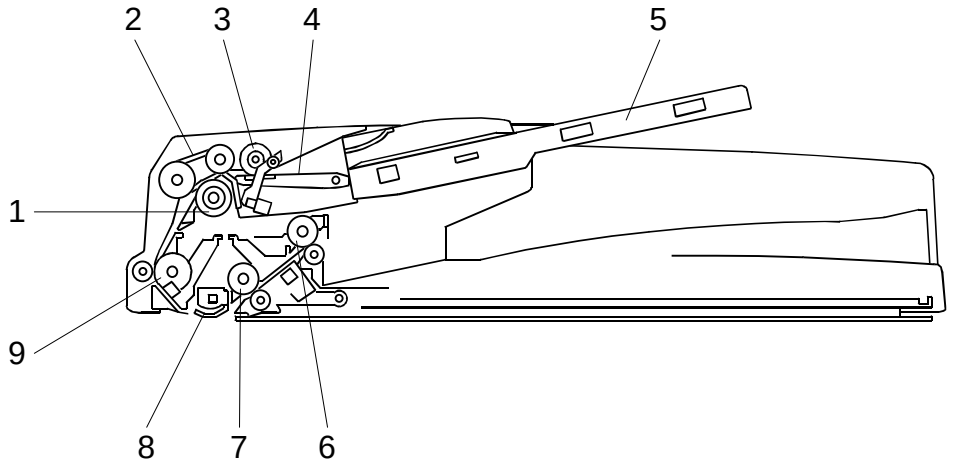
DOCUMENT FEEDER
(Machine Code: A859)

1. OVERALL INFORMATION

1.1 SPECIFICATIONS

Original Size:	Standard Size (Single-sided Mode only): A3 to A5, DLT to HLT Non-standard Size (Single-sided Mode only): Max. width 297 mm Min. width 105 mm Max. length 1,260 mm Min. length 128 mm
Original Weight:	40 ~ 128 g/m^2 (10 ~ 34 lbs.)
Table Capacity:	50 sheets (80 g/m^2, 22 lbs.)
Original Standard Position:	Center
Separation:	FRR
Original Transport:	Roller transport
Original Feed Order:	From the top original
Reproduction Range:	50 ~ 200%
Power Source:	24 & 5 VDC from the copier
Power Consumption:	25 W
Dimensions (W x D x H):	550 mm x 470 mm x 130 mm
Weight:	9 kg or less

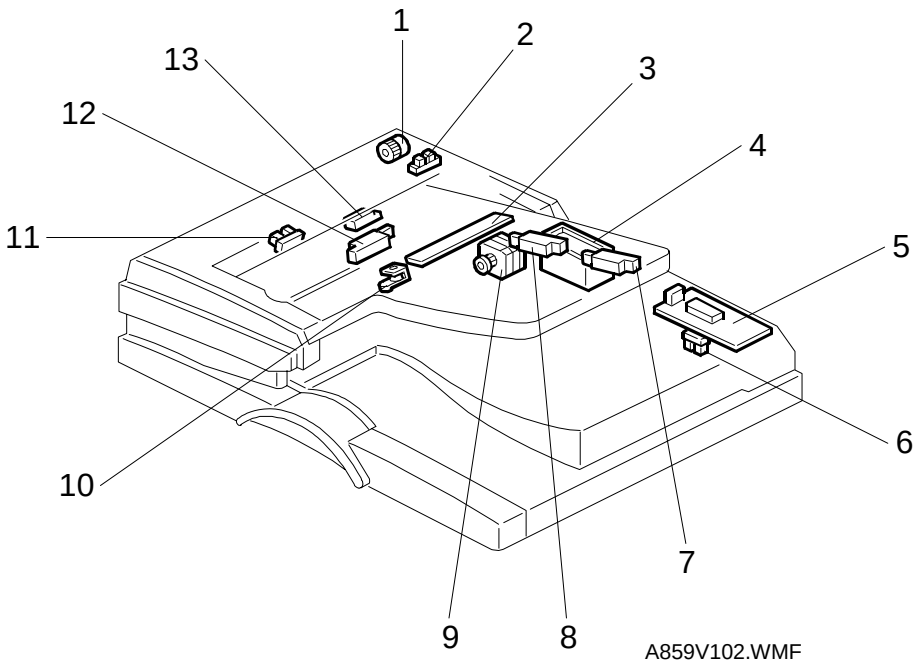
1.2 MECHANICAL COMPONENT LAYOUT



A859V101.WMF

1. Separation roller
2. Original feed belt
3. Pick-up roller
4. Original entrance guide
5. Original table
6. Original exit roller
7. 2nd transport roller
8. Original exposure guide
9. 1st transport roller

1.3 ELECTRICAL COMPONENT LAYOUT

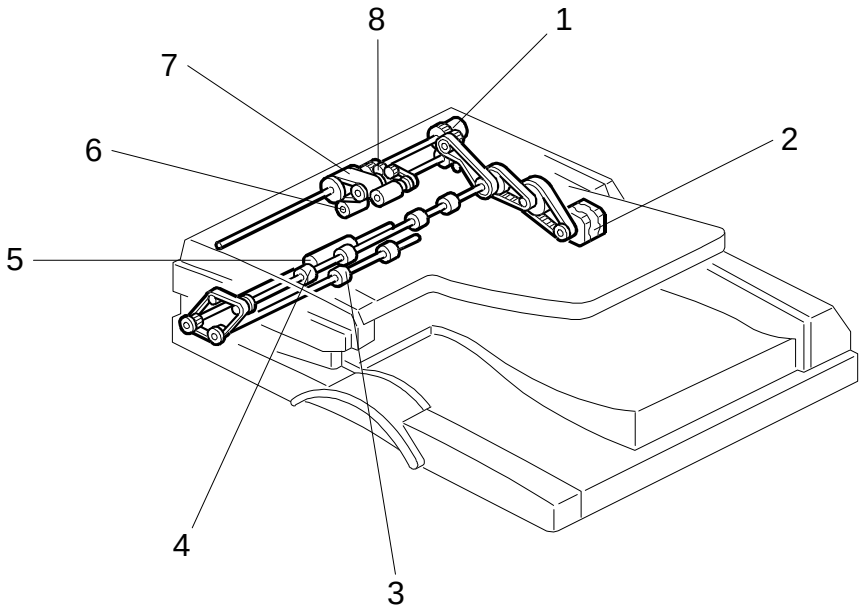


1. DF feed clutch
2. Feed cover open sensor
3. Original width sensor
4. DF pick-up solenoid
5. DF drive board
6. DF open sensor
7. Original length sensor 2
8. Original length sensor 1
9. DF transport motor
10. Stamp solenoid
11. Original set sensor
12. Original trailing edge sensor
13. Registration sensor

1.4 ELECTRICAL COMPONENT DESCRIPTION

Symbol	Name	Function	Index No.
Motors			
M1	DF Transport	Drives the transport and exit rollers	9
Sensors			
S1	DF Open	Informs the CPU of the DF when the DF is opened and closed (for platen mode).	6
S2	Registration	Detects the leading edge of the original to determine when to turn off the DF transport motor and expose the original, and checks for original misfeeds.	13
S3	Feed Cover Open Sensor	Detects whether the feed-in cover is open or not.	2
S4	Original Width	Detects the original width.	3
S5	Original Length 1	Detects the original length.	8
S6	Original Length 2	Detects the original length.	7
S7	Original Set	Detects the original is on the feed table.	11
S8	Original Trailing Edge	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.	12
Solenoids			
SOL1	DF Pick-up	Controls the up-down movement of the original table.	4
SOL2	Stamp	Energizes the stamp to mark the original.	10
Clutches			
MC1	DF Feed	Transfers transport motor drive to the pick-up roller and feed belt.	1
PCBs			
PCB1	DF Drive	Interfaces the sensor signals with the copier, and transfers the magnetic clutch, solenoid, and motor drive signals from the copier.	5

1.5 DRIVE LAYOUT

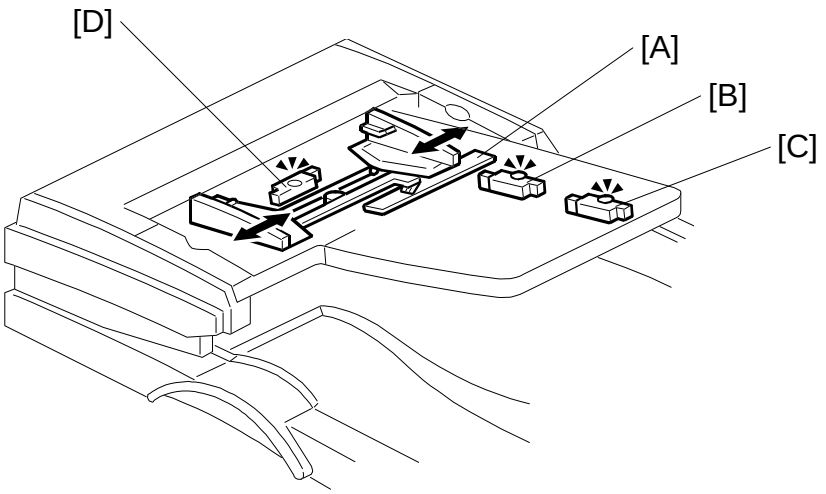


A859V103.WMF

1. DF feed clutch
2. DF transport motor
3. 2nd transport roller
4. Exit roller
5. 1st transport roller
6. Separation roller
7. Original feed belt
8. Pick-up roller

2. DETAILED SECTION DESCRIPTIONS

2.1 ORIGINAL SIZE DETECTION



A859D104.WMF

The DF has one width sensor [A] to detect the original width and two original length sensors (-1 [B] and -2 [C]) to detect the original length. The DF detects the original size through the combination of inputs from those sensors as shown in the table on the next page.

When using an original of a non-standard size, the user needs to input the original length at the operation panel.

The original width sensor [A] has four possible outputs (P1 to P4). The output depends on the position of the sliding electrode on the original rear fence.

During one-to-one copying, copy paper is fed to the registration roller in advance, to increase the copy speed. The original exit trailing edge sensor monitors the stack of originals in the feeder, and detects when the trailing edge of the last page has been fed in. This stops the ADF from feeding an unwanted extra sheet of copy paper.

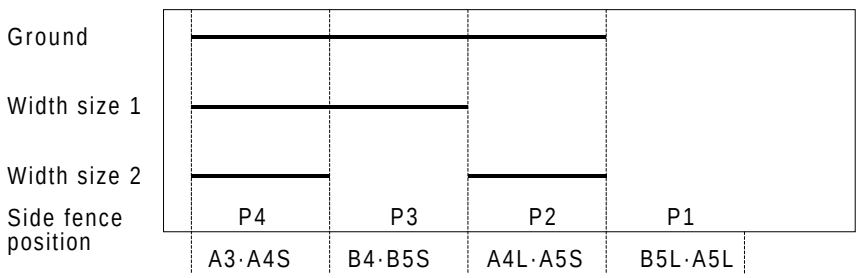
		NA	EU	Original Length 1	Original Length 2	P1	P2	P3	P4
1	A3 L (297 x 420)	✗	❍	ON	ON	—	—	—	ON
2	B4 L (257 x 364)	✗	❍	ON	ON	—	—	ON	—
3	A4 L (210 x 297)	✗	❍	ON	—	—	ON	—	—
4	A4 S (297 x 210)	✗	❍	—	—	—	—	—	ON
5	B5 L (182 x 257)	✗	❍	ON	—	ON	—	—	—
6	B5 S (257 x 182)	✗	❍	—	—	—	—	ON	—
7	A5 L (148 x 210)	✗	❍	—	—	ON	—	—	—
8	A5 S (210 x 148)	✗	❍	—	—	—	ON	—	—
11	11" x 17" L (DLT)	●1	✗	ON	ON	—	—	—	ON
12	11" x 15" L	❍1	✗	ON	ON	—	—	—	ON
13	10" x 14" L	❍	✗	ON	ON	—	—	ON	—
14	8 1/2" x 14" L (LG)	●2	✗	ON	ON	—	ON	—	—
15	8 1/2" x 13" L (F4)	✗	●4	ON	ON	—	ON	—	—
16	8" x 13" L (F)	❍2	❍4	ON	ON	—	ON	—	—
17	8 1/2" x 11" L (LT)	●3	✗	ON	—	—	ON	—	—
18	8 1/2" x 11" S (LT)	❍	✗	—	—	—	—	—	ON
19	10" x 8" L	❍3	✗	ON	—	—	ON	—	—
20	5 1/2" x 8 1/2" L (HLT)	❍	✗	—	—	ON	—	—	—
21	5 1/2" x 8 1/2" S (HLT)	❍	✗	—	—	—	ON	—	—

L: Lengthwise S: Sideways ✗: No ❍: Yes ON: Paper present

❍1, ●1: If the original is 11" x 15" L, it will always be detected as 11" x 17" L (DLT).
❍2, ●2: In North American models, if the original is 8" x 13" L (F size), it will always be detected as 8 1/2" x 14" L (LG).
❍3, ●3: If the original is 10" x 8" L, it will always be detected as 8 1/2" x 11" L (LT).
❍4, ●4: In Europe/Asia models, if the original is 8" x 13" L (F size), it will always be detected as 8 1/2" x 13" L (F4 size).

NA: North America, EU: Europe

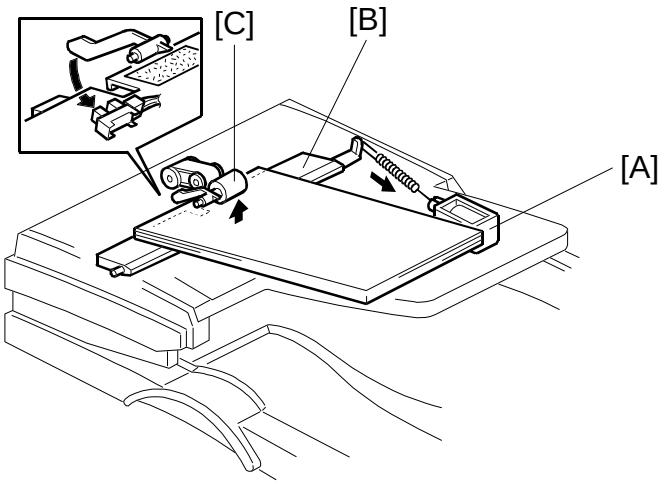
- Original Width Sensor -



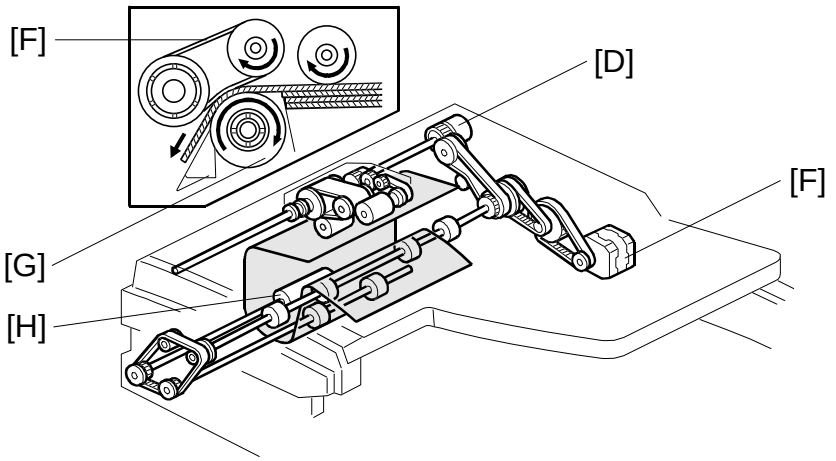
A859D512.WMF

Options

2.2 PICK-UP AND SEPARATION



A859D105.WMF

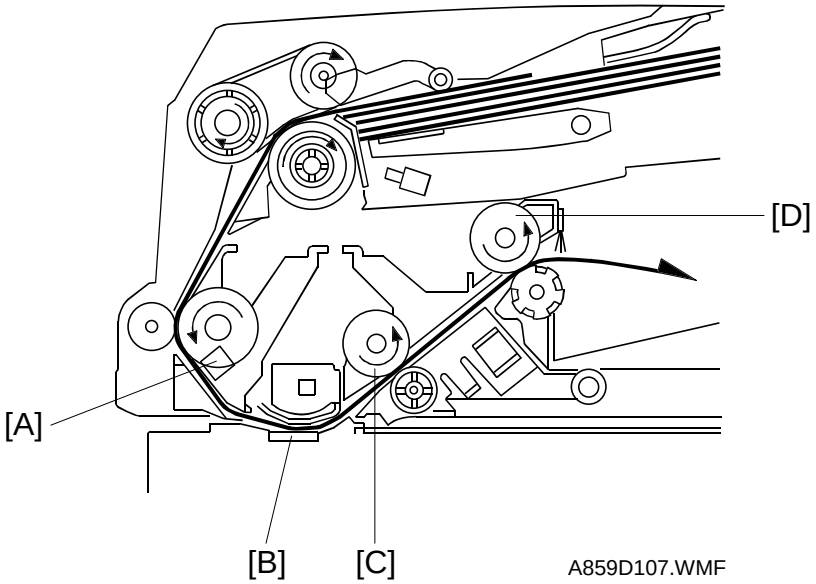


A859D106.WMF

When the print key is pressed, the DF pick-up solenoid [A] turns on and the entrance guide [B] lifts up the originals to the pick-up roller [C]. At the same time, the DF feed clutch [D] turns on.

200 ms after this, the DF transport motor [E] turns on. The original is fed to the paper feed belt [F] from the top page. The pages are separated by the separation roller [G] and the top sheet of the original is fed to the 1st transport roller [H]. The original separation system uses an FRR system.

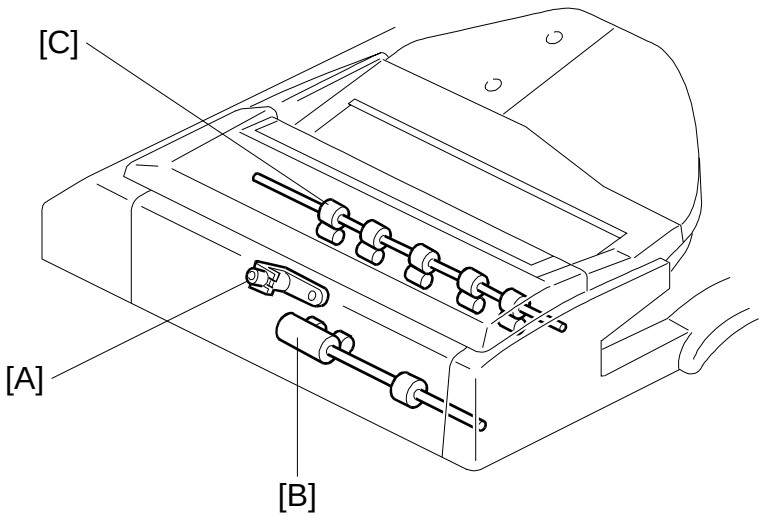
2.3 ORIGINAL TRANSPORT AND EXIT MECHANISM



When the leading edge of the original reaches the registration sensor [A], the DF transport motors turn off. After a short time the DF transport motors turn on again. The original is fed past the DF exposure glass [B], where it is scanned. The original is fed through to the 2nd transport roller [C] and fed out by the exit roller [D].

The DF transport motor speed, while feeding the original to the registration sensor, is constant. However, when the motor turns on again to feed the original to the exposure glass, the speed depends on the selected reproduction ratio. At 100%, it is 90 mm/s.

2.4 STAMP



A859D504.WMF

This function is only for fax mode. The fax unit includes the stamp.

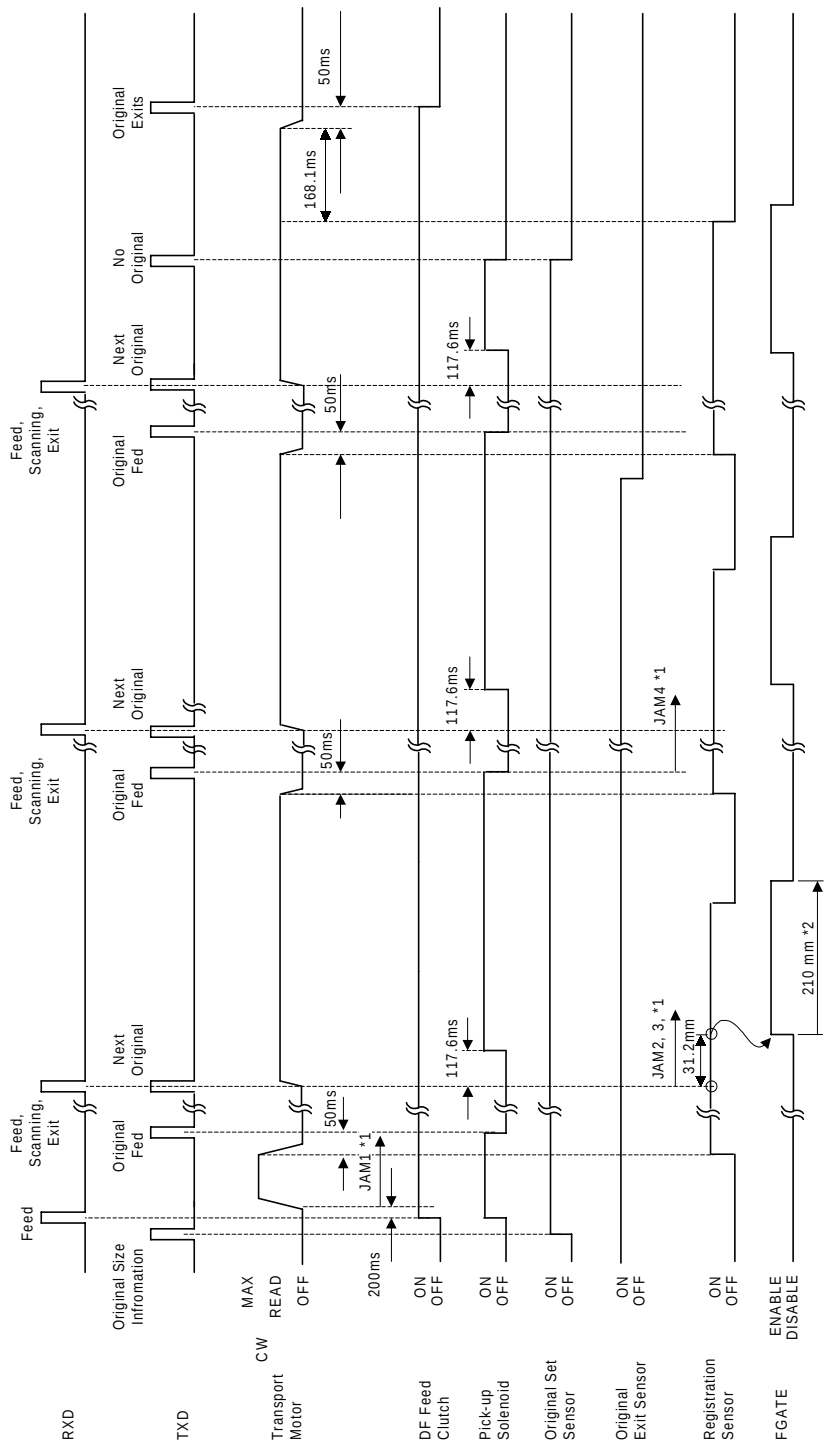
There is a stamp [A] between the 2nd transport roller [B] and the exit roller [C], and the copier controls this solenoid directly.

When the original reaches the stamp position, the DF transport motor stops. 300 milliseconds after stopping the DF transport motor, the stamp solenoid turns on if the page was sent successfully (immediate transmission) or stored successfully (memory transmission). After stamping, the DF transport motor starts again to feed out the document, and its speed is about 1.3 times the normal speed.

Adjusting SP6-010 can change the stamping position on the original.

2.5 TIMING CHARTS

2.5.1 A4 SIDEWAYS

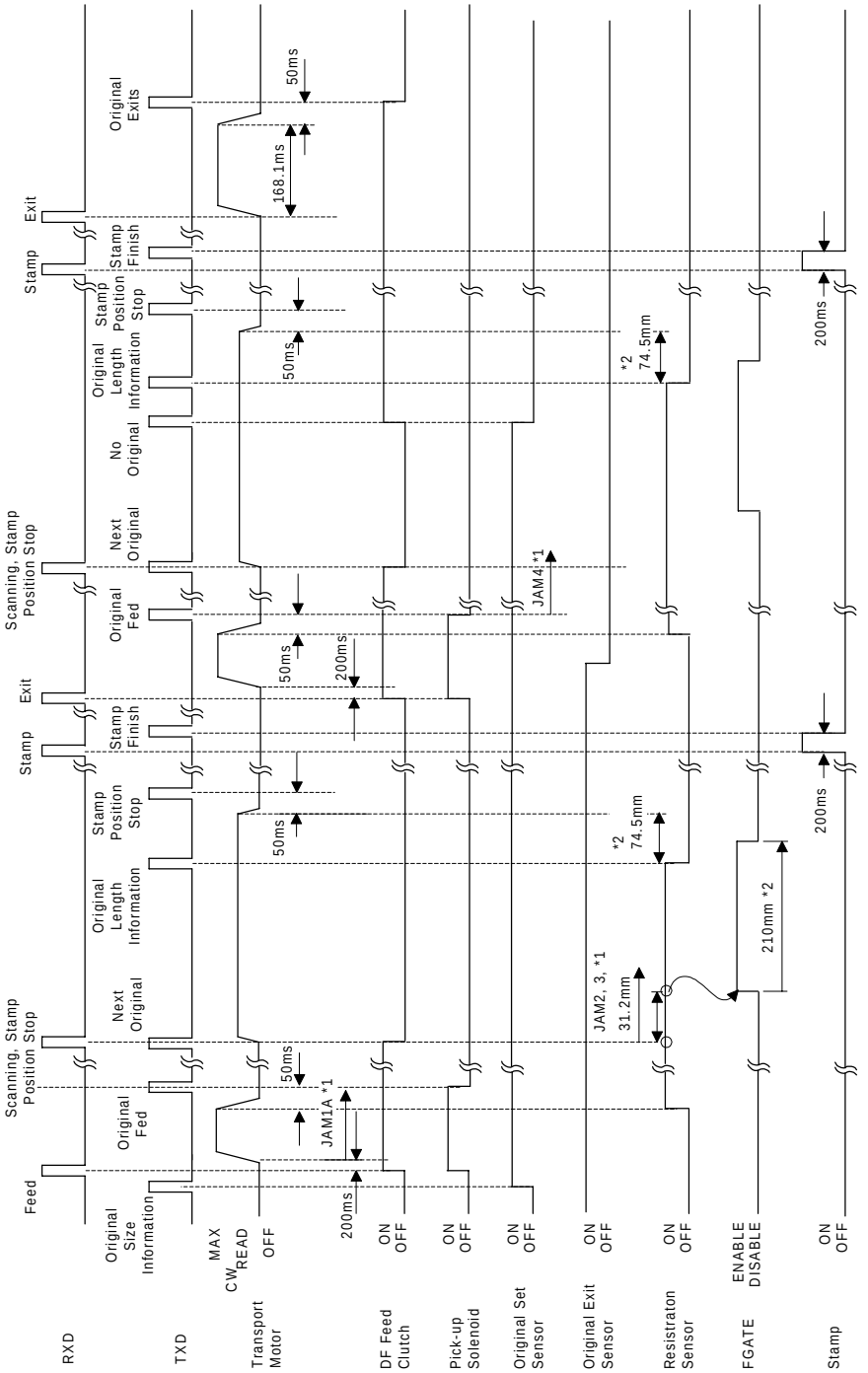


A859D510.WMF

*1 Jam Conditions: Refer to Section 2.6 for details.

*2 F Gate: This signal goes high when the laser starts to write a page to the drum. The distance depends on SP mode 6-006-2 and -3.

2.5.2 A4 SIDEWAYS, STAMP MODE



A859D511.WMF

*1 Jam Conditions: Refer to Section 2.6 for details.

*2 F Gate: This signal goes high when the laser starts to write a page to the drum. The distance depends on SP mode 6-006-2 and -3.

2.6 JAM DETECTION

JAM 1: If the registration sensor does not turn on within x_1 ms since the DF transport motor turned on to feed the original from the original tray.

x_1 = (114 x 1.1)/original speed + 2,000 ms

JAM 2: If the registration sensor does not turn off within x_2 ms since the DF transport motor turned on to feed the original from the original tray.

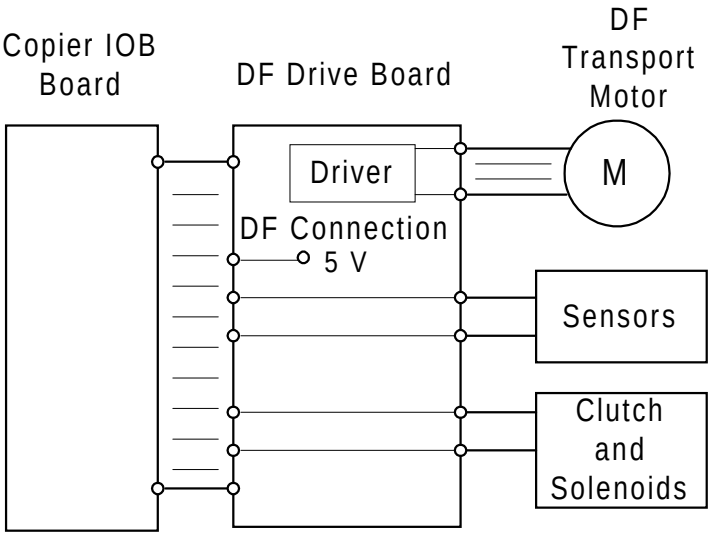
x_2 = (original length/original speed) + 2,000 ms

JAM 3: If the registration sensor turns off while the original is being scanned.

JAM 4: If the original has not passed the scanning position, although the leading edge of the next original has been detected and has stopped at the registration sensor (F gate still off).

JAM 5: If the cover is opened or DF is lifted up during a DF job.

2.7 OVERALL ELECTRICAL CIRCUIT



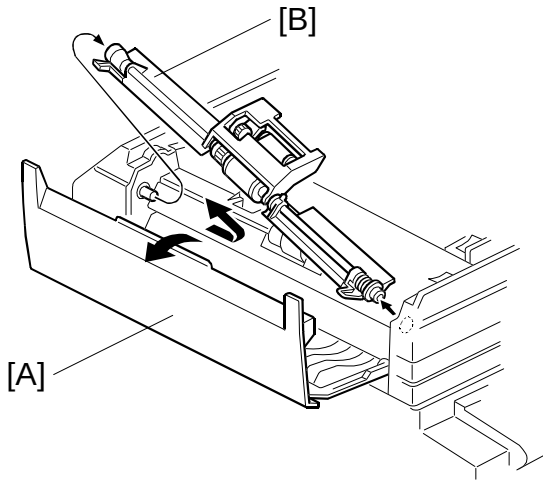
A859D509.WMF

The copier directly controls the DF pick-up solenoid, stamp solenoid, and DF feed clutch through the DF drive board. The sensor signals are directly sent to the copier through the DF drive board. The DF drive board has a driver for the DF transport motor and the drive signals are sent from the copier.

When the DF connector is connected to the copier IOB board, the DF connection signal to the copier goes to 5 V. Then the copier detects that the DF is connected.

3. REPLACEMENT AND ADJUSTMENT

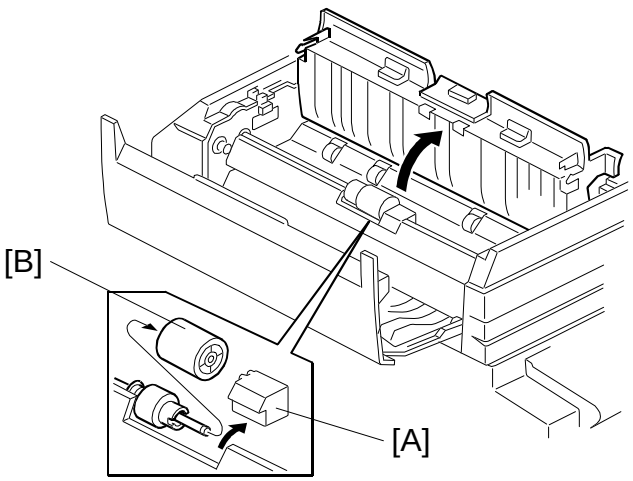
3.1 FEED UNIT REMOVAL



A859R102.WMF

1. Open the DF feed cover [A].
2. Slide the feed unit [B] in the direction of the arrow, then remove it.

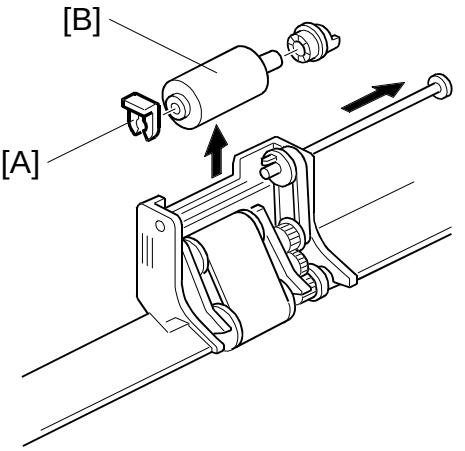
3.2 SEPARATION ROLLER REPLACEMENT



A859R105.WMF

1. Remove the feed unit.
2. Remove the separation roller cover [A].
3. Replace the separation roller [B].

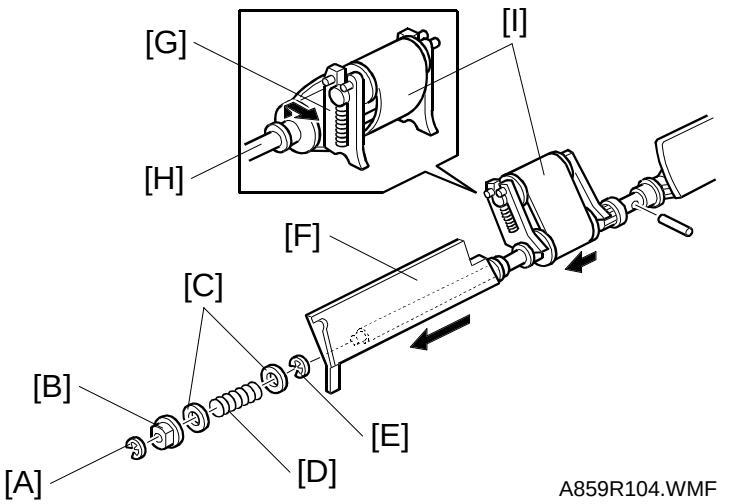
3.3 PICK-UP ROLLER REPLACEMENT



A859R103.WMF

1. Remove the feed unit.
2. Remove the snap ring [A].
3. Replace the pick-up roller [B].

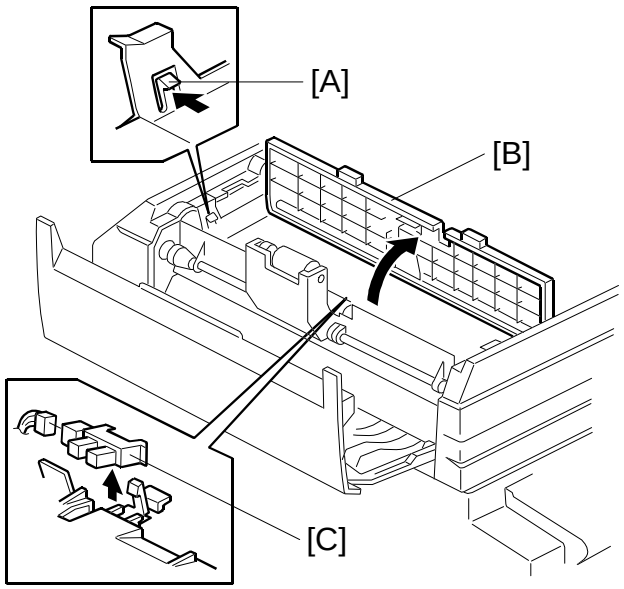
3.4 FEED BELT REPLACEMENT



A859R104.WMF

1. Remove the feed unit.
2. Remove the E-ring [A], bearing [B], washers [C], and spring [D].
3. Remove the E-ring [E], and remove the original guide [F].
4. Release the idle roller holder [G] from the drive roller shaft [H], then release the idle roller.
5. Replace the feed belt [I].

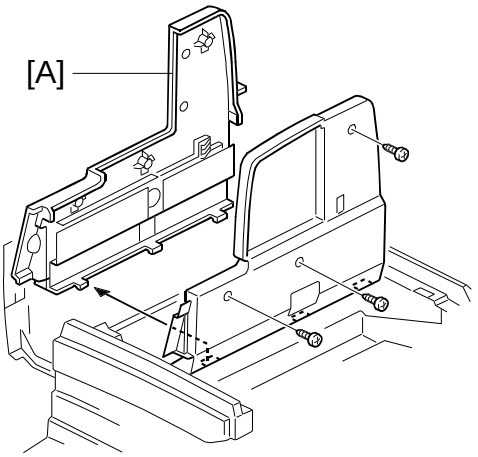
3.5 ORIGINAL SET SENSOR REPLACEMENT



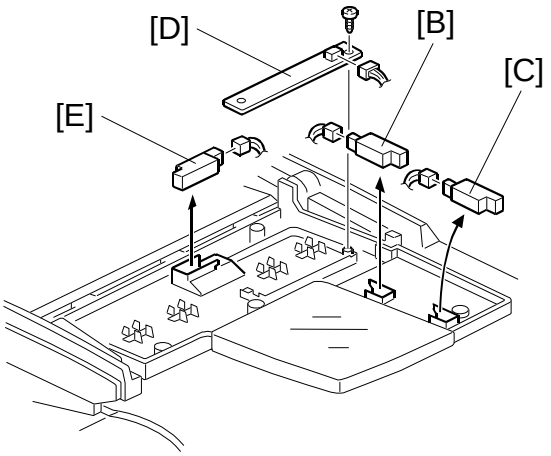
A859R106.WMF

1. Remove the DF feed cover.
2. While releasing the front and rear stoppers [A], open the transport guide [B].
3. Replace the original set sensor [C].

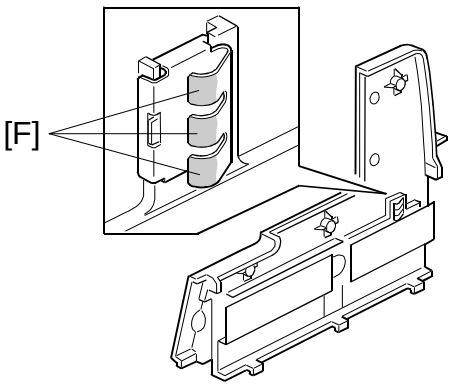
3.6 ORIGINAL WIDTH/LENGTH/TRAILING EDGE SENSOR REPLACEMENT



A859R107.WMF



A859R108.WMF

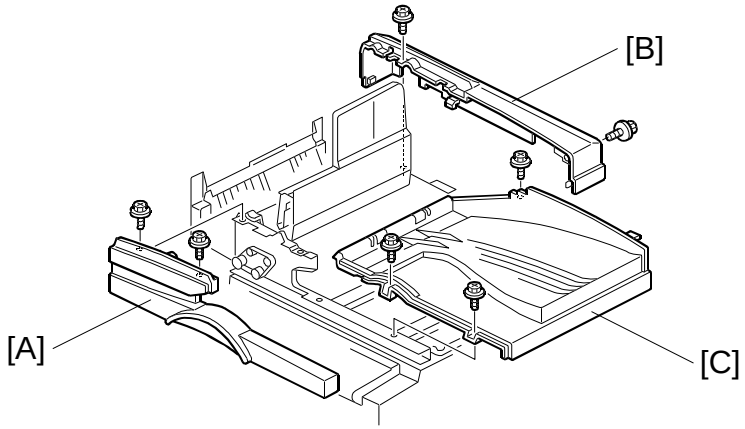


A859R113.WMF

1. Open the original table.
2. Remove the original guide [A] (3 screws).
3. Replace the following sensors:
   - Original length sensor 1 [B]
   - Original length sensor 2 [C]
   - Original width sensor (1 screw) [D]
   - Original trailing edge sensor [E]

NOTE: To prevent incorrect size detection, clean the electrode [F] of the original width sensor using alcohol or a dry cloth. Then apply conductive grease KS-660 (G0049668).

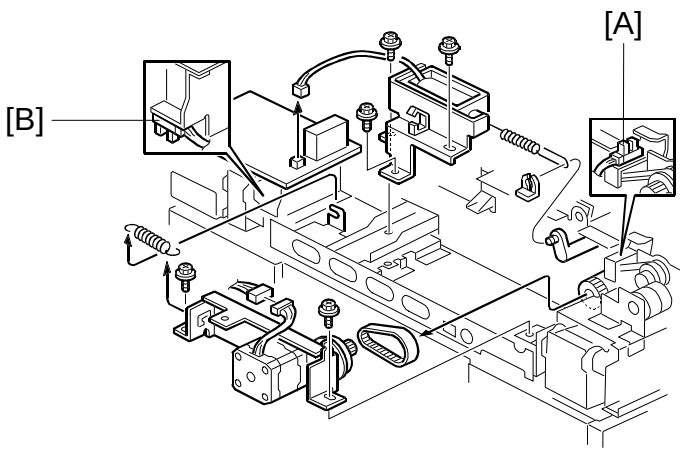
3.7 ORIGINAL EXIT TRAY/FRONT COVER/REAR COVER REMOVAL



A859R101.WMF

1. Open the DF feed cover.
2. Open the original table.
3. Remove the front cover [A] (2 screws).
4. Remove the rear cover [B] (2 screws).
5. Remove the original exit tray [C] (3 screws).

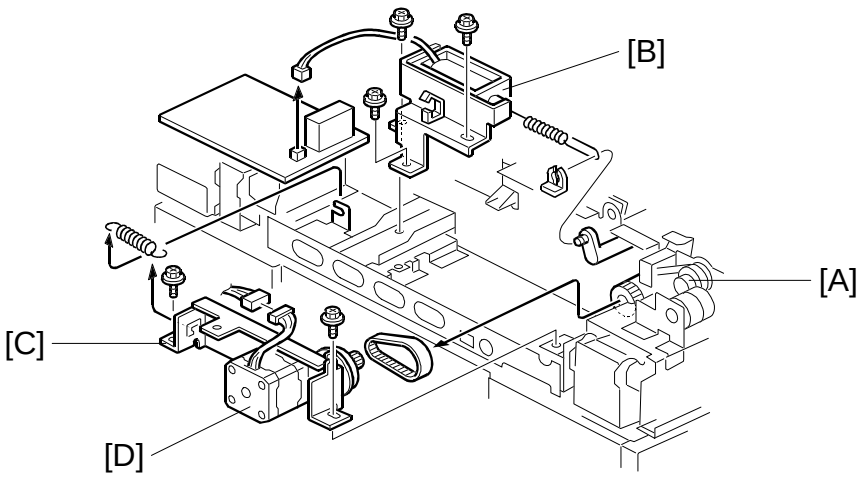
3.8 FEED COVER OPEN SENSOR/DF OPEN SENSOR REPLACEMENT



A859R159.WMF

1. Remove the rear cover (2 screws).
2. Replace the following sensors:
   - Feed cover open sensor [A].
   - DF open sensor [B]

3.9 FEED CLUTCH/PICK-UP SOL/TRANSPORT MOTOR REPLACEMENT



A859R109.WMF

1. Remove the rear cover (2 screws).

- Feed Clutch -

2. Replace the feed clutch [A] (1 E-ring and 1 connector).

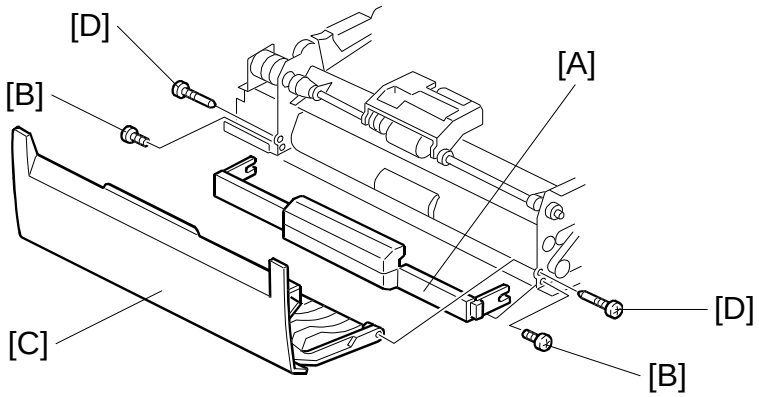
- Pick-up Solenoid -

3. Replace the pick-up solenoid [B] (3 screws and 1 connector).

- Transport Motor -

4. Remove the transport motor bracket [C] (2 screws).
5. Remove the transport motor [D] (2 screws, 1 connector).

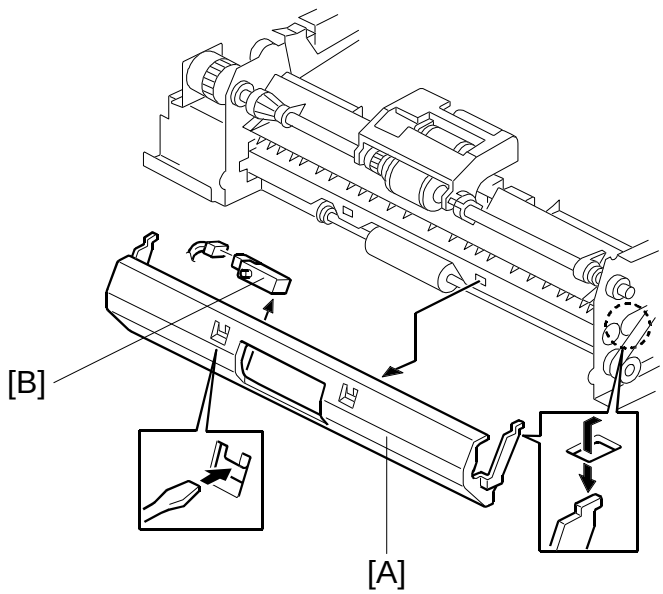
3.10 DF FEED COVER REMOVAL



A859R110.WMF

1. Remove the front cover (2 screws) and the rear cover (2 screws).
2. Remove the turn guide [A] (2 screws [B]).
3. Remove the DF feed cover [C] (2 screws [D]).

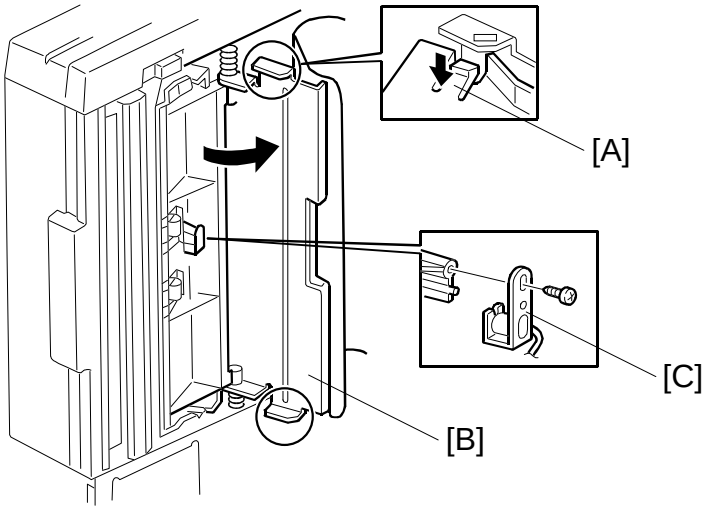
3.11 REGISTRATION SENSOR REPLACEMENT



A859R111.WMF

1. Remove the front cover (2 screws) and the rear cover (2 screws).
2. Remove the transport guide [A].
3. Replace the registration sensor [B].

3.12 STAMP SOLENOID REPLACEMENT

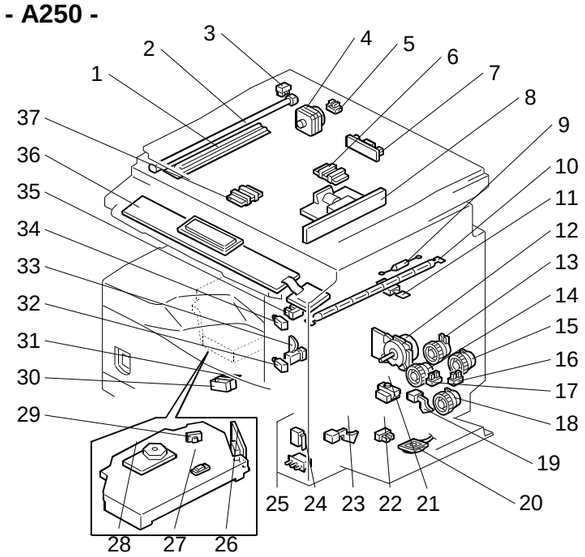


A859R112.WMF

1. Remove the rear cover (2 screws).
2. Lift the DF unit and open the exit guide. Release the front and rear hooks [A] and open the cover [B].
3. Replace the stamp solenoid [C] (1 screw and 1 connector).

ELECTRICAL COMPONENT LAYOUT (A250/A859/A860/A861/A869)

- A250 -

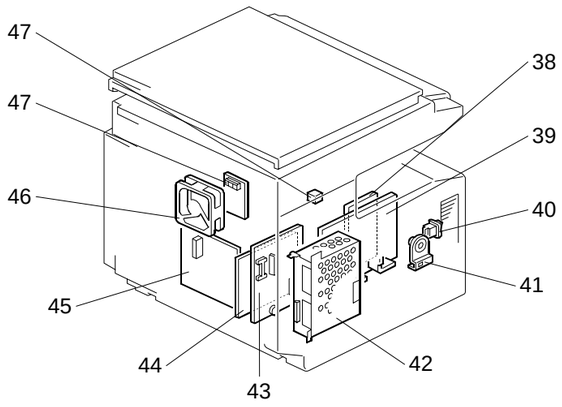


A250S152.WMF

- A250 -

Symbol	Index No.	Description	P to P
Motors			
M1	4	Scanner	K2
M2	28	Polygonal Mirror	C8
M3	12	Main	G2
M4	46	Exhaust Fan	B2
Magnetic Clutches			
MC1	14	Paper Feed	F2
MC2	15	By-pass Feed	C2
MC3	18	Vertical Transport	F2
MC4	13	Registration	B2
Switches			
SW1	40	Main	B7
SW2	30	Right Door Switch 1	A2
SW3	31	Right Door Switch 2	A2
SW4	25	Vertical Transport Cover Switch	B2
SW5	24	Paper Size	L2
Sensors			
S1	3	Scanner HP	K2
S2	37	Original Width	J2
S3	6	Original Length 1	I2
S4	6	Original Length 2	I2
S5	21	Toner Near-End	B2
S6	23	Paper End	B2
S7	19	Paper Near-End	C2
S8	16	By-pass Tray Paper	D2
S9	20	By-pass Paper Size	D2
S10	22	Vertical Transport	E2
S11	17	Registration	D2
S12	35	Fusing Exit	A4
S13	27	Exit Tray Paper	E2
S14	5	Platen Cover	J2
S15	33	AIO Set	L2
PCBs			
PCB1	44	BICU	E9
PCB2	39	PSU	C7
PCB3	45	IOB	E3
PCB4	8	SBU	C9
PCB5	7	Lamp Stabilizer	J2
PCB6	26	LD Unit	C8
PCB7	36	Operation Panel	E10
PCB8	—	Memory (option)	G9
PCB9	42	Printer Controller (option)	G9
PCB10	43	FCU (Option)	F10
PCB11	47	NCU (option)	—

- A250 -

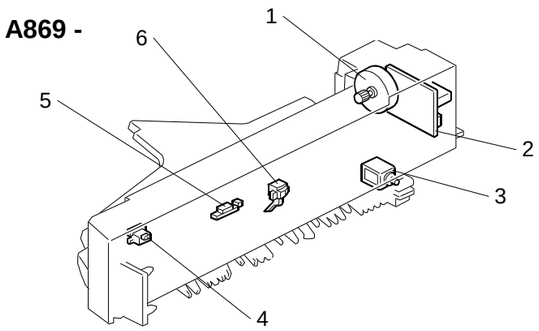


A250S153.WMF

- A250 -

Symbol	Index No.	Description	P to P
Lamps			
L1	2	Exposure Lamps	J2
L2	10	Fusing Lamp	A5
Heaters			
H1	1	Anti-Condensation	A6
H2	—	Drum (option)	A6
Others			
TF1	9	Fusing Thermofuse	A5
TH1	11	Fusing Thermistor	A4
PP1	38	C/B/T	H2
LSD 1	29	Laser Synchronization Detector	C9
CO1	48	Total	F2
CO2	—	Key (option)	L1
LED1	32	Exit Tray	E2
LED2	34	1-bin Tray	F2
SP1	41	Speaker	—

- A869 -

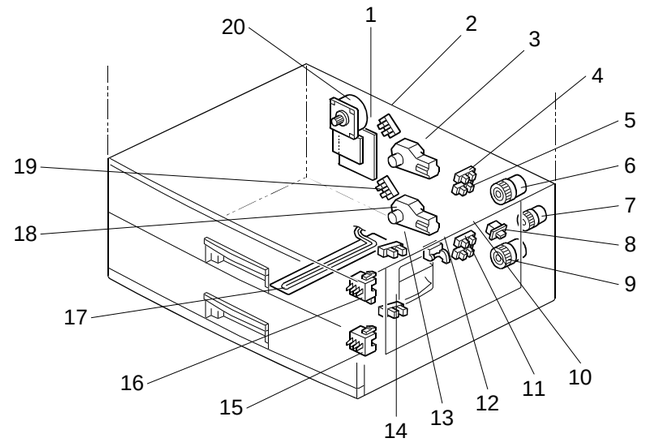


A869S103.WMF

- A869 -

Symbol	Index No.	Description	P to P
Motors			
M1	1	Tray	M1
Sensors			
S1	6	Exit	N1
S2	5	Paper	N1
Switches			
SW1	4	Bin Tray	N1
PCBs			
PCB1	2	1 Bin Tray	N2
LEDs			
LED1	7	1 Bin Exit Tray	F2
Solenoid			
SOL1	3	Junction Gate	M1

- A860 -

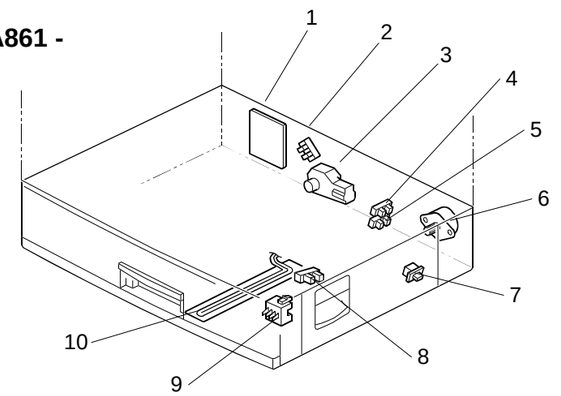


A860S102.WMF

- A860 -

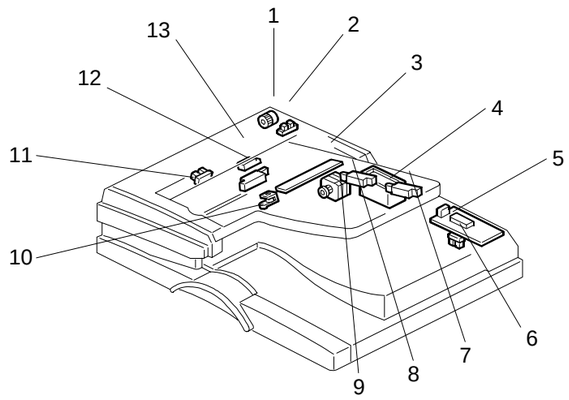
Symbol	Index No.	Description	P to P
Motors			
M1	20	Tray	L8
M2	3	Upper Lift	N8
M3	18	Lower Lift	M8
Sensors			
S1	2	Upper Lift	M8
S2	19	Lower Lift	M8
S3	13	Upper Paper End	J8
S4	14	Lower Paper End	J8
S5	12	Vertical Transport	I8
S6	15	Upper Paper Size	I8
S7	16	Lower Paper Size	I8
S8	5	Upper Paper Height 1	H8
S9	4	Upper Paper Height 2	H8
S10	11	Lower Paper Height 1	G8
S11	10	Lower Paper Height 2	G8
Switches			
SW1	8	Tray Cover	J8
Magnetic Clutches			
MC1	6	Upper Paper Feed	J8
MC2	9	Lower Paper Feed	K8
MC3	7	Relay	K8
PCBs			
PCB1	1	Tray Main	K7
Others			
H1	17	Option Tray Heater	N8

- A861 -



A861S102.WMF

- A859 -



A859S102.WMF

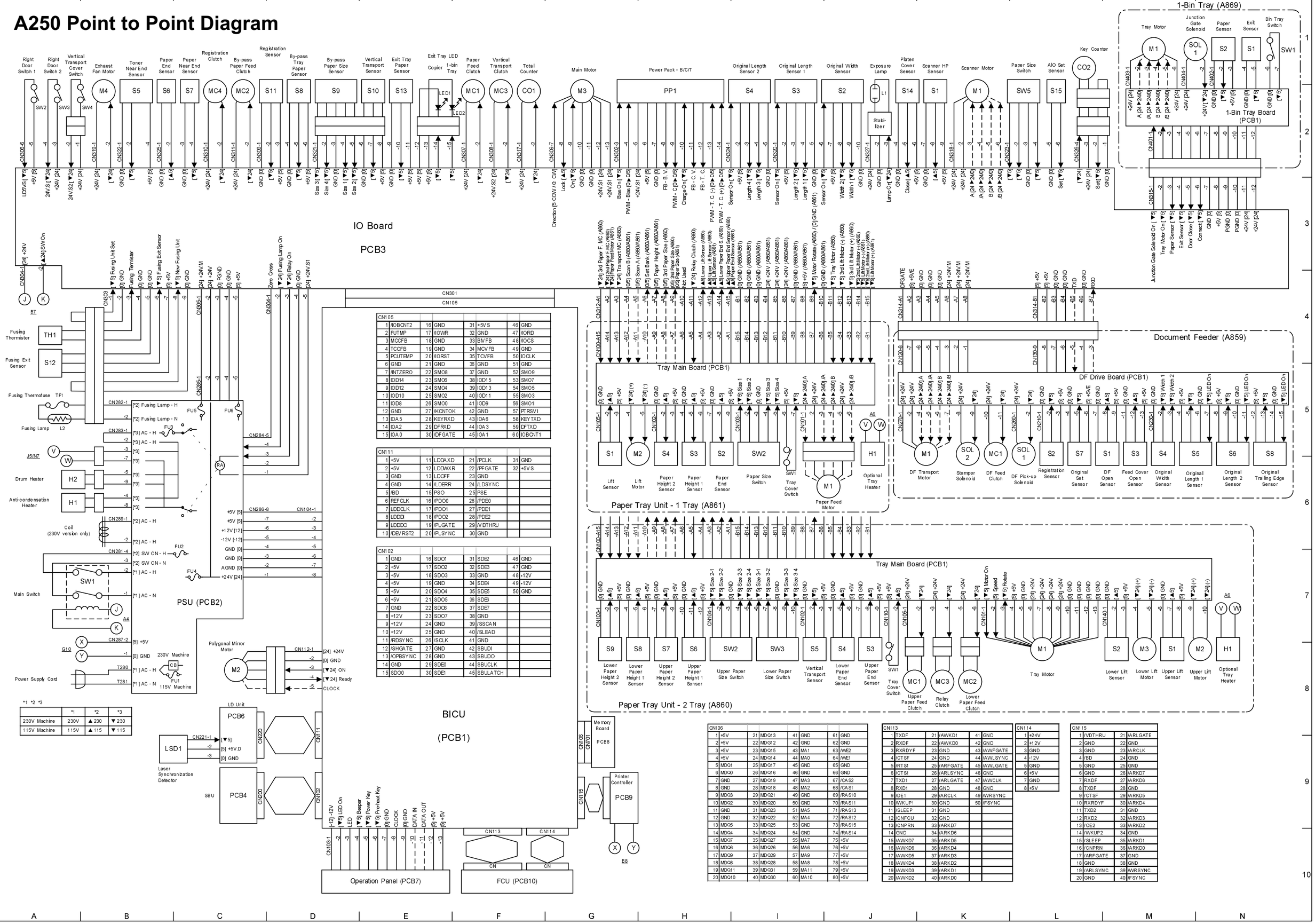
- A859 -

Symbol	Index No.	Description	P to P
Motors			
M1	9	DF Transport	K6
Sensors			
S1	6	DF Open	M6
S2	13	Registration	L6
S3	2	Feed Cover Open Sensor	M6
S4	3	Original Width	M6
S5	8	Original Length 1	N6
S6	7	Original Length 2	N6
S7	11	Original Set	L6
S8	12	Original Trailing Edge	N6
Solenoids			
SOL1	4	DF Pick-up	L6
SOL2	10	Stamper	K6
Clutches			
MC1	1	DF Feed	K6
PCBs			
PCB1	5	DF Drive	M5

- A861 -

Symbol	Index No.	Description	P to P
Motors			
M1	6	Paper Feed	J6
M2	3	Lift	H6
Sensors			
S1	2	Lift	G6
S2	8	Paper End	H6
S3	9	Paper Size	I6
S4	5	Paper Height 1	H6
S5	4	Paper Height 2	H6
Switches			
SW1	7	Tray Cover	I6
PCBs			
PCB1	1	Tray Main	H5
Others			
H1	10	Option Tray Heater	J6

A250 Point to Point Diagram



*1	*2	*3
230V Machine	230V	▲230	▼230
115V Machine	115V	▲115	▼115

CN105					
1	/IOBCNT2	16	GND	31	+5V S	46	GND
2	FUTMP	17	/IOWR	32	GND	47	/IORD
3	MCCFB	18	GND	33	BMFB	48	/IOCS
4	TCCFB	19	GND	34	MCVFB	49	GND
5	PCUTEMP	20	/IORST	35	TCVFB	50	IOCLK
6	GND	21	GND	36	GND	51	GND
7	/INTZERO	22	SMO8	37	GND	52	SMO9
8	IOD14	23	SMO6	38	IOD15	53	SMO7
9	IOD12	24	SMO4	39	IOD13	54	SMO5
10	IOD10	25	SMO2	40	IOD11	55	SMO3
11	IOD8	26	SMO0	41	IOD9	56	SMO1
12	GND	27	/KCNTOK	42	GND	57	PTRSVI
13	IOA5	28	KEYRXD	43	IOA6	58	KEYTXD
14	IOA2	29	DFRXD	44	IOA3	59	DFTXD
15	IOA0	30	/DFGATE	45	IOA1	60	IOBCNT1

CN111					
1	+5V	11	LDDAXD	21	/PCLK	31	GND
2	+5V	12	LDDWXR	22	/PFGATE	32	+5V S
3	GND	13	LDDCFF	23	GND		
4	GND	14	/LDERR	24	/LDSYNC		
5	/BD	15	PSO	25	PSE		
6	REFCLK	16	/PDO0	26	/PDE0		
7	LDDCLK	17	/PDO1	27	/PDE1		
8	LDDDI	18	/PDO2	28	/PDE2		
9	LDDDO	19	/PLGATE	29	/VDTHRU		
10	/DEVRST2	20	/PLSYNC	30	GND		

CN102							
1	GND	16	SDO1	31	SDE2	46	GND
2	+5V	17	SDO2	32	SDE3	47	GND
3	+5V	18	SDO3	33	GND	48	-12V
4	+5V	19	GND	34	SDE4	49	-12V
5	+5V	20	SDO4	35	SDE5	50	GND
6	+5V	21	SDO5	36	SDE6		
7	GND	22	SDO6	37	SDE7		
8	+12V	23	SDO7	38	GND		
9	+12V	24	GND	39	/SSCAN		
10	+12V	25	GND	40	/SLEAD		
11	/RDSYNC	26	/SCLK	41	GND		
12	/SHGATE	27	GND	42	SBUDI		
13	/OPBSYNC	28	GND	43	SBUDO		
14	GND	29	SDE0	44	SBUCLK		
15	SDO0	30	SDE1	45	SBULATCH		

CN106					
1	+5V	21	MDQ13	41	GND	61	GND
2	+5V	22	MDQ12	42	GND	62	GND
3	+5V	23	MDQ15	43	MA1	63	/WE2
4	+5V	24	MDQ14	44	MA0	64	/WE1
5	MDQ1	25	MDQ17	45	GND	65	GND
6	MDQ0	26	MDQ16	46	GND	66	GND
7	GND	27	MDQ19	47	MA3	67	/CAS2
8	GND	28	MDQ18	48	MA2	68	/CAS1
9	MDQ3	29	MDQ21	49	GND	69	/RAS10
10	MDQ2	30	MDQ20	50	GND	70	/RAS11
11	GND	31	MDQ23	51	MA5	71	/RAS13
12	GND	32	MDQ22	52	MA4	72	/RAS12
13	MDQ5	33	MDQ25	53	GND	73	/RAS15
14	MDQ4	34	MDQ24	54	GND	74	/RAS14
15	MDQ7	35	MDQ27	55	MA7	75	+5V
16	MDQ6	36	MDQ26	56	MA6	76	+5V
17	MDQ9	37	MDQ29	57	MA9	77	+5V
18	MDQ8	38	MDQ28	58	MA8	78	+5V
19	MDQ11	39	MDQ31	59	MA11	79	+5V
20	MDQ10	40	MDQ30	60	MA10	80	+5V

CN113					
1	TXDF	21	/AWKD1	41	GND
2	RXDF	22	/AWKD0	42	GND
3	RXRDYF	23	GND	43	/AVFGATE
4	CTSF	24	GND	44	/AVLSYNC
5	RTS1	25	/ARFGATE	45	/AVLGATE
6	CTS1	26	/ARLSYNC	46	GND
7	TXD1	27	/ARLGATE	47	/AVCLK
8	RXD1	28	GND	48	GND
9	IDE1	29	/ARCLK	49	/WRSYNC
10	/WKUP1	30	GND	50	/FSYNC
11	SLEEP	31	GND		
12	CNFCU	32	GND		
13	CNPRN	33	/ARKD7		
14	GND	34	/ARKD6		
15	/AWKD7	35	/ARKD5		
16	/AWKD6	36	/ARKD4		
17	/AWKD5	37	/ARKD3		
18	/AWKD4	38	/ARKD2		
19	/AWKD3	39	/ARKD1		
20	/AWKD2	40	/ARKD0		

CN114	
1	+24V
2	+12V
3	GND
4	-12V
5	GND
6	+5V
7	GND
8	+5V

CN115			
1	/VDTHRU	21	/ARLGATE
2	GND	22	GND
3	GND	23	/ARCLK
4	/BD	24	GND
5	GND	25	GND
6	GND	26	/ARKD7
7	RXDF	27	/ARKD6
8	TXDF	28	GND
9	CTSF	29	/ARKD5
10	RXRDYF	30	/ARKD4
11	TXD2	31	GND
12	RXD2	32	/ARKD3
13	OE2	33	/ARKD2
14	/WKUP2	34	GND
15	/SLEEP	35	/ARKD1
16	/CNPRN	36	/ARKD0
17	/ARFGATE	37	GND
18	GND	38	GND
19	/ARLSYNC	39	/WRSYNC
20	GND	40	/FSYNC