ARDF DF3000
Machine Code: D366

SERVICE MANUAL

October 2008
Subject to change

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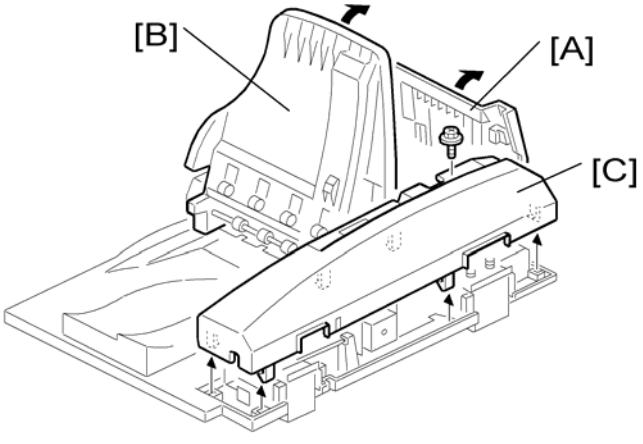
1. Replacement and Adjustment

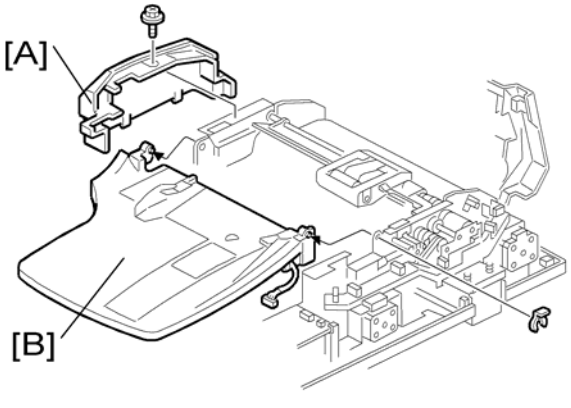
Covers and Tray

Rear Cover



1. Open the left cover [A].
2. Open the original tray [B].
3. Rear cover [C] (🔩 x 1, hook x 6)

Front Cover and Original Tray



1

1. Open the left cover.
2. Rear cover (☛ "Rear Cover")
3. Front cover [A] (x 1)

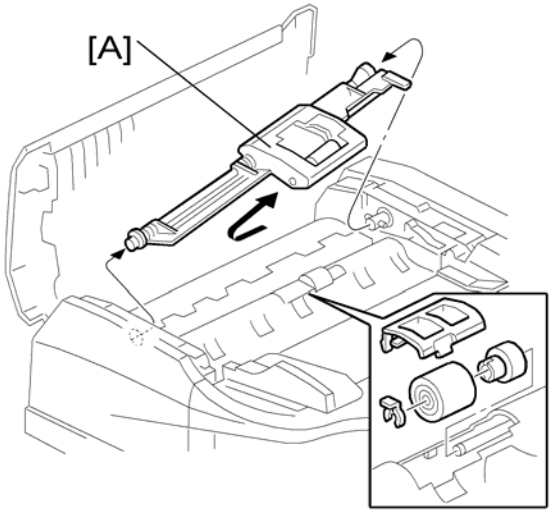
Note

- Keep the original tray open when you remove the front cover.

4. Original tray [B] (x 1, x 1)

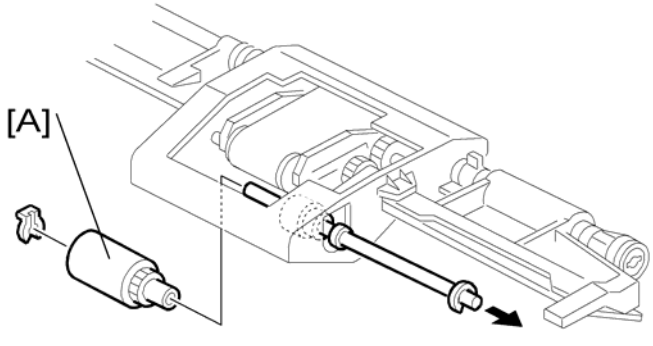
Document Feed Components

Original Feed Unit



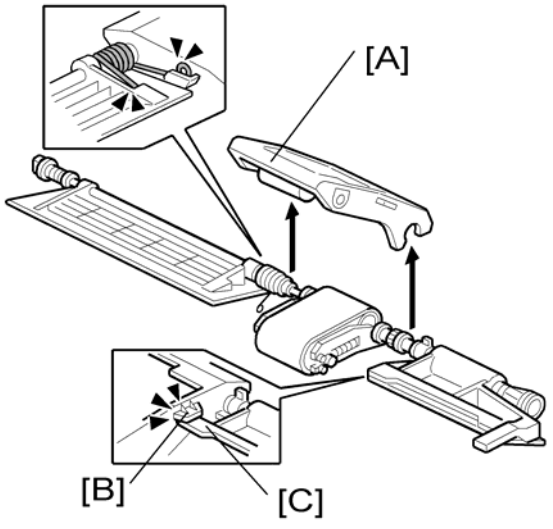
1. Open the left cover.
2. Original feed unit [A].

Pick-Up Roller



1. Open the left cover.
2. Original feed unit (☛ "Original Feed Unit")
3. Pick-up roller [A] (⟲ x 1)

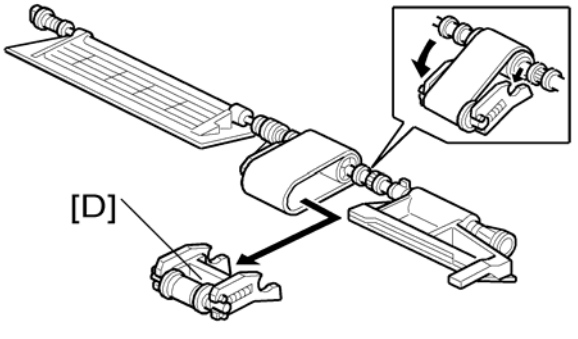
Feed Belt



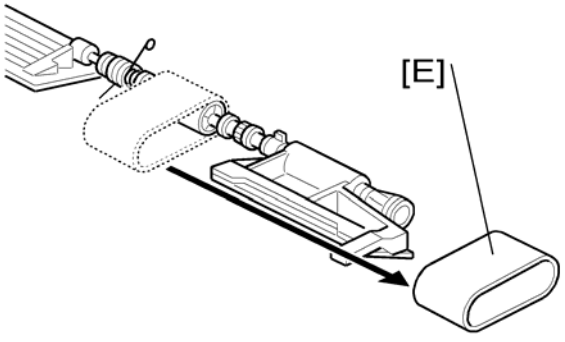
1. Open the left cover.
2. Original feed unit (☛ "Original Feed Unit")
3. Feed belt cover [A] (spring x 1)

Note

- When reassembling the feed belt cover, make sure that the projection [B] of the feed belt cover is on the guide plate rear [C].

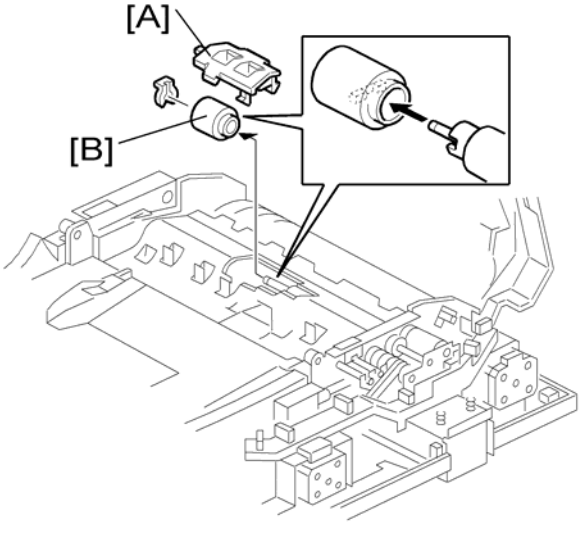


1. Belt tension unit [D]



2. Feed belt [E]

Separation Roller

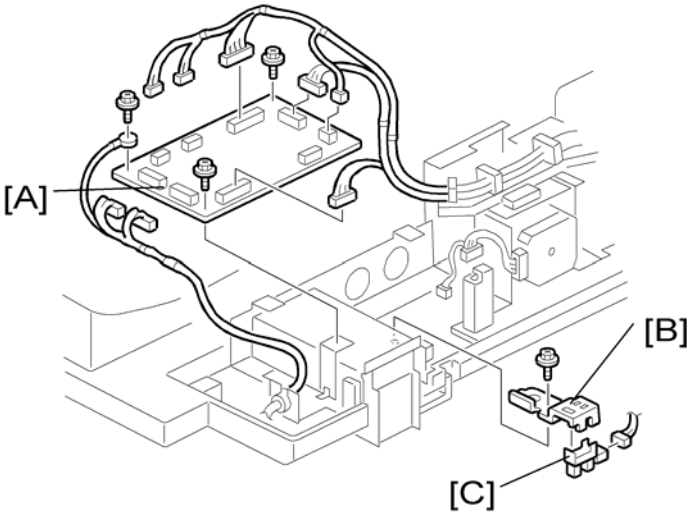


1. Open the left cover.
2. Separation roller cover [A].
3. Separation roller [B] (x 1)

Electrical Components

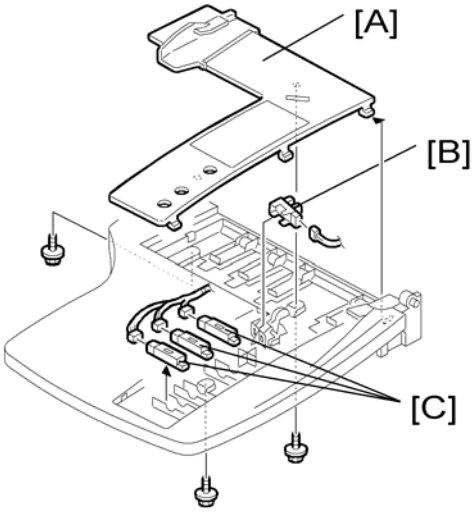
1

ARDF Drive Board and DF Position Sensor



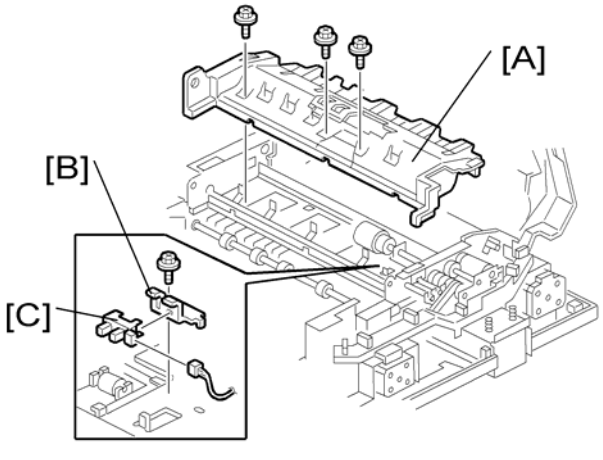
1. Rear cover (see "Rear Cover")
2. ARDF drive board [A] (x 3, all s)
3. DF position sensor with bracket [B] (x 1, x 1)
4. DF position sensor [C] (hook x 2)

Original Length Sensors and Trailing Edge Sensor



1. Original Tray (see "Front Cover and Original Tray")
2. Tray cover [A] (x 3)
3. Original trailing edge sensor [B] (x 1)
4. Original length sensors [C] (x 1 each)

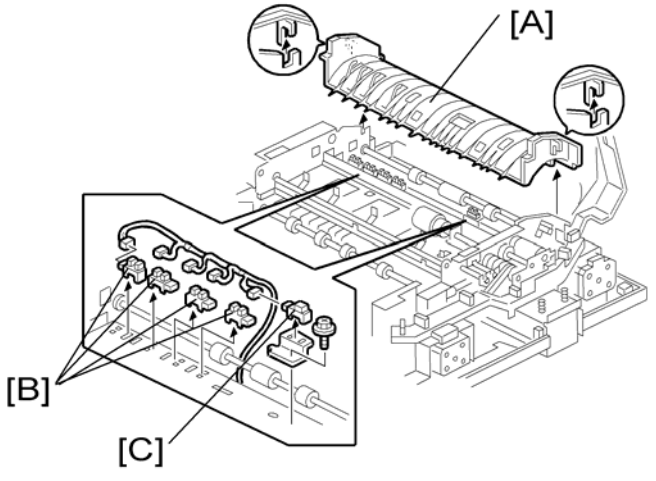
Original Set Sensor



1. Open the left cover.
2. Original feed unit (see the "Original Feed Unit")

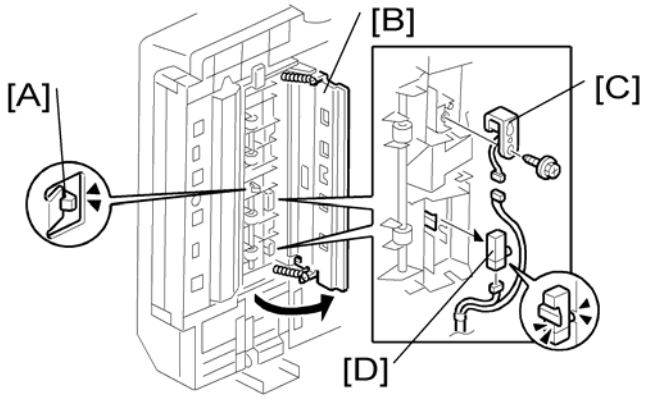
3. Original Tray (see the "Original Tray")
4. Original feed-in guide plate [A] (x 3).
5. Original set sensor bracket [B] (x 1)
6. Original set sensor [C]

Original Size Sensors and Skew Correction Sensor



1. Original feed-in guide plate (see "Original Set Sensor")
2. Original turn guide plate [A] (hook x 1).
3. Original width sensors [B] (x 1 each) and skew correction sensor [C] with bracket (x 1, x 1)

Stamp Solenoid and Original Exit Sensor

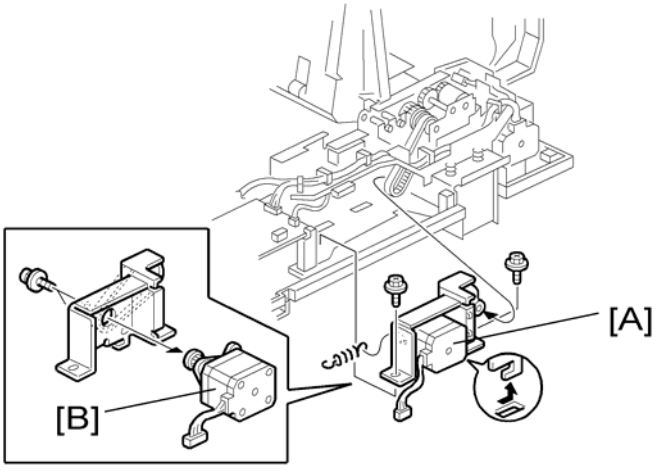


1. Open the ARDF.
2. Remove the left edge of the platen sheet.
3. Release the hook [A].
4. Open the original exit guide plate [B]
5. Stamp solenoid [C] (x 1, x 1)
6. Original exit sensor [D] (x 1, hook x 1)

Original Feed Drive

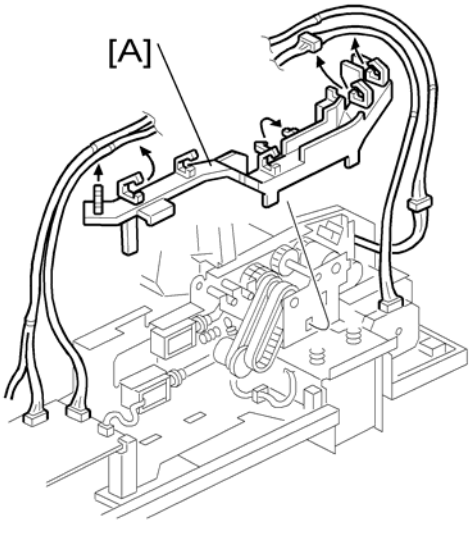
1

Feed Motor

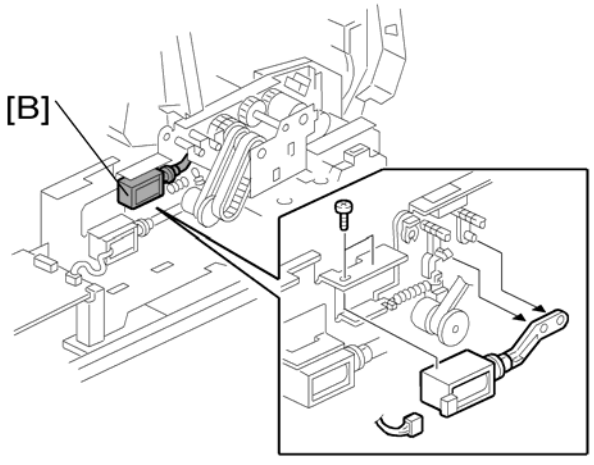


1. Rear cover (see "Rear Cover")
2. Feed motor with bracket [A] (x 2, x 1, spring x 1)
3. Feed motor [B] (x 2)

Pick-up Solenoid

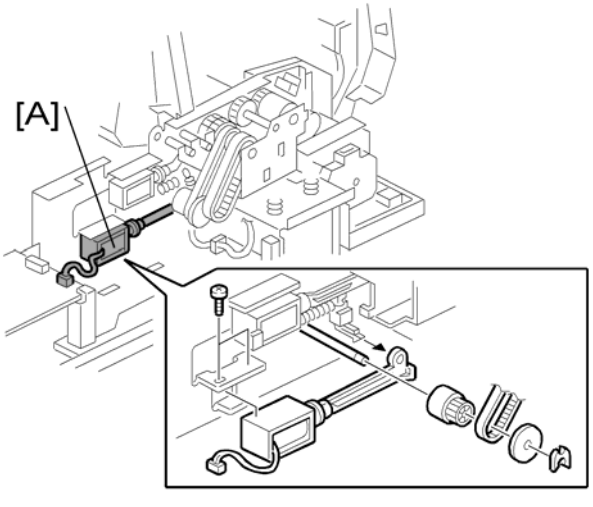


1. Rear cover (see "Rear Cover")
2. Harness guide [A] (all s)



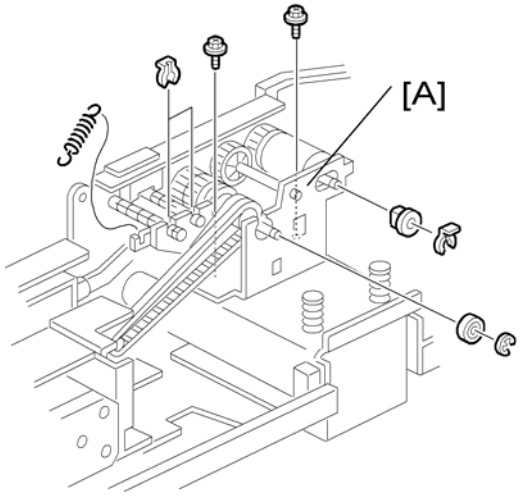
3. Pick-up solenoid [B] (x 2, x 1)

Inverter Solenoid

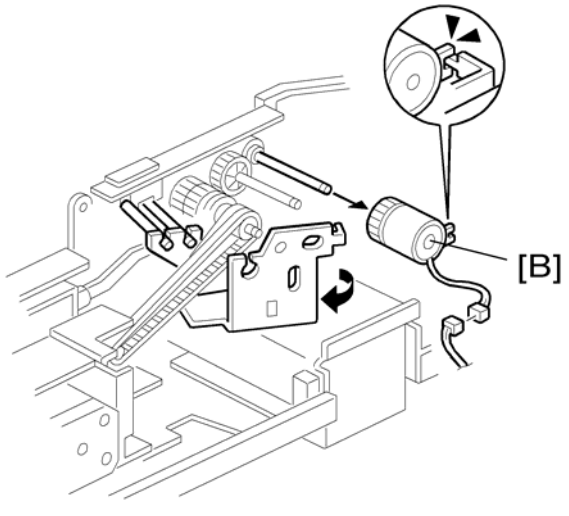


1. Rear cover (see "Rear Cover")
2. Harness guide (see "Pick-up Solenoid")
3. Inverter solenoid [A] (x 2, x 1, x 1, gear x 1, gear cover x 1)

Feed Clutch

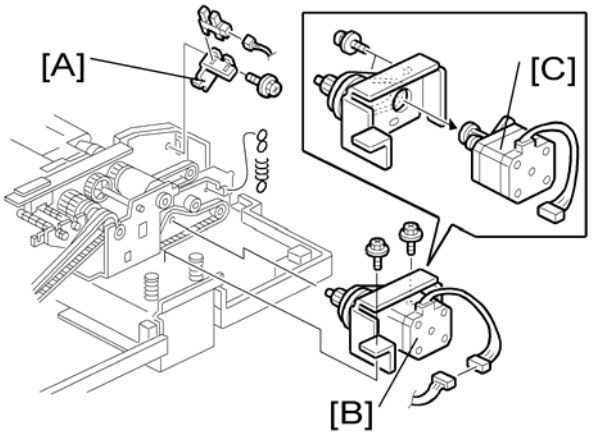


1. Rear cover (see "Rear Cover")
2. Harness guide (see "Pick-up Solenoid")
3. Bracket [A] (x 2, x 3, x 1, bushing x 1, spring x 1)



4. Slide the bracket.
5. Feed clutch [B] (x 1)

Transport Motor

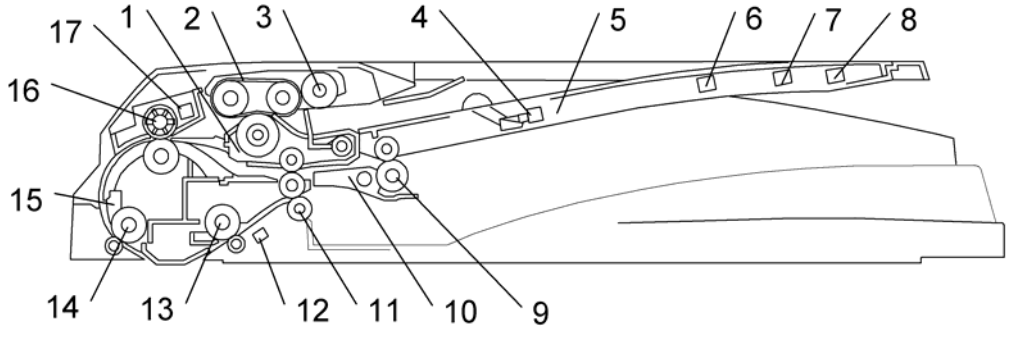


1. Rear cover (☛ "Rear Cover")
2. Harness guide (☛ "Pick-up Solenoid")
3. Left cover sensor with bracket [A] (x 1, x 1)
4. Transport motor with bracket [B] (x 2, x 1, spring x 1)
5. Transport motor [C] (x 2)

2. Detailed Descriptions

Component Layout

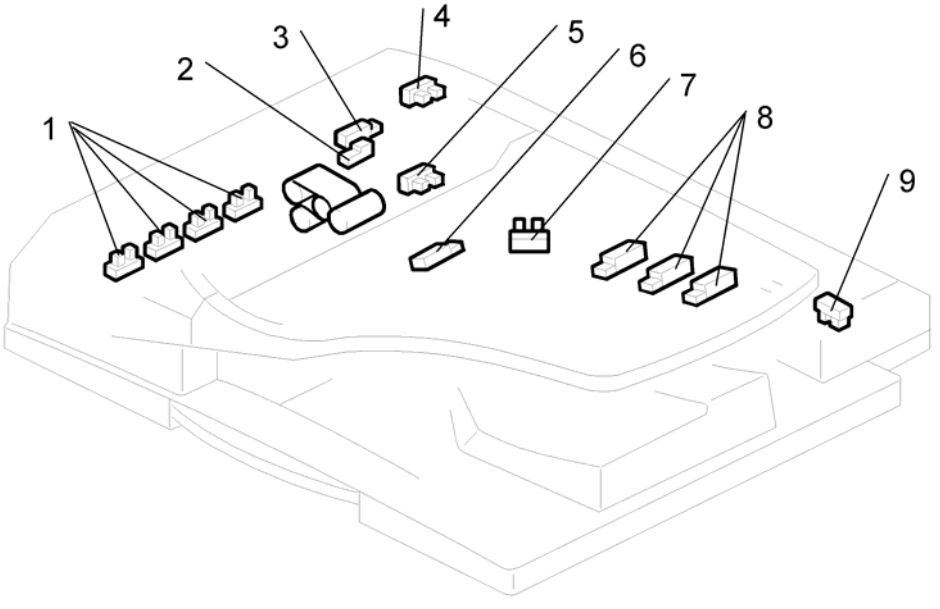
Mechanical Component Layout



1. Separation Roller	10. Junction Gate
2. Paper Feed Belt	11. Exit Roller
3. Pick-up Roller	12. Original Exit Sensor
4. Original Trailing Edge Sensor	13. Transport Roller
5. Original Tray	14. Registration Roller
6. Original Length Sensor 1	15. Registration Sensor
7. Original Length Sensor 2	16. Skew Correction Roller
8. Original Length Sensor 3	17. Skew Correction Sensor
9. Inverter Roller	

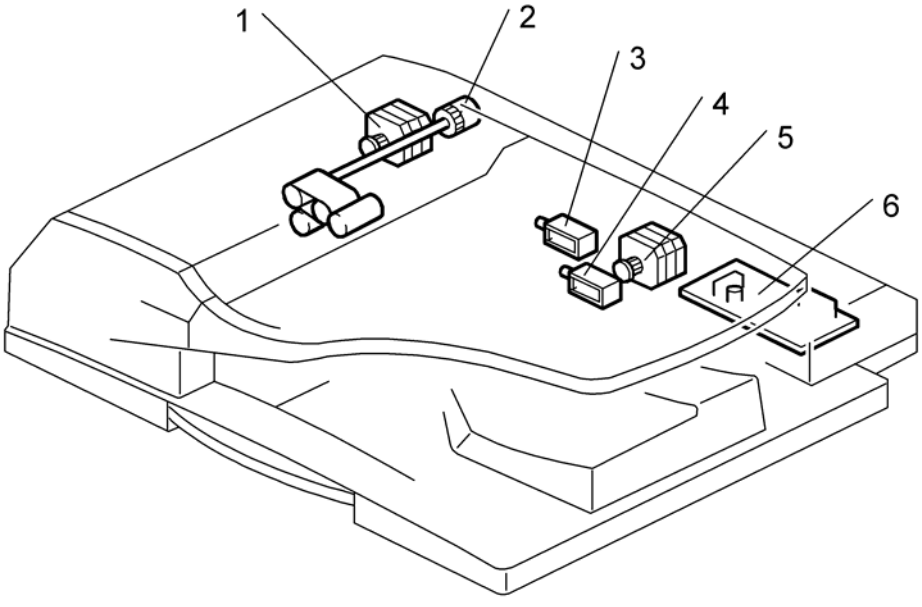
Electrical Component Layout

Sensors



1. Original Width Sensor	6. Exit Sensor
2. Skew Correction Sensor	7. Original Sensor
3. Registration Sensor	8. Original Length Sensor
4. Cover Sensor	9. DF Position Sensor
5. Original Set Sensor	

Drive Components



1. Transport Motor	4. Inverter Solenoid
2. Feed Clutch	5. Feed Motor
3. Pick-up Solenoid	6. Main Board

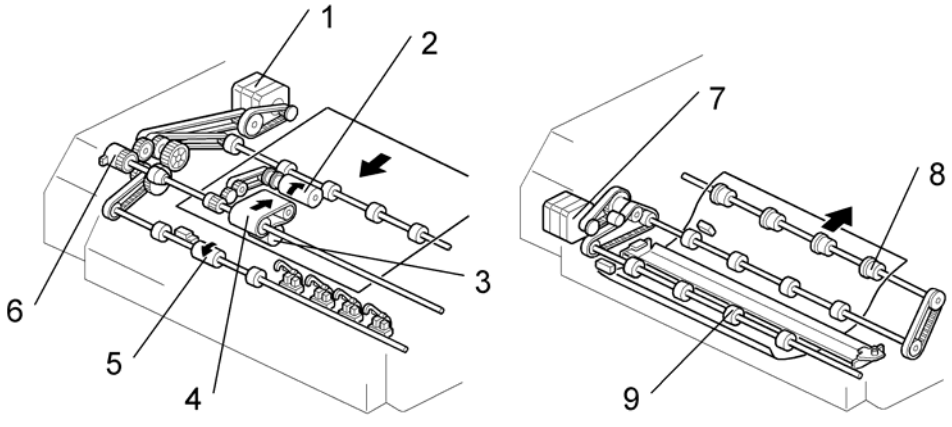
Electrical Component Descriptions

Symbol	Name	Function	Index No.
Motors			
M1	Feed	Drives the feed belt, separation, pick-up, and reverse table rollers.	5
M2	Transport	Drives the transport and exit rollers	1
Sensors			
S9	DF Position	Detects whether the DF is lifted or not.	9
S5	Skew Correction	Detects the leading edge of the original to turn off the DF feed and transport motors.	2

S8	Registration	Detects the original exposure timing, and checks for original misfeeds.	3
S10	Cover Sensor	Detects whether the feed-in cover is opened or not.	4
S1	Original Width Sensor - S	Detects the original width - S.	1
S2	Original Width Sensor - M	Detects the original width - M.	1
S3	Original Width Sensor - L	Detects the original width - L.	1
S4	Original Width Sensor - LL	Detects the original width - LL.	1
S14	Original Length - S	Detects the original length - S.	8
S13	Original Length - M	Detects the original length - M.	8
S12	Original Length - L	Detects the original length - L.	8
S7	Original Set	Detects if an original is on the feed table.	5
S6	Original Exit	Detects the leading edge of the original to turn on the junction gate solenoid and checks for original misfeeds. Detects the trailing edge of the original to turn off the transport and feed motor and junction gate solenoid. In single-sided mode, used to detect original misfeeds.	6
S11	Original	Detects the trailing edge of the last original to stop copy paper feed and to turn off the transport motor, and checks for original misfeeds.	7
Solenoids			
SOL1	Pick-up	Controls the up-down movement of the original table.	3
SOL2	Stamp	Energizes the stamper to mark the original.	
SOL3	Junction Gate	Opens and closes the junction gate.	4
Magnetic Clutches			

MC1	Feed	Drives the feed belt, separation, pick-up, and skew correction rollers	5
PCBs			
PCB1	Main	Interfaces the sensor signals with the copier, and transfers the magnetic clutch, solenoid and motor drive signals from the copier.	6

Drive Layout

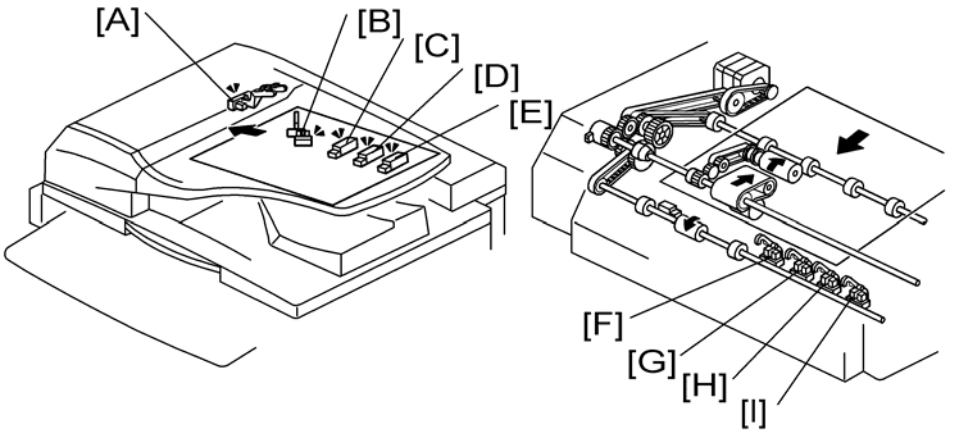


1. Feed Motor	6. Feed Clutch
2. Pick-up Roller	7. Transport Motor
3. Separation Roller	8. Exit Roller
4. Feed Belt	9. Registration Roller
5. Skew Correction Roller	6. Feed Clutch

- Feed Motor: Drives the feed belt, separation, pick-up, and skew correction rollers.
- Transport Motor: Drives the registration and exit rollers.

Basic Operation

Original Set and Size Detection



The original set sensor [A] detects if the original is set or not. The original sensor [B] detects if the original is on the original tray or not (this lets the machine know as early as possible, whether there is another original on the tray).

The original size detection mechanism consists of the four original width sensors ([F]: Width Sensor S, [G]: Width Sensor M, [H] Width Sensor L, [I]: Width Sensor LL) and three original length sensors ([C]: Length Sensor S, [D]: Length Sensor M, [E]: Length Sensor L). Based on the combined output of the length sensors and the width sensors, the machine can detect the size of the original. This integrated detection mechanism is detailed in the table below.

Size	Width Sensor				Length Sensor			Area	
	S	M	L	LL	S	M	L	LT	A/B
A3/SEF (297 x 420)	ON	ON	ON	ON	ON	ON	ON	O	O
B4/SEF (257 x 364)	ON	ON	-	-	ON	ON	ON	-	O
A4/SEF (210 x 297)	ON	-	-	-	ON	ON	-	O	O
A4/LEF (297 x 210)	ON	ON	ON	ON	-	-	-	O	O
B5/SEF (182 x 257)	-	-	-	-	ON	-	-	-	O
B5/LEF (257 x 182)	ON	ON	-	-	-	-	-	-	O
A5/SEF (148 x 210)	-	-	-	-	-	-	-	-	O

A5/LEF (210 x 148)	ON	-	-	-	-	-	-	-	O
11" x 17"/SEF (DLT)	ON	ON	ON	-	ON	ON	ON	O[1]	O[5]
11" x 15"/SEF	ON	ON	ON	-	ON	ON	ON	●[1]	-
10" x 14"/SEF	ON	ON	-	-	ON	ON	ON	O	-
8.5" x 14"/SEF (LG)	ON	-	-	-	ON	ON	ON	O[2]	-
8.5" x 13"/SEF (F4)	ON	-	-	-	ON	ON	ON	●[2]	O
8.25" x 13"/SEF	ON				ON	ON	ON	-	-
8" x 13"/SEF (F)	ON	-	-	-	ON	ON	ON	-	-
8.5" x 11"/SEF (LT)	ON	-	-	-	ON	-	-	O[3]	O[6]
8.5" x 11"/LEF (LT)	ON	ON	ON	-	-	-	-	O[4]	O[7]
7.25" x 10.5"/SEF (US EXE)	ON	-	-	-	ON	-	-	O	-
10.5" x 7.25"/SEF (US EXE)	ON	ON	ON	-	-	-	-	●[4]	-
10" x 8"/SEF	ON	-	-	-	ON	-	-	●[3]	-
5.5" x 8.5"/SEF (HLT)	-	-	-	-	-	-	-	O	-
5.5" x 8.5"/LEF (HLT)	ON	-	-	-	-	-	-	O	-
267 mm x 390 mm	ON	ON	ON	-	ON	ON	ON	-	●[5]
195 mm x 267 mm	ON	-	-	-	ON	-	-	-	●[6]
267 mm x 195 mm	ON	ON	ON	-	-	-	-	-	●[7]

Symbols

O: Yes (Default), ●: Yes (Can select this with SP mode), ON: Paper present, LT: North America, A/B: Europe, Asia

Note

- For "O/●" mark, which has superscripted number, it is possible to change the original detection size with SP6-016. For example, instead of LT (O[3]), the machine can be set up to detect 10" x 8" (●[3]).
- The F size can be selected with SP5-126. The default is 8.5" x 13"
- The machine cannot detect more than one size of original in the same job.

Mixed Original Size Mode

This section explains what happens when the user selects mixed original size mode.

Because this ARDF is a sheet-through document feeder, the method for original document width detection is the same as when the originals are the same size, but the document length detection method is different. Therefore, the scanning speed is slightly slower.

Document length detection

From when the skew correction sensor switches on until it switches off, the CPU counts the transport motor pulses. The number of pulses determines the length of the original.

Feed-in cycle

When the original size for the copy modes listed below cannot be determined, the image cannot be correctly scaled (reduced or enlarged) or processed until the original's length has been accurately detected. The length must be determined before the image is scanned.

Auto Reduce/Enlarge
Centering
Erase Center/Border
Booklet
Image Repeat

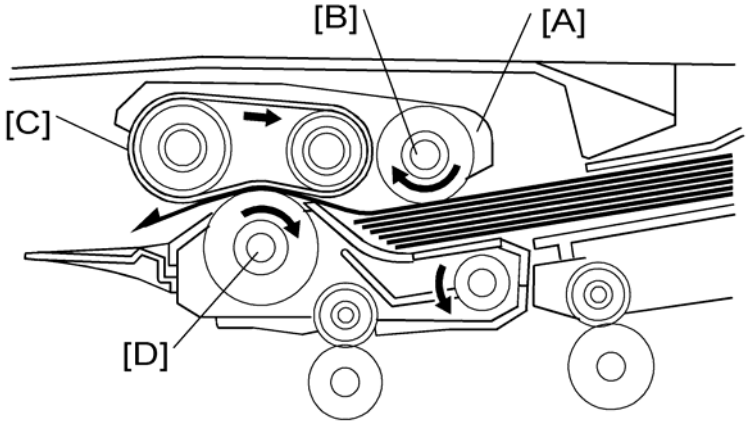
The originals follow this path:

1. Length detection ➔ Scanning glass ➔ Inverter table
2. Inverter table ➔ Scanning glass ➔ Inverter table (restores the original order)
3. Inverter table ➔ Scanning glass (image scanned) ➔ Exit tray

Normal feed-in

In a copy mode other than those listed above, when the reduction/enlargement ratio has been determined, the originals are scanned normally. In order to store the scanned images, a large area of memory (the detected original width x 432 mm length) is prepared. Next, only the portion of the image up to the detected original length is read from memory and printed.

Pick-Up and Separation



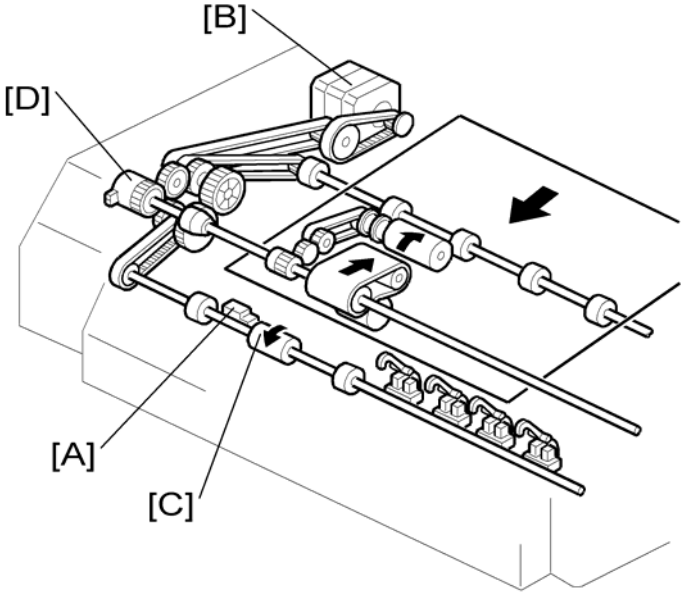
The original is set with the image facing up. The original pushes actuator and the original set sensor is activated.

After pressing the start button, the feed clutch is activated and the original feed unit [A] moves down. At the same time, the pick-up solenoid is activated and the original table lifts until the original comes in contact with the pick-up roller [B]. The pick-up roller then feeds the top sheet of paper.

After being fed from feed belt [C], the topmost sheet is separated from the stack by the separation roller [D] and sent to the skew correction roller.

The mechanism is an FRR system, consisting of the original feed belt [C] and separation roller [D].

Skew Correction



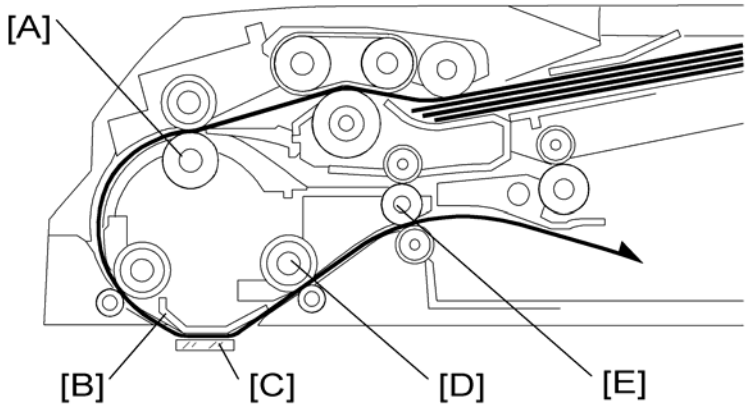
When an original is fed into the feeder, the feed motor [B] rotates forwards. At this time, the feed belt turns but the skew correction roller [C] does not. Because of this, when the leading edge of the paper gets to the skew correction roller, skew in the original is removed.

A short time after the leading edge of the original turns on the skew correction sensor [A], the feed motor [B] turns off for 40 ms and rotates in reverse. At this time, the skew correction roller [C] and the feed belt both turn, and original feed continues.

The original is fed by the skew correction roller after the feed clutch [D] has turned off.

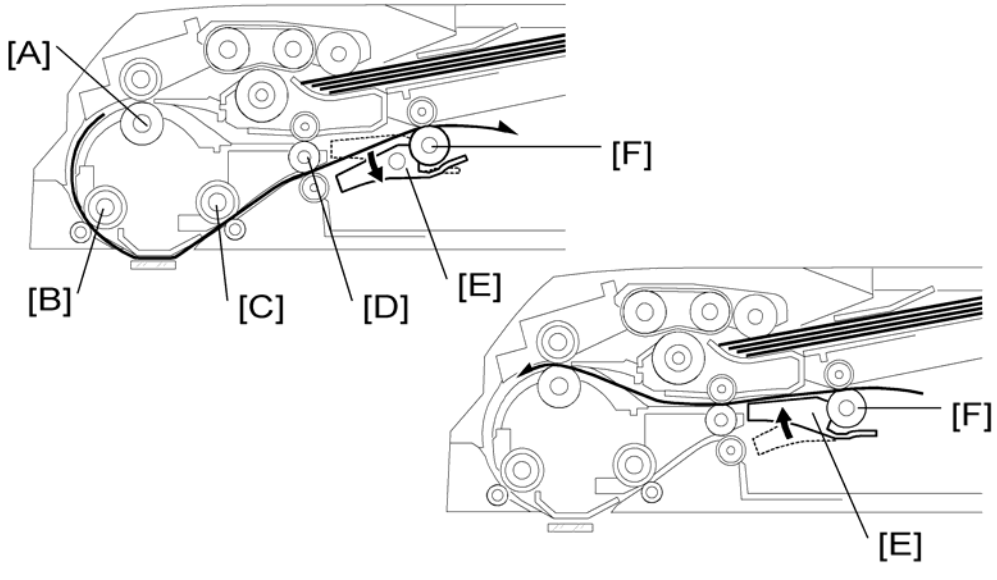
Original Transport and Exit

Single-Sided Originals



The feed motor feeds the separated original to the skew correction roller [A] at maximum speed. After skew correction, the feed and transport motors feed the original through the scanning area at a lower speed (the scanning area contains the original exposure guide [B] and DF exposure glass [C]). After scanning, the original is fed out by the transport roller [D] and exit roller [E].

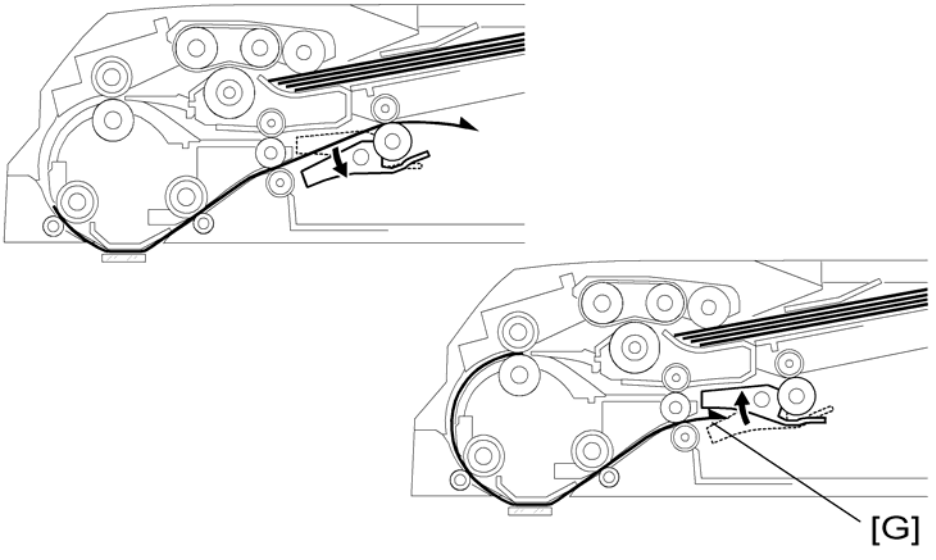
Double-Sided Originals



After skew correction, the feed and transport motors drive the skew correction roller [A], registration roller [B], transport roller [C] and the exit roller [D]. The front side of the original is then scanned.

When the original exit sensor detects the leading edge of the original, the junction gate solenoid is activated and the junction gate [E] opens. The original is then transported towards the inverter table.

Soon after the trailing edge of the original passes the exit sensor, the junction gate solenoid switches off and the junction gate [E] is closed. When the original has been fed onto the inverter table, the feed motor switches on in reverse. The original is then fed by the inverter roller [F], and then by the skew correction roller [A] and registration roller [B] to the scanning area (where the reverse side will be scanned).



The original is then sent to the inverter table again to be turned over. This is done so that the duplex copies will be properly stacked front side down in the exit tray [G] in the correct order.

Original Sensor

During one-to-one copying, copy paper is fed to the skew correction roller in advance (while the original is still being scanned), to increase the copy speed. The original sensor monitors the stack of originals in the feeder, and detects when the trailing edge of the last page has been fed in. The main CPU then stops the copier from feeding an unwanted extra sheet of copy paper.

Conditions for Jam Detection

Jam Mode	Detection Timing
Initial	When turning on the machine, the skew correction sensor, registration sensor or exit sensor detects an original.

	When the cover is closed or DF is down, the skew correction sensor, registration sensor or exit sensor detects an original.
	When the cover is opened or DF is lifted up, the skew correction sensor, registration sensor or exit sensor detects an original.
Sensor stays on too long	The skew correction sensor does not turn off even if the original was fed by the maximum length of the original + 150 mm after the skew correction sensor turned on.
	The registration sensor does not turn off even if the original was fed by its length x 1.5 after the registration sensor turned on.
	The exit sensor does not turn off even if the original was fed by its length x 1.5 after the exit sensor turned on.
Sensor does not come on	The skew correction sensor does not turn on even if the original was fed by transport path length x 1.5.
	The registration sensor does not turn on even if the original was fed by transport path length x 1.5 after the skew correction sensor turned on.
	The exit sensor does not turn on even the original was fed by transport path length x 1.5 after the skew correction sensor turned on.

3. Service Tables

Dip Switches

DIP-SW				Function
1	2	3	4	
0	0	0	0	Normal operating mode (Default)
0	0	0	1	Free run: With original: One-sided mode: 100% speed
0	0	1	0	Free run: With original: Two-sided mode: 100% speed
0	0	1	1	Free run: No original: One-sided mode: 100% speed
0	1	0	0	Free run: No original: Two-sided mode: 100% speed
0	1	0	1	Free run: With original: One-sided mode: 32% speed
0	1	1	0	Free run: With original: Two-sided mode: 32% speed
0	1	1	1	Free run: With original: One-sided mode: 70% speed
1	0	0	0	Free run: With original: Two-sided mode: 70% speed
1	0	0	1	Free run: With original: One-sided mode: 200% speed
1	0	1	0	Free run: With original: Two-sided mode: 200% speed
1	0	1	1	Transport Motor On
1	1	0	0	Feed Motor On
1	1	0	1	Transport Motor On with random mode
1	1	1	0	Feed Motor On with random mode
1	1	1	1	

MEMO