/IP printing

<Management utilities>

	Computer Platform & Operating System Version
BRAdmin Light	Windows® 2000 / XP / XP Professional x64 Edition, Windows Vista®, Windows Server® 2003/2003 x64 Edition, Windows® 7

Paper

Paper handling

Item	Specification
Paper Input: Manual feed slot	1sheet*1
Paper Input: Paper tray	250sheets*1
Paper Output: Face-down	100sheets*1
Paper Output: Face-up	1sheet*1
Duplex: Manual Duplex	Yes

*1 Calculated with 80g/m^2 (20lb) paper

Media specifications

Item	Specification
Media types: Manual feed slot	Plain paper, Bond paper, Recycled paper, Thin paper, Thick paper, Envelopes, Labels, Transparencies
Media types: Paper tray	Plain paper, Recycled paper, Thin paper, Transparencies*1

Item	Specification
Media weights: Manual feed slot	60 to 163g/m^2 (16 to 43lb)
Media weights: Paper tray	60 to 105g/m^2 (16 to 28lb)
Media sizes: Manual feed slot	Width: 76.2 to 220mm (3.0 to 8.66 inch) Length: 116 to 406.4 mm (4.57 to 16 inch)
Media sizes: Paper tray (Standard)	A4, Letter, Legal*2, B5 (ISO), Executive, A5, A6, B6, Folio

*1 Up to 10sheets

*2 Legal size paper is not available in some regions outside the USA and Canada.

Type and size of paper

The printer loads paper from the installed paper tray or the manual feed slot. The names for the paper trays in the printer driver are as follows:

- Paper tray: Tray 1
- Manual feed slot: Manual

<Media type>

	Tray 1	Manual	Choose the media type from the printer driver
Plain paper 75 to 105g/m^2 (20 to 28lb)	Yes	Yes	**Plain paper**
Recycled paper	Yes	Yes	**Recycled paper**
Bond paper Rough paper- 60 to 163g/m^2 (16 to 43lb)	N/A	Yes	**Bond paper**
Thin paper 60 to 75g/m^2 (16 to 20lb)	Yes	Yes	**Thin paper**

	Tray 1	Manual	Choose the media type from the printer driver
Thick paper 105 to 163g/m^2 (28 to 43lb)	N/A	Yes	**Thick Paper** or **Thicker Paper**
Transparency	Yes A4 or Letter	Yes A4 or Letter	**Transparencies**
Labels	N/A	Yes A4 or Letter	**Thicker Paper**
Envelopes	N/A	Yes	**Envelopes** **Env. Thin** **Env. Thick**

Note

- Use paper that is made for plain-paper copying.
- Use papers that is 75 to 90g/m^2 (20 to 24lb).
- Use neutral paper. Do not use acidic or alkaline paper.
- Use long-grain paper.
- Use paper with a moisture content of approximately 5%.
- This printer can use recycled paper that meets DIN 19309 specifications.
- DO NOT use ink jet paper because it may cause a paper jam or damage your machine.

Print Speeds with Various Settings

Print speed is up to 22ppm for A4 size and 23ppm for Letter size when loading A4 or Letter size paper from the paper tray in the plain paper mode.

Actual print speed varies depending on the media type or paper size as shown in the tables below;

<A4/Letter size>

Media type setting	All models
Thin Paper	22/23ppm
Plain Paper	22/23ppm

Media type setting	All models
Recycled Paper	22/23ppm
Thick Paper, Envelopes, Envelopes Thin	10ppm
Thicker Paper, Envelopes Thick	4ppm

<Smaller size than A4 or Letter>

Media type setting	All models
Thin Paper	22/23ppm
Plain Paper	300 sec 22/23ppm → 8ppm
Recycled Paper	300 sec 22/23ppm → 8ppm
Thick Paper, Envelopes, Envelopes Thin	30 sec 22/23ppm → 8ppm
Thicker Paper, Envelopes Thick	4ppm

Note

- The print speed may vary according to conditions, such as paper size and paper tray.
- When a smaller size paper than A4 or Letter is printed, the temperature on both edges of the fuser unit is much higher than the temperature on the center of the unit where the paper is fed depending on the setting or model. Therefore, the print speed is slowed in order to decrease the temperature on the edges after the specified time, it is maximum print speed when you first start printing.
- The actual print speed varies depending on the paper size.

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