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Remy MF1/P1

M156/M157/M154/M155

SP 311SFN/SP 311SFNw/SP 311DN/SP 311DNw

Update training module

Objectives

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- After completing this training you should be able to:
  - Install the Remy-MF1/P1 in the field.
  - Perform routine maintenance.
  - Troubleshoot and repair the product in the field.

Requirements

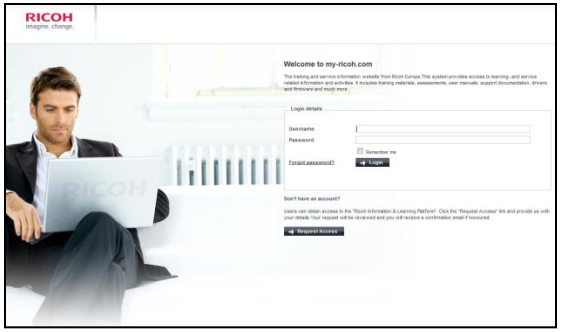
- Remy MF1/P1
- Windows PC
- Printer Drivers
- Field Service Manual
- Operation Manual
- This presentation

Pre-requisites and exam

- Before starting this training you must already have followed the My-Ricoh training for:
  - Printing 2012

- At the end of this course, you can do the exam on:

  www.my-ricoh.com



Module overview

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1) Introduction
2) Maintenance
3) Detailed Section Descriptions
4) Troubleshooting

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1. Introduction

Remy models

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- Remy-MF1a
  - M156: SP 311SFN
- Remy-MF1aw
  - M157: SP 311SFNw
- Remy-P1a
  - M154: SP 311DN
- Remy-P1aw
  - M155: SP 311DNw

- Common items between the models:
  - No AIO refill cartridge.
  - Ethernet connection.
  - Duplex.

Differences from previous models

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	Rinmei-MF1	Rinmei-MF2	Remy-MF1
PPM (A4)	28	28	28
ADF	ADF	ADF/ARDF	ADF
Scanner	CCD	CCD	CIS
Display Panel	2 lines	2 lines	4 lines
Controller and Engine Boards	2 boards	2 boards	1 board
PSU and High Voltage Power Pack	1 board	1 board	2 boards
Duplex	Some models	Some models	All models
Output Capacity	125 sheets	125 sheets	50 sheets
Wireless LAN	No	No	Some models
Machine Life	200k	350k	200k
Optional Tray	Yes	Yes	No
PDL	PCL/PS3	PCL/PS3	PCL

Differences from previous models

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	Rinmei-P1	Rinmei-P2	Remy-P1
PPM (A4)	28	28	28
Display Panel	No	2 lines	No
Controller and Engine Boards	2 boards	2 boards	1 board
PSU and High Voltage Power Pack	1 board	1 board	2 boards
Duplex	Some models	Some models	All models
Output Capacity	125 sheets	125 sheets	125 sheets
Wireless LAN	No	No	Some models
Machine Life	200k	350k	200k
Optional Tray	Yes	Yes	No
PDL	PCL/PS3	PCL/PS3	PCL
SOM (Smart Organizing Monitor)	Yes	No	Yes

Other Points

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- Remy-MF1/P1 do not have a USB host or the scan to USB feature.
- There are no optional units for these models.

AIO Cartridges

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- There are 3 types of AIO cartridges:
  - Starter AIO: 1k per cartridge
  - Low yield AIO: 2k per cartridge
  - High yield AIO: 3.5k per cartridge

- All cartridges are NOT refillable.

Targets

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- Monthly Print Volume
  - Average: 0.7K
  - Maximum: 5.8K
- Estimated Unit Life: 5 years or 200K prints (whichever comes first).

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2. Maintenance

PM Intervals

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- There are no PM parts.
- There are three "yield parts", but given the ACV (Average Copy Volume) for this machine, these "yield parts" are expected to be life-time of the machine.
- Yield Parts
  - Paper Feed Roller (120 K)
  - Transfer Roller (120 K)
  - Fusing Unit (120 K)
- The counters for each yield part can be monitored using either of the following methods:
  - Web Image Monitor
  - Configuration Page in the “List/Test Print” menu

Yield Parts

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- Yield parts are rated to last for 120 K, which should be longer than the machine's rated lifespan of five years.
- For customers who are very heavy users, it may be necessary to change yield parts during the life of the machine.
  - After installing new yield parts, the counters must be reset.
  - The counter reset procedure is not a user function and must be done by a engineer.
  - See the replacement procedures in the FSM (Field Service Manual) for the reset procedures for each yield part.

Access to Service Functions

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- For MF models:
  - To access Maintenance Mode, do the following:
  1. Type the following keys, in sequence:
     - [Clear/Stop] .. [1] .. [0] .. [7]
  2. Hold down the [Start] key until the Maintenance Mode screen is displayed.
     - This should take about 3 seconds.
- For P models:
  - To access the SP mode of Smart Organizing Monitor, open the Printer Configuration screen by inputting the field technician access code: “Admin074”

Image Adjustment

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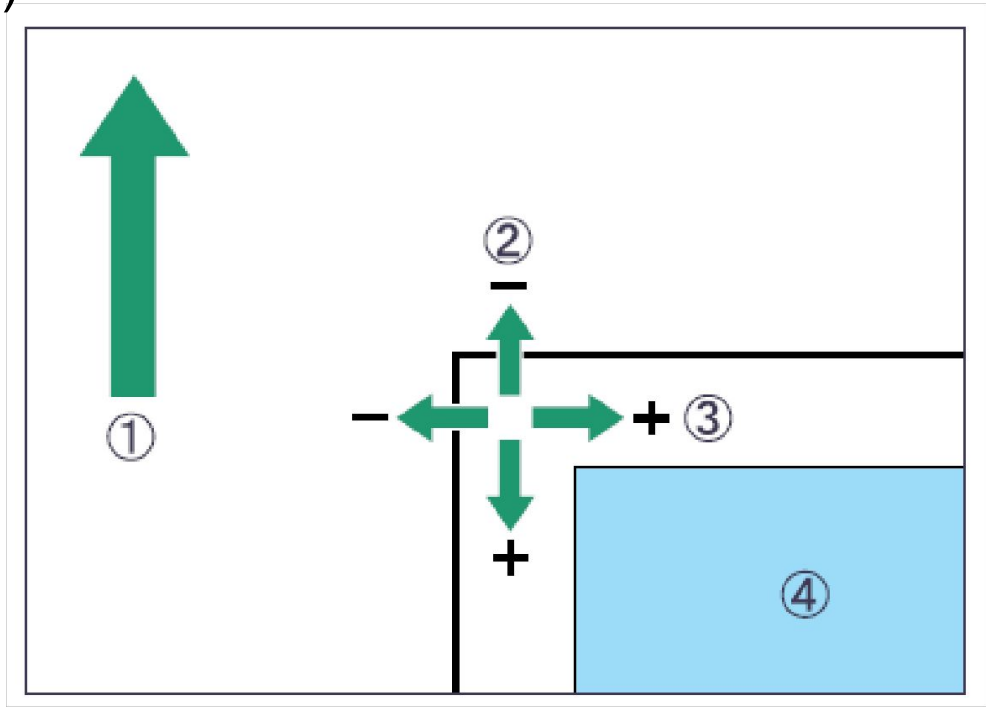
- This adjustment can be done by both service engineers and users.
- Service engineers:
  - Maintenance Mode (MF1)
  - SOM (P1)
- Users:
  - User Mode
- See FSMs (Field Service Manuals) for procedures.



Firmware Updating

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- You need a PC to do the firmware update.
- See the service manual for details on how to update the Machine firmware.

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3. Detailed Section Descriptions

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3.1 Machine Overview

Component Layout – Remy-P1

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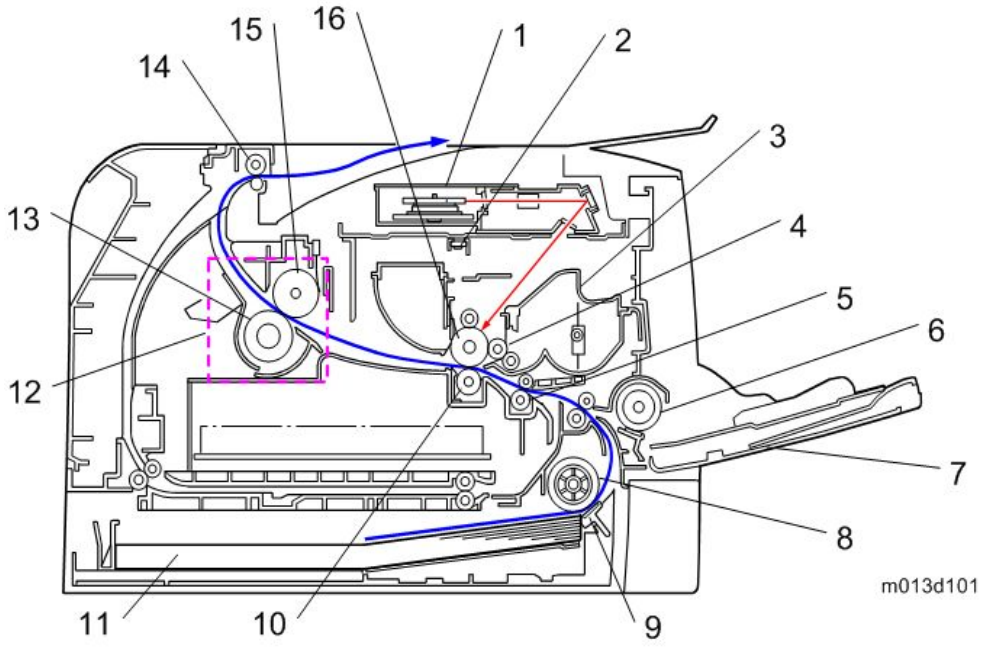
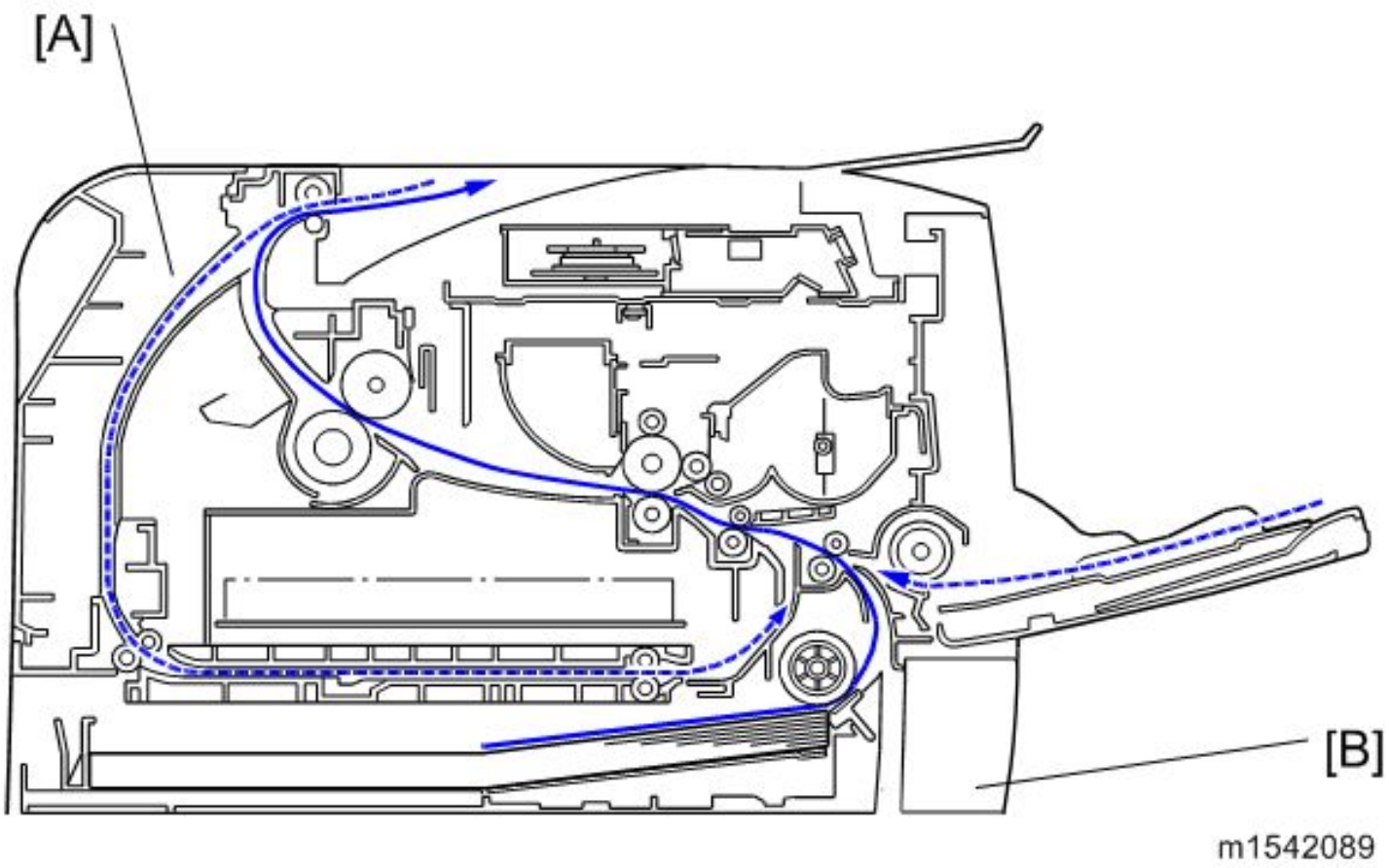


1. Laser unit
2. Quenching lamp
3. Cartridge (AIO-type)
4. Development roller
5. Registration roller
6. By-pass feed roller
7. By-pass feed tray
8. Paper feed roller
9. Friction pad
10. Transfer roller
11. Paper tray
12. Fusing unit
13. Pressure roller
14. Paper exit roller
15. Hot roller
16. Drum

Paper Path – Remy-P1

- [A]: Duplex section
- [B]: Paper tray



Drive Layout – Remy-P1

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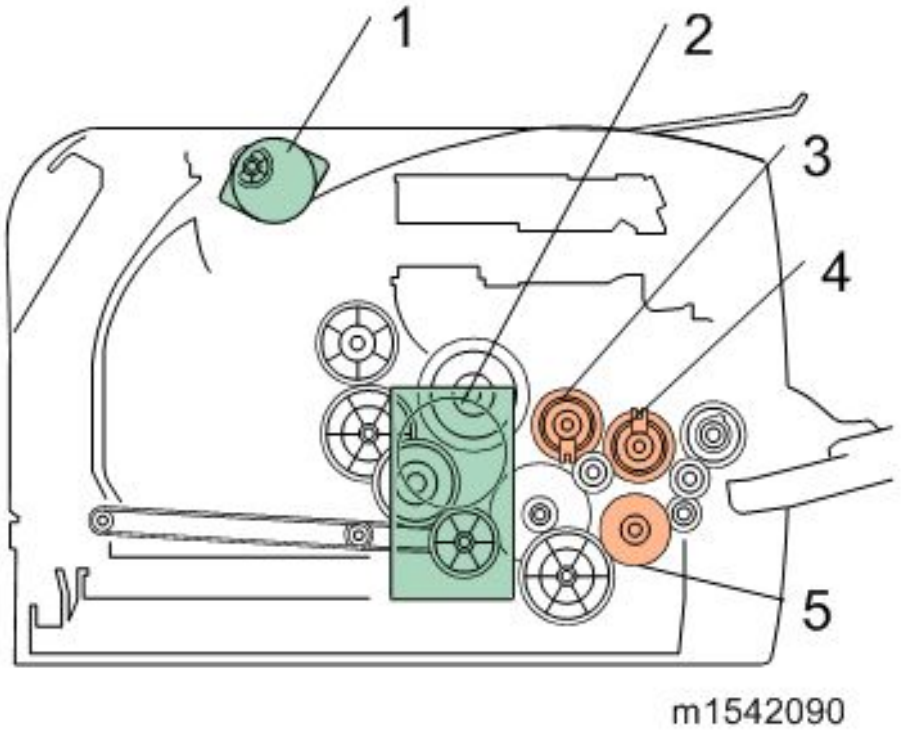
1. Duplex motor
2. Main motor
3. Registration clutch
4. Relay clutch
5. Paper feed clutch



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3.2 Cover Removal & Part Replacement

General Precautions

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- Before you start to work on the machine:
  - If there are printer jobs in the machine, print out all jobs in the printer buffer.
  - Turn off the main power switch and unplug the machine.
- The slides in this presentation only cover a few important points.
  - For full details of all procedures, see the field service manual.
- Follow the notes and cautions in all procedures.

General Precautions

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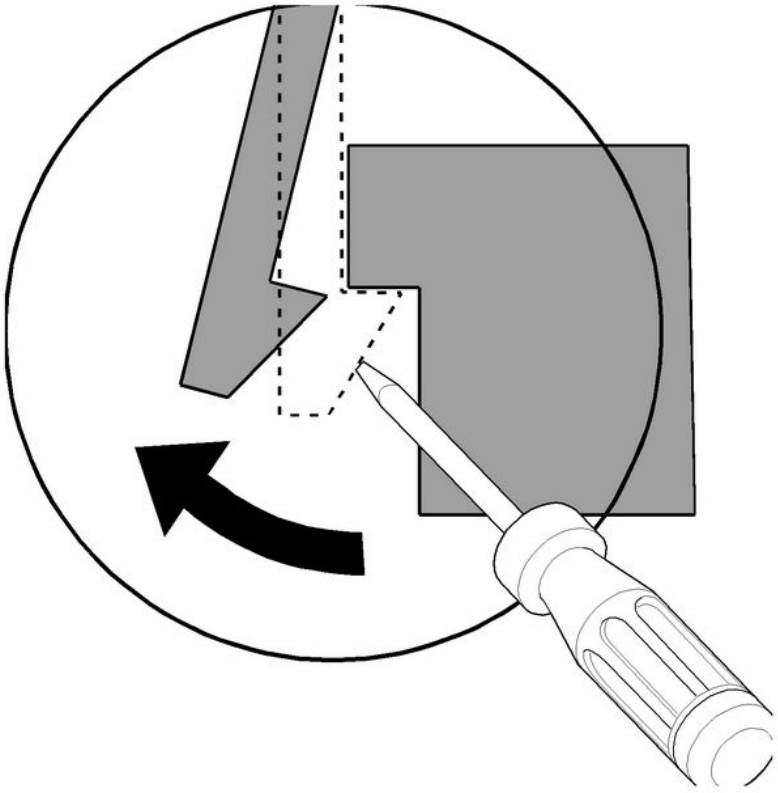
- Many of the parts are held in place with plastic latches which can break easily.
- Release them carefully, pushing the hook end of the latch away from the part to which it is latched.



Removing Covers

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- The covers have a lot of hooks and tabs.
- Disconnect these carefully, as explained on the previous slide.
- See the procedures in the service manual for the locations of the hooks and tabs, and follow the instructions carefully to remove the covers properly.

Re-installing the Top Cover

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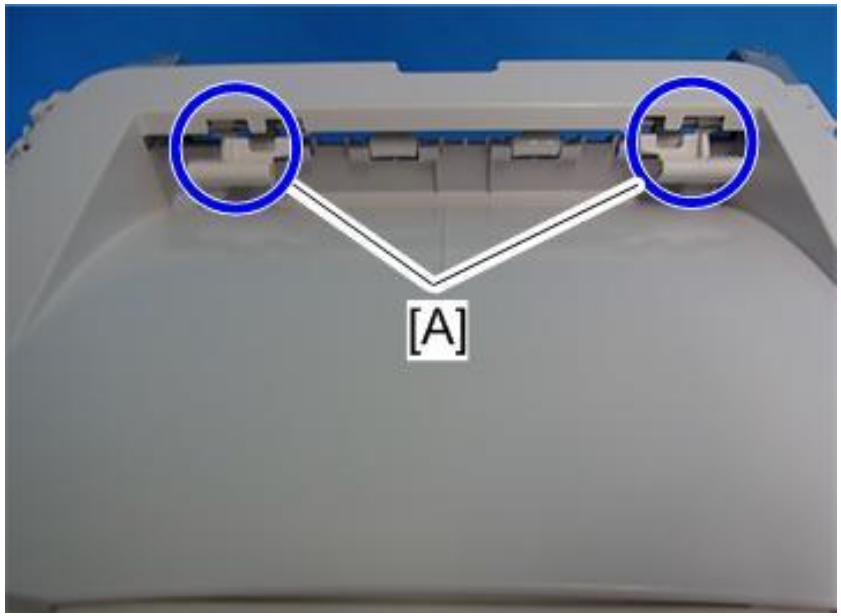
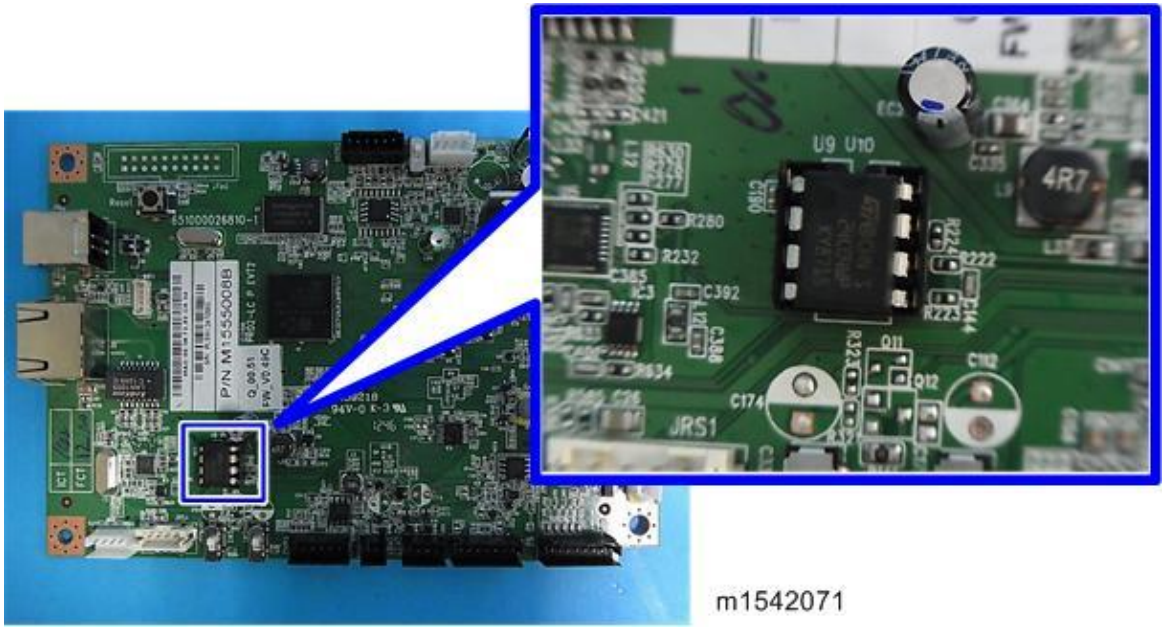
- When re-installing the top cover, always verify that the two paperweights [A] are lifted.
  - If they are not lifted to fit into the paper slot, the paperweights could be damaged.
- Make sure that these paperweights can be moved smoothly (up and down) after installing the top cover.
  - If these paperweights do not move smoothly, install the top cover again.



Replacing the Main Board

- Do not connect any connectors to JRS1 and JRS2 when reinstalling the main board [A]. (Factory use only)
- Do not adjust the dip switch. (Factory use only)
- Remove the EEPROM from the old board (see below), and install it on the new board.



Install a New EEPROM

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- Do the following settings after installing a new EEPROM.
  - Input the PnP Name and Destination in Service Mode.
  - Adjust the Registration in Service Mode.
  - Input the serial number
    - Ask your supervisor about how to access the serial number input display.

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3.3 ADF

Components

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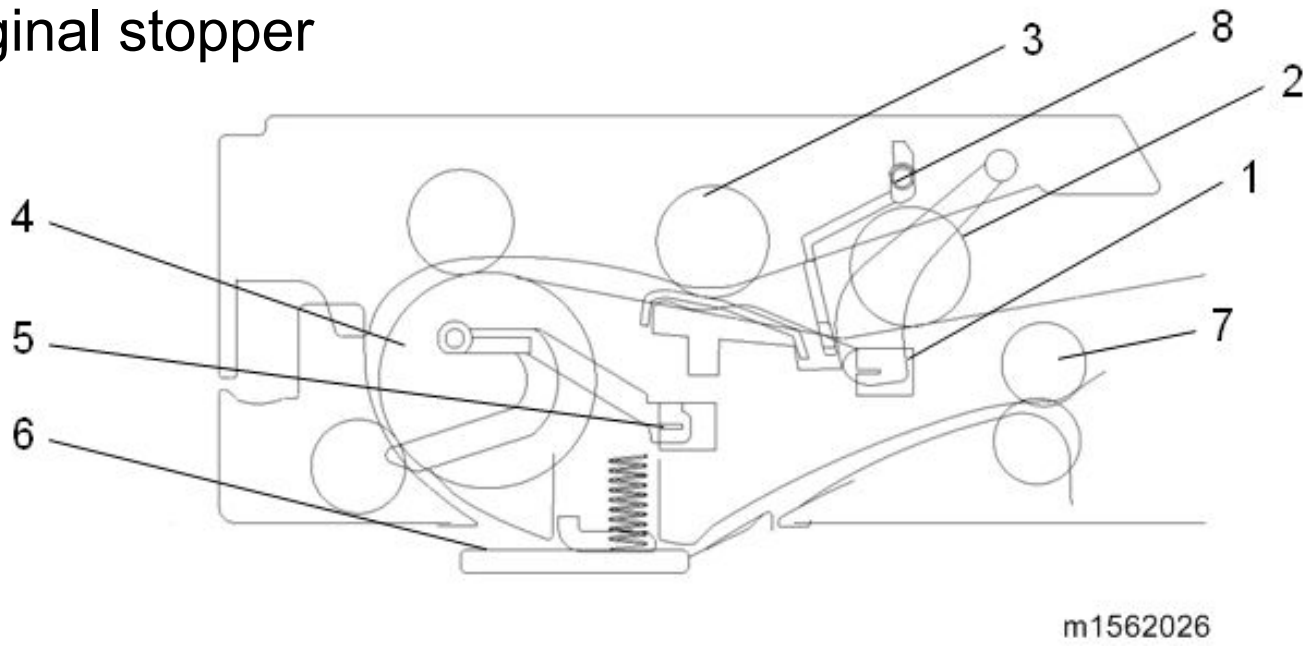
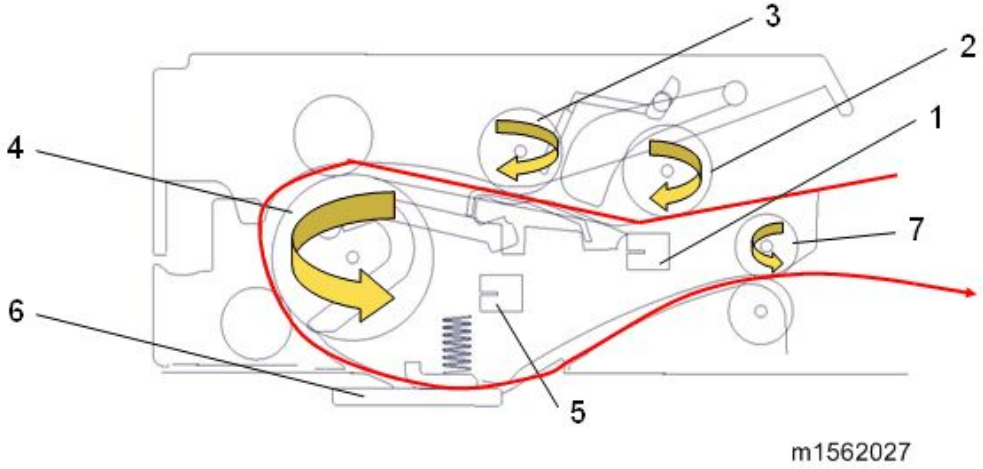
1. Document set sensor
2. Pick roller
3. Separation roller
4. Feed roller
5. DF Exposure glass
6. Original stopper



Paper Path

- When the document set sensor [1] detects an original, the ADF motor rotates to drive the pick roller [2], separation roller [3] and feed roller [4] to feed the original to the feed sensor [5].
- If the feed sensor [5] does not detect the paper, the machine determines that an original jam has occurred.
- If the feed sensor [5] detects paper, then scanning starts by the CIS through the DF exposure glass [6].
- After scanning, the output roller [7] will eject the paper.



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3.4 Scanner

Overview

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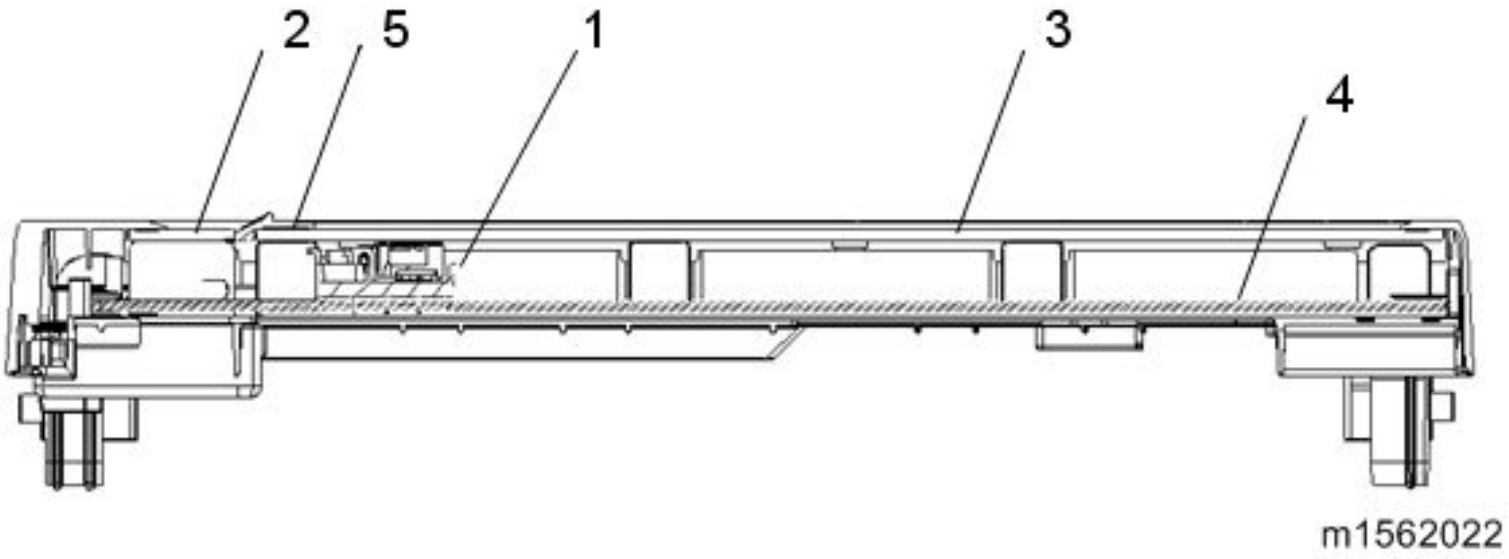
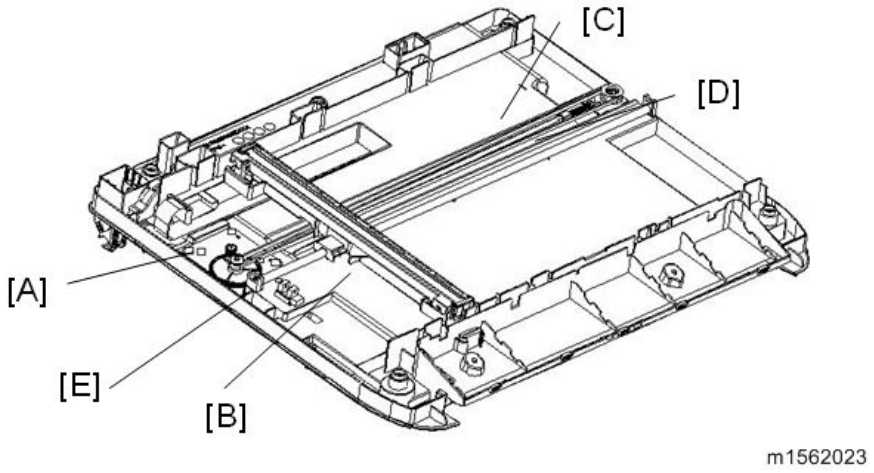
1. Scanner carriage unit
2. DF Exposure glass
3. Scanner exposure glass
4. Carriage drive shaft
5. White sheet



Drive

- Scanner motor [A]: Drives the scanner carriage unit [B] through gears and a timing belt [C].
- Scanner carriage unit: Moves along the carriage drive shaft [D].
- Carriage home position sensor [E]: Detects home position when initializing the scanner or before/after scanning.
- The scanner carriage unit moves to read the white sheet (see the previous slide) before every scan to adjust white level.



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3.5 Laser Exposure

Laser Path

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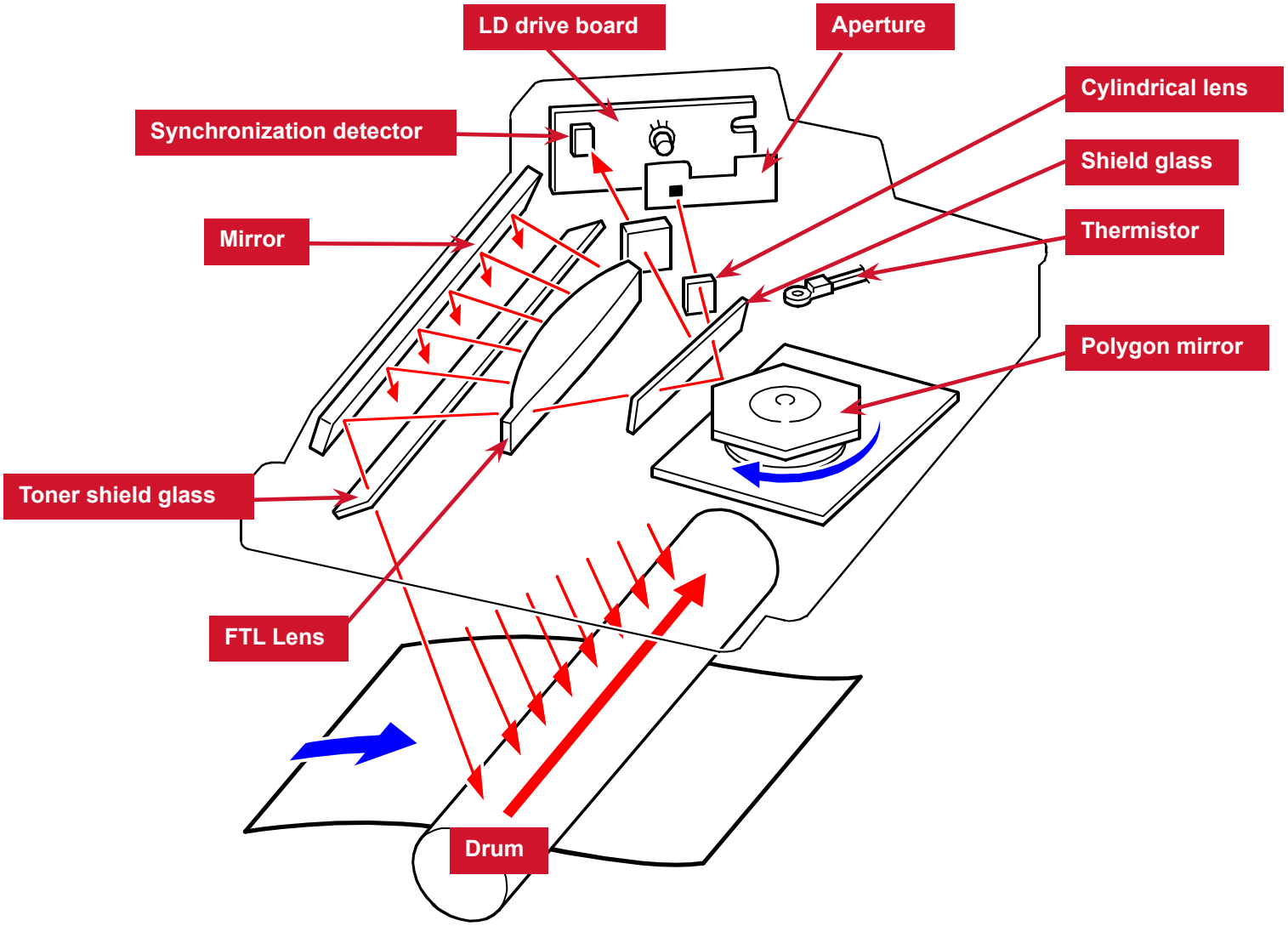

Automatic Power Control (APC)

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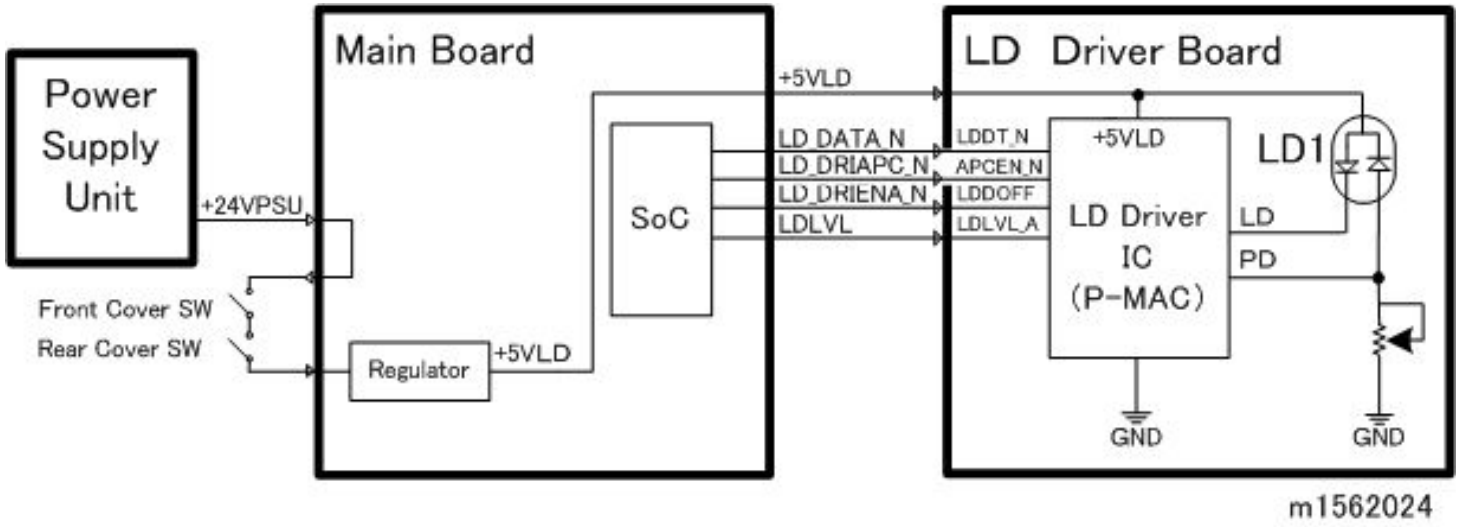
- The LD driver on the LD drive board automatically controls power for the laser diodes.
  - Laser diode power is adjusted at the factory.
- Note: Never touch the variable resistors on the LD unit in the field.



LD Safety Switches

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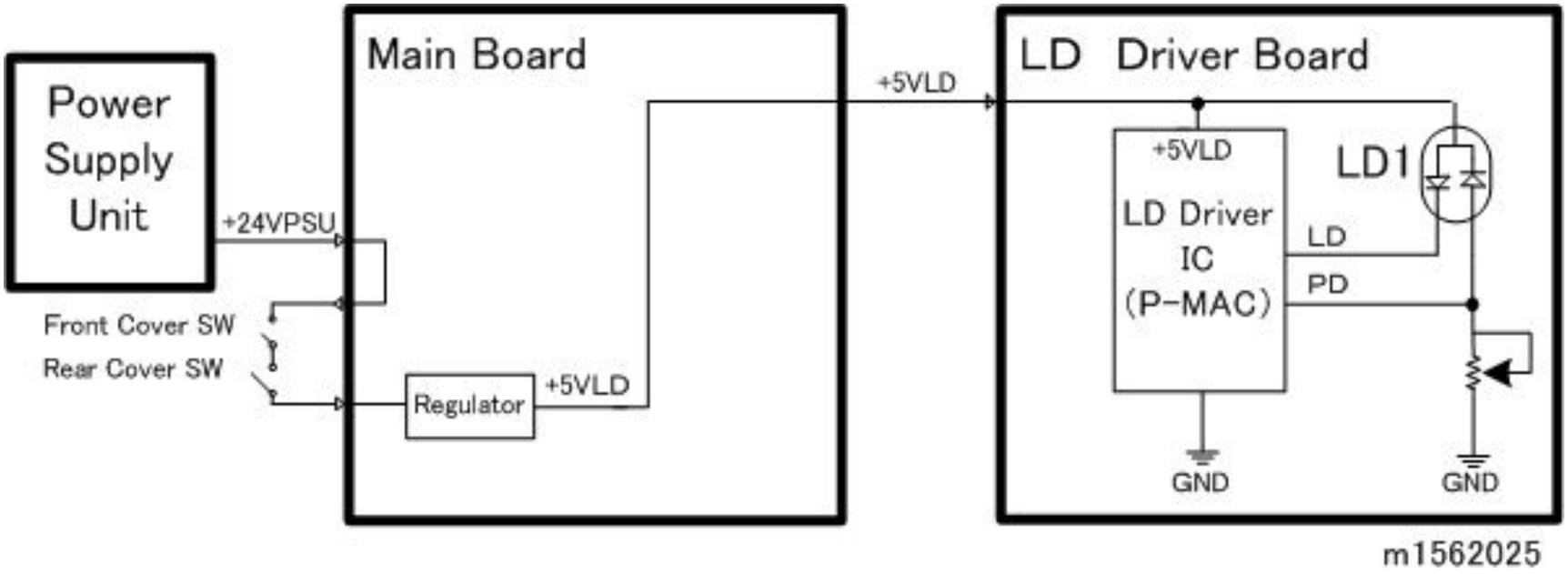
- There are safety switches on the front and rear covers.
- When these covers are opened, the +5VLD power to the laser diodes is stopped.



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3.6 AIO

Cartridge Overview

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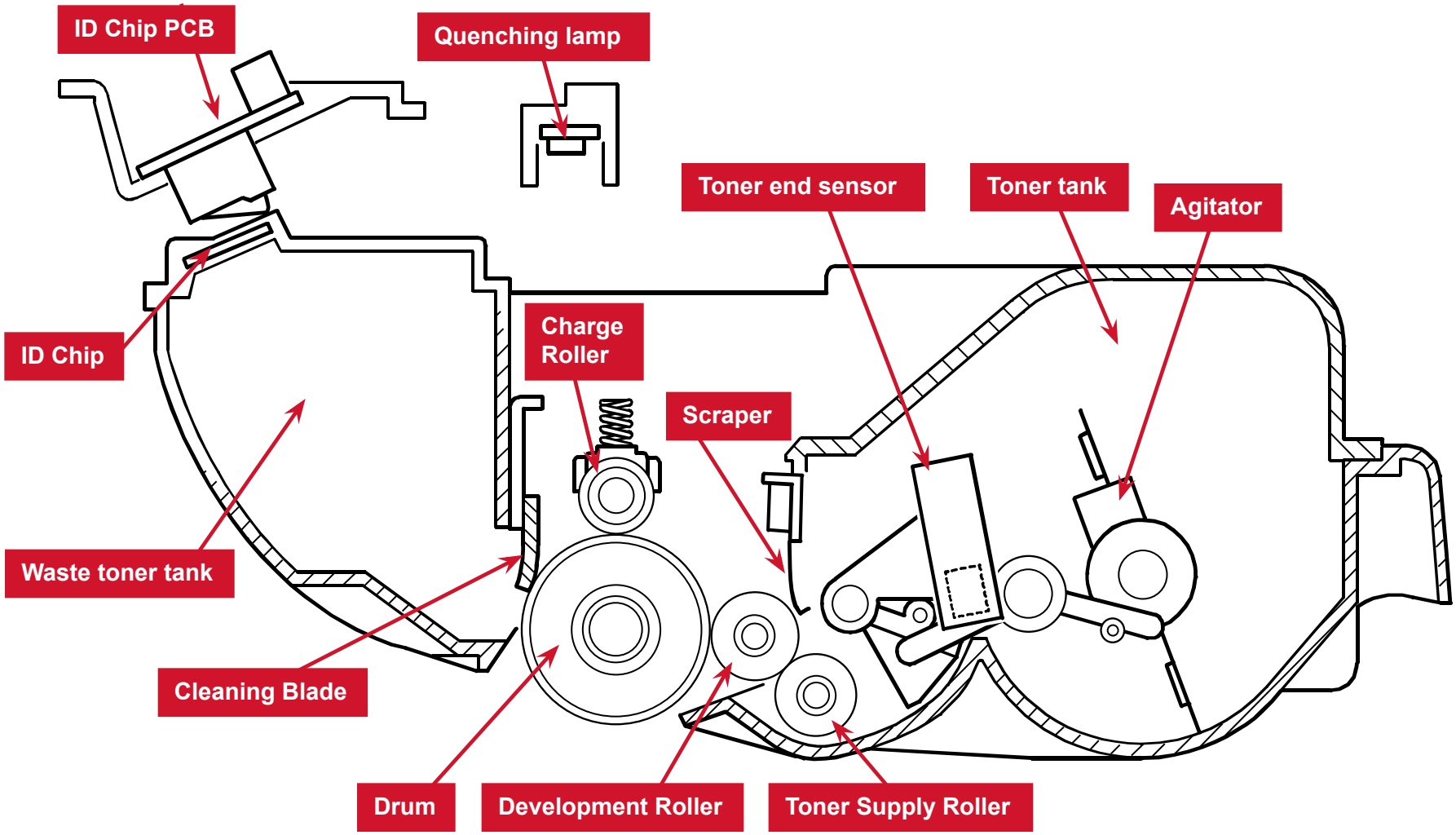
- This is an "AIO" (All In One) type cartridge.



Drum Charge

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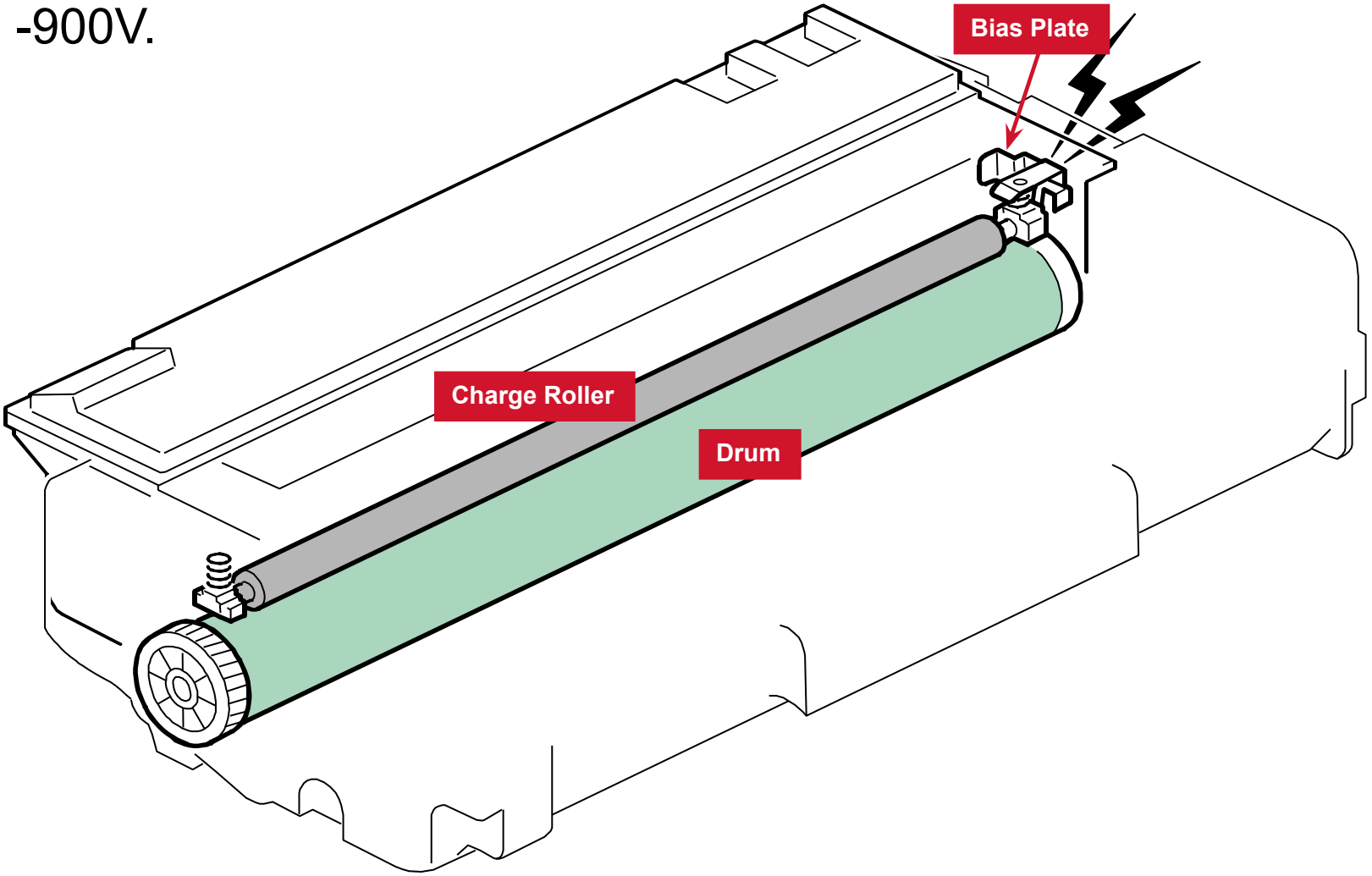
- The charge roller gives the drum surface a charge of about -900V.



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3.7 Toner Supply and Development

Toner End Detection

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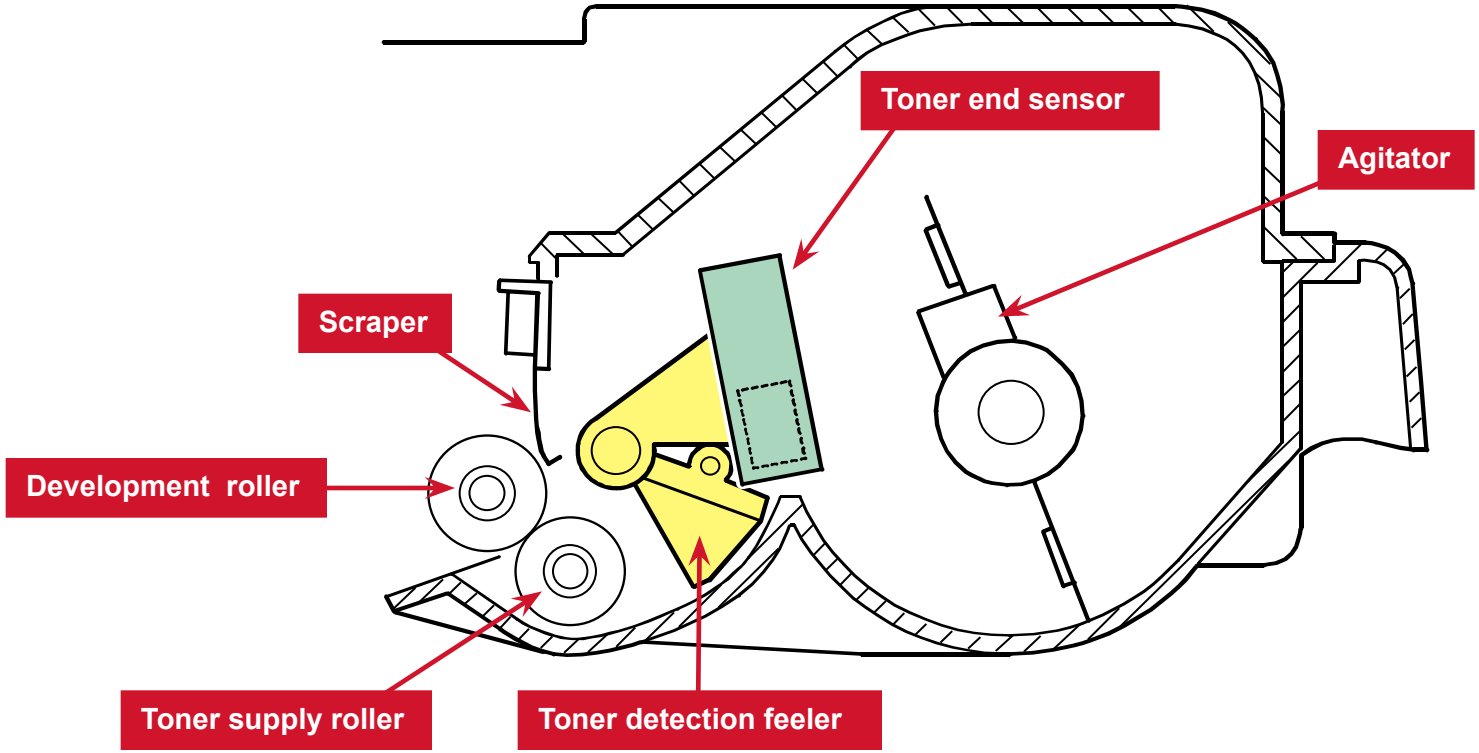
- The toner detection feeler comes down when the toner tank is out of toner, and then the toner end sensor detects toner end.
  - At this time, the machine displays “Low on Toner”.
- After additional pages have been printed, printing stops and “Replace Printer Cartridge” remains in the display.



Toner End Sensor

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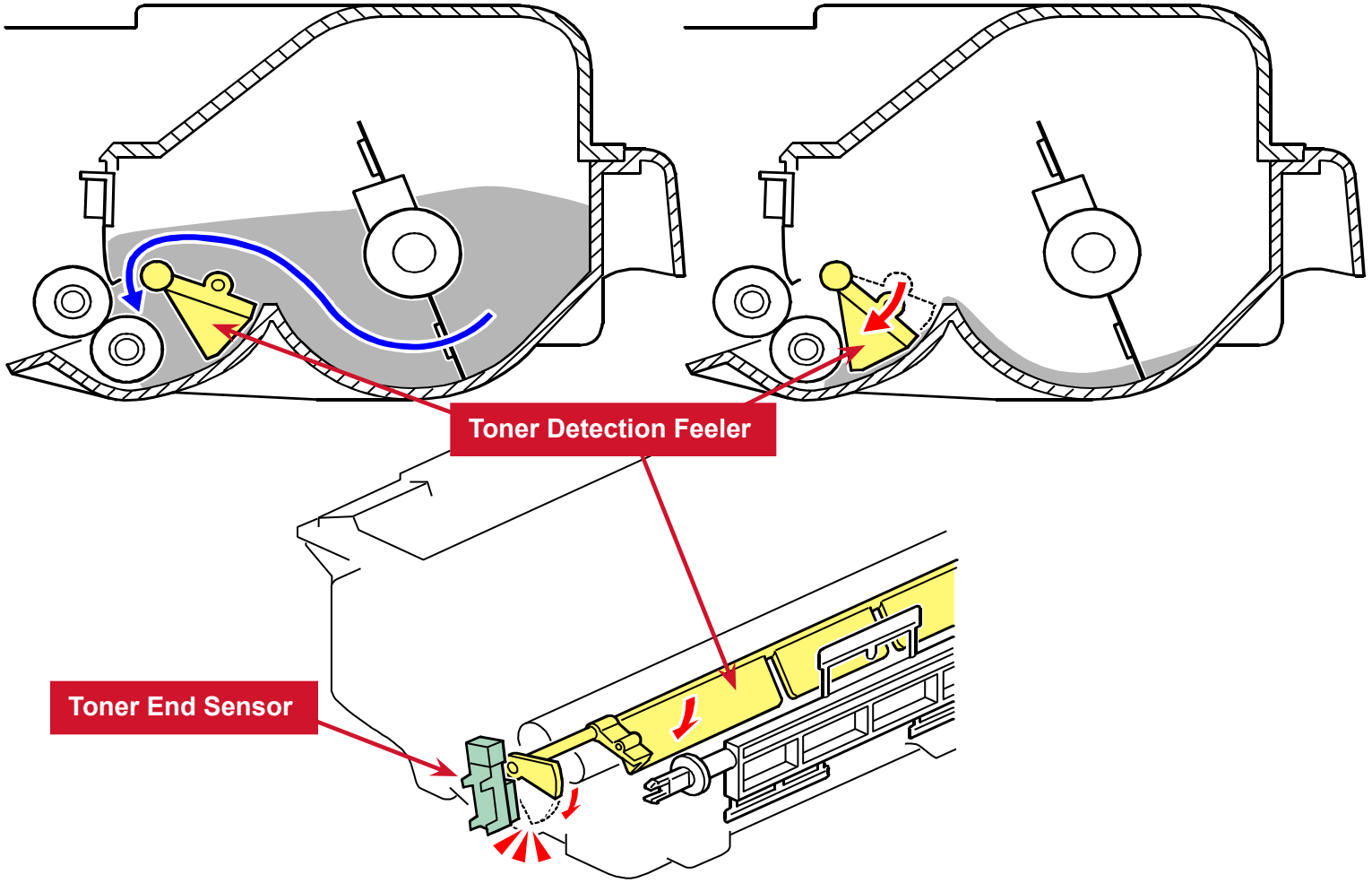

Toner Overflow Prevention 1/2

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- Main Motor Rotation Count
  - Time to replace the AIO cartridge can also be determined by the length of time the main motor has been rotating.
  - When toner end is detected in this manner, ‘Replace Print Cartridge’ is displayed alternately with ‘Ready’.
- Toner Overflow Prevention
  - With the main motor rotation count feature, the machine can be set to stop printing after the print total exceeds a certain set value.
  - If the print count exceeds this value, then ‘Replace Print Cartridge’ remains on the display and a new AIO cartridge must be installed.
  - This feature is a safety measure to prevent the used toner tank from becoming full (there is no toner overflow detection mechanism).

Toner Overflow Prevention 2/2

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- Why do we need this feature?
  - Normally, the AIO is replaced by users.
  - When users do a refill of the AIO with toner, and re-use them, the used toner tank will not be emptied.
    - So there must be a way to stop users from repeatedly filling old AIOs with fresh toner.
  - The toner overflow prevention is disabled by default and can be enabled in the field.
- How does the machine know if an AIO is a new one?
  - Each AIO has serial number information on a chip. The machine checks this number when an AIO is placed.

AIO Replacement

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- The new AIO is detected by the machine with the ID chip when it is installed.
- When a new AIO is detected, the toner counter is reset automatically.
- The AIO can be easily removed and replaced by the user.
  - For more details, please refer to the operating instructions.

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3.8 Transfer & Separation

Image Transfer & Paper Separation

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- The PSU supplies positive current to the transfer roller, attracting toner from drum to paper.
  - Current is set in accordance with paper type, size, and feed tray.

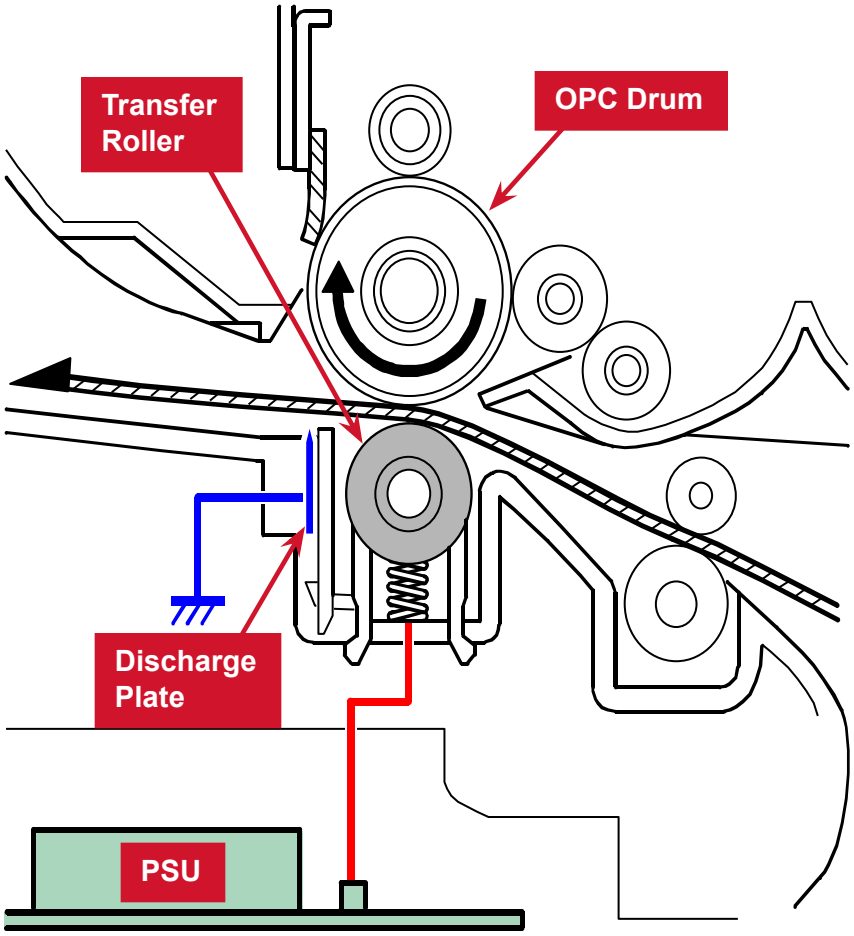

Image Transfer Current Timing

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- There are two transfer current levels: low and high.
  - Low level: Before image transfer starts, the PSU supplies +10uA to the transfer roller to prevent positively charged toner from sticking to the drum.
  - High level: During image transfer, the PSU supplies high current to the transfer roller to attract toner to the paper.
- When the trailing edge of the paper has passed the transfer roller, the PSU stops supplying transfer current.
  - If the machine is printing more pages, the PSU supplies low level current.
- You can adjust these levels, but when increasing the transfer current level, use caution:
  - Increasing the transfer current level may produce ghost images.
  - Increasing the transfer current level might damage the drum.

Transfer Roller Cleaning

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- In case of a paper jam or printing on smaller paper than the image, toner can adhere to the roller surface.
- Periodic cleaning of the roller is required to prevent this toner from migrating back to the rear of new printouts.
- The roller is cleaned automatically at the following times:
  - After initial power on
  - After clearing a copy jam
  - At job end (if at least 10 sheets have been printed since last cleaning)
- To clean the roller, the PSU does the following:
  - Supplies negative cleaning current (about -4uA) to the transfer roller to move negatively charged toner back to the drum.
  - Supplies positive cleaning current (about +5uA) to the transfer roller to move positively charged toner back to the drum.

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3.9 Paper Feed

Paper Tray

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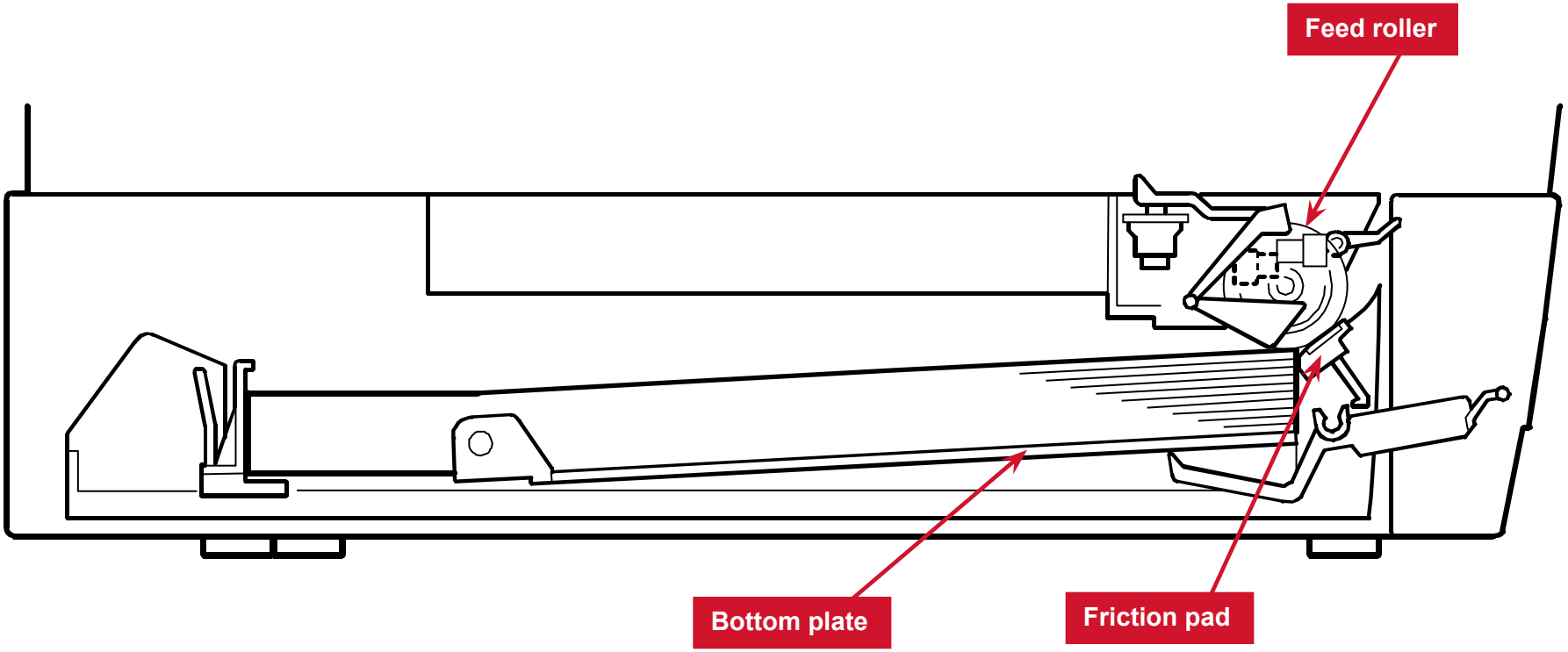
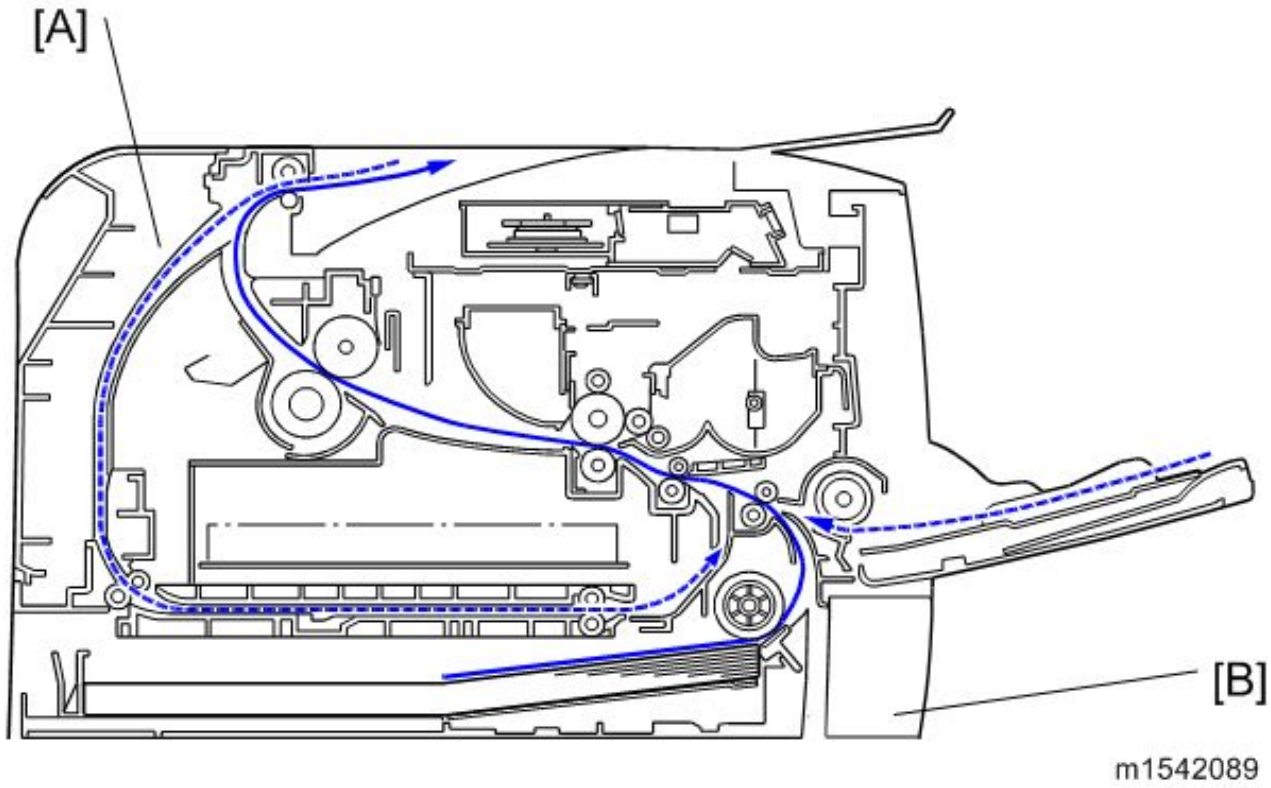
- The tray capacity is 250 sheets.



Paper Path

- [A]: Duplex section
- [B]: Paper tray



Paper Tray Extension Locks

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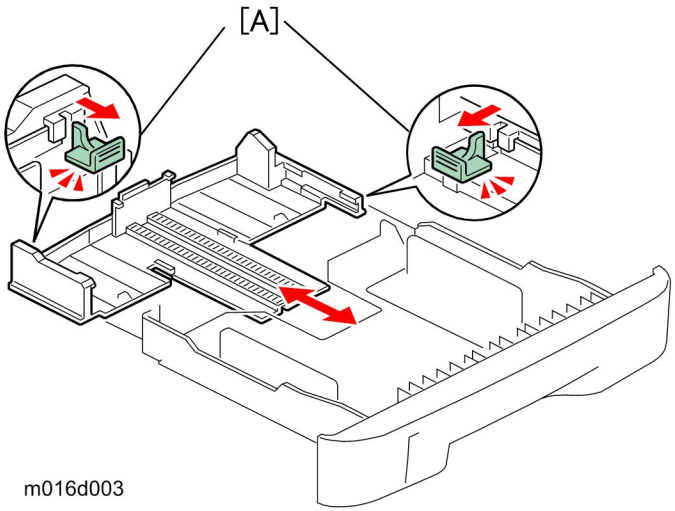
- The user can extend the tray manually to hold paper longer than A4/Letter size.
- To use longer paper:
  - Release the two locks [A]
  - Extend the tray and close the locks.
- Verify that the paper tray extension locks are properly locked before reinserting the paper tray.



Automatic Bottom Plate Positioning

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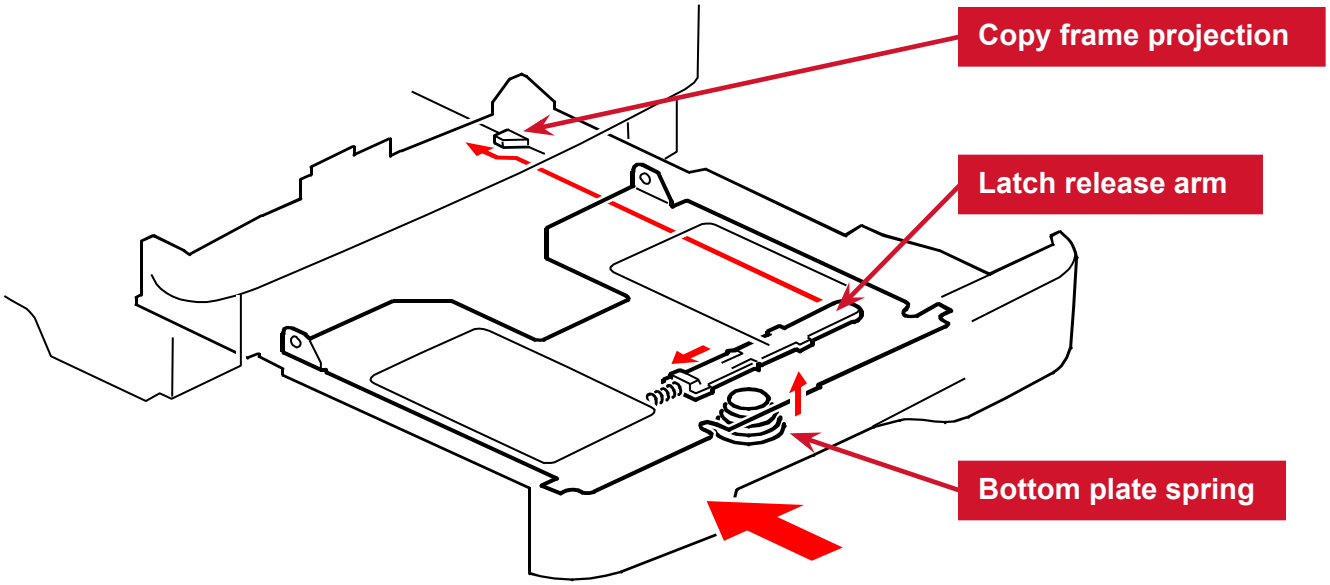
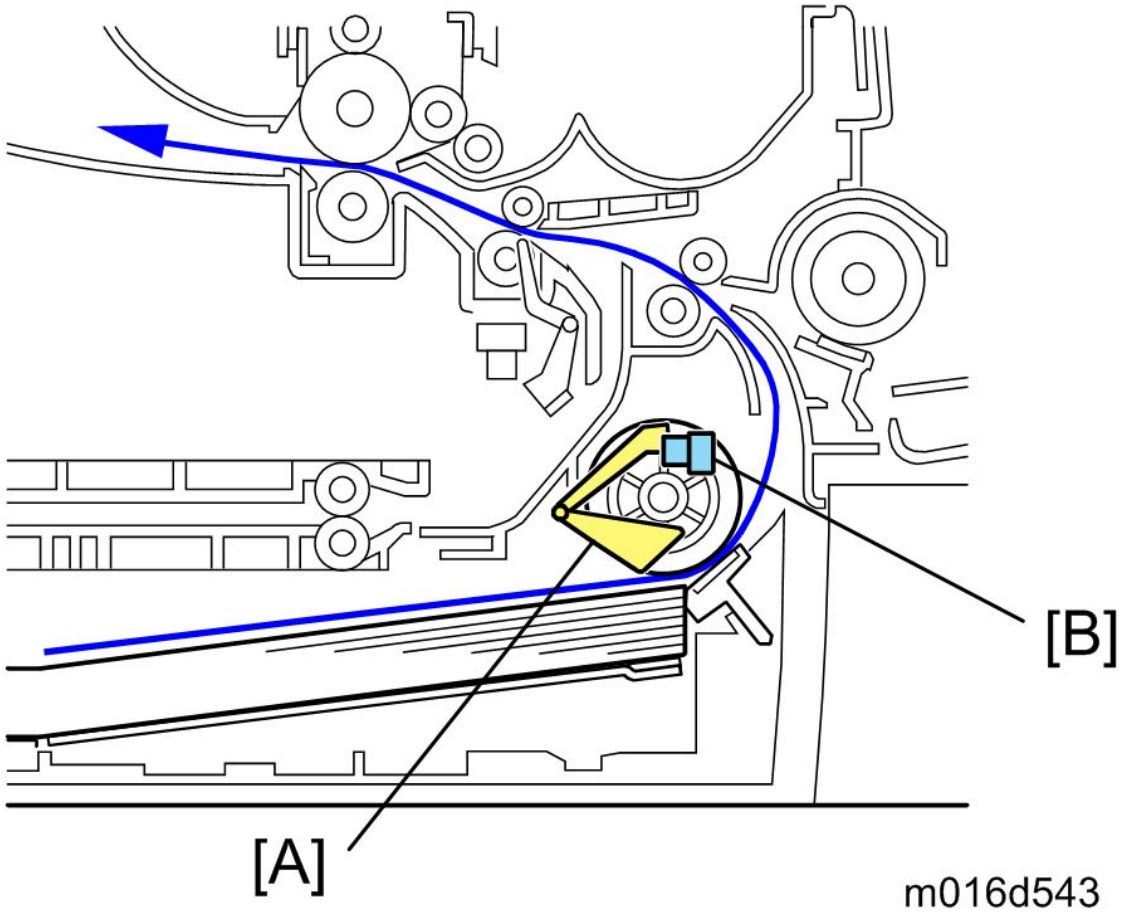
- When the paper tray is inserted into the machine, a projection on the copier frame pushes the latch release arm, enabling the spring to lift the bottom plate.
- The bottom tray does not need to be locked down when reinserting - it is automatically pushed down.



Paper End Detection

- When there is no paper in the tray, the feeler [A] falls into the cutout in the bottom plate, triggering the paper end sensor [B].



By-pass Tray 1/3

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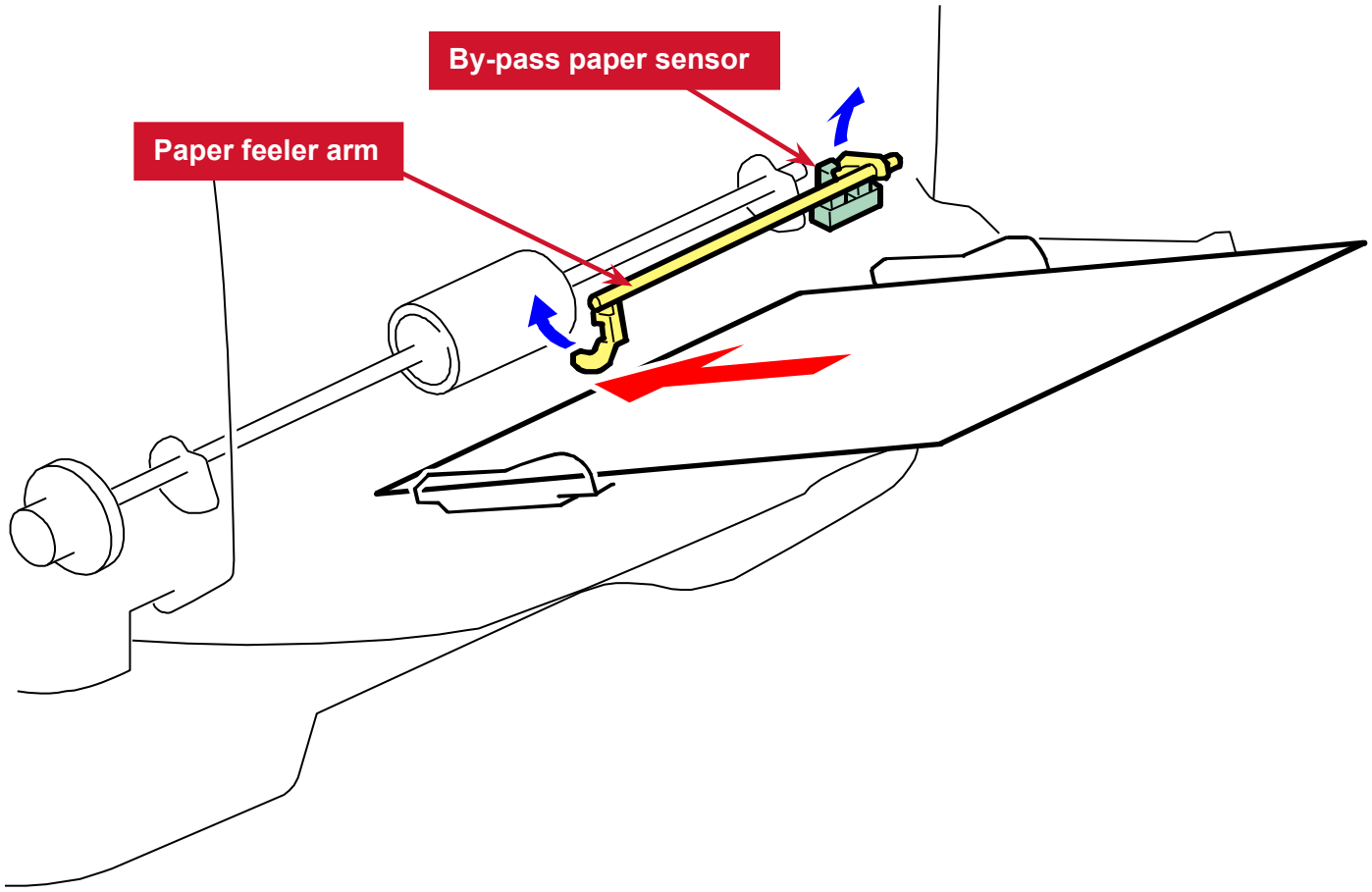
- Paper in the by-pass tray is detected by the by-pass paper sensor, via the paper feeler arm.



By-pass Tray - 2/3

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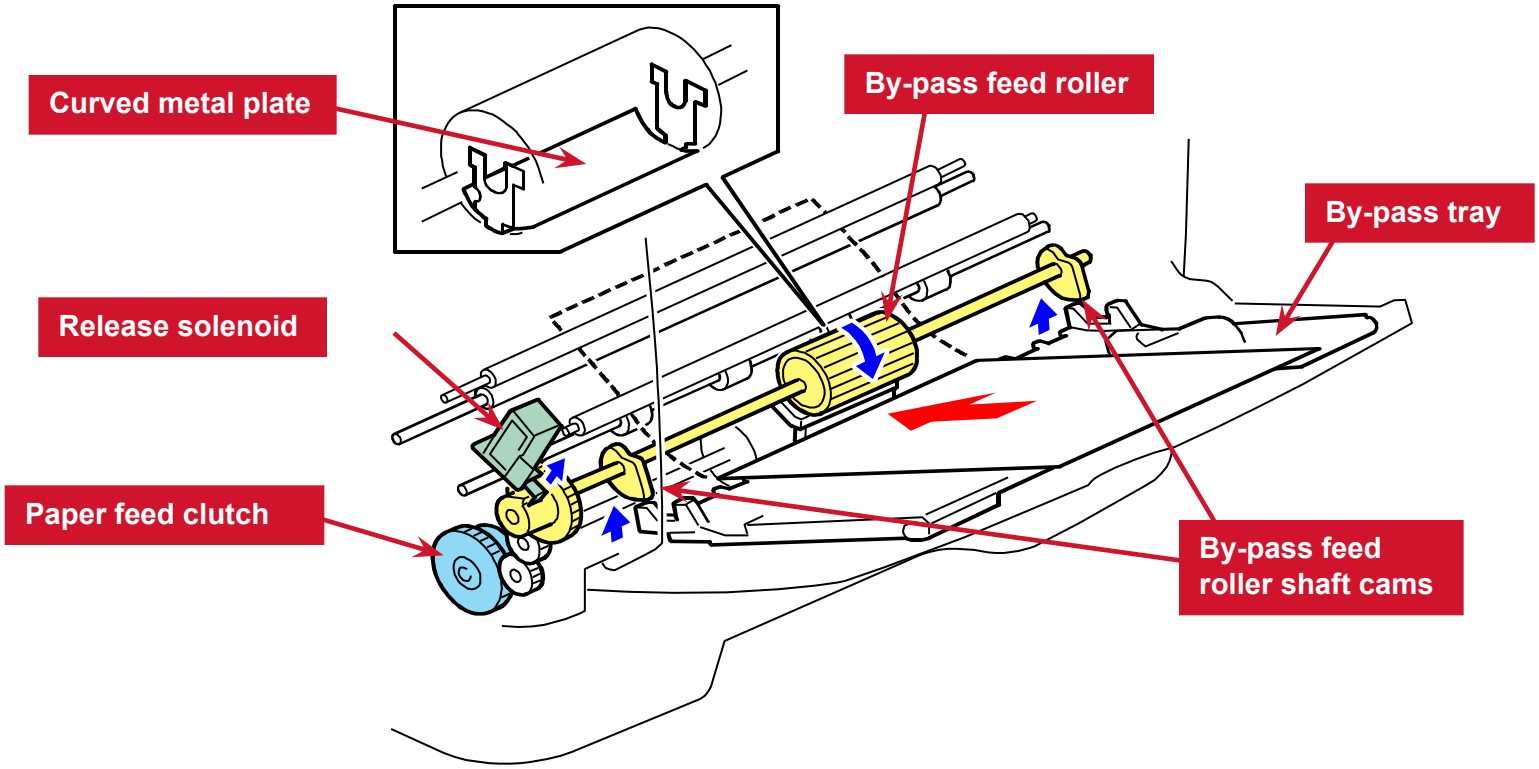
- Power from the main motor is provided via the paper feed clutch.
- Feed begins when the release solenoid releases the latch, enabling the by-pass feed roller to turn.
- Simultaneously, two cams on the by-pass feed roller shaft lift the by-pass tray, pushing paper up against the by-pass feed roller.



By-pass Tray 3/3

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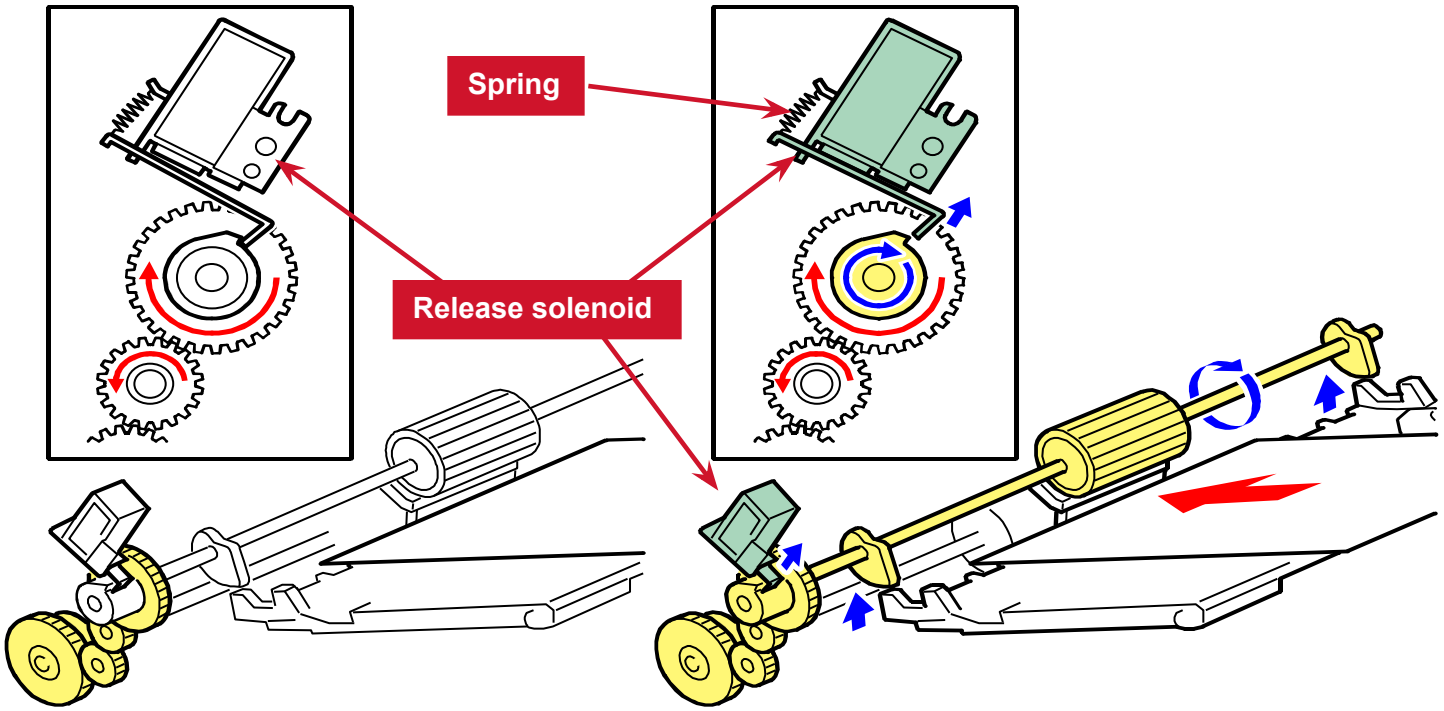
- The by-pass paper feed roller stops after each rotation due to the on/off movement of the solenoid.
  - When off, the spring pulls the latch back down and it catches on the cog.
- The by-pass tray lowers slightly after feeding, and the curved metal plate on the by-pass paper feed roller allows paper to pass the roller upon completion of each rotation while paper is still feeding.



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3.10 Fusing & Paper Exit

Overview

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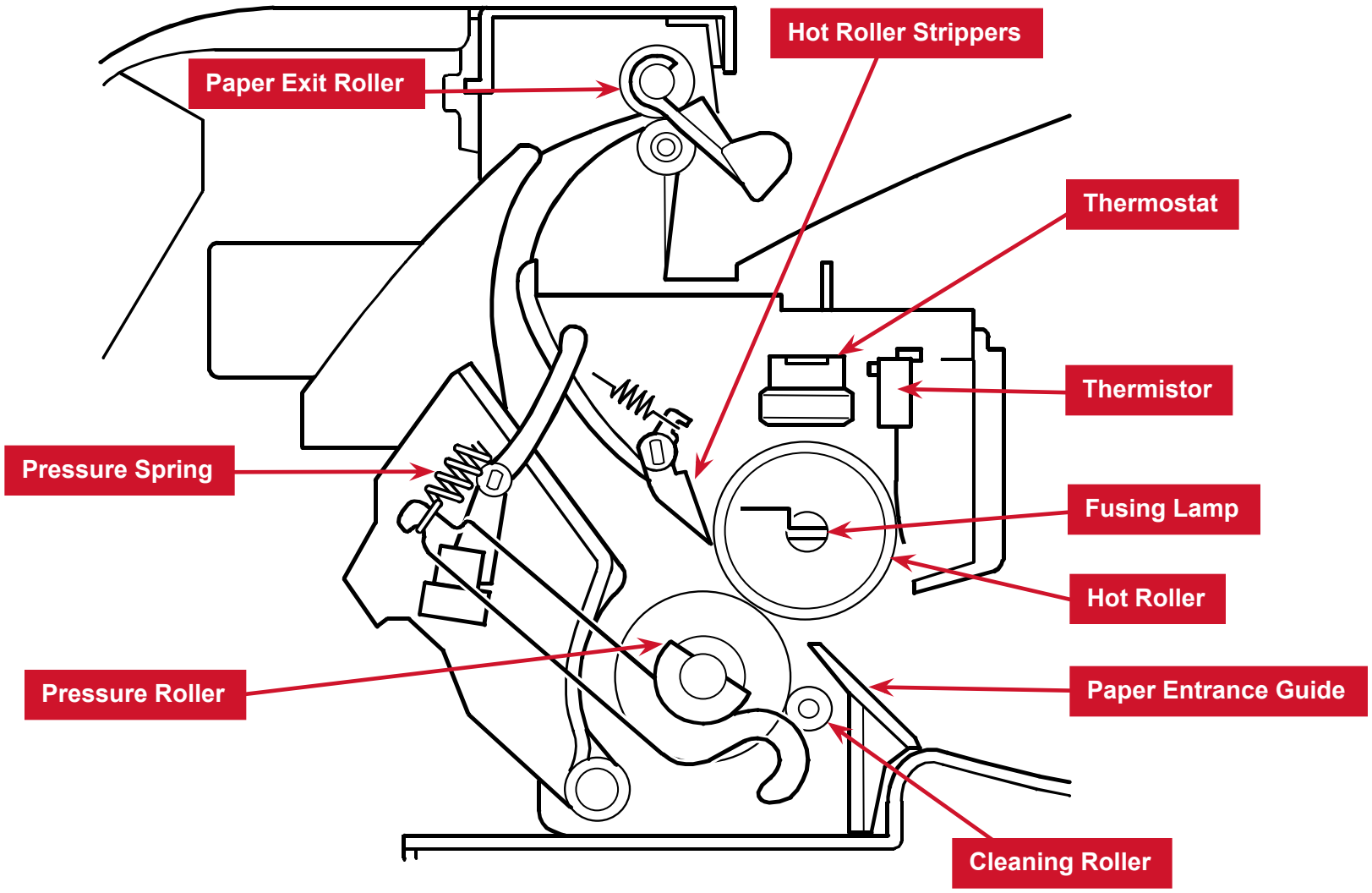

Fusing Unit Layout

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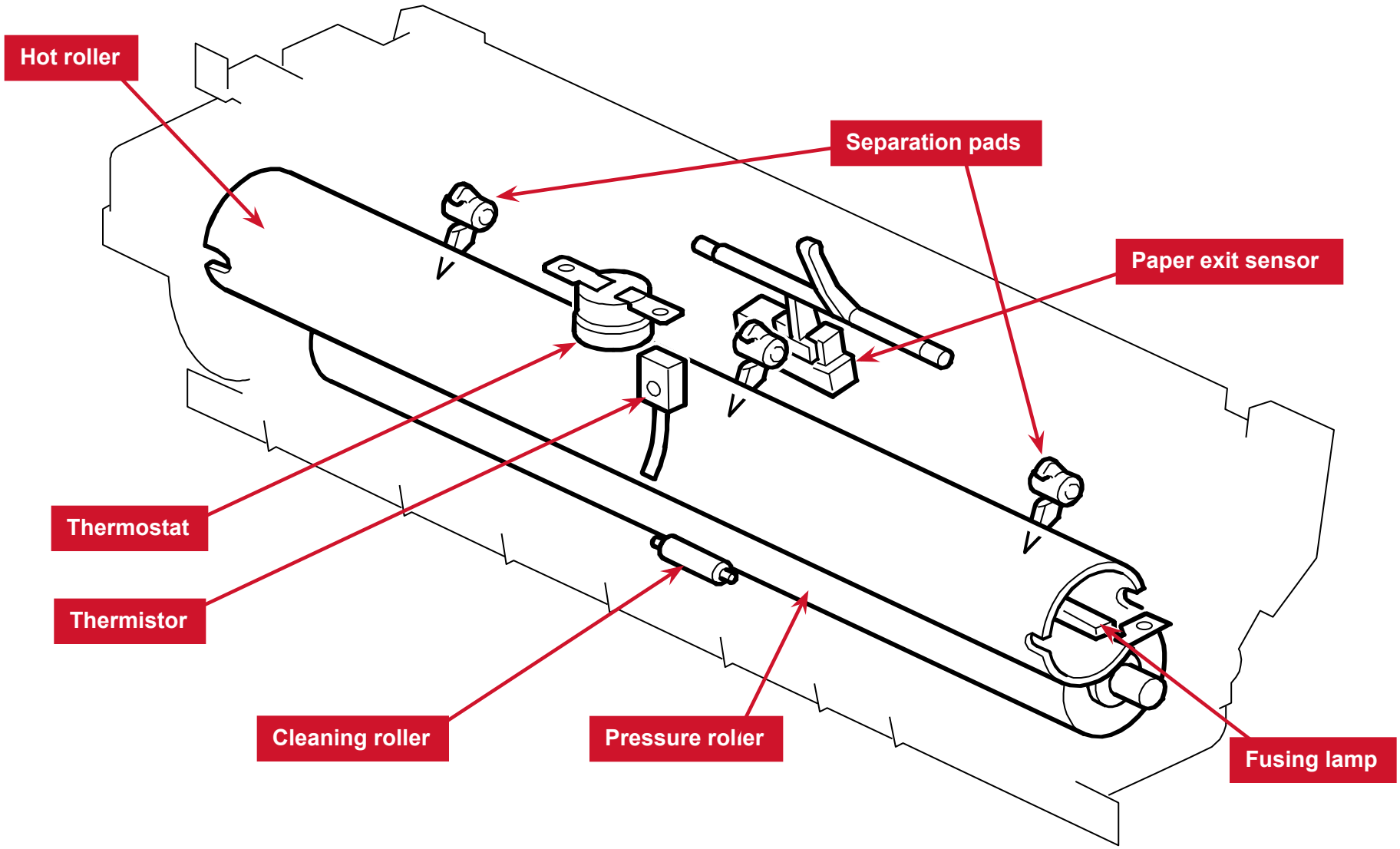

Fusing Drive

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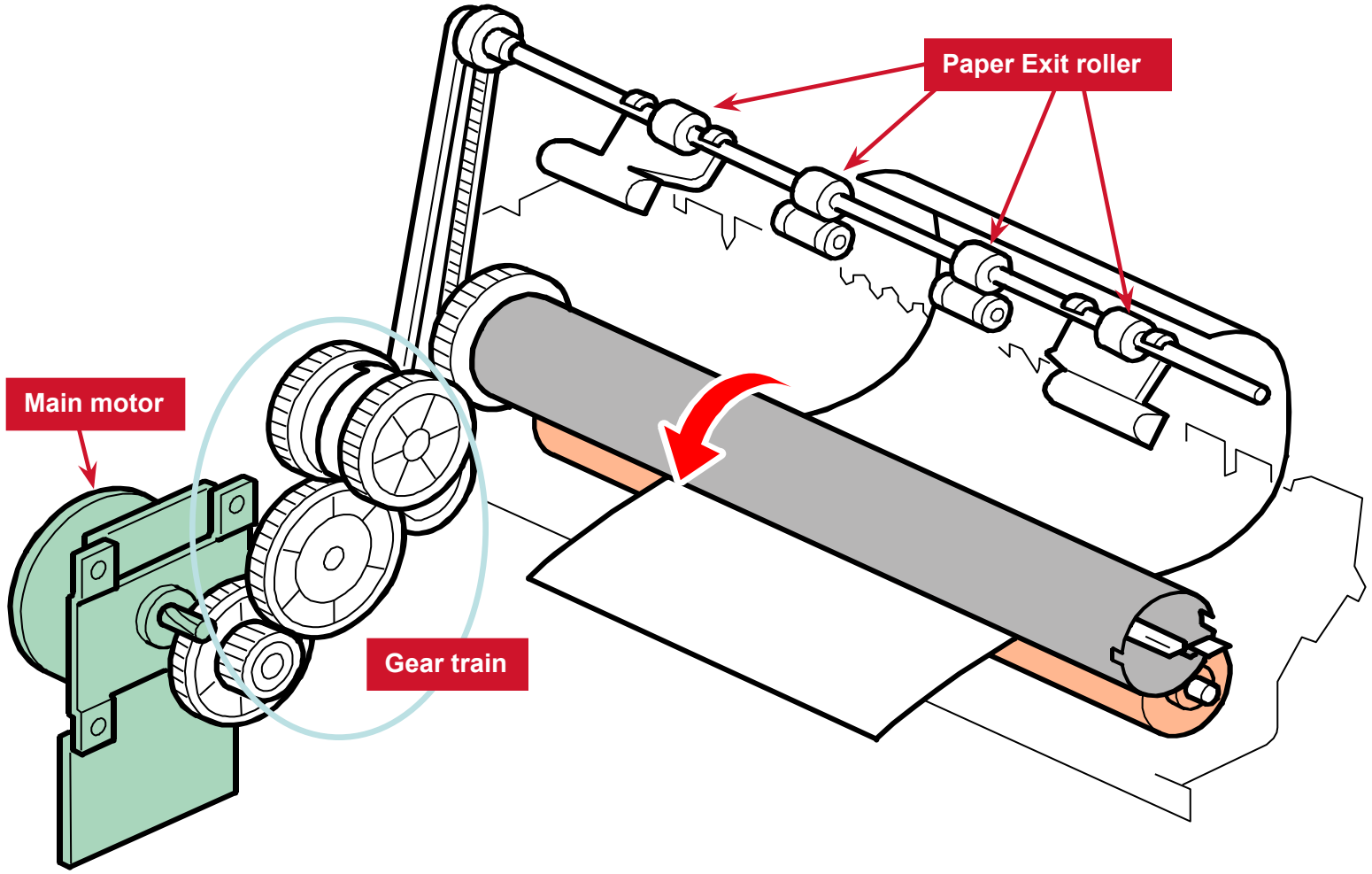
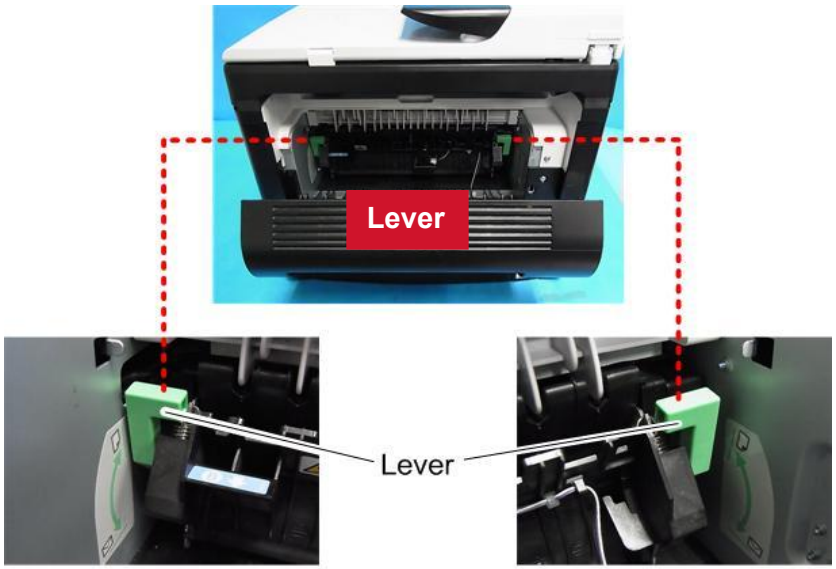
- The main motor drives the fusing unit through a gear train.



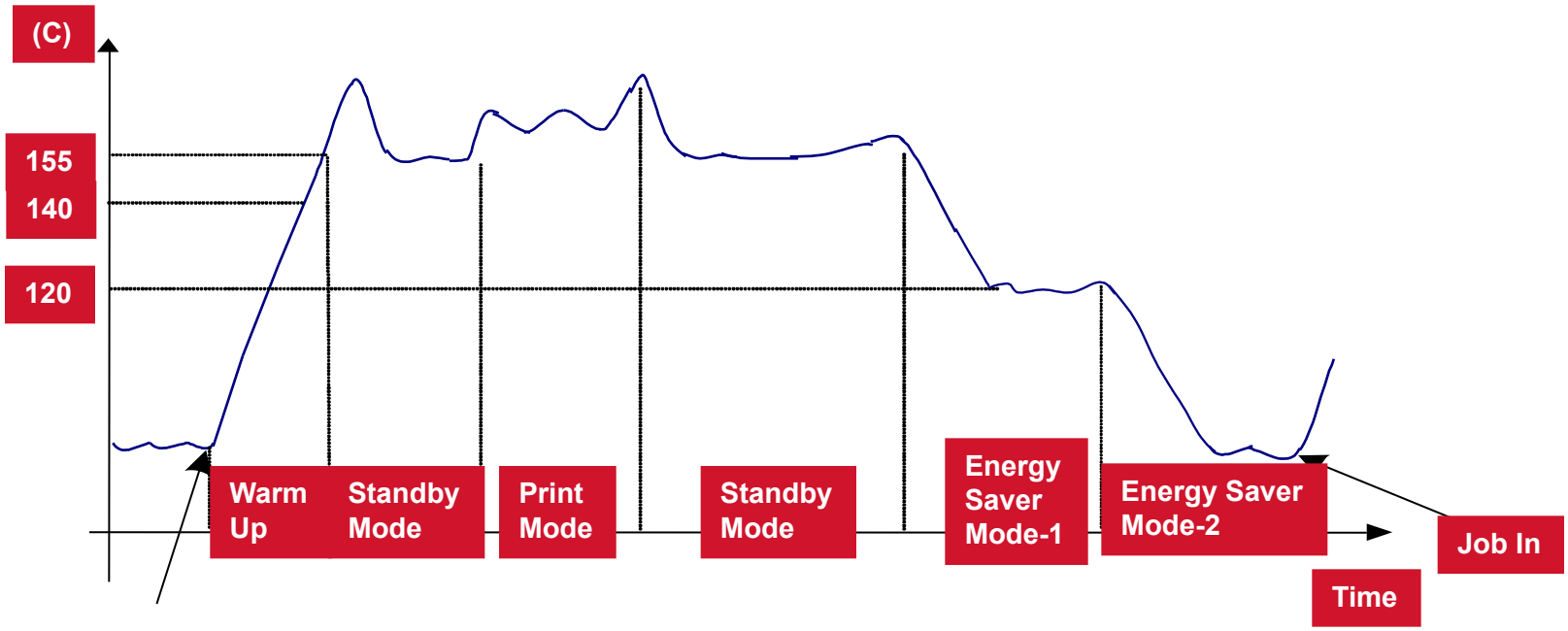
Envelope Levers

- Envelope levers are provided on the right and left sides of the fusing unit.
- When the lever is pulled down, the fusing pressure decreases (approx. 55% of normal).
  - This reduces wrinkles on the envelope.
- There is no sensor to detect the lever position, so the user must make sure to pull up the lever after printing on an envelope.
- At the time of shipment, the lever is lowered (envelope mode) to prevent deformation of the pressure roller.
- When the machine is not used for a long time, leave the lever down.



Fusing Temperature Control

- When the main switch is turned on, the CPU turns on the fusing lamp using the soft start process.
  - The soft start process prevents room lights from flickering.
- The lamp stays on until the thermistor detects the standby temperature.
- Then the CPU maintains this temperature using on-off control.
- To start printing, the CPU raises the temperature to the printing temperature.



Overheat Protection

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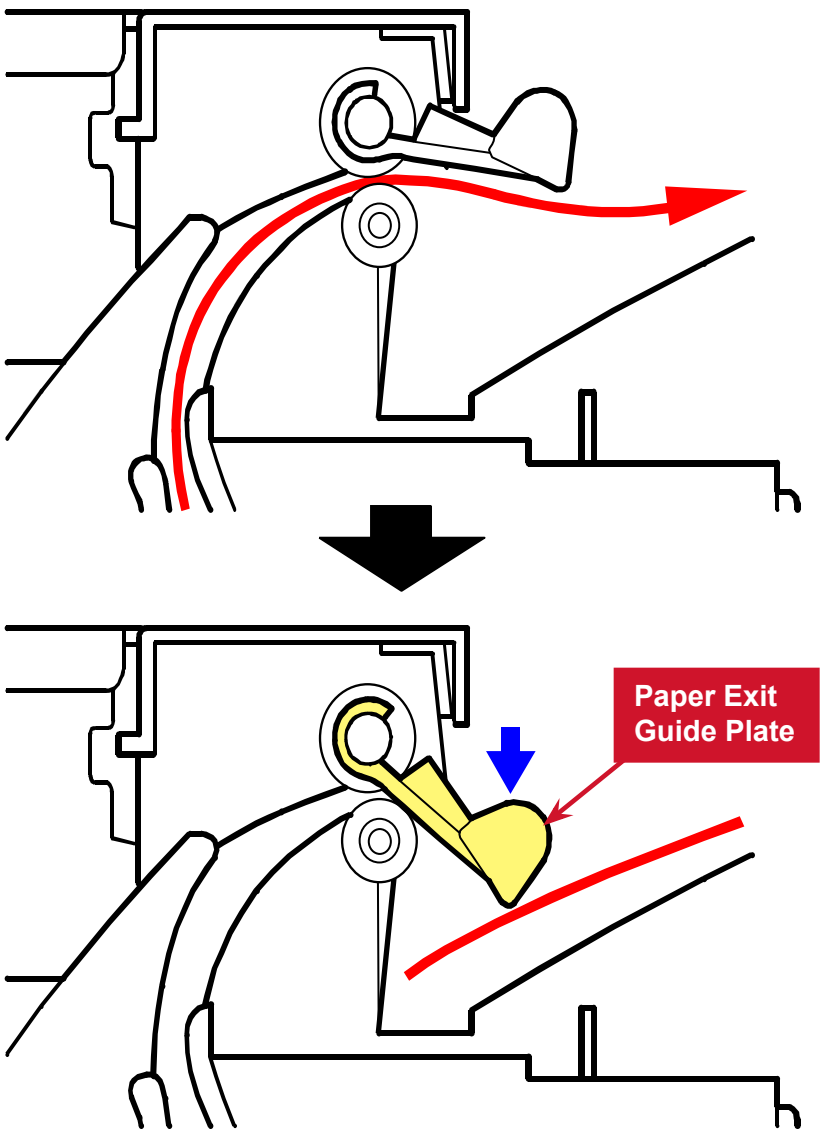
- When hot roller temperature becomes greater than 225°C, the CPU cuts off power to the fusing lamp.
- When thermistor overheat protection fails, there is a thermostat in series with the common ground line of the fusing lamp.
- When the temperature of the thermostat becomes greater than 210°C, the thermostat opens, removing power from the fusing lamp.

Paper Exit

- The paper exit guide plate holds down the trailing edge of each sheet of paper after it exits.
  - This prevents one sheet of paper from obstructing the following sheets of paper as they exit.



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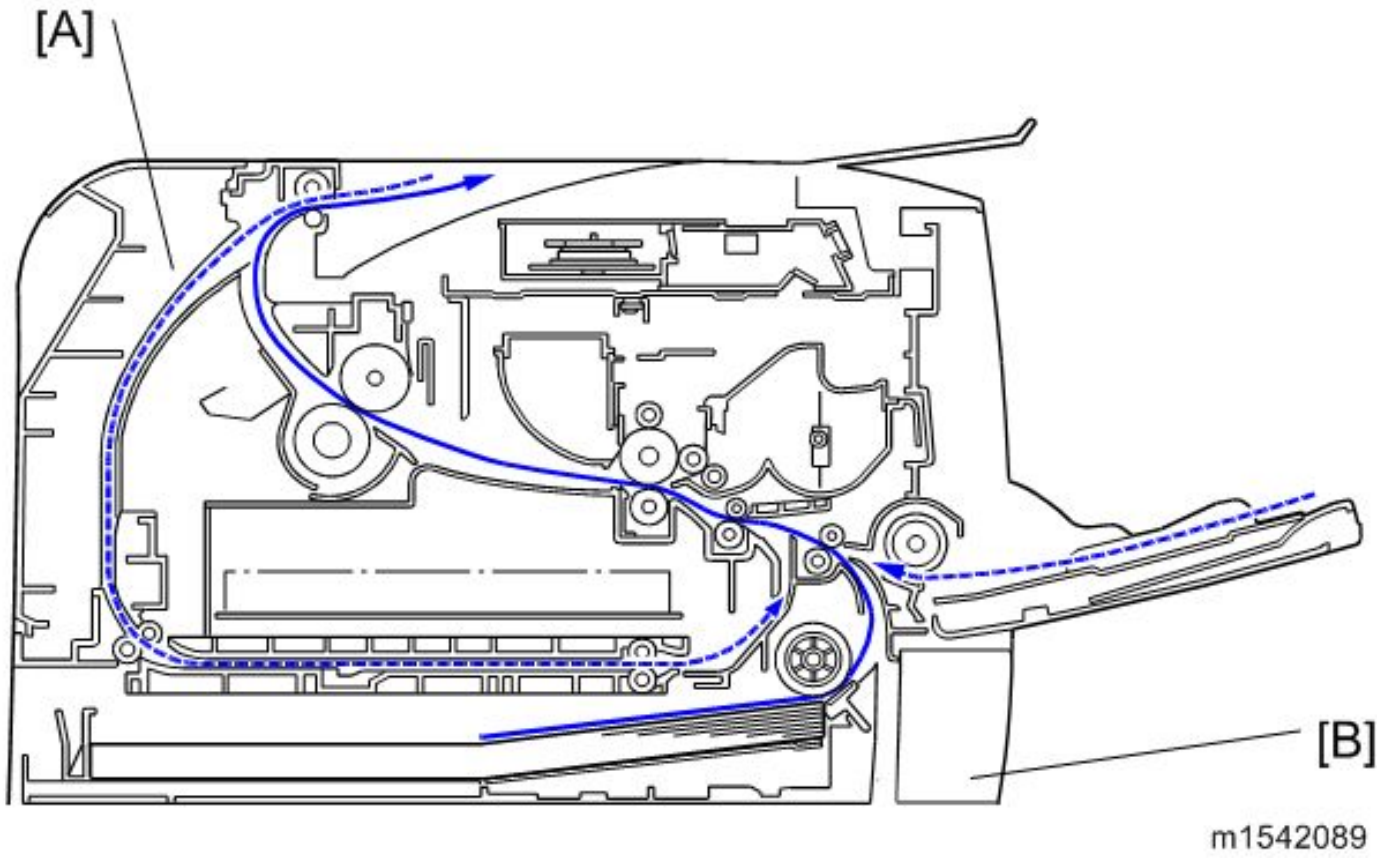
3.11 Duplex

Paper Path

- [A]: Duplex section
- [B]: Paper tray



Duplex Sensors

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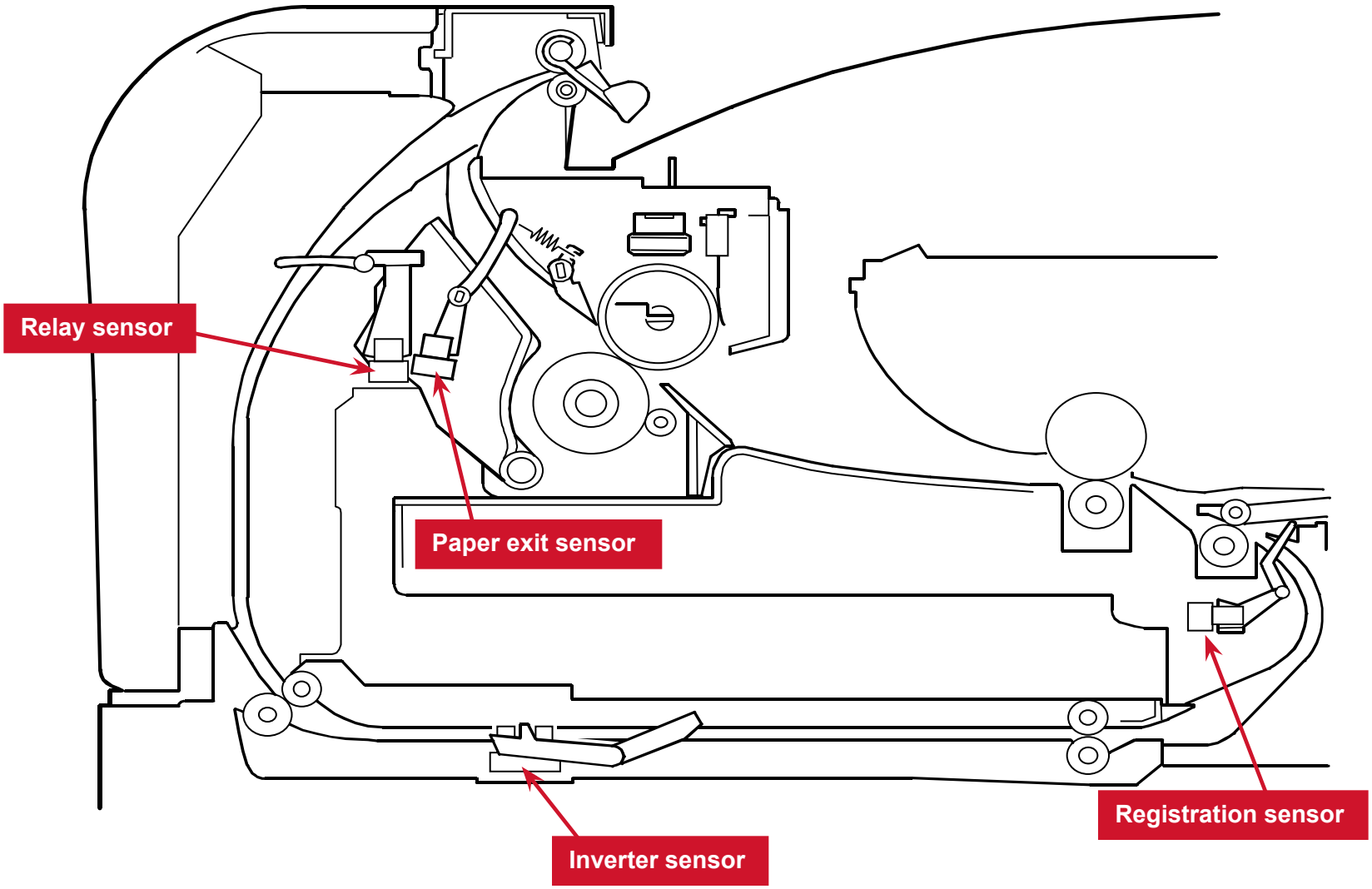
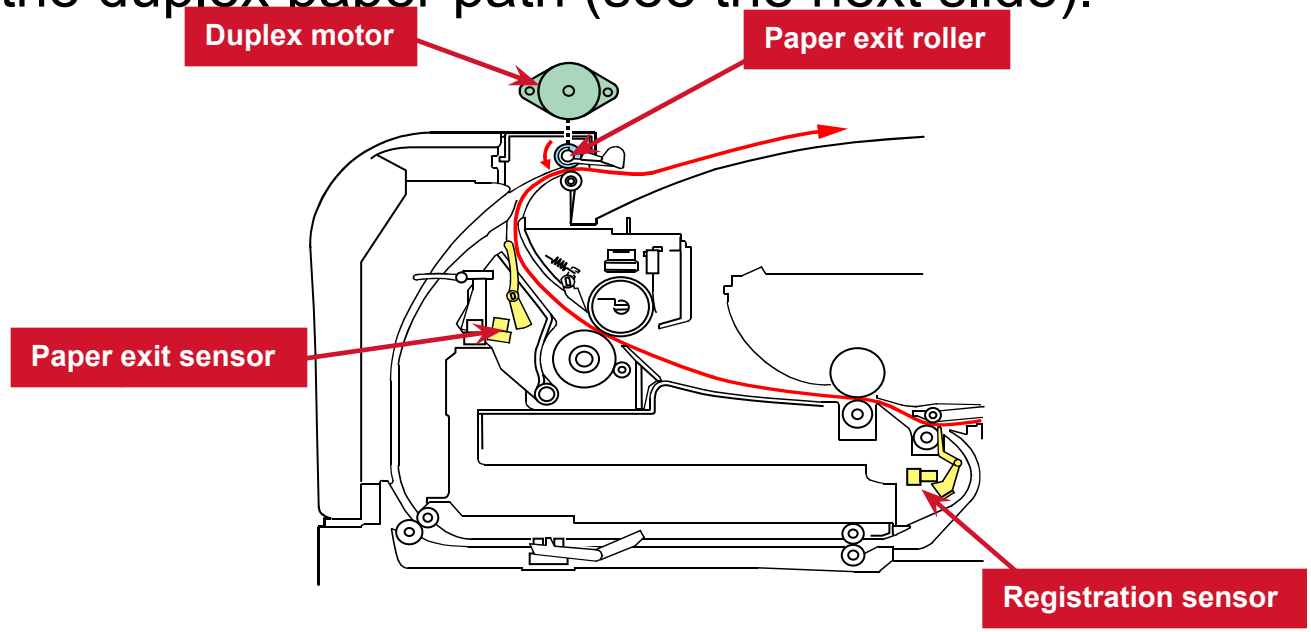


Duplex Details 1/2

- Paper from the registration roller is sent to the paper exit roller.
- The duplex motor controls the paper exit roller.
- The paper exit roller reverses after the trailing edge of the paper has passed the paper exit sensor (but the paper has not fully exited into the output tray).
- Paper goes to the duplex paper path (see the next slide).



Duplex Details 2/2

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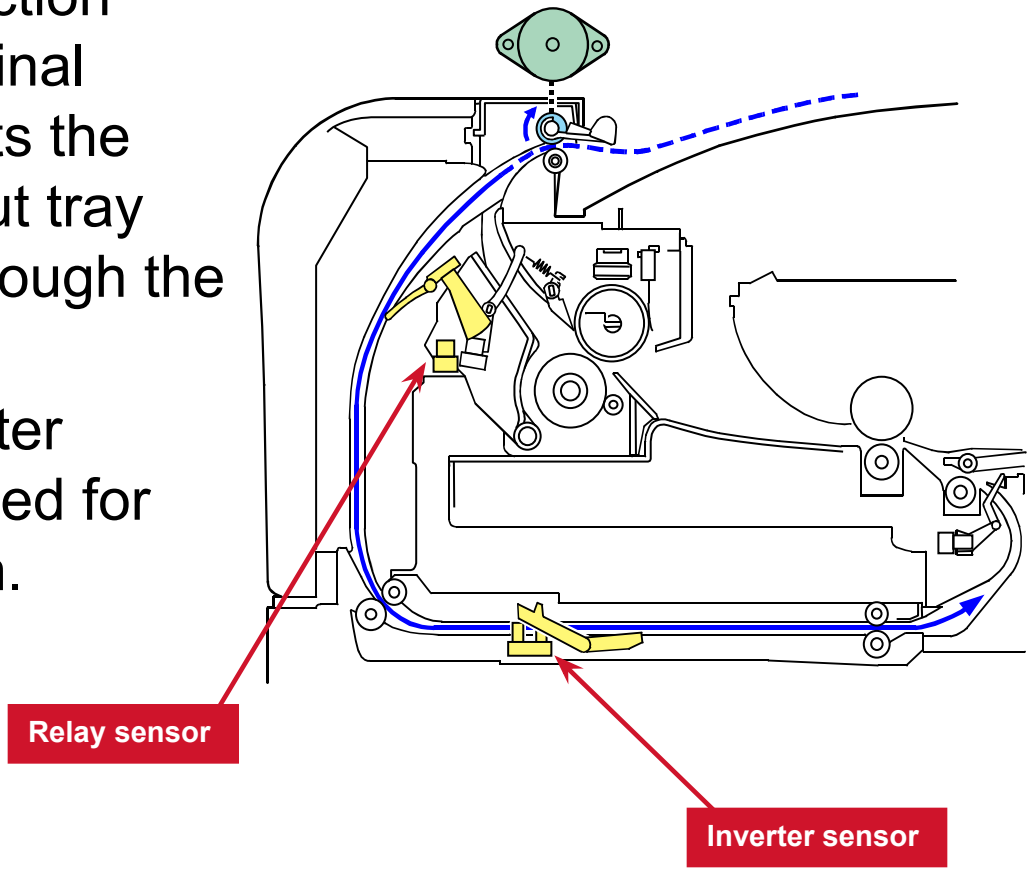
- When the trailing edge of the paper passes the relay sensor, the paper exit roller again changes direction (reverting to its original direction), and ejects the paper into the output tray after it has gone through the fusing unit.
- The relay and inverter sensors are also used for paper jam detection.



Interleaving

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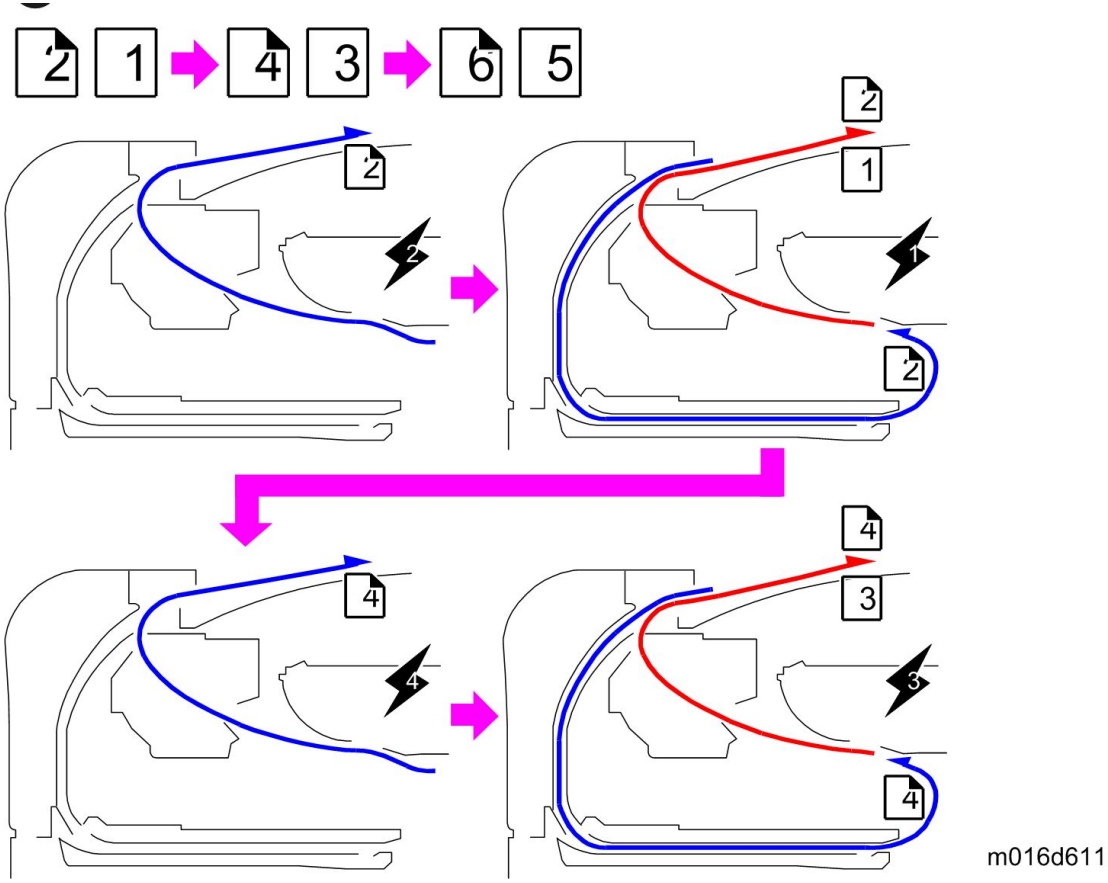
- Two sheets can be fed at the same time.



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4. Troubleshooting

Paper Jams

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- Various types of paper jams and their causes are detailed in the service manual. Some causes include:
  - Use of a non-recommended paper type
  - End fence set incorrectly
  - Paper lift mechanism not functioning correctly
  - Defective paper feed motor
- Go over the causes and suggested actions.
- When clearing jams near the fusing unit, use caution to avoid possible burns.

Printed Image Issues

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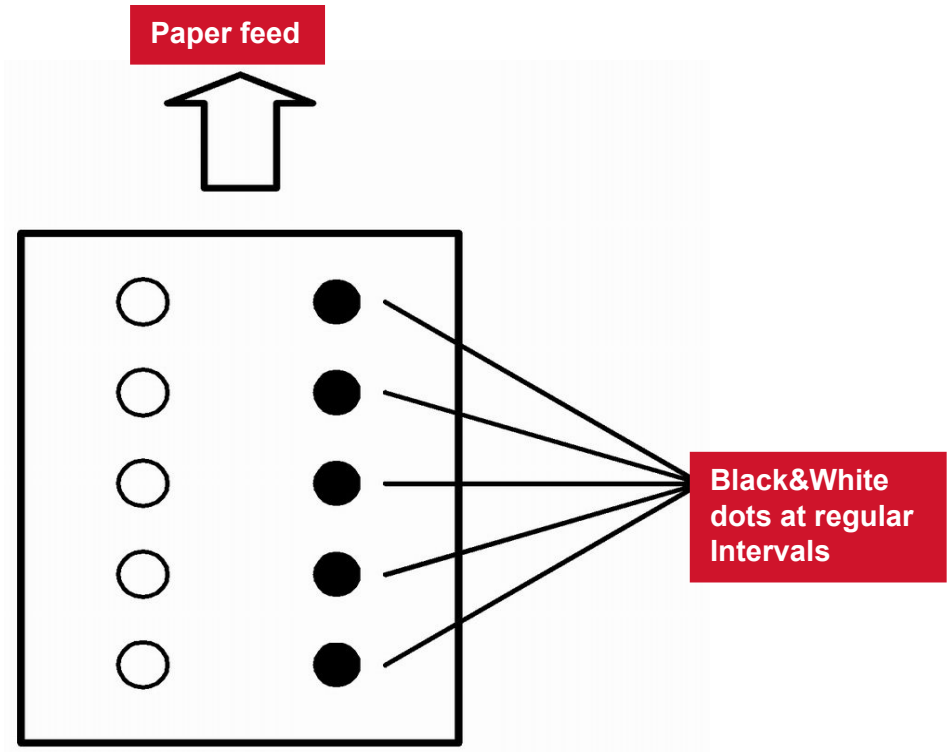
- When abnormal image (black or white dots) appears at certain intervals, component part causing spots may sometimes be identified (based on circumference of certain components):



- 29.8 mm intervals: Charge Roller
- 37.7 mm intervals: Registration Roller
- 37.9 mm intervals (Colored spots): Print cartridge (Development Roller)
- 45.8 mm intervals: Transfer Roller
- 75.3 mm intervals (Colored spots): Print cartridge (OPC Drum)
- 94.2 mm intervals: Fusing unit (Pressure Roller)
- 93.1 mm intervals: Fusing unit (Hot Roller)
- 100.5 mm intervals: Paper Feed Roller

Test Pattern Printing

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- Test Pattern Printing - When checking an image or other problems, it might be necessary to print a test pattern.
- Follow the test pattern print procedure below to print a test pattern.

- Test Pattern Print Procedure
  - 1. Enter "Maintenance Mode".
  - 2. Select "Test Pattern", and then press "OK" key.
  - 3. The following three test pattern pages are printed.
    - Checker flag
    - Trimming Pattern
    - Grid Pattern

Remy P1 / MF1

End