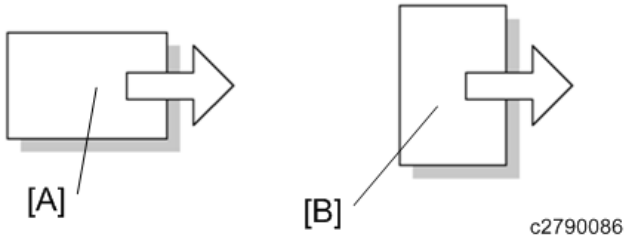
Paper Feed Unit PB3160
Machine Code: D693
Field Service Manual

May, 2016

Symbols, Abbreviations and Trademarks

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

	Clip ring
	Screw
	Connector
	Clamp
SEF	Short Edge Feed [A]
LEF	Long Edge Feed [B]



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1. Replacement and Adjustment

Exterior Cover

The Aim of Anti-tip Components and Precautions

The anti-tip components are necessary for meeting the requirements of IEC60950-1, the international standard for safety.

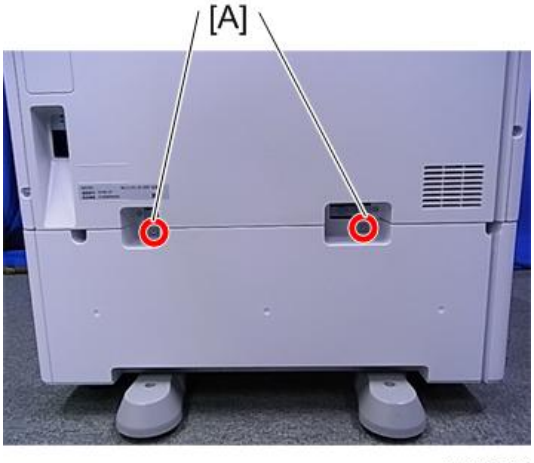
The aim of these components is to prevent the products, which are heavy in weight, from toppling as a result of people running into or leaning onto the products, which can lead to serious accidents such as persons becoming trapped under the product. (U.S.: UL60950-1, Europe: EN60950-1)

Therefore, removal of such components must always be with the consent of the customer.

Do not remove them at your own judgment.

Rear Cover

1. **Securing brackets [A] (×2)**



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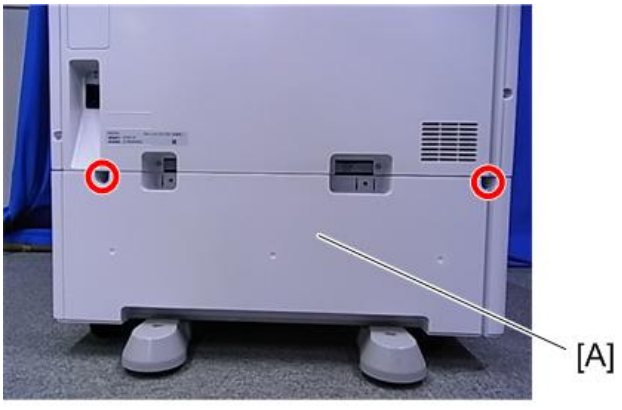
2. Rear cover [A] (×2)



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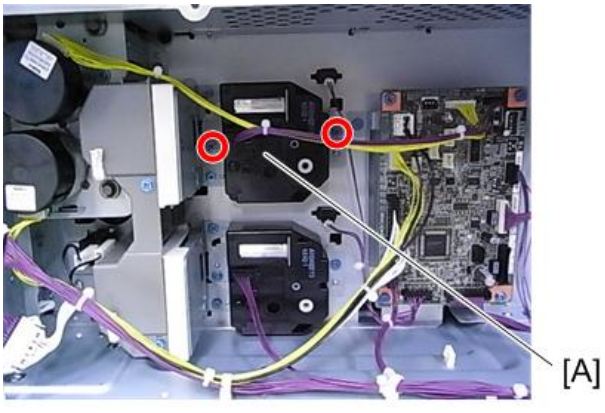
Motors

Tray Lift Motor (Upper)

1. Rear cover (page 5)
2. Tray lift motor (upper) [A] (×2, ×1)



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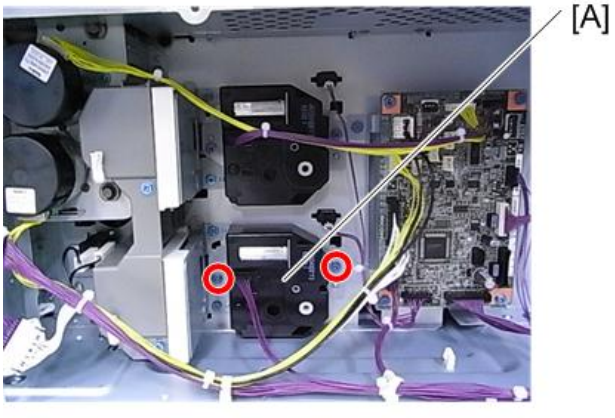
Tray Lift Motor (Lower)

1. Rear cover (page 5)
2. Tray lift motor (lower) [A] (×2, ×1)



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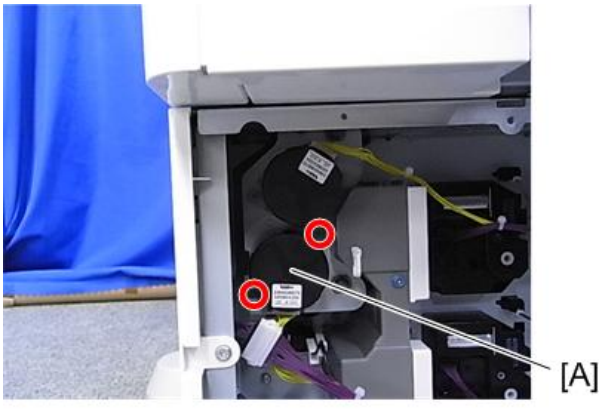
Transport Motor

1. Rear cover (page 5)
2. Transport motor [A] (×2, ×1)



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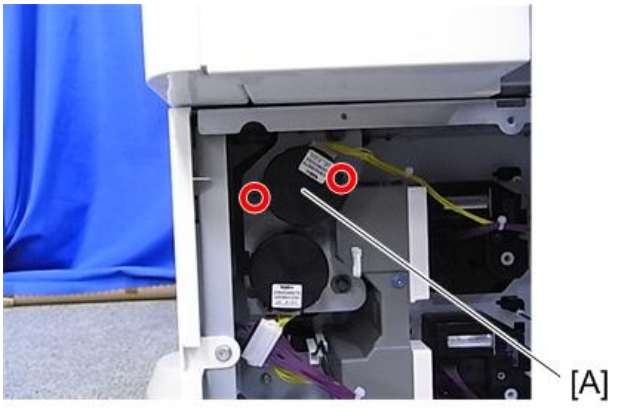
Paper Feed Motor

1. Rear cover (page 5)
2. Paper feed motor [A] (×2, ×1)



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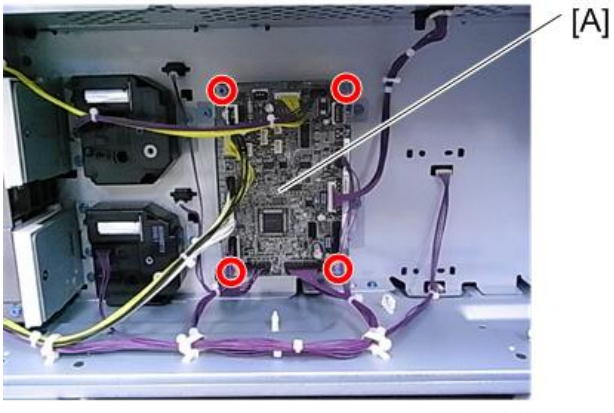
Board

Controller Board

1. Rear cover (page 5)
2. Controller board [A] (×4, ×10)



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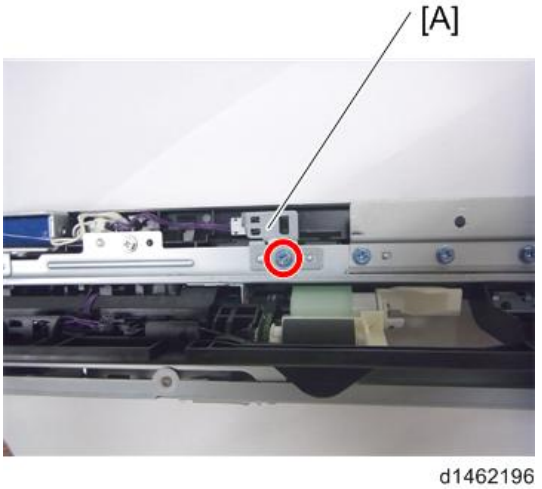
Sensors

Transport Sensor

1. Paper feed unit (page 13, page 18)
2. Transport sensor bracket [A] (×1)



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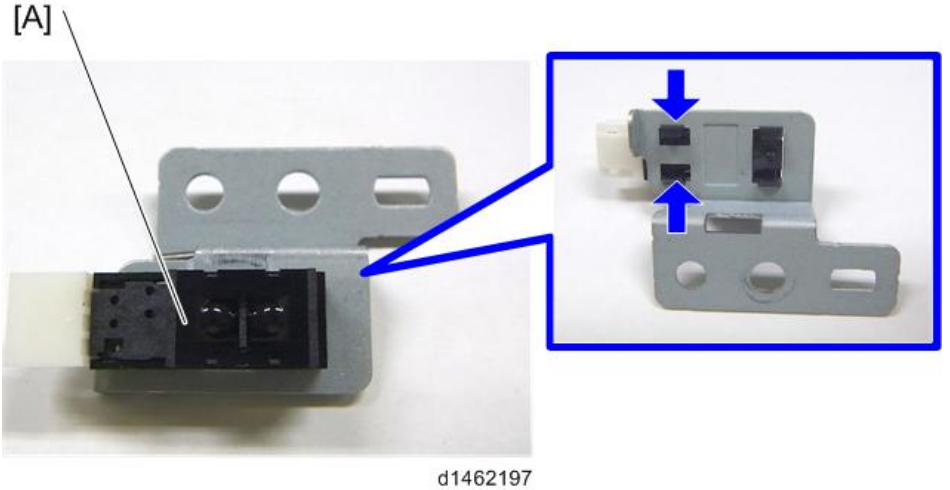
3. Transport sensor [A] (×1)



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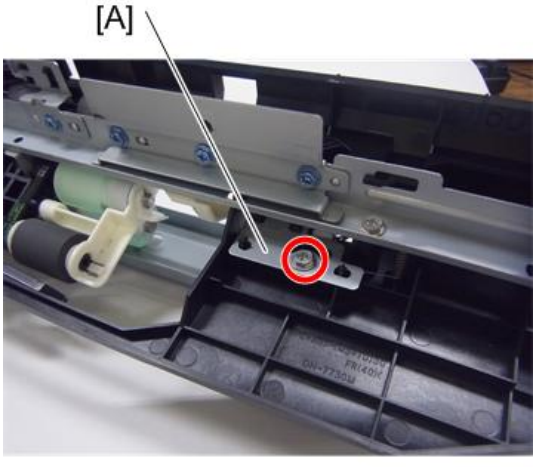
Paper Feed Sensor

1. Paper feed unit (page 13, page 18)

2. Paper feed sensor bracket [A] (×1)



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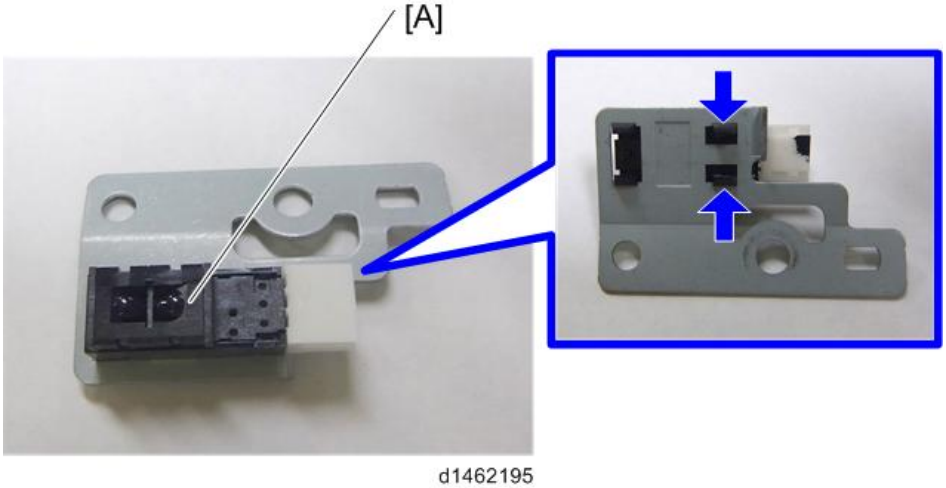
3. Paper feed sensor [A] (×1)



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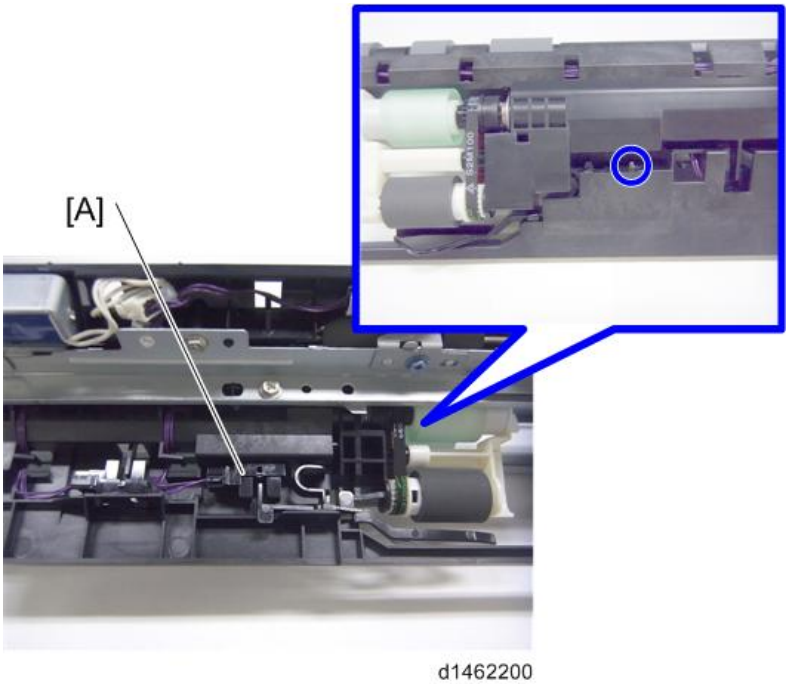
Paper End Sensor

1. Paper feed unit (page 13, page 18)

2. Paper end sensor [A] (×1)



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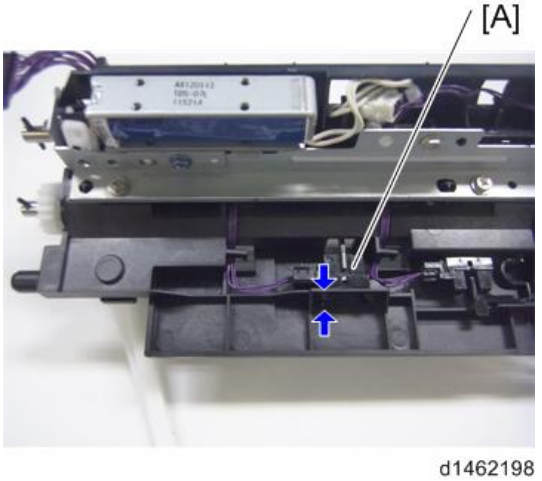
Limit Sensor

1. Paper feed unit (page 13, page 18)
2. Limit sensor [A] (×1)



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Paper Feed Unit

2nd Paper Feed Unit

1. Pull out the paper trays.
2. Rear cover (page 5)
3. Right front cover [A] (×1)

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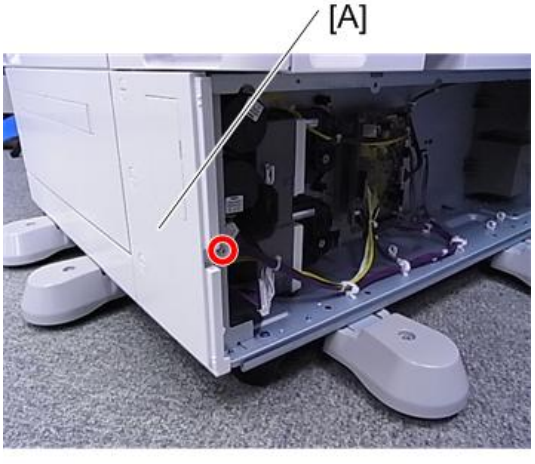
4. Right rear cover [A] (×1)



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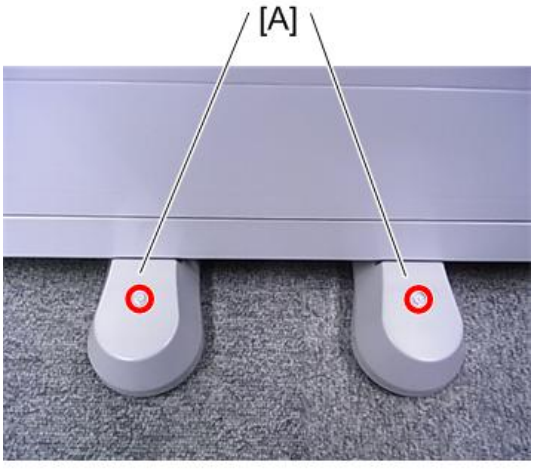
5. **Anti-tip components cover [A] (×2)**



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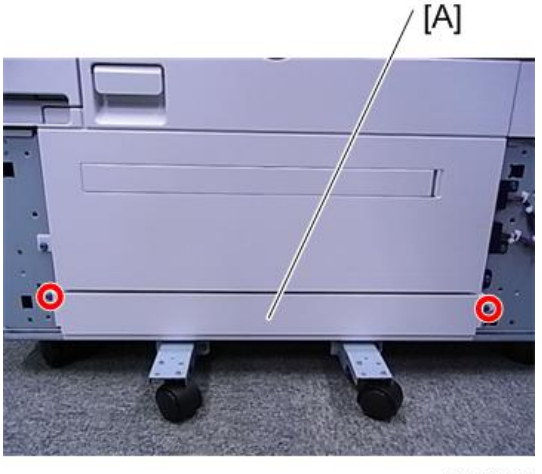
6. **Right lower cover [A] (×2)**



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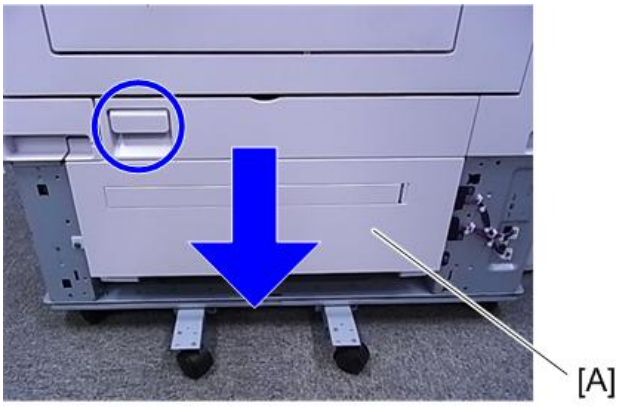
7. **Open the Transport cover [A].**



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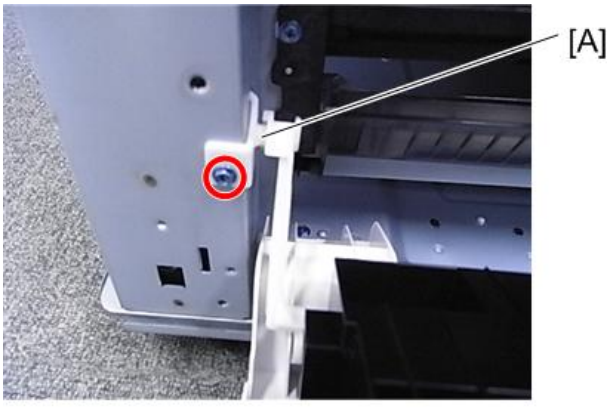
8. **Stopper [A] (×1)**



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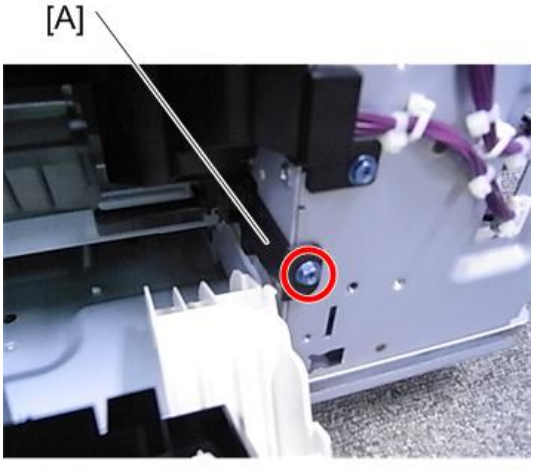
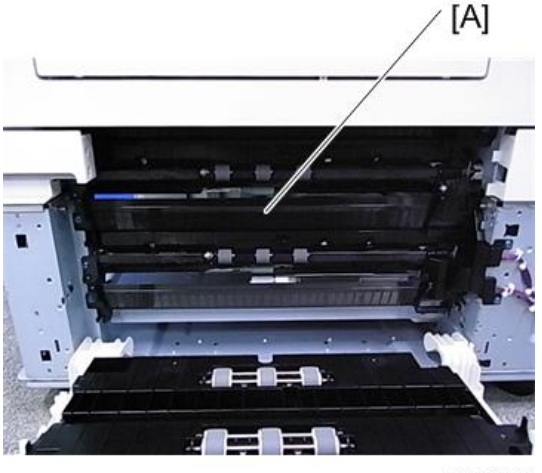
9. **Interlock switch cover [A] (×1)**



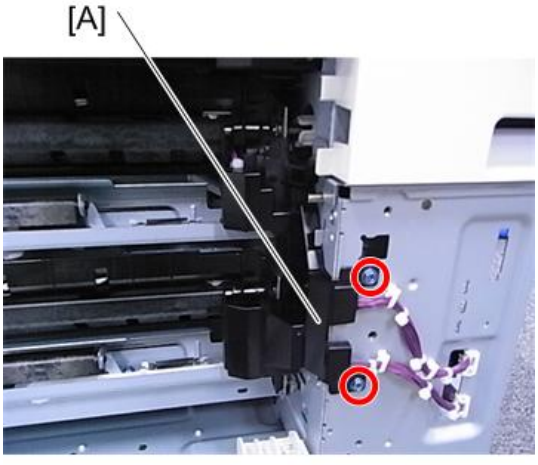
d1462713

10. **Paper feed guide plate [A]**



d1462714

11. **Harness cover [A] (×2)**



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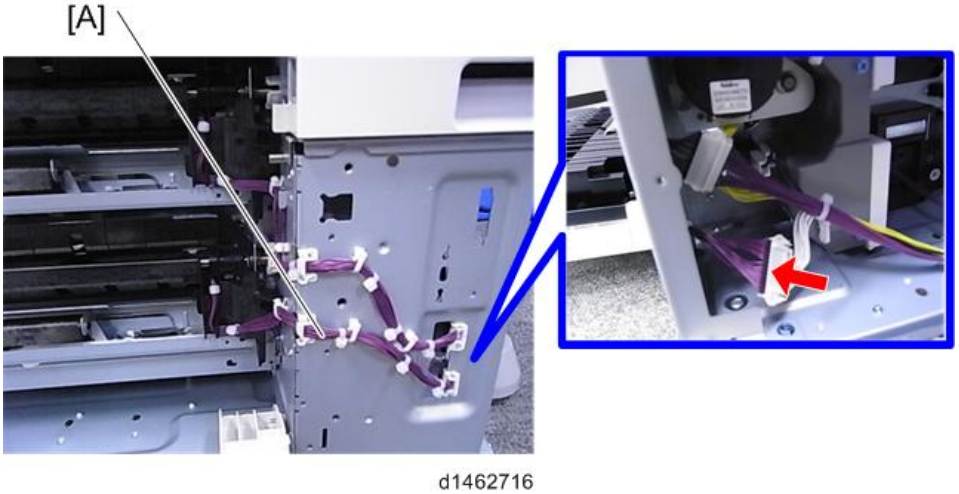
12. **Harness [A] (×1, ×4)**



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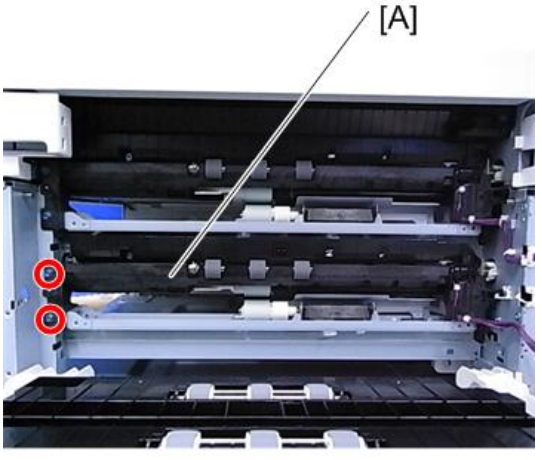
13. 2nd Paper feed unit [A] (×2)



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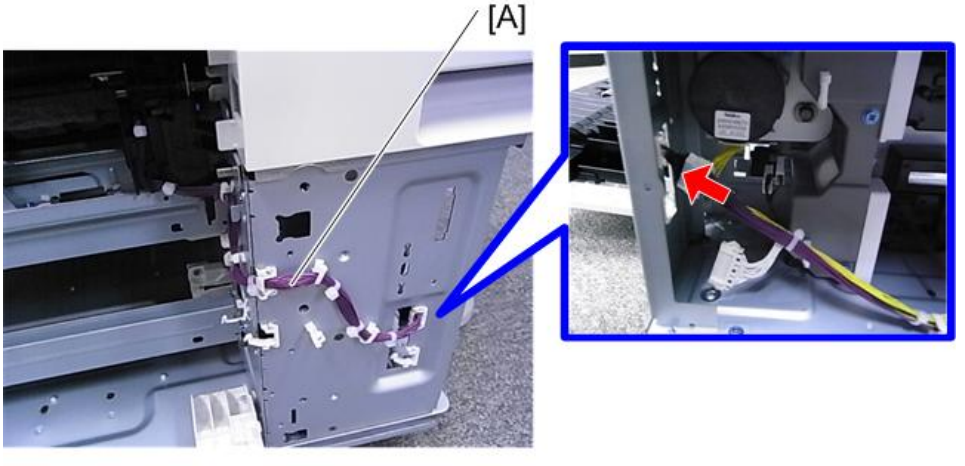
1st Paper Feed Unit

1. 2nd Paper feed unit (page 13)
2. Harness [A] (×1, ×6)



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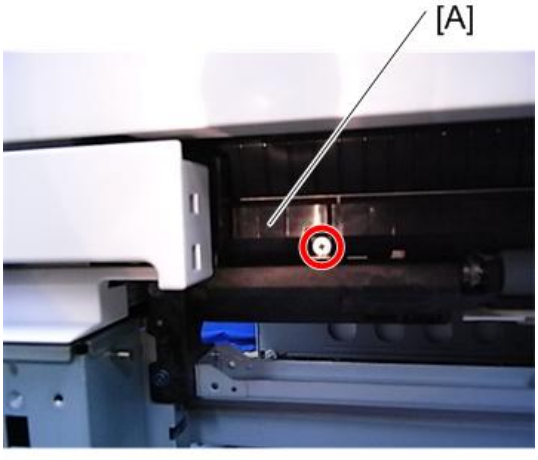
3. Guide plate [A](×1)



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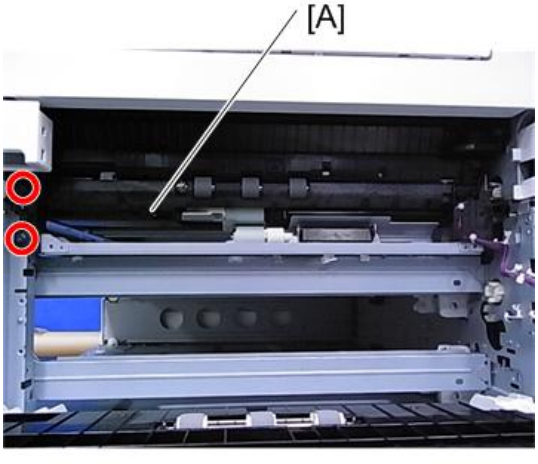
4. 1st Paper feed unit [A] (×2)



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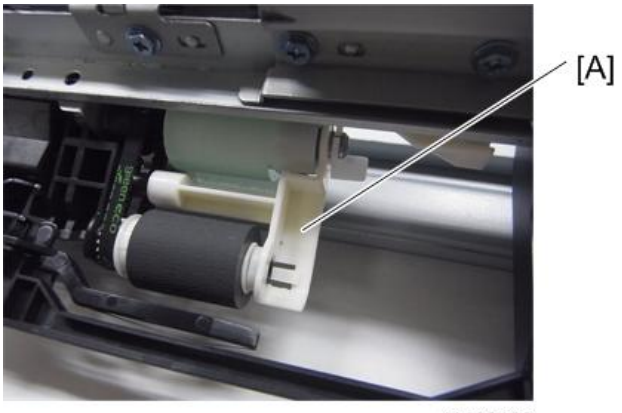
Rollers

Pick-up Roller

1. Paper feed unit (page 13, page 18)
2. Holder [A] (×1)



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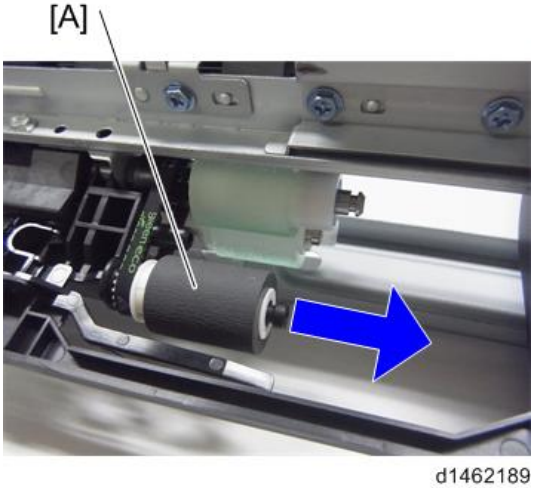
3. Pick-up roller [A]



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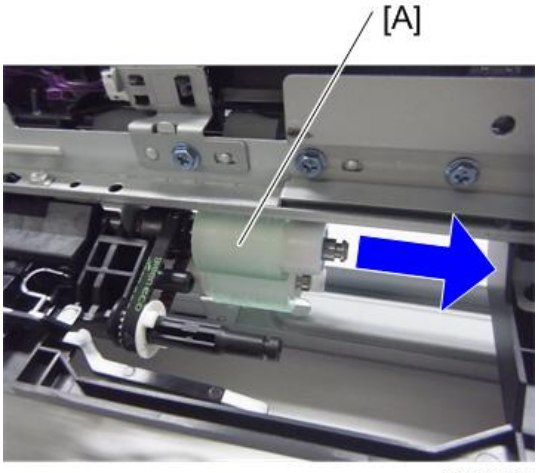
Feed Roller

1. Pick-up roller (page 20)

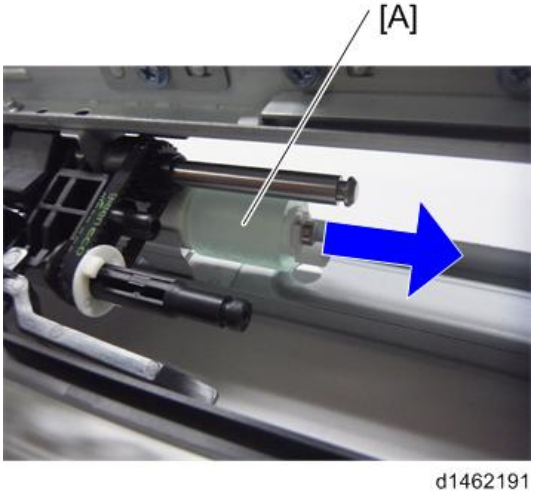
2. Feed roller [A]



d1462190

Friction Roller

1. Feed roller (page 20)
2. Friction roller [A] (×1)



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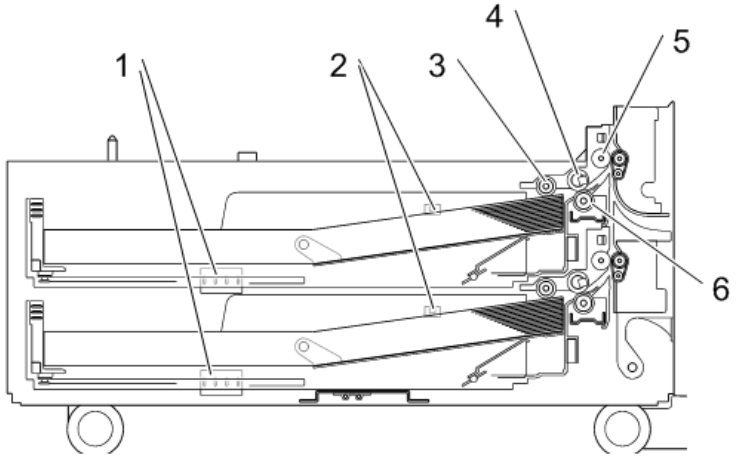
2. Detailed Descriptions

Paper Feed Unit PB3160 (D693)

Parts Layout



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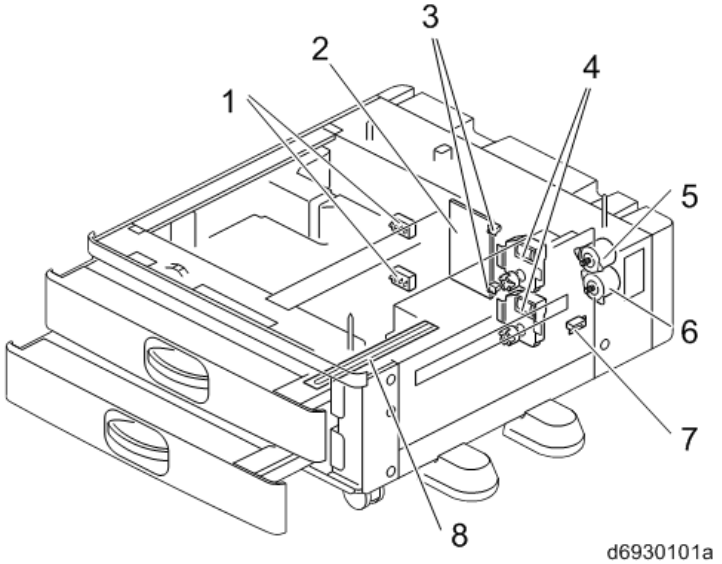
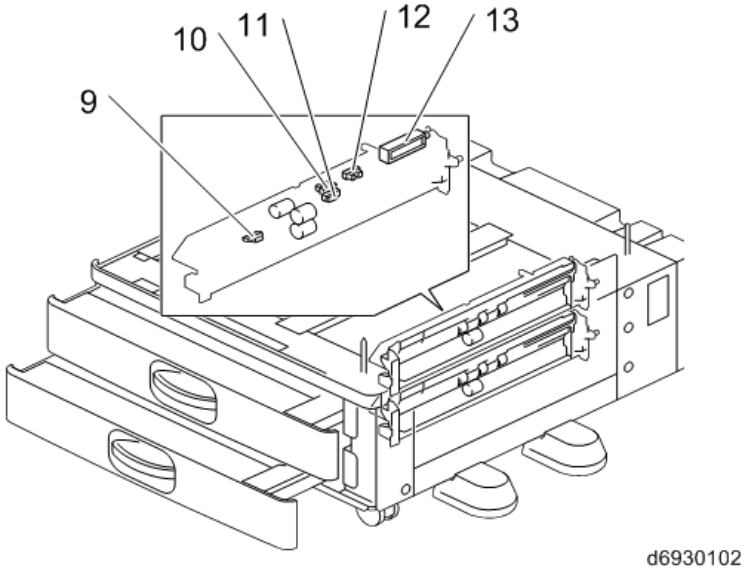
No.	Description
1	Paper size detection switch
2	Tray set detection switch
3	Pick-up roller
4	Feed roller
5	Transport roller
6	Friction roller





No.	Description	No.	Description
1	Paper size detection switch	8	Anti-condensation heater
2	Bank controller board	9	Paper feed sensor
3	Tray set detection switch	10	Paper end sensor
4	Tray lift motor	11	Transport sensor
5	Paper feed motor	12	Limit sensor

No.	Description	No.	Description
6	Transport motor	13	Pick-up solenoid
7	Transport cover open/close switch		

Mechanism

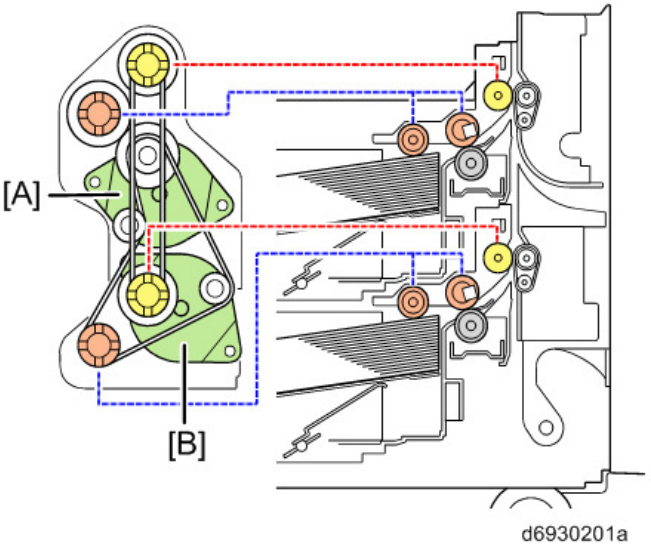
Paper feed separation mechanism

Paper feed is an RF paper feed system. The paper feed unit comprises a Pick-up roller, Feed roller and Friction roller. These rollers are high durability.

In the RF system, paper separation is assisted by the resistance of a separating roller with a torque limiter (reverse drive is not performed).

Drive mechanism

Pick-up roller and Feed roller are driven by the paper feed motor [A]. Transport roller is driven by the transport motor [B]. Friction roller is not driven.



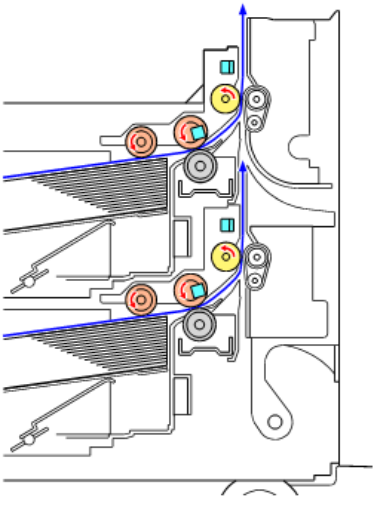
Friction roller/ Pick-up roller release mechanism

When the paper feed tray is set, the Friction roller comes in contact with the Feed roller, and the Pick-up roller contacts the uppermost transfer sheet.

However, when the paper feed tray is pulled out, to prevent paper dropout, the contact between the Feed roller and Friction roller, and between pick-up roller and paper is released.

Paper feed transport mechanism

In this MFP, to maintain a fixed clearance between sheets, a paper feed sensor is provided between the Pickup roller and the Feed roller, which adjusts the paper feed timing.



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1. **The Paper feed motor turns ON, and supplies the first sheet.**
2. **To prevent transport of the next sheet, the pickup solenoid switches ON just before the trailing edge of the first sheet leaves the Pickup roller, and the Pickup roller separates from the paper surface.**
3. **Just before the trailing edge of the first sheet leaves the Paper feed motor, the paper feed motor switches OFF.**

   However, at this time, when the Paper feed sensor detects no sheet (when the second sheet is not transported to the paper feed sensor position), pre-feed is performed without switching the Paper feed motor OFF.

   Pre-feed is as follows.

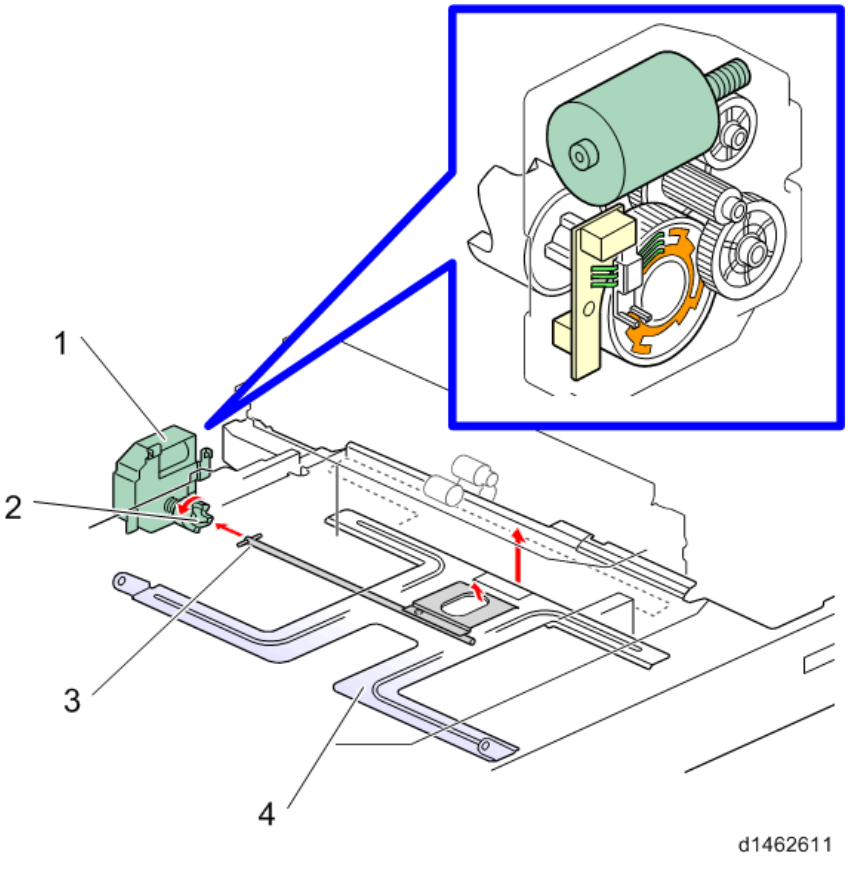
   1. The pickup solenoid switches OFF, and the second sheet of paper is transported to the Paper feed sensor position.
   2. When the trailing edge of the second sheet passes the Feed roller, the Paper feed motor is switched OFF. The pickup solenoid remains OFF.
4. **Just before the trailing edge of the first sheet passes the Feed roller, the pickup solenoid is switched OFF, and the Pickup roller is brought in contact with the paper surface.**

5. **When the first sheet is transported a predetermined distance by the downstream transport roller, the Paper feed motor is switched ON to supply the second sheet.**

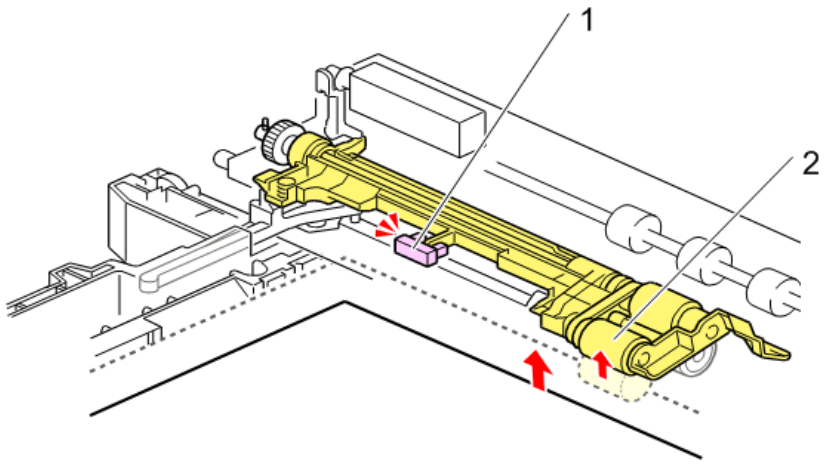
Tray base plate lift

When the paper feed tray is set in the main unit, the set switch switches ON, and it is detected that the tray is set. At this time, the coupling of the lift motor engages with the shaft at the rear of the tray, the motor rotates, and the tray base plate is lifted up. The paper surface pushes up the Pickup roller, the tray base plate is lifted until the upper limit sensor switches OFF (blocked), and the printer enters the standby mode.

When the paper feed tray is removed, the coupling is disengaged, and the base plate descends. At this time, the lift motor rotates until the coupling returns to the home position.



No.	Description	No.	Description
1	Lift motor	3	Tray rear side shaft
2	Coupling	4	Tray base plate

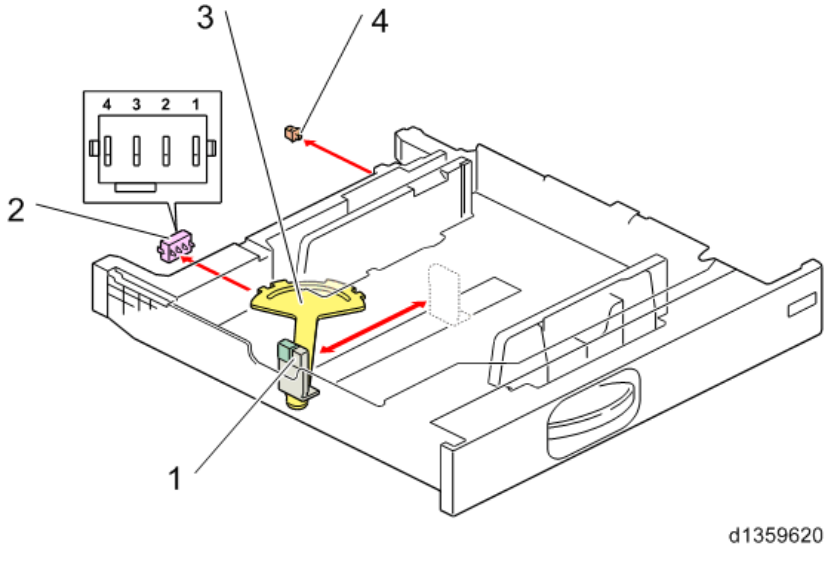


No.	Description	No.	Description
1	Limit sensor	2	Pick-up roller

Paper size detection

The end fence interlocks mechanically with the size detection actuator, and when the end fence is moved, the size detection actuator also moves.

When the Paper feed tray is set, 4 size detection switches switch ON/OFF depending on the position of the size detection actuator. Paper size is detected by the detected combination of these switches.



No.	Description	No.	Description
1	End fence	3	Size detection actuator
2	Size detection switch	4	Tray set detection switch

Size detection switch operation

Paper size	Size detection switch			
	SW4	SW3	SW2	SW1
SRA3 (12″×18″)	1	0	1	0
A3 (DLT)	0	1	0	0
B4 (LG)	0	0	1	1
	0	1	1	1
A4_SEF	1	1	1	0
LT_SEF	1	1	0	0
B5_SEF	1	0	0	0
A4_LEF (LT_LEF)	0	0	0	1
B5_LEF (Exe_LEF)	0	0	1	0
A5_LEF	0	1	0	1

Remaining paper detection/paper end detection

Remaining paper detection

Detection of paper remaining in the Paper feed tray is performed by a combination of ON/OFF (contact/non-contact) of contact-type remaining detection plates (printed circuits) CN-3, CN-5.

When the amount of remaining paper decreases, and the tray lift motor rotates, the remaining paper sensors CN-3 and CN-5 in the motor are turned ON/OFF.

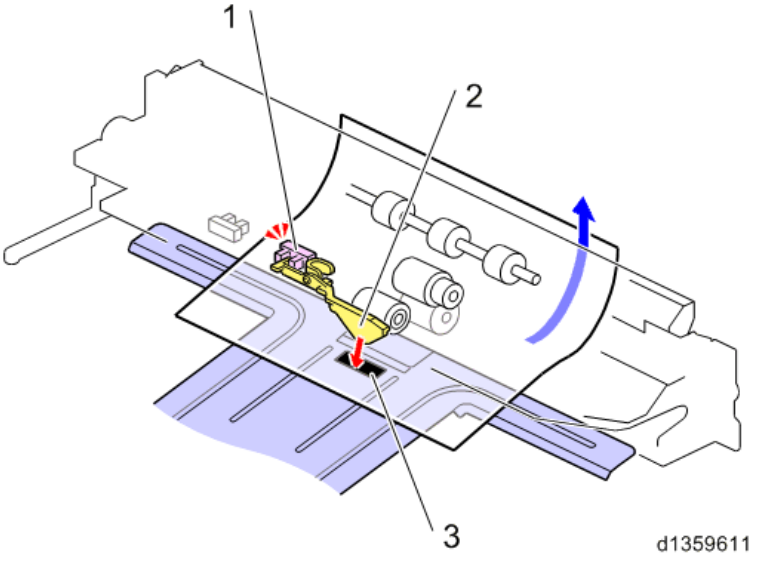
The following 4 levels of remaining paper can be detected:

Amount remaining	100%	70%	30%	10%
CN-3	OFF	ON	ON	OFF
CN-5	OFF	OFF	ON	ON

Amount remaining	100%	70%	30%	10%
Control panel remaining paper display	4 bars	3 bars	2 bars	1 bar

Paper end detection

When the paper feed tray is empty, the paper end sensor switches ON (unblocked) due to the end feeler.



No.	Description	No.	Description
1	Paper end sensor	3	Slot in the tray base plate
2	End feeler		

MEMO

MEMO