Multi Bypass Tray BY5020
Machine Code: D3EV
Field Service Manual
Ver 1.0

Latest Release: Feb, 2018
Initial Release: Feb, 2018
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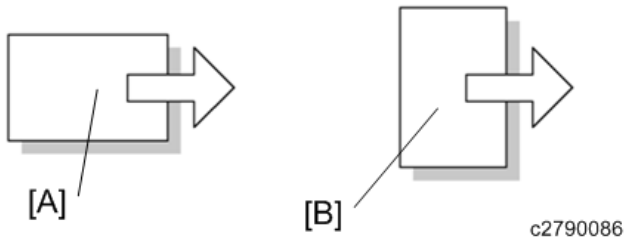
Symbols, Abbreviations

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

Symbol	What it means
	Clip ring
	Screw
	Connector
	Clamp
	E-ring
	Flat Flexible Cable
	Timing Belt
SEF	Short Edge Feed
LEF	Long Edge Feed
K	Black
C	Cyan
M	Magenta
Y	Yellow
B/W, BW	Black and White
FC	Full color



[A] Short Edge Feed (SEF)

[B] Long Edge Feed (LEF)

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1. Replacement and Adjustment

Common Procedures

Opening the Bypass Tray

Important

- This Multi-Bypass Tray can be installed on the vacuum feed LCIT RT5120.
- The procedures in this manual apply to the Multi Bypass Tray, regardless of which unit it is used with.

1. Pull the front left cover in the direction indicated by the arrow.

d517r801

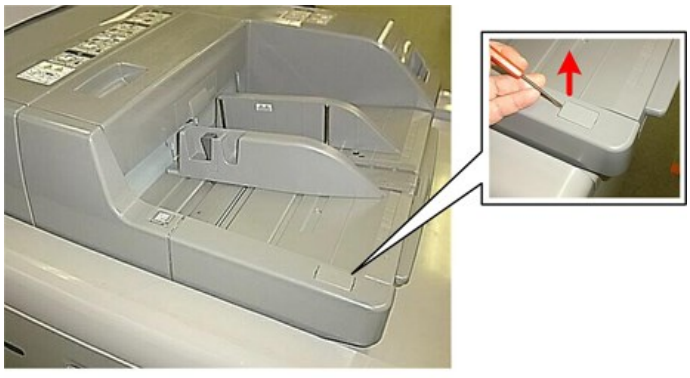
Important

- When moving the LCIT with the bypass unit attached, grip and push the body of the LCIT unit.
- To avoid damaging the bypass tray, never attempt to push or rotate the assembled units by pulling or pushing on the bypass tray.

Covers

Right Front Cover

1. At the front, remove the screw cover.



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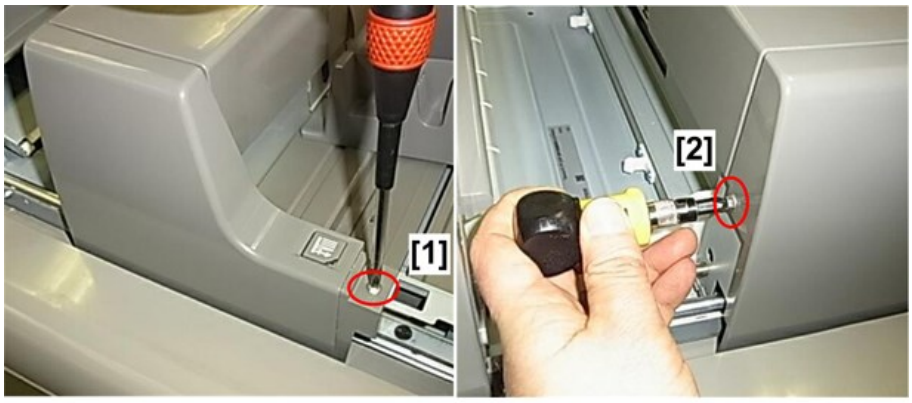
2. Remove the right front cover [1] (x1)

d517r803

Left Front Cover

1. Remove the right front cover.
2. Disconnect the right side [1] (x1).
3. Disconnect the left side [2] (x1). You need a short screwdriver to remove this screw.



d517r804

4. Remove the cover.

d517r805

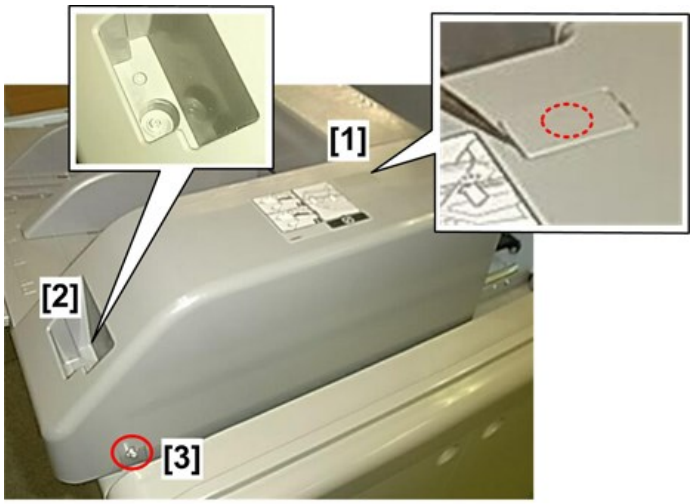
Rear Cover

1. Disconnect the rear cover.

[1] Covered screw (x1)

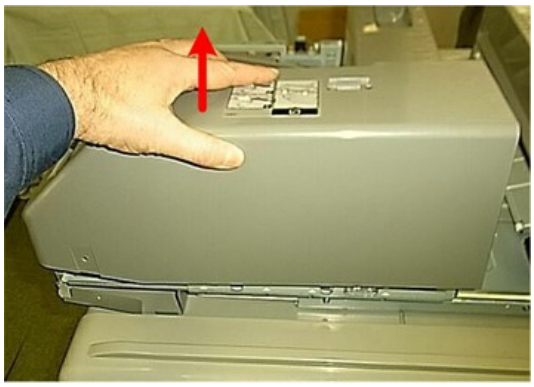
[2] Rear screw (x1)

[3] Well screw (x1)



d517r806

2. Remove the cover.



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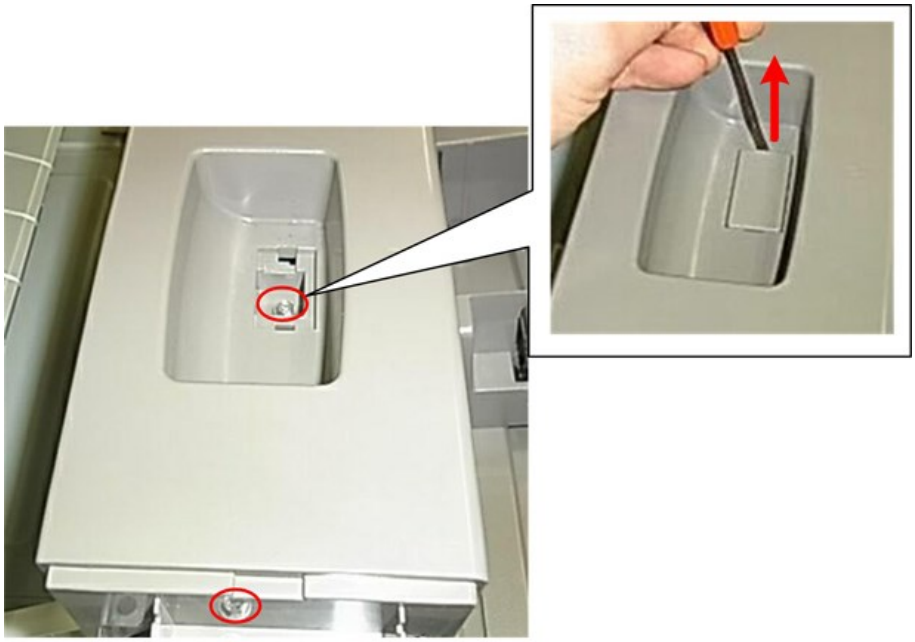
Top Cover

1. Remove the front covers, and the rear cover. (See previous sections).

2. At the front, remove the screw cover and the screw under the cover, and then remove the front

screw (x2).



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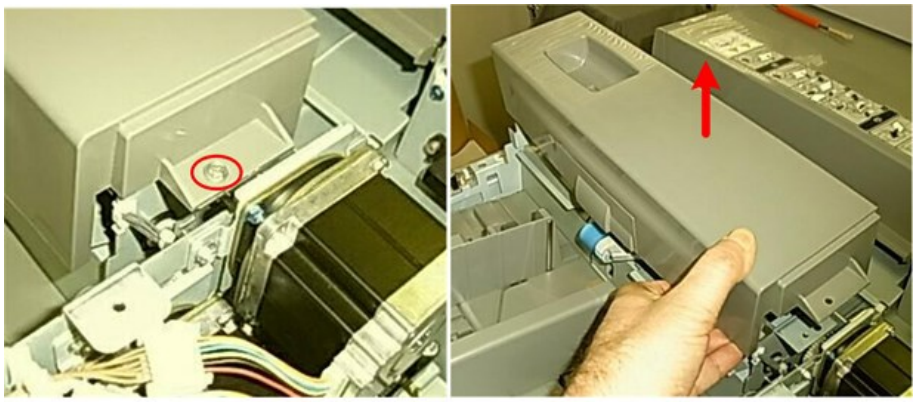
3. At the rear, disconnect the top cover and remove it (x1).



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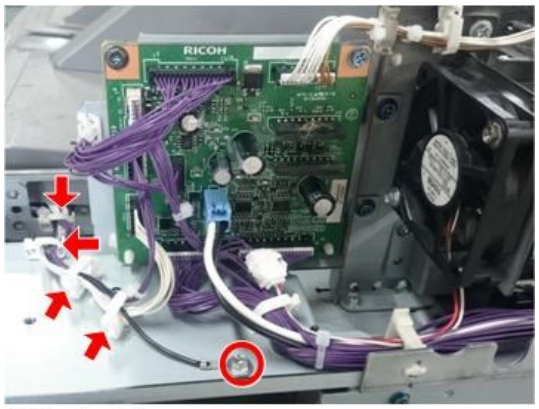
Feed Tray

1. Remove all the covers. (Right Front Cover, Left Front Cover, Rear Cover, Top Cover)

2. Disconnect the ground wire and open the clamps .

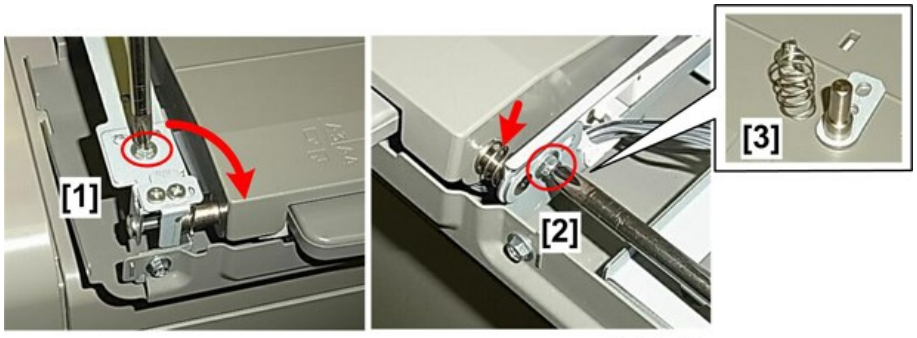


x1 x4 m0b2d8305

3. Disconnect the harnesses.

x2 m0b2d8306

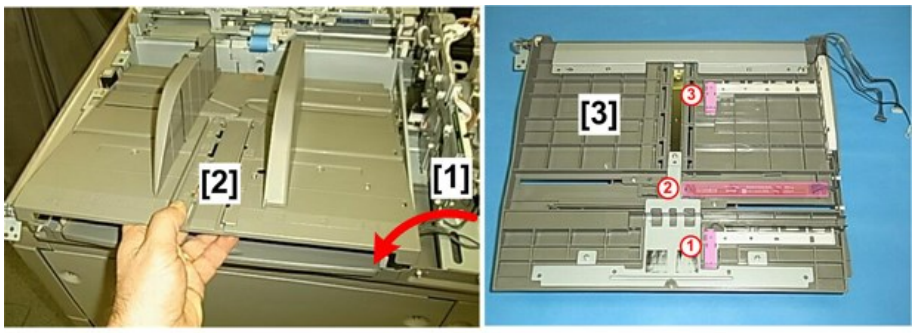
4. At the front, disconnect hinge plate [1] and swing the hinge plate to the right (x1).
5. At the rear, disconnect hinge plate [2] (x1).
6. Carefully disconnect the hinge and spring [3].



d517r812

7. Pull the harnesses through the frame [1].
8. Remove the feed tray [2].
9. Turn over the feed tray. There are three sensors on the bottom of the feed tray.

①	Paper end sensor
②	Paper width sensor
③	Paper length sensor



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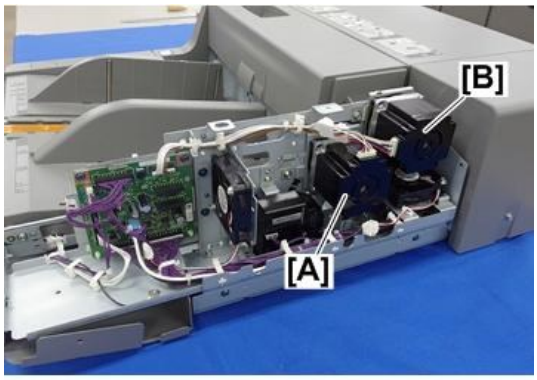
Motors

Paper Feed Motor, Paper Transport Motor

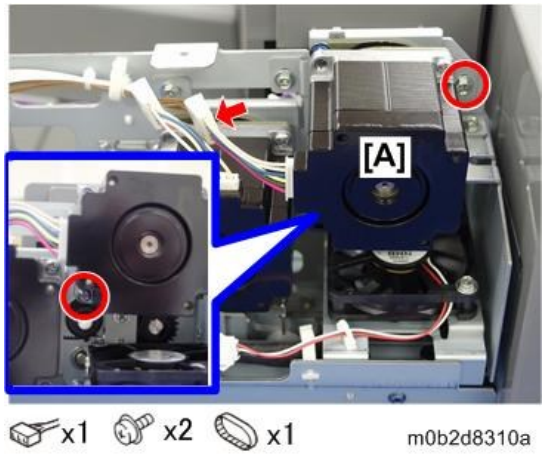
Note

Paper Feed Motor [A] and Paper Transport Motor [B] Location



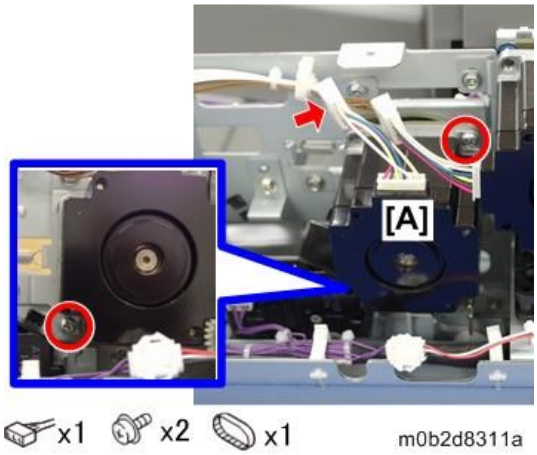
m0b2d8321

1. Remove the rear cover. (Rear Cover)
2. Remove the paper feed motor [A].



m0b2d8310a

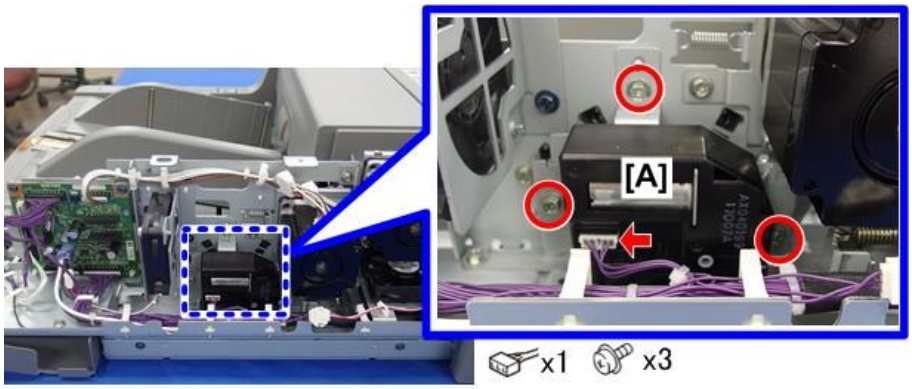
3. Remove the transport motor [A].



m0b2d8311a

Lift Motor

1. Remove the rear cover (Rear Cover)
2. Remove the paper feed motor. (Paper Feed Motor, Paper Transport Motor)
3. Remove the motor with its bracket [A].

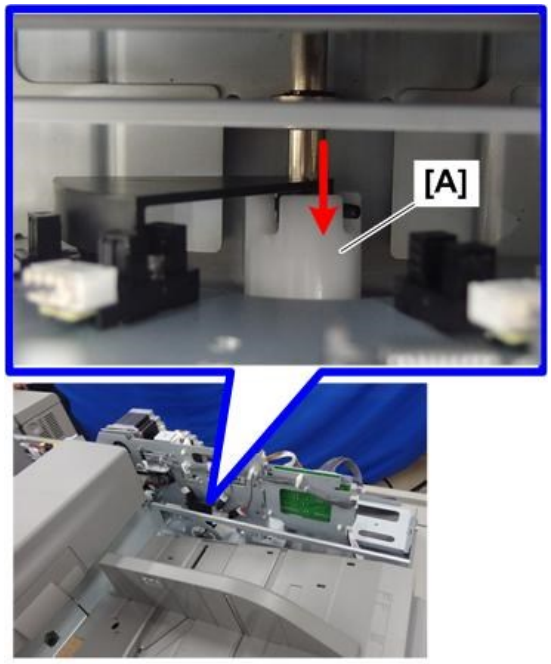


m0b2d8312a

Note

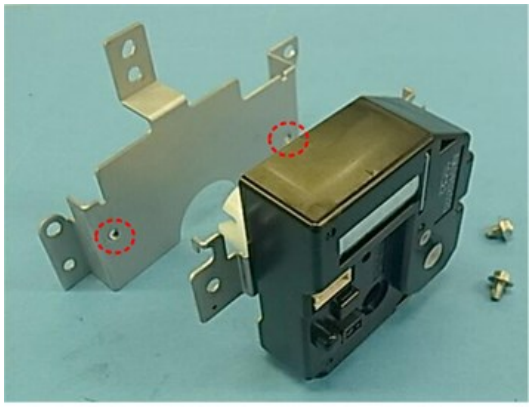
To facilitate the removal, depress the coupling [A] of the motor to let it come off the shaft.

But be careful, because the tray can suddenly drop due to coming off the shaft.



d194d8239

4. Separate the motor and bracket (x2).



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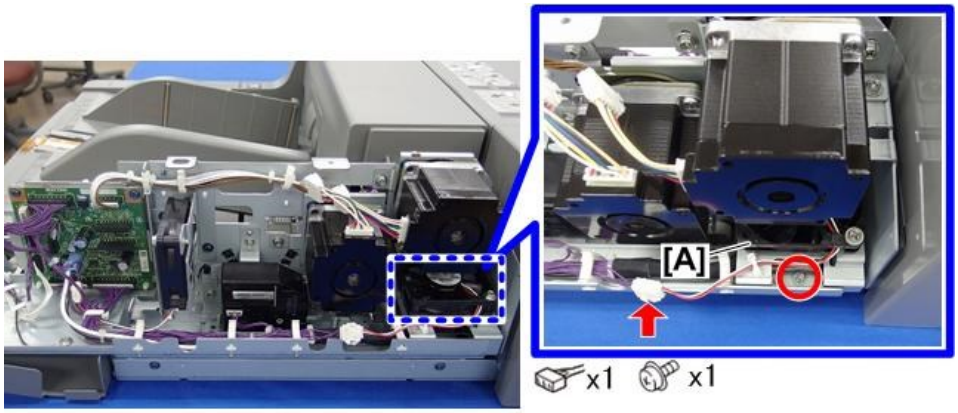
Cooling Fan for Transport Motor

1. Remove the rear cover. (Rear Cover)

2. Disconnect the connector of the fan [A], and then remove the screw to detach the fan with its bracket.



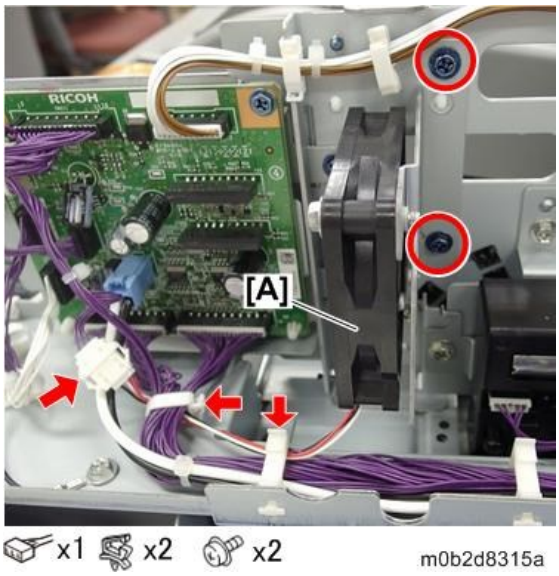
m0b2d8313a

3. Remove the fan.

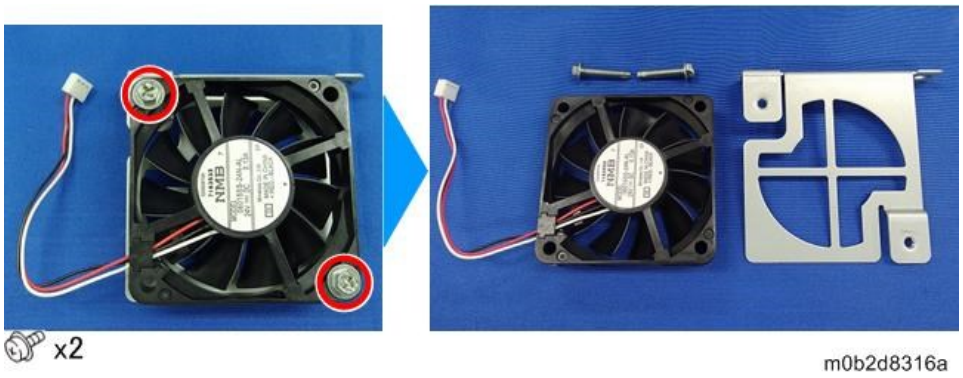
m0b2d8314a

Cooling Fan for Paper Feed Motor

1. Disconnect the connector of the fan [A], and then remove the screws to detach the fan with its bracket.



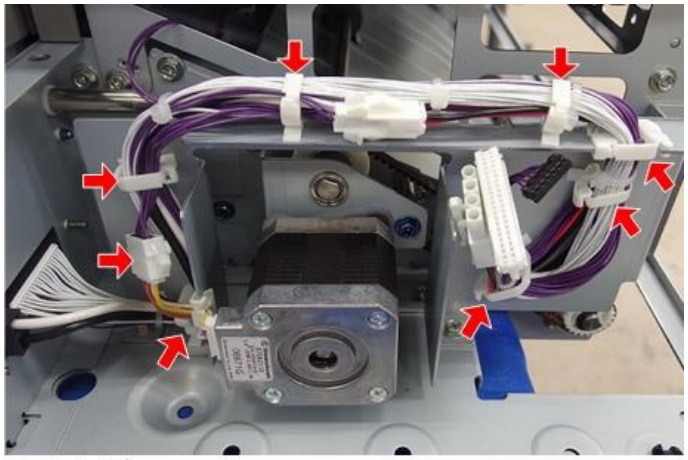
2. Detach the fan from the bracket.



Relay Motor

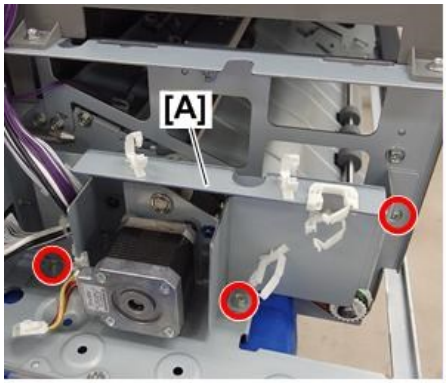
1. Remove the cover [A] (x2).

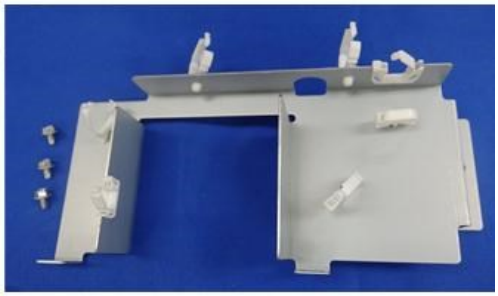
2. Open the clamps to free the harness.



x1 x7 m0b2d8317a

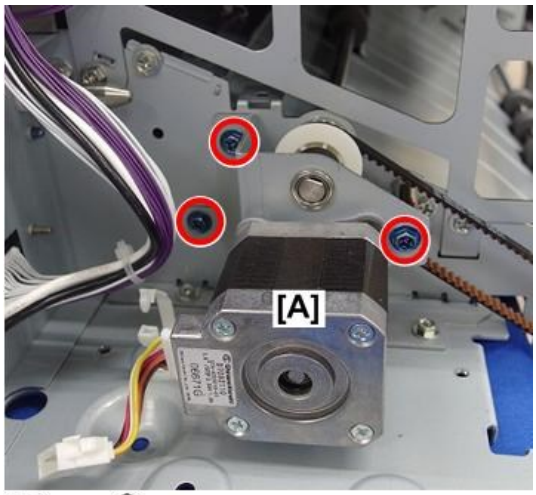
3. Remove the bracket [A]





x3 m0b2d8318a

4. Remove the motor [A] with its bracket.



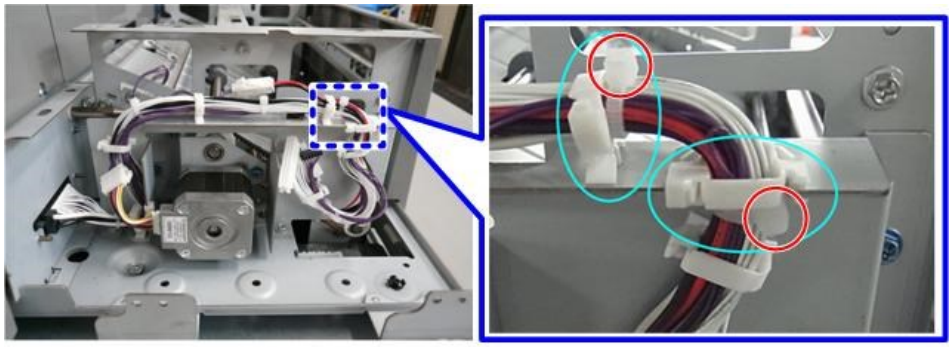
x3 x1 m0b2d8319a

5. Separate the motor and bracket.

Re-installation

When you re-install the harness:

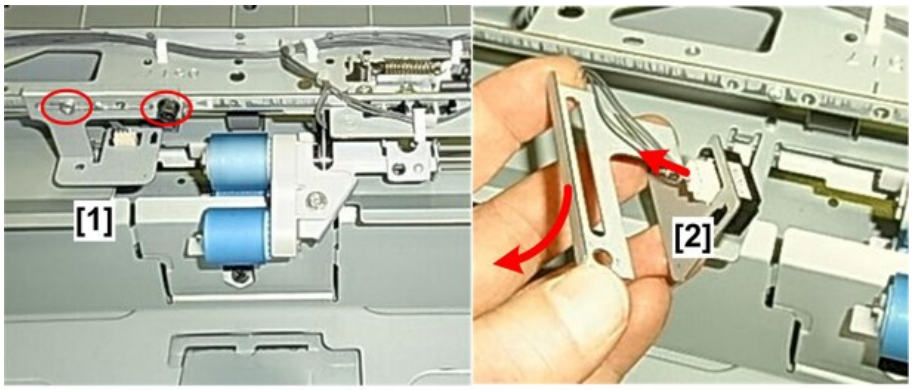
- Work carefully so it does not get pinched.
- Make sure the permanent bands are positioned at the clamps as shown in the photo.



Sensors

Paper Feed Sensor

1. Remove the front, rear, and top covers. (Right Front Cover, Left Front Cover, Rear Cover, Top Cover)
2. Disconnect the sensor bracket [1] (x1, x1).
3. Remove the sensor [2] (x1, x3).



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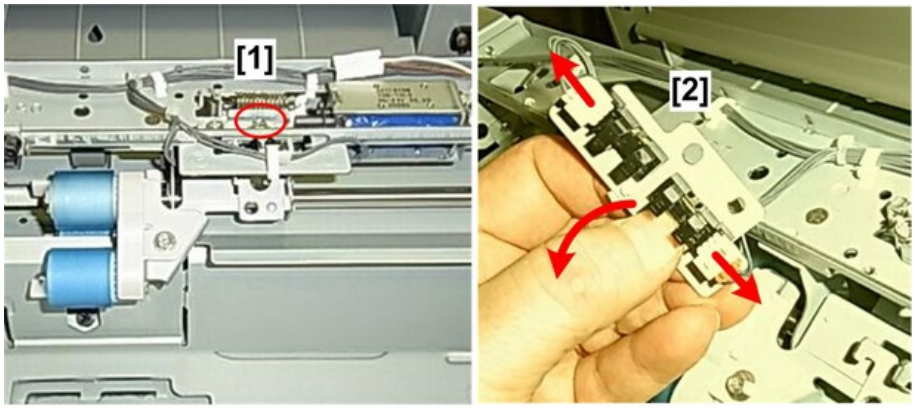
Lift Sensors

1. Remove the front, rear, and top covers. (Right Front Cover, Left Front Cover, Rear Cover, Top Cover)
2. Disconnect the sensor bracket [1] (x1).
3. Disconnect and remove the sensors [2] (x1, x3 each).

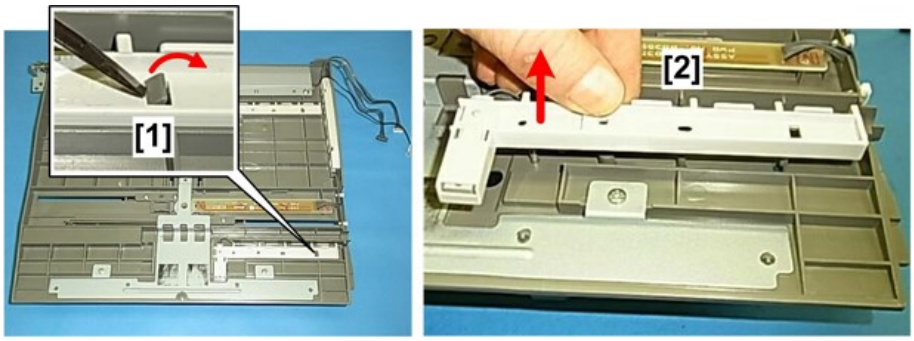


d517r836

Paper End Sensor

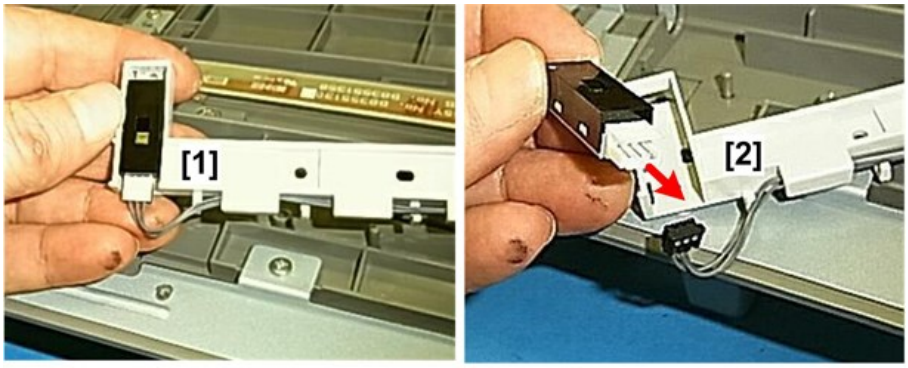
1. Remove the feed tray. (Feed Tray)
2. Turn the feed tray upside down and lay it on a flat surface.

3. Release tab [1] and remove the sensor cover [2] (x1).



d517r814

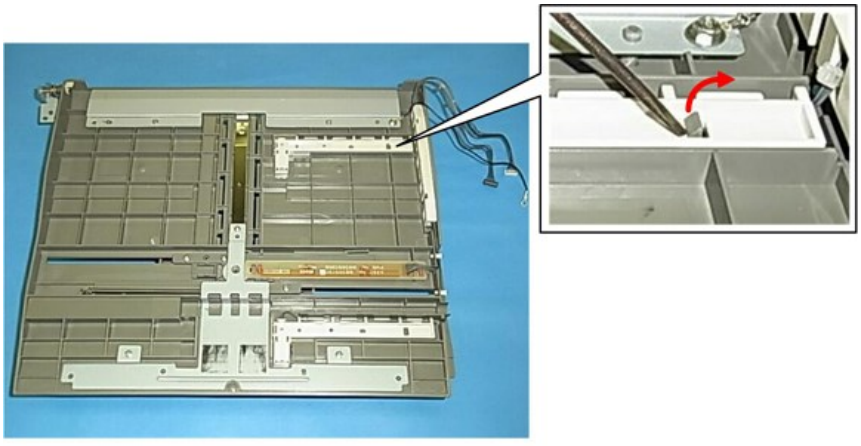
4. Turn over the sensor cover [1].
5. Remove the sensor [2] (x1).



d517r815

Paper Length Sensor

1. Remove the feed tray (Feed Tray)
2. Turn the feed tray upside down and lay it on a flat surface.
3. Release the hook.



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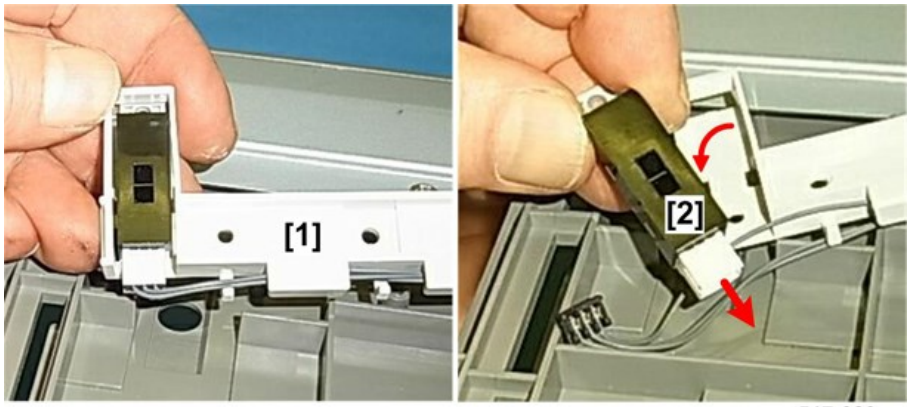
4. Remove the sensor cover [1] and turn it over.

5. Remove the sensor [2] (x1)



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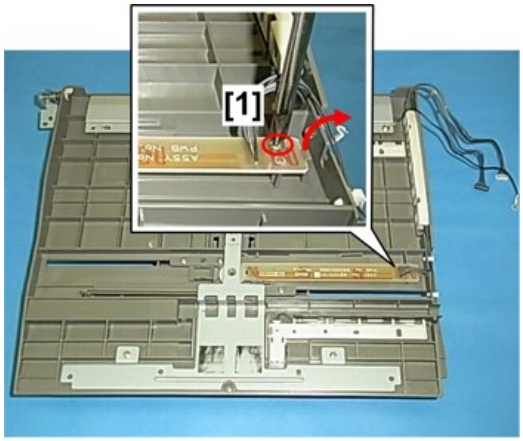
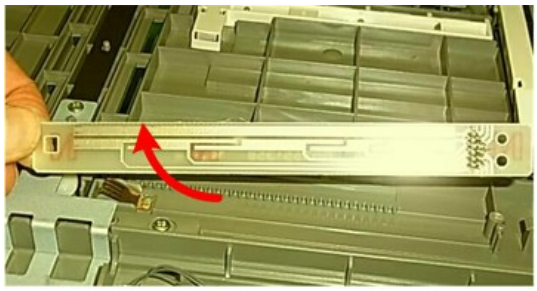
Paper Width Sensor

1. Remove the feed tray. Feed Tray
2. Turn the feed tray upside down and lay it on a flat surface.
3. Disconnect the sensor plate [1] (x1).



d517r816

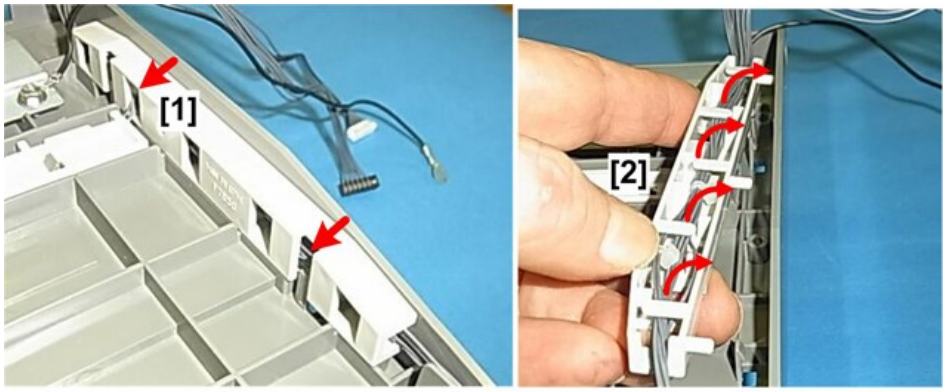
4. Remove the sensor plate (x3).



d517r817

5. Disconnect the sensor cover [1] (x2).

6. Turn the sensor cover over [2] and remove the sensor harness from the cover.



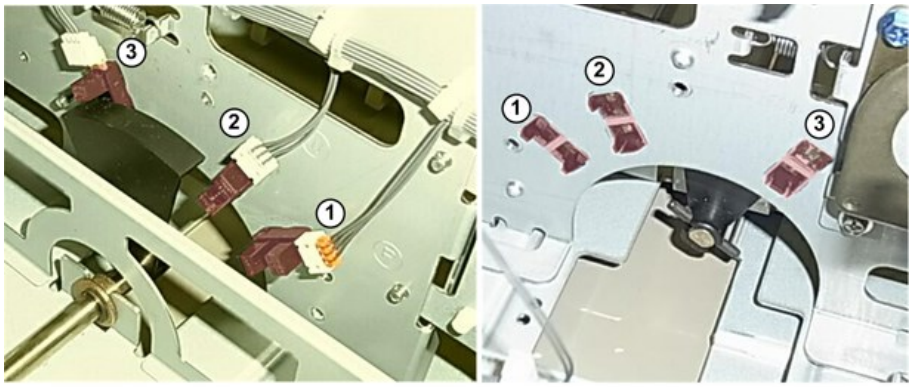
d517r818

Paper Height Sensors 1, 2, Tray Lower Limit Sensor

1. Remove all the covers. (Right Front Cover, Left Front Cover, Rear Cover, Top Cover)

2. Paper height sensors 1 and 2, and the tray lower limit sensor are mounted on the frame.

- The left photo shows the sensors and connectors on the front side of the frame.
- The right photo shows where the sensor pawls protrude from the back of the frame.



d517r832

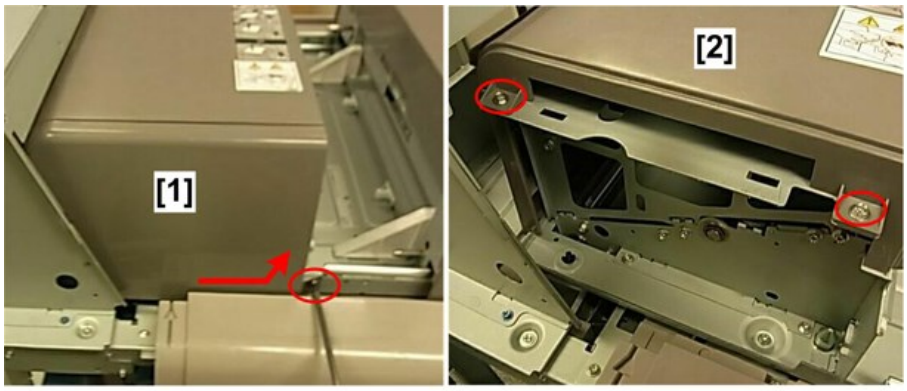
3. To remove a sensor, disconnect it from the frame and the harness (x3, x1).

Relay Sensor

1. Remove the covers for the relay motor removal. Relay Motor

2. Remove the front inner cover [1] (x1).

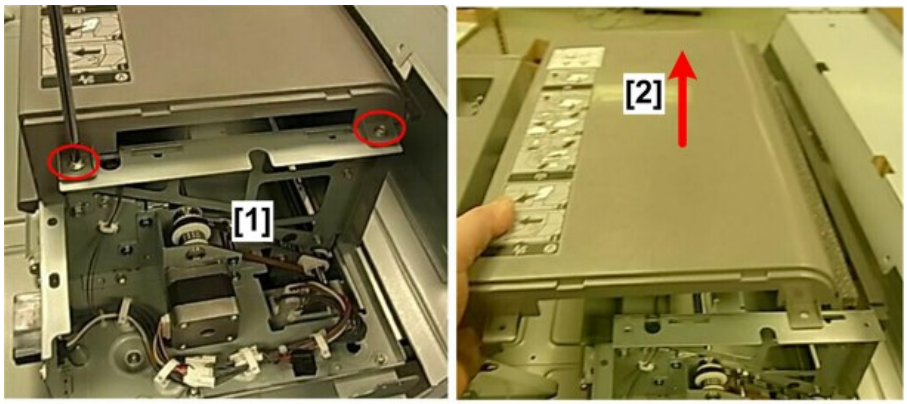
3. Disconnect the top cover [2] at the front (x2).



d517r843

4. Disconnect the top cover [1] at the rear (x2).

5. Remove the top cover [2].



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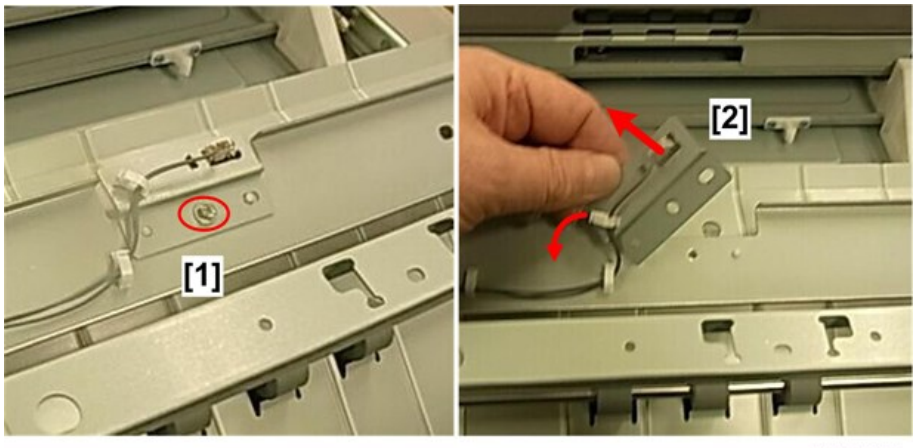
6. Remove the sensor bracket [1] (x1).

7. Remove the sensor [2] (x1, x1).



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Rollers

Overview

d7400002

The bypass feed rollers can be accessed from the top of the LCIT.

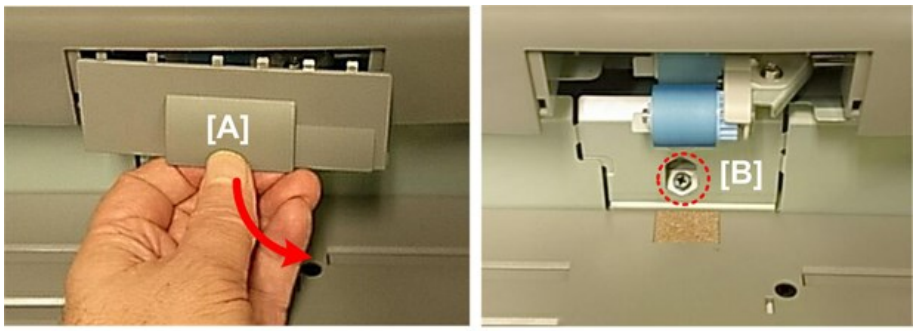
Roller Removal

1. The rollers are behind the snap-off cover.

d517r751

2. Pull off cover [A].

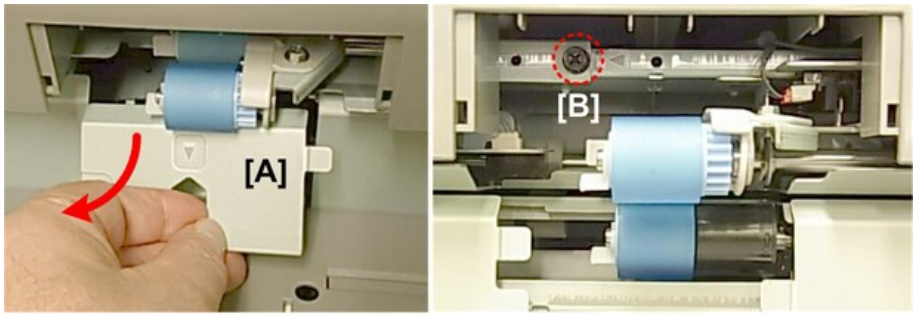
3. Remove screw [B].



d571r752

4. Remove plate [A].

5. Remove screw [B].



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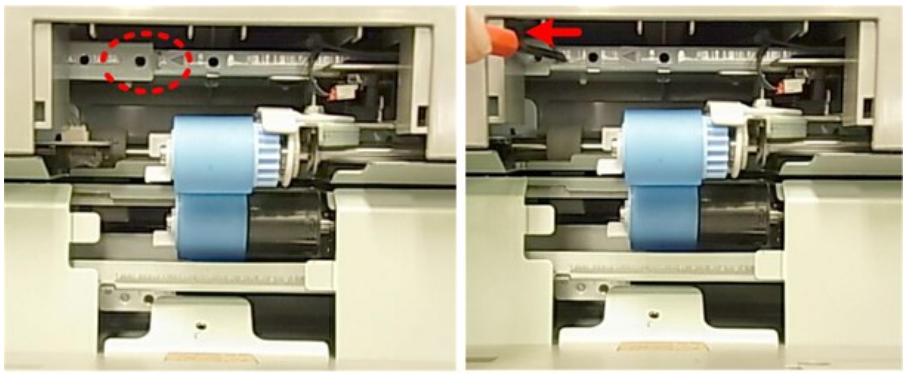
6. Push the sensor positioning plate to the left.



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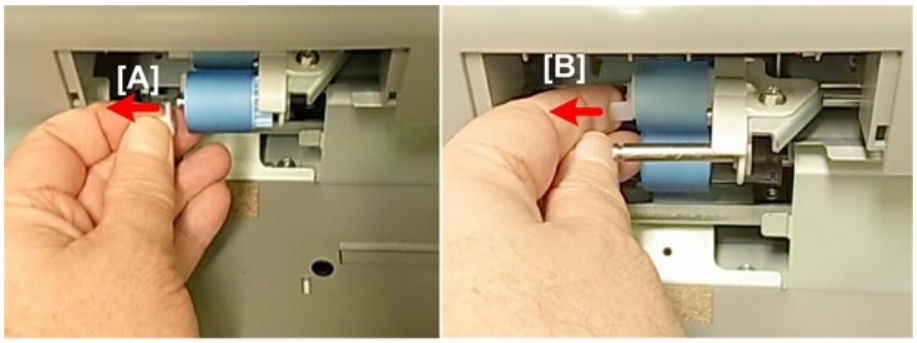
Note

- If this plate is not pushed to the left, you will not be able to remove the feed roller.

7. Remove:

[A] Pick-up roller snap ring and roller.

[B] Feed roller snap ring and roller.



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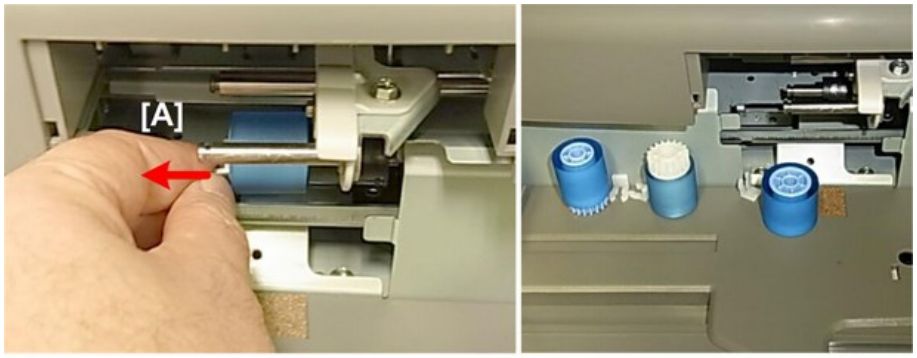
8. Remove the separation snap ring and roller [A].



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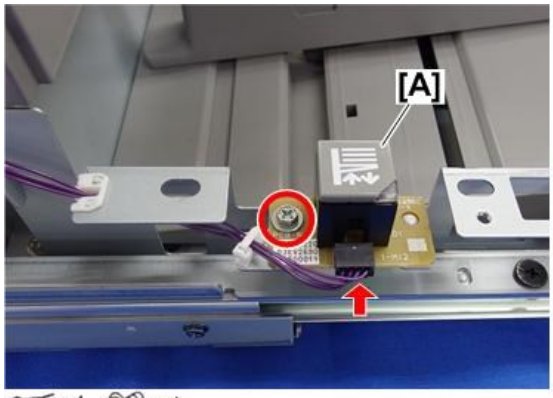
9. After installing new rollers, turn on the machine and wait for it to warm up.

10. Re-set the PM Counts for the replaced rollers.

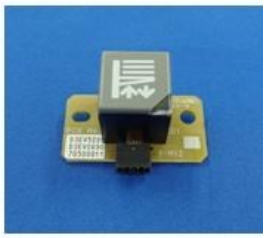
Switch, Solenoid, PCB

Tray Lift Switch

1. Remove the front covers. (Right Front Cover, Left Front Cover)
2. Remove the switch [A].



x1 x1



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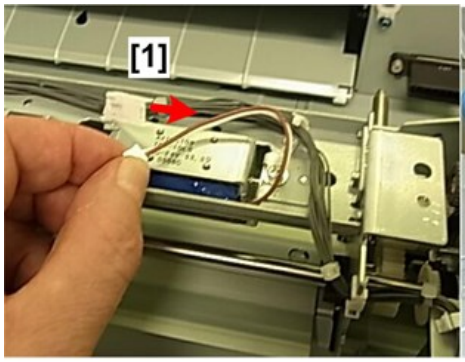
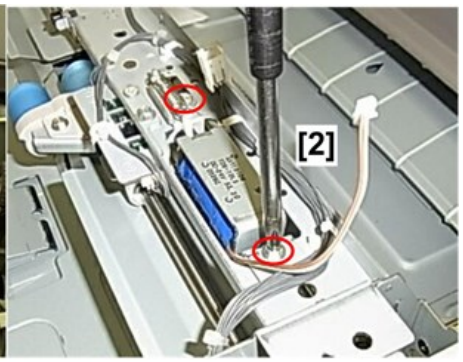
Pickup Solenoid

1. Remove all the covers. (Right Front Cover, Left Front Cover, Rear Cover, Top Cover)
2. Disconnect the solenoid [1] (x1).
3. Unfasten the solenoid [2] (x1).





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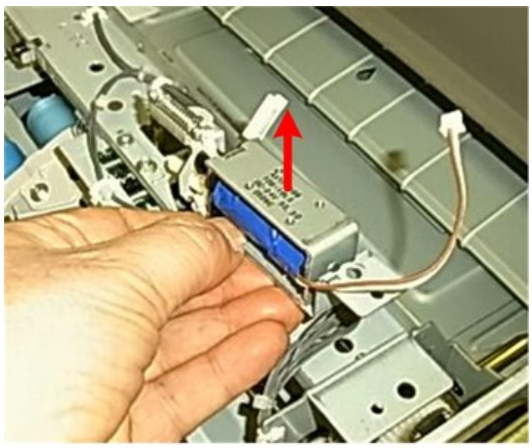
4. Remove the solenoid.



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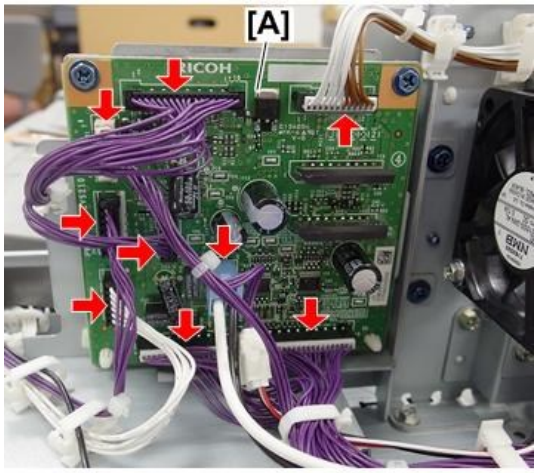
Re-installation

- When re-installing the solenoid, make sure that the arm of the solenoid is positioned above and in contact with the plate of the pick-up roller shaft below.
- To confirm correct installation, manually move the solenoid plunger to the left and right. When the solenoid plunger is moved, the pick-up roller should move up and down smoothly.

Bypass Tray PCB

1. Remove the rear cover. (Rear Cover)
2. Disconnect the connectors on the board.



x9

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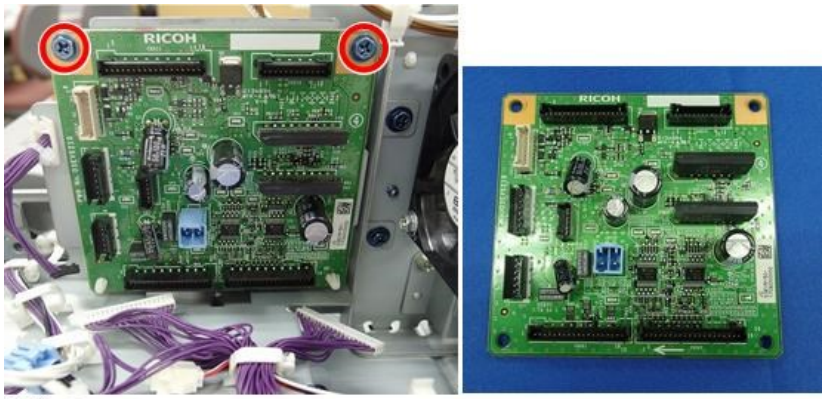
3. Remove the board.

Note

Two rivets secure the lower edge of the board.



x2

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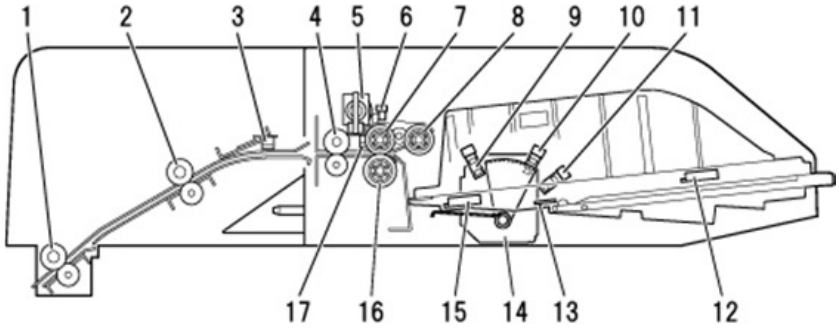
2. Detailed Descriptions

Overview

Specifications

Item	Specification	
Configuration	Mounted on top of the LCT	
Tray	Single tray with extension	
Tray capacity	550 sheets (Normal Paper)	
Paper size	A3 SEF, A4 LEF SEF, A5 LEF SEF, A6 SEF, B4 SEF, SEF, B6 SEF, 11"×17” SEF, 81/2"×14” SEF, 8 1/2"×13” SEF, 8 1/2"×11” LEF SEF, 8 1/4"×14” SEF, 8 1/4"×13” SEF, 8"×13” SEF, 8"×10 1/2” LEF SEF, 8"×10” LEF SEF, 7 1/4"×10 1/2” LEF SEF, 5 1/2"×8 1/2” LEF SEF, 182×210 mm LEF SEF, 170×210 mm LEF SEF, 210×340 SEF, Postcard SEF, 8K SEF, 16K LEF SEF, 12"×18” SEF, 11"×15” SEF, 11"×14” SEF, 10"×15” SEF, 10"×14” SEF, 13"×19 1/5” SEF, 13"×19” SEF, 12 3/5"×19 1/5” SEF, 12 3/5"×18 1/2” SEF, 13"×18” SEF, SRA3 SEF, SRA4 LEF SEF	
	Custom size	SEF: 100 to 330.2 mm LEF: 139.7 to 487.7 mm
Paper weight	52.3 to 216.0g/m^2	
Paper size adjustment	Universal size tray with adjustable size fences for width adjustment, one end fence for length adjustment	
Power source	DC 24V±10% 5±V5% (Main machine to LCT)	
Power consumption	Less than 70W	
Dimensions (w × d × h)	690 × 561 × 210 mm (27 × 22 × 8.3 in.)	
Weight	Approx. 20 kg (44 lb.)	
Paper remains detection	4 sensors (4 steps) at 500, 450, 250, 50 sheets remaining (accuracy ±50 sheets with paper 0.11 mm thick), displayed on the main machine operation panel	
Jam handling	Paper tray slides open for jam removal	
Jam reset	Paper tray opening and closing	

Mechanical Component Layout



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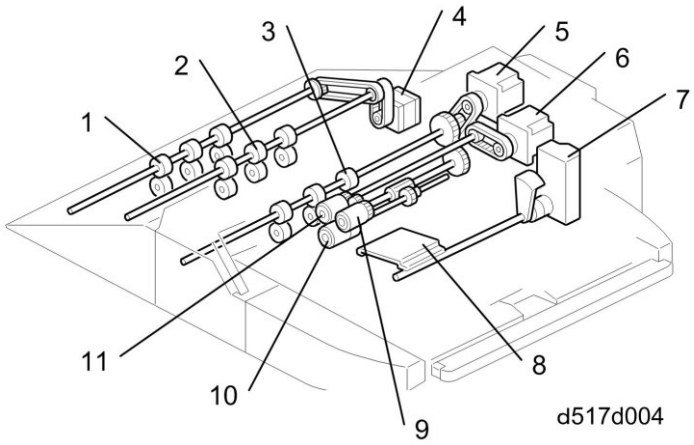
No.	Name	No.	Name
1	Transport Roller 2	10	Paper Height Sensor 1
2	Transport Roller 1	11	Paper Height Sensor 2
3	Relay Sensor	12	Paper Length Sensor
4	Grip Roller	13	Paper Width Sensor
5	Pick-up Solenoid	14	Tray Lift Motor
6	Tray Upper Limit Sensor 1, 2	15	Paper End Sensor
7	Feed Roller	16	Separation Roller
8	Pick-up Roller	17	Paper Feed Sensor
9	Tray Lower Limit Sensor		

Drive Layout



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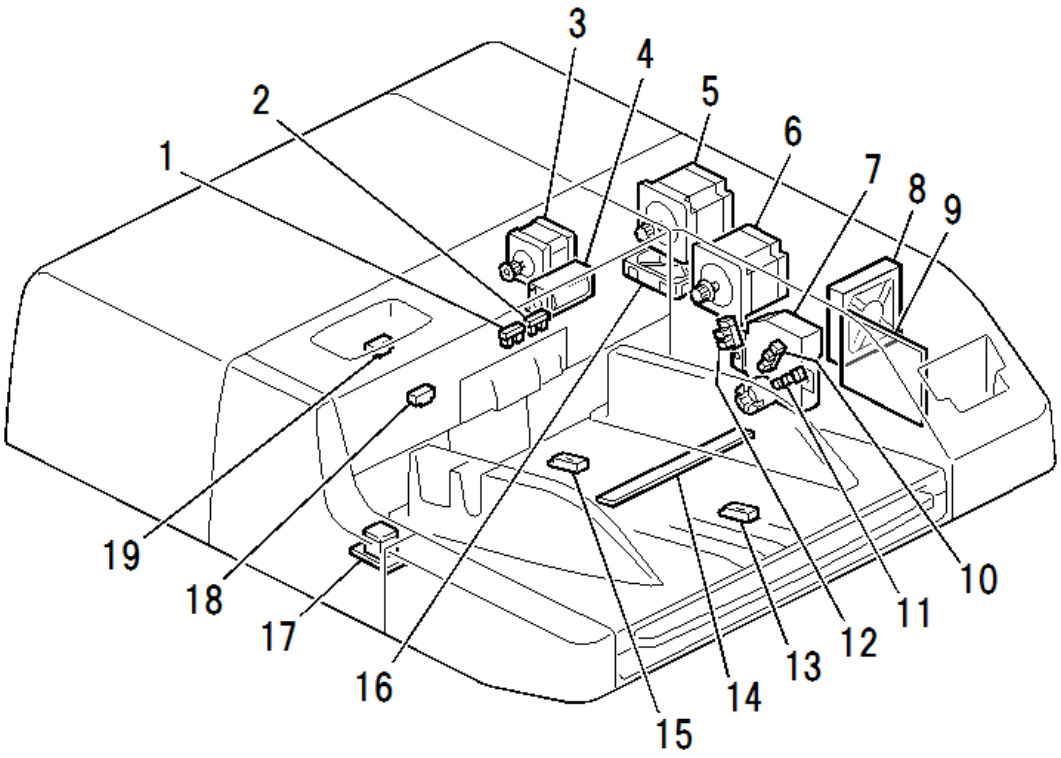
No.	Name	No.	Name
1	Transport Roller 2	7	Lift Motor
2	Transport Roller 1	8	Lift Plate
3	Grip Roller	9	Pick-up Roller
4	Relay Motor	10	Separation Roller
5	Transport Motor	11	Feed Roller

No.	Name	No.	Name
6	Feed Motor		

Electrical Components



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Item	Details	Item	Details
1	Tray Upper Limit Sensor 1	11	Paper Height Sensor 2
2	Tray Upper Limit Sensor 2	12	Tray Lower Limit Sensor
3	Relay Motor	13	Paper Length Sensor
4	Pick-up Solenoid	14	Paper Width Switch
5	Transport Motor	15	Paper End Sensor
6	Paper Feed Motor	16	Cooling Fan for Transport Motor
7	Tray Lift Motor	17	Tray Lift Switch
8	Cooling Fan for Feed Motor	18	Paper Feed Sensor
9	PCB	19	Relay Sensor
10	Paper Height Sensor 1		

Electrical Component Summary

Motor

No.	Name	Description
M1	Feed Motor	Drives the paper feed roller in the feed mechanism.
M2	Lift Motor	Raises and lowers the bottom plate below the paper stack.
M3	Relay Motor	Drives the relay rollers that feed the paper from the bypass tray into the feed path of the LCT below.
M4	Transport Motor	Drives the transport roller of the bypass tray that pulls the paper out of the tray and sends it to the relay roller.
M5	Motor Fan	Mounted below the transport motor, cools the area below the feed motor and transport motor.

PCB

No.	Name	Description
PCB1	Bypass Unit Control Board	Controls operation of all bypass unit electrical components.

Sensors

No.	Name	Description
S1	Lift Sensor	Detects when the paper in the bypass tray is at the proper height for paper feed.
S2	Tray Lower Limit Sensor	Detects when the tray is at its lowest possible position.
S3	Paper End Sensor	Informs the copier when the paper in the bypass tray has run out.
S4	Paper Feed Sensor	Detects the copy paper coming to the 4th paper feed roller and checks for misfeeds.
S5	Paper Height Sensor 1	Paper end sensor. The paper height sensor pair (1 and 2) work together to monitor the height of the paper stack in the bypass tray.
S6	Paper Height Sensor 2	Paper near end sensor. The paper height sensor pair (1 and 2) work together to monitor the height of the paper stack in the bypass tray.
S7	Paper Length Sensor	Used with the paper width switch to determine paper size. This sensor is activated when paper is set for short edge feed. For example, when the paper width switch detects A4 width and this sensor is off, the machine determines A4 is set for long edge feed. When A4 width is detected and the paper length sensor is on, then the machine determines that A3 is loaded for short edge feed.

No.	Name	Description
S8	Relay Sensor	Detects jams in the paper path after paper is fed from the feed roller.

Solenoids

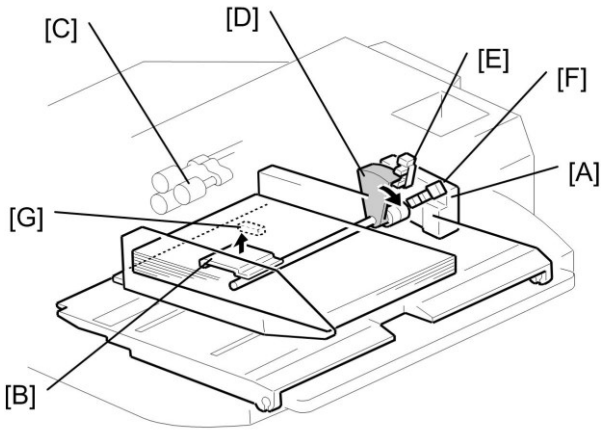
No.	Name	Description
SOL1	Pick-up Solenoid	Controls up-down movement of the pick-up roller in the bypass tray.

Switches

No.	Name	Description
SW1	Tray Lift Switch	Switches the tray lift motor on and off to raise and lower the bottom plate of the tray to the feed position. This switch must be pressed to start paper feed.
SW2	Paper Width Switch	A slide switch connected to the side fences. When the side fences are moved to match the paper width, five feelers inside the paper size switch slide along wiring patterns of a terminal plate. The wire pattern detected determines the paper width.

Mechanisms

Tray Lift



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When the tray lift switch is pressed, the lift motor [A] switches on and pushes the lift plate [B] against the bottom of the feed tray until the top of the stack is at the correct feed position.

If there is paper in the bypass tray when the main machine has just been switched on, the lift motor will turn on and lift the stack to the feed position.

As paper is fed, the pick-up roller [C] lowers until it activates the lift sensor which switches on the lift motor again to raise the stack to the feed level again.

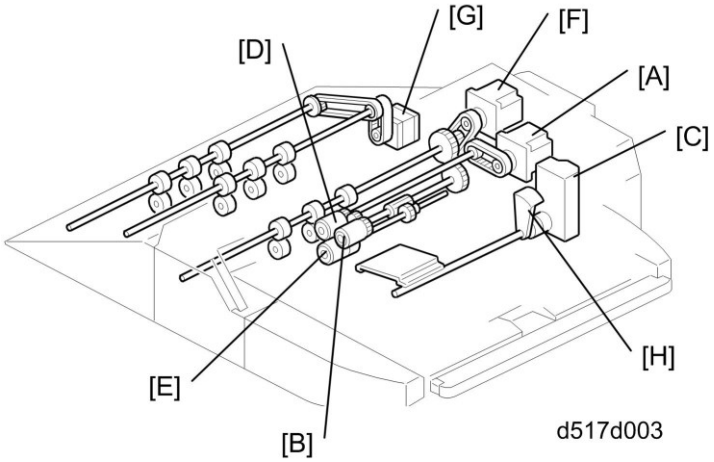
As the bottom plate shaft rotates and raises the bottom plate, the actuator [D] lowers and activates paper height sensor 1 [E] and then paper height sensor 2 [F] as the bottom plate continues to rise. With the tray full, the actuator remains upright and deactivates neither paper height sensor. During continuous feed, the actuator rotates downward through three positions, deactivating the first sensor, then both sensors, then only the second sensor.

These states are used to report the amount of paper on the operation panel.

SN1	SN2	Paper Remaining Status
OFF	OFF	100% (Full)
ON	OFF	90%
ON	ON	50%
OFF	ON	10%

After the last sheet feeds, the paper end sensor [G] below the feed tray detects that the tray is empty. When you re-load the tray with paper, be sure to press the tray lift button to raise the bottom of the tray so the stack is at the correct feed position.

Paper Feed



The bypass tray can hold 500 sheets of standard weight paper.

The bypass tray uses the standard FRR (Feed and Reverse Roller) feed system. When the job starts, the feed motor [A] switches on and rotates the pick-up roller [B]. At the same time, the pick-up solenoid [not shown] switches on and lowers the pick-up roller. The lift motor [C] switches on to raise the stack until the top of the stack reaches the correct feed level. At that time, the paper pushes the pick-up roller down. When the actuator [not shown] goes out of the lift sensor [not shown], the lift motor stops.

The pick-up roller picks up and feeds the first sheet to the feed roller [D] and separation roller [E]. When the feed sensor [not shown] detects the leading edge of the sheet, the pick-up solenoid raises the pick-up roller and the feed roller feeds the sheet.

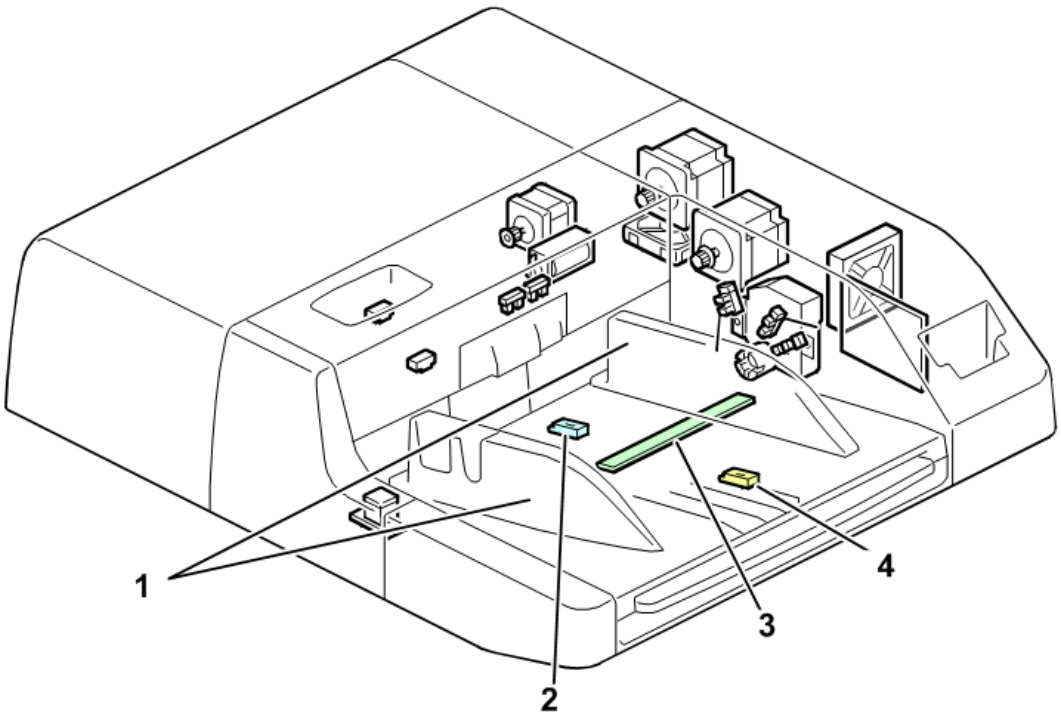
Unlike the separation rollers in the LCT, the separation roller always remains in contact with the feed roller above.

The transport motor [F] then feeds the paper into the bypass tray, and the relay motor [G] feeds the paper out of the bypass tray, and into the machine through the LCT.

When the pick-up roller [B] lowers far enough to go into the lift sensor, the lift motor switches on to raise the bottom plate until the actuator goes out of the lift sensor again and switches off the lift motor. This movement is repeated to maintain the correct height of the stack for paper feed.

Actuator [H] is used by the height sensors, to detect the amount of remaining paper.

Paper Size Detection



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The side fences [1] can be adjusted to standard and non-standard paper sizes.

Paper size is measured with the paper width switch [3] and the paper length sensor [4].

When the side fences are moved to match the paper width, five feelers inside the paper width switch [3] slide along the wiring patterns on the paper width switch terminal plate. The status of each feeler is read to determine whether it is High (in contact with a pattern wire) or Low (not in contact with a wire).

The paper length sensor reading (ON or OFF) is used with the paper width reading to determine the paper size. For more details about how the paper size is determined, see the paper size detection table on the next page.

The paper end sensor [2] de-activates when the last sheet is fed, reports that the paper tray is empty, and halts the job.

Paper Size Detection Table

Paper Size			Paper Width Switch					Length Sensor	Area	
			1	2	3	4	5		NA	EU
Large	12" × 18"		H	H	H	H	L	L	●	○
	320 × 450 mm								○	●
A3	SEF	297 × 420 mm	H	H	H	L	L	L	●	●
A4	LEF	297 × 210 mm						H	●	●

Paper Size			Paper Width Switch					Length Sensor	Area	
			1	2	3	4	5		NA	EU
DLT	SEF	11" × 17"	H	H	H	L	H	L	●	●
LT	LEF	11" × 8 1/2"						H	●	●
B4	SEF	257 × 364 mm	H	H	L	L	H	L	●	●
B5	LEF	257 × 182 mm						H	●	●
A4	SEF	210 × 297 mm	H	H	L	H	H	L	○	●
LT	SEF	8 1/2" × 11"							●	○
A5	LEF	210 × 148 mm						H	○	●
HLT	LEF	81/2" × 51/2"							●	○
B5	SEF	182 × 257 mm	H	L	L	H	H	L	○	○
F	SEF	8" × 13"							●	●
A5	SEF	148 × 210 mm	H	L	H	H	H	H	●	●
HLT	SEF	5 1/2 " × 8 1/2 "	L	L	H	H	H	H	●	●
A6	SEF	105 × 148							●	●

Table Key

Item	Details
1, 2, 3, 4, and 5	The paper width switch consists of 5 feelers that slide along the wiring patterns of the paper width switch terminal plate when the side fences are manually adjusted to fit the size of the paper loaded in the tray. The H, L status of each feeler is determined by whether the feeler is in contact with the wire of a pattern.
H	High (5 V) (Inactive)
L	Low (0 V) (Active)
●	The machine determines the paper size automatically by reading the output of the paper width switches and the paper length sensor.
○	The machine cannot detect the paper size automatically. The user must select the paper size manually before starting the job. See Selecting the Paper Size for Undetectable Sizes.

Selecting the Paper Size for Undetectable Sizes

Press the [Tray Paper Settings] tab on the operation panel to select paper sizes that are not detected automatically by the combination of paper width and paper length sensor readings (marked "○" in the table above, and any other paper size not listed that requires pulling out the paper tray extension). Mixed paper sizes cannot be loaded into the bypass tray. Loading paper of different sizes will cause a paper jam.