AUTO DOCUMENT FEEDER/
# AUTO REVERSE DOCUMENT FEEDER

(Machine code: B616, B617)

ADF B616 AND ARDF B617

ADF B616 and ARDF B617 are both applicable to model K-C2 (B121, B122, B123) and model K-C1 (B039, B040, B043). When the copier (K-C2 or K-C1) starts, the controller of the document feeder communicates with the controller of the copier. The document-feeder controller checks the line speed of the copier, and decides the line speed of the document feeder. The table lists the line speeds of ADF B616 and ARDF B617.

	When installed on K-C2	When installed on K-C1
ADF B616	100 mm/sec	89 mm/sec
ARDF B617	100 mm/sec	89 mm/sec

NOTE: The line speed of K-C2 is 100 mm/sec; the line speed of K-C1 is 89 mm/sec.

The document feeders for the model K-C1 (ADF B387, ARDF B379) are not applicable to model K-C2. If those feeders are installed on the K-C2, SC621 appears. To re-set the SC621, turn the mainswitch off and on.
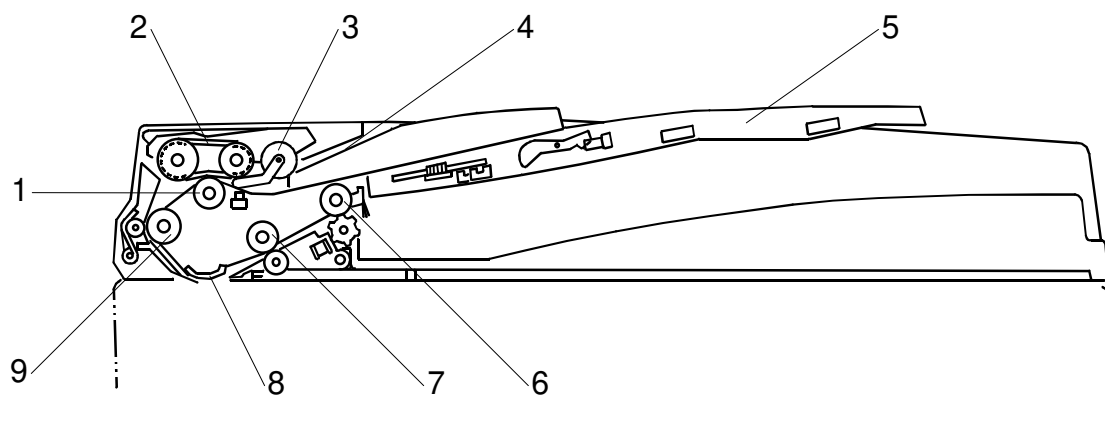

B616D901.WMF

Peripherals
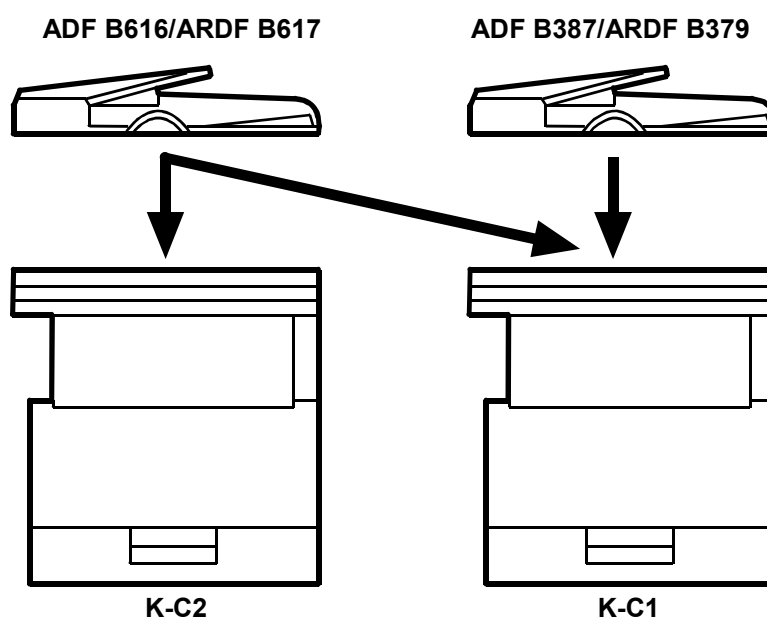
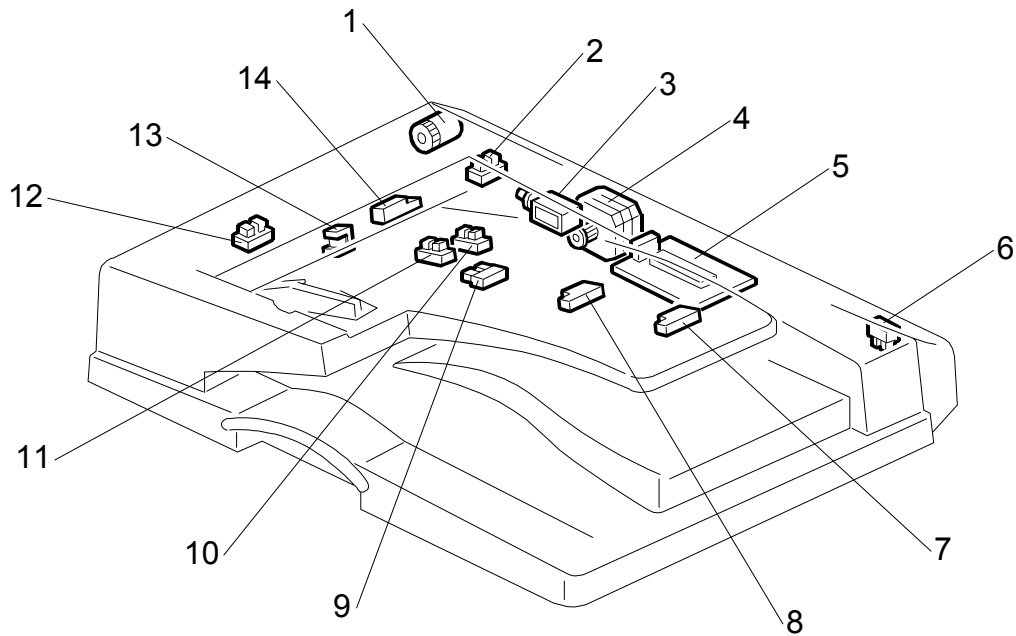# DOCUMENT FEEDER
(Machine Code: B387)

1. OVERALL INFORMATION

1.1 MECHANICAL COMPONENT LAYOUT

B387V103.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

Peripherals

1.2 ELECTRICAL COMPONENT LAYOUT

B387V101.WMF

1. DF feed clutch
2. Feed cover open sensor
3. DF pick-up solenoid
4. DF transport motor
5. DF drive board
6. DF position sensor
7. Original length sensor 2

8. Original length sensor 1
9. Original trailing edge sensor
10. Original width sensor 1
11. Original width sensor 2
12. Original set sensor
13. Stamp solenoid
14. Registration sensor

1.3 DRIVE LAYOUT

B387V102.WMF
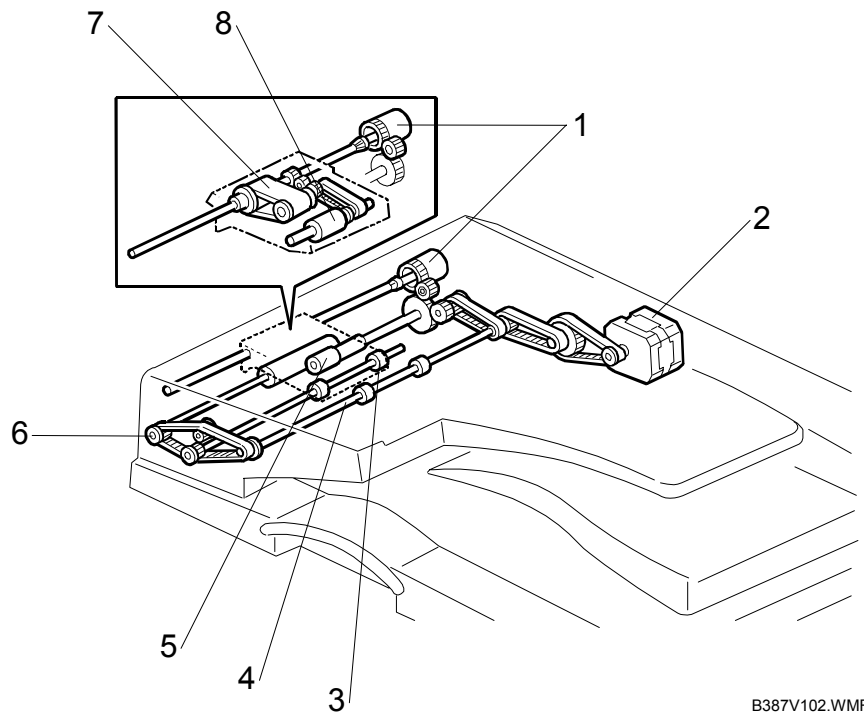
1. DF feed clutch
2. DF transport motor
3. 2nd transport roller
4. Exit roller
5. Separation roller
6. 1st transport roller
7. Original feed belt
8. Pick-up roller

Peripherals

B387-3

2. DETAILED SECTION DESCRIPTIONS

2.1 ORIGINAL SIZE DETECTION
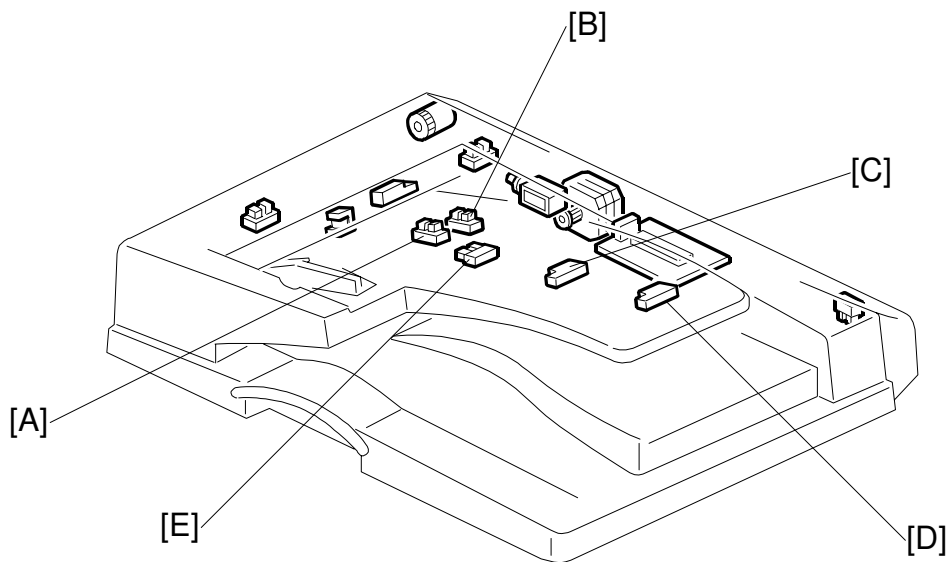
B387V101.WMF

The DF uses two width sensors (width sensor 1 [A] and width sensor 2 [B]) to detect the original width, and two length sensors (length sensor 1 [C] and length sensor 2 [D]) to detect the original length. The DF detects the original size based on the combination of inputs from these sensors, as indicated in the table on the next page.

If using a non-standard original size, the user must input the original length at the operation panel.

The original width sensors have four possible output states: P1 to P4. The output depends on the position of the ridges on the toothed plate attached to 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 [E] 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 causing the feed of an unwanted extra sheet of copy paper.

		NA	EU	Original Length 1	Original Length 2	P1	P2	P3	P4
1	A3 (297 x 420)	✗	◯	ON	ON	-	-	-	ON
2	B4 (257 x 364)	✗	◯	ON	ON	-	-	ON	-
3	A4 SEF (210 x 297)	✗	◯	ON	-	-	ON	-	-
4	A4 LEF (297 x 210)	✗	◯	-	-	-	-	-	ON
5	B5 SEF (182 x 257)	✗	◯	ON	-	ON	-	-	-
6	B5 LEF (257 x 182)	✗	◯	-	-	-	-	ON	-
7	A5 SEF (148 x 210)	✗	◯	-	-	ON	-	-	-
8	A5 LEF (210 x 148)	✗	◯	-	-	-	ON	-	-
9	11" x 17"	◯1	✗	ON	ON	-	-	-	ON
10	11" x 15"	●1	✗	ON	ON	-	-	-	ON
11	10" x 14"	◯	✗	ON	ON	-	-	ON	-
12	81/2" x 14"	◯2	✗	ON	ON	-	ON	-	-
13	81/2" x 13"	✗	◯4	ON	ON	-	ON	-	-
14	8" x 13"	●2	●4	ON	ON	-	ON	-	-
15	81/2" x 11" SEF	◯3	✗	ON	-	-	ON	-	-
16	11" x 81/2" LEF	◯	✗	-	-	-	-	-	ON
17	8" x 10" SEF	●3	✗	ON	-	-	ON	-	-
18	51/2" x 81/2" SEF	◯	✗	-	-	ON	-	-	-
19	81/2" x 51/2" LEF	◯	✗	-	-	-	ON	-	-

NA: America (North, Middle, South)   EU: Europe, Asia, China, Taiwan

✗: No   ◯: Yes   ON: Paper present

◯1, ●1: In NA, original size 11" x 15" is detected as 11" x 17"
◯2, ●2: In NA, original size 8" x 13" is detected as 81/2" x 14"
◯3, ●3: In NA, original size 8" x 10" is detected as 81/2" x 11"
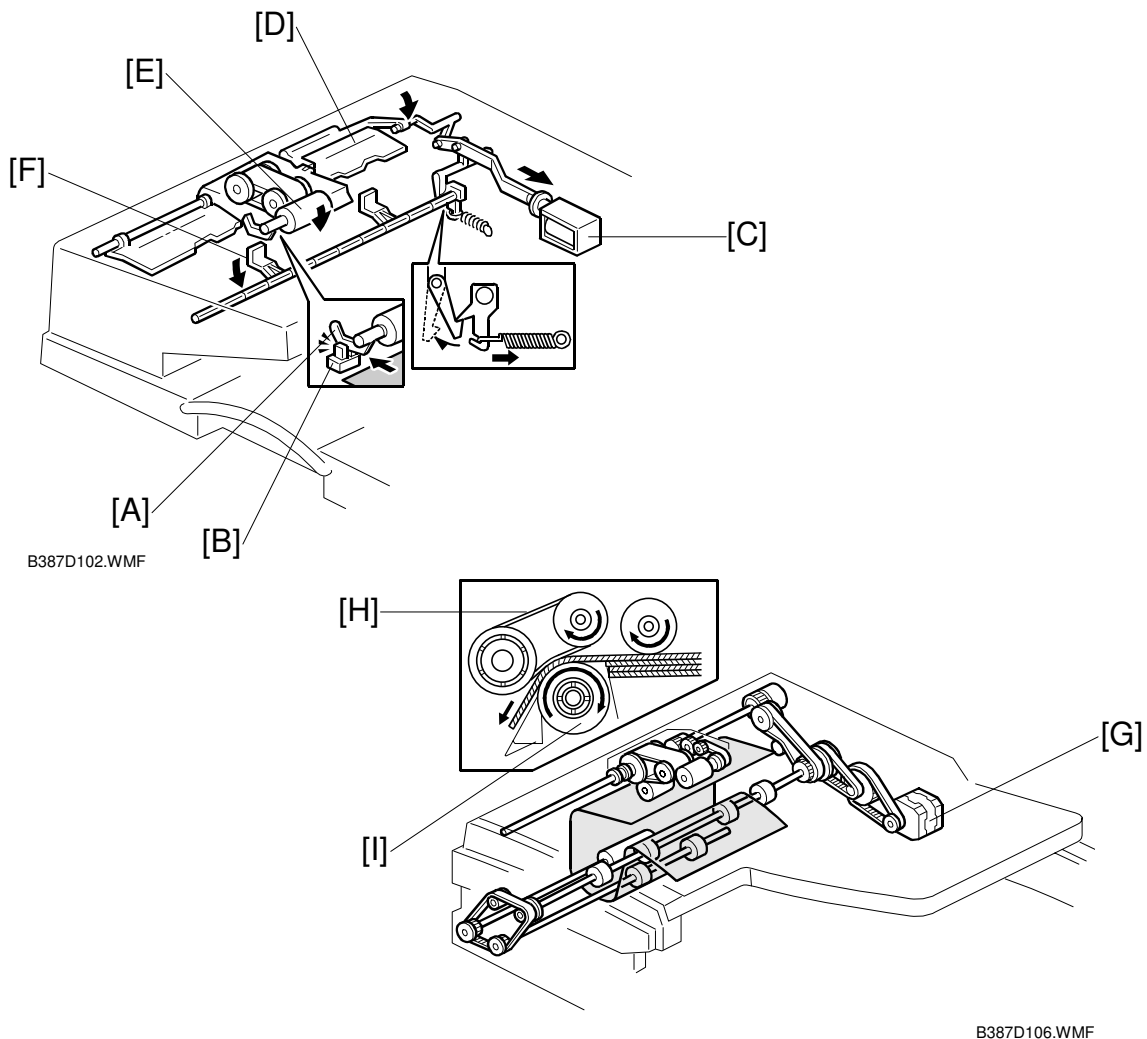◯4, ●4: In EU, original size 8" x 13" is detected as 81/2" x 13"

- Original Width Sensor States -

Width Sensor 1	High	Low	Low	High
Width Sensor 2	High	High	Low	Low
Detection State	P1	P2	P3	P4

Low = Blocked   High = Open

Peripherals

2.2 PICK-UP AND SEPARATION


B387D102.WMF

B387D106.WMF

An FRR (feed and reverse roller) system is used.

Setting original(s) onto the feed table lifts the original set sensor feeler [A], causing the original set sensor [B] to issue a signal informing the main CPU that the DF is ready to start feeding.

When the Start key (⊚) is pressed, the DF pick-up solenoid [C] turns on, causing the transport guide [D] and pick-up roller [E] to lower onto the original, while at the same time causing the original stoppers [F] to drop down to clear the feed path for the original. After 200 ms, the DF transport motor [G] turns on, feeding the top original page to the paper feed belt [H], where it is separated by the separation roller [I].

2.3 ORIGINAL TRANSPORT AND EXIT MECHANISM

B387V104.WMF
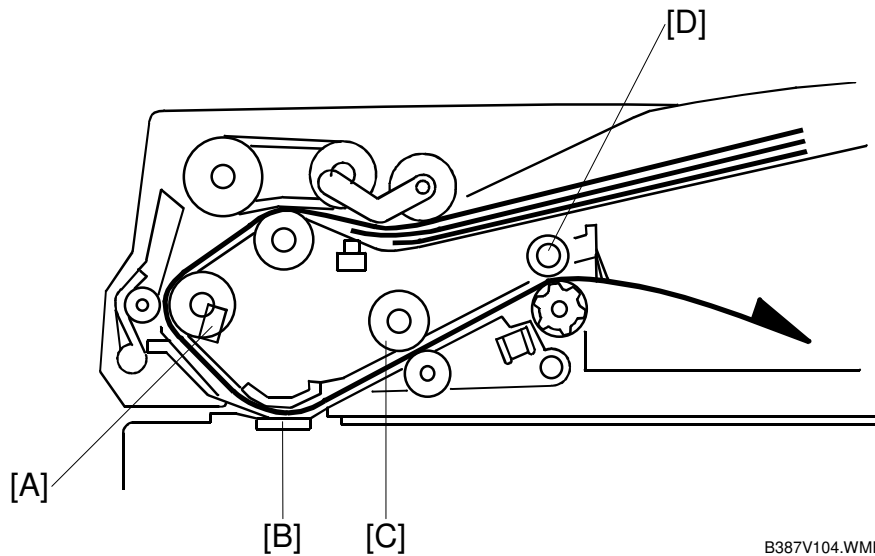
When the leading edge of the original reaches the registration sensor at [A], the DF transport motor turns off. After a short time the DF transport motor turns on again. The original is fed past the DF exposure glass [B], where it is scanned. It is then fed through to the 2nd transport roller [C] and fed out by the exit roller [D].

The DF transport motor uses a constant speed to feed the original up to the registration sensor. When the motor turns on again to feed the original to the DF exposure glass, however, the speed depends on the selected reproduction ratio. At 100%, the speed is 89 mm/s.

Peripherals

2.4 STAMP
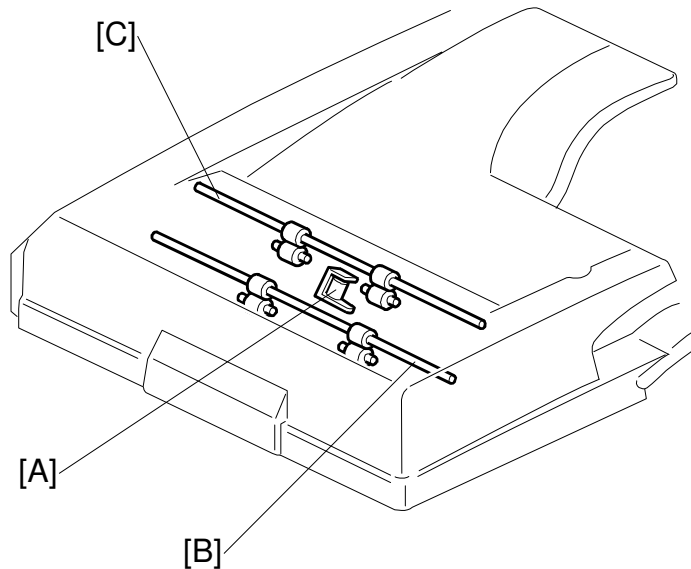
B387D103.WMF

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

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

When the original reaches the stamp position, the DF transport motor stops. Provided that the page was sent successfully (immediate transmission) or stored successfully (memory transmission), the stamp solenoid then comes on 300 ms after the DF motor stops. After stamping, the DF transport motor resumes feeding, at about 1.3 times the normal speed.

The positioning of the stamp on the original can be adjusted using SP6-010.
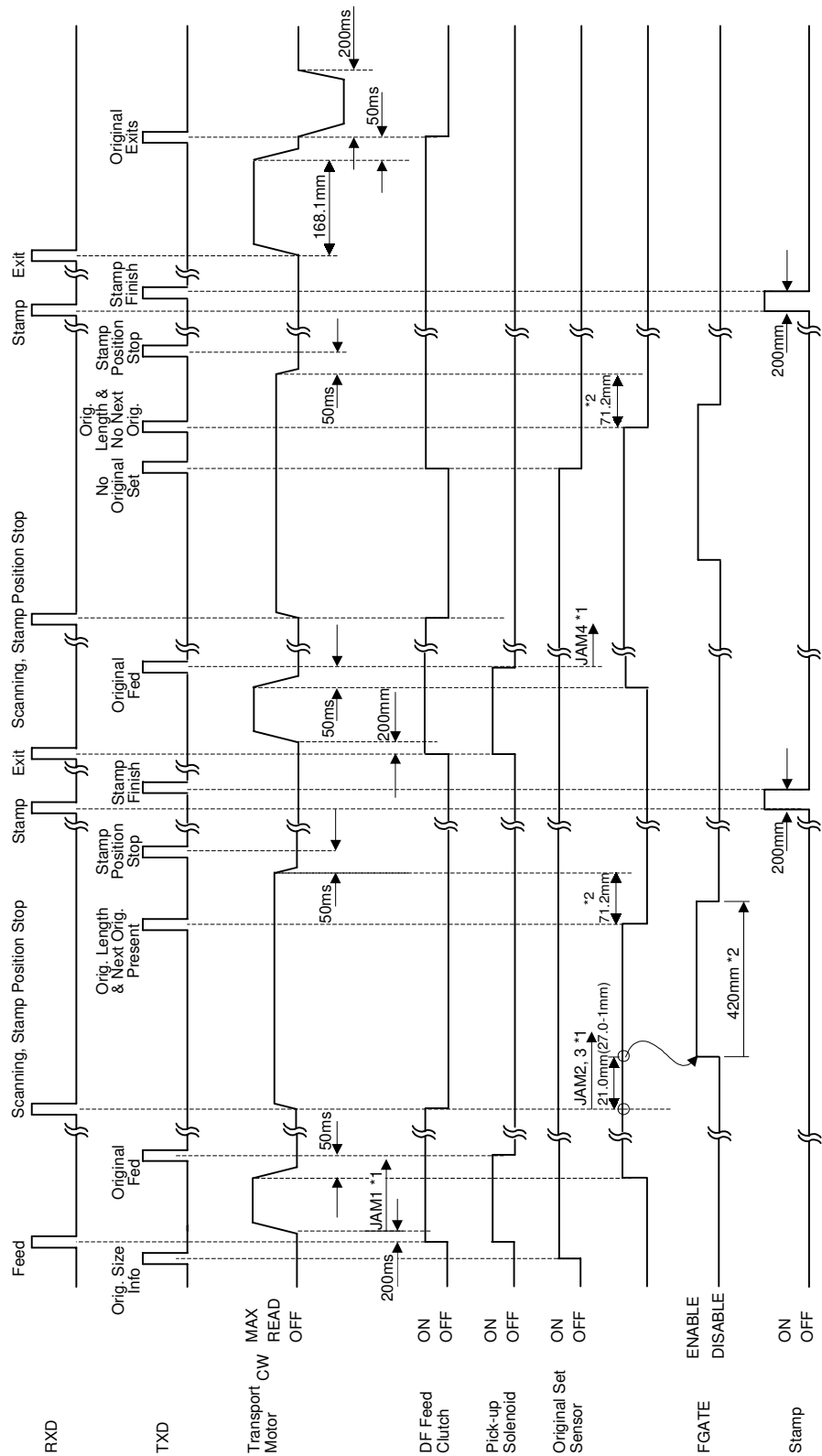
2.5　TIMING CHARTS

2.5.1　A3
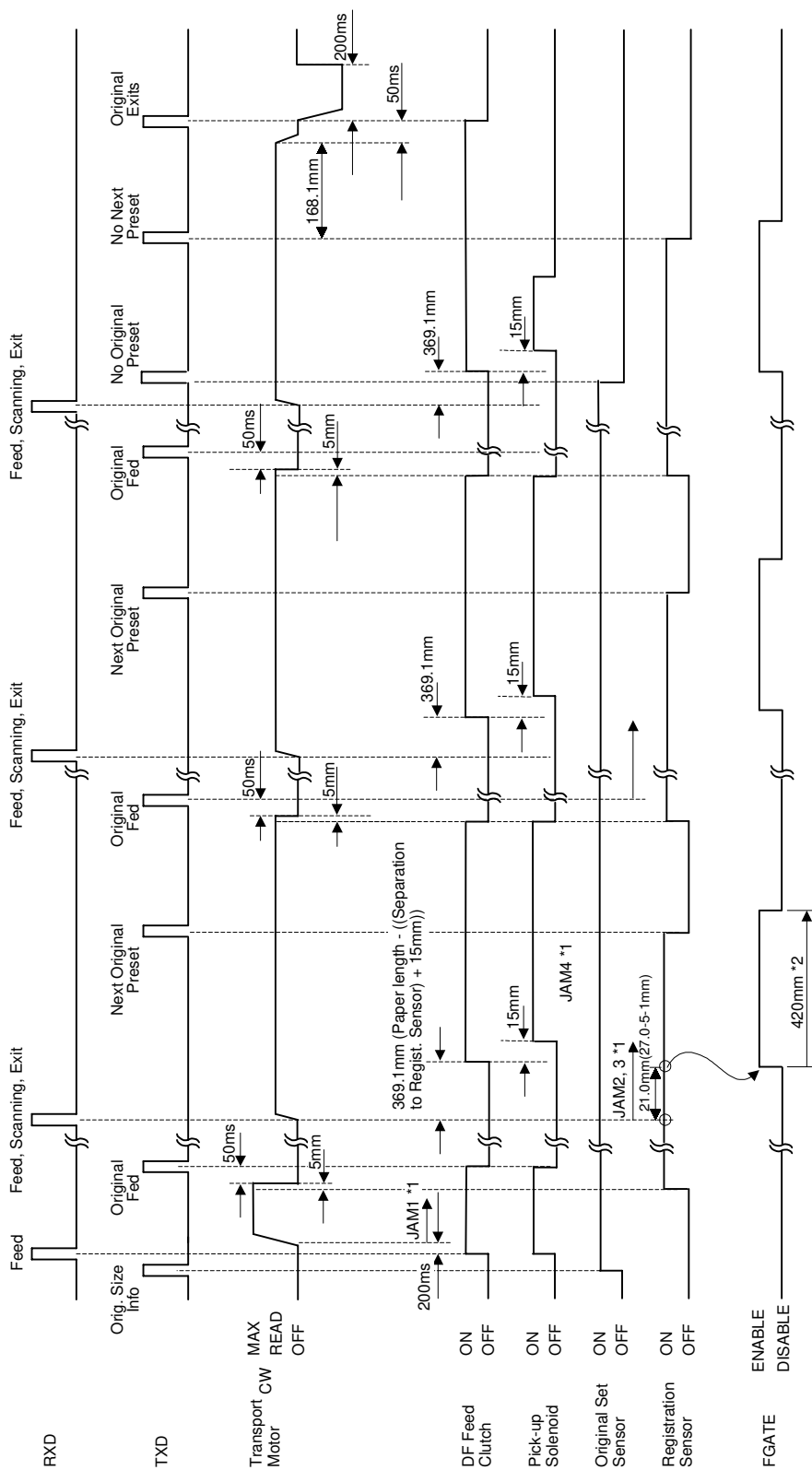
B387D001.WMF

*1　For information about jam conditions, see Section 1.6.

*2　F Gate: This signal goes high when the laser start to wire a pate to the drum.
　　The distance depends on SP mode setting 6-006-2 and -3.

Peripherals

2.5.2 A3, STAMP MODE

B387D002.WMF

*1 For information about jam conditions, see Section 1.6.

*2 F Gate: This signal goes high when the laser start to wire a pate to the drum.
   The distance depends on SP mode setting 6-006-2 and -3.

2.6 JAM DETECTION

JAM 1:   If the registration sensor fails to turn on within x_1 ms after the DF transport motor comes on to feed the original from the original tray.

$$x_1 = (114 \times 1.1)/\text{original speed} + 2{,}000 \text{ ms}$$

JAM 2:   If the registration sensor fails to turn off within x_2 ms after the DF transport motor comes on to feed the original from the original tray.

$$x_2 = (\text{original length}/\text{original speed}) + 2{,}000 \text{ ms}$$

JAM 3:   If there is no original at the registration sensor when scanning is started, even though the sensor had already turned on.

JAM 4:   The current original is stopped after the registration sensor detects its leading edge, but the previous original is still at the scanning position.

JAM 5:   If the original stopped at the stamp position is removed.

JAM 6:   If the cover is opened or the ADF is lifted up while the ADF is in operation.

JAM 7:   If the DF gate signal (indicating that the original is now in the correct position for scanning) is not asserted when the original trailing edge passes the DF exposure glass.
JAM 7 occurs when the original is pulled out while it is being scanned.

Peripherals

2.7 OVERALL ELECTRICAL CIRCUIT

The DF CPU controls the DF transport motor, DF feed clutch, DF pick-up solenoid, and stamp solenoid. The DF CPU also monitors all sensors and provides updated status when prompted at regular intervals by the mainframe, which may then take action based on this information. The DF/mainframe connection is checked automatically immediately after the mainframe is powered on.
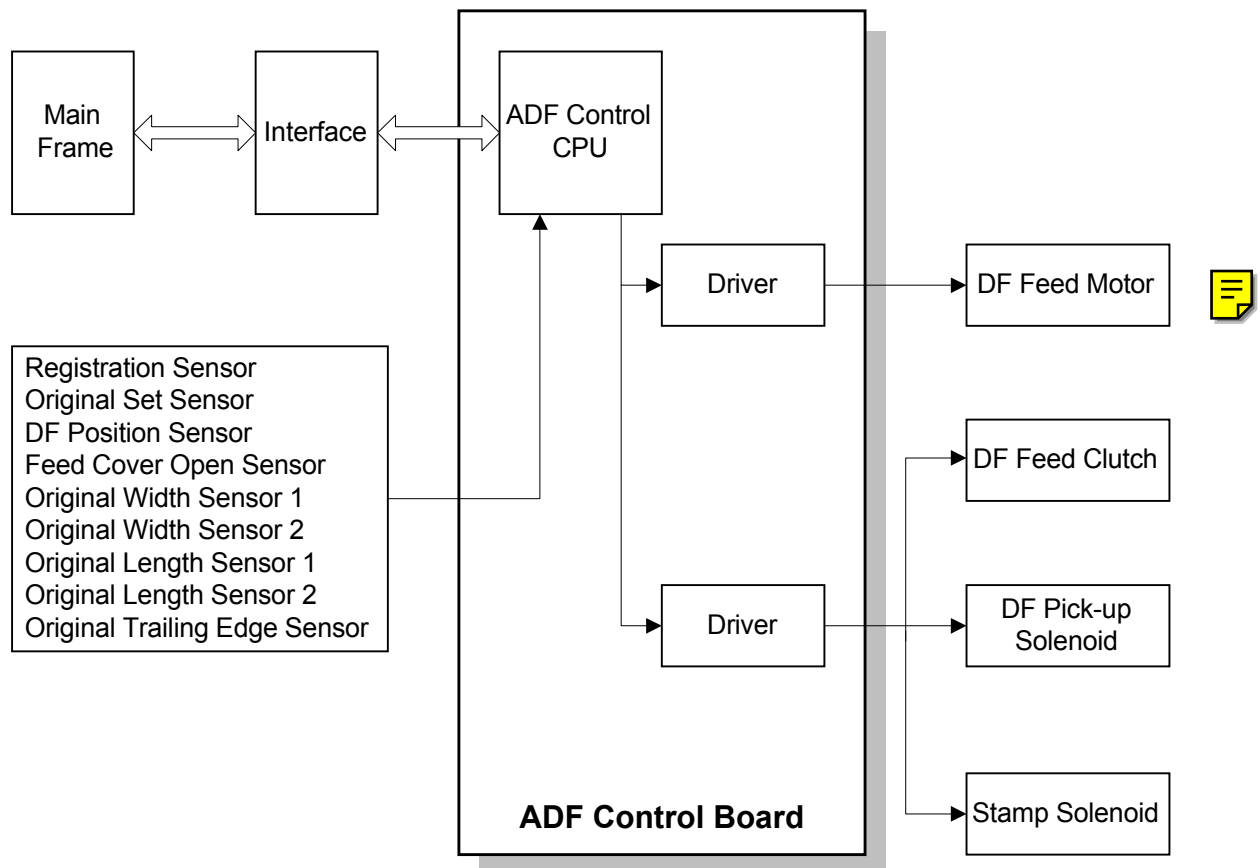
B387D500.WMF

2.8 FREE RUN

You can use DIP switch 100 (on the DF control board) to carry out a one-sided free run.

Bits				
1	OFF	ON	OFF	ON
2	OFF	OFF	ON	ON
Mode	Normal	FR	FR	FR

FR: Free run

Procedure

1. Set bit 1 and/or bit 2 on SW100 (on the DF control board) to ON.

2. Set originals on the original table.

3. The free run starts automatically after about 2 seconds.

4. To stop the run, set SW100 bits 1 and 2 back to OFF. To ensure that the system correctly resets, turn power off and then back on.

Free Run Process

1. Set originals on the DF table.

2. The first original sheet feeds into the DF.

3. The sensor detects the original.

4. The DF outputs the original to the exit tray.

5. Steps 2 through 4 repeat for each subsequent original sheet. When all originals have been fed, the DF stops and waits for more.
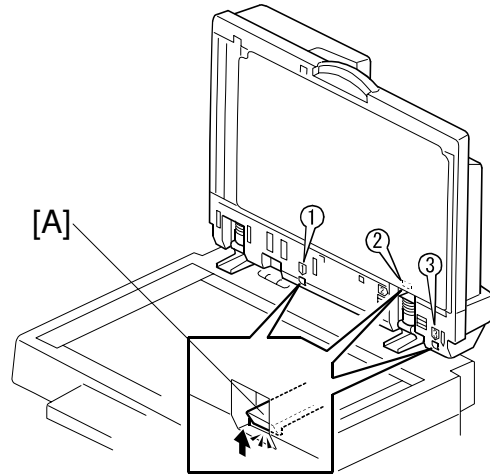
Peripherals

3. REPLACEMENT AND ADJUSTMENT

3.1 EXTERIOR COVERS
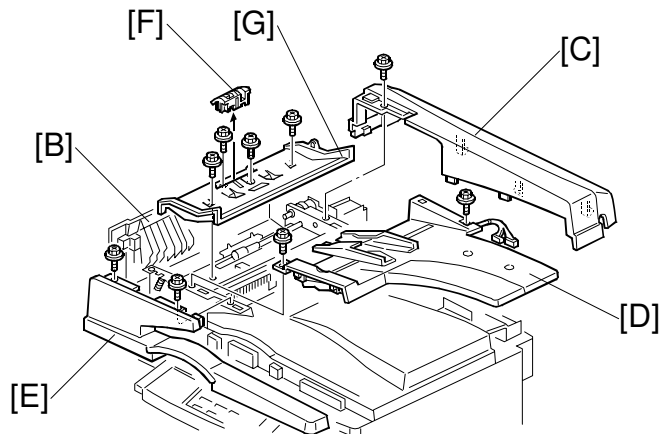
3.1.1 REAR COVER

1. Lift the DF.

2. Unhook the three latches [A] in the order marked on the DF body.

3. Close the DF.

4. Open the DF feed cover [B].

5. Rear cover [C] ($\mathscr{F}$ x 1)

B387R120.WMF

3.1.2 ORIGINAL TABLE

1. Rear cover (☛ 3.1.1)

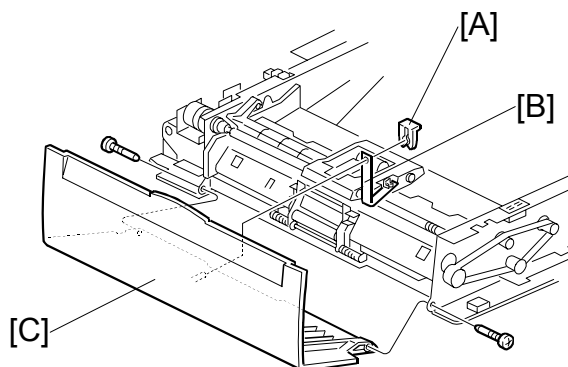2. Original table [D] ($\mathscr{F}$ x 2, ▤ x 2)

3.1.3 FRONT COVER

1. Open the DF feed cover [B].

2. Original table. (☛ 3.1.2)

3. Front cover [E] ($\mathscr{F}$ x 2)

B387R106.WMF

3.1.4 ORIGINAL ENTRANCE GUIDE

1. Feed unit (☛ 3.2)

2. Original table (☛ 3.1.2)

3. Roller cover [F]

4. Original entrance guide [G] ($\mathscr{F}$ x 4)

3.1.5 DF FEED COVER

1. Rear cover (☛ 3.1.1)
2. Original table (☛ 3.1.2)
3. Front cover (☛ 3.1.3)
4. Clip [A]
5. Strap [B] (⏀ x 1)
6. DF feed cover [C] (✐ x 2)

B387R110.WMF

3.2 FEED UNIT

1. Open the DF feed cover [D] and detach the strap [E] (⏀ x 1).

2. Raise the front guide flap [F] to about a 45-degree angle, and push the feed unit [G] into the spring so that it comes free.
   NOTE: 1) The feed unit comes off very easily if you first lift flap [H] to about a 45-degree angle.
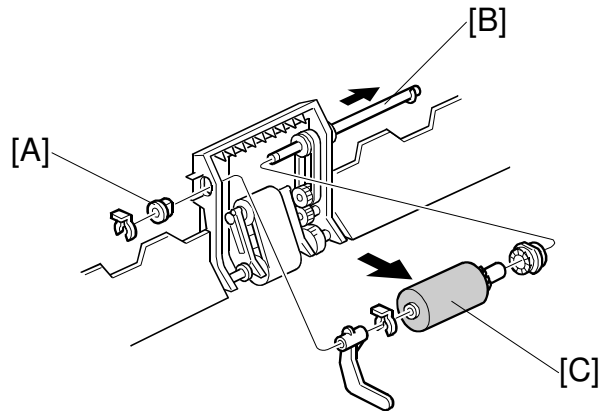   2) When reinstalling, be sure that the lever [I] is above the pin [J].
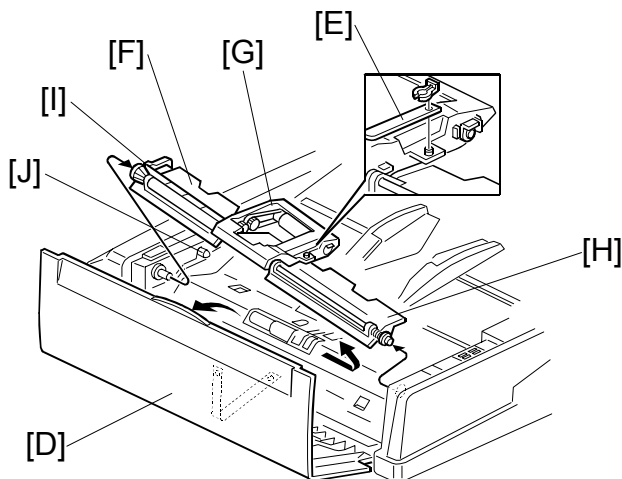
B387R101.WMF

3.3 SEPARATION ROLLER

1. Feed unit (☛ 3.2)
2. Roller cover [K]
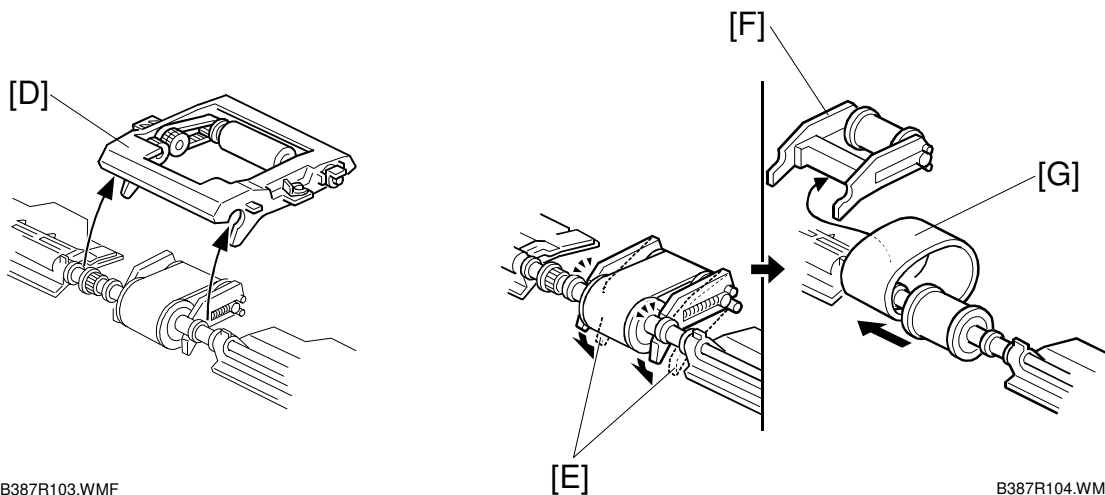3. Separation roller [L] (⏀ x 1).

B387R105.WMF

Peripherals
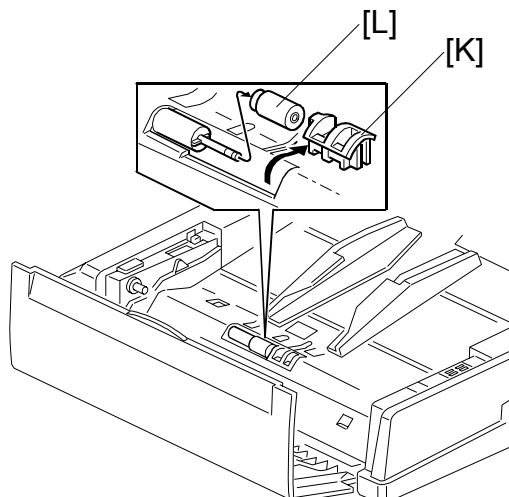
3.4 PICK-UP ROLLER

B387R102.WMF

1. Feed unit (☛ 3.2)

2. Remove 2 clip rings and 1 bushing [A]

3. Pull the shaft [B] part way out at the gear end, so that the pick-up roller [C] can be taken off.
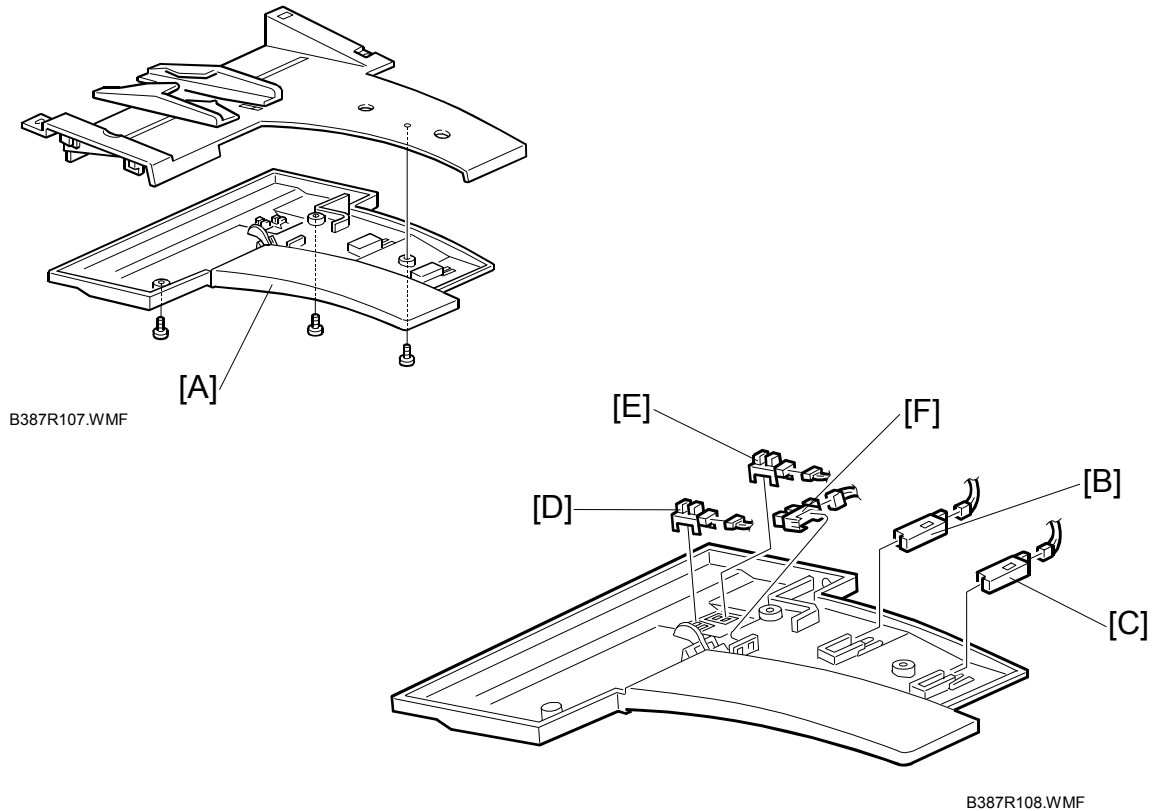
3.5 FEED BELT

B387R103.WMF

B387R104.WMF

1. Feed unit (☛ 3.2)

2. Pick-up roller housing [D]

3. Push down on the lower wings [E] of the tensioning piece [F], so that the tensioning piece comes free of the shaft.

4. Take the tensioning piece out, and then remove the belt [G].

3.6 ORIGINAL SENSORS (WIDTH, LENGTH, TRAILING EDGE)

B387R107.WMF

B387R108.WMF

1. Original table (☛ 3.1.2)

2. Sensor platform [A] (📎 x 3).

3. Length sensors [B], [C] (🔌 x 1 on each sensor)
   NOTE: Replace both sensors at the same time, together with the wiring and connectors.

4. Width sensors [D], [E], and trailing edge sensor [F] (🔌 x 1 on each sensor)
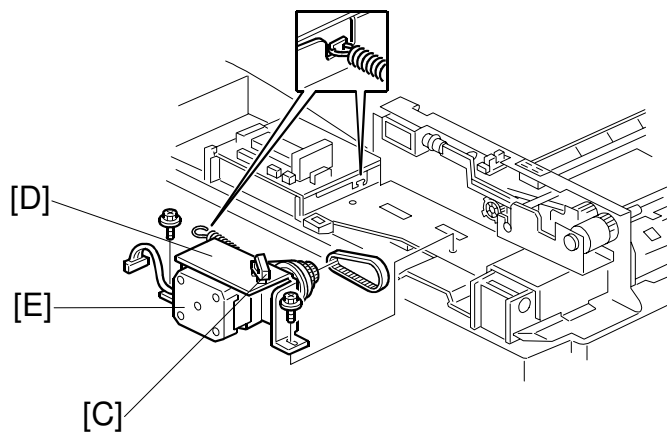   **NOTE:** Replace all three sensors at the same time, together with the wiring and connectors.

Peripherals

3.7 ORIGINAL SET SENSOR
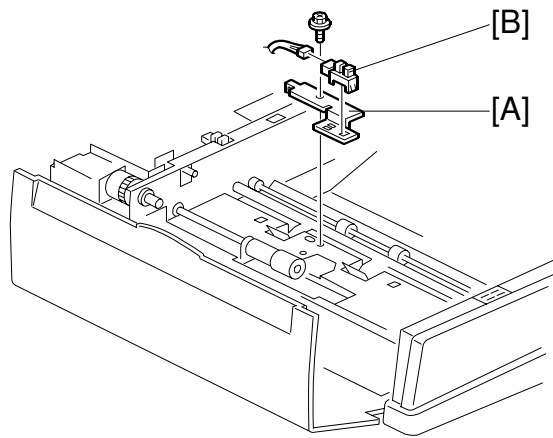
B387R109.WMF

1. Original entrance guide (☛ 3.1.4)

2. Sensor bracket [A] (📎 x 1)

3. Original set sensor [B] (🔌 x 1)
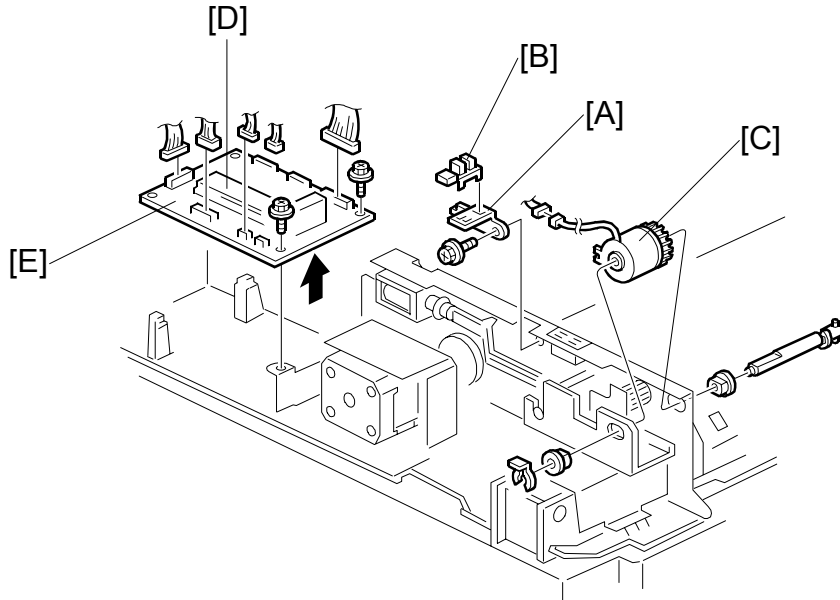
3.8 TRANSPORT MOTOR

B387R111.WMF

1. Rear cover (☛ 3.1.1)

2. Open the wire clamp [C] at the top of the motor bracket [D].

3. Motor bracket [D] (📎 x 2 , 1 spring)
    NOTE: Unhook the spring at the board side.

4. Transport motor [E] (📎 x 2, 🔌 x 1)

B387-18

3.9 FEED COVER OPEN SENSOR/
FEED CLUTCH/ROM/DF DRIVE BOARD

B387R199.WMF

Exterior

1. Rear cover (☛ 3.1.1)

Feed Cover Open Sensor

2. Sensor bracket [A] (🔩 x 1)

3. Feed cover open sensor [B] (📇 x 1)

Feed Clutch

2. Feed unit (☛ 3.2)

3. Feed clutch [C] (🔃 x 1, 1 bushing, 📇 x 1).
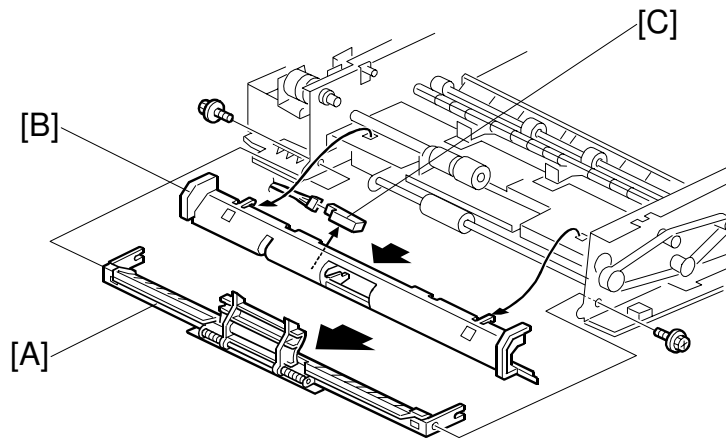   **NOTE:** Pull the shaft inward until the clutch can be removed.

ROM

2. Replace the ROM [D] on the DF drive board.

DF Drive Board
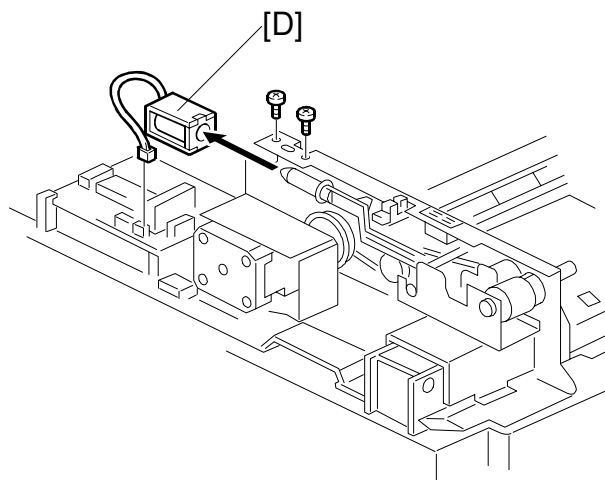
2. DF drive board [E] (🔩 x 3, all connectors)

3.10 REGISTRATION SENSOR

B387R113.WMF

1. DF feed cover (☛ 3.1.5)

2. Original entrance guide (☛ 3.1.4)

3. Outer turn guide [A] (🔩 x 2)

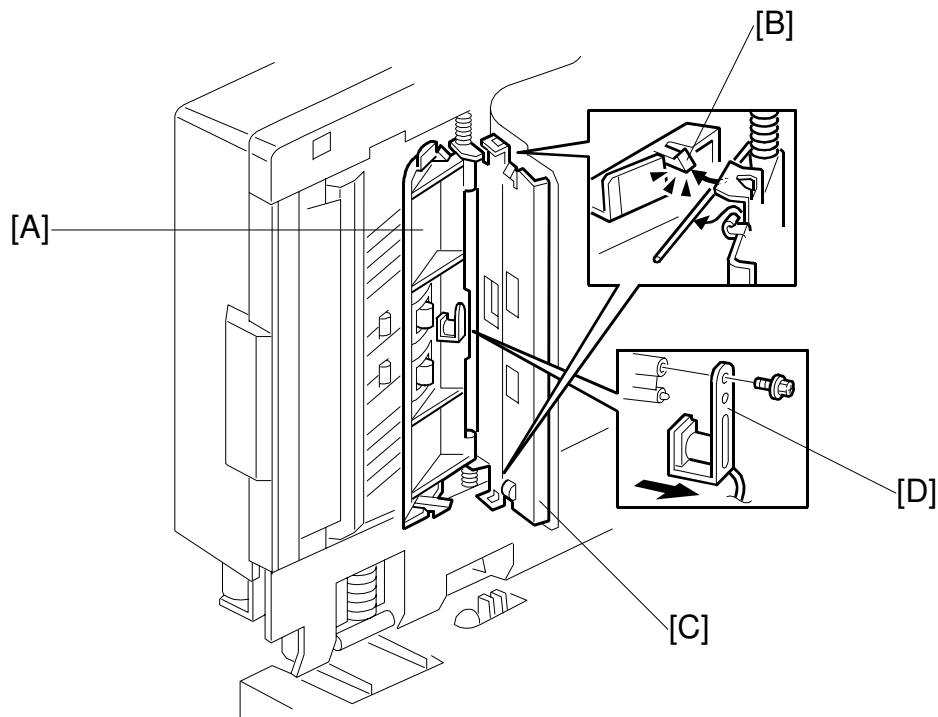4. Pop out the inner turn guide [B], and remove the registration sensor [C] (📭 x 1)

3.11 PICK-UP SOLENOID

B387R112.WMF

1. Rear cover (☛ 3.1.1)

2. Pick-up solenoid [D] (🔩 x 2, 📭 x 1)

3.12 STAMP SOLENOID

B387R114.WMF

1. Rear cover (☛ 3.1.1)

2. Disconnect the stamp solenoid connector.
   NOTE: Pull out the small connector piece from the large connector. (The large connector itself cannot fit through the hole in the frame.)

3. Lift the ADF upright and pull open the exit guide [A]. Release the front and rear hooks [B] and open the cover [C].

4. Remove the stamp solenoid [D] (🔩 x 1), and pull it out together with the wire.

Peripherals

ELECTRICAL COMPONENT LAYOUT (B387)
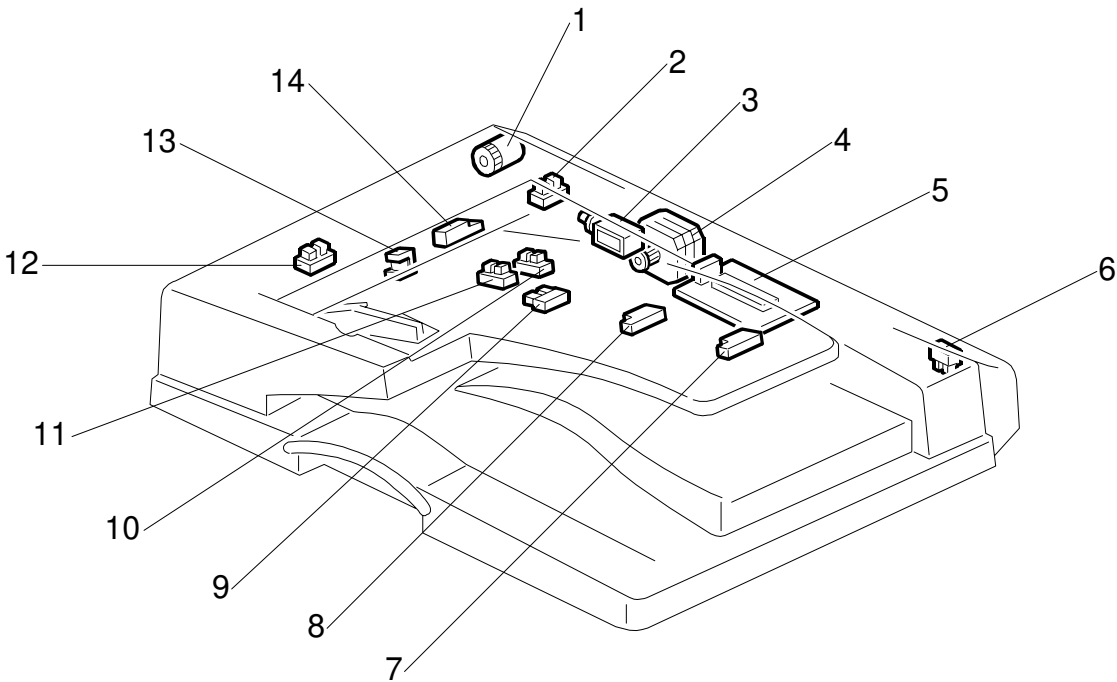
B387V101.WMF

Symbol	Name	Index No.	P-to-P
Motors			
M1	DF Transport	4	J13
Sensors			
S1	Registration	14	J14
S2	Original Set	12	J14
S3	DF Position	6	J14
S4	Feed Cover Open	2	J15
S5	Original Width 1	10	J15
S6	Original Width 2	11	J15
S7	Original Trailing Edge	9	J15
S8	Original Length 1	7	J16
S9	Original Length 2	8	J16
Solenoids			
SOL1	Stamp	13	J13
SOL2	DF Pick-up	3	J14
Magnetic Clutches			
MC1	DF Feed	1	J13
PCBs			
PCB1	DF Drive	5	I13-16