Model Rev-P1/MF1
Machine Codes:
SFP: M290/M0AF
MFP: M291/M0AE

Field Service Manual

January, 2016

Important Safety Notices

Warnings, Cautions, Notes

In this manual, the following important symbols and notations are used.

⚠WARNING

- A Warning indicates a potentially hazardous situation. Failure to obey a Warning could result in death or serious injury.

⚠CAUTION

- A Caution indicates a potentially hazardous situation. Failure to obey a Caution could result in minor or moderate injury or damage to the machine or other property.

Important

- **Obey these guidelines to avoid problems such as misfeeds, damage to originals, loss of valuable data, and to prevent damage to the machine.**

Note

- This information provides tips and advice about how to best service the machine.

General Safety Instructions

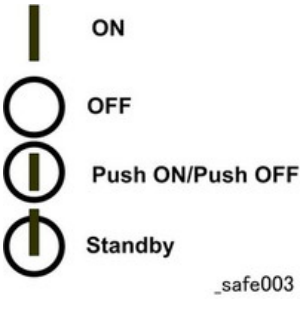
For your safety, please read this manual carefully before you use this product. Keep this manual handy for future reference.

Safety Information

Always obey the following safety precautions when using this product.

Safety During Operation

In this manual, the following important symbols and notations are used.



Switches and Symbols

Where symbols are used on or near switches on machines for Europe and other areas, the meaning of each symbol conforms with IEC60417.

Responsibilities of the Customer Engineer

Customer Engineer

Replacement shall be done only by trained customer engineers who have completed service training for the machine and all optional devices designed for use with the machine.

Reference Material for Maintenance

- Maintenance shall be done using the procedures prescribed for maintenance of the machine described in the reference materials (service manuals, technical bulletins, operating instructions, and safety guidelines for customer engineers).
- Use only consumable supplies and replacement parts designed for use with the machine.

Before Installation, Maintenance

Shipping and Moving the Machine

⚠CAUTION

- Personnel moving or working around the machine should always wear proper clothing and footwear. Never wear loose fitting clothing or accessories (neckties, loose sweaters, bracelets, etc.) or casual footwear (slippers, sandals, etc.) when lifting or moving the machine.
- Always unplug the power cord from the power source before you move the machine. Before you move the product, arrange the power cord so it will not fall under the machine.

Power

⚠WARNING

- Always disconnect the power plug before doing any replacement procedure. After switching off the machine, power is still supplied to the main machine and other devices. To prevent electrical shock, switch the machine off, wait for a few seconds, then unplug the machine from the power source.
- Before you do any checks or adjustments after turning the machine off, work carefully to avoid injury. After removing covers or opening the machine to do checks or adjustments, never touch electrical components or moving parts (gears, timing belts, etc.).

- After turning the machine on with any cover removed, keep your hands away from electrical components and moving parts. Never touch the cover of the fusing unit, gears, timing belts, etc.

Installation, Replacement, and Adjustments

⚠CAUTION

- After installation, replacement, or adjustment, always check the operation of the machine to make sure that it is operating normally. This ensures that all shipping materials, protective materials, wires and tags, metal brackets, etc., removed for installation, have been removed and that no tools remain inside the machine. This also ensures that all release interlock switches have been restored to normal operation.
- Never use your fingers to check moving parts causing spurious noise. Never use your fingers to lubricate moving parts while the machine is operating.

Special Tools

⚠CAUTION

- Use only standard tools approved for machine maintenance.
- For special adjustments, use only the special tools and lubricants described in the service manual. Using tools incorrectly, or using tools that could damage parts, could damage the machine or cause injuries.

During Maintenance

General

⚠CAUTION

- Before you begin a maintenance procedure: 1) Switch the machine off, 2) Disconnect the power plug from the power source, 3) Allow the machine to cool for at least 10 minutes.
- Avoid touching the components inside the machine that are labeled as hot surfaces.

Safety Devices

⚠WARNING

- Never remove any safety device unless it requires replacement. Always replace safety devices immediately.
- Never do any procedure that defeats the function of any safety device. Modification or removal of a safety device (fuse, switch, etc.) could lead to a fire and personal injury. Always test the

operation of the machine to ensure that it is operating normally and safely after removal and replacement of any safety device.

- For replacements use only the correct fuses or circuit breakers rated for use with the machine. Using replacement devices not designed for use with the machine could lead to a fire and personal injuries.

Organic Cleaners

⚠CAUTION

- During preventive maintenance, never use any organic cleaners (alcohol, etc.) other than those described in the service manual.
- Make sure the room is well ventilated before using any organic cleaner. Use organic solvents in small amounts to avoid breathing the fumes and becoming nauseous.
- Switch the machine off, unplug it, and allow it to cool before doing preventive maintenance. To avoid fire or explosion, never use an organic cleaner near any part that generates heat.
- Wash your hands thoroughly after cleaning parts with an organic cleaner to prevent contamination of food, drinks, etc. which could cause illness.
- Clean the floor completely after accidental spillage to prevent slippery surfaces that could cause accidents leading to hand or leg injuries. Use dry rags to soak up spills.

Power Plug and Power Cord

⚠WARNING

- Before servicing the machine (especially when responding to a service call), always make sure that the power plug has been inserted completely into the power source. A partially inserted plug could lead to heat generation (due to a power surge caused by high resistance) and cause a fire or other problems.
- Always check the power plug and make sure that it is free of dust and lint. Clean it if necessary. A dirty plug can generate heat which could cause a fire.
- Inspect the length of the power cord for cuts or other damage. Replace the power cord if necessary. A frayed or otherwise damaged power cord can cause a short circuit which could lead to a fire or personal injury from electrical shock.
- Check the length of the power cord between the machine and power supply. Make sure the power cord is not coiled or wrapped around any object such as a table leg. Coiling the power cord can cause excessive heat to build up and could cause a fire.
- Make sure that the area around the power source is free of obstacles so the power cord can be removed quickly in case of an emergency.
- Make sure that the power cord is grounded (earthed) at the power source with the ground wire on the plug.

- Connect the power cord directly into the power source. Never use an extension cord.
- When you disconnect the power plug from the power source, always pull on the plug, not the cable.

After Maintenance

Disposal of Used Items

⚠WARNING

- Never incinerate used toner, toner cartridges, or AIO units.
- Toner thrown into a fire can ignite or explode and cause serious injury. At the work site always carefully wrap used toner and toner cartridges with plastic bags to avoid spillage before disposal or removal.

⚠CAUTION

- Always dispose of used items (developer, toner, toner cartridges, OPC drums, AIO units, etc.) in accordance with the local laws and regulations regarding the disposal of such items.
- To protect the environment, never dispose of this product or any kind of waste from consumables at a household waste collection point. Dispose of these items at one of our dealers or at an authorized collection site.
- Return used drums to the service center for handling in accordance with company policy regarding the recycling or disposal of such items.

Points to Confirm with Operators

At the end of installation or a service call, instruct the user about use of the machine. Emphasize the following points.

- Show operators how to remove jammed paper and troubleshoot other minor problems by following the procedures described in the operating instructions.
- Point out the parts inside the machine that they should never touch or attempt to remove.
- Confirm that operators know how to store and dispose of consumables.
- Make sure that all operators have access to an operating instruction manual for the machine.
- Confirm that operators have read and understand all the safety instructions described in the operating instructions.
- Demonstrate how to turn off the power and disconnect the power plug (by pulling the plug, not the cord) if any of the following events occur: 1) something has spilled into the product, 2) service or repair of the product is necessary, 3) the product cover has been damaged.

- Caution operators about removing paper fasteners around the machine. They should never allow paper clips, staples, or any other small metallic objects to fall into the machine.

Special Safety Instructions for Toner

Accidental Physical Exposure

⚠CAUTION

- Work carefully when removing paper jams or replacing toner bottles or cartridges to avoid spilling toner on clothing or the hands.
- If toner is inhaled, immediately gargle with large amounts of cold water and move to a well ventilated location. If there are signs of irritation or other problems, seek medical attention.
- If toner gets on the skin, wash immediately with soap and cold running water.
- If toner gets into the eyes, flush the eyes with cold running water or eye wash. If there are signs of irritation or other problems, seek medical attention.
- If toner is swallowed, drink a large amount of cold water to dilute the ingested toner. If there are signs of any problem, seek medical attention.
- If toner spills on clothing, wash the affected area immediately with soap and cold water. Never use hot water! Hot water can cause toner to set and permanently stain fabric.

Handling and Storing Toner

⚠WARNING

- Toner, used toner, and developer are extremely flammable.
- Never store toner, developer, toner cartridges, or toner bottles (including empty toner bottles or cartridges), or AIO units in a location where they will be exposed to high temperature or an open flame.

⚠WARNING

- Do not use a vacuum cleaner to remove spilled toner (including used toner). Vacuumed toner may cause a fire or explosion due to sparks or electrical contact inside the cleaner. However, it is possible to use a cleaner designed to be dust explosion-proof. If toner is spilled over the floor, sweep up spilled toner slowly and clean up any remaining toner with a wet cloth.

⚠CAUTION

- Always store toner and developer supplies such as toner and developer packages, cartridges, bottles (including used toner and empty bottles and cartridges) and AIO units out of the reach of children.

- Always store fresh toner supplies or empty bottles or cartridges in a cool, dry location that is not exposed to direct sunlight.

Toner Disposal

⚠WARNING

- Never attempt to incinerate toner, used toner, or empty toner containers (bottles or cartridges). Burning toner can explode and scatter, causing serious burns.
- Always wrap used toner and empty toner bottles and cartridges in plastic bags to avoid spillage. Follow the local laws and regulations regarding the disposal of such items.
- Dispose of used toner and toner cartridges at one of our dealers or at an authorized collection site. Always dispose of used toner cartridges and toner bottles in accordance with the local laws and regulations regarding the disposal of such items.

Safety Instructions for the Machine

Prevention of Physical Injury

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

Health Safety Conditions

1. If the machine has ozone filters, never operate the machine without the ozone filters installed. Always replace the ozone filters with the specified types at the proper intervals.

2. To avoid possible accumulation of ozone in the work area, locate the machine in a large well ventilated room that has an air turnover rate of more than $30m^3/hr/person$.
3. Toner and developer are non-toxic, but if you get either of them in your eyes by accident, it may cause temporary eye discomfort. Try to remove with eye drops or flush with water as first aid. If unsuccessful, get medical attention.

Observance of Electrical Safety Standards

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

Safety and Ecological Notes for Disposal

1. Never incinerate toner bottles or used toner. Toner dust may ignite suddenly when exposed to an open flame.
2. Dispose of used toner, developer, and organic photoconductors in accordance with local regulations. (These are non-toxic supplies.)
3. Dispose of replaced parts in accordance with local regulations.
4. When keeping used lithium batteries in order to dispose of them later, do not put more than 100 batteries per sealed box. Storing larger numbers or not sealing them apart may lead to chemical reactions and heat build-up.

⚠CAUTION

- The danger of explosion exists if a battery of this type is incorrectly replaced.
- Replace only with the same or an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions.

Laser Safety

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

_safe005

⚠WARNING

- Use of controls, or adjustment, or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.
- Turn off the main switch before attempting any of the procedures in the Laser Unit section. Laser beams can seriously damage your eyes.

RoHS Compliance

These machines are fully compliant with Chinese RoHS and contain no restricted materials such as lead, mercury, cadmium, hexavalent chrome, polybrominated biphenyl, or polybrominated diphenyl ether.

Symbols, Abbreviations and Trademarks

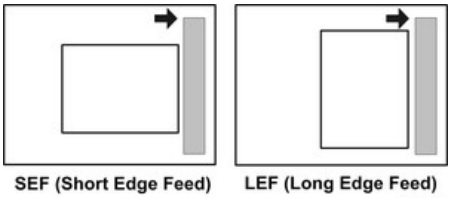
Symbols and Abbreviations

Commonly Used Icons for Replacements and Adjustments

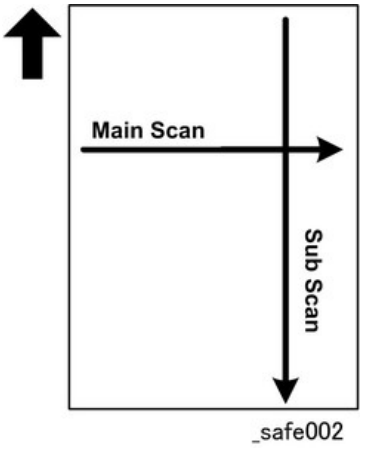
This manual uses several symbols and abbreviations. The meaning of those symbols and abbreviations are as follows:

	Clip ring
	Screw
	Connector
	Clamp
	E-ring
	C-ring
	Spring
	Timing Belt
	FFC

Paper Feed: SEF/LEF



The notations "SEF" and "LEF" describe the direction of paper feed. The arrows indicate the direction of paper feed.



In this manual "Main Scan" means "Horizontal" and "Sub Scan" means "Vertical", both relative to the direction of paper feed.

Key Presses

Symbol	What It Means
[Key]	The names of machine keys and PC keyboard keys are enclosed in square brackets.
>	A right angle bracket means to select a menu item in that order. Example: [CE Tools] > [Adjust Other Settings] > [1] for Destination Code This means that the operator select the CE Tools, followed by [Adjust Other Settings], and then select [1] for Destination Code.

Trademarks

- Microsoft, and Windows are registered trademarks of Microsoft Corporation in the United States and /or other countries.
- PostScript is a registered trademark of Adobe Systems, Incorporated.
- PCL is a registered trademark of Hewlett-Packard Company.
- Ethernet is a registered trademark of Xerox Corporation.
- Wi-Fi is a registered trademark of Wi-Fi Alliance.
- Other product names used herein are for identification purposes only and may be trademarks of their respective companies. We disclaim any and all rights involved with those marks.

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4. System Maintenance

5. Troubleshooting

6. Energy Saving

1. Product Information

Specifications

Specifications of the Machine

For details about machine specifications, see the user guide.

Software Specifications

For details about system requirements for drivers, see the user guide.

For details about system requirements for the Virtual Operation Panel, see the manual for the Virtual Operation Panel.

New Product Information

1

Series Comparison

Machine Names and Host Interface

Abbrev.	Model No.	Product Name	Host Interface
SFP	M290-27/29	SP 150	USB2.0
	M0AF-17/27/29	SP 150w	USB2.0 Wi-Fi 802.11b/g/n
MFP	M291-27/29	SP 150SU	USB2.0
	M0AE-17/27/29	SP 150SUw	USB2.0 Wi-Fi 802.11b/g/n

Comparison of SFP and MFP Models

Abbrev.	PPM	Print	Scan	Copy	ADF	Operation Panel
SFP	22	YES	NO	NO	NO	*1
MFP	22	YES	YES	YES	NO	*2

1 The SFP has two LEDs to indicate status and errors.

2 The MFP has a [Start] button, and two LEDs to indicate status and errors.

Feature Summary

Feature	SFP	MFP
Weight	For details, see the user guide.	
Tray capacity		
GDI driver	Available	Available
TWAIN driver	Not Available	Available
WIA driver	Not Available	Available

Feature	SFP	MFP
Virtual Operation Panel	Available	Available
Firmware update tool	Available (English and Simplified Chinese)	
CE Tools	Available	Available

Toner End Detection

- Toner Near End

  A Toner Near End message is displayed on the Virtual Operation Panel. Printing can be continued.

- Toner End

  A Toner End message is displayed on the Virtual Operation Panel. Printing cannot be continued until toner is replaced.

  If Toner End is detected during printing, printing will continue until the end of that job.

- Waste Toner Full

  A Waste Toner Full message is displayed on the Virtual Operation Panel. Printing cannot be continued until the waste toner box is replaced.

  If Waste Toner Full is detected during printing, printing will continue until the end of that job.

Important Points to Remember

- Virtual Operation Panel

  Use the Virtual Operation Panel to configure settings, view the status, copy (MFP only), and scan (MFP only). For details, see the manual for the Virtual Operation Panel.

- CE Tools

  Use CE Tools for maintenance settings. For details about CE Tools, see page 55 "Using CE Tools".

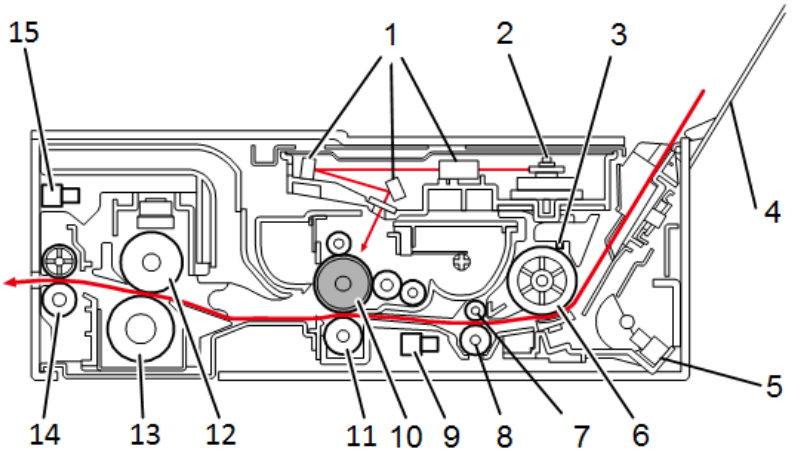
- AIO (All In One) Cartridge
- The AIO is replaced by the user. For more details, refer to the user guide.

General Configuration

For details about the machine configuration, see the user guide.

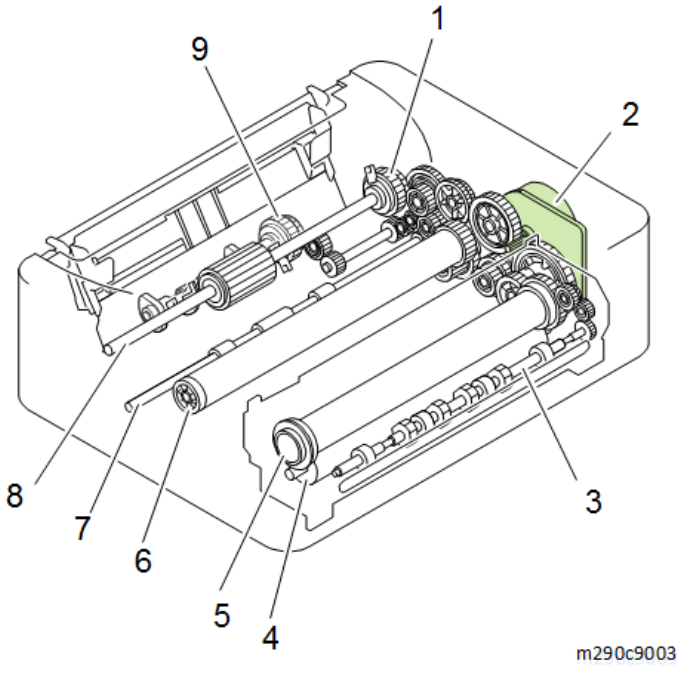
Product Overview

Paper Path and Image Writing



No	Name	No	Name
1	Lenses, Mirrors	9	Registration Sensor
2	Polygon Mirror	10	Drum
3	Paper Size Sensor	11	Image Transfer Roller
4	Paper Tray	12	Hot Roller
5	Bottom Plate Position Sensor	13	Pressure Roller
6	Paper Feed Roller	14	Paper Exit Roller
7	Registration Roller	15	Exit Sensor
8	Paper Transport Roller		

Drive Layout



No	Name	No	Name
1	Paper Feed Clutch	6	Drum (inside the AIO)
2	Main Motor	7	Paper Transport Roller
3	Paper Exit Roller	8	Paper Feed Roller
4	Pressure Roller	9	Bottom Plate Lift Clutch
5	Hot Roller		

2. Installation and Preventive Maintenance

Installation and Preventive Maintenance

This product can be installed and maintained by the user.

Installation

For details about the installation requirements and installation procedures, see the user guide.

Preventive Maintenance

For details about how to maintain the machine, see the user guide.

3. Replacement and Adjustment

Before You Begin

Before You Begin

⚠CAUTION

- Before you begin a maintenance procedure: 1) Switch the machine off, 2) Disconnect the power plug from the power source, 3) Allow the machine to cool for at least 10 minutes.
- Avoid touching the components inside the machine that are labeled as hot surfaces.

Special Tools

There are no special tools required for disassembling the machine. However, you must have these items:

- Standard length hex screwdriver
- Stubby hex screwdriver
- Thin radio pliers

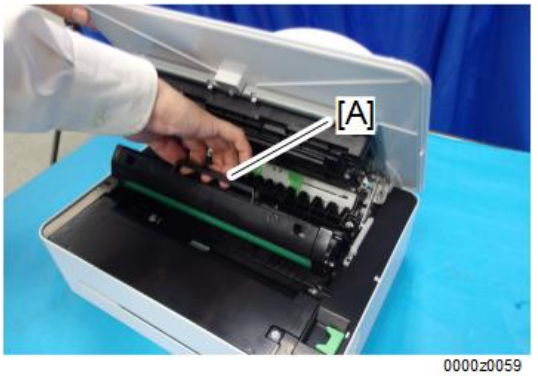
Printing the Configuration Page

To print the Configuration Page, press the Power button 3 times rapidly (within 1 second).

Exterior Covers

AIO

1. Open the top cover.
2. Remove the AIO [A].



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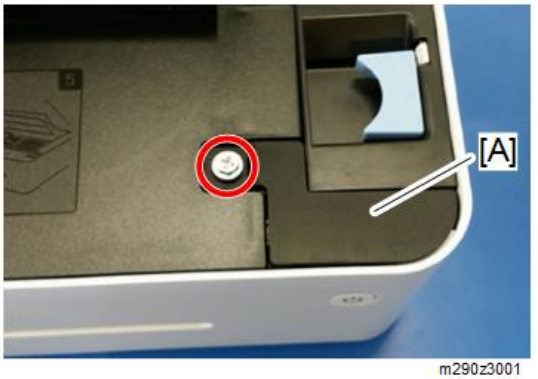
Bottom Cover

1. Open the top cover.
2. Remove the small cover [A]. (x1)



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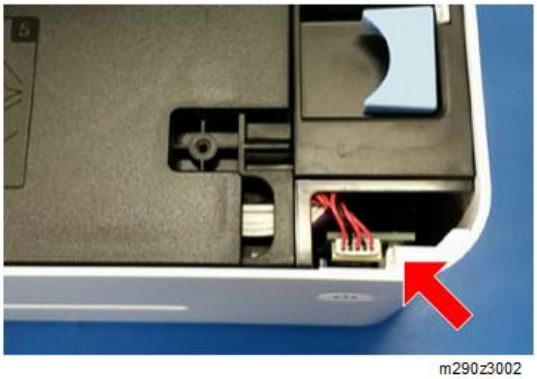
3. **Disconnect the connector. (x1)**



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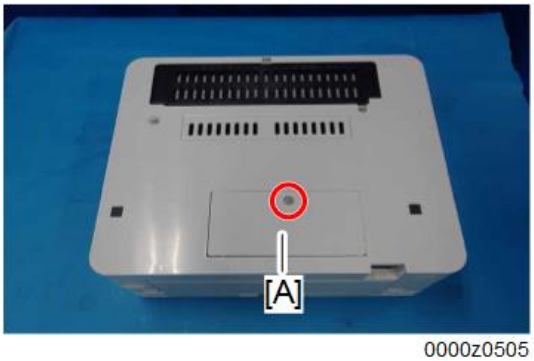
4. **Turn the machine upside down.**
5. **Remove the small cover [A]. (x1)**



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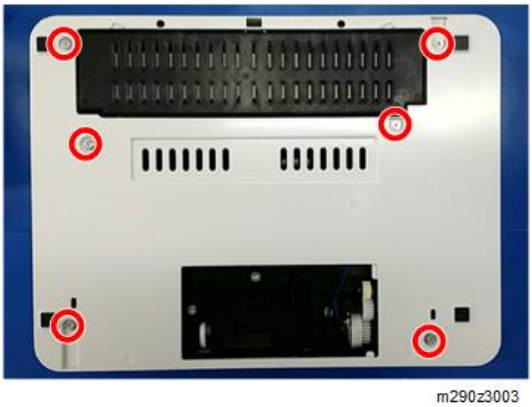
6. **Remove the screws on the bottom cover. (x6)**



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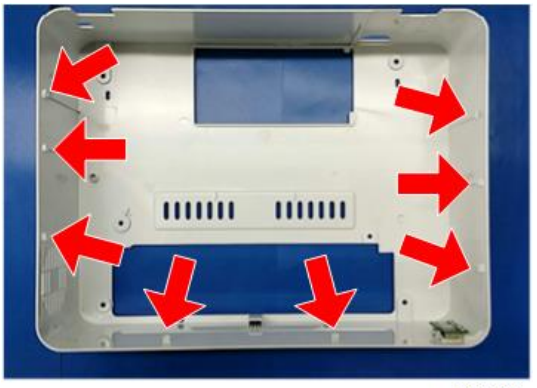
7. **Remove the bottom cover.**

   The bottom cover has hooks on the inside. Gently loosen the cover from the hooks by using the tip of a small screwdriver.



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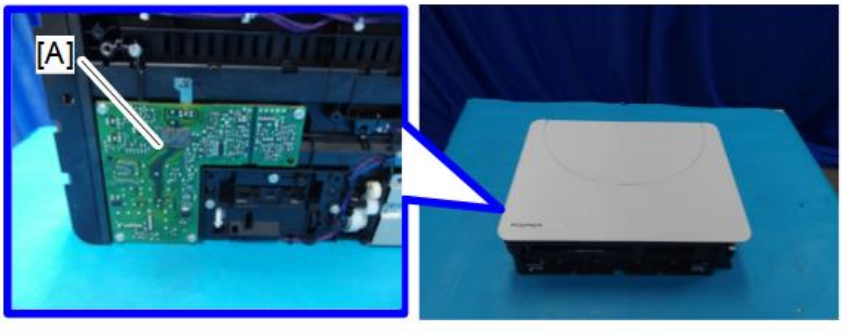
Note

- After removing the bottom cover, place a mat underneath the machine to prevent damage to the HVP and PCB [A] when placing the machine with its bottom side down.



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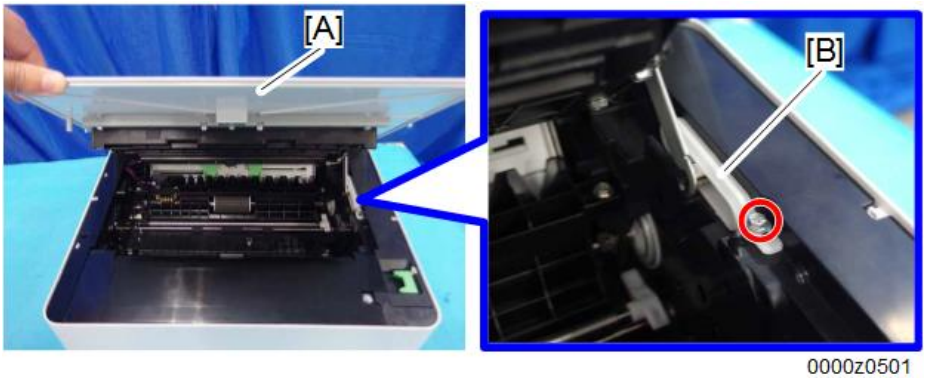
Top Cover

SFP

1. **Open the top cover [A].**

2. Remove the guide rail [B]. (x1)



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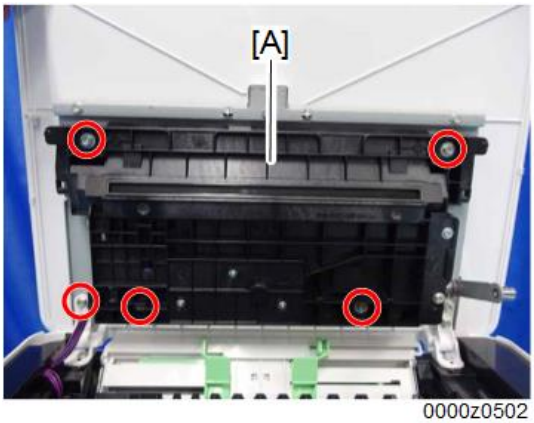
3. Disconnect the laser unit [A] from the top cover. (x5)



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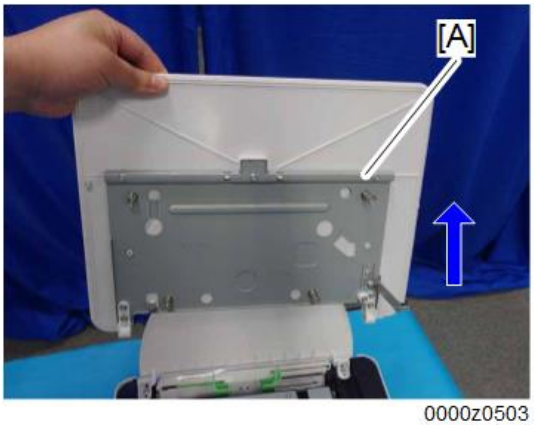
4. Remove the top cover [A].



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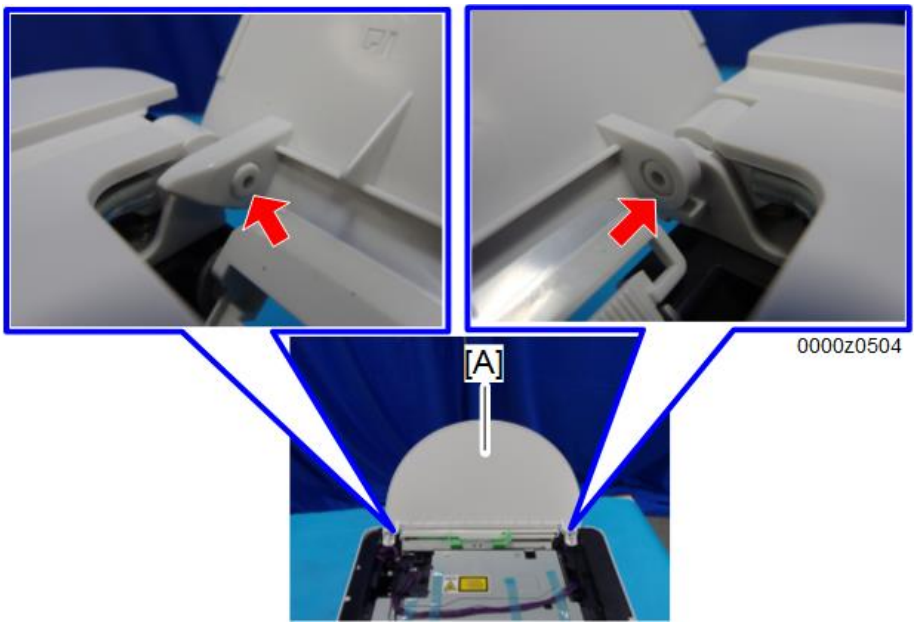
5. **Remove the paper feed guide [A].**



MFP

The MFP does not have a top cover.

For details on how to remove the scanner unit, see page 48 "Scanner Unit".

Laser Unit

Laser Unit

For details on how to remove the laser unit, refer to page 26 "Bottom Cover", page 28 "Top Cover", and page 43 "Electrical Components".

After Replacing the Laser Unit

After replacing the laser unit, check the position of the image area on the page, and adjust the registration value if necessary.

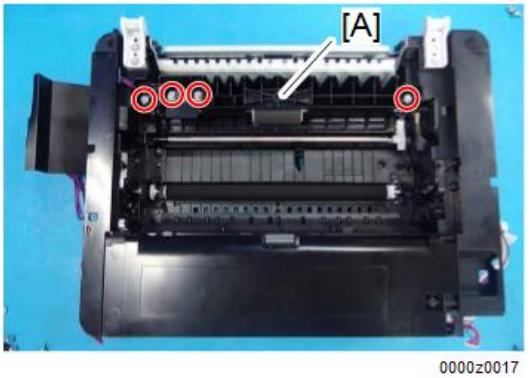
The registration value can be adjusted using either one of the following:

- Virtual Operation Panel
- CE Tools

Paper Feed

Paper Feed Roller

1. Remove the bottom cover. (page 26)
2. Remove the main motor. (page 38)
3. Remove the feed guide [A]. (x 4)



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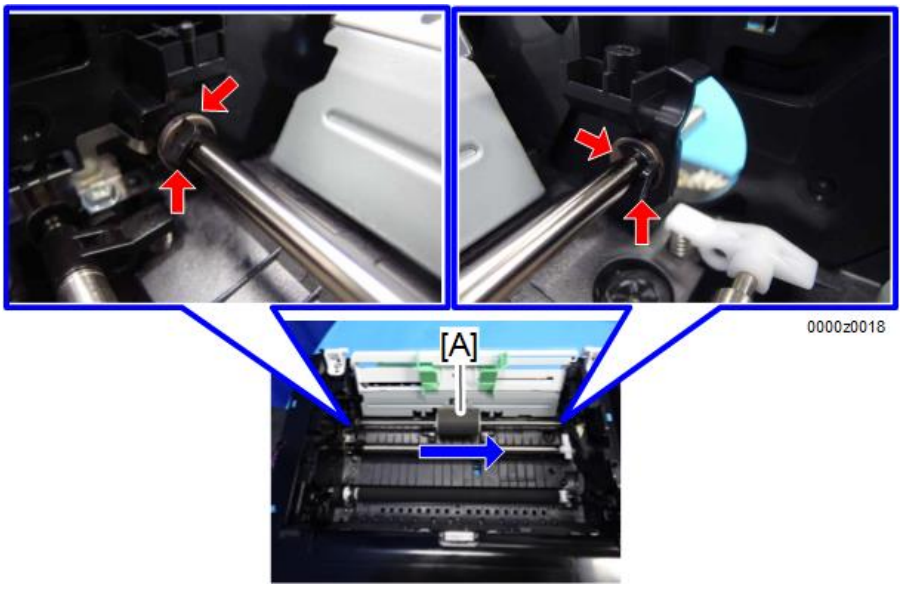
4. Slide the paper feed roller [A] to the right and remove it. (x 2, bushing x 2)



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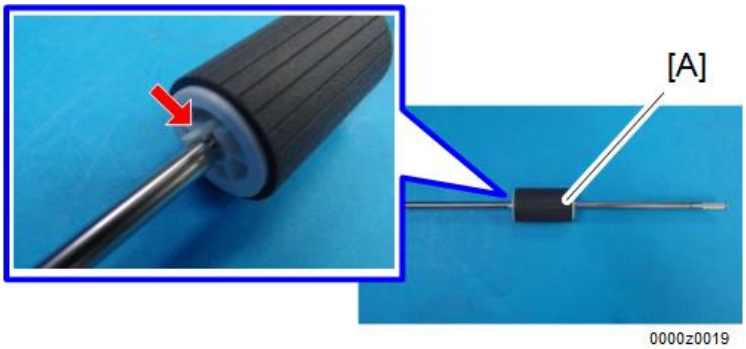
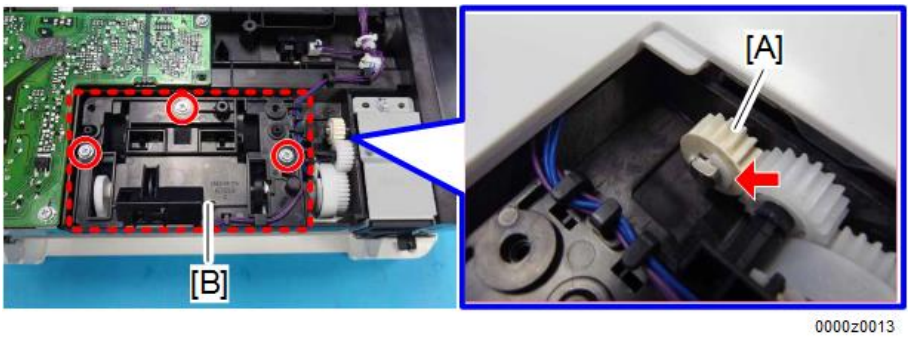
5. Release the hook and remove the paper feed roller [A] from the shaft.

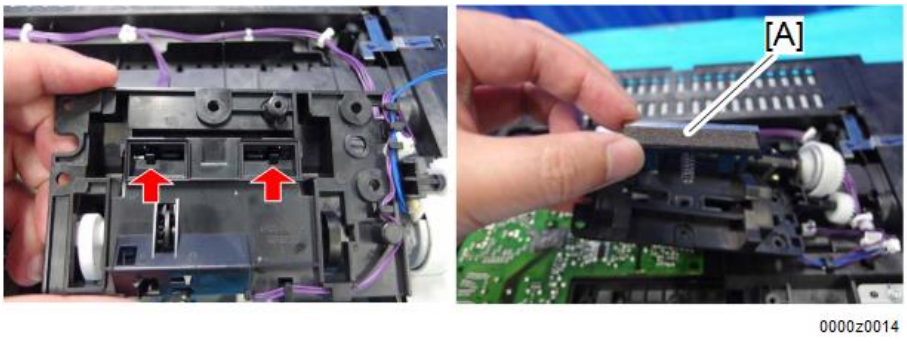


Friction Pad

1. Remove the bottom cover. (page 26)
2. Remove the gear [A]. (x 1)
3. Remove the friction pad unit [B]. (x3)



4. Release the 2 hooks.
5. Remove the friction pad [A].



Registration Roller

1. Remove the AIO. (page 26)
2. Push down the rear end of the bushing [A] on the right end of the registration roller [B] to unlock the roller.
3. Remove the registration roller [B].

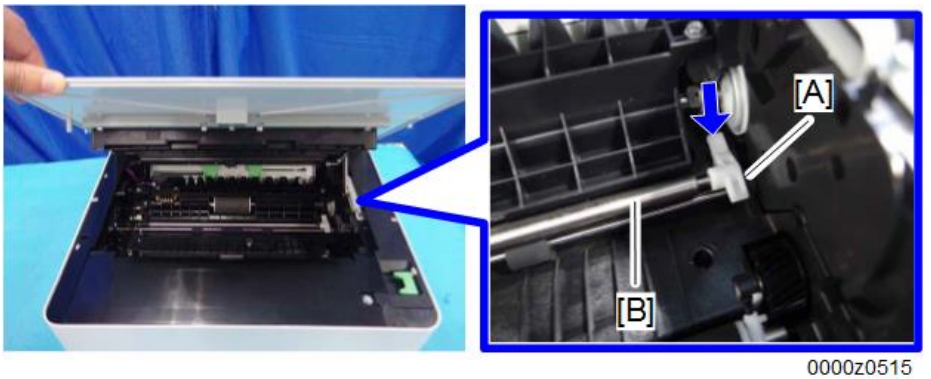
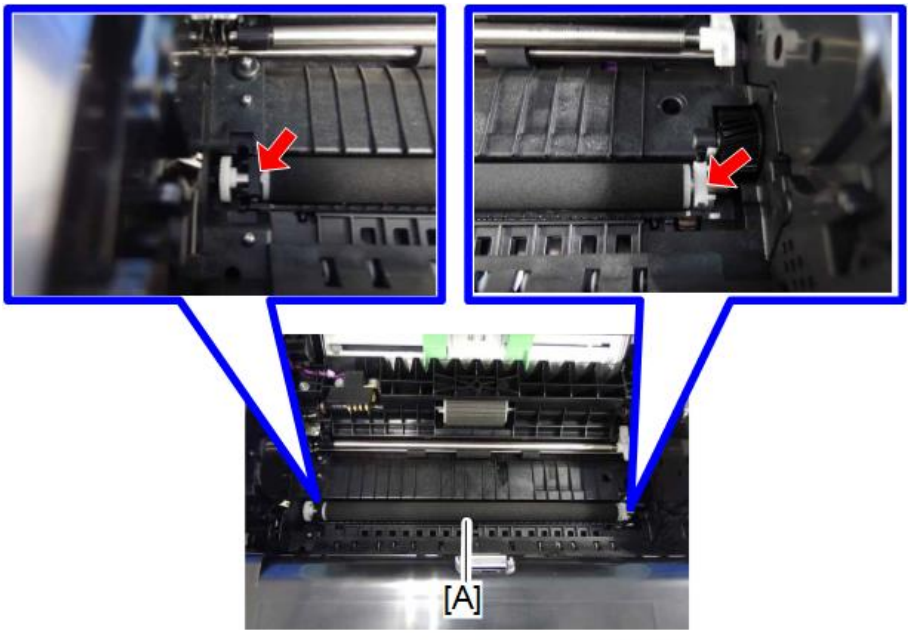


Image Transfer Roller

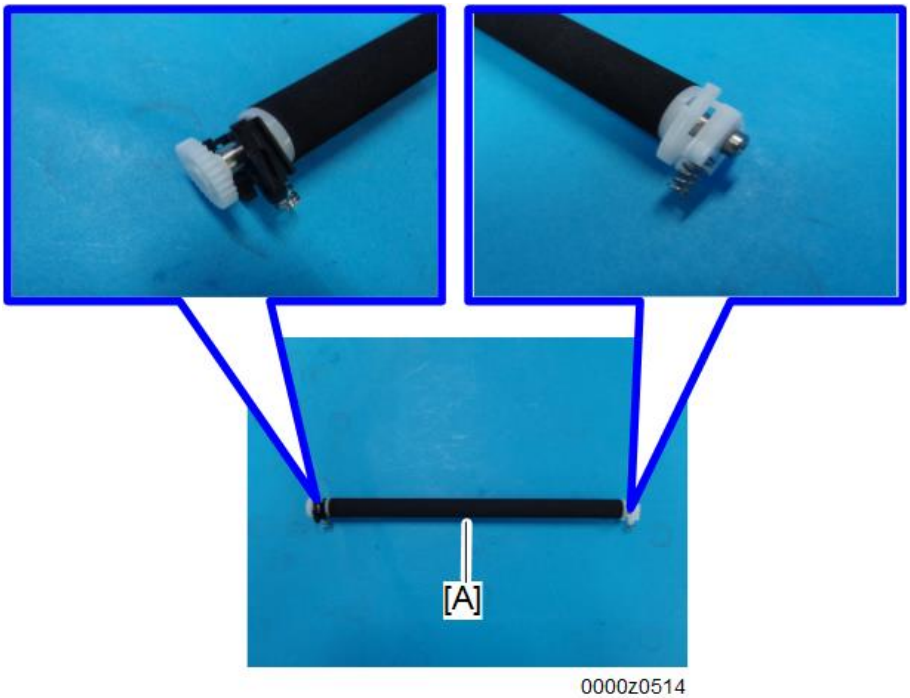
1. Remove the AIO. (page 26)

2. Remove the image transfer roller with the bushing [A].



0000z0513

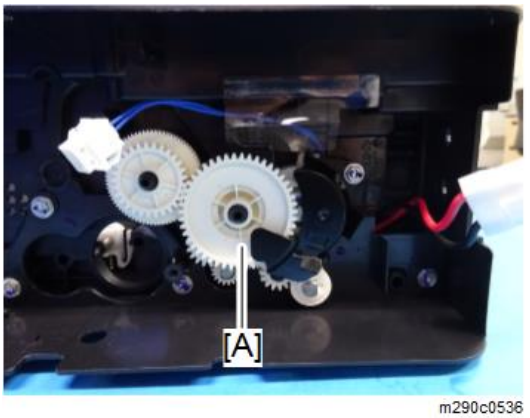
3. Remove the gear x 1, bushing x 2, spring x 2 from the image transfer roller [A].



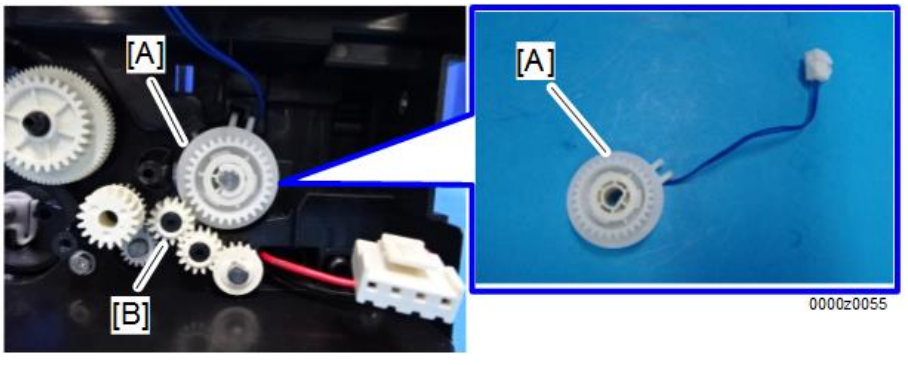
0000z0514

Paper Feed Clutch

1. Remove the bottom cover. (page 26)
2. Remove the main motor. (page 38)
3. Remove the gear [A].



4. Remove the paper feed clutch [A] and the gear [B]. (x1)



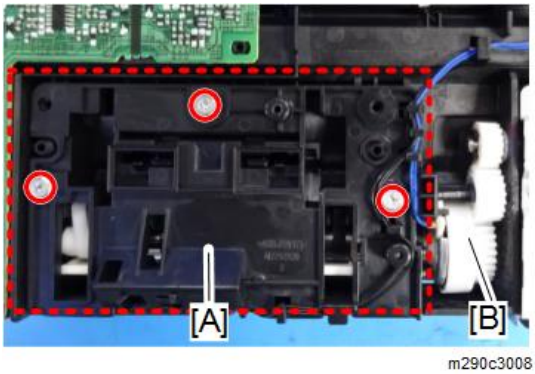
Bottom Plate Lift Clutch

1. Remove the bottom cover. (page 26)

2. Disconnect the harness.

m290c3007

3. Remove the friction pad unit [A]. (x3) Remove the bottom plate lift clutch [B]. (x1)

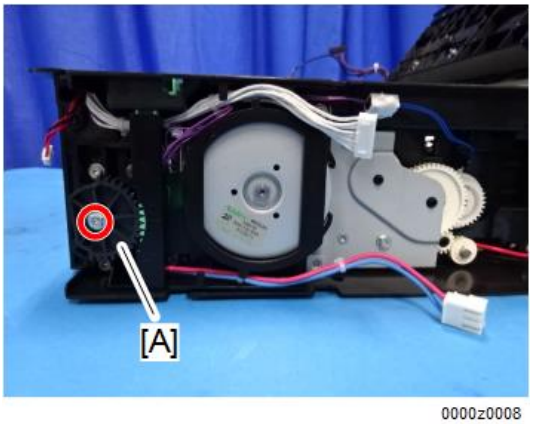


m290c3008

Drive

Main Motor

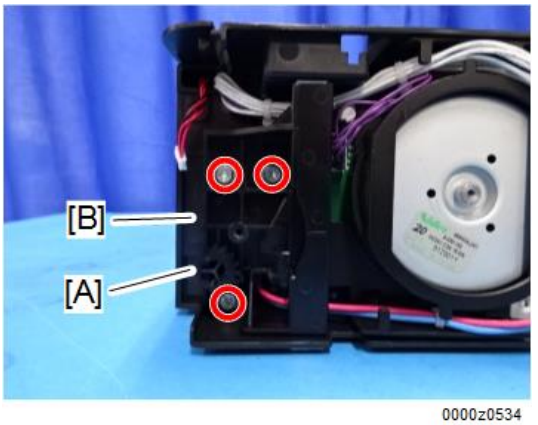
1. **Remove the bottom cover. (page 26)**
2. **Open the top cover.**
3. **Remove the gear [A]. (x1)**



0000z0008

Remember the position of the gear [A]. Put the gear back in the correct position after replacing the motor.

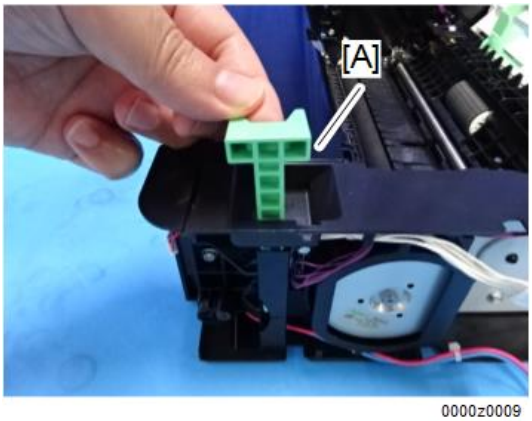
4. **Remove the gear [A]. Remove the bracket [B]. (×3)**



0000z0534

Remember the position of the gear [A]. Put the gear back in the correct position after replacing the motor.

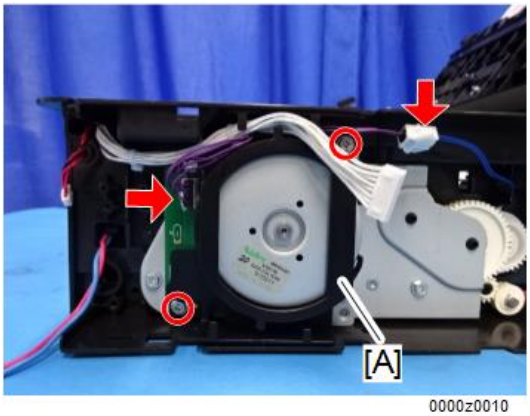
5. **Remove the T-shaped stopper [A].**



0000z0009

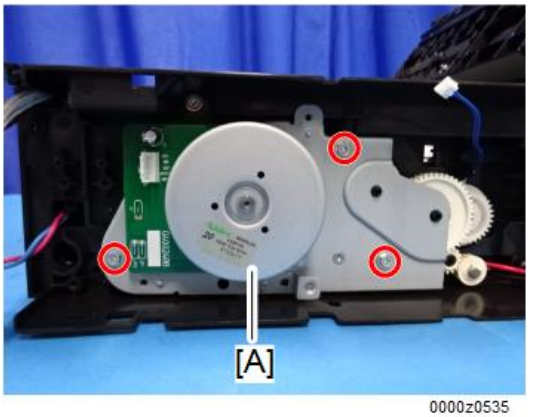
Remember the position of the T-shaped stopper [A]. Put the stopper back in the correct position after replacing the motor.

6. **Remove the bracket [A]. (×2, ×2)**



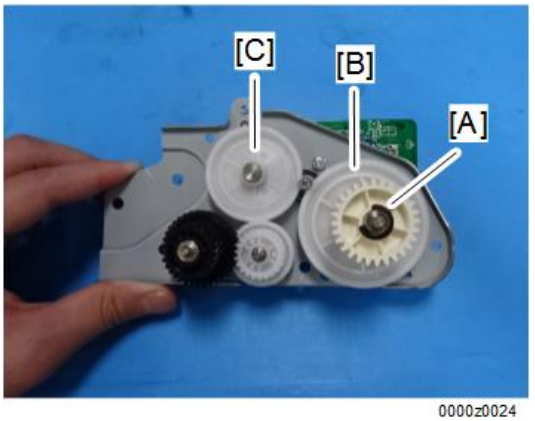
0000z0010

7. Remove the main motor [A] with its bracket. (×3)



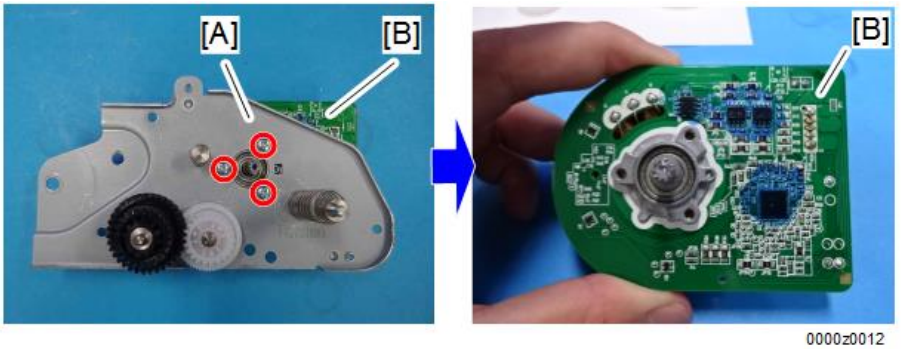
0000z0535

8. Remove the gears [A], [B], and [C]. (×1)



0000z0024

9. Remove the bracket [A] from the main motor [B]. (×3)

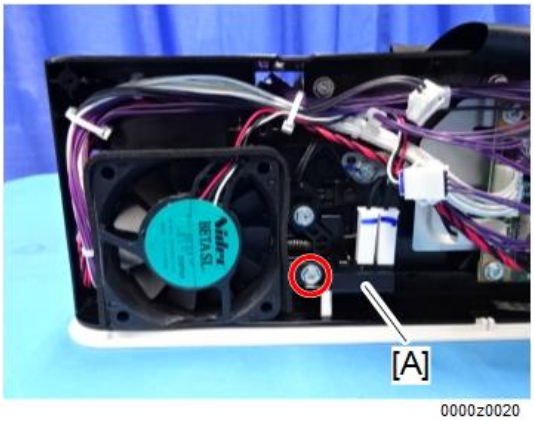


0000z0012

Fan

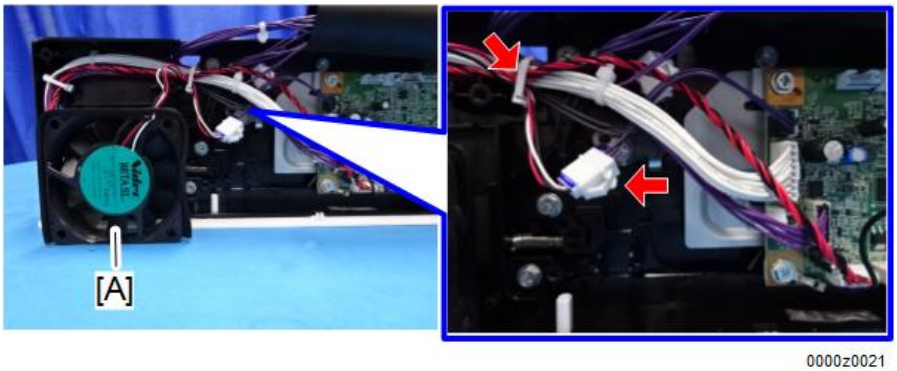
Fan

1. Remove the bottom cover. (page 26)
2. Remove the Wi-Fi PCB (Wi-Fi models only). (page 45)
3. Remove the bracket [A] (×1).



0000z0020

4. Remove the fan [A]. (×1, ×1).



0000z0021

Important

- When replacing the fan, make sure that the decal on the fan faces the outside.

Fusing Unit

Fusing Unit

1. Remove the bottom cover. (page 26)
2. Remove the Wi-Fi PCB (Wi-Fi Models only). (page 45)
3. Remove the fan. (page 41)
4. Remove the PSU. (page 45)
5. Remove the main motor with its bracket. (page 38)
6. Disconnect the harness [A] on the PCB.

m290c0025

7. Remove the fusing unit [A]. (x4)

0000z0037

Electrical Components

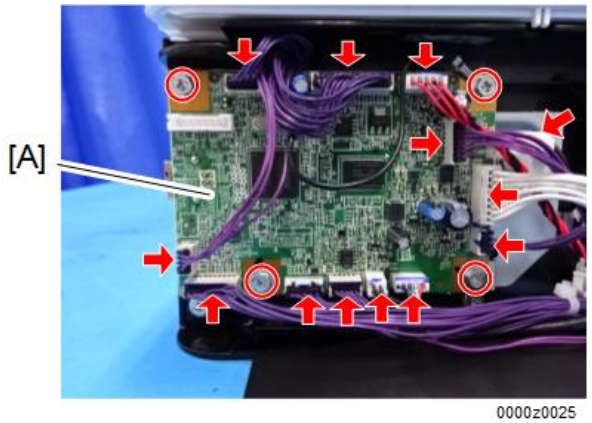
Main Board

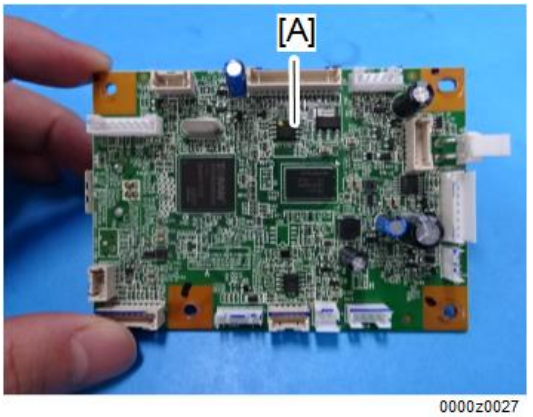
Important

- Do not throw away the transparent sheet covering the main board. This sheet protects the harness from being scratched by the hooks on the inside of the bottom cover. After replacing the main board, re-attach the sheet. If the adhesive is weak, reinforce with double-sided tape.
- Before replacing the main board, print the Configuration page by pressing the Power button 3 times rapidly.
- The EEPROM cannot be removed. Before replacing the main board, remember the machine's "PNP ID", "Destination Code", and "Serial No.". After replacing the main board, enter them manually by using CE Tools. For details, refer to page 55 "Using CE Tools".

Main Board of SFP Models

1. Remove the bottom cover. (page 26)
2. Remove the main board [A]. (×4, ×13)

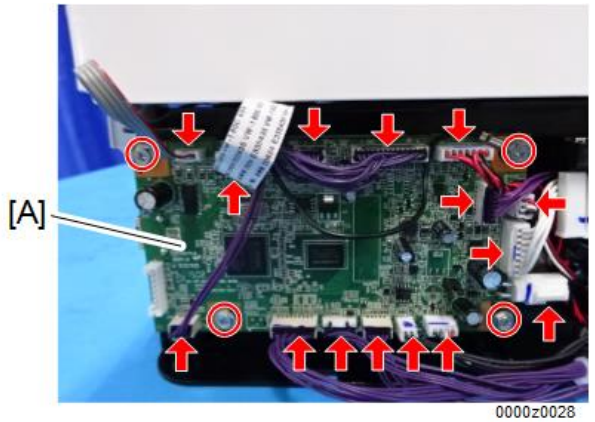




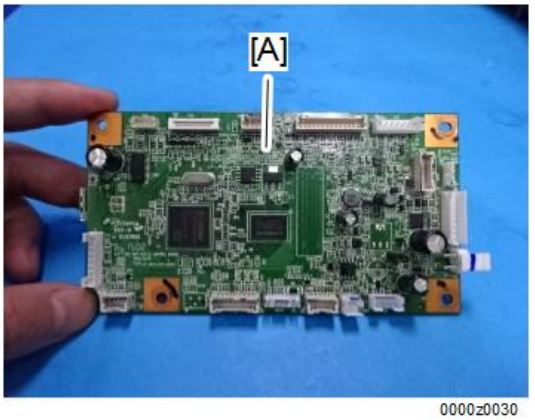
0000z0027

Main Board of MFP Models

1. Remove the bottom cover. (page 26)
2. Remove the main board [A]. (x4, x14, x1)



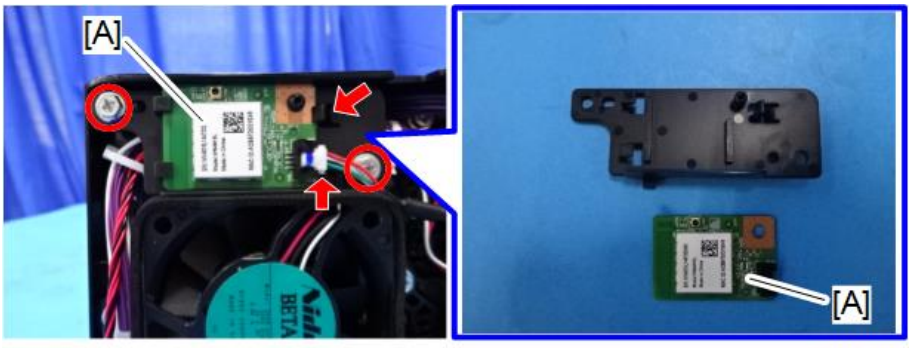
0000z0028



0000z0030

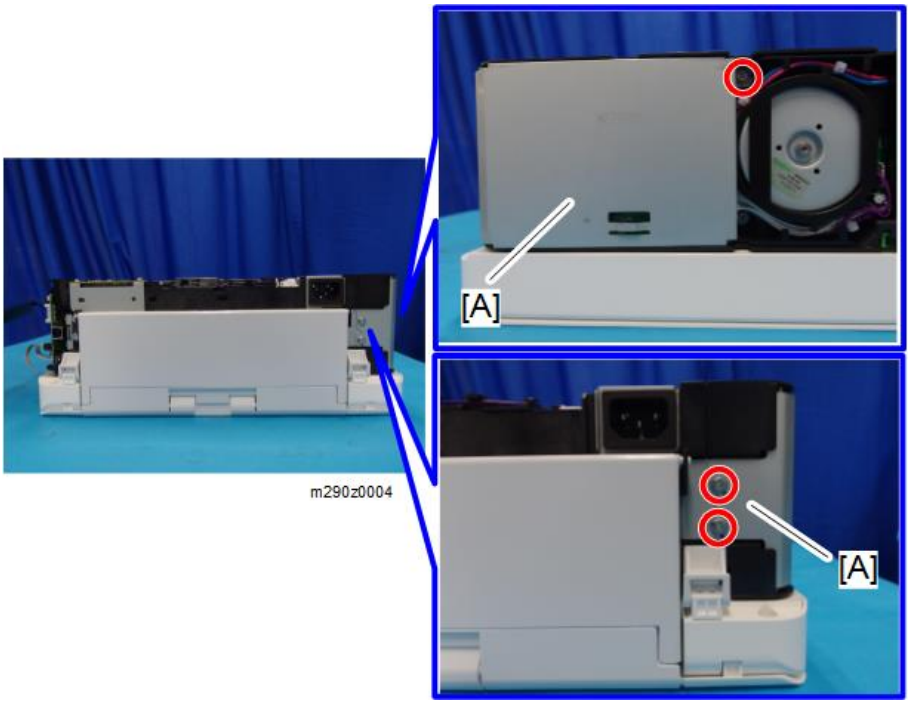
Wi-Fi PCB (Wi-Fi Models Only)

1. Remove the bottom cover. (page 26)
2. Remove the Wi-Fi PCB [A]. (x2, x1, hook x1)



PSU

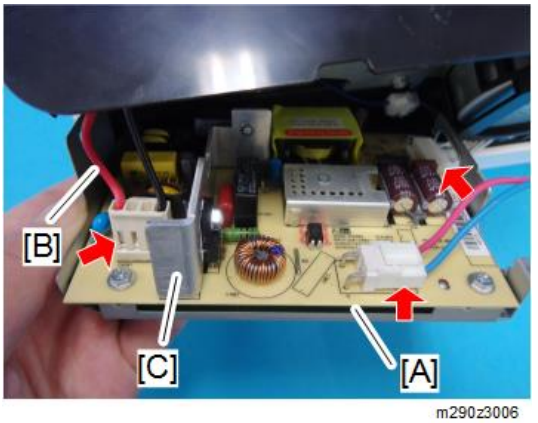
1. Remove the bottom cover. (page 26)
2. Remove the bracket [A]. (×3)



3. Remove the PSU [A] with the bracket. (×3)

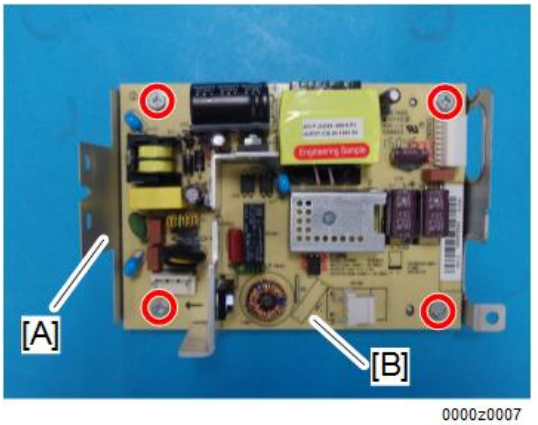
Important

- When removing the PSU, keep the harness [B] away from the heat sink [C]. Otherwise, the cover of the harness may melt because of the heat.



m290z3006

4. Remove the PSU [B] from the bracket [A]. (x4)

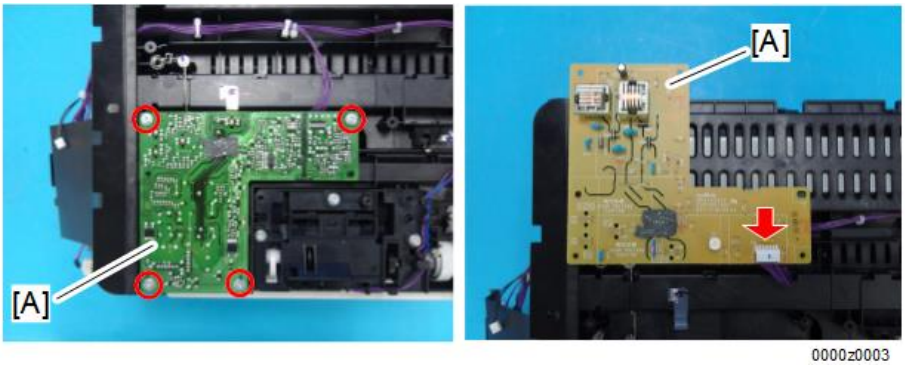


0000z0007

HVP

1. Remove the bottom cover. (page 26)

2. **Remove the HVP [A]. (x4, x1)**



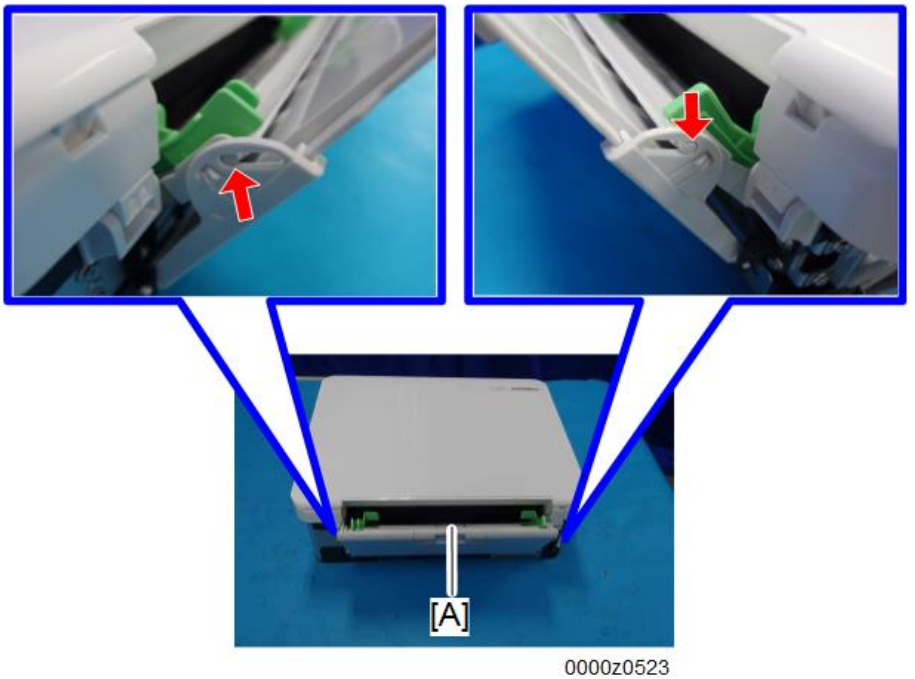
0000z0003

Scanner

RTB 4
This section was revised

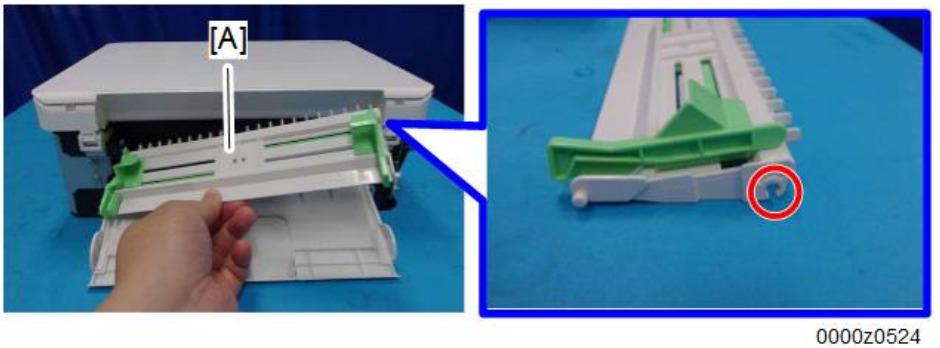
Scanner Unit

1. Remove the AIO. (page 26)
2. Remove the bottom cover. (page 26)
3. Remove the main board. (page 43)
4. Release the guides of the paper feed tray [A].



0000z0523

5. Remove the paper feed guide [A].



0000z0524

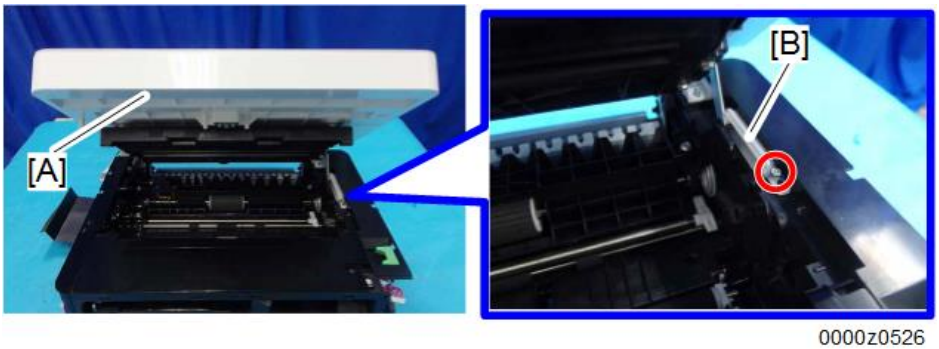
Note

- To remove the paper feed guide [A], release the right linkage first.

6. **Remove the rear cover from the right-hand side [A].**

0000z0525

7. **Open the scanner unit [A] and remove the guide rail [B]. (x1)**



0000z0526

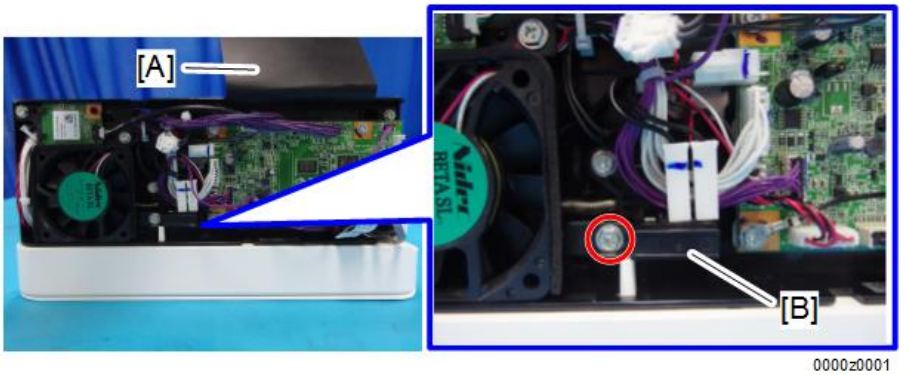
8. **Remove the scanner unit [A].**

0000z0527

9. **Remove the laser unit from the scanner unit [A]. (x4)**

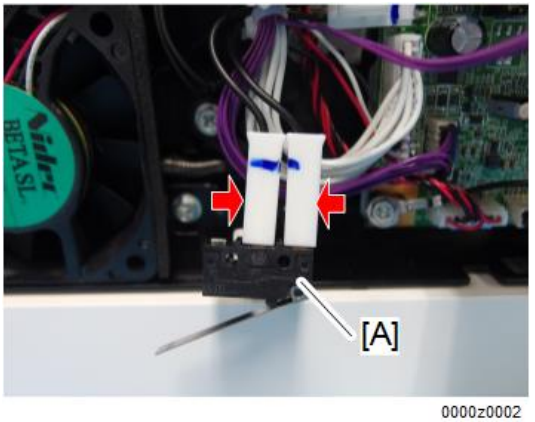
Scanner Open/Close Switch

1. Remove the bottom cover. (page 26)
2. Remove the sheet [A].
3. Remove the bracket [B]. (x1)



0000z0001

4. Remove the scanner open/close switch [A]. (x2)

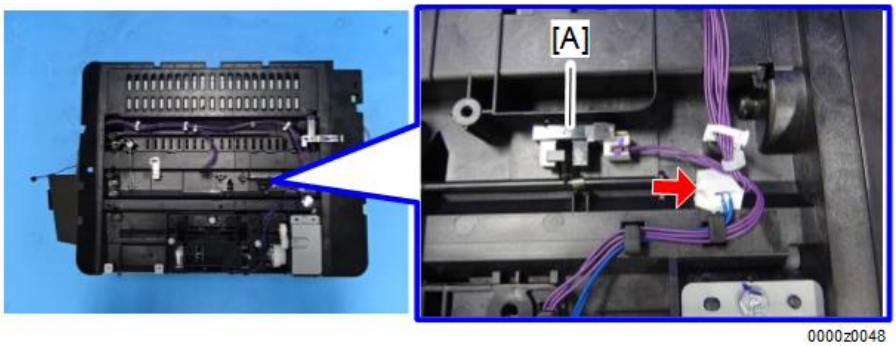


0000z0002

Sensors

Registration Sensor

1. Remove the bottom cover. (page 26)
2. Remove the registration sensor [A]. (x1)



0000z0048

Exit Sensor

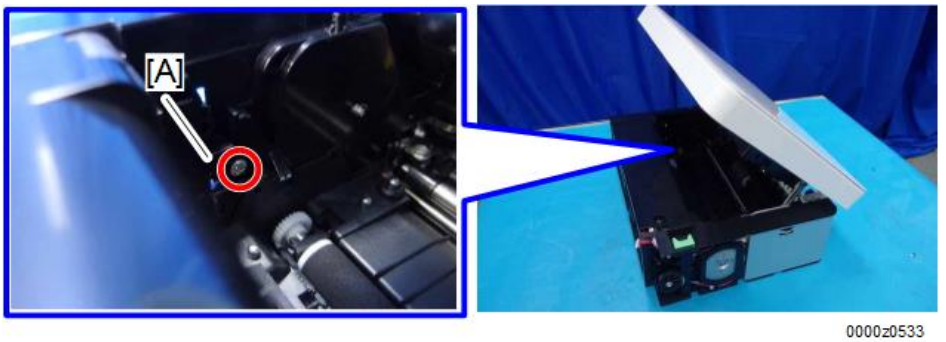
1. Remove the fusing unit. (page 42)
2. Remove the exit sensor [A]. (x1)

0000z0051

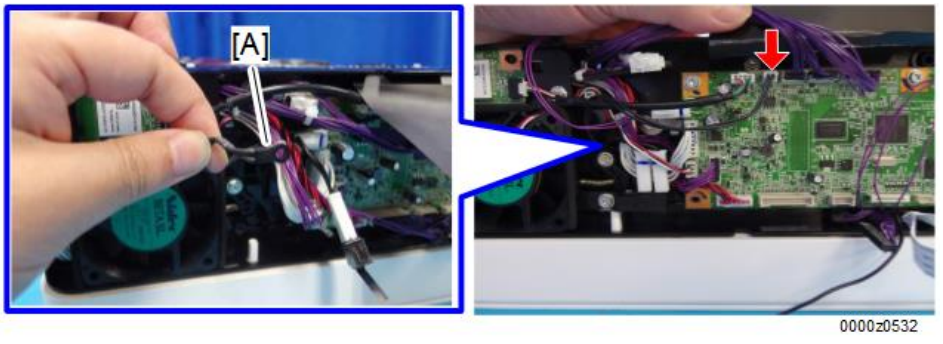
Thermistor

1. Remove the AIO. (page 26)
2. Remove the bottom cover. (page 26)

3. Remove the screw [A]. (x1)

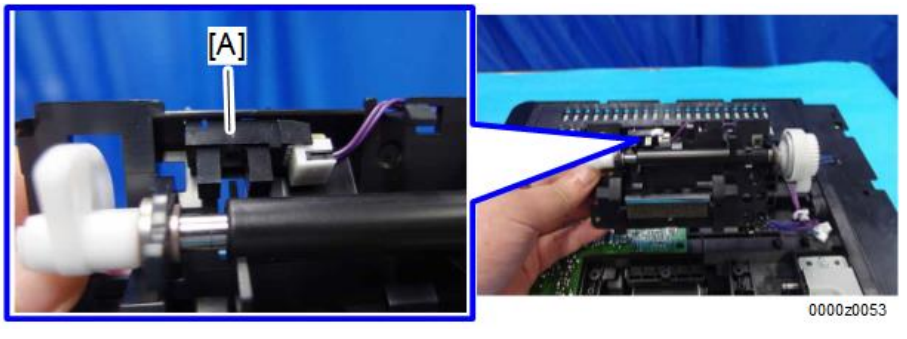


4. Remove the thermistor [A]. (x1)



Bottom Plate Position Sensor

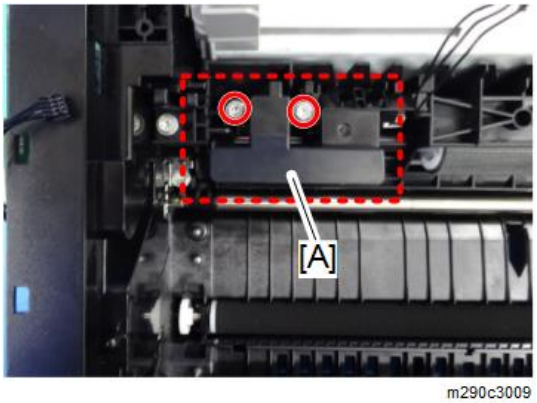
1. Remove the friction pad unit. (page 33)
2. Remove the bottom plate position sensor [A]. (x1)



Paper Size Sensor

1. Remove the AIO. (page 26)

2. Remove the top cover. (page 28)
3. Remove the main board. (page 43)
4. Remove the bracket [A] on the feed guide. (x2)



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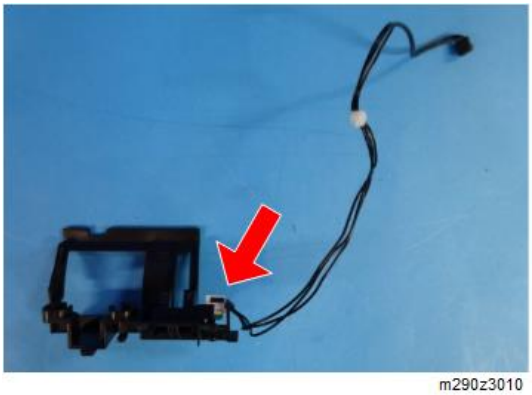
5. Remove the paper size sensor.



m290z3010

4. System Maintenance

Utilities

Using CE Tools

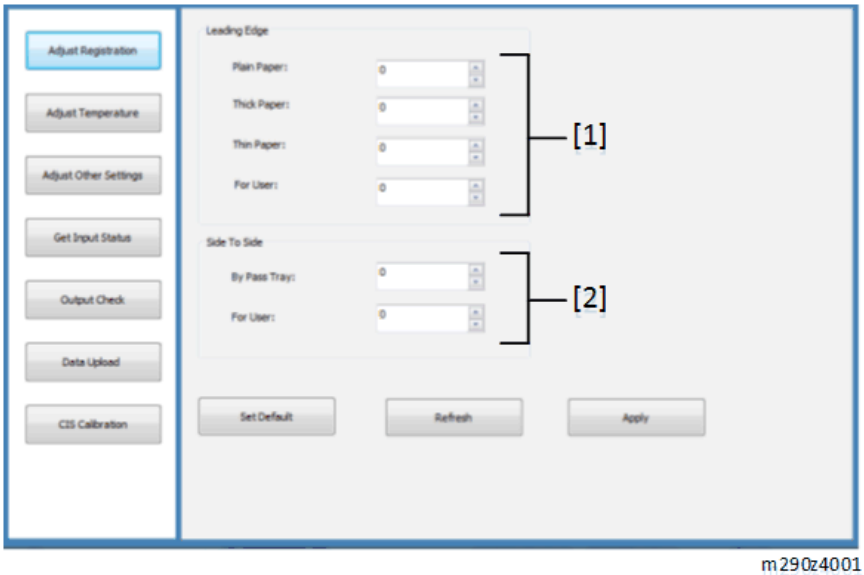
Important

- **Before using CE Tools, make sure that the PC is connected to the machine.**

To start CE Tools, click on the CE Tools icon.

- To return to the default values, click [Set Default] on each screen.
- To update to the latest information, click [Refresh] on each screen.
- To apply the settings, click [Apply] on each screen.

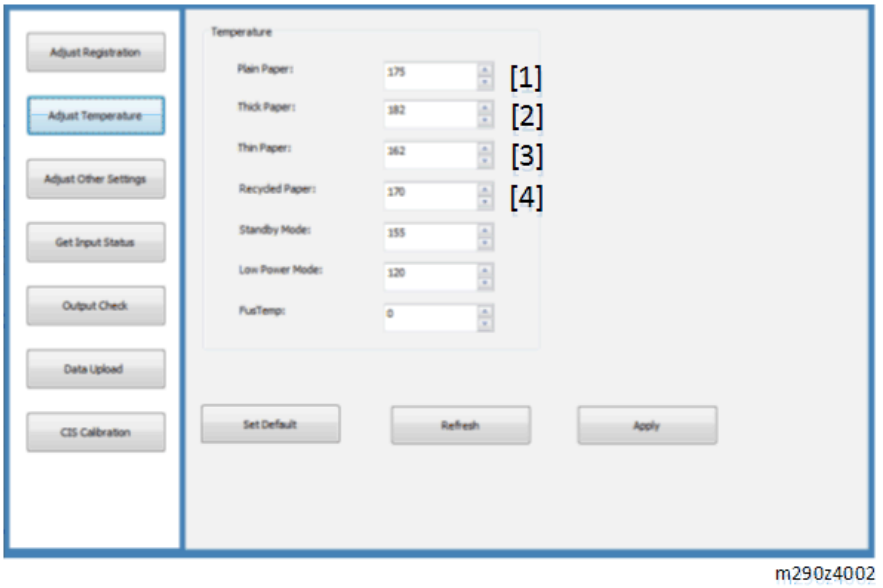
Adjust Registration



m290z4001

No.	Item	Details	Values
1	Leading Edge	Adjust the leading edge registration. • Plain Paper • Thick Paper • Thin Paper	-40 to 40 (0.1 mm steps)
		Adjust the leading edge registration. • For User	-2 to 2 (1 mm steps)
2	Side to Side	Adjust the side to side registration. • By Pass Tray	-40 to 40 (0.1 mm steps)
		Adjust the side to side registration. • For User	-6 to 6 (1 mm steps)

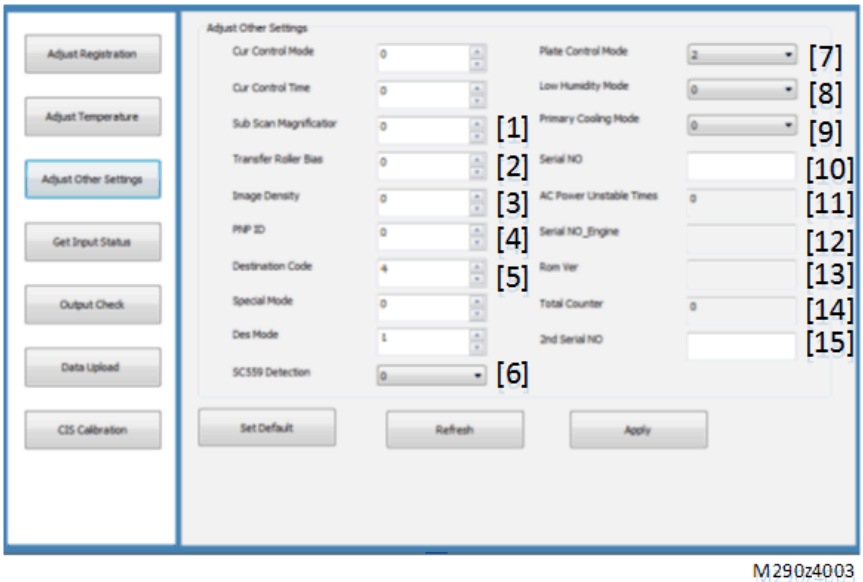
Adjust Temperature



m290z4002

No.	Item	Details	Values
1	Plain Paper	Adjust the fusing temperature according to the paper type.	160 to 190 (1°C steps)
2	Thick Paper		167 to 197 (1°C steps)
3	Thin Paper		147 to 177 (1°C steps)
4	Recycled Paper		155 to 185 (1°C steps)

Adjust Other Settings



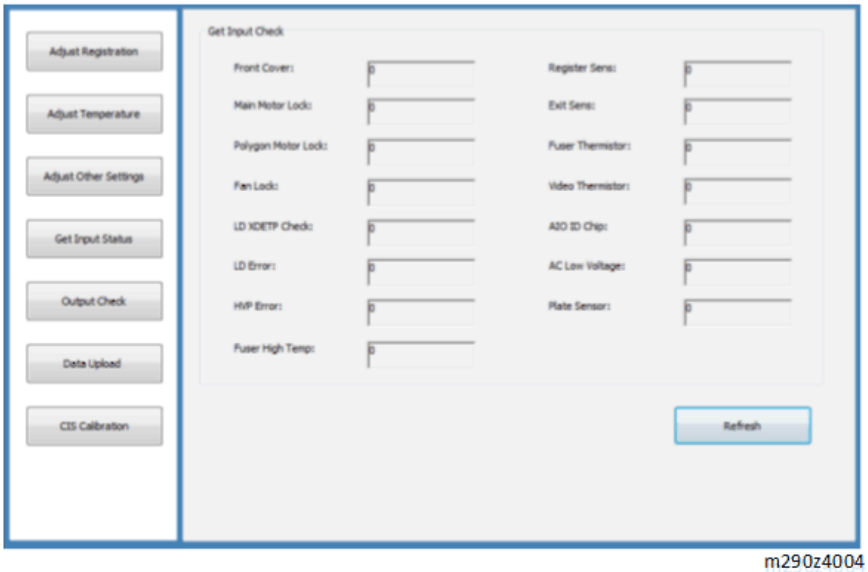
M290z4003

No.	Item	Details	Values
1	Sub Scan Magnification	Specify the sub scan magnification.	-8 to 8 (0.1% steps)
2	Transfer Roller Bias	Adjust the transfer roller bias.	-10 to 10 (12 steps)
3	Image Density	Adjust the image density.	-3 to 3 (7 steps)
4	PNP ID	Specify the Plug and Play ID. Normally, do not change the PNP ID. After replacing the main board, return the PNP ID to its original value.	0 to 255

No.	Item	Details	Values
5	Destination Code	Specify the area where the machine is sold and used. This setting is important. It determines the following: • Default paper size. LT for NA, and A4 for all other areas. • Units of measure: inches for NA, and millimeters for all other areas. • Fixed steps for reduction/ enlargement. Normally, do not change the destination code. After replacing the main board, return the destination code to its original value.	0 to 255
6	SC 559 Detection	SC 559 is the error code for Fusing Unit Third Jam Error (Fatal Error). Specify whether to enable SC 559 detection.	0: Off 1: On
7	Plate Control Mode	Specify whether to use the plate control mode.	0: On 2: Off
8	Low Humidity Mode	Black lines a few millimeters thick may appear on prints when the machine is operated in a low humidity environment. Enabling this mode may help to solve the problem.	0: Off 1: On
9	Primary Cooling Mode	Specify whether to use the primary cooling mode.	0: Off 1: On
10	Serial No.	The serial number of the machine is displayed. Normally, do not change the serial number. After replacing the main board, return the serial number to its original value.	-

No.	Item	Details	Values
11	AC Power Unstable Times	AC power unstable times are displayed.	0 to 99999999
12	Serial No_Engine	The serial number of the engine is displayed. Normally, do not change the serial number. After replacing the main board, return the serial number to its original value.	-
13	Rom Ver	The ROM version number is displayed.	-
14	Total Counter (Engine)	The total counter is displayed.	0 to 99999999
15	2nd Serial No.	Do not change the 2nd Serial No.	-

Get Input Status



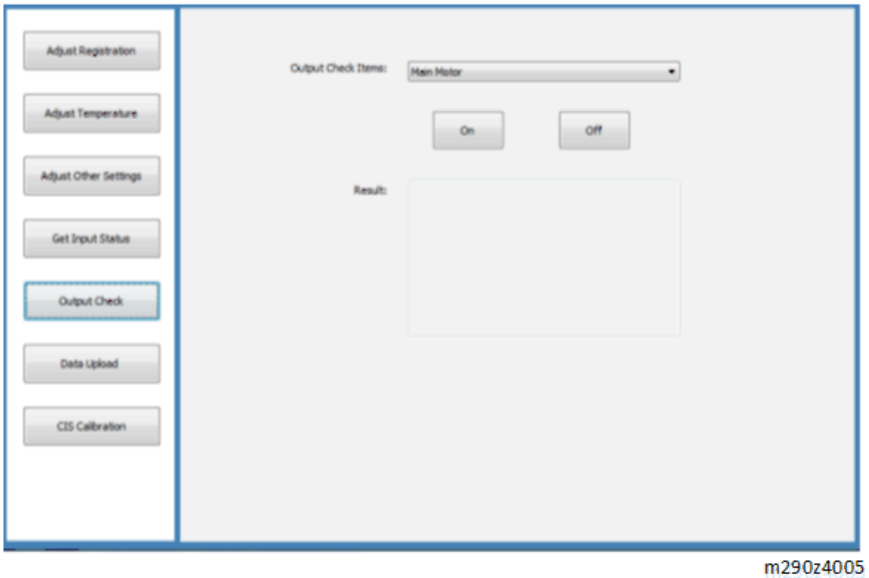
m290z4004

Click [Refresh] to update the information.

The input status of the following items can be viewed.

Items	Values
• Front Cover • Main Motor Lock • Polygon Motor Lock • Fan Lock • LD XDETP Check • LD Error • HVP Error • Fuser High Temp • Register Sens. • Exit Sens.	0: Off 1: On
• Fuser Thermistor • Video Thermistor	0x00 to 0xFFFF
• AIO ID Chip • AC Low Voltage • Plate Sensor	0: Off 1: On

Output Check



m290z4005

Select the following items from the Output Check Items list, and switch them on or off.

Items	Values
• Main Motor • Feed Clutch • Plate Clutch • Fan High Speed • Fan Low Speed • LD Heater On (LD1 & LD2) • Fuser Heater • Charge Bias • Develop Bias • Trans Current • Polygon Motor • LD1 Heate On • LD2 Heate On	On Off
• FusingSCReset	0: Execute

Data Upload

Do not use Data Upload settings.

CIS Calibration

Do not use CIS Calibration settings.

Firmware Update

For details on how to update the machine firmware, refer to the firmware update guide.

5. Troubleshooting

Service Calls

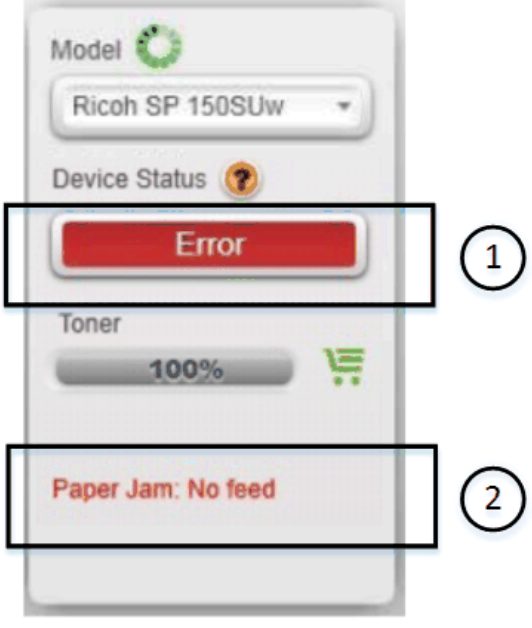
LED Indicators and Error Status

Note

- For details about the LEDs indicators and status descriptions, refer to the user guide.

To find out the SC code, see the message area on the Status screen of the Virtual Operation Panel.

Status Screen



m290z5001

1. **The device status indicate "Error".**
2. **Error messages and SC codes are displayed in this area.**

Points to Note

- All SC codes are logged.
- When an error occurs, turn the power OFF and then ON. This usually solves the problem.

- Before deciding to replace electrical components (PCB/PSU/HVP), always check the harnesses to make sure that the problem was not caused by a loose connection.
- Before deciding to replace a motor or a sensor, always check around the motor or sensor feelers to make sure that there is no physical obstruction such as paper scraps or things that have fallen into the machine (for example, paper clips or pins).

Fatal SC Codes/Fusing Related Errors

Fatal SC codes are related to problems that occur in the fusing unit. Fusing related errors require special handling because there is a risk of fire.

- Once a fatal error occurs, the machine cannot be used until the problem has is solved.
- When SC 559 Detection is enabled, the machine will shut down after three consecutive fusing jam errors. For safety, this setting should remain enabled.
- When a fatal error (fusing related SC code) occurs, the machine cannot be operated until the service technician releases the error by selecting [On] for FusingSCReset.

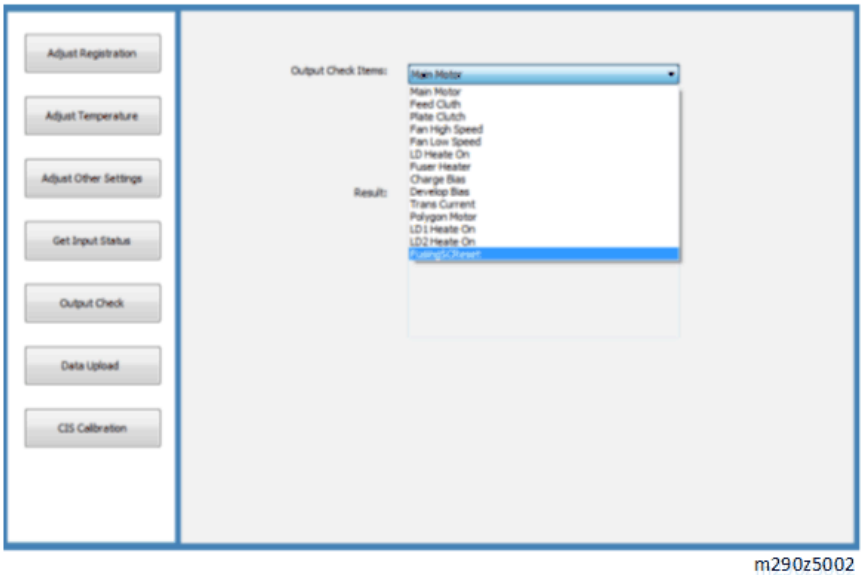
Important

- **After solving the problem that caused the fatal SC code to be issued, the service technician must execute [FusingSCReset] in order to recover full operation of the machine. Otherwise the machine will continue to issue the same SC code even after the problem has been solved.**

Executing Fusing SC Reset

1. **After solving the problem, start CE Tools on the PC.**
2. **Click [Output Check].**

3. From the Output Check Items list, select [FusingSCReset].



m290z5002

4. Click [On].

SC Tables

SC Table Key

SC codes are assigned a level of severity (A, B, C, D) based on the table below. These letters appear in the 3rd column of the SC tables below.

Level	Definition/ Reset Procedure
A	This is a fatal error. The machine is disabled due to a problem in the fusing unit. The operator cannot operate the machine. • The machine requires immediate servicing by a service technician. • After solving the problem, [FusingSCReset] must be executed to release the machine for normal operation.
B	Only the function that uses the defective unit is disabled. The SC code is shown in the message on the Status Panel. • Cycle the power OFF/ON.

Level	Definition/ Reset Procedure
C	These SC codes are not shown. They are logged internally. • Check the SC error log.
D	The SC code is shown in the message on the Status Panel. • Cycle the power OFF/ON. • The SC code will be shown again if the error repeats.

Important

- **Before deciding to replace a PCB, disconnect the board connectors, and then connect them again. This is to make sure that the problem was not caused by a bad or loose connection.**

SC2xx: Polygon Motor Errors

Code	Level	Details
202	D	Polygon Motor On Timeout Error
		No lock signal was received within 10 sec. after the polygon motor was turned on.
		• The polygon motor driver I/F harness is loose, broken, or defective. • The polygon motor is broken or defective.
		• Cycle the power OFF/ON. • Replace the I/F harness. • Replace the polygon motor. • Replace the laser unit.

Code	Level	Details
203	D	Polygon Motor Off Timeout Error
		The lock signal did not go inactive within 20 sec. after the polygon motor was turned off.
		• The polygon motor I/F harness is loose, broken, or defective. • The motor driver board is defective. • The motor is defective.
		• Cycle the power OFF/ON. • Replace the I/F harness. • Replace the polygon motor. • Replace the laser unit.

Code	Level	Details
204	D	Polygon Motor Lock Signal Error
		Four samplings within 200 ms indicate that the polygon motor lock signal remained inactive beyond the prescribed number of revolutions.
		• The I/F harness between the motor and driver board is loose, broken, or defective. • The driver board is defective. • The motor is defective.
		• Cycle the power OFF/ON. • Replace the I/F harness. • Replace the polygon motor. • Replace the laser unit.

Code	Level	Details
220	D	Beam Synchronization Error
		The top cover is closed and locked, and the polygon motor is locked, but laser synchronization could not be achieved within 400 ms.
		• The I/F harness of the LDB is loose, broken, or defective. • The polygon motor is locked. • The angle of incidence of the laser beam and photo-detector is not correct.
		• Cycle the power OFF/ON. • Replace the I/F harness. • Replace the polygon motor. • Replace the laser unit. • Replace the main board.

SC4xx: Bias Leak

Code	Level	Details
491	D	Bias Leak
		A bias leak has occurred for the drum charge, development charge, or transfer charge. PWM signals are sampled at 20 ms intervals. This SC is issued if 10 PWM samplings within 200 ms are abnormal.
		• The HVP harness is loose, broken, or defective. • The HVP board is defective. • The AIO terminal is defective.
		• Cycle the power OFF/ON. • Check all the harness connections of the HVP. • Check the spring-loaded AIO terminal installation behind the HVP. • Replace the HVP.

SC5xx: Main Motor Errors, Fusing Errors

Code	Level	Details
501	D	Plate Action Error
		The status of the bottom plate position sensor does not change even though 2 secs or more have lapsed after the bottom plate lift clutch is turned ON. This SC is displayed if the error is detected 3 times.
		• The bottom plate lift clutch is loose or defective. • The bottom plate position sensor is loose or defective.
		• Cycle the power OFF/ON. • Replace the bottom plate lift clutch. • Replace the bottom plate position sensor. • Replace any harnesses connected to the bottom plate lift clutch or bottom plate position sensor.

Code	Level	Details
520	D	Main Motor Error
		• The machine failed to detect a lock signal within 550 ms after the main motor was turned on. • The machine failed to detect a lock release signal with 2 sec. after the main motor was turned off. • This SC is displayed if a lock signal cannot be detected for 8 consecutive times.
		• The AIO is defective. • The main motor is defective.
		• Cycle the power OFF/ON. • Check the areas around motor and main drive train for any physical obstruction such as paper scraps. • Clean the main motor drive train. • Replace the AIO. • Replace the main motor.

Code	Level	Details
530	D	Main Fan Motor Error
		When the fan motor is ON, a lock signal is sampled every 100 ms. If an incorrect lock signal is detected 100 times (10 sec), the fan is not rotating properly.
		• The fan is defective. • The harness is loose, disconnected or defective.
		• Cycle the power OFF/ON. • Replace the fan. • Check the harness.

Code	Level	Details
541	A	Fuser Thermistor Error
		No temperature was detected within 6 sec. after the machine was turned on (temperature was less than 0°C). This SC is displayed if no temperature was detected 10 times or more.
		• The fusing unit thermistor is disconnected, broken, or not set correctly. • The fusing lamp is disconnected, broken, or not set correctly. • The fusing unit is defective.
		• Check the fusing unit thermistor. • Check the fusing lamp. • Replace the fusing unit. • After solving the problem, the service technician must execute [FusingSCReset]. Otherwise, the machine will continue to issue this SC code and cannot be operated. (page 64 "Executing Fusing SC Reset")

Code	Level	Details
542	A	Fusing Reload Temperature Error
		After starting up or during operation, the reload (operating) temperature cannot be reached.
		• The fusing thermistor is deformed or out of position. • The fusing lamp harness is loose, broken, or defective. • The fusing unit is defective. • The power voltage is not correct.
		• Check the power voltage. • Check the fusing unit thermistor. • Check the fusing lamp. • Replace the fusing unit. • After solving the problem, the service technician must execute [FusingSCReset]. Otherwise, the machine will continue to issue this SC code and cannot be operated. (page 64 "Executing Fusing SC Reset")

Code	Level	Details
543	A	High Temperature Error (Software)
		The temperature inside the fusing unit exceeded 235°C for more than 0.5 sec. This SC is displayed if the error is detected 10 times or more. However, the machine does not check for this error during low power mode, sleep mode, cover open, or when the fusing lamp relay is OFF due to malfunctions.
		• The PSU is defective (triac has short-circuited). • The main board is defective.
		• Replace the main board. • After solving the problem, the service technician must execute [FusingSCReset]. Otherwise, the machine will continue to issue this SC code and cannot be operated. (page 64 "Executing Fusing SC Reset")

Code	Level	Details
544	A	High Temperature Error (Hardware)
		The machine checks the CPU port at 50 ms intervals. This SC is displayed if the CPU port was detected to be LOW for 4 consecutive times.
		• The PSU is defective (triac has short-circuited). • The fusing unit is defective. • The main board is defective.
		• Replace the PSU. • Replace the fusing unit. • Replace the main board. • After solving the problem, the service technician must execute [FusingSCReset]. Otherwise, the machine will continue to issue this SC code and cannot be operated. (page 64 "Executing Fusing SC Reset")

Code	Level	Details
545	A	Fuser Full Heater Error
		The heating element of the fusing lamp remained at full power for more than 7 sec. (100 V) or 9 sec. (200 V) after the reload temperature was detected. The machine checks for this error during standby, energy save, after reload, or when the fusing unit is not rotating.
		• The thermistor is deformed or loose. • The fusing lamp is damaged. • The overheat prevention device is activated.
		• Check the fusing thermistor. • Check the fusing lamp. • After solving the problem, the service technician must execute [FusingSCReset]. Otherwise, the machine will continue to issue this SC code and cannot be operated. (page 64 "Executing Fusing SC Reset")

Code	Level	Details
547	D	Motor Thermistor Error
		After starting up, the temperature inside the machine is checked every 100ms. A temperature of -30°C is detected for 4 sec., or 105°C is detected for 1 sec.
		• Cycle the power OFF/ON. • Check the connection or replace the thermistor. • Replace the I/F harness. • Replace the main board.

Code	Level	Details
559	A	Fusing Unit Third Jam Error
		The exit sensor failed to detect the leading edge of the paper within the prescribed time and triggered a jam alert. After this error has occurred three times, the machine will shut down automatically. It cannot be re-started until the machine has been serviced by a service technician.
		• Check the paper transport path for any physical obstruction such as paper scraps. • Make sure the fusing unit has been installed correctly. • After solving the problem, the service technician must execute [FusingSCReset]. Otherwise, the machine will continue to issue this SC code and cannot be operated. (page 64 "Executing Fusing SC Reset")

Code	Level	Details
560	D	Low Voltage Fuser Reload Error
		Reloading failed because of a voltage drop.
		• Cycle the power OFF/ON. • Ensure a stable power supply.

SC6xx: Communication Errors

Code	Level	Details
688	D	No CTL_PRREQ_N Signal
		Paper failed to feed after the machine has reached the reload temperature, because the main board did not issue a PRREQ signal.
		• The main board harness connector is loose, broken, or defective. • The main board is defective.
		• Check the main board harness connector. • Replace the main board.

SC10xx: Others

RTB 4 Modified

Code	Level	Details
1001	D	Scan Motor Error
		Scanner calibration failed (scanner cannot find the home position).
		• Cycle the power OFF/ON. • Check the connection. • Replace the scanner unit.

Image Problems

Overview

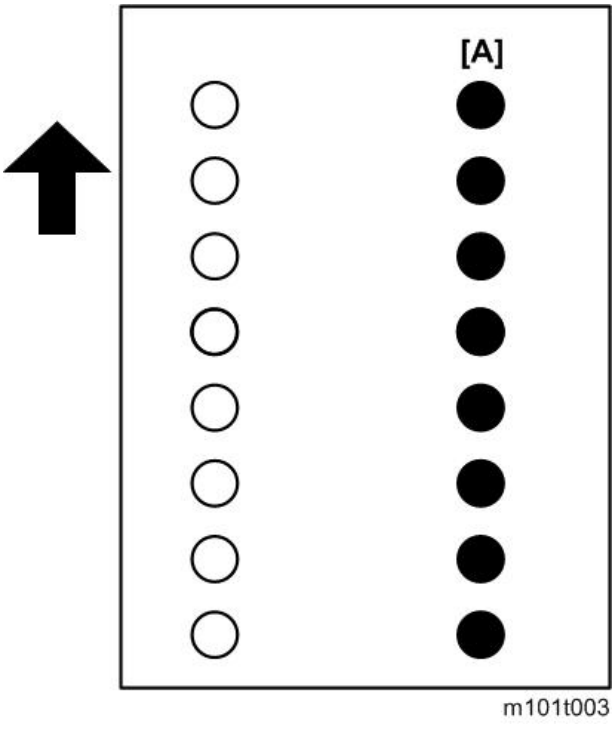


Image problems can occur at regular intervals [A] due to the different circumferences of rollers in the machine and inside the AIO.

Diameter (mm)	Interval (mm)	Component
9.5	30	Charge Roller (AIO)
12	27	Development roller (AIO)
14.6	44	Relay roller
14.2	44.6	Exit Roller
12.14	38	Transfer roller
25.06	78.7	Fusing roller
24	75	Drum (AIO)

Diameter (mm)	Interval (mm)	Component
28	88	Paper feed roller

Dark Lines in Halftone Areas

Dark lines in halftone fill areas can appear at 75 mm intervals when the machine is operating in a room where the humidity is very low. (The low humidity causes variation in light sensitivity across the surface of the drum.)

To prevent this problem, perform the following procedure.

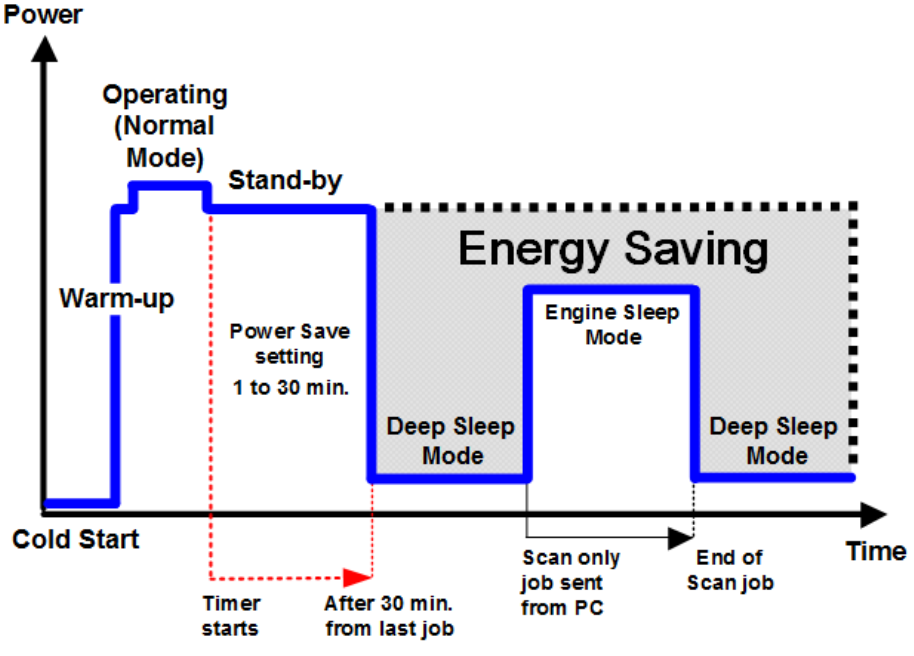
1. **Start CE Tools.**
2. **Click [Adjust Other Settings].**
3. **Select [1] (On) for Low Humidity Mode.**

When this humidity mode setting is on, the drum is rotated slightly every 15 min. to keep the light sensitivity consistent across the entire surface of the drum.

6. Energy Saving

Energy Save

Energy Saving Modes



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MEMO

MEMO

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