

**BELLINI**  
**(Machine Code: A294)**  
**SERVICE MANUAL**



Subject to change  
Ricoh Technical Service  
October 22th, 1999

## **IMPORTANT SAFETY NOTICES**

### **PREVENTION OF PHYSICAL INJURY**

1. Before disassembling or assembling parts of the copier and peripherals, make sure that the copier power cord is unplugged.
2. The wall outlet should be near the copier and easily accessible.
3. Note that some components of the copier and the paper tray unit are supplied with electrical voltage even if the main power switch is turned off.
4. If any adjustment or operation check has to be made with exterior covers off or open while the main switch is turned on, keep hands away from electrified or mechanically driven components.
5. If the Start key is pressed before the copier completes the warm-up period (the Start key starts blinking red and green alternatively), keep hands away from the mechanical and the electrical components as the copier starts making copies as soon as the warm-up period is completed.
6. The inside and the metal parts of the fusing unit become extremely hot while the copier is operating. Be careful to avoid touching those components with your bare hands.

### **HEALTH SAFETY CONDITIONS**

1. Never operate the copier without the ozone filters installed.
2. Toner and developer are non-toxic, but if you get either of them in your eyes by accident, it may cause temporary eye discomfort. Try to remove with eye drops or flush with water as first aid. If unsuccessful, get medical attention.

### **OBSERVANCE OF ELECTRICAL SAFETY STANDARDS**

1. The copier and its peripherals must be installed and maintained by a customer service representative who has completed the training course on those models.
2. The NVRAM on the SICU has a lithium battery which can explode if replaced incorrectly. Replace the NVRAM only with an identical one. The manufacturer recommends replacing the entire NVRAM. Do not recharge or burn this battery. Used NVRAM must be handled in accordance with local regulations.

## SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

1. Do not incinerate toner bottles or used toner. Toner dust may ignite suddenly when exposed to an open flame.
2. Dispose of used toner, developer, and organic photoconductors in accordance with local regulations. (These are non-toxic supplies.)
3. Dispose of replaced parts in accordance with local regulations.
4. When keeping used lithium batteries in order to dispose of them later, do not put more than 100 batteries per sealed box. Storing larger numbers or not sealing them apart may lead to chemical reactions and heat build-up.

## LASER SAFETY

The Center for Devices and Radiological Health (CDRH) prohibits the repair of laser-based optical units in the field. The optical housing unit can only be repaired in a factory or at a location with the requisite equipment. The laser subsystem is replaceable in the field by a qualified Customer Engineer. The laser chassis is not repairable in the field. Customer engineers are therefore directed to return all chassis and laser subsystems to the factory or service depot when replacement of the optical subsystem is required.

### WARNING

**Use of controls, or adjustment, or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.**

### WARNING

**WARNING: Turn off the main switch before attempting any of the procedures in the Laser Unit section. Laser beams can seriously damage your eyes.**

### CAUTION MARKING:



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## OPTION

### 3,000-SHEET FINISHER (B302)

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## **A3/DLT TRAY KIT (B331)**

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|--|---------------|
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# 1. OVERALL MACHINE INFORMATION

## 1.1 SPECIFICATIONS

### 1.1.1 COPIER ENGINE

|                     |   |
|---------------------|---|
| Configuration:      | Console   |
| Copy Process:       | Dry electrostatic transfer system   |
| Originals:          | Sheet/Book  |
| Original Size:      | Maximum: A3/11" x 17"<br>Minimum: A5, 5 1/2" x 8 1/2" (using ADF)   |
| Original Alignment: | Rear left corner  |
| Paper Size/Weight:  |   |
| Size:               | Mainframe, Tray 1 (Tandem Tray):<br>A4 sideways and LT sideways<br>Mainframe, Trays 2 and 3 (Universal Trays):<br>Europe/Asia:<br>A5 sideways - A3 lengthwise,<br>8-kai sideways, 16-kai<br>N. America:<br>5 1/2" x 8 1/2" sideways - 11" x 17" lengthwise<br>LCT, Trays 4 ~ 6:<br>A4 sideways, B5 sideways, LT sideways, A5, HLT<br>Duplex Tray: A5/HLT (lengthwise or sideways)<br>to A3/DLT, except that tab paper cannot<br>be used |
| Weight:             | Mainframe, Trays 1 to 3:<br>52 to 163 g/m <sup>2</sup><br>16 to 40 lbs Bond<br>50 to 60 lbs Cover<br>90 lbs Index (no Tab)<br>LCT, Trays 4 and 5:<br>52 to 216 g/m <sup>2</sup><br>16 to 40 lbs Bond<br>50 to 80 lbs Cover<br>90 to 110 lbs Index<br>LCT, Tray 6:<br>Same as Mainframe, Trays 1 to 3<br>Duplex Tray:<br>64 to 163 g/m <sup>2</sup><br>20 to 40 lbs Bond<br>50 to 60 lbs Cover<br>90 lbs Index (no Tab)                  |

Reproduction Ratios: 7 reduction and 5 enlargement

|             | Metric Version | Inch Version |
|-------------|----------------|--------------|
| Enlargement | 400%           | 400%         |
|             | 200%           | 200%         |
|             | 141%           | 155%         |
|             | 122%           | 129%         |
|             | 115%           | 121%         |
| Full Size   | 100%           | 100%         |
| Reduction   | 93%            | 93%          |
|             | 82%            | 85%          |
|             | 75%            | 78%          |
|             | 71%            | 73%          |
|             | 65%            | 65%          |
|             | 50%            | 50%          |
|             | 25%            | 25%          |

Zoom: 25 ~ 400%

Copy Speed: Max. 85 cpm (A4/8 1/2" x 11" sideways)

Resolution: Scanning: 600 dpi  
Printing: 600 dpi

Gradation: 256 levels

Warm-up Time: Less than 360 s (from Off mode)

First Copy Time: Less than 5.4 s (Finisher upper tray: face down)  
(1st Tray, A4 sideways) Less than 4.1 s (Finisher upper tray: face up)  
Less than 4.5 s (Copier: face down)  
Less than 3.2 s (Copier: face up)

Copy Number Input: Ten-key pad, 1 to 9999

Copy Paper Capacity: 1st Tray: 1,000 sheets (2,000 when used as a tandem tray)  
2nd/3rd Tray: 500 sheets each  
4th/5th Tray (LCT): 1,000 sheets each  
6th Tray (LCT): 2,500 sheets

Memory Capacity: RAM: 48 MB x 2  
HDD: 4.3 GB x 2

Toner Replenishment: Cartridge exchange (1,450 g/cartridge)



Toner Yield: 55 k copies  
(A4 sideways, 6% full black, 1 to 25 copying)

Power Source: North America: 240 V, 60 Hz, 20 A  
Europe/Asia: 220 ~ 240 V, 50Hz/60 Hz, 16 A

## Power Consumption:

N. America Version

(Unit: Wh)

|                      |     | NA (240 V/60 Hz) |             |                  |             |
|----------------------|-----|------------------|-------------|------------------|-------------|
|                      |     | Copier Only      |             | System           |             |
|                      |     | Single Side Copy | Duplex Copy | Single Side Copy | Duplex Copy |
| Warm-up              | ON  | 1,864            |             | 1,888            |             |
| Copying              | OFF | 444              | 462         | 470              | 502         |
|                      | ON  | 2,122            | 2,135       | 2,152            | 2,182       |
| Stand-by             | OFF | 190              |             | 203              |             |
|                      | ON  | 753              |             | 766              |             |
| Energy Star (15 min) | OFF | 169              |             | 183              |             |
|                      | ON  | 733              |             | 746              |             |
| Low Power Mode       |     | 293.2            |             |                  |             |
| OFF Mode             |     | 11               |             |                  |             |

Europe Version

(Unit: Wh)

|                         |     | EU (230 V/50 Hz) |             |                  |             |
|-------------------------|-----|------------------|-------------|------------------|-------------|
|                         |     | Copier Only      |             | System           |             |
|                         |     | Single Side Copy | Duplex Copy | Single Side Copy | Duplex Copy |
| Warm-up                 | ON  | 1,800            |             | 1,810            |             |
| Copying                 | OFF | 453              | 472         | 467              | 510         |
|                         | ON  | 2,014            | 2,036       | 2,032            | 2,074       |
| Stand-by                | OFF | 190              |             | 203              |             |
|                         | ON  | 718              |             | 733              |             |
| Energy Star<br>(15 min) | OFF | 169              |             | 182              |             |
|                         | ON  | 698              |             | 712              |             |
| Low Power Mode          |     | 299.0            |             |                  |             |
| OFF Mode                |     | 11               |             |                  |             |

**NOTE:** ON: Fusing Lamp On, OFF: Fusing Lamp Off

**Noise Emission:****Sound Power Level:**

The measurements were made in accordance with ISO 7779.

|                      | <b>Copier only</b> | <b>Full system</b> |
|----------------------|--------------------|--------------------|
| Stand-by             | Less than 59 dB(A) | Less than 58 dB(A) |
| Copying (ADF 1 to 1) | Less than 72 dB(A) | Less than 78 dB(A) |
| Copying              | Less than 71 dB(A) | Less than 77 dB(A) |

**Sound Pressure Level:**

The measurements were made in accordance with ISO 7779.

|                       | <b>Copier only</b> | <b>Full system</b> |
|-----------------------|--------------------|--------------------|
| Stand-by              | Less than 44 dB(A) | Less than 45 dB(A) |
| Copying (ADF 1 to 1)  | Less than 67 dB(A) | Less than 68 dB(A) |
| Copying (From Memory) | Less than 59 dB(A) | N/A                |

**Dimensions:** 870 x 735 x 1,476 mm (34.3" x 28.9" x 58.1")  
(W x D x H) (without options)

**Weight:** 252 kg (without options)

**Optional Equipment:** Refer to Machine Configuration

**1.1.2 ADF****Original Size:**

Normal Original Mode:

A3 to B6, DLT to HLT

Thin Original Mode:

A3 to B6 sideways, DLT to HLT

Duplex Original Mode:

A3 to A5, DLT to HLT

**Original Weight:**

Normal Original Mode: 52 ~ 156 g/m<sup>2</sup>, 14 ~ 42 lb

Thin Original Mode: 40 ~ 156 g/m<sup>2</sup>, 11 ~ 42 lb

Duplex Original Mode: 52 ~ 128 g/m<sup>2</sup>, 14 ~ 34 lb

**Table Capacity:**

100 sheets (80 g/m<sup>2</sup>, 20 lb)

**Original Feeding Speed:**

72 cpm (A4/LT sideways, 1 to 1)

**Original Standard Position:**

Rear left corner

**Separation:**

FRR

**Original Transport:**

One flat belt

**Original Feed Order:**

From the top original

**Power Source:**

DC 24 V and DC 38 V from the copier

**Power Consumption:**

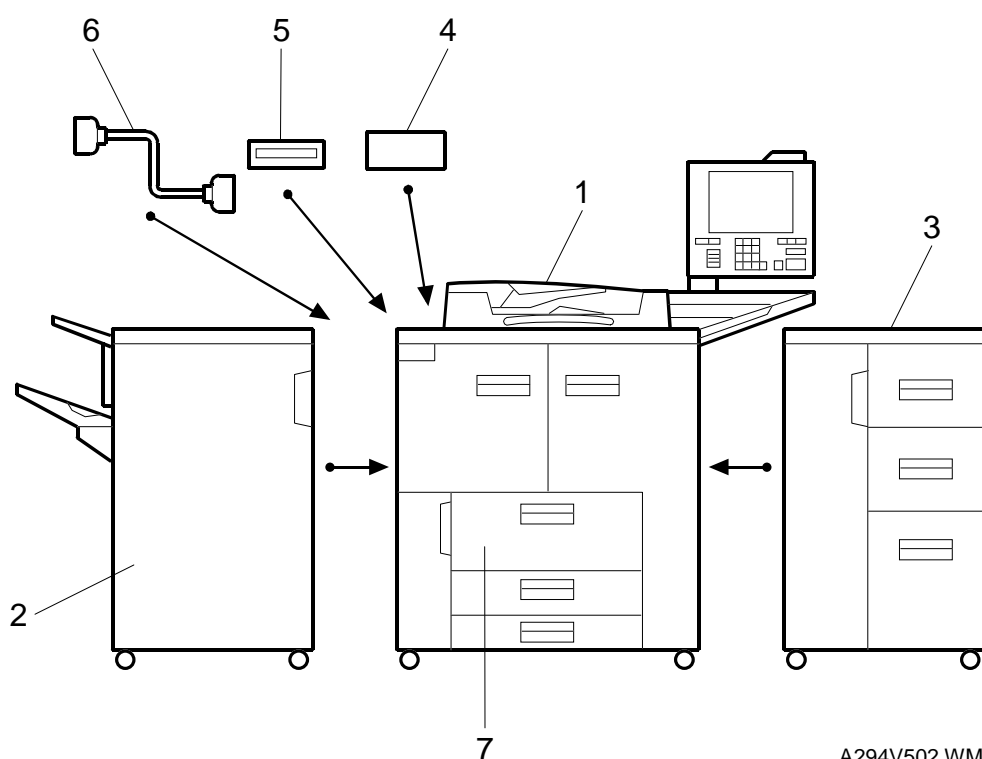
145 W

**Dimensions (W x D x H):**

680 x 560 x 150 mm

## 1.2 MACHINE CONFIGURATION

Overall  
Information



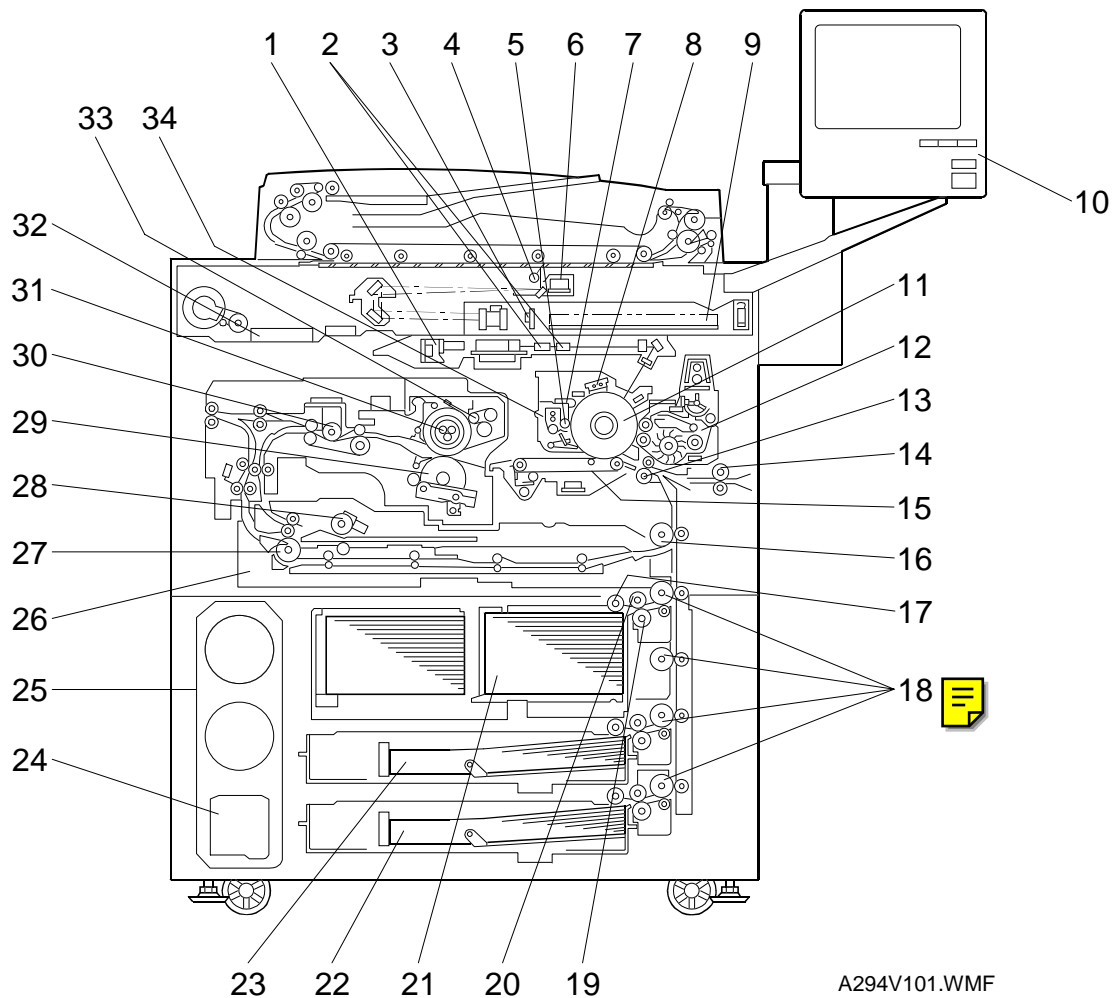
A294V502.WMF

| Item  | Machine Code            | No.                          |
|---|-------------------------|------------------------------|
| Mainframe                                     | A294                    | 1                            |
| Finisher                                      | B302                    | 2                            |
| LCT   | B303                    | 3                            |
| Interface Kit Type 850: *                     | B327                    | 4                            |
| A3/DLT Tray Kit Type 850                      | B331                    | 7<br>Replaces the tandem LCT |
| CD-RW<br>(CDROM reader/writer): *             | B334                    | 5                            |
| Punch Unit                                    | A812-30, 31, 32, 57, 67 | Inside the Finisher          |
| Connector<br>(for the Tandem Copy feature): * | B328                    | 6                            |

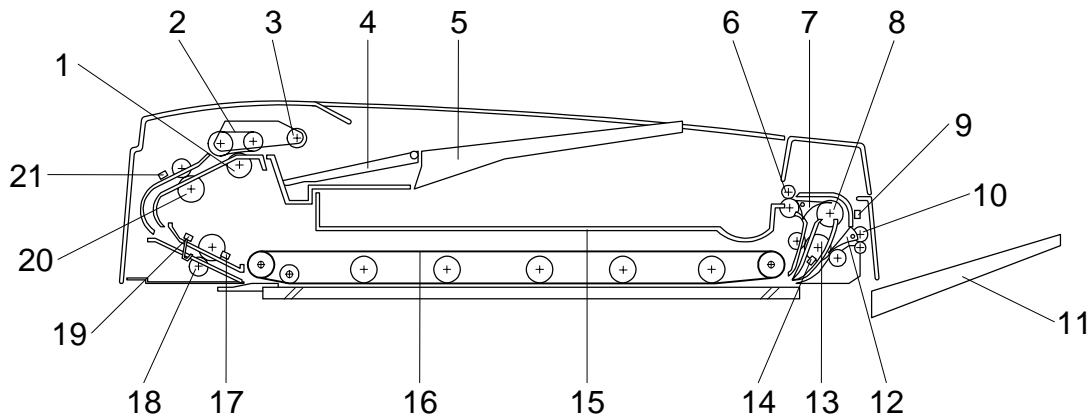
\*: When the CD-RW and/or the copy connector cable are/is installed, the interface kit is required.

## 1.3 COMPONENT LAYOUT

### 1.3.1 COPIER ENGINE



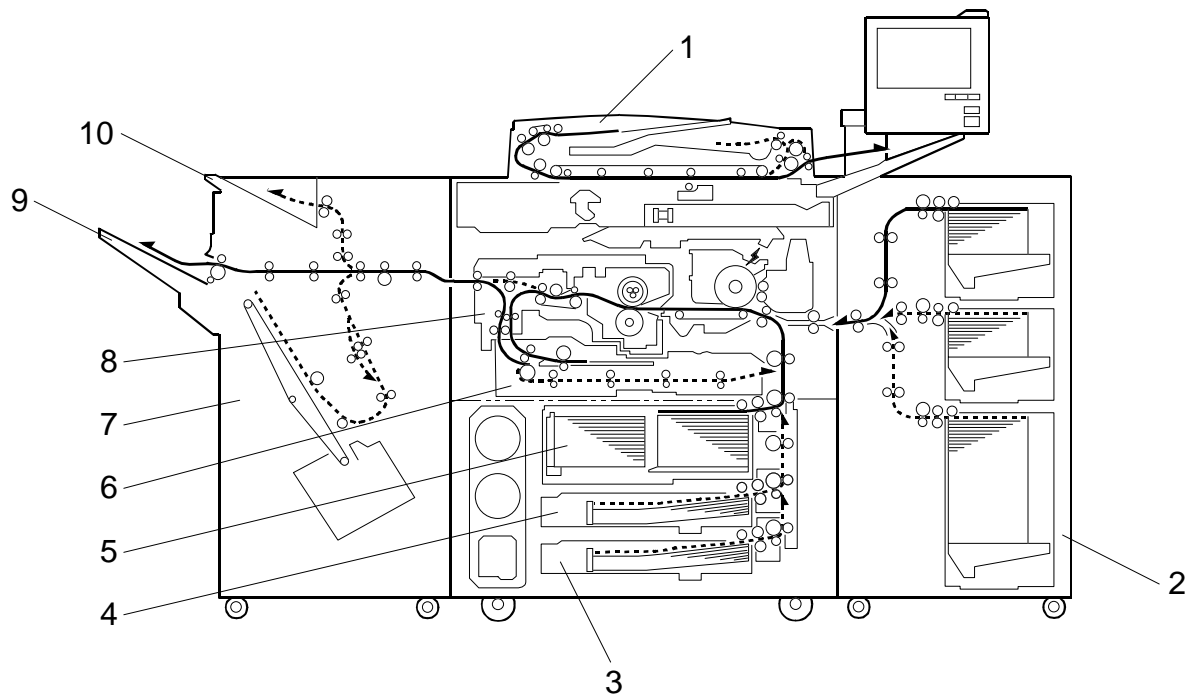
- |                              |  |
|------------------------------|--|
| 1. Laser Diode Board         | 18. Vertical Transport Rollers           |
| 2. $f\theta$ Lenses          | 19. Separation Roller                    |
| 3. Sensor Board Unit         | 20. Feed Roller                          |
| 4. Exposure Lamp             | 21. 1st Tray (Tandem, 1,000 sheets each) |
| 5. Cleaning Brush            | 22. 2nd Tray (500 sheets)                |
| 6. Lamp Regulator            | 23. 3rd Tray (500 sheets)                |
| 7. Cleaning Blade            | 24. Used Toner Bottle                    |
| 8. Charge Corona Unit        | 25. Toner Bank Unit                      |
| 9. System Image Control Unit | 26. Duplex Tray                          |
| 10. Color LCD                | 27. Inverter Unit Paper Exit Roller      |
| 11. Drum                     | 28. Inverter Feed Roller                 |
| 12. Development Unit         | 29. Pressure Roller                      |
| 13. Registration Roller      | 30. Paper Cooling Pipe                   |
| 14. LCT Relay Roller         | 31. Hot Roller                           |
| 15. Transfer Belt Unit       | 32. Motor Control Unit                   |
| 16. Relay Roller             | 33. Oil Supply & Cleaning Web            |
| 17. Pick-up Roller           | 34. Drum Unit                            |

**1.3.2 ADF**

B301V001.WMF

- |                            |                            |
|----------------------------|----------------------------|
| 1. Separation Roller       | 12. Exit Gate              |
| 2. Feed Belt               | 13. Inverter Roller        |
| 3. Pick-up Roller          | 14. Exit Sensor            |
| 4. Bottom Plate            | 15. Upper Exit Tray        |
| 5. Original Tray           | 16. Transport Belt         |
| 6. Upper Tray Exit Roller  | 17. Registration Sensor    |
| 7. Inverter Gate           | 18. Lower Transport Roller |
| 8. Inverter Guide Roller   | 19. Width Sensor           |
| 9. Inverter Sensor         | 20. Upper Transport Roller |
| 10. Right Tray Exit Roller | 21. Entrance Sensor        |
| 11. Right Exit Tray        |                            |

## 1.4 PAPER PATH



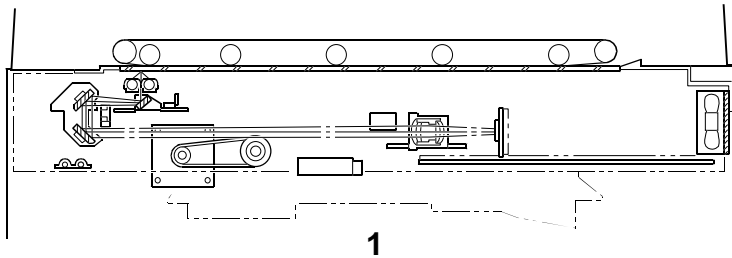
A294V504.WMF



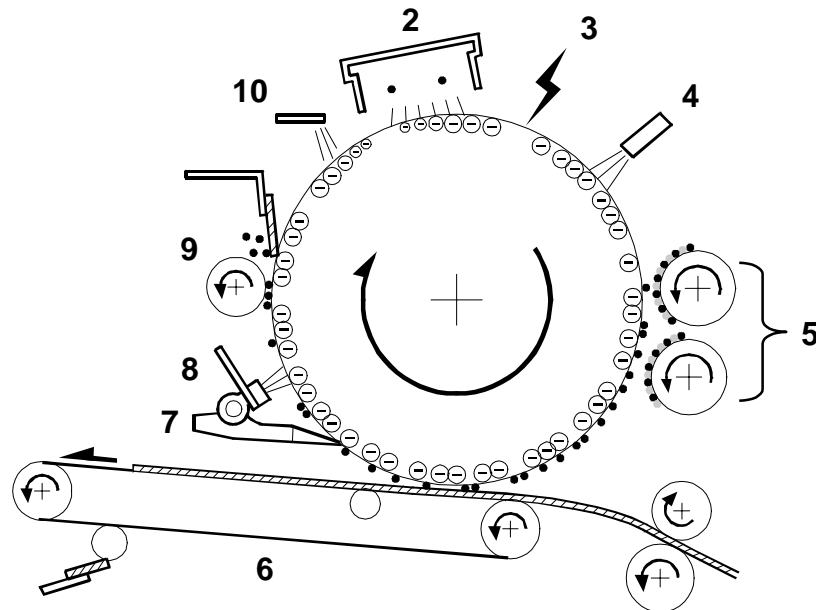
- |                             |                  |
|-----------------------------|------------------|
| 1. ADF                      | 6. Duplex Unit   |
| 2. Optional LCT             | 7. Finisher      |
| 3. Tray 3 (1,500-sheet LCT) | 8. Inverter Unit |
| 4. Tray 2 (550-sheet Tray)  | 9. Shift Tray    |
| 5. Tray 1 (Tandem Tray)     | 10. Upper Tray   |



## 1.5 COPY PROCESS



A229V508.WMF



A229V510.WMF

### 1. EXPOSURE

A xenon lamp exposes the original. Light reflected from the original passes to the CCD, where it is converted into an analog data signal. This data is converted to a digital signal, processed, and stored in the memory. At the time of printing, the data is retrieved and sent to the laser diode. For multi-copy runs, the original is scanned once only and stored to the hard disk.

### 2. DRUM CHARGE

An OPC (organic photoconductor) drum is used in this machine. In the dark, the charge corona unit gives a negative charge to the drum. The grid plate ensures that corona charge is applied uniformly. The charge remains on the surface of the drum because the OPC layer has a high electrical resistance in the dark.

**3. LASER EXPOSURE**

The processed data from the scanned original is retrieved from the hard disk and transferred to the drum by four laser beams, which form an electrostatic latent image on the drum surface. The amount of charge remaining as a latent image on the drum depends on the laser beam intensity, which is controlled by the laser diode board (LDB).

**4. DRUM POTENTIAL SENSOR**

The drum potential sensor detects the electric potential on the drum to correct various process control elements.

**5. DEVELOPMENT**

The magnetic developer brush on the development rollers comes in contact with the latent image on the drum surface. Toner particles are electrostatically attracted to the areas of the drum surface where the laser reduced the negative charge on the drum.

**6. IMAGE TRANSFER**

Paper is fed to the area between the drum surface and the transfer belt at the proper time to align the copy paper and the developed image on the drum. Then, the transfer bias roller and brush apply a high positive charge to the reverse side of the paper through the transfer belt. This positive charge pulls the toner particles from the drum to the paper. At the same time, the paper is electrically attracted to the transfer belt.

**7. PAPER SEPARATION**

Paper separates from the drum as a result of the electrical attraction between the paper and the transfer belt. The pick-off pawls also help separate the paper from the drum.

**8. ID SENSOR**

The laser forms a sensor pattern on the drum surface. The ID sensor measures the reflectivity of the pattern. The output signal is one of the factors used for toner supply control.

**9. CLEANING**

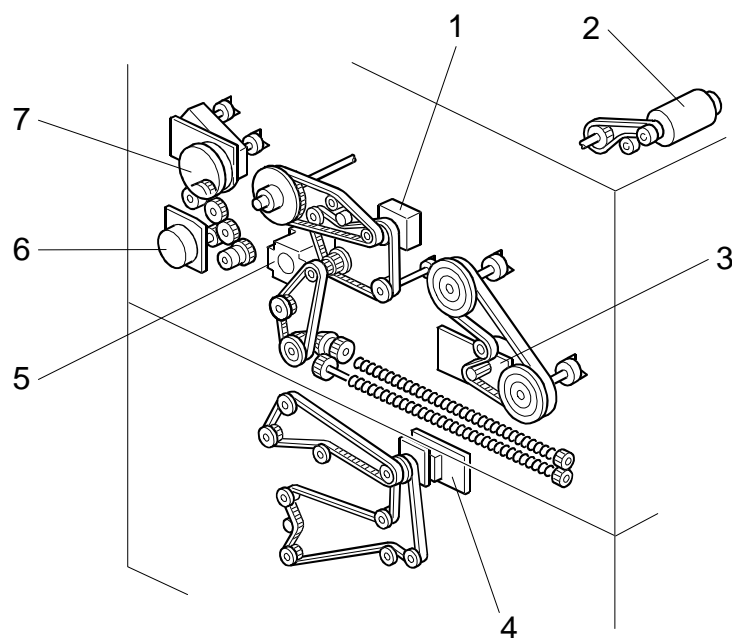
The cleaning brush removes toner remaining on the drum after image transfer and the cleaning blade scrapes off all remaining toner.

**10. QUENCHING**

The light from the quenching lamp electrically neutralizes the charge on the drum surface.

## 1.6 DRIVE LAYOUT

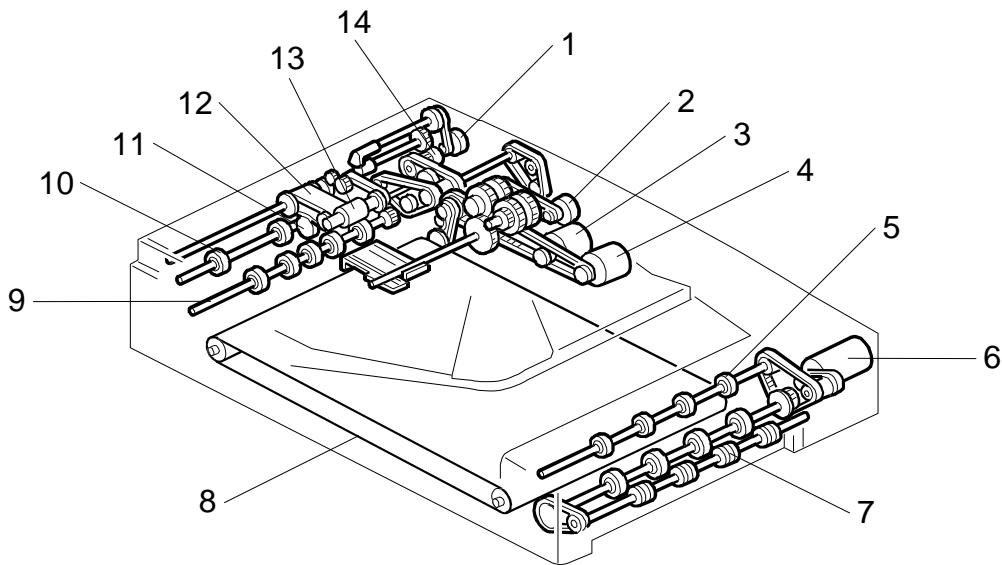
### 1.6.1 COPIER ENGINE



A294V501.WMF

1. Drum Motor
2. Scanner Motor
3. Fusing/Duplex Motor
4. Paper Feed Motor
5. Registration Motor
6. Relay Motor
7. Development Motor

## 1.6.2 ADF



B301V101.WMF

- |                       |                            |
|-----------------------|----------------------------|
| 1. Pick-up Motor      | 8. Transport Belt          |
| 2. Bottom Plate Motor | 9. Lower Transport Roller  |
| 3. Feed-in Motor      | 10. Upper Transport Roller |
| 4. Transport Motor    | 11. Separation Roller      |
| 5. Upper Exit Roller  | 12. Feed Belt              |
| 6. Feed-out Motor     | 13. Pick-up Roller         |
| 7. Right Exit Roller  | 14. Feed-in Clutch         |

## 1.7 ELECTRICAL COMPONENT DESCRIPTIONS

Refer to the electrical component layout on the reverse side of the point-to-point diagram for the location of the components using the symbols and index numbers.

### 1.7.1 COPIER ENGINE

| Symbol        | Name                               | Function   |
|---------------|------------------------------------|--|
| <b>Motors</b> |                                    |  |
| M1            | Scanner                            | Drives the 1st and 2nd scanners.   |
| M2            | Polygonal Mirror                   | Turns the polygonal mirror.  |
| M3            | Drum                               | Drives the drum, cleaning unit, and transfer belt unit.  |
| M4            | Development                        | Drives the development unit.   |
| M5            | Toner Supply                       | Supplies the toner to the toner hopper.  |
| M6            | Toner Bank                         | Drives the toner transport coil, which feeds fresh toner from the toner bank to the toner supply cylinder. |
| M7            | Upper Toner Bottle                 | Rotates the upper toner bottle to supply toner to the toner entrance tank.                                 |
| M8            | Upper Bottle Cap                   | Opens and closes the inner cap of the upper toner bottle.  |
| M9            | Lower Toner Bottle                 | Rotates the lower toner bottle to supply toner to the toner entrance tank.                                 |
| M10           | Lower Bottle Cap                   | Opens and closes the inner cap of the lower toner bottle.  |
| M11           | Charge Corona Wire Cleaner         | Drives the charge corona wire cleaner.   |
| M12           | Fusing/Duplex                      | Drives the fusing unit, duplex unit, inverter unit, and paper exit rollers.                                |
| M13           | Paper Feed                         | Drives the paper feed, separation, pick-up, lower relay, and vertical transport rollers.                   |
| M14           | Relay                              | Drives the upper relay roller and the LCT relay roller.  |
| M15           | 1st Tray Lift                      | Raises and lowers the bottom plate in the 1st paper tray.  |
| M16           | 2nd Tray Lift                      | Raises and lowers the bottom plate in the 2nd paper tray.  |
| M17           | 3rd Tray Lift                      | Raises and lowers the bottom plate in the 3rd paper tray.  |
| M18           | Registration                       | Drives the registration rollers.   |
| M19           | Oil Supply/Cleaning Web            | Drives the oil supply/cleaning web.  |
| M20           | Rear Fence Drive                   | Moves the paper stack in the left tandem tray to the right tandem tray.                                    |
| M21           | Jogger                             | Drives the jogger fences to square the paper stack in the duplex unit.                                     |
| M22           | Optics Cooling Fan                 | Removes heat from the scanner optics unit.   |
| M23           | Polygonal Mirror Motor Cooling Fan | Removes heat from around the polygonal mirror motor.   |
| M24           | LDB Cooling Fan                    | Removes heat from around the LDB.  |

| Symbol         | Name                           | Function  |
|----------------|--------------------------------|---|
| M25            | SICU Cooling Fan               | Removes heat from around the SICU.  |
| M26            | Drum Cooling Fan               | Removes heat from the drum.   |
| M27            | Development Unit Cooling Fan 1 | Removes heat from the development unit.   |
| M28            | Development Unit Cooling Fan 2 | Removes heat from the development unit.   |
| M29            | Paper Cooling Pipe Fan         | Removes heat from the paper cooling pipe.   |
| M30            | Duplex Cooling Fan             | Removes heat from around the duplex unit.   |
| M31            | Exhaust Fan                    | Removes heat from around the fusing unit.   |
| M32            | Steam Removal Fan              | Removes water vapour from around the fusing unit.   |
| M33            | PSU Cooling Fan 1              | Removes heat from the PSU.  |
| M34            | PSU Cooling Fan 2              | Removes heat from the PSU.  |
| <b>Sensors</b> |                                |   |
| S1             | Scanner HP                     | Informs the CPU when the 1st and 2nd scanners are at home position.                       |
| S2             | Original Width                 | Detects original width.<br>This is one of the APS (Auto Paper Select) sensors.            |
| S3             | Original Length 1              | Detects original length.<br>This is one of the APS (Auto Paper Select) sensors.           |
| S4             | Original Length 2              | Detects original length.<br>This is one of the APS (Auto Paper Select) sensors.           |
| S5             | Drum Potential                 | Detects the drum surface potential.   |
| S6             | Toner Density (TD)             | Detects the amount of toner in the developer.   |
| S7             | Image Density (ID)             | Detects the density of the ID sensor pattern on the drum.                                 |
| S8             | Toner Hopper                   | Detects toner in the toner hopper.  |
| S9             | Toner Supply Motor             | Monitors the toner supply motor.  |
| S10            | Upper Toner Bottle             | Detects when the upper toner bottle is set.   |
| S11            | Lower Toner Bottle             | Detects when the lower toner bottle is set.   |
| S12            | Upper Bottle Inner Cap         | Detects when the inner cap of the upper toner bottle is opened.                           |
| S13            | Lower Bottle Inner Cap         | Detects when the inner cap of the lower toner bottle is opened.                           |
| S14            | Toner Collection Bottle        | Detects when the waste toner collection bottle is set.                                    |
| S15            | Toner Overflow                 | Detects when the waste toner collection bottle is full.                                   |
| S16            | Toner Near End                 | Detects toner near end in the toner bank unit.  |
| S17            | 1st Paper Feed                 | Controls the 1st paper feed clutch on/off timing and the 1st pick-up solenoid off timing. |
| S18            | 2nd Paper Feed                 | Controls the 2nd paper feed clutch on/off timing and the 2nd pick-up solenoid off timing. |
| S19            | 3rd Paper Feed                 | Controls the 3rd paper feed clutch on/off timing and the 3rd pick-up solenoid off timing. |
| S20            | 1st Tray Lift                  | Detects when the paper in tray 1 is at the correct height for paper feed.                 |

| Symbol | Name                    | Function   |
|--------|-------------------------|--|
| S21    | 2nd Tray Lift           | Detects when the paper in tray 2 is at the correct height for paper feed.  |
| S22    | 3rd Tray Lift           | Detects when the paper in tray 3 is at the correct height for paper feed.  |
| S23    | 1st Paper End           | Informs the CPU when tray 1 runs out of paper.   |
| S24    | 2nd Paper End           | Informs the CPU when tray 2 runs out of paper.   |
| S25    | 3rd Paper End           | Informs the CPU when tray 3 runs out of paper.   |
| S26    | Rear Fence HP           | Informs the CPU when the tandem tray rear fence is in the home position.   |
| S27    | Rear Fence Return       | Informs the CPU when the tandem tray rear fence is in the return position.                                       |
| S28    | Front Side Fence Open   | Detects whether the tandem tray front side fence is opened.  |
| S29    | Front Side Fence Closed | Detects whether the tandem tray front side fence is closed.  |
| S30    | Rear Side Fence Open    | Detects whether the tandem tray rear side fence is opened.   |
| S31    | Rear Side Fence Closed  | Detects whether the tandem tray rear side fence is closed.   |
| S32    | Base Plate Down         | Detects when the bottom plate is completely lowered, to stop the 1st tray lift motor.                            |
| S33    | 1st Tray Paper Height 1 | Detects the paper height in the 1st tray.  |
| S34    | 1st Tray Paper Height 2 | Detects the paper height in the 1st tray.  |
| S35    | 1st Tray Paper Height 3 | Detects the paper height in the 1st tray.  |
| S36    | 1st Tray Paper Height 4 | Detects the paper height in the 1st tray.  |
| S37    | Left 1st Tray Paper     | Detects whether there is paper in the left side of the 1st tray.   |
| S38    | Right 1st Tray Paper    | Detects whether there is paper in the right side of the 1st tray, allowing the tray to lift if paper is present. |
| S39    | Duplex Inverter         | Detects misfeeds.  |
| S40    | Duplex Entrance         | Detects the leading and trailing edges of the paper to determine the reverse roller solenoid on or off timing.   |
| S41    | Duplex Transport 1      | Detects the position of paper in the duplex unit.  |
| S42    | Duplex Transport 2      | Detects the position of paper in the duplex unit.  |
| S43    | Duplex Transport 3      | Detects the position of paper in the duplex unit.  |
| S44    | Duplex Jogger HP        | Detects if the duplex jogger fences are at the home position or not.   |
| S45    | LCT Relay               | Detects misfeeds.  |
| S46    | Relay                   | Detects misfeeds.  |
| S47    | Registration            | Detects misfeeds and controls registration clutch on/off timing.   |
| S48    | Guide Plate Position    | Detects whether the registration guide plate is open or closed.  |

| Symbol           | Name                        | Function   |
|------------------|-----------------------------|--|
| S49              | Oil Supply/Cleaning Web End | Detects when the oil supply/cleaning web has been used up.   |
| S50              | Fusing Exit                 | Detects misfeeds.  |
| S51              | Exit                        | Detects misfeeds.  |
| <b>Switches</b>  |                             |  |
| SW1              | Main Power                  | Provides power to the machine. If this is off, there is no power supplied to the machine.          |
| SW2              | Right Front Door Safety 1   | Cuts the +24 V dc power line for the fusing/duplex motor.  |
| SW3              | Right Front Door Safety 2   | Detects if the front door is open or not, and cuts the +24 V dc power line for the IOB.            |
| SW4              | Right Front Door Safety 3   | Cuts the +5 V LD dc power line.  |
| SW5              | Right Front Door Safety 4   | Cuts the +5 V LD dc power line.  |
| SW6              | Left Front Door Safety 1    | Cuts the +24 V dc power line for the fusing/duplex motor.  |
| SW7              | Left Front Door Safety 2    | Detects if the front door is open or not, and cuts the +24 V dc power line for the IOB.            |
| SW8              | Left Front Door Safety 3    | Cuts the +5 V LD dc power line.  |
| SW9              | Left Front Door Safety 4    | Cuts the +5 V LD dc power line.  |
| SW10             | 2nd Tray Paper Size         | Determines the size of paper in tray 2. Also detects when the tray has been placed in the machine. |
| SW11             | 3rd Tray Paper Size         | Determines the size of paper in tray 3. Also detects when the tray has been placed in the machine. |
| <b>Solenoids</b> |                             |  |
| SOL1             | Transfer Belt Lift          | Controls the up-down movement of the transfer belt unit.   |
| SOL2             | 1st Pick-up                 | Controls the up-down movement of the pick-up roller in tray 1.                                     |
| SOL3             | 2nd Pick-up                 | Controls the up-down movement of the pick-up roller in tray 2.                                     |
| SOL4             | 3rd Pick-up                 | Controls the up-down movement of the pick-up roller in tray 3.                                     |
| SOL5             | 1st Separation Roller       | Controls the up-down movement of the separation roller in tray 1.                                  |
| SOL6             | 2nd Separation Roller       | Controls the up-down movement of the separation roller in tray 2.                                  |
| SOL7             | 3rd Separation Roller       | Controls the up-down movement of the separation roller in tray 3.                                  |
| SOL8             | Front Side Fence            | Opens and closes the front side fence in the tandem tray.  |
| SOL9             | Rear Side Fence             | Opens and closes the rear side fence in the tandem tray.   |



| Symbol                   | Name                              | Function  |
|--------------------------|-----------------------------------|---|
| SOL10                    | Tandem Tray Connect               | Connects/disconnects the two halves of the tandem tray.   |
| SOL11                    | Left 1st Tray Lock                | Locks the left tandem tray while paper is being transported from left tray to right tray.                     |
| SOL12                    | Duplex Inverter Gate              | Moves the junction gate to direct copies to the duplex tray or to the paper exit.                             |
| SOL13                    | Reverse Roller                    | Controls the up-down movement of the reverse roller in the duplex unit.                                       |
| SOL14                    | Inverter Guide Plate              | Controls the up-down movement of the inverter feed guide plate in the duplex unit.                            |
| SOL15                    | Guide Plate                       | Opens the guide plate when a paper misfeed occurs around this area.   |
| SOL16                    | Inverter Gate                     | Moves the junction gate to direct copies to the duplex/inverter unit or to the paper exit unit.               |
| <b>Magnetic Clutches</b> |                                   |   |
| MC1                      | Toner Supply Coil                 | Transfers drive from the toner bank motor to the toner transport coil, to transport toner towards the hopper. |
| MC2                      | Toner Supply Roller               | Turns the toner supply roller to supply toner from the toner hopper to the development unit.                  |
| MC3                      | 1st Paper Feed                    | Starts paper feed from tray 1.  |
| MC4                      | 2nd Paper Feed                    | Starts paper feed from tray 2.  |
| MC5                      | 3rd Paper Feed                    | Starts paper feed from tray 3.  |
| MC6                      | Inverter Exit Roller              | Releases the drive from the inverter exit roller in the duplex unit.  |
| MC7                      | Duplex Transport                  | Drives the duplex transport rollers to transport the paper to the duplex feed rollers.                        |
| MC8                      | Duplex Feed                       | Starts paper feed out of the duplex tray back into the machine via to the relay rollers.                      |
| MC9                      | 1st Vertical Transport            | Drives the 1st vertical transport rollers.  |
| MC10                     | 2nd Vertical Transport            | Drives the 2nd vertical transport rollers.  |
| MC11                     | 3rd Vertical Transport            | Drives the 3rd vertical transport rollers.  |
| MC12                     | Upper Relay                       | Drives the upper relay rollers (between tray1 and the registration rollers)                                   |
| MC13                     | LCT Relay                         | Drives the relay rollers for paper feed into the machine from the LCT.  |
| MC14                     | Lower Relay                       | Drives the lower relay rollers (between paper trays 1 and 2).   |
| <b>PCBs</b>              |                                   |   |
| PCB1                     | BCU (Base Engine Control Unit)    | Controls all base engine functions both directly and through other control boards.                            |
| PCB2                     | SICU (Scanner Image Control Unit) | Controls image processing, the laser diode, and the polygonal mirror motor.                                   |

| Symbol             | Name                                    | Function   |
|--------------------|---|--|
| PCB3               | PSU<br>(Power Supply Unit)              | Provides dc power to the system and ac power to the fusing lamp and heaters.               |
| PCB4               | IOB<br>(Input/Output Board)             | Controls the paper feed components.  |
| PCB5               | SBU<br>(Sensor Board Unit)              | Contains the CCD, and outputs a video signal to the SBICU board.                           |
| PCB6               | MCU<br>(Motor Control Unit)             | Drives the scanner motor.  |
| PCB7               | Lamp Regulator                          | Provides dc power to the exposure lamp.  |
| PCB8               | Polygonal Mirror<br>Motor Control       | Drives and controls the polygonal mirror motor.  |
| PCB9               | LDB                                     | Controls the laser diode.  |
| PCB10              | AC Drive                                | Drives the ac components.  |
| PCB11              | Operation Panel                         | Controls the components of the operation panel.  |
| PCB12              | Operation Key                           | Controls the operation switch.   |
| <b>Lamps</b>       |   |  |
| L1                 | Exposure Lamp                           | Applies high intensity light to the original for exposure.                                 |
| L2                 | Fusing Lamp 1                           | Provides heat to the hot roller.   |
| L3                 | Fusing Lamp 2                           | Provides heat to the hot roller.   |
| L4                 | Fusing Lamp 3                           | Provides heat to the hot roller.   |
| L5                 | Quenching                               | Neutralizes any charge remaining on the drum surface after cleaning.                       |
| <b>Power Packs</b> |   |  |
| PP1                | Charge/bias/grid                        | Provides high voltage for the charge corona wires, grid plate, and the development roller. |
| PP2                | Transfer                                | Provides high voltage for the transfer belt.   |
| <b>Others</b>      |   |  |
| CB1                | Circuit Breaker                         | Provides back-up high current protection for the electrical components.                    |
| H1                 | Optics<br>Anti-Condensation<br>(option) | Turns on when the main switch is off to prevent moisture from forming on the optics.       |
| H2                 | Drum (option)                           | Turns on when the main switch is off to prevent moisture from forming around the drum.     |
| H3                 | Tray Heater 1<br>(option)               | Turns on when the main switch is off to keep paper dry in the paper tray.                  |
| H4                 | Tray Heater 2<br>(option)               | Turns on when the main switch is off to keep paper dry in the paper tray.                  |
| HDD1               | HDD                                     | Scanned image data is compressed and held here temporarily.                                |
| HDD2               | HDD                                     | Scanned image data is compressed and held here temporarily.                                |
| NF1                | Noise Filter                            | Removes noise from the power line.   |

| Symbol | Name                           | Function  |
|--------|--------------------------------|---|
| SD1    | Laser Synchronization Detector | Detects the laser beam at the start of the main scan.       |
| TC1    | Total Counter                  | Counts the number of copies.                                |
| TF1    | Fusing Thermofuse              | Opens the fusing lamp circuit if the fusing unit overheats. |
| TH1    | Fusing Thermistor              | Detects the temperature of the hot roller.                  |
|        |                                |   |

### 1.7.2 ADF

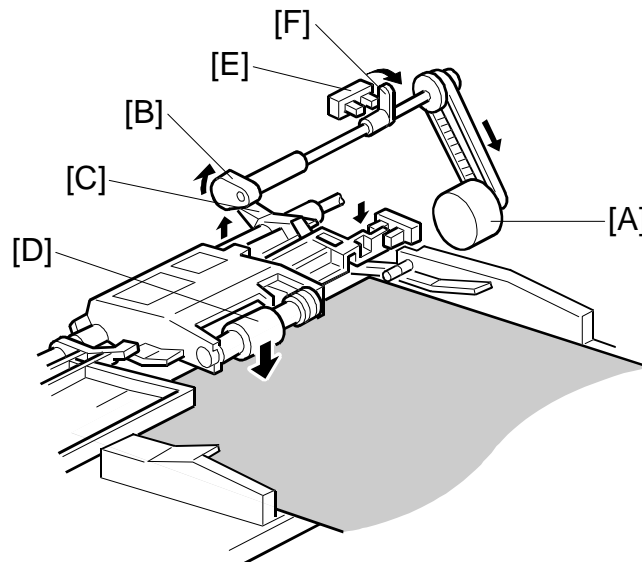
| Symbol         | Name                  | Function   | Index No. |
|----------------|-----------------------|--|-----------|
| <b>Motors</b>  |                       |  |           |
| M1             | Pick-up               | Moves the pick-up roller up and down.  | 3         |
| M2             | Feed-in               | Drives the feed belt, and the separation, pick-up, and transport rollers.  | 8         |
| M3             | Transport Belt        | Drives the transport belt.   | 9         |
| M4             | Feed-out              | Drives the exit and inverter rollers.  | 14        |
| M5             | Bottom Plate          | Moves the bottom plate up and down.  | 7         |
|                |                       |  |           |
| <b>Sensors</b> |                       |  |           |
| S1             | APS Start             | Informs the CPU when the DF is opened and closed (for platen mode) so that the original size sensors in the copier can check the original size.  | 12        |
| S2             | DF Position           | Detects whether the DF is lifted or not.   | 13        |
| S3             | Original Set          | Detects whether an original is on the table.   | 19        |
| S4             | Bottom Plate HP       | Detects whether the bottom plate is in the down position or not.   | 20        |
| S5             | Bottom Plate Position | Detects when the original is at the correct position for feeding.  | 4         |
| S6             | Pick-up Roller HP     | Detects whether the pick-up roller is up or not.   | 2         |
| S7             | Entrance              | Detects when to restart the pick-up motor to lift up the pick-up roller, detects when to change the feed motor direction, detects the trailing edge of the original to finish checking the original length, and checks for misfeeds. | 26        |
| S8             | Registration          | Detects the leading edge of the original to check the original length, detects when to stop the original on the exposure glass, and checks for misfeeds.   | 21        |
| S9             | Original Width 1      | Detects the original width.  | 22        |
| S10            | Original Width 2      | Detects the original width.  | 23        |

| <b>Symbol</b>            | <b>Name</b>      | <b>Function</b>   | <b>Index No.</b> |
|--------------------------|------------------|---|------------------|
| S11                      | Original Width 3 | Detects the original width.   | 24               |
| S12                      | Original Length  | Detects the original length.  | 25               |
| S13                      | Exit             | Detects when to stop the transport belt motor and checks for misfeeds.  | 18               |
| S14                      | Inverter         | Detects when to turn the inverter gate and exit gate solenoids off and checks for misfeeds.                     | 17               |
| S15                      | Feed Cover       | Detects whether the feed cover is open or not.  | 5                |
| S16                      | Exit Cover       | Detects whether the exit cover is open or not.  | 15               |
| <b>Solenoids</b>         |                  |   |                  |
| SOL1                     | Exit Gate        | Opens and closes the exit gate.   | 16               |
| SOL2                     | Inverter Gate    | Opens and closes the inverter gate.   | 11               |
| <b>Magnetic Clutches</b> |                  |   |                  |
| MC1                      | Feed-in          | Drives the feed belt, separation roller, and pick-up roller.  | 1                |
| <b>PCBs</b>              |                  |   |                  |
| PCB1                     | DF Main          | Controls the DF and communicates with the main copier boards.   | 10               |
| PCB2                     | DF Indicator     | Indicates whether an original has been placed in the feeder, and indicates whether SADF mode has been selected. | 6                |
|                          |                  |   |                  |

## 2. DETAILED SECTION DESCRIPTIONS

### 2.1 DOCUMENT FEEDER

#### 2.1.1 PICK-UP ROLLER RELEASE



B301D103.WMF

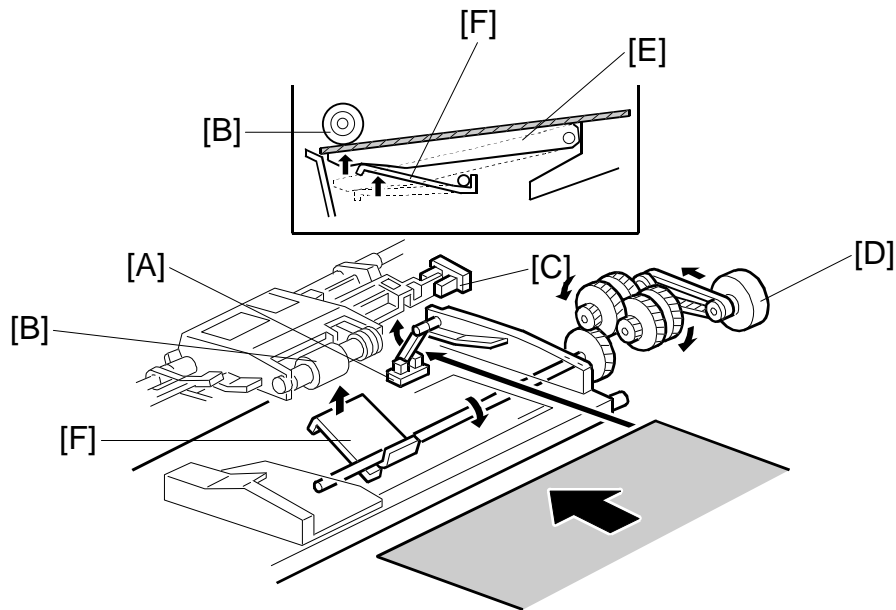
Detailed  
Descriptions

When the original set sensor is off (no original on the original tray), the pick-up roller stays in the up position.

When the original set sensor turns on (or when the trailing edge of a page passes the entrance sensor while pages remain on the original tray), the pick-up motor [A] turns on. The cam [B] rotates away from the pick-up roller release lever [C]. The lever then rises and the pick-up roller [D] drops onto the original.

When the original reaches the entrance sensor, the pick-up motor turns on again. The cam pushes the lever down, and the pick-up roller rises until the pick-up roller HP sensor [E] detects the actuator [F].

## 2.1.2 BOTTOM PLATE LIFT

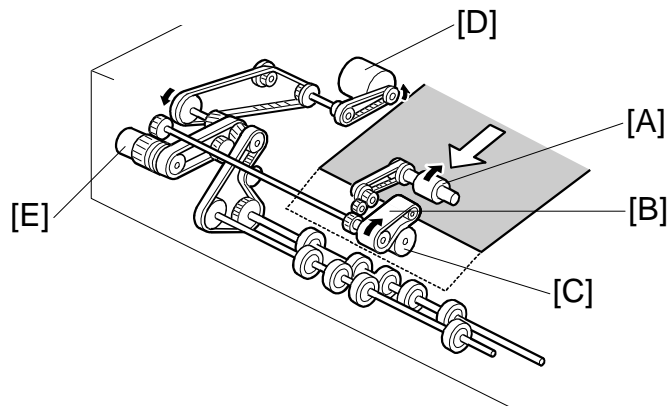


B301D105.WMF

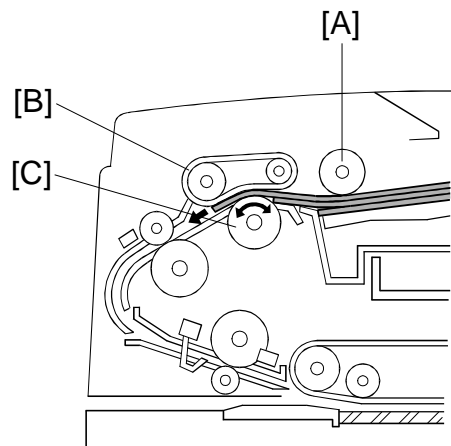
When an original is placed on the original tray, the original set sensor [A] turns on, the pick-up roller [B] drops on to the original, and the bottom plate position sensor [C] turns off. Then the bottom plate motor [D] turns on and lifts the bottom plate [E] by raising the lift lever [F] until the bottom plate position sensor turns on.

The level of the pick-up roller drops as the stack of originals becomes smaller, and eventually, the bottom plate position sensor [C] turns off. Then, the bottom plate motor turns on and lifts the bottom plate until the bottom plate position sensor turns on. This keeps the original at the correct height for feeding.

### 2.1.3 PICK-UP AND SEPARATION



B301D102.WMF



B301D506.WMF

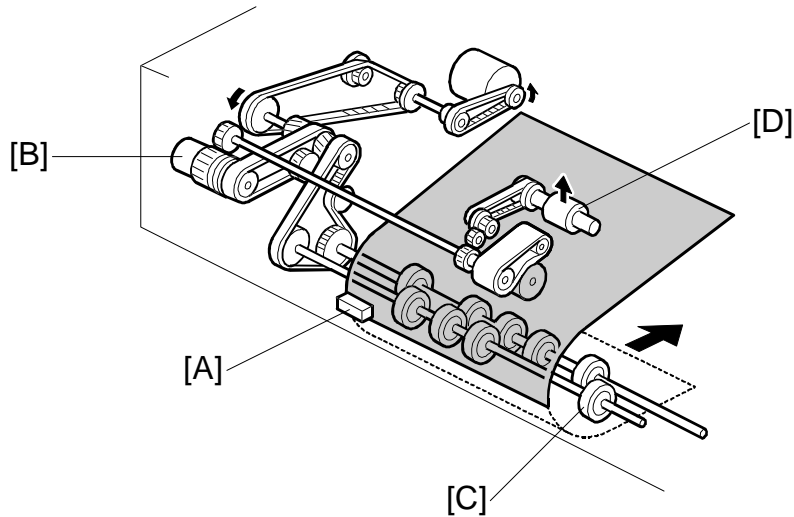
 Detailed  
Descriptions

The original separation system is a Feed and Reverse Roller (FRR) system. The pick-up roller [A], feed belt [B], and separation roller [C] are driven by the feed-in motor [D].

To drive this mechanism, the feed-in motor [D] and feed-in clutch [E] turn on.

When two sheets of originals are fed by the pick-up roller, the separation roller turns in the opposite direction to the feed belt and the 2nd sheet is pushed back to the original tray. When there is only one sheet between the feed belt and separation roller, the separation roller rotates in the same direction as the feed belt. This is because the separation roller contains a torque limiter.

### 2.1.4 ORIGINAL FEED



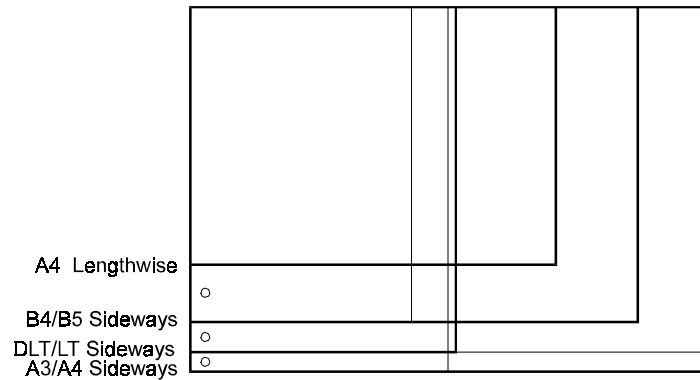
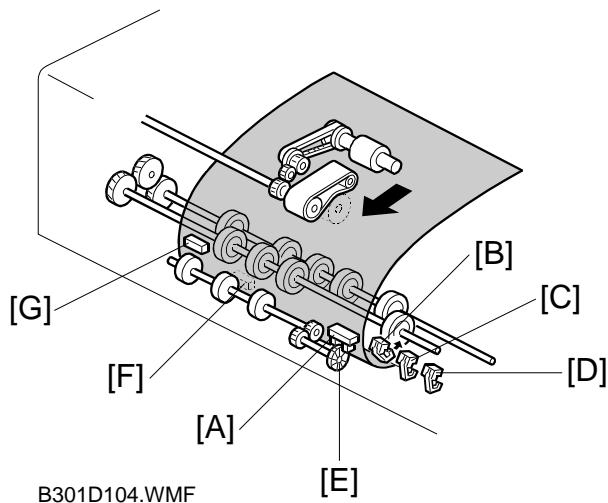
B301D109.WMF

When the leading edge of the original turns the entrance sensor [A] on, the feed-in clutch [B] turns off and the drive for the feed belt is released. The original is fed by the transport rollers [C].

At the same time, the pick-up motor starts again and the pick-up roller [D] is lifted up. When the pick-up roller HP sensor turns on, the pick-up motor stops (see Pick-up Roller Release).



## 2.1.5 ORIGINAL SIZE DETECTION



B301D503.WMF

The DF detects the original size by combining the readings of original length sensor [A], and original width sensors-1 [B], -2 [C], and -3 [D].

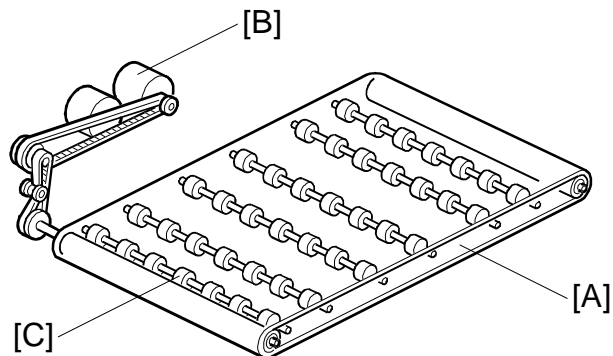
### ***Original Length***

The original length sensor and the disk [E] (connected to the transport roller) generate a pulse signal. The CPU counts pulses, starting when the leading edge of the original turns on the registration sensor [F], until the trailing edge of the original turns off the entrance sensor [G].

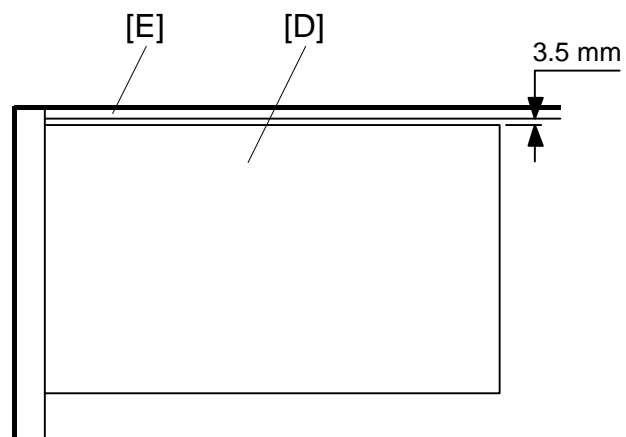
### ***Original Width***

The CPU detects original width using three original width sensors -1, -2, -3 as shown above. Three small circles on the diagram indicate the positions of the sensors.

## 2.1.6 ORIGINAL TRANSPORT



B301D106.WMF



B301D509.WMF

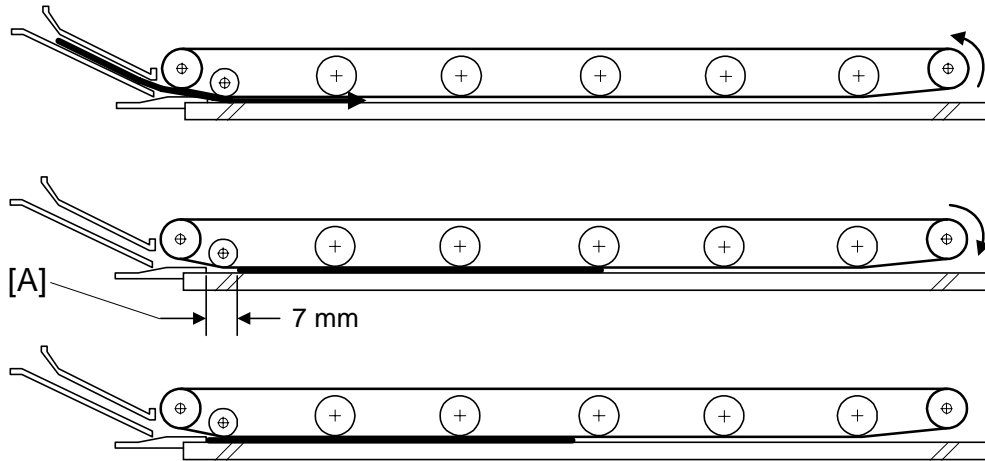
The transport belt [A] is driven by the transport belt motor [B]. The transport belt motor starts when the copier sends an original feed-in signal.

Inside the transport belt are six pressure rollers which maintain the correct pressure between the belt and original. The pressure roller [C] closest to the left original scale is made of rubber for the stronger pressure needed for thick originals. The other rollers are sponge rollers.

Normally, originals are manually placed at the left rear corner, so an original [D] fed from the DF must also be at this position. But if the original is fed along the rear scale [E], original skew, jam, or wrinkling may occur.

To prevent such problems, the original transfer position is set to 3.5 mm away from the rear scale as shown. The 3.5 mm gap is compensated for by changing the starting position of the main scan.

## 2.1.7 ORIGINAL SKEW CORRECTION



B301D500.WMF

Detailed  
Descriptions

The transport belt motor remains energized to carry the original about 7 mm past the left scale [A] (see the middle drawing). Then the motor stops and reverses to feed the original back against the left scale (see the bottom drawing). This forces the original to hit the left scale, which aligns the trailing edge to minimize original skew on the exposure glass.

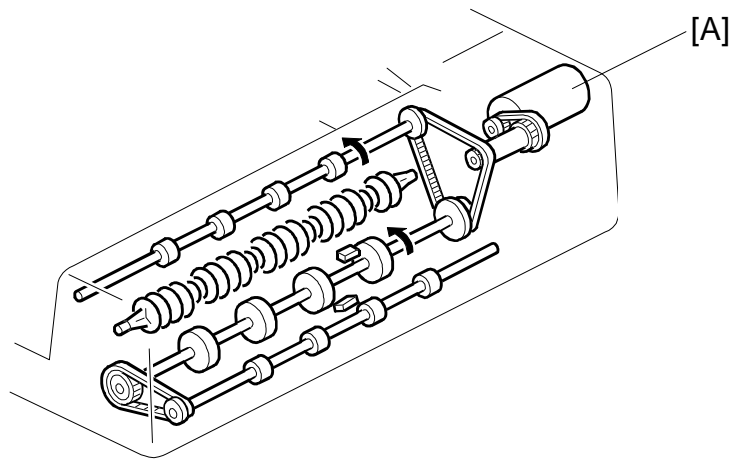
If thin original mode is selected, the original is not forced back against the left scale. This is to prevent damage to the original.

After a two-sided original has been inverted to copy the 2nd side, it is fed in from the inverter against the left scale (see the bottom drawing; the top two drawings do not apply in this mode).

The amount of reverse feed against the left scale can be adjusted with SP modes.

## 2.1.8 ORIGINAL INVERSION AND FEED-OUT

### *General Operation*

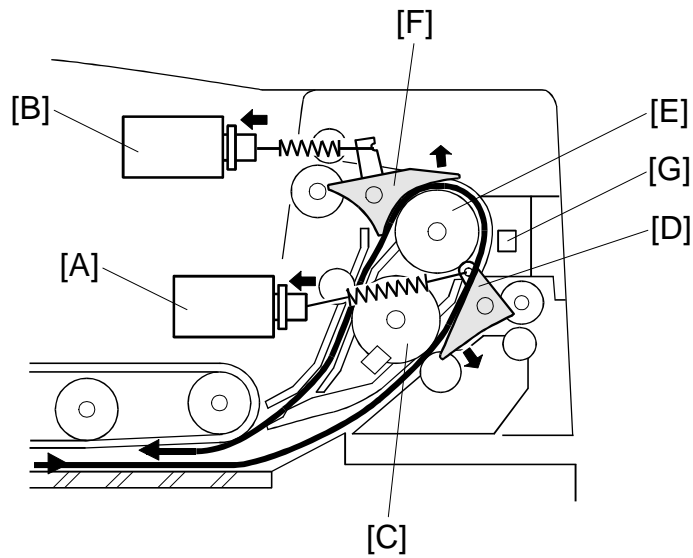


B301D107.WMF

When the scanner reaches the return position, the copier's CPU sends the feed-out signal to the DF. When the DF receives the feed-out signal, the transport belt motor and feed-out motor [A] turn on. The original is then fed out to the exit tray or fed back to the exposure glass after reversing in the inverter section.

This DF has two exit trays. For single-sided original mode, the original is fed out to the right exit tray and for double-sided original mode, the original is fed out to the upper exit tray.

This causes the originals to be fed out in the correct order on the exit trays and allow the maximum one-to-one copy speed for each mode. The user can change the exit tray to the upper exit tray for single-sided mode (for example, if there is not enough space in the room for the right exit tray to be installed). However, one-to-one copy speed for this mode is reduced.

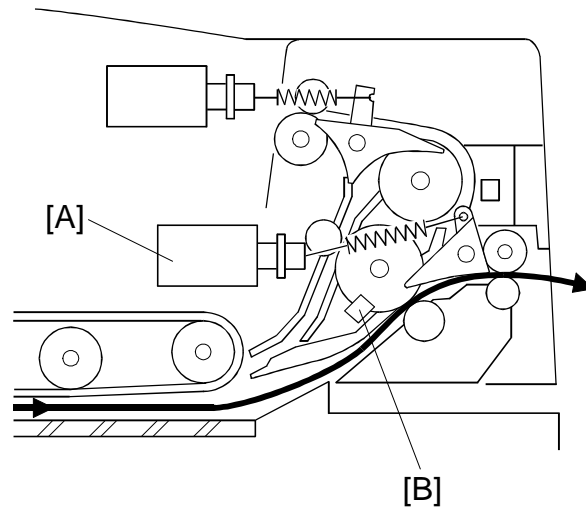
***Original Inversion***

B301D113.WMF

Detailed  
Descriptions

When the DF receives the original invert signal from the copier, the transport belt motor, feed-out motor, exit gate solenoid [A], and inverter gate solenoid [B] turn on and the original is fed back to the exposure glass through the inverter roller [C], exit gate [D], inverter guide roller [E], inverter gate [F], and inverter roller.

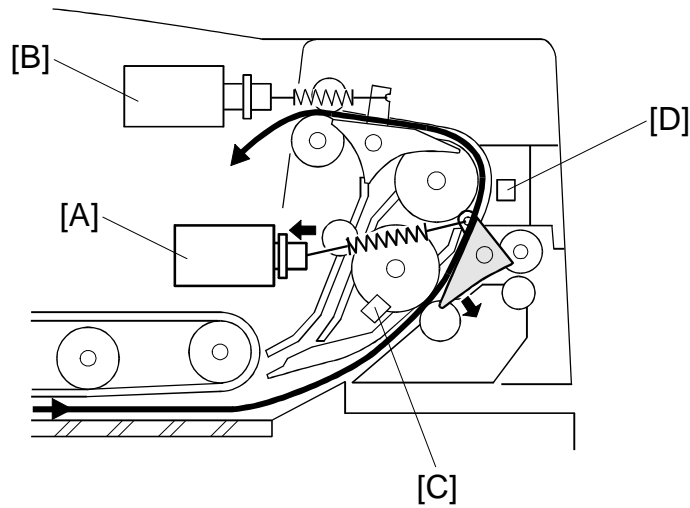
The transport belt motor turns in reverse shortly after the leading edge of the original turns on the inverter sensor [G], and feeds the original to the left scale.

***Original Exit (Single-Sided Original Mode)***

B301D111.WMF

The exit gate solenoid [A] remains off and the original is fed out to the right exit tray. The transport belt motor turns off after the exit sensor [B] turns off.

To stack the originals neatly on the exit tray, the feed-out motor speed is reduced about 30 mm before the trailing edge of the original turns off the exit sensor.

***Original Exit (Double-Sided Original Mode)***

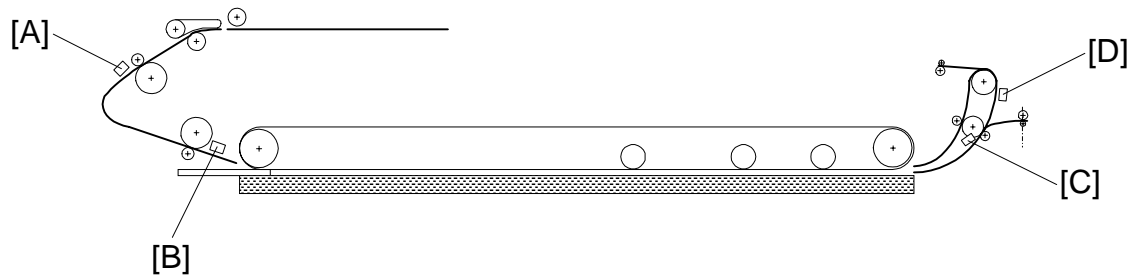
B301D112.WMF

Detailed  
Descriptions

The exit gate solenoid [A] turns on and the inverter gate solenoid [B] remains off, and the original is fed out to the upper tray. The transport belt motor turns off when the trailing edge of the original passes through the exit sensor [C].

To stack the originals neatly on the upper tray, the feed-out motor speed is reduced shortly after the trailing edge of the original turns off the inverter sensor [D].

## 2.1.9 JAM CONDITIONS



B301D501.WMF

### ***Feed-in***

1. The entrance sensor [A] is still off 500 ms after the feed-in motor turned on.
2. The registration sensor [B] is still not off 300 ms after the feed-in motor speed increased.
3. The entrance sensor is still on when the feed-in and transport motors have fed the original 442 mm after the registration sensor turned on.

### ***Feed-out***

4. The registration sensor is still on when the feed-in and transport motors have fed the original 751 mm after the registration sensor turned on.
5. The exit sensor [C] is still off when the transport and feed-out motors have fed the original 129 mm after the feed-out motor turned on.
6. The exit sensor is still on when feed-out motor has fed the original X mm ( $X = \text{original length} \times 1.3$ ) after the exit sensor turned on.

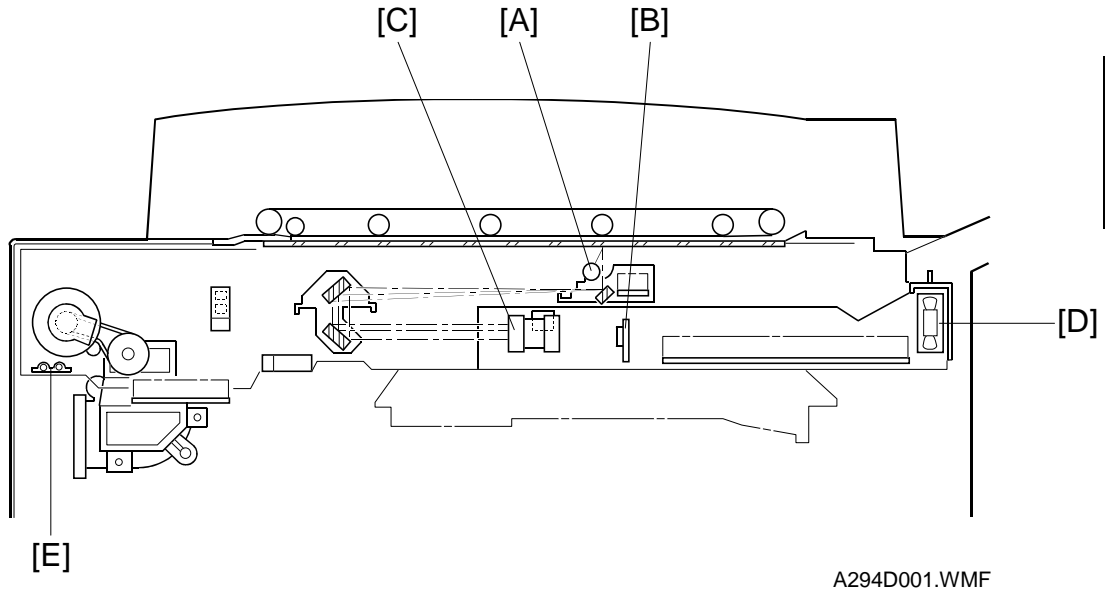
### ***Inversion***

7. The exit sensor is still off when the transport and exit motors have fed the original 198 mm after the transport motor turned on to feed the original to the inverter section.
8. The exit sensor is still on when the feed-out motor has fed the original X mm ( $X = \text{original length} \times 1.3$ ) after the exit sensor turned on.
9. The inverter sensor [D] is still off when the transport and feed-out motors have fed the original 96 mm after the exit sensor turned on.
10. The inverter sensor is still off when the transport and feed-out motors have fed the original 96 mm to the exposure glass after the exit sensor turned off.



## 2.2 SCANNING

### 2.2.1 OVERVIEW



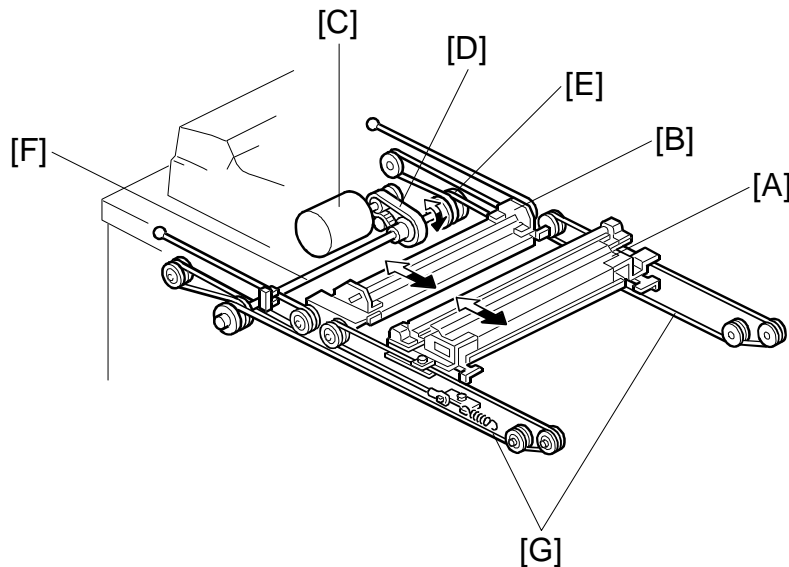
The original is illuminated by the exposure lamp (a xenon lamp) [A]. The image is reflected onto a CCD (Charge Coupled Device) [B] via the 1st, 2nd, and 3rd mirrors, and through the lens [C].

The 1st scanner consists of the exposure lamp, the lamp regulator and the 1st mirror.

There are two fans, optics cooling fan [D] and the SICU cooling fan on the right side of the optics cavity to draw cool air inside. The hot air exits through the vents in the upper cover. The optics cooling fan is turned on when the scanner motor starts and it turns off 10 seconds after the scanner motor turns off. The SICU cooling fan operates whenever the operation switch is on.

If the optional optics anti-condensation heater [E] is installed, it turns on while the main switch is off, to prevent moisture from forming on the optics.

### 2.2.2 SCANNER DRIVE



A294D003.WMF

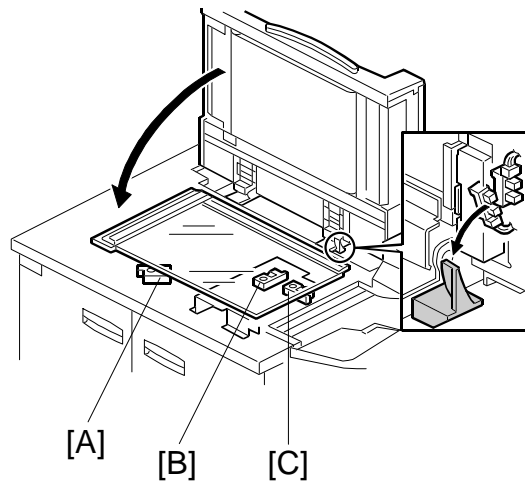
The scanner drive motor is a dc servo motor. The 1st and 2nd scanners [A, B] are driven by the scanner drive motor [C] through the timing belt [D], scanner drive pulley [E], scanner drive shaft [F], and two scanner wires [G].

The MCU board controls the scanner drive motor. In full size mode, the 1st scanner speed is 425 mm/s during scanning. The 2nd scanner speed is half that of the 1st scanner.

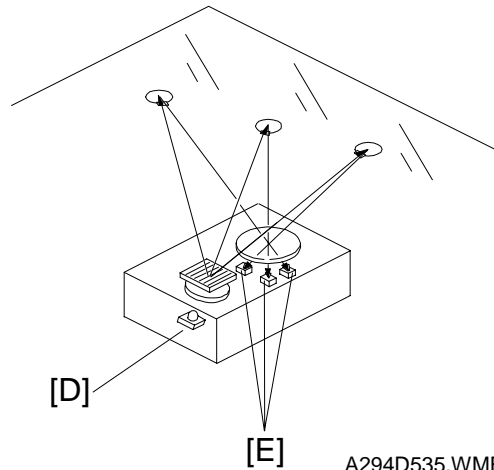
In reduction or enlargement mode, the scanning speed depends on the magnification ratio. The returning speed is always the same, whether in full size or magnification mode. The image length is changed in the sub scan direction by changing the scanner drive motor speed, and in the main scan direction it is changed by image processing on the SICU board.

Magnification in the sub-scan direction can be adjusted by changing the scanner drive motor speed using SP4-008.

### 2.2.3 ORIGINAL SIZE DETECTION IN BOOK MODE



A294D052.WMF



A294D535.WMF

There are three reflective sensors in the optics cavity for original size detection. The original width sensor [A] detects the original width, and the original length sensor-1 [B] and original length sensor-2 [C] detect the original length. These are the APS (Auto Paper Select) sensors.

Inside each APS sensor, there is an LED [D] and either three photoelectric devices [E] (for the width sensor) or one photoelectric device (for each length sensor). In the width sensor, the light generated by the LED is separated into three beams and each beam scans a different point of the exposure glass (in each length sensor, there is only one beam). If the original or DF cover is present over the scanning point, the beam is reflected and each reflected beam exposes a photoelectric device and activates it.

While the main switch is on, these sensors are active and the original size data is always sent to the main CPU. However, the main CPU checks the data only when the DF is being closed.

| Original Size |                         | Length Sensor |   | Width Sensor |   |   | SP4301 Display |
|---------------|-------------------------|---------------|---|--------------|---|---|----------------|
| A4/A3 Version | LT/DLT Version          | 2             | 1 | 3            | 4 | 5 |                |
| A3            | 11" x 17"               | ○             | ○ | ○            | ○ | ○ | 00011111       |
| B4            | 10" x 14"               | ○             | ○ | ○            | ○ | ✕ | 00011110       |
| F4            | 8 1/2" x 14" (8" x 13") | ○             | ○ | ○            | ✕ | ✕ | 00011100       |
| A4-L          | 8 1/2" x 11"            | ✕             | ○ | ○            | ✕ | ✕ | 00001100       |
| B5-L          | —                       | ✕             | ○ | ✕            | ✕ | ✕ | 00001000       |
| A5-L          | 5 1/2" x 8 1/2"         | ✕             | ✕ | ✕            | ✕ | ✕ | 00000000       |
| A4-S          | 11" x 8 1/2"            | ✕             | ✕ | ○            | ○ | ○ | 00000111       |
| B5-S          | —                       | ✕             | ✕ | ○            | ○ | ✕ | 00000110       |
| A5-S          | 8 1/2" x 5 1/2"         | ✕             | ✕ | ○            | ✕ | ✕ | 00000100       |

-L: Lengthwise   -S: Sideways   ○:High (Paper Present)   ✕: Low

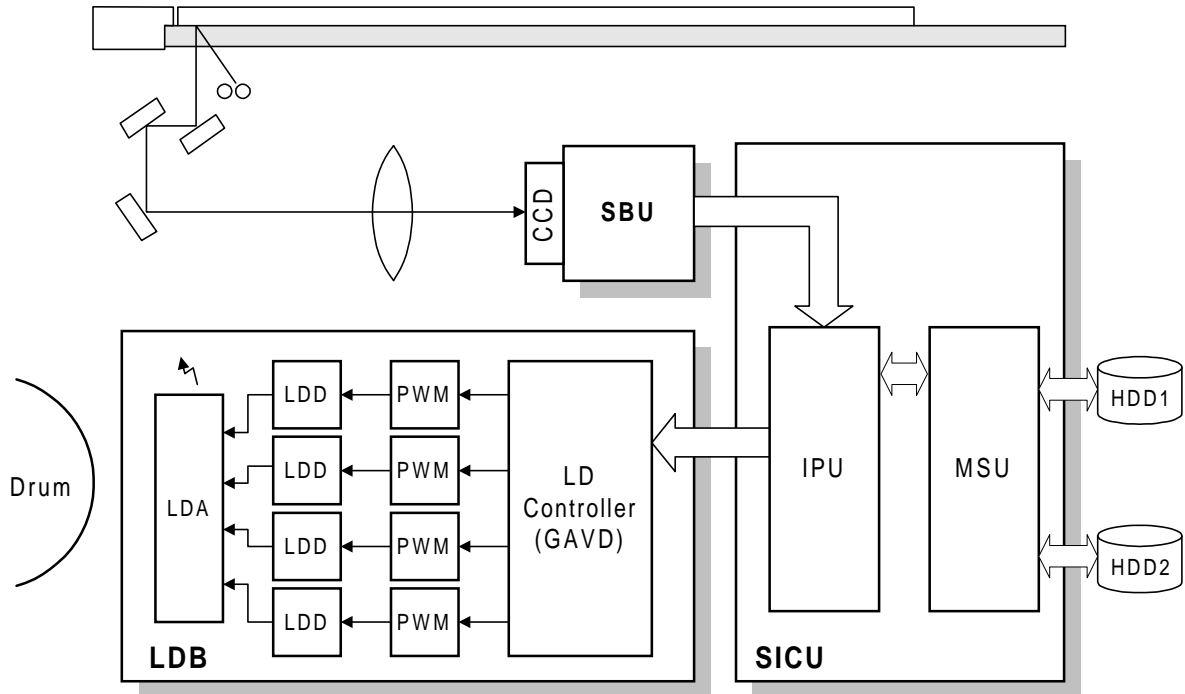
The original size data is taken by the main CPU when the DF position sensor is activated. This is when the DF is positioned about 12 cm above the exposure glass. At this time, only the sensor(s) underneath the original receive the reflected light and switch on. The other sensor(s) are off. The main CPU recognizes the original size from the on/off signals from the five sensors.

If the copy is made with the ADF open, the main CPU decides the original size from the sensor outputs when the Start key is pressed.

The above table shows the outputs of the sensors for each original size. This original size detection method eliminates the necessity for a pre-scan and increases the machine productivity.

## 2.3 IMAGE PROCESSING

### 2.3.1 OVERVIEW



A294D578.WMF

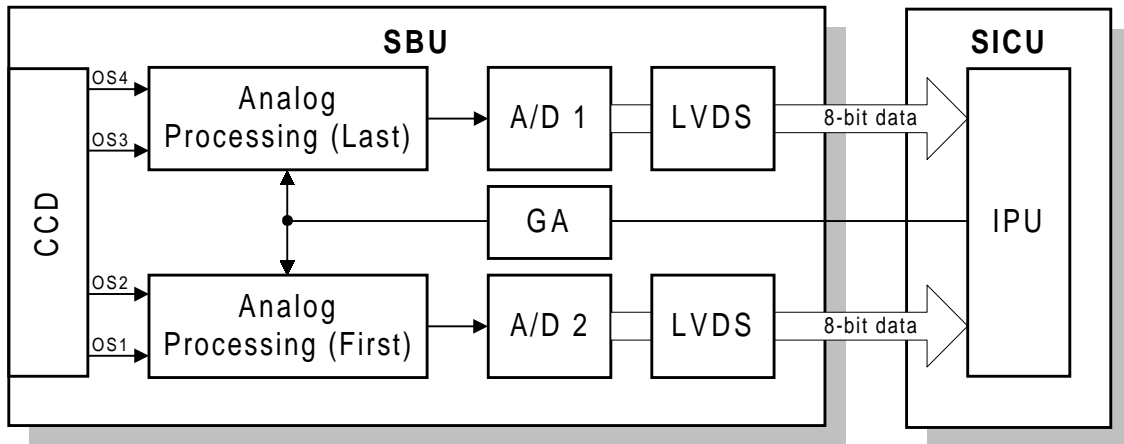
The CCD generates an analog video signal. The SBU (Sensor Board Unit) converts the analog signal to an 8-bit digital signal, then it sends the digital signal to the SICU (Scanner and Image Processing Control Unit) board.

The SICU board can be divided into two image processing blocks: the IPU (Image Processing Unit) and the MSU (Memory Supercharger Unit). These two ICs mainly do the following:

- **IPU:** Auto shading, filtering, magnification,  $\gamma$  correction, gradation processing, and video path control
- **MSU:** Image compression, image rotation, interface with HDD controller, image repeat, and combine originals

Finally, the SICU board sends the video data to the laser diode array (LDA) on the LD drive board (LDB).

### 2.3.2 SBU



A294D579.WMF

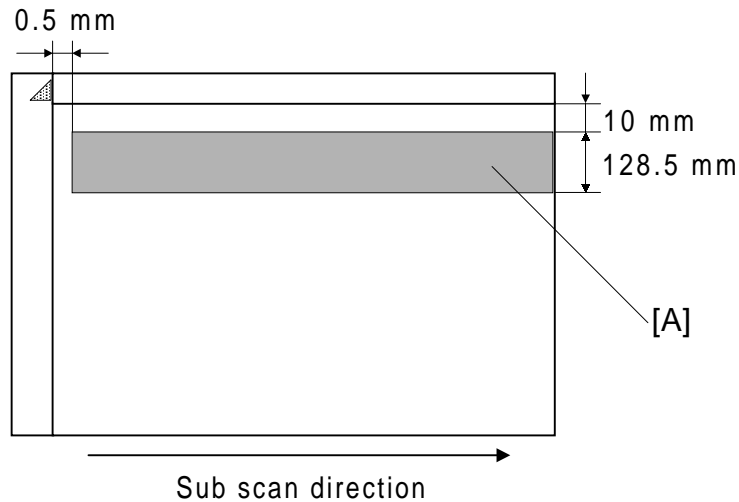
The CCD converts the light reflected from the original into an analog signal. The CCD line has 7,500 pixels and the resolution is 600 dpi (23.6 lines/mm).

The CCD has four output lines: OS1, OS2, OS3, and OS4. OS1 and OS2 are for the first half of the scan line (Non-operation side), and OS3 and OS4 are for the last half of the scan line (Operation side). There are two analog processing ICs; one handles the first half line (OS 1 and OS2) and the other handles the last half line (OS3 and OS4). The analog processing IC performs the following operations:

- 1) Combines the odd and even signals into one line signal.
- 2) Adjust the black reference level of each CCD output channel.
- 3) Amplifies the analog signal from the CCD.

After the above processing, the analog signals are converted to 8-bit signals by the A/D converter. This gives a value for each pixel on scale of 256 grades. Then, the two 8-bit signals are sent to the SICU board through the LVDS (Low Voltage Differential Signaling). The LVDS is a noise-resistant interface.

### 2.3.3 AUTO IMAGE DENSITY (ADS)



A294D581.WMF

Detailed Descriptions

This mode prevents the background of an original from appearing on copies.

The copier scans the auto image density detection area [A]. This corresponds to a narrow strip at one end of the main scan line, as shown in the diagram. As the scanner scans down the page, the IPU on the SICU detects the peak white level for each scan line, within this narrow strip only. From this peak white level, the IPU determines the reference value for A/D conversion for the scan line. Then, the IPU sends the reference value to the A/D controller on the SBU.

When an original with a gray background is scanned, the density of the gray area is the peak white level density. Therefore, the original background will not appear on copies. Because peak level data is taken for each scan line, ADS corrects for any changes in background density down the page.

As with previous digital copiers, the user can select manual image density when selecting auto image density mode and the machine will use both settings when processing the original.

## 2.3.4 IMAGE PROCESSING STEPS AND RELATED SP MODE

The following tables shows the image processing path and the related SP modes used for each image processing mode.

The user can adjust many of the image processing parameters with a UP mode (Copy/Document Server Features – General Features – Original Mode Quality Level), using fixed settings such as Sharp, Normal, and Soft. Each of these fixed settings has different parameter settings. The user's changes do not affect the SP mode settings.

If the user is not satisfied with any of the available settings for this UP mode, the technician can adjust the SP modes. However, the SP mode settings are not used unless the user selects 'Service Mode' with the UP Mode.

|              |                  |        |               |              |
|--------------|------------------|--------|---------------|--------------|
| ▶ Text       | Soft             | Normal | Sharp         | Service Mode |
| ▶ Text/Photo | Photo Priority   | Normal | Text Priority | Service Mode |
| ▶ Photo      | Screened Printed | Normal | Glossy Phot   | Service Mode |
| ▶ Pale       | Soft             | Normal | Sharp         | Service Mode |
| ▶ Generation | Soft             | Normal | Sharp         | Service Mode |

A294D011.WMF

For more details about the settings available for the user, see Service Tables – Image Quality Setting by UP Mode.



## Text Mode

MTF filtering is used in text mode. The MTF filtering coefficient and strength can be adjusted individually for both main and sub scan. Low density originals are produced better when a stronger MTF filter is selected, but in this case, moiré tends to appear.

With UP Mode (Copy/Document Server Features – General Features – Original Mode Quality Level), the user can select 'Soft', 'Normal', 'Sharp', and 'Service Mode'. The settings of the SP modes indicated with an asterisk (\*) are not used unless the user selects 'Service Mode'.

Detailed Descriptions

|                           | Image Processing Steps                    | Related SP Modes  |
|---------------------------|---|---|
| <b>Input Correction 1</b> | Auto Shading                              |   |
| <b>Input Correction 2</b> | Background Erase                          | <ul style="list-style-type: none"> <li>• SP4903-065 * (Scanner Gamma Threshold Level)</li> <li>• SP4903-070 * (Background Erase Level)</li> </ul>     |
|                           | Independent Dot Erase                     | <ul style="list-style-type: none"> <li>• SP4903-060 (Independent Dot Erase Level)</li> </ul>  |
| <b>Filtering</b>          | MTF                                       | <ul style="list-style-type: none"> <li>• SP4903-010 to 011 * (Pre-Filter Coefficient)</li> <li>• SP4903-020 to 035 * (MTF Filter Strength)</li> </ul> |
| <b>Magnification</b>      | Main Scan Magnification                   | <ul style="list-style-type: none"> <li>• SP2909-001 (Main Scan Magnification)</li> </ul>  |
| <b>ID Control</b>         | $\gamma$ Correction                       | <ul style="list-style-type: none"> <li>• SP4903-84 * (Scanner gamma setting)</li> </ul>   |
| <b>Gradation</b>          | Error Diffusion/<br>Line Width Correction | <ul style="list-style-type: none"> <li>• SP4903-78 to 80 *, 4904-20 (Line Width Correction Type)</li> </ul>   |

## Photo Mode

Normally, the smoothing filter is used in photo mode but MTF filtering can also be selected with SP mode.

With UP Mode (Copy/Document Server Features – General Features – Original Mode Quality Level), the user can select ‘Screen Printed’, ‘Normal’, ‘Continuous Tone’, and ‘Service Mode’. The settings of the SP modes indicated with an asterisk (\*) are not used unless the user selects ‘Service Mode’.

When the user selects “Normal Paper” and “Continuous Tone”, error diffusion is used for the gradation process. However, if the user selects “Screen Printed”, dither processing is used.

|                           | Image Processing Path             | Related SP Modes   |
|---------------------------|-----------------------------------|--|
| <b>Input Correction 1</b> | Auto Shading                      |  |
| <b>Input Correction 2</b> | Background Erase                  | <ul style="list-style-type: none"> <li>• SP4903-66 * (Scanner Gamma Thresh Level)</li> <li>• SP4903-071 * (Background Erase Level)</li> </ul>  |
| <b>Filtering</b>          | Smoothing/MTF                     | <ul style="list-style-type: none"> <li>• SP4903-012 * (Pre Filter Coefficient)</li> <li>• SP4903-009 * (Filter Type Selection)</li> <li>• SP4903-036 to 038 * (Smoothing/MTF Filter Coefficient Level in Photo Mode)</li> <li>• SP4904-006 (Smoothing Filter Level)</li> </ul> |
| <b>Magnification</b>      | Main Scan Magnification           | <ul style="list-style-type: none"> <li>• SP2909-001 (Main Scan Magnification)</li> </ul>   |
| <b>ID Control</b>         | $\gamma$ Correction               |  |
| <b>Gradation</b>          | Error Diffusion/<br>Dither Matrix | <ul style="list-style-type: none"> <li>• SP4904-002 * (Grayscale Process Selection: Dither or Error Diffusion)</li> </ul>  |

## Text/Photo Mode

MTF filtering is used for text/photo mode.

With UP Mode (Copy/Document Server Features – General Features – Original Mode Quality Level), the user can select 'Photo Mode', 'Normal', 'Text Mode', and 'Service Mode'. The settings of the SP modes indicated with an asterisk (\*) are not used unless the user selects 'Service Mode'.

Detailed  
Descriptions

|                           | Image Processing Path                     | Related SP Modes   |
|---------------------------|---|--|
| <b>Input Correction 1</b> | Auto Shading                              |  |
| <b>Input Correction 2</b> | Background Erase                          | <ul style="list-style-type: none"> <li>• SP4930-67 * (Scanner Gamma Thresh Level)</li> <li>• SP4903-072 * (Background Erase Level)</li> <li>• SP4906 * (On/Off in Text/Photo Mode)</li> </ul>                  |
|                           | Independent Dot Erase                     | <ul style="list-style-type: none"> <li>• SP4903-062 (Independent Dot Erase Level)</li> </ul>   |
| <b>Filtering</b>          | MTF                                       | <ul style="list-style-type: none"> <li>• SP4903-013 to 014 * (Pre Filter Coefficient)</li> <li>• SP4903-039 to 054 * (Filter Level and Strength)</li> <li>• SP4904-007 (Texture Erase Filter Level)</li> </ul> |
| <b>Magnification</b>      | Main Scan Magnification                   | <ul style="list-style-type: none"> <li>• SP2909-001 (Main Scan Magnification)</li> </ul>   |
| <b>ID Control</b>         | $\gamma$ Correction                       | <ul style="list-style-type: none"> <li>• SP4903-85 * (Scanner gamma setting)</li> </ul>  |
| <b>Gradation</b>          | Error Diffusion/<br>Line Width Correction | <ul style="list-style-type: none"> <li>• SP4904-003, 005 * (Error Diffusion)</li> <li>• SP4903-81 to 83 *, SP4904-22 (Line Width Correction Type)</li> </ul>   |

## Pale Mode

The image processing for pale mode is basically the same as in text mode. However, the contrast of the original is low. So, to preserve details, a stronger MTF filter is used. Also, the independent dot erase level is set at a lower level, so that only the faintest of dots are deleted; this ensures that dotted lines and periods are not deleted.

With UP Mode (Copy/Document Server Features – General Features – Original Mode Quality Level), the user can select ‘Soft’, ‘Normal’, ‘Sharp’, and ‘Service Mode’. The settings of the SP modes indicated with an asterisk (\*) are not used unless the user selects ‘Service Mode’.

|                           | Image Processing Path                               | Related SP Modes   |
|---------------------------|---|--|
| <b>Input Correction 1</b> | Auto Shading  |  |
| <b>Input Correction 2</b> | ↓<br>Background Erase                               | <ul style="list-style-type: none"> <li>• SP4903-068 *<br/>(Scanner Gamma Thresh Level)</li> <li>• SP4903-73 *<br/>(Background Erase Level)</li> </ul>          |
|                           | ↓<br>Independent Dot Erase                          | <ul style="list-style-type: none"> <li>• SP4903-063<br/>(Independent Dot Erase Level)</li> </ul>   |
| <b>Filtering</b>          | ↓<br>MTF  | <ul style="list-style-type: none"> <li>• SP4903-015 *<br/>(Pre Filter)</li> <li>• SP4903-055 to 056 *<br/>(MTF Filter Coefficient – Pale Originals)</li> </ul> |
| <b>Magnification</b>      | ↓<br>Main Scan Magnification                        | <ul style="list-style-type: none"> <li>• SP2909-001<br/>(Main Scan Magnification)</li> </ul>   |
| <b>ID Control</b>         | ↓<br>$\gamma$ Correction                            |  |
| <b>Gradation</b>          | ↓<br>Grayscale Processing/<br>Line Width Correction | <ul style="list-style-type: none"> <li>• SP4904-23<br/>(Line Width Correction Type)</li> </ul>   |

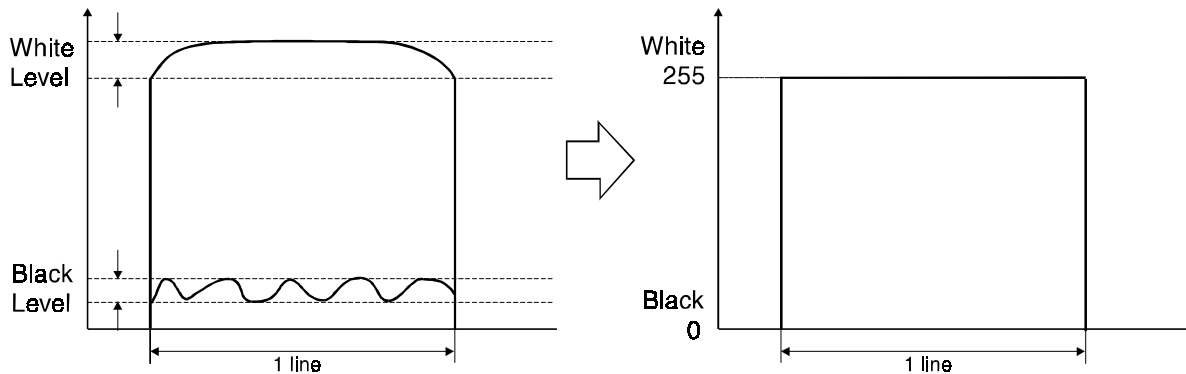
## Generation Copy Mode

The image processing for generation mode is basically the same as in text mode, except that in order to prevent lines in the main scan direction from being reproduced too thickly, line width correction is applied for the final gradation treatment. Also, to reduce unwanted black dots, a weaker MTF filter is used; this ensures that isolated dots do not get bigger, and are spread out. These dots will then be deleted by the independent dot erase feature. This feature, however, is kept at a low setting to ensure that important details such as dotted lines and periods are not deleted.

With UP Mode (Copy/Document Server Features – General Features – Original Mode Quality Level), the user can select 'Soft', 'Normal', 'Sharp', and 'Service Mode'. The settings of the SP modes indicated with an asterisk (\*) are not used unless the user selects 'Service Mode'.

|                           | Image Processing Path                          | Related SP Modes  |
|---------------------------|--|---|
| <b>Input Correction 1</b> | Auto Shading                                   |   |
| <b>Input Correction 2</b> | Background Erase                               | <ul style="list-style-type: none"> <li>• SP4903-069 * (Scanner Gamma Thresh Level)</li> <li>• SP4903-074 * (Background Erase Level)</li> </ul>                      |
|                           | Independent Dot Erase                          | <ul style="list-style-type: none"> <li>• SP4903-064 (Independent Dot Erase Level)</li> </ul>  |
| <b>Filtering</b>          | MTF  | <ul style="list-style-type: none"> <li>• SP4903-016 * (Pre Filter Coefficient)</li> <li>• SP4903-057 to 058 * (MTF Filter Coefficient – Generation Copy)</li> </ul> |
| <b>Magnification</b>      | Main Scan Magnification                        | <ul style="list-style-type: none"> <li>• SP2909-001 (Main Scan Magnification)</li> </ul>  |
| <b>ID Control</b>         | $\gamma$ Correction                            |   |
| <b>Gradation</b>          | Grayscale Processing/<br>Line Width Correction | <ul style="list-style-type: none"> <li>• SP4903-75 to 77*, SP4904-24 (Line Width Correction Type)</li> </ul>  |

### 2.3.5 AUTO SHADING



A294D645.WMF

Two things happen during auto shading.

#### ***Black Level Correction***

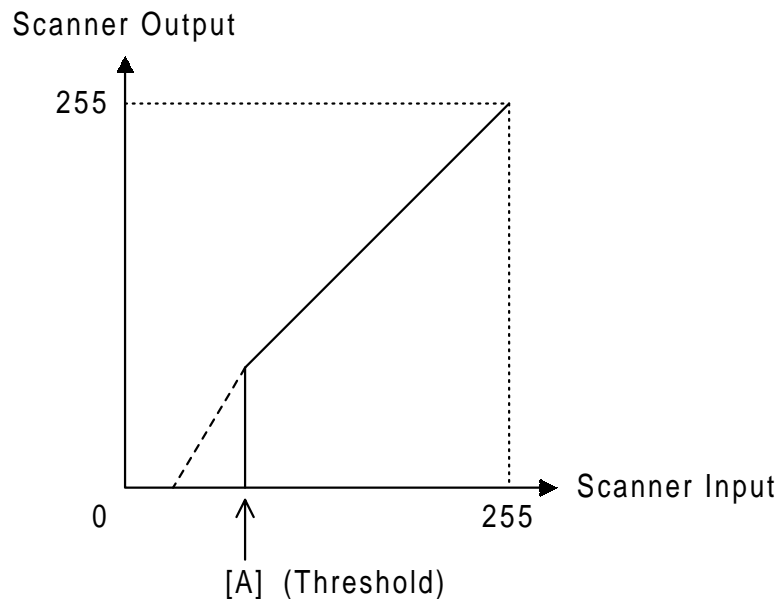
The black level is zeroed for each scan line of data by reading the dummy elements at the end of the CCD signal for each scan line, which should be black.

#### ***White Level Correction***

The data is corrected for variations in white level across the main scan. To do this, a white reference plate is scanned before each original (book mode) or every 30 s (ADF mode). This corrects for the following effects on each pixel:

- Loss of brightness at the ends of the exposure lamp and the edges of the lens
- Variations in sensitivity among the CCD elements
- Distortions in the light path

### 2.3.6 BACKGROUND ERASE



A294D591.WMF

Detailed Descriptions

#### **Background Erase**

The background erase process is used only when setting of SP 4-903-70 to 75 is changed from the default setting (the default is 'disabled').

Usually, dirty background is erased using Auto Image Density (ADS). Background Erase should be used when ADS cannot fully erase the dirty background.

There are two Background Erase modes. The one that is being used depends on the SP mode setting. Setting 2 has a stronger effect than setting 1, but setting 2 may cause sudden changes in the data around the threshold level.

**Setting 1:** MTF correction is not applied to any low image density data that remains after auto shading if the data is lower than a threshold level [A]. The overall effect is to reduce the background in a similar way to that shown by the dotted line in the diagram. This process can be applied for each image mode (except for photo mode) by changing the setting of SP4-903-70, 72, 73 or 74.

**Setting 2:** Any low image density data that remains after auto shading will be treated as "0" if the data is lower than a threshold level [A]. The background is cut off as shown by the solid vertical line in the diagram at [A]. This process can be applied for each image mode by changing the setting of SP4-903-70, 71, 72, 73 or 74.

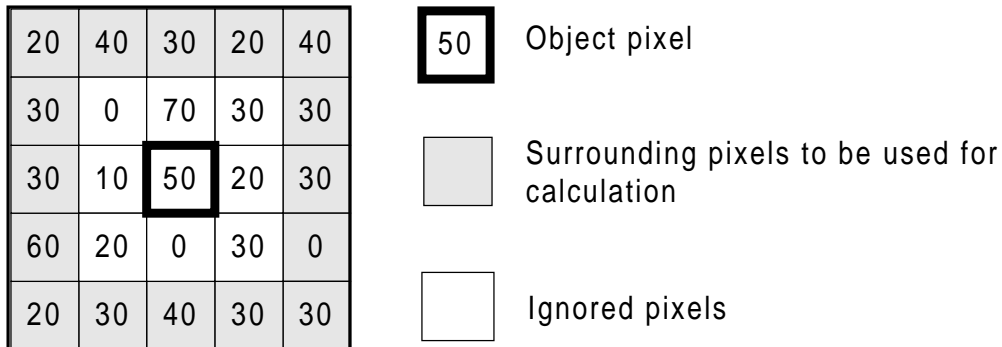
The thresholds can be changed with SP4-903-65 to 69.

### 2.3.7 INDEPENDENT DOT ERASE

By default, this process is used in all image processing modes except for photo mode. This function allows independent black dots appearing on copies to be erased.

As shown in the drawing below, the software compares each pixel with the pixels in the surrounding 5 x 5 area (except for the immediately adjacent pixels).

If all of the surrounding pixels are white, and the difference between the value of the object pixels and the average of the surrounding pixel is larger than the threshold level, the object pixel is either changed to 0 (white) or reduced in density. The combination of the threshold value and the pixel data reduction ratio depends on the setting of SP4-903-60, 62, 63 or 64. If a larger number is selected, the effect of independent dot erase will be stronger. If 0 is selected, independent dot erase is disabled.



A294D592.WMF



## 2.3.8 FILTERING, MAIN SCAN MAGNIFICATION/REDUCTION

### *Overview*

After auto shading, the image data is processed by both filtering and main scan magnification. However, to reduce the occurrence of moiré in the image, the processing order depends on the reproduction ratio, as follows.

1. 64% reduction or less  
Main Scan Reduction → Filtering
2. 65% reduction or higher  
Filtering → Main Scan Magnification

Detailed  
Descriptions

### *Filtering*

By default, an individual MTF filter is used for each image processing mode, to enhance the desired image qualities. (For Photo mode, smoothing filter is selected as the default setting.)

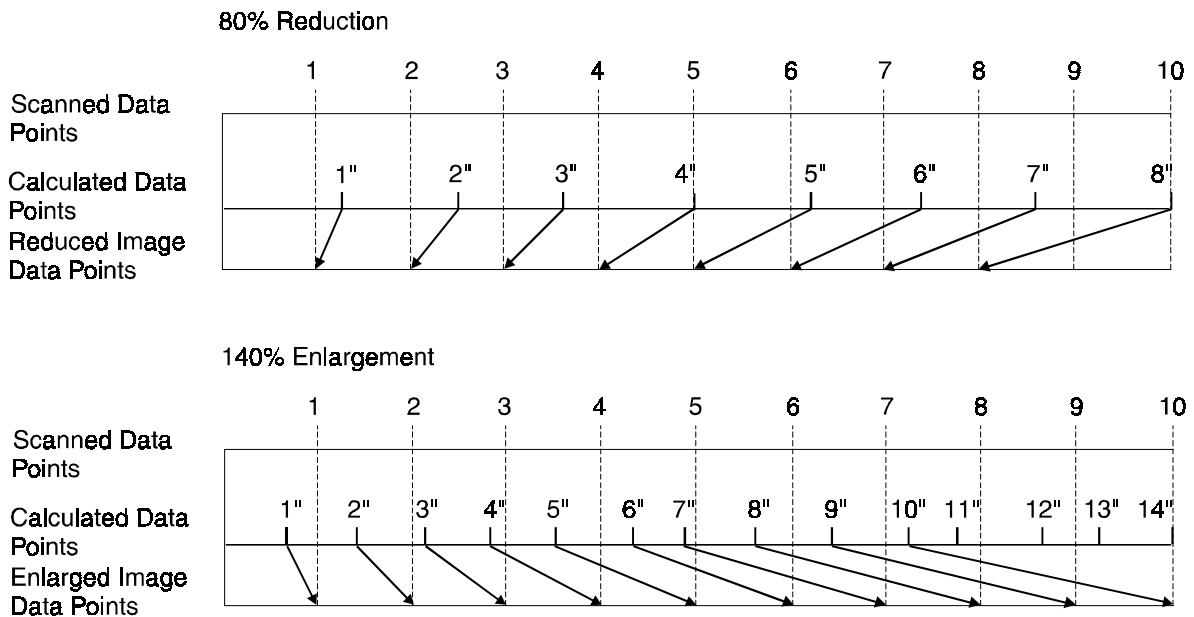
A stronger MTF filter emphasizes sharpness and leads to better reproduction of low image density areas, but may leads to the occurrence of moiré in the image.

The MTF filter strength can be changed by changing the coefficient (MTF Filter Level) and strength of the MTF filter in combination using SP mode. Refer to the combination chart in 'Image Quality Setting by UP Mode' in section 4. The filter coefficient and strength can be adjusted in the main scan and sub scan directions individually. This allows the copy quality to be adjusted more precisely, to match the originals normally scanned by a particular customer.

**Example:** In a case when vertical lines (sub scan) are reproduced clearly, but horizontal lines (main scan) are not reproduced clearly, the technician can adjust the main scan filter only.

For photo mode, the smoothing filter is the default filter, but the MTF filter may be selected by SP mode 4-903-9. This is effective when putting more weight on improving the resolution when copying from "continuous tone" originals.

### **Main Scan Magnification/Reduction**



A294D646.WMF

However, reduction and enlargement in the main scan direction are handled by the IPU chip on the SICU board.

Scanning and laser writing are done at a fixed pitch (the CCD elements cannot be squeezed or expanded). So, to reduce or enlarge an image, imaginary points are calculated that would correspond to a physical enlargement or reduction of the image. The correct image density is then calculated for each of the imaginary points based on the image data of the nearest four true points. The calculated image data then becomes the new (reduced or enlarged) image data.

Main scan magnification can be disabled with SP4-903-5 to test the IPU chip.

### **Sub Scan Magnification**

When the selected magnification is 50% or larger, the image magnification in the sub scan direction is changed by changing the scanner speed. (As the magnification ratio increases, the scanner speed is reduced.)

However, when a magnification ratio smaller than 50% is selected, the required scanner speed exceeds the limit of the scanner motor. So, the scanner speed is reduced to half of the required speed for that reduction ratio. As a result, there are twice as many scan lines as needed. So alternate lines are removed.

For example, if a 49% magnification ratio is selected, the scanner speed is the same as the speed of 98% magnification, but the number of sub scan lines used for the image is half of that for 98% magnification.

### 2.3.9 GAMMA ( $\gamma$ ) CORRECTION

Gamma correction ensures accurate generation of the various shades in the gray scale from black to white, accounting for the characteristics of the scanner and printer.

Scanner gamma correction corrects the data output to the IPU to account for the characteristics of the scanner (e.g., CCD response, scanner optics).

Printer gamma correction corrects the data output from the IPU to the laser diode to account for the characteristics of the printer (e.g., the characteristics of the drum, laser diode, and lenses).

The scanner and printer gamma settings can be changed for the 'Service Mode' original type of text and text/photo modes, using SP4-903-84 and 85.

Detailed  
Descriptions

### 2.3.10 GRADATION PROCESSING

Various processes are available to try to reproduce various types of original as faithfully as possible.

The following processes are used in combination depending on the image mode settings.

- 1) Three-gradation processing
- 2) Four-gradation processing
- 3) Error diffusion
- 4) Dithering

These three processes are used as follows:

|                       |   |
|-----------------------|---|
| Text Mode:            | Error diffusion + line width correction and four-gradation processing   |
| Text/Photo Mode:      | Error diffusion + line width correction and four-gradation processing   |
| Photo Mode:           | Error diffusion or dithering, and three-gradation processing            |
| Generation Copy Mode: | Error diffusion + line width correction, and three-gradation processing |
| Pale Mode:            | Error diffusion and four-gradation processing                           |

#### ***Three-gradation Processing***

This mode is used in Photo mode.

The image density data after gamma correction is changed into three-gradation data (full dot, half dot, or blank) using two thresholds. With this processing, halftone images are reproduced smoother than with four-gradation processing because of stable dot image reproduction due to only one intermediate density level.

### ***Four-gradation Processing***

This process is used in Text mode and Text/Photo mode.

The image density data after gamma correction is changed into 2-bit data using 3 thresholds. The four graduations are reproduced by laser power control. This process is suitable for reproducing fine originals which do not include halftone areas.

### ***Error Diffusion and Dithering***

Error diffusion reduces the difference in contrast between light and dark areas of a halftone image. Each pixel is corrected using the difference between it and the surrounding pixels. The corrected pixels are then corrected using an error diffusion matrix.

With dithering, each pixel is compared with a pixel in a dither matrix. Several matrixes are available, to increase or decrease the detail on the copy.

Comparing with dithering, error diffusion gives a better resolution, and is more suitable for "continuous toned" originals. On the other hand, dithering is more suitable for "screen printed" originals.

In Photo mode, when the user selects "Normal Paper" or "Continuous Tone", error diffusion is used. However, if the user selects "Screen Printed", dither processing is used. If the user selects "SP Mode Changed", then error diffusion or one of three types dither matrix can be selected with SP4-904-002. There are three types of dither matrix, 8" x 8", 6" x 6", and 4" x 4". A larger dither matrix causes halftone areas to become coarser.

## **2.3.11 LINE WIDTH CORRECTION**

This function is effective for Text, Text/Photo and Generation modes.

The software compares each pixel with adjacent pixels. If the differences between the object pixel and adjacent pixels are more than a threshold, the software judges that the pixel is on a line edge, and line width correction is applied.

The line width correction setting can be changed separately for Text, Text/Photo and Generation modes. The widths of vertical and horizontal lines can be corrected separately.

- Thinner 1: If the pixel is on the edge of a line, its density is multiplied by 0.75
- Thinner 2: If the pixel is on the edge of a line its density is multiplied by 0.5
- Thicker: If the pixel is on the edge of a line, 48 is added to its density

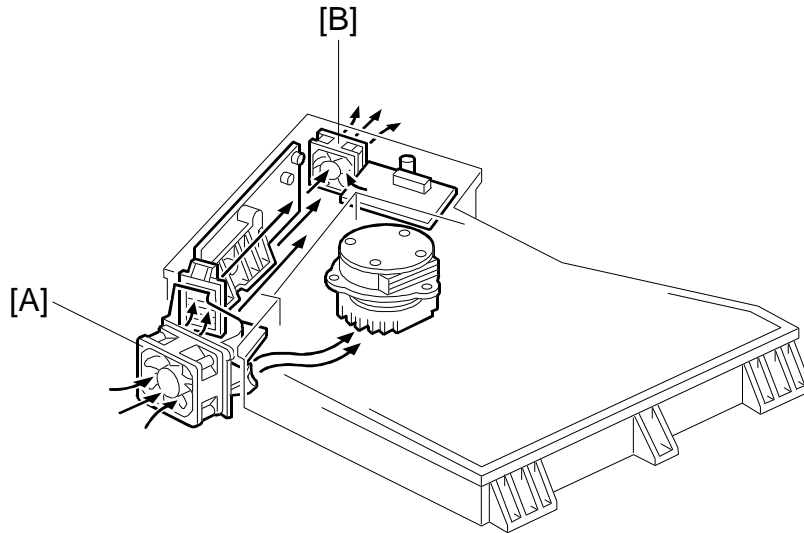
The threshold for detecting edges of lines can also be changed separately for vertical lines and horizontal lines.

Use SP4-903-75 to 83 to adjust the line width correction settings.

Line width can also be corrected by adjusting the laser output (SP4904-20 to 24).

## 2.4 LASER EXPOSURE

### 2.4.1 OVERVIEW



A294D103.WMF

Detailed Descriptions

This machine uses four laser diodes to produce electrostatic images on an OPC drum. The four parallel beams write four lines at once.

The laser diode unit converts image data from the SICU board into laser pulses, and the optical components direct these pulses to the drum.

Exposure of the drum by the laser beam creates the latent image. The laser beam makes the main scan while drum rotation controls the sub scan.

The strength of each beam is 10 mW on the drum surface at a wavelength of 785 nm.

The polygon motor speed is 29,528 rpm.

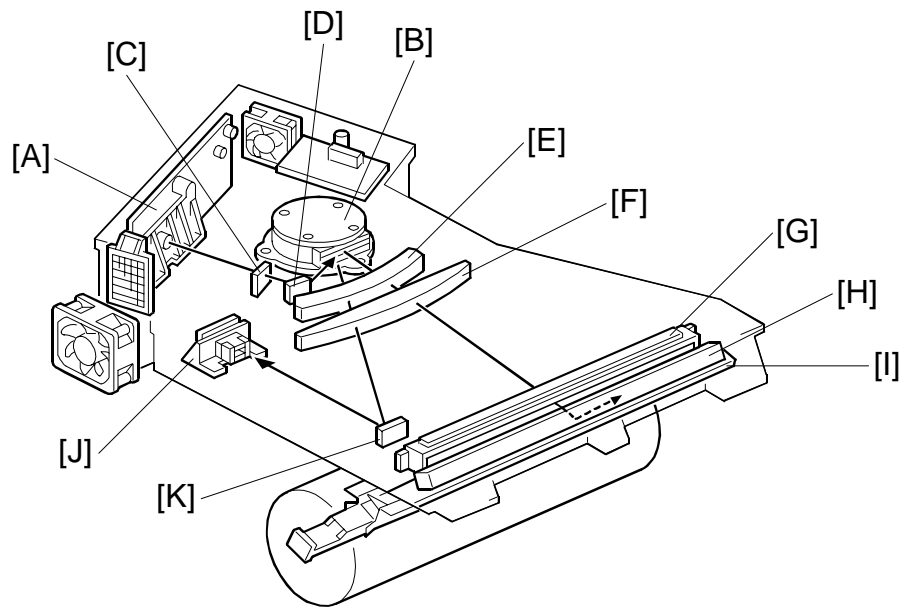
There are up to 4 image density levels for each pixel. To realize this, this machine uses a form of pulse width modulation. In this machine, pulse width modulation consists of the following processes:

- Laser diode pulse positioning
- Laser diode power/pulse width modulation

Laser diode power and pulse width modulation is done by the laser diode drive board (LDR). Briefly, the width of the laser pulse for a pixel depends on the output level (from 0 to 3) required for the pixel.

There are two fan motors, the polygonal motor cooling fan [A] and LDB cooling fan [B], for removing heat in the laser unit.

## 2.4.2 OPTICAL PATH



A294D101.WMF

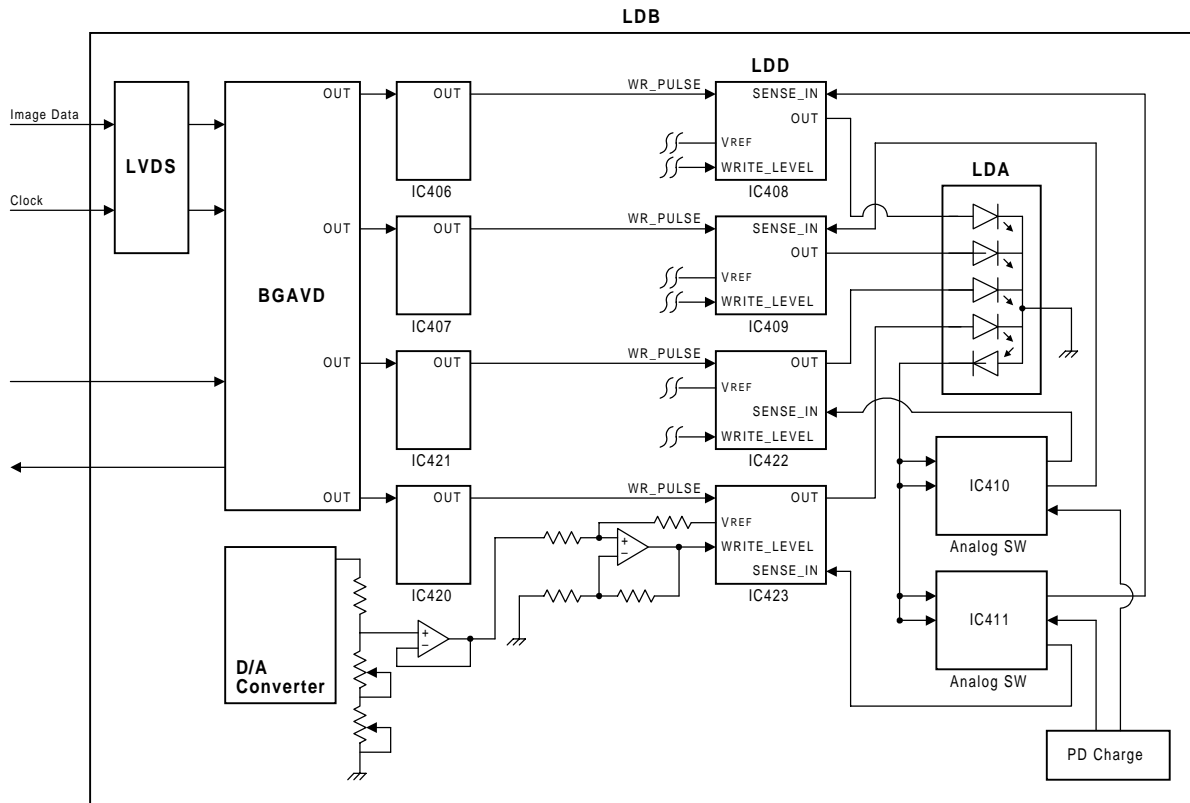
The output path from the laser diode to the drum is shown above.

The LD unit [A] outputs four laser beams to the polygonal mirror [B] (six mirror surfaces) through the cylindrical lens [C] and the 1st mirror [D].

Each surface of the polygon mirror reflects four full main scan lines. The laser beams go to the F-theta lens 1 [E], F-theta lens 2 [F], BTL (barrel toroidal lens) [G], and mirror [H]. Then these laser beams go to the drum through the toner shield glass [I].

The laser synchronizing detector [J] determines the main scan starting position. This board generates and sends a synchronization signal when the laser synchronization detector mirror [K] reflects the laser beam to the detector as the laser beam starts its sweep across the drum. The detector detects only the uppermost beam (channel 1) of the four.

### 2.4.3 AUTO POWER CONTROL (APC)



Detailed  
Descriptions

A294D999.WMF

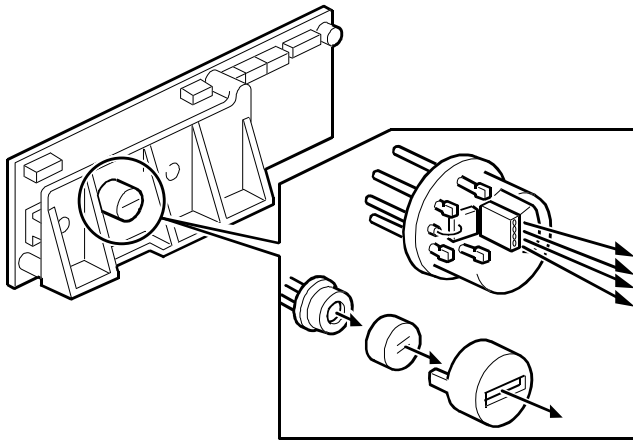
There are four LD drivers (IC408, IC409, IC422 and IC423) on the LDB (Laser diode Drive Board). The LD drivers control the laser diodes on the 4-channel laser diode array. Even if a constant electric current is applied to the laser diode, the intensity of the output light changes with the temperature. The intensity of the output decreases as the temperature increases.

In order to keep the output level constant, IC410 and IC411 monitor the current passing through the photodiode (PD). Then they increase or decrease the current to the laser diode as necessary, comparing it with the reference levels (VREF). To apply APC separately to each laser diode using only one photo diode, the monitor current is sent in turn to each laser diode.

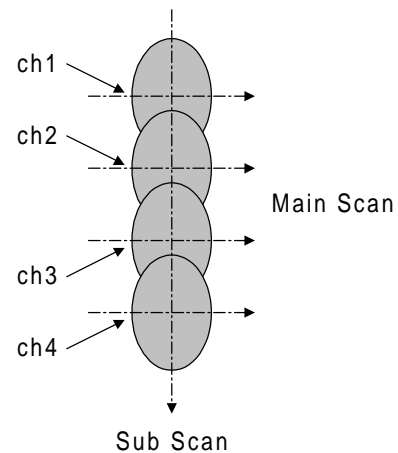
This auto power control is done just after the machine is turned on and during printing while the laser diode is active.

The reference levels are adjusted on the production line. Do not touch the variable resistors on the LDB in the field.

## 2.4.4 FOUR BEAM LASER WRITING



A294D102.WMF



A294D500.WMF

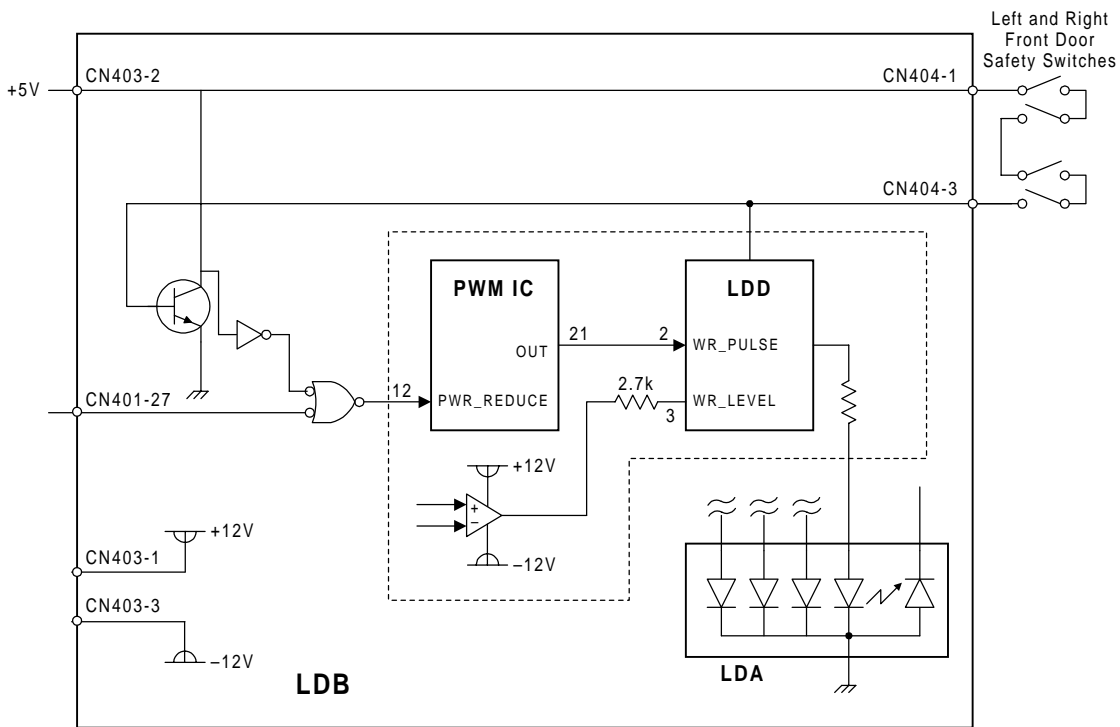
This laser unit has four LD diodes for writing the image. This means that each surface of the polygonal mirror motor writes four main scan lines, and 24 main scan lines are produced when the polygonal mirror rotates once. Due to this multi beam writing, the polygonal mirror motor speed can be reduced, thus the noise generated by the polygonal mirror motor can be reduced.

The four laser beams are transferred to the polygonal mirror through a collimating lens. When the four laser beams arrive on the drum surface, the diameter of the beam spot is 50 x 60 (main scan direction x sub scan direction)  $\mu\text{m}$ , and the distance between each pixel is approximately 42  $\mu\text{m}$ . So the beam spots overlap each other as shown above.

The laser diode array is assembled and adjusted in the factory, and no adjustment can be done in the field.



## 2.4.5 LD SAFETY SWITCHES



A294D998.WMF

Detailed Descriptions

To ensure technician and user safety and to prevent the laser beam from inadvertently switching on during servicing, there are four safety switches inside the front cover.

When one of the front covers is open, the 5 V line connecting to the LD drivers (LDD) is disconnected. The above diagram shows one LD and driver circuit as an example. There are four of these on the LDB board. Additionally, the OUT terminal of the PWM IC is automatically set at a low level to prevent any power from being supplied from the PWM IC to the LDD.

Even if 12 V is supplied from the op amp which controls the LD power level, the power will be less than the minimum power required for LD lighting (5 mA) due to the 2.7 k $\Omega$  resistor.

## **2.5 DRUM UNIT**

### **2.5.1 PROCESS CONTROL**

#### ***Overview***

The drum potential will gradually change because of the following factors.

- Dirty charge corona casing and grid plate
- Changes in drum sensitivity

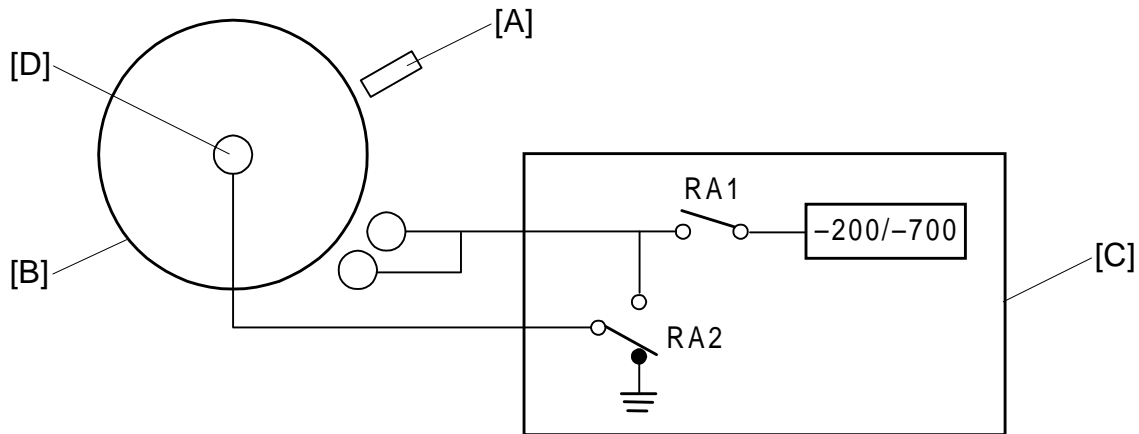
To maintain good copy quality, the machine does the following just after the main switch has been turned on (if the fusing temperature is less than 100 °C and SP3-901 is on).

- 1) Potential Sensor Calibration
- 2) VSG Adjustment
- 3) VG (Grid Voltage) Adjustment
- 4) LD Power Adjustment
- 5) VREF Update

This process is known as 'Process Control Initial Setting'. The rest of this section will describe these steps in more detail.

Processes 1, 3, and 4 in the above list compensate for changes in drum potential. Processes 2 and 5 are for toner density control; see the "Toner Density Control" section for more details.

### ***Drum Potential Sensor Calibration***



A294D641.WMF

Detailed Descriptions

The drum potential sensor [A] detects the electric potential of the drum surface [B].

Since the output of the sensor is affected by environmental conditions, such as temperature and humidity, the sensor needs recalibration at times. This is done during process control initial setting.

The charge/bias/grid power pack [C] has two relay contacts. Usually RA2 grounds the drum. However, to calibrate the sensor, the BCU switches RA2 and RA1 over, which applies the power pack output voltage to the drum shaft [D].

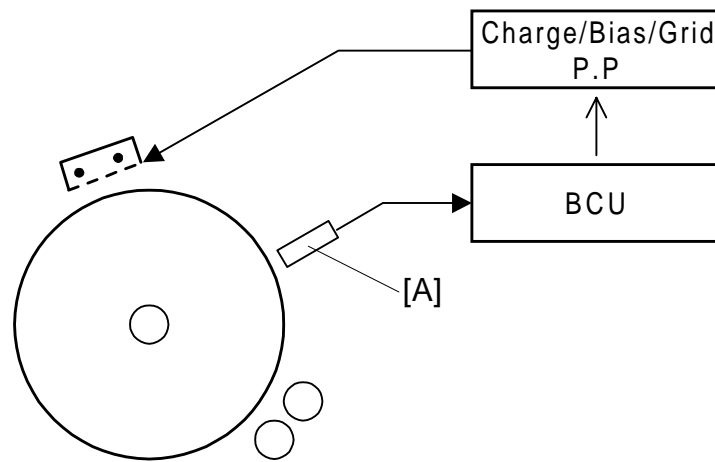
The machine automatically calibrates the drum potential sensor by measuring the output of the sensor when  $-200\text{ V}$  and  $-700\text{ V}$  are applied to the drum. From these two readings, the machine can determine the actual drum potential from the potential sensor output that is measured during operation.

During calibration, if the rate of change in drum potential sensor response to applied voltage is out of the target range, an SC310 or SC311 is logged and auto process control turns off. The VG and LD power adjustments are skipped; VG is set to the value stored in SP2-001-01, and LD power is set to the values stored in SP2-103.

### ***Vsg Adjustment***

This calibrates the ID sensor output for a bare drum to  $4.0 \pm 0.2\text{ V}$ . It does this by changing the intensity of the light shining on the drum from the sensor. This is done automatically during process control initial setting, and it can also be done manually with SP3-001-002.

If the ID sensor output cannot be adjusted to within the standard, an SC353 or 354 is logged and the light intensity is set to the previous accepted value.

***V<sub>G</sub> Adjustment***

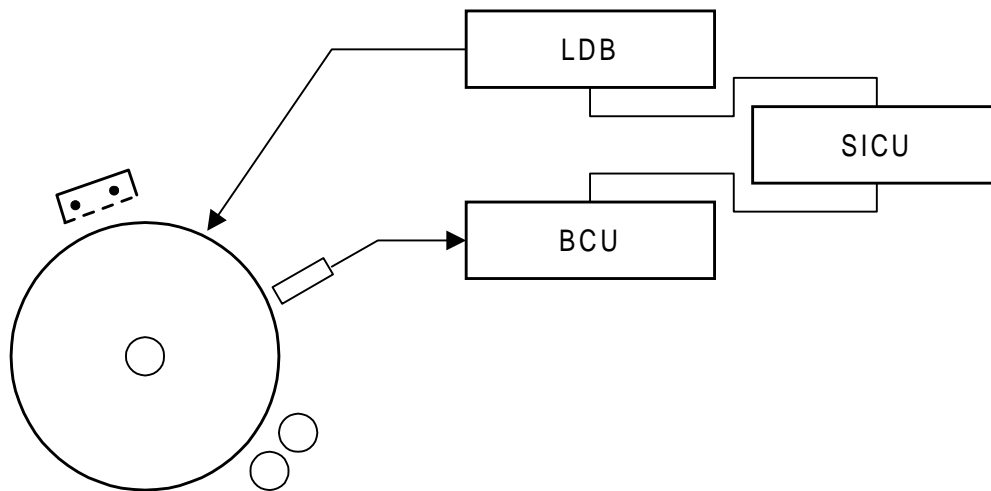
A294D642.WMF

The potential on unexposed areas of the drum ( $V_D$ ) gradually changes during drum life. To keep  $V_D$  constant, the grid voltage ( $V_G$ ) is adjusted during process control initial setting.

The BCU checks  $V_D$  using the drum potential sensor [A]. If it is not within the target range ( $-900\text{ V} \pm 20\text{ V}$ ), the BCU adjusts  $V_G$  (Grid Voltage) through the charge/bias/grid power pack to get the correct target voltage.

The most recently detected values can be displayed with SP3-902-2 ( $V_D$ ) and 3-902-4 ( $V_G$ ).

If the CPU cannot get  $V_D$  within the target range by changing  $V_G$ ,  $V_G$  is set to the value stored in SP2-001-01 and LD power is set to the value stored in SP2-103. Then SC312, SC313, or SC315 is logged.

***LD Power Adjustment***

A294D643.WMF

Detailed  
Descriptions

This adjustment uses the drum potential sensor to keep the ID sensor pattern at the same density, so that VREF will be updated correctly (see the next page).

The VH pattern is developed using the current LD power (the density is the same as the ID sensor pattern). The drum potential sensor detects the potential on this pattern. The LD power is adjusted until VH becomes  $-265\text{ V} \pm 20\text{ V}$ .

This is done only during process control initial setting.

The latest VH can be displayed using SP3-902-3. The size of the correction applied to the LD power can be displayed using SP3-902-5 (the default is stored in SP2-103-1-4).

If VH cannot be adjusted to within the standard within 20 attempts, LD power is set to the latest value (the one used for the 20th attempt) and SC314 or SC316 is logged.

***VREF Update***

The TD sensor reference voltage (VREF) is updated to stabilize the concentration of toner in the development unit as follows;

$$\text{New VREF} = \text{Current VREF} + \Delta\text{VREF}$$

$\Delta\text{VREF}$  is determined using the following table.

| <b>VSP/VSG</b> | <b><math>\Delta\text{VREF}</math></b> |
|----------------|---------------------------------------|
| $\leq 3/40$    | +0.08                                 |
| $\leq 9/100$   | +0.04                                 |
| $\leq 21/200$  | +0.00                                 |
| $\leq 1/8$     | -0.06                                 |
| $\leq 4/25$    | -0.12                                 |
| $\leq 41/200$  | -0.18                                 |
| $\leq 1/2$     | -0.24                                 |
| $> 1/2$        | Previous VREF                         |

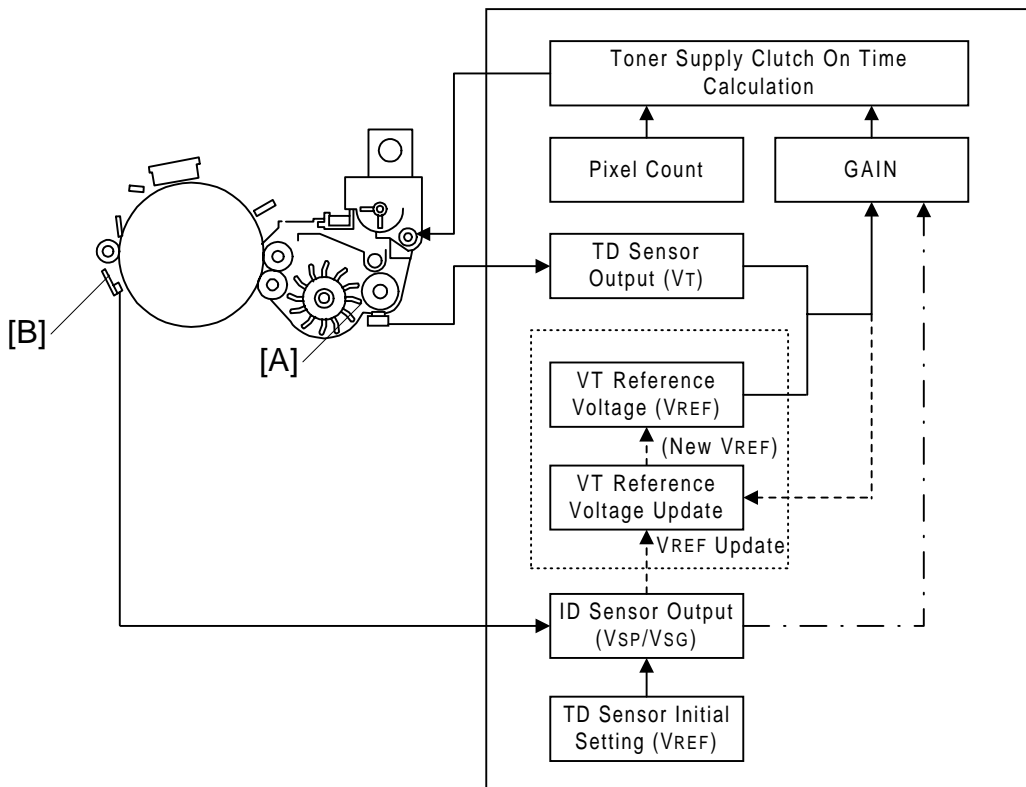
When SC353 or SC354 is generated, VREF is not updated. The machine uses the current value.

VREF is updated during process control initial setting. It is also updated at the end of the copy job, if 10 or more copies have been made since the last VREF update. It is not updated at the start of a job or at any time during a job.

## 2.5.2 TONER DENSITY CONTROL

### Overview

There are two modes for controlling toner supply: sensor control mode and image pixel count control mode. The mode can be selected with SP2-208. The factory setting is sensor control mode. Image pixel count mode should only be used if the TD or ID sensor is defective and cannot be replaced immediately.



A294D644.WMF

Detailed Descriptions

### Sensor Control Mode

#### Introduction

In sensor control mode, the machine varies toner supply for each copy to maintain the correct proportion of toner in the developer and to account for changes in drum reflectivity over time. The adjustment depends on two factors.

- Amount of toner needed to print the page (based on the black pixel amount for the page).
- Readings from the TD sensor [A] and ID sensor [B].

Sensor control mode has two phases, called 'ID sensor control' and 'TD sensor control'. In ID sensor control, VSP/VSG from the most recent ID sensor pattern check determines the GAIN factor in the toner supply calculation (see later in this section). In TD sensor control mode, GAIN depends on the current TD sensor output also (VT – VREF is used).

The phase that is used depends on the number of copies since the start of the job. See the table below for details.

| Number of copies in the job | Copy no. | Control method    |
|-----------------------------|----------|-------------------|
| 10 or fewer                 | 1 to 10  | ID Sensor Control |
| More than 10                | First 10 | ID Sensor Control |
|                             | From 11  | TD Sensor Control |

### ***Toner Density Sensor Initial Setting***

When new developer is installed, TD sensor initial setting must be done using SP2-801. This sets the sensor output to 2.5 V. This value will be used as the TD sensor reference voltage (VREF).

If the sensor output cannot be adjusted to within the standard, SC341 or SC342 is logged and the toner density control is set to the pixel count control.

### ***VSP and VSG Detection***

The ID sensor detects the following voltages.

- VSG: The ID sensor output when checking the drum surface
- VSP: The ID sensor output when checking the ID sensor pattern

In this way, the reflectivity of both the drum and the pattern on the drum are checked.

The ID sensor pattern is made on the drum with the charge corona and laser diode.

### ***VREF Update***

To update VREF (the TD sensor reference voltage), VSP/VSG is detected at the end of the copy job, if 10 or more copies have been made since the last VREF update. This compensates for any variations in the reflectivity of the pattern on the drum or the reflectivity of the drum surface. The 10-copy interval can be changed using SP2-210.

VREF is also updated during process control initial setting.

If the reading of the ID sensor becomes abnormal while checking the ID sensor pattern, SC350, SC351, or SC352 is logged and the toner density control is done using TD sensor only.

See "VREF Update" in the Process Control section for more details.



***VT Detection***

The toner density in the developer is detected once every copy cycle, after the trailing edge of the image passes the development roller.

If the reading from the TD sensor becomes abnormal during a copy job, the machine holds the GAIN factor constant to allow toner supply to vary with only the pixel count for the rest of the copy job. Then at the end of the job, SC340 is generated and the machine must be repaired.

If the TD sensor needs to be replaced and none is available, the toner supply mode can be set to image pixel count mode using SP2-208.

***Image Pixel Count***

For each copy, the CPU adds up the value of each pixel and converts the sum to a value between 0 and 255. (The value would be 255 if the page was all black.)

***Gain Determination***

GAIN is another factor in the toner supply clutch on time calculation. Its value can be 0, 1, 1.5, 2, 3, or 4. It is calculated either using VSP/VSG if ID sensor control is being used, or every copy using “VT – VREF” if TD sensor control is being used (see Sensor Control Mode – Overview for more on TD and ID sensor control).

| <b>ID Sensor Control</b> |      |
|--------------------------|------|
| VSP/VSG                  | GAIN |
| $\leq 3/40$              | 0    |
| $\leq 9/100$             | 0    |
| $\leq 21/200$            | 1    |
| $\leq 1/8$               | 1.5  |
| $\leq 4/25$              | 2    |
| $\leq 41/200$            | 3    |
| $\leq 1/2$               | 4    |
| $> 1/2$                  | 1    |

| <b>TD Sensor Control</b> |      |
|--------------------------|------|
| $a = VT - VREF$          | GAIN |
| $a < 0.00$               | 0    |
| $0.00 \leq a < 0.02$     | 1    |
| $0.02 \leq a < 0.08$     | 2    |
| $0.08 \leq a < 0.14$     | 3    |
| $0.14 \leq a$            | 4    |

***Toner Supply Clutch On Time Calculation***

The toner supply clutch on time for each copy is decided using the following formula: (GAIN x Image pixel count x  $0.7\text{mg}/\text{cm}^2/\text{Toner Supply Rate}$ ) + 50 ms

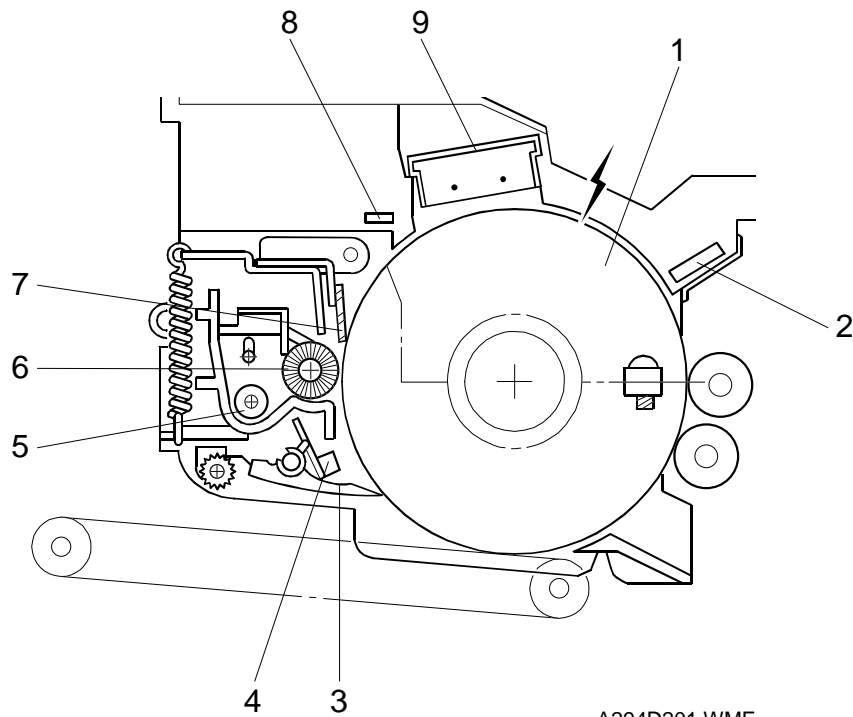
When GAIN is “0”, the above 50 ms is set to “0”.

The toner supply rate can be changed using SP2-209.

***Image Pixel Count Control***

This mode should only be use as a temporary countermeasure while waiting for replacement parts, such as a TD sensor. This mode controls the toner supply using the same formula for the toner supply clutch on time. However, the GAIN value is fixed at 0.7.

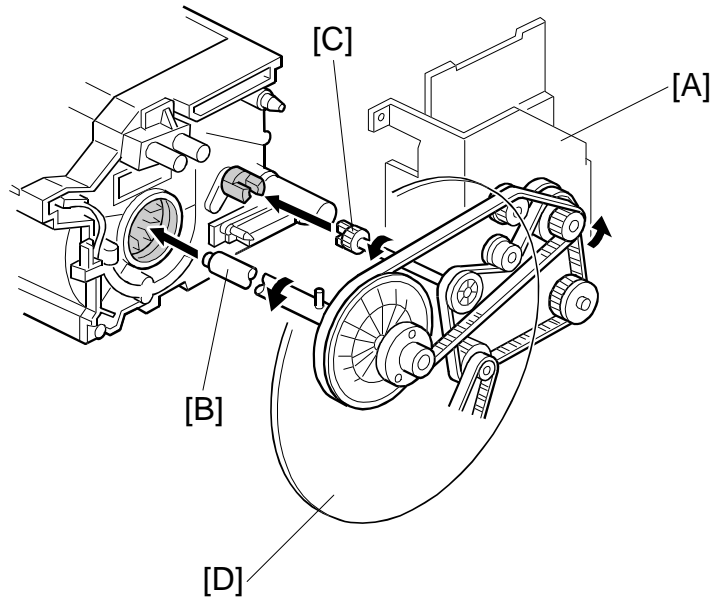
### 2.5.3 DRUM UNIT COMPONENTS



The drum unit consists of the components shown in the above illustration. An organic photoconductor drum (diameter: 100 mm) is used for this model.

- |                          |                       |
|--------------------------|-----------------------|
| 1. OPC Drum              | 6. Cleaning Brush     |
| 2. Drum Potential Sensor | 7. Cleaning Blade     |
| 3. Pick-off Pawl         | 8. Quenching Lamp     |
| 4. Image Density Sensor  | 9. Charge Corona Unit |
| 5. Toner Collection Coil |                       |

## 2.5.4 DRIVE



A294D202.WMF

Detailed  
Descriptions

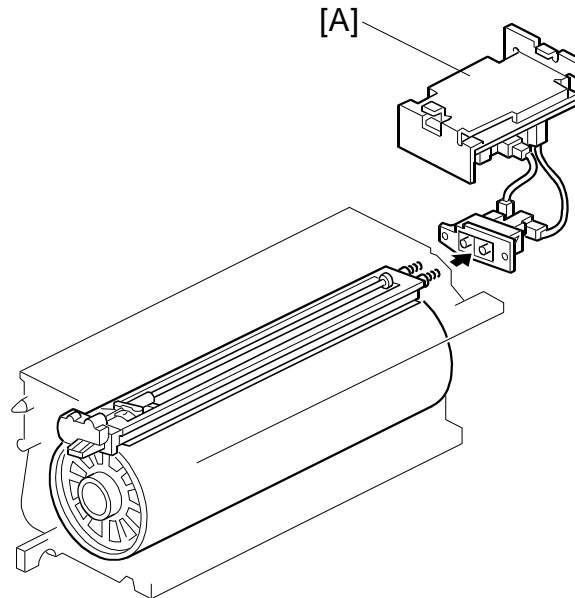
The drive from the drum motor [A] is transmitted to the drum and the cleaning unit through some timing belts, gears, the drum drive shaft [B], and the cleaning unit coupling [C].

The drum motor has a drive controller, which outputs a motor lock signal when the rotation speed is out of the specified range.

The fly-wheel [D] on the end of the drum drive shaft stabilizes the rotation speed.

## 2.5.5 DRUM CHARGE

### *Overview*



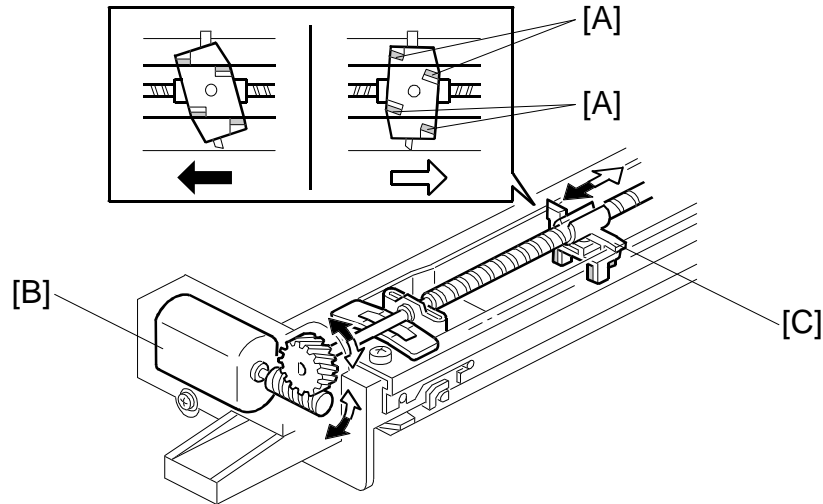
A294D203.WMF

This copier uses a double corona wire scorotron system to charge the drum. Because of the high speed of this copier, two corona wires are needed to give a sufficient negative charge to the drum surface. The stainless steel grid plate makes the corona charge uniform and controls the amount of negative charge on the drum surface by applying a negative voltage to the grid.

The charge/bias/grid power pack [A] gives a constant corona current to the corona wires ( $-1,200 \mu\text{A}$ ).

The voltage to the grid plate is automatically controlled to maintain the correct image density in response to changes in drum potential caused by dirt on the grid plate and charge corona casing. This is described in the Process Control section in more detail.

### ***Charge Corona Wire Cleaning***



A294D558.WMF

 Detailed  
Descriptions

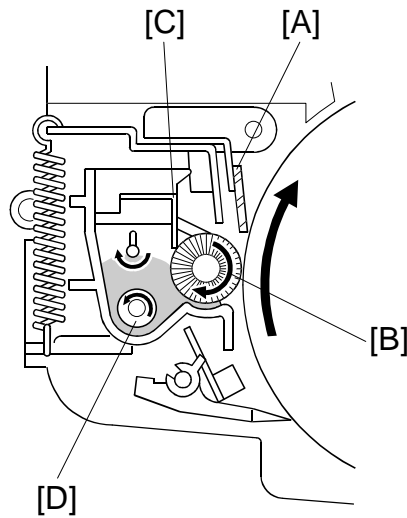
Air flowing around the charge corona wire may deposit toner particles on the corona wires. These particles may interfere with charging and cause low density bands on copies.

The wire cleaner pads [A] automatically clean the wires to prevent such a problem.

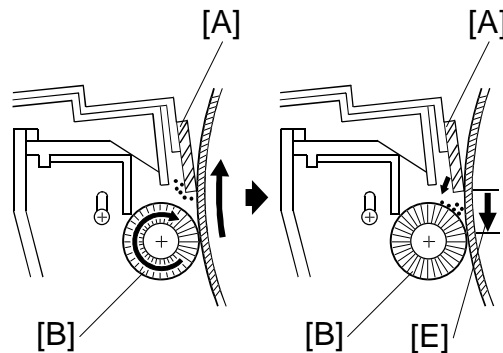
The wire cleaner is driven by a dc motor [B]. Normally the wire cleaner [C] is at the front end (this is the home position). Just after the main switch is turned on, the wire cleaner motor turns on to bring the wire cleaner to the rear and then back to the home position. When the wire cleaner moves from the rear to the home position (black arrow in the illustration), the wire cleaner pads clean the wires. Cleaning is done at auto process control, if 5,000 copies were made since the wires were cleaned last, but only if the fusing temperature is less than 100°C.

## 2.5.6 DRUM CLEANING

### Overview



A294D204.WMF



A294D205.WMF

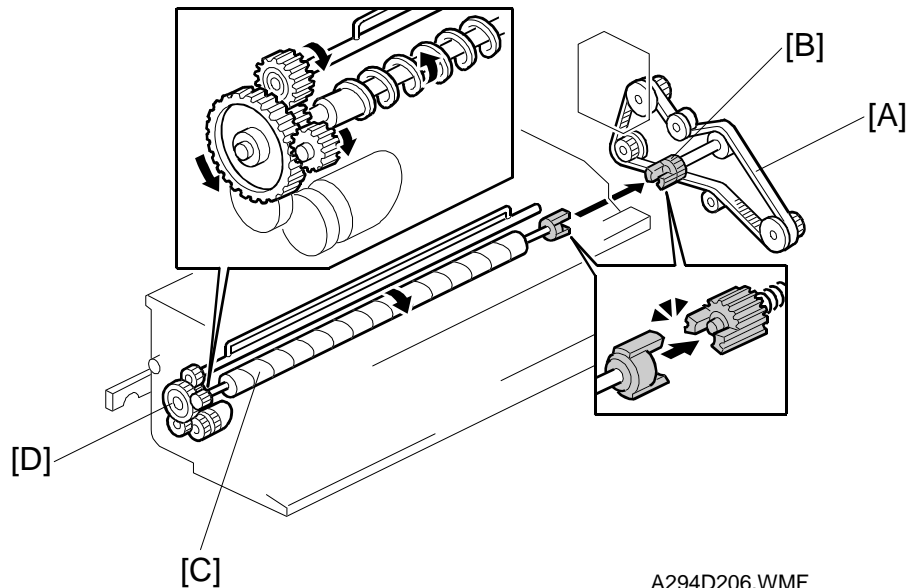
This copier uses a counter blade system to clean the drum. In a counter blade system, the drum cleaning blade [A] is angled against drum rotation. The counter blade system has the following advantages:

- Less wearing of the cleaning blade edge
- High cleaning efficiency

Due to the high efficiency of this cleaning system, the pre-cleaning corona and cleaning bias are not used for this copier.

The cleaning brush [B] helps the cleaning blade. The brush removes toner from the drum surface and any remaining toner is scraped off by the cleaning blade. Toner on the cleaning brush is scraped off by the mylar [C] and falls onto the toner collection coil [D]. The coil transports the toner back to the toner entrance tank in the toner bank unit for recycling.

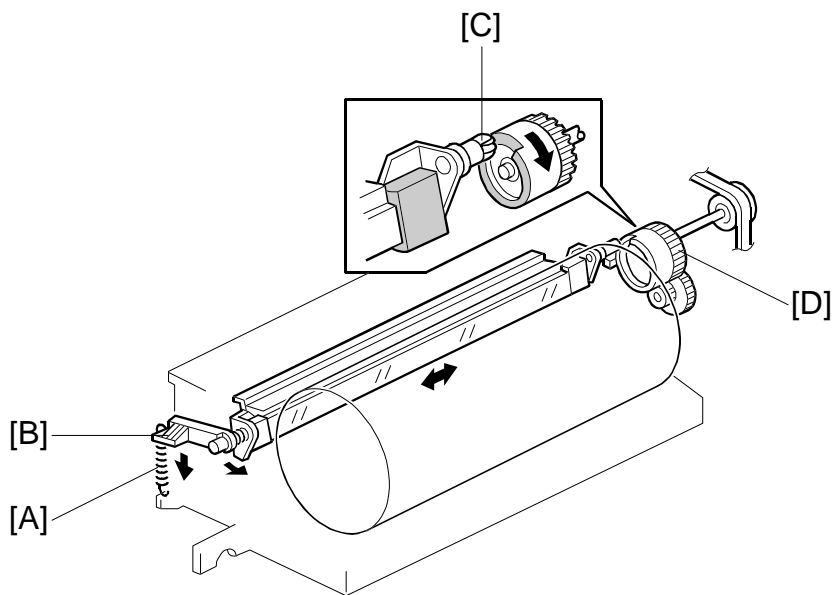
To remove any accumulated toner at the edge of the cleaning blade, the drum turns in reverse for about 4 mm [E] at the end of every copy job. The accumulated toner is deposited on the drum and is removed by the cleaning brush.

***Cleaning Unit Drive***

Detailed  
Descriptions

Drive from the drum motor is transmitted to the cleaning unit drive gear via the timing belt [A] and the cleaning unit coupling [B]. This coupling drives the cleaning brush [C] directly. The cleaning brush then transmits the drive to the gear at the front, which drives the toner collection coil gear [D].

Toner recycling is described in the Toner Supply and Recycling section.

***Cleaning Blade Pressure and Side-to-Side Movement***

A294D207.WMF

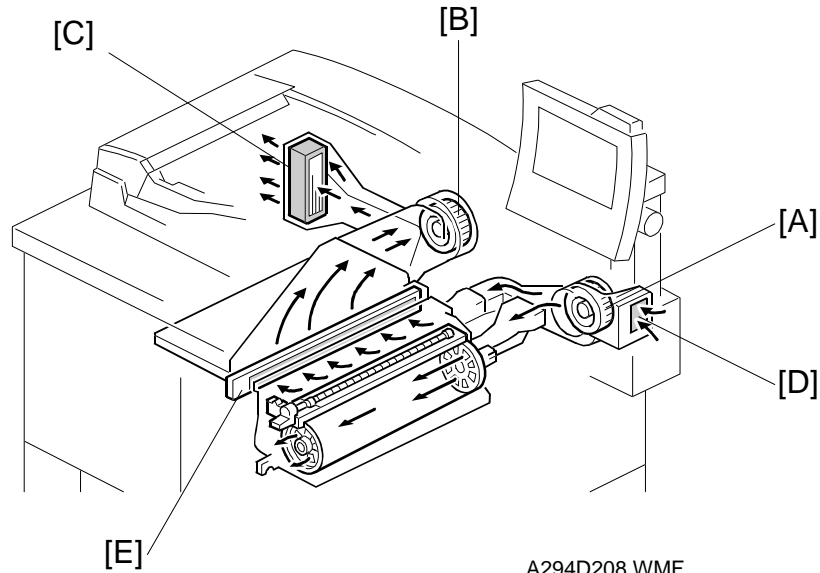
The spring [A] always pushes the cleaning blade against the drum. The cleaning blade pressure can be manually released by pushing up the release lever [B]. To prevent cleaning blade deformation during transportation, the release lever must be locked in the pressure release (upper) position.

The guide roller [C] at the rear end of the cleaning blade holder touches the cam gear [D], which moves the blade from side to side. This movement helps to disperse accumulated toner to prevent early blade edge wear.



## 2.5.7 OTHERS

### *Air Flow Around the Drum*



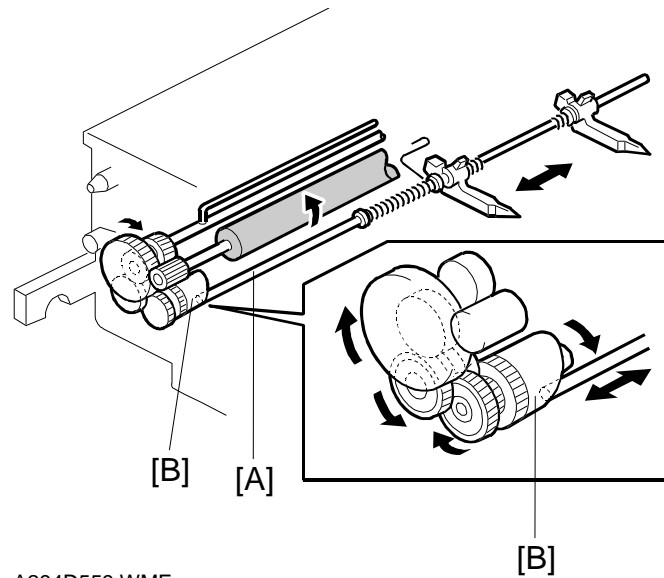
Detailed  
Descriptions

The drum cooling fan [A] provides air flow into the drum to cool the drum and the charge corona unit to prevent uneven build-up of negative ions that can cause uneven drum surface charge. The exhaust fan [B] located above the fusing unit causes air to flow out of the machine.

An ozone filter [C] absorbs the ozone around the drum.

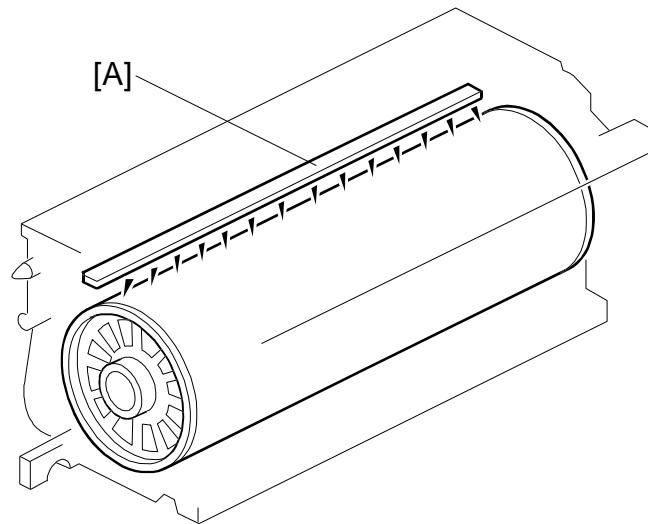
To keep the temperature inside the machine constant, the drum cooling fan and the exhaust fan turn slowly during stand-by, and turn quickly during copying.

To prevent foreign matter from entering the copier inside, there is a dust protection filter in the entrance [D] of the duct. Another dust filter [E] prevents dust from reaching the ozone filter.

***Pick-off Pawls***

A294D559.WMF

The pick-off pawls always contact the drum surface as a result of weak spring pressure. They move from side to side during the copy cycle to prevent drum wear at any particular location. This movement is made via a shaft [A] and a cam [B].

***Quenching*****Detailed  
Descriptions**

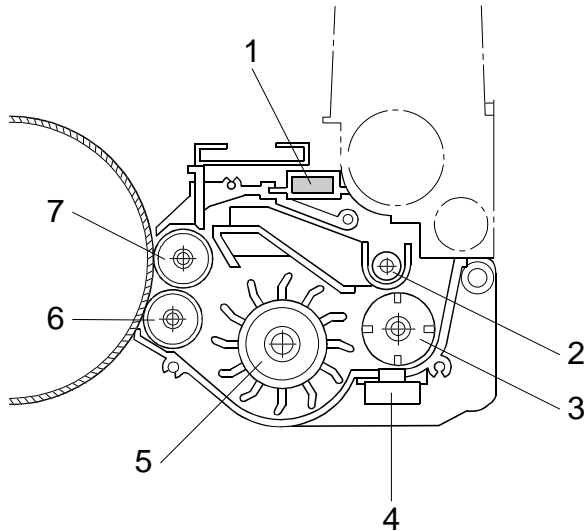
A294D209.WMF

In preparation for the next copy cycle, light from the quenching lamp [A] neutralizes any charge remaining on the drum.

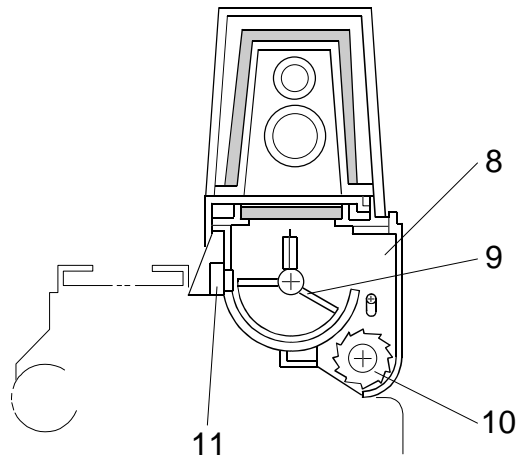
The quenching lamp consists of a line of 16 red LEDs extending across the full width of the drum.

## 2.6 DEVELOPMENT

### 2.6.1 OVERVIEW



A294D301.WMF



A294D302.WMF

- |                             |                             |
|-----------------------------|-----------------------------|
| 1. Development Filter       | 7. Upper Development Roller |
| 2. Toner Auger              | 8. Toner Hopper             |
| 3. Developer Agitator       | 9. Toner Agitator           |
| 4. Toner Density Sensor     | 10. Toner Supply Roller     |
| 5. Paddle Roller            | 11. Toner Hopper Sensor     |
| 6. Lower Development Roller |                             |

This copier uses a double roller development (DRD) system. Each roller has a diameter of 20 mm.

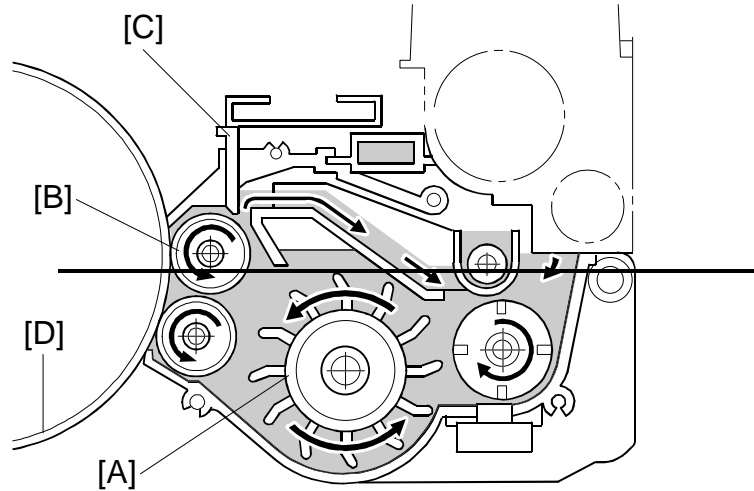
This system differs from single roller development systems in that:

- It develops the image in a narrower area
- It develops the image twice
- The relative speed of each development roller against the drum is reduced.

The particle diameters are about 9.5  $\mu\text{m}$  for toner, and about 70  $\mu\text{m}$  for developer. Both the DRD system and new consumables improve the image quality, especially of thin horizontal lines, the trailing edges of the half-tone areas, and black cross points.

The machine contains a toner recycling system. Toner recycled from the drum cleaning unit is transferred to the toner hopper with fresh toner, where they are mixed by the toner agitator. The mechanism is explained in the Toner Supply and Recycling section.

## 2.6.2 DEVELOPMENT MECHANISM



A294D303.WMF

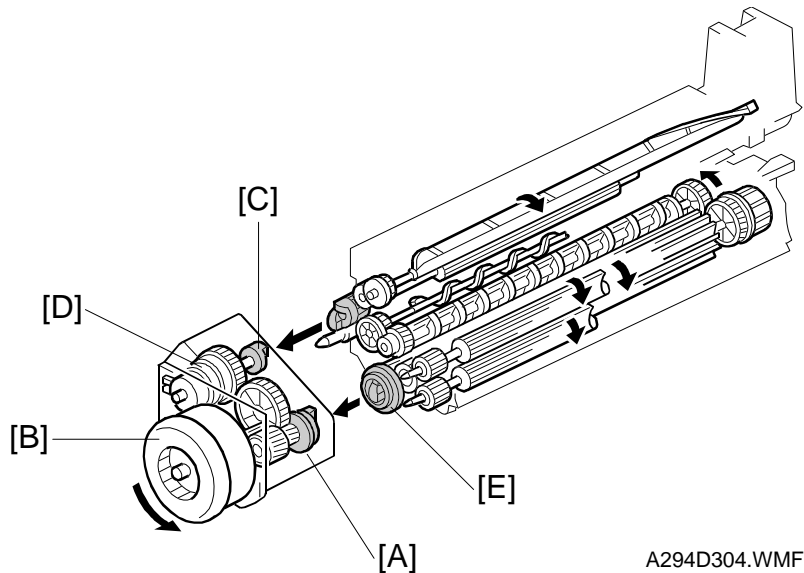
The paddle roller [A] picks up developer and transports it to the upper development roller [B]. Internal permanent magnets in the development rollers attract the developer to the development roller sleeve. The upper development roller carries the developer past the doctor blade [C]. The doctor blade trims the developer to the desired thickness and creates backspill to the cross mixing mechanism.

In this machine, black areas of the latent image are at a low negative charge (about  $-150$  V) and white areas are at a high negative charge (about  $-950$  V).

The development roller is given a negative bias to attract negatively charged toner to the black areas of the latent image on the drum.

The development rollers continue to turn, carrying the developer to the drum [D]. When the developer brush contacts the drum surface, the low-negatively charged areas of the drum surface attract and hold the negatively charged toner. In this way, the latent image is developed.

### 2.6.3 DRIVE

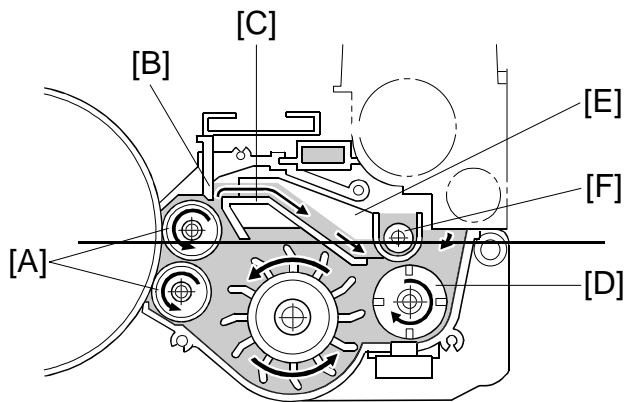


The gears in the development unit are driven by the development drive gear [A] when the development motor [B] (a dc servomotor) turns.

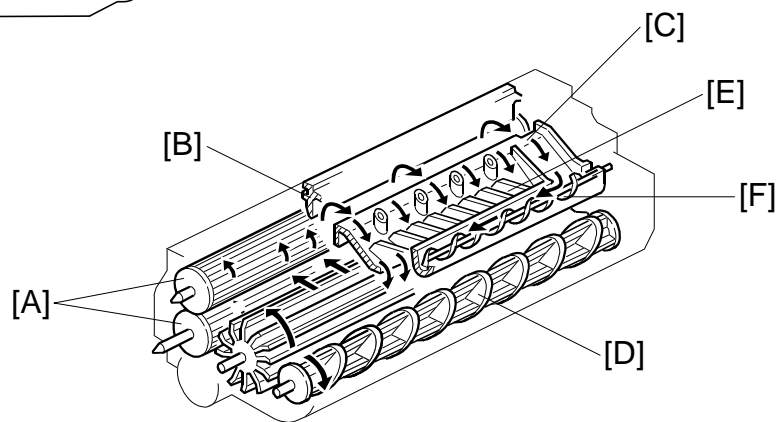
The gears in the toner hopper are driven by the toner supply roller drive gear [C] when the toner supply roller clutch [D] activates.

The above gears are helical gears. Helical gears are more quiet than normal gears. The teeth of the development drive gear are chamfered so that they smoothly engage the development roller gear [E] when the unit is installed.

## 2.6.4 CROSSMIXING



A294D303.WMF



A294D571.WMF

 Detailed  
Descriptions

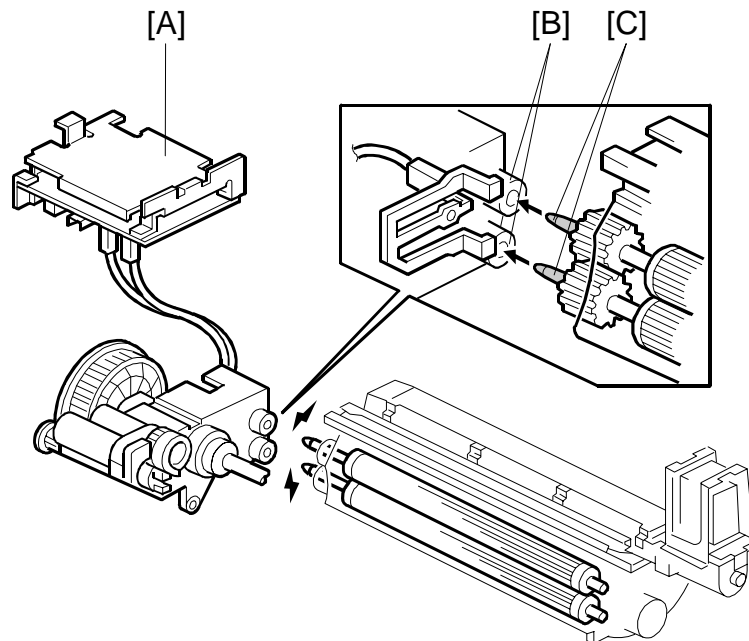
This copier uses a standard cross-mixing mechanism to keep the toner and developer evenly mixed. It also helps agitate the developer to prevent developer clumps from forming and helps create the triboelectric charge.

The developer on the turning development rollers [A] is split into two parts by the doctor blade [B]. The part that stays on the development rollers forms the magnetic brush and develops the latent image on the drum. The part that is trimmed off by the doctor blade goes to the backspill plate [C].

As the developer slides down the backspill plate to the agitator [D], the mixing vanes [E] move it slightly toward the rear of the unit. Part of the developer falls into the auger inlet and is transported to the front of the unit by the auger [F].

The agitator moves the developer slightly to the front as it turns, so the developer stays level in the development unit.

## 2.6.5 DEVELOPMENT BIAS



A294D305.WMF

The charge/bias/grid power pack [A] applies the negative development bias to both the lower sleeve roller and upper sleeve roller through the receptacles [B] and the sleeve roller shafts [C].

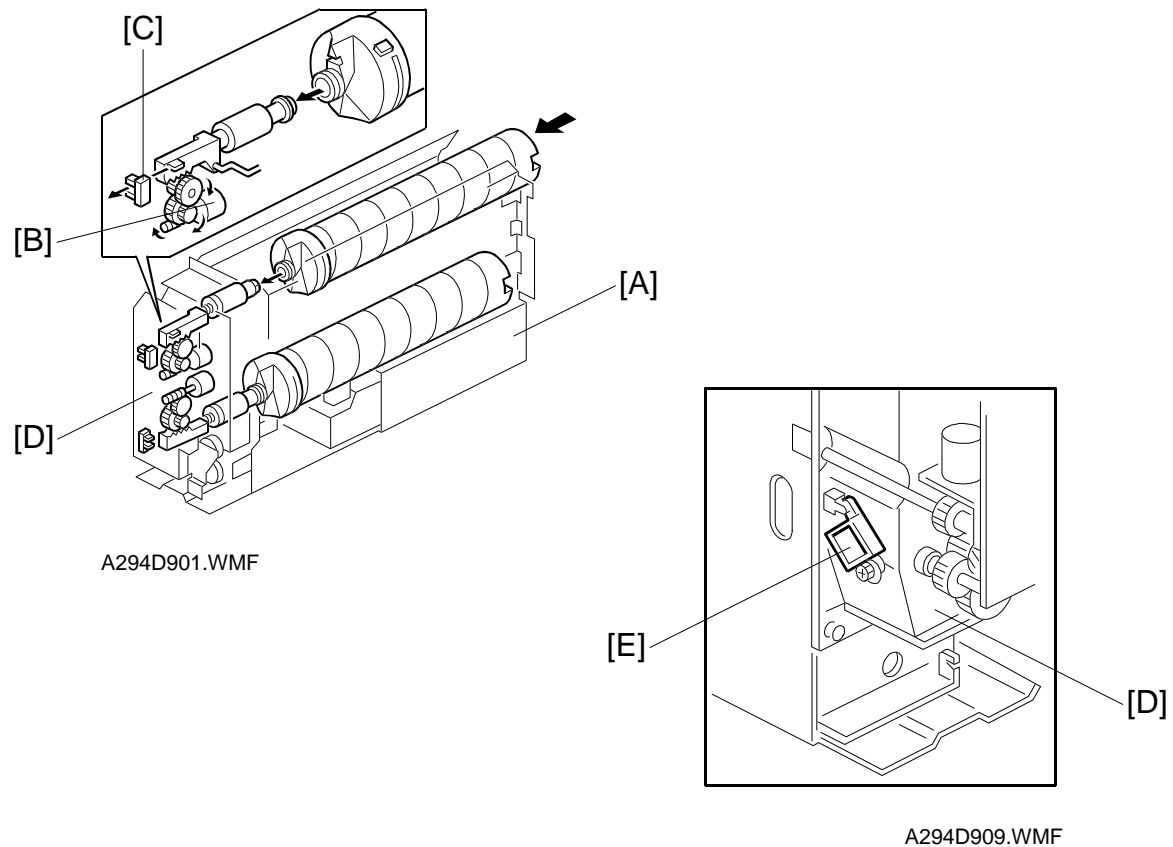
The development bias prevents toner from being attracted to the non-image areas on the drum where there is residual voltage. In addition, the development bias changes with the image density setting chosen by the customer.



## 2.7 TONER SUPPLY AND RECYCLING

### 2.7.1 TONER BANK

#### Overview

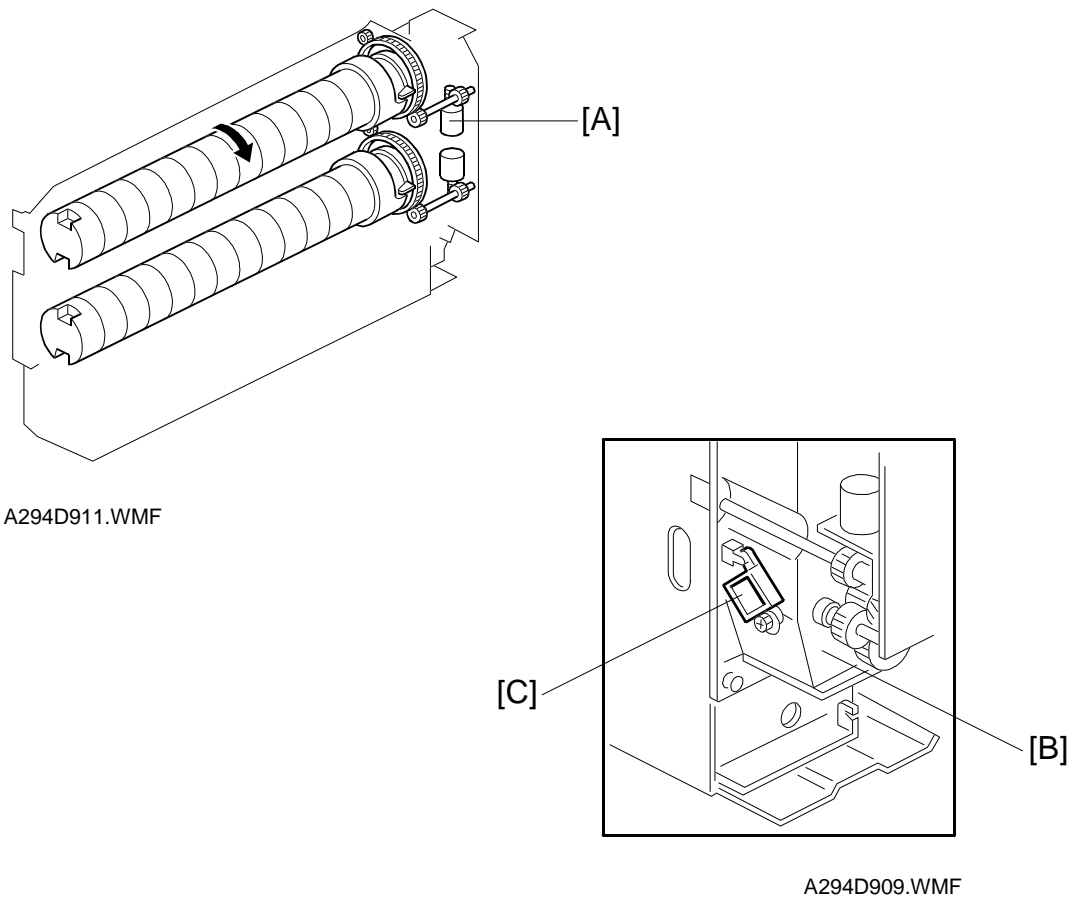


Detailed  
Descriptions

Toner is supplied from a toner bank unit, which is in a different part of the machine from the development unit.

The toner bank [A] holds two toner bottles. The machine works even if there is only one bottle installed. Toner can be supplied from either the upper or lower toner bottle (not from both at the same time). When the upper toner bottle is supplying toner, the upper bottle cap motor [B] pulls out the toner bottle cap. The upper bottle inner cap sensor [C] detects the actuator in the toner bottle opening rod.

Toner is supplied from the toner bottle to the toner entrance tank [D]. The toner near end sensor [E] (at the rear right of the toner bank unit) checks for the presence of toner in the toner entrance tank.

***Toner Near-end and End Detection/Bottle Replacement***

An empty toner bottle can be replaced during printing.

The toner near-end sensor detects toner as it falls from the toner bottle into the toner entrance tank [B]. If the toner near end sensor [C] detects that no toner has come out of the toner bottle, the toner bottle enters the toner near-end condition.

The toner bottle motor [A] then rotates the toner bottle up to 15 times to try to supply toner to the toner entrance tank [B]. If the sensor detects toner more than 5 times, the near-end condition is cleared. However, if the toner near end sensor [C] fails to detect toner 10 consecutive times, 200 more copies can be made from that bottle, then the machine declares it to be empty.

When the bottle is empty, the machine switches to the second toner bottle. The first toner bottle cap motor closes the bottle cap and the second toner bottle cap motor pulls out the second bottle cap. The motors operate until the first bottle inner cap sensor does not detect the actuator and the second bottle inner cap sensor does detect the actuator.

The second toner bottle is then rotated up to 15 times. If the near-end sensor detects toner after 5 times, the machine can print from that bottle.

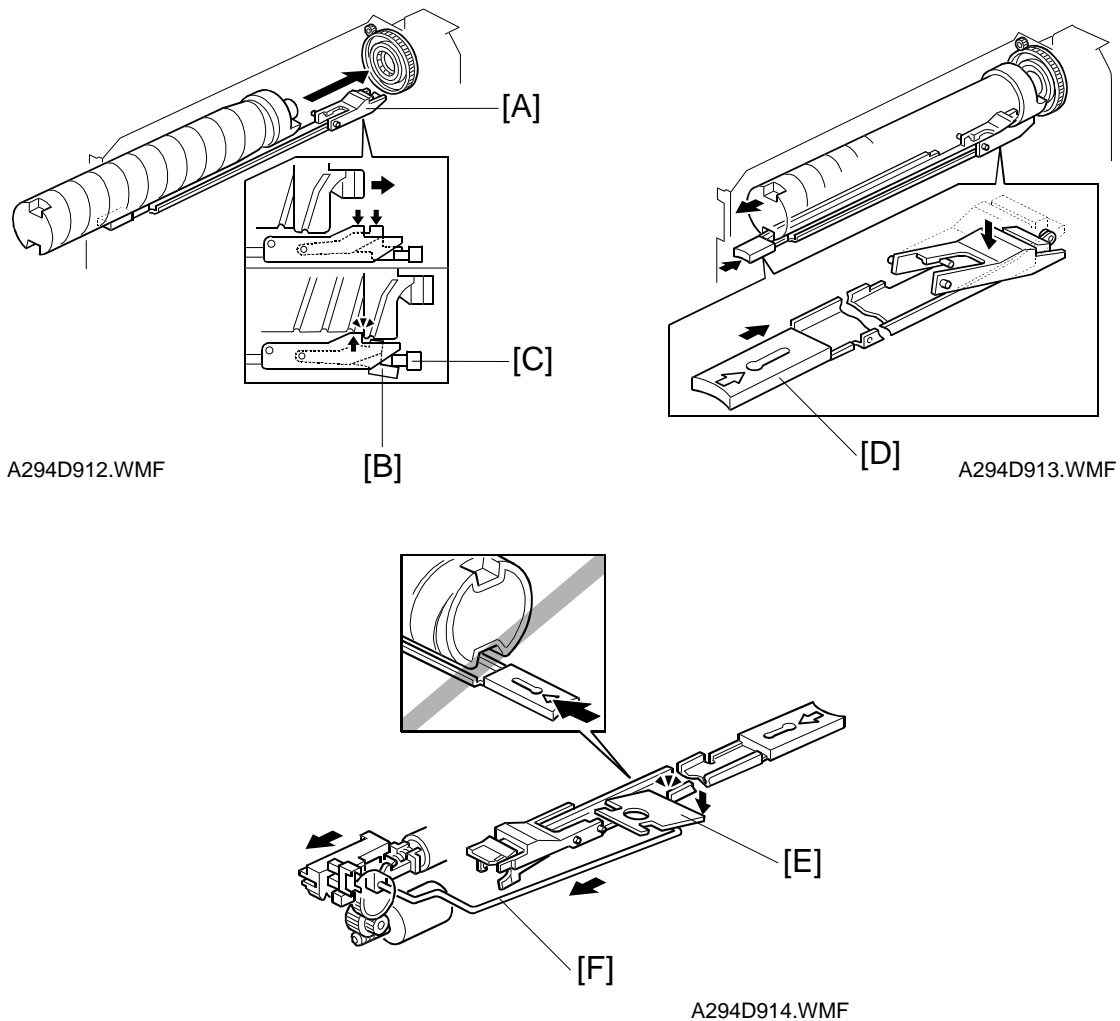
Meanwhile, the machine indicates that the first bottle is empty. When the user takes out the old bottle, and puts in a new one, this is detected by the toner bottle sensor (see the next page for more about the toner bottle sensors). However, this bottle is not tested until the second bottle is empty.

**NOTE:** If an empty bottle is not replaced, and the other bottle becomes empty (no toner detected 10 consecutive times, as described above), 200 more copies can be made. Then the machine enters the 'system toner end condition' (both bottles are empty), and this is indicated in the operation panel display.

When the second bottle is empty, the machine switches back to the first bottle.

The first bottle is tested now, by rotating it 15 times as usual. If this bottle is also found to be empty, the machine enters the system toner end condition. This time, the machine cannot print until one of the toner bottle sensors detects that a new toner bottle has been inserted (the machine does not allow the 200 extra copies).

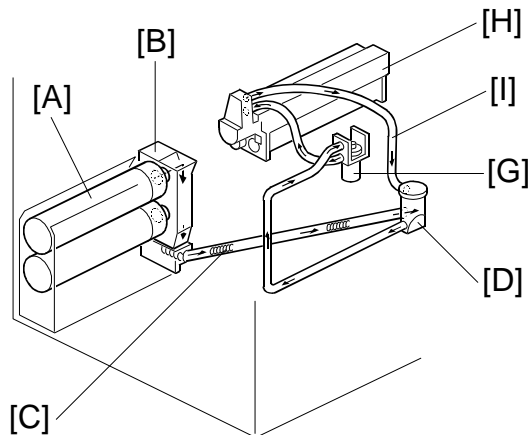
When both bottles are empty and a new toner bottle is placed in the toner bank, the new toner bottle is rotated 15 times to supply toner to the toner entrance tank. If the toner near end sensor then detects toner in the toner entrance tank, the system toner end condition is cleared. If the toner near end sensor detects there is still no toner in the toner entrance tank, the bottle cap motor closes the toner bottle cap. The system toner end condition continues and printing is not possible.

***Toner Bottle Sensors***

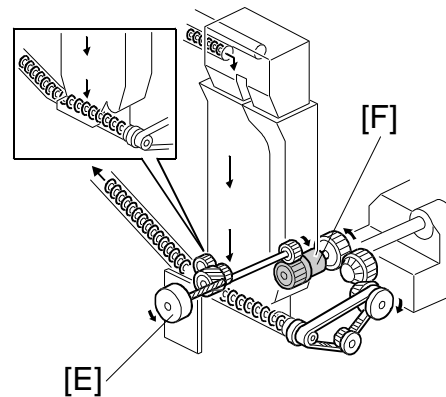
When placing a toner bottle in the toner bank, the toner bottle pushes the lock arm [A] downwards. Then the lock arm catches the toner bottle. Also, lever [B] is pushed down, which causes the toner bottle sensor [C] to detect that a bottle has been installed (the actuator leaves the toner bottle sensor while the bottle is being inserted in the holder).

When replacing a toner bottle, push the toner bottle release lever [D] to release the lock mechanism. When a toner bottle is being used to supply toner, the toner bottle opening rod is pulled to the rear and the lock plate [E] is lowered by the link [F] so that the toner bottle release lever cannot be pushed. Therefore, the toner bottle that is supplying toner is locked in place. The user cannot pull out the bottle until it is empty.

## 2.7.2 SUPPLYING TONER TO THE DEVELOPMENT UNIT



A294D902.WMF



A294D906.WMF

 Detailed  
Descriptions

The toner bottle motor turns the toner bottle, causing toner to leave the toner bottle [A] and drop into the toner entrance tank [B]. Recycled toner in the tube from the drum cleaning unit also enters the toner entrance tank, and is mixed with fresh toner from the toner bottle.

The toner transport coil [C] in the toner transport tube transports toner to the toner supply cylinder [D]. The toner bank motor [E] drives the toner transport coil via the toner supply coil clutch [F].

The toner supply motor [G] pushes air toward the toner hopper. Toner in the toner supply cylinder is transported from the toner supply cylinder to the toner hopper [H]. The toner hopper has two air pressure release filters and an air return tube [I] connected to the toner supply cylinder. Air returns to the toner supply cylinder from the toner hopper.

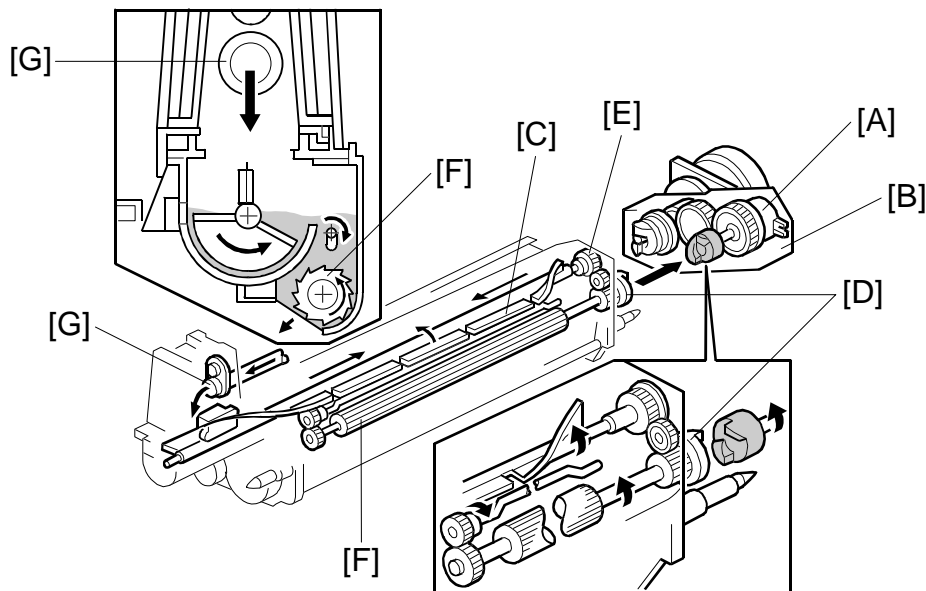
If the toner hopper sensor (in the toner hopper – see ‘Toner Hopper’) detects that there is insufficient toner in the hopper, the toner bank mechanism is started up. If there is toner in the toner entrance tank (detected by the toner near end sensor in the toner bank), the toner supply coil clutch turns on for 2 seconds. The toner supply motor turns on for 7 seconds at the same time as the toner supply coil clutch. After this, if the toner hopper sensor still does not detect toner, the toner supply coil clutch turns on for two seconds again until the toner hopper sensor detects toner (this is done for a maximum of 10 times). When the toner hopper sensor detects toner, the toner supply motor turns off 1 second after the toner supply coil clutch turns off.

If the toner hopper sensor does not detect toner in the toner hopper after the toner supply coil clutch has turned on ten times, the operation panel indicates SC495 (toner bank error).

The toner supply motor sensor monitors the toner supply motor. If the sensor detects that the motor does not rotate during the toner supply process, the operation panel indicates SC591 (toner supply motor lock).

### 2.7.3 TONER HOPPER

#### *Toner Supply*

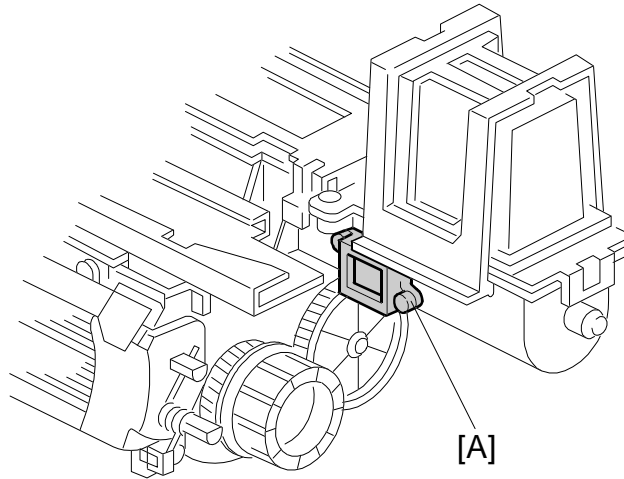


A294D306.WMF

When the toner supply roller clutch [A] (inside the development motor unit [B]) turns on, the agitator [C] mixes the toner transported by the air tube [G] from the toner bank (the toner from the toner bank is new toner mixed with recycled toner). Then it moves the toner from front to rear and sends it to the toner supply roller. Toner is caught in the grooves in the toner supply roller [F]. Then, as the grooves turn past the opening, the toner falls into the development unit.

The toner supply roller clutch [A] transfers drive from the development motor to the toner supply roller gear [D], which drives the agitator gear [E].

For details about Toner Supply Control, see Drum Unit – Toner Supply Control.

***Toner Hopper Empty Detection***

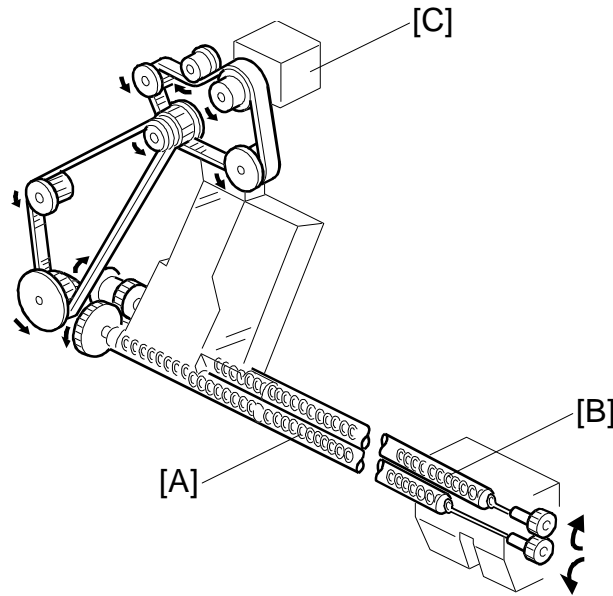
A294D307.WMF

Detailed  
Descriptions

The toner hopper sensor [A] detects whether there is enough toner in the toner hopper. The toner hopper sensor checks for toner once when the toner supply roller clutch turns on. When there is only a small amount of toner inside the toner hopper and pressure on the toner hopper sensor becomes low, the toner hopper sensor outputs a pulse signal (once per copy). Then the toner bank mechanism supplies more toner to the toner hopper, as explained in previous sections.

## 2.7.4 TONER RECYCLING AND WASTE TONER COLLECTION

### *Overview*



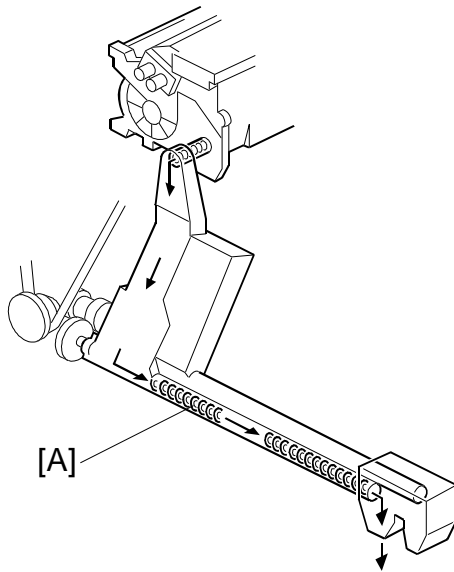
A294D903.WMF

Recycling: The toner recycling coil in the tube [A] transports the toner collected by the drum cleaning to the toner entrance tank for recycling.

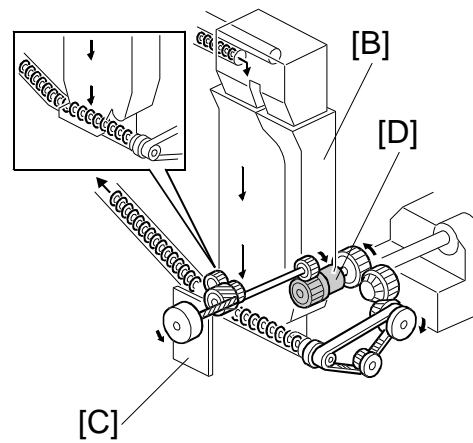
Waste toner collection: The toner collection coil in the tube [B] transports the toner collected by the transfer belt unit to the waste toner collection bottle.

The drum motor [C] drives the toner recycling coil [A] via timing belts and gears, whose rotation in return drives the toner collection coil [B] via gears.



***Toner Recycling***

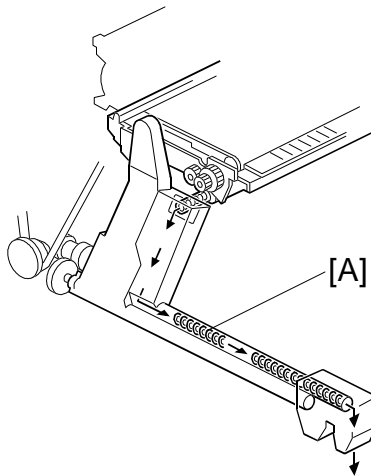
A294D904.WMF



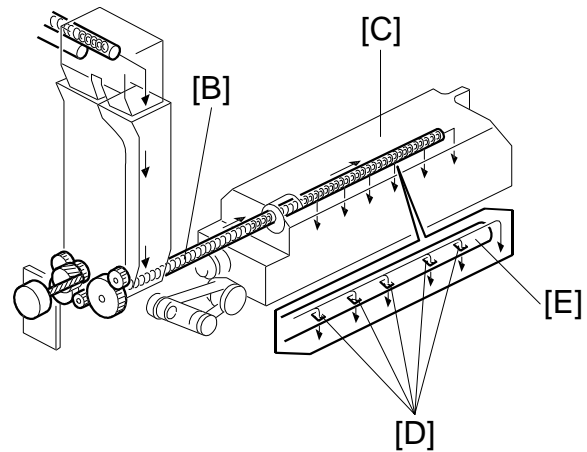
A294D906.WMF

Detailed  
Descriptions

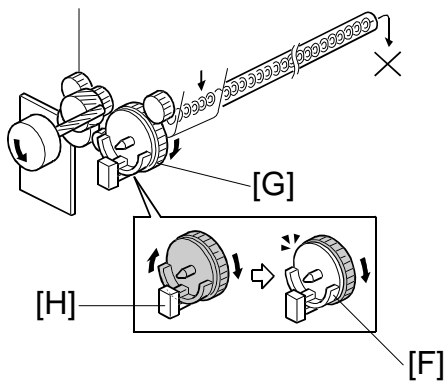
The toner recycling coil in the tube [A] transports the toner collected by the drum cleaning unit to the toner entrance tank [B] for recycling. This toner is dropped into the toner entrance tank and mixed with fresh toner from the toner bottle. The toner bank motor [C] drives the toner transport coil via the toner supply coil clutch [D].

**Waste Toner Collection**

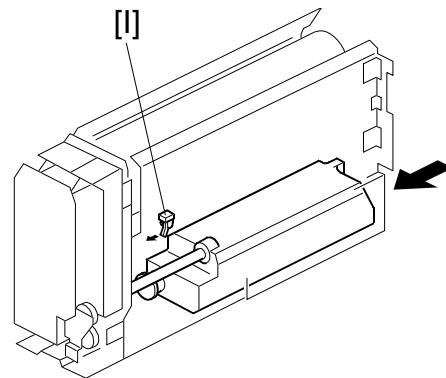
A294D905.WMF



A294D908.WMF



A294D907.WMF



A294D910.WMF

The toner collection coil in the tube [A] transports the toner collected by the transfer belt unit to the waste toner collection bottle. This toner contains paper dust and cannot be recycled.

The waste toner coil [B] transports the waste toner dropped from the toner collection coil tube to the waste toner collection bottle [C]. The waste toner coil tube has five holes [D] and the end [E] of the tube is open. The waste toner drops from these holes.

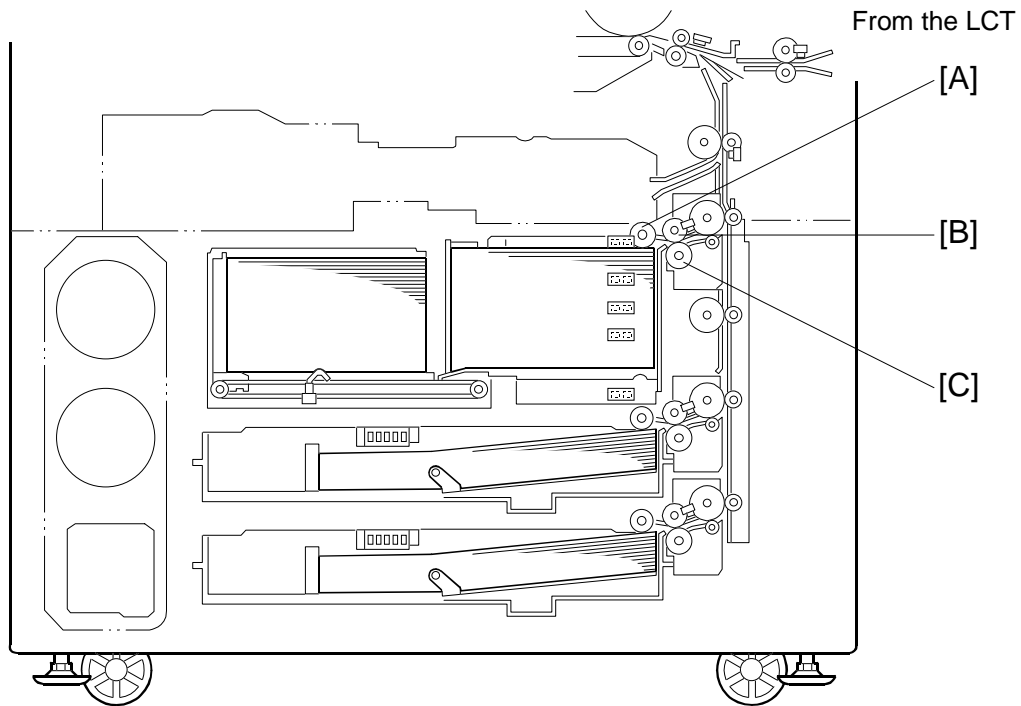
When the waste toner collection bottle fills up, the pressure in the bottle increases and the waste toner coil becomes harder to turn. Then, the actuator plate [F] does not rotate because the waste toner coil drive gear [G] has a torque limiter, and the output of the toner overflow sensor [H] becomes constant. In this condition, the operation panel LCD indicates "Waste Toner Full" and printing is disabled.

The bottle contains 1,000 g to 1,200 g of waste toner. The amount of waste toner from the transfer belt unit is around 3 g per 10 k copies. Three to four million copies (3,000 to 4,000 k) can be made before the waste toner bottle becomes full.

If the waste toner bottle is not properly placed inside the toner bank, the operation panel LCD indicates SC496 (toner collection bottle error). The toner collection bottle sensor [I] detects this condition.

## 2.8 PAPER FEED

### 2.8.1 OVERVIEW



Detailed  
Descriptions

A294D701.WMF

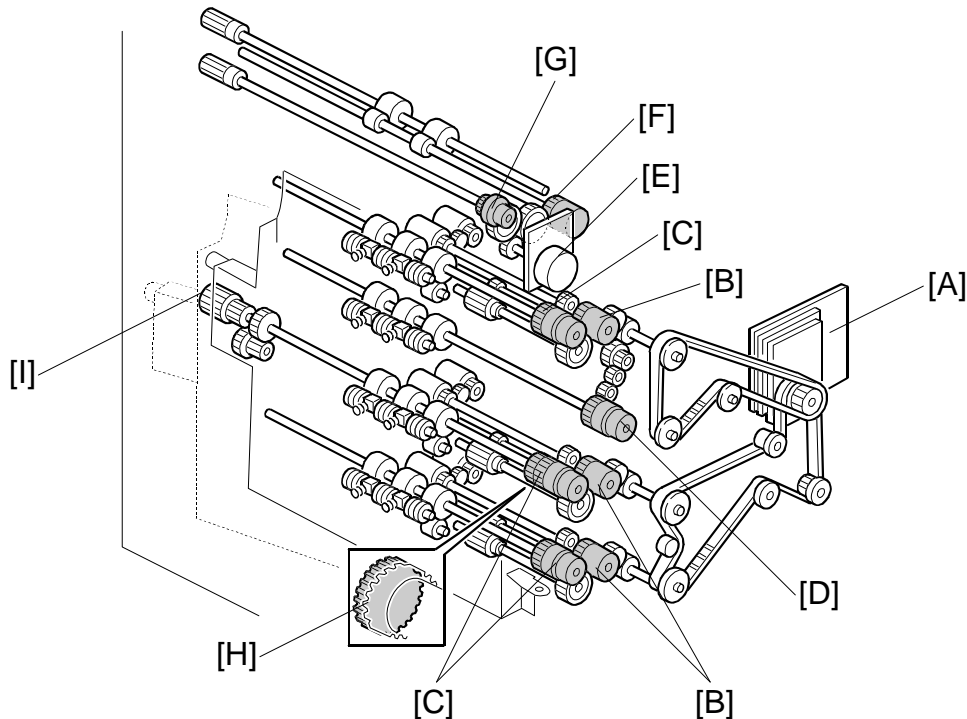
This model has three paper tray feed stations.

The 1st tray is the tandem feed tray. It can hold 2,000 sheets of paper (1,000 sheets x 2 stacks). It can be converted to a 1,000-sheet tray for larger paper sizes with an optional kit.

The 2nd and 3rd trays are universal trays. They can each hold 500 sheets of paper.

All feed stations use an FRR feed system. Rotation of the pick-up roller [A] drives the top sheet of paper to the feed [B] and separation [C] rollers. These rollers then take over the paper drive. If the pick-up roller feeds more than one sheet, the separation rollers rotate in the opposite direction and prevent all but the top sheet from passing through to the registration rollers.

## 2.8.2 DRIVE



A294D709.WMF

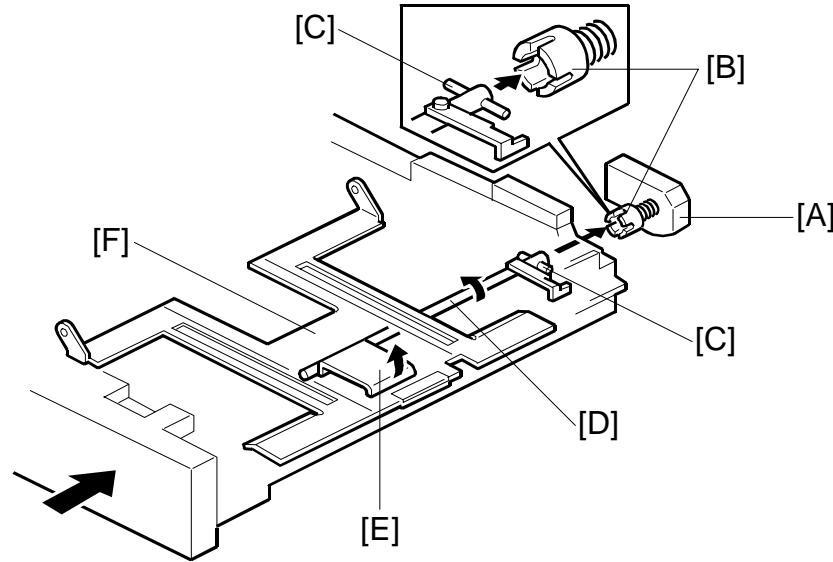
- [A]: Paper Feed Motor
- [B]: Paper Feed Clutches 1 to 3
- [C]: Vertical Transport Clutches 1 to 3
- [D]: Lower Relay Clutch
- [E]: Relay Motor
- [F]: Upper Relay Clutch
- [G]: LCT Relay Clutch

The paper feed motor [A] drives feed, pick-up, and separation rollers in trays 1, 2, and 3 via timing belts, clutches [B], and gears. The paper feed motor also drives the vertical transport rollers and the lower relay roller. Drive is transferred to each of the three vertical transport rollers by a vertical transport clutch [C], and to the lower relay roller by the lower relay clutch [D].

The relay motor [E] drives the upper relay roller and LCT relay roller via gears and clutches [F] and [G].

The 2nd vertical transport clutch has a one-way-gear [H]. This prevents the clutch from slipping when the knob [I] is turned to remove jammed paper in the paper feed tray and vertical transport area.

### 2.8.3 PAPER LIFT – TRAYS 2 & 3

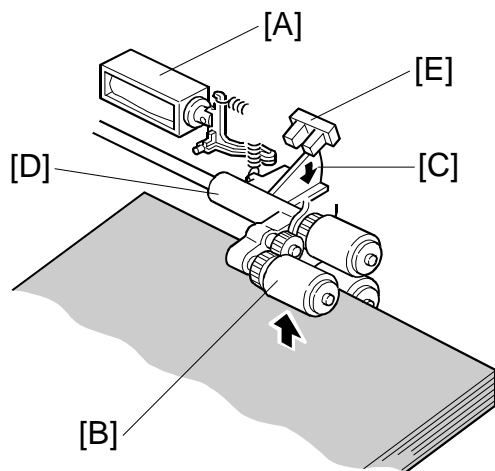


A294D604.WMF

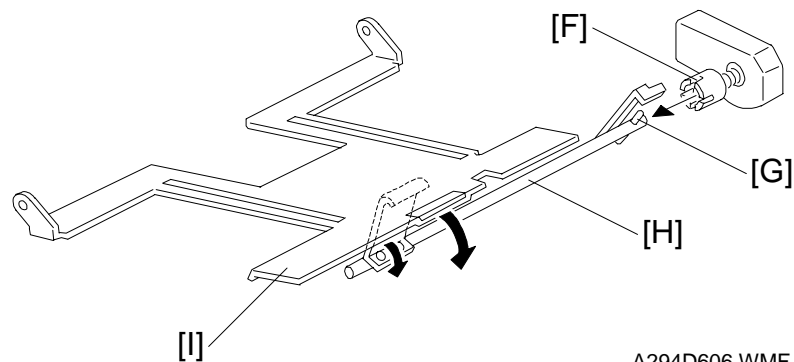
Detailed  
Descriptions

The machine detects when a tray has been placed in the machine by a signal from the paper size switch. When this is detected, the lift motor [A] turns on. The coupling gear [B] on the tray lift motor engages the pin [C] on the lift arm shaft [D], then it turns the tray lift arm [E] to lift the tray bottom plate [F].

For tray 1, an electrical signal from the tray connector automatically informs the cpu when the tray has been placed in the machine.



A294D605.WMF



A294D606.WMF

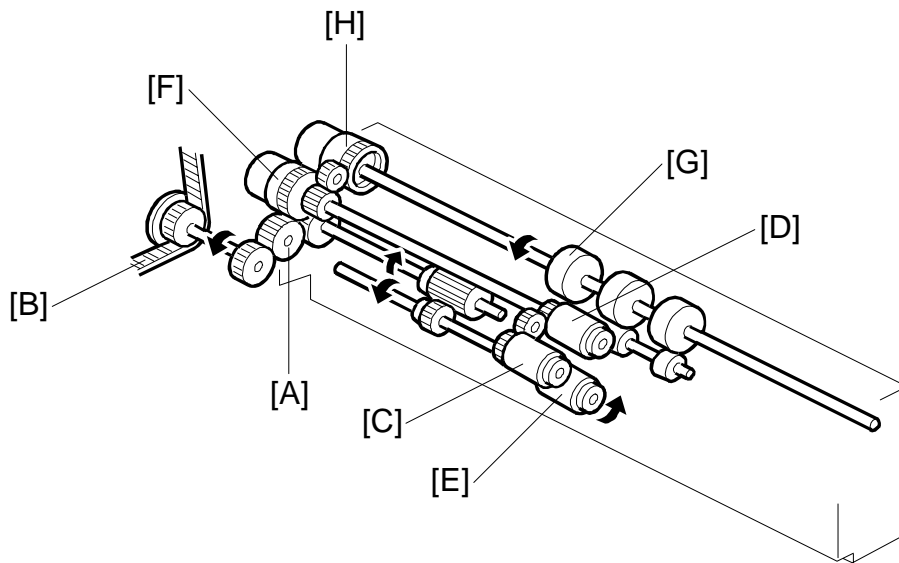
When the lift motor turns on, the pick-up solenoid [A] activates to lower the pick-up roller [B]. When the top sheet of paper reaches the correct height for paper feed, the paper pushes up the pick-up roller, and the actuator [C] on the pick-up roller supporter [D] leaves the lift sensor [E]. Then, the lift motor stops.

After several paper feeds, the paper level gradually lowers and the lift sensor is deactivated. Then the lift motor turns on again until the lift sensor detects the actuator again.

When the tray is drawn out of the feed unit, the lift motor coupling gear [F] disengages the pin [G] of the lift arm shaft [H], then the tray bottom plate [I] drops under its own weight.

## 2.8.4 PICK-UP AND FEED – TRAYS 1 TO 3

### Overview



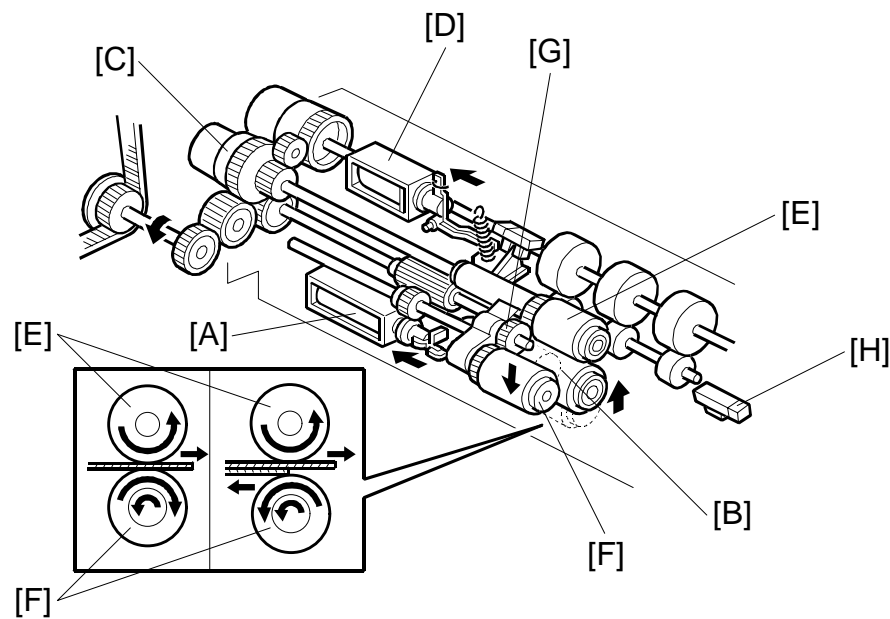
A294D598.WMF

Detailed  
Descriptions

Drive from the paper feed motor is transmitted to the gear [A] in the paper feed unit via the timing belt [B].

Then the gear [A] transmits this drive to the pick-up [C], paper feed [D] and separation [E] rollers via gears and the paper feed clutch [F].

The gear [A] also transmits this drive to the vertical transport roller [G] via gears and the vertical transport clutch [H].

***Pick-up and Feed***

A294D600.WMF

If a paper feed station is not selected, its separation roller solenoid [A] de-activates and the separation roller [B] can turn freely in the opposite direction to paper feed.

When the paper feed station is selected and the start key is pressed, the feed clutch [C], separation roller solenoid [A], and the pick-up solenoid [D] all turn on.

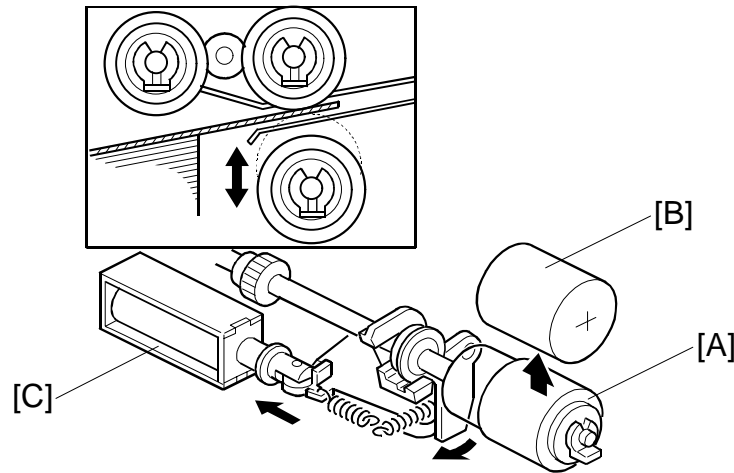
When the feed clutch [C] activates to transfer drive to the feed roller [E], the pick-up roller [F] also turns because it is linked to the feed roller by an idle gear [G].

When the separation roller solenoid [A] turns on, the separation roller [B] contacts the paper feed roller [E] and turns with the feed roller in spite of the torque limiter in the separation roller, which forces it in the opposite direction.

When the pick-up solenoid [D] activates, the pick-up roller [F] lowers to contact the top sheet of the paper stack and send it to the paper feed and separation rollers.

When the paper feed sensor [H] detects the leading edge of the paper, the pick-up solenoid de-energizes to lift the pick-up roller [F], and the vertical transport clutch [I] energizes to feed the paper to the vertical paper feed section.



**Separation Roller Release**

A294D602.WMF

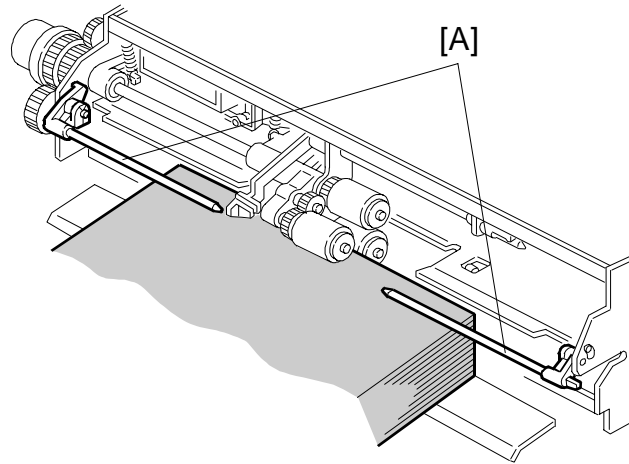
Detailed Descriptions

The separation roller [A] is normally away from the feed roller [B]. When the paper feed station is selected, the separation roller solenoid [C] contacts the separation roller with the feed roller as explained on the previous two pages.

This contact/release mechanism has the following three advantages:

1. When the paper feed motor turns on, all the separation rollers in the three feed stations rotate. If the separation roller is away from the feed roller, it reduces the load on the paper feed motor and drive mechanism, and it also reduces wear to the rubber surface of the separation roller caused by friction between the separation roller and the feed roller.
2. After paper feed is completed, paper sometimes remains between the feed and separation rollers. If the feed tray is pulled out in this condition, this paper might be torn. When the separation roller is away from the feed roller, the remaining paper can be removed from between the rollers.
3. When paper misfeeds occur around this area, the user can easily pull out the jammed paper between the feed and the separation rollers if the separation roller is away from the feed roller.

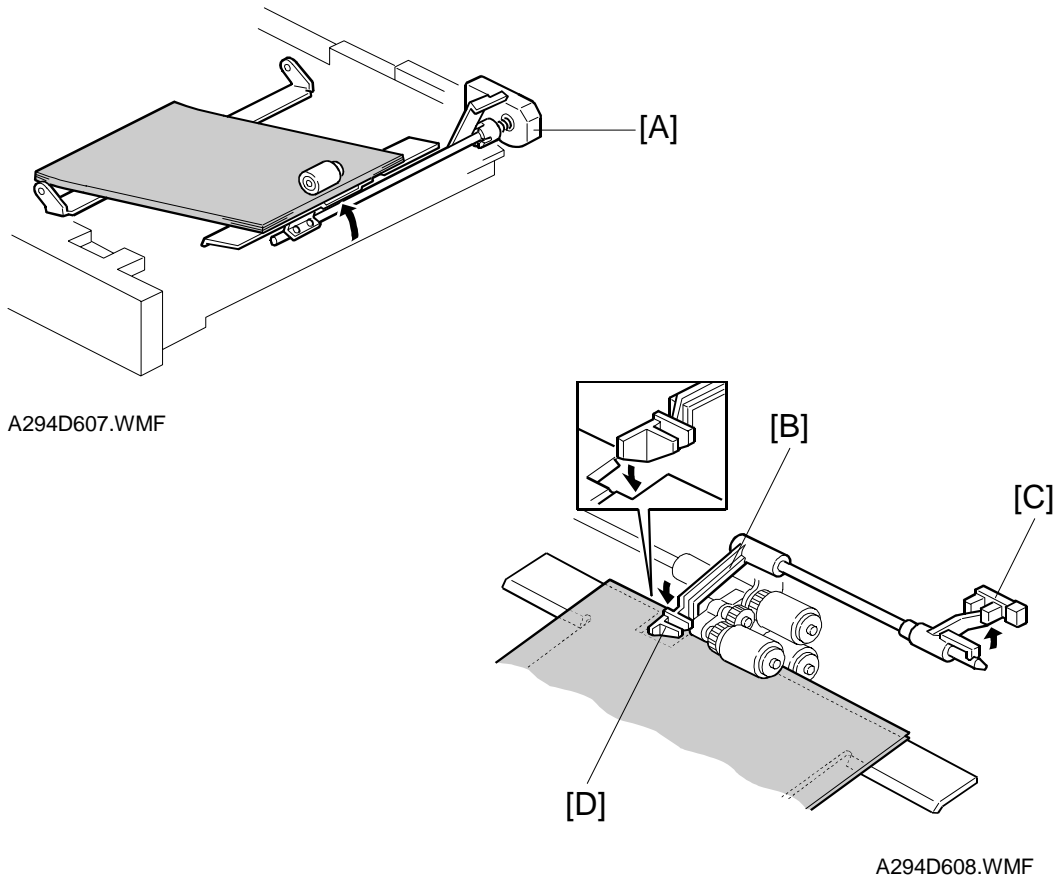
After paper feed and the paper feed clutch turns off, the paper feed motor still turns the separation roller [A] in reverse. The separation roller, still contacting the feed roller, turns the feed roller in reverse for 100 ms. Then the separation solenoid turns off.

***Paper Skew Prevention***

A294D603.WMF

The paper press arms [A] on each side press down both sides of the paper, especially if the paper is curled. This helps to prevent paper skew or jams.

## 2.8.5 REMAINING PAPER/PAPER END DETECTION – TRAYS 2 & 3



Detailed  
Descriptions

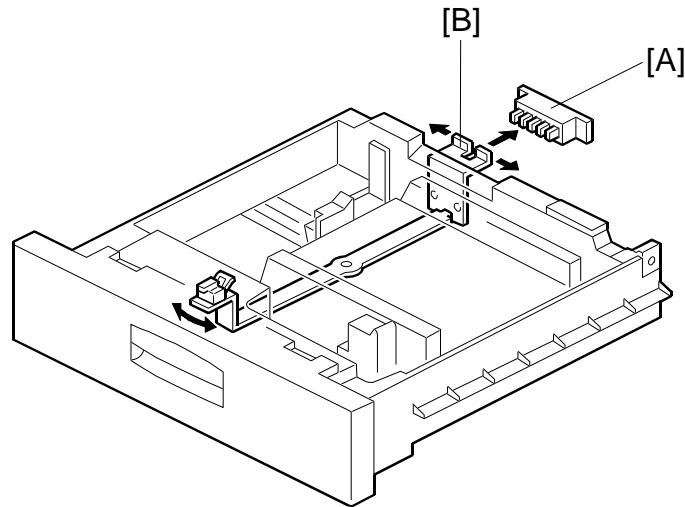
### ***Remaining Paper Detection***

The lift motor [A] rotates when the tray is pushed in. The machine's CPU detects the remaining paper by monitoring the lift motor rotation angle (4 levels).

### ***End Detection***

If there is paper in the tray, the paper stack lifts the paper end feeler [B] and the paper end sensor [C] is deactivated. When the paper tray runs out of paper, the paper end feeler drops into the cutout [D] in the tray bottom plate and the paper end sensor is activated.

## 2.8.6 PAPER SIZE DETECTION – TRAYS 2 & 3



A294D712.WMF



| Paper Size Switch | Paper Size                   |                   |
|-------------------|------------------------------|-------------------|
|                   | A4/A3 Version                | LT/DLT Version    |
| 00111             | A3-L                         | 11" x 17"-L       |
| 00011             | 8 1/4" x 13"                 | 8 1/2" x 14"-L    |
| 10011             | A4-L                         | 8 1/2" x 11"-L    |
| 01001             | A4-S                         | 8 1/2" x 11"-S    |
| 00100             | 8 1/2" x 13"                 | 5 1/2" x 8 1/2"-S |
| 00010             | —                            | 8" x 10"-S        |
| 00001             | A5-S                         | 8" x 10"-L        |
| 10000             | 8 k-L (Taiwan version only)  | 8" x 13"-L        |
| 11000             | 16 k-L (Taiwan version only) | 10" x 14"-L       |
| 11100             | 16 k-S (Taiwan version only) | 11" x 15"-L       |
| 11110             | *                            | *                 |

Actuated - 0 De-actuated - 1 L: Lengthwise S: Sideways

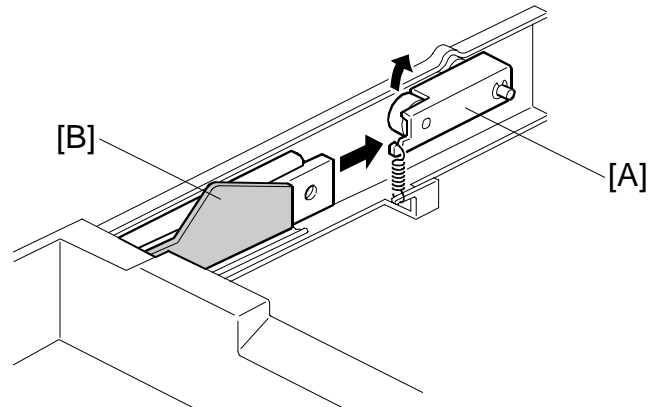
For the 1st feed tray, the paper size has to be stored with SP5-019-001.

For the 2nd and 3rd feed tray (universal trays), the paper size switch [A] detects the paper size. The paper size switch contains five microswitches. The paper size switch is actuated by an actuator plate [B] at the rear of the tray. Each paper size has its own unique combination as shown in the table and the CPU determines the paper size by the combination.

Using the asterisk setting (\*), a wider range of paper sizes can be used, but the size has to be entered with a UP mode.

|                     | Metric version  | Inch version |
|---------------------|-----------------|--------------|
| Main Scan Direction | 148 mm ~ 297 mm | 5.9" ~ 11.8" |
| Sub Scan Direction  | 210 mm ~ 432 mm | 8.3" ~ 17.0" |

## 2.8.7 TRAY LOCK – TRAYS 2 & 3



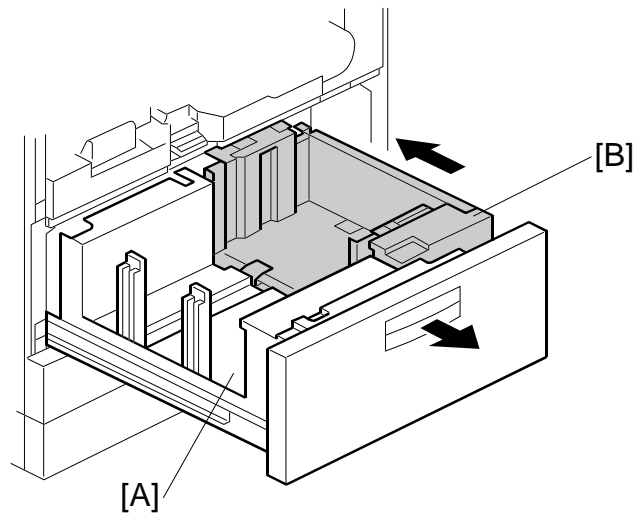
Detailed  
Descriptions

A294D618.WMF

When the tray is placed in the paper feed unit, the lock lever [A] drops behind the lock plate [B] on the support bracket to lock the tray in the proper position.

## 2.8.8 TANDEM FEED – TRAY 1

### *Overview*

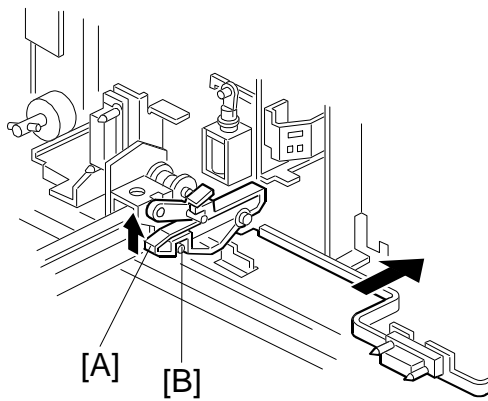


A294D601.WMF

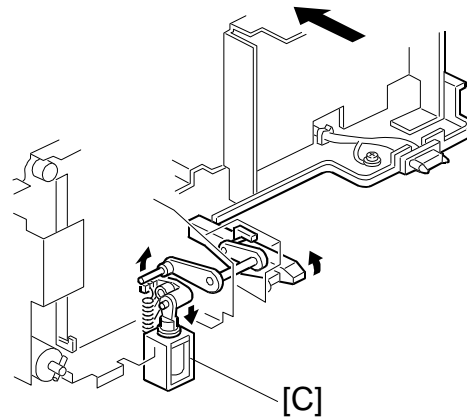
1,000 sheets of paper can be set in each of the left [A] and right trays [B]. Paper is fed from the right tray. When the paper in the right tray runs out, the paper in the left tray automatically transfers to the right tray. After the paper transfer to the right tray, paper feeding resumes.

Normally both the right and the left trays are joined together. However, during copying, if there is no paper in the left tray, the left tray can be pulled out to load paper. During that time, the right tray stays in the machine and paper feed continues.

### Connecting the Left and Right Sides of the Tray

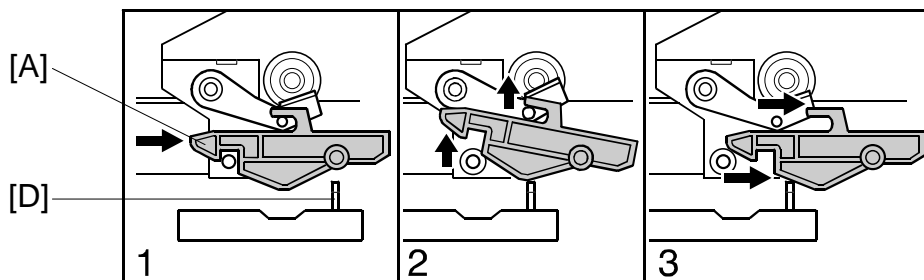


A294D703.WMF



A294D704.WMF

Detailed  
Descriptions



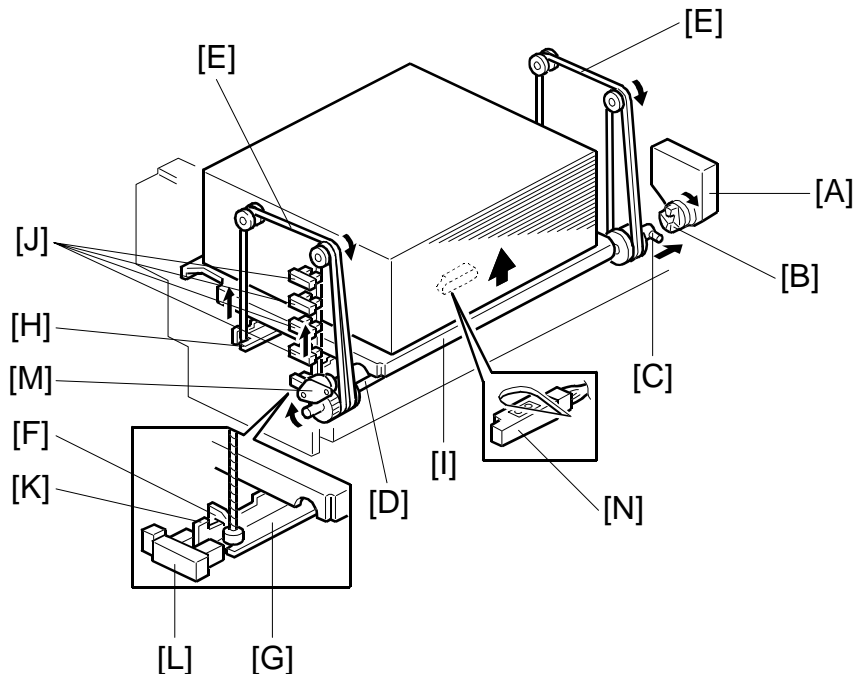
A294D654.WMF

Normally the left tray lock lever [A] in the left tray catches the pin [B] in the right tandem tray. During copying, if there is no paper in the left tray, the tandem tray connect solenoid [C] turns on to release the tray lock lever so that the left tray separates from the right tray. Therefore, the left tray can be pulled out to load paper while paper is still being fed into the machine from the right tray.

When the tandem tray is drawn out fully, the projection [D] pushes up the left tray lock lever [A] so that both trays separate for easier paper loading.

### ***Paper Lift/Remaining Paper Detection***

The machine detects when the 1st tray has been placed in the machine by monitoring the tray set signal through the connector.



A294D710.WMF

When the machine detects that the 1st paper tray is set in the machine, the right 1st tray paper sensor [N] (under the tray) checks whether there is paper in the right tandem tray.

**NOTE:** The right half of the tray holds up to 1,000 sheets. So, if the right 1st tray paper sensor was not present and the tray was empty, the bottom plate would have to lift up fully until the paper end sensor at the top of the tray detected that there was no paper, and this would waste several seconds.

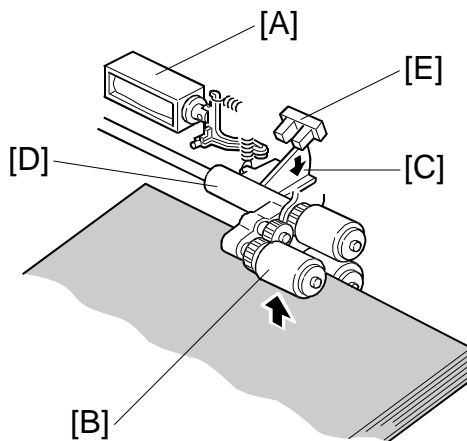
If paper is detected, the lift motor [A] rotates and the coupling gear [B] on the tray lift motor engages the pin [C] of the lift shaft [D]. The tray wires [E] are fixed in the slots [F] at the ends of the tray support rods [G, H]. When the lift motor rotates clockwise, the tray support rods and the tray bottom plate [I] move upward. The tray goes up until the top paper pushes up the pick-up roller and the lift sensor in the 1st feed unit is activated, and the paper end sensor at the top of the tray is deactivated.

When the actuator [K] on the front end of the right support rod [G] activates the paper height sensors [J], the remaining paper capacity is detected (4 levels).

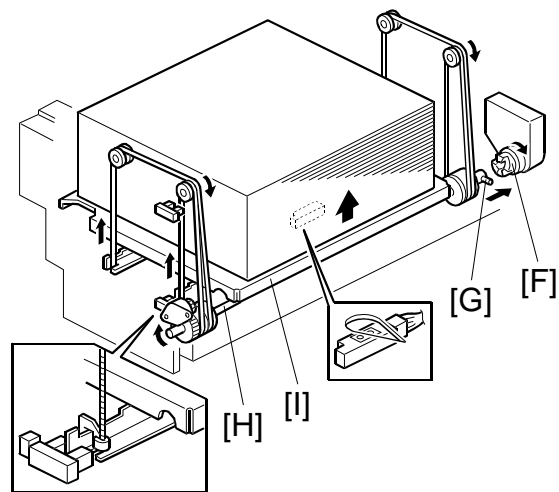
When removing the tray, the coupling gear [B] separates from the pin [C], so that the tray bottom plate moves downward. The tray lowers until the actuator activates the tray down sensor [L]. The damper [M] lets the tray bottom plate drop down slowly.







A294D097.WMF



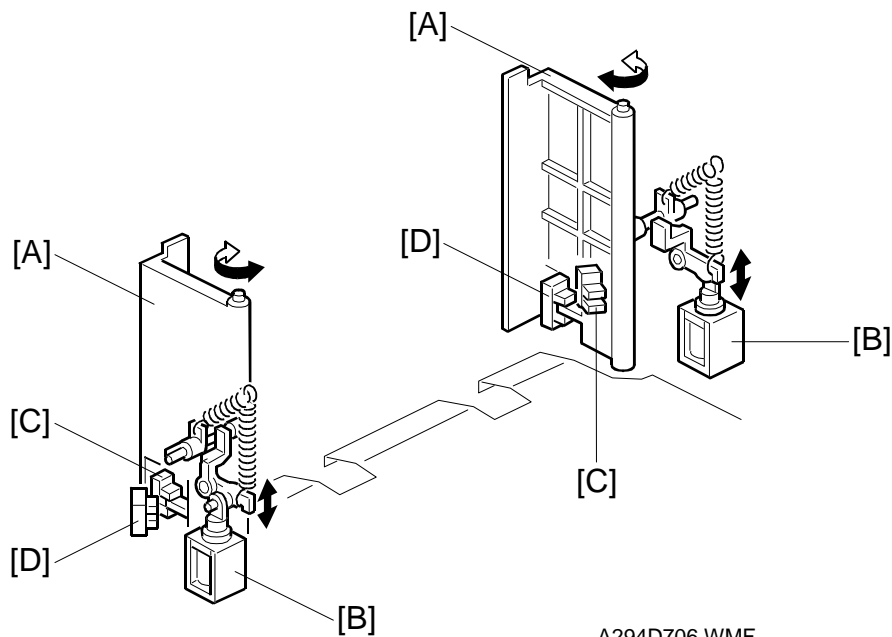
A294D098.WMF

When the lift motor turns on, the pick-up solenoid [A] activates to lower the pick-up roller [B]. When the top sheet of paper reaches the correct height for paper feed, the paper pushes up the pick-up roller and the actuator [C] on the pick-up roller supporter [D] activates the lift sensor [E] to stop the lift motor.

After several paper feeds, the paper level gradually lowers then the lift sensor is de-activated and the lift motor turns on again until the lift sensor is activated again.

When the tray is drawn out of the feed unit, the lift motor coupling gear [F] disengages the pin [G] of the lift shaft [H], then the tray bottom plate [I] drops (the damper slows the fall, as explained on the previous page).

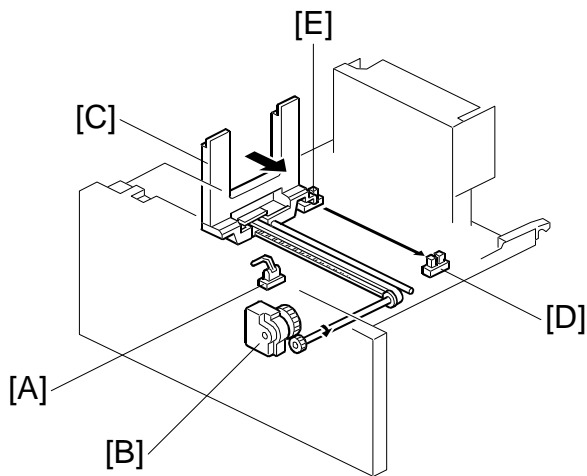
There is also a paper end sensor for the 1st tray, which works in the same way as the sensor in the 2nd and 3rd trays.

**Side Fence Drive**

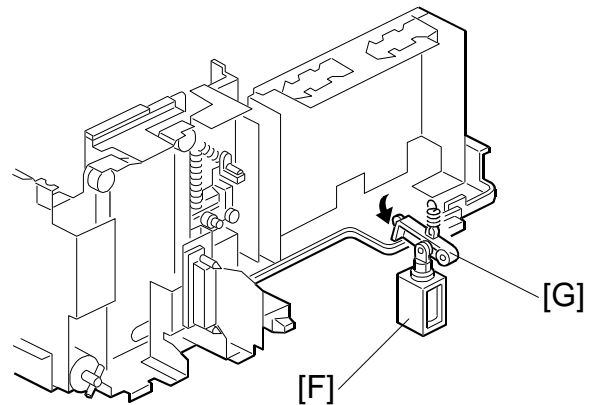
The side fences [A] of the right tray are normally closed. They open only when paper in the left tray is moving to the right tray.

The side fence solenoids [B] drive the side fences. When the paper loaded in the left tray transfers to the right tray, the side fence solenoids turn on to open the side fences until the side fence open sensors [C] activate.

When the rear fence in the left tray has pushed the stack of paper into the right tray, the side fence solenoids turn off to close the side fences. Then, when the side fence closed sensors [D] actuate, the LCD displays a message advising the user to load some paper into the left side of the tandem tray.

**Rear Fence Drive**

A294D651.WMF



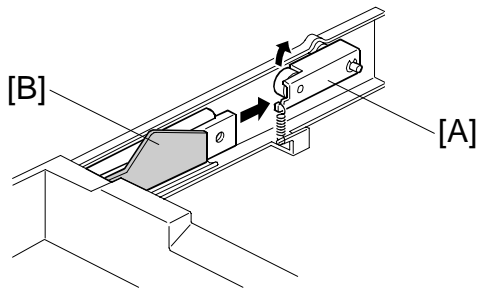
A294D705.WMF

When the left 1st tray paper sensor [A] detects paper but the right 1st tray paper sensor does not, the rear fence drive motor [B] (a DC motor) in the left tray turns counter-clockwise causing the rear fence [C] to push the paper stack into the right tray.

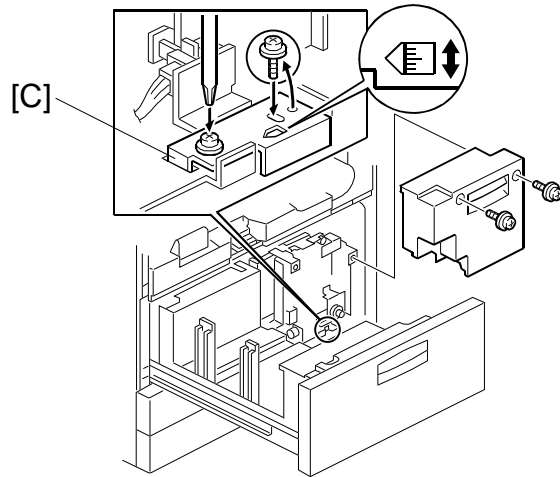
When the actuator on the rear fence activates the rear fence return position sensor [D], the rear fence drive motor turns clockwise until the actuator activates the rear fence HP sensor [E].

While the rear fence is moving, the left 1st tray lock solenoid [F] turns on and the lock lever [G] locks the left tray.

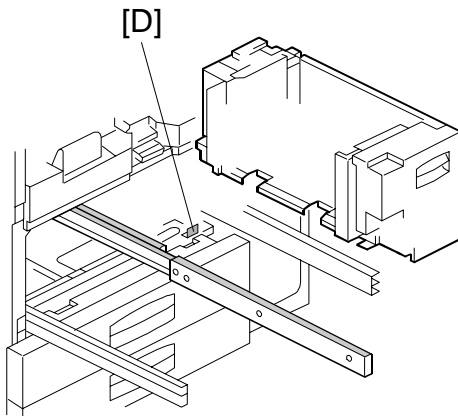
### ***Tray Positioning***



A294D655.WMF



A294D656.WMF



A294D612.WMF

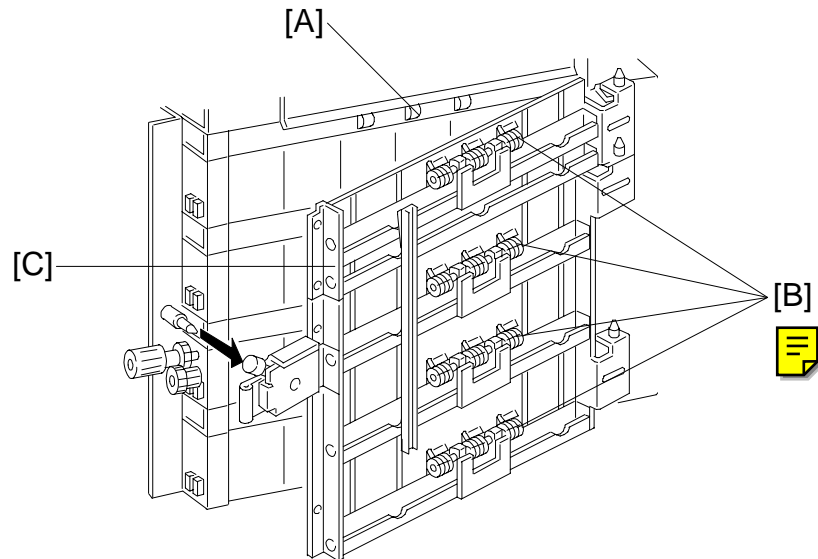
### ***Tray Lock***

When the feed tray is set in the paper feed unit, the lock lever [A] drops behind the lock plate [B] on the Accuride support bracket to lock the tray in the proper position.

### ***Side-to-side Positioning***

When the feed tray is set in the paper feed unit, the side-to-side positioning plate [C] presses the feed tray against the stopper [D]. By moving the positioning plate, the tray position can be changed to adjust the side-to-side registration.

## 2.8.9 VERTICAL TRANSPORT



Detailed  
Descriptions

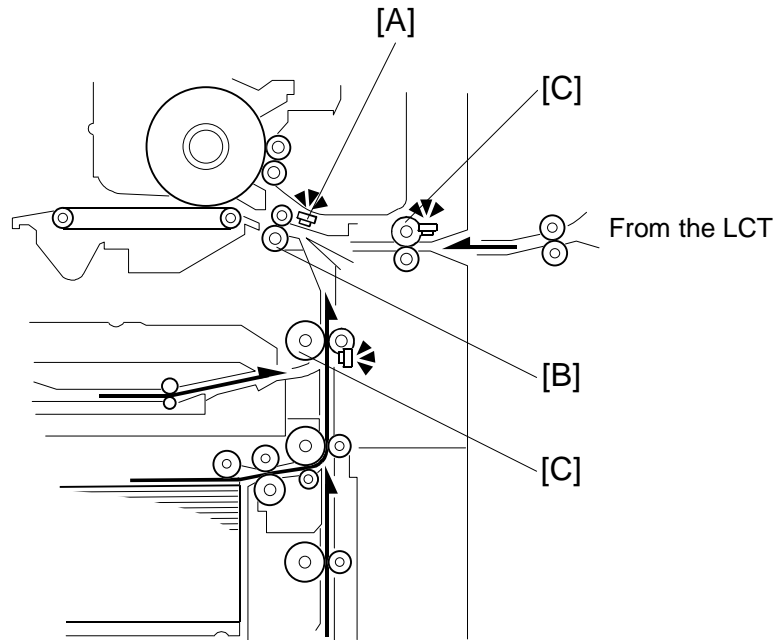
A294D617.WMF

The vertical transport rollers [A] in each feed unit are all driven by the paper feed motor. The vertical transport rollers and the vertical transport idle rollers [B], on the inner and outer vertical guide plates, transport the paper up from each feed unit towards the relay and registration rollers.

The vertical transport guides [C] can be opened to remove jammed paper in the vertical transport area.

## 2.8.10 PAPER REGISTRATION

### Overview

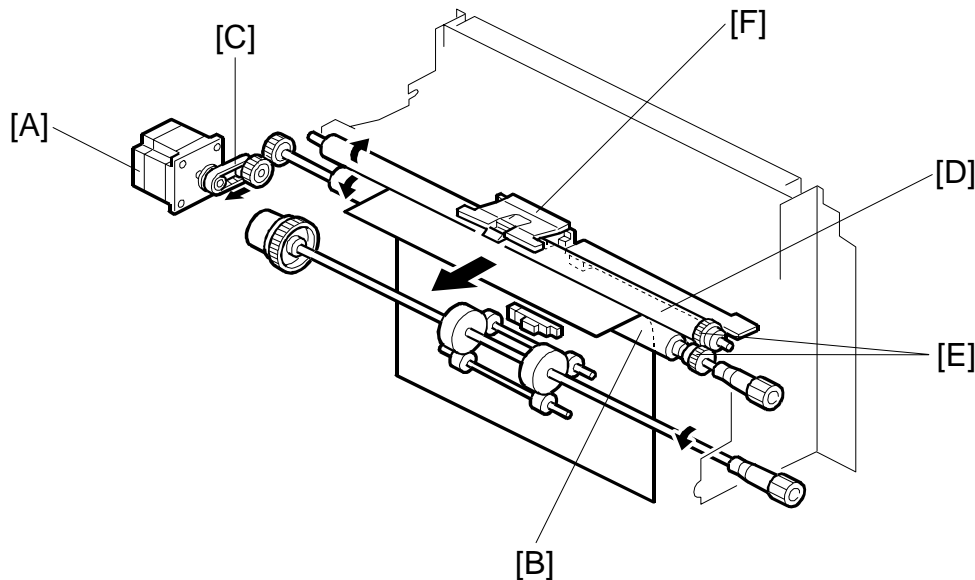


A294D702.WMF

The registration sensor [A] is positioned just before the registration rollers [B].

When the paper leading edge activates the registration sensor, the registration motor is off and the registration rollers are not turning. However, the upper relay roller (or LCT relay roller for feed from the LCT) [C] stays on for a bit longer. This delay allows time for the paper to press against the registration rollers and buckle slightly to correct skew. Then, the registration motor energizes and the relay clutch re-energizes at the proper time to align the paper with the image on the drum. The registration and relay rollers feed the paper to the image transfer section.

The registration sensor is also used for paper misfeed detection.

**Registration Drive**

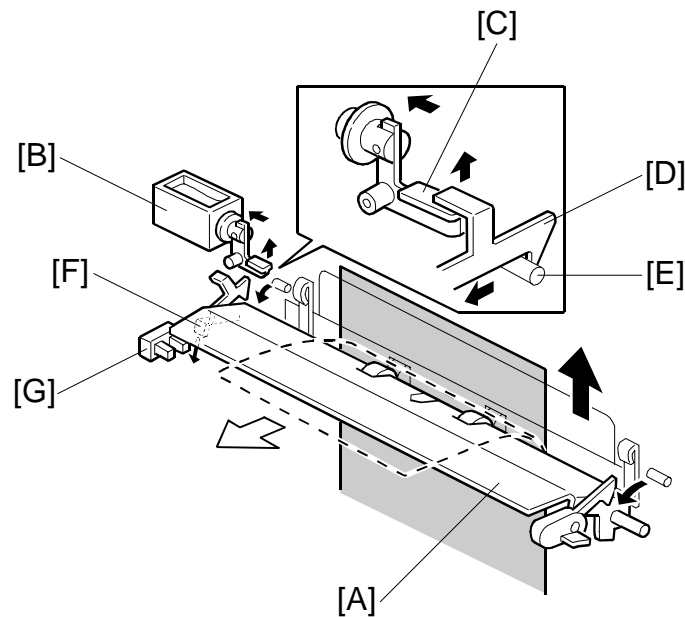
A294D596.WMF

Detailed  
Descriptions

The registration motor [A] drives the lower registration roller [B] through a timing belt [C] and some gears. Drive is transmitted to the upper registration roller [D] via two gears [E] at the front.

There is a paper dust remover [F] at the center of the upper registration roller [D]. This is in line with the feed rollers, where most paper dust is generated.

**NOTE:** Clean the dust remover every PM visit.

**Guide Plate Release**

A294D597.WMF

When a paper misfeed occurs between the vertical transport rollers and the registration rollers, the lower paper guide plate [A] automatically opens.

When the registration sensor is not activated at a certain jam check timing, the guide plate solenoid [B] turns on. The lever [C] raises the lock lever [D] on the guide plate to release it from the pin [E] on the rear side frame. Then the guide plate falls open.

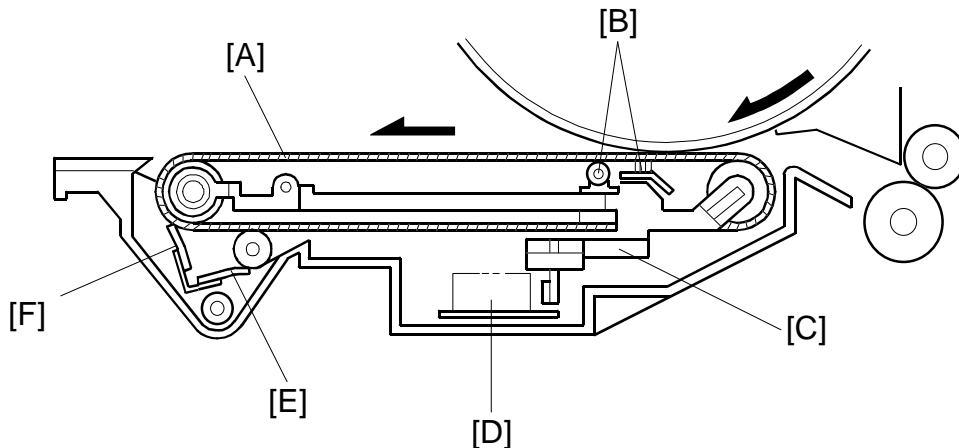
The actuator [F] on the guide plate activates the guide plate position sensor [G] when the guide plate opens.

The user must close this guide plate manually after removing the jam. To prevent the guide plate from being left open, if the guide plate position sensor is activated, copying is disabled and a caution is displayed on the LCD panel.



## 2.9 IMAGE TRANSFER AND PAPER SEPARATION

### 2.9.1 OVERVIEW



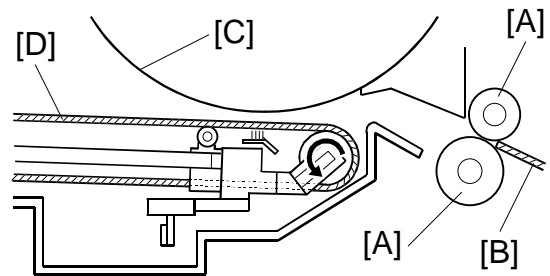
A294D401.WMF

The transfer belt unit consists of the following parts:

- [A]: Transfer belt  
A belt (length: 321 mm) with high electrical resistance which holds a high positive electrical potential to attract toner from the drum to the paper. Also, the electrical potential attracts the paper itself and helps the paper to separate from the drum.
- [B]: Transfer bias roller and transfer belt bias brush  
Applies transfer voltage to the transfer belt.
- [C]: Transfer belt lift lever (driven by a solenoid)  
Lifts the transfer belt into contact with the drum.
- [D]: Transfer power pack  
Generates a constant transfer current.
- [E]: Cleaning roller and cleaning roller cleaning blade  
Removes toner remaining on the transfer belt to prevent the rear side of the paper from getting dirty.
- [F]: Transfer belt cleaning blade  
Removes toner from the transfer belt. Any toner that is not removed by this blade is removed by the cleaning roller [E].

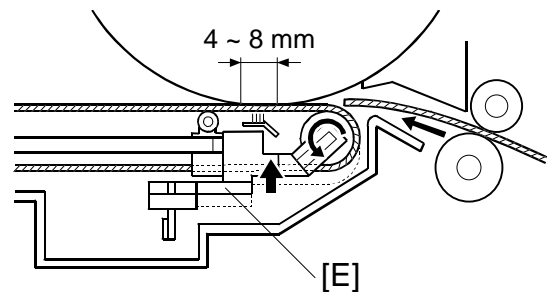
## 2.9.2 IMAGE TRANSFER AND PAPER SEPARATION

The registration rollers [A] feed the paper [B] to the gap between the drum [C] and the transfer belt [D].



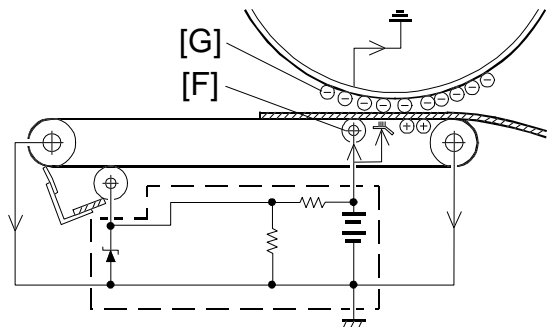
A294D507.WMF

As soon as the leading edge of the first sheet reaches the gap between the transfer belt and the drum, the transfer belt lift lever [E] raises the transfer belt into contact with the drum. The lift lever is driven by a solenoid.



A294D508.WMF

Then a positive charge is applied to the transfer bias roller [F] and transfer belt bias brush to attract the negatively charged toner [G] from the drum. It also attracts the paper and separates it from the drum.



A294D648.WMF

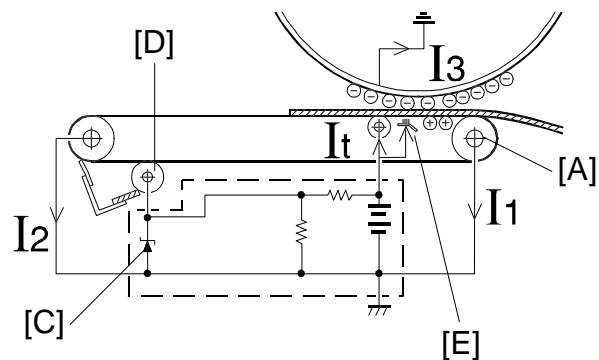
After the image transfer is completed, the charge on the transfer belt holds the paper to the transfer belt. After separating the paper from the transfer belt, the transfer belt is discharged by the transfer belt drive roller [A].

The transfer power pack [B] inside the transfer belt unit monitors the current ( $I_1$  and  $I_2$ ) fed back from the drive rollers at each end of the transfer belt to adjust the transfer current.

Then, the power pack adjusts  $I_t$  to keep the current through the drum ( $I_3$ ) constant, even if the paper, environmental conditions, or transfer belt surface resistance change.

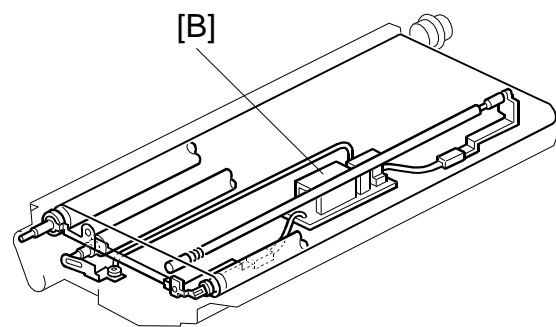
The varistor [C] keeps the voltage at the cleaning bias roller [D] constant.

To apply a higher current to the transfer belt without a higher voltage, the bias brush [E] has been incorporated near the nip between drum and belt. This ensures that enough transfer current is applied for this machine, which has a higher copy volume.



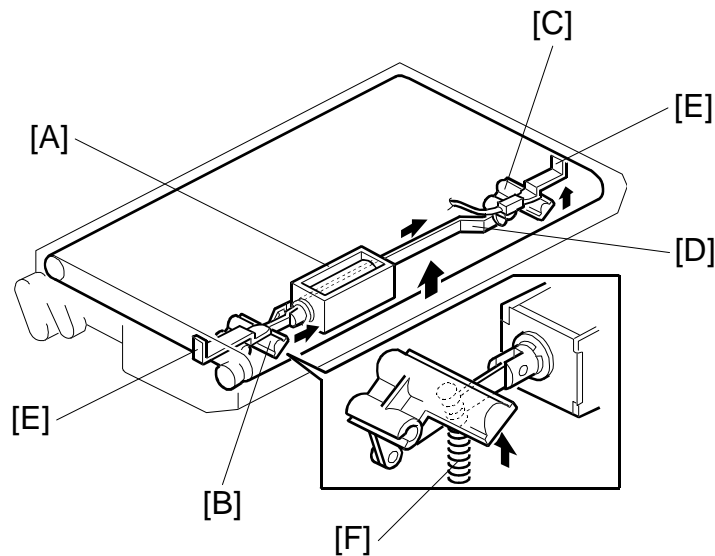
A294D509.WMF

Detailed  
Descriptions



A294D503.WMF

### 2.9.3 TRANSFER BELT UNIT LIFT



A294D506.WMF

The transfer belt lift solenoid [A] inside the transfer belt unit turns on to raise the transfer belt into contact with the drum. The front lever [B] and the rear lever [C] are connected to the solenoid by links [D], and they push up the stays [E] when the solenoid turns on.

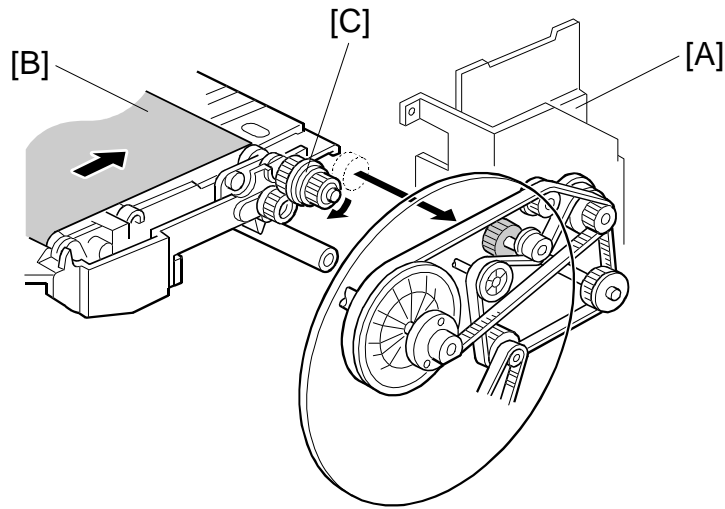
The support spring [F] helps the solenoid to raise the transfer belt.

The solenoid turns off after the copy job is finished.

The transfer belt must be released from the drum for the following reasons:

1. To prevent the ID sensor pattern on the drum from being rubbed off by the transfer belt, because the transfer belt is located between the development unit and the ID sensor.
2. To decrease the load on the bias roller cleaning blade, it is better to prevent toner on non-image areas (for example VD, VH, ID sensor patterns developed during process control data initial setting) from being transferred onto the transfer belt.
3. To prevent drum characteristics from being changed by remaining in contact with the rubber belt.

## 2.9.4 PAPER TRANSPORTATION AND BELT DRIVE

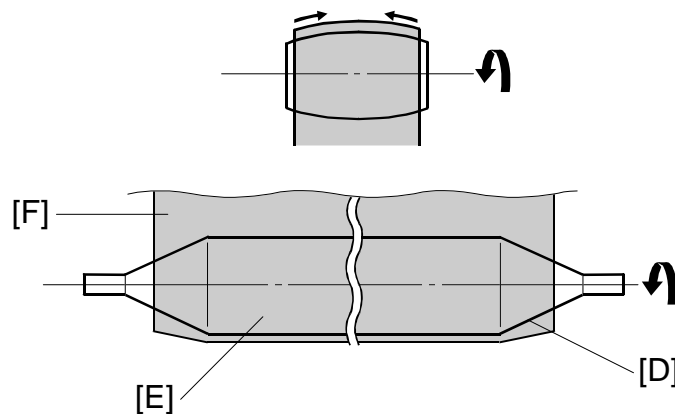


A294D402.WMF

The drum motor [A] drives the transfer belt through belts and gears. Since the transfer belt electrically attracts the paper [B], a transport fan is not required.

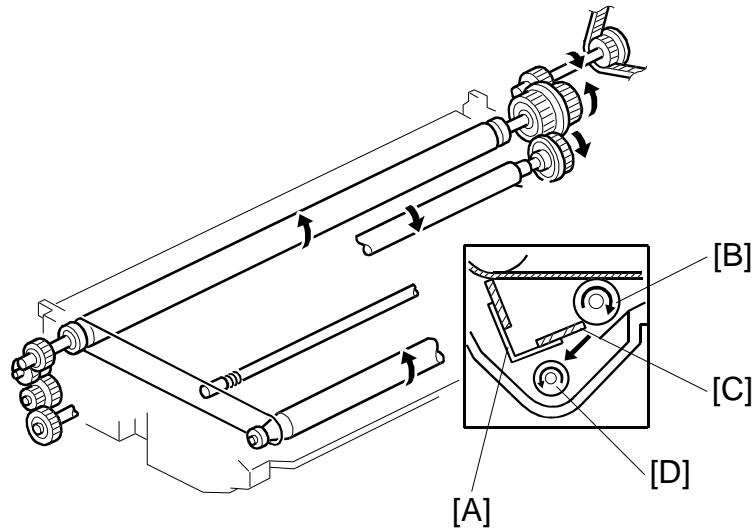
At the turn in the transfer belt, the transfer belt drive roller [C] discharges the belt to reduce paper attraction, and the paper separates from the belt as a result of its own stiffness.

The tapered parts [D] at both ends of the roller [E] help keep the transfer belt [F] in the center, so that it does not run off the rollers.



A294D511.WMF

## 2.9.5 TRANSFER BELT CLEANING



A294D403.WMF

Some toner may adhere to the transfer belt when paper jams occur. The adhered toner must be removed to prevent the rear side of the copy paper from getting dirty.

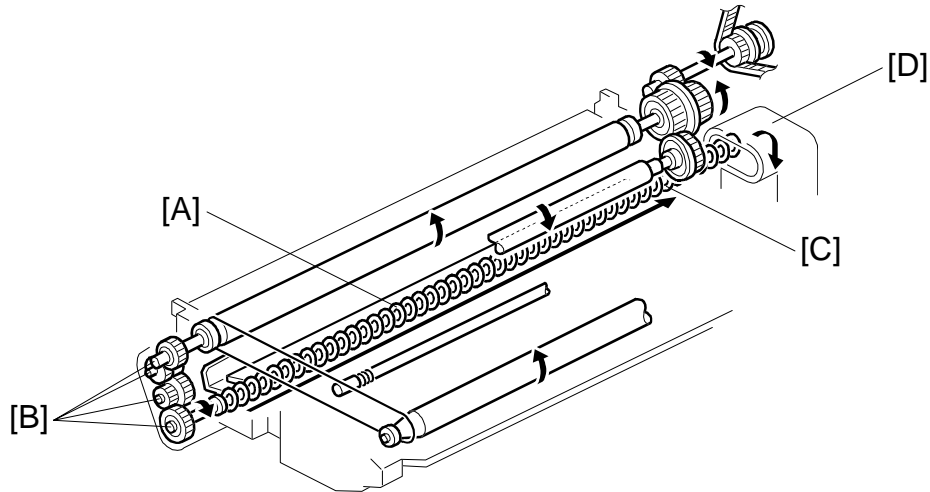
The cleaning blade [A] scrapes off any toner remaining on the transfer belt. This is a counter blade system.

Even if the toner is not completely removed due to paper dust stuck on the transfer belt cleaning blade [A], the positively charged cleaning bias roller [B] attracts the remaining toner. The bias roller cleaning blade [C] scrapes toner off the cleaning bias roller.

The surface of the transfer belt is coated to make it smooth and prevent the transfer belt from flipping the cleaning blade.

The toner collection coil [D] transports toner cleaned off the transfer belt to the waste toner collection bottle (see Toner Supply and Recycling for more on this).

## 2.9.6 TONER COLLECTION



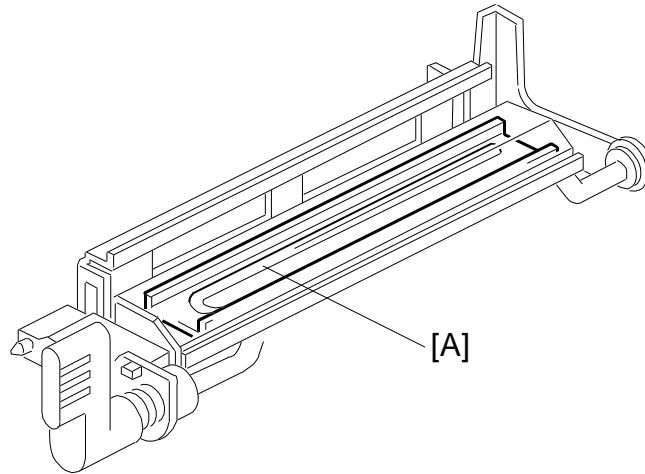
A294D505.WMF

Transfer belt drive is transmitted to the toner collection coil [A] through idle gears [B]. The toner collection coil [C] transports the collected toner to the toner recycling unit [D] and from there it goes to the waste toner collection bottle.

See Toner Supply and Recycling for details.

Detailed  
Descriptions

## 2.9.7 TRANSFER ANTI-CONDENSATION HEATER



A294D048.WMF

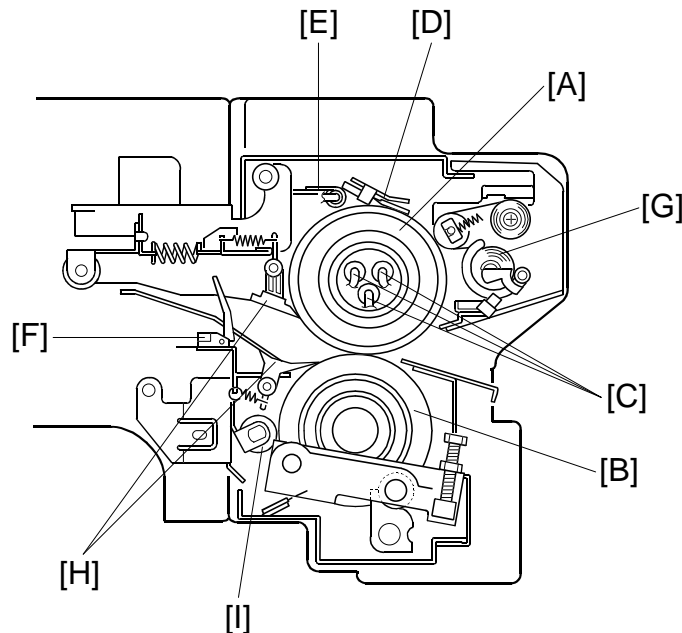
The transfer anti-condensation heater [A] is located under the transfer belt unit. It turns on when the main switch is off to prevent moisture from forming on the transfer belt.

The heater is included in the machine at the factory, but the connector is not connected.



## 2.10 FUSING

### 2.10.1 OVERVIEW



A294D501.WMF

Detailed  
Descriptions

After transferring the image, the copy paper enters the fusing unit. A heat and pressure process using a hot roller [A] and a pressure roller [B] fuses the image to the copy paper.

There are three identical fusing lamps (530 W each) [C] inside the hot roller. They are turned on and off to maintain the operating temperature of 175°C. The CPU monitors the hot roller surface temperature through a thermistor [D], which is in contact with the hot roller's surface. A thermofuse [E] protects the fusing unit from overheating.

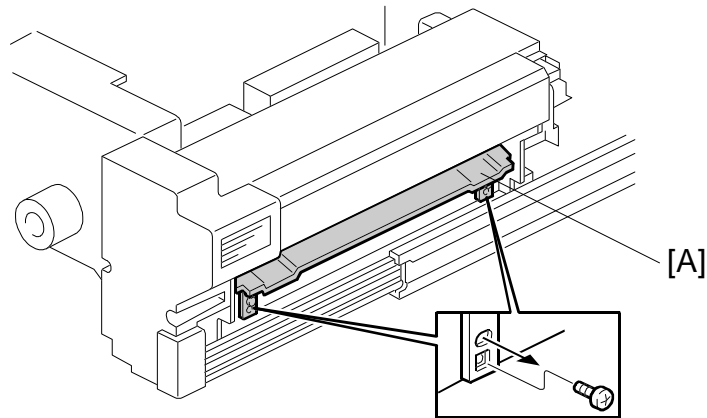
The fusing exit sensor [F] monitors the progress of the copy paper through the fusing unit and acts as a mis-feed detector while the exit rollers drive the copy paper to the inverter section.

The oil supply roller and cleaning web [G] applies a light coat of silicone oil to the hot roller. It also removes the paper dust on the hot roller.

The hot roller and pressure roller have stripper pawls [H] to prevent wrap-around jams.

The pressure roller is cleaned by a steel cleaning roller [I]. Toner adheres to steel more readily than to silicone rubber.

## 2.10.2 FUSING ENTRANCE GUIDE



A294D009.WMF

The entrance guide [A] for this machine is adjustable for thick or thin paper by changing the screw position from the upper to the lower.

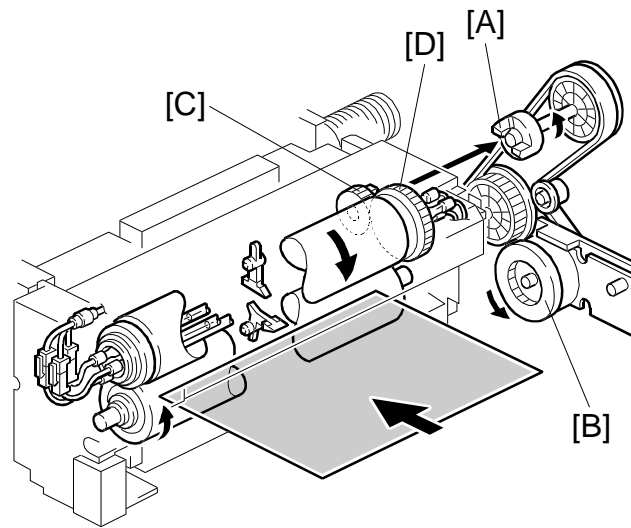
With thin paper, set the entrance guide in the upper position. This slightly lengthens the paper path, which prevents the paper from creasing in the fusing unit.

With thick paper, set the entrance guide in the lower position. This is because thick paper does not bend as easily, and is therefore less prone to creasing. In addition, the lower setting allows more direct access to the gap between the hot and pressure rollers. This prevents thick paper from buckling against the hot roller, which can cause blurring at the leading edge of the copy.

In this model, the transfer belt improves paper transport and stabilizes the paper path to the fusing entrance. This reduces the chance of paper creasing due to paper skews in the fusing unit.

Use the screws to adjust the guide plate position. Since there are very few reasons to change the guide plate position, there is no guide plate position adjustment lever for customer use.

### 2.10.3 FUSING UNIT DRIVE

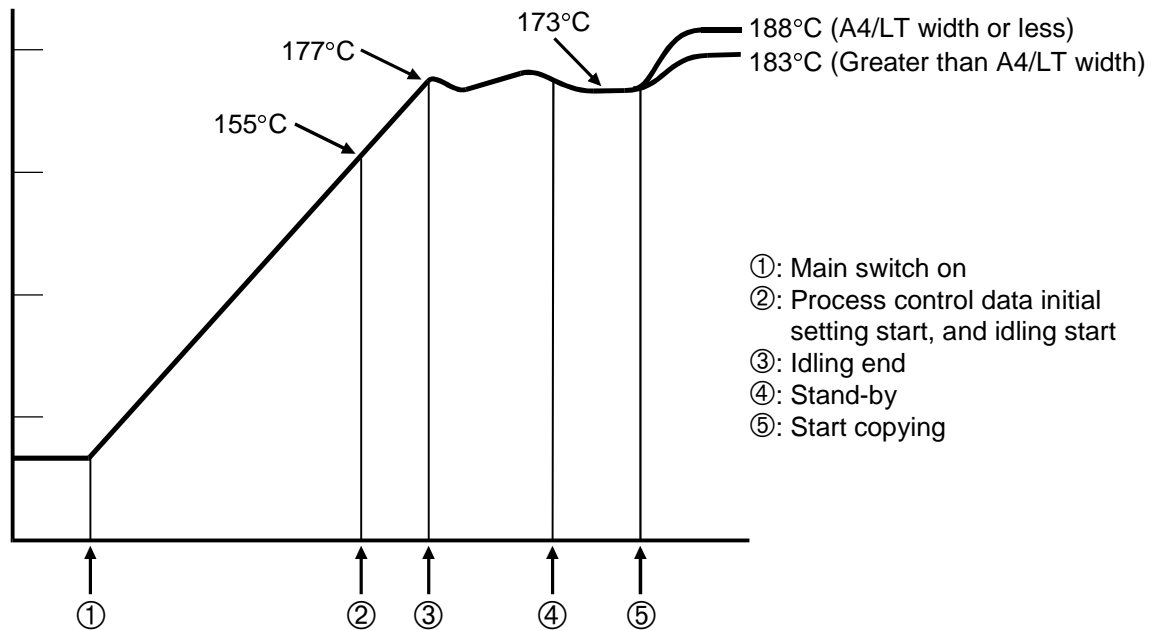


A294D510.WMF

The fusing drive gear [A] transmits drive from the fusing/duplex drive motor [B] to the gear [C], which drives the hot roller gear [D]. Rotation passes from the gear [C] through an idle gear to the exit roller drive section. The pressure roller is driven by the friction between the hot and pressure rollers.

Detailed  
Descriptions

### 2.10.4 FUSING LAMP CONTROL



A294D627.WMF

After turning the main switch on, the CPU turns on all three fusing lamps one at time, with a 1 second interval between each lamp turning on. This prevents the power on the AC line from dropping suddenly.

When the fusing temperature reaches 155°C, the machine starts the process control data initialization. If the fusing temperature was already above 100°C when the main switch was turned on, the process control initial setting is not done.

When the fusing temperature reaches 155°C, the copier starts fusing idling. If the fusing temperature was already above 155°C at power on, fusing idling is not done.

When the temperature has reached 177°C, the warm-up period is completed and the "Ready" indicator turns on. After this, the machine maintains a fusing temperature of 173°C.

In stand-by mode, one of the fusing lamps turns on alternately to maintain the ready temperature. During the copy cycle, the three fusing lamps maintain the operating temperature; if they have to turn on, they turn on one at time, with a 1 second interval between each lamp.

The CPU changes the fusing lamp on period depending on the temperature measured by the thermistor, to keep the fusing temperature as close as possible to the target temperature.

If one lamp breaks during copying, the machine still works. But, if it discovers a broken lamp just after being switched on, an SC occurs and copying is impossible.

The machine uses on-off control mode to maintain the fusing temperature.

Even if thick paper mode is selected, fusing temperature control does not change.

## 2.10.5 OIL SUPPLY AND CLEANING

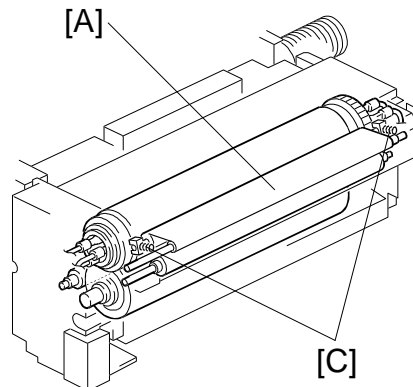


The oil supply and cleaning web [A] feeds the web felt soaked with silicone oil. The roller [B] contacting the web felt also contacts the hot roller because of pressure from springs [C]. It applies a light coat of silicone oil to the hot roller and removes paper dust from the hot roller. A spring clutch inside the mechanism pulls the web to take up the slack, to prevent it getting pulled in between the fusing rollers.

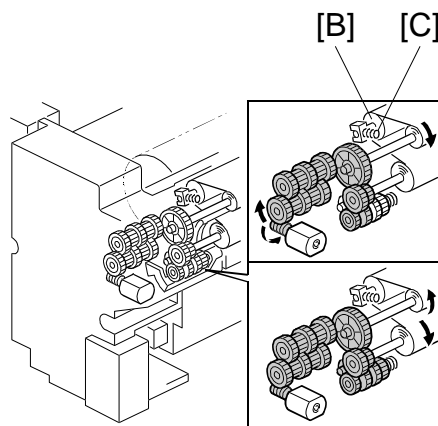
Every 40 s during printing, the oil supply/cleaning web motor turns for 0.8 s to move the oil supply and cleaning web felt. This 40-second interval starts when the first copy reaches the fusing exit sensor, and ends 2 s after the last copy has passed this sensor. SP1-902-2 & 3 adjust the motor rotation interval and rotation time.

SP1-902-1 displays the web consumption. When the web consumption exceeds the value set with SP1-902-4 (web near-end), the machine indicates web near-end on the operation display. The machine still works until the oil supply/cleaning web end sensor [D] detects when the feeler [E] drops from the web. At this time, SC550 is indicated in the operation panel display. In this condition, a technician must install a new oil supply and cleaning web, and return SP1-902-1 to 0. Then, the SC will be cleared.

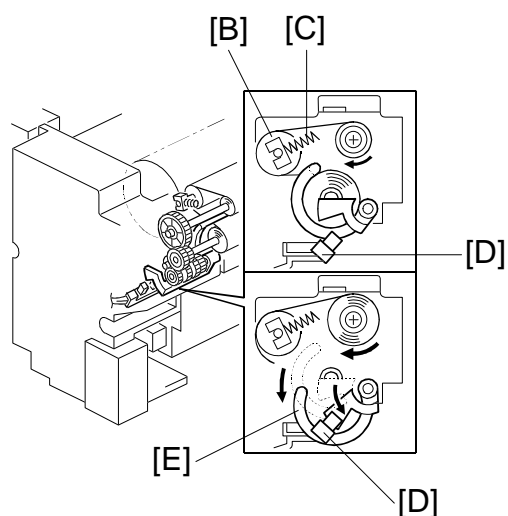
Adjust SP1-902-4 (web near-end) to change the near-end period. The default is 100%. With this setting, about 400 k copies can be made before the near-end message is displayed. After that, another 40 k can be made until the web ends. If this SP is changed to 80%, about 320 k copies can be made before the near-end message is displayed. After that, another 120 k can be made until the web ends. These figures assume that 80% of the user's output is A4 sideways.



A294D553.WMF

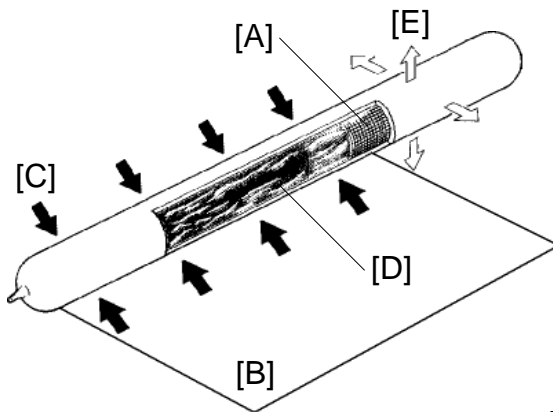


A294D504.WMF

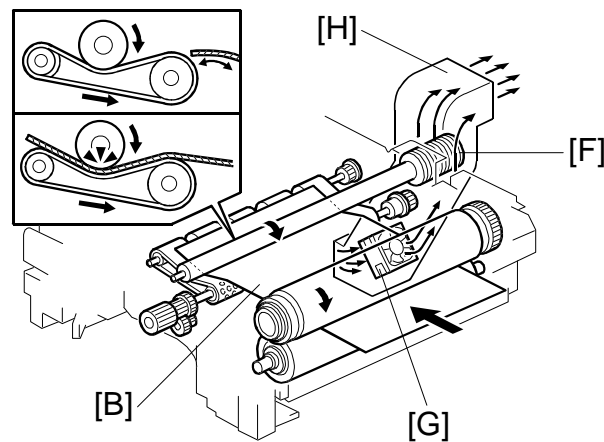


A294D555.WMF

### 2.10.6 PAPER COOLING



A294D631.PCX



A294D653.WMF

The paper cooling pipe cools the copy paper after it has gone through the fusing unit. This prevents the temperature around the drum from increasing in duplex mode.

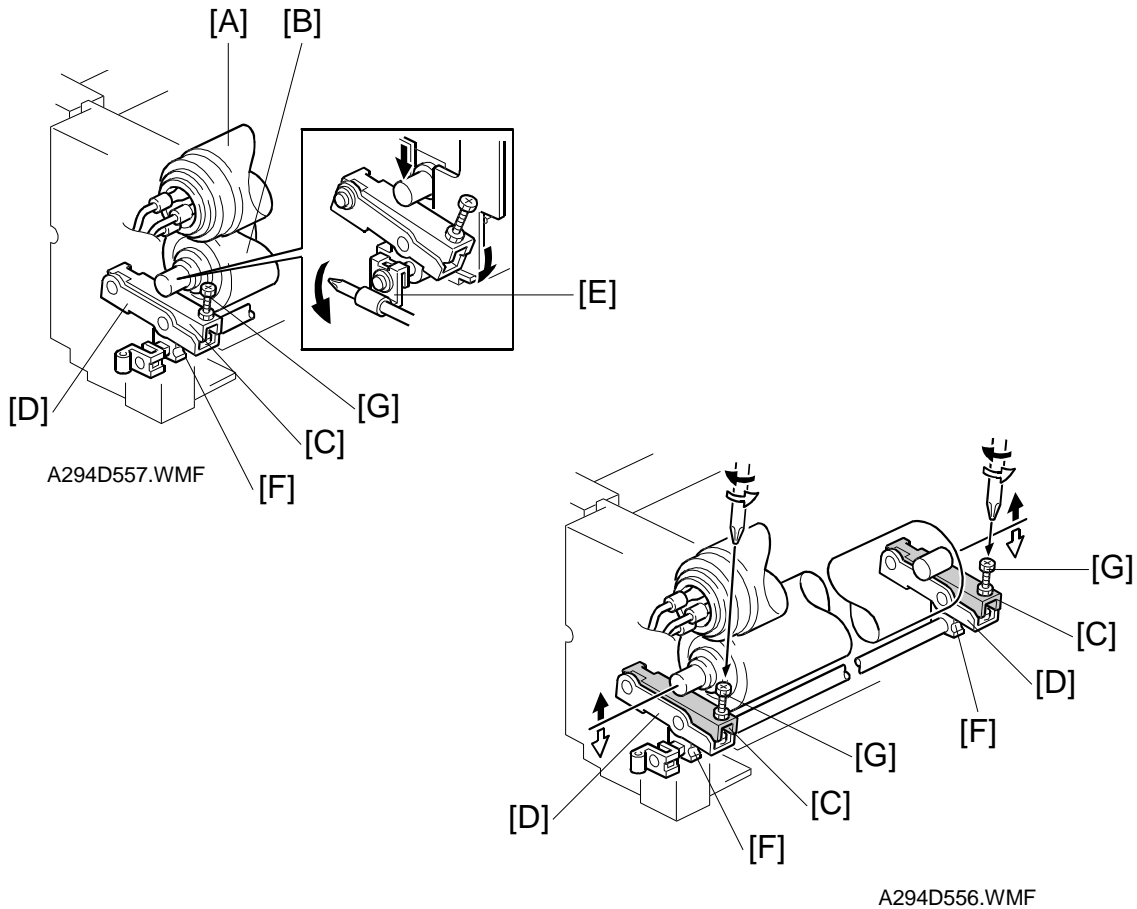
The paper cooling pipe has fins at the rear end. A fan cools the fins.

The paper cooling pipe has a hollow metal tube inside. Water capillary tubes [A] run along the inside of the paper cooling pipe, and these transfer heat within the pipe. The hot paper [B] leaving the fusing unit heats the parts of the cooling pipe that it touches (black arrows [C]), causing the water in the pipe to vaporize. This creates a high-speed flow of steam [D] to the ends of the pipe, which are cooler, and especially to the rear end [E], which is well away from the paper feed path, and has the cooling fins [F] attached to it. When the steam reaches that area, it cools and condenses. The condensed water is returned to the heated part of the pipe by capillary action.

This cycle (vaporization → steam transfer → condensation) repeats again and again. The paper cooling pipe transfers heat from the paper to the fins continuously.

The paper cooling pipe fan [G] in the duct [H] at the machine rear side cools the fins [F].

## 2.10.7 FUSING PRESSURE

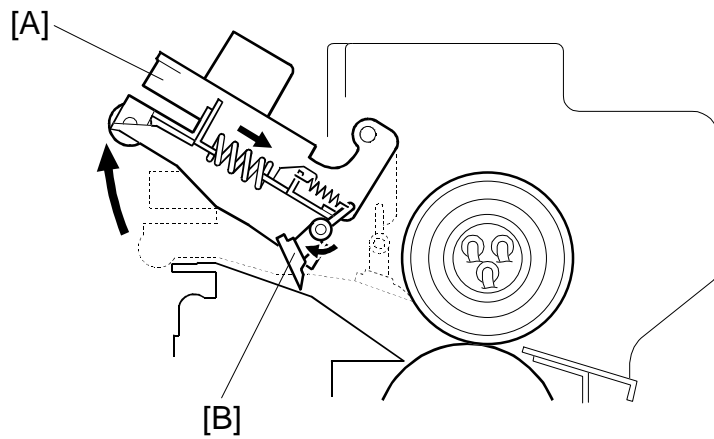


Detailed  
Descriptions

Fusing pressure is constantly applied between the hot roller [A] and pressure roller [B] by the upper pressure lever [C] and lower pressure lever [D], which are lifted by the fusing unit release lever [E] via the pressure cam [F]. The pressure can be adjusted by using the pressure adjustment screw [G].

The fusing pressure is released by turning the fusing unit release lever counterclockwise.

### 2.10.8 HOT ROLLER STRIPPER RELEASE



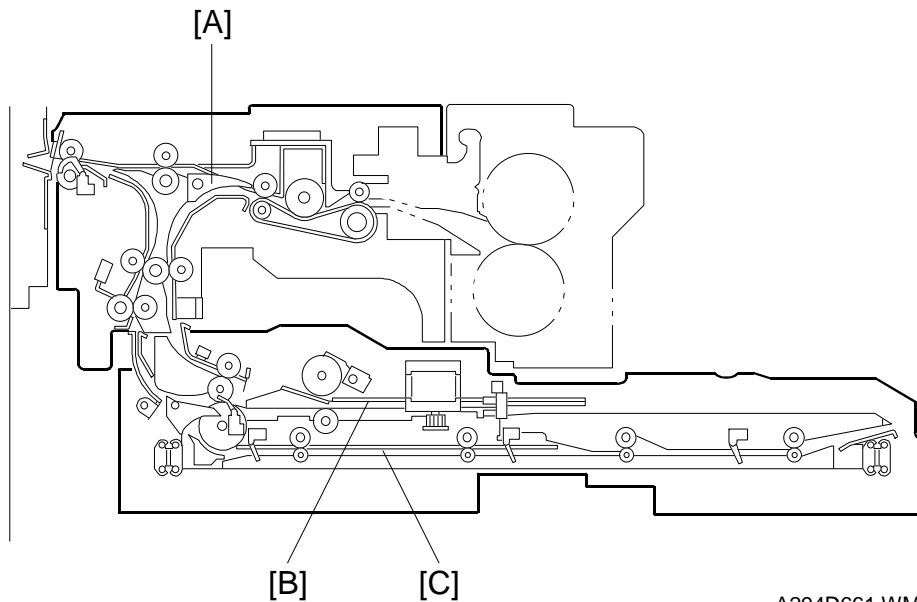
A294D008.WMF

For easier jam removal, when the hot roller stripper unit [A] is opened, the stripper pawls [B] turn clockwise to expand the jam removal area.



## 2.11 PAPER EXIT/DUPLEX

### 2.11.1 OVERVIEW



A294D661.WMF

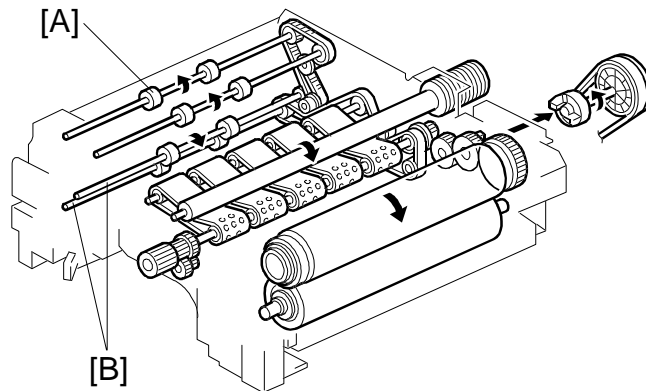
Detailed  
Descriptions

The printed page from the fusing unit goes either straight through to the output tray or finisher, or downward through to the inverter or duplex unit, depending on the position of the junction gate [A].

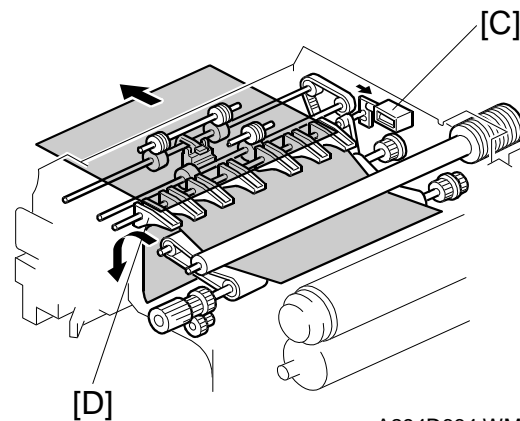
If the page is fed out directly, it arrives on the tray face-up. If the user selected face-down output, the page goes to the inverter [B] before being fed out.

If the user selects duplex mode, the page is directed to the duplex tray [C] after inverting, and back to the machine for printing the second side.

## 2.11.2 PAPER EXIT MECHANISM



A294D662.WMF

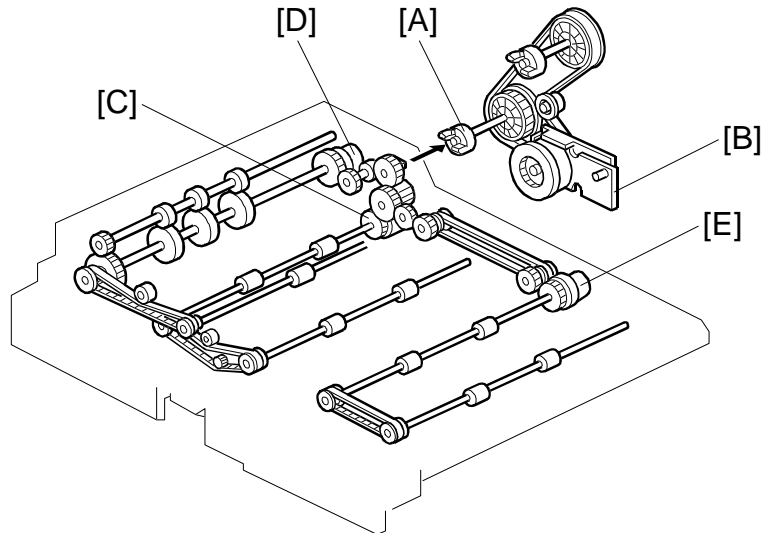


A294D664.WMF

Drive from the fusing/duplex motor is transmitted to the paper exit roller [A] and transport rollers [B].

To feed the printed page from the fusing unit straight through to the output tray or finisher, the inverter gate solenoid [C] energizes to open the junction gate [D]. To feed the page to the inverter and duplex unit, the solenoid stays off.

### 2.11.3 DUPLEX DRIVE MECHANISM



Detailed  
Descriptions

A294D801.WMF

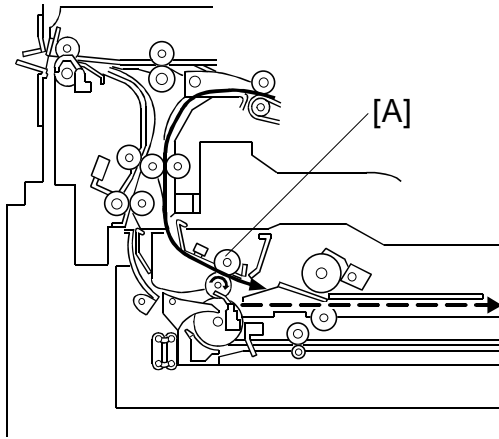
The duplex drive coupling gear [A] transmits drive from the fusing/duplex drive motor [B] to the duplex unit.

The duplex transport clutch [C] transmits this drive to the duplex transport section, the inverter exit roller clutch [D] transmits it to the duplex inverter exit section, and the duplex feed clutch [E] transmits it to the duplex paper feed-out section.

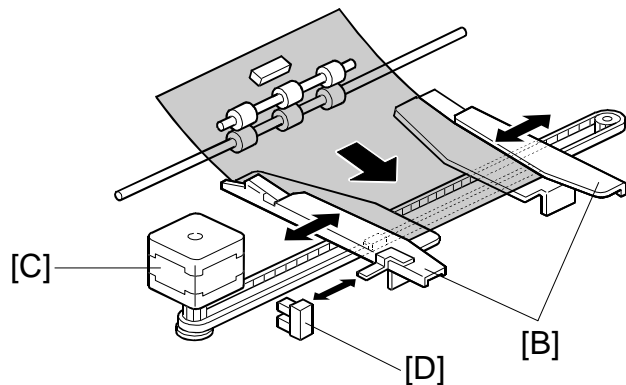
The inverter exit roller clutch engages the drive (i.e., the roller turns) while the clutch is not energized. This clutch disengages the drive when the clutch is turned on. This prevents the clutch from being energized for a long time.

## 2.11.4 INVERTER

### *Feed-in and Jogging*



A294D802.WMF



A294D803.WMF

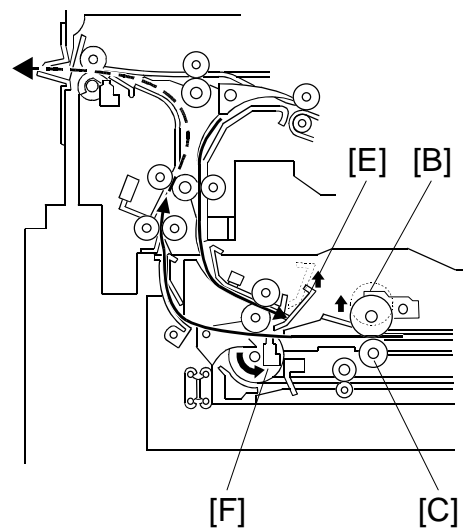
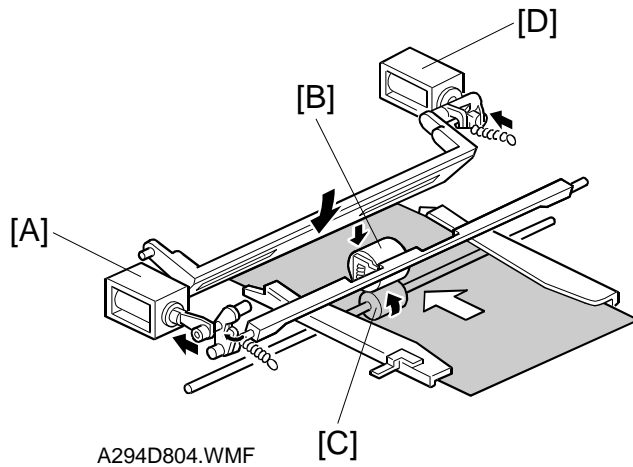
The inverter feed roller [A] feeds paper to the jogger section. After the trailing edge of the paper passes through the inverter feed roller, the jogger fences [B] move to square the paper. This happens every page.

The jogger motor (a stepper motor) [C] moves the jogger fences [B] inward or outward.

When the main switch is turned on, the jogger motor places the jogger fences at the home position, which is determined by monitoring the signal from the jogger home position sensor [D].

When the start key is pressed, the jogger motor positions the jogger fences 15 mm away from the selected paper size to wait for the paper.

When the paper is delivered to the jogger fences, the jogger fences move inward to square the paper. After this, the jogger fences move back to the previous position (15 mm away from the paper).

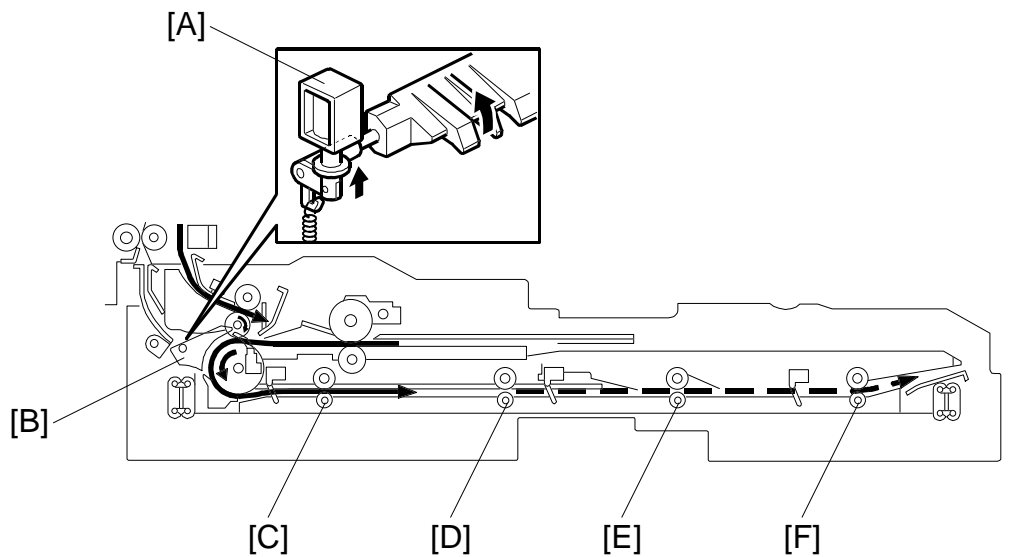
**Feed-out**

Detailed  
Descriptions

After jogging, the reverse roller solenoid [A] energizes to push down the reverse trigger roller [B]. The reverse roller [C] turns counterclockwise continuously, so the paper starts to reverse when the reverse trigger roller is down and catches the paper between the rollers. The inverter guide plate solenoid [D] energizes to lower the inverter guide plate [E], so that the paper is guided by the inverter guide plate. The next sheet waits at the inverter guide plate.

The paper is fed from the reverse roller to the inverter exit roller [F]. After the paper starts to be fed by the inverter exit roller, the reverse trigger roller and inverter guide plate move back up.

### 2.11.5 DUPLEX TRAY FEED MECHANISM



A294D806.WMF

In duplex mode, after the paper leaves the inverter, the duplex inverter gate solenoid [A] switches the junction gate [B] to direct the paper to the duplex tray. The paper is fed through the duplex tray by duplex transport rollers 1 [C], 2 [D], 3 [E], and the duplex feed roller [F].

If duplex mode is not selected, the solenoid does not switch the junction gate, and the paper goes to the output tray or finisher face down.

### 2.11.6 BASIC DUPLEX FEED OPERATION

To improve the productivity of duplex copying, a non-stacking style duplex mechanism is adopted. This type of mechanism allows more than one page to be processed at once, in a process called 'interleaving'. Examples of this are given below.

For paper lengths up to A4/Letter sideways, the top duplex speed is possible, with the duplex unit processing four sheets of copy paper at the same time.

For paper longer than this, the duplex tray can process two sheets of copy paper at once.

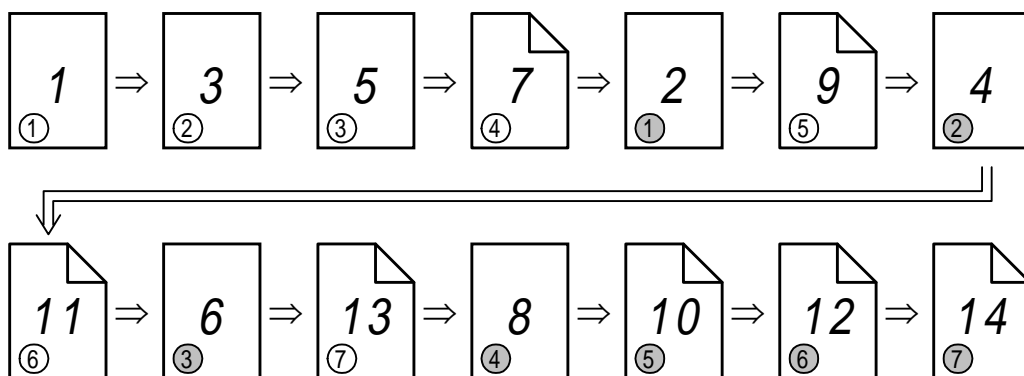
For a single-set duplex copy job, the duplex unit stores only one sheet of copy paper. For a multi-set duplex job, the job is stored first, then the first set is made using interleaving.

Detailed  
Descriptions

#### *Length up to A4/Letter Sideways*

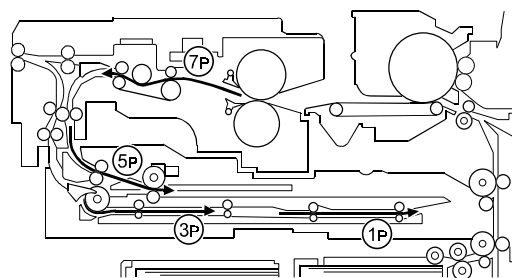
The duplex unit can process four sheets of copy paper

**Example:** A 14-page copy. The large numbers in the illustration show the order of pages. The small numbers in circles show the order of sheets of copy paper (if shaded, this indicates the second side).



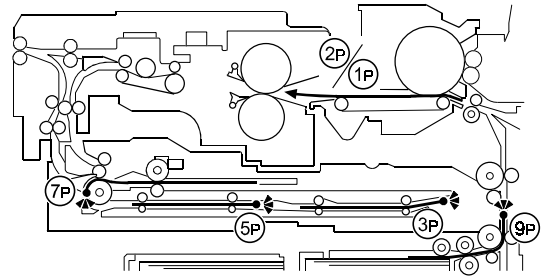
A294D550.WMF

1. The first 4 sheets are fed and printed.
  - 1) 1st sheet printed (1st page)
  - 2) 2nd sheet printed (3rd page)
  - 3) 3rd sheet printed (5th page)
  - 4) 4th sheet printed (7th page)



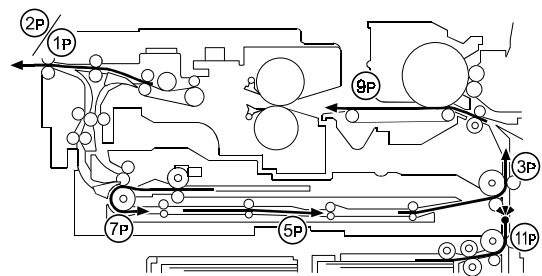
A294D807.WMF

2. The back of the 1st sheet is printed (2nd page).
3. The 2nd, 3rd, 4th sheets (3rd, 5th, and 7th pages) go into the duplex unit.
4. The 5th sheet (9th page) is fed in.



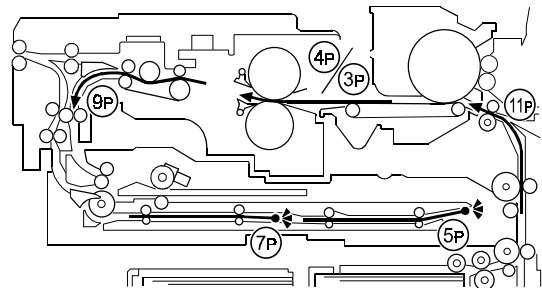
A294D808.WMF

5. The 5th sheet is printed (9th page).
6. The 1st sheet is fed out (1st and 2nd pages printed).



A294D809.WMF

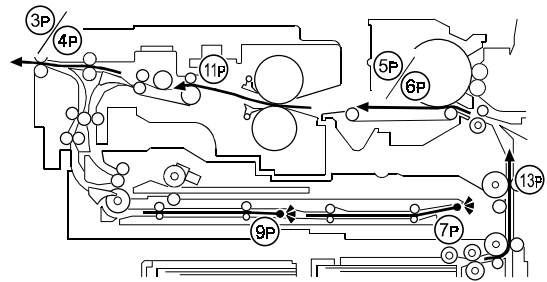
7. The 5th sheet (9th page) is directed to the duplex unit.
8. The 6th sheet (11th page) is fed.
9. The back of the 2nd sheet is printed (4th page).



A294D810.WMF



10. The 2nd sheet is fed out (3rd and 4th pages printed).
11. The 6th sheet is printed (11th page) and directed to the duplex unit.
12. The back of the 3rd sheet (6th page) is printed.
13. The 7th sheet is fed and printed (13th page).
14. The back of the 4th sheet is printed (8th page) and fed out (7th and 8th page).
15. The back of the 5th sheet is printed (10th page) and fed out (9th and 10th pages).
16. The back of the 6th sheet is printed (12th page) and fed out (11th and 12th pages).
17. The back of the 7th sheet is printed and fed out (13th and 14th pages).



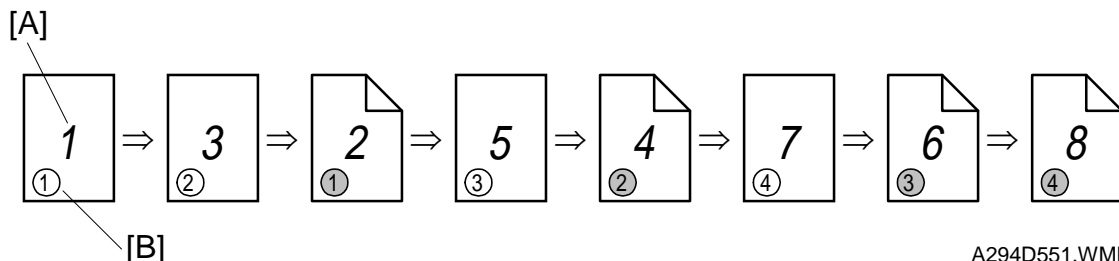
A294D811.WMF

Detailed Descriptions

### ***Longer than A4/Letter Sideways***

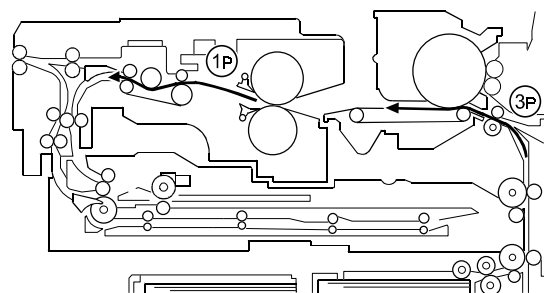
The duplex unit can process two sheets of copy paper

**Example:** 8 pages. The number [A] in the illustration shows the order of pages. The number [B] in the illustration shows the order of sheets of copy paper (if shaded, this indicates the second side).



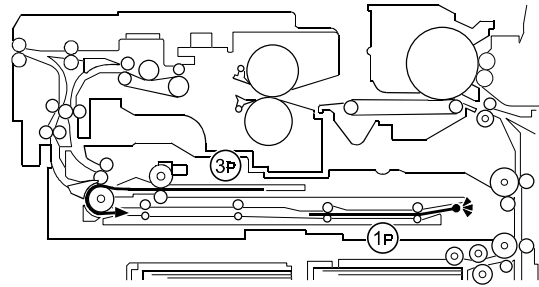
A294D551.WMF

1. The first 2 sheets are fed and printed.
  - 1) 1st sheet printed (1st page)
  - 2) 2nd sheet printed (3rd page)



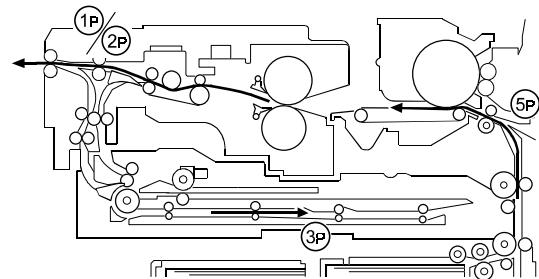
A294D857.WMF

2. The first 2 sheets go into the duplex unit.



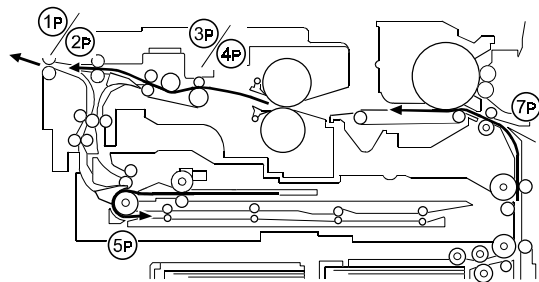
A294D858.WMF

3. The back of the 1st sheet (2nd page) is printed.
4. The 3rd sheet (5th page) is fed and printed.



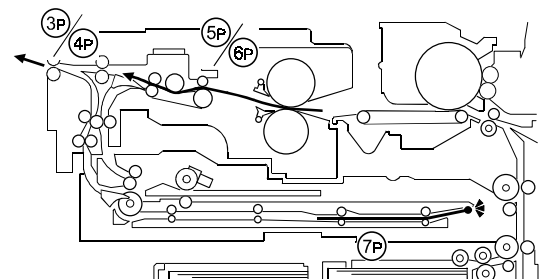
A294D859.WMF

5. The 1st sheet (1st and 2nd pages) is fed out.
6. The back of the 2nd sheet (4th page) is printed.
7. The 4th sheet (7th page) is fed and printed.



A294D860.WMF

8. The 2nd sheet (3rd and 4th pages) is fed out.
9. The back of the 3rd sheet (6th page) is printed.

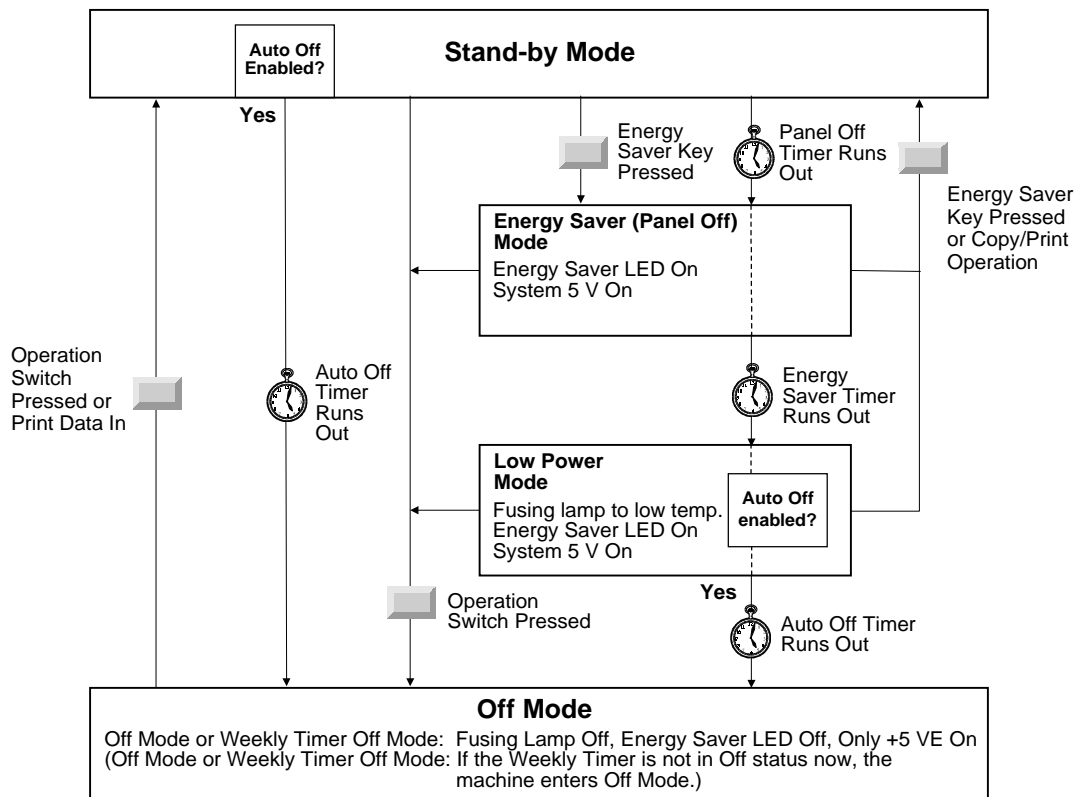


A294D861.WMF

10. The 3rd sheet (5th and 6th pages printed) is fed out.
11. The back of the 4th sheet (8th page) is printed.
12. The 4th sheet (7th and 8th pages) is fed out.

## 2.12 ENERGY SAVER MODES

### 2.12.1 OVERVIEW



Detailed Descriptions

A294D647.WMF

When the machine is not used, the energy saver function reduces power consumption by decreasing the fusing temperature.

This machine has three energy saver modes.

- 1) Energy saver (Panel off) mode
- 2) Low power mode
- 3) Off mode (this has two modes, Auto Off Mode and Weekly Timer Off Mode)

These modes are controlled by the following UP modes.

- Panel off timer: The machine enters energy saver (panel off) mode when this runs out
- Energy saver timer: The machine enters low power mode when this runs out
- Auto off timer: The machine enters auto off mode when this runs out
- Weekly timer programming: Programs a timer for the machine to switch itself on and off (this is for Weekly Timer Off Mode)
- Auto off mode disabling (User Tools – System Setting – Count Manager – AOF)  
If auto off mode is disabled, the machine will never enter auto off mode. The fusing lamps will always stay on, but the machine will still be able to enter energy saver and low power modes.

The way that the machine operates depends on the combination of installed equipment (copier only, copier/printer).

## 2.12.2 ENERGY SAVER (PANEL OFF) MODE

### *Entering Energy Saver (Panel Off) Mode*

The machine enters energy saver mode (also known as 'panel off mode') when one of the following is done.

- The panel off timer runs out after the end of a job.
 

**NOTE:** If the panel off timer is 0, the machine will wait for the energy saver timer to run out, and then it will go straight to low power mode (see Low Power Mode).
- The Clear Mode/Energy Saver Key is held down for a second.

### *What Happens in Energy Saver (Panel Off) Mode*

When the machine enters energy saver (panel off) mode, the fusing unit temperature stays at 173°C and the operation panel indicators are turned off except for the Energy Saver LED and the Power LED. There is only one energy saver level.

If the CPU receives the image print out command from an application (e. g. to print data from a PC), the fusing temperature rises to print the data. However, the operation panel stays off.

### *Return to Stand-by Mode*

If one of the following is done, the machine returns to stand-by mode:

- The Clear Mode/Energy Saver Mode key is pressed
- Any key on the operation panel is pressed
- An original is placed in the ADF
- The ADF is lifted

The recovery time from energy saver to rise the fusing temperature is about **0 s**.

**NOTE:** The polygon motor needs 10 seconds to reach the correct speed.

| Mode         | Operation Switch | Energy Saver LED | Fusing Temp. | System +5 V | Main Power LED |
|--------------|------------------|------------------|--------------|-------------|----------------|
| Energy Saver | On               | On               | 173°C        | On          | On             |

### 2.12.3 LOW POWER MODE

#### *Entering Low Power Mode*

The energy saver timer runs out after the end of a job.

**NOTE:** The energy saver timer cannot be cancelled.

#### *What Happens in Low Power Mode*

The fusing lamp drops to 143°C. The other conditions are the same as for energy saver (panel off) mode.

Detailed  
Descriptions

#### *Return to Stand-by Mode*

The machine returns to standby mode in exactly the same way as from energy saver (panel off) mode.

| Recovery Time    | Operation Switch | Energy Saver LED | Fusing Temp. | System +5 V | Main Power LED |
|------------------|------------------|------------------|--------------|-------------|----------------|
| About 40 seconds | On               | On               | 143°C        | On          | On             |

## 2.12.4 OFF MODE

Off mode has two separate modes.

- Auto Off Mode (Sleep mode)
- Weekly Timer Off Mode

### ***Off Mode (Sleep Mode)***

#### ***Entering Off Mode***

The machine enters off mode when one of the following is done.

- The auto off timer runs out after the end of a job
- The operation switch is pressed to turn the power off

#### ***What Happens in Off Mode***

When the machine enters auto off mode, the operation switch turns off automatically. The fusing lamp and all dc supplies except +5 VE (+5 V for energy saver mode) turns off. At this time, only the main power LED is lit.

| Operation Switch | Energy Saver LED | Fusing Temp.                    | System +5 V | Main Power LED |
|------------------|------------------|---------------------------------|-------------|----------------|
| Off              | Off              | Room Temp.<br>(Fusing lamp off) | Off         | On             |

**NOTE:** Only +5 VE is supplied to the SICU.  
LED (+5 V) is supplied to the operation panel from the SICU.

#### ***Returning to Stand-by Mode***

The machine returns to stand-by mode when the operation switch is pressed.

#### ***Printing Incoming Data***

If the machine receives print data from a PC, the fusing temperature rises to print the data. However, the operation panel stays off. After completing the print job, the machine returns to off mode (sleep mode).

***Weekly Timer Off Mode******Weekly Timer***

The user can program 'on periods' and 'off periods' for each day of the week.

***Entering Weekly Timer Off Mode***

The machine enters this mode when:

- The auto off timer runs out after the end of a job, and the weekly timer has already reached the start of an off period
- The operation switch is pressed to turn the power off, and the weekly timer has already reached the start of an off period
- The weekly timer reaches the start of an off period while in Off Mode.

***What Happens in Weekly Timer Off Mode***

When the machine enters this mode, the operation switch turns off automatically. The fusing lamp and all dc supplies except +5VE (+5V for energy saver mode) turn off. At this time, only the main power LED is lit.

| Operation Switch | Energy Saver LED | Fusing Temp.                    | System +5 V | Main Power LED |
|------------------|------------------|---------------------------------|-------------|----------------|
| Off              | Off              | Room Temp.<br>(Fusing lamp off) | Off         | On             |

**NOTE:** Only +5 VE is supplied to the SICU.  
LED (+5 V) is supplied to the operation panel from the SICU.

***Returning to Stand-by Mode***

If a weekly timer code (Key Operator Code for Off Setting - UP mode) is set, the machine returns to stand-by mode when the operation switch is pressed and the weekly timer code is entered.

If a weekly timer code is not set, the machine returns to stand-by mode when the operation switch is pressed.

***Printing Received Data******If no weekly timer code is set:***

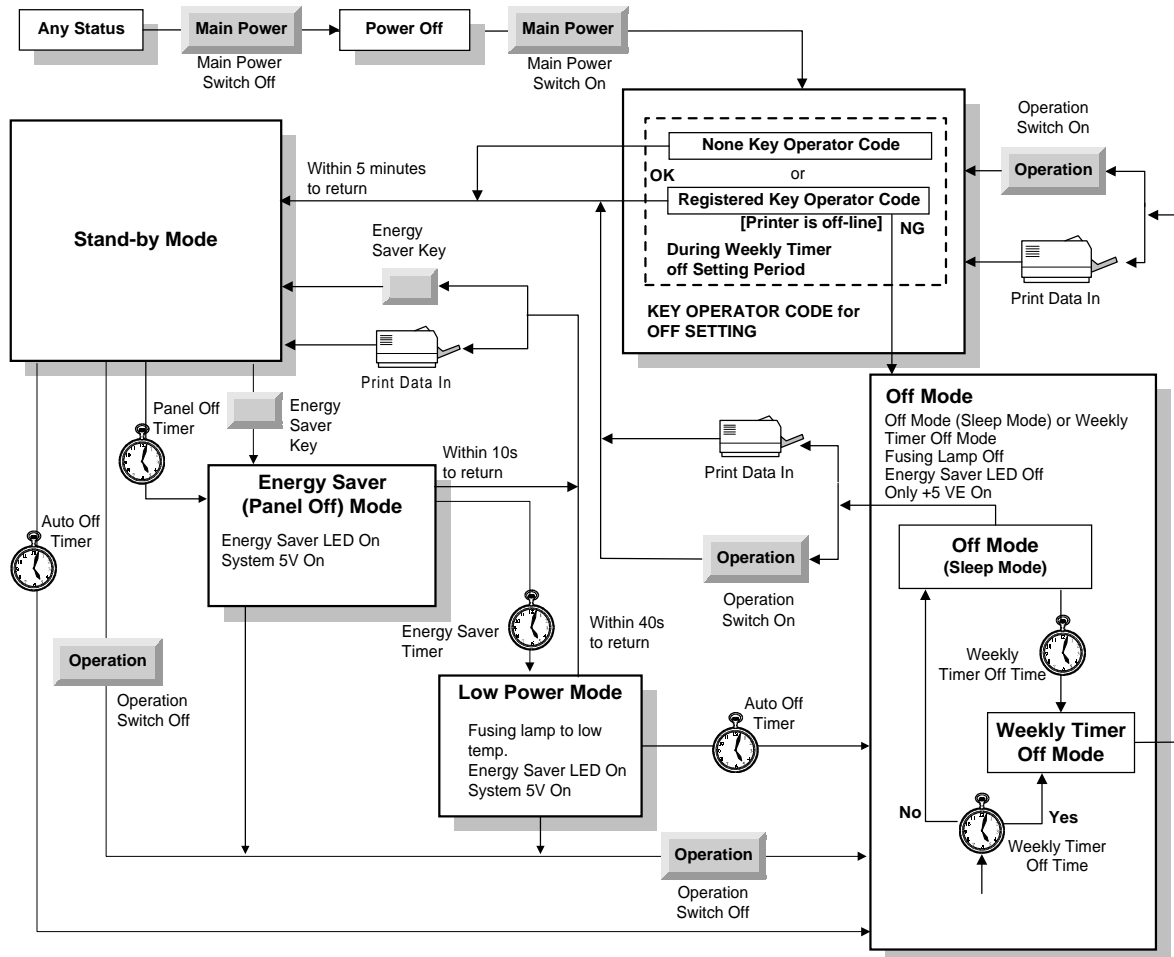
If the machine receives print data from a PC, the fusing temperature rises to print the data. However, the operation panel stays off. After completing the print job, the machine returns to weekly timer off mode.

***If a weekly timer code is set:***

When print data is sent from a PC, the printer stays off-line. After someone enters the weekly timer code, the printer will go on-line and print the data.

## 2.12.5 SUMMARY

For reference, the following flow chart summarizes the various energy saver modes, and their entry and exit conditions.



A294D649.WMF

### Anti-condensation Heaters

All the anti-condensation heaters are unplugged. The transfer anti-condensation (drum) heater is still on the machine. However, the tray heaters and optics anti-condensation heater are not mounted on the machine (option).



## 2.13 OTHERS

### 2.13.1 OPERATION UNIT

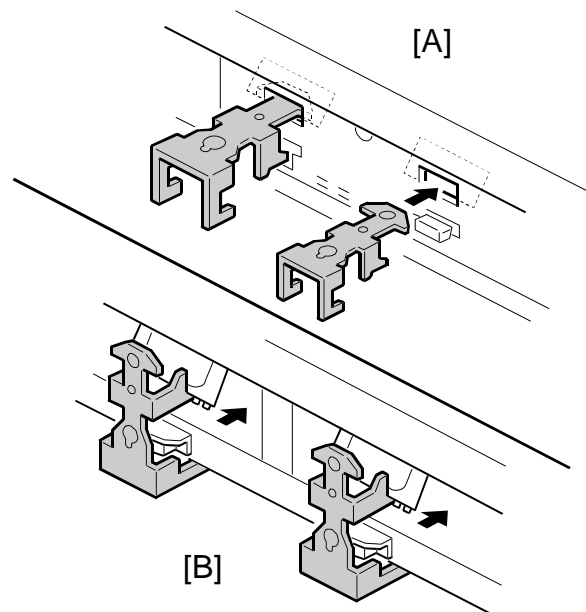
The operation unit consists of the LCD, touch panel, hard keys, back light (cold cathode tube) and the status indicator lamp. A 10.4 inch full color LCD (640 x 480 dot) is used for the operation panel. This operation panel is controlled by the LCD controller on the SICU board inside the copier.

The information on the LCD can be displayed in 256 colors using an 8-bit color scheme (3 bits for R, 3 bits for G, and 2 bits for B).

The status indicator on the top of the operation unit shows the condition of the machine as follows:

- Off: The machine is ready.
- Green (lights): Copying
- Green (blinks): Scanning originals
- Red (blinks): Toner is running out.
- Red (lights): The machine has a problem.

### 2.13.2 DOOR SAFETY SWITCH LOCK TOOLS



A294D942.WMF

There are two service tools are initially placed on the rear side of the left tandem tray. These tools can be used to hold the front door safety switches when the front doors are opened.

1. When the inner cover is installed, the front door safety switches can be held as shown in the illustration [A].
2. When the inner cover is removed, the front door safety switches can be held as shown in the illustration [B].

### 2.13.3 HDD CONTROL

This model has two hard disks to store image data. This allows scanned images to be stored to one hard disk while image data is printed from the other hard disk. Because of this, printing speed does not drop if printing and scanning are done at the same time.

There are two modes (selected with the 'Memory Allocation' UP mode) which determine how the hard disks are shared between normal copy jobs and copy server jobs. The initial setting is "Copier Priority" and the data for copy server jobs is stored only on HDD 1 (this is the disk at the front side).

The following table shows the capacity of the hard disks used for each function.

| UP Setting for<br>"Memory Allocation" | HDD 1 (Front)  | HDD 2 (Rear)  |
|---------------------------------------|--|---|
| Copier Priority                       | Copy Jobs: 0.82 GB<br>Copy Server Jobs: 3.08 GB<br>Printer Jobs: 0.20 GB | Copy Jobs: 3.35 GB<br>Copy Server Jobs: Not used<br>Printer Jobs: 0.76 GB |
| Max. Memory for Document<br>Server    | Copy Jobs: 1.23 GB<br>Copy Server Jobs: 2.57 GB<br>Printer Jobs: 0.31 GB | Copy Jobs: 1.23 GB<br>Copy Server Jobs: 2.57 GB<br>Printer Jobs: 0.31 GB  |

#### ***When a Copy Job is Done***

Basically, the scanned image is stored on the hard disk that has the largest remaining capacity. (If the remaining capacity is the same, the image is stored in HDD 1.) If one hard disk is already being used for printing or while transporting image data from a hard disk to the CD-RW, the other hard disk is used to store new data regardless of the remaining capacity.

Even if the selected hard disk becomes full, data storage continues using the other hard disk. If both hard disks become full, data storage stops and a message is displayed on the screen.

#### ***When a Copy Server Job is Done***

Initially, "Copier Priority" is selected for "Memory Allocation" in UP mode. In this setting, only HDD 1 is used for copy server jobs. If "Max. Memory for Document Server" is selected, HDD 1 and HDD 2 each have the same areas for normal copy jobs and copy server jobs. The hard disk with the greater remaining capacity is selected to store the image if neither hard disk is being used (same as for a copy job).

The image files stored in the hard disks are managed in the NVRAM on the SICU. When the NVRAM is replaced or a memory clear is done, all the copy server files are deleted.

If one of the hard disks is replaced or if SP4-911-1 (HDD 1 Media Check) or SP4-912-1 (HDD 2 Media Check) is performed, the file data in the NVRAM is updated and the deleted files (in the replaced HDD) will not be displayed.

***Limitation when “Max. Memory for Document Server” is Selected***

Magazine mode cannot be used for a copy server job if “Max. Memory for Document Server” is selected. This is because parts of a data file could be stored on separate hard disks, and the image data cannot be combined if that happens.

***Machine Operation when Hard Disk(s) is Defective***

If one of the hard disks is defective, copying is done using the other hard disk. There is no disabled function but the productivity will be reduced when image scanning is done during printing.

If both of the hard disks are defective, functions which need a hard disk (duplex, sort, next job, etc.) are disabled.

If HDD 1 is defective, copy server functions cannot be used in “Copier Priority” mode. An SC code is displayed when a copy server function is selected, but the machine can be operated if that function is not selected. If “Max. Memory for Document Server” is selected, copy server functions can be operated using the remaining hard disk.

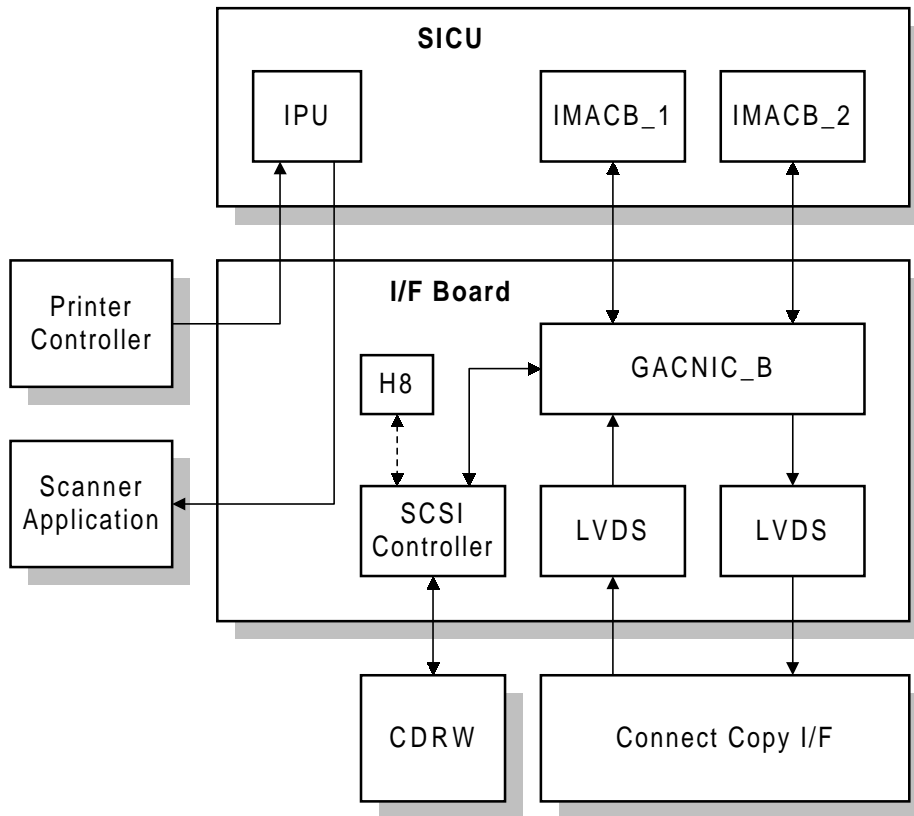
***Stamp Function***

Preset stamp data is stored in the hard disks in the factory. The data is stored in both of the hard disks, so that the data can be read regardless of which hard disk is used for other functions. When a user stamp is programmed, the stamp data is stored in both of the hard disks.

If SP4-911-1 (HDD 1 Media Check) or SP4-912-1 (HDD 2 Media Check) is performed, the preset stamp data and user stamp data are erased from both of the hard disks. (This is because the stamp data on each disk must be exactly the same, and if only one set of data is erased, it is possible that different data will become stored on each disk.) The stamp data must be reinstalled using a flash memory card after one of the hard disks is replaced. Refer to Stamp Data Installation in section 4.

### 2.13.4 DATA PATH THROUGH THE INTERFACE BOARD

When the connect copy kit, CD-ROM reader/writer, or printer controller is used, the image data are transferred through the interface board as shown in the diagram below.



A294D994.WMF

**GACNIU\_B:** An ASIC which handles the data transmission between the memories in the SICU and CD-ROM reader/writer or the connect copy interface.

**LVDS:** A noise-resistant interface

**IMACB:** AN ASIC which controls data memory

**H8:** A CPU which controls the SCSI controller



## 3. INSTALLATION PROCEDURE

### 3.1 INSTALLATION REQUIREMENTS

#### 3.1.1 ENVIRONMENT

1. Temperature Range: 10°C to 32°C (50°F to 89.6°F)
2. Humidity Range: 15% to 80% RH
3. Ambient Illumination: Less than 1,500 lux (do not expose to direct sunlight or strong light)
4. Ventilation: Room air should turn over at least 3 times per hour
5. Ambient Dust: Less than 0.10 mg/m<sup>3</sup> (2.7 x 10<sup>-6</sup> oz/yd<sup>3</sup>)
6. If the place of installation is air-conditioned or heated, do not place the machine where it will be:
  - 1) Subjected to sudden temperature changes
  - 2) Directly exposed to cool air from an air-conditioner
  - 3) Directly exposed to heat from a heater
7. Do not place the machine where it will be exposed to corrosive gases.
8. Do not install the machine at any location over 2,000 m (6,500 feet) above sea level.
9. Place the copier on a strong and level base.
10. Do not place the machine where it may be subjected to strong vibrations.

#### 3.1.2 MACHINE LEVEL

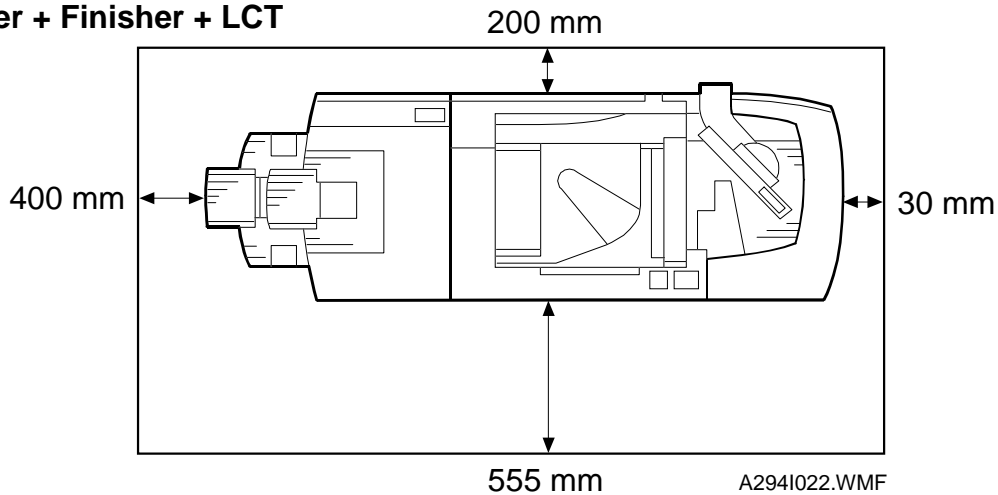
1. Front to back: Within 5 mm (0.2") of level
2. Right to left: Within 5 mm (0.2") of level

**NOTE:** The machine legs may be raised or lowered in order to level the machine.  
Set a carpenter's level on the exposure glass.

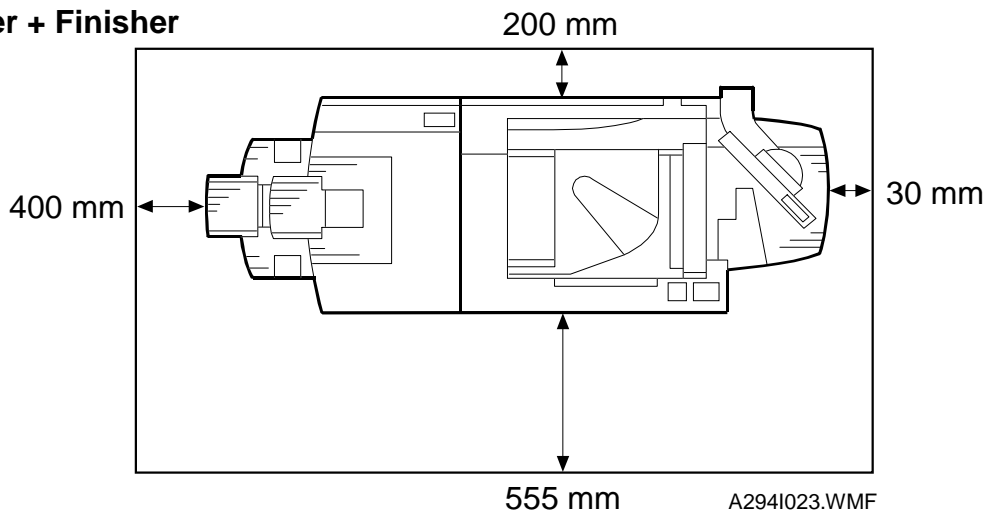
### 3.1.3 MINIMUM SPACE REQUIREMENTS

Place the copier near the power source, providing clearance as shown below. The same amount of clearance is necessary when optional equipment is installed.

#### Copier + Finisher + LCT



#### Copier + Finisher



### 3.1.4 POWER REQUIREMENTS

#### ⚠ CAUTION

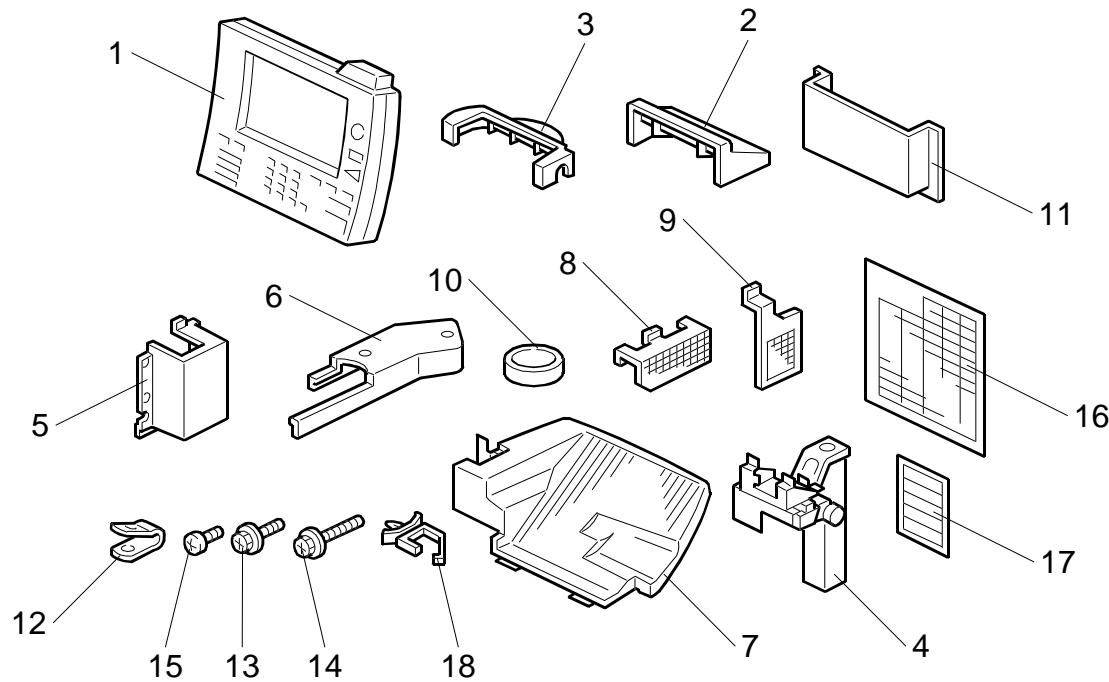
1. Make sure the plug is firmly inserted in the outlet.
2. Avoid multi-wiring.
3. Do not set anything on the power cord.



1. Input voltage level: 220 ~ 240 V, 50/60 Hz: More than 16 A
2. Permissible voltage fluctuation: 10%

3.2 COPIER (A294)

3.2.1 ACCESSORY CHECK



A294I001.WMF

Installation

Check the quantity and condition of the accessories in the box against the following list:

| Description                                 | Quantity |
|---|----------|
| 1. Operation Unit.....                      | 1        |
| 2. Upper Cover - Operation Unit Holder..... | 1        |
| 3. Lower Cover - Operation Unit Holder..... | 1        |
| 4. Operation Unit Arm .....                 | 1        |
| 5. Right Arm Cover.....                     | 1        |
| 6. Arm Upper Cover .....                    | 1        |
| 7. ADF Exit Tray.....                       | 1        |
| 8. Optics Dust Filter .....                 | 1        |
| 9. Dust Filter.....                         | 1        |
| 10. Leveling Shoe .....                     | 4        |



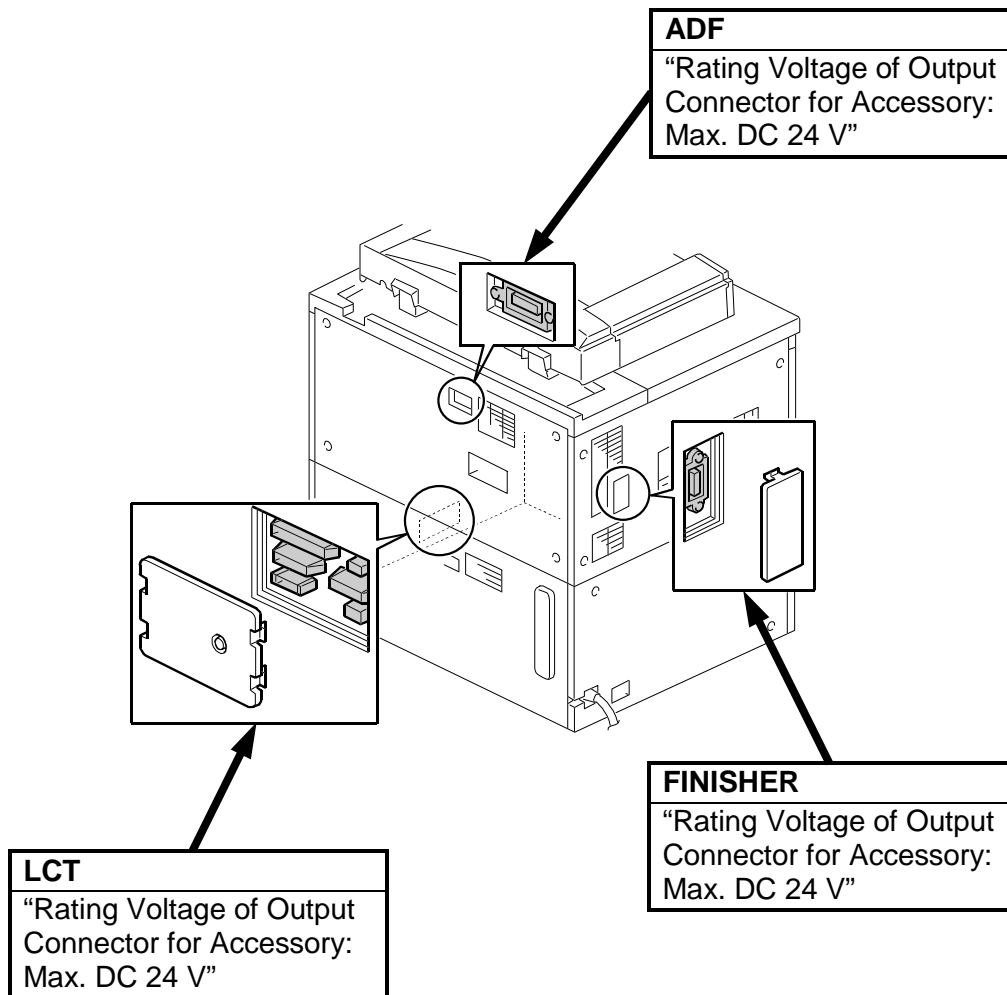
|   |    |
|---|----|
| 11. Operating Instruction Holder .....                          | 1  |
| 12. Metal Cable Clamp.....                                      | 1  |
| 13. Tapping Screw - M4 x 8 .....                                | 25 |
| 14. Tapping Screw - M4 x 12 .....                               | 2  |
| 15. Philips Pan Head Screw - M4 x 6.....                        | 1  |
| 16. Paper Size Decal .....                                      | 1  |
| 17. Decal – Face Up .....                                       | 1  |
| 18. Nylon Clamp .....   | 1  |
| 19. Model Name Plate (-10, -15, -22 machines) – not shown ..... | 1  |
| 20. Operating Instructions – not shown.....                     | 2  |

### 3.2.2 INSTALLATION PROCEDURE

#### CAUTION

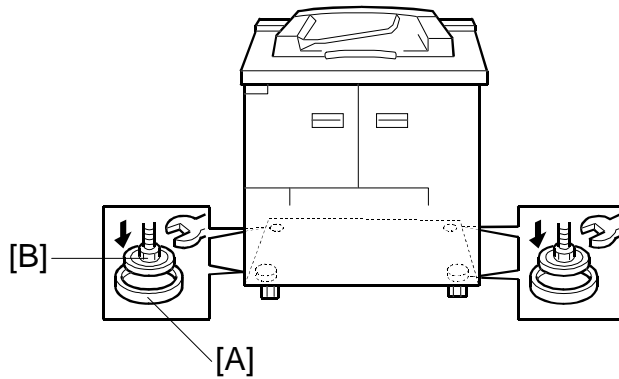
##### Rating Voltage for Peripherals

Make sure to plug the cables into the correct sockets.

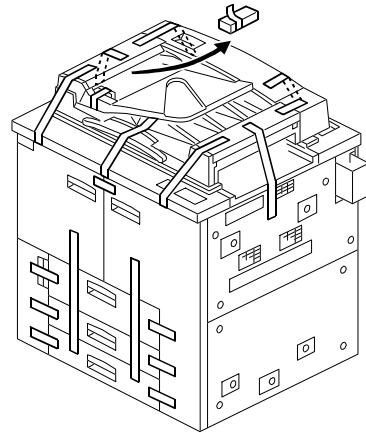


A294I025.WMF

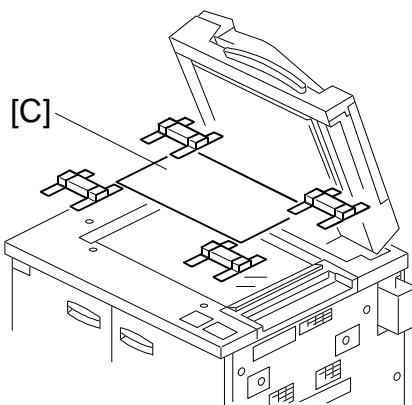
**NOTE:** Since the installation procedure is not packed with the copier as an accessory, always bring this manual with you.



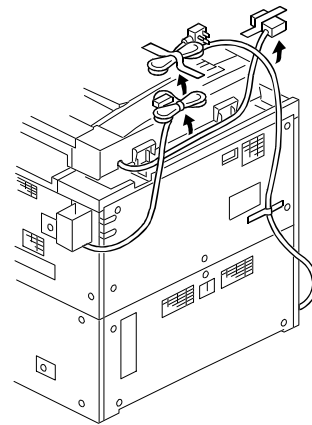
A294I024.WMF



A294I006.WMF



A294I005.WMF



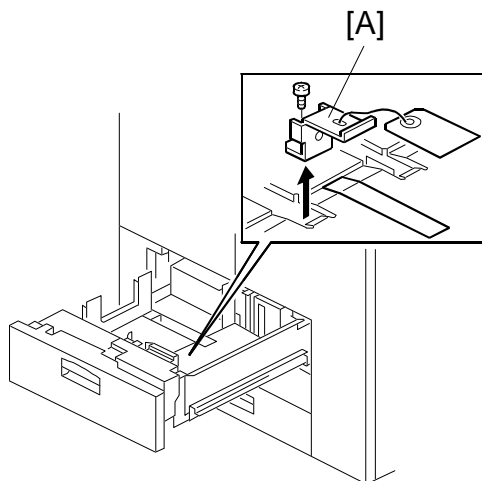
A294I004.WMF

**⚠ CAUTION**

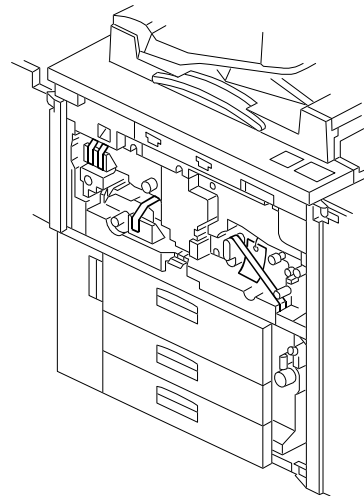
**Keep the power cord unplugged when starting the following procedure.**

**NOTE:** 1) Keep the shipping retainers after installing the machine. They will be reused if the machine is moved to another location in the future.  
2) Insert the leveling shoes [A] under the leveling feet [B], and level the machine before starting the installation.

1. Remove all strips of tapes as shown above.
2. Keep the factory data sheet [C] for future use.

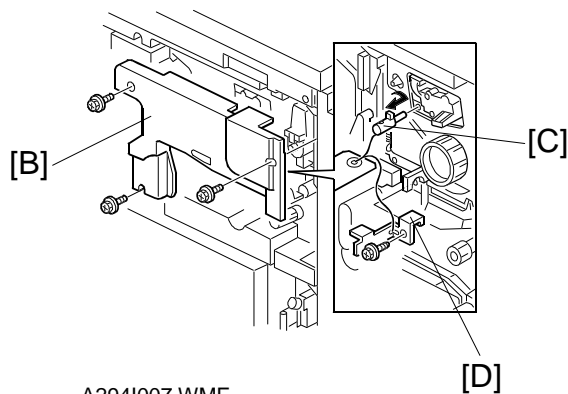


A294I003.WMF

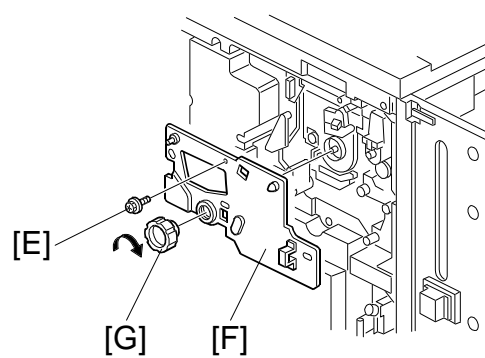


A294I002.WMF

Installation

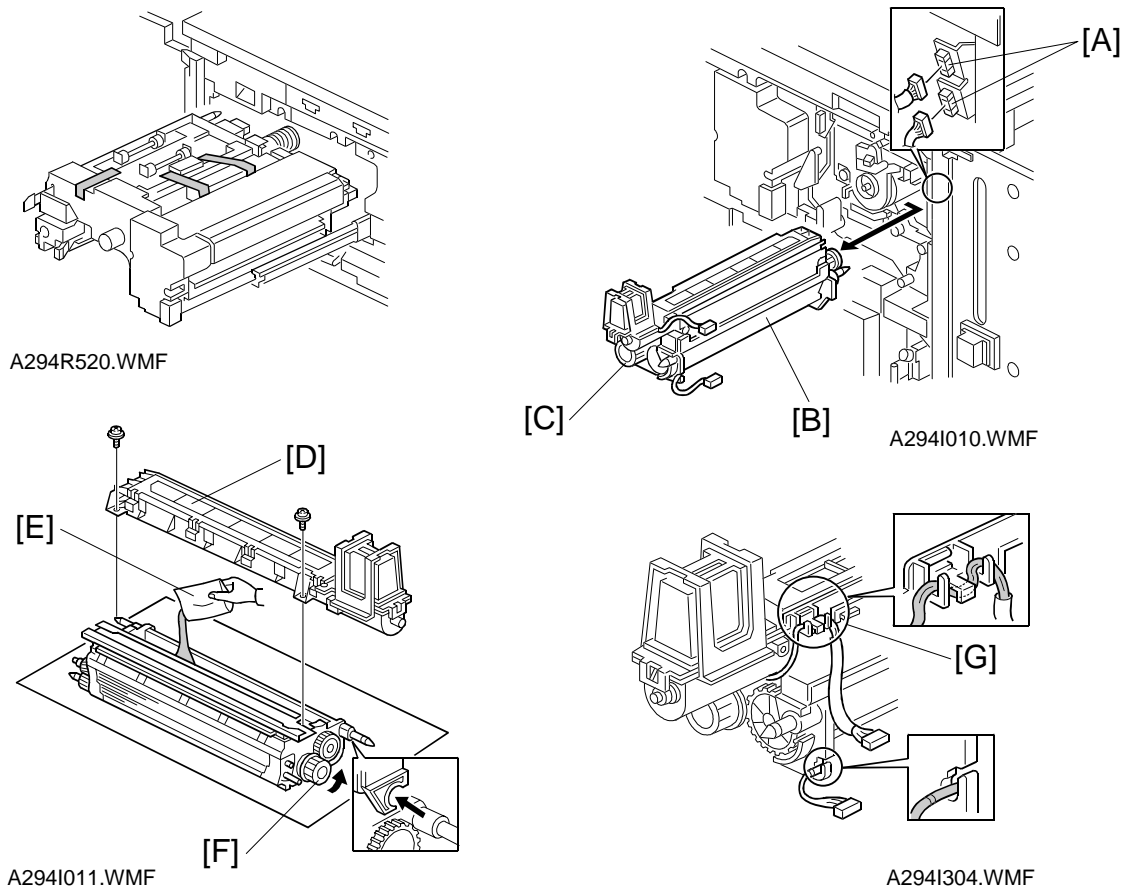


A294I007.WMF



A294I009.WMF

3. Pull out the tandem tray and remove the tray lock plate [A] (1 screw) and 1 cushion between trays.
4. Pull out the foam cushion between trays 2 and 3.
5. Open the front door and remove the strips of tape.
6. Remove the inner cover [B] (3 screws).
7. Remove the blade release pin [C] and the transfer belt lock plate [D] (1 screw).
8. Remove the screw [E] that holds the drum stay [F].



9. Remove the drum stay knob [G] and the drum stay (turn the knob clockwise to remove it).

10. Remove the tape and foam cushion from fusing unit.

11. Disconnect the two connectors [A].



12. Pull out the development unit [B] as shown.

**NOTE:** 1) To prevent scratches on the drum, push the development unit to the right while pulling it out.

2) When pulling out the development unit, do not pull the knob [C].

3) Place the development unit on a clean sheet of paper, to prevent foreign matter from being attracted to the sleeve rollers.

13. Remove the toner hopper [D] (2 screws).

14. Pour in one pack of developer [E] while turning the knob [F]. Distribute the developer evenly along the development unit.

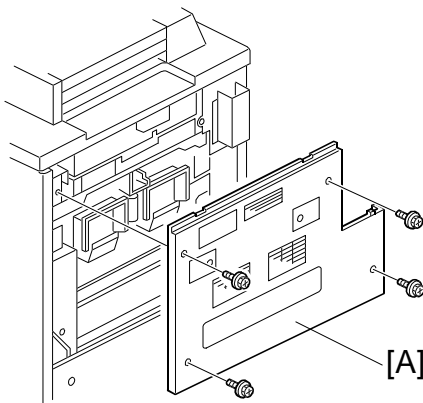
15. Attach the toner hopper to the development unit.

16. Install the development unit in the machine and connect two connectors.

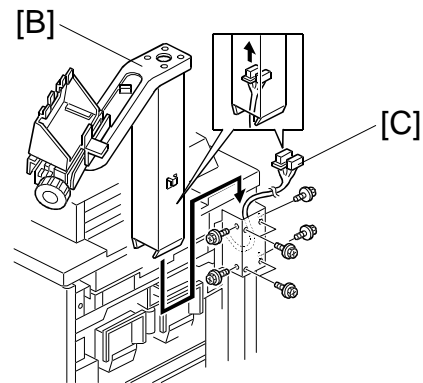
**NOTE:** When reinstalling the development unit, confirm that the harness layout is as shown [G].

17. Attach the drum stay and attach the drum stay knob and one screw.

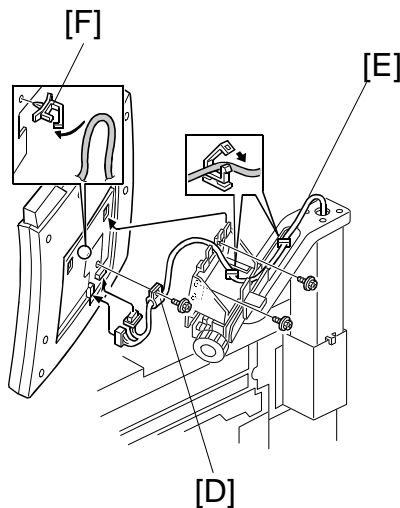
18. Reinstall the inner cover.



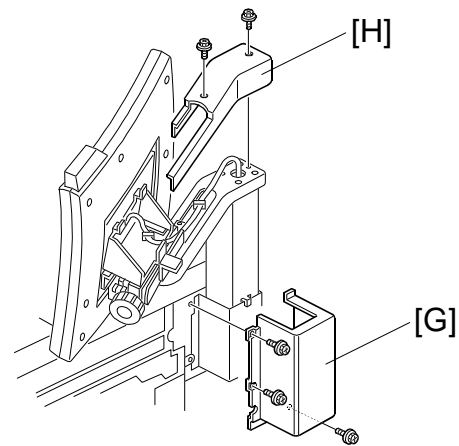
A294I012.WMF



A294I013.WMF

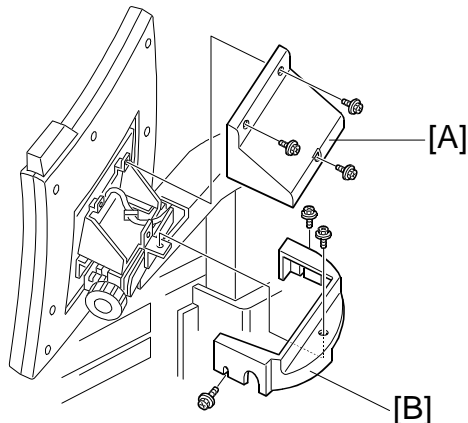


A294I014.WMF

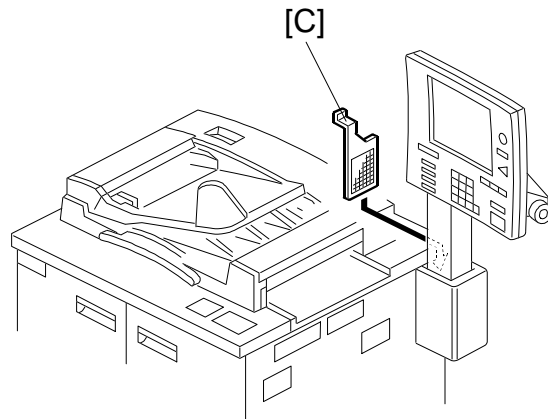


A294I015.WMF

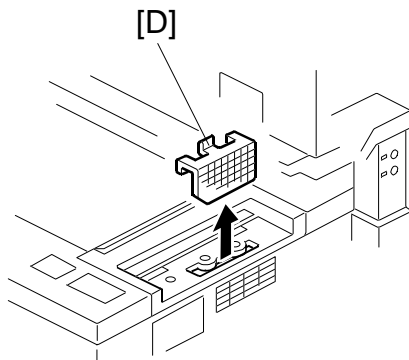
19. Remove the right upper cover [A] (4 screws).
20. Pass the harness through the operation unit arm [B], and install the arm as shown (9 screws).
21. Connect the 2 connectors [C] of the operation unit.
22. Secure the harness clamp [D] on the operation unit (one M4 x 6 pan head screw). Pass the harness [E] through the clamps as shown. Then install the operation unit on the arm (4 screws).
23. Set the nylon clamp [F].
24. Install the right arm cover [G] (3 screws) and the arm upper cover [H] (2 screws).



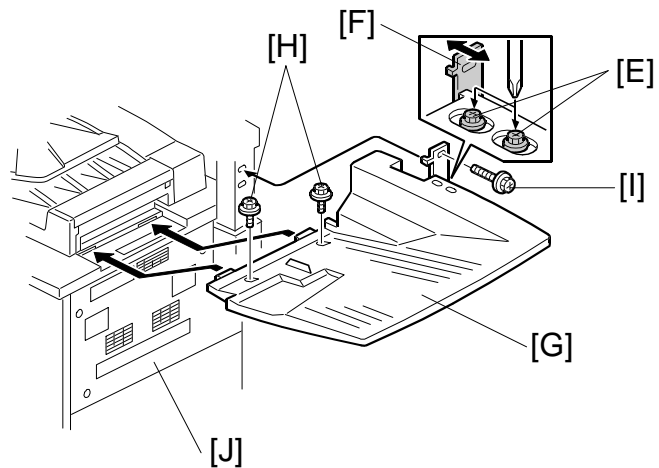
A294I016.WMF



A294I017.WMF



A294I506.WMF



A294I018.WMF

25. Install the upper [A] (3 screws) and lower [B] (3 screws) covers of the operation unit holder.
26. Set the dust filter [C] as shown.
27. Set the optics dust filter [D] as shown.
28. Loosen the two screws [E] of the bracket [F]. Then set the original exit tray [G].
29. Secure the original exit tray with 2 - M4 x 12 screws [H] and 1 M4 x 8 screw [I].  
**NOTE:** Do not use these M4 x 12 screws for securing the other exterior covers. They might hit a moving part inside the machine and damage that part.
30. Secure the bracket [F] to the operation unit arm with screw [I]. Then retighten the two screws [E] to secure the bracket to the original exit tray.
31. Reinstall the right upper cover [J].
32. Plug in the power cord and turn the main switch on. Put toner bottle(s) in the toner bank.

33. When the machine is ready, enter SP mode as follows:

- 1) Press the clear modes key.
- 2) Enter "107".
- 3) Hold down the clear/stop key for more than 3 seconds.



34. Press "Copy SP" on the LCD, and perform the TD initial setting as follows:

- 1) Select SP No. 2-801
- 2) Press the "Start key" on the LCD.

**NOTE:** This SP mode performs the TD initial setting. It will stop automatically in about 1 minute.

35. Supply toner from the toner bank to the toner hopper as follows:

- 1) Select SP2-207-2 (Toner Bank Toner Supply)
- 2) Press the "Start key" on the LCD.

**NOTE:** By performing this SP mode, the toner is distributed into the toner hopper and the toner transport path. It will stop automatically in about 7 minutes. If SP2-207-2 fails after SP2-801 is completed (an SC code is displayed), repeat only SP2-207-2 again.



36. Change the paper size for all paper trays to suit the customer's request.

37. Attach the appropriate paper size decals, which are included as accessories, to each paper tray.

38. Attach the face-up decal to the ADF.

39. Check copy quality and machine operation.



**NOTE:** The first time that the ADF is used, dust on the ADF transport belt will transfer to the exposure glass. To remove this dust, perform SP6-009 (DF Free Run) for 3 minutes, and then remove the dust on the exposure glass if necessary.

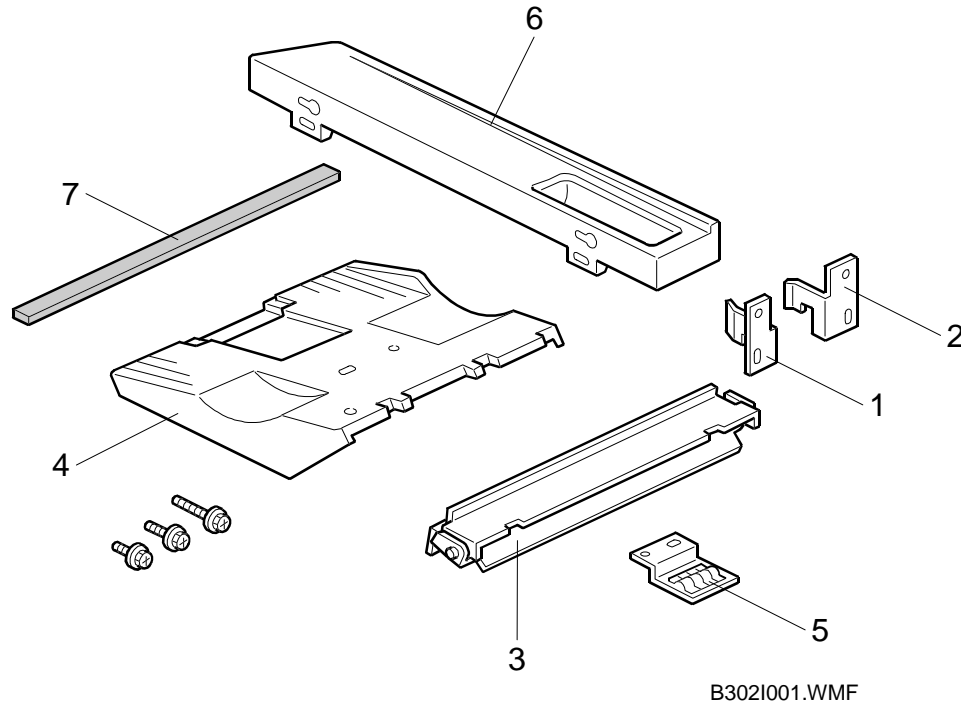
40. Initialize the electrical total counter using SP7-825, if required.





### 3.3 FINISHER INSTALLATION (B302)

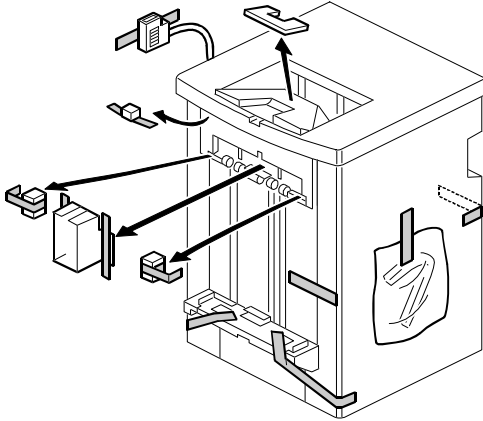
#### 3.3.1 ACCESSORY CHECK



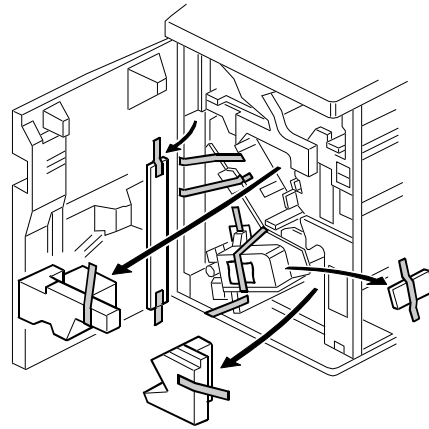
Check the quantity and condition of the accessories in the box against the following list:

| Description                       | Quantity |
|-----------------------------------|----------|
| 1. Front Joint Bracket.....       | 1        |
| 2. Rear Joint Bracket .....       | 1        |
| 3. Entrance Guide Plate .....     | 1        |
| 4. Shift Tray.....                | 1        |
| 5. Grounding Plate .....          | 1        |
| 6. Table Extension .....          | 1        |
| 7. Cushion.....                   | 1        |
| 8. Tapping Screw - M3 x 6 .....   | 4        |
| 9. Tapping Screw - M3 x 8 .....   | 4        |
| 10. Tapping Screw - M4 x 14 ..... | 4        |
| 11. Tapping Screw - M4 x 8 .....  | 2        |
| 12. Installation Procedure .....  | 1        |

### 3.3.2 INSTALLATION PROCEDURE

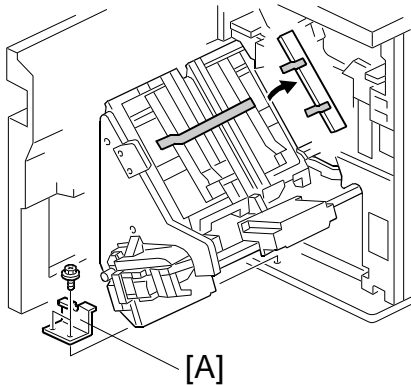


B302I002.WMF

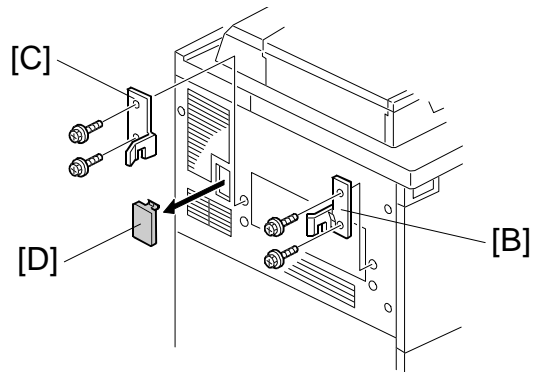


B302I003.WMF

Installation



B302I014.WMF

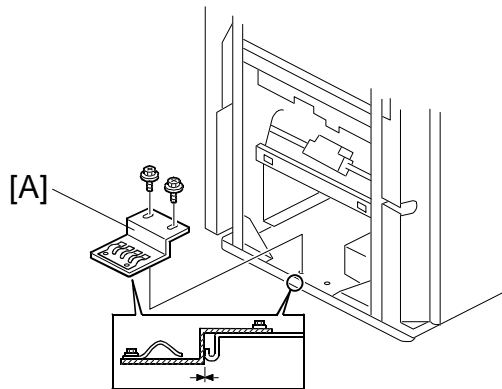


B302I019.WMF

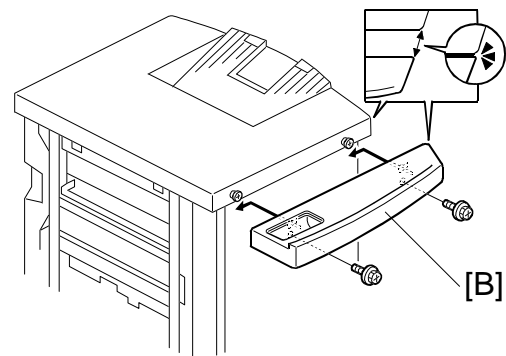
#### **⚠ CAUTION**

**Unplug the machine power cord before starting the following procedure.**

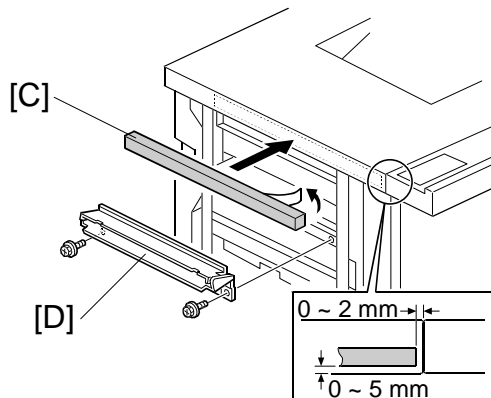
1. Unpack the finisher and remove the tapes and shipping retainers as shown above.
2. Open the front door and remove the shipping retainers. Remove the bracket [A] (2 screws) securing the stapler unit.
3. Install the front joint bracket [B] and rear joint bracket [C] (two M4 x 14 screws each) on the left side of the copier.
4. Remove the connection plate [D].



B302I004.WMF

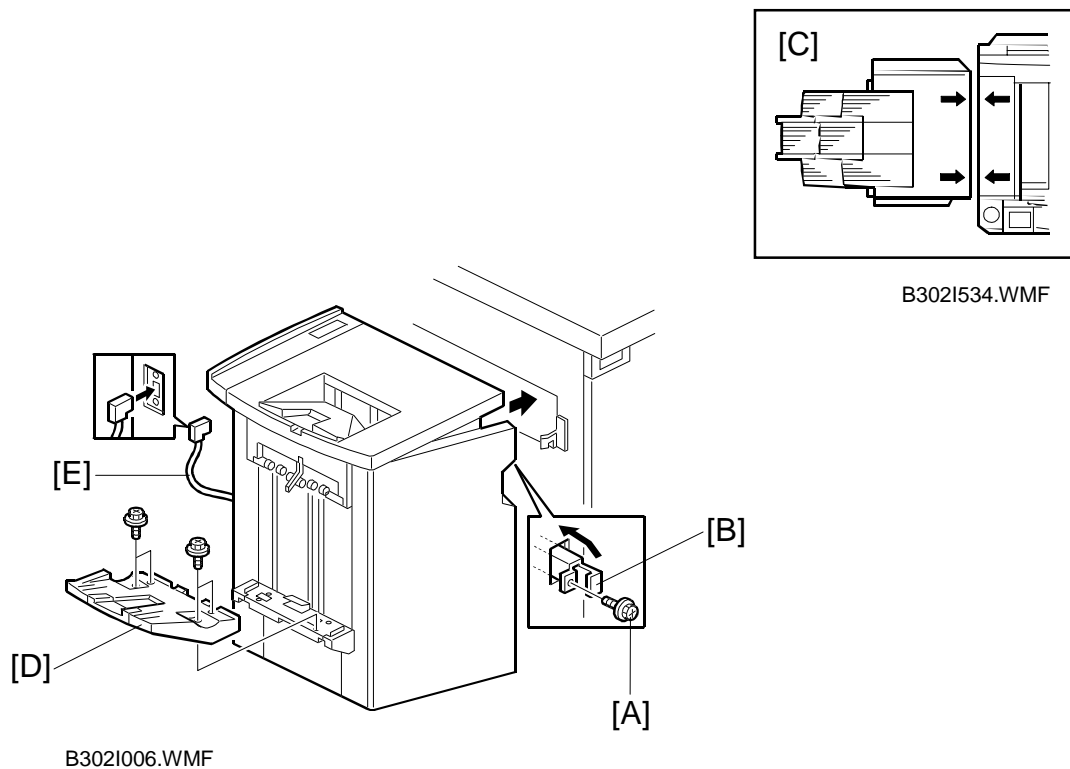


B302I005.WMF



B302I107.WMF

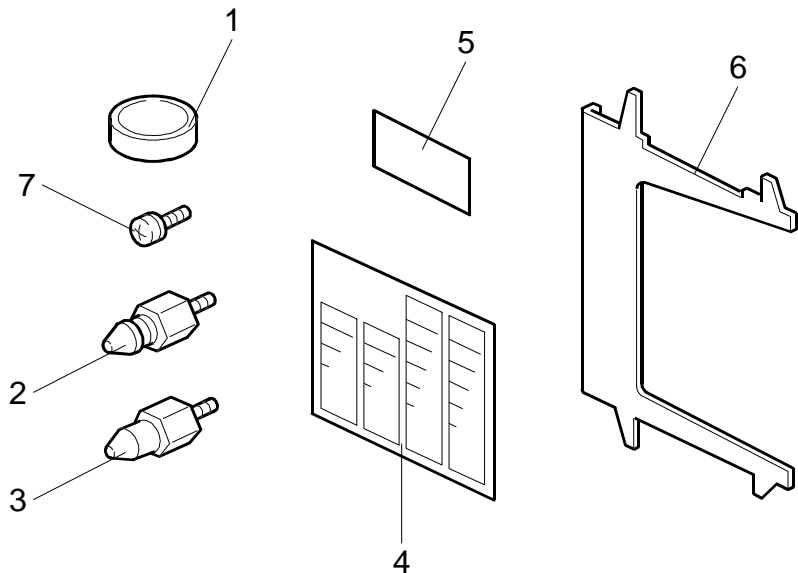
5. Install the grounding plate [A] (two M3 x 6 screws).  
**NOTE:** Set the grounding plate so that there is no gap between the grounding plate and the bottom frame of the finisher (as shown).
6. Install the rear tray as shown [B] (two M4 x 8 screws).  
**NOTE:** The edge of the rear tray should be aligned with the edge of the finisher (as shown).
7. Attach the cushion [C] to the right side of the upper cover.
8. Install the entrance guide plate [D] (two M3 x 6 screws).



9. Open the front door of the finisher, and remove the screw [A] which secures the locking lever. Then pull the locking lever [B].
10. Align the finisher on the joint brackets, and lock it in place by pushing the locking lever [B].  
**NOTE:** Before securing the locking lever, make sure that the top edges of the finisher and the copier are parallel from front to rear as shown [C].
11. Secure the locking lever (1 screw) and close the front door.
12. Install the shift tray [D] (four M3 x 8 screws).
13. Connect the finisher cable [E] to the copier.

3.4 LCT INSTALLATION (B303)

3.4.1 ACCESSORY CHECK

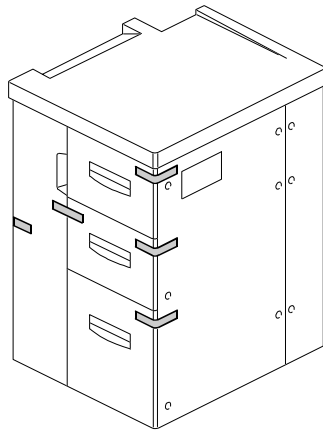


B303I001.WMF

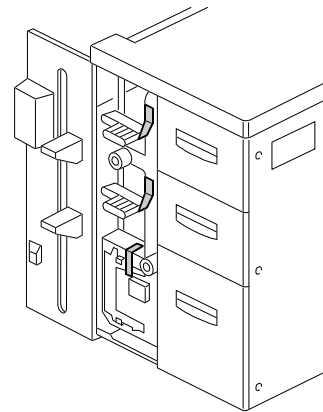
Check the quantity and condition of the accessories in the box against the following list:

| Description                               | Quantity |
|---|----------|
| 1. Leveling Shoe .....                    | 3        |
| 2. Upper Joint Pin .....                  | 2        |
| 3. Lower Joint Pin .....                  | 2        |
| 4. Decal - Paper Size .....               | 1        |
| 5. Decal - Tab Paper End Fence.....       | 1        |
| 6. Tab Paper End Fence .....              | 1        |
| 7. Philips Screw - M4 x 8.....            | 1        |
| 8. Installation Procedure (English) ..... | 1        |

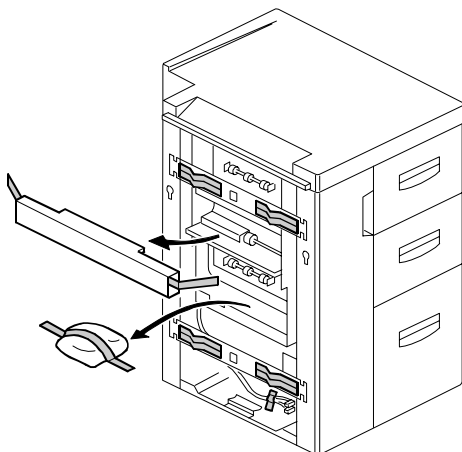
### 3.4.2 INSTALLATION PROCEDURE



B303I002.WMF



B303I004.WMF



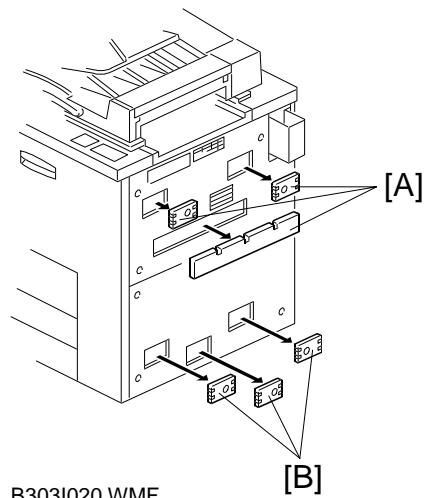
B303I003.WMF

Installation

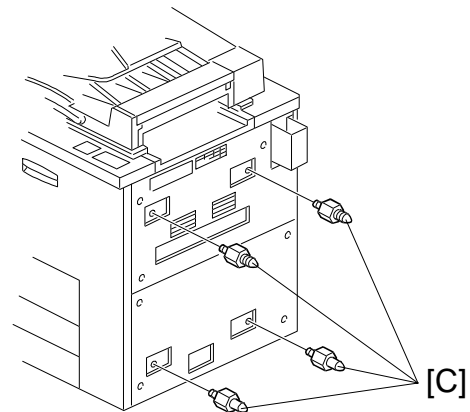
#### **⚠ CAUTION**

**Unplug the power cord before starting the following procedure.**

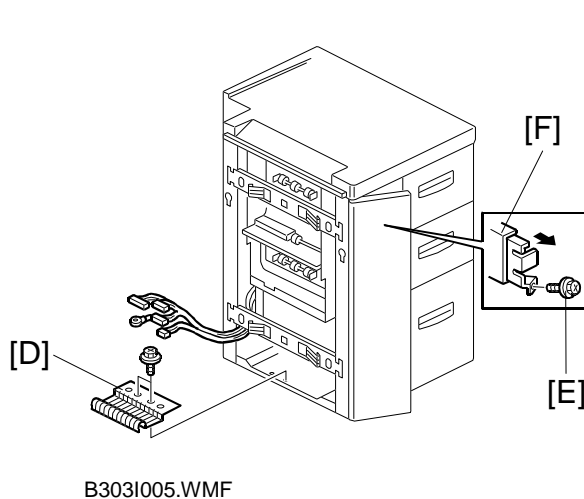
1. Remove the strips of tape on the covers (shown in the top position of the illustration).
2. Open the LCT left door and remove the strips of tape holding the levers.



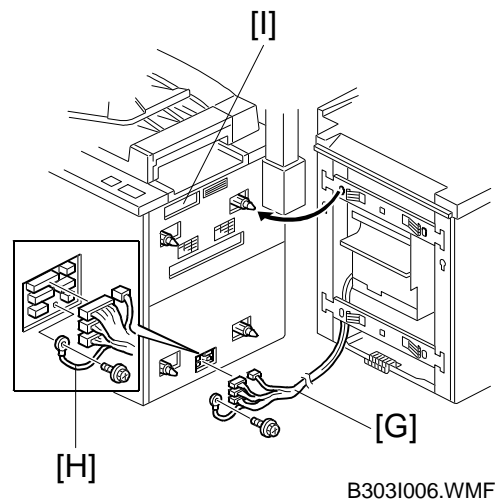
B303I020.WMF



B303I021.WMF



B303I005.WMF

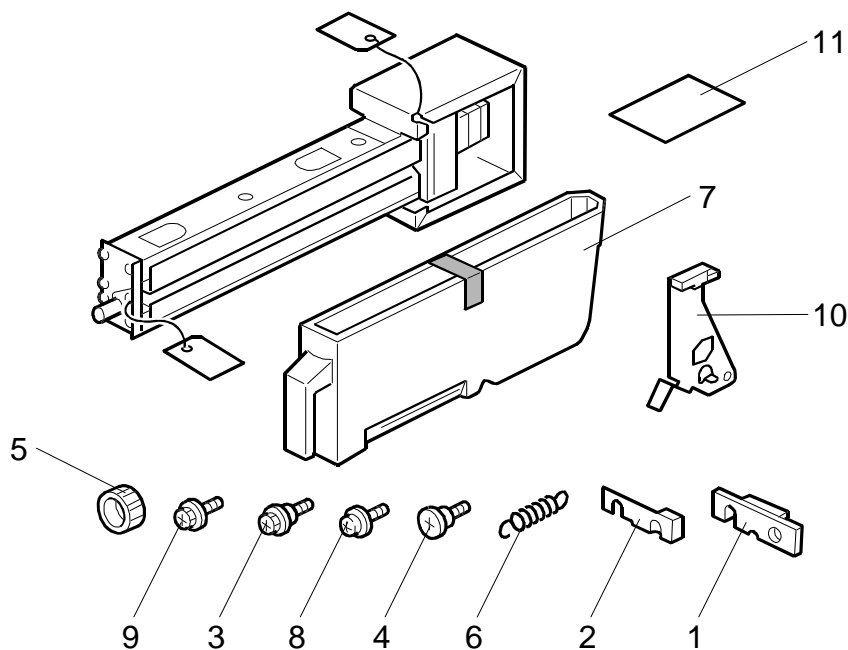


B303I006.WMF

3. Remove the three small covers [A] from the upper right side cover.  
**NOTE:** Small cover [I] can be removed at this time, to facilitate software upgrade using a flash card.
4. Remove the three small covers [B] from the lower right side cover.
5. Install the four joint pins [C] on the right side of the copier. The pins with slots in them should be used for the upper right side cover.
6. Remove the two screws that secure the grounding plate [D]. Turn the plate 180 degrees (so that left becomes right, and vice-versa) and secure it with the two screws.
7. Remove the screw [E], which secures the locking lever [F]. Slide the locking lever toward you (about 1/2 inch).
8. Connect the four connectors [G] and secure the grounding wire [H] (1 screw).
9. Align the LCT on the joint pins, and lock it in place with the locking lever.
10. Insert the leveling shoes under the leveling feet and level the LCT.

3.5 PUNCH UNIT INSTALLATION (A812)

3.5.1 ACCESSORY CHECK



A812I101.WMF

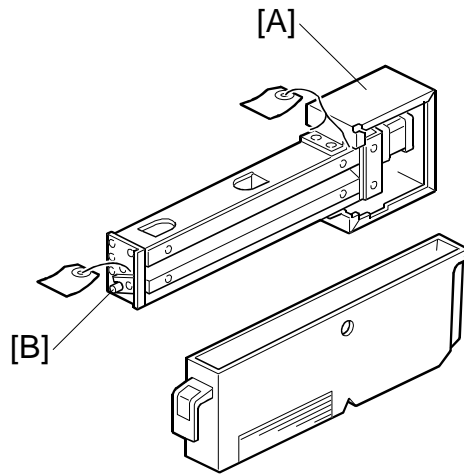
Installation

Check the quantity and condition of the accessories in the box against the following list:

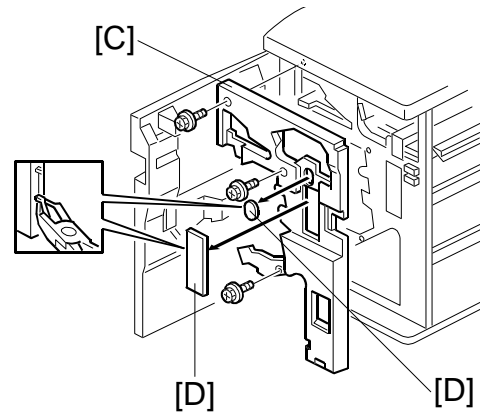
| Description                              | Quantity |
|--|----------|
| 1. Spacer - 2 mm .....                   | 1        |
| 2. Spacer - 1 mm .....                   | 2        |
| 3. Stepped Screw - Short.....            | 1        |
| 4. Stepped Screw - Long.....             | 1        |
| 5. Punch Unit Knob .....                 | 1        |
| 6. Spring.....                           | 1        |
| 7. Hopper .....                          | 1        |
| 8. Tapping Screw - M4 x 10 .....         | 2        |
| 9. Screw with Flat Washer - M4 x 6 ..... | 1        |
| 10. Sensor Bracket .....                 | 1        |
| 11. Punch Position Decal .....           | 1        |



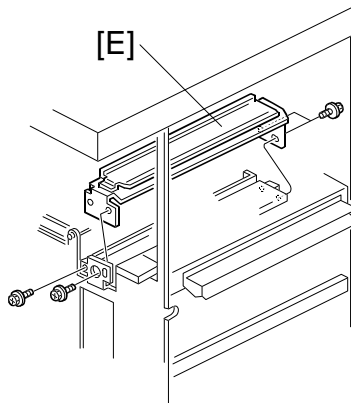
### 3.5.2 PUNCH UNIT INSTALLATION



A812I500.WMF



A812I007.WMF



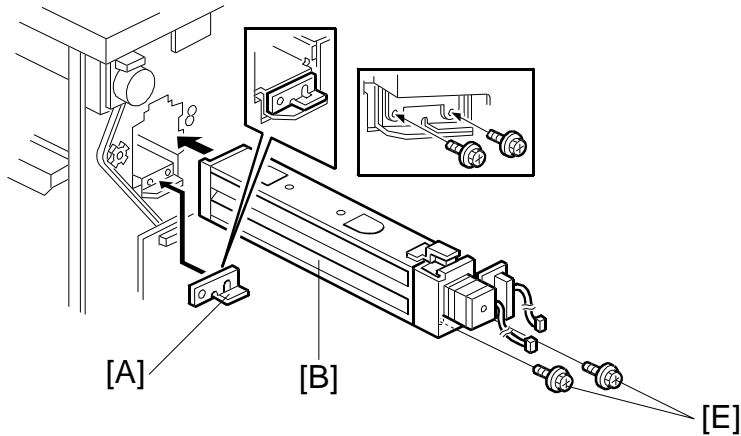
A812I008.WMF

**⚠ CAUTION**

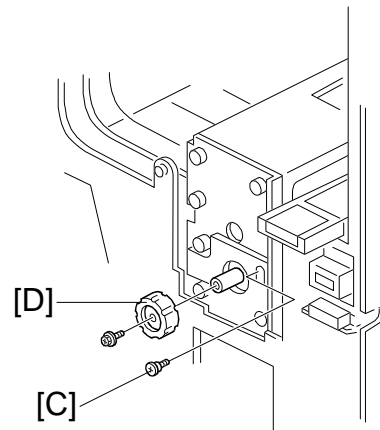
**Unplug the copier power cord and remove the finisher from the copier before starting the following procedure.**

Unpack the punch unit and remove the shipping retainers [A] (4 screws) and [B] (1 screw)

1. Remove the inner cover [C] of the finisher and remove the caps [D].
2. Remove the rear cover of the finisher (2 screws) and remove the transport guide plate [E] (4 screws).



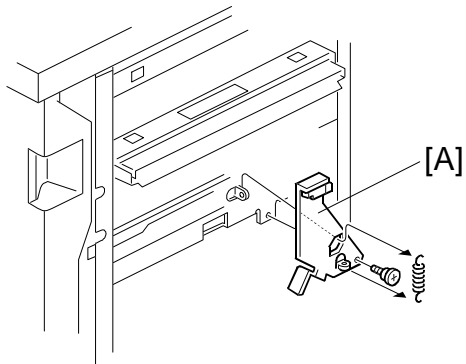
A812I010.WMF



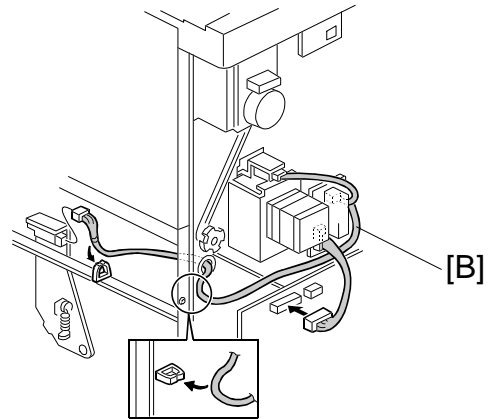
A812I011.WMF

Installation

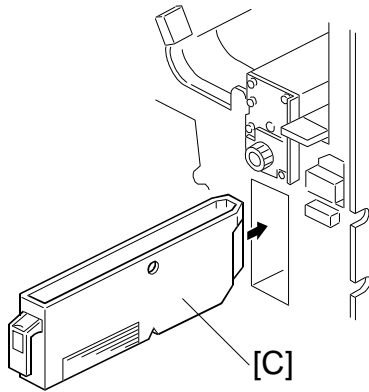
3. Install the spacer [A] (thickness = 2 mm).  
**NOTE:** There are three spacers in the accessory box. Do not lose the other two spacers (1 mm), because they are used for adjusting the punch hole position.
4. Reinstall the inner cover.
5. Install the punch unit [B] and secure it with a long stepped screw [C].
6. Install the punch unit knob [D] (1 screw).
7. Secure the rear of the punch unit (2 screws [E]).



A812I009.WMF



A812I012.WMF

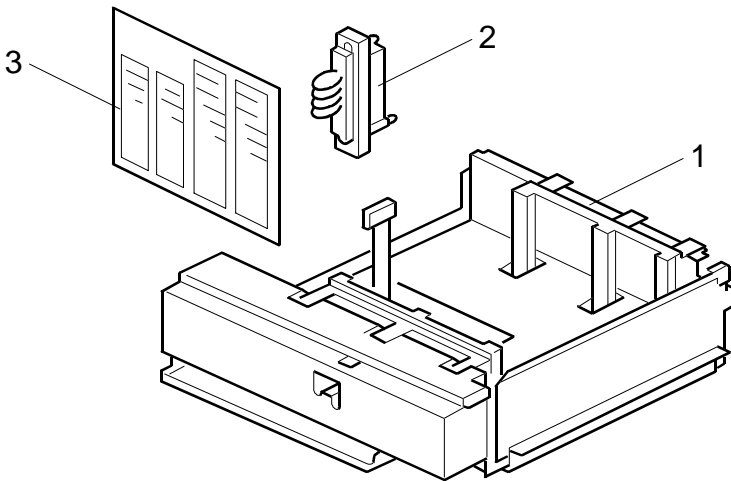


A812I013.WMF

8. Install the sensor bracket [A] (1 short stepped screw, 1 spring).
9. Connect the cables [B] as shown.
10. Slide the hopper [C] into the finisher.
11. Reassemble the finisher and attach it to the copier. Then check the punch unit operation.

3.6 A3/DLT TRAY (B331)

3.6.1 ACCESSORY CHECK



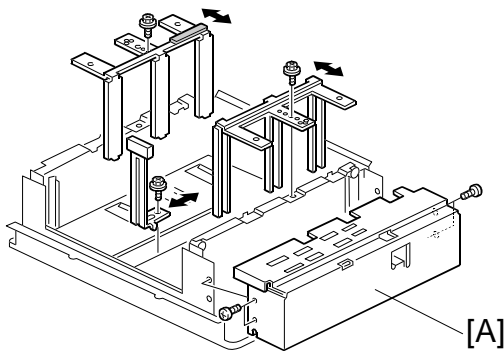
B331I001.WMF

Installation

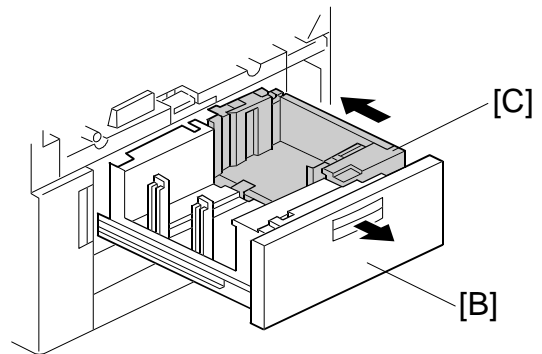
Check the quantity and condition of the accessories in the box against the following list:

| Description               | Quantity |
|---------------------------|----------|
| 1. A3/DLT Tray.....       | 1        |
| 2. Short Connector.....   | 1        |
| 3. Paper Size Decal ..... | 1        |

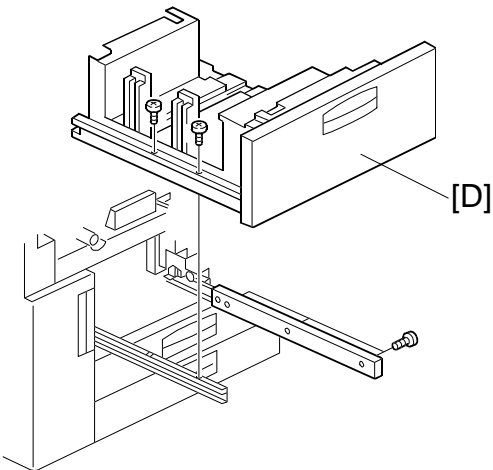
### 3.6.2 INSTALLATION PROCEDURE



B331I006.WMF



B331I707.WMF



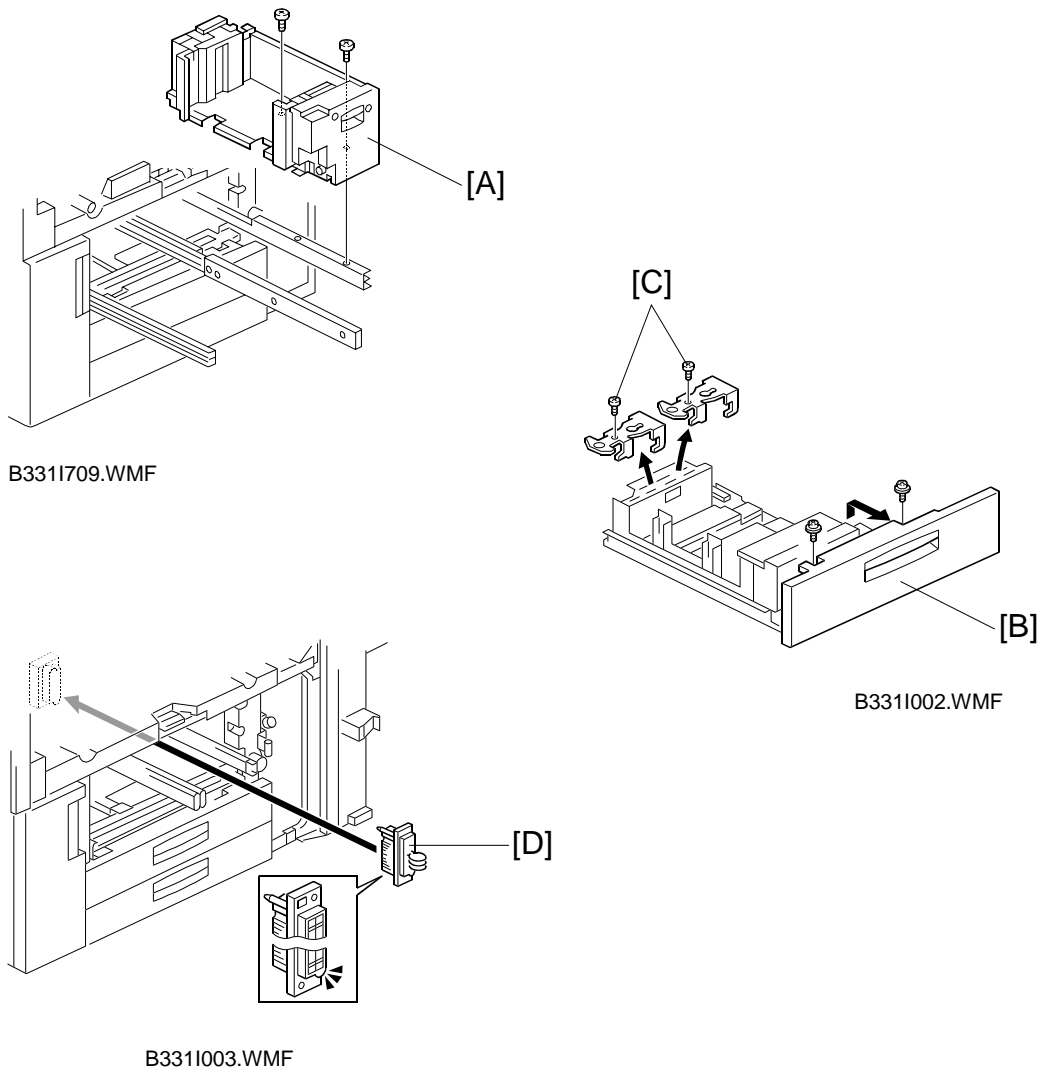
B331I708.WMF

**⚠ CAUTION**

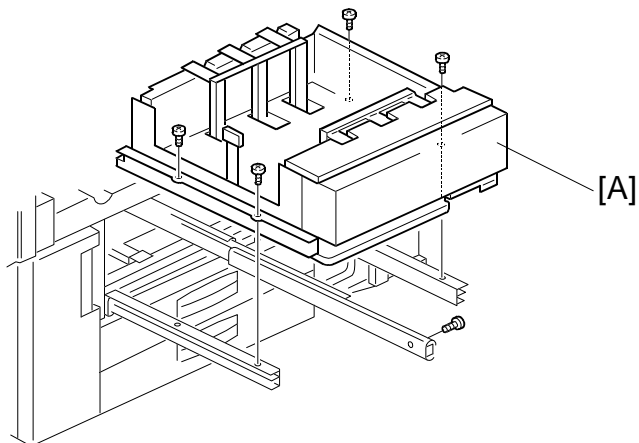
**Unplug the machine before starting the following procedure.**

**NOTE:** If necessary, remove the front frame [A] (4 screws) and change the side fence positions (1 screw each).

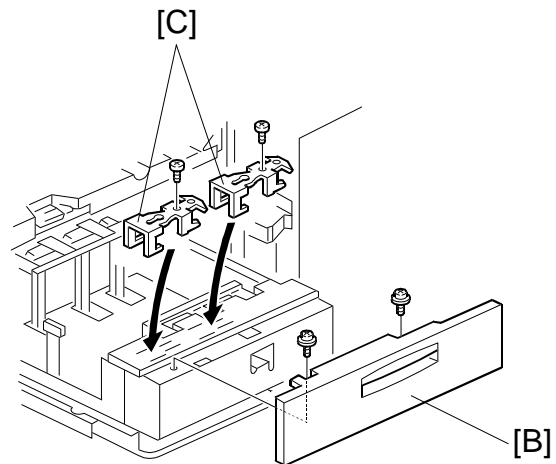
1. Open the front cover.
2. Draw out the tandem feed tray [B] fully to separate the right tandem tray [C] from the left.
3. Push in the right tandem tray.
4. Remove the left tandem tray [D] (5 screws).



5. Remove the right tandem tray [A] (2 screws).
6. Remove the front cover [B] (2 screws).
7. Remove the safety switch holders [C] (1 screw each).
8. Connect the short connector [D] to the terminal for the right tandem tray as shown.



B331I004.WMF

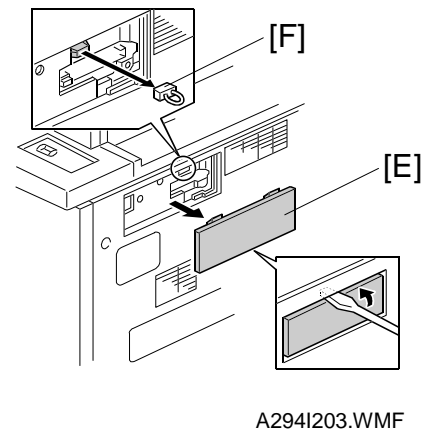
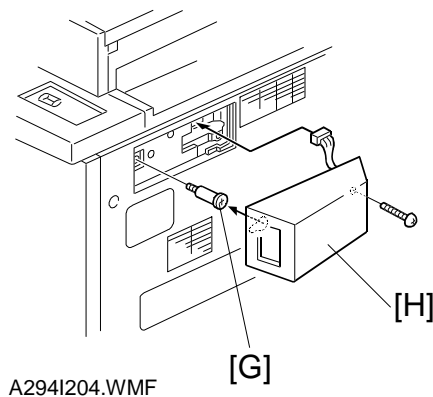
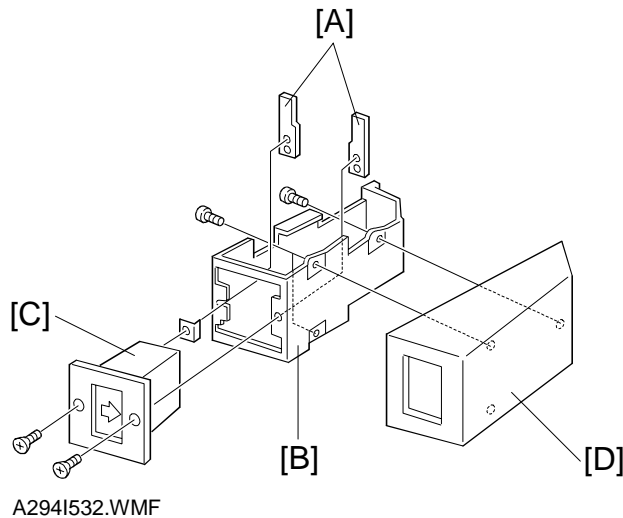


B331I005.WMF

9. Install the A3/DLT tray [A] using the screws removed in steps 4 and 5.
10. Install the front cover [B] and safety switch holders [C] removed in steps 6 and 7.
11. Access SP5-019-001, and change the paper size setting to the size required by the user.



### 3.7 KEY COUNTER INSTALLATION



Installation

#### Common Steps

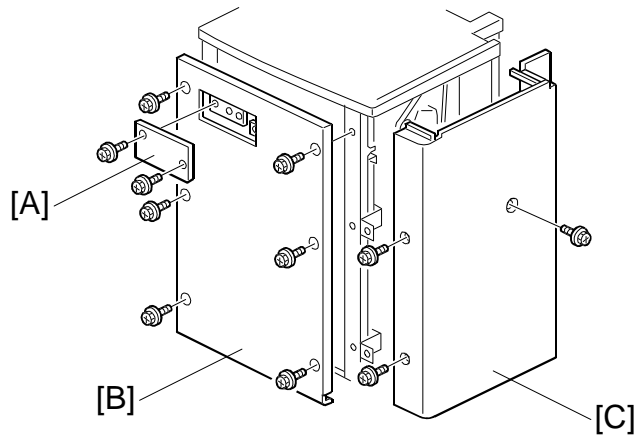
1. Hold the key counter plates [A] on the inside of the key counter bracket [B] and insert the key counter holder [C].
2. Secure the key counter holder to the bracket (2 screws).
3. Attach the key counter cover [D] (2 screws).
4. Remove the small cover [E] on the right side of the copier as shown.
5. Remove the jumper connector [F].

#### If the optional LCT is not installed:

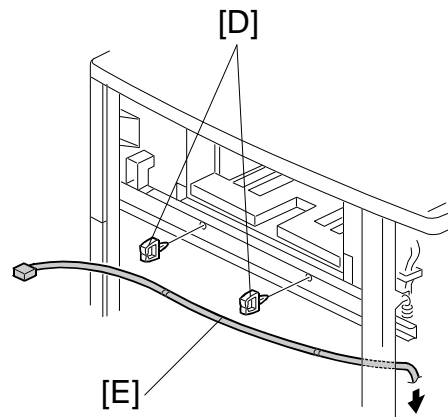
The following steps 6 to 8 are for installing the key counter without the optional LCT. If the LCT is installed, skip steps 6 to 8, and go to step 9.

6. Install the stepped screw [G].
7. Install the key counter assembly [H] (1 screw).
8. Instruct the user's key operator to enable the key counter with the user tools (User Tools – System Settings – Count Manager – Key Counter).





A294I205.WMF



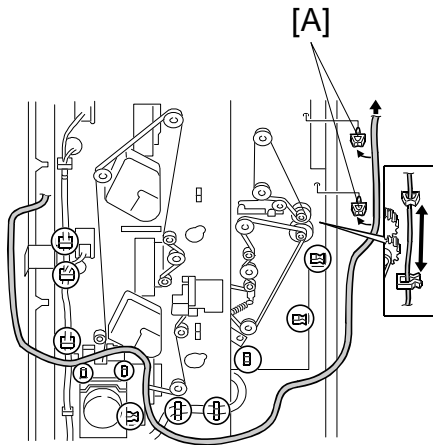
A294I206.WMF

**If the optional LCT is installed:**

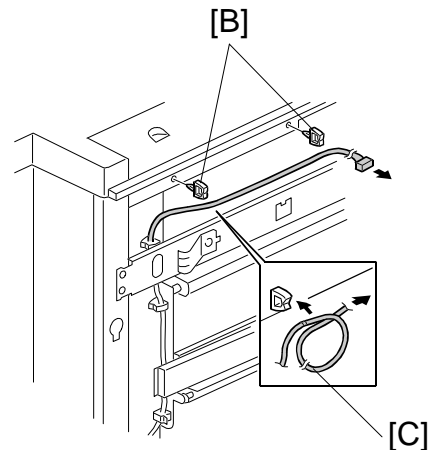
The following steps are required when the key counter is installed with the optional LCT.

**NOTE:** The extension cable is required to install the key counter with the LCT. The cable is supplied with 6 clamps as a service part.

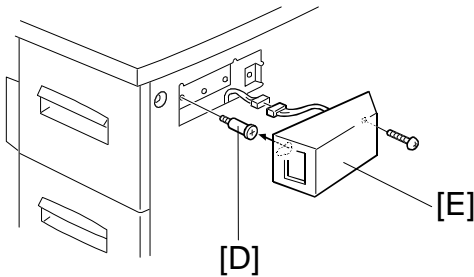
9. Remove the small cover [A] (2 screws) on the LCT right cover.
10. Remove the LCT right cover [B] (6 screws) and rear cover [C] (3 screws).
11. Install 2 clamps [D] on the right side of the LCT, then set the cable [E] in the clamps.



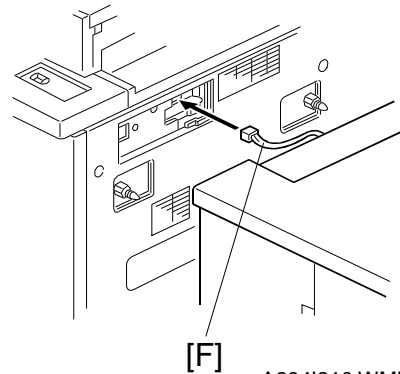
A294I207.WMF



A294I208.WMF



A294I209.WMF



A294I210.WMF

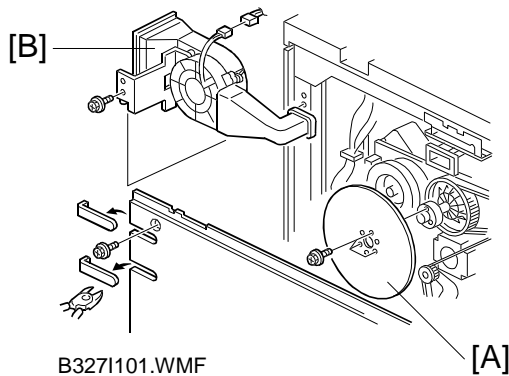
12. Install 2 clamps [A] on the rear side of the LCT. Route the cable as shown.
13. Install 2 clamps [B] on the left side of the LCT. Route the cable as shown.  
**NOTE:** If the cable coming from the right cover opening is too long, make a loop [C] to adjust the length.
14. Install the stepped screw [D].
15. Install the right LCT cover, then install the key counter assembly [E] (1 screw) that was assembled in steps 1 to 3.
16. Connect the cable [F] from the LCT to the connector in the copier. Then join the LCT to the copier.
17. Instruct the user's key operator to enable the key counter with the user tools (User Tools – System Settings – Count Manager – Key Counter).

## 3.8 INTERFACE BOARD (CD-RW/TANDEM COPY KIT/PRINTER CONTROLLER)

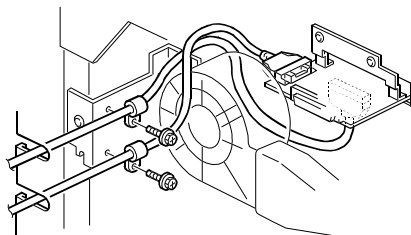


### 3.8.1 INSTALLATION PROCEDURE

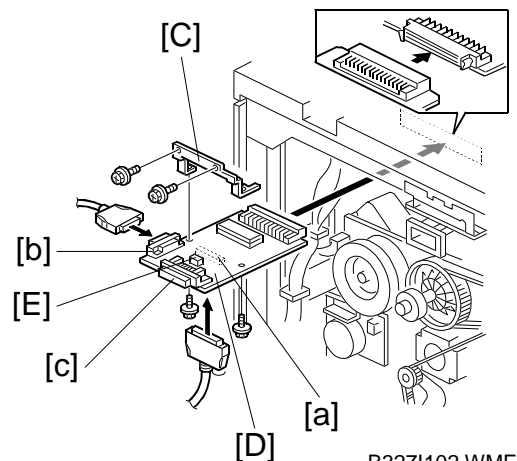
The interface control board is needed to use the optional CD-ROM writer (CD-RW), optional printer controller, or the tandem copy kit.



B327I101.WMF



B327I103.WMF



B327I102.WMF

1. Remove the upper rear cover of the copier.
2. Remove the fly wheel [A] (3 screws) and the drum cooling fan [B].
3. Install the support bracket [C] (2 screws) on the interface board [D].  
**NOTE:** When the CD-RW is installed, remove the short connector [E] installed on TB101.



4. Connect the interface board to the connector on the SICU. Then secure the support bracket to the copier (2 screws).
5. Connect the cable of the optional equipment to the terminal of the interface board.
  - 1) When the CD-RW is installed, connect the cable from the CD-RW to the connector [a] and route the cable as shown. Secure the cable with the upper clamp.
  - 2) When the cable for the tandem copy kit is installed, connect the cable to the connector [b] and route the cable as shown. Secure the cable with the lower clamp.

**NOTE:** The connector [c] is for the printer controller.

6. Reinstall the drum cooling fan and the fly wheel removed in step 2.
7. Reinstall the upper rear cover of the copier.

---

## 4. SERVICE TABLES

### 4.1 GENERAL CAUTIONS

Do not turn off either of the power switches while any of the electrical components are active. Doing so might cause damage to units such as the transfer belt, drum, and development unit when they are pulled out of or put back into the copier.

#### 4.1.1 DRUM

An organic photoconductor (OPC) drum is more sensitive to light and ammonia gas than a selenium drum. Follow the cautions below when handling an OPC drum.

1. Never expose the drum to direct sunlight.
2. Never expose the drum to direct light of more than 1,000 Lux for more than a minute.
3. Never touch the drum surface with bare hands. When the drum surface is touched with a finger or becomes dirty, wipe it with a dry cloth or clean it with wet cotton. Wipe with a dry cloth after cleaning with wet cotton.
4. Never use alcohol to clean the drum; alcohol dissolves the drum surface.
5. Store the drum in a cool, dry place away from heat.
6. Take care not to scratch the drum as the drum layer is thin and is easily damaged.
7. Never expose the drum to corrosive gases such as ammonia gas.
8. Always keep the drum in the protective sheet when keeping the drum unit, or the drum itself, out of the copier. Doing so avoids exposing it to bright light or direct sunlight, and will protect it from light fatigue.
9. Dispose of used drums in accordance with local regulations.
10. When installing a new drum, do the Auto Process Control Data Adjustment (SP 2-962).

#### 4.1.2 DRUM UNIT

1. Before pulling out the drum unit, place a sheet of paper under the drum unit to catch any spilt toner.
2. Make sure that the drum unit is set in position and the drum stay is secured with a screw before the main switch is turned on. If the drum unit is loose, poor contact of the drum connectors may cause electrical noise, resulting in unexpected malfunctions (RAM data change is the worst case).
3. To prevent drum scratches, remove the development unit before removing the drum unit.

### **4.1.3 TRANSFER BELT UNIT**

1. Never touch the transfer belt surface with bare hands.
2. Take care not to scratch the transfer belt, as the surface is easily damaged.
3. Before installing the new transfer belt, clean all the rollers and the inner part of the transfer belt with a dry cloth to prevent the belt from slipping.

### **4.1.4 SCANNER UNIT**

1. When installing the exposure glass, make sure that the white paint is at the rear left corner.
2. Clean the exposure glass with alcohol or glass cleaner to reduce the amount of static electricity on the glass surface.
3. Use a cotton pad with water or a blower brush to clean the mirrors and lens.
4. Do not bend or crease the exposure lamp flat cable.
5. Do not disassemble the lens unit. Doing so will throw the lens and the copy image out of focus.
6. Do not turn any of the CCD positioning screws. Doing so will throw the CCD out of position.

### **4.1.5 LASER UNIT**

1. Do not loosen the screws that secure the LD drive board to the laser diode casing. Doing so would throw the LD unit out of adjustment.
2. Do not adjust the variable resistors on the LD unit, as they are adjusted in the factory.
3. The polygon mirror and F-theta lenses are very sensitive to dust. Do not open the optical housing unit.
4. Do not touch the glass surface of the polygon mirror motor unit with bare hands.

### 4.1.6 CHARGE CORONA

1. Clean the corona wires with a dry cloth. Do not use sandpaper or solvent.
2. Clean the charge corona casing with water first to remove NOx based compounds. Then clean it with alcohol if any toner still remains on the casing.
3. Clean the end block with a blower brush first to remove toner and paper dust. Then clean with alcohol if any toner still remains.
4. Do not touch the corona wires with bare hands. Oil stains from fingers may cause uneven image density on copies.
5. Make sure that the wires are correctly between the cleaner pads and that there is no foreign material (iron filings, etc.) on the casing.
6. When installing new corona wires, do not bend or scratch the wire surface. Doing so may cause uneven charge. Also be sure that the corona wires are correctly positioned in the end blocks. (See Charge Corona Wire Replacement)
7. Clean the grid plate with a blower brush (not with a dry cloth).
8. Do not touch the charge grid plate with bare hands. Also, do not bend the charge grid plate or make any dent in it. Doing so may cause uneven charge.

### 4.1.7 DEVELOPMENT

1. Be careful not to nick or scratch the development roller.
2. Place the development unit on a sheet of paper after removing it from the copier.
3. Never disassemble the development roller assembly. The position of the doctor plate is set with special tools and instruments at the factory to ensure the proper gap between the doctor blade and the development roller.
4. Clean the drive gears after removing used developer.
5. Dispose of used developer in accordance with local regulations.
6. Never load types of developer and toner into the development unit other than specified for this model. Doing so will cause poor copy quality and toner scattering.
7. Immediately after installing new developer, the TD sensor initial setting procedure should be performed to avoid damage to the copier. Do not perform the TD sensor initial setting with used developer. Do not make any copies before doing the TD sensor initial setting.
8. When using a vacuum cleaner to clean the development unit casing, always ground the casing with your fingers to avoid damaging the toner density sensor with static electricity.
9. When replacing the TD sensor, the developer should be replaced and then the TD sensor initial setting procedure (SP2-801) should be done, followed by process control initialization (SP2-962).

### 4.1.8 CLEANING

1. When servicing the cleaning section, be careful not to damage the edge of the cleaning blade.
2. Do not touch the cleaning blade with bare hands.
3. Before disassembling the cleaning section, place a sheet of paper under it to catch any toner falling from it.



### 4.1.9 FUSING UNIT

1. After installing the fusing thermistor, make sure that it is in contact with the hot roller and that it is movable.
2. Be careful not to damage the edges of the hot roller strippers or their tension springs.
3. Do not touch the fusing lamp and rollers with bare hands.
4. Make sure that the fusing lamp is positioned correctly and that it does not touch the inner surface of the hot roller.

### 4.1.10 PAPER FEED

1. Do not touch the surface of the pick-up, feed, and separation rollers.
2. To avoid paper misfeeds, the side fences and end fence of the paper tray must be positioned correctly to align with the actual paper size.

### 4.1.11 USED TONER

1. We recommend checking the amount of used toner at every EM.
2. Dispose of used toner in accordance with local regulations. Never throw toner into an open flame, for toner dust may ignite.

## 4.2 SERVICE PROGRAM MODE

### 4.2.1 SERVICE PROGRAM MODE OPERATION

The service program (SP) mode is used to check electrical data, change modes, and adjust values.

#### *Service Program Access Procedure*

##### *Entering SP mode*

- 1) Press the following keys in sequence.

⏏ → 1 → 0 → 7 → C

Hold the C key for more than 3 seconds.

- 2) A menu of SP modes is displayed on the LCD.



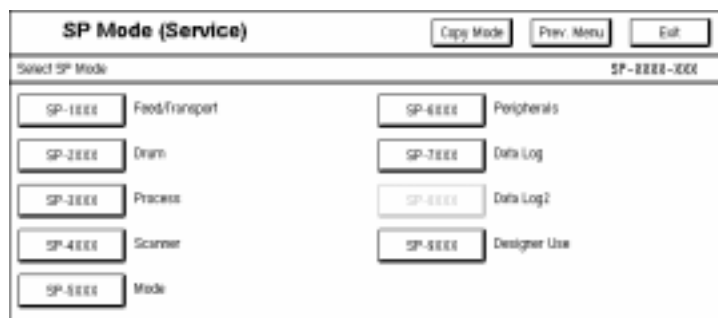
A294M001.PCX

Service  
Tables

**NOTE:** The installed applications appear as Copy SP and Printer SP. If the printer application is not installed, its name does not appear.



- 3) Touch the application which you need. Then, the application's SP mode display will appear, as shown.



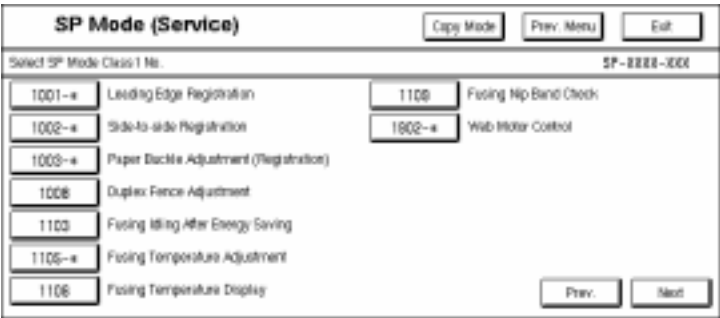
A294M002.PCX

### ***Exiting SP mode***

- 1) Touch the "Exit" keys to return to the standby mode display.

**Accessing Copy Mode from within an SP Mode**

- 1) Touch the “Copy Mode” key.



A294M003.PCX

- 2) Select the appropriate copy mode and make trial copies.
- 3) To return to the SP mode, touch the “SP mode” key.



A294M004.PCX

Service  
Tables

### Selecting the Program Number

Program numbers are composed of two or three levels.  
There are two ways to select the program number.

#### Ten-key Pad

Input the required program number.

#### Touch Panel

- 1) Touch the 1st level program.

A294M002.PCX

- 2) Touch the 2nd level program.


A294M003.PCX

**NOTE:** A “\*” mark indicates that there are 3rd level programs.

- 3) Touch the 3rd level program.

A294M005.PCX

***Inputting a Value or Setting for an SP Mode***

1. Select the required program mode as explained on the previous page.
2. Enter the required setting using the ten-key pad, then touch the “Start” key or OK key or  key.

**NOTE:** 1) If you forget to touch the “Start” key or OK key, the previous value remains.

2) Change between “+” and “–” using the “•” key before entering the required value.

3. Exit SP mode.

## 4.2.2 SERVICE PROGRAM MODE TABLES

**NOTE:** 1) In the Function column, comments are in italics.  
 2) In the Settings column, the default value is in bold letters.  
 3) S and B in the right hand side of the mode number column means that this mode is stored in the NVRAM on the SICU (S) or BCU (B). If you do a RAM reset, all these SP modes will be reset to their factory settings.

| Mode No.<br>(Class 1, 2 and 3) |                           |                                | Function   | Settings                                 |
|--------------------------------|---------------------------|--------------------------------|--|--|
| 1-001                          | Leading Edge Registration |                                |  |  |
|                                | 1                         | Paper Tray<br>(Copier and LCT) | Adjusts the printing leading edge registration for feeding from the trays using the trimming area pattern (SP2-902-3, No.15).  | +9 ~ -9<br>0.1 mm/step<br><b>+3.0 mm</b> |
|                                |                           |                                | B <i>Use the "•" key to toggle between + and - before entering the value.<br/>The specification is <math>3 \pm 2</math> mm.<br/>See "Replacement and Adjustment - Copy Image Adjustments" for details.</i> |  |
|                                | 2                         | Duplex Tray                    | Adjusts the printing leading edge registration for the duplex feeding using the trimming area pattern (SP2-902-3, No.15).  |  |
|                                |                           |                                | B <i>Use the "•" key to toggle between + and - before entering the value.<br/>The specification is <math>3 \pm 2</math> mm.<br/>See "Replacement and Adjustment - Copy Image Adjustments" for details.</i> |  |
| 1-002                          | Side-to-Side Registration |                                |  |  |
|                                | 1                         | Tray-1                         | Adjusts the printing side-to-side registration from the 1st paper feed station using the trimming area pattern (SP2-902-3, No.15).   | +9 ~ -9<br>0.1 mm/step<br><b>+0.0 mm</b> |
|                                |                           |                                | B <i>Use the "•" key to toggle between + and - before entering the value.<br/>See "Replacement and Adjustment - Copy Image Adjustments" for details on SP1-002.</i>  |  |
|                                | 2                         | Tray-2                         | Adjusts the printing side-to-side registration from the 2nd paper feed station using the trimming area pattern (SP2-902-3, No.15).   | +9 ~ -9<br>0.1 mm/step<br><b>+0.0 mm</b> |
|                                |                           |                                | B <i>Use the "•" key to toggle between + and - before entering the value.<br/>The specification is <math>0 \pm 2.0</math> mm.</i>  |  |
|                                | 3                         | Tray-3                         | Adjusts the printing side-to-side registration from the 3rd paper feed station using the trimming area pattern (SP2-902-3, No.15).   | +9 ~ -9<br>0.1 mm/step<br><b>+0.0 mm</b> |
|                                |                           |                                | B <i>Use the "•" key to toggle between + and - before entering the value.<br/>The specification is <math>0 \pm 2.0</math> mm.</i>  |  |





| Mode No.<br>(Class 1, 2 and 3) |  |   | Function   | Settings                                 |
|--------------------------------|--|---|--|--|
| 1-002                          | Side-to-Side Registration              |   |  |  |
|                                | 4                                      | Tray-4 (LCT)                            | B<br>Adjusts the printing side-to-side registration from the 4th paper feed station using the trimming area pattern (SP2-902-3, No.15).<br><i>Use the "•" key to toggle between + and – before entering the value.</i><br><i>The specification is <math>0 \pm 2.0</math> mm.</i> | +9 ~ –9<br>0.1 mm/step<br><b>+0.0 mm</b> |
|                                | 5                                      | Tray-5 (LCT)                            | B<br>Adjusts the printing side-to-side registration from the 5th paper station using the trimming area pattern (SP2-902-3, No.15).<br><i>Use the "•" key to toggle between + and – before entering the value.</i><br><i>The specification is <math>0 \pm 2.0</math> mm.</i>      | +9 ~ –9<br>0.1 mm/step<br><b>+0.0 mm</b> |
|                                | 6                                      | Tray-6 (LCT)                            | B<br>Adjusts the printing side-to-side registration from the 6th paper station using the trimming area pattern (SP2-902-3, No.15).<br><i>Use the "•" key to toggle between + and – before entering the value.</i><br><i>The specification is <math>0 \pm 2.0</math> mm.</i>      | +9 ~ –9<br>0.1 mm/step<br><b>+0.0 mm</b> |
|                                | 7                                      | Duplex Tray                             | B<br>Adjusts the printing side-to-side registration from the duplex tray using the trimming area pattern (SP2-902-3, No.15).<br><i>Use the "•" key to toggle between + and – before entering the value.</i><br><i>The specification is <math>0 \pm 2.0</math> mm.</i>            | +9 ~ –9<br>0.1 mm/step<br><b>+0.0 mm</b> |
| 1-003                          | Paper Buckle Adjustment (Registration) |   |  |  |
|                                | 1                                      | Copier Paper Tray                       | B  | +9 ~ –9<br>1 mm/step<br><b>+0.0 mm</b>   |
|                                | 2                                      | LCT Tray                                | B  |  |
|                                | 3                                      | Duplex Tray                             | B  |  |
| 1-008                          | Duplex Fence Adjustment                |   |  |  |
|                                |  |   | B<br>Adjusts the distance between the front and rear fences.   | +4 ~ –4<br>0.5 mm/step<br><b>±1.0 mm</b> |
| 1-103                          | Fusing Idling After Energy Saving      |   |  |  |
|                                |  |   | B<br>Selects whether fusing idling is done or not when recovering from the Energy Saver mode.  | <b>0: Not done</b><br>1: Done            |
| 1-105                          | Fusing Temperature Adjustment          |   |  |  |
|                                | 1                                      | Fusing Temperature in Waiting Condition | B  | 170 ~ 200<br>1°C/step<br><b>173°C</b>    |
|                                | 2                                      | Fusing Temperature Lower Limit          | B<br><i>This SP mode is for designer's use only.</i>   | 157 ~ 167<br>1°C/step<br><b>163°C</b>    |

| Mode No.<br>(Class 1, 2 and 3) |                               |  | Function | Settings  |
|--------------------------------|-------------------------------|--|----------|---|
| 1-105                          | Fusing Temperature Adjustment |  |          |   |
|                                | 3                             | Fusing Temperature Correction (<A4/LT) | B        | Specifies the amount to raise the fusing temperature from standby mode to print on A4/LT or smaller width paper.<br>+0 ~ +20<br>1°C/step<br><b>+15°C</b>  |
|                                | 4                             | Fusing Temperature Correction (A4/LT)  | B        | Specifies the amount to raise the fusing temperature from standby mode to print on paper of A4/LT width.<br>+0 ~ +25<br>1°C/step<br><b>+10°C</b>  |
| 1-106                          | Fusing Temperature Display    |  |          |   |
|                                |                               |  |          | Displays the fusing temperature.  |
| 1-109                          | Fusing Nip Band Check         |  |          |   |
|                                |                               |  |          | Feeds a sheet from a paper tray and stops the sheet when it is between the hot roller and the pressure roller. Use an OHP sheet. After keeping the sheet there for 30 seconds, the sheet is automatically fed out. For details, see Replacement and Adjustment – Fusing.  |
| 1-902                          | Web Motor Control             |  |          |   |
|                                | 1                             | Web Consumption                        | B        | Displays the percentage of the web consumption in 1% steps (0% ~ 100%). The value can be manually input using number keys.  |
|                                | 2                             | Web Motor Drive Interval               | B        | Change the interval of copy operation time after which the web motor is driven<br>15 ~ 130<br>1 s/step<br><b>40 s</b>   |
|                                | 3                             | Web Motor Drive Time                   | B        | Changes the time that the web motor is driven.<br>0.1 ~ 3.0<br>0.1 s/step<br><b>0.8 s</b>   |
|                                | 4                             | Web Near End Setting                   | B        | Changes the web consumption ratio at which web near end is displayed.<br>0 ~ 100<br>1%/step<br><b>100%</b><br>About 40k A4 copies can be made after the web consumption reaches 100%.   |
| 1-906                          | Duplex Stop Position – Right  |  |          |   |
|                                |                               |  | B        | Changes the paper stop position in the duplex unit after passing duplex transport sensor 2.<br><b>For designer use only.</b><br>-10 ~ 10<br>2 mm/step<br><b>-8 mm</b>   |
| 2-001                          | Charge Corona Bias Adjustment |  |          |   |
|                                | 1                             | Image Area (Auto Process Control OFF)  | B        | Adjusts the voltage applied to the grid plate during copying when auto process control is <b>off</b> .<br><i>Normally, there is no need to adjust this. If there is an ID or TD sensor problem, the machine goes into fixed toner supply mode. After replacing the drum or charge corona wire, change this value to the default.</i><br>-650 ~ -1,300<br>10 V/step<br><b>-1,000 V</b> |

| Mode No.<br>(Class 1, 2 and 3) |                               |  | Function | Settings   |   |
|--------------------------------|-------------------------------|--|----------|--|---|
| 2-001                          | Charge Corona Bias Adjustment |  |          |  |   |
|                                | 2                             | ID Sensor Pattern (Auto Process Control OFF) | B        | Adjusts the voltage applied to the grid plate when making the ID sensor pattern, when auto process control is switched off.<br><i>Normally, there is no need to adjust this. If the user wants high density copies, the sensor pattern must be lighter, so this voltage must be a higher negative voltage.</i> | -650 ~ -1,300<br>10 V/step<br><b>-800 V</b>       |
|                                | 3                             | Image Area (Auto Process Control ON)         | B        | Adjusts the voltage applied to the grid plate during copying when auto process control is switched <b>on</b> .<br>This voltage changes every time auto process control starts up (every time the machine is switched on)   | -650 ~ -1,300<br>10 V/step<br><b>-1,000 V</b>     |
|                                | 4                             | Grid Voltage for Transparent Sheet           | B        | Adjusts the voltage applied to the grid plate when translucent mode is selected.<br>Use this if there is a copy quality problem when making copies on translucent paper. Normally there is no need to adjust this. See 2-001-1.  | -650 ~ -1,300<br>10 V/step<br><b>-1,000 V</b>     |
|                                | 5                             | Total Corona Current                         | B        | Adjusts the current applied to the charge corona wire except for Photo mode.   | -1,400 ~ -2,800<br>100μA/step<br><b>-1,400 μA</b> |
|                                | 6                             | Total Corona Current (Photo mode)            | B        | Adjusts the current applied to the charge corona wire for Photo mode.  | 1,400 ~ -2,800<br>100μA/step<br><b>-1,600 μA</b>  |
| 2-101                          | Printing Erase Margin         |  |          |  |   |
|                                | 1                             | Leading Edge                                 | S        | Adjusts the leading edge erase margin.<br><i>See "Replacement and Adjustment – Copy Image Adjustments" for more on SP2-101.</i>  | 0.0 ~ 9.0<br>0.1 mm/step<br><b>2.5 mm</b>         |
|                                | 2                             | Trailing Edge                                | S        | Adjusts the trailing edge erase margin.  | 0.0 ~ 9.0<br>0.1 mm/step<br><b>2.5 mm</b>         |
|                                | 3                             | Left   | S        | Adjusts the left side erase margin.  | 0.0 ~ 9.0<br>0.1 mm/step<br><b>2.0 mm</b>         |
|                                | 4                             | Right  | S        | Adjusts the right side erase margin.   | 0.0 ~ 9.0<br>0.1 mm/step<br><b>2.0 mm</b>         |
| 2-103                          | LD Power Adjustment           |  |          |  |   |
|                                | 1                             | LD1 - 600dpi                                 | B        | Adjusts the power of LD1.<br><b>Do not change the value.</b>   | -127 ~ +127<br>1/step<br>1 = 1.1 μW<br><b>+0</b>  |
|                                | 2                             | LD2 - 600dpi                                 | B        | Adjusts the power of LD2.<br><b>Do not change the value.</b>   | -127 ~ +127<br>1/step<br>1 = 1.1 μW<br><b>+0</b>  |



| Mode No.<br>(Class 1, 2 and 3)  |   |                                  | Function  |  | Settings   |
|---|---|----------------------------------|---|--|--|
| 2-103   | LD Power Adjustment                     |                                  |   |  |  |
|   | 3                                       | LD3 - 600dpi                     | B   | Adjusts the power of LD3.<br><b>Do not change the value.</b>   | -127 ~ +127<br>1/step<br>1 = 1.1 μW<br><b>+0</b> |
|   | 4                                       | LD4 - 600dpi                     | B   | Adjusts the power of LD4.<br><b>Do not change the value.</b>   | -127 ~ +127<br>1/step<br>1 = 1.1 μW<br><b>+0</b> |
|   | 5                                       | LD1 Power Adjustment (Start/End) | B   | <b>Factory use only. Do not use this SP mode.</b>  | Start<br>Stop                                    |
|   | 6                                       | LD2 Power Adjustment (Start/End) | B   | <b>Factory use only. Do not use this SP mode.</b>  | Start<br>Stop                                    |
|   | 7                                       | LD3 Power Adjustment (Start/End) | B   | <b>Factory use only. Do not use this SP mode.</b>  | Start<br>Stop                                    |
|   | 8                                       | LD4 Power Adjustment (Start/End) | B   | <b>Factory use only. Do not use this SP mode.</b>  | Start<br>Stop                                    |
| 2-104   | LD Power Adjustment (for ID pattern)    |                                  |   |  |  |
|   |   | B                                | Selects the LD power for making the ID pattern when auto process control is switched on. Do not use unless advised. | 0 ~ 7<br>1/step<br><b>4</b>  |  |
| 2-114   | Printer Dot Edge Parameter Setting      |                                  |   |  |  |
| 1   | Leading Dot Level Setting (Left Edge)   | S                                | Changes the LD power level for the left edge pixel in printer mode, if FCI is off.                                  | 20 ~ 100%<br>1% step<br><b>50%</b>   |  |
| 2   | Trailing Dot Level Setting (Right Edge) | S                                | Changes the LD power level for the left edge pixel in printer mode, if FCI is off.                                  | 20 ~ 100%<br>1% step<br><b>50%</b>   |  |
| 3   | Multiple Dot Level Setting              | S                                | Changes the LD power level for continuous pixels in printer mode, if FCI is off.                                    | 20 ~ 100%<br>1% step<br><b>100%</b>  |  |
| 4   | Independent Dot Level Setting           | S                                | Changes the LD power level for independent dots in printer mode, if FCI is off.                                     | 20 ~ 100%<br>1% step<br><b>50%</b>   |  |
| 2-201   | Development Bias Adjustment             |                                  |   |  |  |
|  | 1                                       | Image Area                       | B   | Adjusts the development bias for copying.<br><i>This can be adjusted as a temporary measure if faint copies appear due to an aging drum.</i>   | -200 ~ -700<br>10 V/step<br><b>-550 V</b>        |
|   | 2                                       | ID Sensor Pattern                | B   | Adjusts the development bias for making the ID sensor pattern for VSP measurement.<br><i>This should not be used in the field, because it affects ID sensor pattern density, which affects toner supply.</i> | -200 ~ -700<br>10 V/step<br><b>-400 V</b>        |

| Mode No.<br>(Class 1, 2 and 3) |   |                        | Function  | Settings   |   |   |
|--------------------------------|---|------------------------|---|--|---|---|
| 2-201                          | Development Bias Adjustment   |                        |   |  |   |   |
|                                |  | 3                      | Transparent Sheet   | B  | Adjusts the development bias for copying onto translucent sheets.   | -200 ~ -700<br>10 V/step<br><b>-550 V</b> |
|                                |   | 4                      | ID Sensor Development Potential   | B  | Adjusts the development potential for making the ID sensor pattern for VSP measurement.<br>Do not adjust. | -140 ~ -380<br>1 V/step<br><b>-280 V</b>  |
| 2-207                          | Forced Toner Supply   |                        |   |  |   |   |
|                                | 1   | Forced Toner Supply    |   | Forces toner supply for 7 seconds from the toner bank through the toner hopper to the development unit.  | Start   |   |
|                                |   |                        |   | <i>This mode finishes automatically after the toner is supplied 7 times (1 s for each time).</i>   |   |   |
|                                | 2   | Toner Bank Toner Setup |   | Turns on the main motor, development motor, development bias, toner supply motor and charge corona. Then turns on the toner supply coil clutch to supply toner to the toner hopper, but not to the development unit. It takes about 7 minutes. | Start   |   |
|                                |   |                        | <i>This mode should be used to fill the toner transport path with toner after cleaning the toner supply unit, or at installation.</i> |  |   |   |
| 2-208                          | Toner Supply Mode   |                        |   |  |   |   |
|                                |   |                        | B   | Selects the toner supply mode.<br><i>Use image pixel count mode only as a temporary countermeasure if the ID or TD sensor is defective.</i>  | <b>Sensor Control</b><br>Pixel Count Control  |   |
| 2-209                          | Toner Supply Rate   |                        |   |  |   |   |
|                                |   |                        | B   | Adjusts the toner supply rate from the hopper.   | 100 ~ 2,000<br>10 mg/s/step<br><b>800 mg/s</b>  |   |
|                                |   |                        |   | <i>Increasing this value reduces the toner supply roller clutch on time. Use a lower value if the user tends to make lots of copies that have a high proportion of black.</i>  |   |   |
| 2-210                          | ID Sensor Pattern Interval  |                        |   |  |   |   |
|                                |   |                        | B   | Changes the interval for making the ID sensor pattern (VSP/VSG detection).<br><i>If the user normally makes copies with a high proportion of black, reduce the interval.</i>   | 0 ~ 500<br>1 copy/step<br><b>10 copies</b>  |   |

| Mode No.<br>(Class 1, 2 and 3) |                             |               | Function  | Settings   |  |
|--------------------------------|-----------------------------|---------------|---|--|--|
| 2-220                          | VREF Manual Setting         |               |   | 0 ~ 5.0<br>0.01 V/step<br><b>2.5 V</b>   |  |
|                                |                             | B             | Adjusts the TD sensor reference voltage (VREF).<br><br><i>Change this value after replacing the development unit with another one that already contains toner.</i><br><i>For example, when using a development unit from another machine for test purposes, do the following:</i><br><i>1. Check the value of SP2-220 in both the machine containing the test unit and the machine that you are going to move it to.</i><br><i>2. Install the test development unit, then input the VREF for this unit into SP2-220.</i><br><i>3. After the test, put back the old development unit, and change SP2-220 back to the original value.</i> |  |  |
| 2-223                          | VT Display                  |               |   |  |  |
|                                |                             | B             | Displays the current TD sensor output voltage.  |  |  |
| 2-226                          | Toner Bank Toner Discharge  |               |   | Start  |  |
|                                |                             |               | This SP removes toner from the toner bank to the toner hopper.<br>After turning the toner supply motor and the toner bank motor on, the toner supply coil clutch turns on and off at 2 second intervals. The motors and clutch stop when the toner near-end sensor (in the toner bank unit) detects no toner.<br>Even if the sensor continues to detect toner, this operation stops when the clutch has been turned on and off 10 times, so this SP may have to be repeated to clean out the system completely.   |  |  |
| 2-227                          | Toner Supply Mode Display   |               |   |  |  |
|                                |                             |               | Displays the toner supply mode used for the last copy.<br>1: ID Sensor and TD Sensor (from the 11th copy, using VT – VREF)<br>2: ID Sensor and TD Sensor (using VSP/VSG) – before the 10th copy of a job<br>3: TD Sensor – temporary mode when ID sensor output is abnormal<br>4: Image Pixel Count   |  |  |
| 2-301                          | Transfer Current Adjustment |               |   | 15 ~ 200<br>1 $\mu$ A/step<br><b>120 <math>\mu</math>A</b>   |  |
|                                | 1                           | 1st Copy Side | B<br>Adjusts the current applied to the transfer belt during copying on the 1st side of the paper.<br><br>If the user uses thicker paper, the current may have to be increased to ensure sufficient transfer of toner.  |  |  |
|                                | 2                           | Thick Paper   | B   | Adjusts the current applied to the transfer belt during copying on thick paper.<br><br><i>See above.</i> | 15 ~ 200<br>1 $\mu$ A/step<br><b>120 <math>\mu</math>A</b> |
|                                |                             |               |   |  |  |

| Mode No.<br>(Class 1, 2 and 3) |                                   |                   | Function | Settings  |
|--------------------------------|-----------------------------------|-------------------|----------|---|
| 2-301                          | Transfer Current Adjustment       |                   |          |   |
|                                | 3                                 | OHP Sheet         | B        | Adjusts the current applied to the transfer belt during copying on OHP sheet.<br>15 ~ 200<br>1 $\mu$ A/step<br><b>140 <math>\mu</math>A</b>   |
|                                |                                   |                   |          | See above. If the user normally feeds thicker paper from the bypass tray, use a higher setting.   |
|                                | 4                                 | Transparent Paper | B        | Adjusts the current applied to the transfer belt during copying on translucent paper.<br>15 ~ 200<br>1 $\mu$ A/step<br><b>120 <math>\mu</math>A</b>   |
|                                | 5                                 | 2nd Copy          | B        | Adjusts the current applied to the transfer belt during copying on the 2nd side of the paper.<br>15 ~ 200<br>1 $\mu$ A/step<br><b>120 <math>\mu</math>A</b>   |
| 2-506                          | 6                                 | Between Pages     | B        | Adjusts the current applied to the transfer belt between the pages.<br>15 ~ 200<br>1 $\mu$ A/step<br><b>20 <math>\mu</math>A</b>  |
|                                | Cleaning Interval – Multiple Copy |                   |          |   |
|                                | 1                                 | On/Off            | B        | Selects whether multiple copy jobs are stopped at regular intervals for the following purposes.<br>1. Stop and turn the drum motor in reverse to clean the cleaning blade edge<br>2. Make an ID sensor pattern to correct the toner density control.<br>The interval depends on SP2-506-2. Use if the drum gets dirty or images get too pale or too dark during a long job. Normally keep at 'No', because the 'Yes' setting causes the machine to stop copying every 15 minutes, which may cause problems for the customer.<br><b>1: No</b><br><b>2: Yes</b> |
| 2-801                          | 2                                 | Interval          | B        | Selects the interval at which multi copy jobs are stopped.<br>1 ~ 100<br>1 minute/step<br><b>15 minutes</b>   |
|                                | TD Sensor Initial Setting         |                   |          |   |
| 2-803                          |                                   |                   | B        | Performs the TD sensor initial setting. This SP mode controls the voltage applied to the TD sensor to make the TD sensor output about 2.5 V. After finishing this, the TD sensor output voltage is displayed.<br><i>Use this mode only after changing the TD sensor or the developer.</i>   |
|                                |                                   |                   |          | Start   |
| 2-803                          | Corona Wire Cleaner On            |                   |          |   |
|                                |                                   |                   |          | Turns on the corona wire cleaner manually.<br><i>When copy density across the paper is uneven at EM, clean the wire with this mode.</i>   |
| 2-803                          |                                   |                   |          | Start   |
|                                |                                   |                   |          |   |

| Mode No.<br>(Class 1, 2 and 3) |                               |  | Function  | Settings   |
|--------------------------------|-------------------------------|--|---|--|
| 2-804                          | Charge Corona Cleaner Setting |  |   |  |
|                                | 1                             | Corona Wire Cleaner Operation Setting    | B<br>Selects when automatic corona wire cleaning is done.<br>0: Corona wire cleaning is not done.<br>1: When process control initial setting is done, if the copy number after the last cleaning operation is over the number set in SP2-804-2.<br>2: At the period set in SP2-804-2. | 0: Not done<br><b>1: Done</b><br>2: Periodically |
|                                | 2                             | Operation Interval                       | B<br>Selects the interval for automatic corona wire cleaning.   | 100 ~ 10,000<br>100 print/step<br><b>5,000</b>   |
| 2-813                          | Printer Gamma Setting         |  |   |  |
|                                |                               |  | S<br>Select if printer gamma correction is applied or not.<br><i>This SP mode is for designer use only.</i>   | <b>0: Applied</b><br>1: Not applied              |
| 2-902                          | Printing Test Pattern         |  |   |  |
|                                | 2                             | IPU Test Pattern Selection (for Scanner) | Prints the test patterns for the IPU chip. See section 4.2.3. for how to print test patterns.<br><i>This SP mode is useful for finding whether the SICU or the SBU is defective. If the printout is not OK, the SICU is defective.</i>  |  |
|                                | 3                             | Printing Test Pattern                    | Prints the printer test patterns. See section 4.2.3. for how to print test patterns.<br>Example: 15. Trimming Area<br><i>This SP mode is useful for finding whether the LDDR or the SICU is defective. If the printout is not OK, the LDDR is defective.</i>                          |  |
|                                | 4                             | Outer I/F Block Test Pattern             | Prints the test patterns for the IPU chip. See section 4.2.3. for how to print test patterns.<br><i>This SP mode is useful for finding whether the SICU or the printer application is defective. If the printout is not OK, the SICU is defective.</i>                                |  |
|                                | 5                             | Frequency Pattern Density                | Designer use only.  |  |
|                                |                               |  |   |  |
| 2-906                          | Vcont Manual Setting          |  |   |  |
|                                |                               | B  | <b>Factory use only.</b>  | <b>9.7 V</b>                                     |
| 2-909                          | Main Scan Magnification       |  |   |  |
|                                | 1                             | Copier                                   | S<br>Adjusts the magnification in the main scan direction for copy mode.<br><i>Use the "•" key to toggle between + and -. See "Replacement and Adjustment – Copy Image Adjustments" for details.</i>  | –2.0 ~ +2.0<br>0.1%/step<br><b>+0.0%</b>         |
|                                | 2                             | Printer                                  | S<br>Adjusts the magnification in the main scan direction when printing from a personal computer.<br><i>Use the "•" key to toggle between + and -. See "Replacement and Adjustment – Copy Image Adjustments" for details.</i>   | –2.0 ~ +2.0<br>0.1%/step<br><b>+0.0%</b>         |
|                                |                               |  |   |  |

| Mode No.<br>(Class 1, 2 and 3) |                                    |          | Function  | Settings  |   |
|--------------------------------|------------------------------------|----------|---|---|---|
| 2-910                          | Writing Sub Scan Magnification     |          |   |   |   |
|                                |                                    | S        | Adjusts the magnification in the sub scan direction.<br><i>Use the “•” key to toggle between + and –. See "Replacement and Adjustment – Copy Image Adjustments" for details.</i>  | –1.0 ~ +1.0<br>0.1%/step<br><b>+0.0%</b>  |   |
| 2-911                          | Transfer Current On/Off Timing     |          |   |   |   |
|                                | 1                                  | La (ON)  | B   | Adjusts the transfer current on timing at the leading edge.                                   | –30 ~ +30<br>1 mm/step<br><b>0 mm</b>   |
|                                | 3                                  | Lc (OFF) | B   | Adjusts the transfer current off timing (for example: –5 mm is 5 mm after the trailing edge). | –30 ~ +30<br>1 mm/step<br><b>–10 mm</b> |
| 2-912                          | Drum Reverse Rotation Interval     |          |   |   |   |
|                                |                                    | B        | <b>This SP mode is for designer use only. Do not change the value.</b>  | 0 ~ 10<br>1/step<br><b>2</b>  |   |
| 2-913                          | Test Pattern ID Adjustment         |          |   |   |   |
|                                |                                    |          | Adjusts the image density for printing test patterns (with SP2-902). Usually this SP mode is only used by designers.<br><i>The value is cleared when the main power switch is turned off and on.</i>  | 0 ~ 15<br>1/step<br><b>15</b>   |   |
| 2-920                          | LD Off Check                       |          |   |   |   |
|                                |                                    |          | Checks whether the LD turns off or on when the front door is opened.<br>0: On 1: Off<br><b>Factory use only.</b>  | <b>0: ON</b><br><b>1: OFF</b>   |   |
| 2-930                          | Transfer Pre-cleaning              |          |   |   |   |
|                                |                                    |          | <b>Designer use only</b>  |   |   |
| 2-961                          | Developer Initialization (Factory) |          |   |   |   |
|                                |                                    |          | <b>Factory use only.</b>  |   |   |
| 2-962                          | Auto Process Control               |          |   |   |   |
|                                |                                    | B        | Automatically adjusts the following process control factors.<br>1. Drum potential sensor<br>2. ID sensor<br>3. Charge grid voltage (by changing Vd)<br>4. LD power (by changing Vh)<br>Before using this SP, auto process control should be on (SP3-901).<br><i>After changing the drum, ID sensor, drum potential sensor, LD unit, charge corona wires, or toner density sensor, this SP should be used.</i> | Start   |   |
| 2-966                          | Periodical Auto Process Control    |          |   |   |   |
|                                |                                    | B        | Selects whether auto process control is done after the first job since 24 hours is finished. This setting is required for a customer who keeps the main switch on all day.  | <b>ON</b><br><b>OFF</b>   |   |

| Mode No.<br>(Class 1, 2 and 3) |                               |                                      | Function  | Settings   |
|--------------------------------|-------------------------------|--------------------------------------|---|--|
| 2-967                          | Auto Image Density Adjustment |                                      |   |  |
|                                |                               | B                                    | <p>Selects whether auto image density adjustment is done during machine warm up. This mode is to counter dirty background that occurs when a machine is used in an area that contains ammonia.</p> <p><i>If Periodical Auto Process Control (SP2-966) is used, this adjustment is done also after the auto process control is finished.</i></p> | <b>OFF</b><br><b>ON</b>                                    |
| 2-968                          | Toner Density Correction      |                                      |   |  |
|                                |                               | B                                    | <p>To prevent the image density dropping during continuous copying after a long interval (this is caused by a sudden increase of Q/M), VREF is changed by – 0.06 V every 100 prints. This correction is applied from when the auto process control is done, until the number of prints set with this SP mode have been made.</p>                | 0 ~ 20 k<br>1 k/step<br><b>0</b>                           |
| 3-001                          | ID Sensor Initial Setting     |                                      |   |  |
|                                | 1                             | ID Sensor PWM Setting                | <p>This SP mode is added to recover the machine when an SC condition occurs because ID Sensor Initial Setting is not done after doing an NVRAM Clear or replacing the NVRAM. Reset this SP to the factory setting in this case.</p> <p><i>The PWM data is stored when ID Sensor Initial Setting is done.</i></p>                                | 0 ~ 255<br>1/step<br><b>72</b>                             |
| 3-001                          | ID Sensor Initial Setting     |                                      |   |  |
|                                | 2                             | Initialization                       | <p>Performs the ID sensor initial setting. The ID sensor output for the bare drum (VSG) is adjusted to <math>4.0 \pm 0.2</math> V.</p> <p><i>This SP mode should be performed after:</i></p> <p>1. Replacing or cleaning the ID sensor</p> <p>2. Replacing the NVRAM or doing an NVRAM clear.</p>   | Start  |
| 3-103                          | ID Sensor Output Display      |                                      |   |  |
|                                | 1                             | VSG                                  | <p>Displays the current VSG and VSP output.</p> <p><i>If the ID sensor does not detect the ID pattern, "VSP = 5.0 V/VSG = 5.0 V" is displayed and an SC code is generated.</i></p> <p><i>If the ID sensor does not detect the bare area of the drum, "VSP = 0.0 V/VSG = 0.0 V" is displayed and an SC code is generated.</i></p>                |  |
|                                | 2                             | VSG Initial (Designer Use)           |   |  |
|                                | 3                             | VSP                                  |   |  |
|                                | 4                             | VSP Initial (Designer Use)           |   |  |
| 3-901                          | Auto Process Control Setting  |                                      |   |  |
|                                |                               | B                                    | <p>Decides whether or not the machine checks and corrects the drum potential (VD) and LD power when the fusing temperature is lower than 100°C at power-up.</p>   | <b>ON</b><br><b>OFF</b>                                    |
| 3-902                          | Process Control Data Display  |                                      |   |  |
|                                | 1                             | Auto Process Control (O: OFF, 1: ON) | B   | <p>Displays whether auto process control is on or off.</p> |

| Mode No.<br>(Class 1, 2 and 3) |                                   |                          | Function | Settings   |
|--------------------------------|-----------------------------------|--------------------------|----------|--|
| 3-902                          | Process Control Data Display      |                          |          |  |
|                                | 2                                 | V <sub>D</sub>           | B        | Displays the drum potential.   |
|                                | 3                                 | Half Tone V <sub>H</sub> | B        | Displays the drum potential in areas illuminated by the laser during LD power adjustment (auto process control).   |
|                                | 4                                 | V <sub>G</sub>           | B        | Displays the charge grid voltage which resulted from the latest V <sub>D</sub> adjustment.   |
|                                | 5                                 | LD Power (Correction)    | B        | Displays the LD power correction value which resulted from the latest V <sub>H</sub> adjustment.   |
|                                | 6                                 | V <sub>ID</sub>          | B        | Displays the latest drum surface voltage measured on the ID sensor pattern.  |
|                                | 7                                 | VM200                    | B        | Displays the drum potential sensor output when 200 V is applied during potential sensor correction.  |
|                                | 8                                 | VM700                    | B        | Displays the drum potential sensor output when 700 V is applied during potential sensor correction.  |
| 4-008                          | Scanner Sub Scan Magnification    |                          |          |  |
|                                |                                   |                          | S        | Adjusts the magnification in the sub scan direction for scanning.<br>If this value is changed, the scanner motor speed is changed.<br><i>Use the "•" key to toggle between + and -. See "Replacement and Adjustment – Copy Image Adjustments" for details.</i>             |
| 4-010                          | Scanner Side-to-Side Registration |                          |          |  |
|                                |                                   |                          | S        | Adjusts the leading edge registration for scanning.<br>(-): The image moves in the direction of the leading edge<br><i>Use the "•" key to toggle between + and -. See "Replacement and Adjustment – Copy Image Adjustments" for details.</i>                               |
| 4-011                          | Scanner Side-to-Side Registration |                          |          |  |
|                                |                                   |                          | S        | Adjusts the side-to-side registration for scanning.<br>(-): The image disappears at the left side.<br>(+): The image appears at the left side.<br><i>Use the "•" key to toggle between + and -. See "Replacement and Adjustment – Copy Image Adjustments" for details.</i> |
| 4-012                          | Scanner Erase Margin              |                          |          |  |
|                                | 1                                 | Leading Edge             | S        | Adjusts the leading edge erase margin for scanning.<br><i>Do not adjust this unless the user wishes to have a scanner margin that is greater than the printer margin.</i>  |
|                                |                                   |                          |          |  |
|                                | 2                                 | Trailing Edge            | S        | Adjusts the trailing edge erase margin for scanning.<br><i>See the comment for SP4-012-1.</i>  |
|                                |                                   |                          |          |  |



| Mode No.<br>(Class 1, 2 and 3)        |                                    |                         |   | Function  | Settings   |
|---------------------------------------|------------------------------------|-------------------------|---|---|--|
| 4-012                                 | Scanner Erase Margin               |                         |   |   |  |
|                                       | 3                                  | Right                   | S   | Adjusts the right side erase margin for scanning.   | 0.0 ~ 0.9  |
|                                       |                                    |                         |   | See the comment for SP4-012-1.  | 0.1 mm/step<br><b>0.5 mm</b>   |
|                                       | 4                                  | Left                    | S   | Adjusts the left side erase margin for scanning.  | 0.0 ~ 0.9  |
| See the comment for SP4-012-1.        |                                    |                         |   | 0.1 mm/step<br><b>0.5 mm</b>  |  |
| 4-013                                 | Scanner Free Run                   |                         |   |   |  |
|                                       |                                    |                         | Performs a scanner free run with the exposure lamp on.                                  | <b>0: Stop</b><br><b>1: Start</b>   |  |
| 4-015                                 | Scanner Speed Adjustment           |                         |   |   |  |
|                                       |                                    |                         | S   | Displays the value of the scanner speed fine adjustment. This setting can be changed using the number keys.   | -20 ~ +20<br>1/step<br><b>0</b>  |
|                                       |                                    |                         |   | The scanner speed fine adjustment is automatically done when the main switch is turned on, and the current setting is overwritten.  |  |
| 4-301                                 | APS Sensor Output Display          |                         |   |   |  |
|                                       |                                    |                         | Displays the APS sensor output signals when an original is placed on the exposure glass |   |  |
| 4-303                                 | APS A5/HLT Size Original Detection |                         |   |   |  |
|                                       |                                    |                         | S   | Selects whether or not the copier determines that the original is A5/HLT size when the APS sensor does not detect the size.   | <b>0: Not detected</b><br>1: A5 length/ 5 1/2" x 8 1/2"<br>2: Not detected<br>3: A5 length/ 5 1/2" x 8 1/2" (Setting 2 or 3 is required if 267 x 390 and 267 x 195 paper is used.) |
|                                       |                                    |                         |   | If "A5 length/5 1/2" x 8 1/2"" is selected, paper sizes that cannot be detected by the APS sensors are regarded as A5 lengthwise or 5 1/2" x 8 1/2".<br>If "Not detected" is selected, "Cannot detect original size" will be displayed. |  |
| 4-428                                 | Scanner Adjustment                 |                         |   |   |  |
|                                       | 1                                  | Flag Display            | S   | Displays whether or not the standard white level adjustment has been done.  | Adjusted<br><b>Not adjusted</b>  |
|                                       |                                    |                         |   | 2   |  |
|                                       |                                    |                         |   | This SP mode is for factory use only. Do not use this SP mode.  | Start  |
| 4-902                                 | SBU Setting                        |                         |   |   |  |
|                                       | 1                                  | Image data Path Setting | S   | Changes the image data path in the SBU.   | 0 ~5<br>1/step<br><b>0</b>   |
|                                       |                                    |                         |   | This SP mode is for factory use only. Do not use this SP mode.  |  |
|                                       | 2                                  | ASIC ID Display         |   | Displays the ASIC ID of the SBU.  |  |
| This SP mode is for factory use only. |                                    |                         |   |   |  |

| Mode No.<br>(Class 1, 2 and 3) |             |                                   | Function | Settings  |
|--------------------------------|-------------|-----------------------------------|----------|---|
| 4-902                          | SBU Setting |                                   |          |   |
|                                | 3           | E/O Adjustment - First Side       | S        | Checks the difference value of the black level for the first side after adjusting the black level at power-up.<br><b><i>This SP mode is for designer use only. Do not use this SP mode.</i></b>                   |
|                                | 4           | E/O Adjustment - Last Side        | S        | Checks the difference value of the black level for the last side after adjusting the black level at power-up.<br><b><i>This SP mode is for designer use only. Do not use this SP mode.</i></b>                    |
|                                | 7           | Black Level - First Side          | S        | Checks the value of the black level for the first side after adjusting the black level at power-up.<br><b><i>This SP mode is for designer use only. Do not use this SP mode.</i></b>                              |
|                                | 8           | Black Level - Last Side           | S        | Checks the value of the black level for the last side after adjusting the black level at power-up.<br><b><i>This SP mode is for designer use only. Do not use this SP mode.</i></b>                               |
|                                | 15          | Range Adjustment - First Side     | S        | Checks the AGC gain range of the white level for the first side after adjusting the white level at power-up.<br><b><i>This SP mode is for designer use only. Do not use this SP mode.</i></b>                     |
|                                | 16          | Gain Range Adjustment - Last Side | S        | Checks the AGC gain value of the white level for the last side after adjusting the white level at power-up.<br><b><i>This SP mode is for designer use only. Do not use this SP mode.</i></b>                      |
|                                | 19          | Gain Adjustment - First Side E-ch | S        | Checks the AGC gain value of the white level for the EVEN channel of the first side after adjusting the white level at power-up.<br><b><i>This SP mode is for designer use only. Do not use this SP mode.</i></b> |
|                                | 20          | Gain Adjustment - First Side O-ch | S        | Checks the AGC gain value of the white level for the ODD channel of the first side after adjusting the white level at power-up.<br><b><i>This SP mode is for designer use only. Do not use this SP mode.</i></b>  |
|                                | 21          | Gain Adjustment - Last Side E-ch  | S        | Checks the AGC gain value of the white level for the EVEN channel of the last side after adjusting the white level at power-up.<br><b><i>This SP mode is for designer use only. Do not use this SP mode.</i></b>  |
|                                | 22          | Gain Adjustment - Last Side O-ch  | S        | Checks the AGC gain value of the white level for the ODD channel of the last side after adjusting the white level at power-up.<br><b><i>This SP mode is for designer use only. Do not use this SP mode.</i></b>   |

| Mode No.<br>(Class 1, 2 and 3) |             |  |   | Function   | Settings                        |
|--------------------------------|-------------|--|---|--|---------------------------------|
| 4-902                          | SBU Setting |  |   |  |                                 |
|                                | 25          | Reference Voltage Adjustment           | S | Checks the value of the standard white level after adjusting the white level.<br><b><i>This SP mode is for factory use only. Do not use this SP mode.</i></b>                            | 0 ~ 255<br>1/step<br><b>117</b> |
|                                | 31          | E/O Adjustment - First Side (Memory)   | S | Checks the difference value of the black level for the First side after adjusting the black level at power-up.<br><b><i>This SP mode is for designer use only.</i></b>                   | 0 ~ 255<br>1/step<br><b>128</b> |
|                                | 32          | E/O Adjustment - Last Side (Memory)    | S | Checks the difference value of the black level for the last side after adjusting the black level at power-up.<br><b><i>This SP mode is for designer use only.</i></b>                    | 0 ~ 255<br>1/step<br><b>128</b> |
|                                | 35          | Black Level - First Side (Memory)      | S | Checks the value of the black level for the first side after adjusting the black level at power-up.<br><b><i>This SP mode is for designer use only.</i></b>                              | 0 ~ 255<br>1/step<br><b>170</b> |
|                                | 36          | Black Level - Last Side (Memory)       | S | Checks the value of the black level for the last side after adjusting the black level at power-up.<br><b><i>This SP mode is for designer use only.</i></b>                               | 0 ~ 255<br>1/step<br><b>170</b> |
|                                | 43          | Range Adjustment - First Side (Memory) | S | Checks the AGC gain value of the white level for the EVEN channel of the first side after adjusting the white level at power-up.<br><b><i>This SP mode is for designer use only.</i></b> | 0 ~ 255<br>1/step<br><b>0</b>   |
|                                | 44          | Range Adjustment - Last Side (Memory)  | S | Checks the AGC gain value of the white level for the ODD channel of the first side after adjusting the white level at power-up.<br><b><i>This SP mode is for designer use only.</i></b>  | 0 ~ 255<br>1/step<br><b>0</b>   |
|                                | 47          | Gain Adjustment - F/E ch (Memory)      | S | Checks the AGC gain value of the white level for the EVEN channel of the last side after adjusting the white level at power-up.<br><b><i>This SP mode is for designer use only.</i></b>  | 0 ~ 255<br>1/step<br><b>0</b>   |
|                                | 48          | Gain Adjustment - F/O ch (Memory)      | S | Checks the AGC gain value of the white level for the ODD channel of the last side after adjusting the white level at power-up.<br><b><i>This SP mode is for designer use only.</i></b>   | 0 ~ 255<br>1/step<br><b>0</b>   |
|                                | 49          | Gain Adjustment - L/E ch (Memory)      | S | Checks the AGC gain value of the white level for the EVEN channel of the last side after adjusting the white level at power-up.<br><b><i>This SP mode is for designer use only.</i></b>  | 0 ~ 255<br>1/step<br><b>0</b>   |
|                                | 50          | Gain Adjustment - L/O ch (Memory)      | S | Checks the AGC gain value of the white level for the ODD channel of the last side after adjusting the white level at power-up.<br><b><i>This SP mode is for designer use only.</i></b>   | 0 ~ 255<br>1/step<br><b>0</b>   |
|                                | 53          | Reference Voltage Adjustment (Memory)  | S | Checks the value of the standard white level after adjusting the white level.<br><b><i>This SP mode is for factory use only.</i></b>   | 0 ~ 255<br>1/step<br><b>117</b> |
|                                | 59          | Standard White Level                   |   | Checks either the maximum or minimum white shading data.<br><b><i>This SP mode is for designer use only.</i></b>   | 0: Maximum<br>1: Minimum        |

| Mode No.<br>(Class 1, 2 and 3) |             |   | Function | Settings   |
|--------------------------------|-------------|---|----------|--|
| 4-902                          | SBU Setting |   |          |  |
|                                | 61          | Range F<br>(Factory Setting)                              | S        | Checks the AGC gain value of the white level for the EVEN channel of the first side after adjusting the white level at power-up.<br><b><i>This SP mode is for designer use only.</i></b> |
|                                |             |   |          | 0 ~ 255<br>1/step<br><b>80</b>   |
|                                | 62          | Gain Adjustment -<br>First Side O ch<br>(Factory Setting) | S        | Checks the AGC gain value of the white level for the ODD channel of the first side after adjusting the white level at power-up.<br><b><i>This SP mode is for designer use only.</i></b>  |
|                                |             |   |          | 0 ~ 255<br>1/step<br><b>80</b>   |
|                                | 65          | Range L<br>(Factory Setting)                              | S        | Checks the AGC gain value of the white level for the EVEN channel of the last side after adjusting the white level at power-up.<br><b><i>This SP mode is for designer use only.</i></b>  |
|                                |             |   |          | 0 ~ 255<br>1/step<br><b>0</b>  |
|                                | 66          | Gain F-O ch<br>(Factory Setting)                          | S        | Checks the AGC gain value of the white level for the ODD channel of the last side after adjusting the white level at power-up.<br><b><i>This SP mode is for designer use only.</i></b>   |
|                                |             |   |          | 0 ~ 255<br>1/step<br><b>0</b>  |
|                                | 67          | Gain L/F ch<br>(Factory Setting)                          | S        | Checks the AGC gain value of the white level for the EVEN channel of the last side after adjusting the white level at power-up.<br><b><i>This SP mode is for designer use only.</i></b>  |
|                                |             |   |          | 0 ~ 255<br>1/step<br><b>0</b>  |
|                                | 68          | Gain L-O ch<br>(Factory Setting)                          | S        | Checks the AGC gain value of the white level for the ODD channel of the last side after adjusting the white level at power-up.<br><b><i>This SP mode is for designer use only.</i></b>   |
|                                |             |   |          | 0 ~ 255<br>1/step<br><b>0</b>  |
|                                | 71          | Reference Voltage<br>(Factory Setting)                    | S        | Checks the value of the standard white level after adjusting the white level.<br><b><i>This SP mode is for factory use only.</i></b>   |
|                                |             |   |          | 0 ~ 255<br>1/step<br><b>117</b>  |
|                                | 75          | Overflow Flag   |          | Checks the overflow flag data during the automatic scanner adjustment.<br><b><i>This SP mode is for designer use only.</i></b>   |
|                                |             |   |          | 0 ~ 1023<br>1/step<br><b>0</b>   |
|                                | 76          | Time Out Flag   |          | Checks the time out flag data during the automatic scanner adjustment.<br><b><i>This SP mode is for designer use only.</i></b>   |
|                                |             |   |          | 0 ~ 1023<br>1/step<br><b>0</b>   |
|                                | 78          | SBU Reset Error Flag                                      |          | Checks the error flag data during the automatic scanner adjustment.<br><b><i>This SP mode is for designer use only.</i></b>  |
|                                |             |   |          | 0 ~ 15<br>1/step<br><b>0</b>   |
|                                | 79          | Error Flag  |          | Checks the error flag data during the automatic scanner adjustment.<br><b><i>This SP mode is for designer use only.</i></b>  |
|                                |             |   |          | 0 ~ 255<br>1/step<br><b>0</b>  |
|                                | 80          | E/O Adjustment Error Count                                | S        | Counts the errors during the automatic scanner adjustment.<br><b><i>This SP mode is for designer use only.</i></b>   |
|                                |             |   |          | 0 ~ 255<br>1/step<br><b>0</b>  |
|                                | 81          | Black Adjustment Error Count                              | S        | Counts the errors during the automatic scanner adjustment.<br><b><i>This SP mode is for designer use only.</i></b>   |
|                                |             |   |          | 0 ~ 255<br>1/step<br><b>0</b>  |
|                                | 82          | Gain F/L Difference Error Count                           | S        | Counts the errors during the automatic scanner adjustment.<br><b><i>This SP mode is for designer use only.</i></b>   |
|                                |             |   |          |  |

Service  
Tables

| Mode No.<br>(Class 1, 2 and 3) |                |                                    | Function | Settings   |
|--------------------------------|----------------|------------------------------------|----------|--|
| 4-902                          | SBU Setting    |                                    |          |  |
|                                | 83             | Black Reading Error Count          | S        | Counts the errors during the automatic scanner adjustment.<br><b><i>This SP mode is for designer use only.</i></b>   |
|                                | 84             | White Reading Error Count          | S        | Counts the errors during the automatic scanner adjustment.<br><b><i>This SP mode is for designer use only.</i></b>   |
|                                | 85             | Retry Error Fault Count            | S        | Counts the errors during the automatic scanner adjustment.<br><b><i>This SP mode is for designer use only.</i></b>   |
|                                | 86             | Retry Error Success Count          | S        | Counts the errors during the automatic scanner adjustment.<br><b><i>This SP mode is for designer use only.</i></b>   |
|                                | 87             | White Reading Value - F/E ch       | S        | Displays the white peak level when the main switch is turned on.<br><b><i>This SP mode is for designer use only.</i></b>   |
|                                | 88             | White Reading Value - F/O ch       | S        | Displays the white peak level when the main switch is turned on.<br><b><i>This SP mode is for designer use only.</i></b>   |
|                                | 89             | White Reading Value - L/E ch       | S        | Displays the white peak level when the main switch is turned on.<br><b><i>This SP mode is for designer use only.</i></b>   |
|                                | 90             | White Reading Value - L/O ch       | S        | Displays the white peak level when the main switch is turned on.<br><b><i>This SP mode is for designer use only.</i></b>   |
|                                | 91             | BIPU IO                            | S        | <b><i>This SP mode is for designer use only.</i></b>   |
| 4-903                          | Filter Setting |                                    |          |  |
|                                | 5              | Full Size Mode                     |          | Selects whether the copy is always in full size mode even if the magnification ratio has been changed.<br><i>Set to 1 when checking the magnification in the main scan direction. If the magnification is not 100%, something is wrong with the image processing circuits.</i><br><b>0: Normal operation</b><br>1: Always full size mode |
|                                | 7              | Image Shift in Magnification       |          | Adjusts the pixel shift amount in the main scan direction in magnification mode.<br><b><i>This SP mode is for designer use only.</i></b><br>0 ~ 8191<br>1/step<br><b>0</b>   |
|                                | 9              | Filter Type Selection - Photo Mode | S        | Selects the filter type for Photo mode.<br><i>Coefficients used:</i><br>0: SP4-903-36 1: SP4-903-37<br><i>If "0" is selected, the image will be sharper. However, dot screen areas will be faint. This SP is ignored unless the user selects 'Service Mode' in UP mode.</i><br><b>0: MTF</b><br><b>1: Smoothing</b>                      |

| Mode No.<br>(Class 1, 2 and 3) |                |  |   | Function  | Settings                     |
|--------------------------------|----------------|--|---|---|------------------------------|
| 4-903                          | Filter Setting |  |   |   |                              |
|                                | 10             | Pre-filter Type<br>(Text mode<br>25% ~ 49%)                  | S | Selects the pre-filter type.<br><br>0: None   | 0 ~ 10<br>1/step<br><b>1</b> |
|                                | 11             | Pre-filter Type<br>(Text mode<br>50% ~ 154%)                 | S | 1: Smoothing (Normal)<br>2: Smoothing (Weak)<br>3 ~ 5: Special smoothing filters which  | 0 ~ 10<br>1/step<br><b>0</b> |
|                                | 12             | Pre-filter Type<br>(Photo mode)                              | S | reduce moiré but do not weaken the edges of low contrast text. A suitable filter should be selected depending on the original type.   | 0 ~ 10<br>1/step<br><b>1</b> |
|                                | 13             | Pre-filter Type<br>(Text/Photo mode 25% ~ 49%)               | S | 6: MTF (Weak)<br>7: MTF (Normal)<br>8 ~ 10: Special smoothing filters only for  | 0 ~ 10<br>1/step<br><b>1</b> |
|                                | 14             | Pre-filter Type<br>(Text/Photo mode 50% ~ 154%)              | S | the main scan direction. These filters should be used if the edges of lines that are parallel to the sub scan line are weakened when a filter from 3 ~ 5 is selected. A suitable filter should be selected depending on the original type.  | 0 ~ 10<br>1/step<br><b>0</b> |
|                                | 15             | Pre-filter Type<br>(Pale mode)                               | S |   | 0 ~ 10<br>1/step<br><b>1</b> |
|                                | 16             | Pre-filter Type<br>(Generation mode)                         | S | This SP is ignored unless the user selects 'Service Mode' in UP mode.   | 0 ~ 10<br>1/step<br><b>1</b> |
|                                | 20             | Filter Level - Text<br>(25% ~ 49%)<br>Main Scan Direction    | S | Selects the MTF filter coefficient in the main scan direction for 25% ~ 49% reduction for text mode. Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters.<br>0: Weak 6: Strong 7: Weak 13: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i> | 0 ~ 13<br>1/step<br><b>3</b> |
|                                | 21             | Filter Level - Text<br>(25% ~ 49%)<br>Sub Scan Direction     | S | Selects the MTF filter coefficient in the sub scan direction for 25% ~ 49% reduction for text mode.<br>0: Weak 6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>  | 0 ~ 6<br>1/step<br><b>3</b>  |
|                                | 22             | Filter Strength - Text<br>(25% ~ 49%)<br>Main Scan Direction | S | Selects the MTF strength in the main scan direction for 25% ~ 49% reduction for text mode.<br>0: Weak 6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>   | 0 ~ 6<br>1/step<br><b>1</b>  |
|                                | 23             | Filter Strength - Text<br>(25% ~ 49%)<br>Sub Scan Direction  | S | Selects the MTF strength in the sub scan direction for 25% ~ 49% magnification for text mode.<br>0: Weak 6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>  | 0 ~ 6<br>1/step<br><b>0</b>  |

| Mode No.<br>(Class 1, 2 and 3)   |  | Function  |   | Settings  |                       |
|--|--|---|---|---|-----------------------|
| 4-903  | Filter Setting   |   |   |   |                       |
|  | 24   | Filter Level - Text<br>(50% ~ 154%)<br>Main Scan Direction    | S   | Selects the MTF filter coefficient in the main scan direction for 50% ~ 154% reduction for text mode. Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters.<br>0: Weak 6: Strong 7: Weak 13: Strong  | 0 ~ 13<br>1/step<br>3 |
|  |  |   |   | <i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>  |                       |
|  | 25   | Filter Level - Text<br>(50% ~ 154%)<br>Sub Scan Direction     | S   | Selects the MTF filter coefficient in the sub scan direction for 50% ~ 154% reduction for text mode.<br>0: Weak 6: Strong   | 0 ~ 6<br>1/step<br>3  |
|  |  |   |   | <i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>  |                       |
|  | 26   | Filter Strength - Text<br>(50% ~ 154%)<br>Main Scan Direction | S   | Selects the MTF strength in the main scan direction for 50% ~ 154% reduction for text mode.<br>0: Weak 6: Strong  | 0 ~ 6<br>1/step<br>2  |
|  |  |   |   | <i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>  |                       |
|  | 27   | Filter Strength - Text<br>(50% ~ 154%)<br>Sub Scan Direction  | S   | Selects the MTF strength in the sub scan direction for 50% ~ 154% magnification for text mode.<br>0: Weak 6: Strong.  | 0 ~ 6<br>1/step<br>1  |
|  |  |   |   | <i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>  |                       |
|  | 28   | Filter Level - Text<br>(155% ~ 256%)<br>Main Scan Direction   | S   | Selects the MTF filter coefficient in the main scan direction for 155% ~ 256% reduction for text mode. Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters.<br>0: Weak 6: Strong 7: Weak 13: Strong | 0 ~ 13<br>1/step<br>3 |
|  |  |   |   | <i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>  |                       |
|  | 29   | Filter Level - Text<br>(155% ~ 256%)<br>Sub Scan Direction    | S   | Selects the MTF filter coefficient in the sub scan direction for 155% ~ 256% reduction for text mode.<br>0: Weak 6: Strong  | 0 ~ 6<br>1/step<br>3  |
| <i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i> |  |   |   |   |                       |
| 30   | Filter Strength - Text<br>(155% ~ 256%)<br>Main Scan Direction | S   | Selects the MTF strength in the main scan direction for 155% ~ 256% reduction for text mode.<br>0: Weak 6: Strong | 0 ~ 6<br>1/step<br>5  |                       |
|  |  |   | <i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>                                      |   |                       |

| Mode No.<br>(Class 1, 2 and 3) |                |   | Function | Settings  |                              |
|--------------------------------|----------------|---|----------|---|------------------------------|
| 4-903                          | Filter Setting |   |          |   |                              |
|                                | 31             | Filter Strength - Text<br>(155% ~ 256%)<br>Sub Scan<br>Direction  | S        | Selects the MTF strength in the sub scan direction for 155% ~ 256% magnification for text mode.<br>0: Weak   6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>  | 0 ~ 6<br>1/step<br><b>3</b>  |
|                                | 32             | Filter Level - Text<br>(257% ~ 400%)<br>Main Scan<br>Direction    | S        | Selects the MTF filter coefficient in the main scan direction for 256% ~ 400% reduction for text mode. Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters.<br>0: Weak   6: Strong   7: Weak   13: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i> | 0 ~ 13<br>1/step<br><b>3</b> |
|                                | 33             | Filter Level - Text<br>(257% ~ 400%)<br>Sub Scan<br>Direction     | S        | Selects the MTF filter coefficient in the sub scan direction for 257% ~ 400% reduction for text mode.<br>0: Weak   6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>  | 0 ~ 6<br>1/step<br><b>3</b>  |
|                                | 34             | Filter Strength - Text<br>(257% ~ 400%)<br>Main Scan<br>Direction | S        | Selects the MTF strength in the main scan direction for 257% ~ 400% reduction for text mode.<br>0: Weak   6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>   | 0 ~ 6<br>1/step<br><b>5</b>  |
|                                | 35             | Filter Strength - Text<br>(257% ~ 400%)<br>Sub Scan<br>Direction  | S        | Selects the MTF strength in the sub scan direction for 257% ~ 400% magnification for text mode.<br>0: Weak   6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>  | 0 ~ 6<br>1/step<br><b>3</b>  |
|                                | 36             | MTF Filter in Photo Mode  | S        | Selects the MTF filter coefficient for photo mode, if MTF is enabled for this mode with SP4-903-9. Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters.<br>0: Weak   6: Strong   7: Weak   13: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>     | 0 ~ 13<br>1/step<br><b>3</b> |
|                                | 37             | Smoothing Filter in Photo mode                                    | S        | Selects the smoothing filter coefficient for photo mode, if smoothing is enabled for this mode with SP4-903-9.<br>0: Weak   4: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>   | 0 ~ 4<br>1/step<br><b>1</b>  |
|                                | 38             | Filter Strength in Photo mode                                     | S        | Selects the smoothing filter coefficient for photo mode, if MTF is enabled for this mode with SP4-903-9.<br>0: Weak   6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>   | 0 ~ 6<br>1/step<br><b>3</b>  |

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| Mode No.<br>(Class 1, 2 and 3) |   | Function  |  | Settings                      |
|--------------------------------|---|---|--|-------------------------------|
| 4-903                          | Filter Setting  |   |  |                               |
|                                | 39  | Filter Level -<br>Text/Photo<br>(25% ~ 49%)<br>Main Scan<br>Direction   | S<br><br>Selects the MTF filter coefficient in the main scan direction for 25% ~ 49% magnification for text areas in text/photo mode.<br>Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters.<br>0: Weak 6: Strong 7: Weak 13: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>  | 0 ~ 13<br>1/step<br><b>13</b> |
|                                | 40  | Filter Level -<br>Text/Photo<br>(25% ~ 49%)<br>Sub Scan<br>Direction  | S<br><br>Selects the MTF filter coefficient in the sub scan direction for 25% ~ 49% magnification for text areas in text/photo mode.<br>0: Weak 6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>  | 0 ~ 6<br>1/step<br><b>3</b>   |
|                                | 41  | Filter Strength -<br>Text/Photo<br>(25% ~ 49%)<br>Main Scan<br>Direction  | S<br><br>Selects the MTF strength in the main scan direction for 25% ~ 49% magnification for text areas in text/photo mode.<br>0: Weak 6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>   | 0 ~ 6<br>1/step<br><b>0</b>   |
|                                | 42  | Filter Strength -<br>Text/Photo<br>(25% ~ 49%)<br>Sub Scan<br>Direction   | S<br><br>Selects the MTF strength in the sub scan direction for 25% ~ 49% magnification for text areas in text/photo mode.<br>0: Weak 6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>  | 0 ~ 6<br>1/step<br><b>0</b>   |
|                                | 43  | Filter Level -<br>Text/Photo<br>(50% ~ 154%)<br>Main Scan<br>Direction  | S<br><br>Selects the MTF filter coefficient in the main scan direction for 50% ~ 154% magnification for text areas in text/photo mode.<br>Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters.<br>0: Weak 6: Strong 7: Weak 13: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i> | 0 ~ 13<br>1/step<br><b>13</b> |
|                                | 44  | Filter Level -<br>Text/Photo<br>(50% ~ 154%)<br>Sub Scan<br>Direction   | S<br><br>Selects the MTF filter coefficient in the sub scan direction for 50% ~ 154% magnification for text areas in text/photo mode.<br>0: Weak 6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>   | 0 ~ 6<br>1/step<br><b>3</b>   |
| 45                             | Filter Strength -<br>Text/Photo<br>(50% ~ 154%)<br>Main Scan<br>Direction | S<br><br>Selects the MTF strength in the main scan direction for 50% ~ 154% magnification for text areas in text/photo mode.<br>0: Weak 6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i> | 0 ~ 6<br>1/step<br><b>1</b>  |                               |

| Mode No.<br>(Class 1, 2 and 3) |                |   | Function | Settings   |                               |
|--------------------------------|----------------|---|----------|--|-------------------------------|
| 4-903                          | Filter Setting |   |          |  |                               |
|                                | 46             | Filter Strength - Text/Photo (50% ~ 154%)<br>Sub Scan Direction   | S        | Selects the MTF strength in the sub scan direction for 50% ~ 154% magnification for text areas in text/photo mode.<br>0: Weak 6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>  | 0 ~ 6<br>1/step<br><b>1</b>   |
|                                | 47             | Filter Level - Text/Photo (155% ~ 256%)<br>Main Scan Direction    | S        | Selects the MTF filter coefficient in the main scan direction for 155% ~ 256% magnification for text areas in text/photo mode.<br>Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters.<br>0: Weak 6: Strong 7: Weak 13: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i> | 0 ~ 13<br>1/step<br><b>13</b> |
|                                | 48             | Filter Level - Text/Photo (155% ~ 256%)<br>Sub Scan Direction     | S        | Selects the MTF filter coefficient in the sub scan direction for 155% ~ 256% magnification for text areas in text/photo mode.<br>0: Weak 6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>   | 0 ~ 6<br>1/step<br><b>3</b>   |
|                                | 49             | Filter Strength - Text/Photo (155% ~ 256%)<br>Main Scan Direction | S        | Selects the MTF strength in the main scan direction for 155% ~ 256% magnification for text areas in text/photo mode.<br>0: Weak 6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>  | 0 ~ 6<br>1/step<br><b>1</b>   |
|                                | 50             | Filter Strength - Text/Photo (155% ~ 256%)<br>Sub Scan Direction  | S        | Selects the MTF strength in the sub scan direction for 155% ~ 256% magnification for text areas in text/photo mode.<br>0: Weak 6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>   | 0 ~ 6<br>1/step<br><b>3</b>   |
|                                | 51             | Filter Level - Text/Photo (257% ~ 400%)<br>Main Scan Direction    | S        | Selects the MTF filter coefficient in the main scan direction for 257% ~ 400% magnification for text areas in text/photo mode.<br>Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters.<br>0: Weak 6: Strong 7: Weak 13: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i> | 0 ~ 13<br>1/step<br><b>13</b> |
|                                | 52             | Filter Level - Text/Photo (257% ~ 400%)<br>Sub Scan Direction     | S        | Selects the MTF filter coefficient in the sub scan direction for 257% ~ 400% magnification for text areas in text/photo mode.<br>0: Weak 6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>   | 0 ~ 6<br>1/step<br><b>3</b>   |

| Mode No.<br>(Class 1, 2 and 3) |   | Function   |   | Settings  |                        |
|--------------------------------|---|--|---|---|------------------------|
| 4-903                          | Filter Setting                          |  |   |   |                        |
|                                | 53                                      | Filter Strength - Text/Photo (257% ~ 400%) Main Scan Direction | S   | Selects the MTF strength in the main scan direction for 257% ~ 400% magnification for text areas in text/photo mode.<br>0: Weak 6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>   | 0 ~ 6<br>1/step<br>1   |
|                                | 54                                      | Filter Strength - Text/Photo (257% ~ 400%) Sub Scan Direction  | S   | Selects the MTF strength in the sub scan direction for 257% ~ 400% magnification for text areas in text/photo mode.<br>0: Weak 6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>  | 0 ~ 6<br>1/step<br>3   |
|                                | 55                                      | Filter Level in Pale Mode                                      | S   | Selects the table of the MTF filter coefficient for pale original mode<br>Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters.<br>0: Weak 6: Strong 7: Weak 13: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>  | 0 ~ 13<br>1/step<br>3  |
|                                | 56                                      | Filter Strength in Pale Mode                                   | S   | Selects the table of the MTF filter strength for pale original mode.<br>0: Weak 6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>   | 0 ~ 6<br>1/step<br>3   |
|                                | 57                                      | Filter Level in Generation Mode                                | S   | Selects the table of the MTF filter coefficient for pale original mode.<br>Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters.<br>0: Weak 6: Strong 7: Weak 13: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i> | 0 ~ 13<br>1/step<br>13 |
|                                | 58                                      | Filter Strength in Generation Mode                             | S   | Selects the table of the MTF filter strength for generation original mode.<br>0: Weak 6: Strong<br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i>   | 0 ~ 6<br>1/step<br>3   |
|                                | 60                                      | Independent Dot Erase - Text Mode                              | S   | Selects the independent dot erase level for text mode.<br><i>A larger number erases more dots. 0 means disabled. Refer to "Detailed Section Description – Independent Dot Erase" for details.</i>   | 0 ~ 14<br>1/step<br>3  |
| 62                             | Independent Dot Erase - Text/Photo Mode | S  | Selects the independent dot erase level for text/photo mode.<br><i>A larger number erases more dots. 0 means disabled. Refer to "Detailed Sectional Description – Independent Dot Erase" for details.</i> | 0 ~ 14<br>1/step<br>3   |                        |

| Mode No.<br>(Class 1, 2 and 3) |                |  | Function | Settings  |   |
|--------------------------------|----------------|--|----------|---|---|
| 4-903                          | Filter Setting |  |          |   |   |
|                                | 63             | Independent Dot Erase - Pale Mode            | S        | <div> <div>Selects the independent dot erase level for pale mode.</div> <div>A larger number erases more dots. 0 means disabled. Refer to “Detailed Section Description – Independent Dot Erase” for details.</div> </div>  | <div>0 ~ 14</div> <div>1/step</div> <div>3</div>  |
|                                | 64             | Independent Dot Erase - Generation Copy Mode | S        | <div> <div>Selects the independent dot erase level for generation copy mode.</div> <div>A larger number erases more dots. 0 means disabled. Refer to “Detailed Sectional Description – Independent Dot Erase” for details.</div> </div>   | <div>0 ~ 14</div> <div>1/step</div> <div>3</div>  |
|                                | 65             | Scanner Gamma Thresh Level - Text            | S        | <div> <div>Adjust the threshold level for the background erase function in letter mode.</div> <div>A larger value reduces dirty background. This SP is ignored unless 1 or 2 is selected with SP4-903-70.</div> </div>  | <div>0 ~ 255</div> <div>1/step</div> <div>0</div> |
|                                | 66             | Scanner Gamma Thresh Level - Photo           | S        | <div> <div>Adjust the threshold level for the background erase function in photo mode.</div> <div>A larger value reduces dirty background. This SP is ignored unless 1 or 2 is selected with SP4-903-71.</div> </div>   | <div>0 ~ 255</div> <div>1/step</div> <div>0</div> |
|                                | 67             | Scanner Gamma Thresh Level - Text/Photo      | S        | <div> <div>Adjust the threshold level for the background erase function in text/photo mode.</div> <div>A larger value reduces dirty background. This SP is ignored unless 1 or 2 is selected with SP4-903-72.</div> </div>  | <div>0 ~ 255</div> <div>1/step</div> <div>0</div> |
|                                | 68             | Scanner Gamma Thresh Level - Pale            | S        | <div> <div>Adjust the threshold level for the background erase function in pale mode.</div> <div>A larger value reduces dirty background. This SP is ignored unless 1 or 2 is selected with SP4-903-73.</div> </div>  | <div>0 ~ 255</div> <div>1/step</div> <div>0</div> |
|                                | 69             | Scanner Gamma Thresh Level - Generation      | S        | <div> <div>Adjust the threshold level for background erase in generation copy mode.</div> <div>A larger value reduces dirty background. This SP is ignored unless 1 or 2 is selected with SP4-903-74.</div> </div>  | <div>0 ~ 255</div> <div>1/step</div> <div>0</div> |
|                                | 70             | Background Erase Mode Text                   | S        | <div> <div>Selects the background erase function setting in text mode.</div> <div>0: Not done</div> <div>1: Weak background erase (the MTF filter is not used if the pixel is below the threshold selected with SP4-903-65.)</div> <div>2: Strong background erase (the pixel is changed to 0 if it is below the threshold level selected with SP4-903-65.)</div> <div>This SP is ignored unless the user selects ‘Service Mode’ in UP mode.</div> </div> | <div>0 ~ 2</div> <div>1/step</div> <div>0</div>   |

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| Mode No.<br>(Class 1, 2 and 3) |                |                                  | Function  | Settings                                   |
|--------------------------------|----------------|----------------------------------|---|--|
| 4-903                          | Filter Setting |                                  |   |  |
|                                | 71             | Background Erase Mode Photo      | <p>Selects the background erase function setting in photo mode.</p> <p>0: Not done</p> <p>1: Strong background erase (the pixel is changed to 0 if it is below the threshold level selected with SP4-903-66.)</p> <p><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i></p>   | <p>0 ~ 1</p> <p>1/step</p> <p><b>0</b></p> |
|                                | 72             | Background Erase Mode Text/Photo | <p>Selects the background erase function setting in text/photo mode.</p> <p>0: Not done</p> <p>1: Weak background erase (the MTF filter is not used if the pixel is below the threshold selected with SP4-903-67.)</p> <p>2: Strong background erase (the pixel is changed to 0 if it is below the threshold level selected with SP4-903-67.)</p> <p><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i></p> | <p>0 ~ 2</p> <p>1/step</p> <p><b>0</b></p> |
|                                | 73             | Background Erase Mode Pale       | <p>Selects the background erase function setting in pale mode.</p> <p>0: Not done</p> <p>1: Weak background erase (the MTF filter is not used if the pixel is below the threshold selected with SP4-903-68.)</p> <p>2: Strong background erase (the pixel is changed to 0 if it is below the threshold level selected with SP4-903-68.)</p> <p><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i></p>       | <p>0 ~ 2</p> <p>1/step</p> <p><b>0</b></p> |
|                                | 74             | Background Erase Mode Generation | <p>Selects the background erase function setting in generation mode.</p> <p>0: Not done</p> <p>1: Weak background erase (the MTF filter is not used if the pixel is below the threshold selected with SP4-903-69.)</p> <p>2: Strong background erase (the pixel is changed to 0 if it is below the threshold level selected with SP4-903-69.)</p> <p><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i></p> | <p>0 ~ 2</p> <p>1/step</p> <p><b>0</b></p> |

| Mode No.<br>(Class 1, 2 and 3) |                |  | Function |  |  | Settings              |
|--------------------------------|----------------|--|----------|--|--|-----------------------|
| 4-903                          | Filter Setting |  |          |  |  |                       |
|                                | 75             | Line Thickness Correction - Setting in Generation Mode | S        | Selects the line thickness setting in generation mode. |  | 0 ~ 15<br>1/step<br>5 |
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| Mode No.<br>(Class 1, 2 and 3) |                | Function   |   |  | Settings |                       |
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| 4-903                          | Filter Setting |  |   |  |          |                       |
|                                | 78             | Line Thickness Correction - Setting in Text Mode | S | Selects the line thickness setting in generation mode. |          | 0 ~ 15<br>1/step<br>5 |
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| Mode No.<br>(Class 1, 2 and 3) |  | Function   |  | Settings  |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
|--------------------------------|--|--|--|---|--|-----------|----------|----|---------------|---------------|----|---------------|-----------|----|---------------|-----------|----|---------------|---------|----|-----------|---------------|----|-----------|-----------|----|-----------|-----------|----|-----------|---------|----|-----------|---------------|----|-----------|-----------|-----|-----------|-----------|-----|-----------|---------|-----|---------|---------------|-----|---------|-----------|-----|---------|-----------|-----|---------|---------|-----------------------|
| 4-903                          | Filter Setting   |  |  |   |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
|                                | 81   | Line Thickness Correction - Setting in Text/Photo Mode | S  | <div>Selects the line thickness setting in generation mode.</div> <table><thead><tr><th></th><th>Main Scan</th><th>Sub Scan</th></tr></thead><tbody><tr><td>0:</td><td>No Correction</td><td>No Correction</td></tr><tr><td>1:</td><td>No Correction</td><td>Thinner 1</td></tr><tr><td>2:</td><td>No Correction</td><td>Thinner 2</td></tr><tr><td>3:</td><td>No Correction</td><td>Thicker</td></tr><tr><td>4:</td><td>Thinner 1</td><td>No Correction</td></tr><tr><td>5:</td><td>Thinner 1</td><td>Thinner 1</td></tr><tr><td>6:</td><td>Thinner 1</td><td>Thinner 2</td></tr><tr><td>7:</td><td>Thinner 1</td><td>Thicker</td></tr><tr><td>8:</td><td>Thinner 2</td><td>No Correction</td></tr><tr><td>9:</td><td>Thinner 2</td><td>Thinner 1</td></tr><tr><td>10:</td><td>Thinner 2</td><td>Thinner 2</td></tr><tr><td>11:</td><td>Thinner 2</td><td>Thicker</td></tr><tr><td>12:</td><td>Thicker</td><td>No Correction</td></tr><tr><td>13:</td><td>Thicker</td><td>Thinner 1</td></tr><tr><td>14:</td><td>Thicker</td><td>Thinner 2</td></tr><tr><td>15:</td><td>Thicker</td><td>Thicker</td></tr></tbody></table> <div>Line Thickness:<br/>Thicker &gt; No Correction &gt; Thinner 1 &gt; Thinner 2</div> <div>Refer 'Line Width Correction' in section 2.</div> |  | Main Scan | Sub Scan | 0: | No Correction | No Correction | 1: | No Correction | Thinner 1 | 2: | No Correction | Thinner 2 | 3: | No Correction | Thicker | 4: | Thinner 1 | No Correction | 5: | Thinner 1 | Thinner 1 | 6: | Thinner 1 | Thinner 2 | 7: | Thinner 1 | Thicker | 8: | Thinner 2 | No Correction | 9: | Thinner 2 | Thinner 1 | 10: | Thinner 2 | Thinner 2 | 11: | Thinner 2 | Thicker | 12: | Thicker | No Correction | 13: | Thicker | Thinner 1 | 14: | Thicker | Thinner 2 | 15: | Thicker | Thicker | 0 ~ 15<br>1/step<br>5 |
|                                |  | Main Scan  | Sub Scan   |   |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
|                                | 0:   | No Correction  | No Correction  |   |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
|                                | 1:   | No Correction  | Thinner 1  |   |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
| 2:                             | No Correction  | Thinner 2  |  |   |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
| 3:                             | No Correction  | Thicker  |  |   |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
| 4:                             | Thinner 1  | No Correction  |  |   |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
| 5:                             | Thinner 1  | Thinner 1  |  |   |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
| 6:                             | Thinner 1  | Thinner 2  |  |   |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
| 7:                             | Thinner 1  | Thicker  |  |   |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
| 8:                             | Thinner 2  | No Correction  |  |   |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
| 9:                             | Thinner 2  | Thinner 1  |  |   |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
| 10:                            | Thinner 2  | Thinner 2  |  |   |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
| 11:                            | Thinner 2  | Thicker  |  |   |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
| 12:                            | Thicker  | No Correction  |  |   |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
| 13:                            | Thicker  | Thinner 1  |  |   |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
| 14:                            | Thicker  | Thinner 2  |  |   |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
| 15:                            | Thicker  | Thicker  |  |   |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
| 82                             | Line Thickness Correction Threshold in Text/Photo Mode - Main Scan Direction | S  | Selects the threshold to determine if line thickness correction is applied for a pixel. If higher number is selected, the effectiveness of the line thickness correction selected with SP4-903-81 becomes stronger.                                    | 0 ~ 5<br>1/step<br>2  |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
| 83                             | Line Thickness Correction Threshold in Text/Photo Mode - Sub Scan Direction  | S  | Selects the threshold to determine if line thickness correction is applied for a pixel. If higher number is selected, the effectiveness of the line thickness correction selected with SP4-903-81 becomes stronger.                                    | 0 ~ 5<br>1/step<br>2  |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
| 84                             | Scanner Gamma Setting in Text Mode   | S  | Selects the scanner and printer gamma settings used when 'Service Mode' for Text mode is selected.<br>0: Scanner gamma for 'Soft' is used.<br>1: Scanner gamma for 'Normal' is used.<br>2: Scanner gamma for 'Sharp' is used.                          | 0 ~ 5<br>1/step<br>1  |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |
| 85                             | Scanner Gamma Selection in Text/Photo Mode                                   | S  | Selects the scanner and printer gamma settings used when 'Service Mode' for Text/Photo mode is selected.<br>0: Scanner gamma for 'Photo Priority' is Sused.<br>1: Scanner gamma for 'Normal' is used.<br>2: Scanner gamma for 'Text Priority' is used. | 0 ~ 5<br>1/step<br>1  |  |           |          |    |               |               |    |               |           |    |               |           |    |               |         |    |           |               |    |           |           |    |           |           |    |           |         |    |           |               |    |           |           |     |           |           |     |           |         |     |         |               |     |         |           |     |         |           |     |         |         |                       |



| Mode No.<br>(Class 1, 2 and 3) |  |  | Function  | Settings        |
|--------------------------------|--|--|---|-----------------|
| 4-904                          | IPU Setting-1                          |  |   |                 |
|                                | 2                                      | Gradation Processing Selection - Photo   | S<br>Selects the gradation processing procedure.<br>0: Three-gradation error diffusion<br>1: Four-gradation error diffusion<br>2: 8" x 8" dither matrix<br>3: 6" x 6" dither matrix<br>4: 4" x 4" dither matrix<br><i>A larger dither matrix gives coarser reproduction of halftones. This SP is ignored unless the user selects 'Service Mode' in UP mode.</i> | 0 ~ 4<br>1      |
|                                | 3                                      | Gradation Processing Selection - Text/Photo  | S<br>Selects the gradation processing procedure.<br>0: Three-gradation error diffusion<br>1: Four-gradation error diffusion<br>This SP is ignored unless the user selects 'Service Mode' in UP mode.  | 0 ~ 1<br>1      |
|                                | 4                                      | Forced Binary Mode   | S<br>1: Binary processing is done for all image modes.  | 0: No<br>1: Yes |
|                                | 5                                      | Laser Pulse Positioning in Text/Photo Mode   | S<br>Selects whether phase control is done in text/photo mode or not.<br><i>This mode is available when 0 is selected with SP4-904-003.</i>   | 0: No<br>1: Yes |
|                                | 6                                      | Smoothing Filter Level in Photo Mode   | S<br>Selects the smoothing filter level in photo mode.<br>0: None<br>1: Weak<br>5: Strong   | 0 ~ 5<br>2      |
|                                | 7                                      | Texture Erase Filter Level in Text/Photo Mode  | S<br>Selects the strength of the filter for erasing texture from the image in text/photo mode.<br>0: None<br>1: Weak<br>2: Strong   | 0 ~ 2<br>0      |
|                                | 20                                     | Thin Line Mode in Laser Writing - Text   | S<br>Selects thin line mode level in laser writing for text mode.<br>0: None<br>1: Thin Line Mode - Weak<br>2: Thin Line Mode - Strong  | 0 ~ 2<br>1      |
|                                | 22                                     | Thin Line Mode in Laser Writing - Text/Photo   | S<br>Selects thin line mode level in laser writing for text/photo mode.<br>0: None<br>1: Thin Line Mode - Weak<br>2: Thin Line Mode - Strong  | 0 ~ 2<br>1      |
| 23                             | Thin Line Mode in Laser Writing - Pale | S<br>Selects thin line mode level in laser writing for pale mode.<br>0: None<br>1: Thin Line Mode - Weak<br>2: Thin Line Mode – Strong | 0 ~ 2<br>1  |                 |

| Mode No.<br>(Class 1, 2 and 3) |  |   | Function   | Settings   |
|--------------------------------|--|---|--|------------|
| 4-904                          | IPU Setting-1                                |   |  |            |
|                                | 24   | Thin Line Mode in Laser Writing - Generation  | S<br><br>0: None<br>1: Thin Line Mode - Weak<br>2: Thin Line Mode – Strong   | 0 ~ 2<br>1 |
| 4-905                          | Image Data Path                              |   |  |            |
|                                | 1  | Image Data Path - Filtering/ Magnification  | S<br><br>0: Magnification → Filtering<br>1: Filtering → Magnification<br>2: Pre-filter → Magnification → Filtering<br>3: Pre-filter → Filtering → Magnification<br>4: <b>Normal operation</b><br><b>Do not change the value.</b> |            |
|                                | 4  | Printout Type selection   | S<br><br>0: <b>Normal operation</b><br>1: Black/White<br>2: Not printed out<br>3: Application through<br><b>Do not change the value.</b>   |            |
|                                |  |   |  |            |
| 4-906                          | Image Processing Priority in Text/Photo Mode |   |  |            |
|                                |  | S<br><br>0: Photo priority<br>1: <b>Text priority</b><br><br><i>This SP is ignored unless the user selects 'Service Mode' in UP mode.</i> |  |            |
| 4-909                          | IPU Setting-2                                |   |  |            |
|                                |  | S   | <b>Designer use only. Do not change the value.</b>   |            |
| 4-910                          | Data Compression                             |   |  |            |
|                                | 3  | ABS Core  | S<br><br><b>Designer use only. Do not change the value.</b>  |            |

| Mode No.<br>(Class 1, 2 and 3) |                     |                                    | Function | Settings   |
|--------------------------------|---------------------|------------------------------------|----------|--|
| 4-911                          | HDD 1 Front (Black) |                                    |          |  |
|                                | 1                   | HDD 1 Media Check                  | S        | Checks for bad sectors on hard disk 1 that develop during machine use. This takes 4 minutes.<br><b>All the image data on this disk is erased, and the stamp data is erased from both disks.</b>  |
|                                |                     |                                    |          | <i>This SP mode should be done when an abnormal image is printed. There is no need to do this at installation because the hard disk firmware already contains bad sector information, and damage is not likely during transportation.</i><br><i>Bad sectors detected with this SP mode will be stored in the NVRAM with the bad sector data copied across from the firmware.</i><br><i>If the machine detects over 50 bad sectors, SC364 will be generated. At this time, use SP4-911-2.</i> |
|                                | 2                   | HDD 1 Formatting                   | S        | Formats hard disk 1. This takes 4 minutes.<br><b>Do not turn off the main power switch during this process.</b>  |
|                                | 6                   | HDD 1 Bad Sector Information Reset |          | Resets the bad sector information which is stored in the NVRAM.<br><i>This SP should be used when the hard disk is replaced.</i>   |
|                                | 7                   | HDD 1 Bad Sector Display           | S        | Displays the number of bad sectors there are on hard disk 1.<br><i>If the machine detects a total of over 50 bad sectors on the disk, SC364 will be generated. At this time, use SP4-911-2.</i>  |
|                                | 8                   | HDD 1 Model Name Display           |          | Displays the model name of HDD 1.<br><i>If the HDD is not installed or the HDD connector is not connected, SC360 will be displayed. However, the user can make single copies.</i>  |
|                                |                     |                                    |          | Total: 0<br>Copy: 0<br>Printer: 0<br>AF (Copy Server): 0   |

| Mode No.<br>(Class 1, 2 and 3) |                              |                                    | Function   | Settings   |
|--------------------------------|------------------------------|------------------------------------|--|--|
| 4-912                          | HDD 2 Rear (Gray)            |                                    |  |  |
|                                | 1                            | HDD 2 Media Check                  | <div>Checks for bad sectors on hard disk 2 that develop during machine use. This takes 4 minutes.</div> <div><b>All the image data on this disk is erased, and the stamp data is erased from both disks.</b></div> <div><i>This SP mode should be done when an abnormal image is printed. There is no need to do this at installation because the hard disk firmware already contains bad sector information, and damage is not likely during transportation.</i></div> <div><i>Bad sectors detected with this SP mode will be stored in the NVRAM with the bad sector data copied across from the firmware.</i></div> <div><i>If the machine detects over 50 bad sectors, SC365 will be generated. At this time, use SP4-912-2.</i></div> |  |
|                                | 2                            | HDD 2 Formatting                   | <div>Formats hard disk 2. This takes 4 minutes.</div> <div><b>Do not turn off the main power switch during this process.</b></div>   | Start  |
|                                | 6                            | HDD 2 Bad Sector Information Reset | <div>Resets the bad sector information which is stored in the NVRAM.</div> <div><i>This SP should be used when the hard disk is replaced.</i></div>  |  |
|                                | 7                            | HDD 2 Bad Sector Display           | <div>S</div> <div>Displays the number of bad sectors there are on hard disk 2.</div> <div><i>If the machine detects a total of over 50 bad sectors on the disk, SC365 will be generated. At this time, use SP4-912-2.</i></div>  | Total: 0<br>Copy: 0<br>Printer: 0<br>AF (Copy Server): 0 |
|                                | 8                            | HDD 2 Model Name Display           | <div></div> <div>Displays the model name of HDD 2.</div> <div><i>If the HDD is not installed or the HDD connector is not connected, SC361 will be displayed. However, the user can make single copies. (See Detailed Section Descriptions – Others for details on the use of the two hard disks.)</i></div>  |  |
|                                | HDD Interface Type Selection |                                    |  |  |
|                                |                              | S                                  | <b>Designer use only. Do not change this setting.</b>  | <b>0: Ultra DMA/33 I/F</b><br>1: Multiword DMA I/F       |
| 4-914                          | Forced HDD Selection         |                                    |  |  |
|                                |                              |                                    | <b>Designer use only. Do not change this setting.</b>  | <b>0: Default</b><br>1: HDD1<br>2: HDD2                  |



| Mode No.<br>(Class 1, 2 and 3) |                              |                     | Function  | Settings   |
|--------------------------------|------------------------------|---------------------|---|--|
| 5-019                          | Tray Paper Size Selection    |                     |   |  |
|                                | 1                            | 1st Tray            | B<br>Selects the paper size in the 1 <sup>st</sup> tray.  | A4<br>8 1/2" x 11"<br>A3<br>B4<br>A4R<br>11" x 17"<br>8 1/2" x 14"R<br>8 1/2" x 11"R |
|                                | 6                            | 6th Tray            | B<br>Selects the paper size in the 6 <sup>th</sup> tray (tray 3 of the optional LCT).   | A4<br>B5<br>A5<br>A5R<br>8 1/2" x 11"<br>5 1/2" x 8 1/2"<br>5 1/2" x 8 1/2"R         |
| 5-024                          | mm/inch Display Selection    |                     |   |  |
|                                |                              | S                   | Selects what unit is used.<br><i>After selecting the unit, turn the main power switch off and on.</i>   | <b>0: mm</b><br>1: inch  |
| 5-038                          | Job Memory in Sample Copy    |                     |   |  |
|                                |                              | S                   | Selects whether Next Job can be set before sample copy is finished.<br>0: Next Job cannot be set until sample copy is finished.<br>1: Next Job can be set before sample copy is finished.                       |  |
| 5-104                          | A3/DLT Double Count          |                     |   |  |
|                                |                              | S                   | Specifies whether the counter is doubled for A3/11" x 17" paper.<br><i>If "1" is selected, the total counter and the current user code counter count up twice when A3/11" x 17" paper is used.</i>              | <b>NO</b><br>YES   |
| 5-106                          | ID Level Setting             |                     |   |  |
|                                | 6                            | ADS Level Selection | S<br>Selects the image density level that is used in ADS mode.  | 1 ~ 9<br>1 notch/step<br><b>5</b>  |
| 5-112                          | Non-standard Paper Selection |                     |   |  |
|                                |                              | S                   | Selects whether a non-standard paper size can be input for trays 2 and 3 (universal tray) or not.<br><i>If "Yes" is selected, the customer will be able to input a non-standard paper size using a UP mode.</i> | <b>NO</b><br>YES   |
| 5-113                          | Optional Counter Type        |                     |   |  |
|                                |                              | S                   | <b><i>This SP is for Japan only. Do not change the value.</i></b>   | 0 ~ 5<br>1/step<br><b>0</b>  |
| 5-118                          | Disable Copying              |                     |   |  |
|                                |                              | S                   | Disables copying.<br><i>The setting should always be "0".</i>   | <b>0: No</b><br>1: Yes   |

| Mode No.<br>(Class 1, 2 and 3) |                                    |   | Function   | Settings  |                                      |
|--------------------------------|------------------------------------|---|--|---|--------------------------------------|
| 5-120                          | Mode Clear-Opt. Controller Removal |   |  |   |                                      |
|                                |                                    | S                                       | <i>This function is for Japanese machines only.</i>  | <b>0: Yes</b><br>1: Stand-by<br>2: No   |                                      |
| 5-121                          | Counter Up Timing                  |   |  |   |                                      |
|                                |                                    | S                                       | Determines the key counter count up timing.<br>0: The key counter counts up at paper feed timing.<br>1: The key counter counts up when the paper exits to the finisher tray.   | <b>0: Feed</b><br>1: Exit   |                                      |
|                                |                                    |   | <i>This setting does not affect the timing of the copier total counter.</i>  |   |                                      |
| 5-127                          | APS Mode                           |   |  |   |                                      |
|                                |                                    | S                                       | Selects the availability of APS mode.<br>0: APS can be used<br>1: APS cannot be used   | <b>0: Yes</b><br>1: No  |                                      |
| 5-131                          | Paper Size Type Selection          |   |  |   |                                      |
|                                |                                    | B                                       | Selects the paper size type (for originals and copy paper). (The default setting depends on the settings of DIP SW 1 and 2 on the SICU.)   | 0: Japan<br><b>1: North America</b><br><b>2: Europe</b><br><b>3: China</b>  |                                      |
|                                |                                    |   | <i>After changing the value, turn the main power switch off and on.</i>  |   |                                      |
| 5-212                          | Paper Print Setting                |   |  |   |                                      |
|                                | 3                                  | Page Print Position Side - Side to Side | S  | Adjusts the page print position for the reverse side when compared to the front side. -10 (To the right) ~ 10 (To the left) | -10 ~ 10 mm<br>1 mm/step<br><b>0</b> |
|                                | 4                                  | Page Print Position Up and Down         | S  | Adjusts the page print position for the reverse side when compared to the front side. -10 (Upper) ~ 10 (Lower)              | -10 ~ 10 mm<br>1 mm/step<br><b>0</b> |
| 5-501                          | PM Alarm Interval                  |   |  |   |                                      |
|                                |                                    | S                                       | Set the PM alarm interval. A message is displayed on the screen when the PM counter reaches this value x 1,000.  | 0 ~ 999 (k)<br><b>0 (No PM Alarm)</b>   |                                      |
|                                |                                    |   | <i>The message can be turned off by the following procedure: Clear Modes key – 0 – Clear key – 0 – Clear key (hold for more than 3 seconds). However, the PM counter is not cleared. To clear the PM counter, use SP7-804.</i> |   |                                      |
| 5-504                          | Jam Alarm Interval (RDS Function)  |   |  |   |                                      |
|                                | 1                                  | Jam Alarm Level                         | S  | <b>Japanese version only. Do not change the setting.</b>  | 0: Z<br>1: L<br>2: M<br><b>3: H</b>  |
|                                | 2                                  | Jam Alarm Long Time                     | S  | <b>Japanese version only. Do not change the setting.</b>  | 0: OFF<br><b>1: ON</b>               |
| 5-505                          | Error Alarm (RDS Function)         |   |  |   |                                      |
|                                |                                    | S                                       | <b>Japanese version only. Do not change the setting.</b>   | 0 ~ 255 (k)<br><b>30 k</b>  |                                      |

| Mode No.<br>(Class 1, 2 and 3) |                                  |                         |   | Function   | Settings                               |
|--------------------------------|----------------------------------|-------------------------|---|--|--|
| 5-513                          | PM Call Interval (RDS Function)  |                         |   |  |  |
|                                | 1                                | Copy Paper Standard     | S | <b>Japanese version only. Do not change the setting.</b>   | 0 ~ 9999 k<br><b>300 k</b><br>1 k step |
|                                | 2                                | Original Paper Standard | S | <b>Japanese version only. Do not change the setting.</b>   | 0 ~ 9999 k<br><b>300 k</b><br>1 k step |
| 5-514                          | PM Call On/Off Setting           |                         |   |  |  |
|                                | 1                                | Copy Paper Standard     | S | <b>Japanese version only. Do not change the setting.</b>   | 0: No<br><b>1: Yes</b>                 |
|                                | 2                                | Original Paper Standard | S | <b>Japanese version only. Do not change the setting.</b>   | <b>0: No</b><br>1: Yes                 |
| 5-590                          | Auto Call Setting (RSS Function) |                         |   |  |  |
|                                | 2                                | Door Open               | S | <b>Japanese version only. Do not change the setting.</b>   | 0: OFF<br><b>1: ON</b>                 |
|                                | 3                                | Paper Supply            | S | <b>Japanese version only. Do not change the setting.</b>   | <b>0: OFF</b><br>1: ON                 |
|                                | 4                                | Staple Supply           | S | <b>Japanese version only. Do not change the setting.</b>   | <b>0: OFF</b><br>1: ON                 |
|                                | 5                                | Toner Supply            | S | <b>Japanese version only. Do not change the setting.</b>   | <b>0: OFF</b><br>1: ON                 |
| 5-801                          | Memory All Clear                 |                         |   |  |  |
|                                | 1                                | ALL                     |   | Resets all correction data for process control and all software counters. Also, returns all modes and adjustments to the default settings.<br>Settings for the SICU and BCU can be cleared separately (marked with an S or a B in the Mode No column of this table).<br>See the “Memory All Clear” section for how to use this SP mode correctly.<br>Touch “Start” for over 3 seconds, then turn the main power switch off and on.<br><br><b>Normally, this SP mode should not be used.</b><br><i>It is used only after replacing the NVRAM, or when the copier malfunctions due to a damaged NVRAM.</i><br><i>The LCD coordinates are also cleared, see “Touch Screen Calibration”.</i> | Start                                  |
|                                | 2                                | SICU                    |   |  |  |
|                                | 3                                | BCU                     |   |  |  |
|                                | 5-802                            | Printer Free Run        |   |  |  |
|                                |                                  |                         |   | Press “On” on the display, then go to copy mode.<br>Input the required settings, then press the “Start” key to start the free run. The free run stops when the simulation for the set number of copies is finished.<br><br><i>Before starting the free run, disconnect the finisher connector. Otherwise, a paper jam is detected.</i>   |  |
| 5-803                          | Input Check                      |                         |   |  |  |
|                                |                                  |                         |   | Displays the signals received from sensors and switches.<br>See the “Input Check” section for details.   |  |



| Mode No.<br>(Class 1, 2 and 3) |                                   |                         | Function   | Settings                                     |
|--------------------------------|-----------------------------------|-------------------------|--|--|
| 5-804                          | Output Check                      |                         | Turns on the electrical components individually for test purposes. See the "Output Check" section for details.   | ON<br>OFF                                    |
|                                |                                   |                         |  |  |
| 5-811                          | Machine Serial Number             |                         |  |  |
|                                | 1                                 | Machine Serial Number   | S Displays the machine serial number. The number can be reinput using the number keys.   |  |
|                                | 3                                 | ID 2 Code               | S <i>This function is for Japanese machines only.</i>  |  |
| 5-812                          | Phone No. Setting for Servicing   |                         |  |  |
|                                | 1                                 | Phone No. for Servicing | S Use this to input the telephone number of the service representative (this is displayed when a service call condition occurs.)<br><i>Press the "•" key to input a pause.<br/>Press the "Clear modes" key to delete the telephone number.</i> |  |
|                                | 2                                 | Fax No. for SMC Report  | S Use this to input the telephone number of the service representative. This number is printed on the SMC print.   |  |
| 5-816                          | CSS Function (RDS Function)       |                         |  |  |
|                                |                                   | S                       | <b>Japanese version only. Do not change the setting.</b>   |  |
| 5-821                          | CSS PI Device Code (RDS Function) |                         |  |  |
|                                |                                   | S                       | <b>Japanese version only. Do not change the setting.</b>   | 0 ~ 4<br><b>0</b>                            |
| 5-907                          | Plug and play                     |                         |  |  |
|                                |                                   |                         | <i>This SP mode is for designer use only.</i>  |  |
| 5-914                          | Printer Counter Display           |                         |  |  |
|                                |                                   | S                       | Selects whether or not the total printer counter is displayed in the UP mode.  | Off<br>On                                    |
| 5-915                          | Mechanical Counter Detection      |                         |  |  |
|                                |                                   |                         | Checks whether the mechanical counter inside the inner cover is connected or not.  | 0: Not detected<br>1: Detected<br>2: Unknown |
| 5-917                          | GPC Counter                       |                         |  |  |
|                                |                                   |                         | <b>Japanese version only. Do not change the setting.</b>   |  |
| 5-918                          | A3/DLT Counter Display            |                         |  |  |
|                                |                                   | S                       | Selects whether the A3/DLT counter is displayed in UP mode or when the "Total Counter" key is pressed.   |  |
| 5-954                          | Copy Server Password Check        |                         |  |  |
|                                |                                   | S                       | If "1" is selected, when a file in the copy server is selected, the password for that file is displayed.   | <b>0: Normal</b><br>1: Display the password. |
| 5-965                          | Delete All the Saved Files        |                         |  |  |
|                                |                                   |                         | Deletes all the copy server files stored in the HDD.   |  |





| Mode No.<br>(Class 1, 2 and 3) |                                   |                              | Function  | Settings                                   |
|--------------------------------|-----------------------------------|------------------------------|---|--|
| 5-967                          | Copy Server: Disable Function     |                              |   | <b>0: Normal</b><br>1: Disable copy server |
|                                |                                   | S                            | If "1" is selected, the copy server function is disabled.<br><i>Turn the main switch off and on after changing the setting.</i>                     |  |
| 5-968                          | Delete All the Stored Files in CD |                              |   |  |
|                                |                                   |                              | Deletes all the copy server files stored in the CD currently in the CD-RW.  |  |
| 5-990                          | SMC Print                         |                              |   |  |
|                                | 1                                 | All                          | Prints all the system parameter lists. See the "System Parameter and Data Lists" section for how to print the lists.                                |  |
|                                | 2                                 | SP                           | Prints the SP mode data list. See the "System Parameter and Data Lists" section for how to print the lists.   |  |
|                                | 3                                 | User Program                 | Prints the UP mode data list. See the "System Parameter and Data Lists" section for how to print the lists.   |  |
|                                | 4                                 | Logged Data                  | Prints the machine status history data list. See the "System Parameter and Data Lists" section for how to print the lists.                          |  |
| 6-006                          | DF Registration Adjustment        |                              |   |  |
|                                | 1                                 | Side-to-Side                 | Adjusts the printing side-to-side registration in the ADF mode.<br><i>Use the "•" key to toggle between + and -.</i>                                |  |
|                                |                                   | B                            |   |  |
|                                | 2                                 | Leading Edge (Thin Original) | Adjusts the original stop position.<br><i>Use the "•" key to toggle between + and -.</i>  |  |
|                                |                                   | B                            |   |  |
|                                | 3                                 | Leading Edge (Duplex-1st)    | Adjusts the original stop position against the original left scale in one-sided original mode.<br><i>Use the "•" key to toggle between + and -.</i> |  |
|                                |                                   | B                            |   |  |
|                                | 4                                 | Leading Edge (Duplex-2nd)    | Adjusts the original stop position against the original left scale in two-sided original mode.<br><i>Use the "•" key to toggle between + and -.</i> |  |
|                                |                                   | B                            |   |  |
| 6-007                          | ADF Input Check                   |                              |   |  |
|                                | 1                                 | Group 1                      | Displays the signals received from sensors and switches of the ADF. See the "Input Check" section for details.                                      |  |
|                                | 2                                 | Group 2                      | Displays the signals received from sensors and switches of the ADF. See the "Input Check" section for details.                                      |  |
|                                | 3                                 | Group 3                      | Displays the signals received from sensors and switches of the ADF. See the "Input Check" section for details.                                      |  |
| 6-008                          | ADF Output Check                  |                              |   |  |
|                                |                                   |                              | Turns on the electrical components of the ADF individually for test purposes. See the "Output Check" section for details.                           |  |

| Mode No.<br>(Class 1, 2 and 3) |                                  |             | Function  | Settings                                   |
|--------------------------------|----------------------------------|-------------|---|--|
| 6-009                          | DF Free Run (Two-sided Original) |             |   |  |
|                                |                                  |             | Performs an ADF free run in two-sided original mode. Press "1" to start.  | <b>OFF</b><br><b>ON</b>                    |
|                                |                                  |             | <i>This is a general free run controlled from the copier. For more detailed free run modes, see the 'Test Points/Dip Switches/LEDs' section.</i>  |  |
| 6-016                          | ADF Motor Speed Adjustment       |             |   |  |
|                                |                                  |             | After pressing the Start key, the machine automatically adjusts the speeds of the ADF motors in the following order:<br>Feed-in motor → Transport Belt Motor → Feed-out Motor (High) → Feed-out Motor (Low) |  |
| 6-105                          | Staple Position Adjustment       |             |   |  |
|                                |                                  | B           | Adjusts the stapling position in the main scan direction<br><i>Use the "•" key to toggle between + and -. A larger value causes the stapling position to shift outward.</i>                                 | -1 ~ +3.5<br>0.5 mm/step<br><b>+0.0 mm</b> |
| 6-107                          | Finisher Free Run                |             |   |  |
|                                | 1                                | Staple Mode | The finisher simulates staple mode operation. Press [1] to start the free run. To stop the free run, press [0].   |  |
|                                | 2                                | Shift Mode  | The finisher simulates staple mode free run with tray shifting (without stapling). Press [1] to start the free run.   |  |
| 6-113                          | Punch Hole Position Adjustment   |             |   |  |
|                                |                                  | B           | Adjusts the punch hole position in the sub-scan direction for the punch unit.<br><i>Use the "•" key to toggle between + and -. A larger value shifts the punch holes towards the edge of the paper.</i>     | -7.5 ~ +7.5<br>0.5 mm/step<br><b>0 mm</b>  |
| 6-116                          | Sheet Conversion (Thick Paper)   |             |   |  |
|                                |                                  | B           | Multiply the normal limit by this number to determine the staple limit number for thick paper mode.   | 1 ~ 3<br><b>3</b>                          |
| 6-117                          | Finisher Input Check             |             |   |  |
|                                | 1                                | Group 1     | Displays the signals received from sensors and switches of the finisher. See the "Input Check" section for details.   |  |
|                                | 2                                | Group 2     | Displays the signals received from sensors and switches of the finisher. See the "Input Check" section for details.   |  |
|                                | 3                                | Group 3     | Displays the signals received from sensors and switches of the finisher. See the "Input Check" section for details.   |  |
| 6-117                          | Finisher Input Check             |             |   |  |
|                                | 4                                | Group 4     | Displays the signals received from sensors and switches of the finisher. See the "Input Check" section for details.   |  |



| Mode No.<br>(Class 1, 2 and 3) |  |                |  | Function  | Settings        |
|--------------------------------|--|----------------|--|---|-----------------|
| 6-118                          | Finisher Output Check                  |                |  |   |                 |
|                                |  |                |  | Turn on the electrical components of the finisher individually for test purposes. See the “Output Check” section for details. |                 |
| 6-119                          | Punch Function Enabled (Thick Paper)   |                |  |   |                 |
|                                |  | B              | Determines whether punch mode is enabled or not in thick paper mode. |   | 0: No<br>1: Yes |
| 6-801                          | Communication Test - Tandem Job        |                |  |   |                 |
|                                |  |                | This SP mode is for designer use only.                               |   |                 |
| 7-001                          | Main Motor (Drum Motor) Operation Time |                |  |   |                 |
|                                |  | B              | Displays the total drum rotation time.                               |   | Min.            |
| 7-002                          | Original Counter                       |                |  |   |                 |
|                                | 1                                      | Total          | S  | Displays the total number of fed originals.   |                 |
|                                | 2                                      | Copy           | S  | Displays the total number of fed originals in copy mode.  |                 |
|                                | 3                                      | Copy Server    | S  | Displays the total number of fed originals in copy server mode.   |                 |
| 7-003                          | Copy/Printer Counter                   |                |  |   |                 |
|                                | 1                                      | Total Count    | S  | Displays the total number of prints in all modes.   |                 |
|                                | 2                                      | Copy           | S  | Displays the total number of prints in copy mode.   |                 |
|                                | 4                                      | Printer        | S  | Displays the total number of prints in printer mode.  |                 |
| 7-006                          | GPC Counter                            |                |  |   |                 |
|                                | 1                                      | GPC Total      | S  | Japanese version only.  |                 |
|                                | 2                                      | GPC Copy       | S  |   |                 |
|                                | 3                                      | GPC Printer    | S  |   |                 |
| 7-009                          | Rental GPC Counter                     |                |  |   |                 |
|                                | 1                                      | GPC Total      | S  | Japanese version only.  |                 |
|                                | 2                                      | GPC Copy       | S  |   |                 |
|                                | 3                                      | GPC Printer    | S  |   |                 |
| 7-101                          | Copy Counter by Paper Size             |                |  |   |                 |
|                                | 5                                      | A4 Sideways    | S  | Displays the total number of prints by paper size.  |                 |
|                                | 6                                      | A5 Sideways    | S  |   |                 |
|                                | 14                                     | B5 Sideways    | S  |   |                 |
|                                | 38                                     | LT Sideways    | S  |   |                 |
|                                | 44                                     | HLT Sideways   | S  |   |                 |
|                                | 128                                    | Other Sizes    | S  |   |                 |
|                                | 132                                    | A3             | S  |   |                 |
|                                | 133                                    | A4 Lengthwise  | S  |   |                 |
|                                | 134                                    | A5 Lengthwise  | S  |   |                 |
|                                | 141                                    | B4             | S  |   |                 |
|                                | 142                                    | B5 Lengthwise  | S  |   |                 |
|                                | 160                                    | DLT            | S  |   |                 |
|                                | 164                                    | LG             | S  |   |                 |
|                                | 166                                    | LT Lengthwise  | S  |   |                 |
| 7-101                          | Copy Counter by Paper Size             |                |  |   |                 |
|                                | 172                                    | HLT Lengthwise | S  | Displays the total number of prints by paper size.  |                 |

| Mode No.<br>(Class 1, 2 and 3) |                                    |                  | Function   |  | Settings |
|--------------------------------|------------------------------------|------------------|--|--|----------|
| 7-201                          | Total Scan Count                   |                  |  |  |          |
|                                |                                    | S                | Displays the total number of scanned originals.        |  |          |
| 7-202                          | Original Counter by Size           |                  |  |  |          |
|                                | 4                                  | A3               | S  | Displays the total number of scanned originals by original size.   |          |
|                                | 5                                  | A4               | S  |  |          |
|                                | 6                                  | A5               | S  |  |          |
|                                | 13                                 | B4               | S  |  |          |
|                                | 14                                 | B5               | S  |  |          |
|                                | 32                                 | DLT              | S  |  |          |
|                                | 36                                 | LG               | S  |  |          |
|                                | 38                                 | LT               | S  |  |          |
|                                | 44                                 | HLT              | S  |  |          |
|                                | 128                                | Other Sizes      | S  |  |          |
| 7-204                          | Copy Counter by Paper Tray         |                  |  |  |          |
|                                | 1                                  | 1st Paper Tray   | S  | Displays the total number of sheets fed from each paper feed tray. |          |
|                                | 2                                  | 2nd Paper Tray   | S  |  |          |
|                                | 3                                  | 3rd Paper Tray   | S  |  |          |
|                                | 4                                  | 4th Paper Tray   | S  |  |          |
|                                | 5                                  | 5th Paper Tray   | S  |  |          |
| 7-204                          | Copy Counter – Paper Tray          |                  |  |  |          |
|                                | 6                                  | 6th Paper Tray   | S  | Displays the total number of sheets fed from each paper feed tray. |          |
| 7-205                          | Total ADF Counter                  |                  |  |  |          |
|                                |                                    | S                | Displays the total number of originals fed by the ADF. |  |          |
| 7-206                          | Staple Counter                     |                  |  |  |          |
|                                |                                    | S                | Displays the total number of staples used.             |  |          |
| 7-207                          | Punch Counter                      |                  |  |  |          |
|                                |                                    | S                | Displays the total number of hole punch operations.    |  |          |
| 7-301                          | Total Copies By Reproduction Ratio |                  |  |  |          |
|                                | 1                                  | 32% ~ 49%        | S  | Displays the total number of prints by reproduction ratio.         |          |
|                                | 2                                  | 50% ~ 99%        | S  |  |          |
|                                | 3                                  | 100%             | S  |  |          |
|                                | 4                                  | 101% ~ 200%      | S  |  |          |
|                                | 5                                  | 201% ~ 400%      | S  |  |          |
|                                | 6                                  | Direct Mag.      | S  |  |          |
|                                | 7                                  | Direct Size Mag. | S  |  |          |
|                                | 8                                  | Size Mag.        | S  |  |          |
|                                | 9                                  | Fixed Mag.       | S  |  |          |
| 7-304                          | Total Copies By Copy Mode          |                  |  |  |          |
|                                | 1                                  | Letter           | S  | Displays the total number of prints by copy mode.                  |          |
|                                | 2                                  | Letter/Photo     | S  |  |          |
|                                | 3                                  | Photo            | S  |  |          |
|                                | 4                                  | Generation       | S  |  |          |
|                                | 5                                  | Pale             | S  |  |          |
|                                | 6                                  | Punch            | S  |  |          |
|                                | 7                                  | Multiple Copy    | S  |  |          |

| Mode No.<br>(Class 1, 2 and 3) |                                       |                          |   | Function | Settings  |
|--------------------------------|---------------------------------------|--------------------------|---|----------|---|
| 7-304                          | Total Copies By Copy Mode             |                          |   |          | Displays the total number of prints by copy mode.                             |
|                                | 8                                     | Sort                     | S |          |   |
|                                | 9                                     | Staple                   | S |          |   |
|                                | 10                                    | Combine                  | S |          |   |
|                                | 11                                    | Erase Copy               | S |          |   |
|                                | 12                                    | Duplex Copy              | S |          |   |
|                                | 13                                    | ADF                      | S |          |   |
|                                | 14                                    | Double                   | S |          |   |
|                                | 15                                    | 2-sided Original         | S |          |   |
|                                | 16                                    | Interrupt                | S |          |   |
|                                | 17                                    | Combine Mode<br>- 1 Side | S |          |   |
|                                | 18                                    | Combine Mode<br>- 2 Side | S |          |   |
|                                | 19                                    | Mini Book Mode           | S |          |   |
|                                | 20                                    | Magazine Mode            | S |          |   |
|                                | 21                                    | Batch (SADF)<br>Mode     | S |          |   |
| 22                             | Mixed Size<br>Mode                    | S                        |   |          |   |
| 23                             | Thin Original                         | S                        |   |          |   |
| 7-305                          | Total Copies in Multiple Copy Mode    |                          |   |          | Displays the total number of prints by multiple copy quantity.                |
|                                | 1                                     | 1 to 1                   | S |          |   |
|                                | 2                                     | 1 to 2 ~ 5               | S |          |   |
|                                | 3                                     | 1 to 6 ~ 10              | S |          |   |
|                                | 4                                     | 1 to 11 ~ 20             | S |          |   |
|                                | 5                                     | 1 to 21 ~ 50             | S |          |   |
|                                | 6                                     | 1 to 51 ~ 100            | S |          |   |
|                                | 7                                     | 1 to 100 ~ 300           | S |          |   |
|                                | 8                                     | 1 to 301 ~               | S |          |   |
| 7-306                          | Copy: Each Mode Job                   |                          |   |          | Displays the total number of copy jobs that have been done for various modes. |
|                                | 1                                     | Sort                     | S |          |   |
|                                | 2                                     | Staple                   | S |          |   |
|                                | 3                                     | Punch                    | S |          |   |
|                                | 4                                     | Next Job                 | S |          |   |
|                                | 5                                     | Sample Copy              | S |          |   |
| 7-320                          | Copy Server: Scanned Storage          |                          |   |          | Displays the total number of stored originals in the copy server.             |
|                                | 1                                     | Number of Scan           | S |          |   |
| 7-321                          | Copy Server: Original Counter by Size |                          |   |          | Displays the total number of stored originals in the server by size.          |
|                                | 4                                     | A3                       | S |          |   |
|                                | 5                                     | A4                       | S |          |   |
|                                | 6                                     | A5                       | S |          |   |
|                                | 13                                    | B4                       | S |          |   |
|                                | 14                                    | B5                       | S |          |   |
|                                | 32                                    | DLT                      | S |          |   |
|                                | 36                                    | LG                       | S |          |   |
|                                | 38                                    | LT                       | S |          |   |
|                                | 44                                    | HLT                      | S |          |   |
|                                | 128                                   | Other Size               | S |          |   |

| Mode No.<br>(Class 1, 2 and 3) |  |                  |   | Function | Settings  |  |
|--------------------------------|--|------------------|---|----------|---|--|
| 7-323                          | Copy Server: Each Size of Copies         |                  |   |          | Displays the total number of prints made from the copy server by paper size.                          |  |
|                                | 5  | A4 Sideways      | S |          |   |  |
|                                | 6  | A5 Sideways      | S |          |   |  |
|                                | 14                                       | B5 Sideways      | S |          |   |  |
|                                | 38                                       | LT Sideways      | S |          |   |  |
|                                | 44                                       | HLT Sideways     | S |          |   |  |
|                                | 128                                      | Other Sizes      | S |          |   |  |
|                                | 132                                      | A3               | S |          |   |  |
|                                | 133                                      | A4 Lengthwise    | S |          |   |  |
|                                | 134                                      | A5 Lengthwise    | S |          |   |  |
|                                | 141                                      | B4               | S |          |   |  |
|                                | 142                                      | B5 Lengthwise    | S |          |   |  |
|                                | 160                                      | DLT              | S |          |   |  |
|                                | 164                                      | LG               | S |          |   |  |
|                                | 166                                      | LT Lengthwise    | S |          |   |  |
|                                | 172                                      | HLT Lengthwise   | S |          |   |  |
| 7-324                          | Copy Server: Print Job Counter           |                  |   |          | Displays the total number of copy jobs made from the copy server.                                     |  |
|                                | 1  | Duplex Job       | S |          |   |  |
|                                | 2  | Sort Job         | S |          |   |  |
|                                | 3  | Staple Print Job | S |          |   |  |
|                                | 4  | Punch Print Job  | S |          |   |  |
|                                | 5  | Sample Copy      | S |          |   |  |
|                                | 6  | First Page Print | S |          |   |  |
| 7-325                          | Copy Server: Print Job Page Distribution |                  |   |          | Displays the number of jobs by number of pages, made from the copy server.                            |  |
|                                | 1  | 1                | S |          |   |  |
|                                | 2  | 2                | S |          |   |  |
|                                | 3  | 3 - 5            | S |          |   |  |
|                                | 4  | 6 - 10           | S |          |   |  |
|                                | 5  | 11 -             | S |          |   |  |
| 7-326                          | Copy Server: Print Job File Distribution |                  |   |          | Displays the number of jobs by the number of consecutive files in the job, made from the copy server. |  |
|                                | 1  | 1                | S |          |   |  |
|                                | 2  | 2 - 5            | S |          |   |  |
|                                | 3  | 6 - 10           | S |          |   |  |
|                                | 4  | 11 -             | S |          |   |  |
| 7-327                          | Copy Server: Print Job Set Distribution  |                  |   |          | Displays the total number of prints by multiple copy quantity, using the copy server.                 |  |
|                                | 1  | 1 to 1           | S |          |   |  |
|                                | 2  | 1 to 2 ~ 5       | S |          |   |  |
|                                | 3  | 1 to 6 ~ 10      | S |          |   |  |
|                                | 4  | 1 to 11 ~ 20     | S |          |   |  |
|                                | 5  | 1 to 21 ~ 50     | S |          |   |  |
|                                | 6  | 1 to 51 ~ 100    | S |          |   |  |
|                                | 7  | 1 to 100 ~ 300   | S |          |   |  |
|                                | 8  | 1 to 301 ~       | S |          |   |  |
| 7-328                          | Copy Server: Copy Number of Each Job     |                  |   |          | Displays the total number of duplex prints of one-sided originals from the copy server.               |  |
|                                | 1  | Duplex Copy      | S |          |   |  |
| 7-328                          | Copy Server: Copy Number of Each Job     |                  |   |          | Display the total number of prints of two-sided originals from the copy server.                       |  |
|                                | 2  | Duplex Original  | S |          |   |  |

| Mode No.<br>(Class 1, 2 and 3) |                     |                           | Function   | Settings   |
|--------------------------------|---------------------|---------------------------|--|--|
| 7-330                          | Tandem Job          |                           |  |  |
|                                |                     | S                         | Displays the number of jobs made as the master in tandem mode. | 0  |
| 7-331                          | Tandem: Copy        |                           |  |  |
|                                | 1                   | Master: Copy              | S  | Displays the number of copies made in tandem mode as the master. |
|                                | 2                   | Slave: Copy               | S  | Displays the number of copies made in tandem mode as the slave.  |
| 7-332                          | Tandem/Master: Copy |                           |  |  |
|                                | 1                   | Original Mode: Text       | S  | Displays the number of copies made in each master mode.          |
|                                | 2                   | Original Mode: Text/Photo | S  |  |
|                                | 3                   | Original Mode: Photo      | S  |  |
|                                | 4                   | Original Mode: Generation | S  |  |
|                                | 5                   | Original Mode: Pale       | S  |  |
|                                | 6                   | Punch                     | S  |  |
|                                | 7                   | Repeat                    | S  |  |
|                                | 8                   | Sort                      | S  |  |
|                                | 9                   | Staple                    | S  |  |
|                                | 10                  | Series                    | S  |  |
|                                | 11                  | Erase                     | S  |  |
|                                | 12                  | Duplex Copy               | S  |  |
|                                | 13                  | ADF Mode                  | S  |  |
|                                | 14                  | Double Copy               | S  |  |
|                                | 15                  | Duplex Original           | S  |  |
|                                | 16                  | Interrupt                 | S  |  |
|                                | 17                  | Combine 1 Side            | S  |  |
|                                | 18                  | Combine 2 Side            | S  |  |
|                                | 19                  | Booklet                   | S  |  |
|                                | 20                  | Magazine                  | S  |  |
|                                | 21                  | Batch Mode                | S  |  |
|                                | 22                  | Mixed Sizes               | S  |  |
|                                | 23                  | Thin                      | S  |  |
| 7-333                          | Tandem/Slave: Copy  |                           |  |  |
|                                | 1                   | Original Mode: Text       | S  | Displays the number of copies made in each slave mode.           |
|                                | 2                   | Original Mode: Text/Photo | S  |  |
|                                | 3                   | Original Mode: Photo      | S  |  |
|                                | 4                   | Original Mode: Generation | S  |  |
|                                | 5                   | Original Mode: Pale       | S  |  |
|                                | 6                   | Punch                     | S  |  |
|                                | 7                   | Repeat                    | S  |  |
|                                | 8                   | Sort                      | S  |  |

| Mode No.<br>(Class 1, 2 and 3) |                            |                 |   | Function   | Settings |
|--------------------------------|----------------------------|-----------------|---|--|----------|
| 7-333                          | Tandem/Slave: Copy         |                 |   | Displays the number of copies made in each slave mode. |          |
|                                | 9                          | Staple          | S |  |          |
|                                | 10                         | Series          | S |  |          |
|                                | 11                         | Erase           | S |  |          |
|                                | 12                         | Duplex Copy     | S |  |          |
|                                | 13                         | ADF Mode        | S |  |          |
|                                | 14                         | Double Copy     | S |  |          |
|                                | 15                         | Duplex Original | S |  |          |
|                                | 16                         | Interrupt       | S |  |          |
|                                | 17                         | Combine 1 Side  | S |  |          |
|                                | 18                         | Combine 2 Side  | S |  |          |
|                                | 19                         | Booklet         | S |  |          |
|                                | 20                         | Magazine        | S |  |          |
|                                | 21                         | Batch Mode      | S |  |          |
|                                | 22                         | Mixed Sizes     | S |  |          |
|                                | 23                         | Thin            | S |  |          |
| 7-401                          | Total SC Counter           |                 |   |  |          |
|                                |                            |                 | S |  |          |
| 7-403                          | SC History                 |                 |   | Displays the latest 10 service call codes.             |          |
|                                | 1                          | Latest          | S |  |          |
|                                | 2                          | Latest 1st      | S |  |          |
|                                | 3                          | Latest 2nd      | S |  |          |
|                                | 4                          | Latest 3rd      | S |  |          |
|                                | 5                          | Latest 4th      | S |  |          |
|                                | 6                          | Latest 5th      | S |  |          |
|                                | 7                          | Latest 6th      | S |  |          |
|                                | 8                          | Latest 7th      | S |  |          |
|                                | 9                          | Latest 8th      | S |  |          |
|                                | 10                         | Latest 9th      | S |  |          |
| 7-501                          | Total Jam Counter          |                 |   |  |          |
|                                |                            |                 | S |  |          |
| 7-502                          | Total Copy Jam Counter     |                 |   |  |          |
|                                |                            |                 | S |  |          |
| 7-503                          | Total Original Jam Counter |                 |   |  |          |
|                                |                            |                 | S |  |          |

Service  
Tables



| Mode No.<br>(Class 1, 2 and 3) |   |                                     | Function | Settings |
|--------------------------------|---|-------------------------------------|----------|----------|
| 7-504                          | Copy Jam Counter by Jam Location                            |                                     |          |          |
|                                | These are jams when the paper does not activate the sensor. |                                     |          |          |
|                                | 1   | At Power On                         | S        |          |
|                                | 3   | 1st Paper Tray                      | S        |          |
|                                | 4   | 2nd Paper Tray                      | S        |          |
|                                | 5   | 3rd Paper Tray                      | S        |          |
|                                | 6   | 4th Paper Tray                      | S        |          |
|                                | 7   | 5th Paper Tray                      | S        |          |
|                                | 8   | 6th Paper Tray                      | S        |          |
|                                | 9   | LCT Relay Sensor                    | S        |          |
|                                | 10  | LCT Exit Sensor                     | S        |          |
|                                | 12  | Relay Sensor                        | S        |          |
|                                | 13  | Registration Sensor                 | S        |          |
|                                | 15  | Fusing Exit Sensor                  | S        |          |
|                                | 16  | Exit Sensor                         | S        |          |
|                                | 19  | Duplex Entrance Sensor              | S        |          |
|                                | 20  | Duplex Transport Sensor 1           | S        |          |
|                                | 21  | Duplex Transport Sensor 2           | S        |          |
|                                | 22  | Duplex Transport Sensor 3           | S        |          |
|                                | 23  | Inverter Tray Paper Sensor          | S        |          |
|                                | 25  | Entrance Sensor - Fin.              | S        |          |
|                                | 26  | Upper Tray Exit Sensor - Fin.       | S        |          |
|                                | 27  | Shift Tray Exit Sensor - Fin.       | S        |          |
|                                | 28  | Stapler Tray Entrance Sensor - Fin. | S        |          |
|                                | 29  | Stapler Tray Paper Sensor - Fin.    | S        |          |
|                                | 35  | Entrance Sensor - FIN Staple Tray   | S        |          |

| Mode No.<br>(Class 1, 2 and 3) |  |                            |   | Function  | Settings |
|--------------------------------|--|----------------------------|---|---|----------|
| 7-504                          | Copy Jam Counter by Jam Location                   |                            |   |   |          |
|                                | These are jams when the paper stays at the sensor. |                            |   |   |          |
|                                | 53   | 1st Paper Tray             | S | (1st Paper Feed Sensor)                               |          |
|                                | 54   | 2nd Paper Tray             | S | (2nd Paper Feed Sensor)                               |          |
|                                | 55   | 3rd Paper Tray             | S | (3rd Paper Feed Sensor)                               |          |
|                                | 56   | 4th Paper Tray             | S | (4th Paper Feed Sensor)                               |          |
|                                | 57   | 5th Paper Tray             | S | (5th Paper Feed Sensor)                               |          |
|                                | 58   | 6th Paper Tray             | S | (6th Paper Feed Sensor)                               |          |
|                                | 59   | LCT Relay Sensor           | S |   |          |
|                                | 60   | LCT Exit Sensor            | S |   |          |
|                                | 62   | Relay Sensor               | S |   |          |
|                                | 63   | Registration Sensor        | S |   |          |
|                                | 65   | Fusing Exit Sensor         | S |   |          |
|                                | 66   | Exit Sensor                | S |   |          |
|                                | 69   | Duplex Entrance Sensor     | S |   |          |
|                                | 70   | Duplex Transport Sensor 1  | S |   |          |
|                                | 71   | Duplex Transport Sensor 2  | S |   |          |
|                                | 72   | Duplex Transport Sensor 3  | S |   |          |
|                                | 73   | Inverter Tray Paper Sensor | S |   |          |
| 7-505                          | Original Jam Counter by Jam Location               |                            |   |   |          |
|                                | 1  | At Power On                | S |   |          |
|                                | 3  | ADF Feed-in Sensor         | S | Detected by the entrance and registration sensors     |          |
|                                | 4  | ADF Feed-out Sensor        | S | Detected by the exit and inverter sensors.            |          |
| 7-506                          | Jam Counter by Copy Size                           |                            |   |   |          |
|                                | 5  | A4 Sideways                | S | Displays the total number of copy jams by paper size. |          |
|                                | 6  | A5 Sideways                | S |   |          |
|                                | 14   | B5 Sideways                | S |   |          |
|                                | 38   | LT Sideways                | S |   |          |
|                                | 44   | HLT Sideways               | S |   |          |
|                                | 128  | Other Size                 | S |   |          |
|                                | 132  | A3                         | S |   |          |
|                                | 133  | A4 Lengthwise              | S |   |          |
|                                | 134  | A5 Lengthwise              | S |   |          |
|                                | 141  | B4 Lengthwise              | S |   |          |
|                                | 142  | B5 Lengthwise              | S |   |          |
|                                | 160  | DLT                        | S |   |          |

| Mode No.<br>(Class 1, 2 and 3) |                                |                         |   | Function  | Settings |
|--------------------------------|--------------------------------|-------------------------|---|---|----------|
| 7-506                          | Jam Counter by Copy Size       |                         |   | Displays the total number of copy jams by paper size.   |          |
|                                | 164                            | LG                      | S |   |          |
|                                | 166                            | LT Lengthwise           | S |   |          |
|                                | 172                            | HLT Lengthwise          | S |   |          |
| 7-507                          | Jam History                    |                         |   | Displays the following items for the most recent 10 jams.<br>1. Last 5 digits of the total counter value<br>2. Paper size<br>3. Detected position<br>4. Stuck or not fed          |          |
|                                | 1                              | Copy: Latest            | S |   |          |
|                                | 2                              | Latest 1st              | S |   |          |
|                                | 3                              | Latest 2nd              | S |   |          |
|                                | 4                              | Latest 3rd              | S |   |          |
|                                | 5                              | Latest 4th              | S |   |          |
|                                | 6                              | Latest 5th              | S |   |          |
|                                | 7                              | Latest 6th              | S |   |          |
|                                | 8                              | Latest 7th              | S |   |          |
|                                | 9                              | Latest 8th              | S |   |          |
|                                | 10                             | Latest 9th              | S |   |          |
|                                | 11                             | Original: Latest        | S |   |          |
|                                | 12                             | Latest 1st              | S |   |          |
|                                | 13                             | Latest 2nd              | S |   |          |
|                                | 14                             | Latest 3rd              | S |   |          |
|                                | 15                             | Latest 4th              | S |   |          |
|                                | 16                             | Latest 5th              | S |   |          |
|                                | 17                             | Latest 6th              | S |   |          |
|                                | 18                             | Latest 7th              | S |   |          |
|                                | 19                             | Latest 8th              | S |   |          |
|                                | 20                             | Latest 9th              | S |   |          |
| 7-617                          | Parts PM Alarm Counter Display |                         |   | <b><i>This counter is used for the Japanese market only.</i></b>  |          |
|                                | 1                              | Copy Paper Standard     | S |   |          |
|                                | 2                              | Original Paper Standard |   |   |          |
| 7-618                          | Parts PM Alarm Counter Clear   |                         |   |   |          |
|                                | 1                              | Copy Paper Standard     |   |   |          |
|                                | 2                              | Original Paper Standard |   |   |          |
| 7-801                          | ROM Version Display            |                         |   | Displays the ROM versions.<br>001: SICU<br>002: BCU<br>003: CSS (P1) – Japan only<br>004: HDC (Hard disk controller)<br>005: Scanner<br>006: ADF<br>007: Finisher<br>008: Printer |          |
|                                |                                |                         |   |   |          |
| 7-803                          | PM Counter Display             |                         |   | Displays the PM counter since the last PM.  |          |
|                                |                                |                         | S |   |          |
| 7-804                          | PM Counter Reset               |                         |   | Resets the PM counter.  | Start    |
|                                |                                |                         |   |   |          |

| Mode No.<br>(Class 1, 2 and 3) |   |              |  | Function  | Settings |
|--------------------------------|---|--------------|--|---|----------|
| 7-807                          | SC/Jam Counter Reset                    |              |  |   |          |
|                                |   |              | Resets the SC and jam counters. Press “Start” to reset.  |   | Start    |
| 7-808                          | Counter Clear                           |              |  |   |          |
|                                |   |              | Resets all counters, except for the total counters (SP 7-003): Press “Start” to reset.   |   | Start    |
| 7-810                          | Access Code Clear                       |              |  |   |          |
|                                |   |              | Resets both the key operator code and the weekly timer code (‘key operator code for off setting’). Press “Start” to reset.   |   | Start    |
| 7-816                          | Copy Counter Clear- Paper Tray          |              |  |   |          |
|                                | 1                                       | Paper Tray 1 |  | Resets the total copy counter by paper tray. These SP modes can be used after replacing the pick-up, feed, and separation rollers in the paper feed stations. | Start    |
|                                | 2                                       | Paper Tray 2 |  |   |          |
|                                | 3                                       | Paper Tray 3 |  |   |          |
|                                | 4                                       | Paper Tray 4 |  |   |          |
|                                | 5                                       | Paper Tray 5 |  |   |          |
|                                | 6                                       | Paper Tray 6 |  |   |          |
| 7-817                          | Total ADF Counter Reset                 |              |  |   |          |
|                                |   |              | Resets the ADF Counter (SP7-205). Press “Start” to reset.  |   | Start    |
| 7-822                          | Copy Counter Clear - Magnification      |              |  |   |          |
|                                |   |              | Resets all counters of SP7-301.  |   | Start    |
| 7-825                          | Total Counter Clear                     |              |  |   |          |
|                                |   |              | Resets the electrical total counter.<br><i>Usually, this SP mode is done at installation.</i><br><i>This SP mode works only once when the counter value is negative.</i> |   | Start    |
| 7-826                          | Option Counter Error Counter            |              |  |   |          |
|                                | 1                                       | Total        | S  | For Japanese version only.  |          |
|                                | 2                                       | Staple       | S  |   |          |
| 7-827                          | Option Counter Error Counter Clear      |              |  |   |          |
|                                |   |              | For Japanese version only.   |   |          |
| 7-828                          | Punch Counter Clear                     |              |  |   |          |
|                                |   |              | Resets the punch counter (SP7-207)   |   |          |
| 7-829                          | Rental GPC Counter Clear                |              |  |   |          |
|                                |   |              | For Japanese version only.   |   |          |
| 7-902                          | SC Details                              |              |  |   |          |
|                                |   |              | Displays details about the latest SCs. Not all SCs have these details. For designer use only.  |   |          |
| 7-904                          | Copy Counter Clear – Copy Mode          |              |  |   |          |
|                                |   |              | Resets all counters of SP7-304, 7-331, 7-332, and 7-333.   |   | Start    |
| 7-905                          | Copy Counter Clear – Multiple Copy Mode |              |  |   |          |
|                                |   |              | Resets all counters of SP7-305.  |   | Start    |
| 7-906                          | Original Counter Clear – Size           |              |  |   |          |
|                                |   |              | Resets all counters of SP7-202.  |   | Start    |
| 7-907                          | Job Counter Clear                       |              |  |   |          |
|                                |   |              | Resets all counters of SP7-306, and 7-330.   |   | Start    |

| Mode No.<br>(Class 1, 2 and 3) |  | Function                        | Settings |
|--------------------------------|--|---------------------------------|----------|
| 7-908                          | Copy: Original Counter Clear                   |                                 |          |
|                                |  | Resets SP7-002-2.               | Start    |
| 7-920                          | Copy Server: Scanned Storage Counter Clear     |                                 |          |
|                                |  | Resets the counter of SP7-320.  | Start    |
| 7-921                          | Copy Server: Original Counter Clear - Size     |                                 |          |
|                                |  | Resets all counters of SP7-321. | Start    |
| 7-923                          | Copy Server: Print Counter Clear               |                                 |          |
|                                |  | Resets all counters of SP7-323. | Start    |
| 7-924                          | Copy Server: Print Job Counter Clear           |                                 |          |
|                                |  | Resets all counters of SP7-324. | Start    |
| 7-925                          | Copy Server Print Job Page Distribution Clear  |                                 |          |
|                                |  | Resets all counters of SP7-325. | Start    |
| 7-926                          | Copy Server: Print Job File Distribution Clear |                                 |          |
|                                |  | Resets all counters of SP7-326. | Start    |
| 7-927                          | Copy Server: Print Job Set Distribution Clear  |                                 |          |
|                                |  | Resets all counters of SP7-327. | Start    |
| 7-928                          | Copy Server: Copy Counter Clear – Copy Mode    |                                 |          |
|                                |  | For Japanese machines only.     |          |
| 7-990                          | SC990 Information                              |                                 |          |
|                                | S  | Designer use only.              |          |

### 4.2.3 TEST PATTERN PRINTING (SP2-902)

**NOTE:** Do not operate the machine until the test pattern is printed out completely. Otherwise, an SC may occur.

1. Access the SP mode which contains the test pattern you need.
2. Touch the "Copy Mode" key on the operation panel to access the copy mode display.
3. Select the paper size.
4. Press the "Start" key to print the test pattern.
5. After checking the test pattern, exit copy mode by touching the "SP Mode" key.
6. Exit the SP mode.

**NOTE:** Test patterns are printed out until the main switch is turned off and on. Use this test pattern to test the printer controller.

#### *Test Pattern Table (SP2-902-2: Test Pattern Printing – IPU)*

| No. | Test Pattern            | No. | Test Pattern           |
|-----|-------------------------|-----|------------------------|
| 0   | None                    | 7   | Vertical Strips        |
| 1   | Vertical Line (1-dot)   | 8   | Grayscale (Vertical)   |
| 2   | Vertical Line (2-dot)   | 9   | Grayscale (Horizontal) |
| 3   | Horizontal Line (1-dot) | 10  | Cross Pattern          |
| 4   | Horizontal Line (2-dot) | 11  | Argyle Pattern         |
| 5   | Alternating Dot Pattern | 12  | Frequency (Horizontal) |
| 6   | Grid Pattern (1-dot)    | 13  | Frequency (Vertical)   |

#### *Test Pattern Table (SP2-902-3: Test Pattern Printing – Printing)*

| No. | Test Pattern                        | No. | Test Pattern   |
|-----|-------------------------------------|-----|--|
| 1   | Alternating Dot Pattern (1,024-dot) | 15  | 16 Trimming Area                                       |
| 2   | Alternating Dot Pattern (4-dot)     | 16  | Argyle Pattern   |
| 3   | Alternating Dot Pattern (2-dot)     | 17  | Line Cross Stitch                                      |
| 4   | Alternating Dot Pattern (1-dot)     | 18  | Black Band (Vertical)                                  |
| 5   | Grid Pattern (1-dot 0 ch)           | 19  | Black Band (Horizontal)                                |
| 6   | Grid Pattern (1-dot 1 ch)           | 20  | Gray Trim  |
| 7   | Grid Pattern (1-dot 2 ch)           | 21  | Stair Pattern  |
| 8   | Grid Pattern (1-dot 3 ch)           | 22  | Grayscale Vertical 20 mm                               |
| 9   | Vertical Line (1-dot)               | 23  | Grayscale Vertical 40 mm                               |
| 10  | Horizontal Line (1-dot)             | 24  | Grayscale Vertical 20 mm                               |
| 11  | Vertical Line (2-dot)               | 25  | Grayscale Horizontal 40 mm                             |
| 12  | Horizontal Line (2-dot)             | 26  | Grayscale Horizontal 20 mm                             |
| 13  | Grid Pattern (1-dot)                | 27  | White (Out data mask)                                  |
| 14  | Full Dot Pattern                    | 28  | Grid Pattern (1-dot) (0 ch mode)<br>(Out data overlay) |

## 4.2.4 INPUT CHECK

### *Main Machine Input Check (SP5-803)*

1. Access SP mode.
2. Select the class 3 SP number which will access the switch or sensor you wish to check.
3. Check the status of the sensor or switch.  
**NOTE:** If you wish to change to another class 3 level, press the "Next" or "Prev." key.
4. The reading ("0" or "1") will be displayed. The meaning of the display is as follows.

|       |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|-------|
| Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|       |       |       |       |       |       |       |       |
| 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |

| Class 3 No. | Bit No. | Description                          | Reading        |              |
|-------------|---------|--------------------------------------|----------------|--------------|
|             |         |                                      | 0              | 1            |
| 1           | 7       | Not Used                             |                |              |
|             | 6       | Not Used                             |                |              |
|             | 5       | LCT 3rd Paper End Sensor (6th tray)  | Not paper end  | Paper end    |
|             | 4       | LCT 2nd Paper End Sensor (5th tray)  | Not paper end  | Paper end    |
|             | 3       | LCT 1st Paper End Sensor (4th tray)  | Not paper end  | Paper end    |
|             | 2       | 3rd Paper End Sensor                 | Not paper end  | Paper end    |
|             | 1       | 2nd Paper End Sensor                 | Not paper end  | Paper end    |
|             | 0       | 1st Paper End Sensor                 | Not paper end  | Paper end    |
| 2           | 7       | Not Used                             |                |              |
|             | 6       | Not Used                             |                |              |
|             | 5       | LCT 3rd Paper Feed Sensor (6th tray) | Paper detected | No paper     |
|             | 4       | LCT 2nd Paper Feed Sensor (5th tray) | Paper detected | No paper     |
|             | 3       | LCT 1st Paper Feed Sensor (4th tray) | Paper detected | No paper     |
|             | 2       | 3rd Paper Feed Sensor                | Paper detected | No paper     |
|             | 1       | 2nd Paper Feed Sensor                | Paper detected | No paper     |
|             | 0       | 1st Paper feed Sensor                | Paper detected | No paper     |
| 3           | 7       | Not Used                             |                |              |
|             | 6       | Duplex Entrance Sensor               | Detected       | Not detected |
|             | 5       | Duplex Jogger H.P.                   | Not detected   | Detected     |
|             | 4       | Duplex Transport 3 Sensor            | Detected       | Not detected |
|             | 3       | Duplex Transport 2 Sensor            | Detected       | Not detected |
|             | 2       | Duplex Transport 1 Sensor            | Detected       | Not detected |

| Class 3 No. | Bit No. | Description                    | Reading         |                 |
|-------------|---------|--------------------------------|-----------------|-----------------|
|             |         |                                | 0               | 1               |
| 3           | 1       | Inverter Tray Paper Sensor     | Detected        | Not detected    |
|             | 0       | Duplex Connection              | Connected       | Not connected   |
| 4           | 7       | Not Used                       |                 |                 |
|             | 6       | Not Used                       |                 |                 |
|             | 5       | LCT 3rd Lift Sensor (6th tray) | Lifted          | No paper        |
|             | 4       | LCT 2nd Lift Sensor (5th tray) | Lifted          | No paper        |
|             | 3       | LCT 1st Lift Sensor (4th tray) | Lifted          | No paper        |
|             | 2       | 3rd Lift Sensor                | Lifted          | No paper        |
|             | 1       | 2nd Lift Sensor                | Lifted          | No paper        |
|             | 0       | 1st Lift Sensor                | Lifted          | No paper        |
| 5           | 7       | Not Used                       |                 |                 |
|             | 6       | Not Used                       |                 |                 |
|             | 5       | Not Used                       |                 |                 |
|             | 4       | Not Used                       |                 |                 |
|             | 3       | Drum Unit set                  | Set             | Not set         |
|             | 2       | Polygon Motor Cooling Fan Lock | No lock         | Lock            |
|             | 1       | Toner Hopper Sensor            | Toner end       | Not toner end   |
|             | 0       | Key Counter Set                | Set             | Not set         |
| 6           | 7       | Drum Motor Lock                | No lock         | Lock            |
|             | 6       | Fusing/Duplex Motor Lock       | No lock         | Lock            |
|             | 5       | XFGATE                         |                 |                 |
|             | 4       | Not used                       |                 |                 |
|             | 3       | Development Motor Lock         | No lock         | Lock            |
|             | 2       | Not used                       |                 |                 |
|             | 1       | Not used                       |                 |                 |
|             | 0       | Toner Supply Motor Sensor      | Not interrupted | Interrupted     |
| 7           | 7       | Left Front Door Safety Switch  | Door closed     | Door open       |
|             | 6       | Right Front Door Safety Switch | Door closed     | Door open       |
|             | 5       | Paper Feed Motor Lock          | No lock         | Lock            |
|             | 4       | Guide Plate Position Sensor    | In position     | Out of position |
|             | 3       | LCT Relay Sensor               | On              | Off             |
|             | 2       | Relay Sensor                   | On              | Off             |
|             | 1       | Not Used                       |                 |                 |
|             | 0       | Registration Sensor            | On              | Off             |
| 8           | 7       | Lower Bottle Inner Cap Sensor  | Cap opened      | Cap closed      |
|             | 6       | Upper Bottle Inner Cap Sensor  | Cap opened      | Cap closed      |
|             | 5       | Toner Near-end Sensor          | Toner end       | Toner not end   |
|             | 4       | Toner Collection Bottle Sensor | Bottle set      | Bottle not set  |
|             | 3       | Toner Overflow Sensor          | No lock         | Lock            |
|             | 2       | Toner Bottle Unit Motor Lock   | No lock         | Lock            |
| 8           | 1       | Lower Toner Bottle             | Bottle set      | Bottle not set  |
|             | 0       | Upper Toner Bottle             | Bottle set      | Bottle not set  |
| 9           | 7       | Total Counter Set              | Set             | Not set         |
|             | 6       |                                |                 |                 |



| Class 3 No.    | Bit No. | Description                        | Reading      |                  |
|----------------|---------|------------------------------------|--------------|------------------|
|                |         |                                    | 0            | 1                |
| 9              | 5       | Not Used                           |              |                  |
|                | 4       | Exit Unit Set                      | Set          | Not set          |
|                | 3       | Oil Supply/Cleaning Web End Sensor | Not end      | End              |
|                | 2       | Exit Sensor                        | On           | Off              |
|                | 1       | Fusing Exit Sensor                 | On           | Off              |
|                | 0       | Fusing Unit Set                    | Set          | Not set          |
| 10<br>(Duplex) | 7       | Not Used                           |              |                  |
|                | 6       | Not Used                           |              |                  |
|                | 5       | Not Used                           |              |                  |
|                | 4       | Not Used                           |              |                  |
|                | 3       | Not Used                           |              |                  |
|                | 2       | Not Used                           |              |                  |
|                | 1       | Dip Switch 2 - SICU                | On           | Off              |
|                | 0       | Dip Switch 1 - SICU                | On           | Off              |
| 11             | 7       | Not used                           |              |                  |
|                | 6       | Not used                           |              |                  |
|                | 5       | Not used                           |              |                  |
|                | 4       | 2nd Tray Paper Size 5              | See Table 1  |                  |
|                | 3       | 2nd Tray Paper Size 4              |              |                  |
|                | 2       | 2nd Tray Paper Size 3              |              |                  |
|                | 1       | 2nd Tray Paper Size 2              |              |                  |
|                | 0       | 2nd Tray Paper Size 1              |              |                  |
| 12             | 7       | Not used                           |              |                  |
|                | 6       | Not used                           |              |                  |
|                | 5       | Not used                           |              |                  |
|                | 4       | 3rd Tray Paper Size 5              | See Table 1  |                  |
|                | 3       | 3rd Tray Paper Size 4              |              |                  |
|                | 2       | 3rd Tray Paper Size 3              |              |                  |
|                | 1       | 3rd Tray Paper Size 2              |              |                  |
|                | 0       | 3rd Tray Paper Size 1              |              |                  |
| 13             | 7       | Not used                           |              |                  |
|                | 6       | Not used                           |              |                  |
|                | 5       | Not used                           |              |                  |
|                | 4       | Rear Fence Return Sensor           | Not detected | Return Position  |
|                | 3       | Front Side Fence Closed Sensor     | Open         | Closed           |
|                | 2       | Front Side Fence Open Sensor       | Open         | Closed           |
|                | 1       | Rear Side Fence Closed Sensor      | Open         | Closed           |
|                | 0       | Rear Side Fence Open Sensor        | Open         | Closed           |
| 14             | 7       | Not used                           |              |                  |
|                | 6       | Not used                           |              |                  |
|                | 5       | Not Used                           |              |                  |
|                | 4       | Rear Fence HP                      | Not detected | At home position |
|                | 3       | Left Tandem Tray Set               | Set          | Not set          |

| Class 3 No. | Bit No. | Description                                 | Reading      |                 |
|-------------|---------|---|--------------|-----------------|
|             |         |   | 0            | 1               |
| 14          | 2       | Right Tandem Tray Set                       | Set          | Not set         |
|             | 1       | Left 1st Tray Paper                         | Detected     | Not Detected    |
|             | 0       | Right 1st Tray Paper                        | Detected     | Not Detected    |
| 15          | 7       | Not Used                                    |              |                 |
|             | 6       | Not Used                                    |              |                 |
|             | 5       | Not Used                                    |              |                 |
|             | 4       | Base Plate Down Sensor                      | Not detected | Detected        |
|             | 3       | 1st Tray Paper Height 4                     | —            | Paper 80 ~ 100% |
|             | 2       | 1st Tray Paper Height 3                     | —            | Paper 50 ~ 80%  |
|             | 1       | 1st Tray Paper Height 2                     | —            | Paper 30 ~ 50%  |
|             | 0       | 1st Tray Paper Height 1                     | —            | Paper 0 ~ 30%   |
| 16          | 7       | Not Used                                    |              |                 |
|             | 6       | Not Used                                    |              |                 |
|             | 5       | Not Used                                    |              |                 |
|             | 4       | Toner Supply Motor Lock                     | No lock      | Lock            |
|             | 3       | Not Used                                    |              |                 |
|             | 2       | Not Used                                    |              |                 |
|             | 1       | 2nd Tray Paper Height Sensor 2              | See Table 2  |                 |
|             | 0       | 2nd Tray Paper Height Sensor 1              |              |                 |
| 17          | 7       | Not Used                                    |              |                 |
|             | 6       | Not Used                                    |              |                 |
|             | 5       | Not Used                                    |              |                 |
|             | 4       | Not Used                                    |              |                 |
|             | 3       | Not Used                                    |              |                 |
|             | 2       | Not Used                                    |              |                 |
|             | 1       | 3rd Tray Paper Height 2                     | See Table 2  |                 |
|             | 0       | 3rd Tray Paper Height 1                     |              |                 |
| 18          | 7       | Not Used                                    |              |                 |
|             | 6       | Not Used                                    |              |                 |
|             | 5       | Not Used                                    |              |                 |
| 18          | 4       | Not Used                                    |              |                 |
|             | 3       | Not Used                                    |              |                 |
|             | 2       | LCT 1st Tray Paper Size Switch 3 (4th tray) | See Table 3  |                 |
|             | 1       | LCT 1st Tray Paper Size Switch 2 (4th tray) |              |                 |
|             | 0       | LCT 1st Tray Paper Size Switch 1 (4th tray) |              |                 |
| 19          | 7       | Not Used                                    |              |                 |
|             | 6       | Not Used                                    |              |                 |
|             | 5       | Not Used                                    |              |                 |
|             | 4       | Not Used                                    |              |                 |
|             | 3       | Not Used                                    |              |                 |

| Class 3 No. | Bit No. | Description                                   | Reading     |                 |
|-------------|---------|---|-------------|-----------------|
|             |         |   | 0           | 1               |
| 19          | 2       | LCT 2nd Tray Paper Size Switch 3 (5th tray)   | See Table 3 |                 |
|             | 1       | LCT 2nd Tray Paper Size Switch 2 (5th tray)   |             |                 |
|             | 0       | LCT 2nd Tray Paper Size Switch 1 (5th tray)   |             |                 |
| 20          | 7       | Not Used                                      |             |                 |
|             | 6       | Not Used                                      |             |                 |
|             | 5       | Not Used                                      |             |                 |
|             | 4       | Not Used                                      |             |                 |
|             | 3       | LCT Motor Lock Signal                         | Lock        | Not Lock        |
|             | 2       | LCT Door Open Switch                          | Closed      | Open            |
|             | 1       | LCT Relay Sensor                              | On          | Off             |
|             | 0       | LCT 3rd Tray Set                              | Set         | Not set         |
| 21          | 7       | Not Used                                      |             |                 |
|             | 6       | Not Used                                      |             |                 |
|             | 5       | Not Used                                      |             |                 |
|             | 4       | Not Used                                      |             |                 |
|             | 3       | Not Used                                      |             |                 |
|             | 2       | Not Used                                      |             |                 |
|             | 1       | Not Used                                      |             |                 |
|             | 0       | LCT Connection                                | Connected   | Not Connected   |
| 22          | 7       | Not Used                                      |             |                 |
|             | 6       | Not Used                                      |             |                 |
|             | 5       | Not Used                                      |             |                 |
|             | 4       | Not Used                                      |             |                 |
|             | 3       | LCT 1st Tray Paper Height sensor 4 (4th tray) | —           | Paper 80 ~ 100% |
|             | 2       | LCT 1st Tray Paper Height sensor 3 (4th tray) | —           | Paper 50 ~ 80%  |
|             | 1       | LCT 1st Tray Paper Height sensor 2 (4th tray) | —           | Paper 30 ~ 50%  |
|             | 0       | LCT 1st Tray Paper Height sensor 1 (4th tray) | —           | Paper 0 ~ 30%   |
| 23          | 7       | Not Used                                      |             |                 |
|             | 6       | Not Used                                      |             |                 |
|             | 5       | Not Used                                      |             |                 |
|             | 4       | Not Used                                      |             |                 |
|             | 3       | LCT 2nd Tray Paper Height sensor 4 (5th tray) | —           | Paper 80 ~ 100% |
|             | 2       | LCT 2nd Tray Paper Height sensor 3 (5th tray) | —           | Paper 50 ~ 80%  |
|             | 1       | LCT 2nd Tray Paper Height sensor 2 (5th tray) | —           | Paper 30 ~ 50%  |
|             | 0       | LCT 2nd Tray Paper Height sensor 1 (5th tray) | —           | Paper 0 ~ 30%   |

| Class 3 No. | Bit No. | Description                                   | Reading |                 |
|-------------|---------|---|---------|-----------------|
|             |         |   | 0       | 1               |
| 24          | 7       | Not Used                                      |         |                 |
|             | 6       | Not Used                                      |         |                 |
|             | 5       | Not Used                                      |         |                 |
|             | 4       | Not Used                                      |         |                 |
|             | 3       | LCT 3rd Tray Paper Height sensor 4 (6th tray) | —       | Paper 80 ~ 100% |
|             | 2       | LCT 3rd Tray Paper Height sensor 3 (6th tray) | —       | Paper 50 ~ 80%  |
|             | 1       | LCT 3rd Tray Paper Height sensor 2 (6th tray) | —       | Paper 30 ~ 50%  |
|             | 0       | LCT 3rd Tray Paper Height sensor 1 (6th tray) | —       | Paper 0 ~ 30%   |

Table 1: 2nd and 3rd Tray Paper Size Switch Combination

| Class 3 No. | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 | Paper Width                              |               |
|-------------|-------|-------|-------|-------|-------|--|---------------|
|             |       |       |       |       |       | A/B size version                         | Inch version  |
| 11, 12      | 0     | 1     | 1     | 1     | 1     | A3                                       | DLT           |
|             | 0     | 0     | 1     | 1     | 1     | 8 1/4" x 13"                             | 8 1/2" x 14"  |
|             | 1     | 0     | 0     | 1     | 1     | A4 lengthwise                            | LT lengthwise |
|             | 0     | 1     | 0     | 0     | 1     | A4 sideways                              | LT sideways   |
|             | 0     | 0     | 1     | 0     | 0     | 8 1/2" x 13"                             | HLT sideways  |
|             | 0     | 0     | 0     | 1     | 0     | —  | 8" x 10 1/2"  |
|             | 0     | 0     | 0     | 0     | 1     | A5 sideways                              | 8" x 10"      |
|             | 1     | 0     | 0     | 0     | 0     | 8 k lengthwise<br>(Taiwan Version only)  | 8" x 13"      |
|             | 1     | 1     | 0     | 0     | 0     | 16 k lengthwise<br>(Taiwan Version only) | 10" x 14"     |
|             | 1     | 1     | 1     | 0     | 0     | 16 k sideways<br>(Taiwan Version only)   | 11" x 15"     |
|             | 1     | 1     | 1     | 1     | 0     | *  | *             |

Service  
Tables

Table 2: 2nd and 3rd Tray Paper Height Sensor Combination

| Class 3 No. | Bit 4 | Bit 3 | Paper Height |
|-------------|-------|-------|--------------|
| 16, 17      | 1     | 1     | 70 ~ 100%    |
|             | 1     | 0     | 30 ~ 70%     |
|             | 0     | 1     | 10 ~ 30%     |
|             | 0     | 0     | 0 ~ 10%      |

**Table 3: LCT 1st and 2nd Paper Size Switch Combination**

| Class 3 No. | Bit 2 | Bit 1 | Bit 0 | Paper Size  |
|-------------|-------|-------|-------|-------------|
| 18, 19      | 1     | 1     | 1     | A4 Sideways |
|             | 1     | 0     | 1     | B5 Sideways |
|             | 0     | 1     | 0     | A5 Sideways |
|             | 1     | 0     | 0     | B5 Sideways |

**ADF Input Check (SP6-007)**

| Class 3 No. | Bit No. | Description                       | Reading          |                   |
|-------------|---------|-----------------------------------|------------------|-------------------|
|             |         |                                   | 0                | 1                 |
| 1           | 7       | Original Set Sensor               | No original      | Original detected |
|             | 6       | Original Width Sensor 1           | No original      | Original detected |
|             | 5       | Original Width Sensor 2           | No original      | Original detected |
|             | 4       | Original Width Sensor 3           | No original      | Original detected |
|             | 3       | Entrance Sensor                   | No original      | Original detected |
|             | 2       | Registration Sensor               | No original      | Original detected |
|             | 1       | Exit Sensor                       | No original      | Original detected |
|             | 0       | Inverter Sensor                   | No original      | Original detected |
| 2           | 7       | DF Position Sensor                | Down             | Up                |
|             | 6       | APS Start Sensor                  | Start            | Off               |
|             | 5       | Feed Cover Sensor                 | Close            | Open              |
|             | 4       | Exit Cover Sensor                 | Close            | Open              |
|             | 3       | Bottom Plate HP Sensor            | At home position | Not home position |
|             | 2       | Bottom Plate Position Sensor      | Detected         | Not detected      |
|             | 1       | Pick-up Roller HP Sensor          | At home position | Not home position |
|             | 0       | ADF Feed-in Motor Encoder Pulse   |                  |                   |
| 3           | 7       | ADF Transport Motor Encoder Pulse |                  |                   |
|             | 6       | ADF Feed-out Motor Encoder Pulse  |                  |                   |
|             | 5       | Original Length Sensor            | No original      | Original detected |
|             | 4       | Not Used                          |                  |                   |
|             | 3       | Not Used                          |                  |                   |
|             | 2       | Not Used                          |                  |                   |
|             | 1       | Not Used                          |                  |                   |
|             | 0       | Not Used                          |                  |                   |


**Finisher Input Check (SP6-117)**

| Class 3 No. | Bit No. | Description                     | Reading       |              |
|-------------|---------|---------------------------------|---------------|--------------|
|             |         |                                 | 0             | 1            |
| 1           | 7       | Stack Feed-out Belt HP Sensor   | HP            | Not HP       |
|             | 6       | Not Used                        |               |              |
|             | 5       | Shift Tray Lower Limit 1 Sensor | Off           | On           |
|             | 4       | Shift Tray Lower Limit 2 Sensor | Off           | On           |
|             | 3       | Stapler Tray Entrance Sensor    | Not detected  | Detected     |
|             | 2       | Shift Tray Exit Sensor          | Detected      | Not detected |
|             | 1       | Upper Tray Exit Sensor          | Detected      | Not detected |
|             | 0       | Entrance Sensor                 | Not detected  | Detected     |
| 2           | 7       | Not used                        |               |              |
|             | 6       | Front Door Safety Switch        | Door closed   | Door open    |
|             | 5       | Stapler Tray Paper Sensor       | Detected      | Not detected |
|             | 4       | Staple End Sensor               | End           | Not end      |
|             | 3       | Staple Hammer HP Sensor         | HP            | Not HP       |
|             | 2       | Stapler HP Sensor               | Not HP        | HP           |
|             | 1       | Shift Tray Half-turn Sensor     | HP            | Not HP       |
|             | 0       | Jogger Fence HP Sensor          | Not HP        | HP           |
| 3           | 7       | Not Used                        |               |              |
|             | 6       | Staple Cartridge Set Sensor     | Not set       | Set          |
|             | 5       | Stack Height Sensor 2           | Off           | On           |
|             | 4       | Stack Height Sensor 1           | Off           | On           |
|             | 3       | Not Used                        |               |              |
|             | 2       | Punch Waste Hopper Sensor       | Full          | Not full     |
|             | 1       | Punch HP Sensor                 | HP            | Not HP       |
|             | 0       | Punch Unit Connection           | Not connected | Connected    |
| 4           | 7       | Stapler Ready                   | Ready         | Not ready    |
|             | 6       | Stapler Return Sensor           | HP            | Not HP       |
|             | 5       | Exit Guide Open Sensor          | HP            | Not HP       |
|             | 4       | Stack Plate HP Sensor           | Not HP        | HP           |
|             | 3       | Pre-stack Tray Paper Sensor     | Not detected  | Detected     |
|             | 2       | Staple Waste Hopper Sensor      | Not full      | Full         |
|             | 1       | Stapler Rotation HP Sensor      | Not HP        | HP           |
|             | 0       | Upper Tray Paper Limit Sensor   | Not full      | Full         |

## 4.2.5 OUTPUT CHECK

**NOTE:** Motors keep turning in this mode regardless of upper or lower limit sensor signals. To prevent mechanical or electrical damage, do not keep an electrical component on for a long time.

### *Main Machine Output Check (SP5-804)*

1. Access SP mode 5-804.
2. Select the SP number that corresponds to the component you wish to check.
3. Press "1", then press  to check that component.
4. Press "0" to interrupt the test.
5. If you wish to check another component, press the "Next" or "Prev." Key.

| No. | Description                        | No. | Description                   |
|-----|------------------------------------|-----|-------------------------------|
| 1   | 1st Paper Feed Clutch              | 34  | LCT 3rd Tray Lift Motor       |
| 2   | 2nd Paper Feed Clutch              | 35  | Rear Fence Drive Motor        |
| 3   | 3rd Paper Feed Clutch              | 36  | Tandem Tray Connect Solenoid  |
| 4   | LCT 1st Paper Feed Clutch          | 37  | Front Side Fence Solenoid     |
| 5   | LCT 2nd Paper Feed Clutch          | 38  | Rear Side Fence Solenoid      |
| 6   | LCT 3rd Paper Feed Clutch          | 39  | Left Tandem Lock Solenoid     |
| 7   | 1st Pick-up Solenoid               | 40  | Relay Motor                   |
| 8   | 2nd Pick-up Solenoid               | 41  | Paper Feed Motor              |
| 9   | 3rd Pick-up Solenoid               | 42  | LCT Motor                     |
| 10  | LCT 1st Pick-up Solenoid           | 43  | Drum Motor                    |
| 11  | LCT 2nd Pick-up Solenoid           | 44  | Fusing/Duplex Motor           |
| 12  | LCT 3rd Pick-up Solenoid           | 45  | Registration Motor            |
| 13  | 1st Separation Roller Solenoid     | 46  | Oil Supply/Cleaning Web Motor |
| 14  | 2nd Separation Roller Solenoid     | 47  | Guide Plate Solenoid          |
| 15  | 3rd Separation Roller Solenoid     | 48  | Inverter Gate Solenoid        |
| 16  | LCT 1st Separation Roller Solenoid | 49  | Duplex Transport Clutch       |
| 17  | LCT 2nd Separation Roller Solenoid | 50  | Duplex Feed Clutch            |
| 18  | LCT 3rd Separation Roller Solenoid | 51  | Inverter Exit Roller Clutch   |
| 19  | Lower Relay                        | 52  | Inverter Guide Plate Solenoid |
| 20  | LCT Transport Clutch               | 53  | Duplex Inverter Gate Solenoid |
| 21  | 1st Vertical Transport Clutch      | 54  | Reverse Roller Solenoid       |
| 22  | 2nd Vertical Transport Clutch      | 55  | Jogger Motor                  |
| 23  | 3rd Vertical Transport Clutch      | 56  | Toner Supply Roller Clutch    |
| 24  | LCT 1st Grip Clutch                | 57  | Development Motor             |
| 25  | LCT 2nd Grip Clutch                | 58  | Toner Supply Motor            |
| 26  | LCT 3rd Grip Clutch                | 59  | Upper Toner Bottle Motor      |
| 27  | Upper Relay Clutch                 | 60  | Lower Toner Bottle Motor      |
| 28  | LCT Relay                          | 61  | Toner Bank Motor              |
| 29  | 1st Tray Lift Motor                | 62  | Upper Toner Cap Motor         |
| 30  | 2nd Tray Lift Motor                | 63  | Lower Toner Cap Motor         |
| 31  | 3rd Tray Lift Motor                | 64  | Toner Supply Coil Clutch      |
| 32  | LCT 1st Tray Lift Motor            | 65  | ID Sensor LED                 |
| 33  | LCT 2nd Tray Lift Motor            | 66  | Transfer Belt Lift Solenoid   |

| No. | Description                        | No. | Description                    |
|-----|------------------------------------|-----|--------------------------------|
| 67  | Quenching Lamp                     | 78  | Drum Cooling Fan (Low)         |
| 68  | Charge Corona                      | 79  | Drum Cooling Fan (High)        |
| 69  | Grid Plate                         | 80  | Paper Cooling Pipe Fan         |
| 70  | Development Bias                   | 81  | Steam Removal Fan (Low)        |
| 71  | Transfer Belt Bias                 | 82  | Steam Removal Fan (High)       |
| 72  | Exposure Lamp                      | 83  | Development Unit Cooling Fan 1 |
| 73  | Optics Cooling Fan                 | 84  | Development Unit Cooling Fan 2 |
| 74  | Polygonal Mirror Motor Cooling Fan | 85  | Duplex Cooling Fan             |
| 75  | SICU Cooling Fan                   | 86  | LDB Cooling Fan                |
| 76  | Exhaust Fan - Low Speed            | 87  | Not Used                       |
| 77  | Exhaust Fan - High Speed           | 88  | Total Counter                  |

**ADF Output Check (SP6-008)**

| No. | Description               |
|-----|---------------------------|
| 1   | Feed-in Motor (High)      |
| 2   | Feed-in Motor (Low)       |
| 3   | Transport Motor (Forward) |
| 4   | Transport Motor (Reverse) |
| 5   | Feed-out Motor            |
| 6   | Exit Gate Solenoid        |
| 7   | Inverter Gate Solenoid    |
| 8   | DF Indicators             |
| 9   | Pick-up Motor (Forward)   |
| 10  | Bottom Plate Motor        |
| 11  | Feed-in Clutch            |

**Finisher Output Check (SP6-118)**

| No. | Description                      |
|-----|----------------------------------|
| 1   | Upper Transport Motor            |
| 2   | Shift Tray Exit Motor            |
| 3   | Tray Junction Gate Solenoid      |
| 4   | Shift Tray Lift Motor            |
| 5   | Jogger Motor                     |
| 6   | Stapler Motor                    |
| 7   | Staple Hammer Motor              |
| 8   | Punch Motor                      |
| 9   | Stapler Junction Gate Solenoid   |
| 10  | Positioning Roller Solenoid      |
| 11  | Stack Feed-out Motor             |
| 12  | Shift Motor                      |
| 13  | Stapler Rotation Motor           |
| 14  | Lower Transport Motor            |
| 15  | Exit Guide Motor                 |
| 16  | Stack Plate Motor                |
| 17  | Pre-stack Junction Gate Solenoid |
| 18  | Pre-stack Paper Stopper Solenoid |
| 19  | Stapler Return Solenoid          |



#### 4.2.6 SYSTEM PARAMETER AND DATA LISTS (SMC LISTS)

1. Access the SP mode corresponding to the list that you wish to print.
  - 1) SP5-990-1: All system parameter list
  - 2) SP5-990-2: SP mode data list
  - 3) SP5-990-3: UP mode data list
  - 4) SP5-990-4: Machine status history data list
2. Touch the "Copy Mode" key to access the copy mode display.
3. Select the paper size and press the "Start" key to print the list.
4. After printing the list, exit the copy mode display by touching the "SP Mode" key.
5. Exit SP mode.

#### 4.2.7 MEMORY ALL CLEAR (SP5-801)

**NOTE:** Memory All Clear mode resets all the SP mode settings stored in the NVRAMs on the SICU and the BCU to their default settings except for SP7-003-1 (Electrical total counter value).

There are three RAM clear modes which can be selected after entering SP5-801.

- 1) Clear all data in the NVRAMs on the SICU and BCU.
- 2) Clear the data in the NVRAM on the SICU.
- 3) Clear the data in the NVRAM on the BCU.

Among the settings that are reset are the correction data for process control and all the software counters.

Normally, this SP mode should not be used. This procedure is required only after replacing the NVRAM or when the copier malfunctions due to a damaged NVRAM.

1. Print out all SMC Data Lists (SP mode 5-990-1).
2. Access SP mode 5-801, and select 1, 2, or 3 for the required RAM clear mode.
3. Press "Start" on the display. At this time the beeper will sound.
4. A confirmation message will be displayed, then press "Yes" .
5. Turn the main power switch off and back on.
6. Do the printer and scanner registration and magnification adjustments (see Replacement and Adjustment – Copy Image Adjustments).
7. Referring to the SMC data lists, re-enter any values which had been changed from their factory settings.
8. Do SP3-001-2 (ID Sensor Initial Setting). If the SICU data was cleared, also do SP4-911-1 and 4-912-1 (HDD media tests). Note that the HDD media tests will delete copy server and stamp data on the disks.
9. Check the copy quality and the paper path, and do any necessary adjustments.

### 4.2.8 SOFTWARE RESET

The software can be reset when the machine hangs up. Do either of the following.

Either:

Turn the main power switch off and on.

Or:

Hold down the “#” key and “.” key at the same time for over 10 seconds.

### 4.2.9 SYSTEM SETTING AND COPY SETTING (UP MODE) RESET

#### ***System Setting Reset***

The system settings in the UP mode can be reset to their defaults using the following procedure.

1. Make sure that the machine is in the copier standby mode.
2. Press the User Tools key.
3. Hold down the “#” key and touch the “System Setting” key.
4. A confirmation message will be displayed, then press “Yes”.

#### ***Copy Features Reset***

The copy settings in the UP mode can be reset to their defaults using the following procedure.


1. Make sure that the machine is in the copier standby mode.
2. Press the User Tools key.
3. Hold down the “#” key and touch “Copy Features” key.
4. A confirmation message will be displayed, then press “Yes”.

## 4.3 PM COUNTER

Each PM part has a counter which counts up at the appropriate time. (For example, the counter for the hot roller counts up every copy, and the counter for a feed roller counts up when paper is fed from the corresponding tray.) These counters should be used as references for part replacement timing.

### 4.3.1 PM COUNTER ACCESS PROCEDURE

- 1) Press the following keys in sequence.

 → **1** → **0** → **7** → **C**

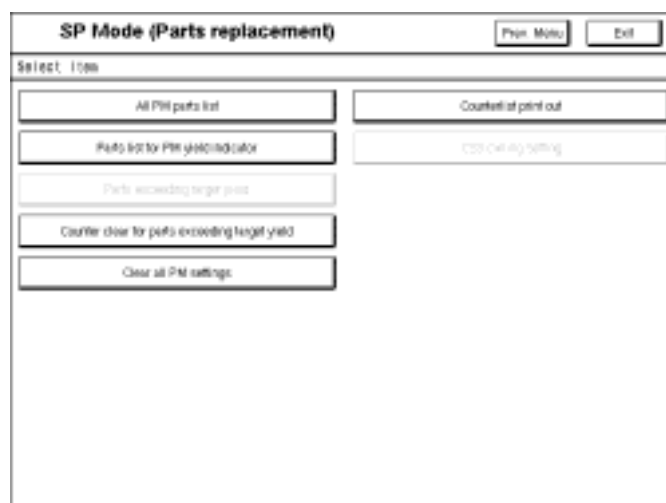
Hold the **C** key for more than 3 seconds

The SP mode menu is displayed.



A294M001.PCX

- 2) Press [PM Counter] on the display.  
3) The following menu appears on the display.



A294M013.PCX

1. All PM Parts List

Displays all the counters for PM parts.

| SP Mode (Parts replacement) |                                 |          |         |        |       |
|-----------------------------|---------------------------------|----------|---------|--------|-------|
| All PM parts list           |                                 |          |         |        |       |
| No                          | Description                     | PM yield | Current | Target |       |
| 001                         | Developer                       | Yes      | 0000236 | 0000K  | Clear |
| 002                         | Oil Supply & Cleaning Web       | Yes      | 0000236 | 0300K  | Clear |
| 003                         | Web Cleaning Roller             | Yes      | 0000236 | 0300K  | Clear |
| 004                         | Hot Roller                      | Yes      | 0000236 | 0450K  | Clear |
| 005                         | Pressure Roller                 | Yes      | 0000236 | 0450K  | Clear |
| 006                         | Pressure Roller Cleaning Roller | Yes      | 0000236 | 0300K  | Clear |
| 007                         | Hot Roller Strippers            | Yes      | 0000236 | 0300K  | Clear |
| 008                         | Development Filter              | Yes      | 0000236 | 0300K  | Clear |
| 009                         | Toner Hopper Filter - Center    | Yes      | 0000236 | 0300K  | Clear |
| 010                         | Toner Hopper Filter - Front     | Yes      | 0000236 | 0300K  | Clear |
| 011                         | Feed Roller - Tray 1            | Yes      | 0000236 | 0300K  | Clear |
| 012                         | Pick-up Roller - Tray 1         | Yes      | 0000236 | 0300K  | Clear |
| 013                         | Separation Roller - Tray 1      | Yes      | 0000236 | 0300K  | Clear |
| 014                         | Feed Roller - Tray 2            | Yes      | 0000000 | 0300K  | Clear |
| 015                         | Pick-up Roller - Tray 2         | Yes      | 0000000 | 0300K  | Clear |
| 016                         | Separation Roller - Tray 2      | Yes      | 0000000 | 0300K  | Clear |
| 017                         | Feed Roller - Tray 3            | Yes      | 0000000 | 0300K  | Clear |
| 018                         | Pick-up Roller - Tray 3         | Yes      | 0000000 | 0300K  | Clear |

A294M014.PCX

On this screen, the current counter and the target yield of each PM part can be checked.

Additionally, the PM yield indicator setting can be changed. To change the setting press [Yes/No] key in the “PM yield” column.

When “Parts list for PM yield” is selected in the parts replacement menu, only the parts with [Yes] in the “PM yield” are listed.

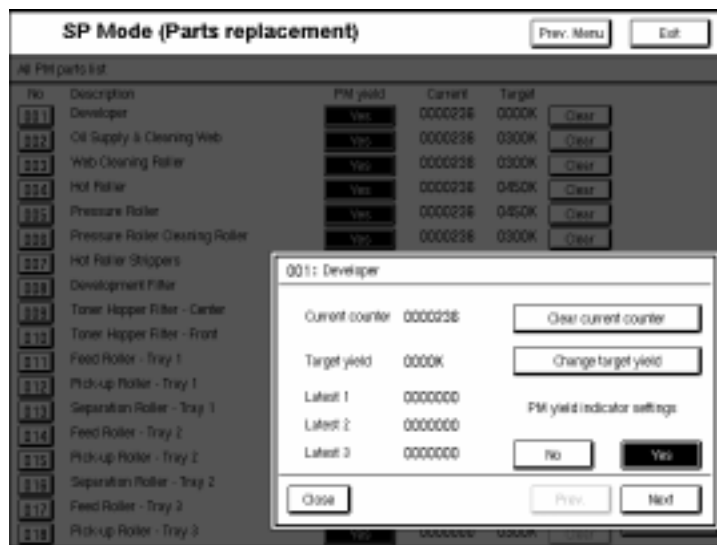
To clear a counter, press [Clear] on the display. The following appears.

| SP Mode (Parts replacement)   |                            |         |         |        |       |
|---|----------------------------|---------|---------|--------|-------|
| Parts list for PM yield indicator   |                            |         |         |        |       |
| No  | Description                | Entered | Current | Target |       |
| 001   | Developer                  |         | 0000236 | 0000K  | Clear |
| 002   | Oil Supply & Cleaning Web  |         | 0000236 | 0300K  | Clear |
| <div>001: Developer<br/>Current settings will be cleared<br/>Execute ?<br/>YES No</div> |                            |         |         |        |       |
| 013   | Separation Roller - Tray 1 |         | 0000236 | 0300K  | Clear |
| 014   | Feed Roller - Tray 2       |         | 0000000 | 0300K  | Clear |
| 015   | Pick-up Roller - Tray 2    |         | 0000000 | 0300K  | Clear |
| 016   | Separation Roller - Tray 2 |         | 0000000 | 0300K  | Clear |
| 017   | Feed Roller - Tray 3       |         | 0000000 | 0300K  | Clear |
| 018   | Pick-up Roller - Tray 3    |         | 0000000 | 0300K  | Clear |

A294M016.PCX

Then press [Yes] to clear the counter.

If one of the keys in the “No” column is pressed, the following appears on the display.



A294M017.PCX

On this screen, the records of the last three part replacements are displayed. When 'Clear current counter' is pressed, the current counter is cleared, the current counter is overwritten to "Latest 1", the Latest 1 counter is overwritten to "Latest 2", and the Latest 2 counter is overwritten to "Latest 3".

Additionally, the target yield can be changed on this screen. To change the target yield setting, do the following:

- 1) Press [Change target yield] on the screen.
- 2) Input the target yield using the ten-key pad.
- 3) Press the # key.

2. Parts List for PM Yield Indicator

| SP Mode (Parts replacement)       |                                 |        |         |        | Prev. Menu | Exit |
|-----------------------------------|---------------------------------|--------|---------|--------|------------|------|
| Parts list for PM yield indicator |                                 |        |         |        |            |      |
| No                                | Description                     | Exceed | Current | Target |            |      |
| 001                               | Developer                       |        | 0000236 | 0000K  | Clear      |      |
| 002                               | Oil Supply & Cleaning Web       |        | 0000236 | 0300K  | Clear      |      |
| 003                               | Web Cleaning Roller             |        | 0000236 | 0300K  | Clear      |      |
| 004                               | Hot Roller                      |        | 0000236 | 0450K  | Clear      |      |
| 005                               | Pressure Roller                 |        | 0000236 | 0450K  | Clear      |      |
| 006                               | Pressure Roller Cleaning Roller |        | 0000236 | 0300K  | Clear      |      |
| 007                               | Hot Roller Stoppers             |        | 0000236 | 0300K  | Clear      |      |
| 008                               | Development Filter              |        | 0000236 | 0300K  | Clear      |      |
| 009                               | Toner Hopper Filter - Center    |        | 0000236 | 0300K  | Clear      |      |
| 010                               | Toner Hopper Filter - Front     |        | 0000236 | 0300K  | Clear      |      |
| 011                               | Feed Roller - Tray 1            |        | 0000236 | 0300K  | Clear      |      |
| 012                               | Pick-up Roller - Tray 1         |        | 0000236 | 0300K  | Clear      |      |
| 013                               | Separation Roller - Tray 1      |        | 0000236 | 0300K  | Clear      |      |
| 014                               | Feed Roller - Tray 2            |        | 0000000 | 0300K  | Clear      |      |
| 015                               | Pick-up Roller - Tray 2         |        | 0000000 | 0300K  | Clear      |      |
| 016                               | Separation Roller - Tray 2      |        | 0000000 | 0300K  | Clear      |      |
| 017                               | Feed Roller - Tray 3            |        | 0000000 | 0300K  | Clear      |      |
| 018                               | Pickup Roller - Tray 3          |        | 0000000 | 0300K  | Clear      |      |

A294M015.PCX

On this screen, only the parts selected in the “All PM parts list” screen are displayed. Normally, the PM parts counters should be checked on this screen.

If the current counter exceeds the target yield, there is a \* mark in the “Exceed” column.

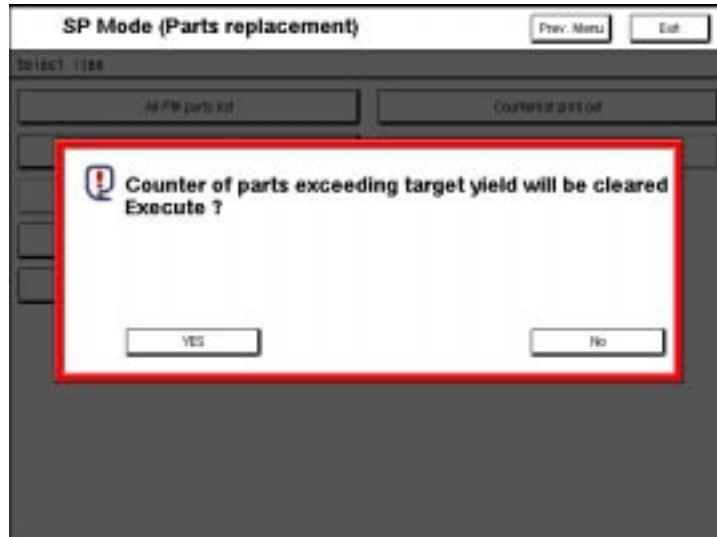
Each counter can also be cleared on this screen. To clear all counters on this screen at once, see ‘Counter Clear for Parts Exceeding Target Yield’ on the next page.

3. Parts Exceeding Target Yield

Only the parts whose counters are exceeding the target yield are displayed. If none of the PM counters is exceeding the target yield, this item cannot be selected from the parts replacement menu.

#### **4. Counter Clear for Parts Exceeding Target Yield**

Clears all the counters which are exceeding the target yield. When this item is selected, the following appears on the display.

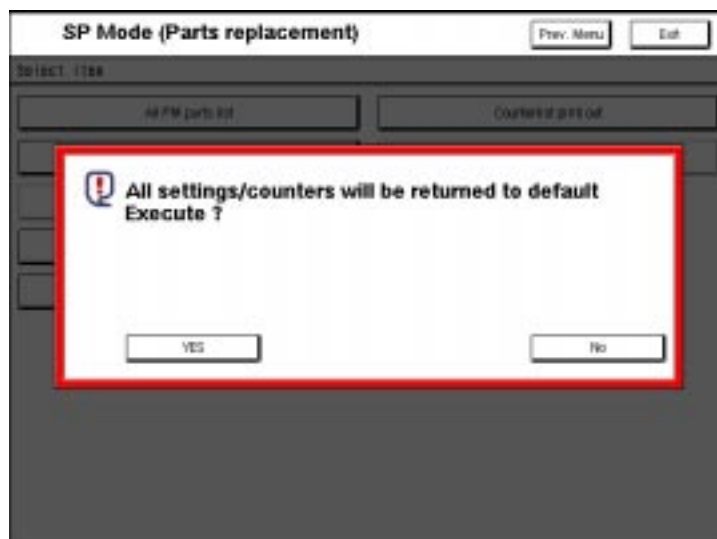


A294M018.PCX

Press [Yes] to clear the counters.

#### **5. Clear All PM Settings**

Clears all the PM counters and returns all the settings (PM parts list and target yield) to the defaults. When this item is selected, the following appears.

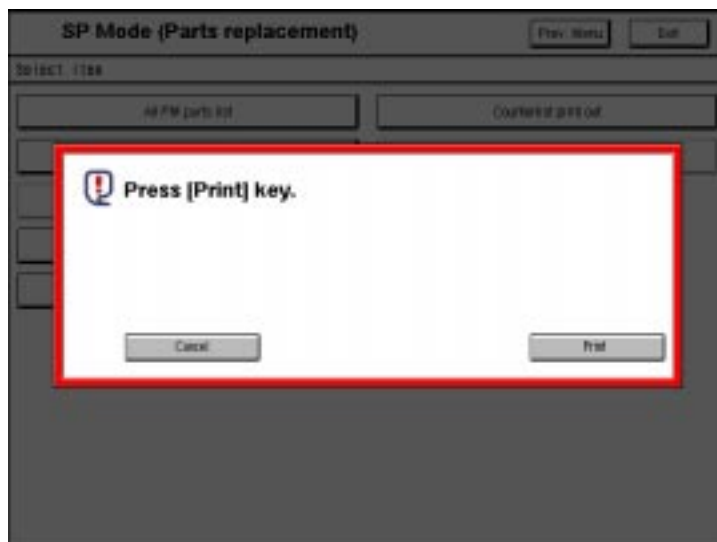


A294M019.PCX

Press [Yes] to clear the settings.

### 6. Counter List Print Out

Prints a list of all the PM part counters. When this item is selected, the following appears on the display.



A294M010.PCX

Press [Print] to print out the counter list.

### 7. CSS Calling Setting (RSS Function)

This function is for Japanese machines only.



## 4.4 PROGRAM DOWNLOAD

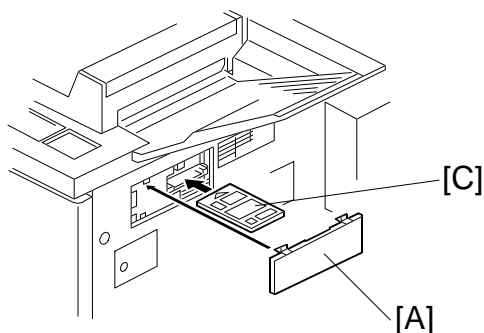
The flash memory card holds two programs, one is for the SICU and the other is for the BCU. Both programs can be downloaded from the slot in the SICU (the program for the BCU is transferred from the SICU).

There is also a function to download the program from the SICU to a flash memory card. However, the BCU program cannot be downloaded to a flash memory card.

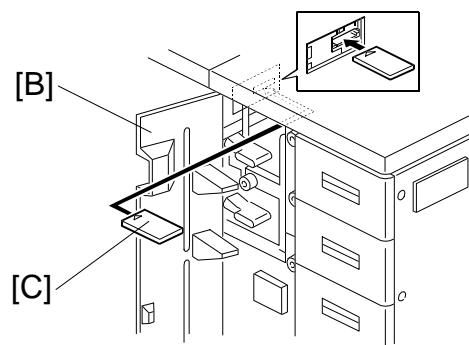
**NOTE:** The procedure for how to write the source software from a flash memory card writer to a flash memory card is described in the SwapBox FTL manual.

### *Download to the SICU and BCU*

**NOTE:** The program for the SICU and the program for the BCU can be downloaded separately. However, both programs should be updated at the same time to prevent mismatching of the programs.



A294M900.WMF



A294M025.WMF

1. Turn off the main power switch.
2. Remove the flash memory card cover [A]. If the optional LCT is installed, open the left cover [B] of the LCT.
3. Plug the flash memory card [C] into the card slot in the SICU.  
**NOTE:** Make sure that the surface printed "A" faces upwards.
4. Turn on the main power switch.
5. Touch "Install" to download the SICU software. The machine erases the current software, then writes the new software to the SICU.
6. Touch "Install" to download the BCU software. The machine erases the current software, then writes the new software to the BCU.

If downloading from the flash card to the SICU failed, an error message appears on the display. At this time, touch the "OK" key to re-try the download.

***Download to the BCU***

**NOTE:** This procedure is required only when download from the SICU to the BCU failed for some reason.

1. Turn off the main power switch.
2. Remove the upper rear cover.
3. Plug the flash memory card into the card slot of the BCU.  
**NOTE:** Set the card so that the surface printed "A" is visible.
4. Turn on the main power switch.
5. Touch "Install" on the display to download the BCU software. The machine erases the current software, then writes the new software to the BCU.
6. Turn the main switch off, then remove the card from the BCU.

***Download from SICU to Flash Memory Card***

1. Turn off the main switch.
2. Plug a blank flash memory card into the card slot of the SICU.  
**NOTE:** Make sure that the surface printed "A" faces upwards.
3. Turn on the main switch.
4. Select [4. Program Upload (SICU)].
5. Press [EXEC] on the display.
6. After download is completed, turn the main switch off and remove the flash memory card.

## 4.5 NVRAM DATA DOWNLOAD

The NVRAM data in the SICU and BCU can be downloaded to a flash memory card. The downloaded data can be copied back to the machine.

This is useful to save the settings before a RAM clear is done. The procedure is as follows:

**NOTE:** It is recommended that the current settings are printed out before starting the following procedure, in case the download fails.

### ***Download from the SICU and BCU NVRAMs to the Flash Memory Card***

1. Turn the main switch off.
2. Plug a blank flash memory card into the card slot of the SICU.  
**NOTE:** Make sure that the surface printed "A" faces upwards.
3. Turn on the main switch.  
**NOTE:** If the flash memory card contains SICU and BCU firmware, the firmware download screen will now appear. Press [EXIT] on this screen to go on to step 4. (Note that the firmware on the card will be erased by the following steps.)
4. Select [3. NVRAM Upload]
5. Press [EXEC] on the display.
6. After the download is completed, turn the main switch off and remove the flash memory card.

### ***Download from the Flash Memory Card to the NVRAMs***

**NOTE:** The download can be done separately for the BCU or SICU, or for user tool settings only.

1. Turn the main switch off.
2. Plug the flash memory card which contains the NVRAM data into the card slot of the SICU.  
**NOTE:** Make sure that the surface printed "A" faces upwards.
3. Turn on the main switch.
4. Select [2. NVRAM Download]
5. Select the required menu item from the following.
  - [1. All NVRAM Download]: (Downloads all data in the NVRAMs to the SICU and BCU.)
  - [2. Mode NVRAM Down load]: (Downloads only UP mode settings)
  - [3. SICU NVRAM Down load]: (Downloads the data to the NVRAM on the SICU)
  - [4. BCU NVRAM Down load]: (Downloads the data to the NVRAM on the BCU)
6. Press [EXEC] on the display.
7. After the download is completed, turn the main switch off and remove the flash memory card.



## 4.6 LANGUAGE DATA DOWNLOAD

This machine can use up to two languages for the operation panel display. The stored languages can be replaced with other languages.

1. Turn the main switch off.
2. Connect the flash memory card which contains the language data to the SICU flash card slot.
3. Turn the main switch on.
4. Select the language to be replaced (1st or 2nd), and press [Select] on the screen.
5. Select the language to be installed on the screen. (If the 2nd language is unnecessary, it can be deleted by selecting [0. Delete].)
6. If necessary, repeat steps 4 and 5 to replace another language (1st or 2nd).
7. Press [Install] on the screen, or press # to start overwriting the language(s). The machine erases the current language(s) and writes the new language(s).
8. When the downloading is completed, turn the main switch off and remove the flash memory card.

## 4.7 STAMP DATA DOWNLOAD

Both hard disks contain the stamp data used with the stamp feature. However, if a disk is replaced, the replacement disk does not have this stamp data. The data must be reinstalled from an IC card which contains the stamp data.

1. Turn the main switch off.
2. Connect the flash memory card which contains the stamp data to the SICU flash card slot.  
**NOTE:** Make sure that the surface printed "A" faces upwards.
3. Turn the main switch on.  
**NOTE:** If the flash memory card contains SICU and BCU firmware, the firmware download screen will now appear. Press [EXIT] on this screen to go on to step 4. (Note that the firmware on the card will be erased by the following steps.)
4. Select [1. Stamp Data Download].
5. Press [EXEC] on the display.
6. After the download is completed, turn the main switch off and remove the flash memory card.

## 4.8 USER PROGRAM MODE

### 4.8.1 HOW TO ENTER AND EXIT UP MODE

The user program (UP) mode is accessed by users, and by sales and service staff. UP mode is used to input the copier's default settings.

Press the User Tools/Counter button, then select the UP mode program. After finishing the UP mode program, touch "Exit" key to exit UP mode.

### 4.8.2 UP MODE TABLE

**NOTE:** Each UP mode is explained in the operating instructions.

#### *System Settings*

|                  |                                    |
|------------------|------------------------------------|
| General Features | Function Priority                  |
|                  | Panel tone                         |
|                  | Ready Panel Tone                   |
|                  | Copy Count Display                 |
|                  | System Reset                       |
|                  | Panel Off Timer                    |
|                  | Auto Tray Switching                |
|                  | Copier/Document Server Output Tray |
|                  | Status Indicator                   |
|                  | Language Priority                  |
|                  | Screen Color Setting               |
|                  | Paper Tray Priority                |
|                  | Original: F/F4 Size Setting        |
| Timer Setting    | Date                               |
|                  | Time                               |
|                  | Weekly Timer: Monday               |
|                  | Weekly Timer: Tuesday              |
|                  | Weekly Timer: Wednesday            |
|                  | Weekly Timer: Thursday             |
|                  | Weekly Timer: Friday               |
|                  | Weekly Timer: Saturday             |
|                  | Weekly Timer: Sunday               |
|                  | Key Operator Code for Off Setting  |

|                    |                            |
|--------------------|----------------------------|
| Paper Size Setting | Tray 1: Paper Type         |
|                    | Tray 2: Paper Type         |
|                    | Tray 3: Paper Type         |
|                    | Tray 4: Paper Type         |
|                    | Tray 5: Paper Type         |
|                    | Tray 6: Paper Type         |
|                    | Slip Sheet 1               |
|                    | Slip Sheet 2               |
|                    | Slip Sheet 3               |
|                    | Cover Sheet                |
|                    | Separation sheet           |
| Key Operator Tools | User Codes:                |
|                    | Copier/Document Server     |
|                    | Key Counter: Copier Access |
|                    | Key Operator Access        |
|                    | User Code Display          |
|                    | AOF (Keep it on)           |
|                    | Memory Allocation          |
|                    | Display/Print Counter      |

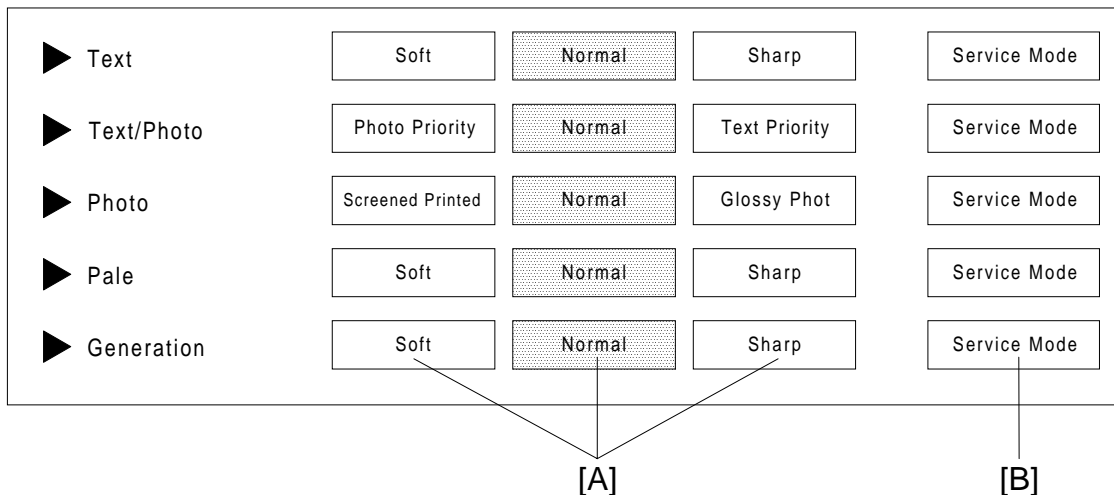
**Copy Features Table**

| <b>Tab</b>       | <b>Category</b>        | <b>Item</b>                           |
|------------------|------------------------|---------------------------------------|
| General Features | General Features       | Auto Paper Select Priority            |
|                  |                        | Auto Density Select Priority          |
|                  |                        | Original Mode Priority                |
|                  |                        | Paper Tray Priority                   |
|                  |                        | Duplex Mode Priority                  |
|                  |                        | Original Orientation in Duplex Mode   |
|                  |                        | Copy Orientation in Duplex Mode       |
|                  |                        | Initial Mode Set                      |
|                  |                        | Maximum Copy Quantity                 |
|                  |                        | Copy Reset Timer                      |
|                  |                        | Job List Screen Timeout               |
|                  | Set Ratio              | Preset Reduce Enlarge Setting         |
|                  |                        | Ratio Priority                        |
|                  |                        | Shortcut R/E                          |
|                  |                        | Create Margin ration Setting          |
|                  | Image Quality          | Text                                  |
|                  |                        | Text/Photo                            |
|                  |                        | Photo                                 |
|                  |                        | Pale                                  |
|                  |                        | Generation                            |
|                  | Display/Panel Tone     | Original Mode Display                 |
|                  |                        | Paper Tray Display                    |
|                  |                        | Other Tab Priority Function Setting   |
|                  |                        | Image Adjustment Priority             |
|                  |                        | Stamp Priority                        |
|                  |                        | Staple Format Setting                 |
|                  |                        | Original Tone                         |
|                  |                        | Job End Call                          |
|                  | Adjust Image           | Copy Back Cover                       |
|                  |                        | Front Margin: Left/Right              |
|                  |                        | Back Margin: Left/Right               |
|                  |                        | Front Margin: Top/Bottom              |
|                  |                        | Back Margin: Top/Bottom               |
|                  |                        | 1 → Duplex Auto Margin Adjust         |
|                  |                        | Border Erase Width                    |
|                  |                        | Combine Orig. Shadow Erase            |
|                  |                        | Center Erase Width                    |
|                  |                        | Repeat Separation Line                |
|                  |                        | Double Copies Separation Line         |
|                  |                        | Combine Separation Line               |
|                  |                        | Copy Orientation in Combine Mode      |
|                  |                        | Booklet/Magazine Original Orientation |
| Stamp Setting    | Background No. Setting | Background Numbering Size             |
|                  |                        | Background Numbering Density          |

| Tab                                 | Category                                | Item                                    |
|-------------------------------------|---|---|
| Stamp Setting                       | Background No. Setting                  | Background Numbering: Positive Negative |
|                                     | Preset Stamp Setting                    | Language Setting                        |
|                                     |   | Stamp Type Priority                     |
|                                     |   | Stamp Layout                            |
|                                     |   | Position Setting                        |
|                                     |   | Size Setting                            |
|                                     |   | Density                                 |
|                                     |   | Print Page                              |
|                                     |   | Preset Stamp: Positive/Negative         |
|                                     | User Stamp Setting                      | Register/Delete Stamp                   |
|                                     |   | Position: Stamp 1-5                     |
|                                     | Data Stamp Setting                      | Type Setting                            |
|                                     |   | Font Setting                            |
|                                     |   | Position Setting                        |
|                                     |   | Size Setting                            |
|                                     |   | Date Stamp: Positive/Negative           |
|                                     | Page Number Setting                     | Page Numbering type Priority            |
|                                     |   | Font Setting                            |
|                                     |   | Size setting                            |
|                                     |   | Duplex Back Page Number                 |
|                                     |   | Page Numbering in Combine Mode          |
|                                     |   | Copy On Slip In Designate Mode          |
|                                     |   | Page Numbering: Positive/Negative       |
|                                     |   | Position: P1, P2                        |
|                                     |   | Position: 1/5, 2/5                      |
| Input Output                        | SADF Auto Reset                         |   |
|                                     | Rise ADF Orig. Table When               |   |
|                                     | Deliver Copies Face Up/Down From Platen |   |
|                                     | Auto Sort Mode                          |   |
|                                     | Memory Full Auto Scan Restart           |   |
|                                     | Shift Print In Sort/Stack Mode          |   |
|                                     | Separation Sheet                        |   |
| Document server                     | Auto File Delete Period                 |   |
|                                     | List Display Priority                   |   |
|                                     | Delete All Stored Files                 |   |
| Key Operator Tools<br>Count Manager | Print Counter List                      |   |
|                                     | Reset Counters                          |   |
|                                     | Reset All                               |   |
|                                     | Register                                |   |
|                                     | Change                                  |   |
|                                     | Delete User Code                        |   |
|                                     | Delete All User Codes                   |   |

### 4.8.3 IMAGE QUALITY SETTING BY UP MODE

'Original Mode Level' in the 'General Features' UP menu is related to the 'MTF Filter Settings' SP mode.



A294M511.WMF

Service Tables

If a setting from the above three columns [A] is selected, the MTF level (coefficient) and MTF strength (SP4-903-20 to 58) are fixed. Any changes to the SP mode settings are not reflected on the copy. To use the settings specified by SP mode, the user must select "Service Mode" [B].

The detailed relationship between the different original modes, the UP modes, and the SP modes are as follows.

#### Text Mode

Different gamma correction settings are used for "Sharp", "Normal" or "Soft" mode. So, when adjusting the "Service Mode" setting, first select a gamma correction setting for the basic image setting using SP4-903-84.

1. The following tables should be used when 1 (Normal) or 2 (Sharp) is selected in SP4-903-84.

Magnification Ratio: 25 ~ 49%

| MTF Filter Strength  | Strong |       |        |    |   | Weak |
|--|--------|-------|--------|----|---|------|
| UP mode  |        | Sharp | Normal |    |   |      |
| Pre-filter Type – Text<br>SP4-903-010                        | 1      | 1     | 1      | 1  | 1 | 1    |
| Filter Level – Text<br>Main Scan Direction<br>SP4-903-020    | 13     | 13    | 13     | 13 | 7 | 7    |
| Filter Strength – Text<br>Main Scan Direction<br>SP4-903-022 | 3      | 2     | 1      | 0  | 0 | 0    |



Magnification Ratio: 50 ~ 154%

| MTF Filter Strength  | Strong |       |        |    | Weak |
|--|--------|-------|--------|----|------|
| UP mode  |        | Sharp | Normal |    |      |
| Pre-filter Type – Text<br>SP4-903-011                        | 0      | 0     | 0      | 0  | 2    |
| Filter Level – Text<br>Main Scan Direction<br>SP4-903-024    | 13     | 13    | 13     | 13 | 13   |
| Filter Strength – Text<br>Main Scan Direction<br>SP4-903-026 | 3      | 2     | 1      | 0  | 0    |

Magnification Ratio: 155 ~ 256%

| MTF Filter Strength  | Strong |       |        |   | Weak |
|--|--------|-------|--------|---|------|
| UP mode  |        | Sharp | Normal |   |      |
| Filter Level – Text<br>SP4-903-028                           | 13     | 13    | 13     | 9 | 7    |
| Filter Strength – Text<br>Main Scan Direction<br>SP4-903-030 | 2      | 1     | 0      | 0 | 0    |

Magnification Ratio: 257 ~ 400%

| MTF Filter Strength  | Strong |       |        |   | Weak |
|--|--------|-------|--------|---|------|
| UP mode  |        | Sharp | Normal |   |      |
| Filter Level – Text<br>SP4-903-032                           | 13     | 13    | 13     | 9 | 7    |
| Filter Strength – Text<br>Main Scan Direction<br>SP4-903-034 | 2      | 1     | 0      | 0 | 0    |

2. The following tables should be used when 0 (Soft) is selected in SP4-903-84.

Magnification Ratio: 25 ~ 49%

| MTF Filter Strength  | Strong |   |      |   | Weak |
|--|--------|---|------|---|------|
| UP mode  |        |   | Soft |   |      |
| Pre-filter Type – Text<br>SP4-903-010                        | 1      | 1 | 1    | 1 | 1    |
| Filter Level – Text<br>Main Scan Direction<br>SP4-903-020    | 3      | 3 | 3    | 3 | 3    |
| Filter Level – Text<br>Sub Scan Direction<br>SP4-903-021     | 6      | 6 | 6    | 6 | 6    |
| Filter Strength – Text<br>Main Scan Direction<br>SP4-903-022 | 4      | 3 | 2    | 1 | 1    |
| Filter Strength – Text<br>Sub Scan Direction<br>SP4-903-023  | 2      | 2 | 1    | 1 | 0    |

## Magnification Ratio: 50 ~ 154%

| MTF Filter Strength  | Strong |   |      |   | Weak |
|--|--------|---|------|---|------|
| UP mode  |        |   | Soft |   |      |
| Pre-filter Type – Text<br>SP4-903-011                        | 0      | 0 | 0    | 0 | 0    |
| Filter Level – Text<br>Main Scan Direction<br>SP4-903-024    | 3      | 3 | 3    | 3 | 3    |
| Filter Level – Text<br>Sub Scan Direction<br>SP4-903-025     | 6      | 6 | 6    | 6 | 6    |
| Filter Strength – Text<br>Main Scan Direction<br>SP4-903-026 | 4      | 3 | 2    | 1 | 1    |
| Filter Strength – Text<br>Sub Scan Direction<br>SP4-903-027  | 2      | 2 | 1    | 1 | 0    |

## Magnification Ratio: 155 ~ 256%

| MTF Filter Strength  | Strong |   |      |   | Weak |
|--|--------|---|------|---|------|
| UP mode  |        |   | Soft |   |      |
| Filter Level – Text<br>Main Scan Direction<br>SP4-903-028    | 0      | 0 | 0    | 0 | 0    |
| Filter Level – Text<br>Sub Scan Direction<br>SP4-903-029     | 2      | 2 | 2    | 2 | 2    |
| Filter Strength – Text<br>Main Scan Direction<br>SP4-903-030 | 5      | 4 | 2    | 2 | 1    |
| Filter Strength – Text<br>Sub Scan Direction<br>SP4-903-031  | 5      | 4 | 4    | 2 | 1    |

Service  
Tables

## Magnification Ratio: 257 ~ 400%

| MTF Filter Strength  | Strong |   |      |   | Weak |
|--|--------|---|------|---|------|
| UP mode  |        |   | Soft |   |      |
| Filter Level – Text<br>Main Scan Direction<br>SP4-903-032    | 0      | 0 | 0    | 0 | 0    |
| Filter Level – Text<br>Sub Scan Direction<br>SP4-903-033     | 2      | 2 | 2    | 2 | 2    |
| Filter Strength – Text<br>Main Scan Direction<br>SP4-903-034 | 5      | 4 | 2    | 2 | 1    |
| Filter Strength – Text<br>Sub Scan Direction<br>SP4-903-035  | 5      | 4 | 4    | 2 | 1    |

**Text/Photo Mode**

Initially, the same filter settings are used for Sharp, Normal, and Soft in Text/Photo mode. The difference of each image mode is due to the gamma correction setting. The following filter settings should be changed after selecting the gamma correction setting in SP4-903-85.

Magnification Ratio: 25 ~ 49%

| MTF Filter Strength  | Strong |    |  |   |   | Weak |
|--|--------|----|--|---|---|------|
| UP mode  |        |    | Photo Priority<br>Normal Text Priority |   |   |      |
| Pre-filter Type – Text/Photo<br>SP4-903-013                        | 1      | 1  | 1                                      | 1 | 1 |      |
| Filter Level – Text/Photo<br>Main Scan Direction<br>SP4-903-039    | 13     | 13 | 13                                     | 9 | 7 |      |
| Filter Strength – Text/Photo<br>Main Scan Direction<br>SP4-903-041 | 2      | 1  | 0                                      | 0 | 0 |      |

Magnification Ratio: 50 ~ 154%

| MTF Filter Strength  | Strong |    |  |    |    | Weak |
|--|--------|----|--|----|----|------|
| UP mode  |        |    | Photo Priority<br>Normal Text Priority |    |    |      |
| Pre-filter Type – Text/Photo<br>SP4-903-014                        | 0      | 0  | 0                                      | 2  | 1  |      |
| Filter Level – Text/Photo<br>Main Scan Direction<br>SP4-903-43     | 13     | 13 | 13                                     | 13 | 13 |      |
| Filter Strength – Text/Photo<br>Main Scan Direction<br>SP4-903-045 | 2      | 1  | 0                                      | 0  | 0  |      |

Magnification Ratio: 155 ~ 256%

| MTF Filter Strength  | Strong |    |  |   |   | Weak |
|--|--------|----|--|---|---|------|
| UP mode  |        |    | Photo Priority<br>Normal Text Priority |   |   |      |
| Filter Level – Text/Photo<br>Main Scan Direction<br>SP4-903-047    | 13     | 13 | 13                                     | 9 | 7 |      |
| Filter Strength – Text/Photo<br>Main Scan Direction<br>SP4-903-049 | 2      | 1  | 0                                      | 0 | 0 |      |

Magnification Ratio: 257 ~ 400%

| MTF Filter Strength  | Strong |    |  |   | Weak |
|--|--------|----|--|---|------|
| UP mode  |        |    | Photo Priority<br>Normal Text Priority |   |      |
| Filter Level – Text/Photo<br>Main Scan Direction<br>SP4-903-051    | 13     | 13 | 13                                     | 9 | 7    |
| Filter Strength – Text/Photo<br>Main Scan Direction<br>SP4-903-053 | 2      | 1  | 0                                      | 0 | 0    |

### Photo Mode

Normally the smoothing filter is used in this mode, whether the user selects “Glossy Photo”, “Normal”, or “Screen Printed”.

When a stronger setting is selected, the reproduction of graduations is improved. However, the image tends to go out of focus.

| MTF Filter Strength                             | Strong |                     |   |   |        |   |   | Weak            |    |
|---|--------|---------------------|---|---|--------|---|---|-----------------|----|
| UP mode   |        | Screened<br>Printed |   |   | Normal |   |   | Glossy<br>Photo |    |
| Pre-filter Type – Photo Mode<br>SP4-903-012     |        | 1                   | 2 | 1 | 1      | 1 | 7 | 7               | 10 |
| Smoothing Filter – Photo<br>Mode<br>SP4-903-037 |        | 4                   | 4 | 2 | 1      | 0 | 1 | 0               | 0  |

Service  
Tables

If the user selects “Service Mode” to use another smoothing filter setting, SP4-903-009 (Filter Type Selection in Photo Mode) should be “1: Smoothing”.

If the user selects “Service Mode” to use an MTF filter setting for photo mode, SP4-903-009 (Filter Type Selection in Photo Mode) should be “0: MTF”.

The following table should be used to change the MTF filter strength for Photo mode.

| MTF Filter Strength                               | Strong |    |    |    | Weak |
|---|--------|----|----|----|------|
| UP mode   |        |    |    |    |      |
| Pre-filter Type – Photo Mode<br>SP4-903-012       | 10     | 10 | 7  | 2  | 1    |
| MTF Filter – Photo Mode<br>SP4-903-36             | 13     | 13 | 13 | 13 | 13   |
| MTF Filter Strength –<br>Photo Mode<br>SP4-903-38 | 2      | 1  | 1  | 1  | 0    |

**Pale Mode**

| MTF Filter Strength                        | Strong |       |   |        |   |      | Weak |
|--|--------|-------|---|--------|---|------|------|
| UP mode                                    |        | Sharp |   | Normal |   | Soft |      |
| Pre-filter Type – Pale Mode<br>SP4-903-015 | 1      | 1     | 1 | 1      | 1 | 1    | 1    |
| Filter Level – Pale Mode<br>SP4-903-055    | 3      | 3     | 3 | 3      | 3 | 3    | 1    |
| Filter Strength – Pale Mode<br>SP4-903-056 | 6      | 5     | 4 | 3      | 2 | 1    | 0    |

**Generation Mode**

| MTF Filter Strength                                 | Strong |       |    |        |    |      | Weak |
|---|--------|-------|----|--------|----|------|------|
| UP mode   |        | Sharp |    | Normal |    | Soft |      |
| Pre-filter Type –<br>Generation Mode<br>SP4-903-016 | 1      | 1     | 1  | 1      | 1  | 1    | 1    |
| Filter Level –<br>Generation Mode<br>SP4-903-057    | 13     | 13    | 10 | 13     | 10 | 13   | 7    |
| Filter Strength –<br>Generation Mode<br>SP4-903-058 | 3      | 2     | 2  | 1      | 1  | 0    | 0    |

## 4.8.4 LEDS

### SICU

| Number | Monitored Signal                                   |
|--------|--|
| LED101 | Blinking: Normal<br>Stays on or off: CPU defective |
| LED102 | Off: Normal  |
| LED103 | Off: Normal  |
| LED104 | Blinking: Normal                                   |

### BCU

| Number            | Monitored Signal   |
|-------------------|--|
| LED601<br>(Green) | Off: Normal<br>Stays on: While downloading the flash memory card.      |
| LED602<br>(Red)   | Blinking: Normal<br>Stays on: While downloading the flash memory card. |

### I/O Board

| Number | Monitored Signal   |
|--------|--|
| LED1   | Turns on when motor/solenoid drive signal is sent from the BCU to IOB (Normally on). |

### PSU

| Number | Monitored Signal                       |
|--------|--|
| LED1   | On: Normal                             |
| LED2   | On: Stand-by<br>Off: Energy saver mode |
| LED3   | On: Stand-by<br>Off: Energy saver mode |

### ADF Main Board

○: ON ☆: Blinking

| LED100 | LED101 | LED102 |  |
|--------|--------|--------|--|
| ○      | —      | —      | Entrance Sensor Jam  |
| —      | ○      | —      | Registration Sensor Jam  |
| ○      | ○      | —      | Exit Sensor Jam  |
| —      | —      | ○      | Inverter Sensor Jam  |
| ○      | —      | ○      | Jammed paper not removed:<br>Between entrance sensor + registration sensor |
| ○      | ○      | ○      | Jammed paper not removed: On the exposure glass                            |
| ☆      | —      | —      | Feed-in Motor Abnormal   |
| —      | ☆      | —      | Transport Motor Abnormal   |
| —      | —      | ☆      | Feed-out Motor Abnormal  |
| ☆      | ☆      | —      | Pick-up Motor Abnormal   |
| —      | ☆      | ☆      | Bottom Plate Motor Abnormal  |
| ☆      | ☆      | ☆      | DF Position (Open)   |
| ☆      | —      | ☆      | APS Sensor ON  |
| ☆      | —      | —      | Normal   |

## 4.9 TEST POINTS/DIP SWITCHES/LEDS

### 4.9.1 DIP SWITCHES

SICU

Paper size type default (see SP 5-131)

| SW101 |   | Destination           |
|-------|---|-----------------------|
| 1     | 2 |                       |
| 0     | 0 | Japanese version      |
| 1     | 0 | North America version |
| 0     | 1 | Europe version        |
| 1     | 1 | Chinese version       |

ADF Main Board

| DPS100 |   |   |   | Description   |
|--------|---|---|---|---|
| 4      | 3 | 2 | 1 |   |
| 0      | 0 | 0 | 0 | Normal operating mode   |
| 0      | 0 | 0 | 1 | Motor Test: Transport motor – Forward   |
| 0      | 0 | 1 | 0 | Motor Test: Transport motor – Reverse   |
| 0      | 0 | 1 | 1 | Motor Speed Adjustment (Automatic)  |
| 0      | 1 | 0 | 0 | Original stop position adjustment – Single-sided original mode<br>(No original skew correction) |
| 0      | 1 | 0 | 1 | Original stop position adjustment – Double sided original mode                                  |
| 1      | 0 | 0 | 0 | Free Run: Single-sided original mode with skew correction                                       |
| 1      | 0 | 1 | 0 | Free Run: Single-sided original mode without skew correction                                    |
| 0      | 1 | 1 | 0 | Free Run: Double-sided original mode  |
| Others |   |   |   | Do not select   |

“SADF” LED turns on when one of DIP switch turns on.

MCU: All the dip switches should be OFF. Do not change the settings.



## 4.9.2 TEST POINTS

### ADF Main Board

| Number | Label | Monitored Signal    |
|--------|-------|---------------------|
| TP100  | TXD   | TXD to the copier   |
| TP101  | RXD   | RXD from the copier |
| TP102  | GND   | Ground              |
| TP103  | 12 V  | +12 V               |
| TP104  | 5 V   | +5 V                |

### BCU

| Number | Monitored Signal |
|--------|------------------|
| TP647  | Ground           |
| TP679  | Ground           |

## 4.9.3 FUSES

### ADF Main Board

| Number | Description            |
|--------|------------------------|
| FU100  | Protects the 38 V line |
| FU101  | Protects the 24 V line |

### PSU

| Number | Description                |
|--------|----------------------------|
| FU401  | Protect the ac input line. |

### I/F Board (Option)

| Number             | Description  |
|--------------------|--|
| FJ101<br>(T1A250U) | Protects the 5 V power line. If this fuse is broken, all the related options are not recognized. |

## 4.9.4 VARIABLE RESISTORS

### ADF Main Board

| Number | Function   |
|--------|--|
| VR100  | Adjusts the original stop position for the single-sided original at no skew correction mode. |
| VR101  | Adjusts the original stop position for the double-sided original.                            |

### Charge/Bias/Grid Power Pack

| Number | Function  |
|--------|---|
| VRC    | For the charge corona PWM. This VR is secured by paintlock. Do not change the setting in the field. |
| VRG    | For the grid PWM. This VR is secured by paintlock. Do not change the setting in the field.          |



## 4.10 SPECIAL TOOLS AND LUBRICANTS

### 4.10.1 SPECIAL TOOLS

| Part Number | Description                         | Q'ty |
|-------------|-------------------------------------|------|
| A2309352    | Flash Memory Card - 4MB             | 1    |
| A2309351    | Case - Flash Memory Card            | 1    |
| A0069104    | Scanner Positioning Pin (4 pcs/set) | 1    |
| 54209516    | Test Chart - OS-A3 (10 pcs/Set)     | 1    |
| A0299387    | Digital Multimeter – FLUKE 87       | 1    |

### 4.10.2 LUBRICANTS

| Part Number | Description                | Q'ty |
|-------------|----------------------------|------|
| A0289300    | Grease Barrierta JFE 5 5/2 | 1    |
| 52039502    | Silicone Grease G-501      | 1    |
| G0049668    | Grease: KS660: SHIN ETSU   | 1    |

## 5. PREVENTIVE MAINTENANCE SCHEDULE



### 5.1 PM PARTS

**NOTE:** The amount mentioned as the PM interval indicates the number of prints, unless stated otherwise.

Symbol key: **R**, **r**: Replace on a PM part counter basis (refer to Service Tables – PM Counter)

**R**: The counter counts up every copy, in the same way as the copy counter

**r**: The counter only counts up if that part was used for the copy


**I**: Inspect, and clean and/or lubricate

**i**: Inspect, and clean and/or lubricate only if necessary

| Description                 | Activity Type | Interval | Note/Remarks                                    |
|-----------------------------|---------------|----------|---|
| <b>OPTICS</b>               |               |          |   |
| Exposure Glass              | i             | 300 k    |   |
| 1st ~ 3rd Mirrors           | i             | 300 k    | Optical cloth                                   |
| APS Sensor                  | i             | 300 k    | Dry cloth                                       |
| Scanner Rail                | i             | 300 k    | Dry cloth                                       |
| Scanner Filter              | I             | 600 k    | Blower brush                                    |
| Toner Shield Glass          | I             | 300 k    | Optical cloth                                   |
| LD Filter                   | I             | 300 k    | Blower brush                                    |
| <b>DEVELOPMENT UNIT</b>     |               |          |   |
| Side Seal                   | I             | 300 k    | Blower brush or dry cloth                       |
| Development Unit            | i             | 300 k    | Blower brush or dry cloth                       |
| Entrance Seal               | I             | 300 k    | Blower brush or dry cloth                       |
| Toner Hopper (Outside)      | i             | 300 k    | Blower brush or dry cloth                       |
| Gears (All Gears)           | i             | 300 k    | Blower brush                                    |
| Development Filter          | r             | 320 k    |   |
| Toner Filter (Center)       | r             | 400 k    |   |
| Toner Filter (Front)        | r             | 400 k    |   |
| Developer                   | r             | 390 k    | TD sensor initial setting (SP2-801)             |
| <b>AROUND THE DRUM</b>      |               |          |   |
| Side Seal                   | i             | 300 k    | Blower brush or dry cloth                       |
| Ground Plate/Screw          | i             | 300 k    | Electrical connection check<br>Alcohol or water |
| Drum Filter                 | I             | 380 k    | Blower brush                                    |
| Cleaning Brush Seal         | i             | 300 k    | Blower brush or dry cloth                       |
| Cleaning Entrance Seal      | I             | 300 k    | Blower brush or dry cloth                       |
| ID Sensor                   | I             | 300 k    | Blower brush or dry cloth                       |
| Transfer Unit Entrance Stay | I             | 300 k    | Blower brush or dry cloth                       |
| Corona Wire Casing          | I             | 300 k    | Damp cloth                                      |

| Description                              | Activity Type | Interval | Note/Remarks                |
|--|---------------|----------|-----------------------------|
| Drum Potential Sensor                    | I             | 300 k    | Blower brush                |
| Quenching Lamp                           | I             | 300 k    | Blower brush or dry cloth   |
| Cleaning Brush                           | R             | 300 k    |                             |
| Toner Filter                             | R             | 300 k    |                             |
| Transfer Belt Cleaning Blade             | R             | 450 k    |                             |
| Cleaning Blade                           | R             | 300 k    |                             |
| Grid Plate                               | r             | 380 k    |                             |
| Charge Corona Wire                       | r             | 380 k    |                             |
| Wire Cleaner                             | r             | 380 k    |                             |
| Pick-off Pawls                           | R             | 300 k    |                             |
| Transfer Belt                            | R             | 450 k    |                             |
| Transfer Belt Bias Brush                 | I             | 450 k    | Blower brush                |
| Rear Casing Guide                        | I             | 300 k    | Dry cloth                   |
| Exit Bias Plate                          | I             | 300 k    | Blower brush                |
| Belt Drive Roller                        | I             | 450 k    | Alcohol                     |
| Belt Roller                              | I             | 450 k    | Alcohol                     |
| Cleaning Bias Roller                     | I             | 450 k    | Alcohol                     |
|  |               |          |                             |
| <b>FUSING UNIT</b>                       |               |          |                             |
| Pressure Roller Cleaning Roller Bearings | i             | 600 k    | Inspect only                |
| Pressure Roller Cleaning Roller          | R             | 600 k    |                             |
| Fusing Entrance Guide                    | I             | 300 k    | Clean with water or alcohol |
| Oil Supply & Cleaning Web                | r             | 300 k    |                             |
| Hot Roller                               | r             | 600 k    |                             |
| Hot Roller Stripper                      | r             | 600 k    |                             |
| Pressure Roller Stripper                 |               | 600 k    | Clean with a dry cloth      |
| Fusing Exit Roller                       |               | 600 k    | Clean with water or alcohol |
| Pressure Roller                          | r             | 700 k    |                             |
| Pressure Roller Cleaning Roller Cleaner  | r             | 600 k    |                             |
| Bearings                                 | i             | 300 k    | Inspect only                |
| Bushings                                 | i             | 700 k    | Inspect only                |
|  |               |          |                             |
| <b>PAPER FEED</b>                        |               |          |                             |
| Relay Roller                             | I             | 300 k    | Damp cloth                  |
| Paper Feed Guide Plate                   | i             | 300 k    | Damp cloth                  |
| Registration Rollers                     | I             | 300 k    | Damp cloth                  |
| Registration Sensor                      | I             | 300 k    | Blower brush                |
| Relay Sensor                             | I             | 300 k    | Blower brush                |
| Paper Dust Remover                       | I             | 300 k    | Damp cloth                  |
| Paper Feed Sensor                        | I             | 300 k    | Blower brush                |
| Paper Feed Rollers                       | r             | 300 k    |                             |
|  |               |          |                             |

| Description                  | Activity Type | Interval | Note/Remarks |
|------------------------------|---------------|----------|--------------|
| <b>DUPLEX</b>                |               |          |              |
| Feed and Transport Rollers   | I             | 300 k    | Damp cloth   |
| Reverse and Inverter Rollers | I             | 300 k    | Damp cloth   |
| Entrance Sensor              | I             | 300 k    | Blower brush |
| Entrance Anti-static Brush   | i             | 300 k    | Blower brush |
|                              |               |          |              |



| Description       | Activity Type | Interval | Note/Remarks      |
|-------------------|---------------|----------|-------------------|
| <b>ADF</b>        |               |          |                   |
| Transport Belt    | r             | 80 k     | Belt cleaner      |
| Feed Belt         | r             | 80 k     | Belt cleaner      |
| Separation Roller | r             | 80 k     | Dry or damp cloth |
| Pick-up Roller    | r             | 80 k     | Dry or damp cloth |
| Sensors           | i             | 80 k     | Blower brush      |
| Drive Gears       | i             | 80 k     | Grease G501       |
|                   |               |          |                   |

| Description       | Activity Type | Interval | Note/Remarks      |
|-------------------|---------------|----------|-------------------|
| <b>LCT</b>        |               |          |                   |
| Paper Feed Roller | r             | 300 k    |                   |
| Pick-up Roller    | r             | 300 k    |                   |
| Separation Roller | r             | 300 k    |                   |
| Bottom Plate Pad  | i             | 300 k    | Dry or damp cloth |
|                   |               |          |                   |

Preventive Maintenance

| Description                 | Activity Type | Interval | Note/Remarks                           |
|-----------------------------|---------------|----------|--|
| <b>3,000-SHEET FINISHER</b> |               |          |  |
| Rollers                     | i             | 300 k    | Clean with water or alcohol.           |
| Brush Roller                | i             | 300 k    | Inspect only.<br>Replace if necessary. |
| Discharge Brush             | i             | 300 k    | Clean with a dry cloth.                |
| Sensors                     | i             | 300 k    | Blower brush                           |
| Jogger Fences               | i             | 300 k    | Inspect only.<br>Replace if necessary. |
| Punch Waste Hopper          | i             | 300 k    | Empty the hopper.                      |
|                             |               |          |  |

**NOTE:** PM parts should be replaced on a PM counter basis. The PM counter corresponding to the replaced part should be cleared (refer to Service Tables – PM Counter).

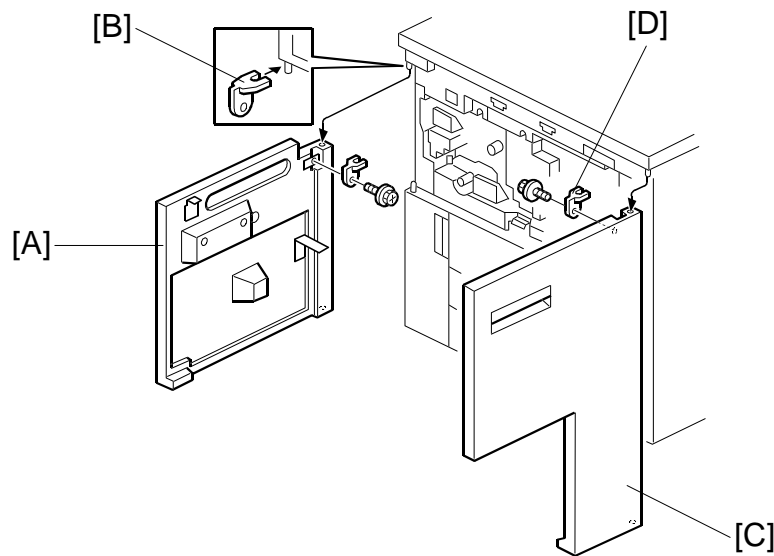
## 6. REPLACEMENT AND ADJUSTMENT

### ⚠ CAUTION

Turn off the main power switch and unplug the machine before attempting any of the procedures in this section.

### 6.1 EXTERIOR

#### 6.1.1 FRONT



A294R945.WMF

#### **Left Door**

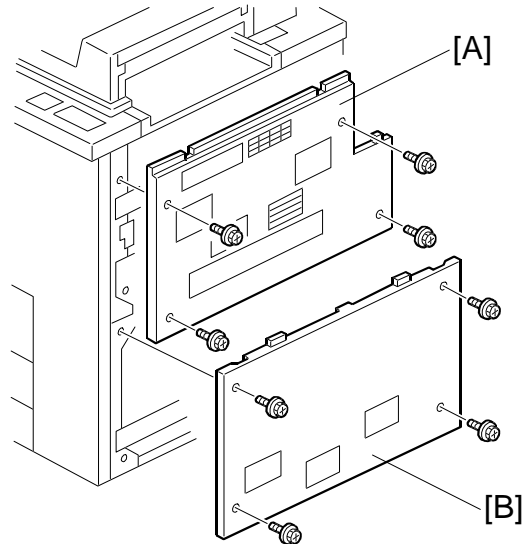
1. Open the left door [A].
2. Remove the stopper [B] (1 screw).
3. Lift up the left door and remove it.

#### **Right Door**

1. Open the right door [C].
2. Remove the stopper [D] (1 screw).
3. Lift up the right door and remove it.

Replacement  
Adjustment

## 6.1.2 RIGHT



A294R946.WMF

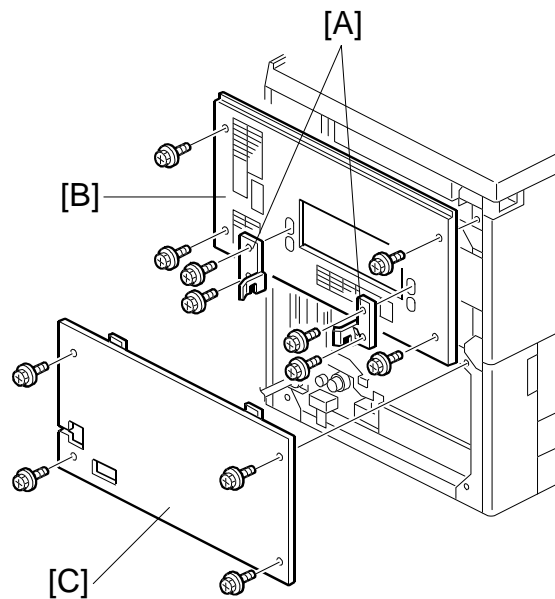
### ***Upper Right Cover***

1. Remove the upper right cover [A] (4 screws).

### ***Lower Right Cover***

1. Remove the lower right cover [B] (4 screws).

### 6.1.3 LEFT



A294R910.WMF

#### ***Upper Left Cover***

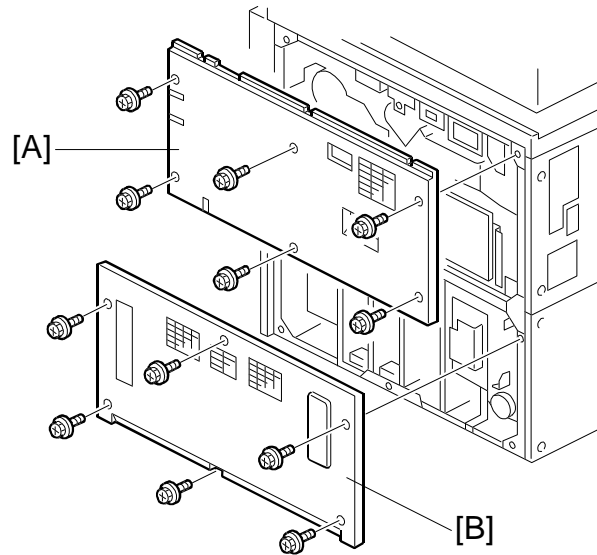
1. Remove the optional finisher, if it is installed.
2. Remove the front and rear joint brackets [A] (2 screws each), if the optional finisher was installed.
3. Remove the upper left cover [B] (4 screws)

#### ***Lower Left Cover***

1. Remove the lower left cover [C] (4 screws).

Replacement  
Adjustment

## 6.1.4 REAR



A294R911.WMF

### ***Upper Rear Cover***

1. Remove the upper rear cover [A] (6 screws).

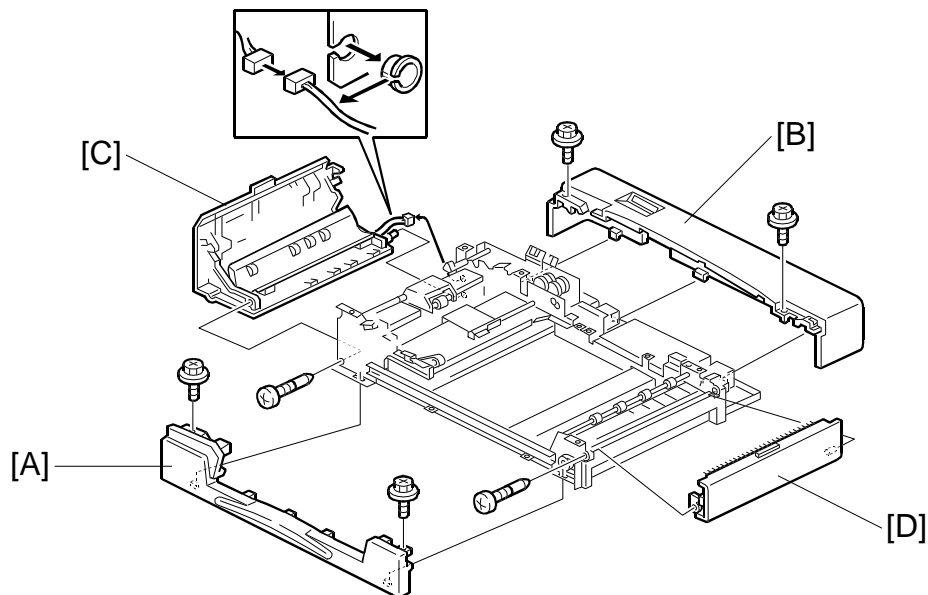
### ***Lower Rear Cover***

1. Remove the lower rear cover [B] (6 screws).



## 6.2 DOCUMENT FEEDER

### 6.2.1 COVER REMOVAL



B301R106.WMF

#### ***Front Cover Removal***

1. Remove the front cover [A] (2 screws).

#### ***Rear Cover Removal***

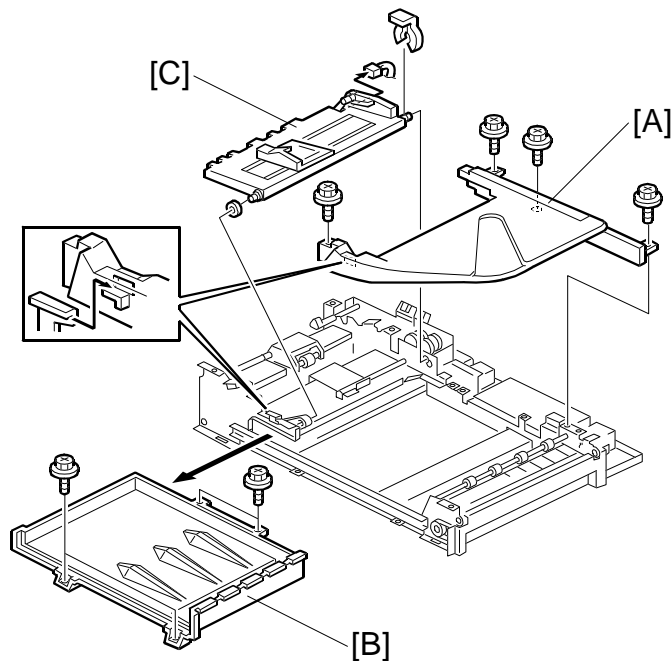
1. Remove the rear cover [B] (3 screws).

#### ***Left Cover Removal***

1. Remove the front cover.
2. Remove the grounding wire (not shown) (1 screw).
3. Remove the left cover [C] (1 screw, 2 connectors).

#### ***Upper Exit Cover Removal***

1. Remove the front cover.
2. Remove the upper exit cover [D] (1 screw).



B301R105.WMF

***Original Tray Removal***

1. Remove the front and rear covers.
2. Remove the original tray [A] (4 screws).

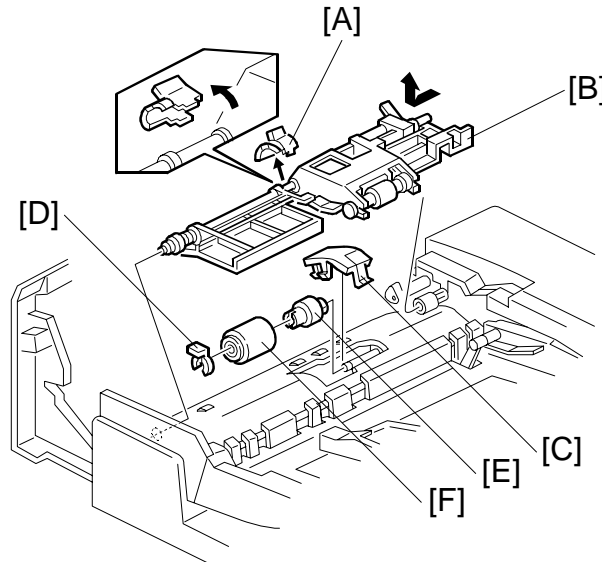
***Upper Cover Removal***

1. Remove the front and rear covers.
2. Remove the original tray.
3. Remove the upper cover [B] (2 screws).

***Bottom Plate Removal***

1. Remove the front and rear covers.
2. Remove the original tray.
3. Remove the bottom plate [C] (1 snap ring, 1 connector).

## 6.2.2 FEED UNIT REMOVAL AND SEPARATION ROLLER REPLACEMENT

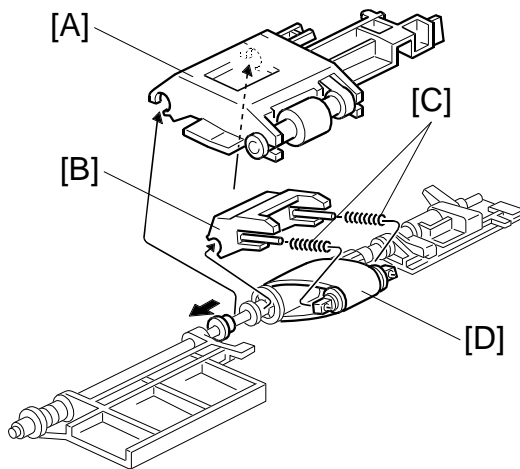


B301R107.WMF

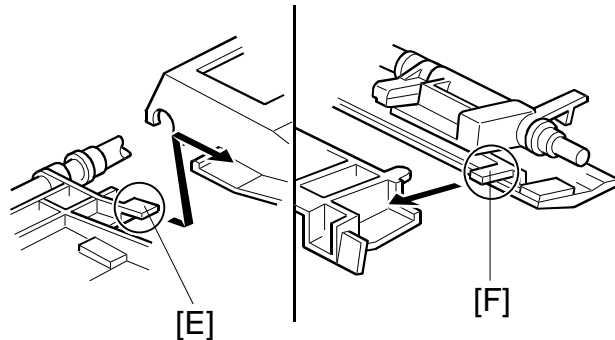
1. Open the left cover.
2. Remove the clip [A].
3. Remove the feed unit [B].  
(Pull the feed unit to the front, release the shaft at the rear, and release the front bushing.)
4. Remove the separation roller cover [C].
5. Remove the snap ring [D].
6. Remove the torque limiter [E] and separation roller [F].

Replacement  
Adjustment

### 6.2.3 FEED BELT REPLACEMENT



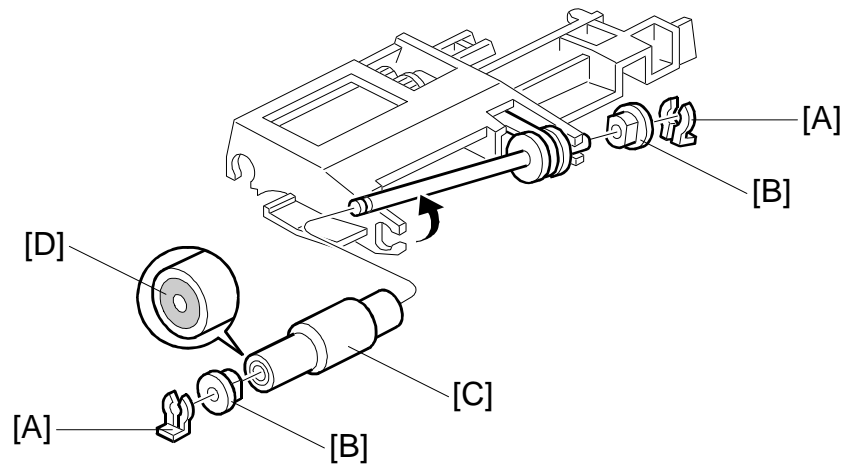
B301R504.WMF



B301R513.WMF

1. Remove the feed unit.
2. Remove the pick-up roller unit [A].
3. Remove the feed belt holder [B].  
**NOTE:** The springs [C] come off the feed belt cover easily.
4. Replace the feed belt [D].  
**NOTE:** When reinstalling the pick-up roller unit, make sure that levers [E] and [F] on the front and rear original guides are resting on the pick-up roller unit cover.

## 6.2.4 PICK-UP ROLLER REPLACEMENT



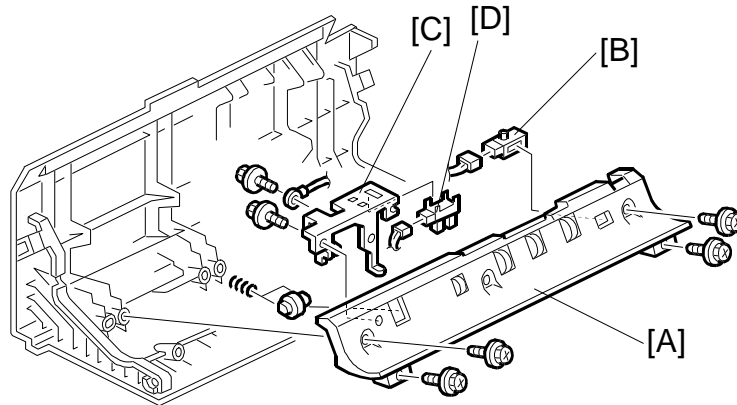
B301R514.WMF

1. Open the left cover.
2. Remove the two snap rings [A].
3. Remove the two bushings [B].
4. Replace the pick-up roller [C].

**NOTE:** When reinstalling the pick-up roller, make sure that the one-way clutch [D] is not at the gear side.

Replacement  
Adjustment

## 6.2.5 SENSOR REPLACEMENT



B301R125.WMF

1. Remove the left cover.
2. Remove the guide plate [A] (5 screws).

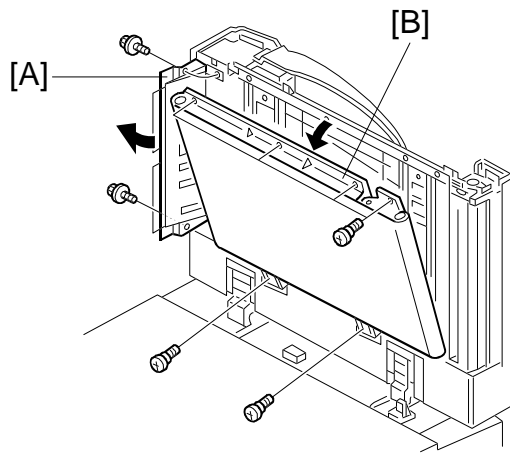
### ***Entrance Sensor***

3. Replace the entrance sensor [B] (1 connector).

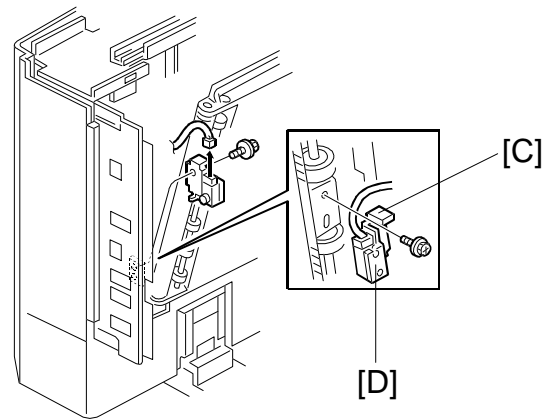
### ***Length Sensor***

3. Remove the length sensor bracket [C] (1 screw).
4. Replace the length sensor [D] (1 connector).

## Registration Sensor



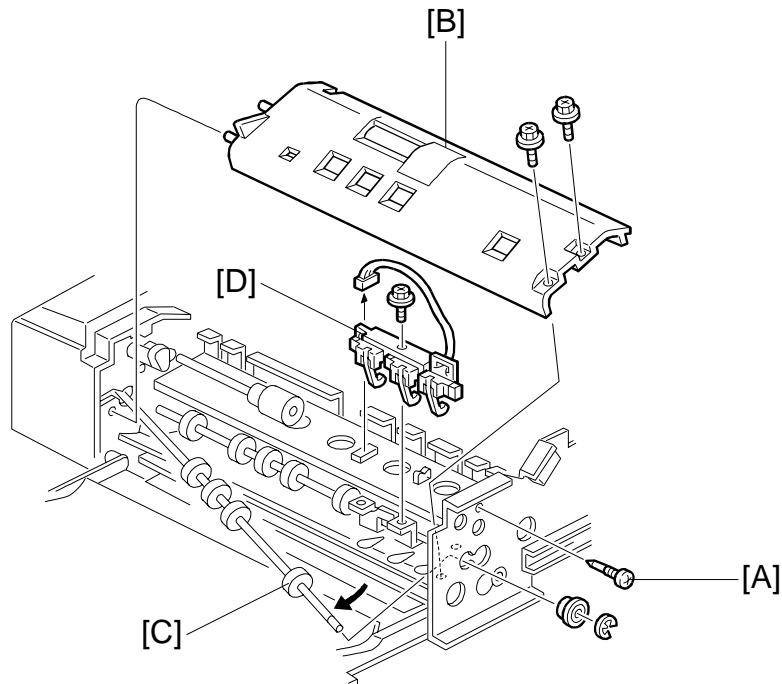
B301R103.WMF



B301R108.WMF

1. Release the entrance guide [A] (2 screws).
2. Release the transport belt unit [B].
3. Remove the sensor bracket [C] (1 screw).
4. Replace the registration sensor [D] (1 connector, 1 screw).

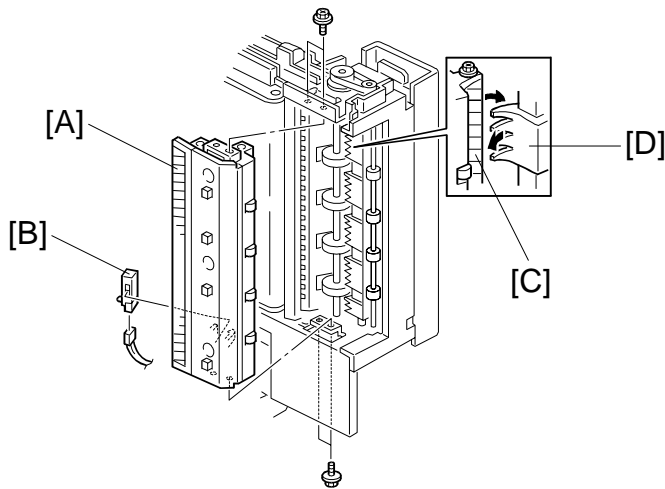
Replacement  
Adjustment

**Width Sensor**

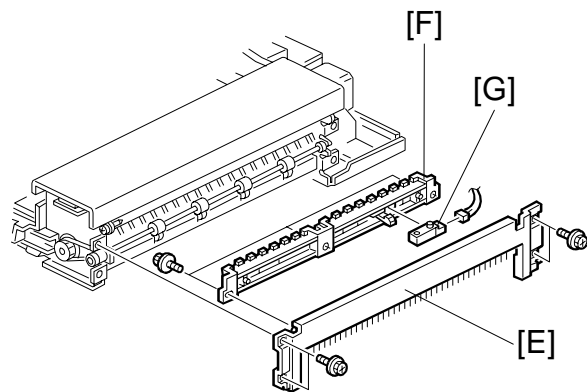
B301R507.WMF

1. Remove the feed unit.
2. Remove the front cover.
3. Remove the stopper screw [A].
4. Remove the guide plate [B] (2 screws).
5. Release the front end of the upper transport roller [C] (1 bushing, 1 E-ring).
6. Remove the sensor unit [D] (1 screw).
7. Replace the width sensor.



***Exit Sensor and Inverter Sensor***

B301R509.WMF



B301R508.WMF

***Exit Sensor***

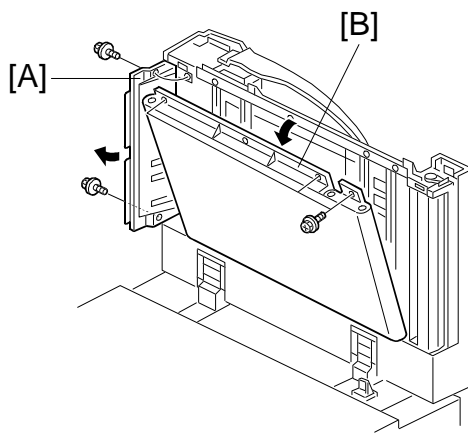
1. Remove the front and rear covers.
2. Remove the exit guide unit [A] (4 screws).
3. Replace the exit sensor [B] (1 connector).

**NOTE:** When reinstalling the exit guide unit, make sure that the guide plate [C] on the exit unit is over the exit gate [D].

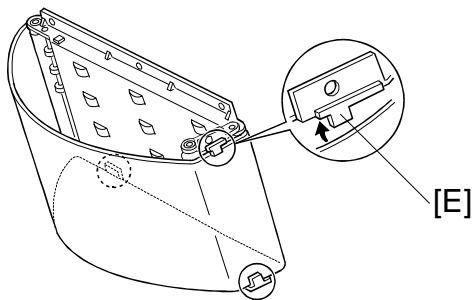
***Inverter Sensor***

1. Remove the front and rear covers.
2. Remove the right lower cover [E] (4 screws).
3. Remove the guide plate [F] (3 screws).
4. Replace the inverter sensor [G] (1 connector).

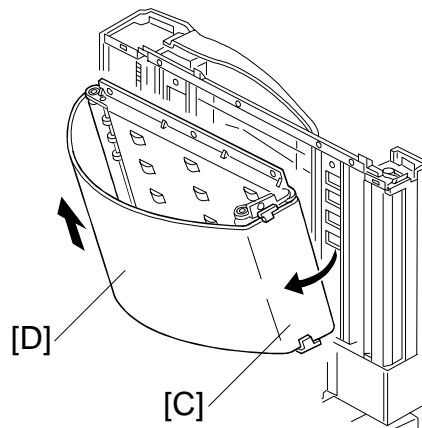
## 6.2.6 TRANSPORT BELT REPLACEMENT



B301R113.WMF



B301R512.WMF



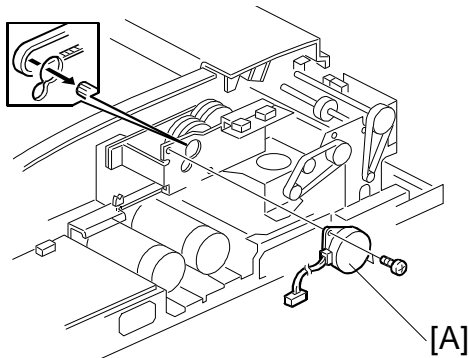
B301R511.WMF

1. Remove the front cover.
2. Release the entrance guide [A] (2 screws).
3. Remove the three screws securing the transport belt assembly [B].
4. Fold up the transport belt assembly extension [C].
5. Pull off the transport belt [D] and replace it.

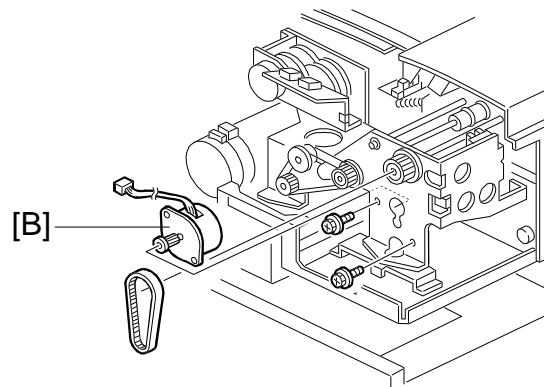
**NOTE:** When installing the transport belt, make sure that the belt runs under the upper and lower belt guide spacers [E].

6. Using SP6-009, do a DF free run for 3 minutes. After the free run is finished, clean off any dust that came off the transport belt onto the exposure glass.

## 6.2.7 MOTOR REPLACEMENT



B301R119.WMF



B301R121.WMF

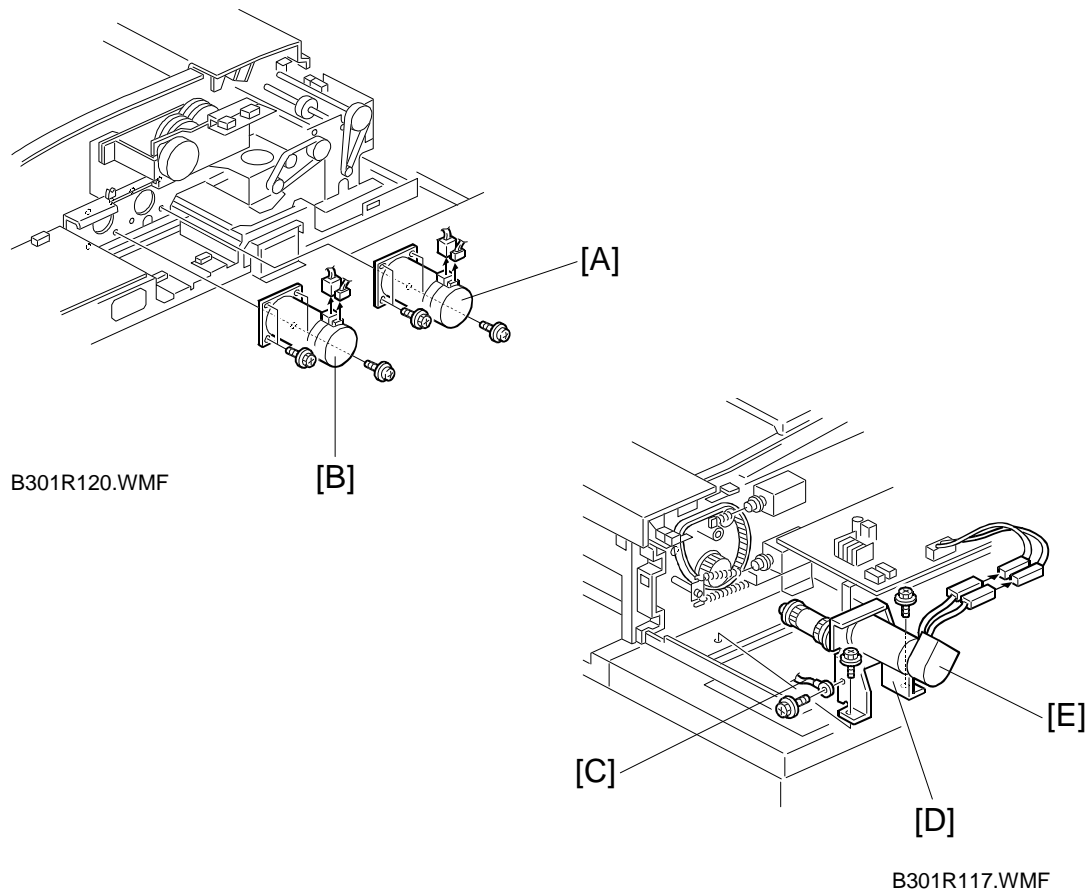
1. Remove the rear cover.

### ***Bottom Plate Motor***

2. Replace the bottom plate motor [A] (2 screws, 1 connector).

### ***Pick-up Motor***

2. Replace the pick-up motor [B] (2 screws, 1 connector).



1. Remove the rear cover.

### ***Feed-in Motor***

2. Replace the feed-in motor [A] (4 screws, 2 connectors).

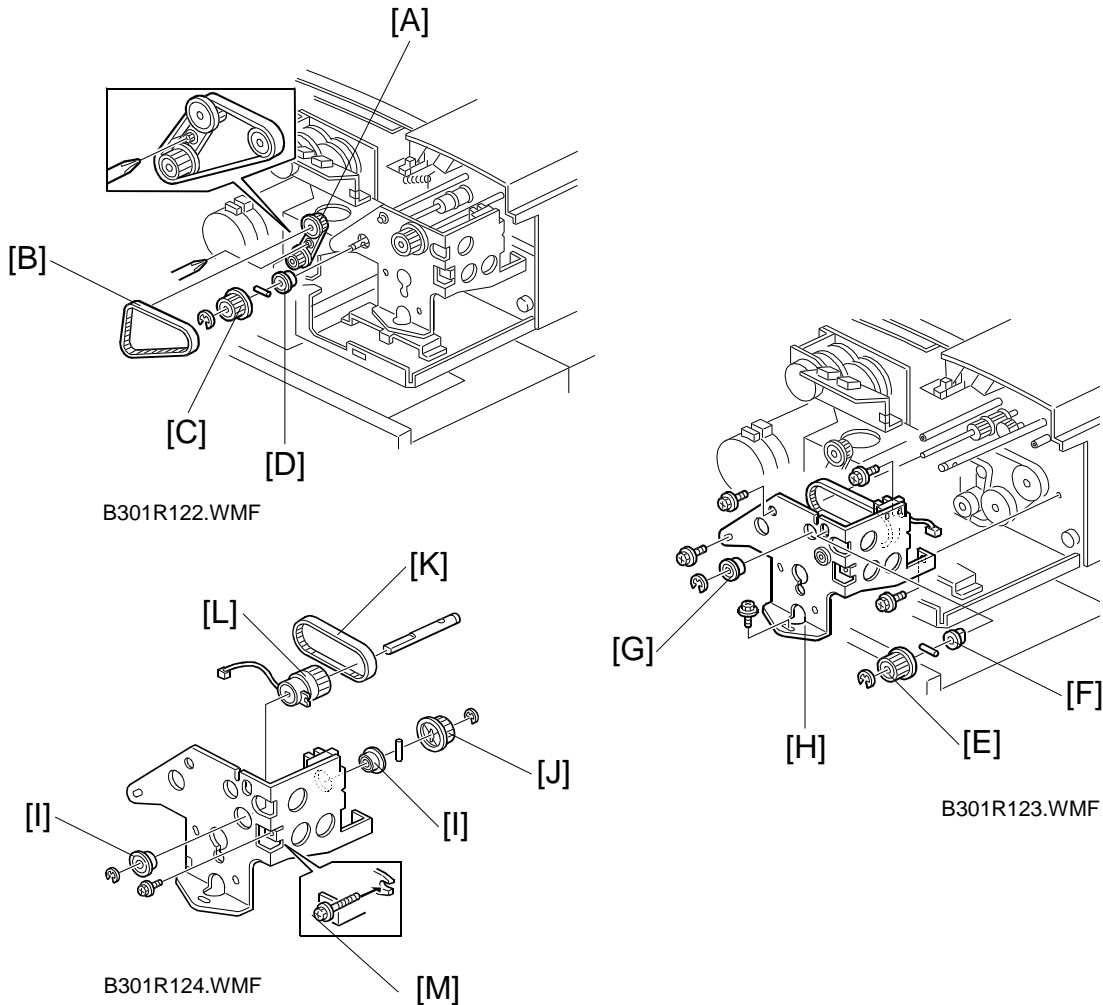
### ***Transport Motor***

2. Replace the transport motor [B] (4 screws, 2 connectors).

### ***Feed-out Motor***

2. Remove the grounding wire [C] (1 screw).
3. Remove the feed-out motor assembly [D] (2 screws, 2 connectors).
4. Replace the feed-out motor [E] (2 screws).

## 6.2.8 FEED-IN CLUTCH REPLACEMENT

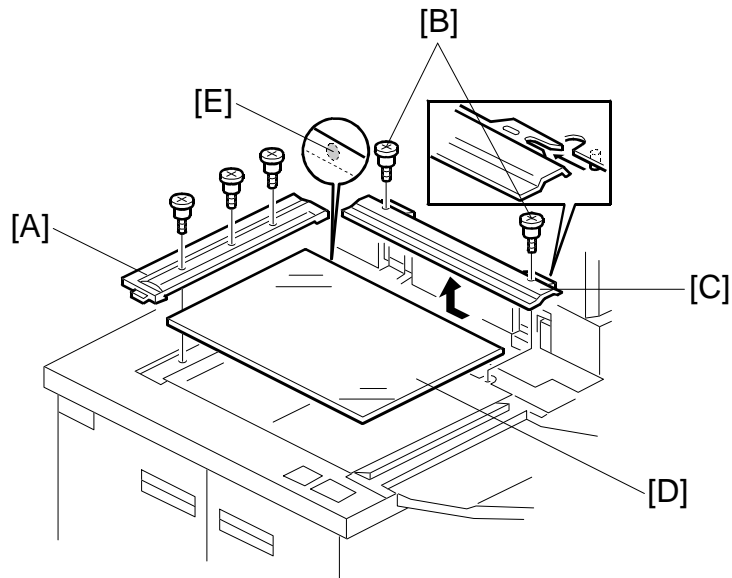


1. Remove the rear cover.
2. Remove a screw from the tightener [A].
3. Remove the timing belt [B].
4. Remove the pulley [C] and ball bearing [D] from the feed-in drive shaft (1 E-ring, 1 pin).
5. Remove the pulley [E] and bushing [F] from the pick-up roller cam shaft (1 E-ring, 1 pin).
6. Remove the ball bearing [G] from the feed belt drive shaft (1 E-ring).
7. Remove the feed-in clutch assembly [H] (5 screws).
8. Remove 2 ball bearings [I] from the feed-in clutch shaft (1 E-ring each).
9. Remove the pulley [J], pin and timing belt [K].
10. Replace the feed-in clutch [L].

**NOTE:** When re-installing the feed-in clutch, put the stopper screw [M] in the clutch hook.

## 6.3 SCANNER UNIT

### 6.3.1 EXPOSURE GLASS

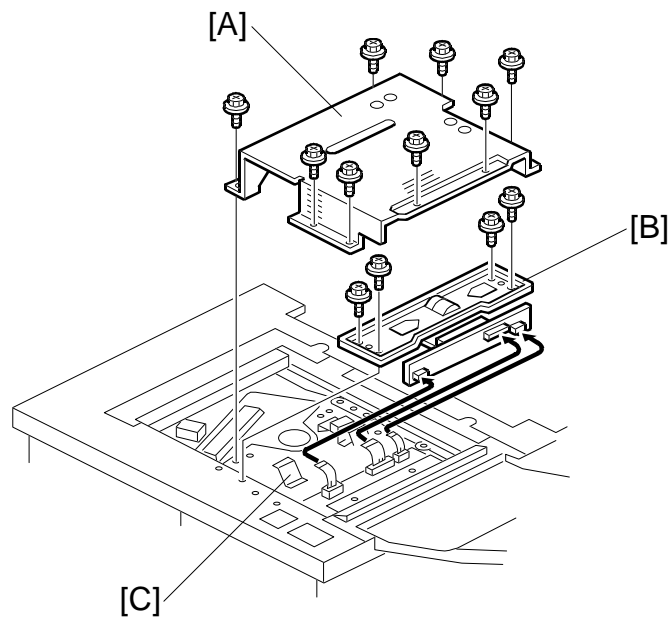


A294R001.WMF

1. Remove the left scale [A] (3 screws).
2. Remove the 2 screws [B] holding the rear scale.
3. Slide the rear scale [C] in the direction of the arrow, then remove it.
4. Remove the exposure glass [D].

**NOTE:** When reinstalling the exposure glass, make sure that the mark [E] is at the rear left corner, as shown.

### 6.3.2 LENS BLOCK



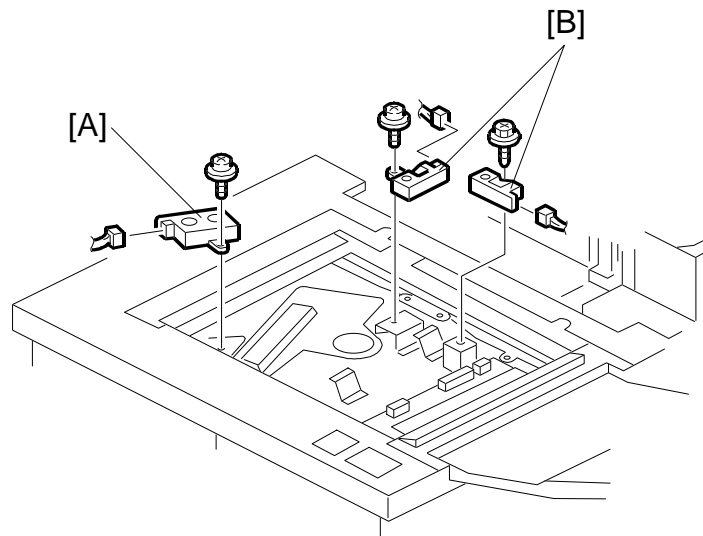
A294R003.WMF

1. Remove the exposure glass. (See Exposure Glass.)
2. Remove the lens cover [A] (8 screws).
3. Remove the lens block [B] (4 screws, 3 connectors).
4. After reassembly, do the scanner and printer copy adjustment. (See Replacement and Adjustment – Copy Image Adjustment.)

**NOTE:** Do not drive the scanner unit without the lens cover. The grounding plates [C] will contact the 1st scanner and damage the scanner.

Replacement  
Adjustment

### 6.3.3 ORIGINAL SIZE SENSORS

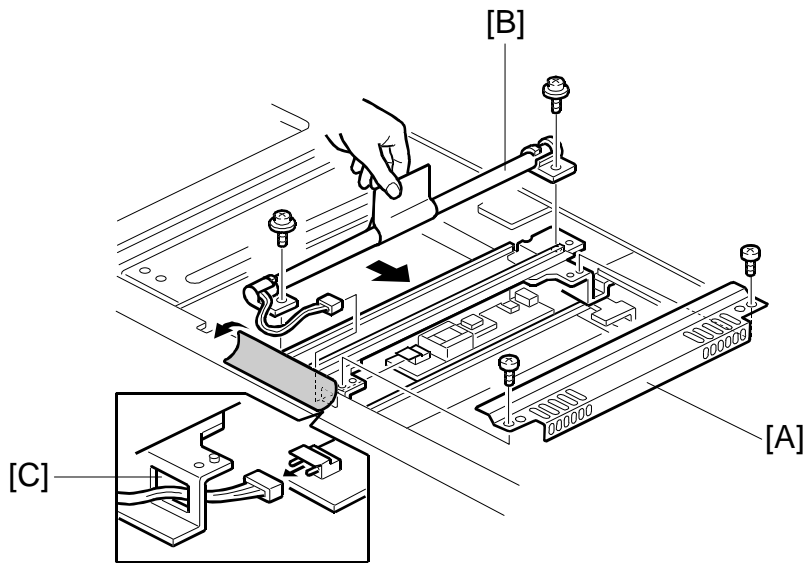


A294R052.WMF

1. Remove the exposure glass. (See Exposure Glass.)
2. Remove the original width sensor [A] (1 screw, 1 connector).
3. Remove the lens cover (8 screws). (See Lens Block.)
4. Remove the original length sensors [B] (1 screw, 1 connector each).



### 6.3.4 EXPOSURE LAMP



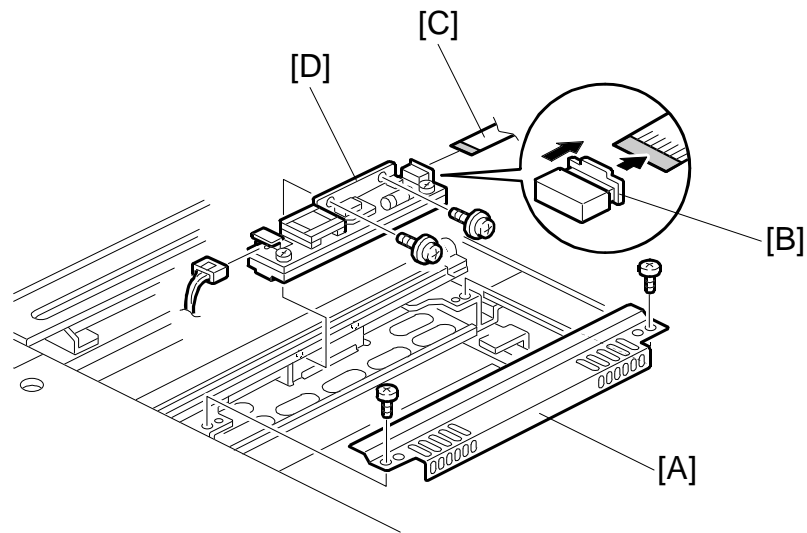
A294R050.WMF

1. Remove the exposure glass. (See Exposure Glass.)
2. Remove the front upper cover (7 screws, 1 connector). See Scanner Motor Removal.
3. Remove the lamp regulator cover [A] (2 screws).
4. Remove the exposure lamp [B] (2 screws, 1 connector).

**NOTE:** When reinstalling the exposure lamp, pass the cable through the opening [C] in the bracket.

Replacement  
Adjustment

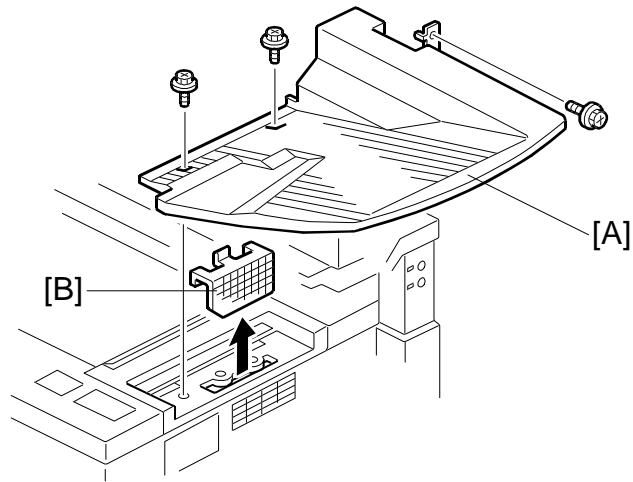
### 6.3.5 LAMP REGULATOR



A294R007.WMF

1. Remove the exposure glass. (See Exposure Glass.)
2. Remove the lamp regulator cover [A] (2 screws).
3. Slide the holder [B] in the direction of the arrow. Then disconnect the flat cable [C].
4. Remove the lamp regulator [D] (2 screws, 1 connector).

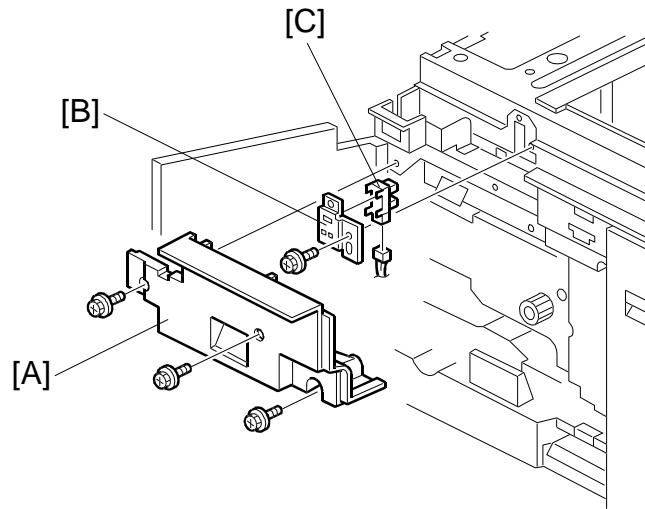
### 6.3.6 OPTICS DUST FILTER



A294R006.WMF

1. Remove the original exit tray [A] (3 screws).
2. Remove the optics dust filter [B].

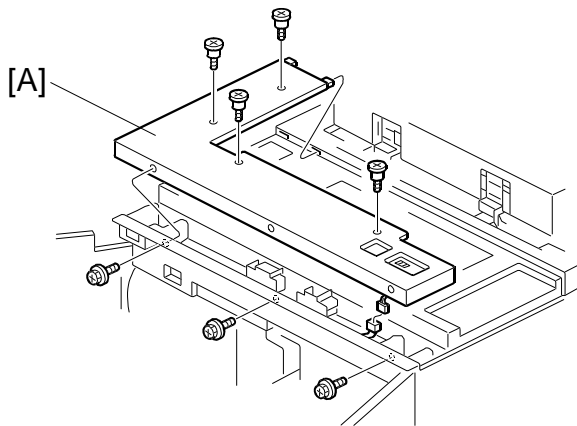
### 6.3.7 SCANNER H.P. SENSOR



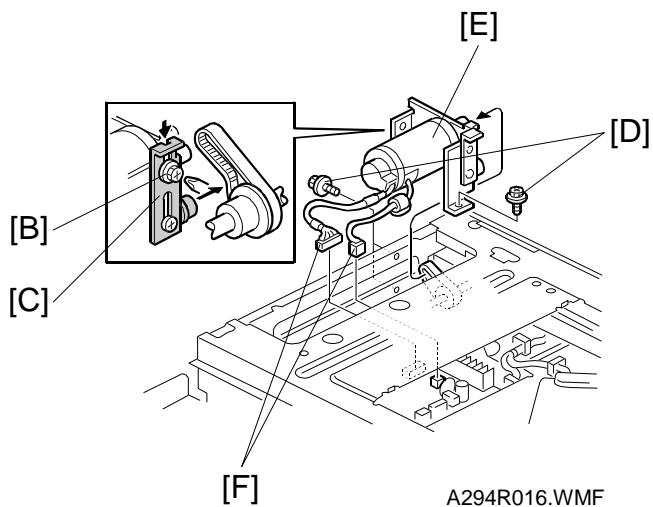
A294R017.WMF

1. Remove the front upper cover (7 screws, 1 connector). See Scanner Cover Removal.
2. Remove the left upper inner cover [A] (3 screws).
3. Remove the scanner H.P. sensor bracket [B] (1 screw).
4. Remove the scanner H.P. sensor [C] (1 connector).

### 6.3.8 SCANNER MOTOR



A294R058.WMF

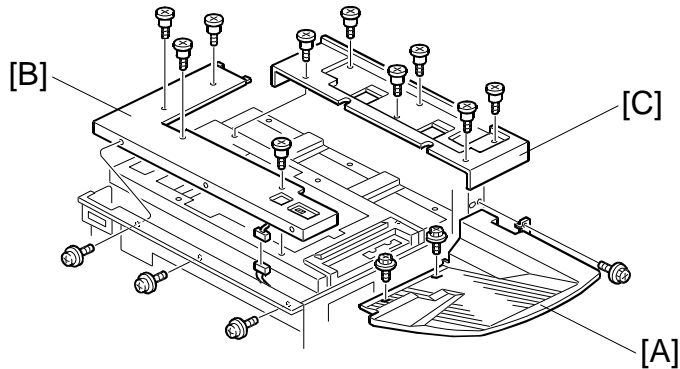


A294R016.WMF

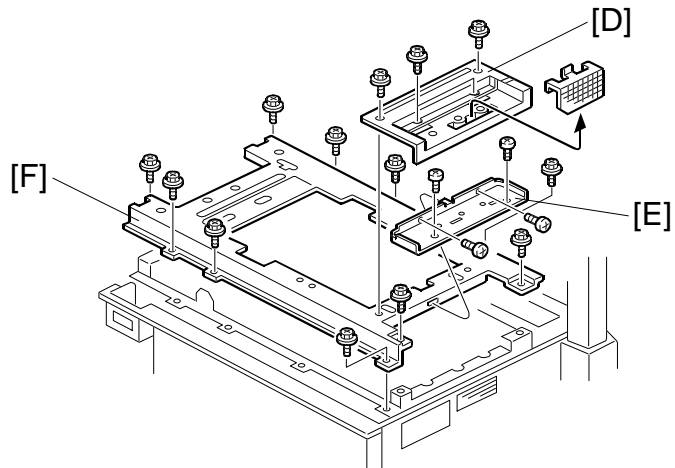
1. Remove the exposure glass. (See Exposure Glass.)
2. Remove the upper left cover. (See Exterior.)
3. Remove the front upper cover [A] (7 screws, 1 connector).
4. Loosen the screw [B] holding the belt tension bracket [C].
5. Remove the 3 screws [D] securing the scanner motor assembly [E].
6. Disconnect the two connectors [F] from the MCU.
7. While pushing down the bracket [C] to release belt tension, remove the scanner motor assembly.
8. Remove the scanner motor from the bracket (3 screws) and replace it.
9. After reassembly, do the copy image adjustments.

### 6.3.9 SCANNER DRIVE WIRES

#### *Preparation*

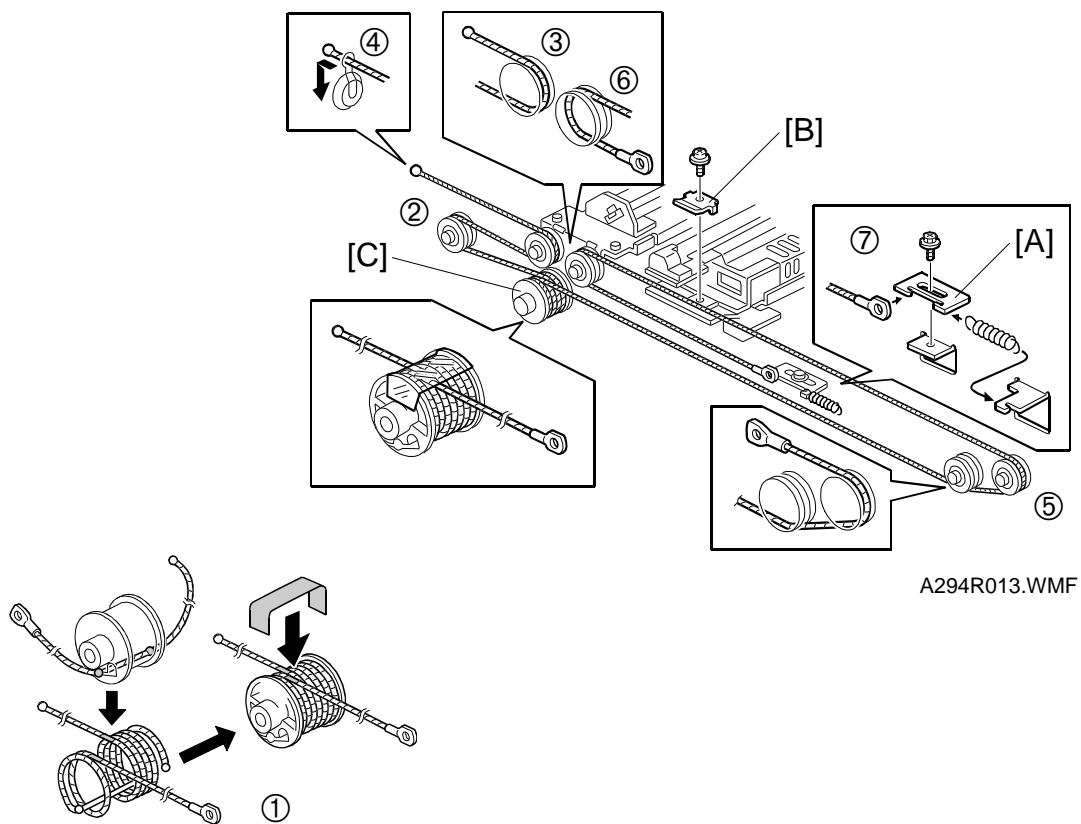


A294R011.WMF



A294R012.WMF

1. Remove the ADF.
2. Remove the original exit tray [A] (3 screws).
3. Remove the scanner front cover [B] (7 screws, 1 connector) and the rear upper cover [C] (6 screws).
4. Remove the scanner right cover [D] (4 screws).
5. Remove the bracket [E] (4 screws).
6. Remove the scanner frame [F] (10 screws).

**Scanner Drive Wires (Front and Rear)**

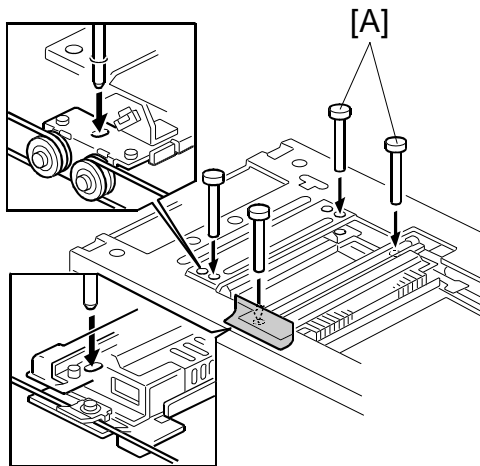
A294R013.WMF

A294R014.WMF

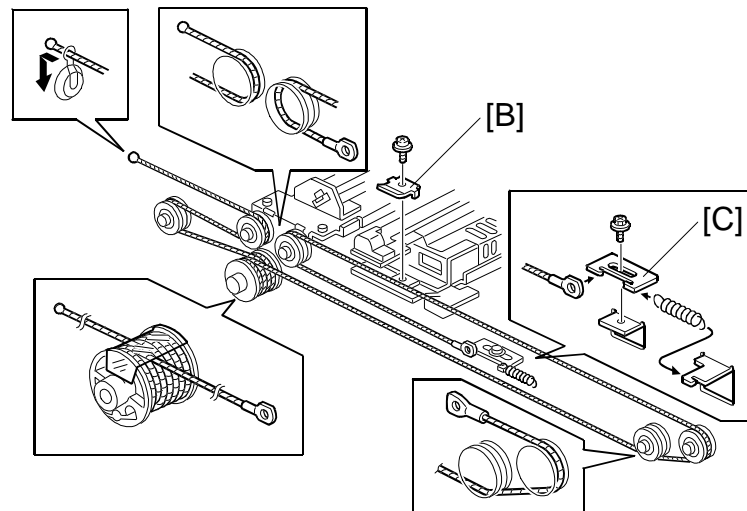
1. Remove the wire tension bracket [A] (1 screw).
2. Remove the front scanner wire bracket [B].
3. Remove the front scanner wire.

**Reinstallation**

4. Remove the scanner wire pulley [C] (1 screw).
5. While making sure of the direction, place the beads on the middle of the wire on the pulley openings. Then wind the wire (ball side) 3 times and the other side (ring side) once as shown ①. Secure the pulley with tape to keep this condition.
6. Install the pulley on the scanner drive shaft (1 screw).
7. Wind the end of the wire with the ball as shown (②, ③, and ④).
8. Wind the end of the wire with the ring as shown (⑤, ⑥, and ⑦).
9. Install the tension spring on the tension bracket, and slightly tighten the tension bracket (1 screw).



A294R015.WMF



A294R013.WMF

10. Install the 1st scanner and adjust the position with the positioning tools (P/N A0069104) [A].
11. Secure the 1st scanner with the scanner wire bracket [B] (1 screw).
12. Fully tighten the tension bracket [C].
13. Remove the positioning tools. After sliding the scanner to the right and left several times, set the positioning tools to check the scanner wire bracket and the tension bracket again.
14. Reassemble the scanner and do the scanner and copy adjustments (see Replacement and Adjustment – Copy Image Adjustments).



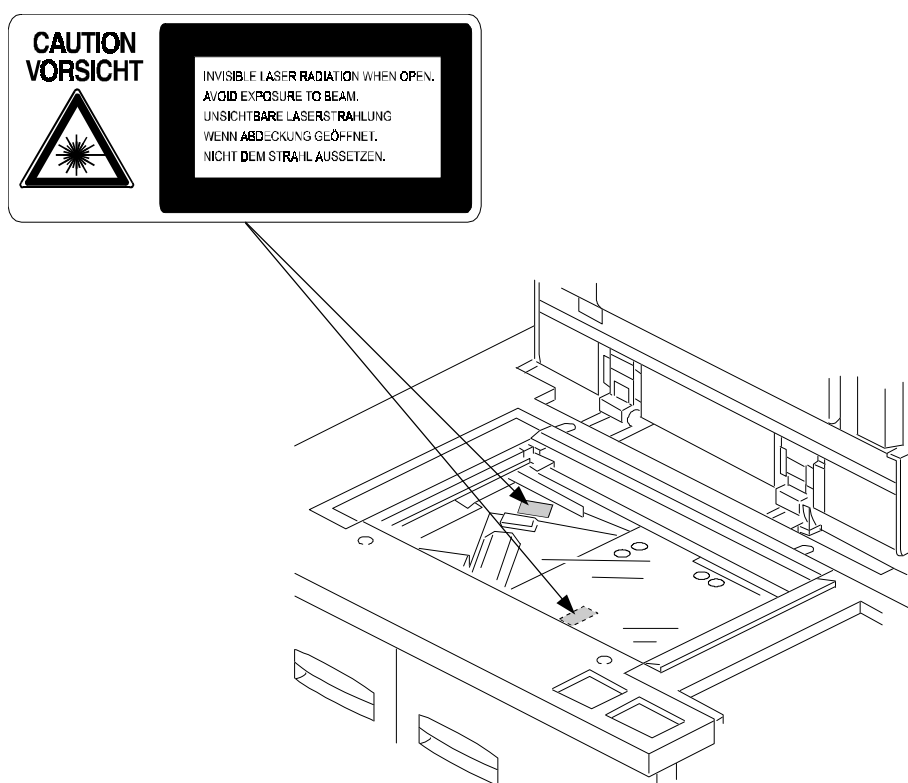
## 6.4 LASER UNIT

### WARNING

Turn off the main power switch and unplug the machine before attempting any of the procedures in this section. Laser beams can seriously damage your eyes.

### 6.4.1 CAUTION DECAL LOCATIONS

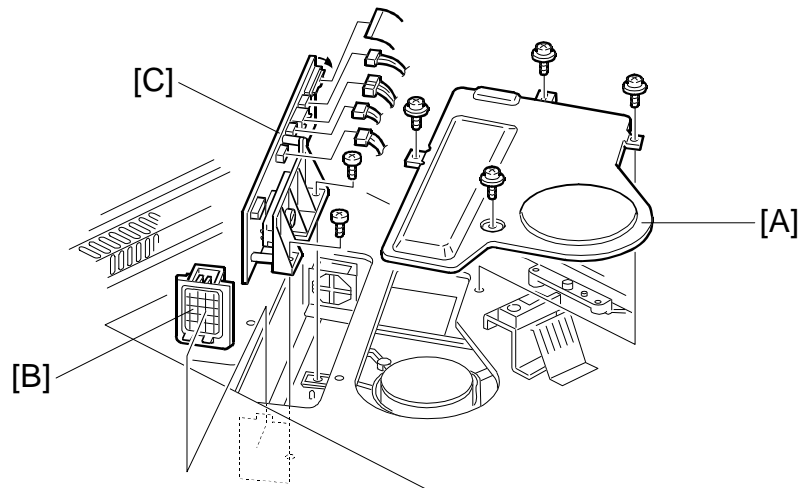
There are two caution decals in the laser section as shown below.



Replacement  
Adjustment

A294R106.WMF

## 6.4.2 LDB AND LD FILTER REPLACEMENT



A294R102.WMF

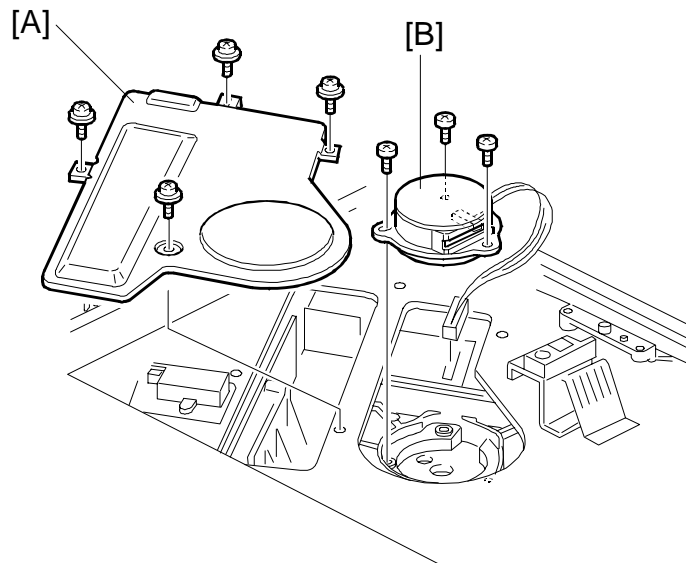
**⚠ WARNING**

**Turn off the main power switch and unplug the machine before attempting this procedure. Laser beams can seriously damage your eyes.**

**NOTE:** Do not touch the printed circuit board, to avoid damaging the board with static electricity.

1. Remove the exposure glass. (See Exposure Glass Removal.)
2. Remove the LD cover [A] (4 screws).
3. Remove the LD filter [B].
4. Replace the LDB [C] (2 screws and 5 connectors).  
**NOTE:** When disconnecting the cables, hold the LD unit.
5. Do SP 2-962 (process control initialization).

### 6.4.3 POLYGON MIRROR MOTOR REPLACEMENT



A294R101.WMF

**NOTE:** Do not remove the polygon mirror motor within 3 minutes after the main switch is turned off (wait until the motor rotation stops). Otherwise, the motor will be damaged.

1. Turn off the main power switch and unplug the machine.
2. Remove the exposure glass. (See Exposure Glass Removal.)
3. Remove the LD cover [A] (4 screws).
4. Replace the polygon mirror motor [B] (3 screws, 1 connector.)

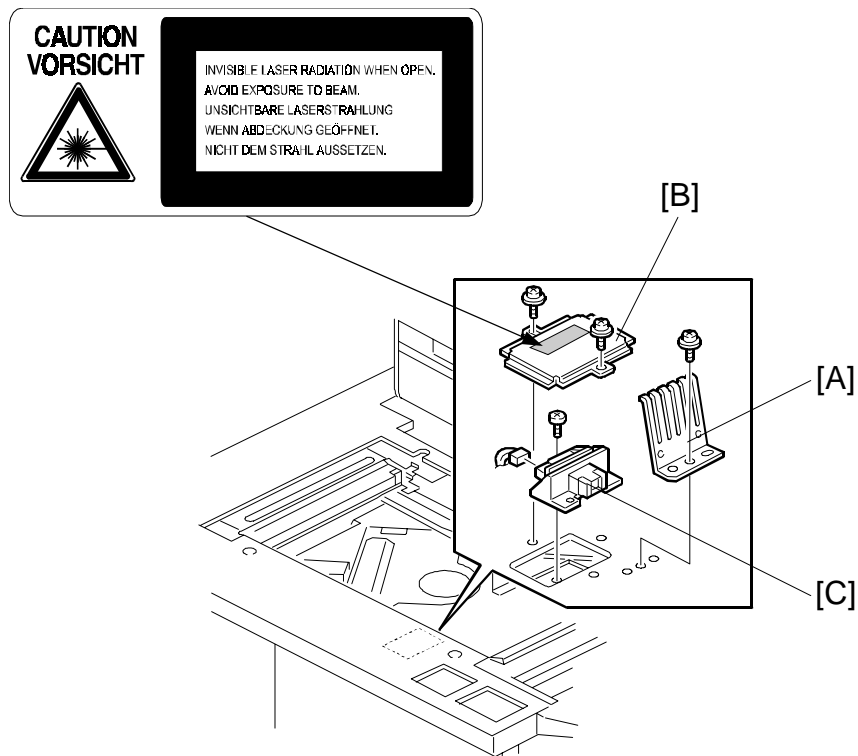
**NOTE:** 1) When reinstalling, make sure that the polygon mirror opening faces the right.

2) Do not touch the glass surface of the polygon mirror motor with bare hands.

5. After reassembly, do the scanner and printer copy adjustments. (See Replacement and Adjustment – Copy Image Adjustments.)

Replacement  
Adjustment

#### 6.4.4 LASER SYNCHRONIZATION DETECTOR REPLACEMENT

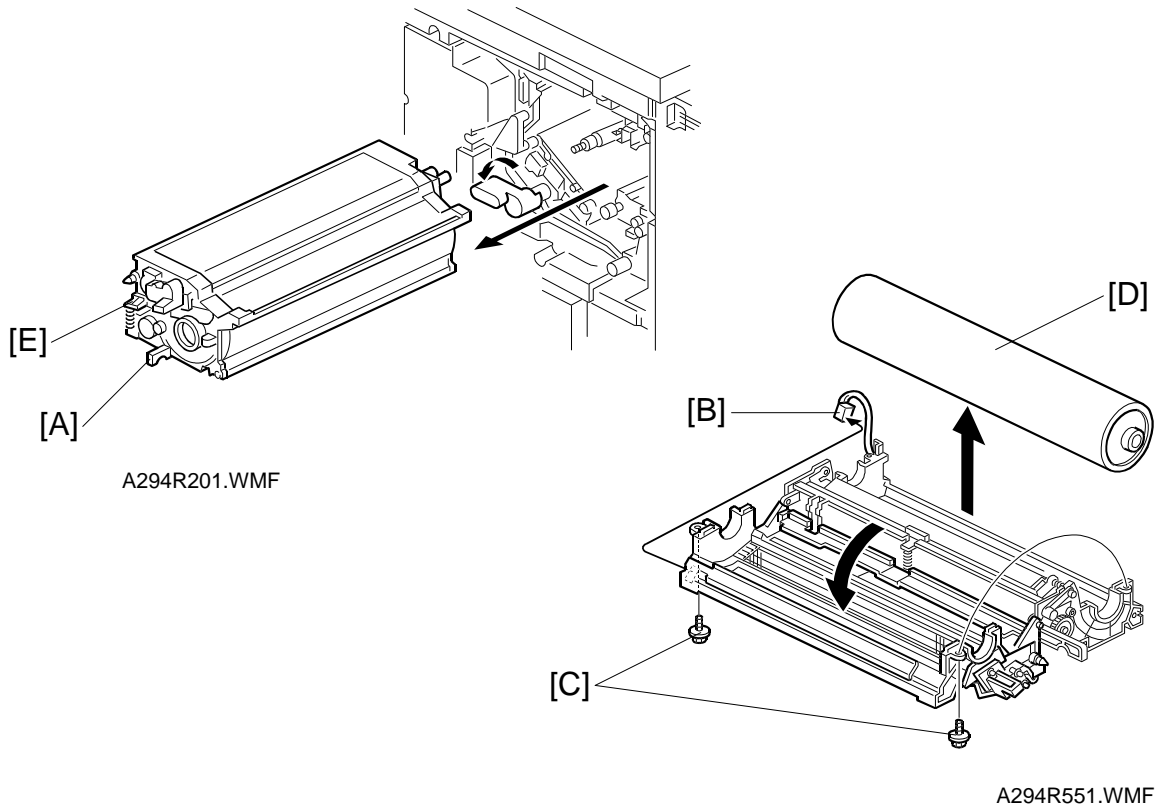


A294R105.WMF

1. Turn off the main power switch and unplug the machine.
2. Remove the ground plate [A] (1 screw).
3. Remove the detector cover [B] (2 screws).
4. Replace the laser synchronization detector [C] (1 screw, 1 connector).

## 6.5 DRUM UNIT

### 6.5.1 DRUM UNIT REMOVAL AND DRUM REPLACEMENT

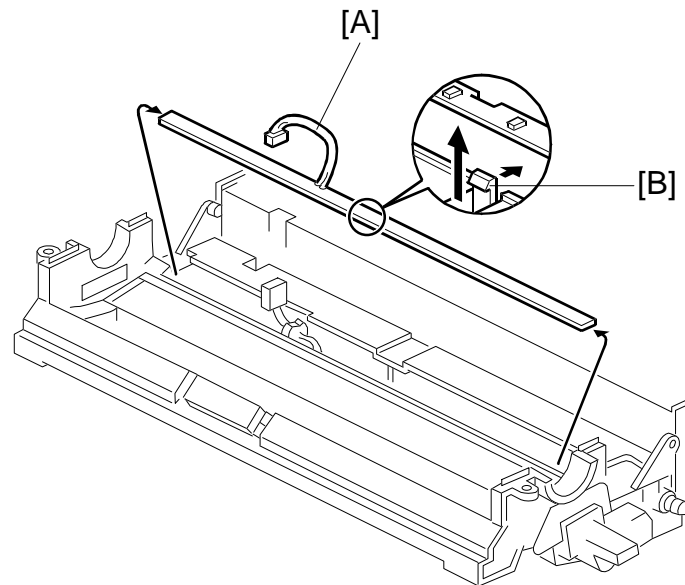


1. Take out the development unit. (Refer to Development Unit Removal.)
2. Lower the transfer belt unit.
3. Take out the drum unit by holding the handle [A].  
**NOTE:** 1) Cover the drum unit with a sheet of paper to protect it from light when the drum unit is left outside the machine for servicing.  
 2) Do not touch the drum surface with bare hands.
4. Disconnect the connector of the drum potential sensor [B].
5. Open the upper drum unit (2 screws [C]).
6. Replace the drum [D]. Then remove the drum protective sheet from the new drum.

**NOTE:** If it is hard to completely set the drum unit in the machine because the gear is disengaged, push in the drum unit while holding down the cleaning blade release lever [E].

After installing a new drum, do the following SP mode: 2-962 (process control initialization).

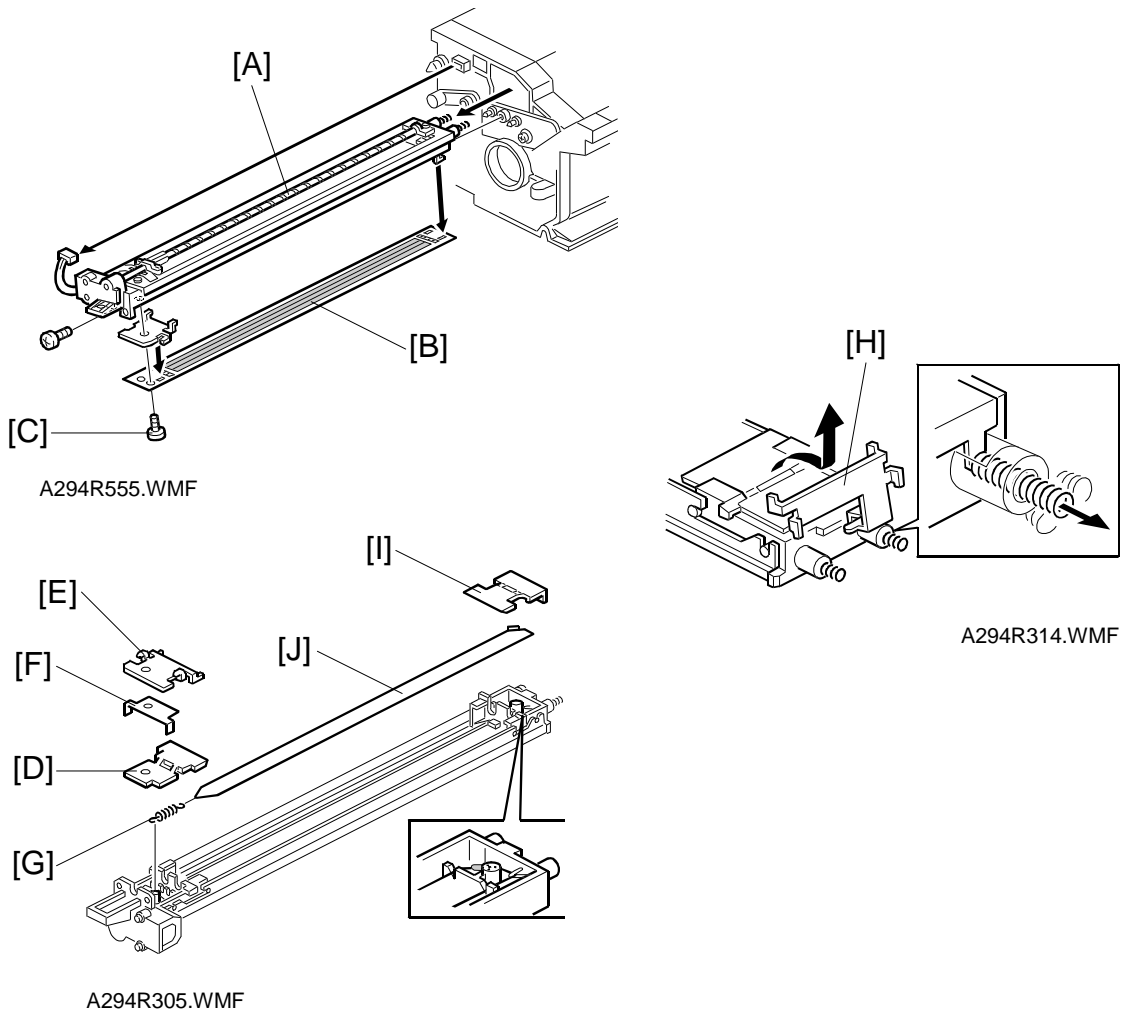
## 6.5.2 QUENCHING LAMP REPLACEMENT



A294R202.WMF

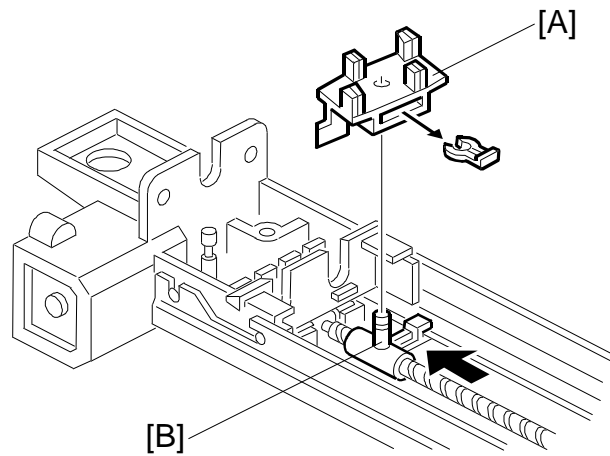
1. Remove the drum. (Refer to Drum Unit Removal and Drum Replacement.)  
**NOTE:** Wrap a protective sheet or a few sheets of paper around the drum to protect it from light.
2. Slightly pull up the quenching lamp cable [A], then release the hook [B] at the center of the quenching lamp.  
**NOTE:** Do not pull the wire too strongly.
3. Disconnect the connector [A].
4. Replace the quenching lamp.

### 6.5.3 GRID PLATE/CHARGE CORONA WIRE/WIRE CLEANER REPLACEMENT



1. Take out the charge corona unit [A] (1 screw, 1 connector).
2. Remove the grid plate [B] (1 plastic screw, 4 hooks).  
**NOTE:** 1) When installing the grid plate, do not tighten the plastic screw [C] too strongly.  
 2) Do not touch the corona wire and grid plate with bare hands.
3. Remove the front grid terminal [D], then the front end block cover [E].
4. Remove the plate [F].
5. Remove the terminal spring [G].
6. Slide the rear grid terminal [H] to the rear and remove it, then remove the rear end block cover [I].
7. Remove the charge corona wire [J].

Replacement  
Adjustment



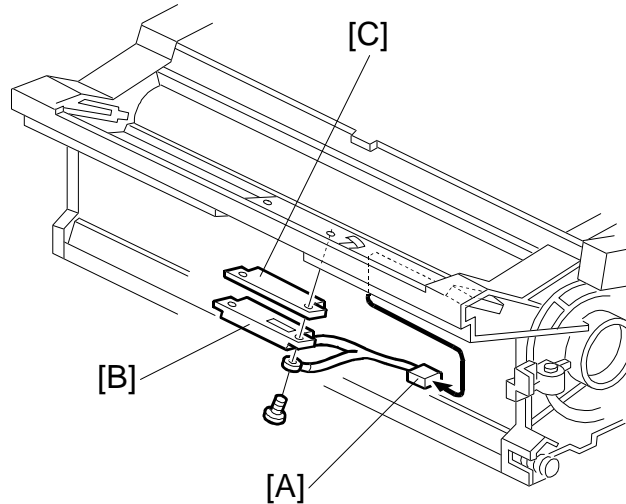
A294R553.WMF

8. Remove the wire cleaner [A] (1 snap ring).
9. Install the wire cleaner and the charge corona wire.  
**NOTE:** Locate the joint part [B] of the wire in the rear end block as shown.

After installing new wires, reset SP2-001-1 to 2-001-6 (corona voltage and current) to the defaults. Then do SP2-962 (process control initialization).



### 6.5.4 DRUM POTENTIAL SENSOR REPLACEMENT



A294R203.WMF

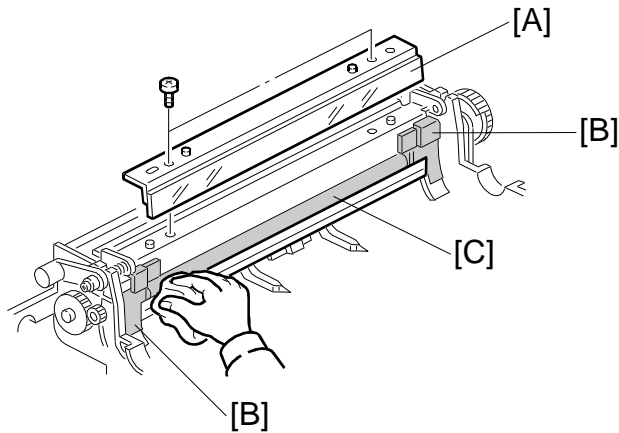
1. Take out the drum unit. (Refer to Drum Unit Removal.)
2. Disconnect the connector [A].  
**NOTE:** Before removing the drum potential sensor, put a few sheets of paper between the sensor and the drum to protect the drum surface.
3. Remove the drum potential sensor [B] and the grounding plate [C] (2 screws).
4. Replace the drum potential sensor [B].

**⚠ CAUTION**

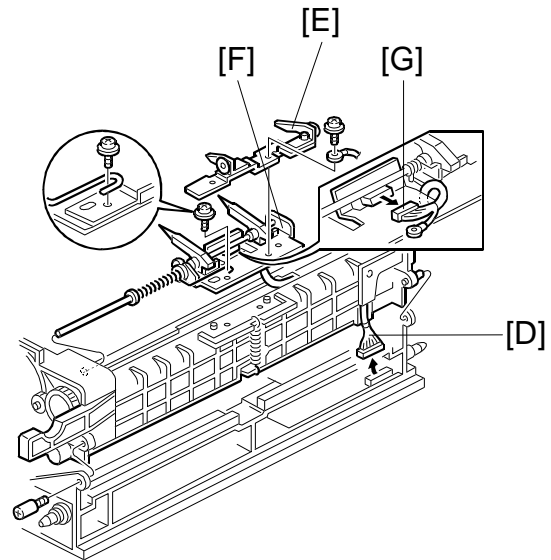
After replacing the drum potential sensor, perform the process control data initial setting (SP mode No. 2-962).

Replacement  
Adjustment

### 6.5.5 CLEANING BLADE/ID SENSOR REPLACEMENT



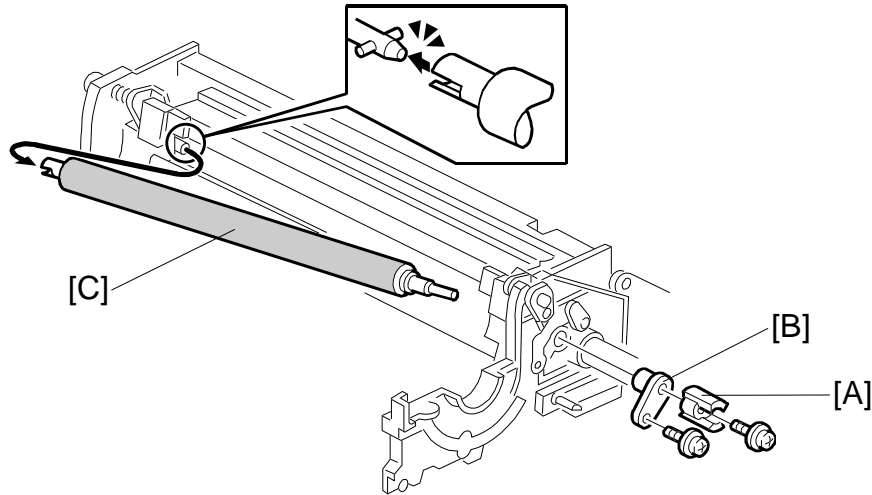
A294R558.WMF



A294R559.WMF

1. Remove the drum. (Refer to Drum Unit Removal and Drum Replacement.)
2. Remove the cleaning blade [A] (2 screws).
3. Clean the side seals [B] and cleaning brush [C].  
**NOTE:** When a vacuum cleaner is used, to protect the electrical parts from static electricity, disconnect the connector on the charge power pack and remove the ID sensor as follows:
  - 1) Disconnect the 12-pin connector [D].
  - 2) Separate the upper and lower drum units.
  - 3) Remove the spur bracket [E] and pick-off pawl bracket [F] (2 screws).
  - 4) Disconnect the connector [G].
  - 5) Slide the pick-off pawl bracket to the rear, while turning it counterclockwise (as seen from the front). The ID sensor is on this bracket.**NOTE:** After installing a new ID sensor, do SP3-001-2.
4. Install the new cleaning blade.  
**NOTE:** Do not clean the edge of the cleaning blade with a cloth; this damages the edge and causes black lines on copies.  
 Do not touch the edge of the new cleaning blade. If some setting powder or toner on the blade edge is removed, apply toner at that place.  
 When installing the cleaning blade, do not pinch the side seals.

## 6.5.6 CLEANING BRUSH REPLACEMENT



A294R204.WMF

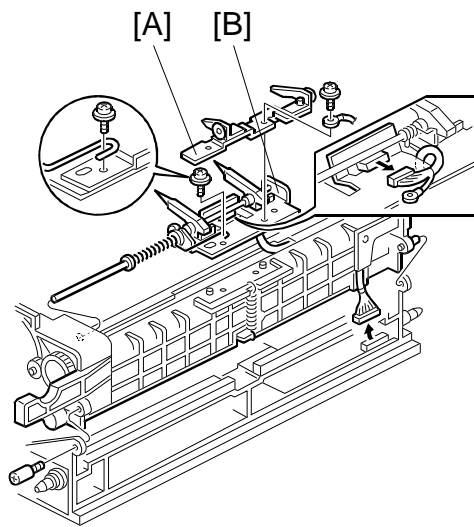
1. Remove the cleaning blade. (Refer to Cleaning Blade Replacement.)
2. Remove the coupling gear [A] (1 screw).
3. Remove the bushing [B] (1 screw).
4. Pull the cleaning brush shaft to the rear to release the cleaning brush [C], then remove the cleaning brush.

**NOTE:** Do not touch the cleaning brush with bare hands.

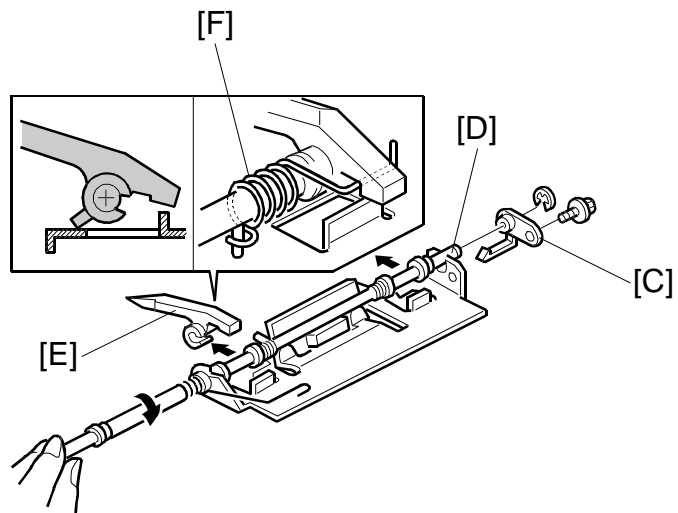
After replacement, clean the ID sensor surface. Then do SP3-001-2 to initialize the sensor.

Replacement  
Adjustment

### 6.5.7 PICK-OFF PAWL REPLACEMENT



A294R559.WMF



A294R561.WMF

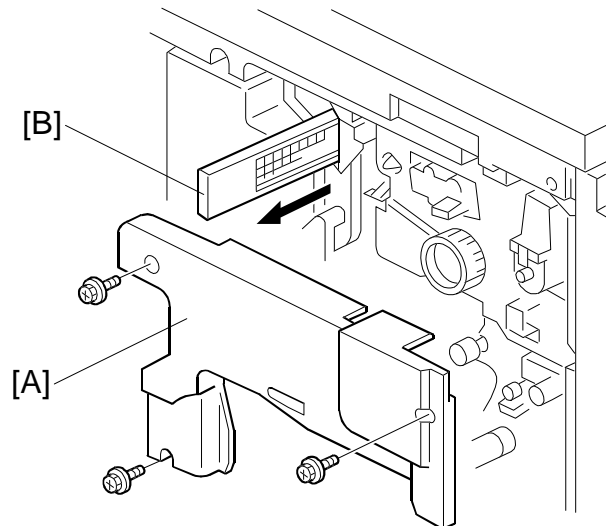
1. Remove the drum. (Refer to Drum Unit Removal and Drum Replacement.)
2. Remove the spur bracket [A] and pick-off pawl bracket [B] (2 screws).
3. Remove the bushing [C] (1 screw, 1 retaining ring).
4. While pulling the shaft [D] to the rear, turn the pick-off pawl shaft about 45 degrees clockwise (as viewed from the front) in order to move up the pick-off pawl.
5. Replace the pick-off pawl [E].

**NOTE:** 1) Do not forget to hook the tension spring [F].

2) After replacement, check that the pick-off pawl moves smoothly.

3) Do not touch the pick-off pawl edge.

## 6.5.8 DRUM FILTER REPLACEMENT



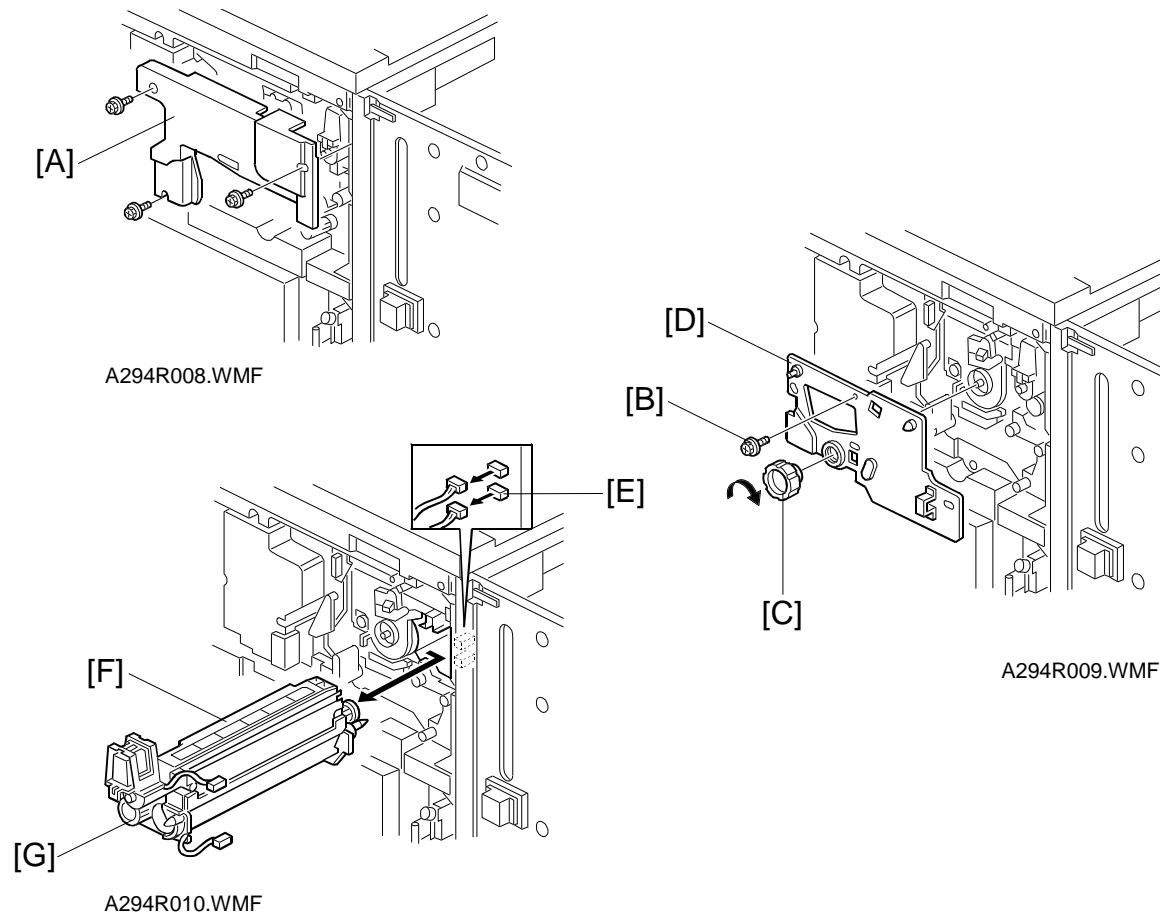
A294R205.WMF

1. Open the front doors.
2. Remove the right inner cover [A] (3 screws).
3. Replace the filter unit [B].

Replacement  
Adjustment

## 6.6 DEVELOPMENT AND TONER SUPPLY

### 6.6.1 DEVELOPMENT UNIT REMOVAL



1. Turn off the main switch.
2. Open the right door.
3. Remove the right inner cover [A] (3 screws).
4. Remove the screw [B] that holds the drum stay.
5. Remove the drum stay knob [C] then take out the drum stay [D].
6. Disconnect the two connectors [E].



7. Pull out the development unit [F].

**NOTE:** 1) To prevent scratches on the drum, push the development unit to the right while pulling it out.

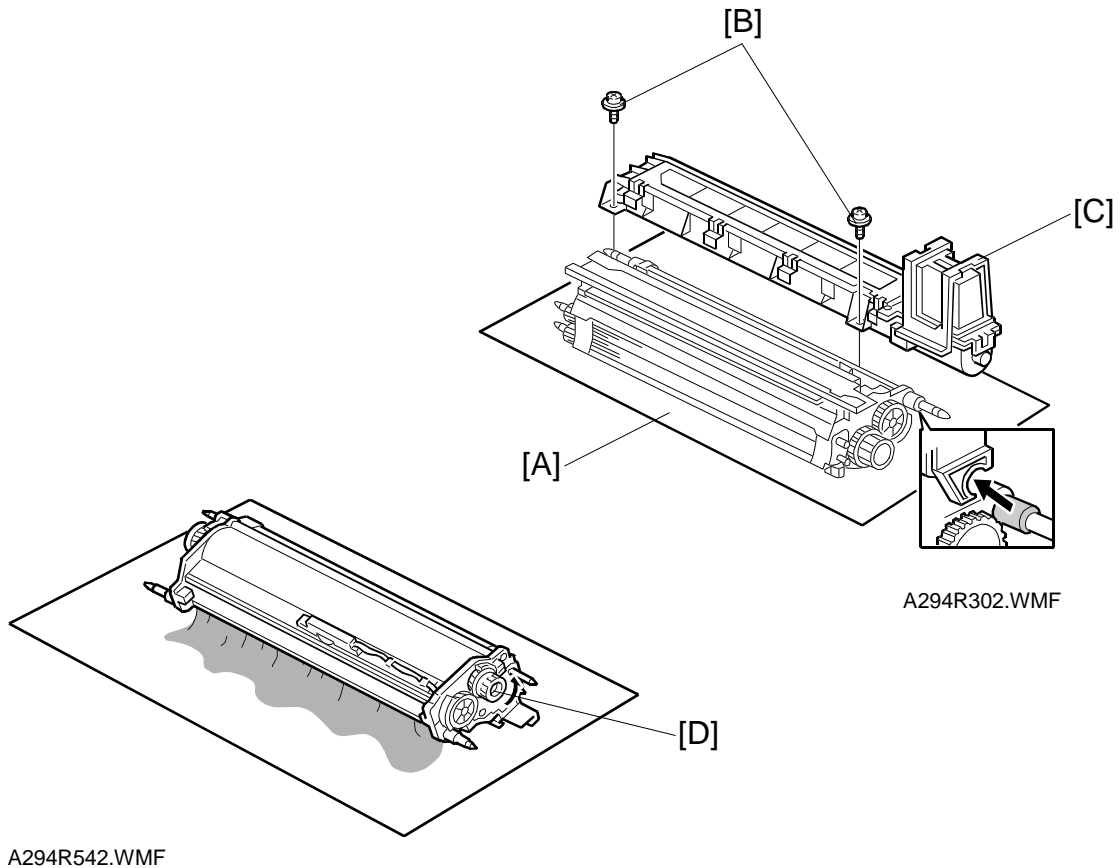
2) When installing the development unit, do not forget to connect the two connectors [E].

3) When pulling out the development unit, do not hold the knob [G].

4) Keep the development unit connector as far as possible away from the development unit when cleaning the unit with a vacuum cleaner.

5) When removing the development unit, hold the knob [C] to pull out the unit.

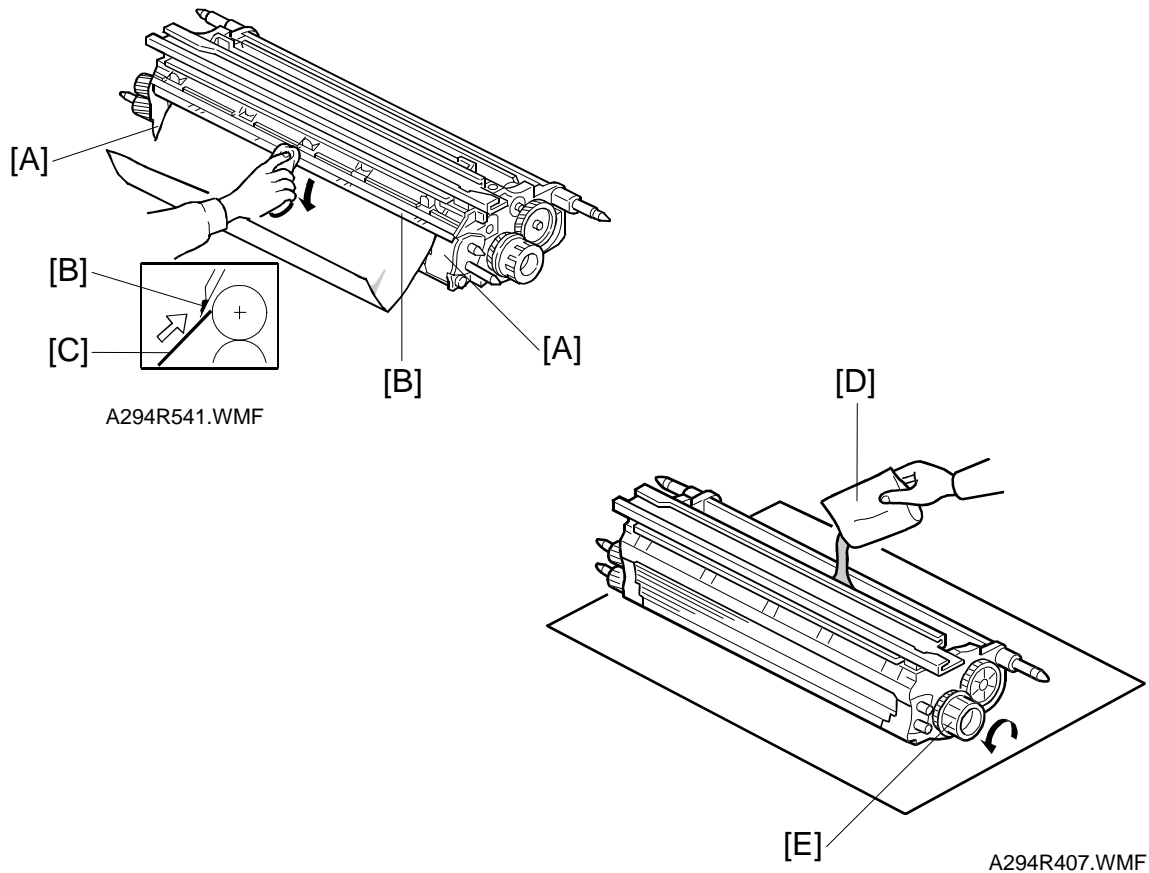
## 6.6.2 DEVELOPER REPLACEMENT



1. Take out the development unit. (Refer to Development Unit Removal.)
2. Place the development unit on a sheet of paper [A].
3. Remove the two screws [B] that hold the toner hopper [C].
4. Remove the toner hopper from the development unit.
5. Turn over the development unit. Then turn the paddle roller knob [D] to empty the remaining developer onto the sheet. (The knob [D] allows the paddle roller to be turned counterclockwise only.)

**NOTE:** Dispose of used developer in accordance with local regulations.

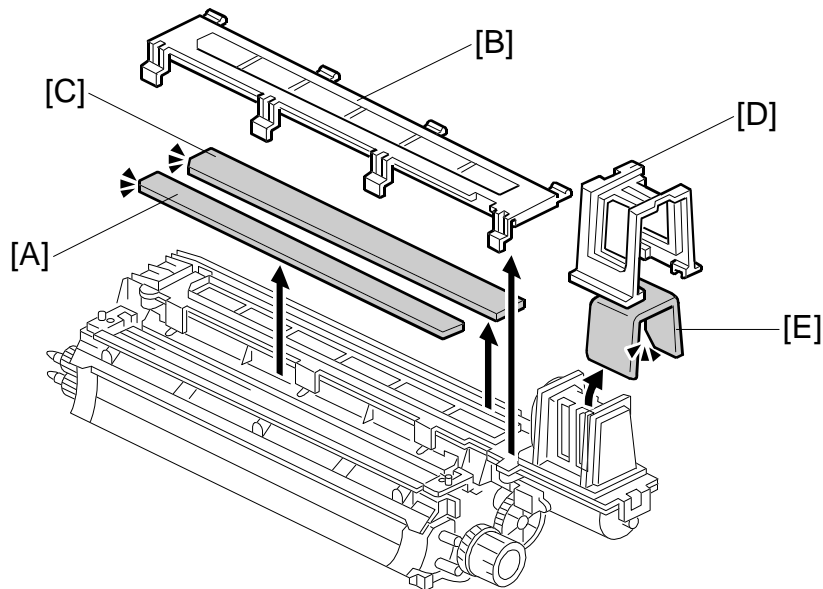
Make sure that no developer remains on the development rollers or in the development unit.



6. Clean the side seals [A] and entrance seal [B].  
**NOTE:** Cover the sleeve rollers with a sheet of paper [C] to prevent the used developer from being attracted to the sleeve rollers.
7. Pour in one pack of developer [D] evenly across the width of the development unit, while turning the knob [E].
8. Re-install the toner hopper, then re-assemble the machine.  
**NOTE:** 1) Be sure to connect the connectors after installing the development unit in the machine.  
 2) Tilt the toner hopper so that there is toner near the toner hopper sensor.
9. Turn on the main switch, then do developer initial setting (SP mode No. 2-801).  
**NOTE:** 1) Do not make any copies with the new developer before completing the developer initial setting, otherwise toner density control will be abnormal.  
 2) If the developer initial setting did not complete correctly, you cannot exit the SP mode by pressing the "Quit" key. If this problem occurs, turn the main switch off and on, then perform the initial setting again. If the result is the same, see "SC342" in the troubleshooting section.



### 6.6.3 DEVELOPMENT AND AIR DUST FILTER REPLACEMENT



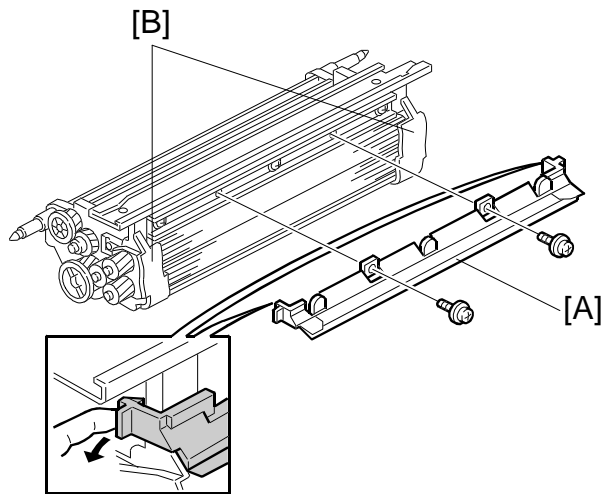
A294R301.WMF

1. Take out the development unit. (Refer to Development Unit Removal.)
2. Remove the toner hopper. (Refer to Developer Replacement.)
3. Replace the development filter [A].
4. Remove the central air dust filter cover [B] (1 hook).
5. Replace the central air dust filter [C].
6. Remove the front air dust filter cover [D].
7. Replace the front air dust filter [E].

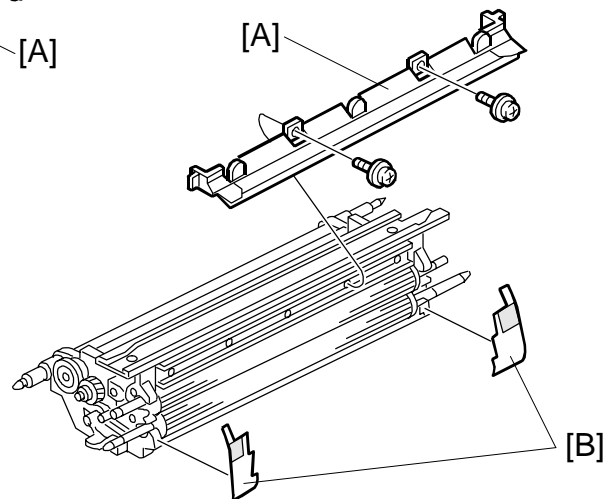
**NOTE:** Make sure that the air dust filter cover [B] is fully installed.

Replacement  
Adjustment

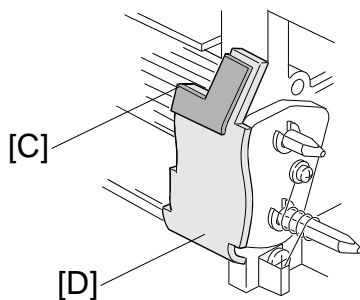
### 6.6.4 DEVELOPMENT ENTRANCE, FRONT, AND REAR SIDE SEALS



A294R545.WMF



A294R571.WMF



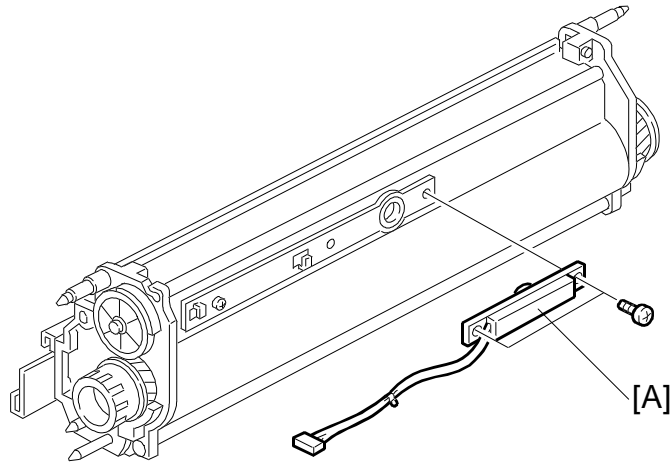
A294R546.WMF

1. Remove the developer. (Refer to Developer Replacement.)
2. Replace the developer entrance seal [A] (2 screws, 2 hooks).
3. Replace the front and rear side seals [B].

**NOTE:** When re-assembling the development unit, use new side seals and align the edges of the side seals with the corner [C] and the edge [D] as shown.

There is no need to change the developer with this procedure.

## 6.6.5 TONER DENSITY SENSOR REPLACEMENT

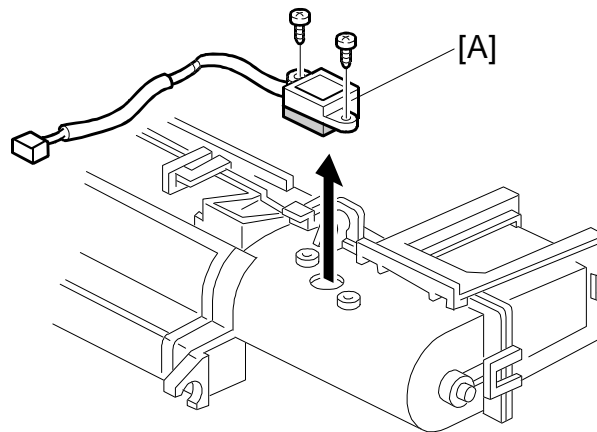


A294R547.WMF

1. Remove the developer. (Refer to Developer Replacement.)
2. Replace the TD sensor [A] (2 screws).  
**NOTE:** Before installing the TD sensor, clean the development unit well so that no carrier particles remain in the gap between the TD sensor and the development unit casing.
3. Install new developer and reassemble the development unit.
4. Perform the developer initial setting (SP2-801) then process control initialization (SP2-962).  
**NOTE:** Do not make any copies before completing the developer initial setting (SP2-801).

Replacement  
Adjustment

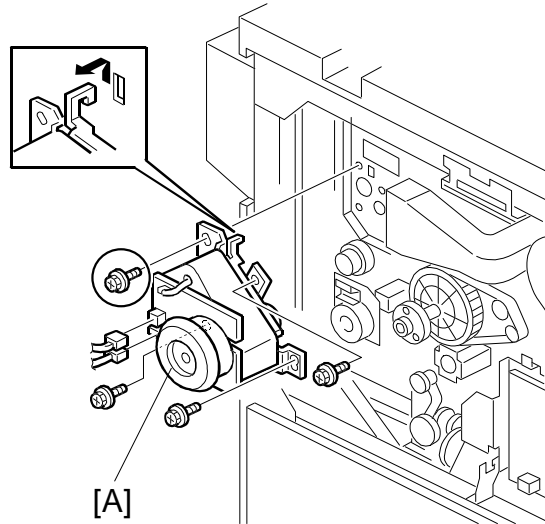
### 6.6.6 TONER HOPPER SENSOR REPLACEMENT



A294R303.WMF

1. Take out the toner hopper. (Refer to Developer Replacement.)
2. Replace the toner hopper sensor [A] (2 screws, 1 connector).

## 6.6.7 DEVELOPMENT MOTOR REPLACEMENT

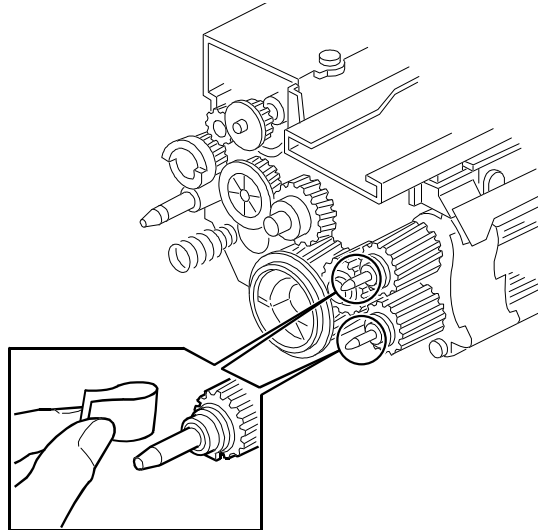


A294R919.WMF

1. Turn off the main switch.
2. Remove the rear covers. (Refer to Exterior Cover Removal.)
3. Remove the fly wheel (3 screws).
4. Replace the development motor unit [A] (4 screws, 2 connectors, and 1 hook).

Replacement  
Adjustment

## 6.6.8 DEVELOPMENT ROLLER SHAFT CLEANING

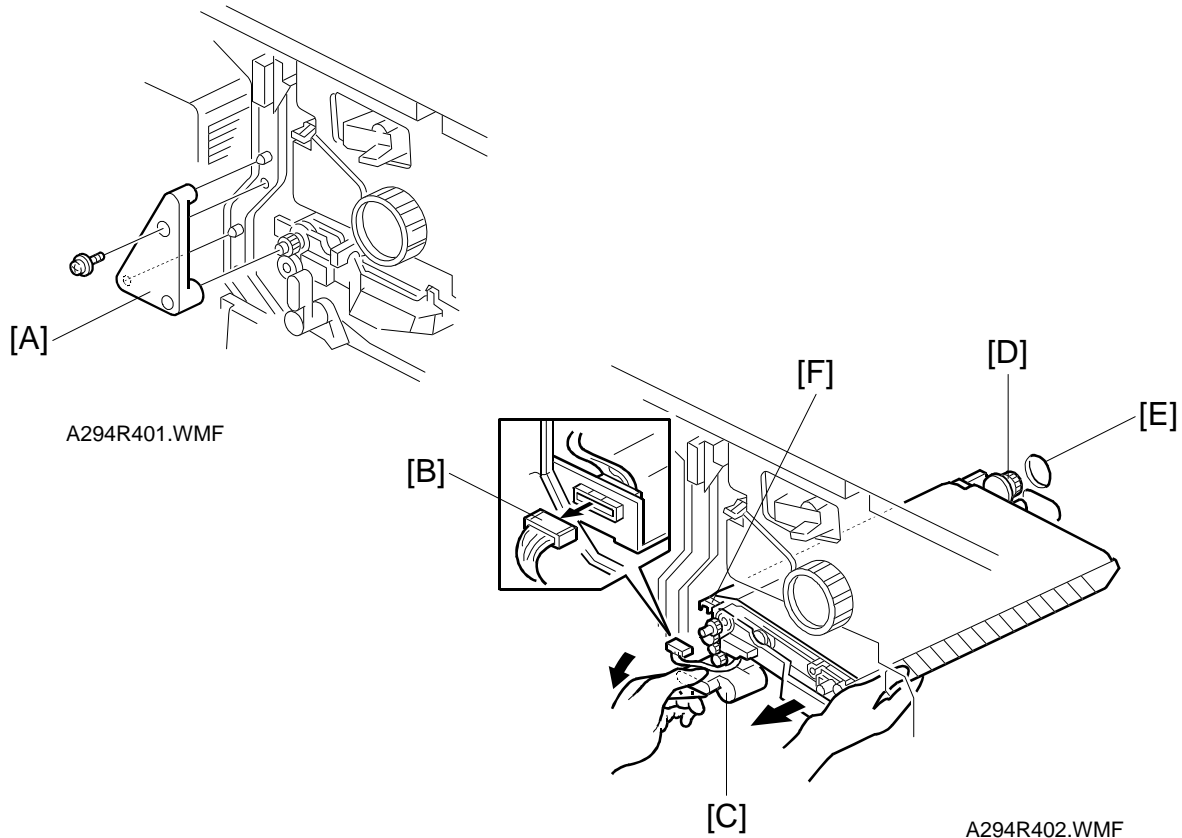


A294R405.WMF

1. Take out the development unit. (Refer to Development Unit Replacement.)
2. Remove toner and developer from the development roller shafts with teflon tape.

## 6.7 TRANSFER BELT UNIT

### 6.7.1 TRANSFER BELT UNIT REMOVAL/INSTALLATION



#### Removal

1. Turn off the main switch.
2. Remove the right inner cover (see Development Unit Removal).
3. Remove the transfer belt unit holder [A] (1 screw).
4. Disconnect the connector [B].
5. While turning the lever [C] counterclockwise, take out the transfer belt unit.

**NOTE:** 1) Do not touch the transfer belt with bare hands.

- 2) Take care not to scratch the drum with the transfer belt unit. Be careful when installing the transfer belt unit.

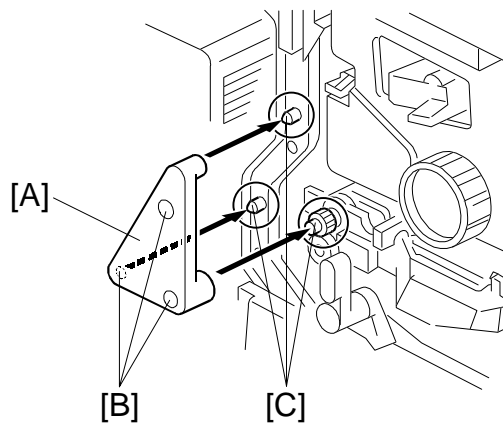
#### Reassembly

1. While keeping the lever [C] rotated fully counterclockwise, install the transfer belt unit.

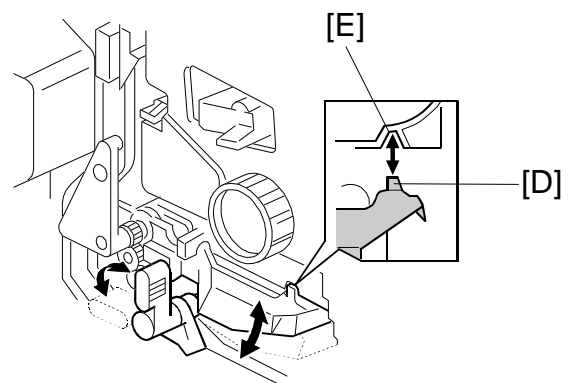
**NOTE:** 1) Insert the gear [D] into the opening [E] in the rear frame.

- 2) Place the slot [F] in the transfer belt unit on the rail.

Replacement  
Adjustment



A294R403.WMF

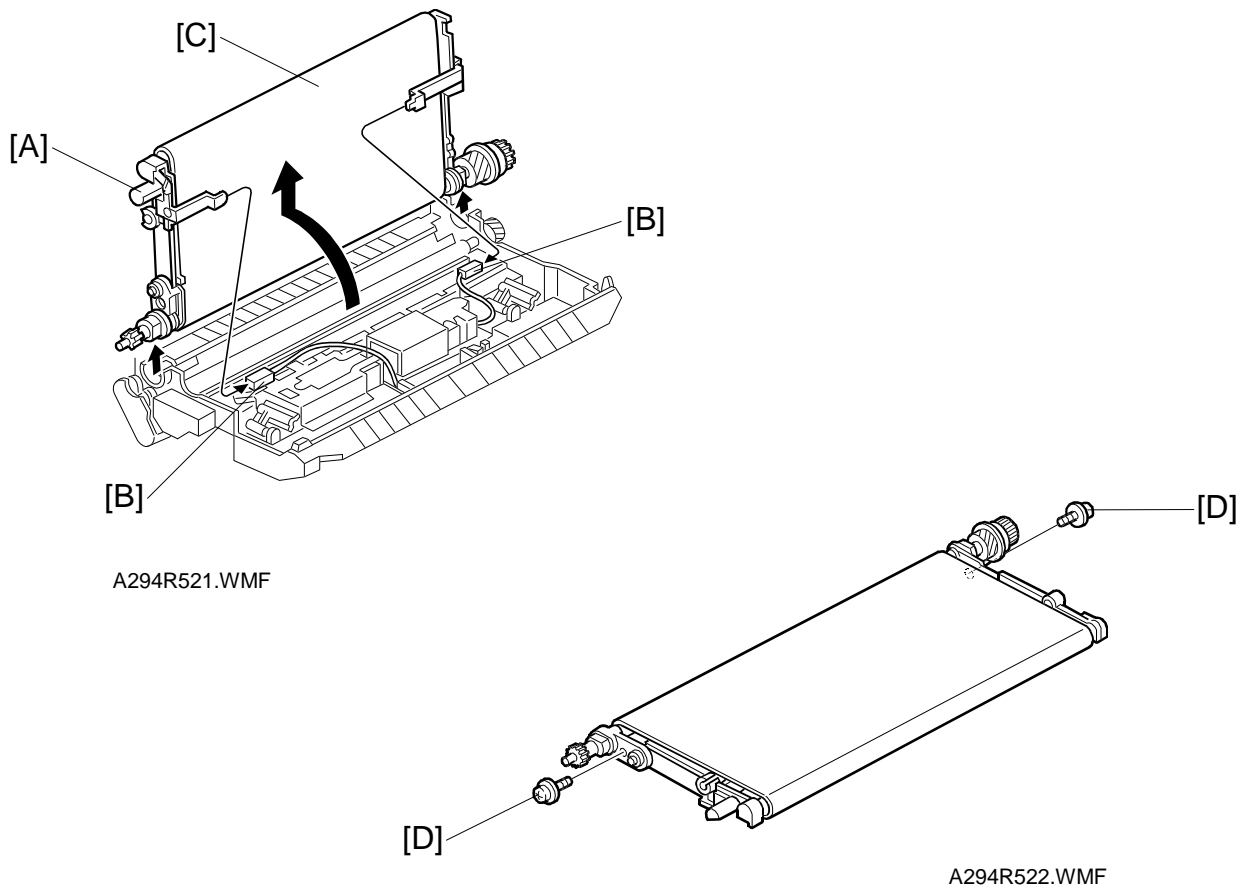


A294R404.WMF

2. Attach the transfer belt unit holder [A] (1 screw).  
**NOTE:** Align the three holes [B] with the three projections [C].
3. After installation, check the following points:
  - 1) The transfer belt unit must move up and down smoothly
  - 2) Part [D] of the transfer belt unit must be behind the drum stay,
  - 3) Part [D] of the transfer belt unit must be set in the indent [E] in the drum unit casing.

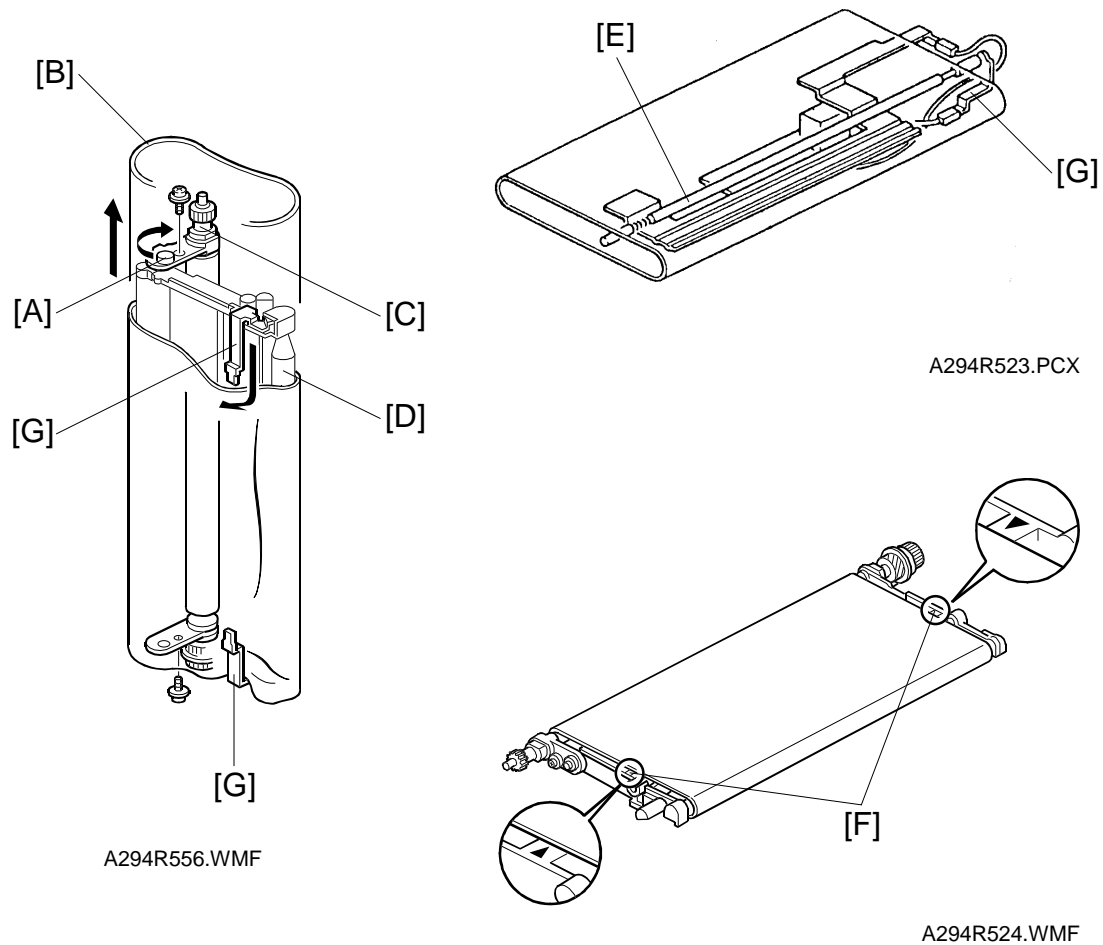


## 6.7.2 TRANSFER BELT REPLACEMENT



1. Take out the transfer belt unit. (Refer to Transfer Belt Unit Removal.)
2. While raising the knob [A], disconnect the two connectors [B].
3. Turn the transfer belt upper unit [C] 90 degrees counterclockwise, then raise and remove it.
4. Remove the screws [D].

Replacement  
Adjustment



5. Turn the belt drive roller holder [A] clockwise (front view).

6. Replace the transfer belt [B].

**NOTE:** 1) Before installing the transfer belt, clean both sides of the transfer belt with a dry cloth (do not use alcohol).

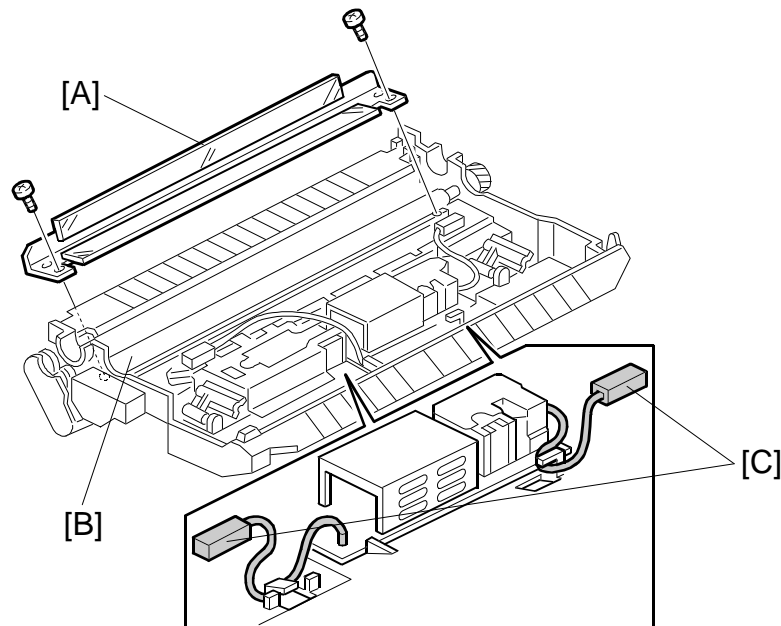
2) Before installing the transfer belt, clean the following items with alcohol.

- Belt drive roller [C]
- Belt roller [D]
- Bias roller [E]

3) Position the transfer belt at the center of the belt roller [D]. (Both marks [F] should be visible.)

4) Set the transfer belt under the bias terminals [G] (see the previous page).

### 6.7.3 TRANSFER BELT CLEANING BLADE REPLACEMENT



A294R108.WMF

1. Remove the transfer belt unit. (Refer to Transfer Belt Replacement.)
2. Remove the transfer belt cleaning blade [A].
3. Clean the cleaning bias roller [B].

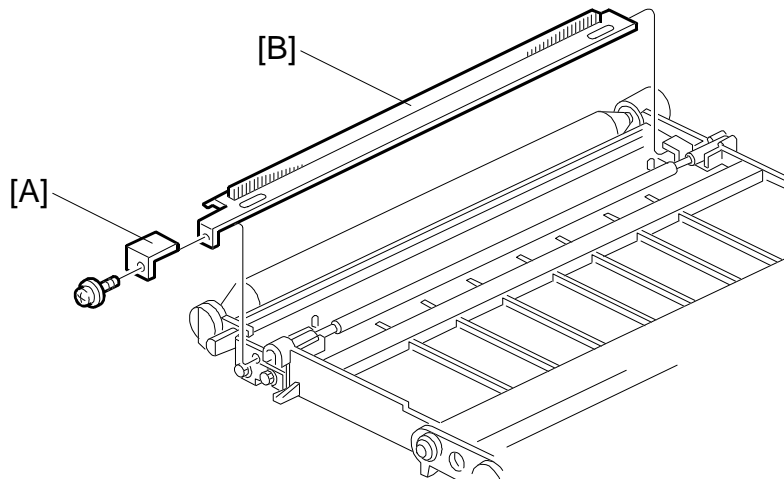
**NOTE:** When using a vacuum cleaner, to protect the transfer power pack from static electricity, remove the power pack connectors [C].

4. Install the new cleaning blade.

**NOTE:** Do not touch the edge of the cleaning blade. If some of the setting powder on the blade edge is removed, apply setting powder or toner at that place.

Replacement  
Adjustment

### 6.7.4 TRANSFER BELT BIAS BRUSH REPLACEMENT



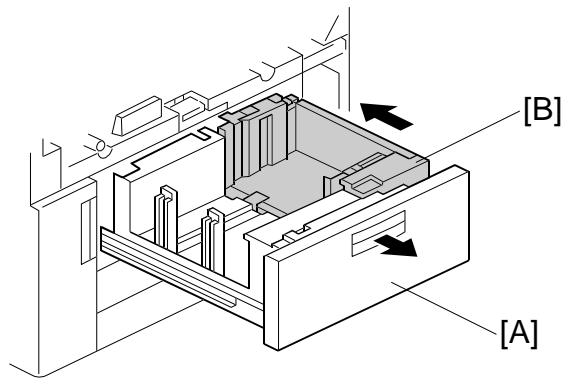
A294R455.WMF

1. Remove the transfer belt.
2. Remove the transfer belt bias brush holder [A] (1 screw).
3. Replace the transfer belt bias brush [B].

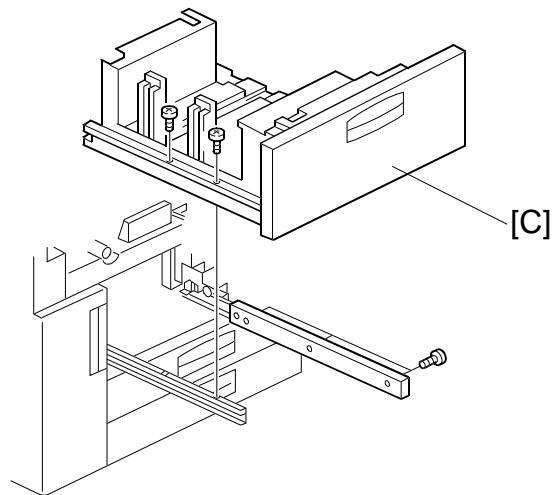
## 6.8 PAPER FEED

### 6.8.1 PAPER TRAY REMOVAL

#### *Tandem Tray Removal*

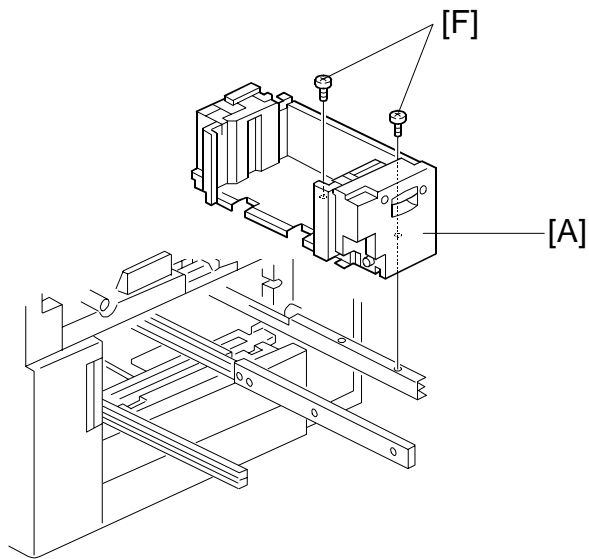


A294R707.WMF

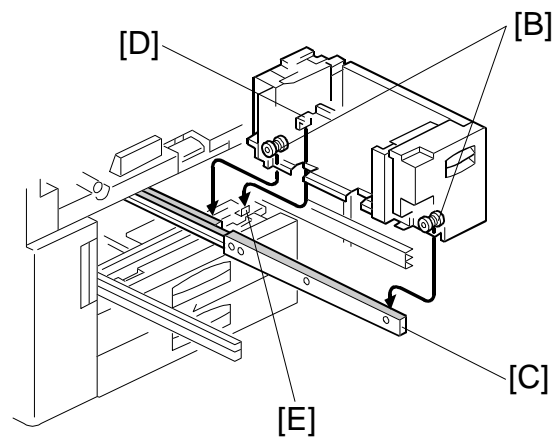


A294R708.WMF

1. Open the front cover.
2. Draw out the tandem feed tray [A] so that the right tandem tray [B] fully separates from the left one.
3. Push in the right tandem tray.
4. Remove the left tandem tray [C] (5 screws).



A294R709.WMF

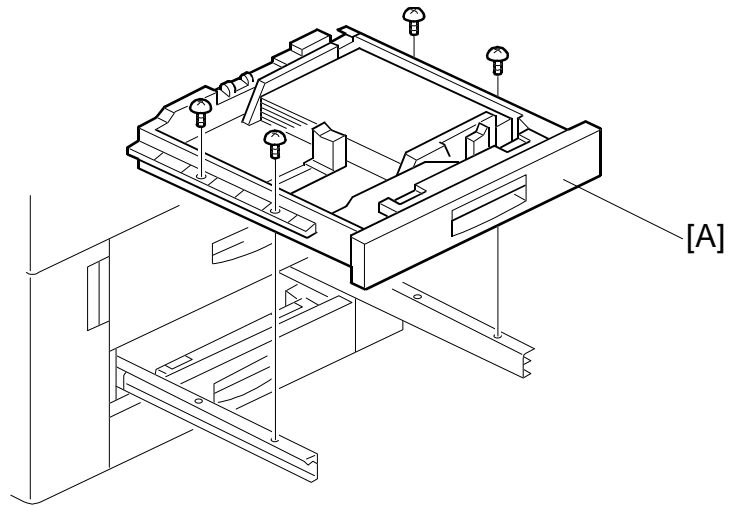


A294R710.WMF

5. Remove the right tandem tray [A] (2 screws).

**NOTE:** 1) When re-installing the right tandem tray, make sure that the wheels [B] ride on the slide rail [C].  
2) When re-installing the right tandem tray, make sure that the tandem tray stopper [D] is set behind the stopper [E] on the copier frame.  
3) Use M4 x 4 screws [F] for securing the right tandem tray. Screws longer than 4 mm will prevent the right tandem tray from sliding out and in smoothly.

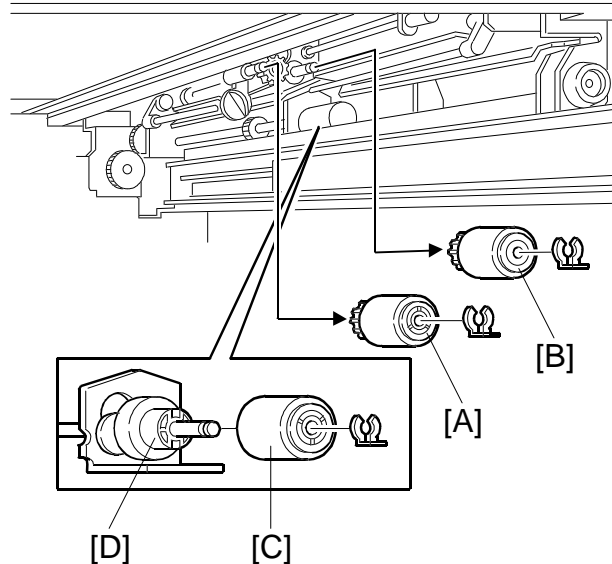
### ***Universal Tray Removal***



A294R711.WMF

1. Draw out the tray.
2. Remove the tray [A] from both guide rails, as shown (4 screws).

## 6.8.2 PAPER FEED ROLLER REPLACEMENT



A294R804.WMF

1. Turn off the main switch.
2. Remove the paper tray for the appropriate feed unit. (Refer to Paper Tray Removal.)
3. Remove the pick-up roller [A] (1 snap ring).
4. Remove the feed roller [B] (1 snap ring).
5. Remove the separation roller [C] from the torque limiter [D] (1 snap ring).

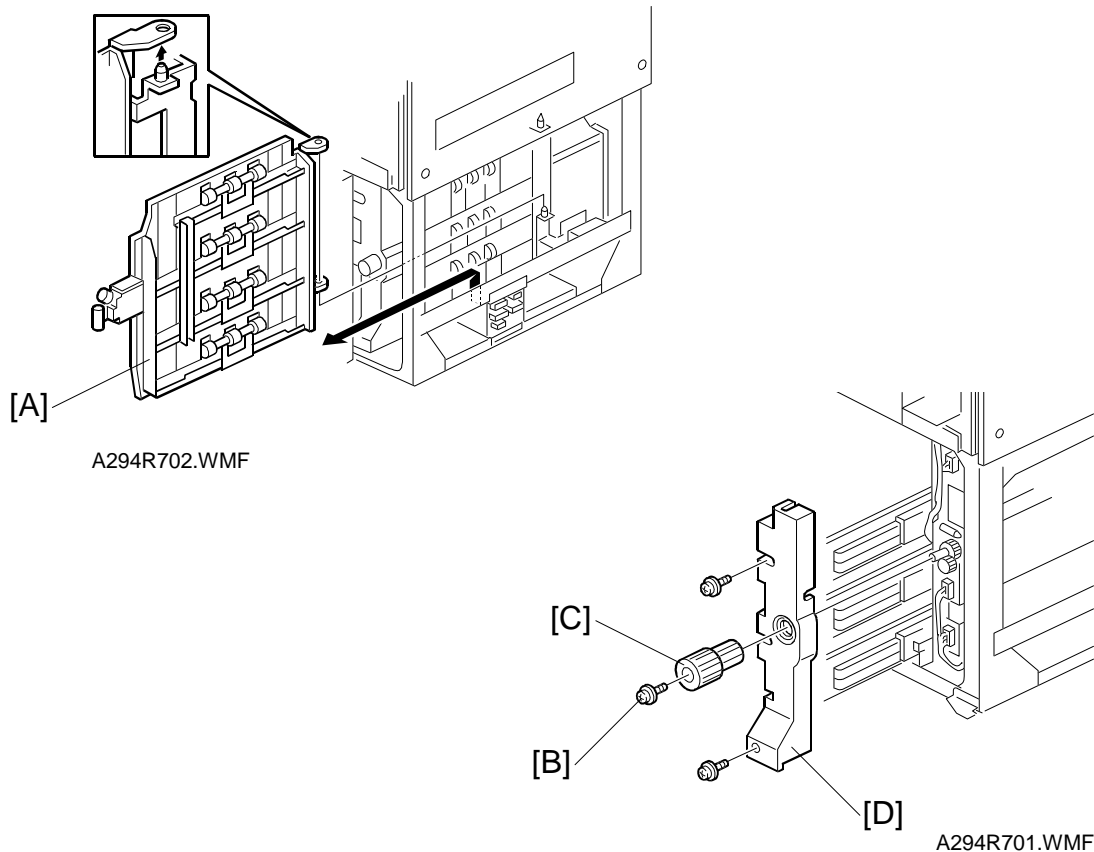
**NOTE:** 1) The paper feed rollers (pick-up, feed, separation) used in the 1st ~ 3rd feed units in the paper tray unit are different from the rollers used in the LCT. They are not interchangeable.

2) Do not touch the surface of the rollers with your bare hands.

Note that there are counters for these rollers that you may wish to reset after installing a new roller (SP 7-816).



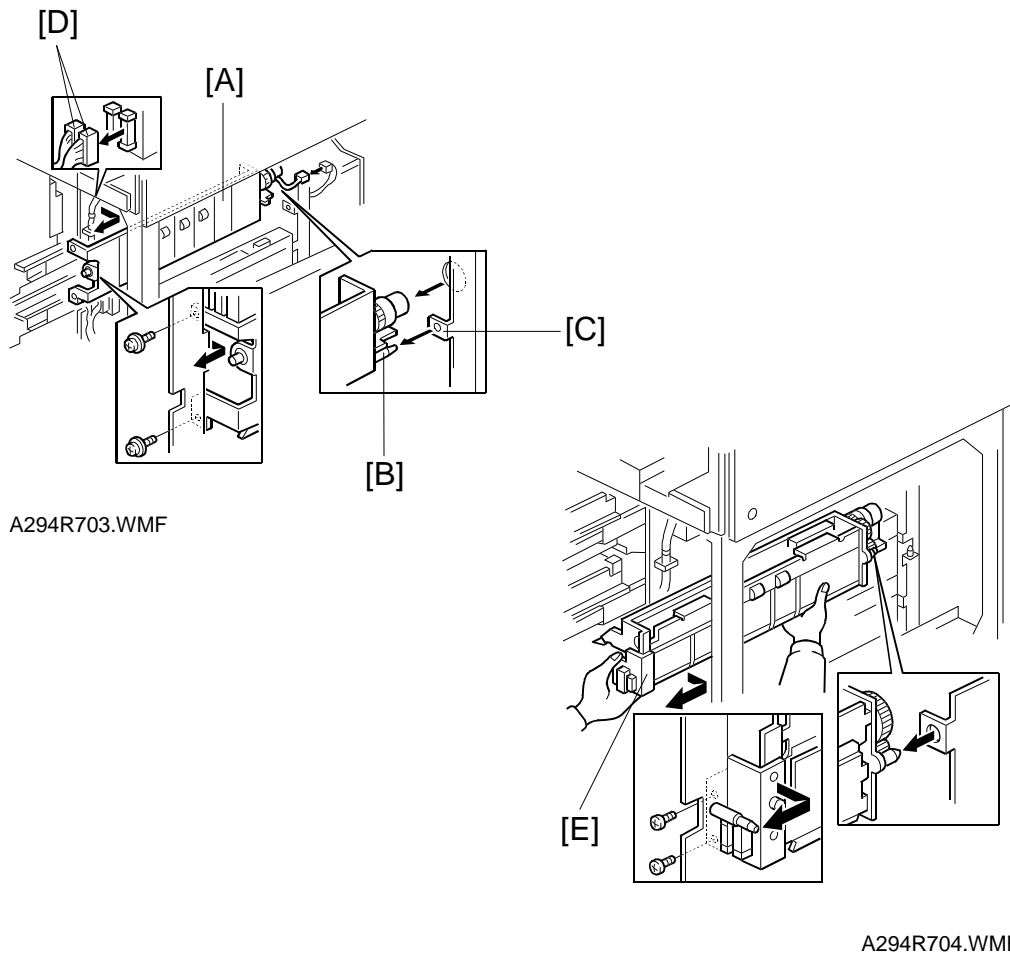
### 6.8.3 PAPER FEED AND VERTICAL TRANSPORT CLUTCH, AND TRAY LIFT, PAPER FEED, AND PAPER END SENSOR REMOVAL



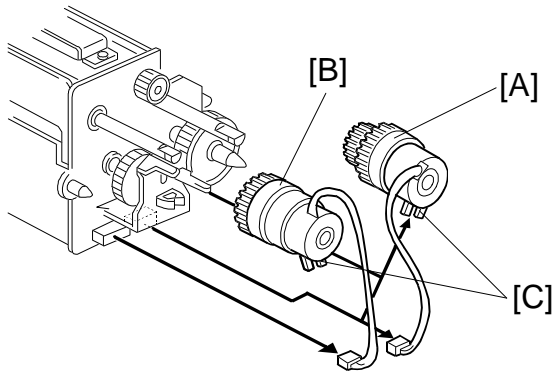
This procedure is described for the 1st feed unit as an example.

1. Turn off the main switch.
2. Remove the right front door.
3. Remove the lower right cover. (Refer to Lower Right Cover Removal.)  
**NOTE:** If the LCT is installed, remove it from the copier.
4. Remove the feed unit cover. (Refer to Feed Unit Cover Removal.)
5. Slightly lift the vertical transport guide [A] and remove it.
6. Remove the securing screw [B], then remove the knob [C].
7. Pull out the paper trays, then remove the paper tray unit inner cover [D] (2 screws).

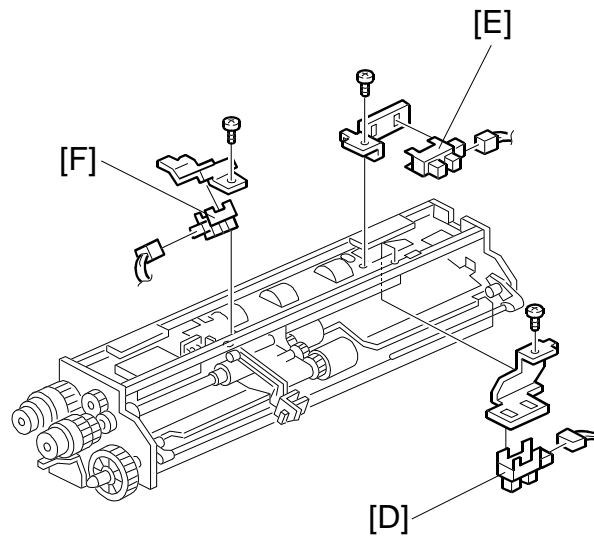
Replacement  
Adjustment



8. Hold the inner vertical transport guide [A] and pull it out (2 screws, 1 connector).  
**NOTE:** When re-installing the inner vertical transport guide, make sure to set the pin [B] of the inner vertical transport guide into the slot [C] on the main body.
9. Disconnect the two connectors [D].
10. Grasp the 1st or 2nd paper feed unit [E] and pull it out (2 screws).  
**NOTE:** Before removing the 1st or 2nd paper feed unit, remove the inner vertical transport guide [A]. Otherwise, the 1st or 2nd paper feed unit may be damaged.



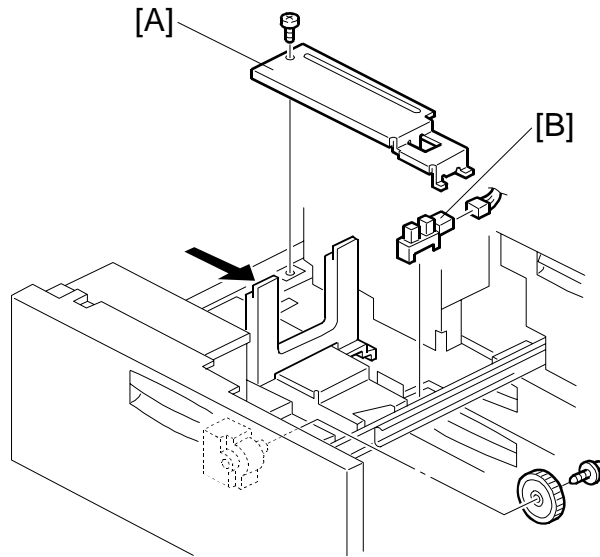
A294R706.WMF



A294R705.WMF

11. Remove the paper feed clutch [A] (1 hook, 1 connector).
12. Remove the vertical transport clutch [B] (1 hook, 1 connector).
13. When re-installing the clutches, put the stopper [C] of each clutch on the correct hook on the bracket.
14. Remove the paper feed [D], paper end [E], or tray lift sensor [F] as required (1 bracket, 1 screw, and 1 connector for each sensor).

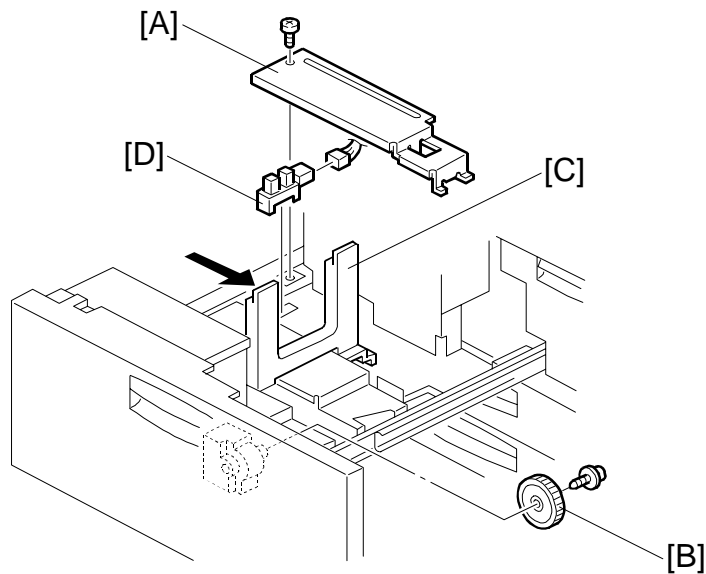
### 6.8.4 REAR FENCE RETURN SENSOR REPLACEMENT



A294R525.WMF

1. Turn off the main switch.
2. Draw out the tandem feed tray.
3. Remove the rear bottom plate [A] (1 screw).
4. Replace the rear fence return sensor [B] (1 connector).

### 6.8.5 REAR FENCE HP SENSOR REPLACEMENT

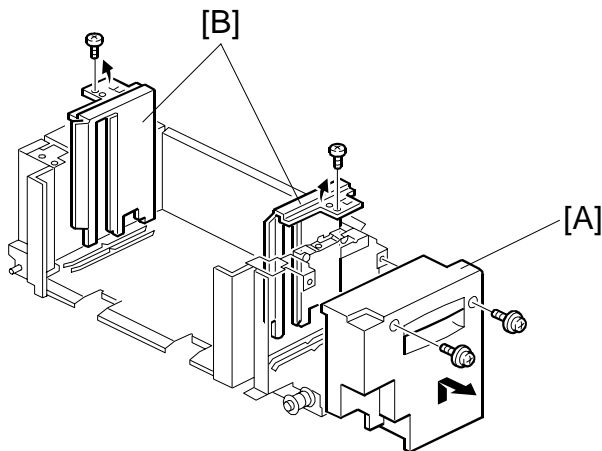


A294R002.WMF

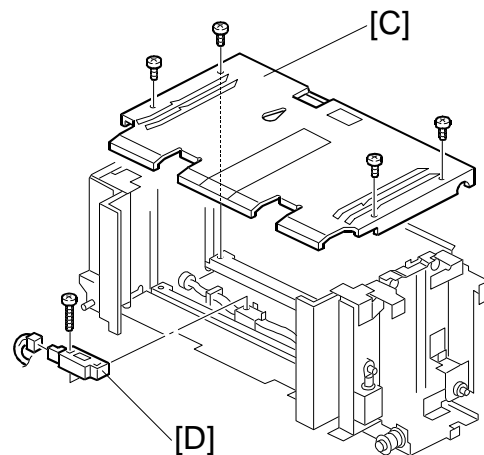
1. Turn off the main switch.
2. Draw out the tandem feed tray.
3. Remove the rear bottom plate [A] (1 screw).
4. Remove the rear fence transport gear [B] (1 screw).
5. Move the rear fence [C] to the right.
6. Remove the rear fence HP sensor [D] (1 connector).

Replacement  
Adjustment

### 6.8.6 RIGHT 1ST TRAY PAPER SENSOR REPLACEMENT



A294R543.WMF

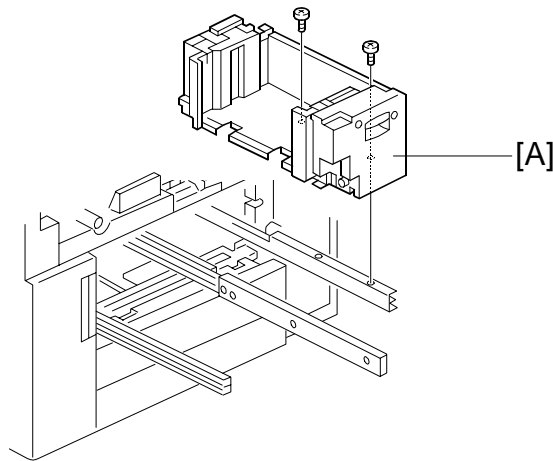


A294R526.WMF

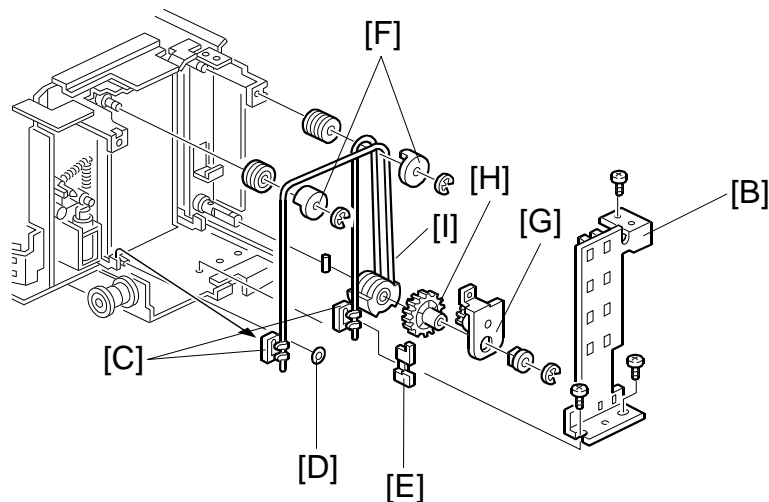
1. Turn off the main switch.
2. Remove the right tandem tray. (Refer to Paper Tray Removal.)
3. Remove the inner cover [A] (2 screws).
4. Remove the side fences [B] (1 screw each).  
**NOTE:** When putting back the side fences, make sure that the position of the side fences is correct.  
A4: Outer  
LT: Inner
5. Remove the bottom plate [C] (4 screws).
6. Replace the right 1st tray paper sensor [D] (1 screw and 1 connector).

## 6.8.7 BOTTOM PLATE LIFT WIRE REPLACEMENT

**NOTE:** Before replacing the rear bottom plate lift wire, remove the front bottom plate lift wire. The procedure for the two wires is the same.



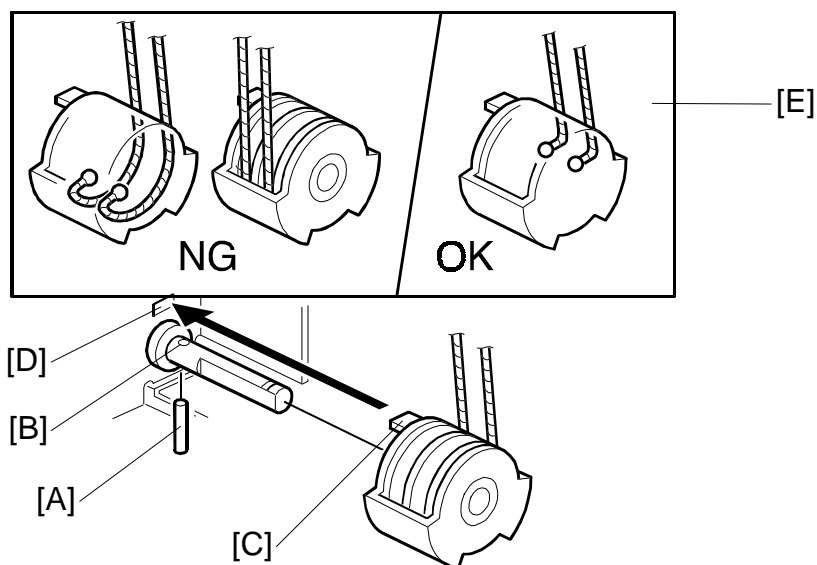
A294R709.WMF



A294R712.WMF

Replacement  
Adjustment

1. Remove the right tandem tray [A]. (Refer to Paper Tray Removal.)
2. Remove the inner cover (2 screws). (See Right 1st Tray Paper Sensor Removal.)
3. Remove the sensor bracket [B] (3 screws).
4. Slightly lift the front bottom plate and unhook the wire stoppers [C] (1 stopper [D] and 1 actuator [E]).
5. Remove the wire covers [F] (1 E-ring each).
6. Remove the bracket [G] (1 screw, 1 E-ring, and 1 bushing).
7. Remove the gear [H].
8. Replace the bottom plate lift wire [I].



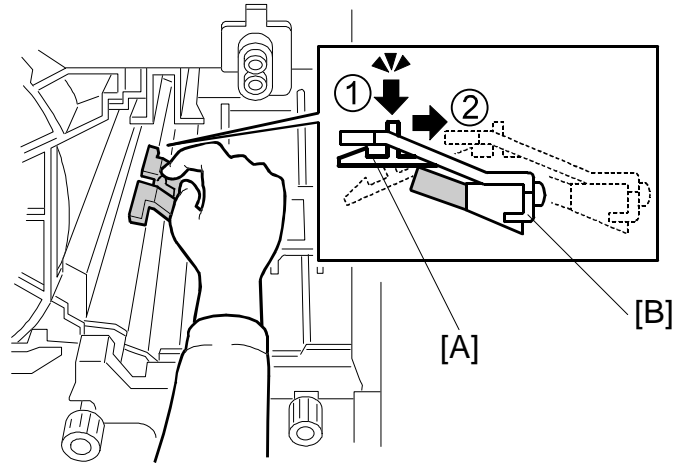
A294R061.WMF

**NOTE:** When re-installing the bottom plate lift wire:

- 1) Set the positioning pin [A] in the hole [B] and set the projection [C] in the hole [D].
- 2) Position the wire as shown [E].
- 3) Do not cross the wires.



## 6.8.8 PAPER DUST REMOVER CLEANING

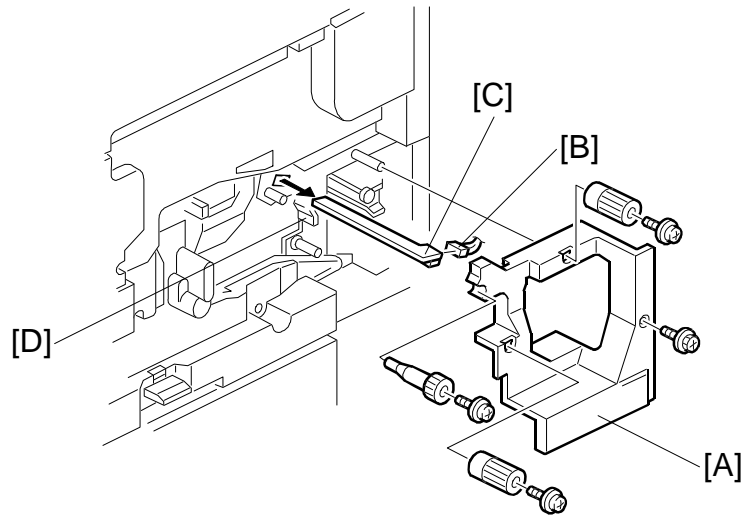


A294R936.WMF

1. Remove the development unit. (Refer to Development Unit Removal.)
2. While pushing down the hook lever [A], remove the paper dust remover [B].
3. Remove the paper dust inside the paper dust remover and clean inside it with a dry cloth or a blower-brush.

Replacement  
Adjustment

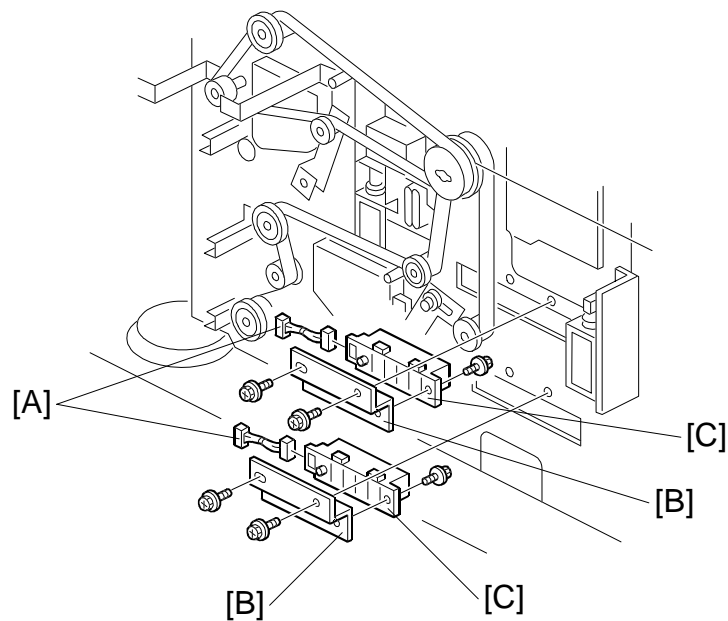
### 6.8.9 REGISTRATION SENSOR CLEANING



A294R937.WMF

1. Remove the lower right inner cover [A] (4 screws, 3 knobs).
2. Disconnect the connector [B].
3. Pull out the registration sensor assembly [C].
4. Clean the photo sensor [D] with a blower-brush.

### 6.8.10 UNIVERSAL TRAY SIZE SWITCH REPLACEMENT

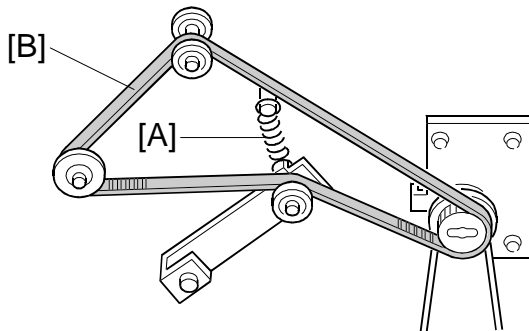


A294R932.WMF

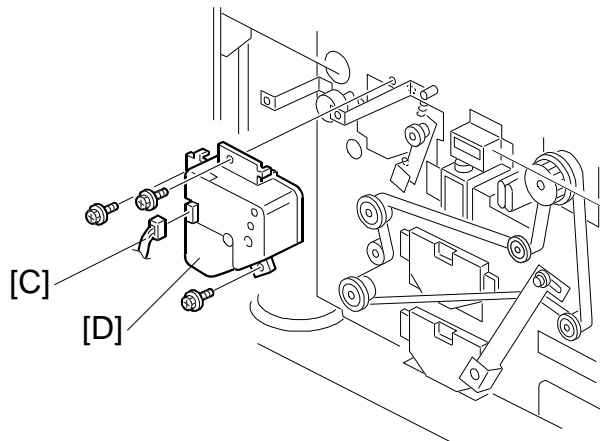
1. Turn off the main switch.
2. Remove the lower rear cover. (See Exterior.)
3. Remove the PSU (5 screws, all connectors). See Boards and Other Items.
4. Disconnect the connector [A].
5. Remove the tray size switch bracket [B] (2 screws).
6. Replace the universal tray size switch [C] (1 connector).

Replacement  
Adjustment

### 6.8.11 1ST TRAY LIFT MOTOR REMOVAL



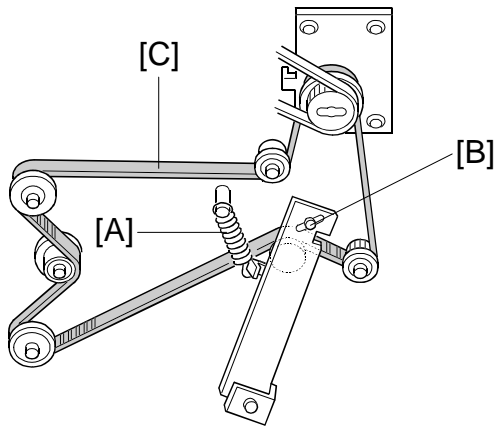
A294R929.WMF



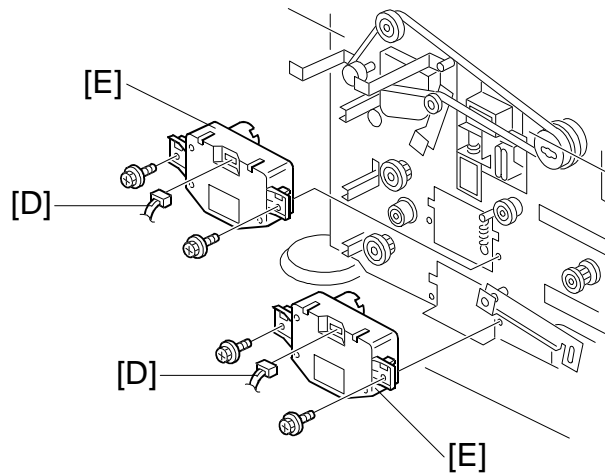
A294R926.WMF

1. Turn off the main switch.
2. Remove the lower rear cover. (See Exterior.)
3. Remove the PSU (5 screws, all connectors) and IOB board (4 screws, all connectors). See Boards and Other Items.
4. Remove the tension spring [A].
5. Remove the upper timing belt [B].
6. Disconnect the connector [C].
7. Remove the 1st tray lift motor [D] (3 screws).

## 6.8.12 LIFT MOTOR REMOVAL (2ND & 3RD TRAYS)



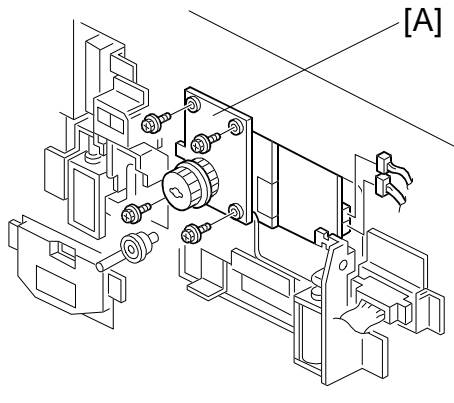
A294R930.WMF



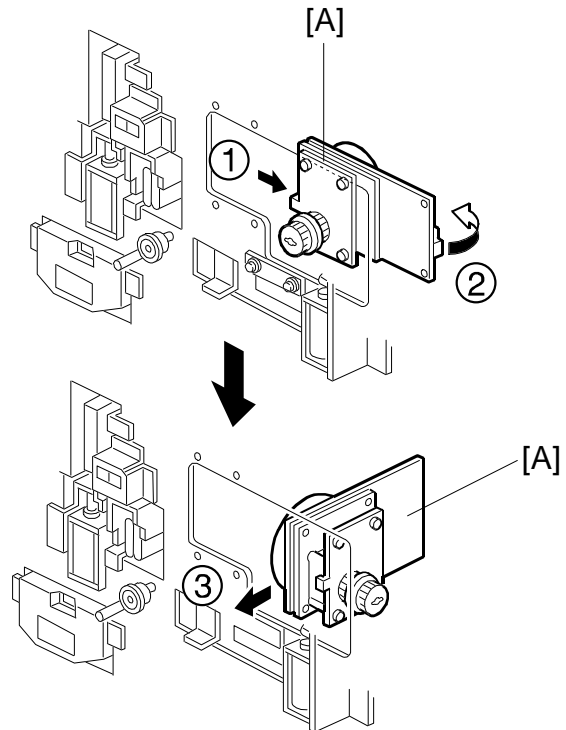
A294R931.WMF

1. Turn off the main switch.
2. Remove the lower rear cover. (See Exterior.)
3. Remove the PSU (5 screws, all connectors) and IOB board (4 screws, all connectors). See Boards and Other Items.
4. Remove the tension spring [A].
5. Remove the screw [B].
6. Remove the lower timing belt [C].
7. Disconnect the connectors [D].
8. Remove the lift motors [E] (2 screws each).

### 6.8.13 PAPER FEED MOTOR REMOVAL



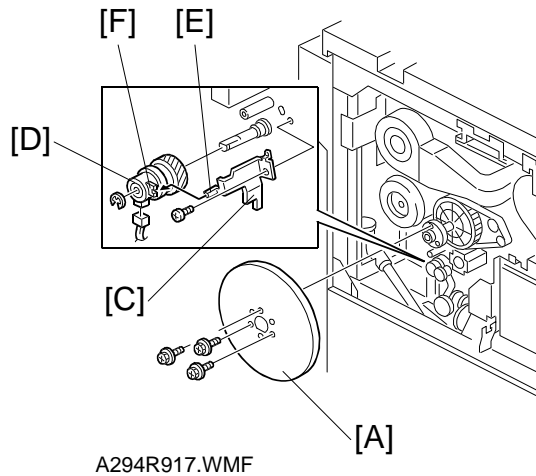
A294R933.WMF



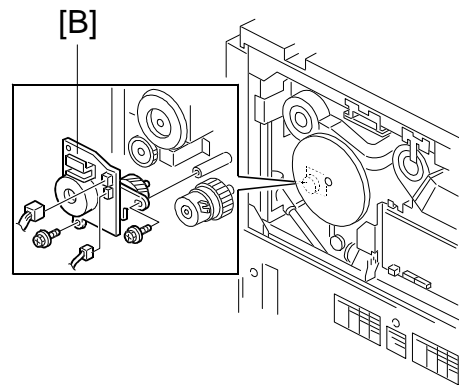
A294R934.WMF

1. Remove the upper and lower timing belts:  
Follow steps from 1 to 5 of 1st tray lift motor removal and from 1 to 6 of 2nd and 3rd lift motor removal.
2. Remove the paper feed motor [A], as shown above (4 screws, 2 connectors).

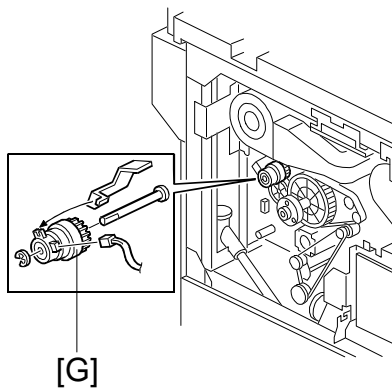
### 6.8.14 RELAY MOTOR, UPPER RELAY CLUTCH, LCT RELAY CLUTCH REMOVAL



A294R917.WMF



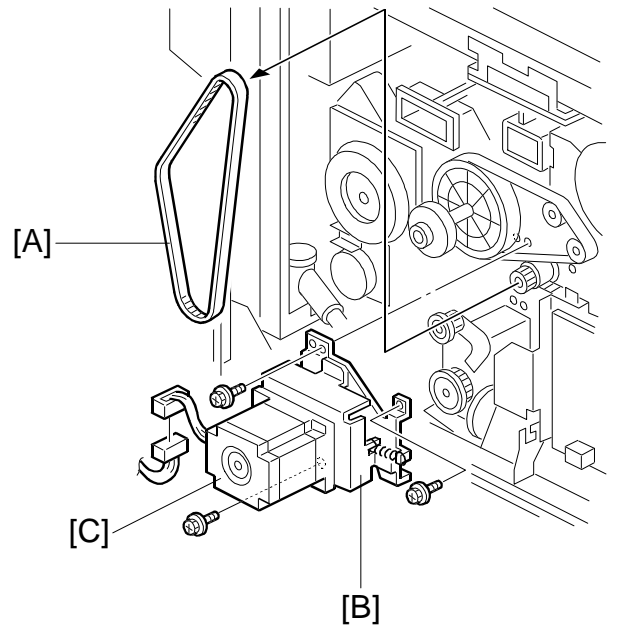
A294R916.WMF



A294R944.WMF

1. Remove the upper rear cover. (Refer to Upper Rear Cover Removal.)
2. Remove the fly wheel [A] (3 screws).
3. Remove the relay motor [B] (2 screws, 2 connectors).
4. Remove the clutch stopper [C] (1 screw).
5. Remove the relay clutch [D] (1 retaining ring, 1 connector).  
**NOTE:** When re-installing the clutch [D], put the pin [E] in the stopper in the cutout [F] in the clutch.
6. Remove the LCT relay clutch [G] (1 retaining ring, 1 connector).

### 6.8.15 REGISTRATION MOTOR REMOVAL

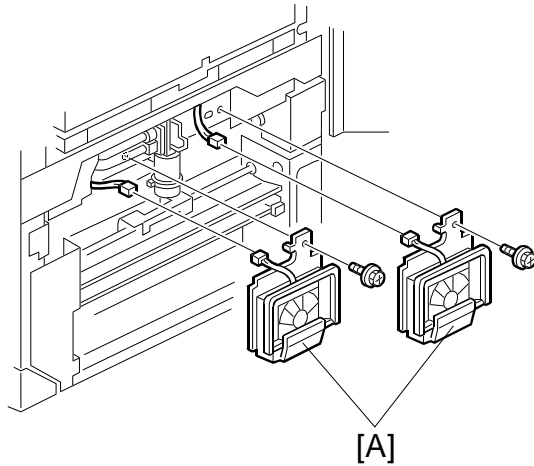


A294R922.WMF

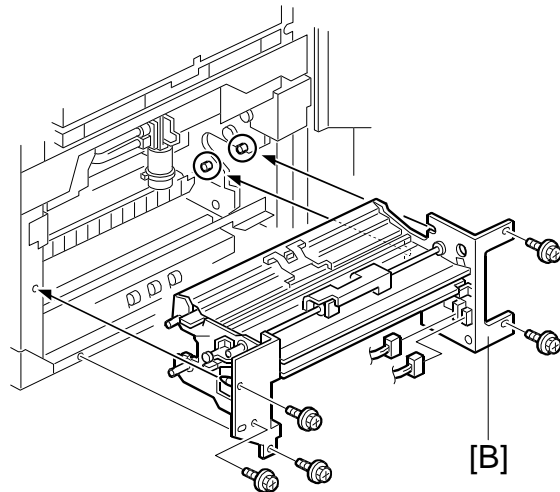
1. Remove the upper rear cover. (Refer to Cover Removal.)
2. Remove the fly wheel (3 screws).
3. Remove the timing belt [A].
4. Remove the bracket [B] with the motor (3 screws, 1 connector).
5. Remove the registration motor [C] (3 screws, 1 timing belt, and 1 spring).



### 6.8.16 COPIER FEED UNIT/DEVELOPMENT FAN MOTOR REMOVAL



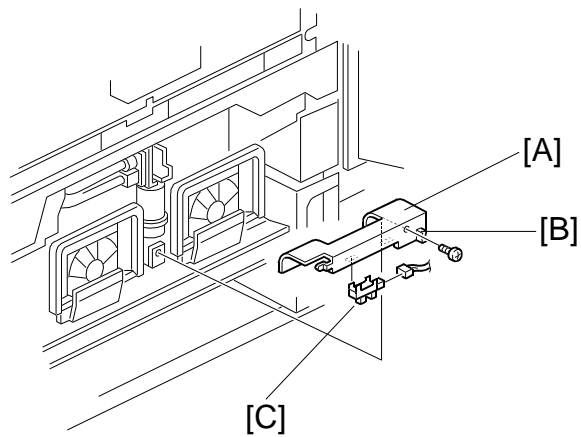
A294R939.WMF



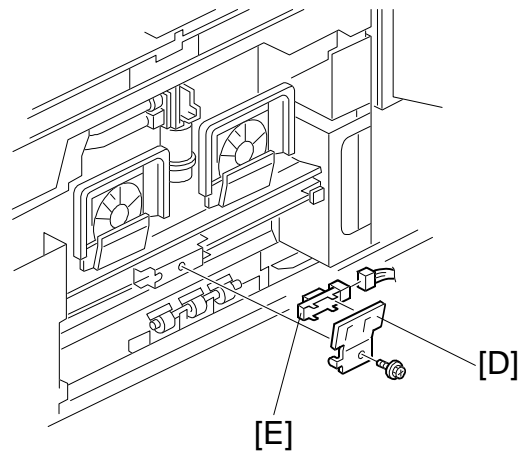
A294R940.WMF

1. Turn off the main switch.
2. Remove the development unit. (Refer to Development Unit Removal.)
3. Remove the lower right inner cover. (Refer to Registration Sensor Cleaning.)
4. Draw out the duplex unit about 10 cm.
5. Remove the LCT relay motor. (Refer to LCT Relay Motor Removal.)
6. Remove the upper right cover. (See Exterior.)
7. Remove the two fan motors [A] (1 screw, 1 connector each).
8. Remove the copier feed unit [B] (5 screws, 2 connectors).

### 6.8.17 LCT RELAY AND RELAY SENSOR REMOVAL



A294R935.WMF

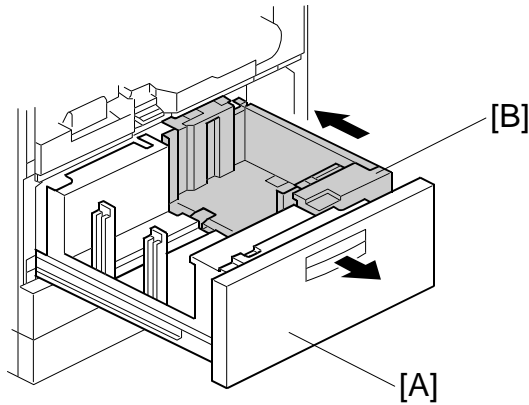


A294R938.WMF

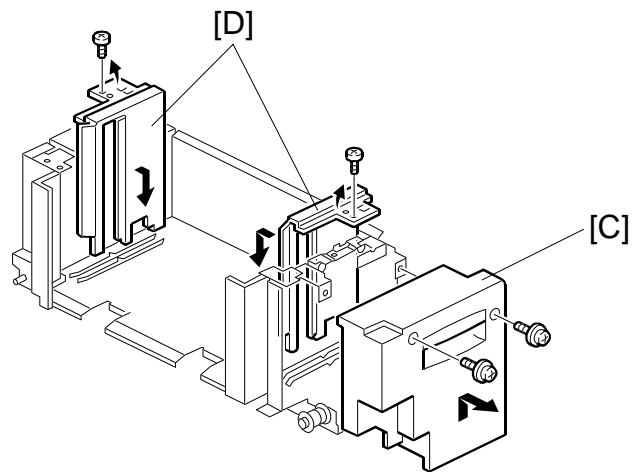
1. Remove the upper right cover. (See Exterior.)
2. Remove the bracket [A] with the LCT relay sensor (1 screw, 1 connector and 1 harness clamp [B]).
3. Remove the LCT relay sensor [C].
4. Remove the bracket [D] with the relay sensor (1 screw, 1 connector).
5. Remove the relay sensor [E].

### 6.8.18 TANDEM FEED TRAY PAPER SIZE CHANGE

**NOTE:** At the factory, this tray is set up for A4 or LT sideways. Only A4 or LT sideways paper can be used for tandem feed.



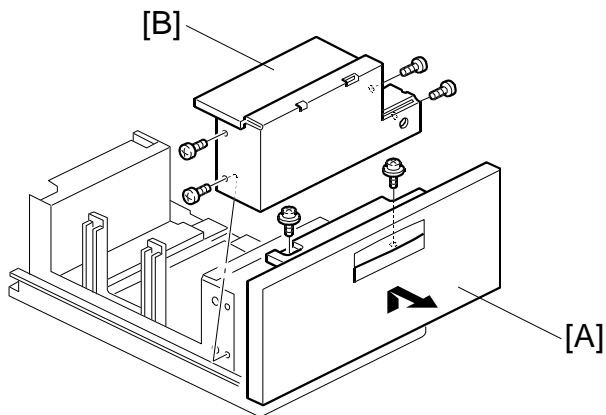
A294R564.WMF



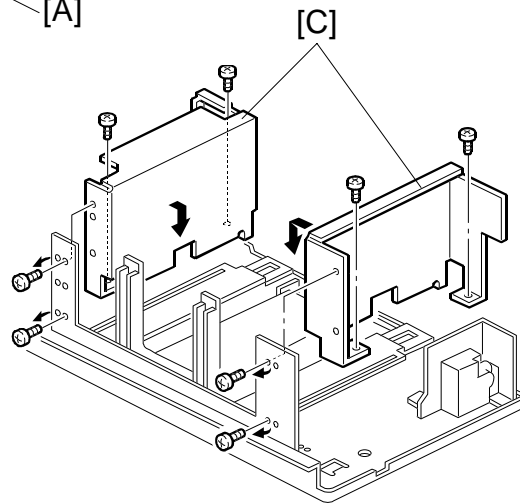
A294R565.WMF

1. Open the front cover.
2. Completely pull out the tandem feed tray [A] so that the right tandem tray [B] separates from the left tandem tray.
3. Remove the right tandem inner cover [C].
4. Re-position the side fences [D] (1 screw each). The outer slot position is used when loading A4 size paper.
5. Re-install the right tandem inner cover [C].

Replacement  
Adjustment

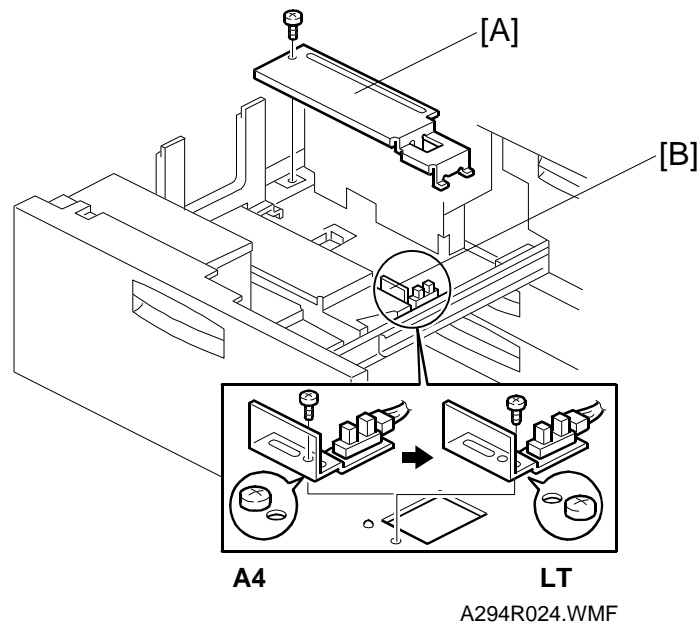


A294R566.WMF



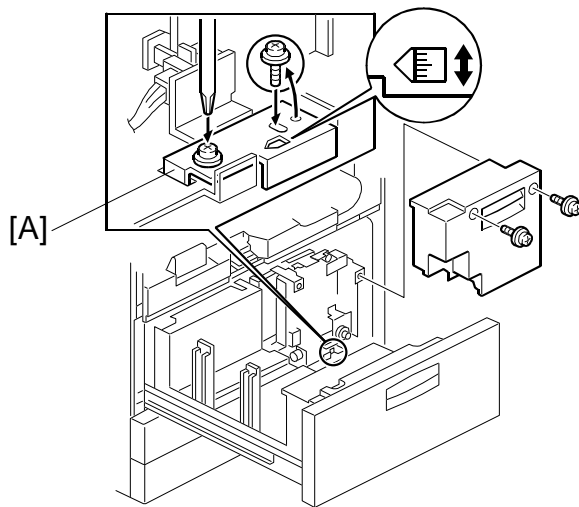
A294R523.WMF

6. Remove the tray cover [A] (2 screws).
7. Remove the motor cover [B] (4 screws).
8. Re-position the side fences [C] (4 screws each). The outer slot position is used when loading A4 size paper.
9. Re-install the motor cover and the tray cover.

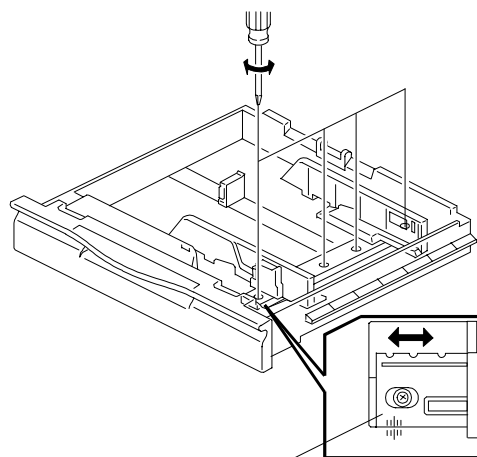


10. Remove the rear bottom plate [A] (1 screw).
11. Re-position the return position sensor bracket [B] (1 screw). To use the paper tray for A4 size, put the screw in the left hole as shown. (For LT size, the screw should be placed on the right.)
12. Re-install the rear bottom plate.
13. Change the paper size using SP5-019-001.

### 6.8.19 MECHANICAL SIDE REGISTRATION ADJUSTMENT



A294R656.WMF



A294R613.WMF

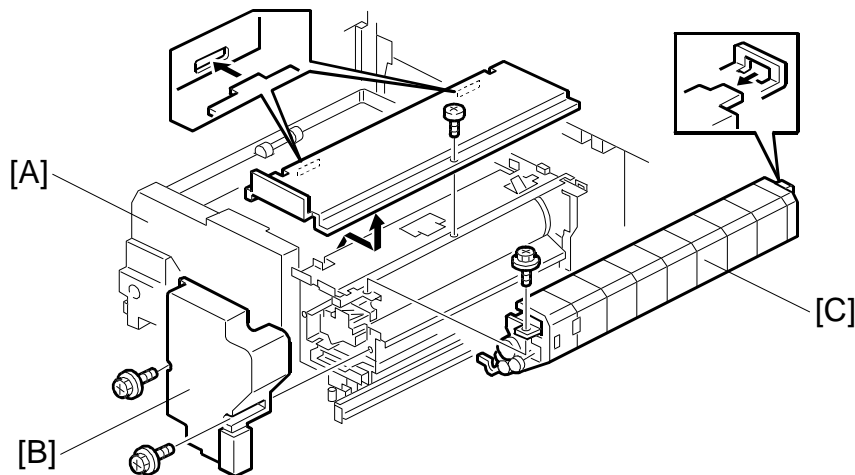
**NOTE:** Normally the side registration of the image can be adjusted with SP mode. When the punch hole positions are not aligned from a particular feed station, adjusted the side registration by changing the tray cover position for that tray, as described below. Then adjust the side registration of the image with the SP mode.

1. Pull out the tray.
2. Move the plate [A] as shown.

Adjustment range:  $0 \pm 2.0$  mm adjustment step: 1.0 mm/step

## 6.9 FUSING UNIT

### 6.9.1 OIL SUPPLY & CLEANING WEB UNIT REMOVAL

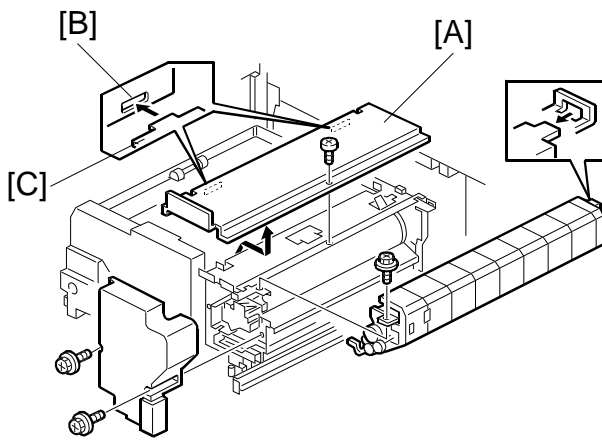


A294R501.WMF

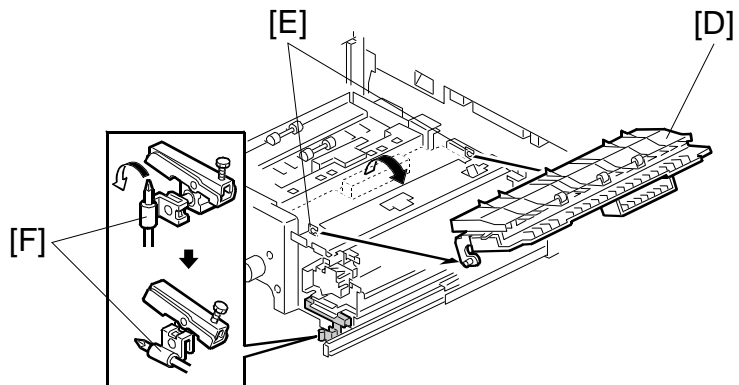
1. Turn off the main switch.
2. Pull out the fusing and exit unit [A].
3. Remove the fusing unit inner cover [B] (2 screws).  
**NOTE:** The oil supply and cleaning web unit is still hot even if the main switch is turned off for servicing.
4. Remove the oil supply and cleaning web unit [C] (1 screw).  
**NOTE:** Make sure that the web collecting roller gear engages with the gears on the fusing/exit unit after re-installing the oil supply and cleaning web unit.

**Replacement  
Adjustment**

## 6.9.2 HOT ROLLER UNIT REMOVAL AND PRESSURE ROLLER REPLACEMENT



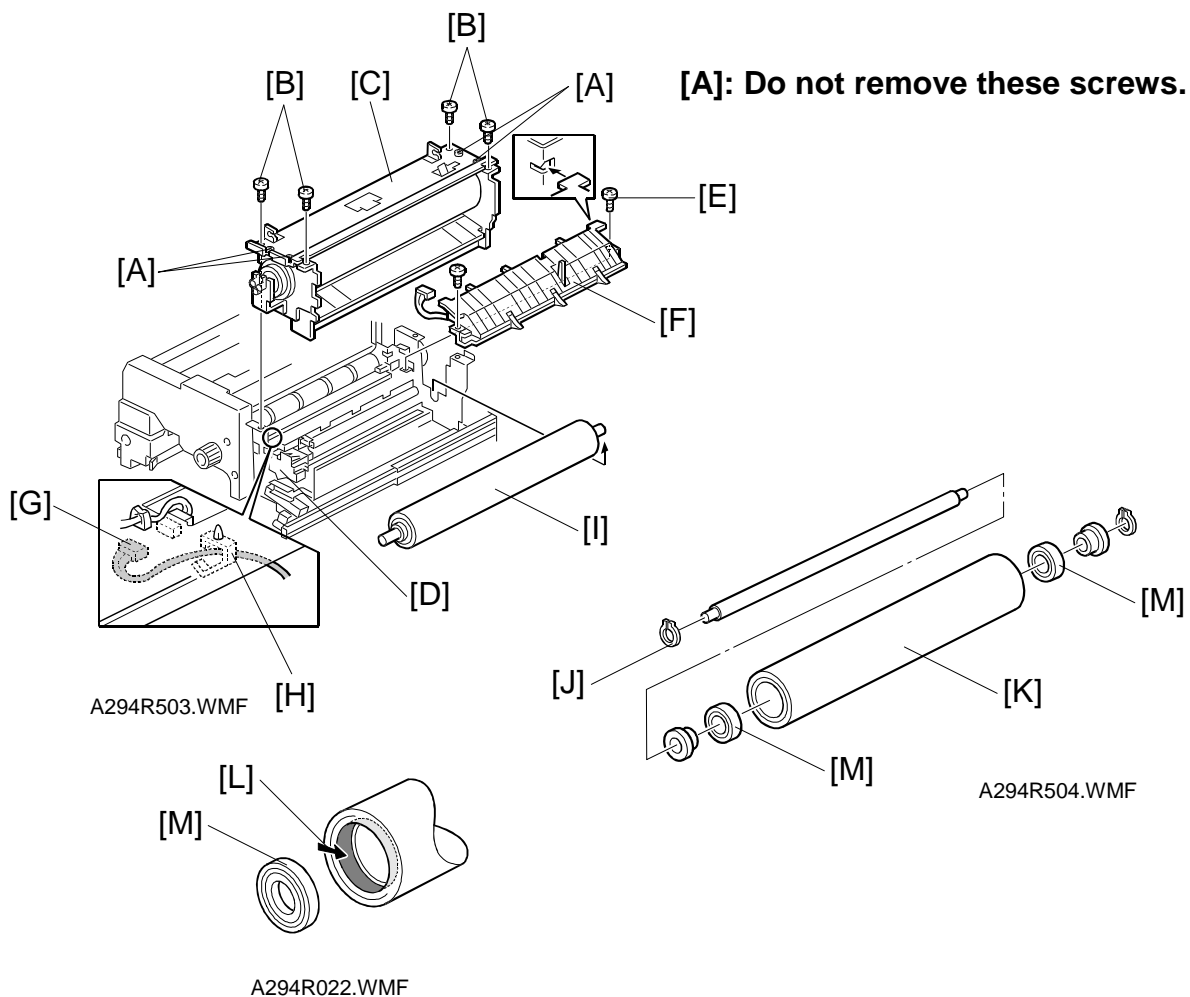
A294R501.WMF



A294R502.WMF

1. Remove the oil supply and cleaning web unit. (See Oil Supply and Cleaning Web Unit Removal.)
2. Remove the top cover [A] of the fusing unit (1 screw).  
**NOTE:** When re-installing this cover, align the cutouts [B] and projections [C] and slide the cover to the right. Make sure that the cover does not pinch the thermistor and thermofuse cables against the stay.
3. Turn the hot roller stripper unit [D] clockwise approximately 160° and slide the pivot shaft out of the cutout [E].
4. Release the fusing pressure by turning the pressure lever [F] 1/4 of a turn counterclockwise with a screw driver.  
**NOTE:** If the fusing pressure is still released when re-installing the inner cover of the fusing unit, that cover cannot be installed.





**NOTE:** Do not remove the four **M4 bind screws** [A] in the next step.



5. Remove the four **M5 pan head screws** [B] and remove the hot roller unit [C].

**NOTE:** 1) When re-installing the hot roller unit, make sure that the flanges of the ball bearings in the hot roller unit are set inside the fusing exit side plate [D] and the gear in the hot roller unit is installed on the rear side.

- 2) Secure the M5 pan head screws at the rear side first. Then, secure the screws at the front side.

6. Remove the two bind screws [E] securing the pressure roller stripper unit [F].

7. Slide the pressure roller stripper unit [F] to the right while slightly raising the side near the pressure roller (1 connector [G] and 1 clamp [H]).

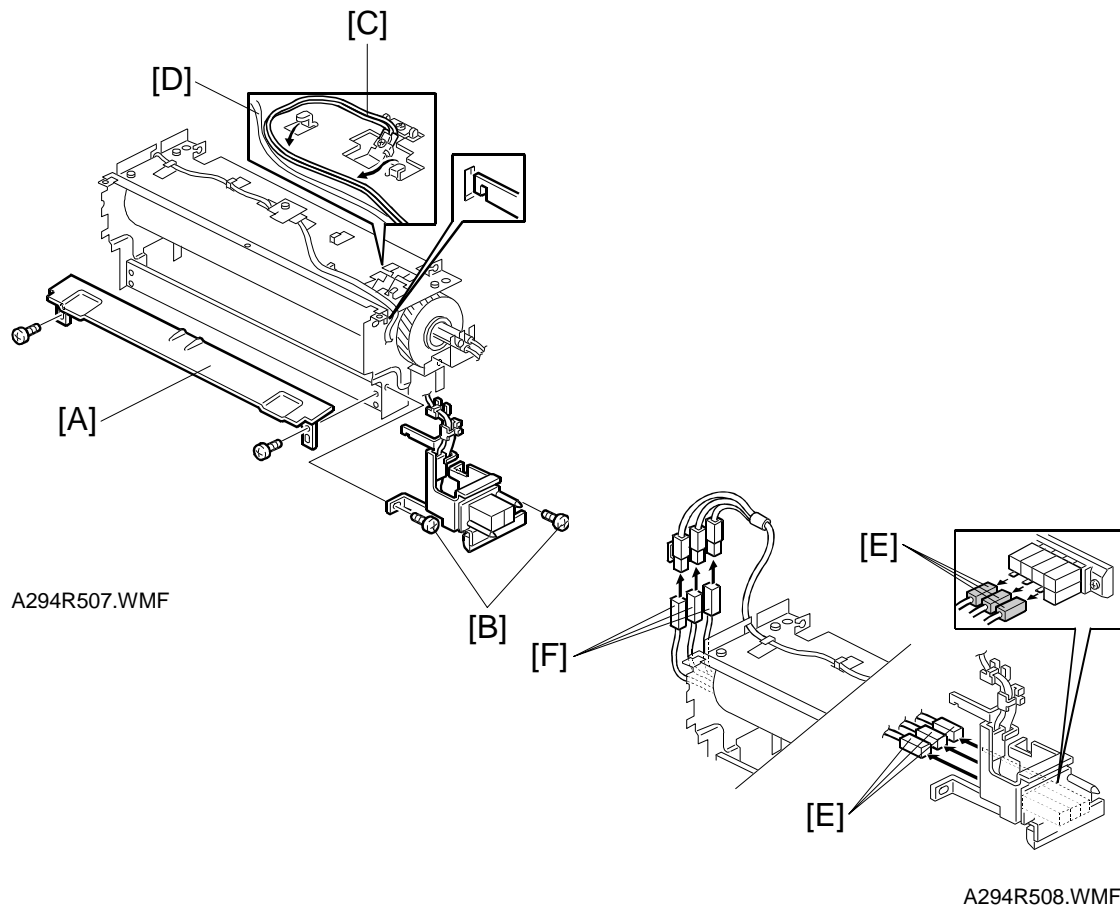
**NOTE:** Be careful not to touch the pressure roller surface during this step.

8. Lift up the pressure roller unit [I].

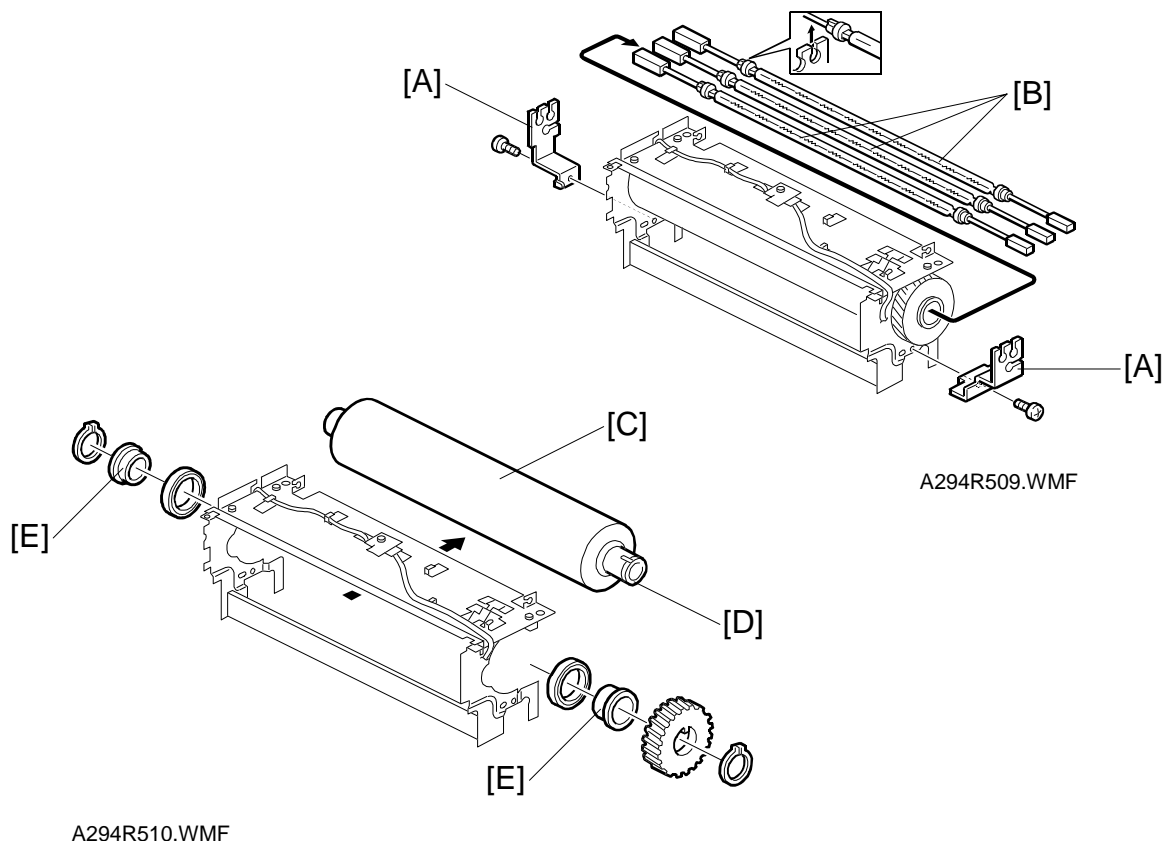
9. Remove the C-ring [J] from the pressure roller and replace the pressure roller [K] (2 ball bearings, 2 bushings).

**NOTE:** Lubricate the inner surface [L] of the pressure roller (bearing [M] contact part) with BARRIERTA L55/2 grease when replacing the pressure roller.

### 6.9.3 HOT ROLLER REPLACEMENT



1. Remove the hot roller unit:  
Follow steps 1 to 5 of hot roller unit removal and pressure roller replacement.
2. Remove the fusing entrance guide [A] (2 screws).
3. Remove the two screws [B] securing the harness terminal bracket, and unhook the bracket.  
**NOTE:** Unhook the thermistor cable [C] and themofuse cable [D] to prevent them from becoming damaged.
4. Disconnect the three green connectors [E] for the fusing lamp cables from the terminal on the rear side.
5. Disconnect the three white fusing lamp connectors [F] on the front side.



6. Remove the front and rear lamp holders [A] (1 screw each).
7. Remove the three fusing lamps [B] one-by-one.
8. Replace the hot roller [C] (1 gear, 2 C-rings, 2 bushings, and 2 ball bearings).
 

**NOTE:** 1) When replacing the hot roller, make sure that the end with long part of the shaft [D] is at the rear (gear side).

2) When re-installing the ball bearings and bushings, make sure that the flanges for the bearings and bushings are placed on the outside.

3) Lubricate the inner and outer surfaces of the bushings [E] with BARRIERTA L55/2 grease when replacing the pressure roller.

When re-installing the three fusing lamps, make sure of the following points:

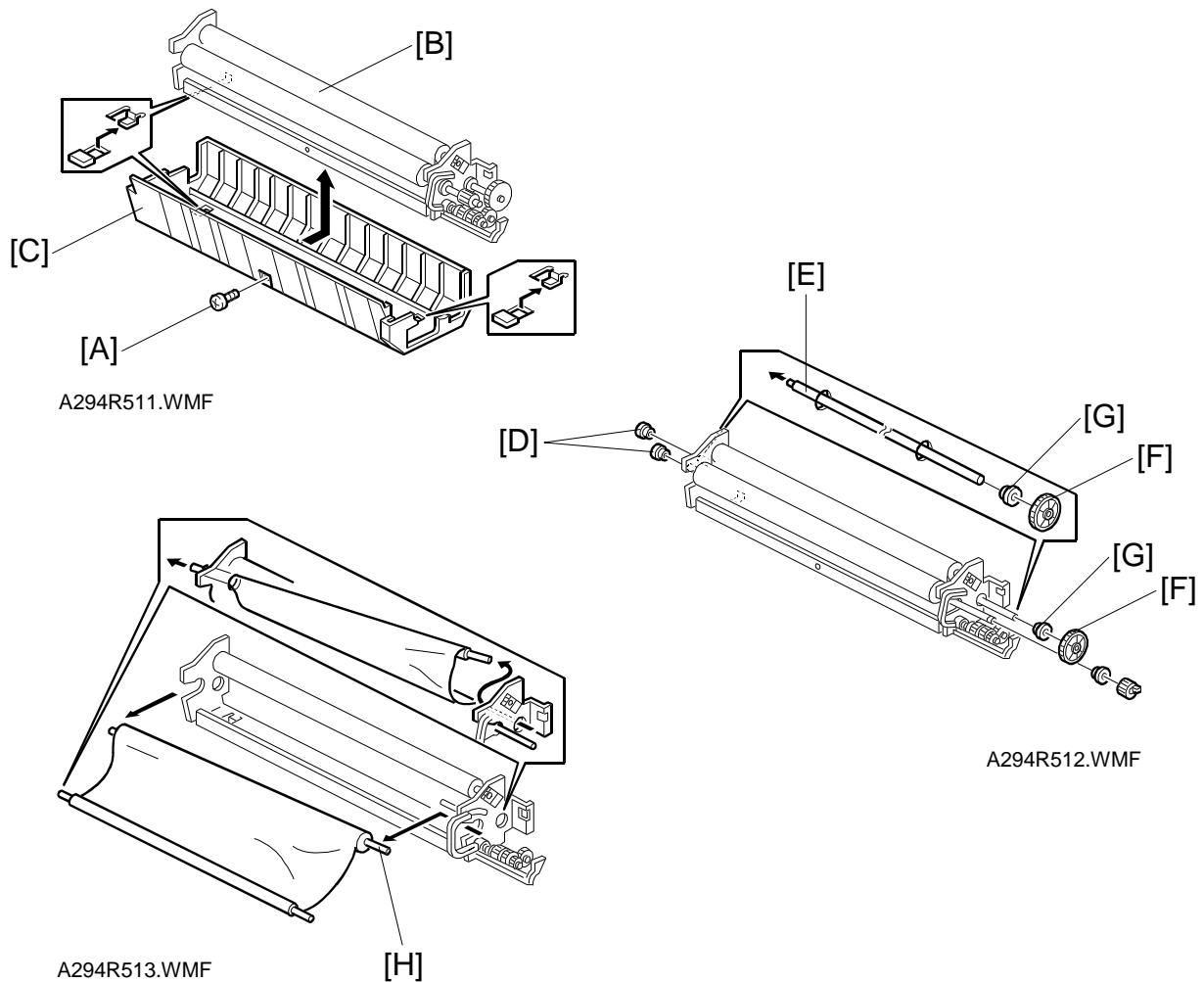
- 1) The three lamps must be parallel inside the hot roller (DO NOT CROSS THEM).
- 2) While aligning the three lamps with the cutouts in the front lamp holder, re-install the front and rear lamp holders.
- 3) At the front, connect the white fusing lamp connectors to the white connectors on the cable. At the rear, connect the green fusing lamp connectors to the green connectors on the cable.
- 4) Route the thermistor cable and themofuse cable (refer to [C] and [D] on the previous page).

Make sure that the cables are not pinched and do not contact the gears.

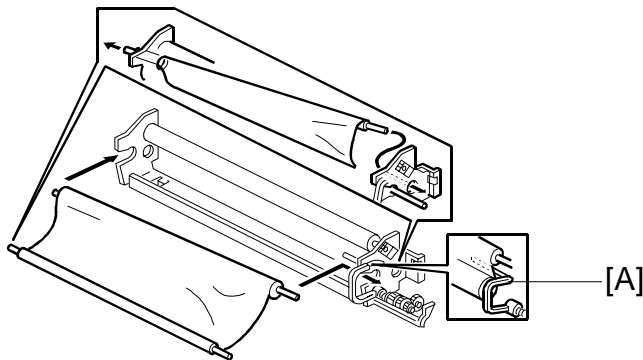
Replacement  
Adjustment



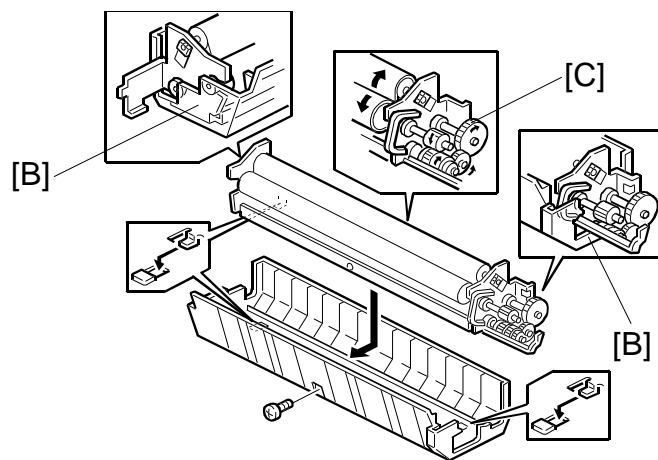
## 6.9.4 OIL SUPPLY & CLEANING WEB REPLACEMENT



1. Remove the oil supply and cleaning web unit. (See Oil Supply And Cleaning Web Unit Removal.)
2. Put the oil supply and cleaning web unit on a stable flat surface (opening side up) as shown.
3. Remove the screw [A] from the oil supply and cleaning web unit cover.
4. Slide the oil supply and cleaning web assembly [B] to the rear while holding the oil supply and cleaning web unit cover [C]. Then, remove the oil supply and cleaning web assembly [B].
5. Remove two bushings [D] from the short shaft side (rear side).
6. Push the web collecting roller shaft [E] to the short shaft side (rear side). Then remove the web collecting roller gear [F] and bushing [G].
7. Replace the oil supply and cleaning web [H] (1 gear and 1 bushing).



A294R514.WMF

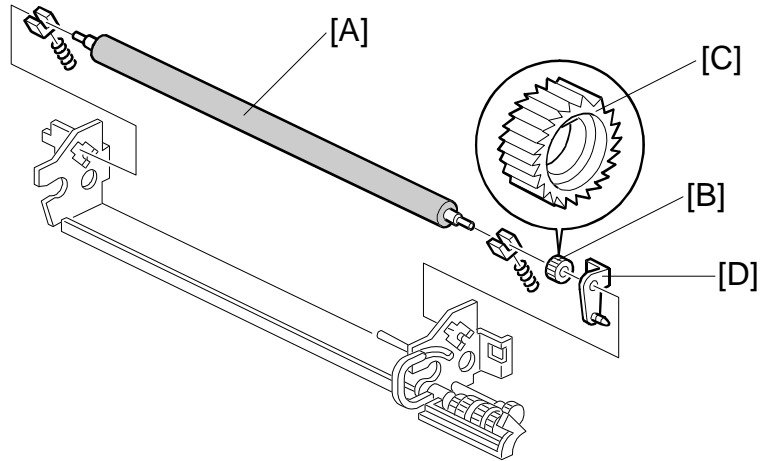


A294R515.WMF

- NOTE:** 1) When re-installing parts, make sure that the feeler lever [A] for the web end sensor is on the web as shown. Otherwise, after re-installing the parts and turning on the main switch, web end (SC550) will be displayed.
- 2) When putting back the oil supply and cleaning web assembly, make sure that the flange for the bushings does not ride on the side edges [B] of the oil supply and cleaning web unit cover.
- 3) If the web has a buckle between the web supply roll and web collecting roll, turn the web collecting roller gear [C] clockwise (front view) until the buckle is pulled straight.
8. Reassemble the fusing unit.
- NOTE:** Make sure that the web collecting roller gear engages with the gears on the fusing unit exit unit after re-attaching the oil supply and cleaning web unit.
9. Access SP1-902-1 (web consumption counter), and change the value to 0.



## 6.9.5 WEB CLEANING ROLLER REPLACEMENT

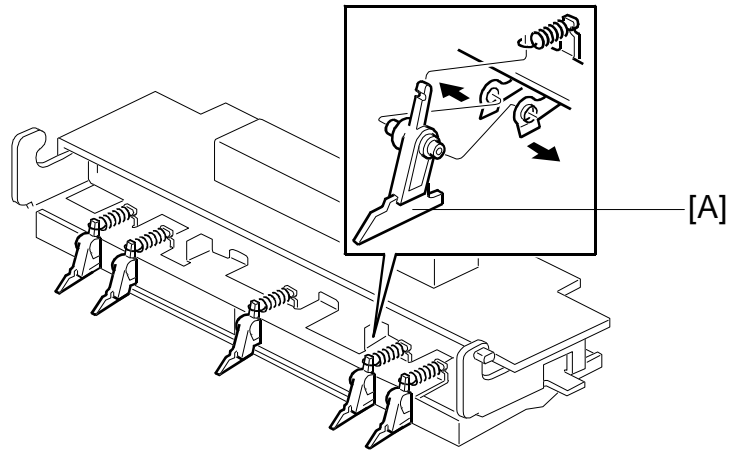


A294R519.WMF

1. Remove the oil supply and cleaning web.
2. Replace the web cleaning roller [A] (1 gear, 1 bracket, 2 bushings, and 2 springs).

**NOTE:** When putting back the gear [B], the D-shaped opening in this gear should face the roller shaft side. The circular-shaped opening [C] in the gear should face the bracket side [D].

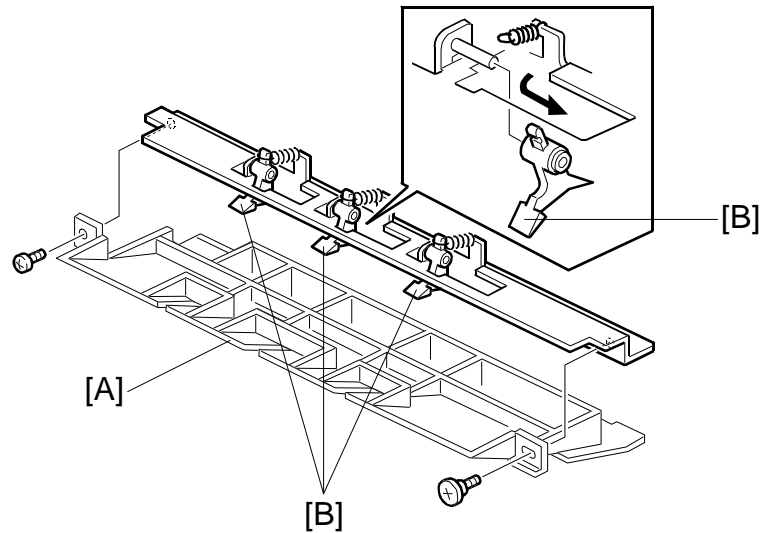
## 6.9.6 HOT ROLLER STRIPPER REPLACEMENT



A294R517.WMF

1. Remove the hot roller stripper unit:  
Follow steps 1 to 3 of hot roller unit removal.
2. Replace the hot roller strippers [A].

### 6.9.7 PRESSURE ROLLER STRIPPER REPLACEMENT

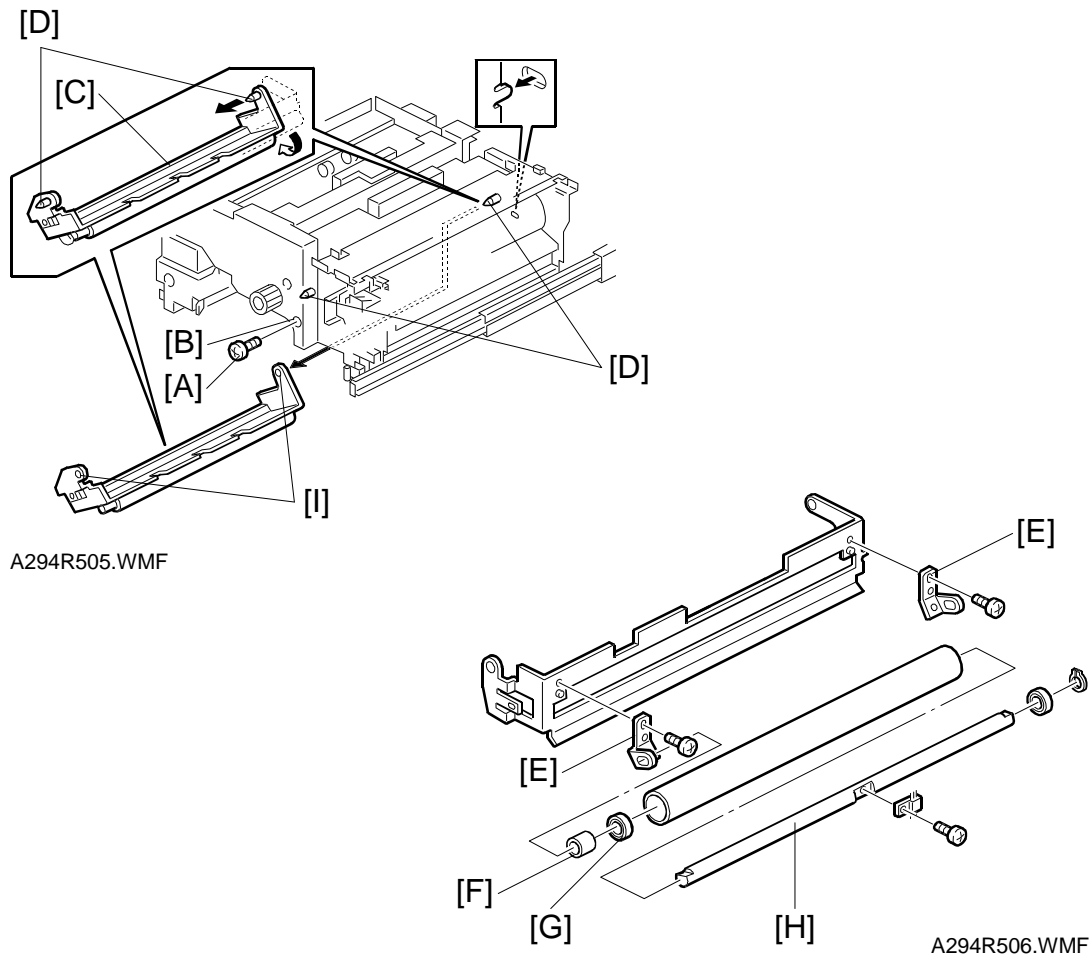


A294R518.WMF

1. Remove the pressure roller stripper unit:  
Follow steps 1 to 7 of hot roller unit removal and pressure roller replacement.
2. Remove the stripper pawl cover [A] (2 screws).
3. Replace the pressure roller strippers [B].



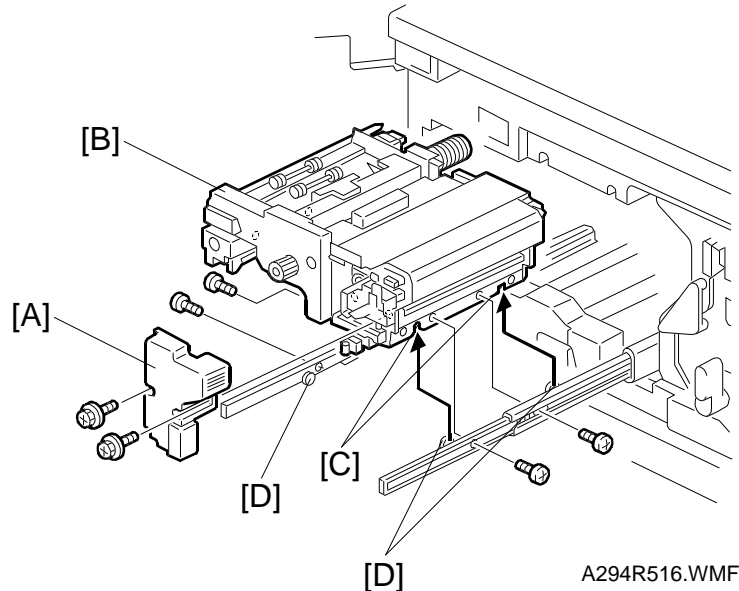
### 6.9.8 PRESSURE ROLLER CLEANING ROLLER REPLACEMENT



1. Remove the screw [A] through the hole [B] in the fusing unit exit inner cover as shown.
2. Pull the pressure cleaning roller unit [C] to the front, then swing the pressure roller cleaning roller unit down clockwise.
3. Pull out the pressure roller cleaning roller unit again. The pressure roller cleaning roller unit dislodges from the pins [D] on the front and rear side plate of the fusing exit.
4. Remove the two plate springs [E] (2 screws) and replace the pressure roller cleaning roller (1 spacer [F], 1 ball bearing [G] and 1 shaft assembly [H]).

**NOTE:** When re-installing the pressure roller cleaning roller unit, fit the holes [I] (first the rear, then the front) in the pressure roller cleaning roller unit bracket onto the pins [D] on the rear and front side plates of the fusing unit exit. Then, turn the pressure roller cleaning roller unit counterclockwise, and push the pressure roller cleaning roller unit to the rear. Finally, secure it with the screw [A].

### 6.9.9 FUSING AND EXIT UNIT REMOVAL



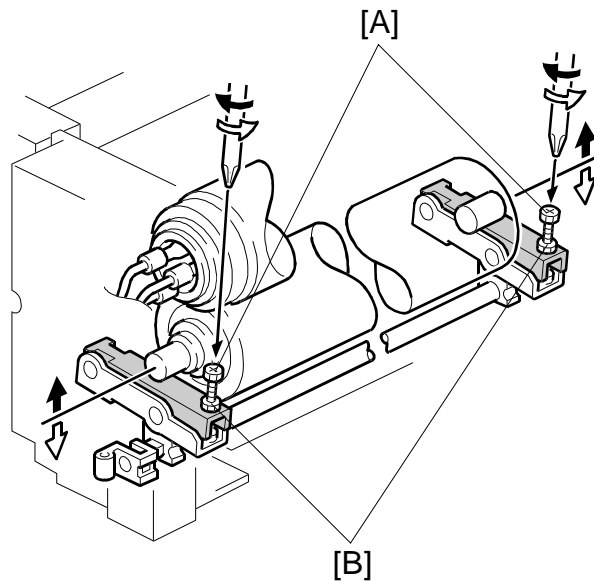
#### **⚠ CAUTION**

**The fusing and exit unit is heavy. Take care not to injure yourself by dropping the fusing and exit unit when removing and installing it.**

1. Remove the fusing unit inner cover [A] (2 screws).
2. Remove the fusing and exit unit [B] (4 screws).

**NOTE:** 1) When putting back the fusing and exit unit, hook the cutouts [C] on the projections [D] on the right and left slide rails.  
2) The fusing inner cover prevents the fusing and exit unit from hooking the fusing and exit unit on the slide rails. Put back the fusing and exit unit without the fusing inner cover. Then, put back the fusing inner cover.

### 6.9.10 FUSING PRESSURE ADJUSTMENT



A294R056.WMF

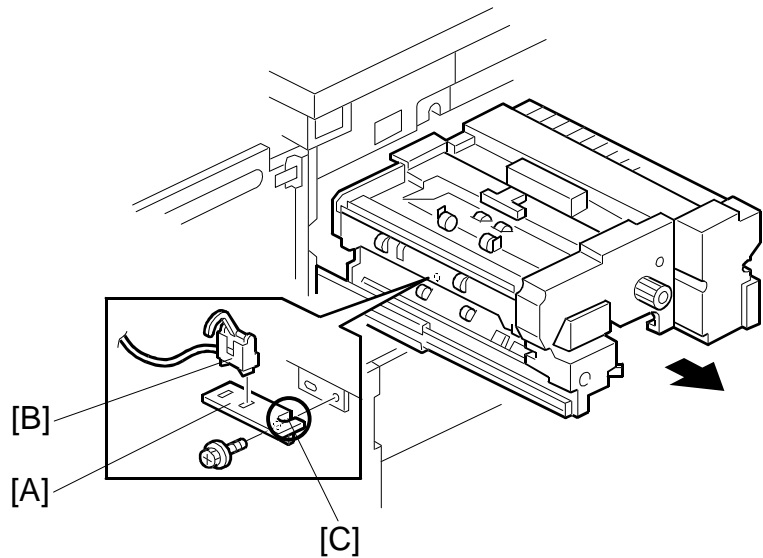
Adjustment standards: Nip width  $11.5 \pm 0.5$  mm (the difference between front and rear measurements should be less than 0.5 mm).

1. Select the fusing nip band check mode (SP1-109).
2. Make a copy using an A4/LT OHP sheet. Copying will start. It will stop in the fusing unit for 30 seconds and then will exit.  
**NOTE:** If an OHP sheet is not available, use a solid black copy on plain paper (make the copy with the ADF open – the copy will be all black).
3. Measure the nip band width (the shiny band) at both ends.
4. If the nip band width is not within specifications at both ends, release the fusing pressure and adjust it using the adjustment screw [A] (clockwise = increases the pressure, counterclockwise = decreases the pressure).  
**NOTE:** Loosen the lock nuts [B] before turning the pressure adjustment screw. Re-tighten the nuts after adjusting.
5. Repeat steps 1 to 4 to confirm the nip band width.

 Replacement  
Adjustment

## 6.10 PAPER EXIT/DUPLEX UNIT

### 6.10.1 EXIT SENSOR REPLACEMENT

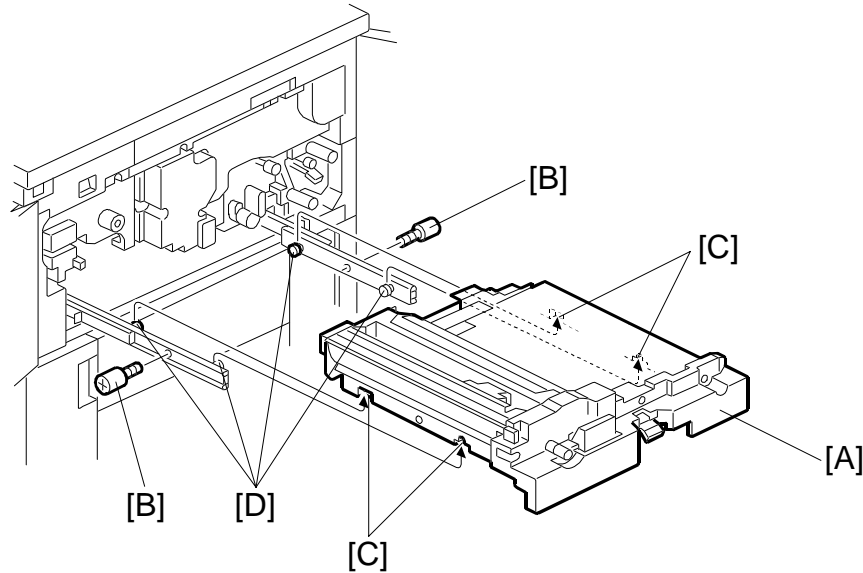


A294R601.WMF

1. Pull out the fusing and exit unit.
2. Remove the sensor bracket [A] with the sensor (1 screw, 1 connector, and 2 clamps).
3. Replace the exit sensor [B].

**NOTE:** When putting back the sensor bracket, run the cable through the cutout [C] to slacken the cable.

## 6.10.2 DUPLEX UNIT REMOVAL



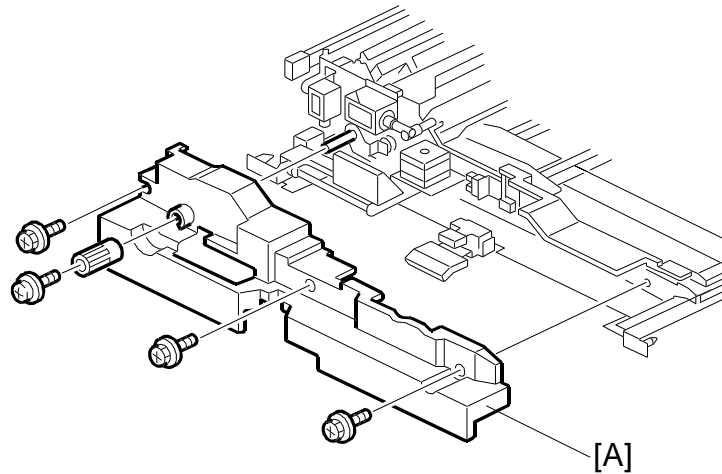
A294R801.WMF

1. Open the left and right front doors and pull out the duplex unit [A].
2. Remove the 2 shoulder screws [B].
3. Lift up the duplex unit.

**NOTE:** When putting back the duplex unit, align the cutouts [C] with the slide rail projections [D].

Replacement  
Adjustment

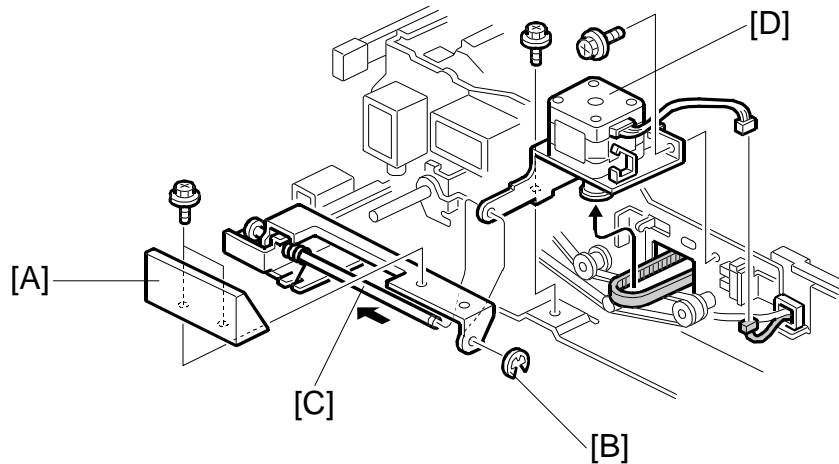
### 6.10.3 DUPLEX UNIT INNER COVER REMOVAL



A294R802.WMF

1. Pull out the duplex unit.
2. Remove the duplex unit inner cover [A] (1 knob and 4 screws).

### 6.10.4 JOGGER MOTOR REPLACEMENT



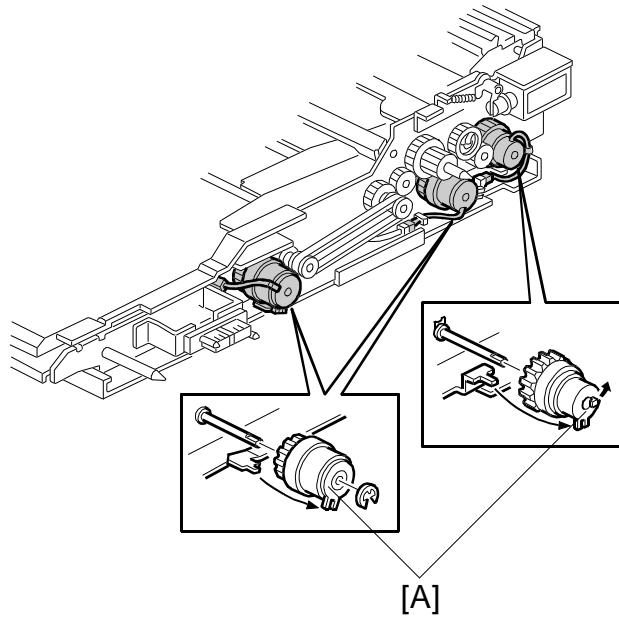
A294R803.WMF

1. Remove the duplex inner cover. (See Duplex Unit Inner Cover Removal.)
2. Remove the duplex grip [A] (2 screws).
3. Remove the E-ring [B] and slide the duplex grip shaft [C] to the left.
4. Remove the jogger motor [D] (2 screws, 1 connector, 2 clamps).

**NOTE:** When putting back the jogger motor, put back the duplex grip shaft and E-ring first. Then, tighten the screws for the jogger motor.

Replacement  
Adjustment

## 6.10.5 DUPLEX UNIT CLUTCH REPLACEMENT

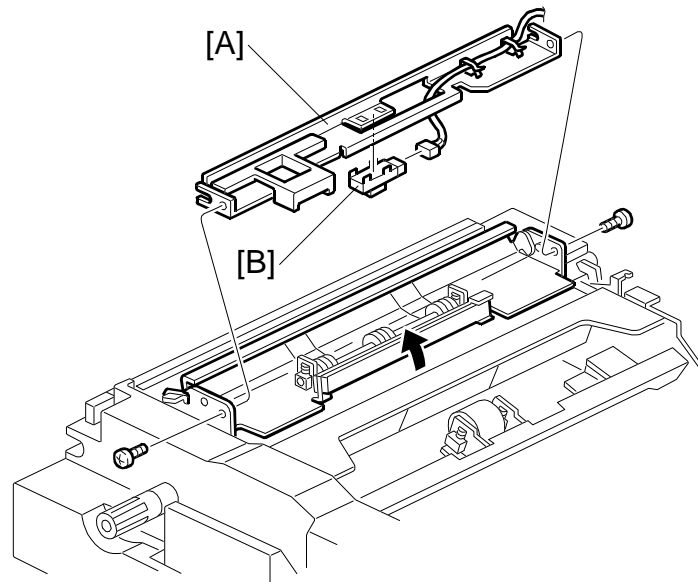


A294R854.WMF

1. Remove the duplex unit.
2. Replace each clutch [A] (1 connector and 1 E-ring or 1 clutch stopper).



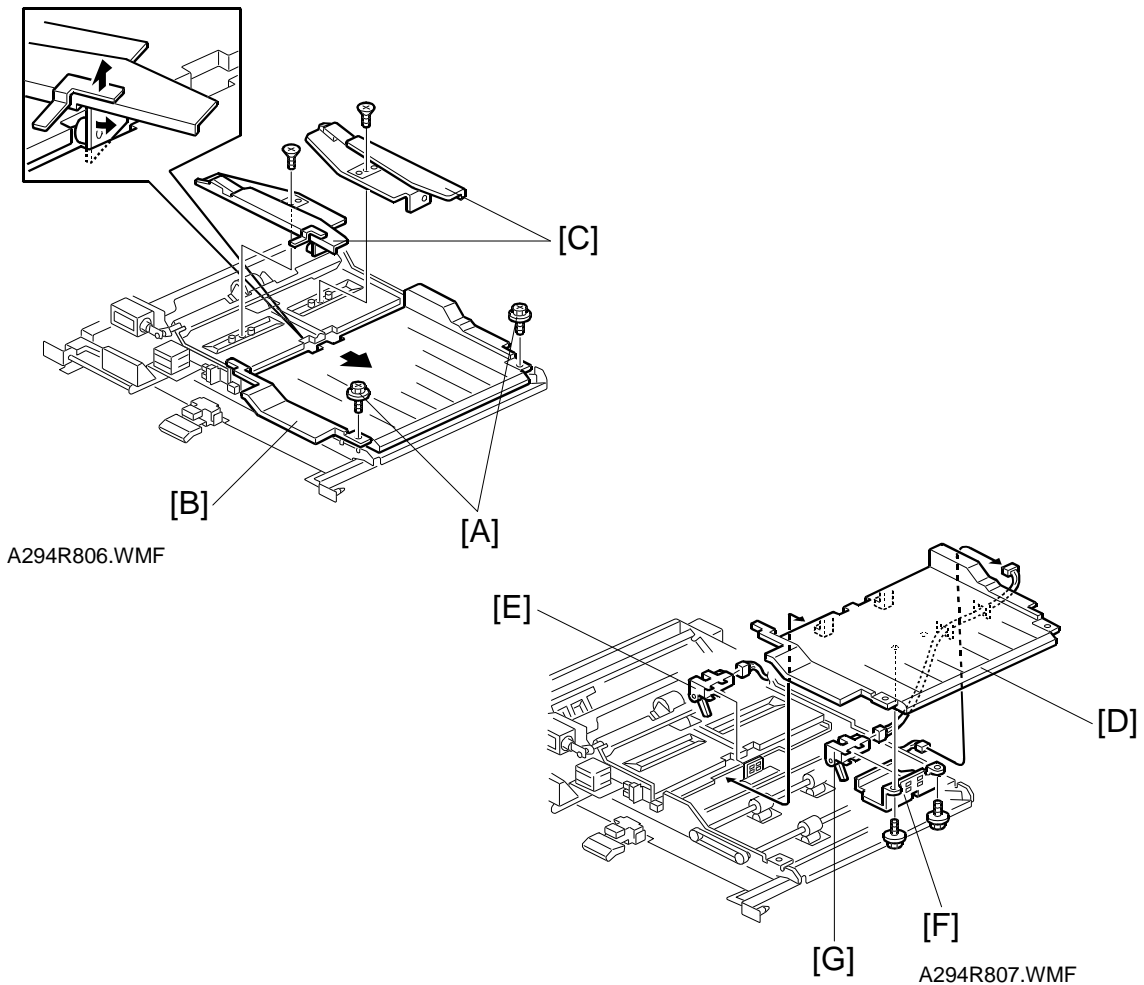
## 6.10.6 DUPLEX ENTRANCE SENSOR REPLACEMENT



A294R805.WMF

1. Pull out the duplex unit.
2. Remove the entrance sensor bracket [A] with the sensor (2 screws).
3. Replace the duplex entrance sensor [B] (1 connector).

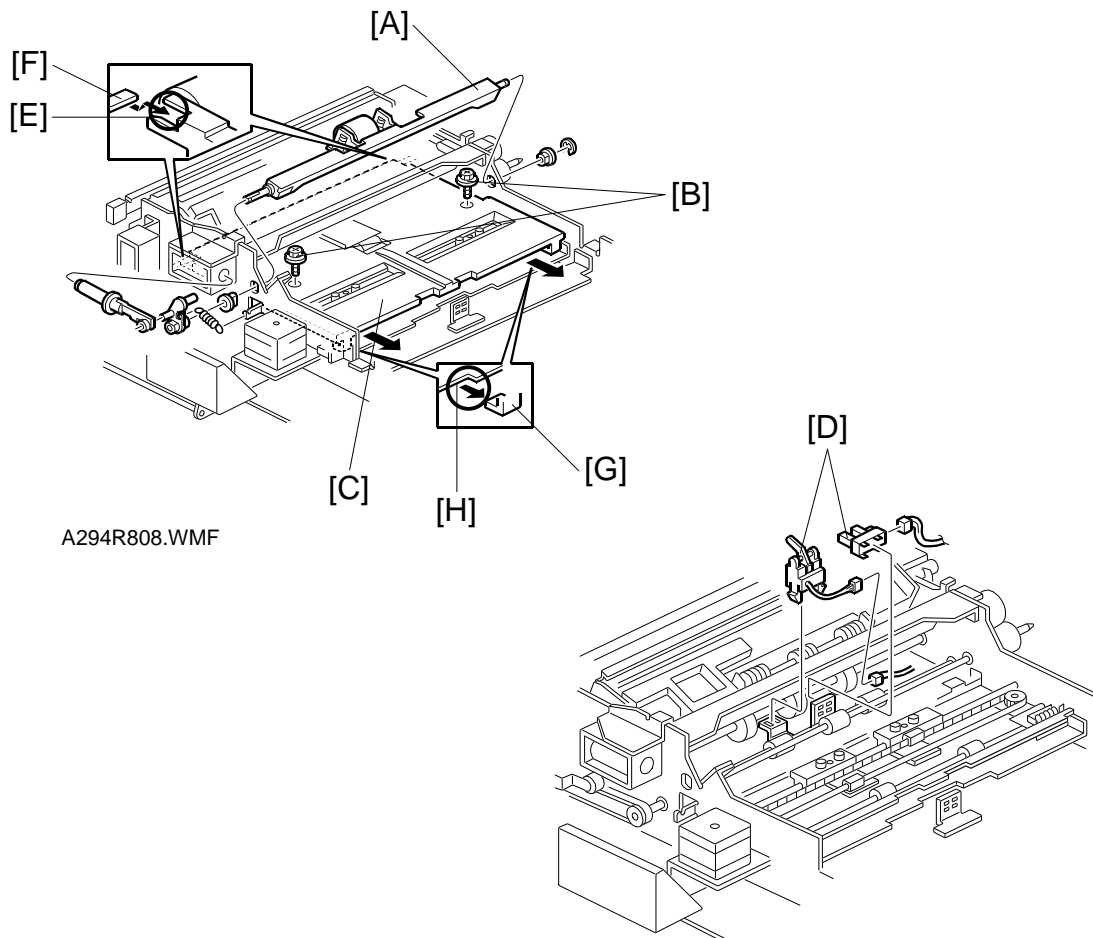
Replacement  
Adjustment

**6.10.7 DUPLEX TRANSPORT SENSORS 2 & 3**

1. Pull out the duplex unit.
2. Remove the 2 screws [A] (front side: shoulder screw) securing the upper duplex cover and slide the upper duplex cover [B] to the right.
3. Remove both the front and rear jogger fences [C] (1 screw each).
4. Remove the upper duplex cover [D] (1 connector).
5. Replace duplex transport sensor 2 [E] (1 connector).
6. Remove the sensor bracket [F] with duplex transport sensor 3 (2 screws and 1 connector).
7. Replace duplex transport sensor 3 [G].

**NOTE:** When putting back the jogger fences, re-install both the jogger fences so that they are parallel.

### 6.10.8 DUPLEX TRANSPORT SENSOR 1/DUPLEX INVERTER SENSOR



A294R808.WMF

A294R809.WMF

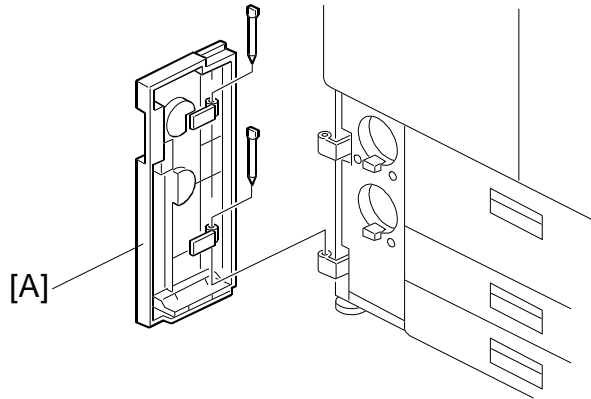
1. Pull out the duplex unit.
2. Remove the upper duplex cover.
3. Remove the reverse trigger roller [A] (1 E-ring, 2 bushings, and 2 solenoid links).
4. Remove the 2 screws [B] (front side: shoulder screw) securing the left upper cover and slide the left upper cover [C] to the right and remove it.
5. Replace each sensor [D] (1 connector each).

**NOTE:** When putting back the upper left cover, make sure that the cutouts [E] catch the duplex side plate projections [F] and the hooks [G] are underneath the bracket plate [H].

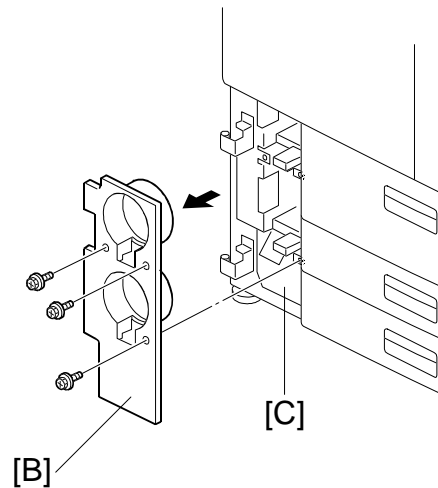
Replacement  
Adjustment

## 6.11 TONER BANK

### 6.11.1 WASTE TONER BOTTLE REMOVAL



A294R901.WMF

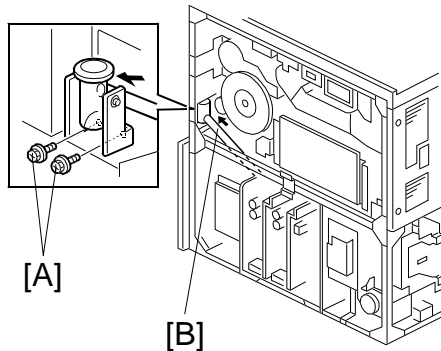


A294R902.WMF

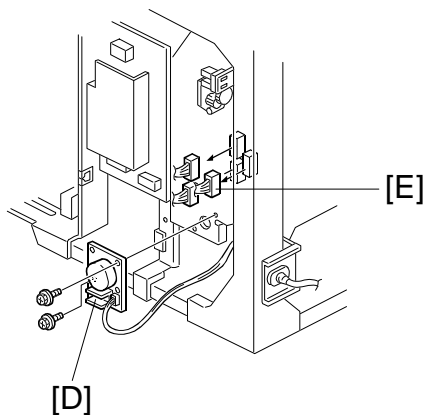
1. Remove the toner bank cover [A] (2 pins).
2. Remove the toner bank inner cover [B] (3 screws).
3. Remove the waste toner bottle [C].



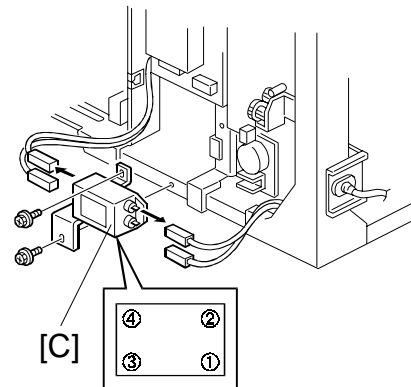
## 6.11.2 TONER BANK UNIT REMOVAL



A294R903.WMF



A294R905.WMF



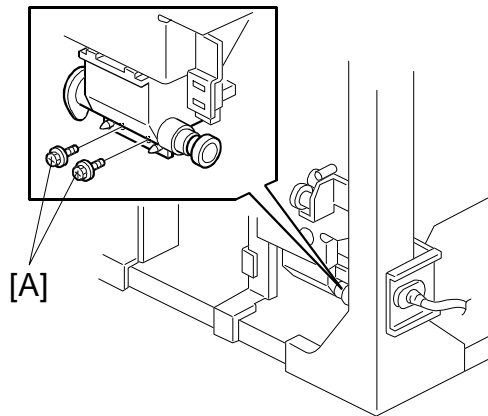
A294R904.WMF

1. Close the toner bottle cap using SP5-804-62 (upper bottle) or -63 (lower bottle). Then remove the toner bottles from the bank.
2. Turn the toner bank motor for 1 minute using SP5-804-61.
3. Discharge toner from the toner bank by using SP2-226.
4. Turn off the main switch and unplug the power cord. Follow steps 1 and 2 of waste toner bottle removal.
5. Remove the upper rear and lower rear covers. (See Exterior.)
6. Remove the upper left cover and lower left cover. (See Exterior.)
7. Remove the two screws [A] securing the toner supply cylinder so that the toner transport coil tube [B] can be shifted to the left to remove the snap ring in the toner bank drive section later.

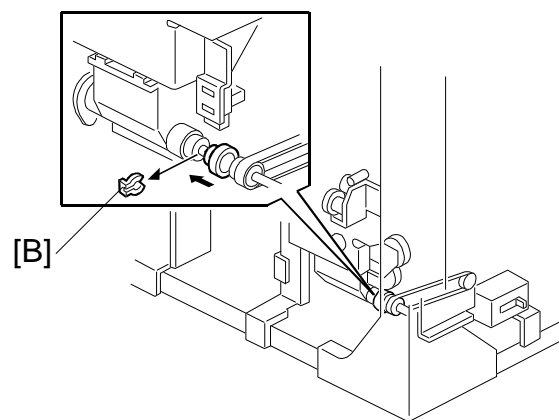
### **⚠ CAUTION**

**Make sure that the power cord is unplugged before removing the noise filter in the next step.**

8. Remove the noise filter [C] (2 screws and 4 connectors; upper: ④, ② white lower: ③, ① yellow) and toner bank motor [D] (2 screws, 1 connector).
9. Disconnect the three connectors [E] from the toner bank unit.

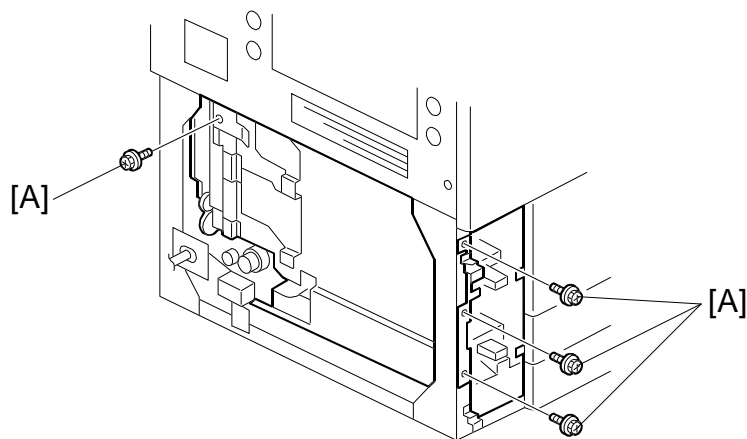


A294R907.WMF

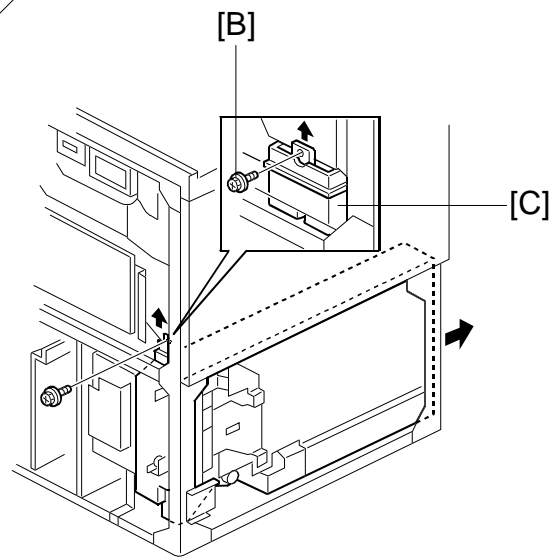


A294R906.WMF

10. Remove the two screws [A] securing the toner transport coil tube.
11. While sliding the toner transport coil tube, remove the snap ring [B].



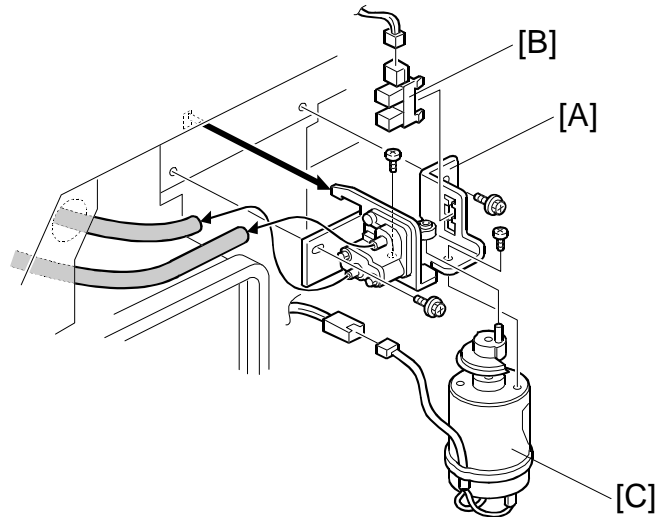
A294R908.WMF



A294R909.WMF

12. Remove the four screws [A] securing the toner bank unit.  
**NOTE:** Try not to spill much toner from the toner bank.
13. Remove the screw [B] securing the toner recycling and collection cover [C].
14. While lifting the toner recycling and collection cover [C], pull out the toner bank unit.

### 6.11.3 TONER SUPPLY MOTOR AND TONER SUPPLY MOTOR SENSOR REMOVAL



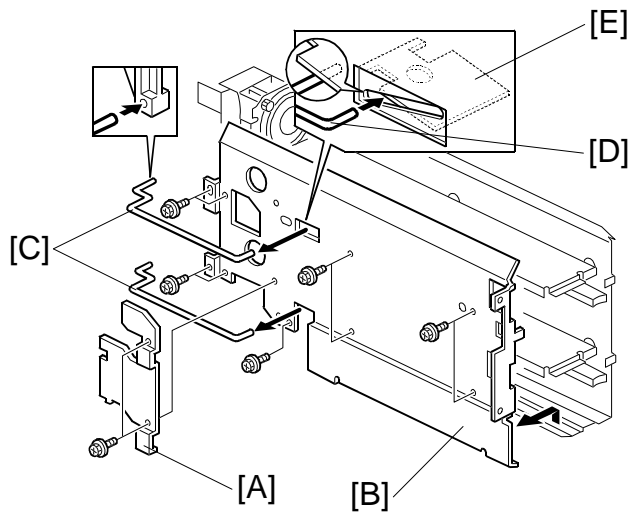
A294R912.WMF

1. Remove the upper right cover.
2. Remove the bracket [A] with the toner supply motor (2 screws, 2 connectors and 2 pipes).
3. Remove the toner supply motor sensor [B].
4. Remove the toner supply motor [C] (2 screws).

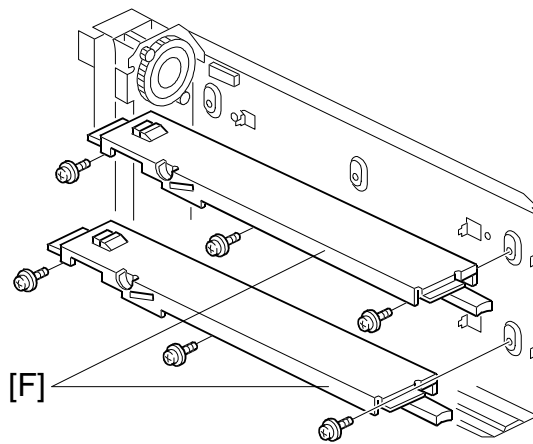
**NOTE:** When putting back the parts, make sure that the 2 pipes are connected at the correct positions, as shown.



### 6.11.4 ACCESS TO INSIDE THE TONER BANK



A294R947.WMF



A294R948.WMF

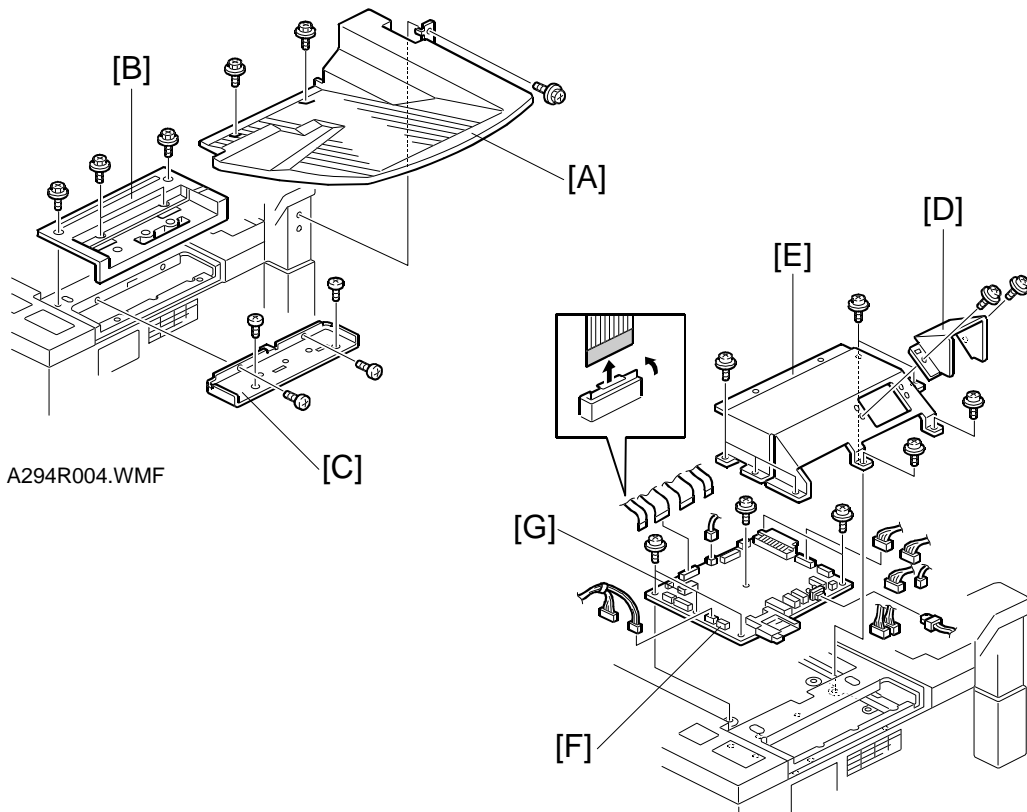
Replacement  
Adjustment

**NOTE:** The toner bottle sensors and toner collection bottle sensor are inside the toner bank.

1. Remove the toner bank (see Toner Bank Unit Removal).
2. Remove the toner release link bracket [A] (2 screws).
3. Remove the left side plate [B] (9 screws and 2 links [C]).  
**NOTE:** When putting back the links [C], put the front pin [D] under the lock plate [E].
4. Remove the toner bottle bottom plates [F] (3 screws each).

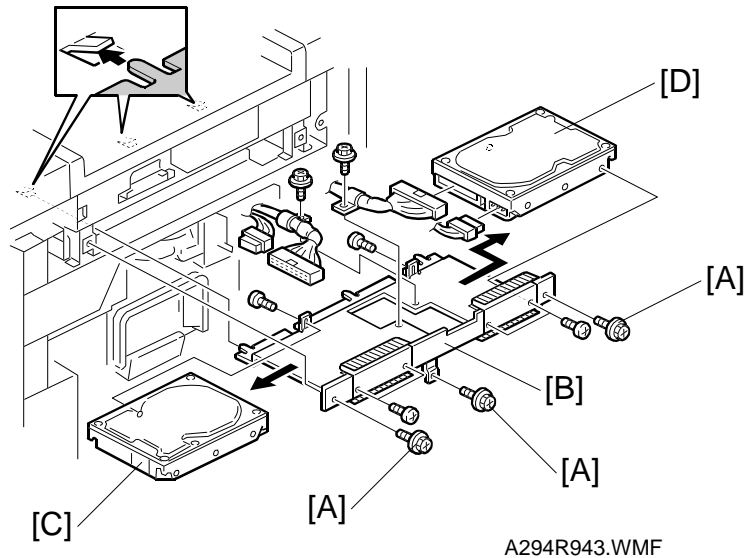
## 6.12 BOARDS AND OTHER ITEMS

### 6.12.1 SICU BOARD



1. Remove the exposure glass (see Exposure Glass).
2. Remove the lens cover (8 screws) (see Lens Block).
3. Remove the original exit tray [A] (3 screws).
4. Remove the scanner right cover [B] (4 screws).
5. Remove the cover bracket [C] (4 screws).
6. Remove the cooling fan bracket [D] (2 screws).
7. Remove the SICU cover bracket [E] (7 screws).
8. Replace the SICU [F] (4 flat cables, 9 connectors, and 7 screws).
9. Remove the NV-RAM [G] from the old SICU and install it on the new board.

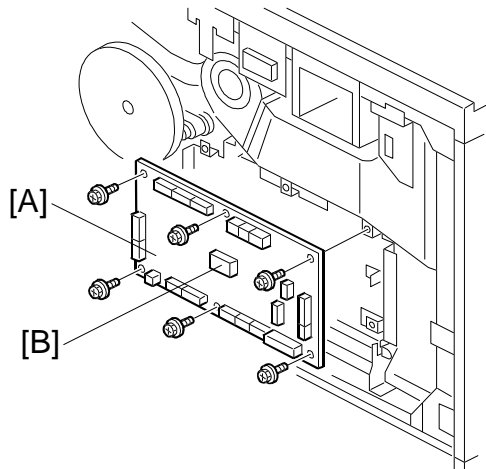
## 6.12.2 HARD DISK DRIVE



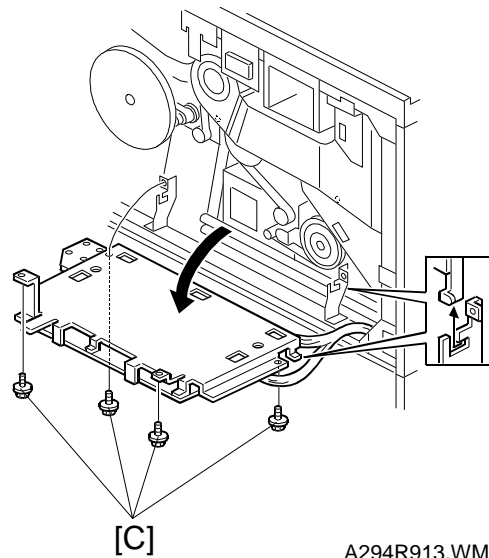
1. Remove the upper right cover (4 screws). See Exterior.
2. Remove three screws [A] holding the HDD bracket [B]. Then pull out the HDD assembly.
3. Replace hard disk drive 1 [C] or hard disk drive 2 [D] (2 screws and 2 connectors each).  
**NOTE:** Connect the black connector to HDD 1, and the gray connector to HDD 2.
4. Turn the main switch on and do SP4-911-1 (for HDD 1) or SP4-912-1 (for HDD 2).  
**NOTE:** If either SP4-911-1 or SP4-912-1 is done, all the data for pre-set stamps and user stamps are deleted from both disks.
5. Install the stamp data using a flash memory card. (Refer to Stamp Data Installation in section 4.)

 Replacement  
Adjustment

### 6.12.3 BCU BOARD



A294R914.WMF

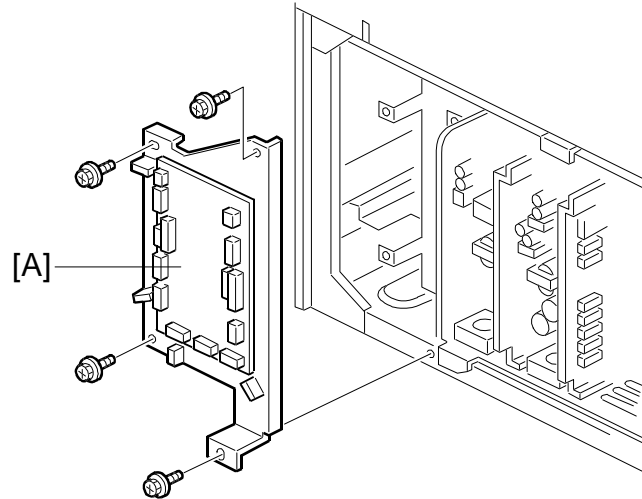


A294R913.WMF

1. Remove the upper rear cover (6 screws). See Exterior.
2. Replace the BCU board [A] (6 screws and 20 connectors).
3. Remove the NV-RAM [B] from the old BCU board and install it on the new board.

**NOTE:** If the screws [C] are removed, the BCU board can be swung out.

### 6.12.4 I/O BOARD

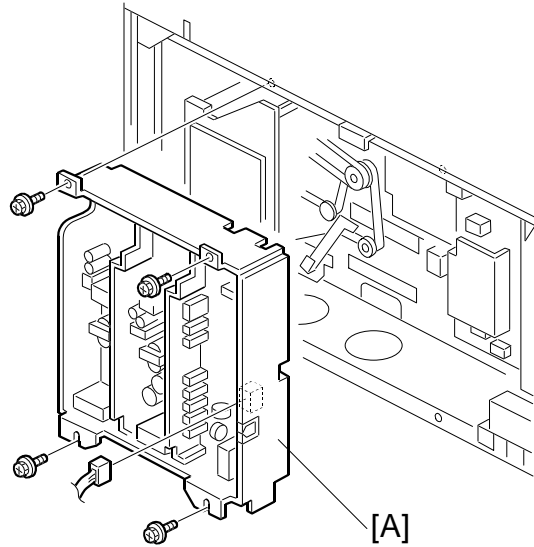


A294R925.WMF

1. Remove the lower rear cover (6 screws). See Exterior.
2. Replace the I/O board [A] (6 screws and 16 connectors).

Replacement  
Adjustment

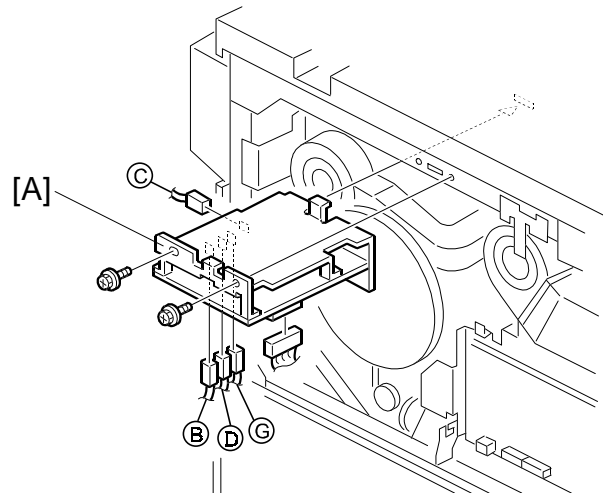
## 6.12.5 PSU



A294R927.WMF

1. Remove the lower rear cover (6 screws). See Exterior.
2. Replace the PSU [A] (4 screws and 8 connectors).

## 6.12.6 CHARGE/GRID/BIAS POWER PACK

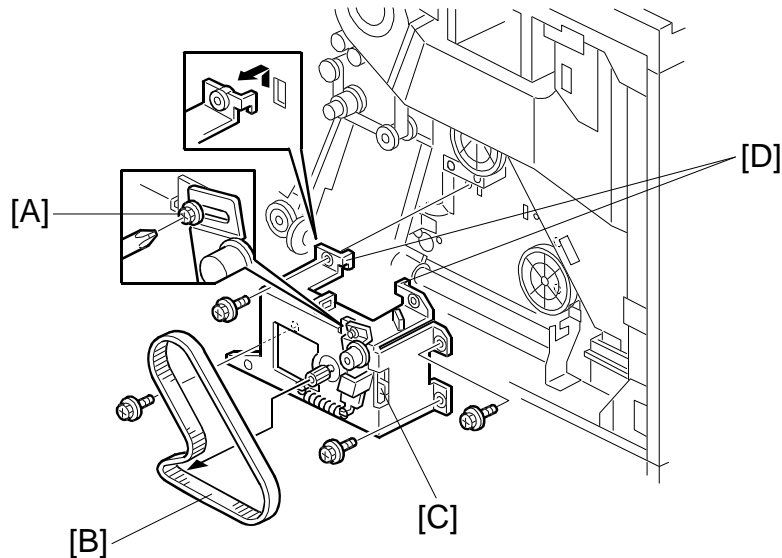


A294R915.WMF

1. Remove the upper rear cover (6 screws). See Exterior.
2. Replace the charge/grid/bias power pack [A] (2 screws and 5 connectors).

Replacement  
Adjustment

### 6.12.7 FUSING/DUPLEX MOTOR REPLACEMENT



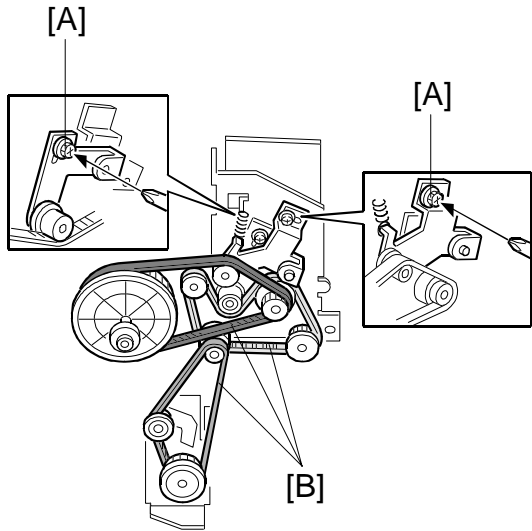
A294R921.WMF

1. Remove the upper rear cover.
2. Swing out the BCU board. (Refer to the BCU board replacement procedure)
3. Loosen screw [A] to release the belt tension.
4. Remove the timing belt [B].
5. Remove the fusing/duplex motor [C] (4 screws, 2 hooks [D]).

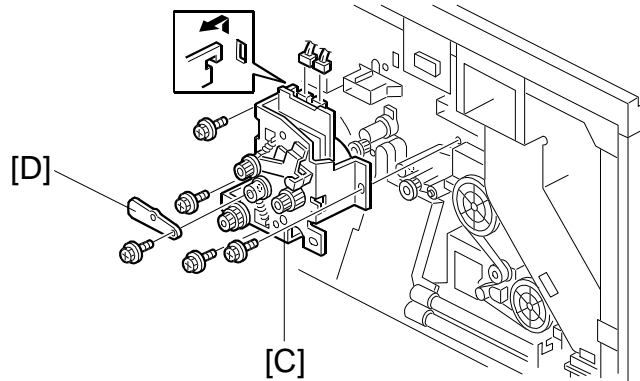
**NOTE:** When putting back the parts, hook up the tension spring (this automatically gives the belt the correct tension), then tighten screw [A].



## 6.12.8 DRUM MOTOR REPLACEMENT



A294R923.WMF



A294R924.WMF

1. Remove the upper rear cover.
2. Remove the fly wheel (3 screws).
3. Lower the BCU board (4 screws).
4. Loosen the screws [A] to loosen the belts, and remove the three timing belts [B].
5. Remove the drum motor [C] (5 screws, 2 connector, 1 hook, and 1 stopper [D]).

**NOTE:** When putting back the parts, hook up the tension spring (this automatically gives the belt the correct tension), then tighten screw [A].

## 6.13 COPY IMAGE ADJUSTMENT: PRINTING/SCANNING

**NOTE:** 1) You need to perform these adjustment(s) after replacing any of the following parts:

- Scanner Wires
- Lens Block
- Scanner Motor
- Polygon Mirror Motor
- Paper Side Fences
- Memory All Clear

2) For more details about accessing SP modes, refer to section 4.

### 6.13.1 PRINTING

**NOTE:** 1) Make sure the paper is installed correctly in each paper tray before you start these adjustments.

2) Use the Trimming Area Pattern (SP2-902-3, No.15) to print the test pattern for the following procedures.

3) Set SP2-902-3 to 0 again after completing these printing adjustments.

#### **Registration – Leading Edge**

1. Check the leading edge registration using the Trimming Area Pattern, and adjust it using SP1-001 if necessary. The specification is:  $3 \pm 2$  mm.

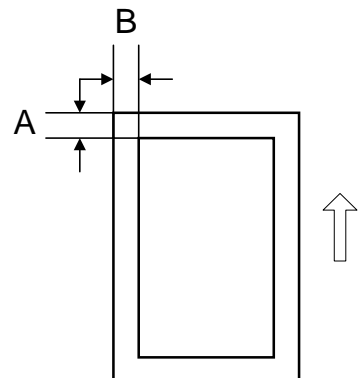
#### **Registration – Side-to-Side**

Do the parallel image adjustment after the side-to-side registration adjustment.

#### **Using SP Mode**

1. Check the side-to-side registration for each paper feed station using the Trimming Area Pattern, and adjust them using the following SP modes if necessary.

|   | SP mode   | Specification  |
|---|-----------|----------------|
| 1st paper feed                          | SP1-002-1 | $2 \pm 1.5$ mm |
| 2nd paper feed                          | SP1-002-2 |                |
| 3rd paper feed<br>(Optional PFU tray 1) | SP1-002-3 |                |
| 4th paper feed (LCT)                    | SP1-002-4 |                |
| 5th paper feed (LCT)                    | SP1-002-5 |                |
| 6th paper feed (LCT)                    | SP1-002-6 |                |
| Duplex                                  | SP1-002-7 |                |



A: Leading Edge Registration  
B: Side-to-side Registration

A294R633.WMF

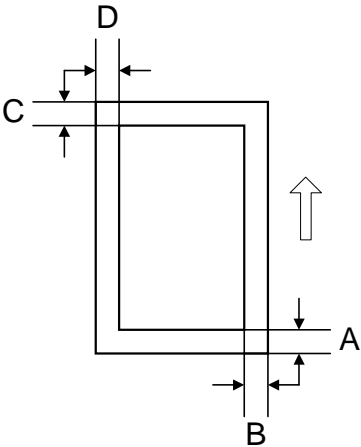
**Blank Margin**

**NOTE:** If the leading edge/side-to-side registration cannot be adjusted within the specifications, adjust the leading/left side edge blank margin.

- 1. Check the trailing edge and right side edge blank margins using the Trimming Area Pattern, and adjust them using the following SP modes if necessary.

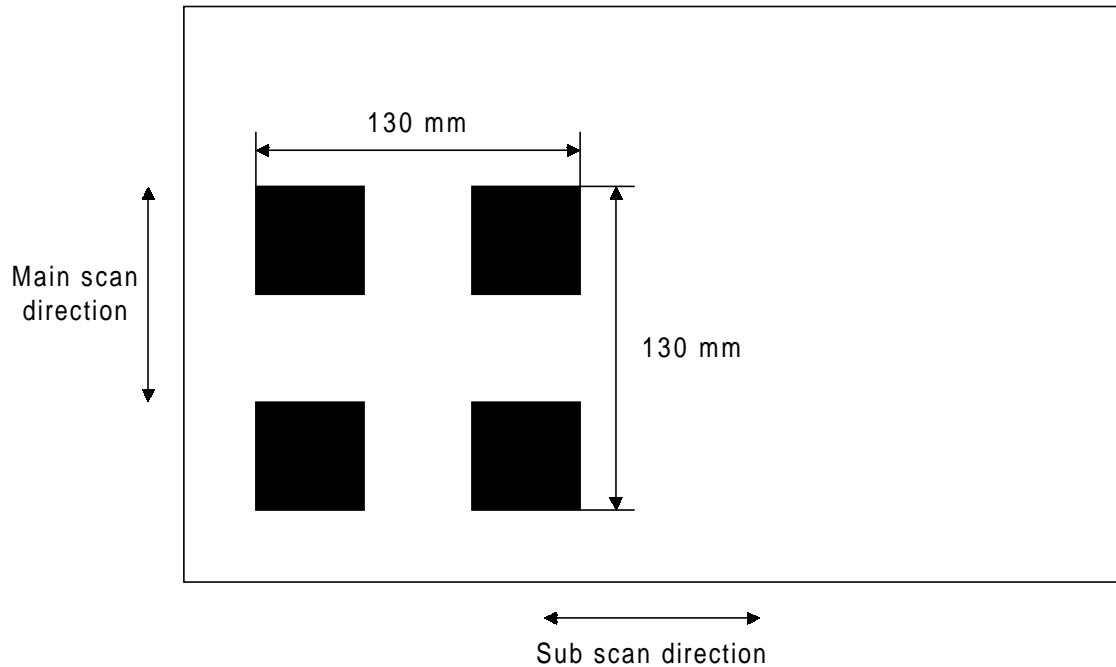
|               | SP mode   | Specification    |
|---------------|-----------|------------------|
| Trailing edge | SP2-101-2 | $3 \pm 2$ mm     |
| Right edge    | SP2-101-4 | More than 0.5 mm |
| Leading edge  | SP2-101-1 | $3 \pm 2$ mm     |
| Left edge     | SP2-101-3 | $2 \pm 1.5$ mm   |

A: Trailing Edge Blank Margin  
B: Right Edge Blank Margin  
C: Leading Edge Blank Margin  
D: Left Edge Blank Margin



A294R634.WMF

Replacement  
Adjustment

***Magnification Adjustment***

A294R999.WMF

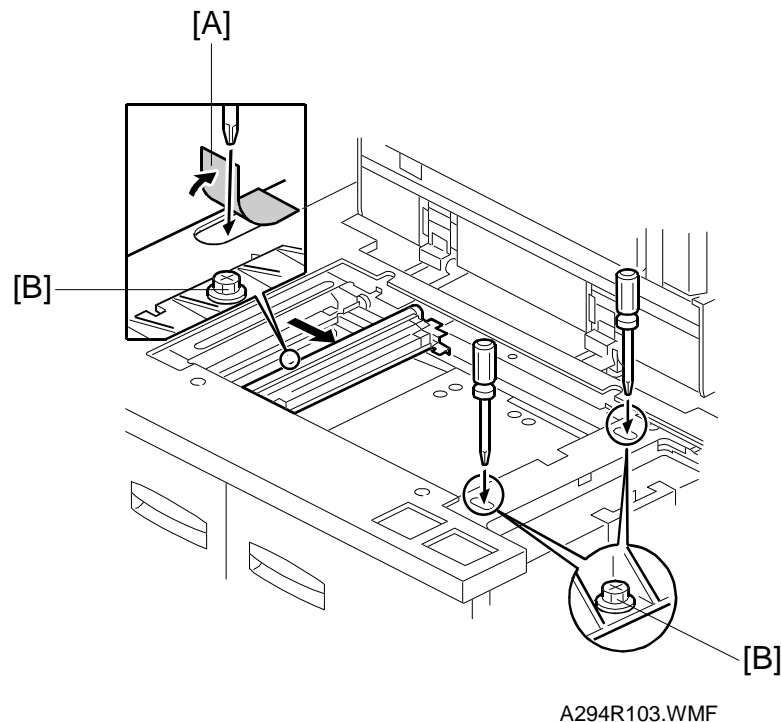
1. Enter SP mode and access SP2-902-3.
2. Select pattern 1 (Alternating Dot pattern – 1,024 dots) and make a print using A3 (DLT) paper.
3. Check the length between the edges of the black squares. The length should be 130 mm.
  - 1) If the magnification in the main scan direction is not within  $100 \pm 0.5\%$ , adjust using SP2-909-1.
  - 2) If the magnification in the sub scan direction is not within  $100 \pm 1.0\%$ , adjust using SP2-910.

**NOTE:** Check the magnification after the paper cools down.

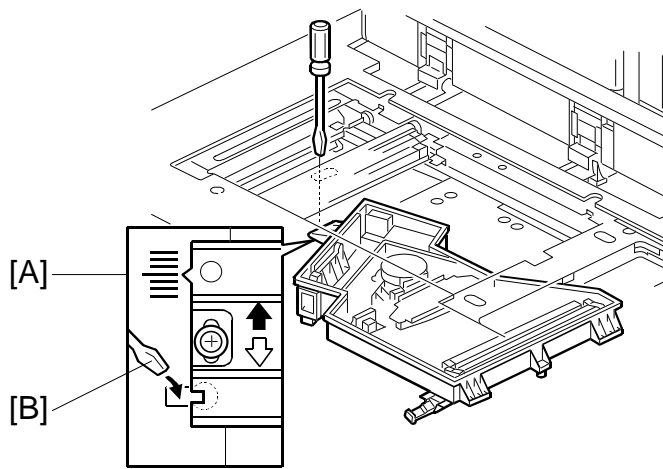
### 6.13.2 PARALLELOGRAM IMAGE ADJUSTMENT

If a parallelogram type image is printed while using a trimming area pattern, do the following to adjust the printing registration or the printing margin.

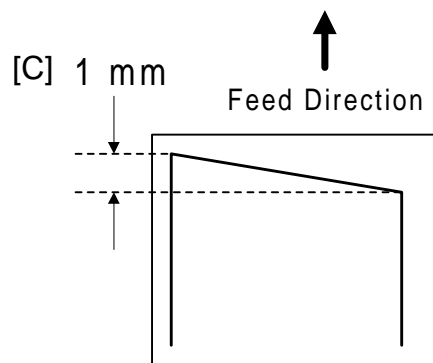
- NOTE:** 1) The following procedure should be done after adjusting the side-to-side registration for each paper tray.  
 2) This adjustment is only effective for a parallelogram image caused by the printer. It should not be applied if the skew is caused by the scanner.



1. Check whether a parallelogram image appears as shown on the next page when printing a trimming area pattern (SP2-902-3, No.15). If it appears, do the following.
2. Remove the exposure glass (see Replacement and Adjustment – Exposure Glass Removal).
3. Remove the original exit tray and the scanner right cover. (see Replacement and Adjustment – Scanner Drive Wires)
4. Peel away the mylar [A] covering the opening in the frame.
5. Loosen the three screws [B] that hold the laser unit.



A294R104.WMF



A294R591.WMF

6. Make a note of the position of the laser unit using the scale [A].
7. Adjust the laser unit position using a flat screwdriver [B] as shown.  
If the right side of the trimming area pattern is down by about 1 mm as shown [C], the laser unit should be rotated about one graduation in the direction of the black arrow. If the opposite side is down, adjust in the opposite direction.
8. Tighten the three screws to secure the laser unit.
9. Print the trimming area pattern to check the image. If it is still the same, repeat steps 2 to 7.

### 6.13.3 SCANNING

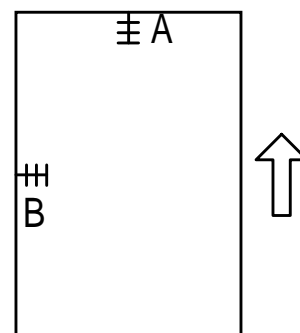
- NOTE:** 1) Before doing the following scanner adjustments, check the printing registration/side-to-side adjustment and the blank margin adjustment.  
2) Use an OS-A3 test chart to perform the following adjustments.

#### **Registration: Platen Mode**

1. Place the test chart on the exposure glass and make a copy from one of the feed stations.
2. Check the leading edge and side-to-side registration, and adjust them using the following SP modes if necessary.

|              | SP mode |
|--------------|---------|
| Leading Edge | SP4-010 |
| Side-to-side | SP4-011 |

A: Leading Edge Registration  
B: Side-to-side Registration



A294R635.WMF

#### **Magnification**

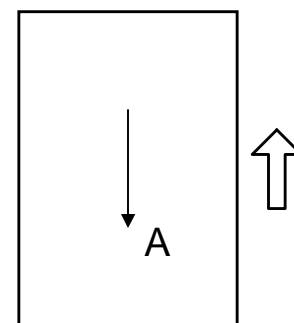
**NOTE:** Use an OS-A3 test chart to perform the following adjustment.

#### **Scanner Sub Scan Magnification**

1. Place the test chart on the exposure glass and make a copy from one of the feed stations.
2. Check the magnification ratio, and adjust it using the following SP mode if necessary. The specification is within  $\pm 1\%$ .

|                                | SP mode |
|--------------------------------|---------|
| Scanner Sub Scan Magnification | SP4-008 |

A: Sub Scan Magnification



A294R636.WMF

 Replacement  
Adjustment

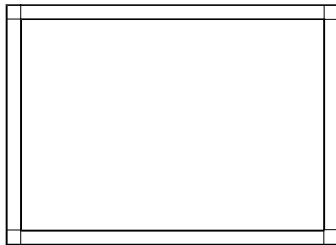
### 6.13.4 ADF IMAGE ADJUSTMENT

#### *Registration*

**NOTE:** Make a temporary test chart as shown below left, using A3/DLT paper.

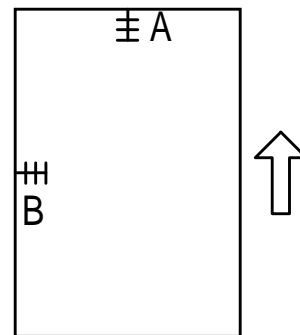
1. Place the temporary test chart on the ADF and make a copy from one of the feed stations.
2. Check the registration, and adjust using the following SP modes if necessary.

|  | SP mode   |
|--|-----------|
| Side-to-side Registration                              | SP6-006-1 |
| Leading Edge Registration (Thin original mode)         | SP6-006-2 |
| Leading Edge Registration (Single-sided/Duplex: front) | SP6-006-3 |
| Leading Edge Registration (Duplex: rear)               | SP6-006-4 |



A294R637.WMF

A: Leading Edge Registration  
B: Side-to-side Registration



A294R692.WMF

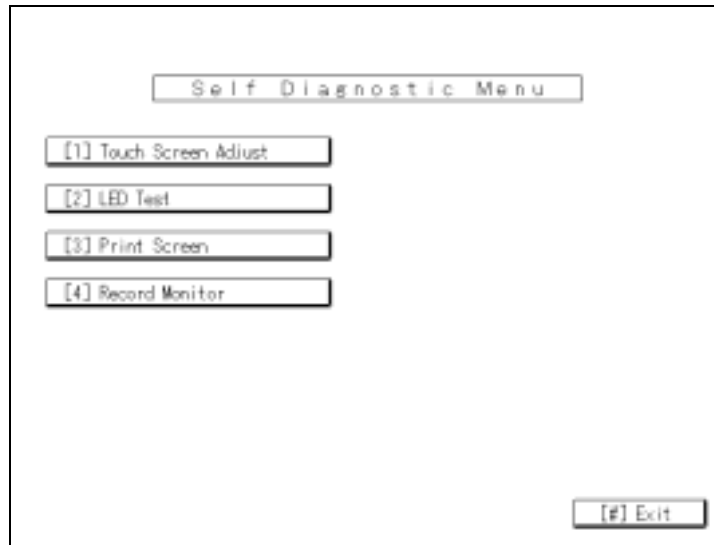


## 6.14 TOUCH SCREEN CALIBRATION

When the touch panel detection mechanism is not working properly, calibrate the touch screen as follows:

1. Press the following keys in sequence to enter operation panel self diagnostic mode.

**1** → **9** → **9** → **3** → **C** × 5



A294R116.PCX

2. Select "[1] Touch Screen Adjust".


**NOTE:** [2] tests the LEDs on the operation unit, not the machine's main operation panel.

[3] and [4] are for factory use only. Do not use unless directed by senior technical staff.



A294R117.PCX

Replacement  
Adjustment

3. The "Touch Screen Adjustment" calibration screen will appear. Touch the center of the circle in the upper left corner then the lower right corner of the panel using a pointer (but not sharp!) tool.
4. Touch a few spots on the LED touch panel, and confirm that the marker appears on the screen at exactly the same location as where it is touched. If it does not, touch "Re-input" (or press the  key) and repeat the calibration procedure.
5. Touch "OK" on the adjustment screen.`
6. Touch "Exit" to exit the self diagnostic mode.

## 7. TROUBLESHOOTING

### 7.1 SERVICE CALL CONDITIONS

#### 7.1.1 SUMMARY

There are 4 levels of service call conditions.

| Level | Definition  | Reset Procedure   |
|-------|---|---|
| A     | To prevent the machine from being damaged, the SC can only be reset by a service representative (see the note below). The copier cannot be operated at all. | Enter SP mode, then turn the main power switch off and on.  |
| B     | The SC can be reset by turning the main power switch off and on if the SC was caused by incorrect sensor detection.   | Turn the operation switch or main power switch off and on. A level B' SC can only be reset by turning the main power switch off and on. |
| C     | The copier can be operated as usual except for the unit related to the service call.  | Turn the operation switch off and on.   |
| D     | The SC history is updated. The machine can be operated as usual.  | The SC will not be displayed. All that happens is that the SC history is updated.   |

- NOTE:**
- 1) If the problem concerns electrical circuit boards, first disconnect then reconnect the connectors before replacing the PCBs.
  - 2) If the problem concerns a motor lock, first check the mechanical load before replacing motors or sensors.
  - 3) When a Level A or B SC occurs while in an SP mode, the display does not indicate the SC number. If this occurs, check the SC number after leaving the SP mode. This does not apply to Level B' codes.

## 7.1.2 SC CODE DESCRIPTIONS

### ***SC101: Exposure Lamp Error***

#### Definition [B]

The standard white level was not detected properly when scanning the white plate.

#### Possible Causes

- Exposure lamp defective
- Lamp stabilizer defective
- Exposure lamp connector defective
- Dirty standard white plate
- Dirty scanner mirror or scanner mirror out of position
- SBU board defective
- SBU connector defective
- Lens block out of position

### ***SC120: Scanner Home Position Error 1***

#### Definition [B]

The scanner home position sensor does not detect the on condition during initialization or copying.

#### Possible Causes

- Scanner home position sensor defective
- Scanner motor defective
- MCU defective
- Scanner home position sensor connector defective
- Scanner drive motor connector defective

### ***SC121: Scanner Home Position Error 2***

#### Definition [B]

The scanner home position sensor does not detect the off condition during initialization or copying.

#### Possible Causes

- Scanner home position sensor defective
- Scanner drive motor defective
- MCU defective
- Scanner home position sensor connector defective
- Scanner drive motor connector defective
- Scanner drive wire, timing belt out of position

**SC124: Scanner Motor Error 1**

## Definition [B]

The feedback signal from the scanner motor is not detected within 200 ms after the scanner motor turns on.

## Possible Causes

- Scanner motor defective
- Poor connection of the connector for the feedback signal
- Poor connection of the connector for the scanner motor power line

**SC125: Scanner Motor Error 2**

## Definition [B]

- 1) The scanner motor speed is less than 300 mm/s when the scanner home position sensor turns on.
- 2) The scanner motor stops before scanner home position when the scanner returns.

## Possible Causes

- Scanner motor defective
- Large load on the scanner drive

**SC126: Scanner Motor Error 3**

## Definition [B]

The scanner motor does not stop within 12 mm after the scanner home position sensor turns on when the scanner returns.

## Possible Causes

- Scanner motor defective
- MCU defective

**SC127: Scanner Motor Error 4**

## Definition [B]

The scanner motor rotates in the opposite direction from the signal from the MCU.

## Possible Causes

- Scanner motor defective

***SC128: Scanner Motor Error 5***

## Definition [B]

The scanner motor speed does not reach the target speed within a certain time after the scanner motor starts.

## Possible Causes

- Scanner motor defective
- MCU defective
- Scanner drive mechanism defective

***SC129: Scanner Motor Error 6***

## Definition [B]

The scanner motor speed is not controlled properly.

## Possible Causes

- Scanner motor defective
- PSU defective
- Scanner unit defective

***SC130: SBU Error***

## Definition [B]

The SICU does not receive the correct signal from the SBU.

## Possible Causes

- SICU defective
- SBU defective
- Poor connection between SICU and SBU

***SC300: Charge Corona Output Error 1***

## Definition [B]

A feedback voltage for the charge corona of more than 4.5 V was detected from the charge/bias/grid power pack 9 times consecutively.

## Possible Causes

- Charge/bias/grid power pack defective
- Poor charge corona unit connection

***SC301: Charge Corona Output Error 2***

## Definition [B]

A feedback voltage for the charge corona of less than 1.5 V was detected from the charge/bias/grid power pack 9 times consecutively.

## Possible Causes

- Charge/bias/grid power pack defective
- Poor charge corona unit connection

**SC303: Charge Grid Output Error 1**

## Definition [B]

A feedback voltage for the grid of more than 4.5 V was detected from the charge/bias/grid power pack 9 times consecutively.

## Possible Causes

- Charge/bias/grid power pack defective
- Poor charge corona unit connection

**SC304: Charge Grid Output Error 2**

## Definition [B]

A feedback voltage for the grid of less than 1.0 V was detected from the charge/bias/grid power pack 9 times consecutively.

## Possible Causes

- Charge/bias/grid power pack defective
- Poor charge corona unit connection

**SC305: Charge Corona Wire Cleaner Error 1**

## Definition [B]

The charge corona wire cleaner does not return to its home position.

## Possible Causes

- Charge corona wire cleaner motor defective
- BCU defective

**SC306: Charge Corona Wire Cleaner Error 2**

## Definition [D]

The charge corona wire cleaner motor connector is not connected.

## Possible Causes

- Poor connection or disconnected charge corona wire cleaner motor connector

**SC310: Drum Potential Sensor Error 1**

## Definition [D]

When calibrating the drum potential sensor during process control initial setting, the drum potential sensor output voltage is out of specification.

## Possible Causes

- Drum potential sensor defective
- Poor connection between the drum potential sensor and the BCU
- BCU defective
- Charge/bias/grid power pack defective

**SC311: Drum Potential Sensor Error 2**

## Definition [D]

When calibrating the drum potential sensor during process control initial setting, the rate of change of drum potential sensor output with voltage on the drum is out of specification.

## Possible Causes

- Drum potential sensor defective
- Poor connection between the drum potential sensor and the BCU
- BCU defective
- Charge/bias/grid power pack defective

**SC312: Drum Potential Sensor Error 3**

## Definition- [D]

When adjusting  $V_D$  for the unexposed drum during process control initial setting,  $-1,000$  V is applied to the charge grid, but the drum potential sensor detects that  $V_D$  is more than  $-970$  V.

## Possible Causes

- Drum potential sensor defective
- Poor connection between the drum unit and the BCU
- Charge/bias/grid power pack defective
- Dirty or worn charge corona wire

**SC313: Drum Potential Sensor Error 4**

## Definition [D]

When adjusting the drum potential ( $V_D$ ) during process control initial setting, the drum potential sensor detects that  $V_D$  is more than  $V_G$  (grid voltage).

## Possible Causes

- Drum potential sensor defective
- Poor connection between the drum potential sensor and the BCU
- BCU defective
- Charge/bias/grid power pack defective
- Dirty or worn charge corona wire



**SC314: Drum Potential Sensor Error 5****Definition [D]**

When adjusting the drum potential (VH) for LD power adjustment during process control initial setting, the first time the VH pattern is made, the drum potential sensor detects that VH is more than 500 V.

**Possible Causes**

- Drum potential sensor defective
- Poor connection between the drum potential sensor and the BCU
- BCU defective
- LDB defective

**SC315: Drum Potential Sensor Error 6****Definition [D]**

When adjusting VD for the unexposed drum during process control initial setting, VD does not reach  $-900 \pm 20$  V even if VG has been adjusted 5 times.

**Possible Causes**

- Drum potential sensor defective
- Poor connection between the drum potential sensor and the BCU
- BCU defective
- Charge/bias/grid power pack defective

**SC316: Drum Potential Sensor Error 7****Definition [D]**

When adjusting the drum potential (VH) for half tone during process control initial setting, the drum potential sensor detects that VH does not become  $-265 \pm 20$  V even though the LD power has been changed twenty times.

**Possible Causes**

- Drum potential sensor defective
- Poor connection between the drum potential sensor and the IBCU
- BCU defective
- LDB defective
- Poor drum cleaning

**SC321: Laser Writing Signal (F-gate) Error****Definition- [B]**

The laser writing signal (F-gate) does not go to LOW for more than 15 seconds after the copy paper reaches the registration sensor.

**Possible Causes**

- SICU board defective
- Poor connection of the printer controller
- Printer controller defective

***SC322: Laser Synchronization Error*****Definition [B']**

The laser synchronization signal cannot be detected from the synchronization detector even if the laser diodes are activated.

**Possible Causes**

- Poor connection between the laser synchronization detector and the LDB
- Laser synchronization detector out of position
- Laser synchronization detector defective
- LDB defective
- SICU defective
- Front door safety switches defective

***SC323: Excessive LD Drive Current*****Definition [B']**

The LDB applies more than 110 mA to the LD.

**Possible Causes**

- LDB defective (not enough power, due to aging)
- Poor connection between the LDB and the SICU board
- High temperature of LD on LDB

***SC335: Polygonal Mirror Motor Error 1*****Definition [B]**

The polygonal mirror motor does not reach its operating speed within 20 seconds after the polygonal mirror motor turns on, or the polygonal mirror motor speed is changed.

**Possible Causes**

- Polygonal mirror motor defective
- Poor connection between the polygonal mirror motor drive board and the SICU board
- Polygonal mirror motor drive board defective
- SICU board defective

***SC336: Polygonal Mirror Motor Error 2*****Definition [B]**

The SICU does not receive the stop signal from the polygonal mirror motor for more than 20 seconds after the polygonal mirror motor turns off.

**Possible Causes**

- Polygonal mirror motor defective
- Poor connection between the polygonal mirror motor drive board and the SICU board
- Polygonal mirror motor drive board defective
- SICU board defective

**SC337: Polygonal Mirror Motor Error 3**

## Definition [B]

The polygonal mirror motor status is changed even though no signal is sent from the SICU.

## Possible Causes

- Polygonal mirror motor defective
- Electrical noise
- Polygonal mirror motor drive board defective
- SICU board defective

**SC338: Polygonal Mirror Motor Error 4**

## Definition [B]

- 1) The polygonal mirror motor operating speed does not become stable for 20 seconds after the polygonal mirror motor is turned on, or the polygonal mirror motor speed is changed.
- 2) The stop signal from the polygonal mirror motor does not become stable for 20 seconds after the polygonal mirror motor is turned off.

## Possible Causes

- Polygonal mirror motor defective
- Poor connection between the polygonal mirror motor drive board and the SICU board
- Polygonal mirror motor drive board defective
- SICU board defective

**SC340: TD Sensor Error 1**

## Definition [B]

The TD sensor output voltage is less than 0.5 V or more than 4.0 V 10 times consecutively during copying.

## Possible Causes

- TD sensor defective
- Poor connection between the TD sensor and the BCU
- BCU defective
- Toner supply defective

**SC341: TD Sensor Error 2**

## Definition [B]

One of the following TD sensor output voltages is detected during TD sensor initial setting.

- 1) Less than 2.5 V when the maximum PWM (255) is applied to the TD sensor.
- 2) 2.5 V or more when minimum PWM (0) is applied to the TD sensor.

## Possible Causes

- TD sensor defective
- Poor connection between the TD sensor and the BCU
- BCU defective
- Toner supply defective

**SC342: TD Sensor Error 3**

## Definition [B]

The TD sensor output voltage is not adjusted to  $2.5 \pm 0.1$  V within 20 seconds during TD sensor initial setting.

## Possible Causes

- TD sensor defective
- Poor connection between the TD sensor and the BCU
- BCU defective
- Toner supply defective

**SC345: Development Bias Leak**

## Definition [B]

Maximum PWM for the development bias signal is applied 10 times consecutively.

## Possible Causes

- Poor connection between the development bias terminal and the charge/bias/grid power pack
- Charge/bias/grid power pack

**SC350: ID Sensor Error 1****Definition [D]**

One of the following ID sensor output voltages was detected when checking the ID sensor pattern.

- 1)  $VSP \geq 2.5 \text{ V}$
- 2)  $VSP = 0 \text{ V}$

**Possible Causes**

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- BCU defective
- Charge/bias/grid power pack defective
- Dirty ID sensor
- Defect on the drum at the ID sensor pattern writing area

**SC351: ID Sensor Error 2****Definition [D]**

The following two conditions were detected at the same time when checking the ID sensor pattern.

- 1)  $VSG \leq 2.5 \text{ V}$  or  $VSG = 0 \text{ V}$
- 2) The ID sensor output voltage is 5.0 V and the PWM signal input to the ID sensor is 0

**Possible Causes**

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- BCU defective
- Charge/bias/grid pack defective
- Dirty ID sensor
- Defect on the drum at the ID sensor pattern writing area

**SC352: ID Sensor Error 3****Definition [D]**

The ID sensor pattern edge voltage is not at 2.5 V for 1.5 seconds during the ID sensor pattern check.

**Possible Causes**

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- BCU defective
- Charge/bias/grid pack defective
- Dirty ID sensor
- Defect on the drum at the ID sensor pattern writing area

**SC353: ID Sensor Error 4**

## Definition [D]

One of the following ID sensor output voltages is detected at ID sensor initialization.

- 1)  $V_{SG} < 4.0$  V when the maximum PWM input (255) is applied to the ID sensor.
- 2)  $V_{SG} \geq 4.0$  V when the minimum PWM input (0) is applied to the ID sensor.

## Possible Causes

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- BCU defective
- Charge/bias/grid pack defective
- Dirty ID sensor
- Defect on the drum at the ID sensor pattern writing area

**SC354: ID Sensor Error 5**

## Definition [D]

$V_{SG}$  is not adjusted within the target ( $4.0 \pm 0.2$  V) within 20 seconds during  $V_{SG}$  checking.

## Possible Causes

- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- BCU defective
- Charge/bias/grid pack defective
- Dirty ID sensor
- Defect on the drum at the ID sensor pattern writing area

**SC355: ID Sensor Voltage Error**

## Definition [B]

The ID sensor voltage ( $V_P$ ) exceeds 700 V, 10 times consecutively.

## Possible Causes

- Drum potential sensor defective
- IO Board defective
- Poor connection of the drum unit connector
- LD defective
- Poor drum cleaning
- Dirty optics
- Drum wear

**SC360: Hard Disk Drive Error 1**

## Definition [B]

The machine does not detect the connection signal from HDD 1 when the main switch is turned on.

## Possible Causes

- Poor connection between the HDD and SICU
- The dc power connector to the HDD is disconnected
- HDD defective
- SICU defective

**SC361: Hard Disk Drive Error 2**

## Definition [C]

The machine does not detect the connection signal from HDD 2 when the main switch is turned on.

## Possible Causes

- Poor connection between the HDD and SICU
- The dc power connector to the HDD is disconnected
- HDD defective
- SICU defective

**SC362: Hard Disk Drive Error 3**

## Definition [C]

The machine does not detect the connection signal from HDD 1 when the operation switch is turned on.

## Possible Causes

- Poor connection between the HDD and SICU
- The dc power connector to the HDD is disconnected
- HDD defective
- SICU defective

**SC363: Hard Disk Drive Error 4**

## Definition [C]

The machine does not detect the connection signal from HDD 2 when the operation switch is turned on.

## Possible Causes

- Poor connection between the HDD and SICU
- The dc power connector to the HDD is disconnected
- HDD defective
- SICU defective

**SC364: Hard Disk Drive Error 5**

## Definition [C]

The image data stored in HDD 1 cannot be output properly.

## Possible Causes

- When this SC occurs only once, this problem will be solved after turning the main power switch off and on.
- When this SC occurs while performing SP4-911-1 (HDD 1 media check), it can be cured by doing SP4-911-2 (HDD 1 formatting).
- HDD 1 defective

**SC365: Hard Disk Drive Error 6**

## Definition [C]

The image data stored in HDD 2 cannot be output properly.

## Possible Causes

- When this SC occurs only once, this problem will be solved after turning the main power switch off and on.
- When this SC occurs while performing SP4-912-1 (HDD 2 media check), it can be cured by doing SP4-912-2 (HDD 2 formatting).
- HDD 2 defective

**SC366: Hard Disk Drive Error 7**

## Definition [C]

The number of bad sectors in HDD 1 exceeds the maximum value.

## Possible Causes

- NVRAM defective
- HDD 1 defective

**SC367: Hard Disk Drive Error 8**

## Definition [C]

The number of bad sectors in HDD 2 exceeds the maximum value.

## Possible Causes

- NVRAM defective
- HDD 2 defective

**SC370, 371, 372, 373, 374, 375: IMAC (Image Compression IC) Error 1**

## Definition [B]

An error occurs during image processing in the IMAC, which handles image compression and image data transfer between the machine's components.

## Possible Causes

- SICU defective



***SC376, 377: IMAC (Image Compression IC) Error 2***

## Definition [B]

While image data is transferred in tandem mode, an error occurs during image processing in the IMAC, which handles image compression and image data transfer between the machine's components.

## Possible Causes

- SICU defective

***SC380, 381, 382, 383: Image Data Transfer Timeout***

## Definition [B]

The image data could not be transferred to the memory within 20 seconds.

## Possible Causes

- SICU defective
- Printer controller defective
- SBU defective

***SC384, 385: Image Data Transfer Timeout in Tandem Mode***

## Definition [B]

The image data could not be transferred to the memory within 20 seconds in tandem mode.

## Possible Causes

- SICU defective
- Printer controller defective
- SBU defective
- Interface board defective

***SC386, 387: Image Data Transfer Timeout (HDD)***

## Definition [B]

The image data could not be transferred to the HDD within 15 seconds.

## Possible Causes

- SICU defective
- Printer controller defective
- SBU defective
- Interface board defective

***SC390: Tandem Image Data Transfer Error***

## Definition [B]

The image data sent from the master does not match the data received by slave.

## Possible Causes

- SICU defective
- Interface board defective
- Electrical noise

***SC391, 392: Image Storage Address Error***

## Definition [B]

The SICU receives an image data output request signal for data that is not stored in memory.

## Possible Causes

- SICU defective

***SC400: Transfer Bias Roller Leak***

## Definition [B]

Abnormal feedback data from the transfer power pack is detected 6 times consecutively.

## Possible Causes

- Transfer power pack defective
- Poor connection between the transfer current terminal and the transfer power pack.

***SC401: Transfer roller open error***

## Definition [B]

The following conditions are detected at the same time 6 times consecutively.

- 1) The transfer bias roller feedback data is less than the minimum target.
- 2) Maximum PWM for the transfer bias roller is applied.

## Possible Causes

- Transfer power pack defective
- Poor connection between the transfer current terminal and the transfer power pack.

***SC430: Quenching Lamp Error*****Definition [D]**

When finishing the process control initial setting, the drum potential which is detected by the drum potential sensor is out of the normal range.

**Possible Causes**

- Quenching lamp defective
- Poor connection between quenching lamp and charge/bias/grid power pack

***SC440: Drum Motor Lock*****Definition [B]**

The drum motor lock signal is longer than 2 seconds while the drum motor is on.

**Possible Causes**

- Too much load on the drive mechanism
- Drum motor defective
- Poor drum motor connector connection
- BCU defective

***SC441: Development Motor Lock*****Definition [B]**

The development motor lock signal is longer than 2 seconds while the development motor is on.

**Possible Causes**

- Too much load on the drive mechanism
- Development motor defective
- Poor development motor connector connection
- BCU defective

***SC491: Polygonal Mirror Motor Cooling Fan Motor Lock*****Definition [B]**

The polygonal mirror motor cooling fan motor lock signal is longer than 5 seconds while the polygonal mirror motor cooling fan motor is on.

**Possible Causes**

- Too much load on the drive mechanism
- Polygonal mirror motor cooling fan motor defective

**SC495: Toner Bottle Unit Error**

## Definition [B]

The toner hopper sensor cannot detect toner even if the toner supply coil clutch turns on for 2 seconds x 10 times during toner supply during copying.



## Possible Causes



- Toner supply motor defective
- Toner supply coil clutch defective
- Toner supply motor connector connection
- Toner supply coil clutch connector connection
- Toner near-end sensor (in the toner bank) defective
- Toner hopper sensor defective
- Toner clogged in the supply system

**SC496: Toner Collection Bottle Error**

## Definition [B]

The toner collection bottle sensor remains off for 3 seconds.

## Possible Causes

- No toner collection bottle
- Toner collection bottle sensor defective

**SC501: 1st Tray Lift Malfunction**

## Definition [C]

One of the following conditions is detected in the 1st tray.

- 1) The 1st lift sensor is not activated for 10 seconds after the tray lift motor turned on.
- 2) The 1st lift sensor is already activated when the 1st tray is placed in the machine.

## Possible Causes

- 1st lift sensor defective
- 1st tray lift motor defective
- Poor 1st pick-up solenoid connection
- Poor 1st tray lift motor connection

**SC502: 2nd Tray Lift Malfunction**

## Definition [C]

One of the following conditions is detected in the 2nd tray.

- 1) The 2nd lift sensor is not activated for 10 seconds after the tray lift motor turned on.
- 2) The 2nd lift sensor is already activated when the 2nd tray is placed in the machine.

## Possible Causes

- 2nd lift sensor defective
- 2nd tray lift motor defective
- Poor 2nd pick-up solenoid connection
- Poor 2nd tray lift motor connection

**SC503: 3rd Tray Lift Malfunction**

## Definition [C]

One of the following conditions is detected in the 3rd tray.

- 1) The 3rd lift sensor is not activated for 10 seconds after the tray lift motor turned on.
- 2) The 3rd lift sensor is already activated when the 3rd tray is placed in the machine.

## Possible Causes

- 3rd lift sensor defective
- 3rd tray lift motor defective
- Poor 3rd pick-up solenoid connection
- Poor 3rd tray lift motor connection

**SC504: LCT 1st Tray Lift Malfunction**

## Definition [C]

One of the following conditions is detected in the LCT 1st tray.

- 1) The LCT 1st lift sensor is not activated for 10 seconds after the tray lift motor turned on.
- 2) The LCT 1st lift sensor is already activated when the LCT 1st tray is placed in the machine.

## Possible Causes

- LCT 1st lift sensor defective
- LCT 1st tray lift motor defective
- Poor LCT 1st pick-up solenoid connection
- Poor LCT 1st tray lift motor connection

***SC505: LCT 2nd Tray Lift Malfunction***

## Definition [C]

One of the following conditions is detected in the LCT 2nd tray.

- 1) The LCT 2nd lift sensor is not activated for 10 seconds after the tray lift motor turned on.
- 2) The LCT 2nd lift sensor is already activated when the LCT 2nd tray is placed in the machine.

## Possible Causes

- LCT 2nd lift sensor defective
- LCT 2nd tray lift motor defective
- Poor LCT 2nd pick-up solenoid connection
- Poor LCT 2nd tray lift motor connection

***SC506: LCT 3rd Tray Lift Malfunction***

## Definition [C]

One of the following conditions is detected in the LCT 3rd tray.

- 1) The LCT 3rd lift sensor is not activated for 10 seconds after the tray lift motor turned on.
- 2) The LCT 3rd lift sensor is already activated when the LCT 3rd tray is placed in the machine.

## Possible Causes

- LCT 3rd lift sensor defective
- LCT 3rd tray lift motor defective
- Poor LCT 3rd pick-up solenoid connection
- Poor LCT 3rd tray lift motor connection

***SC510: Paper Feed Motor Lock***

## Definition [B]

A paper feed motor lock signal is detected for more than 50 ms during rotation.

## Possible Causes

- Paper feed motor defective
- Too much load on the drive mechanism
- Poor paper feed motor connector connection

***SC511: LCT Motor Lock (Optional LCT)***

## Definition [B]

An LCT motor lock signal is detected for more than 50 ms during rotation.

## Possible Causes

- LCT motor defective
- Too much load on the drive mechanism
- Poor LCT motor connector connection

**SC515: Tandem Rear Fence Drive Motor Error****Definition [C]**

One of the following conditions is detected in the tandem tray.

- 1) The rear fence return sensor and the rear fence HP sensor are on at the same time.
- 2) It takes 10 seconds or more for the rear fence return sensor to detect the on condition after the rear fence drive motor starts.
- 3) It takes 10 seconds or more for the rear fence HP sensor to detect the on condition after this fence starts moving to the home position.

**Possible Causes**

- Rear fence drive motor defective
- Too much load on the drive mechanism
- Poor motor connector connection

**SC520: Jogger Motor Error 1****Definition [C]**

When the jogger fence moves to the home position, the jogger HP sensor does not turn on even if the jogger fence motor has moved the jogger fence 153.5 mm.

**Possible Causes**

- Jogger fence motor defective
- Too much load on the drive mechanism
- Poor motor connector connection

**SC521: Duplex Jogger Motor Error 2****Definition [C]**

When the jogger fence moves from the home position, the jogger fence HP sensor does not turn off even if the jogger motor has moved the jogger fence 153.5 mm.

**Possible Causes**

- Jogger fence motor defective
- Too much load on the drive mechanism
- Poor motor connector connection

***SC531: Fusing/Duplex Motor Lock***

## Definition [B]

A fusing/duplex motor lock signal is detected for more than 2 seconds during rotation.

## Possible Causes

- Fusing/duplex motor defective
- Too much load on the drive mechanism
- Poor fusing/duplex motor connector connection
- BCU defective
- Front door safety switches defective

***SC532: Relay Motor Lock***

## Definition [C]

A relay motor lock signal is detected for more than 2 seconds during rotation.

## Possible Causes

- Relay motor defective
- Too much load on the drive mechanism
- Poor relay motor connector connection
- BCU defective

***SC541: Fusing Thermistor Open***

## Definition [A]

The fusing temperature detected by the thermistor was below 7°C for 15 seconds.

## Possible Causes

- Fusing thermistor defective or out of position
- Poor thermistor terminal connection

***SC542: Fusing Temperature Warming-up Error***

## Definition [A]

The fusing temperature does not reach the fusing standby temperature within 6 minutes after the main power switch is turned on, or after the front doors are closed.

## Possible Causes

- Fusing thermistor defective or out of position
- Fusing lamp open
- Fusing thermofuse open
- BCU defective
- AC drive board defective
- Poor fusing unit connection



**SC543: Fusing Overheat Error 1**

## Definition [A]

A fusing temperature of over 220°C is detected for 5 seconds by the fusing thermistor.

## Possible Causes

- Fusing thermistor defective
- BCU defective

**SC544: Fusing Overheat Error 2**

## Definition [A]

The fusing temperature monitoring circuit detects abnormal fusing temperature.

## Possible Causes

- Fusing thermistor defective
- BCU defective

**SC545: Fusing Overheat Error 3**

## Definition [A]

The fusing lamp stays on at full power for 45 seconds while in the stand-by condition after warming-up is completed.

## Possible Causes

- Fusing thermistor out of position

**SC546: Fusing Ready Temperature Malfunction**

## Definition [A]

The fusing temperature twice consecutively is detected 20°C lower or 20°C higher than the temperature 1 second earlier.

## Possible Causes

- Poor thermistor connector connection
- Poor fusing unit connection

**SC547: Zero Cross Signal Malfunction**

## Definition [A]

When one of the following conditions is detected 10 times consecutively.

- 1) More than 66 or fewer than 45 zero-cross signals in 500 ms.
- 2) An interval between zero-cross signals shorter than 7.5 ms is detected 3 times in 500 ms.

## Possible Causes

- Noise on the ac power line

***SC550: Oil Supply/Cleaning Web End***

## Definition [A]

The oil supply/cleaning web end sensor stays on for 500 ms after the oil supply/web end motor starts.

## Possible Causes

- Oil supply/cleaning web end
- Oil supply/cleaning web motor defective

***SC591: Toner Supply Motor Lock***

## Definition [B]

The toner supply motor sensor status does not change for 1 second while the toner supply motor is energized.

## Possible Causes

- Toner supply motor defective
- Toner supply motor sensor defective
- BCU defective

***SC592: Toner Bank Motor Error***

## Definition [B]

The BCU receives an abnormal signal from the toner bank motor.



## Possible Causes

- Toner bank motor defective
- Too much load on the drive mechanism
- BCU defective

***SC601: Communication Error Between SICU and SBU***

## Definition [B']

The SICU cannot communicate with the SBU board properly.

## Possible Causes

- Poor connection between the SICU and SBU
- SBU defective
- SICU defective

***SC602: Communication Error Between SICU and HDD Controller***

## Definition [B]

The SICU cannot communicate with the HDD controller properly.

## Possible Causes

- Poor connection between the SICU board and HDD
- SICU board defective

***SC620: Communication Error between BCU and ADF 1***

## Definition [B']

The TXD and RXD signals between BCU and ADF main board do not stabilize.

## Possible Causes

- Poor connection between the BCU board and the ADF main board
- Noise on interface cable

***SC621: Communication Error between BCU and ADF 2***

## Definition [B']

The TXD and RXD signals between BCU and ADF main board do not stabilize.

## Possible Causes

- Poor connection between the BCU board and the ADF main board
- ADF main board defective
- BCU board defective

***SC622: Communication Error between BCU and ADF 3***

## Definition- [B']

Software error after abnormal user operation.

## Possible Causes

- Software error

***SC625, 626: Communication Error between BCU and Finisher***

## Definition [B]

The BCU cannot communicate with the finisher properly.

## Possible Causes

- Poor connection between the BCU board and the finisher main board
- Finisher main board defective
- BCU board defective
- Noise on the interface cable

***SC630: CSS (RSS) Communication Error between Line Adapter and CSS Center***

- Japan only

***SC640: Communication Error between SICU and BCU (CH1) 1***

## Definition [B]

The SICU cannot communicate with the BCU properly.

## Possible Causes

- Poor connection between the SICU and BCU boards
- SICU board defective
- BCU board defective
- Noise on the interface cable

***SC641: Communication Error between SICU and BCU (CH1) 2***

## Definition [A]

The BCU cannot receive the data from the SICU properly.

## Possible Causes

- Poor connection between the SICU and BCU boards
- SICU board defective
- BCU board defective
- Noise on the interface cable

***SC642: Communication Error between SICU and BCU (CH1) 3***

## Definition [B]

The SICU cannot receive the data from the BCU properly.

## Possible Causes

- Poor connection between the SICU and BCU boards
- SICU board defective
- BCU board defective
- Noise on the interface cable

***SC643: Communication Error between SICU and BCU (CH2) 1***

## Definition [B]

The SICU cannot communicate with the BCU properly.

## Possible Causes

- Poor connection between the SICU and BCU boards
- SICU board defective
- BCU board defective
- Noise on the interface cable

**SC644: Communication Error between SICU and BCU (CH2) 2**

## Definition [A]

The BCU cannot receive the data from the SICU properly.

## Possible Causes

- Poor connection between the SICU and BCU boards
- SICU board defective
- BCU board defective
- Noise on the interface cable

**SC645: Communication Error between SICU and BCU (CH2) 3**

## Definition [B]

The SICU cannot receive the data from the BCU properly.

## Possible Causes

- Poor connection between the SICU and BCU boards
- SICU board defective
- BCU board defective
- Noise on the interface cable

**SC646: SICU Error**

## Definition [B]

The BCU detects a defective SICU.

## Possible Causes

- SICU board defective

**SC650: Optional Counter Error 1**

- Japanese version only

**SC651: Optional Counter Error 2**

- Japanese version only

**SC652: Optional Counter Error 3**

- Japanese version only

**SC653: Optional Counter Error 4**

- Japanese version only

***SC701: ADF Pick-up Roller Release Malfunction***

## Definition [B']

The pick-up roller HP sensor does not activate or de-activate when the pick-up motor turns on.

## Possible Causes

- Pick-up roller HP sensor defective
- Pick-up motor defective
- ADF main board defective

***SC702: ADF Feed-in Motor Error***

## Definition [B]

The feed-in motor does not turn properly.

## Possible Causes

- Feed-in motor defective
- ADF main board defective
- Poor connection between the feed-in motor and ADF main board
- Too much load

***SC703: ADF Transport Belt Motor Error***

## Definition [B]

The transport belt motor does not turn properly.

## Possible Causes

- Transport belt motor defective
- ADF main board defective
- Poor connection between the transport motor and ADF main board
- Too much load

***SC704: ADF Feed-out Motor Error***

## Definition [B']

The feed-out motor does not turn properly

## Possible Causes

- Feed-out motor defective
- ADF main board defective
- Poor connection between the feed-out motor and ADF main board
- Too much load

***SC705: ADF Original Table Lift Malfunction***

## Definition [B]

One of the following conditions was detected.

- 1) The bottom plate position sensor does not activate when the original table motor lifts the original table.
- 2) The bottom plate HP sensor does not activate when the bottom plate motor lowers the original table.

## Possible Causes

- Bottom plate H.P sensor defective
- Bottom plate motor defective
- ADF main board defective
- Bottom plate position sensor defective

***SC720: Finisher Lower Transport Motor Error***

## Definition [B']

The lower transport motor does not turn properly

## Possible Causes

- Lower transport motor defective
- Finisher main board defective
- Poor connection between the lower transport motor and finisher main board
- Too much load

***SC722: Finisher Jogger Motor Error***

## Definition [B]

- 1) The finisher jogger HP sensor remains de-activated for more than a certain time when returning to home position.
- 2) The finisher jogger HP sensor remains activated for more than a certain time when moving away from home position.

## Possible Causes

- Jogger H.P sensor defective
- Jogger motor defective
- Poor connection between the jogger motor and finisher main board
- Too much load

***SC724: Finisher Staple Hammer Motor Error***

## Definition [B]

Stapling does not finish within a certain time after the staple hammer motor turned on.

## Possible Causes

- Staple hammer motor defective
- Staple jam
- Too much load on the stapling mechanism
- Poor hammer motor cable connection

***SC725: Finisher Stack Feed-out Motor Error***

## Definition [B]

The stack feed-out belt HP sensor does not activate within a certain time after the stack feed-out motor turned on.

## Possible Causes

- Stack feed-out HP sensor defective
- Stack feed-out motor defective
- Too much load
- Poor stack feed-out motor cable connection

***SC726: Finisher Shift Motor Error***

## Definition [B]

The shift tray half-turn sensor status does not change within 1 second after the shift motor turns on.

## Possible Causes

- Shift motor defective
- Shift tray half-turn sensor defective
- Too much load

***SC727: Finisher Stapler Rotation Motor Error***

## Definition [B]

- 1) Stapler rotation does not finish within a certain time after the stapler rotation motor turned on.
- 2) The stapler does not return to its home position within a certain time after stapling finished.

## Possible Causes

- Stapler rotation motor defective
- Poor stapler rotation motor connection
- Staple rotation HP sensor defective
- Too much load



**SC729: Finisher Punch Motor Error**

## Definition [B]

The punch HP sensor is not activated within a certain time after the punch motor turned on.

## Possible Causes

- Punch motor defective
- Punch HP sensor defective
- Poor punch motor connection

**SC730: Finisher Stapler Motor Error**

## Definition [B]

- 1) The stapler HP sensor stays on for longer than normal when the stapler motor turns on to return the stapler to its home position.
- 2) The stapler HP sensor does not turn on within a certain time after the stapler motor turned on to move the stapler away from home position.

## Possible Causes

- Stapler motor defective
- Stapler HP sensor defective
- Poor stapler motor connection

**SC735: Finisher Paper Stack Plate Motor Error**

## Definition [B]

The stack plate HP sensor does not turn on within a certain time after the stack plate motor turned on.

## Possible Causes

- Stack plate motor defective
- Stack plate HP sensor defective
- Poor stack plate motor connection

**SC735: Finisher Exit Guide Motor Error**

## Definition [B]

The exit guide open sensor does not change within 750 mm after the exit guide motor is energized.

## Possible Causes

- Exit guide motor defective
- Exit guide open sensor defective
- Poor exit guide motor connection

***SC737: Full Finisher Staple Hopper***

## Definition [B]

The staple waste hopper is full.

## Possible Causes

- Full staple waste hopper
- Staple waste hopper sensor defective

***SC738: Finisher Shift Tray Lift Motor Error***

## Definition [B]

The stack height sensor does not activate within a certain time after the shift tray lift motor turned on.

## Possible Causes

- Shift tray lift motor defective
- Too much load

***SC900: Electrical Total Counter Error***

## Definition [A]

The total counter contains something that is not a number.

## Possible Causes

- NVRAM defective

***SC901: Mechanical Total Counter Error***

## Definition [B]

The mechanical total counter is disconnected.

## Possible Causes

- Mechanical total counter defective

***SC951: F-gate Signal Error***

## Definition [B']

When the IPU has already received the F-gate signal (laser writing start trigger signal), the IPU receives another F-gate signal.

## Possible Causes

- SICU defective

**SC953: Scanner Image Setting Error**

## Definition [B']

The settings that are required for image processing using the scanner are not sent from the IPU.

## Possible Causes

- Software defective

**SC954: Printer Image Setting Error**

## Definition [B']

The settings that are required for image processing using the printer controller are not sent from the IPU.

## Possible Causes

- Software defective

**SC955: Memory Setting Error**

## Definition [B']

The settings that are required for image processing using the memory are not sent from the IPU.

## Possible Causes

- Software defective

**SC964: Printer Ready Error**

## Definition [B']

The print ready signal is not generated for more than 17 seconds after the IPU received the print start signal.

## Possible Causes

- Software defective

**SC970: Scanner Ready Error**

## Definition [B']

The scan ready signal is not generated by the MCU for more than 10 seconds after the read start signal is sent to the MCU.

## Possible Causes

- Poor connection between SICU and MCU
- MCU software error

**SC980: HDD Access Error**

## Definition [B]

Incorrect parameter sent to the HDD controller.

## Possible Causes

- Software defective
- SICU defective

**SC982: HDD Construction Error**

## Definition [B']

A HDD that does not have the correct specifications has been installed.

## Possible Causes

- HDD defective
- Incorrect HDD type

**SC984: HDD 1 Data Transfer Error 1**

## Definition [B']

The data transfer from the DRAM to HDD 1 is not completed within 15 seconds.

## Possible Causes

- HDD 1 defective
- SICU defective
- Software defective
- Poor connection between the SICU and HDD 1

**SC985: HDD 2 Data Transfer Error 2**

## Definition [B']

The data transfer from the DRAM to HDD 2 is not completed within 15 seconds.

## Possible Causes

- HDD 2 defective
- SICU defective
- Software defective
- Poor connection between the SICU and HDD 2

***SC986: HDD 1 Data Transfer Error 2***

## Definition [B']

The data transfer from HDD 1 to the DRAM is not completed within 15 seconds.

## Possible Causes

- HDD 1 defective
- SICU defective
- Software defective
- Poor connection between the SICU and HDD 1

***SC987: HDD 2 Data Transfer Error 2***

## Definition [B']

The data transfer from HDD 2 to the DRAM is not completed within 15 seconds.

## Possible Causes

- HDD 2 defective
- SICU defective
- Software defective
- Poor connection between the SICU and HDD 2

***SC990: Software Performance Error***

## Definition [B']

The software performs an unexpected function.

## Possible Causes

- Software defective

## 7.2 ELECTRICAL COMPONENT DEFECTS

### 7.2.1 SENSORS

| Component (Symbol)           | CN                | Condition | Symptom  |
|------------------------------|-------------------|-----------|--|
| Scanner Home Position (S1)   | CN555-2 (MCU)     | Stays On  | SC121 is displayed.  |
|                              |                   | Stays Off | SC120 is displayed.  |
| Original Width (S2)          | CN555-6.7.8 (MCU) | Stays On  | The CPU cannot detect the original size properly. APS and ARE (Auto Reduce/Enlarge) do not function correctly.   |
|                              |                   | Stays Off | The CPU cannot detect the original size properly. APS and ARE do not function correctly.                         |
| Original Length 1 (S3)       | CN555-11 (MCU)    | Stays On  | The CPU cannot detect the original size properly. APS and ARE do not function correctly.                         |
|                              |                   | Stays Off | The CPU cannot detect the original size properly. APS and ARE do not function correctly.                         |
| Original Length 2 (S4)       | CN555-14 (MCU)    | Stays On  | The CPU cannot detect the original size properly. APS and ARE do not function correctly.                         |
|                              |                   | Stays Off | The CPU cannot detect the original size properly. APS and ARE do not function correctly.                         |
| Drum Potential Sensor (S5)   | CN609-10 (BCU)    | Open      | The machine quits auto process control and goes to auto process control off mode.                                |
|                              |                   | Shorted   |  |
| Toner Density (S6)           | CN610-B6 (BCU)    | Stays On  | SC340 is displayed.  |
|                              |                   | Stays Off | SC340 is displayed.  |
| Image Density (S7)           | CN609-5 (BUC)     | Open      | SC350 is displayed after copying.  |
|                              |                   | Shorted   | SC350 is displayed after copying.  |
| Toner Supply Motor (S9)      | CN613-B8 (BCU)    | Stays On  | SC591 is displayed.  |
|                              |                   | Stays Off |  |
| Upper Toner Bottle (S10)     | CN623-A2 (BCU)    | Stays On  | A toner bottle is detected in the upper position even if there is no toner bottle there.                         |
|                              |                   | Stays Off | The toner bottle in the upper position is not detected.  |
| Lower Toner Bottle (S11)     | CN623-B2 (BCU)    | Stays On  | A toner bottle is detected in the lower position even if there is no toner bottle there.                         |
|                              |                   | Stays Off | The toner bottle in the lower position is not detected.  |
| Upper Bottle Inner Cap (S12) | CN623-A5 (BCU)    | Stays On  | Normally, the machine works properly because the current status of the toner bottle cap is stored in the memory. |
|                              |                   | Stays Off |  |

| Component (Symbol)            | CN             | Condition | Symptom   |
|-------------------------------|----------------|-----------|---|
| Lower Bottle Inner Cap (S13)  | CN623-B5 (BCU) | Stays On  | Normally, the machine works properly because the current status of the toner bottle cap is stored in the memory.        |
|                               |                | Stays Off |   |
| Toner Near End (S16)          | CN610-B9 (BCU) | Open      | "Toner End" is displayed even if there is enough toner in the toner entrance tank.                                      |
|                               |                | Shorted   | "Toner End" is not displayed even if there is no toner in the toner entrance tank.                                      |
| Toner Collection Bottle (S14) | CN624-11 (BCU) | Stays On  | The machine cannot detect a no toner collection bottle condition.   |
|                               |                | Stays Off | SC496 is displayed.   |
| Toner Overflow (S15)          | CN624-8 (BCU)  | Stays On  | "Waste Toner Bottle Full" is detected and printing is disabled.   |
|                               |                | Stays Off | "Waste Toner Bottle Full" is detected and printing is disabled.   |
| Toner Hopper (S8)             | CN624-14 (BCU) | Stays On  | SC495 is displayed.   |
|                               |                | Stays Off | Toner is not supplied to the toner hopper, and toner end is detected even if there is enough toner in the toner bottle. |
| 1st Paper Feed (S17)          | CN514-2 (IOB)  | Stays On  | "Paper Jam" is displayed even if there is no paper.   |
|                               |                | Stays Off | "Paper Jam" is displayed whenever a copy is made.   |
| 2nd Paper Feed (S18)          | CN511-A2 (IOB) | Stays On  | "Paper Jam" is displayed even if there is no paper.   |
|                               |                | Stays Off | "Paper Jam" is displayed whenever a copy is made.   |
| 3rd Paper Feed (S19)          | CN511-B2 (IOB) | Stays On  | "Paper Jam" is displayed even if there is no paper.   |
|                               |                | Stays Off | "Paper Jam" is displayed whenever a copy is made.   |
| 1st Tray Lift (S20)           | CN514-8 (IOB)  | Stays On  | SC501 is displayed.   |
|                               |                | Stays Off | SC501 is displayed.   |
| 2nd Tray Lift (S21)           | CN511-A8 (IOB) | Stays On  | SC502 is displayed.   |
|                               |                | Stays Off | SC502 is displayed.   |
| 3rd Tray Lift (S22)           | CN511-B8 (IOB) | Stays On  | SC503 is displayed.   |
|                               |                | Stays Off | SC503 is displayed.   |
| 1st Paper End (S23)           | CN514-5 (IOB)  | Stays On  | "Paper End" is displayed even if there is paper in the 1st paper tray.  |
|                               |                | Stays Off | "Paper End" is not displayed even if there is no paper in the 1st paper tray.   |
| 2nd Paper End (S24)           | CN511-A5 (IOB) | Stays On  | "Paper End" is displayed even if there is paper in the 2nd tray.  |
|                               |                | Stays Off | "Paper End" is not displayed even if there is no paper in the 2nd tray.   |

| Component<br>(Symbol)            | CN                 | Condition | Symptom   |
|----------------------------------|--------------------|-----------|---|
| 3rd Paper End<br>(S25)           | CN511-B5<br>(IOB)  | Stays On  | "Paper End" is displayed even if there is paper in the 3rd tray.  |
|                                  |                    | Stays Off | "Paper End" is not displayed even if there is no paper in the 3rd tray.   |
| Rear Fence HP<br>(S26)           | CN515-5<br>(IOB)   | Stays On  | SC515 is displayed  |
|                                  |                    | Stays Off | SC515 is displayed  |
| Rear Fence Return<br>(S27)       | CN515-9<br>(IOB)   | Stays On  | SC515 is displayed  |
|                                  |                    | Stays Off | SC515 is displayed  |
| Front Side Fence<br>Open (S28)   | CN516-A3<br>(IOB)  | Stays On  | Wrench mark appears in the 1st tray indicator.  |
|                                  |                    | Stays Off |   |
| Front Side Fence<br>Closed (S29) | CN516-A6<br>(IOB)  | Stays On  | Wrench mark appears in the 1st tray indicator.  |
|                                  |                    | Stays Off |   |
| Rear Side Fence<br>Open (S30)    | CN516-A9<br>(IOB)  | Stays On  | Wrench mark appears in the 1st tray indicator.  |
|                                  |                    | Stays Off |   |
| Rear Side Fence<br>Closed (S31)  | CN516-A12<br>(IOB) | Stays On  | Wrench mark appears in the 1st tray indicator.  |
|                                  |                    | Stays Off |   |
| Base Plate Down<br>(S32)         | CN516-B13<br>(IOB) | Stays On  | The bottom plate lift lever locks at the lowest position.   |
|                                  |                    | Stays Off | The bottom plate is not lowered when paper on the left tray needs to be moved to the right tray and paper is set in the incorrect position. |
| 1st Tray Paper<br>Height 1 (S33) | CN516-B10<br>(IOB) | Stays On  | "Paper Near End" is not displayed even if the tray is almost empty.   |
|                                  |                    | Stays Off | "Paper Near End" is displayed even if there is enough paper in the paper tray.  |
| 1st Tray Paper<br>Height 2 (S34) | CN516-B8<br>(IOB)  | Stays On  | "Paper Near End" is not displayed even if the tray is almost empty.   |
|                                  |                    | Stays Off | "Paper Near End" is displayed even if there is enough paper in the paper tray.  |
| 1st Tray Paper<br>Height 3 (S35) | CN516-B7<br>(IOB)  | Stays On  | "Paper Near End" is not displayed even if the tray is almost empty.   |
|                                  |                    | Stays Off | "Paper Near End" is displayed even if there is enough paper in the paper tray.  |
| 1st Tray Paper<br>Height 4 (S36) | CN516-B6<br>(IOB)  | Stays On  | "Paper Near End" is not displayed even if the tray is almost empty.   |
|                                  |                    | Stays Off | "Paper Near End" is displayed even if there is enough paper in the paper tray.  |
| Left 1st Tray Paper<br>(S37)     | CN516-B10<br>(IOB) | Stays On  | The rear fence moves back and forth continuously.   |
|                                  |                    | Stays Off | The paper in the left tray is not moved to the right tray.  |



| Component (Symbol)         | CN              | Condition | Symptom  |
|----------------------------|-----------------|-----------|--|
| Right 1st Tray Paper (S38) | CN515-12 (IOB)  | Stays On  | "Paper Jam" is displayed after the last sheet is fed from the right 1st tray.  |
|                            |                 | Stays Off | Paper end is detected in the 1st tray even if there is paper in the tray. If there is paper in the left tray, the rear plate locks and SC515 is displayed. |
| Inverter Tray Paper (S39)  | CN611-A3 (BCU)  | Stays On  | "Paper Jam" is displayed even if there is no paper.  |
|                            |                 | Stays Off | "Paper Jam" is displayed whenever a copy is made.  |
| Duplex Entrance (S40)      | CN611-A11 (BCU) | Stays On  | "Paper Jam" is displayed even if there is no paper.  |
|                            |                 | Stays Off | "Paper Jam" is displayed whenever a copy is made.  |
| Duplex Transport 1 (S41)   | CN611-A5 (BCU)  | Stays On  | "Paper Jam" is displayed whenever a copy is made.  |
|                            |                 | Stays Off | "Paper Jam" is displayed even if there is no paper.  |
| Duplex Transport 2 (S42)   | CN611-A7 (BCU)  | Stays On  | "Paper Jam" is displayed whenever a copy is made.  |
|                            |                 | Stays Off | "Paper Jam" is displayed even if there is no paper.  |
| Duplex Transport 3 (S43)   | CN611-A9 (BCU)  | Stays On  | "Paper Jam" is displayed whenever a copy is made.  |
|                            |                 | Stays Off | "Paper Jam" is displayed even if there is no paper.  |
| Duplex Jogger HP (S44)     | CN611-A10 (BCU) | Stays On  | SC521 is displayed.  |
|                            |                 | Stays Off | SC520 is displayed.  |
| LCT Relay (S45)            | CN602-A7 (BCU)  | Stays On  | "Paper Jam" is displayed even if there is no paper.  |
|                            |                 | Stays Off | "Paper Jam" is displayed whenever a copy is made.  |
| Relay (S46)                | CN602-A4 (BCU)  | Stays On  | "Paper Jam" is displayed even if there is no paper.  |
|                            |                 | Stays Off | "Paper Jam" is displayed whenever a copy is made.  |
| Registration (S47)         | CN602-A9 (BCU)  | Stays On  | "Paper Jam" is displayed even if there is no paper.  |
|                            |                 | Stays Off | "Paper Jam" is displayed whenever a copy is made.  |
| Guide Plate Position (S48) | CN602-4 (BCU)   | Stays On  | A paper jam will occur when the guide plate is opened.   |
|                            |                 | Stays Off | "Guide Plate Close" is displayed after the front door is closed even if the guide plate is closed.   |

| Component (Symbol)                    | CN              | Condition | Symptom   |
|---------------------------------------|-----------------|-----------|---|
| Oil Supply/<br>Cleaning Web End (S49) | CN603-A6 (BCU)  | Stays On  | Cleaning web end is not detected.                   |
|                                       |                 | Stays Off | SC550 is displayed.                                 |
| Fusing Exit (S50)                     | CN602-A11 (BCU) | Stays On  | "Paper Jam" is displayed whenever a copy is made.   |
|                                       |                 | Stays Off | "Paper Jam" is displayed even if there is no paper. |
| Exit (S51)                            | CN602-A14 (BCU) | Stays On  | "Paper Jam" is displayed whenever a copy is made.   |
|                                       |                 | Stays Off | "Paper Jam" is displayed even if there is no paper. |

**NOTE:** For a photointerrupter, "Stays on" means that the actuator is in the sensor.

## 7.2.2 SWITCHES

| Component (Symbol)              | CN                          | Condition | Symptom  |
|---------------------------------|-----------------------------|-----------|--|
| Main Power (SW1)                | CN703-1, 3 (PSU)            | Open      | The machine does not turn on.  |
|                                 |                             | Shorted   | The machine does not turn off.   |
| Right Front Door Safety 1 (SW2) | CN625-1 (BCU)               | Open      | The door open indicator does not turn off.   |
|                                 |                             | Shorted   | The door open condition is not detected.   |
| Right Front Door Safety 2 (SW3) | CN404-3 (LDB)               | Open      | SC322 is displayed.  |
|                                 |                             | Shorted   |  |
| Right Front Door Safety 3 (SW4) | CN404-3 (LDB)               | Open      | SC322 is displayed.  |
|                                 |                             | Shorted   |  |
| Right Front Door Safety 4 (SW5) | CN715-2 (PSU)               | Open      | SC531 is displayed.  |
|                                 |                             | Shorted   |  |
| Left Front Door Safety 1 (SW6)  | CN625-3 (BUC)               | Open      | The door open indicator does not turn off.   |
|                                 |                             | Shorted   | The door open condition is not detected.   |
| Left Front Door Safety 2 (SW7)  | CN404-3 (LDB)               | Open      | SC322 is displayed.  |
|                                 |                             | Shorted   |  |
| Left Front Door Safety 3 (SW8)  | CN404-3 (LDB)               | Open      | SC322 is displayed.  |
|                                 |                             | Shorted   |  |
| Left Front Door Safety 4 (SW9)  | CN715-2 (PSU)               | Open      | SC531 is displayed.  |
|                                 |                             | Shorted   |  |
| 2nd Tray Paper Size (SW10)      | CN510-A8, A9, A10, A11, A12 | Open      | The CPU cannot detect the proper paper size, and misfeeds may occur when a copy is made. |
|                                 |                             | Shorted   |  |
| 3rd Tray Paper Size (SW11)      | CN510-A2, A3, A4, A5, A6    | Open      | The CPU cannot detect the proper paper size, and misfeeds may occur when a copy is made. |
|                                 |                             | Shorted   |  |

## 7.3 BLOWN FUSE CONDITIONS

Fuses are not used for the output lines from the PSU. An electronic current cut-off method is used instead.

The PSU consists of three converters; 1st converter, 2nd converter, and Energy saver converter. Each converter has an LED which indicates the status of the converter.

| LED No.   | LED 1        | LED 2         | LED 3         |
|---|--------------|---------------|---------------|
| Converter                                       | Energy saver | 1st Converter | 2nd Converter |
| Output  | Vcc1         | Vcc2, Vmm     | Vaa, Vca, Vcb |
| In Stand-by Condition                           | On           | On            | On            |
| In Energy Saver Mode                            | On           | Off           | Off           |
| <b>LED status when a converter is defective</b> |              |               |               |
| Energy saver                                    | Off          | Off           | Off           |
| 1st   | On           | Off           | Off           |
| 2nd   | On           | On            | Off           |

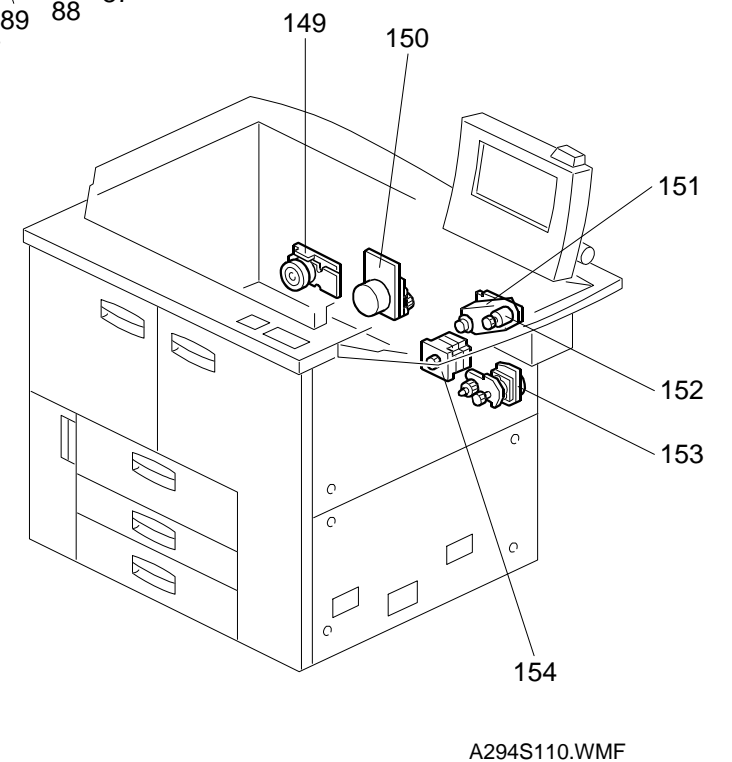
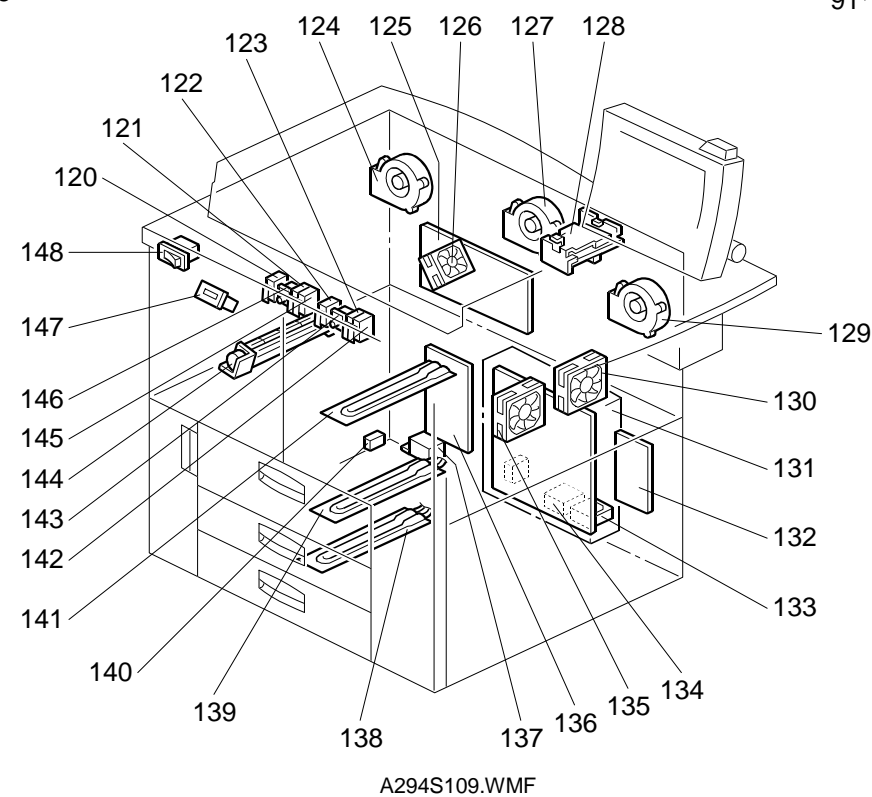
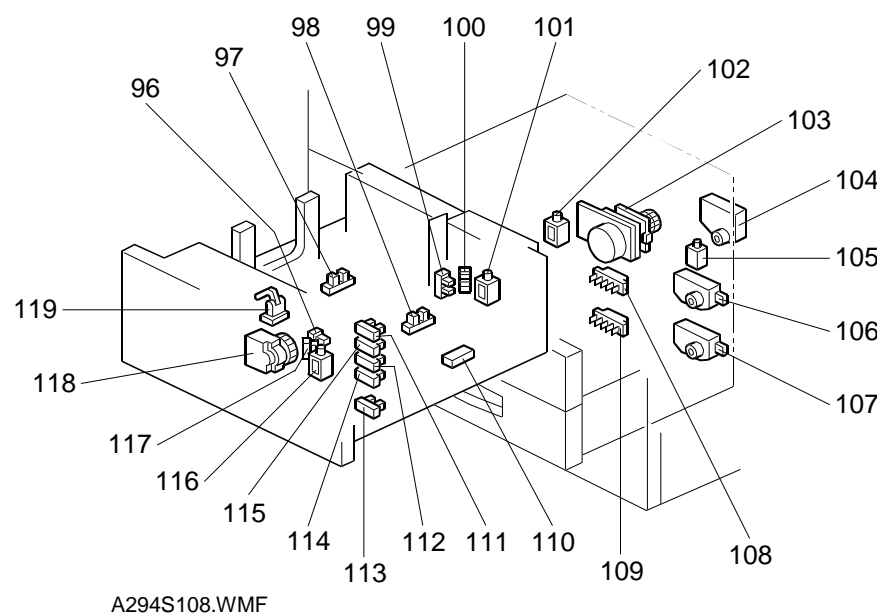
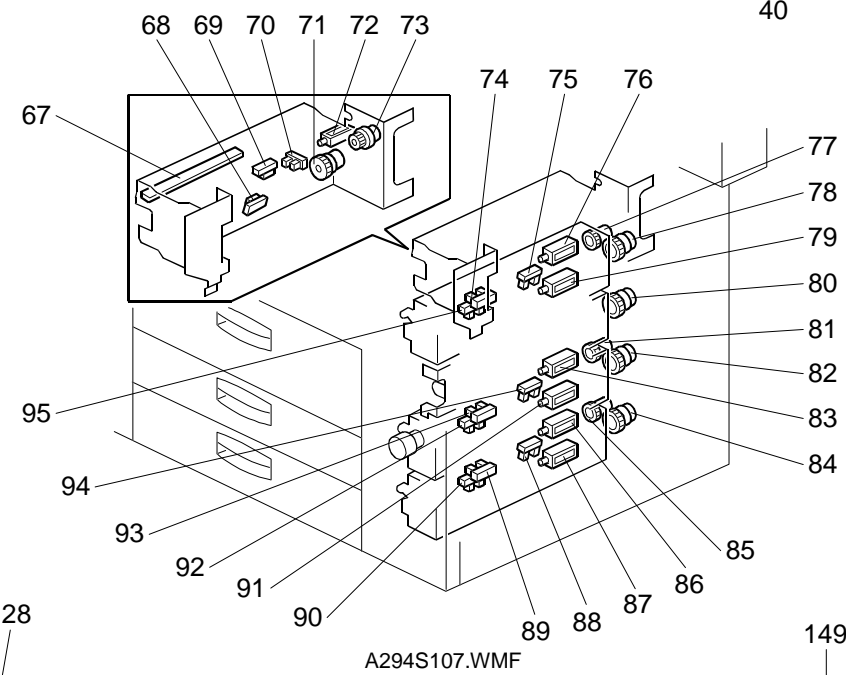
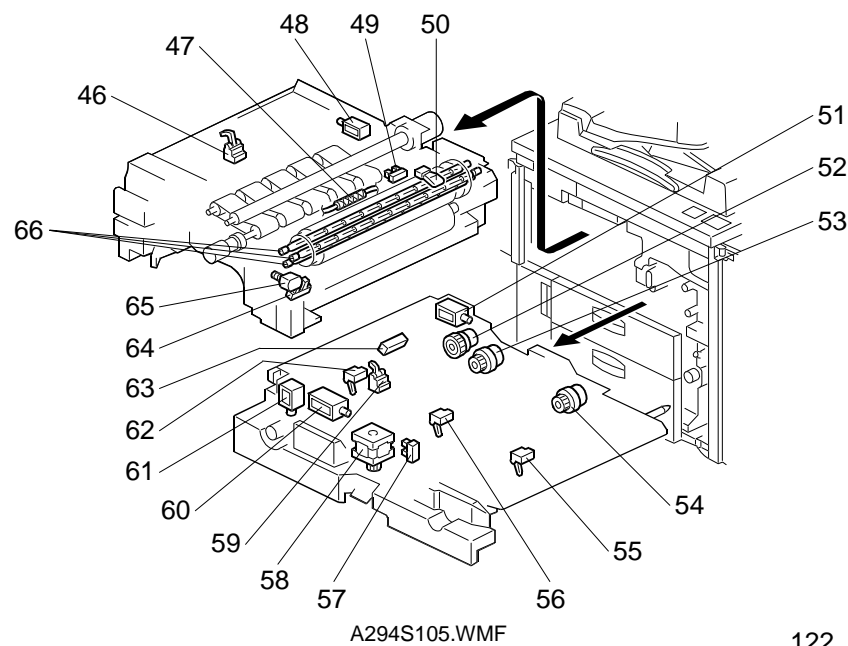
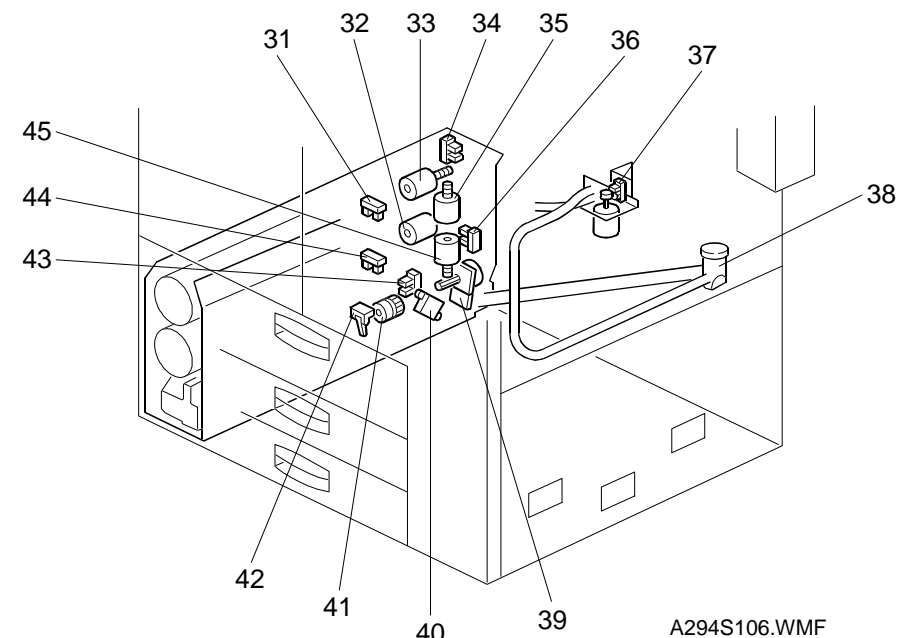
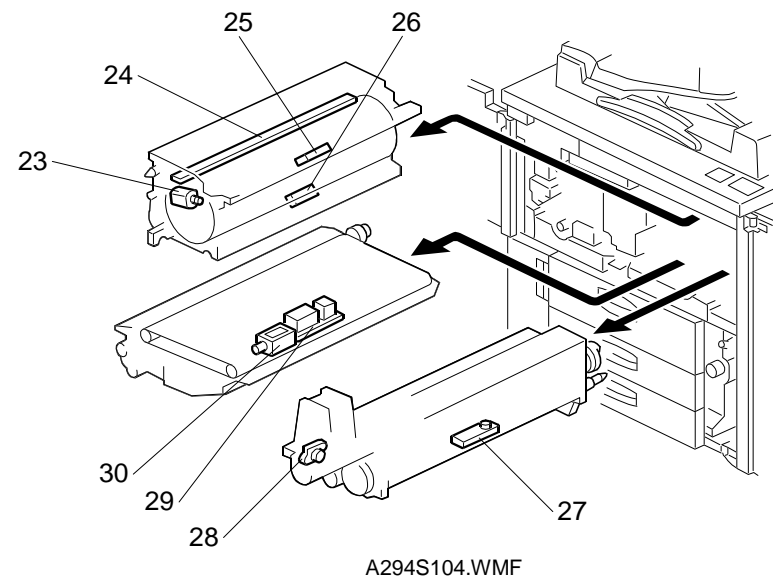
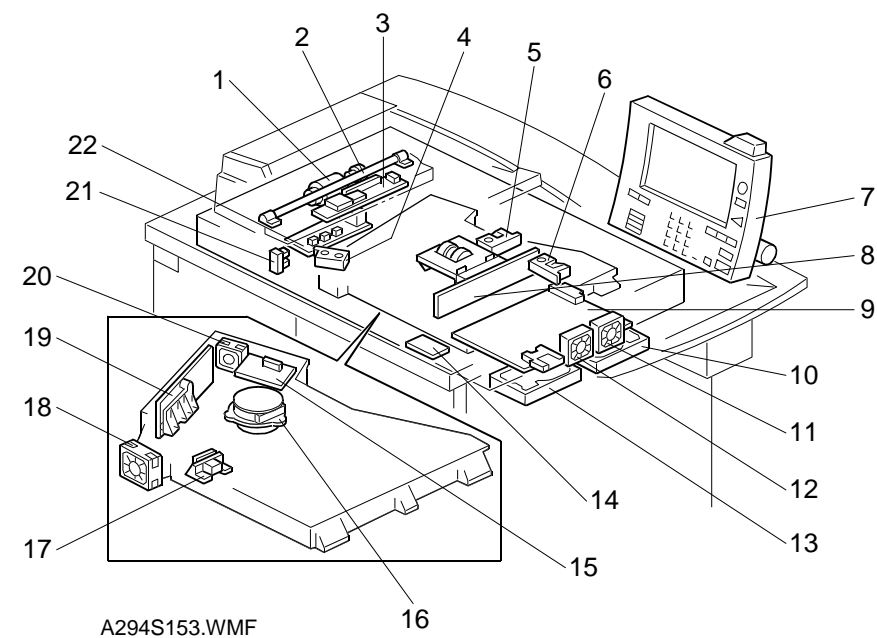
When the 1st converter is defective, the output of the 2nd converter is also stopped. When the energy saver converter is defective, all the outputs are stopped.

There is a circuit breaker CB1 on the PSU which cuts all the power from the PSU when excess current flows.

Additionally, there is a fuse only for the AC input line of the energy saver converter.

| Fuse                      | Symptom when turning on the main power switch |
|---------------------------|---|
| <b>Power Supply Board</b> |   |
| FU404                     | No response                                   |

COPIER (A294) ELECTRICAL COMPONENT LAYOUT (1/2)



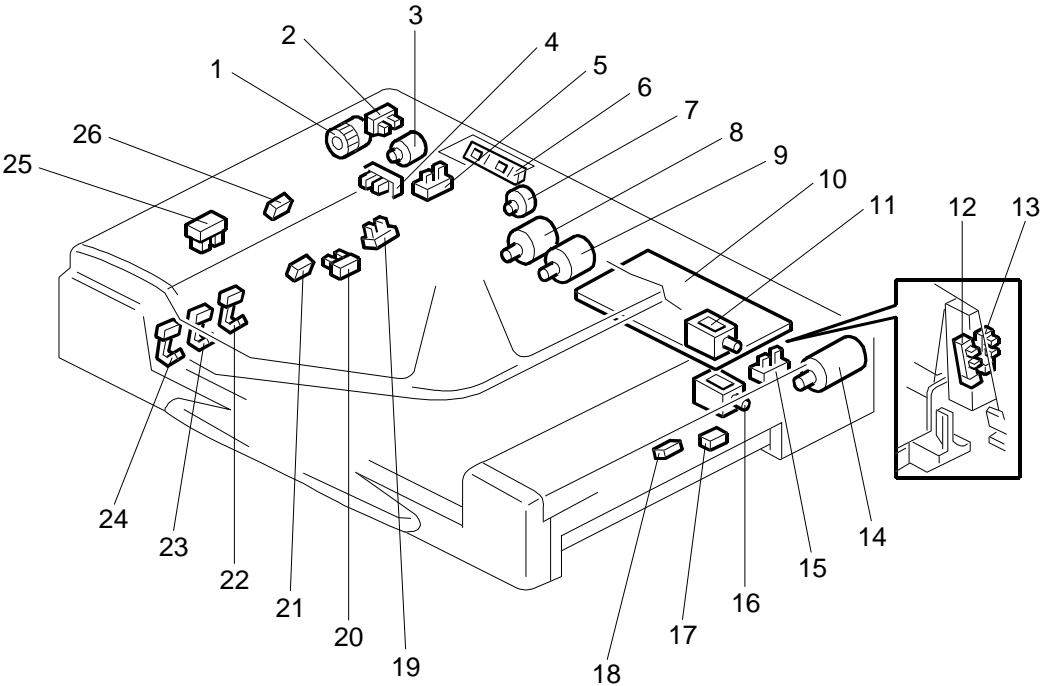
COPIER (A294) ELECTRICAL COMPONENT LAYOUT (2/2)

| Symbol  | Index No. | Description                        | P to P |
|---------|-----------|------------------------------------|--------|
| Motors  |           |                                    |        |
| M1      | 1         | Scanner                            | 1-J21  |
| M2      | 16        | Polygonal Mirror                   | 2-K22  |
| M3      | 150       | Drum                               | 1-J11  |
| M4      | 151       | Development                        | 1-J11  |
| M5      | 38        | Toner Supply                       | 1-I10  |
| M6      | 39        | Toner Bank                         | 1-I13  |
| M7      | 35        | Upper Toner Bottle                 | 1-I15  |
| M8      | 33        | Upper Bottle Cap                   | 1-I15  |
| M9      | 45        | Lower Toner Bottle                 | 1-I14  |
| M10     | 32        | Lower Bottle Cap                   | 1-P16  |
| M11     | 23        | Charge Corona Wire Cleaner         | 1-J12  |
| M12     | 149       | Fusing/Duplex                      | 1-N7   |
| M13     | 103       | Paper Feed                         | 1-L22  |
| M14     | 153       | Relay                              | 1-N2   |
| M15     | 104       | 1st Tray Lift                      | 1-M2   |
| M16     | 106       | 2nd Tray Lift                      | 1-M2   |
| M17     | 107       | 3rd Tray Lift                      | 1-M2   |
| M18     | 154       | Registration                       | 1-N8   |
| M19     | 65        | Oil Supply/Cleaning Web            | 1-O13  |
| M20     | 118       | Rear Fence Drive                   | 1-G2   |
| M21     | 58        | Jogger                             | 1-O17  |
| M22     | 12        | Optics Cooling Fan                 | 2-N12  |
| M23     | 18        | Polygonal Mirror Motor Cooling Fan | 1-N9   |
| M24     | 20        | LDB Cooling Fan                    | 2-O16  |
| M25     | 11        | SICU Cooling Fan                   | 2-N12  |
| M26     | 129       | Drum Cooling Fan                   | 1-N10  |
| M27     | 135       | Development Unit Cooling Fan 1     | 1-I10  |
| M28     | 130       | Development Unit Cooling Fan 2     | 1-I10  |
| M29     | 126       | Paper Cooling Pipe Fan             | 1-N11  |
| M30     | 144       | Duplex Cooling Fan                 | 1-N11  |
| M31     | 127       | Exhaust Fan                        | 1-N9   |
| M32     | 124       | Steam Removal Fan                  | 1-N10  |
| M33     | 133       | PSU Cooling Fan 1                  | 1-E13  |
| M34     | 134       | PSU Cooling Fan 2                  | 1-E13  |
| Sensors |           |                                    |        |
| S1      | 21        | Scanner HP                         | 2-H21  |
| S2      | 4         | Original Width                     | 2-H21  |
| S3      | 5         | Original Length 1                  | 2-I21  |
| S4      | 6         | Original Length 2                  | 2-I21  |
| S5      | 25        | Drum Potential                     | 1-O15  |
| S6      | 27        | Toner Density (TD)                 | 1-N9   |
| S7      | 26        | Image Density (ID)                 | 1-O15  |
| S8      | 28        | Toner Hopper                       | 1-N8   |
| S9      | 37        | Toner Supply Motor                 | 1-I10  |
| S10     | 31        | Upper Toner Bottle                 | 1-I15  |
| S11     | 44        | Lower Toner Bottle                 | 1-I14  |
| S12     | 34        | Upper Bottle Inner Cap             | 1-I15  |
| S13     | 36        | Lower Bottle Inner Cap             | 1-I14  |
| S14     | 42        | Toner Collection Bottle            | 1-I13  |
| S15     | 43        | Toner Overflow                     | 1-I13  |
| S16     | 40        | Toner Near End                     | 1-I12  |
| S17     | 95        | 1st Paper Feed                     | 1-A2   |
| S18     | 92        | 2nd Paper Feed                     | 1-B2   |
| S19     | 90        | 3rd Paper Feed                     | 1-D2   |
| S20     | 75        | 1st Tray Lift                      | 1-B2   |
| S21     | 94        | 2nd Tray Lift                      | 1-C2   |
| S22     | 88        | 3rd Tray Lift                      | 1-D2   |
| S23     | 74        | 1st Paper End                      | 1-B2   |

| Symbol    | Index No. | Description                 | P to P |
|-----------|-----------|-----------------------------|--------|
| S24       | 93        | 2nd Paper End               | 1-C2   |
| S25       | 89        | 3rd Paper End               | 1-D2   |
| S26       | 97        | Rear Fence HP               | 1-G2   |
| S27       | 98        | Rear Fence Return           | 1-G2   |
| S28       | 117       | Front Side Fence Open       | 1-H2   |
| S29       | 96        | Front Side Fence Closed     | 1-H2   |
| S30       | 100       | Rear Side Fence Open        | 1-I2   |
| S31       | 99        | Rear Side Fence Closed      | 1-I2   |
| S32       | 113       | Base Plate Down             | 1-K2   |
| S33       | 111       | 1st Tray Paper Height 1     | 1-K2   |
| S34       | 115       | 1st Tray Paper Height 2     | 1-J2   |
| S35       | 112       | 1st Tray Paper Height 3     | 1-J2   |
| S36       | 114       | 1st Tray Paper Height 4     | 1-J2   |
| S37       | 119       | Left 1st Tray Paper         | 1-G2   |
| S38       | 110       | Right 1st Tray Paper        | 1-I2   |
| S39       | 59        | Duplex Inverter             | 1-O20  |
| S40       | 63        | Duplex Entrance             | 1-O19  |
| S41       | 62        | Duplex Transport 1          | 1-O20  |
| S42       | 56        | Duplex Transport 2          | 1-O20  |
| S43       | 55        | Duplex Transport 3          | 1-O19  |
| S44       | 57        | Duplex Jogger HP            | 1-O19  |
| S45       | 69        | LCT Relay                   | 1-K22  |
| S46       | 68        | Relay                       | 1-K22  |
| S47       | 67        | Registration                | 1-K22  |
| S48       | 70        | Guide Plate Position        | 1-L22  |
| S49       | 64        | Oil Supply/Cleaning Web End | 1-O13  |
| S50       | 49        | Fusing Exit                 | 1-O12  |
| S51       | 46        | Exit                        | 1-O12  |
| Switches  |           |                             |        |
| SW1       | 148       | Main Power                  | 1-C12  |
| SW2       | 122       | Right Front Door Safety 1   | 1-F13  |
| SW3       | 143       | Right Front Door Safety 2   | 1-D9   |
| SW4       | 123       | Right Front Door Safety 3   | 2-O16  |
| SW5       | 142       | Right Front Door Safety 4   | 2-P16  |
| SW6       | 120       | Left Front Door Safety 1    | 1-G13  |
| SW7       | 146       | Left Front Door Safety 2    | 1-D8   |
| SW8       | 121       | Left Front Door Safety 3    | 2-P15  |
| SW9       | 145       | Left Front Door Safety 4    | 2-O15  |
| SW10      | 108       | 2nd Tray Paper Size         | 1-L2   |
| SW11      | 109       | 3rd Tray Paper Size         | 1-K2   |
| Solenoids |           |                             |        |
| SOL1      | 30        | Transfer Belt Lift          | 1-O16  |
| SOL2      | 76        | 1st Pick-up                 | 1-B2   |
| SOL3      | 83        | 2nd Pick-up                 | 1-C2   |
| SOL4      | 86        | 3rd Pick-up                 | 1-D2   |
| SOL5      | 79        | 1st Separation Roller       | 1-E2   |
| SOL6      | 91        | 2nd Separation Roller       | 1-E2   |
| SOL7      | 87        | 3rd Separation Roller       | 1-F2   |
| SOL8      | 116       | Front Side Fence            | 1-I2   |
| SOL9      | 101       | Rear Side Fence             | 1-I2   |
| SOL10     | 105       | Tandem Tray Connect         | 1-N2   |
| SOL11     | 102       | Left 1st Tray Lock          | 1-N2   |
| SOL12     | 61        | Duplex Inverter Gate        | 1-O18  |
| SOL13     | 60        | Reverse Roller              | 1-O18  |
| SOL14     | 51        | Inverter Guide Plate        | 1-O18  |
| SOL15     | 72        | Guide Plate                 | 1-K22  |
| SOL16     | 48        | Inverter Gate               | 1-O12  |
|           |           |                             |        |

| Symbol            | Index No. | Description                       | P to P |
|-------------------|-----------|-----------------------------------|--------|
| Magnetic Clutches |           |                                   |        |
| MC1               | 41        | Toner Supply Coil                 | 1-I13  |
| MC2               | 152       | Toner Supply Roller               | 1-I11  |
| MC3               | 77        | 1st Paper Feed                    | 1-E2   |
| MC4               | 81        | 2nd Paper Feed                    | 1-E2   |
| MC5               | 85        | 3rd Paper Feed                    | 1-F2   |
| MC6               | 52        | Inverter Exit Roller              | 1-O18  |
| MC7               | 53        | Duplex Transport                  | 1-O18  |
| MC8               | 54        | Duplex Feed                       | 1-O18  |
| MC9               | 78        | 1st Vertical Transport            | 1-E2   |
| MC10              | 82        | 2nd Vertical Transport            | 1-F2   |
| MC11              | 84        | 3rd Vertical Transport            | 1-F2   |
| MC12              | 71        | Upper Relay                       | 1-L22  |
| MC13              | 73        | LCT Relay                         | 1-J22  |
| MC14              | 80        | Lower Relay                       | 1-N2   |
| PCBs              |           |                                   |        |
| PCB1              | 125       | BCU                               | 1-L13  |
| PCB2              | 9         | SICU                              | 2-F10  |
| PCB3              | 131       | PSU                               | 1-D14  |
| PCB4              | 132       | IOB                               | 1-B5   |
| PCB5              | 8         | SBU                               | 2-E20  |
| PCB6              | 22        | MCU                               | 2-G20  |
| PCB7              | 3         | Lamp Regulator                    | 2-G21  |
| PCB8              | 15        | Polygonal Mirror Motor Control    | 2-K20  |
| PCB9              | 19        | LDB                               | 2-N17  |
| PCB10             | 136       | AC Drive                          | 1-B10  |
| PCB11             | 7         | Operation Panel                   | 2-N9   |
| PCB12             | 14        | Operation Key                     | 2-O11  |
| Lamps             |           |                                   |        |
| L1                | 2         | Exposure Lamp                     | 2-G22  |
| L2                | 66        | Fusing Lamp 1                     | 1-B8   |
| L3                | 66        | Fusing Lamp 2                     | 1-B8   |
| L4                | 66        | Fusing Lamp 3                     | 1-B8   |
| L5                | 24        | Quenching                         | 1-P16  |
| Power Packs       |           |                                   |        |
| PP1               | 128       | Charge/bias/grid                  | 1-N14  |
| PP2               | 30        | Transfer                          | 1-O16  |
| Others            |           |                                   |        |
| CB1               | 140       | Circuit Breaker                   | 1-A7   |
| H1                | —         | Optics Anti-Condensation (option) | 1-A13  |
| H2                | 141       | Drum (option)                     | 1-A13  |
| H3                | 139       | Tray Heater 1 (option)            | 1-A12  |
| H4                | 138       | Tray Heater 2 (option)            | 1-A12  |
| HDD1              | 13        | HDD                               | 2-F3   |
| HDD2              | 10        | HDD                               | 2-J3   |
| NF1               | 137       | Noise Filter                      | 1-A8   |
| SD1               | 17        | Laser Synchronization Detector    | 2-O15  |
| TC1               | 147       | Total Counter                     | 1-N11  |
| TF1               | 47        | Fusing Thermofuse                 | 1-B8   |
| TH1               | 50        | Fusing Thermistor                 | 1-B7   |
|                   |           |                                   |        |

# ELECTRICAL COMPONENT LAYOUT (ADF: B301)

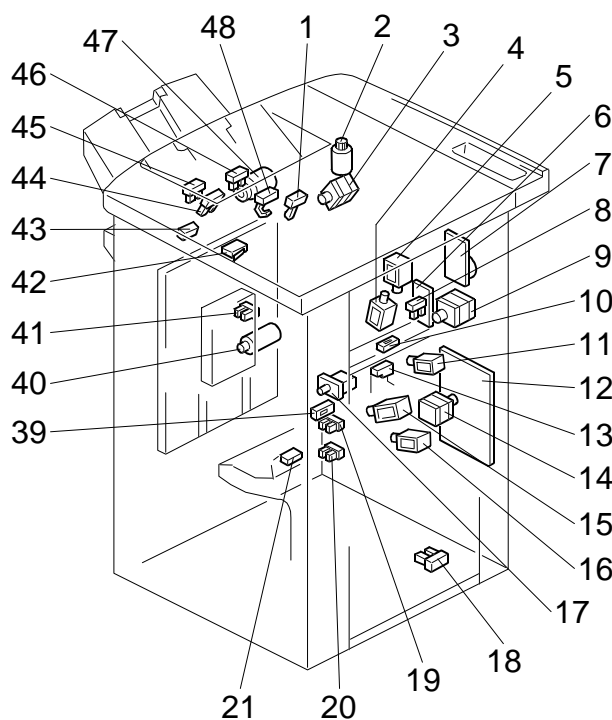


B301S108.WMF

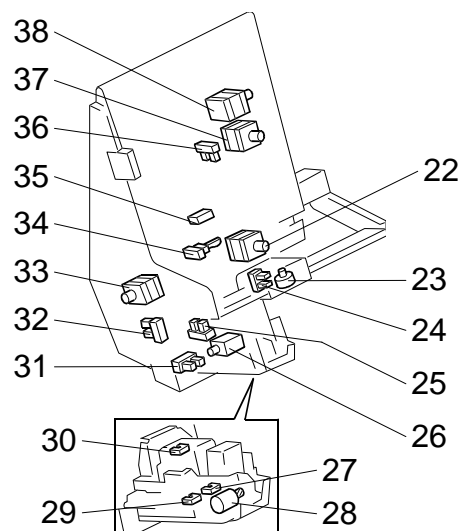
| Symbol    | Index No. | Description           | P to P |
|-----------|-----------|-----------------------|--------|
| Motors    |           |                       |        |
| M1        | 3         | Pick-up               | F1     |
| M2        | 8         | Feed-in               | D1     |
| M3        | 9         | Transport             | E1     |
| M4        | 14        | Feed-out              | F1     |
| M5        | 7         | Bottom plate          | G1     |
| Sensors   |           |                       |        |
| S1        | 12        | APS Start             | I6     |
| S2        | 13        | DF Position           | H6     |
| S3        | 19        | Original Set          | A6     |
| S4        | 20        | Bottom Plate HP       | B6     |
| S5        | 4         | Bottom Plate Position | D6     |
| S6        | 2         | Pick-up Roller HP     | D6     |
| S7        | 26        | Entrance              | C7     |
| S8        | 21        | Registration          | C6     |
| S9        | 22        | Original Width 1      | E6     |
| S10       | 23        | Original Width 2      | F6     |
| S11       | 24        | Original Width 3      | F6     |
| S12       | 25        | Original Length       | B6     |
| S13       | 18        | Exit                  | G6     |
| S14       | 17        | Inverter              | G6     |
| S15       | 5         | Feed Cover            | E6     |
| S16       | 15        | Exit Cover            | H6     |
| Solenoids |           |                       |        |
| SOL1      | 16        | Exit Gate             | H1     |
| SOL2      | 11        | Inverter Gate         | I1     |

| Symbol            | Index No. | Description  | P to P |
|-------------------|-----------|--------------|--------|
| Magnetic Clutches |           |              |        |
| MC1               | 1         | Feed-in      | H1     |
| PCBs              |           |              |        |
| PCB1              | 10        | DF Main      | J4     |
| PCB2              | 6         | DF Indicator | I1     |
| PCB1              | 10        | DF Main      | J4     |
| PCB2              | 6         | DF Indicator | I1     |

# ELECTRICAL COMPONENT LAYOUT (FINISHER: B302)



B302S501.WMF

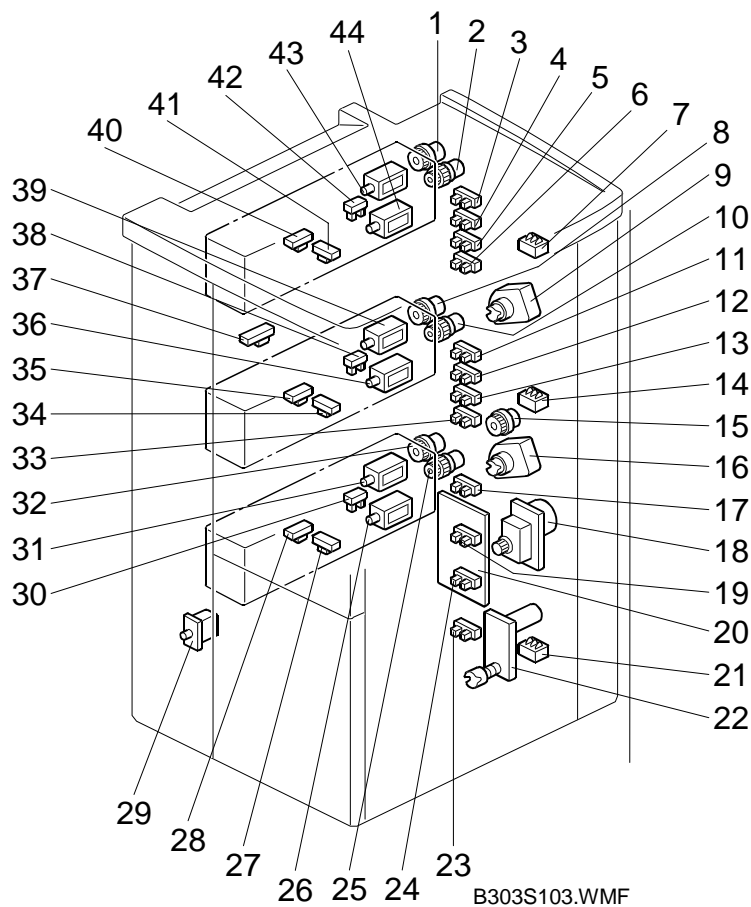


B302S502.WMF

| Symbol         | Index No. | Description            | P to P |
|----------------|-----------|------------------------|--------|
| <b>Motors</b>  |           |                        |        |
| M1             | 7         | Upper Transport        | A6     |
| M2             | 14        | Lower Transport        | C6     |
| M3             | 37        | Jogger                 | F6     |
| M4             | 23        | Stack Plate            | G6     |
| M5             | 22        | Stapler                | G6     |
| M6             | 33        | Stapler Rotation       | I6     |
| M7             | 28        | Staple Hammer          | I6     |
| M8             | 38        | Stack Feed-out         | F6     |
| M9             | 47        | Exit Guide             | C6     |
| M10            | 3         | Shift Tray Exit        | B6     |
| M11            | 40        | Shift                  | D6     |
| M12            | 2         | Shift Tray Lift        | C6     |
| M13            | 9         | Punch                  | J2     |
| <b>Sensors</b> |           |                        |        |
| S1             | 10        | Entrance               | B2     |
| S2             | 39        | Pre-stack              | E2     |
| S3             | 21        | Stapler Tray Entrance  | F2     |
| S4             | 36        | Jogger Fence HP        | F2     |
| S5             | 35        | Stapler Tray Paper     | F2     |
| S6             | 24        | Stack Plate HP         | G2     |
| S7             | 32        | Stapler HP             | G2     |
| S8             | 31        | Stapler Rotation HP    | G2     |
| S9             | 30        | Staple Hammer HP       | J2     |
| S10            | 29        | Cartridge Set          | J2     |
| S11            | 27        | Staple End             | J2     |
| S12            | 18        | Staple Waste Hopper    | I2     |
| S13            | 34        | Stack Feed-out Belt HP | F2     |
| S14            | 46        | Exit Guide Open        | C2     |

| Symbol           | Index No. | Description              | P to P |
|------------------|-----------|--------------------------|--------|
| S15              | 43        | Shift Tray Exit          | C2     |
| S16              | 45        | Stack Height 1           | D2     |
| S17              | 44        | Stack Height 2           | D2     |
| S18              | 1         | Upper Tray Exit          | C2     |
| S19              | 48        | Upper Tray Paper Limit   | C2     |
| S20              | 41        | Shift Tray Half-turn     | D2     |
| S21              | 19        | Shift Tray Lower Limit 1 | E2     |
| S22              | 20        | Shift Tray Lower Limit 2 | E2     |
| S23              | 13        | Punch Waste Hopper       | J2     |
| S24              | 8         | Punch HP                 | I2     |
| S25              | 25        | Stapler Return           | I2     |
| <b>Switches</b>  |           |                          |        |
| SW1              | 17        | Front Door Safety        | B2     |
| SW2              | 42        | Shift Tray Upper Limit   | C6     |
| <b>Solenoids</b> |           |                          |        |
| SOL1             | 4         | Stapler Junction Gate    | D6     |
| SOL2             | 5         | Tray Junction Gate       | D6     |
| SOL3             | 11        | Pre-stack Junction Gate  | E6     |
| SOL4             | 16        | Pre-stack Paper Stopper  | E6     |
| SOL5             | 15        | Positioning Roller       | E6     |
| SOL6             | 26        | Stapler Return           | I6     |
| <b>PCBs</b>      |           |                          |        |
| PCB1             | 12        | Main                     | K4     |
| PCB2             | 6         | Punch                    | J3     |

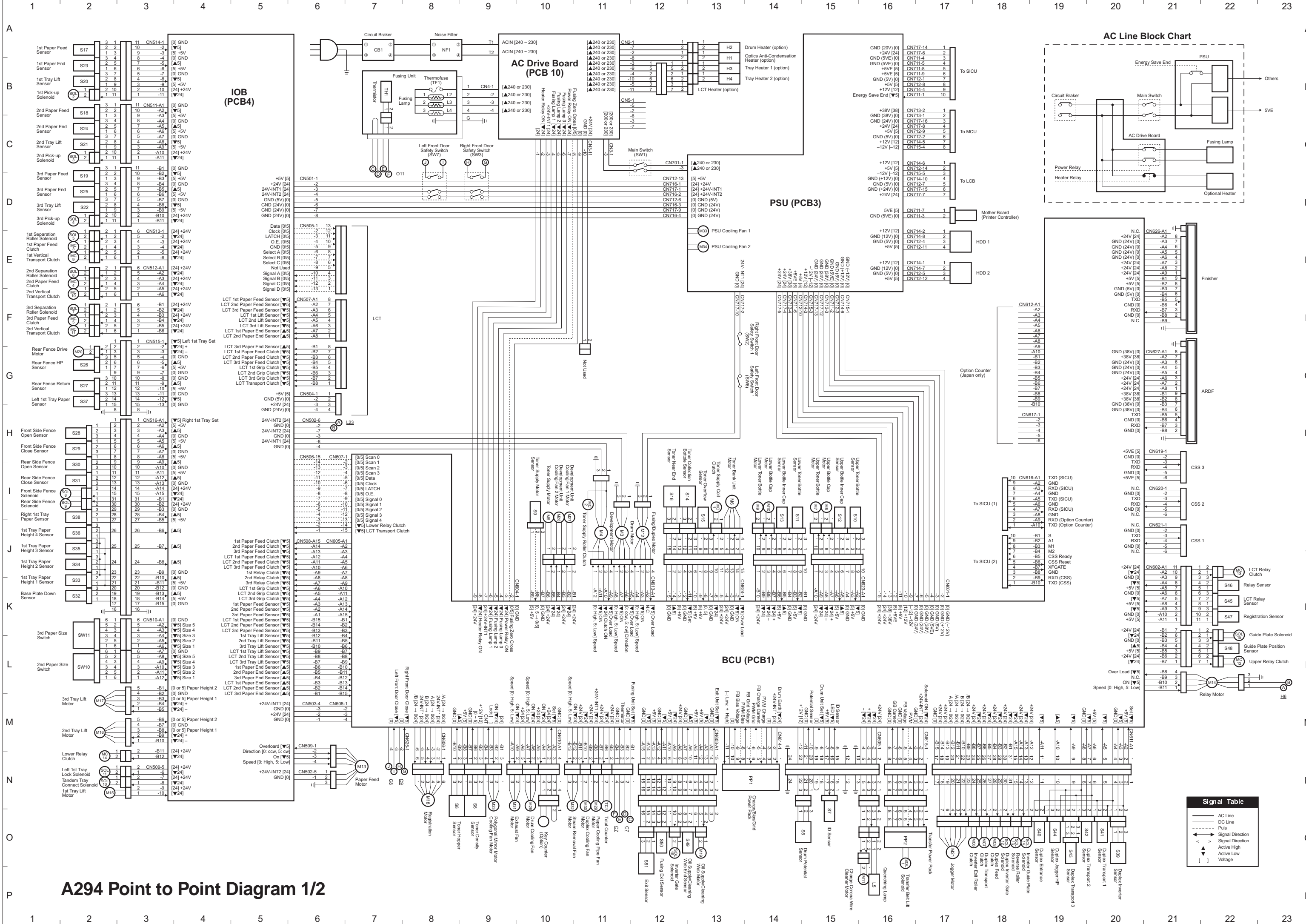
# ELECTRICAL COMPONENT LAYOUT (LCT: B303)

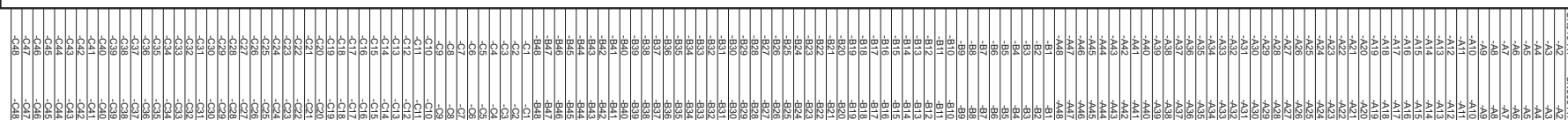
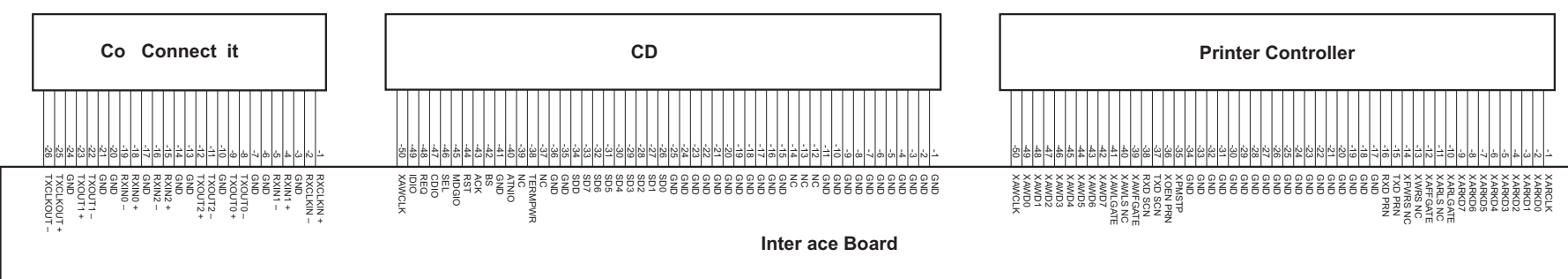
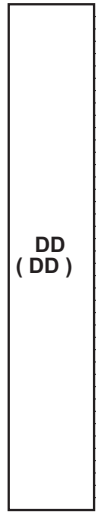
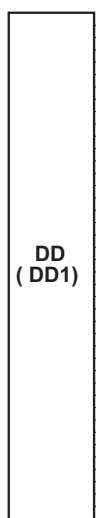


| Symbol         | Index No. | Description        | P to P |
|----------------|-----------|--------------------|--------|
| <b>Motors</b>  |           |                    |        |
| M1             | 18        | LCT                | E2     |
| M2             | 9         | 1st Lift           | F2     |
| M3             | 16        | 2nd Lift           | F2     |
| M4             | 22        | 3rd Lift           | E2     |
| <b>Sensors</b> |           |                    |        |
| S1             | 40        | 1st Paper Feed     | E6     |
| S2             | 35        | 2nd Paper Feed     | F6     |
| S3             | 28        | 3rd Paper Feed     | G6     |
| S4             | 42        | 1st Lift           | F6     |
| S5             | 38        | 2nd Lift           | G6     |
| S6             | 30        | 3rd Lift           | H6     |
| S7             | 41        | 1st End            | F6     |
| S8             | 34        | 2nd End            | G6     |
| S9             | 27        | 3rd End            | H6     |
| S10            | 3         | 1st Paper Height 1 | A6     |
| S11            | 4         | 1st Paper Height 2 | B6     |
| S12            | 5         | 1st Paper Height 3 | B6     |
| S13            | 6         | 1st Paper Height 4 | B6     |
| S14            | 11        | 2nd Paper Height 1 | C6     |
| S15            | 12        | 2nd Paper Height 2 | C6     |
| S16            | 13        | 2nd Paper Height 3 | C6     |
| S17            | 33        | 2nd Paper Height 4 | D6     |
| S18            | 17        | 3rd Paper Height 1 | D6     |
| S19            | 19        | 3rd Paper Height 2 | D6     |
| S20            | 24        | 3rd Paper Height 3 | E6     |
| S21            | 23        | 3rd Paper Height 4 | E6     |

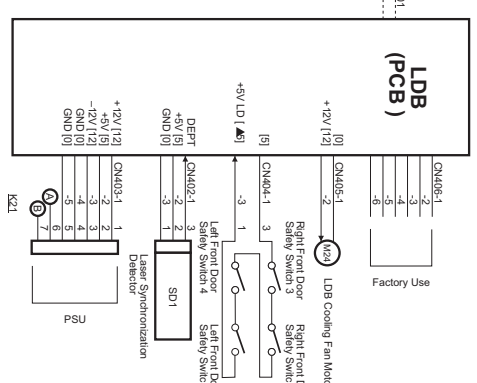
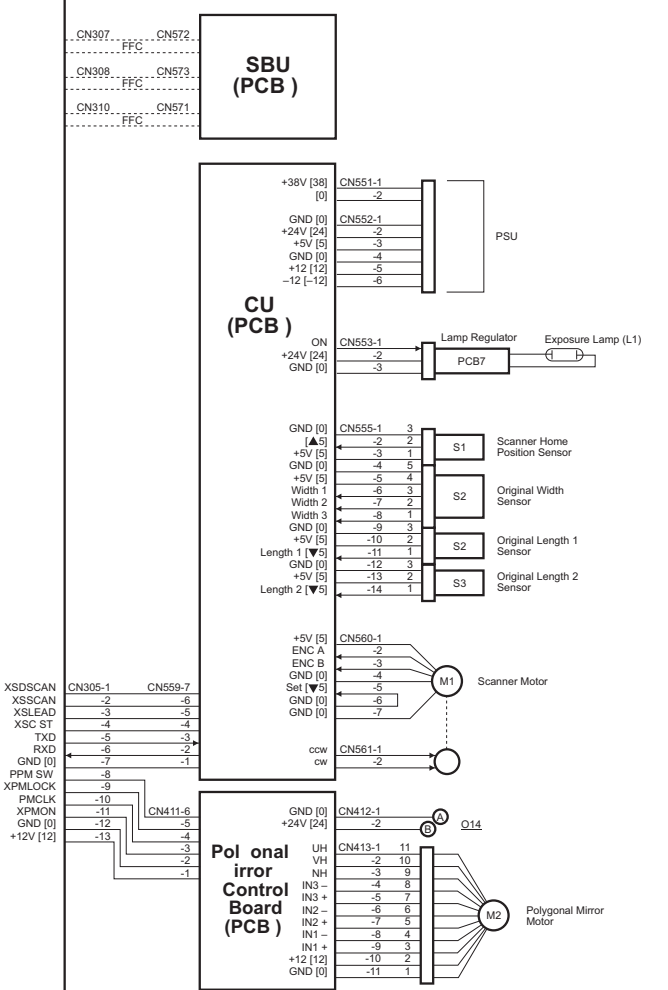
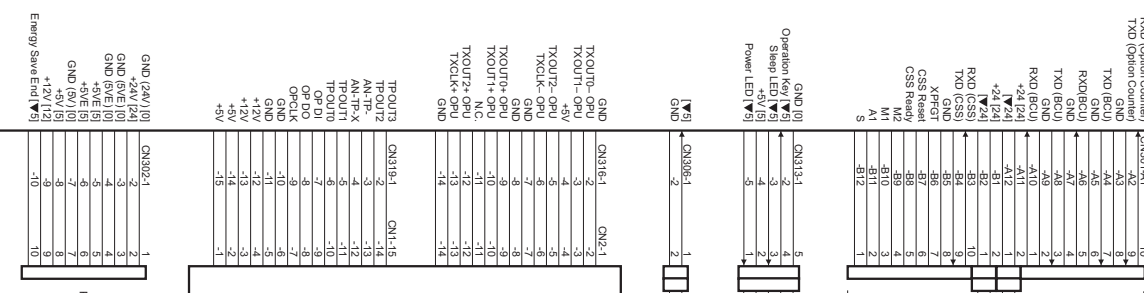
| Symbol                   | Index No. | Description       | P to P |
|--------------------------|-----------|-------------------|--------|
| S22                      | 37        | Relay             | E6     |
| <b>Switches</b>          |           |                   |        |
| SW1                      | 29        | Front Door Safety | J6     |
| SW2                      | 7         | 1st Paper Size    | H6     |
| SW3                      | 14        | 2nd Paper Size    | I6     |
| SW4                      | 21        | 3rd Paper Size    | I6     |
| <b>Magnetic Clutches</b> |           |                   |        |
| MC1                      | 2         | 1st Paper Feed    | G2     |
| MC2                      | 10        | 2nd Paper Feed    | H2     |
| MC3                      | 25        | 3rd Paper Feed    | H2     |
| MC4                      | 1         | 1st Grip          | G2     |
| MC5                      | 8         | 2nd Grip          | H2     |
| MC6                      | 32        | 3rd Grip          | I2     |
| MC7                      | 15        | Transport         | F2     |
| <b>Solenoids</b>         |           |                   |        |
| SOL1                     | 43        | 1st Pick-up       | I2     |
| SOL2                     | 39        | 2nd Pick-up       | I2     |
| SOL3                     | 31        | 3rd Pick-up       | J2     |
| SOL4                     | 44        | 1st Separation    | G2     |
| SOL5                     | 39        | 2nd Separation    | G2     |
| SOL6                     | 31        | 3rd Separation    | H2     |
| <b>PCBs</b>              |           |                   |        |
| PCB1                     | 20        | Main              | J4     |





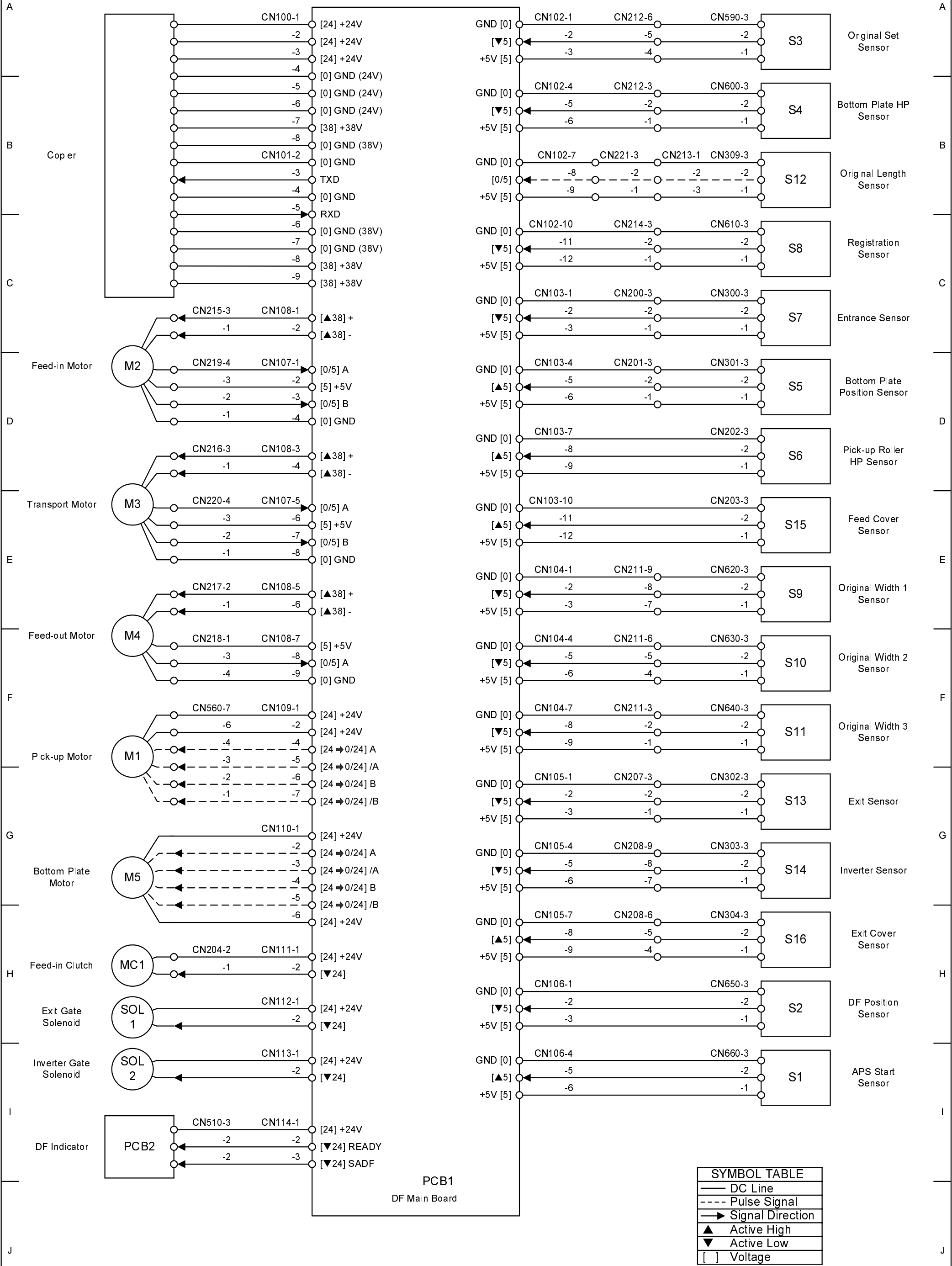


| SICU ↔ SBU      |              | SICU ↔ LDB  |                | SICU ↔ SBU      |                 | SICU ↔ LDB     |                   | SICU ↔ SBU      |              |
|-----------------|--------------|-------------|----------------|-----------------|-----------------|----------------|-------------------|-----------------|--------------|
| SICU            | SBU          | SICU        | LDB            | SICU            | SBU             | SICU           | LDB               | SICU            | SBU          |
| CN307           | CN572        | CN308       | CN573          | CN308           | CN573           | CN309          | CN401             | CN310           | CN571        |
| -1 GND          | -15 GND      | -1 GND      | -26 GND        | -15 GND         | -15 GND         | -1 GND         | -50 GND           | -1 GND          | -15 GND      |
| -2 GND          | -14 GND      | -2 GND      | -27 SCOUT SBU  | -14 SIN         | -2 GND          | -27 XLDON 0    | -24 XLDON 0ch     | -2 GND          | -14 GND      |
| -3 GND          | -13 GND      | -3 GND      | -28 TXCLK+ LDB | -48 RXCLKIN+    | -3 GND          | -28 OFFSETON 0 | -23 OFFSET ON 0ch | -3 GND          | -13 GND      |
| -4 RXIN1+ SBUF  | -12 TXLOUT1+ | -4 GND      | -29 SCLK SBU   | -12 SCLK        | -4 TXCLK- LDB   | -29 XLDON 1    | -22 XLDON 1ch     | -4 RXIN1+ SBUF  | -12 TXFOUT1+ |
| -5 RXIN2+ SBUF  | -11 TXLOUT2+ | -5 +5V      | -30 GND        | -11 GND         | -5 GND          | -30 OFFSETON 1 | -21 OFFSET ON 1ch | -5 RXIN2+ SBUF  | -11 TXFOUT2+ |
| -6 GND          | -10 GND      | -6 +5V      | -31 XRD5 NC    | -10 XRD5 NC     | -6 GND          | -31 XLDON 2    | -20 XLDON 2ch     | -6 GND          | -10 GND      |
| -7 GND          | -9 GND       | -7 +5V      | -32 XSLEAD     | -9 XSLEAD       | -7 TXOUT2+ LDB  | -32 OFFSETON 2 | -19 OFFSET ON 2ch | -7 GND          | -9 GND       |
| -8 RXIN2+ SBUF  | -8 TXLOUT2+  | -8 +5V      | -33 XSSCAN     | -8 XSSCAN       | -8 TXOUT2- LDB  | -33 XLDON 3    | -18 XLDON 3ch     | -8 RXIN2+ SBUF  | -8 TXFOUT2-  |
| -9 RXIN2+ SBUF  | -7 TXLOUT2+  | -9 +5V      | -34 XSDESCAN   | -9 XSDESCAN     | -9 GND          | -34 OFFSETON 3 | -17 OFFSET ON 3ch | -9 RXIN2+ SBUF  | -7 TXFOUT2+  |
| -10 GND         | -6 GND       | -10 +5V     | -35 GND        | -6 GND          | -10 GND         | -35 XRST LDB   | -16 SPOR          | -10 GND         | -6 GND       |
| -11 GND         | -5 GND       | -11 GND     | -36 GND        | -5 GND          | -11 TXOUT1+ LDB | -36 GND        | -15 GND           | -11 GND         | -5 GND       |
| -12 RXCLK- SBUF | -4 TXCLK+    | -12 GND     | -37 RXIN1+     | -12 TXOUT1- LDB | -12 RXIN1+      | -37 XLD5 NC    | -14 XLD5 NC       | -12 RXCLK- SBUF | -4 TXFCLK-   |
| -13 RXCLK+ SBUF | -3 TXCLK+    | -13 GND     | -38 GND        | -13 GND         | -13 GND         | -38 DTOT LDB   | -13 GND           | -13 RXCLK+ SBUF | -3 TXFCLK+   |
| -14 GND         | -2 GND       | -14 GND     | -39 +12V SBU   | -2 +12V         | -14 GND         | -39 LDERR      | -12 LDERR         | -14 GND         | -2 GND       |
| -15 GND         | -1 GND       | -15 +5V     | -40 +12V SBU   | -1 +12V         | -15 GND         | -40 XFAN LDB   | -11 GND           | -15 GND         | -1 GND       |
|                 |              | -16 +5V     | -25 +5V        | -16 GND         | -16 GND         | -41 DROOPEN    | -10 DOOR OPEN     |                 |              |
|                 |              | -17 +5V     | -24 +5V        | -17 HOLD ICS    | -34 ICS HOLD    | -42 GND        | -9 GND            |                 |              |
|                 |              | -18 +5V     | -23 +5V        | -18 GND         | -33 GND         | -43 VDSOI      | -8 SROUT          |                 |              |
|                 |              | -19 +5V     | -22 +5V        | -19 CLK DACICS  | -32 SIR CLK     | -44 GND        | -7 GND            |                 |              |
|                 |              | -20 +5V     | -21 +5V        | -20 GND         | -31 GND         | -45 VDSOI      | -6 SRIN           |                 |              |
|                 |              | -21 GND     | -20 GND        | -21 DO DACICS   | -30 SIR DATA    | -46 GND        | -5 GND            |                 |              |
|                 |              | -22 GND     | -19 GND        | -22 GND         | -29 GND         | -47 XVDCS      | -4 SVCS           |                 |              |
|                 |              | -23 SIN SBU | -18 SIN SBU    | -23 LD DAC      | -28 DAC LOAD    | -48 GND        | -3 GND            |                 |              |
|                 |              | -24 GND     | -17 GND        | -24 PWIR REDUCE | -27 XPWR REDUCE | -49 VDSCLK     | -2 SCLK           |                 |              |
|                 |              | -25 XCS SBU | -16 XCS        | -25 LDOFF       | -26 LDOFFIN     | -50 GND        | -1 GND            |                 |              |

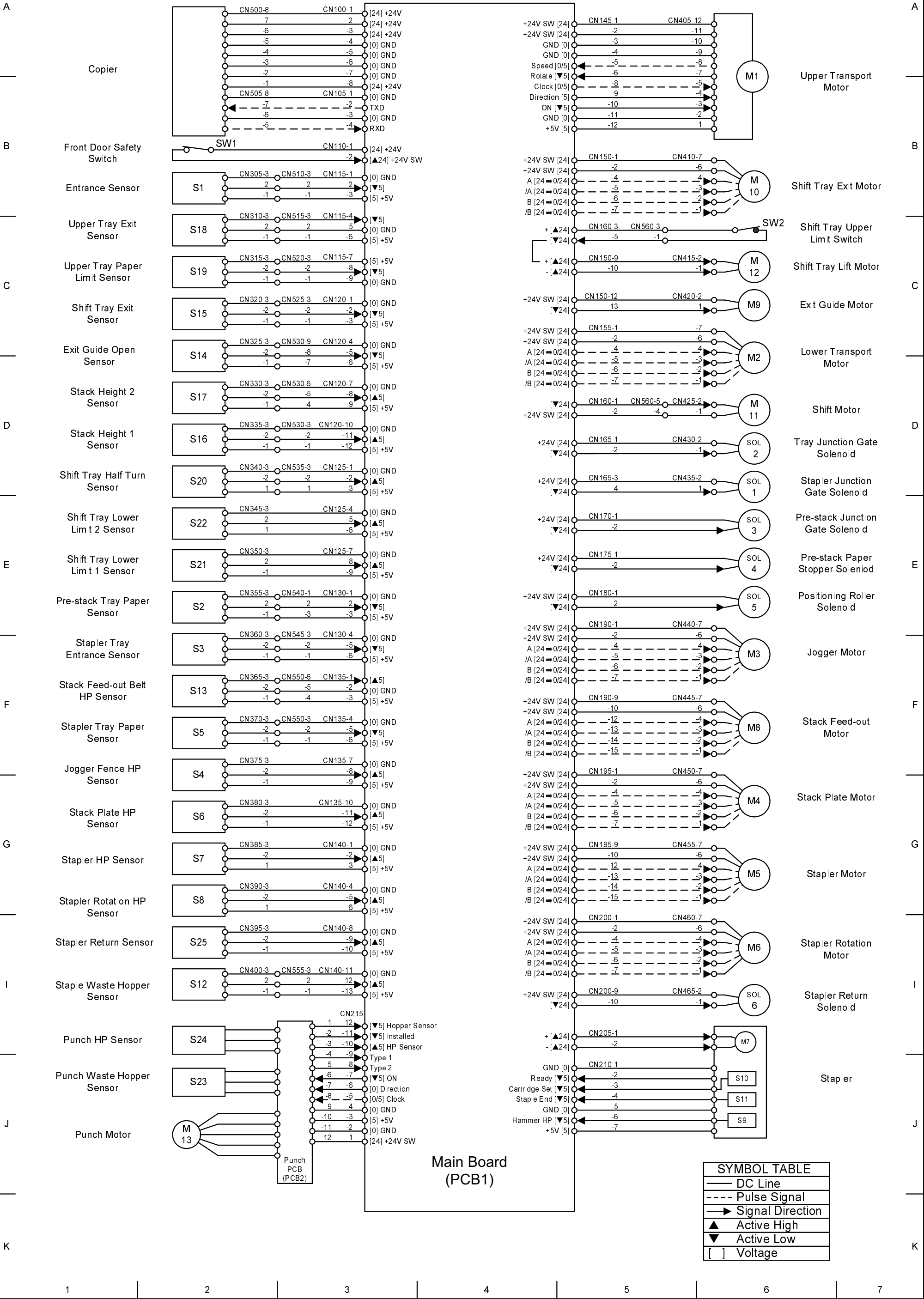


| Signal Table |                  |
|--------------|------------------|
| —            | AC Line          |
| —            | DC Line          |
| —            | Puls             |
| →            | Signal Direction |
| <            | Signal Direction |
| ▲            | Active High      |
| ▼            | Active Low       |
| [ ]          | Voltage          |

POINT TO POINT DIAGRAM (ADF: B301)



POINT TO POINT DIAGRAM (Finisher: B302)



POINT TO POINT DIAGRAM (LCT: B303)

A

A

B

B

C

C

D

D

E

E

F

F

G

G

H

H

I

I

J

J

Copier

Tray Heater  
(Option)

Tray Heater  
(Option)

LCT Motor

3rd Lift Motor

2nd Lift Motor

1st Lift Motor

Transport Clutch

1st Separation Roller  
Solenoid

1st Paper Feed  
Clutch

1st Grip Clutch

2nd Separation  
Roller Solenoid

2nd Paper Feed  
Clutch

2nd Grip Clutch

3rd Separation Roller  
Solenoid

3rd Paper Feed  
Clutch

3rd Grip Clutch

1st Pick-up Roller  
Solenoid

2nd Pick-up Roller  
Solenoid

3rd Pick-up Roller  
Solenoid

| SYMBOL TABLE |                  |     |             |
|--------------|------------------|-----|-------------|
| —            | DC Line          | ▲   | Active High |
| ---          | Pulse Signal     | ▼   | Active Low  |
| →            | Signal Direction | [ ] | Voltage     |

Main Board  
(PCB1)

1st Paper Height 1  
Sensor

1st Paper Height 2  
Sensor

1st Paper Height 3  
Sensor

1st Paper Height 4  
Sensor

2nd Paper Height 1  
Sensor

2nd Paper Height 2  
Sensor

2nd Paper Height 3  
Sensor

2nd Paper Height 4  
Sensor

3rd Paper Height 1  
Sensor

3rd Paper Height 2  
Sensor

3rd Paper Height 3  
Sensor

3rd Paper Height 4  
Sensor

Relay Sensor

1st Paper Feed  
Sensor

1st Paper End  
Sensor

1st Lift Sensor

2nd Paper Feed  
Sensor

2nd Paper End  
Sensor

2nd Lift Sensor

3rd Paper Feed  
Sensor

3rd Paper End  
Sensor

3rd Lift Sensor

1st Paper Size  
Switch

2nd Paper Size  
Switch

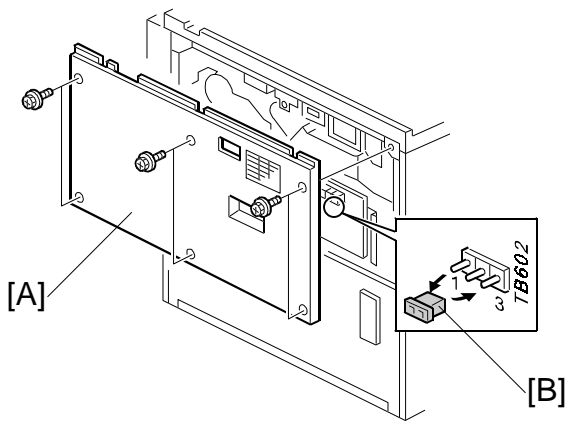
3rd Paper Size  
Switch

Front Door Safety  
Switch

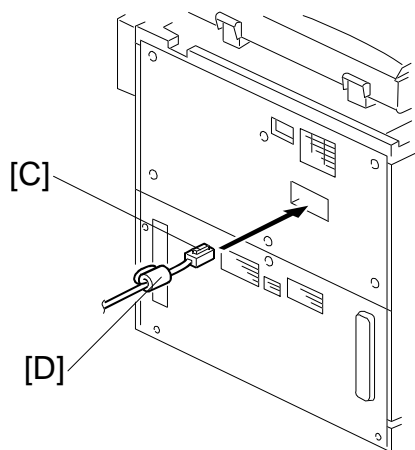
## APPENDIX 1

### 1. RSS (REMOTE SERVICE SYSTEM)

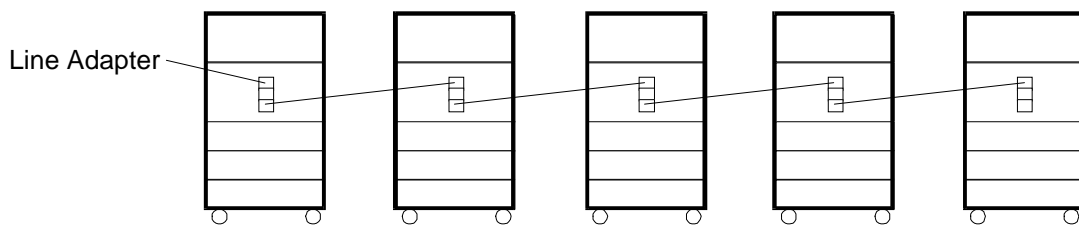
#### 1.1 RSS SET UP



A294X201.WMF



A294X202.WMF



A294X538.WMF

| Machine No.    | 1   | 2   | 3   | 4   | 5   |
|----------------|-----|-----|-----|-----|-----|
| Jumper set     | 2-3 | 2-3 | 2-3 | 2-3 | 1-2 |
| PI device code | 0   | 1   | 2   | 3   | 4   |

#### **⚠ CAUTION**

**Unplug the machine power cord before starting the following procedure.**

**NOTE:** When connecting only one machine to the line adapter, start from step 6.

1. Turn the main switch off and unplug the machine.
2. Remove the ADF connector and remove the rear cover [A] (6 screws).
3. Set the jumper switch [B] on the BCU as shown (default setting is 1-2).
4. Reinstall the rear cover and ADF connector.
5. Set the PI device code with SP5-821 (default 0).

**NOTE:** After changing the value, turn the main power switch off and on to enable the PI device code.

6. Connect the modular cord [C] to the **left** modular connector, as shown.  
**NOTE:** Make sure that the harness end with the ferrite core [D] is connected to the terminal.
7. Install the line adapter (refer to chapter 2-1 L-ADP Installation Procedure in the CSS L-ADP Service Manual).

## 1.2 SP MODE SETTING

After installing the machine and line adapter, perform SP5-816-1 (CSS Function).

Check and set the value of the following SP modes. Ensure they are set correctly.

**NOTE:** SP5-507 is only for the Japanese version. Do not change.

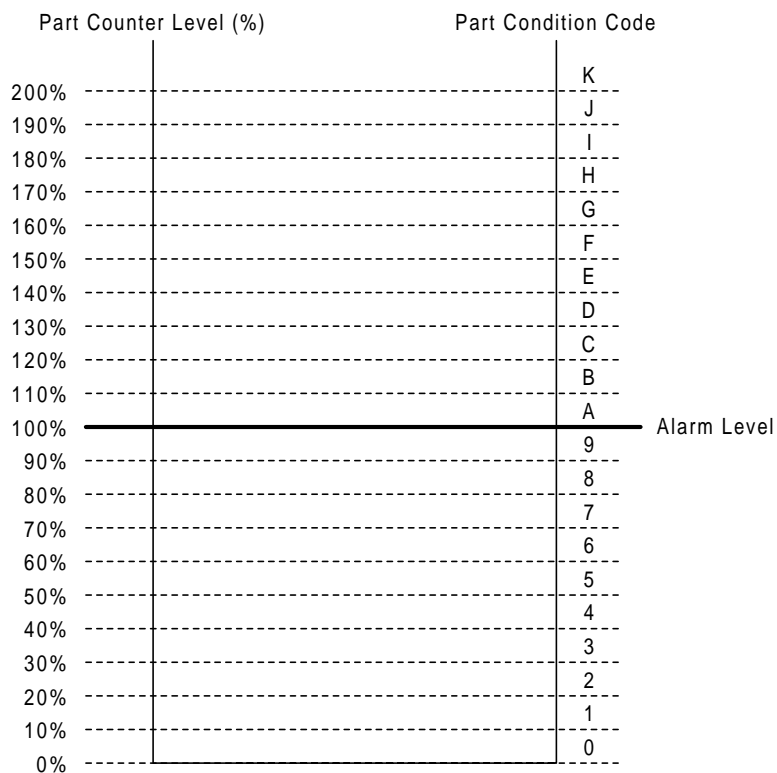
- SP5-504-1 (Jam Alarm Level): 3
- SP5-504-2 (Jam Auto Call): 1 (On)
- SP5-505 (Error Alarm Level): 30
- SP5-513-1 (PM Call Interval – Copy Paper): 300
- SP5-514-1 (PM Call On/Off Setting – Copy Paper): 1 (Yes)
- SP5-590-2 (Cover Open Auto Call): 0 (Off) → 1 (On)

## 1.3 CHECKING ITEMS USING RSS

### 1.3.1 READ ONLY ITEMS

| Item                       | Item                               |
|----------------------------|------------------------------------|
| Paper end                  | Total original jam counter         |
| Toner end                  | Paper jam counter by location      |
| Staple end                 | Original jam counter by location   |
| Toner near-end             | Jam counter by copy size           |
| Door open                  | Jam history                        |
| Jammed paper position      | Number of each SCs                 |
| Unit connection condition  | Total copies by reproduction ratio |
| Machine condition          | Total copies by copy mode          |
| Paper size information     | PM call interval                   |
| System configuration       | Counter level by PM part *Note     |
| Total counter              | Total machine operation time       |
| Original counter           | Fusing temperature                 |
| Copy counter by paper tray | ID sensor data                     |
| Staple counter             | Process control data               |
| Total paper jam counter    | ROM version                        |

**NOTE:** The counter level for each PM part is indicated as a code. The code shows the current value of the parts counter compared with the alarm level for the part. The diagram below shows the relationship between the code and the counter level. A part which is not selected for the PM list ("No" is selected in the All PM Parts List) is shown as "Z".





### 1.3.2 AUTO CALL AND READ ITEMS

| Item                              |
|-----------------------------------|
| Continuously jam auto call        |
| Cover open auto call              |
| Jam condition auto call           |
| Jam alarm                         |
| SC alarm                          |
| SC auto call:                     |
| PM Alarm                          |
| Fusing cleaning web near end call |

### 1.3.3 READ AND WRITE ITEMS

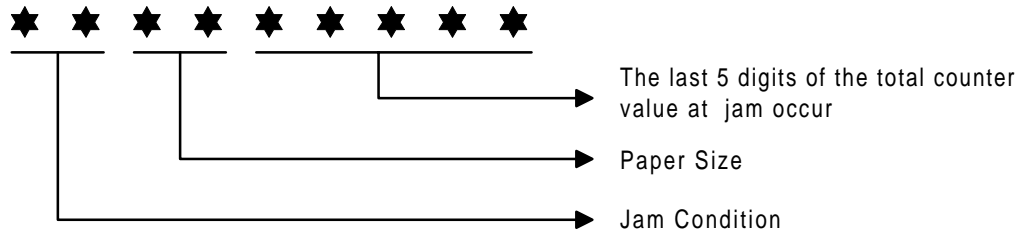
All data for SP modes and UP modes except few modes.

### 1.3.4 EXECUTE ITEMS

| Item                                  | Item                             |
|---------------------------------------|----------------------------------|
| TD sensor initial setting             | Original counter reset           |
| ID sensor initial setting             | Reset counter by each paper tray |
| User code (clear, register, change)   | Reset counter by magnification   |
| SC reset                              | Reset counter by image editing   |
| PM counter reset                      | Reset counter by copy mode       |
| SC/jam counters rest                  | Reset counter by multiple copies |
| Counters reset (except total counter) | Punch counter reset              |
| Copy counter reset                    | Staple counter reset             |

## 1.4 JAM HISTORY

The jam history is read in this way.



AA294X539.WMF

### 1.4.1 JAM CONDITION TABLE

#### *Copier*

| Code | Condition  |
|------|--|
| 01   | Jams at power on   |
| 03   | 1st paper tray: paper non-feed jam   |
| 04   | 2nd paper tray: paper non-feed jam   |
| 05   | 3rd paper tray: paper non-feed jam   |
| 06   | 4th paper tray (LCT): paper non-feed jam                                   |
| 07   | 5th paper tray (LCT): paper non-feed jam                                   |
| 08   | 6th paper tray (LCT): paper non-feed jam                                   |
| 09   | Relay sensor (LCT): paper does not activate the sensor                     |
| 10   | LCT relay sensor: paper does not activate the sensor                       |
| 12   | Relay sensor paper does not activate the sensor                            |
| 13   | Registration sensor: paper does not activate the sensor                    |
| 15   | Fusing exit sensor: paper does not activate the sensor                     |
| 16   | Exit sensor: paper does not activate the sensor                            |
| 19   | Duplex entrance sensor: paper does not activate the sensor                 |
| 20   | Duplex transport sensor 1: paper does not activate the sensor              |
| 21   | Duplex transport sensor 2: paper does not activate the sensor              |
| 22   | Duplex transport sensor 3: paper does not activate the sensor              |
| 23   | Inverter tray paper sensor: paper does not activate the sensor             |
| 25   | Finisher entrance sensor: paper does not activate the sensor               |
| 26   | Finisher upper tray exit sensor: paper does not activate the sensor        |
| 27   | Finisher shift tray exit sensor: paper does not activate the sensor        |
| 28   | Finisher staple tray paper sensor: paper does not activate the sensor      |
| 29   | Finisher stack feed-out belt HP sensor: paper does not activate the sensor |
| 35   | Finisher stapler tray entrance sensor: paper does not activate the sensor  |
| 53   | 1st paper feed sensor does not turn off                                    |
| 54   | 2nd paper feed sensor does not turn off                                    |
| 55   | 3rd paper feed sensor does not turn off                                    |
| 56   | LCT 1st paper feed sensor does not turn off                                |

| Code | Condition                                    |
|------|--|
| 57   | LCT 2nd paper feed sensor does not turn off  |
| 58   | LCT 3rd paper feed sensor does not turn off  |
| 59   | Relay sensor (LCT) does not turn off         |
| 60   | LCT relay sensor does not turn off           |
| 62   | Relay sensor does not turn off               |
| 63   | Registration sensor does not turn off        |
| 65   | Fusing exit sensor does not turn off         |
| 66   | Exit sensor does not turn off                |
| 69   | Duplex entrance sensor does not turn off     |
| 70   | Duplex transport sensor 1 does not turn off  |
| 71   | Duplex transport sensor 2 does not turn off  |
| 72   | Duplex transport sensor 3 does not turn off  |
| 73   | Inverter tray paper sensor does not turn off |

**Document Feeder**

| Code | Condition                 |
|------|---------------------------|
| 01   | Jams at power on          |
| 03   | Jams in the feed-in area  |
| 04   | Jams in the feed-out area |

**1.4.2 PAPER SIZE**

| Code | Paper Size                | Code | Paper Size                  |
|------|---------------------------|------|-----------------------------|
| 05   | A4 sideways               | 86   | A5 lengthwise               |
| 06   | A5 sideways               | 87   | A6 lengthwise               |
| 07   | A6 sideways               | 8D   | B4                          |
| 0E   | B5 sideways               | 8E   | B5 lengthwise               |
| 0F   | B6 sideways               | 8F   | B6 lengthwise               |
| 11   | Return post card sideways | 91   | Return post card lengthwise |
| 12   | Post card sideways        | 92   | Post card lengthwise        |
| 24   | 8.5" x 14" sideways       | A0   | 11" x 17"                   |
| 26   | 8.5" x 11" sideways       | A4   | 8.5" x 14" lengthwise       |
| 2C   | 8.5" x 5.5" sideways      | A6   | 8.5" x 11" lengthwise       |
| 84   | A3                        | AC   | 8.5" x 5.5" lengthwise      |
| 85   | A4 lengthwise             |      |                             |

## **1.5 OTHERS**

### **1.5.1 SC630 [RDS COMMUNICATION ERROR]**

Frequent occurrence of SC630 indicates a problem in the customer's communication line or line adapter. To maintain the communications environment in good working order, it is necessary to contact planned inspections periodically.

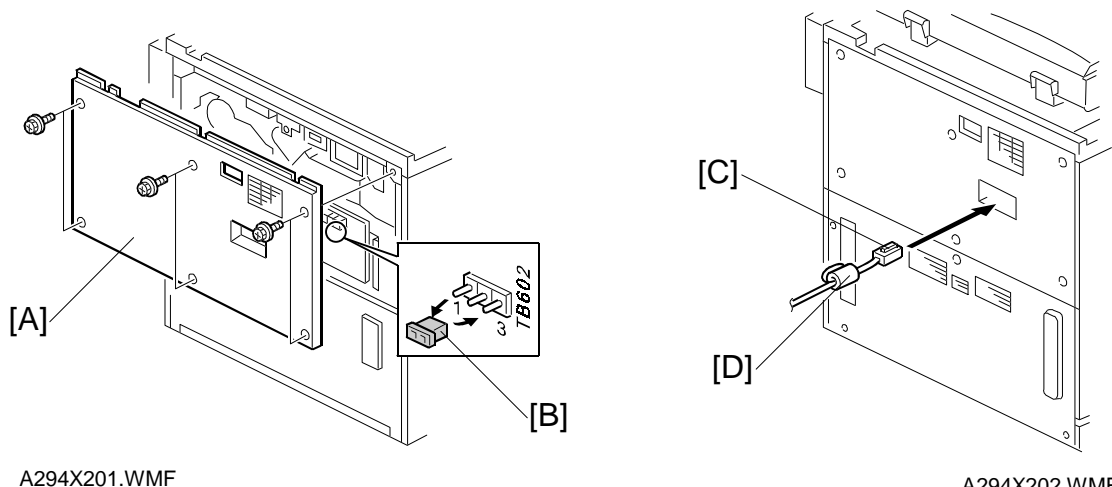
### **1.5.2 PM PROCEDURE OR OTHER MAINTENANCE**

Before beginning PM or other maintenance procedure, SP5-816-2 should be set to "Start". This will disable the RDS function. When maintenance is completed, SP5-816-2 should be set to "Stop". This will re-enable the RDS function.

**NOTE:** The RDS function will remain disabled for four hours. Therefore, if maintenance for longer than four hours is required, SP5-816-2 should be set to "Start" again to disable RDS.

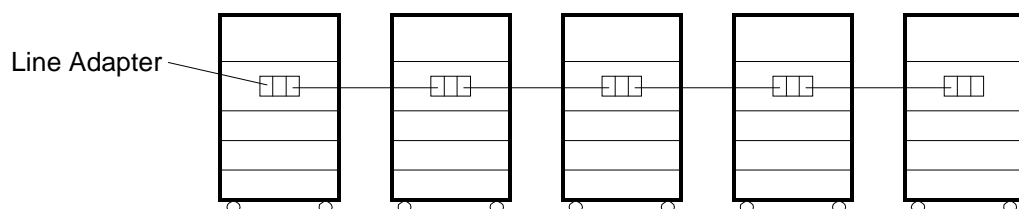
# 1. RSS INSTALLATION PROCEDURE

## 1.1 COPIER SET UP



A294X201.WMF

A294X202.WMF



A294X538.WMF

| Machine No.    | 1   | 2   | 3   | 4   | 5   |
|----------------|-----|-----|-----|-----|-----|
| Jumper set     | 2-3 | 2-3 | 2-3 | 2-3 | 1-2 |
| PI device code | 0   | 1   | 2   | 3   | 4   |

### ⚠ CAUTION

**Unplug the machine power cord before starting the following procedure.**

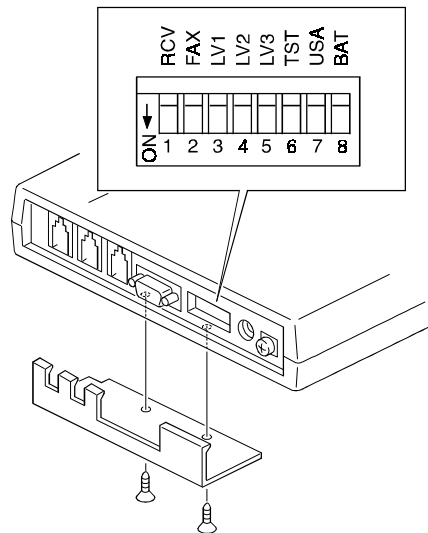
**NOTE:** When connecting only one machine to the line adapter, start from step 6.

1. Turn the main switch off and unplug the machine.
2. Remove the ADF connector and remove the rear cover [A] (6 screws).
3. Set the jumper switch [B] on the BCU as shown (default setting is 1-2).
4. Reinstall the rear cover and ADF connector.
5. Set the PI device code with SP5-821 (default 0).  
**NOTE:** After changing the value, turn the main power switch off and on to enable the PI device code.
6. Connect the modular cord [C] (included with the L-ADP) to the **left** modular connector, as shown.  
**NOTE:** Make sure that the harness end with the ferrite core [D] is connected to the terminal.

## 1.2 L-ADP SET UP

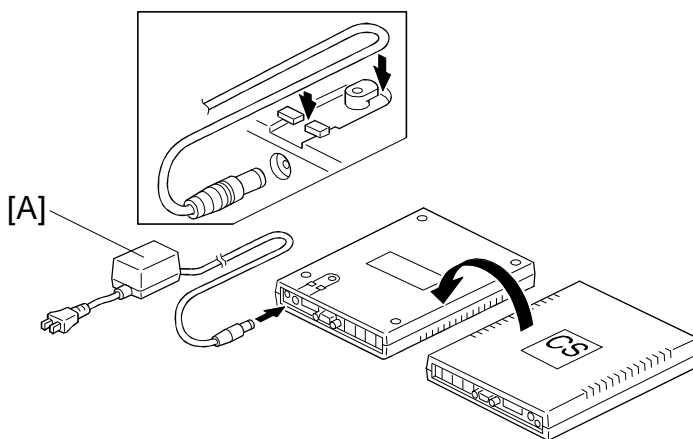
### 1.2.1 L-ADP INITIAL PROGRAMMING

1. Set FAX mode or Tel mode with DIP switch 2.  
If the fax machine is set to auto receive mode, the L-ADP must be set to fax mode (DIP switch 2: on). **(Refer to 1.3 CONNECTION EXAMPLES.)**

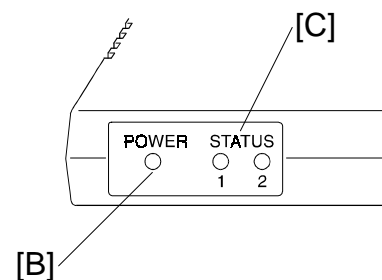


CSS104.WMF

2. Install the AC adapter [A] on the L-ADP and plug it in.  
Confirm that the POWER-LED [B] is blinking green and STATUS LED 1 and 2 [C] are off.



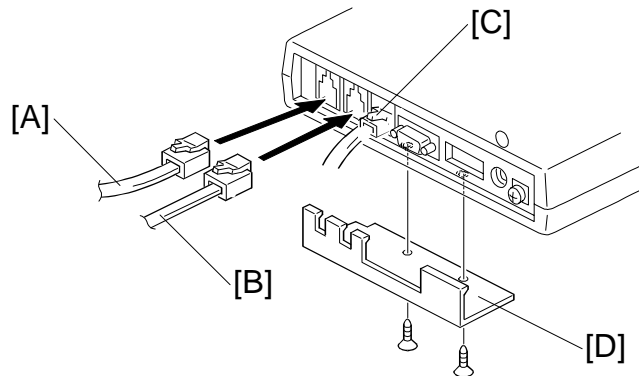
CSS105.WMF



CSS106.WMF

3. To set the back up battery, turn on DIP switch 8.  
Ensure that DIP switch 6 is off.

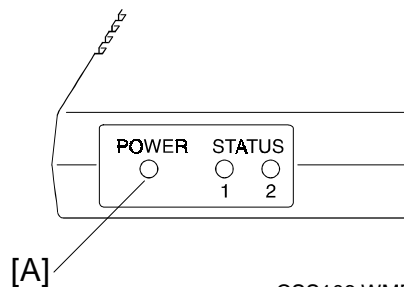
### 1.2.2 CONNECTING L-ADP WITH TELEPHONE OR FAX LINE



CSS131.WMF

1. Unplug the PSTN line connected with the fax or telephone.  
**NOTE:** Make sure that the telephone or fax is not in use.
2. Plug the PSTN line [A] into PSTN/PBX on the L-ADP.
3. Connect the L-ADP and the copier with the modular cord [C] installed in step 6 of "COPIER SET UP".
4. Connect the L-ADP and the fax or telephone with a modular cord [B]. Prepare the cord in advance.
5. Install the protection cover [D].

### 1.2.3 CONNECTION TEST



CSS106.WMF

1. Turn on the copier main switch.
2. Inform the Concorde Center that the installation is completed.
3. Concorde Center will send L-ADP default setting parameters to the L-ADP. Once the L-ADP receives the parameters, the cycle of POWER\_LED [A] blinking rate changes from 0.2 s to 1.0 s.

## 1.3 CONNECTION EXAMPLES

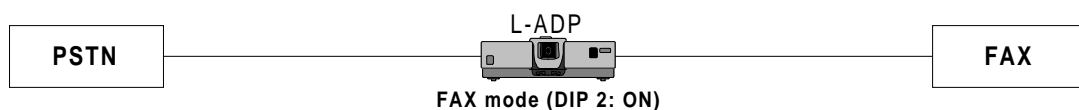
L-ADP has two modes to receive data from Concorde center:

**Fax Mode:** The L-ADP will not receive incoming calls. It will pass them through to the fax/telephone line. Once the line is answered by the fax or telephone, the L-ADP will monitor the signal. If the L-ADP determines that the signal is from the Concorde center, it will intercept the call and begin communications with the Concorde center.

**TEL mode:** The L-ADP will receive all incoming calls. At the time of reception, the L-ADP will determine if the signal is from the Concorde center. If so, the L-ADP will begin communications with the Concorde center. If the incoming calls is not from the Concorde center, the L-ADP will ring the fax/telephone line and pass the signal to that line.

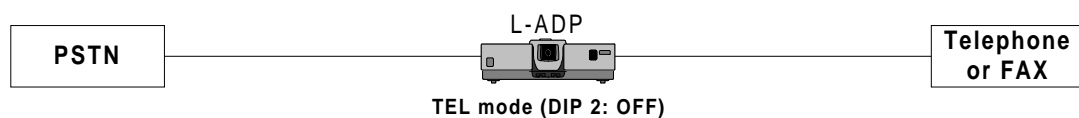
The following is connection examples and L-ADP mode.

### 1. Connecting to a Fax



12.WMF

### 2. Connecting to a Telephone or a Fax in TEL mode

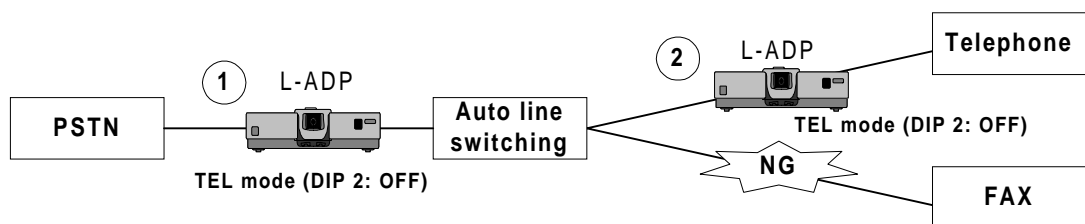


13.WMF

**NOTE:** 1) When a call comes in, the telephone or fax rings once or twice. Then the L-ADP rings a *different tone* for 5-6 seconds while determining where the call comes from.

2) A telephone charge is accrued during determination.

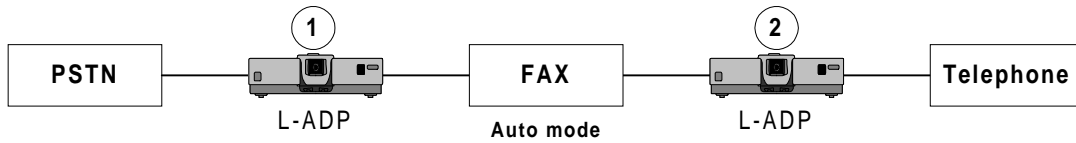
### 3. If auto line switching equipment is used, the L-ADP can be connected at positions 1 or 2.



14.WMF



4. Connecting to a fax in AUTO mode (auto Tel/Fax switching), the L-ADP can be connected at positions 1 or 2.  
Refer to the mode chart for setting Tel/FAX mode.

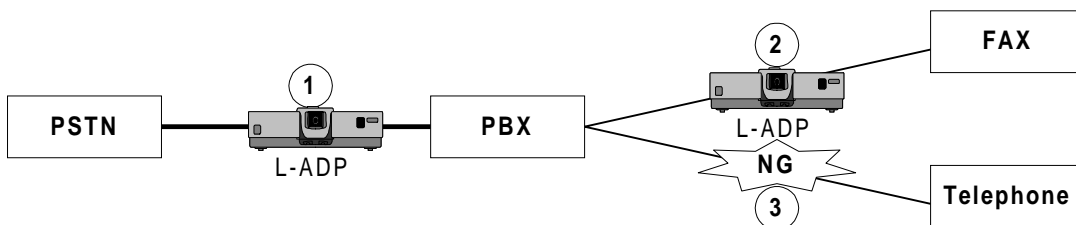


15.WMF

#### Mode chart

| L-ADP position<br>↓ | TEL mode<br>DIP switch 2: OFF   | FAX mode<br>DIP switch 2: ON   |
|---------------------|---|--|
| 1                   | Line switching is done twice, at the L-ADP and FAX. This requires more time until the line is connected to the fax. During this time, the fax may not be able to receive. | An incoming call from the Concorde center will go through to the telephone. Fax operations will be unaffected. |
| 2                   | Line switching is done twice, at the L-ADP and FAX. This requires more time until the line is connected to the telephone. Fax operations will be unaffected.              | N/A  |

5. If a PBX is connected, the L-ADP can be connected at positions 1 or 2.  
Refer to the mode chart for setting TEL/FAX mode.



16.WMF

#### Mode chart

| L-ADP position<br>↓ | TEL mode<br>DIP switch 2 : OFF  | FAX mode<br>DIP switch 2 : ON   |
|---------------------|---|---|
| 1                   | N/A   | The L-ADP must be connected to the fax line.  |
| 2                   | The L-ADP in TEL mode can be installed at point 2.  | The L-ADP can be installed at point 2, when the fax is set to auto mode (auto Tel/Fax switching) or fax mode. |
|                     | <b>NOTE:</b> In case of PBX with the auto TEL/FAX switching feature, the L-ADP can not be installed at point 2. |   |