## Gestetner RПCon 5avin



## A292/A293 <br> A292P/A293P SERVICE MANUAL

(To be used in conjunction with A229 Service Manual)

# Gestetner <br> RICOM <br> 52VII 



RICOH GROUP COMPANIES

# Gestetner RICOM SaVIn 

A292/A293<br>A292P/A293P<br>SERVICE MANUAL

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## LEGEND

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## ©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. Always replace the ozone filters with the specified ones at the specified intervals.
3. 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 system control board 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.

## 1. SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

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.



## COMPARISON BETWEEN A292/A293 AND A229

SECTION 1: OVERALL INFORMATION

| Section | Item | Description | Page |
| :---: | :---: | :---: | :---: |
| Specifications | Copy Size | Minimum: A5/51/2" $\times 81 / 2^{\prime \prime}$ Lengthwise in 2nd Tray | 1-1 |
|  | Zoom | Minimum: 25\% (A229:32\%) | 1-2 |
|  | Copying Speed | 70/55 cpm (A229: 65/55 cpm) | 1-2 |
|  | 1 to 1 Copying Speed with ADF | $\begin{aligned} & 70 \mathrm{cpm} \text { (A229: } 50 \mathrm{cpm}) \\ & \text { ARDF: New A294 } \end{aligned}$ | N/A |
|  | Resolution | Scanning: 600 dpi (A229: 400 dpi$)$ <br> Printing: 600 dpi (A229: 400 dpi ) | 1-2 |
|  | First Copy Time | Face Up: 3.5 seconds, Face Down: 5.3 seconds (A229: Face Up: 3.7 seconds, Face Down: 5.5 seconds) | 1-2 |
|  | Copy Paper Capacity | Tray 1: 3,100 sheets (A229: 1,000 sheets) Tray 3: 550 sheets (A229: 1,500 sheets) | 1-2 |
|  | Memory Capacity | $\begin{array}{\|l} \hline \text { RAM: } 48 \mathrm{MB}(\text { A229: } 12 \mathrm{MB}) \\ \text { HDD: } 4.3 \mathrm{~GB} \text { (A229: } 1.7 \mathrm{~GB}) \\ \hline \end{array}$ | N/A |
|  | Power Consumption | (Refer to service manual) | 1-3 |
|  | Additional Feature | Document Server function is available as a standard function. | N/A |
|  | Additional Feature | User Stamp, etc. | N/A |
|  | Peripherals | Finisher (B312): Pre-stack function <br> Finisher (A763): <br> Folds paper in half with 2 staples <br> Finisher (B302): <br> Pre-stack function, 100 sheets for staple <br> Punch Unit (for B312 B302, A812): <br> 2 holes ( $80 \mathrm{~mm} / 6.5 \mathrm{~mm}$ ) (Same as A229) <br> 3 holes ( $108-108 \mathrm{~mm} / 8 \mathrm{~mm}$ ) (Same as A229) <br> 4 holes ( $21-70-21 \mathrm{~mm} / 6.5 \mathrm{~mm}$ ) (New) <br> 4 holes ( $80-80-80 \mathrm{~mm} / 6.5 \mathrm{~mm}$ ) (New) <br> 2 holes ( $70 \mathrm{~mm} / 8 \mathrm{~mm}$ ) (New) <br> LCT (A698): Upgraded version <br> Copy Connector Unit (B322) <br> Output Tray (B333) <br> Tab Sheet Holder (B373) <br> 81/2" x 14" Size Kit (B375) | 1-4 |
|  | Consumable | ```New Toner (NA: Type 5105D, EU/Asia: Type 5205D) New Developer (Type 15) Toner Particle: 9.5 \mum (A229: 7.5 \mum``` | 2-49 |

DIFFERENT POINTS

SECTION 2: DETAILED DESCRIPTIONS

| Section | Item | Description | Page |
| :---: | :---: | :---: | :---: |
| Scanning | Overview | - The number of exposure lamp is one. (A229: 2 lamps) <br> - The CCD is changed to 4-channel type because of a higher processing speed. (A229: 2 channels) <br> - A reflector is added to 1 st scanner. <br> - The Scanner Motor has been changed to a DC Servo type because of a higher processing speed. <br> - The location of Lamp Regulator moves onto the 1st scanner. | 2-13 |
| Laser Exposure | Overview | - The LD unit and Polygon Motor have been changed because of a higher processing speed. <br> - The method controlling the LD has been changed because the standard resolution has been changed from 400 dpi to 600 dpi . | N/A |
| Process Control | Image Density Control | The toner amount in the development unit is updated using Vsp/Vsg data in addition to the Vref update. | 2-36 |
| Drum Unit | Drum Flange | The holes for airflow have been added to Drum Flange to make cooling power up because of higher processing speed. | 2-47 |
| Drum Unit | Rotation Speed | $362 \mathrm{~mm} / \mathrm{s}$ (A229: $330 \mathrm{~mm} / \mathrm{s}$ ) This is because a higher copying speed. | N/A |
|  | Corona Wire Cleaner | One of the conditions making the cleaner start moving "only if the fusing temperature is lower than $100^{\circ}{ }^{\circ}$ " has not been used any more because the other condition "only when 5000 or more copies have been made since the last movement" is effective enough to function. | 2-43 |
| Cleaning | Cleaning Brush | - The turning direction of the brush has been changed to the counter direction to increase the cleaning ability. <br> - The brush has been changed from a rope type to a straight type. A rope type scrapes off the drum surface too much because of the change of the turning direction. | 2-44 |
|  | Cleaning Blade Side-to-Side Movement | The location of the cam gear is changed onto the main frame to increase reliability. | 2-46 |
| Development | Toner Supply Control | TBA | N/A |
|  | ID Sensor Pattern | The pattern has become darker to increase reliability of toner supply control. | N/A |
|  | Lower <br> Development <br> Roller | The shaft of the roller does not turn. It is not necessary to lubricate conductive grease on the shaft. | N/A |


| Section | Item | Description | Page |
| :---: | :---: | :---: | :---: |
| Transfer | Transfer Belt | The surface treatment has been changed to increase cleaning ability. | N/A |
|  | Cleaning Bias Roller | The nylon tube has been added as the surface of the cleaning bias roller to increase the cleaning ability. <br> This allows to increasing the maximum charging voltage up to 1000 V (A229: 330 V ). | N/A |
|  | Bushing | A bearing has been added to the bushing to make the movement smoother. | N/A |
|  | Gear | The gear has been changed to a diagonal type with the color of black to decrease a jitter level. | 2-58 |
|  | Transfer Current | $\begin{array}{ll}\text { 1st Copy (Front): } & 65 \mu \mathrm{~A}(\mathrm{~A} 229: 60 \mu \mathrm{~A}) \\ \text { 2nd Copy (Front): } & 65 \mu \mathrm{~A}(\mathrm{~A} 229: 60 \mu \mathrm{~A}) \\ \text { By-pass Tray (Front): } & 75 \mu \mathrm{~A}(\mathrm{~A} 229: 70 \mu \mathrm{~A}) \\ \text { Post Card (Front): } & 165 \mu \mathrm{~A}(\mathrm{~A} 229: 150 \mu \mathrm{~A}) \\ \text { This is because of a higher drum rotation speed. }\end{array}$ | $\begin{gathered} \hline \text { SP } \\ 2-301 \end{gathered}$ |
| Paper Feed | Torque Limitter | The type of the Torque Limitter has been changed from a non-contact magnet type to a metal powder type to increase reliability. | N/A |
|  | Paper size setting in 2nd tray | The paper size setting can be done at the front side of the tray for easier operation. | 2-72 |
|  | By-pass Tray Switch | The By-pass Tray Switch has been deleted. The bypass tray indicator is always on the operation panel and turns on when paper is placed in the tray. | N/A |
|  | Paper Feed Mode | The thick paper mode is used for any paper type in all paper feed stations to increase paper transportation ability. | N/A |
| Toner Recycling | Condition of "Full Toner Collection Bottle" | The number of copies, which can be made after the toner overflow switch is activated and the "full toner collection bottle" indication lights, becomes only "up to 100 copies". The other one "the copy job is allowed to end" is not effective any more. | N/A |
| Fusing | Inner Cover | The grip and the jam removal decal have been changed. <br> The procedure of jammed paper removal has also been changed. | N/A |
|  | Fusing Sensor | The Fusing Sensor has been added to detect a jammed paper with an accordion shape. | 2-73 |
| Paper Exit/Duplex | Inverter Exit Clutch | The Inverter Exit Clutch has been added to stop a paper coming into the duplex unit for a while. <br> This is to keep the maximum productivity of printing even when it takes a longer time for image processing for a paper coming out of the duplex unit. <br> When the clutch is ON, paper stops. | N/A |
|  | Duplex Inverter Sensor | The Inverter Exit Sensor has been added to control the ON/OFF timing of the Inverter Exit Clutch. | 2-79 |
|  | Jogger Start Timing | The Jogger Fences start moving 83 ms after the trailing edge of paper passes the Duplex Entrance Sensor. (A229: 100 ms ) | N/A |
| Ozone Filter |  | An inlet is added to change the airflow direction of the exhaust fan to downward. This is to increase the cooling ability and decrease the ozone smell level. The shape of the rear cover has been changed. | N/A |


| Section | Item | Description | Page |
| :---: | :---: | :---: | :---: |
| Electrical Components | BICU Board | - Scanner control circuit has been independent from SBICU as MCU (Motor Control Unit) and Scanner Motor Drive Board is deleted. The name of SBICU is changed to BICU. This is because the Scanner Motor has been changed from a stepper motor to a servomotor to enable the copying speed in the ADF 1 to 1 mode to be 70 cpm . <br> - The exposure lamp, APS sensor and scanner HP sensor are also connected to the MCU. | N/A |
|  | 1/O Board | The RDS function has been independent from the I/O board as RDS Board and has been controlled by the BICU board because of the following reasons: <br> 1. The $I / O$ board can completely turn off in the weekly timer off mode. <br> 2. It has been possible that only the RDS board is replaced. | N/A |
|  | PSU | A 38 V output has been added for the scanner motor that is changed from a stepper motor to a servomotor. | N/A |
|  | CNB (Connector Board) | This is a new name of the Interface Board which the functions for the registration motor, by-pass motor and development motor are deleted from. <br> Those functions are on the DRB (Driver Board) as a new board. <br> This is to reduce the harnesses used. | N/A |
|  | 12V Power Supply Board | The DC/DC converter has been deleted and its function has moved to the PSU. | N/A |
|  | DRB <br> (Driver Board) | This is an interface board for the signal lines of the registration motor, by-pass motor and development motor. <br> The power line for each motor is connected to the CNB. | N/A |
|  | Copy Connect Board | The connection between the BICU and Copy Connect Board has been changed from via the FCC cable to via the interface board. <br> This is to make installation easier. | N/A |
|  | Printer Controller | The connection between the BICU and Printer Controller has been changed from only via the FCC cable to via the interface board and the FCC cable. <br> This is to make installation easier. | N/A |

SECTION 3: INSTALLATION

| Section | Item | Description | Page |
| :---: | :---: | :---: | :---: |
| Installation Procedure | Finisher (B302, B312) | - The caps on the upper left cover of the copier have not been equipped, so that it is not necessary to remove them when a finisher is installed. <br> - New type of grounding bracket. | $\begin{aligned} & 3-22 \\ & 3-29 \end{aligned}$ |
| Installation Procedure | Output Tray | - A cavity has been made in each Paper Exit Roller and a plug is prepared beside each roller on the shaft. The plugs are necessary to be inserted into the cavities. <br> - The caps on the upper left cover have become accessories of the Output Tray and are necessary to be installed. <br> - The stack height sensors at the paper exit area have become accessories of the Output Tray and are necessary to be installed. |  |

SECTION 4.2.2.: SERVICE PROGRAM MODE TABLE

| Mode No. | Mode | Description | Page |
| :---: | :---: | :---: | :---: |
| 1-901 | CPM change for thick paper | The setting range is changed from 0 to 2 to 0 to 3 as follows: <br> 0 : None <br> 1: 55 cpm at $165^{\circ} \mathrm{C}(\mathrm{A} 229: 50 \mathrm{cpm})$ <br> 2: 45 cpm at $165^{\circ} \mathrm{C}(\mathrm{A} 229: 45 \mathrm{cpm})$ <br> 3: 35 cpm (newly added) | 4-12 |
| 2-001-3 | Charge Corona Bias Adjustment | Factory setting: $-1300 \mu \mathrm{~A}$ (A229: $-1200 \mu \mathrm{~A}$ ) This is because the copy speed is increased. | 4-12 |
| 2-201-2 | ID Sensor Pattern | Factory setting: -400 V (A229: -440 V ) | 4-14 |
| 2-201-3 | OHP Sheet | Factory setting: -300 V (A229: -550 V) | 4-15 |
| 2-201-4 | Development Performance | Factory setting: -280 V (A229: -320 V ) | 4-15 |
| 2-210 | ID Sensor Interval | Factory setting: 10 copies (A229: 50 copies) | 4-15 |
| 2-220 | Vref Manual Setting | Factory setting: 3.0 V or 2.5 V (A229:2.5 V) | 4-15 |
| 2-301-1 | Transfer Current Adjustment | Factory setting: $65 \mu \mathrm{~A}$ (A229: $60 \mu \mathrm{~A}$ ) <br> This is because the copy speed is increased. | 4-16 |
| 2-301-2 | Transfer Current Adjustment | Factory setting: $65 \mu \mathrm{~A}$ (A229: $60 \mu \mathrm{~A}$ ) <br> This is because the copy speed is increased. | 4-16 |
| 2-301-3 | Transfer Current Adjustment | Factory setting: $75 \mu \mathrm{~A}$ (A229: $70 \mu \mathrm{~A}$ ) <br> This is because the copy speed is increased. | 4-16 |
| 2-301-4 | Transfer Current Adjustment | Factory setting: $165 \mu \mathrm{~A}$ (A229: $150 \mu \mathrm{~A}$ ) <br> This is because the copy speed is increased. | 4-16 |
| 2-301-6 | Transfer Current Adjustment | This function is new. | 4-16 |
| 2-801 | TD Sensor Initial Setting | This function can also be performed in the Wait condition. | 4-17 |
| $\begin{array}{\|l\|} \hline 2-902-4 \\ 2-902-5 \\ \hline \end{array}$ | Printing Test Pattern | These functions are new. | 4-17 |
| 2-906-2 | Vcont Manual Setting | This function is new. | 4-18 |
| 2-962 | Auto Process Control | This function can also be performed in the Wait condition. | 4-19 |
| 2-963 | Toner Supply From Toner Bottle | This function can also be performed in the Wait condition. | 4-19 |
| 2-966 | Periodical Auto Process Control | This function is new. | 4-20 |
| 2-967 | Auto Image Density Adjustment | This function is new. | 4-20 |
| 2-970 | Transfer Belt Resistance Value Display | This function is new. | 4-20 |
| 2-971 | Output Value Measured Between Copies | This function is new. | 4-20 |
| 3-001-2 | ID Sensor PWM Setting | This function can also be performed in the Wait condition. | 4-20 |
| 3-902-7 | Process Control Data Display | This function is new. | 4-21 |
| 4-015 | Scanner Speed Adjustment | This function is new. | 4-22 |
| 4-902 | SBU Setting | All the functions in SP4-901-X are shifted to SP4-902-X. | $\begin{gathered} 4-23 \\ \text { to } 4-27 \end{gathered}$ |


| $\begin{array}{c}\text { Mode } \\ \text { No. }\end{array}$ | Mode | Description | Page |
| :--- | :--- | :--- | :---: |
| $5-824$ | Upload NVRAM Data | This function is new. | $4-50$ |
| $5-825$ | Download NVRAM Data | This function is new. | $4-50$ |
| $5-826$ | Program Upload | This function is new. | $4-50$ |
| $5-829$ | Stamp Data Download | This function is new. | $4-50$ |
| $5-921$ | Stamp Data Download | This function is new. | $4-51$ |
| $5-922$ | $\begin{array}{l}\text { Counter Operation } \\ \text { Setting }\end{array}$ | This function is new. | $4-51$ |
| $5-923$ | Edge Erase Standard | This function is new. | $4-51$ |
| $5-954$ | $\begin{array}{l}\text { Copy Server password } \\ \text { Display }\end{array}$ | (A229: SP5-940) | $4-51$ |
| $5-965$ | $\begin{array}{l}\text { All Copy Server File } \\ \text { Delete }\end{array}$ | This function is new. | $4-51$ |
| $6-116$ | Thick Paper Count | This function is new. | $4-53$ |
| $6-801$ | Copy Connect I/F Test | This function is new. | $4-53$ |
| $6-901$ | $\begin{array}{l}\text { Original Exchange Time } \\ \text { Adjustment }\end{array}$ | This function is new. | $4-53$ |
| $6-902$ | $\begin{array}{l}\text { Saddle Stitch } \\ \text { Adjustment }\end{array}$ | This function is new. | $4-53$ |
| $7-304-24$ | $\begin{array}{l}\text { Total Copies By Copy } \\ 7-304-25 \\ \text { Mode } \\ 7-304-26\end{array}$ | These functions are new. | $4-56$ |
| $7-330$ | Connect Copy Job | This function is new. | $4-58$ |
| $7-331$ | Connect Copy: Copy | This function is new. | $4-58$ |
| $7-332$ | $\begin{array}{l}\text { Connect Copy: Copy } \\ \text { Number by Copy Mode } \\ 7-333\end{array}$ | These functions are new. | $4-58$ |
| $7-504-35$ |  |  |  |
| to | $\begin{array}{l}\text { Copy Jam Counter by } \\ 7-504-40\end{array}$ | These functions are new. | $4-61$ |
| $7-808$ | Counters Reset | $\begin{array}{l}\text { The counters which are reset: SP7-003, SP7- } \\ 006, ~ S P 7-206 ~ a n d ~ S P 7-101-132 ~(A 229: ~ S P 7-~\end{array}$ |  |
| 003, SP7-006 and UP1-19-2) |  |  |  |$)$

## DIFFERENT POINTS

SECTION 4.2.4: INPUT CHECK

| Class 3 no. | Bit no. | Description | Reading |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | 0 | 1 |
| 9(Motor Lock/Transport) | 7 | Drum Motor Lock | Overload | Normal |
|  | 6 | By-pass Feed Motor Lock | Overload | Normal |
|  | 5 | Development Motor Lock | Overload | Normal |
|  | 4 | Fusing Motor Lock | Overload | Normal |
|  | 3 | LD Unit Home position Sensor | Detected | Not detected |
|  | 2 | Fusing Sensor | Paper detected | No paper |
|  | 1 | Exit Sensor | Paper detected | No paper |
|  | 0 | Tray Paper Limit Sensor | Not full | Full |
| $\begin{gathered} 12 \\ \text { (LCT2) } \end{gathered}$ | 7 | Fusing Cooling Fan Motor Lock | Overload | Normal |
|  | 6 | Not Used |  |  |
|  | 5 | Front Door Safety Switch | Closed | Open |
|  | 4 | Not Used |  |  |
| 13(By-pass) | 7 | LCT Paper Position Sensor | Detected | Not detected |
|  | 6 | Toner End Sensor | Toner End | Not toner end |
|  | 5 | Not Used |  |  |
|  | 4 | Relay Sensor | Paper detected | No paper |
|  | 3 | By-pass Paper End Sensor | Not paper end | Paper end |
|  | 2 | Registration Sensor | Paper detected | No paper |
|  | 1 | Not Used |  |  |
|  | 0 | Not Used |  |  |
| $14$ <br> (Unit Set) | 7 | Inverter Exit Sensor | Detected | Not detected |
|  | 6 | Not used |  |  |
|  | 5 | Key Counter Set | Set | Not set |
|  | 4 | Total Counter Set | Set | Not set |
|  | 3 | Polygon Motor Cooling Fan Lock | No lock | Lock |
|  | 2 | Toner Recycling Sensor | Pulse | Pulse |
|  | 1 | Drum Unit Set | Set | Not set |
|  | 0 | Fusing Unit Set | Set | Not set |

SECTION 4.2.5: OUTPUT CHECK

| No. | Description | No. | Description |
| :---: | :---: | :---: | :---: |
| 47 | Inverter Exit Clutch | 71 |  |
| 72 |  | 73 |  |
| 74 |  | 77 |  |
| 78 |  | 79 |  |

SECTION 5.1: PM TABLE

|  | EM | $\begin{gathered} \hline 150 \\ K \end{gathered}$ | $\begin{gathered} \hline 300 \\ K \end{gathered}$ | $\begin{gathered} \hline 450 \\ K \end{gathered}$ | Expected Life | NOTE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SCANNER/OPTICS |  |  |  |  |  |  |
| 1st, 2nd, 3rd Mirror |  | C | C | C |  | Optics cloth |
| Reflectors |  | C | C | C |  | Optics cloth (Newly added) |
| White Reference Plate |  | 1 | 1 | 1 |  | Water (Newly added) |
| Scanner Guide Rails |  | C | C | C |  | Dry cloth |
| Exposure Glass | C | C | C | C |  | Dry cloth or alcohol |
| Toner Shield Glass |  | C | C | C |  | Optics cloth |
| Optics Dust Filter |  | 1 | R | I |  | Blower brush |
| AROUND THE DRUM |  |  |  |  |  |  |
| Charge Corona Wire |  | C | C | c | 300K | Dry Cloth <br> A229: 150K-Replacement |
| Charge Corona Casing |  | C | C | C |  | Damp cloth |
| Corona Wire Cleaner |  | c | c | C | 300K | A229: 150K-Cleaning |
| Drum Potential Sensor |  | C | C | C |  | Blower brush |
| Charge Corona Grid |  | C | C | C | 300K | Blower brush <br> A229: 150K-Cleaning |
| ID Sensor |  | C | C | C |  | Blower brush; initialize with SP3-001-2 after cleaning. |
| Quenching Lamp |  | C | C | C |  | Dry cloth |
| Pick-off Pawls |  | C | C | C |  | Dry cloth <br> Replace if necessary. |
| Cleaning Blade |  |  |  |  | 300K | A229: 150K-Replacement |
| Cleaning Brush |  |  |  |  | 300K | A229: 300K-Replacement |
| Cleaning Brush Seal |  |  | C |  |  | Dry cloth |
| Cleaning Side Seals |  | 1 | 1 | 1 |  | Dry cloth |
| Cleaning Entrance Seal |  | C | C | C |  | Dry cloth <br> Replace if necessary |
| DEVELOPMENT UNIT <br> "Development Roller Shaft (Lower)" is deleted. (A229: 150K-Lubricate) |  |  |  |  |  |  |
| Developer |  |  | R |  |  |  |
| Side Seals |  | 1 | I | 1 |  | Dry cloth or blower brush |
| Development Filter |  | R | R | R |  |  |
| Entrance Seal |  | C | C | C |  | Dry cloth or blower brush |
| Air Filter - Large/ Small |  | R | R | R |  |  |
| Drive Gears |  | C | C | C |  | Blower brush |
| Toner Bottle Holder |  | C | C | C |  | Dry cloth or vacuum cleaner |
| Toner Hopper Entrance |  | C | C | C |  | Dry cloth |
| Development Roller Shaft |  | C | C | C |  | Dry cloth or blower brush |


|  | EM | $\begin{gathered} \hline 150 \\ K \end{gathered}$ | $\begin{gathered} \hline 300 \\ K \end{gathered}$ | $\begin{gathered} \hline \hline 450 \\ K \end{gathered}$ | Expected Life | NOTE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| PAPER FEED |  |  |  |  |  |  |
| Registration Rollers |  | C | C | C |  | Water or alcohol |
| Relay Rollers |  | C | C | C |  | Water or alcohol |
| Paper Dust Remover |  | C | C | C |  | Dry cloth |
| Registration Sensor |  | C | C | C |  | Blower brush |
| Relay Sensor |  | C | C | C |  | Blower brush |
| Paper Feed Rollers |  | C | C | C | 300K | Replace pick-up, feed and separation roller as a set. Check the counter value for each paper tray station (SP7-204). If the value has reached 300K, replace the rollers. After replacing the rollers, reset the counter (SP7-816). <br> A229: 150K-Replacement |
| Paper Feed Guide Plate |  | C | C | C |  | Water or alcohol |
| Vertical Transport Rollers |  | C | C | C |  | Water or alcohol |
| Paper Feed Sensor |  | C | C | C |  | Blower brush |
| TRANSFER BELT UNIT |  |  |  |  |  |  |
| Transfer Belt |  | C | C | C | 450K | Dry cloth A229: 300K-Replacement |
| Cleaning Roller Cleaning Blade |  |  |  | C | 450K | A229: 300K-Replacement |
| Transfer Entrance Guide Plate |  | C | C | C |  | Dry cloth |
| Belt Drive/Guidel Bias Roller/Cleaning Roller |  | C | C | C |  | Alcohol <br> A229: 300K-Cleaning |
| Transfer Exit Guide Plate |  | C | C | C |  | Dry cloth |
| FUSING/PAPER EXIT <br> "Pressure Roller Cleaning Brush" (EUlAsia only) is deleted. (A229: 150K-Replacement) |  |  |  |  |  |  |
| Hot Roller |  | I | $I$ | 1 | 200K | A229: 150K-replacement |
| Hot Roller Bearings |  | 1 | $I$ | I | 600K | A229: Replace if necessary |
| Pressure Roller |  | 1 | 1 | I | 450K | Replace as a set. |
| Pressure Roller Bearings |  | 1 | I | I | 450K | A229: 300K-replacement |
| Fusing Thermistor | I | 1 | 1 | 1 |  | Replace if necessary |
| Hot Roller Strippers | C | C | C | C | 300K | Water or alcohol A229: 300K-replacement |
| Oil Supply Roller Bushings | 1 | I | I | I |  | Replace if necessary |
| Pressure Roller Cleaning Roller and Bushings |  | R | R | R |  | Replace as a set |
| Oil Supply Roller |  | R | R | R |  | Replace as a set |
| Oil Supply Cleaning Roller |  | R | R | R |  |  |
| Fusing Entrance and Exit Guide Plates |  | C | C | C |  | Clean with water or alcohol |
| Transport/Exit Rollers |  |  | C |  |  | Water |
| Exit Anti-static Brush |  |  | 1 |  |  | A229:150K-Inspection |


|  | EM | $\begin{gathered} \hline 150 \\ K \end{gathered}$ | $\begin{gathered} \hline 300 \\ K \end{gathered}$ | $\begin{gathered} \hline \hline \mathbf{4 5 0} \\ \mathrm{K} \end{gathered}$ | Expected Life | NOTE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| DUPLEX |  |  |  |  |  |  |
| Entrance Sensor |  | C | C | C |  | Blower brush |
| Reverse Roller |  | C | C | C |  | Water or alcohol |
| Separation Rollers |  | C | C | C |  |  |
| Duplex Roller |  | C | C | C |  |  |
| Feed Rollers |  | C | C | C |  |  |
| Entrance Anti-static Brush |  | I | I | I |  |  |
| Reverse Junction Gate |  | C | C | C |  | Dry cloth |
|  |  |  |  |  |  |  |
| OTHERS |  |  |  |  |  |  |
| Ozone Filter: PCU |  |  | R |  |  |  |
| Ozone Filter: Duct |  |  | $R$ |  |  | Newly added |
| Filter: Vacuum |  | $R$ | $R$ | $R$ |  | Newly added |
| Used Toner Tank | I | I | I | I |  | Clean or Replace if necessary (about 1,000K copies). <br> A229:1,500K-Inspection |


|  | EM | 80K | 160K | 240K | NOTE |
| :--- | :---: | :---: | :---: | :---: | :---: | :--- |
| ADF (the PM interval is for the number of originals that have been fed) |  |  |  |  |  |
| Transport Belt | C | R | R | R | Belt cleaner |
| Feed Belt | C | R | R | R | Belt cleaner |
| Separation Roller | C | R | R | R | Dry or damp cloth |
| Pick-up Roller | C | R | R | R | Dry or damp cloth |
| Sensors | C | C | C | C | Belt brush |
| Drive Gears |  | L | L | L | Grease G501 |


|  | EM | $\begin{gathered} 150 \\ K \end{gathered}$ | $\begin{gathered} 300 \\ K \end{gathered}$ | $\begin{gathered} 450 \\ K \end{gathered}$ | Expected Life | NOTE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LCT |  |  |  |  |  |  |
| Paper Feed Roller |  | C | C | C | 300K | Check the counter value for the LCT (SP7-204-5). If the value has reached 200K, replace the rollers. After replacing the rollers, reset the counter (SP7-816-5). A229: 150K-Replacement |
| Pick-up Roller |  | c | c | C | 300K |  |
| Separation Roller |  | C | C | C | 300K |  |
| Bottom Plate Pad |  | C | C | C |  | Dry or damp cloth |
| Paper Feed Clutch |  |  |  |  | 1,200K | A229: 1,500K-Replacement |
| Relay Clutch |  |  |  |  | 1,200K | A229: 1,500K-Replacement |
| Pick-up Solenoid |  |  |  |  | 2,400K | A229: 1,500K-Replacement |


|  | EM | 150 <br> K | $\mathbf{3 0 0}$ <br> K | $\mathbf{4 5 0}$ <br> K | Expected <br> Life | NOTE |
| :--- | :---: | :---: | :---: | :---: | :---: | :--- |
| 3,000-SHEET FINISHER (50-SHEET STAPLER): B312 |  |  |  |  |  |  |
| Rollers | C | C | C | C |  | Clean with water or alcohol. |
| Brush Roller | I | I | I | I | $\mathbf{2 , 4 0 0 K}$ | A229: Replace if necessary. |
| Discharge Brush | C | C | C | C |  | Clean with a dry cloth. |
| Sensors | C | C | C | C |  | Blower brush |
| Jogger Fences | I | I | I | I |  | Replace if necessary. |
| Punch Waste Hopper | I | I | I | I |  | Empty the hopper. |


|  | EM | $\mathbf{1 5 0}$ <br> $\mathbf{K}$ | $\mathbf{3 0 0}$ <br> K | $\mathbf{4 5 0}$ <br> K | Expected <br> Life | NOTE |
| :--- | :---: | :---: | :---: | :---: | :---: | :--- |
| 3,000-SHEET FINISHER | (100-SHHEET STAPLER): | B302 |  |  |  |  |
| Rollers | C | C | C | C |  | Clean with water or alcohol. |
| Brush Roller | I | I | I | I | $2,000 \mathrm{~K}$ | Check the counter value for <br> the total copies by copy mode <br> for staple (SP7-304-6). If the <br> value has reached 600. <br> replace the brush roller. |
| Discharge Brush |  |  |  |  |  |  |
| Sensors | C | C | C | C |  | Clean with a dry cloth. |
| Jogger Fences | C | C | C | C |  | Blower brush |
| Punch Waste Hopper | I | I | I | I |  | Replace if necessary. |


|  | EM | $\mathbf{1 5 0}$ <br> $\mathbf{K}$ | $\mathbf{3 0 0}$ <br> $\mathbf{K}$ | $\mathbf{4 5 0}$ <br> $\mathbf{K}$ | Expected <br> Life | NOTE |
| :--- | :---: | :---: | :---: | :---: | :---: | :--- |
| BOOKLET FINISHER: A763 |  |  |  |  |  |  |
| Rollers | C | C | C | C |  | Clean with water or alcohol. |
| Brush Roller | I | I | I | I |  | Clean with a dry cloth. |
| Discharge Brush | C | C | C | C |  | Blower brush |
| Sensors | C | C | C | C |  | Replace if necessary. |
| Jogger Fences | I | I | I | I |  | Empty the hopper. |
| Punch Waste Hopper | I | I | I | I |  |  |

SECTION 7: TROUBLESHOOTING

| Section | Item | Description | Page |
| :---: | :---: | :---: | :---: |
| Service <br> Call <br> Conditions | SC124 | Scanner motor encoder signal error (New) | 7-3 |
|  | SC125 | Scanner motor speed error 1 (New) | 7-3 |
|  | SC126 | Scanner motor speed error 2 (New) | 7-3 |
|  | SC127 | Scanner motor encoder rotating direction error (New) | 7-3 |
|  | SC128 | Scanner motor start error (New) | 7-4 |
|  | SC129 | Scanner motor speed control error (New) | 7-4 |
|  | SC130 | SBU error (New) | 7-4 |
|  | SC300 | Charge corona output error 1 (A229: SC302-01) | 7-5 |
|  | SC301 | Charge corona output error 2 (A229: SC302-02) | 7-5 |
|  | SC302 | Charge corona output error 3 (A229: SC302-03) | 7-5 |
|  | SC303 | Charge corona output error 4 (A229: SC302-04) | 7-5 |
|  | SC305 | Charge corona wire cleaner error 1 (A229: SC303-01) | 7-5 |
|  | SC306 | Charge corona wire cleaner error 2 (A229: SC303-02) | 7-6 |
|  | SC310 | Potential sensor error 1 (A229: SC370-01) | 7-6 |
|  | SC311 | Potential sensor error 2 (A229: SC370-02) | 7-6 |
|  | SC312 | Potential sensor error 4 (A229: SC370-04) | 7-7 |
|  | SC314 | Potential sensor error 5 (A229: SC370-05) | 7-7 |
|  | SC329 | LD unit home position error 3 (A229: SC329) | 7-9 |
|  | SC330 | LD unit no initial setting (A229: SC329) | 7-9 |
|  | SC331 | LD unit home position error 4 (A229: SC329) | 7-10 |
|  | SC332 | LD unit present position error (A229: SC329) | 7-10 |
|  | SC335 | Polygonal mirror motor error 1 (A229: SC320) | 7-10 |
|  | SC336 | Polygonal mirror motor error 2 (A229: SC320) | 7-11 |
|  | SC337 | Polygonal mirror motor error 3 (A229: SC320) | 7-11 |
|  | SC338 | Polygonal mirror motor error 1 (A229: SC320) | 7-11 |
|  | SC340 | TD sensor output error (A229: SC390-01) | 7-12 |
|  | SC341 | TD sensor adjustment error 1 (A229: SC390-02) | 7-12 |
|  | SC342 | TD sensor adjustment error 2 (A229: SC390-03) | 7-13 |
|  | SC345 | Development bias leak (A229: SC391) | 7-13 |
|  | SC350 | ID sensor error 1 (A229: SC350-01) | 7-13 |
|  | SC351 | ID sensor error 2 (A229: SC350-02) | 7-14 |
|  | SC352 | ID sensor error 3 (A229: SC350-03) | 7-14 |
|  | SC353 | ID sensor error 4 (A229: SC350-04) | 7-15 |
|  | SC354 | ID sensor error 5 (A229: SC350-05) | 7-15 |
|  | SC360 | Hard disk detection error 1 (A229: SC360) | 7-15 |
|  | SC362 | Hard disk detection error 2 (A229: SC360) | 7-16 |
|  | SC364 | Hard disk drive error (A229: SC361) | 7-16 |
|  | SC366 | Hard disk bad sector maximum (New) | 7-16 |
|  | SC367 | Hard disk (HDD:R) bad sector maximum (New) | 7-16 |
|  | SC370 | IMAC (image compression IC) input FIFO error (A229: SC362) | 7-17 |
|  | SC372 | IMAC (image compression IC) output FIFO error (A229: SC362) | 7-17 |
|  | SC374 | IMAC (image compression IC) modes setting error (A229: SC362) | 7-17 |
|  | SC376 | Data transmission error (A229: SC363) | 7-17 |
|  | SC380 | Data transmission time out (video input) (New) | 7-18 |
|  | SC382 | Data transmission time out (video output) (New) | 7-18 |
|  | SC384 | Data transmission time out (connect copy) (A229: SC364) | 7-18 |
|  | SC386 | Data transmission time out (Hard disk write) (New) | 7-18 |
|  | SC388 | Data transmission time out (Hard disk read) (New) | 7-18 |
|  | SC390 | CRC error (A229: SC366) | 7-19 |

## DIFFERENT POINTS

| Section | Item | Description | Page |
| :---: | :---: | :---: | :---: |
| Service Call Conditions | SC391 | Image storage address error (A229: SC365) | 7-19 |
|  | SC400 | Transfer roller leak error (A229: SC401-01) | 7-19 |
|  | SC401 | Transfer roller open error (A229: SC401-02) | 7-19 |
|  | SC493 | Exhaust fan motor lock (New) | 7-20 |
|  | SC494 | Fusing exhaust fan motor lock (New) | 7-20 |
|  | SC501 | 1st tray lift malfunction (A229: SC501) | 7-21 |
|  | SC502 | 2nd tray lift malfunction (A229: SC502) | 7-22 |
|  |  |  |  |
|  | SC505 | LCT tray malfunction (optional LCT) (A229: SC510) | 7-22 |
|  | SC510 | Paper feed motor lock (A229: SC506) | 7-22 |
|  | SC511 | LCT motor lock (optional LCT) (A229: SC507) | 7-23 |
|  | SC515 | Tandem rear fence motor error (A229: SC508) | 7-23 |
|  | SC516 | Tandem side fence motor error (A229: SC511) | 7-23 |
|  | SC520 | Duplex jogger motor error 1 (A229: SC521-1) | 7-23 |
|  | SC521 | Duplex jogger motor error 2 (A229: SC521-2) | 7-24 |
|  | SC543 | Fusing overheat error 1 (software) (A229: SC543) | 7-25 |
|  | SC544 | Fusing overheat error 1 (hardware) (A229: SC543) | 7-25 |
|  | SC546 | Fusing temperature stability error (A229: SC546) | 7-26 |
|  | SC547 | Zero cross signal malfunction (A229: SC547) | 7-26 |
|  | SC620 | Communication error between BICU and ADF 1 (A229: SC620-1) | 7-27 |
|  | SC621 | Communication error between BICU and ADF 2 (A229: SC620-2) | 7-27 |
|  | SC622 | Communication error between BICU and ADF 3 (A229: SC620-3) | 7-27 |
|  | SC625 | Communication error between BICU and finisher 1 (A229: SC621) | 7-28 |
|  | SC626 | Communication error between BICU and finisher 2 (A229: SC621) | 7-28 |
|  | SC635 | Communication error between BICU and paper feed board 1 (A229: SC623) | 7-28 |
|  | SC636 | Communication error between BICU and paper feed board 2 (A229: SC623) | 7-29 |
|  | SC650 | Key card error 1 (Japan only) | - |
|  | SC651 | Key card error 2 (Japan only) | - |
|  | SC652 | Key card error 3 (Japan only) | - |
|  | SC653 | Key card error 4 (Japan only) | - |
|  | SC701 | ADF original pick-up malfunction 2 (New) | 7-29 |
|  | SC702 | ADF feed-in motor lock (New) | 7-30 |
|  | SC703 | ADF transport motor lock (New) | 7-30 |
|  | SC704 | ADF feed-out motor lock (New) | 7-30 |
|  | SC705 | ADF bottom plate motor error (New) | 7-31 |
|  | SC720 | Finisher transport motor error (New) | 7-31 |
|  | SC731 | Finisher paper exit guide plate motor lock (New) | 7-33 |
|  | SC735 | Finisher pre-stack motor error (New) | 7-33 |
|  | SC736 | Finisher paper exit guide plate motor error (New) | 7-34 |
|  | SC737 | Finisher disposal staple full (New) | 7-34 |
|  | SC738 | Finisher shift tray lift motor error (New) | 7-34 |
|  | SC740 | 1,000-sheet finisher error in finisher area (New) | 7-34 |
|  | SC741 | 1,000-sheet finisher error in saddle stitching area (New) | 7-34 |
|  | SC901 | Mechanical total counter error (New) | 7-35 |
|  | SC956 | Scanner parameter setting ID error (New) | 7-36 |
|  | SC957 | Scanner return ID error (New) | 7-36 |
|  | SC958 | Scanner ready ID error (New) | 7-36 |
|  | SC959 | Printer setting ID error (A229: SC959) | 7-36 |
|  | SC960 | Printer return ID error (A229: SC960) | 7-37 |


| Section | Item | Description | Page |
| :---: | :---: | :---: | :---: |
| Service Call Conditions | SC970 | Scanner ready error (New) | 7-38 |
|  | SC984 | HDD response error (A229: SC981) | 7-38 |
|  | - | SC370-3 is deleted. (A229: Page 7-9) | - |
|  | - | SC370-6 is deleted. (A229: Page 7-10) | - |
|  | - | SC370-7 is deleted. (A229: Page 7-11) | - |
|  | - | SC491 is deleted. (A229: Page 7-13) | - |
|  | Connector Number | Connector numbers are changed. | $\begin{gathered} 7-40 \\ \text { to } \\ 7-44 \end{gathered}$ |
|  | Sensors | Duplex Inverter Sensor (S35) and Fusing Exit sensor (S43) are added | $\begin{aligned} & 7-42 \\ & 7-43 \end{aligned}$ |
| Blown Fuse Conditions | Fuse | The number of fuses is decreased. | 7-45 |

SECTION 9: OPTION - 3,000-SHEET FINISHER ("B312")

| Section | Item | Description | Page |
| :--- | :--- | :--- | :--- |
| Specifications | Paper <br> weight in <br> punch <br> mode | The maximum paperweight, that the 2-hole and 3-hole <br> punch units can handle, has become $157 \mathrm{~g} / \mathrm{m}^{2}$. (A229: <br> $128 \mathrm{~g} / \mathrm{m}^{2}$ ) <br> The 4-hole types can handle up to $128 \mathrm{~g} / \mathrm{m}^{2}$. | B312-1 |
|  | Paper size <br> in staple <br> mode | The paper sizes with the same width like A3 and A4 <br> sideways and LG and LT sideways can be stapled <br> together. | B312-1 |
| Component |  | - A motor and a sensor to move the Paper Exit Guide <br> Layout | Plate have been added. <br> A motor and a junction gate solenoid for the Pre- <br> stack function have been added. |
| Paper feed | Pre-stack <br> function | The pre-stack tray and a junction gate have been <br> added to increase the productivity when using A4, LT <br> and B5 sideways. <br> The pre-stack tray holds the first paper of next job <br> until the stapling for the present job is finished and <br> sends it to the staple tray together with the second <br> paper. | B312-9 |

SECTION 10: OPTION - 1,000-SHEET FINISHER ("A763")

| Section | Item | Description |
| :---: | :---: | :---: |
| Finisher | Paper Size | A3 to A5, DLT to LT |
|  | Output Tray | Proof tray, Shift tray and Saddle stitching (Center stapling) tray |
|  | Paper Weight | Proof tray: $\quad 64$ to $80 \mathrm{~g} / \mathrm{m}^{2}, 17$ to 21 lb Shift tray: $\quad 64$ to $128 \mathrm{~g} / \mathrm{m}^{2}, 17$ to 34 lb Saddle stitching tray: 64 to $128 \mathrm{~g} / \mathrm{m}^{2}, 17$ to 34 lb |
|  | Paper Capacity | Proof tray: <br> A4/LT or smaller: 50 sheets <br> Larger than A4/LT: 30 sheets <br> Shift tray: <br> A4/LT or smaller: 1,000 sheets (without staples) 750 sheets (with staples) <br> Larger than A4/LT: 500 sheets (With/without staples) |
|  | Staple Position | ```3 positions 1 staple (Front Slant or Rear Slant) 2 staples``` |
|  | Stapler Capacity | A4/LT or smaller: 50 sheets $\left(80 \mathrm{~g} / \mathrm{m}^{2}, 20 \mathrm{lb}\right)$ Larger than A4/LT: 30 sheets $(80 \mathrm{~g} / \mathrm{m} 2,20 \mathrm{lb})$ |
|  | Stapler Replenishment | Cartridge (5,000 staples) Type H (5 cartridges/box) |
|  | Paper Size for Stapling | 1 staple: A3 to B5, DLT to LT <br> 2 staples: A3 to A4/B5 sideways, DLT to LT sideways |
|  | Power Source | 24 Vdc (from copier) |
|  | Power Consumption | 55 W |
|  | Weight | $45 \mathrm{~kg}, 20.5 \mathrm{lb}$ |
|  | Dimension | $689 \times 582 \times 1,047 \mathrm{~mm}, 27 \times 23 \times 41$ inches |
| Saddle Stitching | Saddle Stitching | Folding in half with/without stapling |
|  | Paper Size | A3 to A4 lengthwise, DLT to LT lengthwise |
|  | Stapler Capacity | 15 sheets (including a cover page) |
|  | Paper Weight | 64 to $80 \mathrm{~g} / \mathrm{m}^{2}, 17$ to 21 lb (Cover page: up to $128 \mathrm{~g} / \mathrm{m}^{2}, 34 \mathrm{lb}$ ) |
|  | Tray Capacity | 25 sets (Up to 5 sheets/set) 20 sets (Up to 10 sheets/set) 10 sets (Up to 15 sheets/set) |
|  | Staple Position | 2 staples (adjustable) |
|  | Stapler Replenishment | Cartridge (2,000 staples) Type E (4 cartridges/box) |
|  | Power Consumption | 160 W |

## OVERALL INFORMATION

## 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" $\times 17{ }^{\prime \prime}$ |
|  | Minimum B6, 51/2"x 81/2" (using ADF) |
| Original Alignment: | Rear left corner |
| Copy Paper Size: | Maximum <br> A3/11" x 17" (2nd/3rd Tray, By-pass) <br> Minimum <br> A5/51/2" x 81/2" (2nd/3rd Tray) <br> A6/51/2" x 81/2" lengthwise (By-pass) |
|  | Tandem LCT (1st Tray) A4/81/2" x 11" sideways only |
| Duplex Copying: | Maximum A3/11" x 17" <br> Minimum A5/51/2" x 81/2" lengthwise |
| Copy Paper Weight: | Paper tray: $52.3 \sim 127.9 \mathrm{~g} / \mathrm{m}^{2}, 14 \sim 34 \mathrm{lb}$ Bypass feed table: $52.3 \sim 157 \mathrm{~g} / \mathrm{m}^{2}, 14 \sim 41.7 \mathrm{lb}$ Duplex copying: $64 \sim 104.7 \mathrm{~g} / \mathrm{m}^{2}, 17 \sim 28 \mathrm{lb}$ |
| Reproduction Ratios: | 6 reduction and 5 enlargement |


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


| Zoom: | 25 ~ 400\% |
| :---: | :---: |
| Copy Speed: | A292: Max. 55 cpm (A4 / 81/2" x 11" sideways) A293: Max. 70 cpm (A4 / 81/2" x $11^{\prime \prime}$ sideways) |
| Resolution: | Scanning: 600 dpi <br> Printing: 400/600 dpi |
| Gradation: | 256 levels |
| Warm-up Time: | Less than 330 s (from Off-mode) <br> Less than 30 s (from Low Power Mode) |
| First Copy Time: (1st Tray) | Less than 3.5 s (A4/LT, Face up mode) Less than 5.3 s (A4/LT, Face down mode) |
| Copy Number Input: | Ten-key pad, 1 to 999 |
| Copy Paper Capacity: | Tray 1: 3100 sheets (when used as a tandem tray) <br> Tray 2: 550 sheets <br> Tray 3:550 sheets By-pass Tray: 50 sheets |
| Copy Tray Capacity: (Output Tray) | A4/81/2" x 11" : 500 sheets ( $100 \mu \mathrm{~m}$ thickness paper) A3/11" x 17" : 250 sheets |
| Memory Capacity: | RAM: 48 MB HDD: 4.3 GB |
| Toner Replenishment: | Cartridge exchange (1220g/ cartridge) |
| Toner Yield: | 42k copies/cartridge (A4 sideways, $6 \%$ full black, 1 to 5 copying, including toner recycling ratio 20\%) |
| Power Source: | North America: $120 \mathrm{~V}, 60 \mathrm{~Hz}, 20 \mathrm{~A}$ <br> Europe/Asia: $220 \sim 240 \mathrm{~V}, 50 \mathrm{~Hz} / 60 \mathrm{~Hz}, 10 \mathrm{~A}$ |

Power Consumption: A292/A293 copier (120 V Model)

|  | Copier only | Full system* |
| :---: | :---: | :---: |
| Warm-up | About 1.290 kW | About 1.300 kW |
| Stand-by | About 0.255 kW | About 0.270 kW |
| Copying | About 1.630 kW | About 1.650 kW |
| Maximum | Less than 1.75 kW | Less than 1.75 kW |
| Energy Saver | About 0.230 kW | About 0.240 kW |
| Low Power | About 0.225 kW | About 0.235 kW |
| Off Mode | About 0.009 kW | About 0.009 kW |

A292/A293 copier (220 to 240 V Model)

|  | Copier only | Full system $^{*}$ |
| :---: | :---: | :---: |
| Warm-up | About 1.255 kW | About 1.300 kW |
| Stand-by | About 0.270 kW | About 0.285 kW |
| Copying | About 1.610 kW | About 1.590 kW |
| Maximum | Less than 1.75 kW | Less than 1.75 kW |
| Energy Saver | About 0.245 kW | About 0.255 kW |
| Low Power | About 0.240 kW | About 0.250 kW |
| Off Model | About 0.012 kW | About 0.012 kW |

*Full System:
Mainframe with LCT and Finisher (B302)
Noise Emission:
Sound Power Level: The measurements were made in accordance with ISO 7779 at the operator position.

|  | Copier only | Full system |
| :---: | :---: | :---: |
| Stand-by | Less than $49 \mathrm{~dB}(A)$ | Less than $49 \mathrm{~dB}(A)$ |
| Copying (ADF 1 to 1) | Less than $75 \mathrm{~dB}(A)$ | Less than $75 \mathrm{~dB}(A)$ |
| Copying (From Memory) | Less than $71 \mathrm{~dB}(A)$ | Less than $71 \mathrm{~dB}(A)$ |

Sound Pressure Level: The measurements were made in accordance with ISO 7779.

|  | Copier only | Full system |
| :---: | :---: | :---: |
| Stand-by | Less than $35 \mathrm{~dB}(\mathrm{~A})$ | Less than $35 \mathrm{~dB}(\mathrm{~A})$ |
| Copying (ADF 1 to 1) | Less than $65 \mathrm{~dB}(\mathrm{~A})$ | Less than $65 \mathrm{~dB}(\mathrm{~A})$ |
| Copying (From Memory) | Less than $58 \mathrm{~dB}(\mathrm{~A})$ | Less than $58 \mathrm{~dB}(\mathrm{~A})$ |

Dimensions:
(W x D x H)
Weight:
$690 \times 750 \times 1138 \mathrm{~mm}$ (27.2" x 29.5" x 44.8") (without ADF right exit tray, and options)
188 kg (without options)

Optional Equipment: - Output tray (B333-17)

- Finisher (A763)
- Finisher (B302)
- Finisher (B312)
- Punch unit (A812-30, -31, -32, -57, 67)
- Large capacity tray (A698)
- Copy connector kit (B322)
- LG kit (A375)
- Tab sheet holder (B373)


### 1.1.2 ADF

Original Size:

Original Weight:
Normal Original Mode: $52 \sim 156 \mathrm{~g} / \mathrm{m}^{2}, 14 \sim 42 \mathrm{lb}$
Thin Original Mode: $40 \sim 156 \mathrm{~g} / \mathrm{m}^{2}, 11 \sim 42 \mathrm{lb}$ Duplex Original Mode: $52 \sim 128 \mathrm{~g} / \mathrm{m}^{2}, 14 \sim 34 \mathrm{lb}$
Table Capacity: 100 sheets ( $80 \mathrm{~g} / \mathrm{m}^{2}, 20 \mathrm{lb}$ )

Original Standard Position:
Separation:
Rear left corner
FRR
Original Transport:
One flat belt
Original Feed Order:
Power Source:
From the top original
DC 24 V and DC 38 V from the copier
Power Consumption:
130 W
Dimensions (W x D x H): $\quad 680 \times 560 \times 150 \mathrm{~mm}$

### 1.2 MACHINE CONFIGURATION



| Item | Machine Code | No. |
| :--- | :---: | :---: |
| Mainframe | A292/A293 | 3 |
| Output Tray | B333 | 2 |
| Finisher | A763, B302, B312 | 1 |
| Large Capacity Tray | A698 | 4 |
| Punch Unit (Option for Finisher) | A812-30 (4 holes) European <br> A812-31 (4 holes) European <br> A812-32 (2 holes) <br> A812-57 (3 holes) <br> A812-67 (2 holes) | Inside the <br> Finisher |
|  | B322 |  |
|  | B375 |  |
|  | B373 |  |

MECHANICAL COMPONENT LAYOUT

### 1.3 MECHANICAL COMPONENT LAYOUT

### 1.3.1 COPIER ENGINE



1. 3rd Mirror
2. 2nd Mirror
3. 1st Mirror
4. Exposure Lamps
5. LD Unit
6. Cylindrical Lens
7. Polygonal Mirror
8. Cleaning Brush
9. Quenching Lamp
10. Barrel Toroidal Lends (BTL)
11. F-theta Mirror
12. SBU
13. Charge Corona Unit
14. Shield Glass
15. Laser Synchronization Detector
16. Optics Cooling Fan Motor
17. Drum Cleaning Blade
18. Drum Potential Sensor
19. Drum
20. Pick-off Pawl
21. Development Unit
22. TD Sensor
23. Pick-up Roller
24. Feed Roller (By-pass Tray)
25. Separation Roller
26. Registration Rollers
27. Transfer Belt Unit
28. Relay Roller
29. Vertical Transport Rollers
30. Feed Roller
31. Separation Roller
32. Tray 1 (Tandem LCT)
33. Tray 2 (550-sheet Tray)
34. Tray 3 (550-sheet Tray)
35. Pick-up Roller
36. Duplex Feed Roller
37. Duplex Transport Rollers
38. Reverse Trigger Roller
39. Inverter Unit Paper Exit Roller
40. Inverter Feed Roller
41. Pressure Roller
42. Transport Rollers
43. Paper Exit Rollers
44. Curl Correction Roller
45. Hot Roller

### 1.3.2 ADF



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

### 1.4 PAPER PATH



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

### 1.5 COPY PROCESS



## 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 two 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 BICU board.

## 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 applies 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



5

1. Drum Motor
2. Scanner Motor
3. Fusing/Duplex Motor
4. Toner Recycling Clutch
5. Paper Feed Motor
6. Toner Collection Motor
7. Registration Motor
8. Relay Clutch
9. By-pass Feed Motor
10. By-pass Feed Clutch
11. Development Motor
(1) Cleaning Unit
(2) Scanner Unit
(3) Transfer Belt Unit
(4) Fusing Unit
(5) Duplex Unit
(6) Paper Feed Units
$(7$ Toner Hopper
(8) Development Unit
© Drum

### 1.6.2 ADF



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

### 1.7 ELECTRICAL COMPONENT DESCRIPTION

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 | Index No. |
| :---: | :---: | :---: | :---: |
| Motors |  |  |  |
| M1 | Scanner | Drives the 1st and 2nd. | 15 |
| M2 | Polygonal Mirror | Turns the polygonal mirror. | 22 |
| M3 | LD Positioning | Rotates the LD unit to adjust the LD beam pitch when a different resolution is selected. | 25 |
| M4 | Drum | Drives the drum and cleaning unit. | 36 |
| M5 | Development | Drives the development unit. | 37 |
| M6 | Toner Supply | Rotates the toner bottle to supply toner to the development unit. | 43 |
| M7 | Charge Corona Wire Cleaner | Drives the charge corona wire cleaner. | 68 |
| M8 | Fusing/Duplex | Drives the fusing unit, duplex unit, inverter unit, and paper exit rollers. | 44 |
| M9 | Toner Collection | Transports the collected toner to the toner collection bottle. | 3 |
| M10 | Toner Recycling | Drives the air pump to send recycled toner to the development unit. | 6 |
| M11 | Paper Feed | Drives all feed and transport rollers in the paper tray unit. | 124 |
| M12 | 1st Tray Lift | Raises and lowers the bottom plate in the 1st paper tray. | 125 |
| M13 | 2nd Tray Lift | Raises the bottom plate in the 2nd paper tray. | 126 |
| M14 | 3rd Tray Lift | Raises the bottom plate in the 3rd paper tray. | 127 |
| M15 | By-pass Feed | Drives the by-pass feed rollers. | 41 |
| M16 | Registration | Drives the registration rollers. | 40 |
| M17 | Rear Fence | Moves the paper stack in the left tandem tray to the right tandem tray. | 136 |
| M18 | Jogger | Drives the jogger fences to square the paper stack in the duplex unit. | 94 |
| M19 | Optics Cooling Fan | Removes heat from the optics unit. | 21 |
| M20 | Drum Cooling Fan | Sends the air to the drum inside. | 38 |
| M21 | Exhaust Fan | Removes heat from around the fusing unit. | 37 |
| M22 | Fusing Fan | Removes heat from around the fusing unit. | 34 |


| Symbol | Name | Function | $\begin{gathered} \hline \text { Index } \\ \text { No. } \end{gathered}$ |
| :---: | :---: | :---: | :---: |
| M23 | Duplex Cooling Fan | Removes heat from around the duplex unit. | 42 |
| M24 | Exit Cooling Fan | Removes heat from the exit unit. | 45 |
| M25 | PSU Cooling Fan | Removes heat from around the PSU. | 54 |
| M26 | SBU Cooling | Removes the heat from around CCD. | 19 |
| Magnetic Clutches |  |  |  |
| MC1 | Toner Supply | Turns the toner supply roller to supply toner to the development unit. | 39 |
| MC2 | Toner Recycling | Drives the toner recycling unit. | 1 |
| MC3 | 1st Paper Feed | Starts paper feed from tray 1. | 100 |
| MC4 | 2nd Paper Feed | Starts paper feed from tray 2. | 104 |
| MC5 | 3rd Paper Feed | Starts paper feed from tray 3. | 109 |
| MC6 | By-pass Feed | Starts paper feed from the by-pass table. | 78 |
| MC7 | Inverter Exit Clutch | Drives the inverter exit roller. | 88 |
| MC8 | Duplex Transport | Drives the duplex transport rollers to transport the paper to the duplex feed rollers. | 89 |
| MC9 | Duplex Feed | Starts paper feed out of the duplex tray back into the machine via to the relay rollers. | 91 |
| MC10 | 1st Vertical Relay | Drives the 1st vertical transport rollers. | 101 |
| MC11 | 2nd Vertical Relay | Drives the 2nd vertical transport rollers. | 105 |
| MC12 | 3rd Vertical Relay | Drives the 3rd vertical transport rollers. | 108 |
| MC13 | Bank Relay | Drives the bank relay roller. | 103 |
| MC14 | Relay | Drives the relay rollers. | 81 |
| Switches |  |  |  |
| SW1 | Main Power | Provides power to the machine. If this is off, there is no power supplied to the machine. | 9 |
| SW2 | Operation | Provides power for machine operation. The machine still has power if this switch is off. | 27 |
| SW3 | Front Door Safety Switch 1 | Cuts the +5 V LD dc power line. | 10 |
| SW4 | Front Door Safety Switch 2 | Detects if the front door is open or not, and cuts the +24 V dc power line. | 11 |
| SW5 | Front Door Safety Switch 3 | Cuts the +5 V LD dc power line. | 12 |
| SW6 | Lower Front Door Safety | Cuts the +24 V dc power line. | 8 |


| Symbol | Name | Function | Index No. |
| :---: | :---: | :---: | :---: |
| SW7 | Toner Collection Bottle Set | Detects if the toner collection bottle is set or not. | 5 |
| SW8 | Toner Overflow | Detects when the toner collection bottle is full. | 4 |
| SW9 | Paper Size | Determines the size of paper in tray 2. | 3 |
| Solenoids |  |  |  |
| SOL1 | Transfer Belt Lift | Controls the up-down movement of the transfer belt unit. | 70 |
| SOL2 | 1st Pick-up | Controls the up-down movement of the pick-up roller in tray 1. | 99 |
| SOL3 | 2nd Pick-up | Controls the up-down movement of the pick-up roller in tray 2. | 106 |
| SOL4 | 3rd Pick-up | Controls the up-down movement of the pick-up roller in tray 3. | 110 |
| SOL5 | By-pass Pick-up | Controls the up-down movement of the pick-up roller for by-pass feed. | 76 |
| SOL6 | 1st Separation Roller | Controls the up-down movement of the separation roller in tray 1. | 102 |
| SOL7 | 2nd Separation Roller | Controls the up-down movement of the separation roller in tray 2. | 107 |
| SOL8 | 3rd Separation Roller | Controls the up-down movement of the separation roller in tray 3. | 111 |
| SOL9 | Right Tray Lock | Locks the right tandem tray during paper feed from tandem tray. | 126 |
| SOL10 | Left Tray Lock | Locks the left tandem tray during more the paper from left tray to right tray. | 123 |
| SOL11 | Front Side Fence | Opens the front side fence of right tandem tray. | 134 |
| SOL12 | Rear Side Fence | Opens the rear side fence of right tandem tray. | 130 |
| SOL13 | Duplex Inverter Gate | Moves the junction gate to direct copies to the duplex tray or to the paper exit. | 96 |
| SOL14 | Reverse Roller | Controls the up-down movement of the reverse trigger roller. | 95 |
| SOL15 | Guide Plate | Opens the guide plate when a paper misfeed occurs around this area. | 80 |
| SOL16 | Inverter Gate | Opens the inverter gate during a duplex job. | 74 |
| Sensors |  |  |  |
| S1 | Scanner HP | Informs the CPU when the 1st and 2nd scanners are at home position. | 32 |
| S2 | Original Width | Detects original width. This is one of APS (Auto Page Select) sensors. | 33 |


| Symbol | Name | Function | $\begin{array}{c}\text { Index } \\ \text { No. }\end{array}$ |
| :---: | :--- | :--- | :---: |
| S3 | Original Length 1 | $\begin{array}{l}\text { Detects original length. This is one of } \\ \text { APS (Auto Page Select) sensors. }\end{array}$ | 16 |
| S4 | Original Length 2 | $\begin{array}{l}\text { Detects original length. This is one of } \\ \text { APS (Auto Page Select) sensors. }\end{array}$ | 18 |
| S5 | $\begin{array}{l}\text { LD Unit Home } \\ \text { Position }\end{array}$ | $\begin{array}{l}\text { Informs the CPU when the LD unit is } \\ \text { at home position. }\end{array}$ | 24 |
| S6 | Drum Potential | Detects the drum surface potential. | 66 |
| S7 | Toner Density (TD) | $\begin{array}{l}\text { Detects the amount of toner in the } \\ \text { developer. }\end{array}$ | 73 |
| S8 | Image Density (ID) | $\begin{array}{l}\text { Detects the density of the ID sensor } \\ \text { pattern on the drum. }\end{array}$ | 69 |
| S9 | Toner End | Detects toner end. | 72 |
| S10 | $\begin{array}{l}\text { Toner Collection } \\ \text { Motor }\end{array}$ | $\begin{array}{l}\text { Monitors the toner collection motor. }\end{array}$ | 7 |
| S11 | Toner Recycling | $\begin{array}{l}\text { Monitors the toner recycling and } \\ \text { collection unit operation. }\end{array}$ | 2 |
| S12 | 1st Paper Feed | $\begin{array}{l}\text { Controls the 1st paper feed clutch } \\ \text { off/on timing and the 1st pick-up } \\ \text { solenoid off timing. }\end{array}$ | 120 |
| S13 | 2nd Paper Feed | $\begin{array}{l}\text { Controls the 2nd paper feed clutch } \\ \text { off/on timing and the 2nd pick-up } \\ \text { solenoid off timing. }\end{array}$ | 116 |
| S14 | 3rd Paper Feed | $\begin{array}{l}\text { Controls the 3rd paper feed clutch } \\ \text { off/on timing and the 3rd pick-up } \\ \text { solenoid off timing. }\end{array}$ | 114 |
| S15 | 1st Tray Lift | $\begin{array}{l}\text { Detects when the paper in tray 1 is at } \\ \text { the correct height for paper feed. }\end{array}$ | 122 |
| S16 | 2nd Tray Lift | $\begin{array}{l}\text { Detects when the paper in tray 2 is at } \\ \text { the correct height for paper feed. }\end{array}$ | 118 |
| S17 | 3rd Tray Lift | $\begin{array}{l}\text { Detects when the paper in tray 3 is at } \\ \text { the correct height for paper feed. }\end{array}$ | 112 |
| S18 | 1st Paper End | $\begin{array}{l}\text { Informs the CPU when tray 1 runs out } \\ \text { of paper. }\end{array}$ | 121 |
| S19 | 2nd Paper End | $\begin{array}{l}\text { Informs the CPU when tray 2 runs out } \\ \text { of paper. }\end{array}$ | 117 |
| S20 | 3rd Paper End | $\begin{array}{l}\text { Informs the CPU when tray 3 runs out } \\ \text { of paper. }\end{array}$ | 113 |
| S21 | By-pass Paper End | $\begin{array}{l}\text { Informs the CPU that there is no } \\ \text { paper in the by-pass feed table. }\end{array}$ | 77 |
| S22 | 1st Paper Near End | $\begin{array}{l}\text { Informs the CPU when the paper in } \\ \text { tray 1 is almost finished. }\end{array}$ | 140 |
| $\begin{array}{l\|\|l\|l\|\|}\hline \text { 2nforms the CPU when the paper in } \\ \text { tray 2 is almost finished. }\end{array}$ | 119 |  |  |
| $\begin{array}{l\|l\|l\|\|}\hline \text { Informs the CPU when the paper in } \\ \text { tray 3 is almost finished. }\end{array}$ | 115 |  |  |
| tray rear fence is in the home position. |  |  |  |$] 139$


| Symbol | Name | Function | Index No. |
| :---: | :---: | :---: | :---: |
| S26 | Rear Fence Return | Informs the CPU when the tandem tray rear fence is in the return position. | 132 |
| S27 | Front Side Fence Open | Defects that the front side fence of tandem tray is opened. | 135 |
| S28 | Front Side Fence Close | Defects that the front side fence of tandem tray is closed. | 138 |
| S29 | Rear Side Fence Open | Defects that the rear side fence of tandem tray is opened. | 142 |
| S30 | Rear Side Fence Close | Defects that the rear side fence of tandem tray is closed. | 141 |
| S31 | Right Tray Down | Detects when the bottom plate of the right tandem tray is completely lowered to stop the 1st tray lift motor. | 133 |
| S32 | Right Tray Paper | Detects whether there is paper or not in the right tray of tandem tray. | 131 |
| S33 | Left Tandem Tray Paper | Detects whether there is paper or not in the left tray of tandem tray. | 137 |
| S34 | Duplex Entrance Sensor | Detects the leading and trailing edges of the paper to determine the reverse roller solenoid on or off timing. | 98 |
| S35 | Duplex Inverter | Defects the leading edge and tray edges of the paper to determine the inverter exit clutch on or off timing. | 97 |
| S36 | Duplex Transport Sensor 1 | Detects the position of paper in the duplex unit. | 87 |
| S37 | Duplex Transport Sensor 2 | Detects the position of paper in the duplex unit. | 93 |
| S38 | Duplex Transport Sensor 3 | Detects the position of paper in the duplex unit. | 92 |
| S39 | Duplex Jogger HP | Detects if the duplex jogger fences are at the home position or not. | 90 |
| S40 | Relay | Detects misfeeds. | 82 |
| S41 | Registration | Detects misfeeds and controls registration clutch off-on timing. | 83 |
| S42 | Guide Plate Position | Detects whether the registration guide plate is closed or not. | 75 |
| S43 | Fusing Exit | Defects misfeeds | 62 |
| S44 | 1st Exit | Detects misfeeds. | 84 |
| S45 | 2nd Exit | Detects misfeeds. | 85 |
| S46 | Tray Paper Limit (option) | Detects paper overflow on the output tray. | 86 |
| PCBs |  |  |  |
| PCB1 | BICU | Controls all base engine functions both directly and through other control boards. | 20 |


| Symbol | Name | Function | Index No. |
| :---: | :---: | :---: | :---: |
| PCB2 | PSU | Provides dc power to the system and ac power to the fusing lamp and heaters. | 53 |
| PCB3 | IOB | Controls the mechanical parts of the machine (excluding the scanner unit section), and the fusing lamp. | 47 |
| PCB4 | SBU | Contains the CCD, and outputs a video signal to the SBICU board. | 17 |
| PCB5 | MCU | Controls the components in the scanner unit. | 46 |
| PCB6 | Lamp Regulator | Provides dc power to the exposure lamp. | 14 |
| PCB7 | CNB | Passes signals and dc supplies from the PSU and IOB to motors and other components. | 59 |
| PCB8 | DRB | Drives the registration, by-pass feed and development motor. | 50 |
| PCB9 | Paper Feed Control <br> Board (PFB) | Controls the mechanical parts of all paper feed sections. | 52 |
| PCB10 | Operation Panel 1 | Controls the components on the righthand side of the operation panel. | 28 |
| PCB11 | Operation Panel 2 | Controls the components on the lefthand side of the operation panel. | 31 |
| PCB12 | LCD Control | Controls the LCD. | 30 |
| PCB13 | By-pass Paper Size | Detects the paper width on the bypass tray. | 79 |
| PCB14 | Mother (Option) | Connects the printer control board. | - |
| PCB15 | Printer Control (Option) | Receives print data from a PC. | - |
| PCB16 | Copy Connect | Receives and sends data to other copier. | - |
| PCB17 | RSS Board | Passes signal for RDS function | 51 |
| Lamps |  |  |  |
| L1 | Exposure Lamp | Apply high intensity light to the original for exposure. | 13 |
| L2 | Fusing Lamp 1 | Provides heat to the hot roller. | 64 |
| L3 | Fusing Lamp 2 | Provides heat to the hot roller. | 63 |
| L4 | Quenching | Neutralizes any charge remaining on the drum surface after cleaning. | 67 |
| Power Packs |  |  |  |
| PP1 | Charge | Provides high voltage for the charge corona wires and the grid plate. | 65 |
| PP2 | Development | Provides high voltage for the development unit. | 49 |
| PP3 | Transfer | Provides high voltage for the transfer belt. | 71 |

## ELECTRICAL COMPONENT DESCRIPTION

| Symbol | Name | Function |  |
| :---: | :--- | :--- | :---: |
| Index <br> No. |  |  |  |
| Others |  |  |  |
| TF1 | Fusing Thermofuse | Opens the fusing lamp circuit if the <br> fusing unit overheats. | 61 |
| TH1 | Fusing Thermistor | Detects the temperature of the hot <br> roller. | 60 |
| H1 | Drum | Turns on when the main switch is off <br> to prevent moisture from forming <br> around the drum. | 58 |
| H2 | Tray Heater 1 | Turns on when the main switch is off <br> to keep paper dry in the paper tray. | 57 |
| H3 | Tray Heater 2 | Turns on when the main switch is off <br> to keep paper dry in the paper tray. | 55 |
| CB1 | Circuit Breaker | Provides back-up high current <br> protection for the electrical <br> components. | 56 |
| HDD 1 | HDD | Scanned image data is compressed <br> and held here temporarily. | 48 |
| LCD 1 | LCD | Displays the operation menus and <br> messages. | 29 |
| LSD 1 | Laser Synchronization <br> Detector | Detects the laser beam at the start of <br> the main scan. | 23 |
| LDU1 | Laser Diode Unit | Controls the laser diode. 26 <br> TP1 Touch Panel | Monitors the key matrix. |

### 1.7.2 ADF

| Symbol |  |  | Function |  | Index No. |
| :---: | :--- | :--- | :---: | :---: | :---: |
| Motors |  |  |  |  |  |
| M1 | Pick-up | Moves the pick-up roller up and down. | 3 |  |  |
| M2 | Feed-in | Drives the feed belt, and the separation, <br> 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 |  |  |
|  |  |  |  |  |  |
| Sensors | APS Start | Informs the CPU when the DF is opened <br> and closed (for platen mode) so that the <br> original size sensors in the copier can <br> check the original size. | 12 |  |  |
| S1 | Detects whether the DF is lifted or not. | 13 |  |  |  |
| S2 | DF Position | Detects whether an original is on the <br> table. | 19 |  |  |
| S3 | Original Set | Detects whether the bottom plate is in <br> the down position or not. | 20 |  |  |
| S4 | Bottom Plate HP |  |  |  |  |



## DETAILED DESCRIPTIONS

## 2. DETAILED DESCRIPTIONS

### 2.1 DOCUMENT FEEDER

### 2.1.1 PICK-UP ROLLER RELEASE



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



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



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



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 Pickup Roller Release).

### 2.1.5 ORIGINAL SIZE DETECTION


[E]


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



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



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



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-toone copy speed for this mode is reduced.

## Original Inversion



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.

## DOCUMENT FEEDER

## Original Exit (Single-Sided Original Mode)


[B]

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 30 mm before the trailing edge of the original turns off the exit sensor.

## Original Exit (Double-Sided Original Mode)



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



## 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 $X \mathrm{~mm}$ ( $\mathrm{X}=$ 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 ( $\mathrm{X}=$ 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 in this model) [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 1st mirror and the lamp regulator [D].
The exposure lamp is energized by a dc supply $(24 \mathrm{~V})$ to avoid uneven light intensity while the 1st scanner moves in the sub scan direction (down the page). The entire exposure lamp surface is frosted to ensure even exposure in the main scan direction (across the page).

There is an optics cooling fan [E] 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 fan operates whenever the operation switch is turned on.

### 2.2.2 SCANNER DRIVE



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 $425 \mathrm{~mm} / \mathrm{s}$ during scanning. The 2 nd 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 BICU board.
Magnification in the sub-scan direction can be adjusted by changing the scanner drive motor speed using SP4008.

### 2.2.3 ORIGINAL SIZE DETECTION IN BOOK MODE

| Original Size |  | Length Sensor |  | Width Sensor |  |  | SP4301 <br> Display |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| A4/A3 <br> Version | LT/DLT Version | 2 | 1 | 3 | 4 | 5 |  |
| A3 | $11{ }^{\prime \prime} \times 17{ }^{\prime \prime}$ | i | i | i | $i$ | i | 10011111 |
| B4 | 10 x 14" | i | i | i | i | X | 10011110 |
| F4 | 81/2" x 14" (8" x 13") | i | i | i | X | X | 10011100 |
| A4-L | 81/2" x 11" | X | i | i | X | X | 10001100 |
| B5-L | - | X | i | X | X | X | 10001000 |
| A5-L | 51/2" x 81/2" | X | X | X | X | X | 10000000 |
| A4-S | 11 " x 81/2" | X | X | i | i | i | 10000111 |
| B5-S | - | X | X | i | i | X | 10000110 |
| A5-S | 81/2" x 51/2" | X | X | i | X | X | 10000100 |

-L: Lengthwise, -S: Sideways, O: High (Paper Present), X: 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 15 cm above the exposure glass. At this time, only the sensor(s) located underneath the original receive the reflected light and switch on. The other sensor(s) are off. The main CPU can recognize the original size from the on/off signals from the five sensors.
If the copy is made with the platen 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's productivity. However, if the by-pass tray is used, the machine assumes that the copy paper is lengthwise. For example, if A4 sideways paper is placed on the by-pass tray, the machine thinks it is A3 paper and scans the full A3 area, disregarding the original size sensors. However, for each page, the data signal to the laser diode is stopped to match the copy paper length detected by the registration sensor. This means that copy time for the first page may be slower (because of the longer time required for scanning), but it will be normal for the rest of the job.

### 2.3 IMAGE PROCESSING

### 2.3.1 OVERVIEW



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 BICU (Base-engine, and Image Processing Control Unit) board.
The BICU board can be divided into two image processing blocks; the IPU (Image Processing Unit) and the memory control IC. These two ICs mainly do the following:

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

Finally, the BICU board sends the video data to the LD drive board.

### 2.3.2 SBU



The CCD converts the light reflected from the original into an analog signal. The CCD line has 7,500 pixels and the resolution is $600 \mathrm{dpi}(23.6$ lines $/ \mathrm{mm}$ ).
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 BICU board through the LVDS (Low Voltage Differential Signaling). The LVDS is a noise-resistant interface.

### 2.3.3 AUTO IMAGE DENSITY (ADS)



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 BICU 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 IPU (IMAGE PROCESSING UNIT)

## Overview



The image data from the SBU goes to the IPU (Image Processing Unit) IC on the BICU board, which carries out the following processes on the image data.

1. Auto shading
2. Text/Photo separation
3. Background/Independent dot erase
4. Filtering (MTF and smoothing)
5. Magnification
6. $\gamma$ correction
7. Grayscale processing
8. Error diffusion
9. Dithering
10. Video path control
11. Test pattern generation

### 2.3.5 IMAGE PROCESSING STEPS AND RELATED SP MODES

## 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 Features - General Features - Original Mode Quality Level), the user can select 'Soft', 'Normal', 'Sharp', and 'SP Mode Changed'. The settings of the SP modes indicated with an asterisk (*) are not used unless the user selects 'SP Mode Changed'.

|  | Image Processing Steps | Related SP Modes |
| :---: | :---: | :---: |
| Input Correction 1 | Auto Shading |  |
| Input Correction 2 | Background Erase | - SP4903-065 * <br> (Scanner Gamma Threshold Level) <br> SP4903-070 * <br> (Background Erase Level) |
|  | Independent Dot Erase | - SP4903-060 (Independent Dot Erase Level) |
| Filtering | $\underset{\text { MTF }}{\downarrow}$ | - SP4903-010 to 011 * (Pre-Filter Coefficient) <br> - SP4903-020 to 035 * (MTF Filter Strength) |
| Magnification | Main Scan Magnification | - SP2909-001 <br> (Main Scan Magnification) |
| ID Control | $\gamma$ Correction | - SP4903-84 * <br> (Scanner gamma setting) |
| Gradation | Error Diffusion/ Line Width Correction | - SP4903-78 to 80 *, 4904-20 (Line Width Correction Type) |

## 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 Features - General Features - Original Mode Quality Level), the user can select 'Screen Printed', 'Normal', 'Continuous Tone', and 'SP Mode Changed'. The settings of the SP modes indicated with an asterisk (*) are not used unless the user selects 'SP Mode Changed'.
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 |
| :---: | :---: | :---: |
| Input Correction 1 | Auto Shading |  |
| Input Correction 2 |  | - SP4903-66 * <br> (Scanner Gamma Thresh Level) <br> - SP4903-071 * <br> (Background Erase Level) |
| Filtering | Smoothing/MTF | - SP4903-012 * <br> (Pre Filter Coefficient) <br> - SP4903-009* <br> (Filter Type Selection) <br> - SP4903-036 to 038 * <br> (Smoothing/MTF Filter Coefficient <br> Level in Photo Mode) <br> - SP4904-006 <br> (Smoothing Filter Level) |
| Magnification | Main Scan Magnification | - SP2909-001 (Main Scan Magnification) |
| ID Control | $\gamma$ Correction |  |
| Gradation | Error Diffusion/ <br> Dither Matrix | - SP4904-002 * (Grayscale Process Selection: Dither or Error Diffusion) |

## Text/Photo Mode

MTF filtering is used for text/photo mode.
With UP Mode (Copy Features - General Features - Original Mode Quality Level), the user can select 'Photo Mode', 'Normal', 'Text Mode', and 'SP Mode Changed'. The settings of the SP modes indicated with an asterisk (*) are not used unless the user selects 'SP Mode Changed'.

|  | Image Processing Path | Related SP Modes |
| :---: | :---: | :---: |
| Input Correction 1 | Auto Shading |  |
| Input Correction 2 | Background Erase | - SP4930-67* <br> (Scanner Gamma Thresh Level) <br> - SP4903-072 * <br> (Background Erase Level) <br> - SP4906* <br> (On/Off in Text/Photo Mode) <br> - SP4903-062 <br> (Independent Dot Erase Level) |
|  | Independent Dot Erase |  |
| Filtering | $\frac{\downarrow}{\mathrm{MTF}}$ | - SP4903-013 to 014 * (Pre Filter Coefficient) <br> - SP4903-039 to 054 * (Filter Level and Strength) <br> - SP4904-007 <br> (Texture Erase Filter Level) |
| Magnification | Main Scan Magnification | - SP2909-001 (Main Scan Magnification) |
| ID Control | $\gamma$ Correction | - SP4903-85 * (Scanner gamma setting) |
| Gradation | Error Diffusion/ Line Width Correction | - SP4904-003, 005 * <br> (Error Diffusion) <br> - SP4903-81 to 83 *, SP4904-22 (Line Width Correction Type) |

## 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 Features - General Features - Original Mode Quality Level), the user can select 'Soft', 'Normal', 'Sharp', and 'SP Mode Changed'. The settings of the SP modes indicated with an asterisk (*) are not used unless the user selects 'SP Mode Changed'.

|  | Image Processing Path | Related SP Modes |
| :---: | :---: | :---: |
| Input Correction 1 | Auto Shading |  |
| Input Correction 2 | Background Erase | - SP4903-068 * <br> (Scanner Gamma Thresh Level) <br> - SP4903-73 * <br> (Background Erase Level) |
|  | Independent Dot Erase | - SP4903-063 (Independent Dot Erase Level) |
| Filtering |  | - SP4903-015 * <br> (Pre Filter) <br> - SP4903-055 to 056 * <br> (MTF Filter Coefficient - Pale Originals) |
| Magnification | Main Scan Magnification | - SP2909-001 <br> (Main Scan Magnification) |
| ID Control | $\gamma$ Correction |  |
| Gradation | Grayscale Processing/ Line Width Correction | - SP4904-23 <br> (Line Width Correction Type) |

## 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 Features - General Features - Original Mode Quality Level), the user can select 'Soft', 'Normal', 'Sharp', and 'SP Mode Changed'. The settings of the SP modes indicated with an asterisk (*) are not used unless the user selects 'SP Mode Changed'.

|  | Image Processing Path | Related SP Modes |
| :---: | :---: | :---: |
| Input Correction 1 | Auto Shading |  |
| Input <br> Correction 2 | Background Erase | - SP4903-069 * <br> (Scanner Gamma Thresh Level) <br> - SP4903-074 * (Background Erase Level) |
|  | Independent Dot Erase | - SP4903-064 (Independent Dot Erase Level) |
| Filtering |  | - SP4903-016 * (Pre Filter Coefficient) <br> - SP4903-057 to 058 * (MTF Filter Coefficient Generation Copy) |
| Magnification | Main Scan Magnification | - SP2909-001 (Main Scan Magnification) |
| ID Control | $\gamma$ Correction |  |
|  |  |  |
| Gradation | Grayscale Processing/ Line Width Correction | - SP4903-75 to $77^{*}$, SP4904-24 (Line Width Correction Type) |

### 2.3.6 AUTO SHADING



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


### 2.3.7 BACKGROUND ERASE



## 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.

### 2.3.8 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 $5 \times 5$ 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.

| 20 | 40 | 30 | 20 | 40 |
| :---: | :---: | :---: | :---: | :---: |
| 30 | 0 | 70 | 30 | 30 |
| 30 | 10 | 50 | 20 | 30 |
| 60 | 20 | 0 | 30 | 0 |
| 20 | 30 | 40 | 30 | 30 |

Object pixel
$\square$ Surrounding pixels to be used for calculation


Ignored pixels

### 2.3.9 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 $\rightarrow$ Filtering
2. $65 \%$ reduction or higher

Filtering $\rightarrow$ Main Scan Magnification

## 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



Scanned Data
Points
Calculated Data Points
Enlarged Image
Data Points
140\% Enlargement


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

### 2.3.10 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.

### 2.3.11 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-graduation processing
2) Four-graduation processing
3) Error diffusion
4) Dithering

These three processes are used as follows:

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

## Three-graduation Processing

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

## Four-graduation 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, $8 " \times 8 ", 6 " \times 6 "$, and $4 " \times 4$ ". A larger dither matrix causes halftone areas to become coarser.

### 2.3.12 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 AUTO POWER CONTROL



IC2 and IC3 on the LDDR drive the laser diodes. 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, IC2 and IC3 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 (REF1 and REF2). 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 LDDR in the field.

### 2.4.2 DUAL BEAM WRITING



This LD unit has two laser diodes; LD1 [A] and LD2 [B] for writing the image. This means that each face of the polygon mirror writes two main scan lines, and twelve main scans are produced when the polygon mirror rotates once. The reasons for this mechanism are as follows.

1) To reduce the polygon motor rotation speed
2) To reduce the noise generated by the polygon motor
3) To reduce the frequency of the image data clock

Two laser beams are transferred to the polygon mirror [C] through collimating lens [D] and prism [E]. The two laser beams arrive on the drum surface about 2 mm away from each other in the main scan direction and about 0.04 mm (at 600 dpi ) in the sub scan direction (see the next page).
The reason for the two-mm difference in the main scan direction is so that the machine can detect a laser synchronization signal for each beam.

### 2.4.3 LASER BEAM PITCH CHANGE MECHANISM



A printer option is available for this machine and the resolution of the printer is 400 dpi or 600 dpi . The machine changes the resolution between 400 and 600 dpi by rotating the LD unit.
When the LD positioning motor $[A]$ turns, the metal block $[B]$ (which contacts the LD unit housing [C]) moves up and down. This changes the position of the L2 laser beam (L1 does not move).

Both LD unit positions are at fixed distances from the LD home position sensor [D] (measured by motor pulses). Usually, the LD unit moves directly to the proper position. However, when the number of times that the resolution has changed reaches the value of SP2-109-5, the LD unit moves to the home position (the home position sensor activates), then it moves to the proper position. This recalibrates the LD unit positioning mechanism.

### 2.4.4 LD SAFETY SWITCHES



To ensure technician and user safety and to prevent the laser beam from inadvertently switching on during servicing, there are two safety switches located at the front cover. These two switches are installed in series on the LD5 V line coming from the power supply unit (PSU) through the BICU board.
When the front cover or the upper right cover is opened, the power supply to the laser diode is interrupted.

### 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 $100^{\circ} \mathrm{C}$ and SP3901 is on).

1) Potential Sensor Calibration
2) VSG Adjustment
3) $V G($ Grid Voltage) Adjustment
4) LD Power Adjustment
5) VREF Update
6) Density Adjustment

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 "Development and Toner Supply" section for more details.

## Drum potential sensor calibration



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 development power pack [C] has two relay contacts. Usually RA102 grounds the drum. However, to calibrate the sensor, the BICU switches RA102 and RA101 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 V and -700 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, SC310 or 311 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 $4.0 \pm 0.2 \mathrm{~V}$. 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, SC353 or 354 is logged and toner density control is done using the TD sensor only.
For details of how the machine determines an abnormal sensor detection, see section 7 (Troubleshooting).

DRUM UNIT

## Vg Adjustment



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

The BICU checks VD using the drum potential sensor [A]. If it is not within the target range ( $-900 \mathrm{~V} \pm 10 \mathrm{~V}$ ), the BICU adjusts VG (Grid Voltage) through the Charge/Grid power pack to get the correct target voltage.
The most recently detected values can be displayed with SP3-902-2 (VD) and 3-902-4 (VG).
If the CPU cannot get VD within the target range by changing VG, VG is set to the value in SP2001-001 and SC312 is logged.
For details of how the machine determines an abnormal sensor detection, see section 7 (Troubleshooting).

## LD power adjustment



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 drum potential sensor detects the potential on this pattern. The LD power is adjusted until VH becomes $-300 \mathrm{~V} \pm 20 \mathrm{~V}$.

This is done only during process control initial setting.
The latest VH can be displayed using SP3-902-3. The corrected LD power can be displayed using SP3-902-5 (the default is stored in SP2-103-1-4). See "Laser exposure" for more details about laser power.
If VH cannot be adjusted to within the standard within 25 attempts, LD power is set to the latest value (the one used for the 25th attempt) and SC314 is logged.
For details of how the machine determines an abnormal sensor detection, see section 7 (Troubleshooting).

## Toner Density Adjustment

This adjustment uses the ID sensor to maintain the toner density in the development unit to around the target range as follows.

Vsp/Vsg $\geq$ Target range: Supply Toner
Vsp/Vsg $\leq$ Target range: Consume Toner

DRUM UNIT

## Vref Update

The TD sensor reference voltage (VREF) is updated to stabilize the concentration of toner in the development unit as follows;
New VREF $=$ Current VREF $+\Delta$ VREF
$\Delta \mathrm{VREF}$ is determined using the following $\mathrm{Vsp} / \mathrm{Vsg}$ and $\mathrm{VREF}-\mathrm{V} T$ table

|  | Vsp/Vsg (B) |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| VREF- $V_{T}$ <br> (A) |  | $\mathrm{B}<0.055$ | $0.055<\mathrm{B}=<0.07$ | $\cdots \cdots \cdots$ | $0.15<\mathrm{B}$ |
|  | $\mathrm{A}=<-0.2$ | 0.25 | 0.22 | $:$ | -0.03 |
|  | $-0.2<\mathrm{A}=<-0.1$ | 0.25 | 0.22 | $:$ | -0.05 |
|  | $:$ | $\vdots$ | $\vdots$ | $\vdots$ | $\vdots$ |
|  | $:$ | $0.2<\mathrm{A}$ | 0 | $:$ | $\vdots$ |

VT: TD Sensor Output

When SC350, 351 or 352 (ID Sensor Abnormal) is generated, VREF is not updated. The machine uses the current value.

VREF is updated during process control initial setting. It is also updated if both of the following conditions exist:

- 10 or more copies have been made since the last VREF update
- The copy job is finished


### 2.5.2 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
2. Drum Potential Sensor
3. Pick-off Pawl
4. Image Density Sensor
5. Toner Collection Coil
6. Cleaning Brush
7. Cleaning Blade
8. Charge Power Pack
9. Quenching Lamp
10. Charge Corona Unit

## DRUM UNIT

### 2.5.3 DRUM CHARGE

## Overview



This copier uses a double corona wire scorotron system to charge the drum. 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 grid bias voltage.
The charge power pack [A] gives a constant corona current to the corona wires (-1300 $\mu \mathrm{A}$ ).
The bias 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 Mechanism



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 located 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. This is only done when 5000 or more copies have been made since the wires were cleaned last.

### 2.5.4 DRUM CLEANING AND TONER RECYCLING

## Overview



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 $[B]$ supports 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 to the toner collector bottle.
To remove any accumulated toner at the edge of the cleaning blade, the drum turns in reverse for about 10 mm at the end of every copy job. The accumulated toner is deposited on the drum and is removed by the cleaning brush.

## Drive Mechanism




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

## Cleaning Blade Pressure Mechanism and Side-to-Side Movement



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 pin [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.

### 2.5.5 OTHERS

## Air Flow Around the Drum



The drum cooling fan $[\mathrm{A}]$ 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.

## DRUM UNIT

## Pick-off Mechanism



The pick-off pawls are always in contact with 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 an a cam [B].

### 2.6 DEVELOPMENT AND TONER SUPPLY

### 2.6.1 OVERVIEW



- Paddle Roller [A]
- Upper Development Roller [B]
- Lower Development Roller [C]
- Toner Density Sensor [D]
- Developer Agitator [E]
- Toner Auger [F]
- Development Filter [G]
- Toner Supply Motor [H]
- Toner End Sensor [I]
- Toner Agitator [J]
- Toner Supply Roller [K]
- Toner Hopper [L]

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:
(1) It develops the image in a narrower area
(2) It develops the image twice
(3) The relative speed of each development roller against the drum is reduced.

Also, this machine uses fine toner (about $9.5 \mu \mathrm{~m}$ ) and developer (about $80 \mu \mathrm{~m}$ ). 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. The recycled toner is carried to the toner hopper [L] by the toner recycling motor and mixed with new toner by the toner agitator [J]. (The toner recycling system is described in the "Drum Cleaning And Toner Recycling section".)

### 2.6.2 DEVELOPMENT MECHANISM



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 -120 V ) and white areas are at a high negative charge (about -900 V ).
$\Rightarrow$ The development roller is given a negative bias (-550 V) 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 DEVELOPMENT BIAS



To attract negatively charged toner to the black areas of the latent image on the drum, the development power pack [A] applies the negative development bias to the upper and lower sleeve roller through the terminal $[B]$ and roller shafts [C].
Also, the bias is applied to the lower casing through the spring which is mounted on the front lower development shaft. The bias applied to the lower casing prevents toner from being attracted back from the drum.

### 2.6.4 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 changed with SP2-208. The factory setting is sensor control mode. Image pixel count mode should only be used if the TD and ID sensor are defective.


## Sensor control mode

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.

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


## Toner density sensor initial setting

When the new developer is installed, TD sensor initial setting must be done using SP2-801. This sets the sensor output to 3.0V. This value will be used as the TD sensor reference voltage (VREF).
If Vt cannot be adjusted to within standard, SC341 or 342 is generated and the machine cannot make copies.

## 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. VSP/VSG is detected at the end of a copy job of more than 10 pages to update the TD sensor reference voltage (VREF). This interval can be changed using SP2-210. This compensates for any variations in the reflectivity of the pattern on the drum or the reflectivity of the drum surface.

## Vref Update

VREF is updated using VsP/VsG and V . This is done (or at the end of a copy job of more than 10 pages, and during process control initial setting. See "Vref Update" in the Process Control section for details.

## VT detection

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

## Image pixel count

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

## Gain Determination

GAIN is another factor in the toner supply clutch on time calculation. Its value can be $0,1,2,3$, or 4 . It is calculated every copy using "VREF - VT".

## Toner Supply Clutch On Time Calculation

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

### 2.6.5 TONER END DETECTION

Toner near end and toner end are detected every copy using the toner end sensor and toner supply motor as follows.

## Toner Near End

When the toner end sensor is on for two consecutive pages, the toner supply motor turns on for 1.1 s . If the toner supply motor has turned on more than 30 times during the last 100 prints, "Toner Near End" is displayed.

The "Toner Near End" condition is cleared if the toner end sensor turns off.

## Toner End

If the toner end sensor has been continuously on for 200 copies (toner end sensor copy counter), "Toner End" is displayed.
If the toner end sensor is off twice consecutively, the toner end sensor copy counter is reset to 0 .

### 2.6.6 TONER END RECOVERY

If the front door is opened and closed while a toner near end or toner end condition exists, the machine will attempt to recover using measurements from the toner end sensor and TD sensor.

At this time, the drum and development motor, charge and development bias turn on.

The toner supply motor turns on for 1.1 s , then the toner supply clutch turns on for 1s. Then the CPU checks the toner end sensor output.

If the toner end sensor is off (meaning that there is toner in the toner hopper), the CPU compares VT and VREF.

If VT is less than or equal to VREF (meaning that there is enough toner in the development unit), the CPU waits for 20s to mix the toner in the developer evenly. Then the above components turn off, and the toner end or toner near end is cleared.

If VT is more than VREF, the CPU turns on the toner supply clutch for 1 s again until VT becomes less than or equal to VREF.
If the toner end sensor output remains on even after trying the above procedure 7 times, the components turn off and "Toner End" remains on.

### 2.6.7 ABNORMAL TD AND ID SENSOR CONDITIONS

If the TD sensor and/or ID sensor is/are defective, the toner supply mode is changed as follows.

## TD Sensor Defective

The toner supply amount is controlled by the ID sensor. ID sensor output is used to decide the GAIN factor for the toner supply clutch on time calculation. SC340 is logged.

## ID Sensor Defective

The toner supply amount is controlled by the TD sensor. However, TD sensor reference output VREF is not updated.
SC350, 351, 352, 353 or 354 is logged.

## TD and ID sensor defective

Toner supply mode is changed to image pixel count mode.

### 2.7 IMAGE TRANSFER AND PAPER SEPARATION

### 2.7.1 IMAGE TRANSFER AND PAPER SEPARATION MECHANISM

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 (l1 and I2) fed back from the drive rollers at each end of the transfer belt.

Then, the power pack adjusts It to keep the current (14) 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 if there are fluctuations.


### 2.7.2 TRANSFER BELT UNIT LIFT MECHANISM



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 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 coming into contact with material of the rubber belt.

### 2.7.3 TRANSFER BELT CLEANING MECHANISM



Some toner may adhere to the transfer belt when paper jams occur, or when the by-pass feed table side fences are set in the wrong position. The adhered toner must be removed to prevent the rear side of the copy paper from getting dirty.
The cleaning roller $[A]$ is always in contact with the transfer belt. It collects toner and paper dust adhering to the surface of the transfer belt. This is because a positive bias is applied to the cleaning roller and this attracts the negatively charged toner on the transfer belt.

A counter blade system cleans the cleaning roller. The cleaning blade [B] scrapes off toner collecting on the cleaning roller [A]. The gear [C] moves the agitator plate [D] from side to side to transport toner to the toner collection coil [E]. Toner cleaned off the transfer belt is transported to the waste toner collection bottle by the coil.

### 2.8 PAPER FEED

### 2.8.1 OVERVIEW



This model has three built-in paper feed trays: tandem LCT (1st tray) [A] (1550 + 1550 sheets), universal tray (2nd tray) [B] (550 sheets), and single-size tray (3rd tray) [C] (550 sheets).

Paper can also be fed using the by-pass feed table [D] which has an independent feed mechanism. The by-pass feed table can hold 50 sheets of paper.
All feed stations use an FRR feed system.

## PAPER FEED

### 2.8.2 DRIVE MECHANISM


[A] Paper Feed Motor
[B] Paper Feed Clutches
[C] Vertical Relay Clutches
[D] Relay Clutch
[E] By-pass Feed Motor
[F] By-pass Feed Clutch
[I] Bank Relay Clutch

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

The by-pass feed motor [E] drives all the rollers in the by-pass tray via gears and a clutch [F].

The second vertical relay clutch has a one-way-gear [G]. This prevents the clutch from slipping when the knob $[\mathrm{H}]$ is turned to remove jammed paper in the paper feed tray and vertical transport area.

### 2.8.3 TANDEM LCT - TRAY 1

## Overview



1,550 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.

## PAPER FEED

## Connecting the Left and Right Sides of the Tray



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.


When the machine detects that the 1st paper tray is set in the machine, the right 1 st 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 1,550 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 [l] 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 near end sensor [J], the paper near end condition is detected.

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.


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.

## Fence Drive



The side fences [A] of the right tray are normally closed. They open only when paper in the left tray goes 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 positioning sensor [C] activates.

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

## PAPER FEED

## Rear Fence Drive

## [E]



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




## Side-to-side Positioning

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

### 2.8.4 TRAY POSITIONING MECHANISM - TRAYS 1 TO 3

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.

### 2.8.5 PAPER LIFT MECHANISM - TRAYS 2 AND 3



When the machine detects that the paper tray has been placed in the machine, 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].

### 2.8.6 VERTICAL TRANSPORT MECHANISM



The vertical transport rollers $[A]$ in each feed unit are all driven by the paper feed motor. The vertical transport rollers and the idle vertical transport 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.

### 2.8.7 PAPER REGISTRATION

## Overview



The registration sensor $[\mathrm{A}]$ is positioned just before the registration rollers $[\mathrm{B}]$.
When the paper leading edge activates the registration sensor, the registration motor is off and the registration rollers are not turning. However, the relay clutch [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.

### 2.8.8 PAPER SIZE DETECTION - TRAY 2



| SW <br> Actuated - 0 <br> De-actuated - 1 | Paper size | L: Lengthwise S: Sideways |
| :---: | :---: | :---: |
|  | A4/A3 <br> Version | LT/DLT Version |
| 01111 | A3-L | 11" x 17"-L |
| 00111 | 81/4" x 13" | 81/2" x 14"-L |
| 10011 | A4-L | 81/2" $\times 11^{\prime \prime-L}$ |
| 01001 | A4-S | 81/2" x 11"-S |
| 00100 | 81/2" x 13" | 51/2" $\times$ 81/2"-L |
| 00010 | A5-L | 51/2" $\times 81 / 2^{\prime \prime}-\mathrm{S}$ |
| 00001 | A5-S | 8" $\times 101 / 2^{\prime \prime}-\mathrm{L}$ |
| 10000 | - | 8" x 10"-L |
| 11000 | - | 8" x 13"-L |
| 11100 | - | 10" x 14"-L |
| 11110 | * | * |

For the first and the third feed trays, the paper size has to be stored with a UP mode.

For the second feed tray (universal tray), 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.

### 2.9 IMAGE FUSING

### 2.9.1 OVERVIEW



After the developed latent image is transferred from the drum to the paper, the copy paper enters the fusing unit. Then the image is fused to the copy paper by a heat and pressure process through the use of a hot roller $[\mathrm{A}]$ and a pressure roller [B].

There are two fusing lamps [C] in the hot roller. Both lamps are 550 W lamps. They switch on and off at the same time.

The fusing lamps turn on and off to keep the operating temperature at $185^{\circ} \mathrm{C}$. The CPU monitors the hot roller surface temperature through a thermistor [D] which is in contact with the hot roller surface. A thermofuse [E] protects the fusing unit from overheating.

The hot roller strippers [F] separate the copy paper from the hot roller and direct it to the fusing exit rollers [G]. The exit sensor in the inverter and paper exit unit monitors the progress of the copy paper through the fusing unit and acts as a misfeed detector while the exit rollers feed the copy paper to the inverter section.
The hooking position of the tension springs [H] on the pressure lever [I] adjusts the roller pressure.
The oil supply roller [J] applies a light coat of silicone oil to the hot roller. The oil supply cleaning roller $[\mathrm{K}]$ removes the paper dust attached to the cleaning roller.
The fusing sensor [L] detects concertina jams at the fusing unit exit. This sensor is needed because the user may not see this type of jam inside the machine when removing jams at the exit.

### 2.9.2 FUSING ENTRANCE GUIDE



The entrance guide [A] for this machine is adjustable for thick or thin paper.
For thin paper, the entrance guide should be in the upper position (this is the standard position). This slightly lengthens the paper path which prevents the paper from creasing in the fusing unit.

For thick paper, move the entrance guide to the lower position. This is because thick paper does not bend as easily, and is therefore less prone to creasing. Also, 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 the paper path to the fusing entrance is stabilized. This reduces the chance of paper creasing due to paper skew in the fusing unit.

### 2.9.3 FUSING DRIVE MECHANISM



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 the idle gear [E] to the exit roller drive gear [F].
The pressure roller is driven by the friction between the hot and pressure rollers.

### 2.10 PAPER EXIT/DUPLEX

### 2.10.1 OVERVIEW



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.

### 2.10.2 INVERTER

## Feed-in and Jogging



When the paper is fed to the jogger section by the inverter feed roller [A], it pushes down the gate $[B]$. After the paper passes through the gate $[B]$, the jogger fences [C] move to square the paper. This happens every page.
NOTE: The gate has no solenoid. A spring pushes the gate back up again after the paper has gone.
The jogger motor (a stepper motor) [D] moves the jogger fences [C] 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 [E].
When the start key is pressed, the jogger motor positions the jogger fences 10 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 ( 10 mm away from the paper).

## PAPER EXIT/DUPLEX

## Feed-out



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 paper is fed from the reverse roller to the inverter exit roller [D]. After the paper starts to be fed by the inverter exit roller, the reverse trigger roller moves back up.

### 2.10.3 DUPLEX TRAY FEED MECHANISM

In duplex mode, after the paper leaves the inverter, the duplex inverter 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] and 2 [D], and the duplex feed roller [E].
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.
The duplex inverter sensor [F] controls the on/off timing of the inverter exit clutch which stops paper coming into the duplex unit for a while. If image processing for the page coming out of the duplex unit is taking a long time, this mechanism prevents the paper entering the duplex unit from slipping over the paper at the duplex unit exit and accidentally being fed out of the unit first. The mechanism maintains the maximum productivity of printing while preventing this type of duplex feed error. When the clutch is on, paper stops.

### 2.10.4 BASIC DUPLEX FEED OPERATION

## $\Rightarrow$ Longer than A4 / Letter lengthwise (8.5 x 11 L)

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 $[\mathrm{B}]$ in the illustration shows the order of sheets of copy paper (if shaded, this indicates the second side).

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

2. The first 2 sheets go into the duplex unit

3. The back of the 1 st sheet (2nd page) is printed.
4. The 3rd sheet (5th page) is fed and printed.
5. The 1 st sheet ( 1 st and 2 nd pages) is fed out.
6. The back of the 2 nd sheet (4th page) is printed.
7. The 4th sheet (7th page) is fed and printed.

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

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


### 2.11 ENERGY SAVER MODES

### 2.11.1 LOW POWER MODE

## Entering low power mode

The low power shift timer runs out after the end of a job.

## What happens in low power mode

The fusing lamp drops to a certain temperature, that depends on the setting of SP5-920 (the default is $177^{\circ} \mathrm{C}$ ). The other conditions are the same as for energy saver mode.

## Return to stand-by mode

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

The recovery time from low power mode depends on the setting of SP5-920. The default (from $177^{\circ} \mathrm{C}$ ) is about 20 seconds.

| Recovery <br> Time | Operation <br> Switch | Energy <br> Saver LED | Fusing Temp. | System <br> +5V | Main Power <br> LED |
| :---: | :---: | :---: | :---: | :---: | :---: |
| About <br> 20 seconds | On | On | $170^{\circ} \mathrm{C}(\mathrm{A} 292)$ <br> $177^{\circ} \mathrm{C}(\mathrm{A} 293)$ | On | On |

INSTALLATION

## 3. INSTALLATION PROCEDURE

### 3.1 INSTALLATION REQUIREMENTS

### 3.1.1 ENVIRONMENT

1. Temperature Range: $10^{\circ} \mathrm{C}$ to $32^{\circ} \mathrm{C}\left(50^{\circ} \mathrm{F}\right.$ to $\left.89.6^{\circ} \mathrm{F}\right)$
2. Humidity Range: $15 \%$ to $80 \% \mathrm{RH}\left(27^{\circ} \mathrm{C} 80 \%, 32^{\circ} \mathrm{C} 54 \%\right)$
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 Less than $0.10 \mathrm{mg} / \mathrm{m}^{3}\left(2.7 \times 10^{-6} \mathrm{oz} / \mathrm{yd}^{3}\right)$
5. Ambient Dust:
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 $5 \mathrm{~mm}\left(0.2^{\prime \prime}\right)$ of level
2. Right to left: Within $5 \mathrm{~mm}\left(0.2^{\prime \prime}\right)$ of level

NOTE: The machine legs may be screwed up or down 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.


More than 70 cm, 27.6"

### 3.1.4 POWER REQUIREMENTS

$\triangle$ CAUTION1. 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:
2. Permissible voltage fluctuation:
$120 \mathrm{~V} / 60 \mathrm{~Hz}$ : More than 20 A 220~240 V/50-60 Hz: More than 10 A 10\%

### 3.2 COPIER (A229/A293)

### 3.2.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box against the following list:
Description Q'ty

1. Model Name Decal (-15, -22 machines) ..... 1
2. Operation Instructions - English (-14, -15, -17, -22, -26, -29 machines) ..... 1
3. NECR with Envelope - English (-17 machines) ..... 1
4. NECR - Multi-language (-27, -29 machines) ..... 1
5. Operation Panel Brand Decal (-22 machines) ..... 1
6. Paper Size Decal ..... 1
7. Decal - Face Up ..... 1
8. Original Exit Tray ..... 1
9. Tapping Screw $-\mathrm{M} 4 \times 8$ ..... 3
10. Plastic Mylar - Large ..... 2
11. Plastic Mylar - Small ..... 1
12. Leveling Shoes ..... 2
13. Operation Instruction Holder ..... 1

### 3.2.2 INSTALLATION PROCEDURE

## . CAUTION <br> Rating Voltage for Peripherals

Make sure to plug the cables into the correct sockets.

## FINISHER

"Rating voltage of Output Connector for Accessory; Max. DC 24 V"

[^0]NOTE: Since the installation procedure is not packed with the copier as an accessory, always bring this manual with you.



## ©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 $[B]$ at the front, and level the machine before starting the installation. (The leveling feet [B] can be screwed up or down.) Extra leveling shoes and leveling feet are available as spare parts.

1. Remove the strips of tape from the outside as shown above.
2. Keep the factory setting data sheet [C] for future usage.

3. Draw out trays 1 and 2, and take out the accessory items [A] placed inside.
4. Remove the strips of tape from the inside and spring retainer $[B]$ as shown above.


5. Open the front cover and remove the strips of tape $[A]$.
6. Remove the blade release pin $[B]$ together with the transfer belt lock plate [C] (1 screw).
7. Pull out the fusing unit. Lower the lever [D], remove the oil supply unit [E], and remove the front and rear clamps [F]. Reinstall the oil supply unit and push in the fusing unit. Remove the strip of filament tape [G] from the fusing unit.

8. Remove the shutter inner cover $[A]$ ( 1 screw).
9. Remove the screw $[B]$ securing the toner bottle holder.
10. Swing out the toner bottle holder [C].
11. Remove the screw [D] that holds the drum stay [E].
12. Remove the drum stay knob [F] and the drum stay (turn the knob clockwise to remove it).

13. Disconnect two connectors [A].
14. 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 [D], to prevent foreign matter from being attracted to the sleeve rollers.
15. Remove the two screws $[E]$ that hold the toner hopper [F].
16. Remove the toner hopper by lifting it out.

17. Pour in one pack of developer [A] while turning the knob [B]. Distribute the developer evenly along the development unit.
18. Attach the toner hopper [C] to the development unit (2 screws).
19. Install the development unit in the machine.
20. Connect two connectors [D].
21. Attach the drum stay [E] and attach the drum stay knob [F] and one screw [G].

NOTE: When installing the drum stay, be careful not to pinch the cables, and keep the cables away from the gear $[\mathrm{H}]$.

22. Set the toner bottle holder in position (1 screw [A]) and attach the shutter inner cover [B] (1 screw).
NOTE: When attaching the shutter cover, make sure that the pin [C] in the shutter engages the stopper [D].
23. Install a toner bottle by following the instructions on the decal.
24. Attach the three plastic mylar strips [E] to the back of the original exit tray [F].

NOTE: 1) The small mylar strip should be in the middle.
2) The mylar strips must be attached to the tray side [G] first, then to the base copier side $[\mathrm{H}]$.

25. Install the original exit tray [A] (3 screws).
26. Connect the ARDF connector $[B]$ to the socket at the rear of the copier.
27. Attach the face up decal [C] to the feed tray as shown.
28. Plug in the power cord, then turn on the main power switch and the operation switch.
NOTE: Do not make any copies until after SP2963 has finished in step 30.
29. Before the machine automatically starts the Auto Process Control (within approximately 2 minutes after the main switch is turned on), 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.

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$$

NOTE: If you cannot enter the SP mode before the machine automatically starts Auto Process Control, do not turn off the main switch until step 30 finishes.
30. Select "Copy SP" on the LCD, and perform the initial setting as follows:

1) Enter " 2963 " using the numeric keys.
2) Press the "Enter" key.
3) Press the "Start" key on the LCD.

NOTE: This SP mode performs the TD initial setting and the forced toner supply. It will stop automatically when both procedures have finished.
31. Initialize the electrical copy counter using SP7-825.
32. If necessary, select the correct display language (SP5-009).
33. Press the "Exit" key on the LCD to exit SP mode.
34. Change the paper size for all paper trays to suit the customer's requests. (See section 3.3 "Paper Size Change" for details.)
35. Attach the appropriate paper size decals, which are included as accessories, to each paper feed tray.
36. Check copy quality and machine operation.

### 3.3 LCT (A698)

### 3.3.1 ACCESSORY CHECK

Check the accessories in the box according to the following list:

Description Q'ty

1. LCT Feed Unit ..................................................................... 1
2. Small Cap - Left Cover ........................................................ 1
3. Tapping Screw - M4 x 8....................................................... 3
4. Philips Pan Head Screw - M4 x 16 ...................................... 3
5. Philips Pan Head Screw - M4 x 6 ........................................ 1
6. Installation Procedure (English)........................................... 1
7. New Equipment Condition Report (Multi-language)............. 1

### 3.3.2 INSTALLATION PROCEDURE



## $\triangle$ CAUTION <br> Unplug the copier power cord before starting the following procedure.

1. Remove the four strips of tape $[A]$.
2. Open the LCT cover $[B]$ and remove the tape $[C]$ fixing the paper trailing edge stopper.
3. Remove the tray cushion [D] secured with strips of tape [E].
4. Remove the LCT connector [F] (3 screws).

5. Remove the feed unit cover [A] (2 screws) and free the LCT connectors [B].
6. Remove the shipping retainers [C].
7. Install the LCT feed unit [D] to the copier (3 screws - M $4 \times 8$ ).


8. Install the LCT connector $[\mathrm{A}]$ to the copier.
1) Remove the three caps $[B]$.
2) Set the two pins [C] of the LCT connector into the two holes [D] on the copier.
3) Install the LCT connector to the copier ( 3 screws - M4 x 16).
9. Remove the screw fixing the upper cover hinge $[E]$ then slide and remove the LCT cover [F] (1 screw).
10. Remove the rear upper cover [G] (2 screws).

11. Hold the upper stay [A] of the LCT and place the LCT on the plates $[B]$ of the LCT connector.

[^1]
15. Connect the connectors.

- Between the copier and the LCT (2 connectors).
- Between the LCT and the LCT feed unit (2 connectors).

16. Secure the protective earth wire $[A]$ on the copier ( 1 screw $-\mathrm{M} 4 \times 6$ ).
17. To install this LCT to the A292/A293 copier, the DIP SW [B] must be set as 288.3 rpm . (To install to the A229 copier, the DIP SW setting is 270 rpm .)
18. Install the rear upper cover [C] (2 screws).
19. Install the LCT cover [D] (1 screw).
20. Plug in the copier and check machine operation.

NOTE: The copier automatically recognizes that the LCT has been installed.

### 3.4 3,000-SHEET FINISHER (B312)

### 3.4.1 ACCESSORY CHECK

Check the accessories in the box according to the following list:

| No. | Description | Q'ty |
| :---: | :--- | :---: |
| 1 | Front Joint Bracket | 1 |
| 2 | Rear Joint Bracket | 1 |
| 3 | Entrance Guide Plate | 1 |
| 4 | Shift Tray | 1 |
| 5 | Exit Guide Mylar | 1 |
| 6 | Staple Position Decal | 1 |
| 7 | Tapping Screw - M3 x 6 | 1 |
| 8 | Tapping Screw - M4 $\times 14$ | 4 |
| 9 | Tapping Screw - M3 $\times 8$ | 4 |
| 10 | Cushion | 1 |
| 11 | Lower Grounding Plate | 1 |
| 12 | Installation Procedure (English) | 1 |
| 13 | New Equipment Condition Report (Multi-language) | 1 |



### 3.4.2 INSTALLATION PROCEDURE



[^2]1. Unpack the finisher and remove the tapes.

2. Install the front joint bracket [A] and rear joint bracket [B] (2 screws - M4 x 14 each).
3. Install the lower grounding plate [C].
4. The position of the cushion [D] varies depending on which base copier or peripherals that are installed. Attach the cushion on the plate as follows

- Position [E] for A292/A293 copier.
- Position [F] when the optional mailbox (G909) in installed.

5. Install the entrance guide plate [G] (2 screws).


Installation
6. Open the front door of the finisher, and remove the screw $[A]$ which secures the locking lever [B]. Then pull the locking lever.
7. Align the finisher on the joint brackets, and lock it in place by pushing the locking lever.
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].
8. Secure the locking lever (1 screw) and close the front door.
9. Install the shift tray [D] (4 screws).
10. Connect the finisher cable [E] to the main machine.
11. Attach the staple position decal [F] to the ARDF as shown.
12. Turn on the main power switch and check the finisher operation.

### 3.5 PUNCH UNIT INSTALLATION (A812) FOR B312 FINISHER

### 3.5.1 ACCESSORY CHECK

Check the accessories in the box against the following list.
Description ..... Q'ty

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. Harness - Long ..... 1
8. Harness - Short ..... 1
9. Hopper ..... 1
10. Punch Position Decal ..... 1
11. Tapping Screw $-\mathrm{M} 4 \times 10$ .....  2
12. Screw with Flat Washer - M4 x 6 ..... 1
13. New Equipment Condition Report (Multi-language) ..... 1

### 3.5.2 PUNCH UNIT INSTALLATION



## $\triangle$ CAUTION <br> Unplug the copier power cord and remove the 3,000-sheet finisher from the copier before starting the following procedure.

1. Unpack the punch unit and remove the shipping retainers [A] (4 screws) and [B] (1 screw).
2. Open the front door and remove the hopper cover [C] (2 screws).
3. Remove the rear cover ( 2 screws) and remove the transport guide plate [D] (4 screws).

4. Install the spacer $[\mathrm{A}]$ (thickness $=2 \mathrm{~mm}$ ).

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.
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]).


Installation
8. Install the sensor bracket [A] (1 short stepped screw, 1 spring).
9. Connect the cables $[B]$.

NOTE: 1) The cable binders [C] must not be between the cable clamps [D].
2) The cable binder [ E ] must be positioned to the left of the cable clamp.
10. When a three-punch-hole-unit is installed: Change switch 1 of DIP SW 100 on the punch drive board to ON.
11. Slide the hopper [F] into the finisher.
12. Reassemble the finisher and attach it to the copier. Then check the punch unit operation.

### 3.6 FINISHER (B302)

### 3.6.1 INSTALLATION PROCEDURE



## . CAUTION <br> 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 $\times 14$ screws each) on the left side of the copier.
4. Remove the connection plate [D].

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. - A294/A295 copiers only -

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 $\times 6$ 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 $\times 8$ screws).
13. Connect the finisher cable [E] to the copier.

### 3.7 PUNCH UNIT INSTALLATION (A812) FOR B302 FINISHER

### 3.7.1 ACCESSORY CHECK



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 $6 \ldots . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . ~ . ~ . ~ 1 ~ 1 ~$
10. Sensor Bracket ........................................................................... 1
11. Punch Position Decal ............................................................... 1

### 3.7.2 PUNCH UNIT INSTALLATION



## . CAUTION <br> 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).

3. Install the spacer $[\mathrm{A}]$ (thickness $=2 \mathrm{~mm}$ ).

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]).

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.

### 3.8 KEY COUNTER INSTALLATION




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].
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).

### 3.9 COPY CONNECTOR KIT INSTALLATION



1. If the optional LCT is installed, remove it from the copier.
2. Remove the original exit tray.
3. Remove the paper feed cover [A] (2 screws).
4. Remove the upper right cover [B] (2 screws).
5. Remove the connector cover [C] and the clamp cover [D] from the upper right cover.
6. Remove the connecting plate [E] (3 screws).

7. Connect the harness $[A]$ between the interface board $[B]$ and the connector board [C].
8. Connect the cable [D] to the boards.

NOTE: The terminals [E] must face the right hand side of the machine.
9. Install the interface board [F] (1 connector).
10. Install the connector board [G] (3 screws).

NOTE: Push the HDD cable [H] into the inside of the machine.
11. Reassemble the machine.

12. Install the other copy connector kit in the other machine.
13. Connect the two machines with the cable $[A]$ and secure it with clamps $[B]$ (1 screw each).
14. Check the operation.
$\Rightarrow$ NOTE: To enable the Connect Copy Feature:

1. Select User Tools.
2. Select Copy/Document Server Features
3. Select Count Manager
4. Set Connect Copy Master to YES.

### 3.10 COPY TRAY TYPE 700 INSTALLATION

### 3.10.1 ACCESSORY CHECK

Check the accessories in the box against the following list.

## Description Q'ty

1. Copy Tray ........................................................................... 1
2. Tray Paper Limit Sensor Assembly...................................... 1
3. Cap - 222 ............................................................................. 4
4. Connector Cap .................................................................... 1
5. Philips Tapping Screw - M4x8............................................. 2

### 3.10.2 INSTALLATION PROCEDURE

1) Remove the left cover [A] (2 screws).
[A]

2) Slide the collars (black) [B] into the holes in the rubber rollers [C] of the exit drive roller.

$\Rightarrow$
3) Remove the shorting connector $[A]$.
4) Install the tray paper limit sensor assembly [B].

[B]
5) Reinstall the left cover.
6) Install the four caps ( $\phi 22$ ) [C] and the connector cap [D].
7) Install the copy tray [E].


## SERVICE TABLES

## 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.
5. After replacing the LD unit, do the laser beam pitch adjustment. Otherwise, an SC condition will be generated.

### 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 (SP 2-801) should be done.

### 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.

NOTE: Hold the c/ه key for more than 3 seconds.
2) A menu of SP modes is displayed on the LCD.


NOTE: 1) The installed applications appear as Copy SP and Printer SP. If the printer application is not installed, its name does not appear.
2) The meaning of the bottom line is as follows.

- "Ver 7.15 uk" is the BICU board software version.

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


## 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.

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


## 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.

2. Touch the 2nd level program.


NOTE: A "*" mark indicates that there are 3rd level programs.
3. Touch the 3rd level program.

| SF Mode (Serviceman) |  | Copy mode | Prev. Menu | Exit |
| :---: | :---: | :---: | :---: | :---: |
| SP Made Class |  |  | W00-60 |  |
| 1002-1 | Tray-1 |  |  |  |
| 10022 | Tray-2 |  |  |  |
| $1002-3$ | Tray-3 |  |  |  |
| $1002-4$ | Tray-4 |  |  |  |
| 101025 | Duplex Tray |  |  |  |
| $10102-6$ | By-pass Tray |  |  |  |
| $1002-7$ | LCT |  | \$ P |  |

## 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 囲 key.

NOTE: 1) If you forget to touch the "Start" key or OK key, the previous value remains.
2) Change between " + " and "-" using the " $\bullet$ " 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) An asterisk ( *) in the right hand side of the mode number column means that this mode is stored in the NVRAM. If you do a RAM reset, all these SP modes will be reset to their factory settings.


| Mode No.(Class 1, 2 \& 3) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1-007 | By-pass Feed Paper Size Display |  |  |  |  |
|  |  |  |  | Displays the paper width sensor data for the by-pass feed table. <br> 132 : A3 <br> 133 : A4 Lengthwise <br> 134 : A5 Lengthwise <br> 141 : B4 Lengthwise <br> 142 : B5 Lengthwise <br> 160 : DLT <br> 164 : LG <br> 166 : LT Lengthwise <br> 172 : HLT Lengthwise |  |
| 1-008 | Duplex Fence Position Adjustment |  |  |  |  |
|  |  |  |  | Adjusts the position of the fence (side-toside position with reference to paper feed). | $\begin{aligned} & 0 \sim-2 \\ & 0.5 \mathrm{~mm} / \mathrm{step} \\ & -1.0 \mathrm{~mm} \end{aligned}$ |
| 1-103 | Fusing Idling |  |  |  |  |
|  |  |  | * | Selects whether fusing idling is done or not. <br> If fusing is incomplete on the 1st and 2nd copies, change the setting to a longer time. This may occur if the room is cold. Refer to "Detailed Section Descriptions Fusing Temperature Control" for more details. | 0: 51/2 min. <br> 1: 10 min . <br> 2: 15 min . <br> 3: No idling |
| $1-104$ | Fusing Temperature Control |  |  |  |  |
|  |  |  | * | Selects the fusing temperature control mode. <br> After changing the setting, turn the main switch off and on. | On/Off control Phase control |
| 1-105 | Fusing Temperature Adjustment |  |  |  |  |
|  | 1 | By-pass | * | Adjusts the fusing temperature for paper fed from a by-pass tray. | $\begin{aligned} & 170 \sim 200 \\ & 1^{\circ} \mathrm{C} / \text { step } \\ & 185^{\circ} \mathrm{C} \\ & \hline \end{aligned}$ |
|  | 2 | OHP | * | Adjusts the fusing temperature for OHP sheets fed from the by-pass feed unit. | $\begin{aligned} & +10 \sim-10^{\circ} \mathrm{C} \\ & 1^{\circ} \mathrm{C} / \text { step } \\ & 0\left(165^{\circ} \mathrm{C}\right) \end{aligned}$ |
|  | 3 | Thick Paper | * | Adjusts the fusing temperature for thick paper fed from the by-pass feed unit. | $\begin{aligned} & +5 \sim-10^{\circ} \mathrm{C} \\ & 1^{\circ} \mathrm{C} / \text { step } \\ & 0\left(195^{\circ} \mathrm{C}\right) \\ & \hline \end{aligned}$ |
| 1-106 | Fusing Temperature Display |  |  |  |  |
|  |  |  |  | Displays the fusing temperature. |  |
|  |  |  |  |  |  |


| Mode No.(Class $1,2 \& 3$ ) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1-901 | CPM Change for Special Paper |  |  |  |  |
|  | 1 | Thick Paper |  | Selects the copy speed when the paper setting for the by-pass table is thick paper. <br> NA: North America, EU: Europe | 0: 25 cpm <br> 1: 35 cpm <br> 2: 45 cpm <br> 3: 55 cpm <br> NA: 3 <br> EU: 2 |
|  | 2 | Tab Stack | * | Selects the copy speed when the paper setting for the 2nd tray is tab stack. | 0: 25 cpm <br> 1: 35 cpm <br> 2: 45 cpm <br> 3: 55 cpm <br> NA: 2 <br> EU: 0 |
| 1-904 | By-pass Tray Paper Size Correction |  |  |  |  |
|  | 1 | Minimum Size |  | Calibrates the minimum paper width position of the sensor ( 100 mm ). | Start |
|  | 2 | Maximum Size |  | Calibrates the maximum paper width position of the sensor (A3). | Start |
| 1-905 | Thick Paper Mode - By-pass Table |  |  |  |  |
|  |  |  | - | Selects the by-pass feed clutch on mode for thick paper mode. | ON: Twice OFF: Once |
| 2-001 | Charge Corona Bias Adjustment |  |  |  |  |
|  | $1$ | Image Area | * | Adjusts the voltage applied to the grid plate during copying when auto process control is off. <br> 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. <br> After replacing the drum or charge corona wire, change this value to the default. | $\begin{aligned} & -600 \sim-1300 \\ & 10 \mathrm{~V} / \text { step } \\ & -1000 \mathrm{~V} \end{aligned}$ |
|  | 2 | ID Sensor Pattern | * | Adjusts the voltage applied to the grid plate when making the ID sensor pattern. <br> 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. | $\begin{aligned} & \hline-600 \sim-1300 \\ & 10 \mathrm{~V} / \text { step } \\ & -650 \mathrm{~V} \end{aligned}$ |
|  | 3 | Total Corona Current | * | Adjusts the current applied to the charge corona wire. <br> Factory use only. | $\begin{aligned} & -900 \sim-1500 \\ & 10 \mu \mathrm{~A} / \text { step } \\ & -1300 \mu \mathrm{~A} \\ & \hline \end{aligned}$ |
|  | 4 | Image Area | * | Adjusts the voltage applied to the grid plate during copying when auto process control is on. <br> This voltage changes every time auto process control starts up (every time the machine is switched on) | $\begin{aligned} & -600 \sim-1300 \\ & 10 \mathrm{~V} / \text { step } \\ & -\mathbf{- 1 0 0 0 ~ V} \end{aligned}$ |


| Mode No.(Class 1, 2 \& 3) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 2-001 | Charge Corona Bias Adjustment |  |  |  |  |
|  | 5 | OHP Sheet | * | Adjusts the voltage applied to the grid plate when OHP mode is selected. <br> Use this if there is a copy quality problem when making OHPs. <br> Normally there is no need to adjust this. See 2-001-1. | $\begin{aligned} & -600 \sim-1300 \\ & 10 \mathrm{~V} / \text { step } \\ & -700 \mathrm{~V} \end{aligned}$ |
| 2-101 | Printing Erase Margin |  |  |  |  |
|  | 1 | Leading Edge | * | Adjusts the leading edge erase margin. | $\begin{aligned} & 0.0 \sim 9.0 \\ & 0.1 \mathrm{~mm} / \mathrm{step} \\ & 3.0 \mathrm{~mm} \end{aligned}$ |
|  |  |  |  | The specification is $3 \pm 2 \mathrm{~mm}$. See "Replacement and Adjustment - Copy Image Adjustments" for more on SP2-101. |  |
|  | 2 | Trailing Edge | * | Adjusts the trailing edge erase margin. | $\begin{aligned} & 0.0 \sim 9.0 \\ & 0.1 \mathrm{~mm} / \text { step } \\ & 3.0 \mathrm{~mm} \end{aligned}$ |
|  |  |  |  | The specification is $3 \pm 2 \mathrm{~mm}$. |  |
|  | 3 | Left | * | Adjusts the left side erase margin. | $\begin{array}{\|l\|} \hline 0.0 \sim 9.0 \\ 0.1 \mathrm{~mm} / \text { step } \\ \mathbf{2 . 0} \mathbf{~ m m} \\ \hline \end{array}$ |
|  |  |  |  | The specification is $2 \pm 1.5 \mathrm{~mm}$. |  |
|  | 4 | Right | * | Adjusts the right side erase margin. | $\begin{aligned} & 0.0 \sim 9.0 \\ & 0.1 \mathrm{~mm} / \mathrm{step} \\ & 2.0 \mathrm{~mm} \\ & \hline \end{aligned}$ |
|  |  |  |  | The specification is $2+2.5 /-1.5 \mathrm{~mm}$. |  |
| 2-103 | LD Power Adjustment |  |  |  |  |
|  | 1 | LD1-400dpi | * | Adjusts the power of LD1 for 400 dpi resolution. | $\begin{aligned} & -127 \sim+127 \\ & 1 / \text { step } \\ & 1=1.1 \mu \mathrm{~W} \\ & +0 \end{aligned}$ |
|  |  |  |  | Do not change the value. |  |
|  | 2 | LD1-600dpi | * | Adjusts the power of LD1 for 600 dpi resolution. |  |
|  |  |  |  | Do not change the value. |  |
|  | 3 | LD2 - 400dpi | * | Adjusts the power of LD2 for 400 dpi resolution. |  |
|  |  |  |  | Do not change the value. |  |
|  | 4 | LD2-600dpi | * | Adjusts the power of LD2 for 600 dpi resolution. |  |
|  |  |  |  | Do not change the value. |  |
|  | 5 | LD1 Power Adjustment (Start/End) | * | Factory use only. Do not use this SP mode. | Start <br> Stop |
|  | 6 | LD2 Power Adjustment (Start/End) | * | Factory use only. Do not use this SP mode. | Start <br> Stop |
| 2-109 | Laser Beam Pitch Adjustment |  |  |  |  |
|  | 1 | 400 dpi | - | Adjusts the laser beam pitch value for 400 dpi resolution. | $\begin{aligned} & 0 \sim 262 \\ & 4 \text { pulses/step } \\ & 144 \end{aligned}$ |
|  |  |  |  | After replacing the LD unit or replacing or clearing the NVRAM, use this SP mode and SP2-109-3 to adjust the laser beam pitch. Refer to "Replacement and Adjustment - Laser Beam Pitch Adjustment" for details. |  |








| Mode No. <br> (Class $1,2 \& 3)$ <br> 2 |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 2-965 | Toner Pump Adjustment |  |  |  |  |
|  | 1 | First Toner Waste Adjustment | * | Factory use only | $\begin{aligned} & \hline 0 \sim 100 \\ & 1 \mathrm{~g} / \mathrm{step} \\ & \mathbf{3 g} \end{aligned}$ |
|  | 2 | After First Toner Waste | * | Factory use only | $\begin{aligned} & 0 \sim 100 \\ & 1 \mathrm{~g} / \mathrm{step} \\ & 3 \mathrm{~g} \\ & \hline \end{aligned}$ |
|  | 3 | Pump Clutch On Time | * | Factory use only | $\begin{aligned} & 0 \sim 5 \\ & 1 / \text { step } \\ & 2 \mathrm{~s} \end{aligned}$ |
|  | 4 | Pump Motor On Time | * | Factory use only | $\begin{aligned} & \hline 0 \sim 20 \\ & 1 \mathrm{~s} / \mathrm{step} \\ & 6 \mathrm{~s} \end{aligned}$ |
|  | 5 | Return to First Toner Waste | * | Factory use only | $\begin{aligned} & 0 \sim 50 \\ & 1 \text { time/step } \\ & 30 \text { times } \end{aligned}$ |
| 2-965 | Toner Pump Adjustment |  |  |  |  |
|  | 6 | Aggregate of Toner Waste |  | Factory use only |  |
| 2-966 | Periodical Auto Process Control |  |  |  |  |
|  |  |  |  | When both the following conditions exist, auto process control and charge corona wire cleaning will be done automatically. <br> 1. The main switch was not turned off since 24 hours after the last auto process control was done. <br> 2. A copy job has finished. | OFF: No ON: Yes |
| 2-967 | Auto Image Density Adjustment |  |  |  |  |
|  |  |  |  | During the auto process control after the main switch is turned on, the toner amount in the development unit is checked and adjusted using the ID sensor. | OFF: No ON: Yes |
| 2-970 | Transfer Belt Resistance Value Display |  |  |  |  |
|  |  |  |  | XX.XM <br> Unit is $\Omega$ <br> Very High $\rightarrow 190 \leftarrow$ High $\rightarrow 90 \leftarrow$ <br> Standard $\rightarrow 25 \leftarrow$ Low $\rightarrow 15 \leftarrow$ Very Low |  |
| 2-971 | Output Value Measured Between Copies |  |  |  |  |
|  | 1 | Voltage |  | Displays the measurement condition of value in SP2-970. |  |
|  | 2 | Current |  |  |  |





| Mode No.(Class 1, 2 \& 3) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 4-902 | SBU Setting |  |  |  |  |
|  | 7 | First-side Bk Adjustment | * | Checks the value of the black level for the first side after adjusting the black level at power-up. <br> This SP mode is for designer use only. Do not use this SP mode. | $\begin{aligned} & 0 \sim 255 \\ & \text { 1/step } \\ & 170 \end{aligned}$ |
|  |  |  |  |  |  |
|  | 8 | Last-side Bk Adjustment | * | Checks the value of the black level for the last side after adjusting the black level at power-up. | $\begin{aligned} & 0 \sim 255 \\ & 1 / \text { step } \\ & 170 \end{aligned}$ |
|  |  |  |  | This SP mode is for designer use only. Do not use this SP mode. |  |
|  | 15 | First-side Gain Range Adjustment | * | Checks the AGC gain range of the white level for the first side after adjusting the white level at power-up. | $\begin{aligned} & 0 \sim 255 \\ & 1 / \text { step } \\ & 80 \end{aligned}$ |
|  |  |  |  | This SP mode is for designer use only. Do not use this SP mode. |  |
|  | 16 | Last-side Gain Range Adjustment | * | Checks the AGC gain value of the white level for the last side after adjusting the white level at power-up. | $\begin{aligned} & 0 \sim 255 \\ & 1 / \text { step } \\ & 80 \end{aligned}$ |
|  |  |  |  | This SP mode is for designer use only. Do not use this SP mode. |  |
|  | 19 | First-side Gain Adjustment E-ch | * | 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> This SP mode is for designer use only. Do not use this SP mode. | $\begin{aligned} & 0 \sim 255 \\ & 1 / \text { step } \\ & 0 \end{aligned}$ |
|  | 20 | First-side Gain Adjustment O-ch | * | 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> This SP mode is for designer use only. Do not use this SP mode. | $0 \sim 255$ <br> 1/step <br> 0 |
|  | 21 | Last-side Gain Adjustment E-ch | * | 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> This SP mode is for designer use only. Do not use this SP mode. | $0 \sim 255$ <br> 1/step <br> 0 |
|  | 22 | Last-side Gain Adjustment O-ch | * | 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> This SP mode is for designer use only. Do not use this SP mode. | $0 \sim 255$ <br> 1/step <br> 0 |
|  | 25 | Standard White Level Adjustment | * | Checks the value of the standard white level after adjusting the white level. <br> This SP mode is for factory use only. Do not use this SP mode. | $\begin{aligned} & \hline 0 \sim 255 \\ & 1 / \text { step } \\ & 117 \end{aligned}$ |
|  | 31 | First-side E/O Adjustment (Memory) | * | Checks the difference value of the black level for the First side after adjusting the black level at power-up. | $\begin{aligned} & \hline 0 \sim 255 \\ & 1 / \text { step } \\ & 128 \\ & \hline \end{aligned}$ |
|  |  |  |  | This SP mode is for designer use only. |  |



| Mode No.(Class 1, 2 \& 3) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 4-902 | SBU Setting |  |  |  |  |
|  | 62 | Last-side Gain Range Adjustment at Factory | * | 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> This SP mode is for designer use only. | $\begin{aligned} & 0 \sim 255 \\ & 1 / \text { step } \\ & 80 \end{aligned}$ |
|  | 65 | First-side Gain Adjustment -E ch at Factory | * | 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. This SP mode is for designer use only. | $\begin{aligned} & 0 \sim 255 \\ & 1 / \text { step } \\ & 0 \end{aligned}$ |
|  | 66 | First-side Gain Adjustment-O ch at Factory | * | 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. This SP mode is for designer use only. | $\begin{aligned} & 0 \sim 255 \\ & 1 / \text { step } \\ & 0 \end{aligned}$ |
|  | 67 | Last-side Gain Adjustment-E ch at Factory | * | 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. This SP mode is for designer use only. | $0 \sim 255$ <br> 1/step <br> 0 |
|  | 68 | Last-side Gain Adjustment-O ch at Factory | * | 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> This SP mode is for designer use only. | $\begin{aligned} & \hline 0 \sim 255 \\ & 1 / \text { step } \\ & 0 \end{aligned}$ |
|  | 71 | Standard White Level Adjustment at Factory | * | Checks the value of the standard white level after adjusting the white level. <br> This SP mode is for factory use only. | $0 \sim 255$ 1/step 117 |
|  | 75 | Overflow Flag |  | Checks the overflow flag data during the automatic scanner adjustment. | $\begin{aligned} & 0 \sim 1023 \\ & 1 / \text { step } \\ & 0 \end{aligned}$ |
|  | 76 | Time-out Flag |  | Checks the time out flag data during the automatic scanner adjustment. | $\begin{aligned} & 0 \sim 1023 \\ & 1 / \text { step } \\ & 0 \end{aligned}$ |
|  |  |  |  | This SP mode is for designer use only. |  |
|  | 78 | SBU Reset Error Flag |  | Checks the error flag data during the automatic scanner adjustment. | $\begin{aligned} & 0 \sim 15 \\ & 1 / \text { step } \\ & 0 \end{aligned}$ |
|  |  |  |  | This SP mode is for designer use only. |  |
|  | 79 | Error Flag |  | Checks the error flag data during the automatic scanner adjustment. <br> This SP mode is for designer use only. | $\begin{aligned} & 0 \sim 255 \\ & 1 / \text { step } \\ & 0 \end{aligned}$ |
|  | 80 | Gain <br> Adjustment <br> Fast/Last <br> Error Times | * | Counts the errors during the automatic scanner adjustment. <br> This SP mode is for designer use only. | $0 \sim 255$ <br> 1/step <br> 0 |
|  | 81 | Offset Level Read Error Times | * | Counts the errors during the automatic scanner adjustment. | $0 \sim 255$ <br> 1/step <br> 0 |
|  |  |  |  | This SP mode is for designer use only. |  |


| Mode No.(Class $1,2 \& 3)$ |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 4-902 | SBU Setting |  |  |  |  |
|  | 82 | Gain Level Read Error Times | * | Counts the errors during the automatic scanner adjustment <br> This SP mode is for designer use only. |  |
|  | 83 | Offset Level Read Error Times | * | Counts the errors during the automatic scanner adjustment. <br> This SP mode is for designer use only. |  |
|  | 84 | Gain Level Read Error Times | * | Counts the errors during the automatic scanner adjustment. <br> This SP mode is for designer use only. |  |
|  | 85 | Retry to Adjust Error Fail Time | * | Counts the errors during the automatic scanner adjustment. <br> This SP mode is for designer use only. |  |
|  | 86 | Retry to Adjust Success Time <br> Setting | * | Counts the errors during the automatic scanner adjustment. <br> This SP mode is for designer use only. |  |
|  | Filter Setting |  |  |  |  |
| 4-903 | 2 |  |  | Filter Mode Setting | * | This SP mode is designer use only. Do not change the value. | $\begin{aligned} & 0 \sim 3 \\ & 0 \end{aligned}$ |
|  | 5 | Full Size Mode |  | Selects whether the copy is always in full size mode even if the magnification ratio has been changed. <br> 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. | 0: Normal operation <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> This SP mode is for designer use only. | $\begin{array}{\|l} \hline 0 \sim 8191 \\ 1 / \text { step } \\ 0 \end{array}$ |
|  | 9 | Photo Mode Filter Selection | * | Selects the filter used in photo mode | 0: MTF Filter <br> 1: <br> Smoothing Filter |



| Mode No.(Class 1, $2 \& 3$ ) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 4-903 | Filter Setting |  |  |  |  |
|  | 22 | Filter <br> Strength- <br> 25\% ~ 49\% <br> (Main Scan <br> Direction-Text) |  | Selects the MTF strength in the main scan direction for $25 \% \sim 49 \%$ reduction for text mode. <br> 0: Weak 6:Strong <br> This SP is ignored unless the user selects 'Service Mode' in UP mode. | $\begin{aligned} & \hline 0 \sim 6 \\ & 1 / \text { step } \\ & 1 \end{aligned}$ |
|  | 23 | Filter Strength- $25 \% \sim 49 \%$ <br> (Sub Scan Direction-Text) | * | Selects the MTF strength in the sub scan direction for $25 \% \sim 49 \%$ magnification for text mode. <br> 0: Weak 6: Strong <br> This SP is ignored unless the user selects 'Service Mode' in UP mode. | $\begin{aligned} & \hline 0 \sim 6 \\ & 1 / \text { step } \\ & 1 \end{aligned}$ |
|  | 24 | $\begin{aligned} & \hline \text { Filter Level- } \\ & 50 \% \sim 154 \% \\ & \text { (Main Scan } \\ & \text { Direction-Text) } \end{aligned}$ | * | Selects the MTF filter coefficient in the main scan direction for $50 \% \sim 154 \%$ reduction for text mode. Settings 0 to 6 are MTF filters, and settings 7 to 13 are moiré erase filters. 0: Weak 6: Strong 7: Weak 13: Strong This SP is ignored unless the user selects 'Service Mode' in UP mode. | $\begin{aligned} & 0 \sim 13 \\ & 1 / \text { step } \\ & 13 \end{aligned}$ |
|  | 25 | Filter Level50\% ~ 154\% (Sub Scan Direction-Text) | * | Selects the MTF filter coefficient in the sub scan direction for $50 \% \sim 154 \%$ reduction for text mode. <br> 0: Weak 6: Strong <br> This SP is ignored unless the user selects <br> 'Service Mode' in UP mode. | $0 \sim 6$ <br> 1/step <br> 6 |
|  | 26 | Filter <br> Strength50\% ~ 154\% <br> (Main Scan Direction-Text) | * | Selects the MTF strength in the main scan direction for $50 \% \sim 154 \%$ reduction for text mode. <br> 0: Weak 6: Strong <br> This SP is ignored unless the user selects 'Service Mode' in UP mode. | $0 \sim 6$ <br> 1/step <br> 1 |
|  | 27 | Filter Strength50\% ~ 154\% (Sub Scan Direction-Text) | * | Selects the MTF strength in the sub scan direction for $50 \% \sim 154 \%$ magnification for text mode. <br> 0: Weak 6: Strong. <br> This SP is ignored unless the user selects 'Service Mode' in UP mode. | $\begin{aligned} & 0 \sim 6 \\ & 1 / \text { step } \\ & 1 \end{aligned}$ |
|  | 28 | $\begin{aligned} & \hline \text { Filter Level- } \\ & 155 \% \sim 256 \% \\ & \text { (Main Scan } \\ & \text { Direction-Text) } \end{aligned}$ | * | Selects the MTF filter coefficient in the main scan direction for $155 \% \sim 256 \%$ 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 <br> This SP is ignored unless the user selects 'Service Mode' in UP mode. | $\begin{aligned} & 0 \sim 13 \\ & 1 / \text { step } \\ & 13 \end{aligned}$ |



| Mode No.(Class $1,2 \& 3$ ) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 4-903 | Filter Setting |  |  |  |  |
|  | 36 | MTF FilterPhoto Mode | * 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. 0: Weak 6: Strong 7: Weak 13: Strong This SP is ignored unless the user selects 'Service Mode' in UP mode. |  | $\begin{aligned} & 0 \sim 13 \\ & 1 / \text { step } \\ & 13 \end{aligned}$ |
|  | 37 | Smoothing Filter-Photo mode | * | Selects the smoothing filter coefficient for photo mode, if smoothing is enabled for this mode with SP4-903-9. <br> 0: Weak 7: Strong <br> This SP is ignored unless the user selects 'Service Mode' in UP mode. | $\begin{aligned} & 0 \sim 7 \\ & 1 / \text { step } \\ & \mathbf{4} \end{aligned}$ |
|  | 38 | Filter StrengthPhoto mode | * | 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> This SP is ignored unless the user selects 'Service Mode' in UP mode. | $\begin{aligned} & \hline 0 \sim 6 \\ & 1 / \text { step } \\ & 1 \end{aligned}$ |
|  | 39 | Filter Level25\% ~ 49\% <br> (Main Scan DirectionText/Photo) | * | Selects the MTF filter coefficient in the main scan direction for $25 \% \sim 49 \%$ 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> This SP is ignored unless the user selects 'Service Mode' in UP mode. | $\begin{aligned} & 0 \sim 13 \\ & 1 / \text { step } \\ & 13 \end{aligned}$ |
|  | 40 | Filter Level25\% ~ 49\% <br> (Sub Scan DirectionText/Photo) | * | Selects the MTF filter coefficient in the sub scan direction for $25 \% \sim 49 \%$ magnification for text areas in text/photo mode. <br> 0: Weak 6: Strong <br> This SP is ignored unless the user selects 'Service Mode' in UP mode. | $\begin{aligned} & \hline 0 \sim 6 \\ & 1 / \text { step } \end{aligned}$ $3$ |
|  | 41 | Filter <br> Strength-25\% <br> ~ 49\% (Main <br> Scan <br> Direction- <br> Text/Photo) | * | Selects the MTF strength in the main scan direction for $25 \% \sim 49 \%$ magnification for text areas in text/photo mode. <br> 0: Weak 6: Strong <br> This SP is ignored unless the user selects 'Service Mode' in UP mode. | $\begin{aligned} & 0 \sim 6 \\ & 1 / \text { step } \\ & 0 \end{aligned}$ |
|  | 42 | Filter <br> Strength-25\% <br> ~ 49\% (Sub <br> Scan <br> Direction- <br> Text/Photo) | * | Selects the MTF strength in the sub scan direction for $25 \% \sim 49 \%$ magnification for text areas in text/photo mode. <br> 0: Weak 6: Strong <br> This SP is ignored unless the user selects 'Service Mode' in UP mode. | $\begin{aligned} & 0 \sim 6 \\ & 1 / \text { step } \\ & 0 \end{aligned}$ |


| Mode No. <br> (Class 1, 2 \& 3) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 4-903 | Filter Setting |  |  |  |  |
|  | 43 | Filter Level50\% ~ 154\% (Main Scan Direction Text/Photo) | 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 This SP is ignored unless the user selects 'Service Mode' in UP mode. |  | $\begin{aligned} & 0 \sim 13 \\ & 1 / \text { step } \\ & 13 \end{aligned}$ |
|  | 44 | Filter Level50\% ~ 154\% (Sub Scan DirectionText/Photo) | * | 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> This SP is ignored unless the user selects 'Service Mode' in UP mode. | $\begin{aligned} & 0 \sim 6 \\ & 1 / \text { step } \\ & 3 \end{aligned}$ |
|  | 45 | Filter <br> Strength-50\% <br> ~ 154\% (Main <br> Scan <br> Direction- <br> Text/Photo) | * | 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> This SP is ignored unless the user selects 'Service Mode' in UP mode. | $\begin{aligned} & \hline 0 \sim 6 \\ & 1 / \text { step } \\ & 0 \end{aligned}$ |
|  | 46 | Filter <br> Strength-50\% <br> ~ 154\% (Sub <br> Scan <br> Direction- <br> Text/Photo) | * | Selects the MTF strength in the sub scan direction for $50 \% \sim 154 \%$ magnification for text areas in text/photo mode. <br> 0: Weak 6: Strong <br> This SP is ignored unless the user selects 'Service Mode' in UP mode. | $\begin{aligned} & 0 \sim 6 \\ & 1 / \text { step } \\ & 1 \end{aligned}$ |
|  | 47 | Filter Level155\% ~ 256\% <br> (Main Scan DirectionText/Photo) | * | Selects the MTF filter coefficient in the main scan direction for $155 \% \sim 256 \%$ 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> This SP is ignored unless the user selects 'Service Mode' in UP mode. | $\begin{aligned} & 0 \sim 13 \\ & 1 / \text { step } \\ & 13 \end{aligned}$ |
|  | 48 | Filter Level155\% ~ 256\% (Sub Scan DirectionText/Photo) | * | Selects the MTF filter coefficient in the sub scan direction for $155 \% \sim 256 \%$ magnification for text areas in text/photo mode. <br> 0: Weak 6: Strong <br> This SP is ignored unless the user selects 'Service Mode' in UP mode. | $\begin{aligned} & 0 \sim 6 \\ & 1 / \text { step } \\ & 3 \end{aligned}$ |




| Mode No.(Class $1,2 \& 3$ ) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 4-903 | Filter Setting |  |  |  |  |
|  | 64 | Independent Dot Erase Generation Copy Mode | * | Selects the independent dot erase level for generation copy mode. <br> A larger number erases more dots. 0 means disabled. Refer to "Detailed Sectional Description - Independent Dot Erase" for details. | $\begin{aligned} & 0 \sim 14 \\ & 1 / \text { step } \\ & 3 \end{aligned}$ |
|  | 65 | Scanner Gamma Thresh Level Text | * | Adjust the threshold level for the background erase function in letter mode. <br> A larger value reduces dirty background. This SP is ignored unless 1 or 2 is selected with SP4-903-70. | $0 \sim 255$ <br> 1/step <br> 0 |
|  | 66 | Scanner Gamma Thresh Level Photo | * | Adjust the threshold level for the background erase function in photo mode. <br> A larger value reduces dirty background. This SP is ignored unless 1 or 2 is selected with SP4-903-71. |  |
|  | 67 | Scanner Gamma Thresh Level Text/Photo | * | Adjust the threshold level for the background erase function in text/photo mode. <br> A larger value reduces dirty background. This SP is ignored unless 1 or 2 is selected with SP4-903-72. |  |
|  | 68 | Scanner Gamma Thresh Level Pale | * | Adjust the threshold level for the background erase function in pale mode. <br> A larger value reduces dirty background. This SP is ignored unless 1 or 2 is selected with SP4-903-73. |  |
|  | 69 | Scanner Gamma Thresh Level Generation | * | Adjust the threshold level for background erase in generation copy mode. <br> A larger value reduces dirty background. This SP is ignored unless 1 or 2 is selected with SP4-903-74. |  |


| Mode No.(Class 1, $2 \& 3$ ) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 4-903 | Filter Setting |  |  |  |  |
|  | 70 | Background Erase Mode Text | * Selects the background erase function setting in text mode. <br> 0 : Not done <br> 1: Weak background erase (the MTF filter is not used if the pixel is below the threshold selected with SP4-903-65.) <br> 2: Strong background erase (the pixel is changed to 0 if it is below the threshold level selected with SP4-903-65.) <br> This SP is ignored unless the user selects 'Service Mode' in UP mode. |  | $\begin{aligned} & 0 \sim 2 \\ & 1 / \text { step } \\ & 0 \end{aligned}$ |
|  | 71 | Background Erase Mode Photo | * | Selects the background erase function setting in photo mode. <br> 0 : Not done <br> 1: Strong background erase (the pixel is changed to 0 if it is below the threshold level selected with SP4-903-66.) <br> This SP is ignored unless the user selects 'Service Mode' in UP mode. | $\begin{aligned} & 0 \sim 1 \\ & 1 / \text { step } \\ & 0 \end{aligned}$ |
|  | 72 | Background Erase Mode Text/Photo | * | Selects the background erase function setting in text/photo mode. <br> 0 : Not done <br> 1: Weak background erase (the MTF filter is not used if the pixel is below the threshold selected with SP4-903-67.) <br> 2: Strong background erase (the pixel is changed to 0 if it is below the threshold level selected with SP4-903-67.) <br> This SP is ignored unless the user selects 'Service Mode' in UP mode. | $0 \sim 2$ <br> 1/step 0 |
|  | 73 | Background Erase Mode Pale | S | Selects the background erase function setting in pale mode. <br> 0 : Not done <br> 1: Weak background erase (the MTF filter is not used if the pixel is below the threshold selected with SP4-903-68.) <br> 2: Strong background erase (the pixel is changed to 0 if it is below the threshold level selected with SP4-903-68.) <br> This SP is ignored unless the user selects 'Service Mode' in UP mode. | $0 \sim 2$ <br> 1/step 0 |
|  | 74 | Background Erase ModeGeneration | * | Selects the background erase function setting in generation mode. <br> 0 : Not done <br> 1: Weak background erase (the MTF filter is not used if the pixel is below the threshold selected with SP4-903-69. <br> 2: Strong background erase (the pixel is changed to 0 if it is below the threshold level selected with SP4-903-69. <br> This SP is ignored unless the user selects 'Service Mode' in UP mode. | $\begin{aligned} & 0 \sim 2 \\ & 1 / \text { step } \\ & 0 \end{aligned}$ |


| Mode No.(Class 1, 2 \& 3) |  |  |  | Function |  |  | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 4-903 | Filter Setting |  |  |  |  |  |  |
|  | 75 | Line Thickness CorrectionGeneration | * | Selects the line thickness setting in generation mode. |  |  | $\begin{aligned} & 0 \sim 15 \\ & 1 / \text { step } \\ & 5 \end{aligned}$ |
|  |  |  |  | $\begin{array}{r} 0: \\ 1: \\ 2: \\ 3: \\ 4: \\ 5: \\ 6: \\ 7: \\ 8: \\ 9: \\ 10: \\ 11: \\ 12: \\ 13: \\ 14: \\ 15: \\ \hline \end{array}$ | Main Scan No Correction No Correction No Correction No Correction Thinner 1 Thinner 1 Thinner 1 Thinner 1 Thinner 2 Thinner 2 Thinner 2 Thinner 2 Thicker Thicker Thicker Thicker | Sub Scan No Correction Thinner 1 Thinner 2 Thicker No Correction Thinner 1 Thinner 2 Thicker No Correction Thinner 1 Thinner 2 Thicker No Correction Thinner 1 Thinner 2 Thicker |  |
|  |  |  |  | Line T <br> Thick <br> Thinne <br> Refer | kness: <br> No Correction > <br> e Width Correction | inner 1 > <br> in section 2. |  |
|  | 76 | Line <br> Thickness Correction Threshold (Main Scan Generation) | * | Selec thickn If a hig effect select strong | e threshold to d correction is ap number is sele ess of the line thi with SP4-903-75 | rmine if line d for a pixel. d, the ness correction comes | $\begin{aligned} & 0 \sim 5 \\ & 1 / \text { step } \\ & 2 \end{aligned}$ |
|  | 77 | Line <br> Thickness Correction Generation (Sub Scan) | * | Selec <br> thickn <br> a high effectiv select strong | e threshold to d correction is ap number is select ess of the line this with SP4-903-75 | rmine if line d for a pixel. If the ness correction comes | $\begin{aligned} & 0 \sim 5 \\ & 1 / \text { step } \\ & 2 \end{aligned}$ |


| Mode No.(Class $1,2 \& 3)$ |  |  |  | Function |  |  | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 4-903 | Filter Setting |  |  |  |  |  |  |
|  | 78 | Line <br> Thickness <br> Correction Text | * | Selects the line thickness setting in generation mode. |  |  | 0~15 <br> 1/step 5 |
|  |  |  |  | $\begin{array}{r} 0: \\ 1: \\ 2: \\ 3: \\ 4: \\ 5: \\ 6: \\ 7: \\ 7: \\ 9: \\ 9: \\ 10: \\ 11: \\ 12: \\ 13: \\ 14: \\ 15: \end{array}$ | Main Scan <br> No Correction <br> No Correction <br> No Correction <br> No Correction <br> Thinner 1 <br> Thinner 1 <br> Thinner 1 <br> Thinner 1 <br> Thinner 2 <br> Thinner 2 <br> Thinner 2 <br> Thinner 2 <br> Thicker <br> Thicker <br> Thicker <br> Thicker | Sub Scan No Correction Thinner 1 Thinner 2 Thicker No Correction Thinner 1 Thinner 2 Thicker No Correction Thinner 1 Thinner 2 Thicker No Correction Thinner 1 Thinner 2 Thicker |  |
|  |  |  |  | Line Thickness: <br> Thicker > No Correction > Thinner 1 > Thinner 2 |  |  |  |
|  | 79 | Line <br> Thickness Correction Threshold (Main ScanText) | * | Selects the threshold to determine if line thickness correction is applied for a pixel. If a higher number is selected, the effectiveness of the line thickness correction selected with SP4-903-78 becomes stronger. |  |  | $\begin{aligned} & 0 \sim 5 \\ & 1 / \text { step } \\ & 2 \end{aligned}$ |
|  | 80 | Line <br> Thickness Correction Threshold (Sub ScanText) | * | Selects the threshold to determine if line thickness correction is applied for a pixel. If a higher number is selected, the effectiveness of the line thickness correction selected with SP4-903-78 becomes stronger. |  |  | $\begin{aligned} & 0 \sim 5 \\ & 1 / \text { step } \\ & 2 \end{aligned}$ |


| Mode No.(Class 1, 2 \& 3) |  |  |  | Function |  |  | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 4-903 | Filter Setting |  |  |  |  |  |  |
|  | 81 | Line <br> Thickness Correction Text/Photo Mode | * | Selects the line thickness setting in generation mode. |  |  | $\begin{aligned} & 0 \sim 15 \\ & 1 / \text { step } \\ & 5 \end{aligned}$ |
|  |  |  |  | $\begin{array}{r} 0: \\ 1: \\ 2: \\ 3: \\ 4: \\ 5: \\ 6: \\ 7: \\ 8: \\ 9: \\ 10: \\ 11: \\ 12: \\ 13: \\ 14: \\ 15: \\ \hline \end{array}$ | Main Scan No Correction No Correction No Correction No Correction Thinner 1 Thinner 1 Thinner 1 Thinner 1 Thinner 2 Thinner 2 Thinner 2 Thinner 2 Thicker Thicker Thicker Thicker | Sub Scan No Correction Thinner 1 Thinner 2 Thicker No Correction Thinner 1 Thinner 2 Thicker No Correction Thinner 1 Thinner 2 Thicker No Correction Thinner 1 Thinner 2 Thicker |  |
|  |  |  |  | Line T <br> Thick Thinn <br> Refer | kness: <br> No Correction > <br> e Width Correction | inner 1 > <br> 'in section 2. |  |
|  | 82 | Line <br> Thickness Correction Threshold (Main ScanText/Photo) | * | Selec <br> thickn <br> higher <br> of the <br> SP4-9 | he threshold to d correction is ap mber is selected thickness corre 81 becomes str | rmine if line d for a pixel. If e effectiveness n selected with er. | $\begin{aligned} & 0 \sim 5 \\ & 1 / \text { step } \\ & 2 \end{aligned}$ |
|  | 83 | Line <br> Thickness Correction Threshold (Sub Scan Text/Photo) | * | Selec thickn higher of the SP4-9 | he threshold to d correction is ap mber is selected thickness corre 81 becomes str | rmine if line d for a pixel. If e effectiveness n selected with er. | $\begin{aligned} & 0 \sim 5 \\ & 1 / \text { step } \\ & 2 \end{aligned}$ |
|  | 84 | Scanner Gamma Selection Text Mode | * | Selec setting mode 0: Sca <br> 1: Sca <br> 2: Sca | e scanner and sed when 'Serv elected. <br> gamma for 'S <br> gamma for ' N <br> gamma for 'S | ter gamma Mode' for Text <br> is used. mal' is used. ' is used. | $\begin{aligned} & 0 \sim 2 \\ & 1 / \text { step } \\ & 1 \end{aligned}$ |


| Mode No. <br> (Class 1, 2 \& 3) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 4-903 | Filter Setting |  |  |  |  |
|  | 85 | Scanner Gamma Selection Text/Photo Mode |  | 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 used. <br> 1: Scanner gamma for 'Normal' is used. <br> 2: Scanner gamma for 'Text Priority' is used. | $\begin{aligned} & 0 \sim 2 \\ & 1 / \text { step } \\ & 1 \end{aligned}$ |
| 4-904 | IPU Setting -1 |  |  |  |  |
|  | 1 | Laser Pulse Positioning in Text and Text/Photo | * | Selects whether or not laser pulse positioning control is used in text and text/photo modes Do not change the value. | $\begin{aligned} & \text { 0: Off } \\ & \text { 1: On } \end{aligned}$ |
|  | 2 | Gradation Processing Selection Photo | S | Selects the gradation processing procedure. <br> 0 : Three-gradation error diffusion <br> 1: Four-gradation error diffusion <br> 2: 8" $\times 8^{\prime \prime}$ dither matrix <br> 3: $6^{\prime \prime} \times 6^{\prime \prime}$ dither matrix <br> 4: 4" $\times 4^{\prime \prime}$ dither matrix <br> A larger dither matrix gives coarser reproduction of halftones. This SP is ignored unless the user selects 'Service Mode' in UP mode. | $\begin{aligned} & 0 \sim 4 \\ & 1 \end{aligned}$ |
|  | 4 | Forced Binary Mode | S | 1: Binary processing is done for all image modes. | $\begin{aligned} & \text { 0: No } \\ & \text { 1: Yes } \end{aligned}$ |
|  | 6 | Smoothing Filter Level in Photo Mode | S | Selects the smoothing filter level in photo mode. <br> 0 : None <br> 1: Weak <br> 5: Strong | $\begin{aligned} & 0 \sim 5 \\ & 2 \end{aligned}$ |
|  | 7 | Texture Erase Filter Level in Text Mode | S | 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 | $\begin{aligned} & 0 \sim 2 \\ & 0 \end{aligned}$ |


| Mode No.(Class 1, 2 \& 3) |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: |
| 4-904 | IPU Setting -1 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  | 20 | Thin Line Mode in Laser Writing - Text | Selects thin line mode level in laser writing for text mode. <br> 0 : None <br> 1: Weak <br> 2: Medium <br> 3: Strong | $\begin{aligned} & 0 \sim 3 \\ & 2 \end{aligned}$ |
|  | 22 | Thin Line Mode in Laser Writing Text/Photo | Selects thin line mode level in laser writing for text/photo mode. <br> 0 : None <br> 1: Weak <br> 2: Medium <br> 3: Strong | $\begin{aligned} & 0 \sim 3 \\ & 2 \end{aligned}$ |
|  | 23 | Thin Line Mode in Laser Writing - Pale | Selects thin line mode level in laser writing for pale mode. <br> 0 : None <br> 1: Weak <br> 2: Medium <br> 3: Strong | $\begin{aligned} & 0 \sim 3 \\ & 2 \end{aligned}$ |



| Mode No.(Class $1,2 \& 3)$ |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 4-909 | IPU Setting - 2 |  |  |  |  |
|  | 1 | Data Through Setting in IPU (Image Processing) | * | Do not change the value. | $\begin{aligned} & \hline 0 \sim 255 \\ & 1 / \text { step } \\ & 0 \end{aligned}$ |
|  | 2 | Data Through Setting in IPU (I/F-1) | * | Do not change the value. | $0 \sim 255$ <br> 1 /step 0 |
|  | 3 | Data Through Setting in IPU (I/F-2) | * | Do not change the value. | $\begin{aligned} & 0 \sim 15 \\ & 1 \text { /step } \\ & 13 \end{aligned}$ |
|  | 4 | Thin Line Level 2 White | * | Decides the threshold value for a pixel to be white when line width correction type 2 is performed. | $0 \sim 15$ <br> 1 /step <br> 4 |
|  |  |  |  | Do not change the value. |  |
|  | 5 | Thin Line Level 2 - Black | * | Decides the threshold value for a pixel to be black when line width correction type 2 is performed. | $\begin{aligned} & 0 \sim 15 \\ & 1 / \text { step } \\ & 12 \end{aligned}$ |
|  |  |  |  | Do not change the value. |  |
|  | 6 | Error Diffusion Table | * | Do not change the value. | $\begin{aligned} & 0 \sim 1 \\ & 0 \end{aligned}$ |
|  | 15 | Main Scan Data Conversion |  | Do not change the value. | $\begin{aligned} & 0 \sim 1 \\ & 0 \end{aligned}$ |
|  | 16 | Image Data Path-Scanner Test |  | Do not change the value. | $0 \sim 4$ <br> 1 /step <br> 0 |
|  | 17 | Image Data Path-MSU | - | Do not change the value. | $\begin{array}{\|l\|} \hline 0 \sim 3 \\ 1 \text { /step } \\ 3 \end{array}$ |
|  | 18 | Image Data PathApplication | Do not change the value. |  | $\begin{array}{\|l\|} \hline 0 \sim 4 \\ 1 / \text { step } \\ 3 \\ \hline \end{array}$ |
|  | 20 | Image Data Path-Printer | Do not change the value. |  | $\begin{aligned} & 0 \sim 4 \\ & 1 \text { /step } \\ & 3 \end{aligned}$ |
| 4-910 | Data Compression |  |  |  |  |
|  | 1 | Data Compression |  | Do not change the value. | $\begin{aligned} & \text { 0: On } \\ & \text { 1: Off } \end{aligned}$ |
|  | 2 | Data Compression |  | Do not change the value. | $\begin{aligned} & \hline 0 \sim 255 \\ & 1 / \text { step } \\ & 8 \end{aligned}$ |
|  | 3 | ABS Core |  | Do not change the value. | $\begin{aligned} & \text { 0: On } \\ & \text { 1: Off } \end{aligned}$ |

## Service Tables

| Mode No.(Class 1, 2 \& 3) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 4-911 | HDD |  |  |  |  |
|  | 1 | HDD Media Check |  | Checks for bad sectors on the hard disk that develop during machine use. This takes 4 minutes. <br> This SP mode should be done when an abnormal image is printed. There is no need to do this at installation as the hard disk firmware already contains bad sector information, and damage is not likely during transportation. <br> Bad sectors detected with this SP mode will be stored in the NVRAM with the bad sector data copied across from the firmware. If the machine detects over 50 bad sectors, SC361 will be generated. At this time, use SP4-911-2. | Start |
|  | 2 | HDD Formatting |  | Formats the hard disk. This takes 4 minutes. <br> Do not turn off the main power switch during this process. |  |
|  | 6 | HDD Bad Sector Information Reset |  | Resets the bad sector information which is stored in the NVRAM. <br> This SP should be used when the hard disk is replaced. | Start |
|  | 7 | HDD Bad Sector Display | * | Displays the number of bad sectors there are on the hard disk. <br> If the machine detects a total of over 50 bad sectors on the disk, SC361 will be generated. At this time, use SP4-911-2. | Total: 0 <br> Copy: 0 <br> Printer: 0 <br> Copy Server: <br> 0 |
|  | 8 | HDD Model Name Display |  | Displays the model name of the HDD. <br> If the HDD is not installed or the HDD connector is not connected, SC360 will be displayed. However, the user can make single copies. |  |

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| Mode No. | Function | Settings |
| :---: | :---: | :---: |
| (Class $1,2 \& 3)$ |  |  |








| $$ |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 5-923 | Edge Erase Standard |  |  |  |  |
|  |  |  |  | Selects the standard for edge erase. <br> 0 : The margin is erased from the original data. <br> 1: The margin is erased from the data sent to the laser diode. <br> Note that the output resulting from each of the settings will be different when reduction or enlargement is used. | 0: Original <br> 1: Paper |
| 5-924 | Adjust Margin for each Original |  |  |  |  |
|  | 1 | Adjust margin for each original |  | Selects whether or not Margin per Original is enabled. <br> No: Images are shifted with a binding margin during image writing. <br> Yes: The margin is applied during scanning. NOTE: After Yes has been selected, the "per original" key is displayed. This key must be pressed to activate the mode. | Range: Yes or No |
|  | 2 | Per original priority |  | Selects whether or not Margin per Original is enabled as default. This setting is given priority over SP5-924-01. | Range: On or Off |
| 5-954 | Copy Server Password Display |  |  |  |  |
|  |  |  |  | Selects whether to display the password when a file with a password is selected on the copy server. | Normal Display password |
|  |  |  |  | If you forget the password, select "1" to check it. |  |
| 5-965 | All Copy Server File Delete |  |  |  |  |
|  |  |  |  | Delete the all copy server files. | Start Cancel |
| 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. | Start |
|  | 2 | SP |  | Prints the SP mode data list. <br> See the "System Parameter and Data Lists" section for how to print the lists. | Start |
| 5-990 | SMC Print |  |  |  |  |
|  | 3 | User Program |  | Prints the UP mode data list. See the "System Parameter and Data Lists" section for how to print the lists. | Start |
|  | 4 | Logged Data |  | Prints the machine status history data list. See the "System Parameter and Data Lists" section for how to print the lists. | Start |
| 6-006 | DF Registration Adjustment |  |  |  |  |
|  | 1 | Side-to-Side | * | Adjusts the printing side-to-side registration in the ADF mode. | $\begin{aligned} & \hline-3 \sim+3 \\ & 0.1 \mathrm{~mm} / \mathrm{step} \\ & +0.0 \mathrm{~mm} \end{aligned}$ |
|  | 2 | Leading Edge (Thin Original) | * | Adjusts the original stop position. | $\begin{aligned} & \hline-29 \sim+29 \\ & 0.18 \\ & \mathrm{~mm} / \text { step } \\ & +0.0 \mathrm{~mm} \\ & \hline \end{aligned}$ |
|  | 3 | Leading Edge (Duplex-front) | * | Adjusts the original stop position against the original left scale in one-sided original mode. | $\begin{aligned} & \hline-29 \sim+29 \\ & 0.18 \\ & \mathrm{~mm} / \mathrm{step} \\ & +0.0 \mathrm{~mm} \\ & \hline \end{aligned}$ |


| Mode No.(Class 1, 2 \& 3) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 6-006 | 4 | Reading Edge (Duplex-rear) | * | Adjusts the original stop position against the original left scale in two-sided original mode. | $\begin{aligned} & -29 \sim+29 \\ & 0.1 \mathrm{~mm} / \mathrm{step} \\ & +\mathbf{0 . 0 \mathrm { mm }} \end{aligned}$ |
| 6-007 | ADF Input Check |  |  |  |  |
|  | 1 | Group 1 |  | Displays the signals received from sensors and switches of the ADF. <br> See the "Input Check" section for details. |  |
|  | 2 | Group 2 |  | Displays the signals received from sensors and switches of the ADF. <br> See the "Input Check" section for details. |  |
| 6-008 | ADF Output Check |  |  |  |  |
|  |  |  |  | Turns on the electrical components of the ADF individually for test purposes. <br> See the "Output Check" section for details. |  |
| 6-009 | ADF Free Run (Two-sided original) |  |  |  |  |
|  | 1 |  |  | Performs an ADF free run in two-sided original mode. Press " 1 " to start. | $\begin{aligned} & \text { Off } \\ & \text { On } \end{aligned}$ |
|  |  |  |  | This is a general free run controlled from the copier. For more detailed free run modes, see the 'Test Points/Dip Switches/LEDs' section. |  |
| 6-016 | Adjust Motor Speed |  |  |  |  |
|  |  |  |  | Adjust the speed of the feed-in, transport and feed-out motors. Perform this SP when replacing the Main Board or above motors. |  |
| 6-020 | ADF Speed Adjustment |  |  |  |  |
|  |  |  | * | When the customer points out noise form the ADF, use this to adjust the ADF speed to low. | High speed: 70 cpm Low Speed: 55 cpm |
| 6-105 | Stapling Position Adjustment |  |  |  |  |
|  |  |  | ${ }^{+}$ | Adjusts the stapling position in the main scan direction | $\begin{array}{\|l\|} \hline-3.5 \sim+3.5 \\ 0.5 \mathrm{~mm} / \mathrm{step} \\ \mathbf{+ 0 . 0 \mathrm { mm }} \\ \hline \end{array}$ |
|  |  |  |  | A larger value causes the stapling position to shift outward. |  |
| 6-113 | Punch Hole Adjustment |  |  |  | Rev. 06/2000 |
|  | 1 | 2-Holes |  | Adjusts the punch hole position in the subscan direction for the punch unit with two punch holes. | $\begin{aligned} & -7.5 \sim+7.5 \\ & 0.5 \mathrm{~mm} / \text { step } \\ & 0 \mathrm{~mm} \end{aligned}$ |
|  |  |  |  | A larger value shifts the punch holes towards the edge of the paper. |  |
|  | 2 | 3-Holes |  | Adjusts the punch hole position in the subscan direction for the punch unit with three punch holes. | $-7.5 ~+7.5$ $0.5 \mathrm{~mm} / \mathrm{step}$ 0 mm |
|  |  |  |  | A larger value shifts the punch holes towards the edge of the paper. |  |



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| Mode No. <br> (Class $1,2 \& 3$ ) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 7-320 | Document Server : Scanned Storage |  |  |  |  |
|  | 1 | Total Number of Original Scan | * | Displays the total number of stored originals in the document server. |  |
| 7-321 | Document Server : Each Size of Original |  |  |  |  |
|  | 4 | A3 | * | Displays the total number of stored originals in the document server by size. |  |
|  | 5 | A4 | * |  |  |
|  | 6 | A5 | * |  |  |
|  | 13 | B4 | * |  |  |
|  | 14 | B5 | * |  |  |
|  | 32 | DLT | * |  |  |
|  | 36 | LG | * |  |  |
|  | 38 | LT | * |  |  |
|  | 44 | HLT | * |  |  |
|  | 128 | Other Size | * |  |  |
| 7-323 | Document Server : Each Size of Copies |  |  |  |  |
|  | 5 | A4 Sideways | * | Displays the total number of prints made from the document server by paper size. |  |
|  | 6 | A5 Sideways | * |  |  |
|  | 14 | B5 Sideways | * |  |  |
|  | 38 | LT Sideways | * |  |  |
|  | 44 | HLT Sideways | * |  |  |
|  | 128 | Other Sizes | * |  |  |
|  | 132 | A3 | * |  |  |
|  | 133 | A4 Lengthwise | * |  |  |
|  | 134 | A5 Lengthwise | * |  |  |
|  | 141 | B4 | * |  |  |
|  | 142 | B5 Lengthwise | * |  |  |
|  | 160 | DLT | * |  |  |
|  | 164 | LG | * |  |  |
|  | 166 | LT Lengthwise | * |  |  |
|  | 172 | HLT Lengthwise | * |  |  |
| 7-324 | Document Server: Print Job |  |  |  |  |
|  | 1 | Duplex | * | Displays the total number of copy jobs made from the document server. |  |
|  | 2 | Electrical Sort | * |  |  |
|  | 3 | Staple Print Job | * |  |  |
|  | 4 | Punch Print Job | * |  |  |
|  | 5 | Sample Copy | * |  |  |
|  | 6 | First Page Print | * |  |  |
| 7-325 | Document Server : Print Job Page Distribution |  |  |  |  |
|  | 1 | 1 | * | Displays the number of jobs by number of pages, made from the document server. |  |
|  | 2 | 2 | * |  |  |
|  | 3 | 3-5 | * |  |  |
|  | 4 | 6-10 | * |  |  |
|  | 5 | 11- | * |  |  |


| Mode No. (Class 1, 2 \& 3) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 7-326 | Document Server : Print Job File Distribution |  |  |  |  |
|  | 1 | 1 | * | Displays the number of jobs by the number of consecutive files in the job, made from the document server. |  |
|  | 2 | 2-5 |  |  |  |
|  | 3 | 6-10 | * |  |  |
|  | 4 | 11 - | * |  |  |
| 7-327 | Document Server : Print Job Set Distribution |  |  |  |  |
|  | 1 | 1 to 1 | * | Displays the total number of prints by multiple document quantity, using the document server. |  |
|  | 2 | 1 to $2 \sim 5$ |  |  |  |
|  | 3 | 1 to $6 \sim 10$ | * |  |  |
|  | 4 | 1 to $11 \sim 20$ | * |  |  |
|  | 5 | 1 to $21 \sim 50$ | * |  |  |
|  | 6 | 1 to $51 \sim 100$ | * |  |  |
|  | 7 | 1 to 100~300 | * |  |  |
|  | 8 | 1 to 301 ~ | * |  |  |
| 7-328 | Document Server : Copy Number of Each Job |  |  |  |  |
|  | 1 | Duplex Copy | * | Displays the total number of prints for each type of job. |  |
|  | 2 | Duplex Original | * |  |  |
|  | 6 | Punch | * |  |  |
|  | 8 | Sort | * |  |  |
|  | 9 | Staple | * |  |  |
|  | 12 | Duplex |  |  |  |
|  | 16 | Interrupt Document Server | * |  |  |
|  | 19 | Booklet | * |  |  |
|  | 20 | Magazine | * |  |  |
|  | 24 | Stamp | * |  |  |
|  | 25 | Index | * |  |  |
|  | 26 | Slip Sheet | * |  |  |
| 7-330 | Connect Copy Job |  |  |  |  |
|  |  | Connect Copy | * | Displays the total number of jobs as the master machine. |  |
| 7-331 | Connect Copy: Copy |  |  |  |  |
|  | 1 | Copy Number of Master | * | Display the total number of copies as the master machine. |  |
|  | 2 | Copy Number of Slave | * | Display the total number of copies as the slave machine. |  |
| 7-332 | Connect Copy : Copy Number by Copy Mode |  |  |  |  |
|  | 1 | Original Mode : Text | * | Display the total number of copies by copy mode as the master machine. |  |
|  | 2 | Original Mode :Text/Photo | * |  |  |
|  | 3 | Original Mode : Photo | * |  |  |
|  | 4 | Original Mode : Generation | * |  |  |
|  | 5 | Original Mode - Pale | * |  |  |
|  | 6 | Punch | * |  |  |





| Mode No. <br> (Class 1,2 \& 3) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 7-504 | Copy Jam Counter by Jam Location |  |  |  |  |
|  | 62 | Relay Sensor |  | These are jams when the paper stays at the sensor. <br> (Duplex Transport Sensor 1) <br> (Duplex Transport Sensor 2) <br> (Duplex Transport Sensor 3) <br> (Not Used) |  |
|  | 63 | Registration Sensor | * |  |  |
|  | 65 | 1st Exit Sensor | * |  |  |
|  | 66 | 2nd Exit Sensor | * |  |  |
|  | 69 | Duplex <br> Entrance Sensor | * |  |  |
|  | 70 | Duplex Relay Sensor 1 | * |  |  |
|  | 71 | Duplex Relay Sensor 2 | * |  |  |
|  | 72 | Duplex Relay Sensor 3 | * |  |  |
|  | 73 | Duplex Exit Sensor | * |  |  |
| 7-505 | Original Jam Counter by Jam Location |  |  |  |  |
|  | 1 | At Power On | * | Displays the total number of original jams by location. <br> (Entrance and Registration Sensor) <br> (Exit and Inverter Sensor) |  |
|  | 3 | ADF Feed-in Sensor | * |  |  |
|  | 4 | ADF Feed-out Sensor | * |  |  |
| 7-506 | Jam Counter by Copy Size |  |  |  |  |
|  | 5 | A4 Sideways | * | Displays the total number of copy jams by paper size. |  |
|  |  | A5 Sideways | * |  |  |
|  | 14 | B5 Sideways |  |  |  |
|  | 38 | LT Sideways |  |  |  |
|  | 44 | HLT Sideways | * |  |  |
|  | 128 | Other Size | * |  |  |
|  | 132 | A3 | * |  |  |
|  | 133 | A4 Lengthwise |  |  |  |
|  | 134 | A5 Lengthwise | * |  |  |
|  | 141 | B4 Lengthwise |  |  |  |
|  | 142 | B5 Lengthwise |  |  |  |
|  | 160 | DLT | * |  |  |
|  | 164 | LG | * |  |  |
|  | 166 | LT Lengthwise |  |  |  |
|  | 172 | HLT <br> Lengthwise | * |  |  |
| 7-507 | Jam History |  |  |  |  |
|  | 1 | Copy : Latest | * | 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 |  |
|  | 2 | Latest 1 st | * |  |  |
|  | 3 | Latest 2 nd | * |  |  |
|  | 4 | Latest 3 rd | * |  |  |
|  | 5 | Latest 4 th | * |  |  |


| Mode No. <br> (Class 1, 2 \& 3) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 7-507 | Jam History |  |  |  |  |
|  | 6 | Latest 5 th | * | 4. Stuck or not fed |  |
|  | 7 | Latest 6 th |  |  |  |
|  | 8 | Latest 7 th | * |  |  |
|  | 9 | Latest 8 th | * |  |  |
|  | 10 | Latest 9 th | * |  |  |
|  | 11 | Original : Latest |  | 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 |  |
|  | 12 | Latest 1 st |  |  |  |
|  | 13 | Latest 2 nd |  |  |  |
|  | 14 | Latest 3 rd |  |  |  |
|  | 15 | Latest 4 th |  |  |  |
|  | 16 | Latest 5 th |  |  |  |
|  | 17 | Latest 6 th | * |  |  |
|  | 18 | Latest 7 th | * |  |  |
|  | 19 | Latest 8 th | * |  |  |
|  | 20 | Latest 9 th | * |  |  |
| 7-617 | PM Alarm Counter |  |  |  |  |
|  | 1 | Copy Paper Based |  | Displays the PM alarm counter |  |
|  | 2 | Original Based | * |  |  |
| 7-618 | PM Alarm Counter Clear |  |  |  |  |
|  | 1 | Copy Paper <br> Based <br> Original Based |  | Reset the PM alarm counter. | Start |
|  | 2 |  |  | Start |  |
| 7-801 | ROM Version Display |  |  |  |  |
|  |  |  |  |  |  |
|  | 4 | LCDC |  |  |  | Displays the ROM versions. |
|  | 5 | SIB |  |  |  |  |
|  | 6 | HDC |  |  |  |  |
|  | 7 | CSS (P1) |  |  |  |  |
|  | 8 | BANK |  |  |  |  |
|  | 9 | ADF |  |  |  |  |
|  | 10 | FIN/Booklet FIN (stable) |  |  |  |  |
|  | 11 | Print Post (Mailbox) |  |  |  |  |
|  | 12 | Printer |  |  |  |  |
|  | 13 | Booklet FIN (Stitching) |  |  |  |  |
|  | 14 | Stamp |  |  |  |  |
| 7-803 | PM Counter Display |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 7-804 | PM Counter Reset |  |  |  |  |  |
|  |  |  |  | Resets the PM counter. | Start |  |
| 7-807 | SC/Jam Counter Reset |  |  |  |  |  |
|  |  |  |  | Resets the SC and jam counters. Press "Start" to reset. | Start |  |



| Mode No. <br> (Class 1, 2 \& 3) |  | Function | Settings |
| :---: | :---: | :---: | :---: |
| 7-906 | Clear Original Number of Each size |  |  |
|  |  | Resets all counters of SP7-202. | Start |
| 7-907 | Clear Job Number of Each size |  |  |
|  |  | Resets all counters of SP7-306. | Start |
| 7-908 | Document : Clear Original Number |  |  |
|  |  | Resets all counters of SP7-002-2. | Start |
| 7-920 | Document Server: Clear Scanned Storage |  |  |
|  |  | Resets the counter of SP7-320. | Start |
| 7-921 | Document Server : Clear Original Number of Each Size |  |  |
|  |  | Resets all counters of SP7-321. | Start |
| 7-923 | Document Server : Clear Print Number of Each Copy |  |  |
|  |  | Resets all counters of SP7-323 | Start |
| 7-924 | Document Server : Clear Print Job Logging |  |  |
|  |  | Resets all counters of SP7-324 | Start |
| 7-925 | Document Server : Clear Print Job Page Distribution |  |  |
|  |  | Resets all counters of SP7-325 | Start |
| 7-926 | Document Server : Clear Print Job File Distribution |  |  |
|  |  | Resets all counters of SP7-326 | Start |
| 7-927 | Document Server : Clear Print Job Set Distribution |  |  |
|  |  | Resets all counters of SP7-327. | Start |
| 7-990 | Display the detail information for SC990 |  |  |
|  | 001 Filename <br> 002 Line Number <br> 003 Value | Displays the detail information for SC990. |  |

### 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.

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

$\Rightarrow$| No. | Test Pattern | No. | Test Pattern |
| :---: | :--- | :---: | :--- |
| 0 | None | 7 | Vertical Strips |
| 1 | Vertical Lines (1-dot) | 8 | Grayscale (Vertical) |
| 2 | Vertical Lines (2-dots) | 9 | Grayscale (Horizontal) |
| 3 | Horizontal Line (1-Dot) | 10 | Cross Pattern |
| 4 | Horizontal Line (2-Dots) | 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)

$\Rightarrow$| No. | Test Pattern | No. | Teat Pattern |
| :---: | :--- | :---: | :--- |
| 0 | None | 13 | 16 Grayscales (Vertical) |
| 1 | Vertical Line (1-dot) | 14 | 16 Grayscales (Vert./Hor.) |
| 2 | Horizontal Line (1-dot) | 15 | 16 Grayscales (Vert./Hor Overlay) |
| 3 | Vertical Line (2 dot) | 16 | Hound'sTooth Check (1-Dot, 600dpi) |
| 4 | Horizontal Line (2-dot) | 17 | Hound'sTooth Check (1-Dot, 400dpi) |
| 5 | Grid Pattern (Single-dot) | 18 | Horizontal Line (1-Dot)(Reverse Order <br> ofLD1 \& LD2) |
| 6 | Grid Pattern (Double-dot) | 19 | Grid Pattern (1-Dot)(Reverse Order of <br> LD1 \& LD2) |
| 7 | Independent Pattern (1-Dot) | 20 | Grid Pattern (2-Dot)(Reverse Order of <br> LD1 \& LD2) |
| 8 | Full Dot Pattern | 21 | Independent Pattern (1-Dot)(Reversed <br> Order of LD1 \& LD2) |
| 9 | Black Band | 22 | Blank Page |
| 10 | Trimming Area | 23 | Grid Pattern (1-dot) (Overlaying <br> Outside Data) |
| 11 | Argyle Pattern | 24 | Trimming Area (Overlaying Outside <br> Data) |
| 12 | 16 Grayscales (Horizontal) |  |  |

### 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.


| Class 3 no. | Bit no. | Description | Reading |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | 0 | 1 |
| 1 (Paper Feed <br> 1) | 7 | Paper Size 1 Switch | On | Off |
|  | 6 | Paper Size 2 Switch | On | Off |
|  | 5 | Paper Size 3 Switch | On | Off |
|  | 4 | Paper Size 4 Switch | On | Off |
|  | 3 | Paper Size 5 Switch | On | Off |
|  | 2 | 2nd Near End Sensor | Not detected | Near end |
|  | 1 | 1st Tray Set Detection | Set | Not Set |
|  | 0 | 1st Near End Sensor | Not detected | Near end |
| 2(Paper Feed2) | 7 | Not used |  |  |
|  | 6 | Not used |  |  |
|  | 5 | Tray Construction 1 | 4:0,5:1 Export <br> 4:1,5:1 Japan |  |
|  | 4 | Tray Construction 2 |  |  |
|  | 3 | Not Used |  |  |
|  | 2 | Not Used |  |  |
|  | 1 | 3rd Tray Set Detection | Set | Not Set |
|  | 0 | 3rd Near End Sensor | Not Detected | Near end |
| 3(Paper Feed3 ) | 7 | Left Tandem Tray Set Detection 2 (Connector) | Set | Not set |
|  | 6 | Side Fence Positioning Sensor | Not Detected | Fence Detected |
|  | 5 | Right Tray Down Sensor | Not Detected | Detected |
|  | 4 | Rear Fence HP Sensor | Not Detected | At home Position |
|  | 3 | Side Fence Close Sensor | Open | Closed |
|  | 2 | Rear Fence Return Sensor | Not detected | Return position |


| Class 3 no. | Bit no. | Description | Reading |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | 0 | 1 |
| 3 <br> (Paper Feed <br> 3 ) <br> 3) | 1 | 2nd Paper End Sensor | Not paper end | Paper end |
|  | 0 | Right Tandem Tray Set Detection 2 (Connector) | Set | Not set |
| 4(Paper Feed4) | 7 | 1st Paper Feed Sensor | Paper detected | No paper |
|  | 6 | 2nd Paper Feed Sensor | Paper detected | No paper |
|  | 5 | 3rd Paper Feed Sensor | Paper detected | No paper |
|  | 4 | Not used |  |  |
|  | 3 | Not used |  |  |
|  | 2 | Not used |  |  |
|  | 1 | Not used |  |  |
|  | 0 | Not used |  |  |
| 5(Paper Feed5 ) | 7 | 1st Lift Sensor | Lifted | No paper |
|  | 6 | 2nd Lift Sensor | Lifted | No paper |
|  | 5 | 3rd Lift Sensor | Lifted | No paper |
|  | 4 | Not used |  |  |
|  | 3 | 1st Paper End Sensor | Not paper end | Paper end |
|  | 2 | 2nd Paper End Sensor | Not paper end | Paper end |
|  | 1 | 3rd Paper End Sensor | Not paper end | Paper end |
|  | 0 | Not used |  |  |
| 6(3rd PaperFeed Tray) | 7 | Not used |  |  |
|  | 6 | Not used |  |  |
|  | 5 | Not used |  |  |
|  | 4 | Not used |  |  |
|  | 3 | 3rd Tray Down Switch | On | Off |
|  | 2 | 3rd Tray Down Sensor | Not detected | Overload |
|  | 1 | 3rd Tray Motor Lock | Normal | Overload |
|  | 0 | 3rd Tray Paper Set | No Paper | Detected |
| 7 <br> (Toner Collection) | 7 | Not used |  |  |
|  | 6 | Not used |  |  |
|  | 5 | Not used |  |  |
|  | 4 | Not used |  |  |
|  | 3 | Paper Feed Motor Lock | Overload | Normal |
|  | 2 | Toner Overflow Switch | Full | Not full |
|  | 1 | Toner Collection Bottle Set Switch | Set | Not set |
|  | 0 | Toner Collection Motor Sensor | Pulse | Pulse |


| Class 3 no. | Bit no. | Description | Reading |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | 0 | 1 |
| 8 <br> (I/O Board <br> Dip Switch 101) | 7 | Dip Switch - 8 | On | Off |
|  | 6 | Dip Switch - 7 | On | Off |
|  | 5 | Dip Switch - 6 | On | Off |
|  | 4 | Dip Switch - 5 | On | Off |
|  | 3 | Dip Switch - 4 | On | Off |
|  | 2 | Dip Switch - 3 | On | Off |
|  | 1 | Dip Switch - 2 | On | Off |
|  | 0 | Dip Switch - 1 | On | Off |
| 9(Motor Lock/Transport) | 7 | Drum Motor Lock | Overload | Normal |
|  | 6 | By-pass Feed Motor Lock | Overload | Normal |
|  | 5 | Development Motor Lock | Overload | Normal |
|  | 4 | Fusing/Duplex Motor Lock | Overload | Normal |
|  | 3 | LD Unit HP Sensor | Not detected | Detected |
|  | 2 | 1st Exit Sensor | Paper detected | No paper |
|  | 1 | 2nd Exit Sensor | Paper detected | No paper |
|  | 0 | Tray Paper Limit Sensor | Not full | Full |
| $\begin{gathered} 10 \\ \text { (Duplex) } \end{gathered}$ | 7 | Duplex Entrance Sensor | Detected | Not detected |
|  | 6 | Duplex Transport 3 Sensor | Detected | Not detected |
|  | 5 | Duplex Transport 2 Sensor | Detected | Not detected |
|  | 4 | Duplex Transport 1 Sensor | Detected | Not detected |
|  | 3 | Duplex Jogger HP Sensor | Not detected | Detected |
|  | 2 | Duplex Connection | Connected | Not Connected |
|  | 1 | Toner Pump Connection | Connected | Not Connected |
|  | 0 | Guide Plate Position Sensor | In position | Out of position |
| $\begin{gathered} 11 \\ \text { (LCT1) } \end{gathered}$ | 7 | LCT Motor Lock | Overload | Normal |
|  | 6 | LCT Tray Down Switch | On | Off |
|  | 5 | LCT Connection | Connected | Not connected |
|  | 4 | LCT Cover Open Switch | Closed | Open |
|  | 3 | LCT Paper End Sensor | Paper end | Not paper end |
|  | 2 | LCT Down Sensor | Not detected | Detect |
|  | 1 | LCT Lift Sensor | Layout | Not lifted |
|  | 0 | LCT Paper Height 1 Sensor | Not detected | Detected |
| $\begin{gathered} 12 \\ \text { (LCT2) } \end{gathered}$ | 7 | Fusing Fan Motor Lock | Detected | Not detected |
|  | 6 | Not Used |  |  |
|  | 5 | Front Door Safety Switch | Closed | Open |
|  | 4 | Not Used |  |  |


| Class 3 no. | Bit no. | Description | Reading |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | 0 | 1 |
| $\begin{gathered} 12 \\ \text { (LCT2) } \end{gathered}$ | 3 | LCT Paper Height 2 Sensor | Not detected | Detected |
|  | 2 | LCT Paper Height 3 Sensor | Not detected | Detected |
|  | 1 | LCT Near End Sensor | Not detected | Near end |
|  | 0 | LCT Paper Feed Sensor | Paper detected | Paper end |
| 13 <br> (Registration) | 7 | LCT Paper Position Sensor | Detected | Not detected |
|  | 6 | Toner End Sensor | Toner End | Not toner end |
|  | 5 | Not Used |  |  |
|  | 4 | Relay Sensor | Paper detected | No paper |
|  | 3 | By-pass Paper End Sensor | Not paper end | Paper end |
|  | 2 | Registration Sensor | Paper detected | No paper |
|  | 1 | Not Used |  |  |
|  | 0 | Not Used |  |  |
| $14$ <br> (Unit Set) | 7 | Duplex Inverter Sensor | Not detected | Detected |
|  | 6 | Fusing Exit Sensor | Not detected | Detected |
|  | 5 | Key Counter Set | Set | Not set |
|  | 4 | Total Counter Set | Set | Not set |
|  | 3 | Exhaust Fan Lock | No lock | Lock |
|  | 2 | Toner Recycling Sensor | Pulse | Pulse |
|  | 1 | Drum Unit Set | Set | Not set |
|  | 0 | Fusing Unit Set | Set | Not set |

Table 1: 2nd Tray Paper Size Switch Combination

| $\text { Class } 3$no. | $\begin{gathered} \hline \text { Bit } \\ 7 \end{gathered}$ | $\begin{gathered} \hline \text { Bit } \\ 6 \end{gathered}$ | $\begin{gathered} \hline \text { Bit } \\ 5 \end{gathered}$ | $\begin{gathered} \mathrm{Bit} \\ 4 \end{gathered}$ | $\begin{gathered} \text { Bit } \\ 3 \end{gathered}$ | Paper Width |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  | A/B size version | Inch version |
| 1 | 0 | 1 | 1 | 1 | 1 | A3 | DLT |
|  | 0 | 0 | 1 | 1 | 1 | 81/4" x 13" | 81/2" 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 | 81/2" x 13" | HLT sideways |
|  | 0 | 0 | 0 | 1 | 0 | - | 8" $\times 101 / 2^{\prime \prime}$ |
|  | 0 | 0 | 0 | 0 | 1 | A5 sideways | 8" $\times 10{ }^{\prime \prime}$ |
|  | 1 | 0 | 0 | 0 | 0 | 8K lengthwise (Taiwan Version only) | 8" x 13" |
|  | 1 | 1 | 0 | 0 | 0 | 16K lengthwise (Taiwan Version only) | 10 x 14 " |
|  | 1 | 1 | 1 | 0 | 0 | 16K sideways (Taiwan Version only) | 11 " $\times 15$ |
|  | 1 | 1 | 1 | 1 | 0 | * | * |

ADF Input Check (SP6-007)

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

### 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 囲 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 | 38 | Relay Clutch (LCT) |
| 2 | 2nd Paper Feed Clutch | 39 | Registration Motor |
| 3 | 3rd Paper Feed Clutch | 40 | Guide Plate Solenoid |
| 4 | Not Used | 41 | Inverter Gate Solenoid |
| 5 | By-pass Feed Clutch | 42 | Not used |
| 6 | Paper Feed Clutch (LCT) | 43 | Duplex Transport Clutch |
| 7, 8 | Not used | 44 | Duplex Feed Clutch |
| 9 | 1st Pick-up Solenoid | 45 | Duplex Inverter Gate Solenoid |
| 10 | 2nd Pick-up Solenoid | 46 | Reverse Roller Solenoid |
| 11 | 3rd Pick-up Solenoid | 47 | Inverter Exit Clutch |
| 12 | Not Used | 48~ 51 | Not used |
| 13 | By-pass Pick-up Solenoid | 52 | Toner Supply Clutch |
| 14 | Pick-up Solenoid (LCT) | 53 | Development Motor |
| 15, 16 | Not used | 54 | Toner Recycling Motor |
| 17 | 1st Separation Roller Solenoid | 55 | Not used |
| 18 | 2nd Separation Roller Solenoid | 56 | Toner Supply Motor |
| 19 | 3rd Separation Roller Solenoid | 57 | Transfer Belt Solenoid |
| 20~23 | Not used | $58 \sim 61$ | Not used |
| 24 | Rear Fence Motor | 62 | Quenching Lamp |
| 25 | LCT Motor (LCT) | 63 | Charge Corona |
| 26 | Paper Feed Motor | 64 | Charge Corona Grid |
| 27 | By-pass Feed Motor | 65, 66 | Not used |
| 28 | Drum Motor | 67 | Development Bias |
| 29~30 | Not used | 68 | Not used |
| 31 | Fusing/Duplex Motor | 69 | Transfer Belt Voltage |
| 32 | 1st Vertical Relay Clutch | 70 | ID Sensor |
| 33 | 2nd Vertical Relay Clutch | 71 | SBU Cooling Fan Motor |
| 34 | 3rd Vertical Relay Clutch | 72 | Exposure Lamp |
| 35 | Not used | 73 | Optics Cooling Fan Motor |
| 36 | Relay Clutch | 74 | Not used |
| 37 | Not used | 75 | Duplex Fan Motor |


| No. | Description | No. | Description |
| :---: | :--- | :---: | :--- |
| 76 | Exhaust Fan | 88 | Staple Hammer Motor (Finisher) |
| 77 | Drum Cooling Fan | 89 | Punch Motor (Punch Unit) |
| 78 | Fusing Fan | 90 | Laser Diode |
| 79 | Exit Cooling Fan | 91 | Not used |
| 80 | Tray Junction Gate Solenoid <br> (Finisher) | 92 | Tray Lift Motor (Finisher) |
| 81 | Stapler Junction Gate Solenoid <br> (Finisher) | 93 | Jogger Motor (Finisher) |
| 82 | Positioning Roller Solenoid <br> (Finisher) | 94 | Stapler Motor (Finisher) |
| 83 | Not used | 95 | Stack Feed-out Belt Motor <br> (Finisher) |
| 84 | Mechanical Counter | 96 | Shift Motor (Finisher) |
| 85 | Upper Transport Motor (Finisher) | 97 | Stapler Rotation Motor (Finisher) |
| 86 | Lower Transport Motor (Finisher) | $98 \sim 99$ | Not used |
| 87 | Shift Tray Exit Motor (Finisher) |  |  |

## ADF Output Check (SP6-008)

| No. | Description |
| :---: | :--- |
| 1 | Feed-in Motor (Forward) |
| 2 | Feed-in Motor (Reverse) |
| 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 |

### 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 settings stored in the NVRAM to their default settings except the following:

- Electrical total counter value (SP7-003-1)
- Machine serial number (SP5-811)
- Plug \& Play Brand Name and Production Name Setting (SP5-907)

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.

| NV-RAM is not defective | NV-RAM is defective |
| :--- | :--- |
| 1. Print out all SMC data lists (SP 5-990-1). | 1. If possible, print out all SMC data lists (SP 5- <br> 990-1). |
| 2. Upload the NVRAM data from the BICU to the <br> flash memory card (SP 5-824). | 2. Turn the main power switch off. |
|  | 3. Replace the NV-RAM Minus Counter. |
| 3. Turn the main power switch off. | 4. Replace the developer because the TD initial <br> data is missing if the NV-RAM is defective. |
| 4. Replace the NV-RAM Minus Counter. | 5. Perform memory all clear (SP 5-801). |
| 5. Perform memory all clear (SP 5-801). NOTE 1 | 6. Turn the main power switch off and on. |
| 6. Turn the main power switch off and on. | 7. Calibrate the LCD touch panel. |
| 7. Calibrate the LCD touch panel. | 8. Perform the TD initial setting (SP 2-963). <br> Note: Do this step before the machine <br> automatically starts the Auto Process Control <br> (within approximately 2 minutes after the main <br> switch is turned on). |
| 8. Input the machine serial number (SP 5-811). | 9. Input the machine serial number (SP 5-811). |
| 9. Download the NVRAM data from the flash <br> memory card to the BICU (SP 5-825). Or, <br> referring to the SMC data lists, re-enter any <br> value which has been changed from its factory <br> setting. | 10. Adjust the laser beam pitch (SP 2-109). |
|  | 11. Perform the printer and scanner registration <br> adjustments. (See Replacement and <br> Adjustment - Copy Image - Adjustments) |
| 10. Download the stamp data from the flash <br> memory card (SP5-829). | 12. Referring to the SMC data lists, re-enter any <br> value which has been changed from its factory <br> setting. |
| 11. Check the copy quality and the paper path | 13. Download the stamp data from the flash <br> memory card (SP5-829). |
| and do any necessary adjustments. |  |

### 4.2.8 SOFTWARE RESET

The software can be reset when the machine hangs up. Use the following procedure.

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 PROGRAM AND DATA DOWNLOAD

### 4.3.1 OVERVIEW

In this machine, the program, NVRAM data and stamp data are downloaded using flash memory card as shown in the table.

| BICU Software | Flash Card $\rightarrow$ BICU |
| :--- | :--- |
|  | BICU $\rightarrow$ Flash Card |
| NVRAM Data | BICU $\rightarrow$ Flash Card |
|  | Flash Card $\rightarrow$ BICU |
| Stamp Data | Flash Card $\rightarrow$ BICU |

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.

### 4.3.2 DOWNLOADING SOFTWARE FROM FLASH ROM TO THE BICU

1. Turn off the main power switch.
2. Remove the flash memory card cover [A].
3. Plug the flash memory card $[B]$ into the card slot.

NOTE: Make sure that the surface printed "A" faces upwards.
4. Turn on the main power switch.

5. Touch "Install". The machine erases the current software, then writes the new software to the BICU. This takes about 3 minutes.
Display during erasing

| Flash Card Ltility |  |
| :---: | :---: |
|  | $\mathrm{Crd} \rightarrow \mathrm{FOM}$ <br> Cand:2097560 FOM:AZ29560 <br> Erasing... $\qquad$ <br>  |

Display during writing

| Flast Cars Litily |  |
| :---: | :---: |
|  | $\mathrm{Cand} \rightarrow \mathrm{FOM}$ <br> Cand: 22297560 ROW:AZ29756io <br> Writing... xx $\qquad$ <br> ADRS $=0680000 \mathrm{~h}$ RT $=00000 \mathrm{~h}$ WDT=0000h |

Display when the download is complete


If downloading failed, an error message appears on the display. At this time, touch the "OK" key to re-try the download.

### 4.3.3 DOWNLOAD THE BICU SOFTWARE FROM BICU TO FLASH MEMORY CARD



1. Turn off the main power switch.
2. Remove the flash memory card cover [A].
3. Plug the flash memory card $[B]$ into the card slot.

NOTE: Make sure that the surface printed " $A$ " faces upwards.
4. Turn on the main power switch.

5. Enter SP mode.
6. Select SP5-826.
7. Touch "START". The machine erases the current software, then writes the new software to the flash memory card.
8. Exit SP Mode.
9. Turn off the main switch.
10. Pull out the flash memory card.

### 4.3.4 DOWNLOAD NVRAM DATA TO THE BICU

1. Turn off the main power switch.
2. Remove the flash memory card cover [A].
3. Plug the flash memory card $[B]$ into the card slot.
NOTE: Make sure that the surface printed "A" faces upwards.
4. Turn on the main power switch.
5. Enter SP Mode.

6. Open the front door.

NOTE: Do not close the front door until the download finishes.
7. Select SP5-825-***.

001: All data
002: User tools (UP mode) data

NOTE: 1) Data of SP7-003 and SP7-006 are not downloaded.
2) When you select "001", no data is downloaded if the serial number on the BICU is not the same as the one on the flash card.

8. Press "Start".
9. Exit SP Mode.
10. Turn off the main switch.
11. Pull out the flash memory card.

### 4.3.5 DOWNLOAD NVRAM DATA FROM BICU TO FLASH MEMORY CARD



1. Turn off the main power switch.
2. Remove the flash memory card cover [A].
3. Plug the flash memory card $[B]$ into the card slot.

NOTE: Make sure that the surface printed "A" faces upwards.
4. Turn on the main power switch while holding down the operation switch.

5. Enter SP Mode.
6. Select SP5-824.
7. Touch the "Start" key.

### 4.3.6 DOWNLOAD STAMP DATA TO THE BICU



1. Turn off the main power switch.
2. Remove the flash memory card cover [A].
3. Plug the flash memory card $[B]$ into the card slot

NOTE: Make sure that the surface printed "A" faces upwards.
4. Turn on the main power switch.
5. Enter SP Mode.
6. Select SP5-829.
7. Open the front door.

NOTE: Do not close the front door until the download finishes.
8. Touch the "Start" key.
9. Exit SP Mode.
10. Turn off the main switch.
11. Pull out the flash memory card.

### 4.4 USER PROGRAM 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.

### 4.4.1 HOW TO ENTER AND EXIT UP MODE

Press the User Tools button, then select the UP mode program. After finishing the UP mode program, touch "Exit" key to exit UP mode.

### 4.4.2 UP MODE TABLE

NOTE: The function of each UP mode is explained in the System Setting and Copy Reference sections of the operating instructions.

## System Setting Table



Copy Features Table

| Tab | Item | Detail |
| :---: | :---: | :---: |
| General Features $1 / 3$ | Auto Paper Select Priority |  |
|  | Auto Paper Select Tray Display |  |
|  | Auto Image Density Priority |  |
|  | Original Mode Priority |  |
|  | Original Mode Display |  |
|  | Original Mode Quality Level | Text |
|  |  | Text/Photo |
|  |  | Photo |
|  |  | Pale |
|  |  | Generation |
|  | Original Image Density Level | Text |
|  |  | Text/Photo |
|  |  | Photo |
|  |  | Pale |
|  |  | Generation |
|  | Auto Reset Timer |  |
| General Features 2/3 | Duplex Mode Priority |  |
|  | Copy Orientation in Duplex Mode |  |
|  | Original Orientation in Duplex Mode |  |
|  | Initial Mode |  |
|  | Maximum Copy Quantity |  |
|  | Original Beeper |  |
|  | Job End Call |  |
|  | Time for indicating starts. |  |
| General Features 3/3 | Shortcut keys: F1 |  |
|  | Shortcut keys: F2 |  |
|  | Shortcut keys: F3 |  |
|  | Shortcut keys: F4 |  |
|  | Shortcut keys: F5 |  |
| Reproduction Ratio 1/2 | Shortcut R/E |  |
|  | R/E Priority |  |
|  | Enlarge 1 |  |
|  | Enlarge 2 |  |
|  | Enlarge 3 |  |
|  | Enlarge 4 |  |
|  | Enlarge 5 |  |
|  | Priority Setting : Enlarge |  |
| $\begin{aligned} & \text { Short Cut } \\ & \text { R/E } \end{aligned}$ | RE Priority |  |


| Tab | Item | Detail |  |
| :---: | :---: | :---: | :---: |
| Reproduction Ratio 2/2 | Reduce 1 |  |  |
|  | Reduce 2 |  |  |
|  | Reduce 3 |  |  |
|  | Reduce 4 |  |  |
|  | Reduce 5 |  |  |
|  | Reduce 6 |  |  |
|  | Priority Setting : Reduce |  |  |
|  | Shrink \& Center Ratio |  |  |
| Page | Front Margin : Left/Right |  |  |
| Format 1/2 | Back Margin : Left Right |  |  |
|  | Front Margin : Top/Bottom |  |  |
|  | Back Margin : Top/Bottom |  |  |
|  | $1 \rightarrow 2$ Duplex Auto Margin Adjust |  |  |
|  | Erase Border |  |  |
|  | Combine Original Shadow Erase |  |  |
|  | Erase Center |  |  |
|  | Repeat Separation Line |  |  |
| Page | Double Copies Separation Line |  |  |
|  | Combine Separation Line |  |  |
|  | Copy Back Cover |  |  |
|  | Cover Page in Combine Mode |  |  |
|  | Designated Slip Sheet Copy in Combine |  |  |
|  | Booklet/Magazine Original Orientation |  |  |
|  | Copy Order in Combine Mode |  |  |
| Stamp | Background Numbering | Size |  |
|  |  | Density |  |
|  |  | Superimpose |  |
|  | Preset Stamp (1/4) | Stamp Priority |  |
|  |  | Stamp Language |  |
|  |  | Stamp Position: Copy |  |
|  |  | Stamp Position: URGENT |  |
|  |  | Stamp Position: PRIORITY |  |
|  |  | Stamp Position: For Your Info. |  |
|  |  | Stamp Position: PRELIMINARY |  |
|  | Preset Stamp (2/4) | Stamp Position :For Interval Use only |  |
|  |  | Stamp Position: CONFIDENTIAL |  |
|  |  | Stamp Position: DRAFT |  |
|  |  | Stamp Condition: Size |  |
|  |  | Copy | Density |
|  |  |  | Print Page |


| Tab | Item | Detail |  |
| :---: | :---: | :---: | :---: |
|  | Preset Stamp (3/4) | Stamp Condition: URGENT | Size |
|  |  |  | Density |
|  |  |  | Print Page |
|  |  | Stamp Condition: PRIORITY | Size |
|  |  |  | Density |
|  |  |  | Print Page |
|  |  | Stamp Condition: For Your Info. | Size |
|  |  |  | Density |
|  |  |  | Print Page |
|  |  | Stamp Condition: PRELIMINARY | Size |
|  |  |  | Density |
|  |  |  | Print Page |
|  | Preset Stamp (4/4) | Stamp Condition: For Internal Use | Size |
|  |  |  | Density |
|  |  |  | Print Page |
|  |  | Stamp Condition: CONFIDENTIAL | Size |
|  |  |  | Density |
|  |  |  | Print Page |
|  |  | Stamp Condition: DRAFT | Size |
|  |  |  | Density |
|  |  |  | Print Page |
|  |  | Superimpose |  |
|  | User Stamp (1/2) | Program/Delete Stamp | Program |
|  |  |  | Delete |
|  |  | Stamp Position: 1 |  |
|  |  | Stamp Position: 2 |  |
|  |  | Stamp Position: 3 |  |
|  |  | Stamp Position: 4 |  |
|  |  | Stamp Condition: 1 |  |
|  |  | Stamp Condition: 2 |  |
|  | User Stamp (2/2) | Stamp Condition: 3 |  |
|  |  | Stamp Condition: 4 |  |
|  | Date Stamp | Format |  |
|  |  | Font |  |
|  |  | Position Priority |  |
|  |  | Size |  |
|  |  | Superimpose |  |
|  | Page Numbering (1/2) | Format Priority |  |
|  |  | Font |  |
|  |  | size |  |
|  |  | Duplex Back Page Number Position |  |
|  |  | Page Numbering in Combine Mode |  |
|  |  | Copy on Slip Sheet in Designate Mode |  |
|  |  | Position Priority: P1, P2, . . . . . . |  |



### 4.4.3 IMAGE QUALITY SETTING BY UP MODE

'Original Mode Level' in the 'General Features' UP menu is related to the 'MTF Filter Settings' SP mode.


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 |  |  |
| Filter Level - Text <br> Main Scan Direction <br> SP4-903-020 | 13 | 13 | 13 | 13 | 7 |  |  |
| Filter Strength - Text <br> Main Scan Direction <br> SP4-903-022 | 3 | 2 | 1 | 0 | 0 |  |  |

USER PROGRAM MODE

Magnification Ratio: 50 ~ 154\%

| MTF Filter Strength | Strong |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
| UP mode |  | Sharp | Normal |  | Weak |
| 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 |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
| UP mode |  | Sharp | Normal |  |  |
| Pre-filter Type - Text <br> SP4-903-011 | 0 | 0 | 0 | 0 | 2 |
| 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 |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
| UP mode |  | Sharp | Normal |  |  |
| Pre-filter Type - Text <br> SP4-903-011 | 0 | 0 | 0 | 0 | 2 |
| 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 |  |  | Soft |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
| UP mode |  |  | 1 | 1 | 1 |
| Pre-filter Type - Text <br> SP4-903-010 | 3 | 3 | 3 | 3 | 3 |
| Filter Level - Text <br> Main Scan Direction <br> SP4-903-020 | 6 | 6 | 6 | 6 | 6 |
| Filter Level - Text <br> Sub Scan Direction <br> SP4-903-021 | 4 | 3 | 2 | 1 | 1 |
| Filter Strength - Text <br> Main Scan Direction <br> SP4-903-022 | 2 | 2 | 1 | 1 | 0 |
| Filter Strength - Text <br> Sub Scan Direction <br> SP4-903-023 |  |  |  |  |  |

Magnification Ratio: 50 ~ 154\%

| MTF Filter Strength | Strong |  |  |  |  |  | Soft |  | Weak |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| UP mode |  |  | 0 | 0 | 0 |  |  |  |  |
| Pre-filter Type - Text <br> SP4-903-011 | 3 | 3 | 3 | 3 | 3 |  |  |  |  |
| Filter Level - Text <br> Main Scan Direction <br> SP4-903-024 | 6 | 6 | 6 | 6 | 6 |  |  |  |  |
| Filter Level - Text <br> Sub Scan Direction <br> SP4-903-025 | 4 | 3 | 2 | 1 | 1 |  |  |  |  |
| $\|$Filter Strength - Text <br> Main Scan Direction <br> SP4-903-026 | 2 | 2 | 1 | 1 | 0 |  |  |  |  |
| Filter Strength - Text <br> Sub Scan Direction <br> SP4-903-027 |  |  |  |  |  |  |  |  |  |

USER PROGRAM MODE

Magnification Ratio: 155 ~ 256\%

| MTF Filter Strength | Strong |  |  |  | Weak |
| :---: | :---: | :---: | :---: | :---: | :---: |
| UP mode |  |  | Soft |  |  |
| Filter Level - Text Main Scan Direction SP4-903-028 | 0 | 0 | 0 | 0 | 0 |
| Filter Level - Text Sub Scan Direction SP4-903-029 | 2 | 2 | 2 | 2 | 2 |
| Filter Strength - Text Main Scan Direction SP4-903-030 | 5 | 4 | 2 | 2 | 1 |
| Filter Strength - Text Sub Scan Direction SP4-903-031 | 5 | 4 | 4 | 2 | 1 |

Magnification Ratio: 257 ~ 400\%

| MTF Filter Strength | Strong |  |  |  | Weak |
| :---: | :---: | :---: | :---: | :---: | :---: |
| UP mode |  |  | Soft |  |  |
| Filter Level - Text Main Scan Direction SP4-903-032 | 0 | 0 | 0 | 0 | 0 |
| Filter Level - Text Sub Scan Direction SP4-903-033 | 2 | 2 | 2 | 2 | 2 |
| Filter Strength - Text Main Scan Direction SP4-903-034 | 5 | 4 | 2 | 2 | 1 |
| Filter Strength - Text Sub Scan Direction 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 |  | 1 |
| 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 |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
| 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 |  |  | Normal/Text Priority |  | Photo Priority |  |
| Filter Level - Text/Photo |  |  |  |  |  |  |
| 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 |  |  | Normal Text Priority |  | Photo Priority |
| Filter Level - Text/Photo |  |  |  |  |  |
| 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 |  |  |  |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 |

If the user selects "Service Mode" to use another smoothing filter setting, SP4-903009 (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 |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
| UP mode |  |  |  |  | Weak |
| 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 |  |  | Neak |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 |  |  |

### 4.5 TEST POINTS/DIP SWITCHES/LEDS

### 4.5.1 DIP SWITCHES

ADF Main Board

| DPS100 |  |  |  |  | Description |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 2 | 3 | 4 |  |
|  |  | 0 | 0 | 0 | Normal operating mode |
|  |  | 0 | 0 | 1 | Motor Test: Transport motor - Forward |
|  |  | 0 | 1 | 0 | Motor Test: Transport motor - Reverse |
|  |  | 0 | 1 | 1 | Motor Speed Adjustment (Automatic) |
|  |  | 1 | 0 | 0 | Original stop position adjustment - Single-sided original mode (No original skew correction) |
|  |  | 1 | 0 | 1 | Original stop position adjustment - Double sided original mode |
|  |  | 0 | 0 | 0 | Free Run: Single-sided original mode with skew correction |
|  |  | 0 | 1 | 0 | Free Run: Single-sided original mode without skew correction |
|  |  | 1 | 1 | 0 | Free Run: Double-sided original mode |
| Others |  |  |  |  | Do not select |

"SADF" LED turns on when one of the DIP switches is on.
MCU: All the dip switches should be OFF. Do not change the settings.

### 4.5.2 TEST POINTS

BICU

| Number | Monitored Signal |
| :---: | :--- |
| TP113 | GDN |
| TP123 | 5 VE |
| TP136 | Not used |
| TP143 | Not used |

Paper Feed Board

| Number | Monitored Signal |
| :---: | :--- |
| TP101 | Ground |
| TP102 | +24 V |
| TP103 | Ground |
| TP104 | +5 V |

I/O Board

| Number | Monitored Signal |
| :---: | :--- |
| TP104 | +12 V |
| TP154 | +5 V |
| TP155 | Ground |
| TP162 | +24 V |
| TP163 | Ground |
| TP172 | -12 V |
| TP173 | +24 VINT |

ADF Main Board

| No. | 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 |

I/O BOARD (DIP SW101)

| No. | Description | Function |
| :---: | :--- | :--- |
| 1 | Should be off. | - |
| 2 | Should be off. | - |
| 3 | SC codes display. | On: SC codes are not displayed. |
| 4 | Should be off. | - |
| 5 | Should be off. | - |
| 6 | Version 1 | 6: Off, 7: Off - Japanese version |
| 7 | Version 2 | 6: On, 7: Off - 115 V version <br> 6: Off, 7: On - 220/240 V version |
| 8 | Should be off. | - |

NOTE: When replacing the I/O board in the field, change the setting of DIP SW6 and 7 for your field.

### 4.5.3 FUSES

PSU

| Number | Description |
| :---: | :--- |
| FU101 | Protects the ac input line. |
| FU102 | Protects +24V |
| FU103 | Protects +24V |
| FU104 | Protects +24V |
| FU105 | Protects +24V |
| FU106 | Protects +24V |
| FU107 | Protects +24V |

ADF Main Board

| Number | Description |
| :---: | :--- |
| FU100 | Protects the 38 V line |
| FU101 | Protects the 24 V line |

### 4.5.4 VARIABLE RESISTORS

ADF Main Board

| Number | Function |
| :---: | :--- |
| VR100 | Adjusts the original stop position for the single-sided original at <br> no skew correction mode. |
| VR101 | Adjusts the original stop position for the double-sided original. |

### 4.5.5 LEDS

## BICU

| Number | Monitored Signal |
| :---: | :--- |
| LED101 | Blinking : Normal <br> Stays on or off : CPU defective |
| LED103 | Turns on when the main power switch on. |
| LED104 | Blinking : Normal <br> Stays on or off : HDD abnormal |

Paper Feed Board

| Number | Monitored Signal |
| :---: | :--- |
| LED101 | Turns on 500ms interval : Normal (software) <br> Turns on 200ms interval : Software error <br> Stays on of off : Paper feed board defective |

ADF Main Board O: ON \&

| LED100 | LED101 | LED102 |  |
| :---: | :---: | :---: | :---: |
| $\bigcirc$ | - | - | Entrance Sensor Jam |
| - | $\bigcirc$ | - | Registration Sensor Jam |
| $\bigcirc$ | $\bigcirc$ | - | Exit Sensor Jam |
| - | - | $\bigcirc$ | Inverter Sensor Jam |
| $\bigcirc$ | - | $\bigcirc$ | Jammed paper not removed: <br> Between entrance sensor + registration sensor |
| $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | Jammed paper not removed: On the exposure glass |
| $\pm$ | - | - | Feed-in Motor Abnormal |
| - | 2 | - | Transport Motor Abnormal |
| - | - | 2 | Feed-out Motor Abnormal |
| 2 | 2 | - | Pick-up Motor Abnormal |
| - | 2 | 2 | Bottom Plate Motor Abnormal |
| \% | \& | * | DF Position (Open) |
| \& | - | \& | APS Sensor ON |
| \% | - | - | Normal |

## $\Rightarrow 4.6$ SPECIAL TOOLS AND LUBRICANTS

### 4.6.1 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 |

### 4.6.2 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 |

### 4.7 FIRMWARE HISTORY

### 4.7.1 A292/A293 FIRMWARE MODIFICATION HISTORY

| A292/A293 BICU FIRMWARE MODIFICATION HISTORY |  |  |  |
| :---: | :---: | :---: | :---: |
| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION |
| Initial Production | A2937553 B | Initial Production | 3.0 |
| Note: <br> 1) The LCDC ROM A2935203C is required for BICU firmware version 3.1 (A2937564, A2937565 and A2937566). <br> 2) Version 3.1 requires the printer controller. <br> 1. Language <br> The following items have been changed from English to the language selected: <br> 1) Stamp Setting <br> Note: For Portuguese and Polish, the Stamp setting is still displayed in English. <br> The correction for this will be included in the next software update. <br> 2) Language Priority button <br> 2. A3/DLT Double Count corrected for Copy counter and Printer counter When making A3/DLT copies, the Copy and Printer Counters do not count up by 2, <br> even if A3/DLT Double Count has been set. <br> Note: The Total Counter correctly counts up by 2 . <br> 3. Key counter in connect copy mode. When the key counter is removed from the machine during a copy job in connect copy mode, both copiers will stop and display "paper jam". <br> 4. Slip-Sheet Mode It is possible to select "Copy" or "Blank" from the operation panel in Slip-Sheet Mode. | A2937553 C | Not Available | 3.1 |

8. 8K/16K Paper Size (China/Taiwan)
8K/16K paper size can be fed from Trays
2 and 3 by selecting 3:CH in SP5131
"Paper Size Type Selection".
Note: The factory default for SP5131 is
3:CH in models for China and Taiwan.



A292/A293 BICU FIRMWARE MODIFICATION HISTORY

| A292/A293 BICU FIRMWARE MODIFICATION HISTORY |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| DESCRIPTION OF MODIFICATION |  |  |  | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION |
| Corrections / Updates: <br> 1. New Copy Feature and SP Mode (SP5971) Added <br> 1) New Copy Feature: Enhance Density Mode <br> This feature has been added to ensure that image density does not drop while making multiple copies of originals with a high percent of solid black areas. <br> To set effective original density and number of copies for multi-copy mode, use SP5971 (see below). To add the Enhance Density Key to the display panel and to control the level, perform the following procedure: <br> (1) Press the User Tools/Counter key. <br> (2) Press the Copy/Document Server Features Key. <br> (3) Open General Features, screen $3 / 3$. <br> (4) Select one of the Shortcut Keys from F1-F5. <br> (5) Register the Enhance Density Key. <br> (6) Open General Features, screen $1 / 3$. <br> (7) Select the setting for <br> 2) New SP Mode: SP5971 (Enhance Copy Setting): <br> The following settings apply to Enhance Density Mode: |  |  |  | A2937553 E | Not Available | 3.5.1 |
| Mode No.$5971$ | Enhance Copy Setting Function $\quad$ Setting |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  | 2 | Effective Original Density |  | Selects the original image ratio at which the mode is activated (calc. from setting). |  | $\begin{aligned} & 1 \sim 60 \% \\ & 1 \% \text { step } \\ & 4 \% \end{aligned}$ |
|  | 3 | Effective Multiple Copy | Selects the sheet number at which mode is activated with multi-copy jobs (calc. from setting). |  |  | 1 ~ 50sheets 1 sheet step 3 sheets |


| A292/A293 BICU FIRMWARE MODIFICATION HISTORY |  |  |  |
| :---: | :---: | :---: | :---: |
| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION |
| 3. Fusing Unit Fan Motor Off-Timing Change <br> To ensure that the hot air around the toner bottle is properly removed, the fusing unit fan motor will be kept on whenever the 24 V is being supplied. <br> Therefore, it will turn off only when the main switch or operation switch is turned off or when the machine is shut down by the AutoOff function. <br> 4. Word Correction <br> Some display language words and phrases have been corrected or improved. |  |  |  |
| Corrections / Updates: <br> 1. New SP Mode (SP5970) for EB-70 (Printer controller) The following setting applies when the EB-70 printer controller is installed. | A2937553 F | Not Availbale | 3.6 |
| Function |  |  | Setting |
| Printer Installed |  |  |  |
|  | Selects whethe controller is inst | EB-70 printer d or not. | $\begin{aligned} & \text { 0: No } \\ & \text { 1: Yes } \end{aligned}$ |
| 2. Some Part of Image Missing in Tab Stock when Printing from Document Server <Symptom> <br> When files in the Document Server are printed onto Tab Stock, the image is not rotated even though tab stock can be set sideways only. This is because the documents are saved lengthwise only in the Document Server. <br> <Modification> <br> The error has been corrected. |  |  | Continue ... |


$\Rightarrow$| A292/A293 BICU FIRMWARE MODIFICATION HISTORY |  |  |  |
| :--- | :---: | :---: | :---: |
|  | DESCRIPTION OF MODIFICATION | FIRMWARE <br> LEVEL | SERIAL <br> NUMBER | | FIRMWARE |
| :---: |
| VERSION |$|$| 3.Malfunction with Printer Dot Edge <br> Parameter Setting when Printing from <br> Document Server <br> <Symptom> <br> When edge smoothing is off, the line <br> thickness is not changed when the <br> printer dot edge parameter setting <br> (SP2114) is changed. <br> <Modification> <br> The error has been corrected. |  |  |
| :--- | :--- | :--- |

## PREVENTIVE MAINTENANCE

## 5. PREVENTIVE MAINTENANCE SCHEDULE

### 5.1 PM TABLE

NOTE: The amounts mentioned as the PM interval indicate the number of prints, unless stated otherwise.
Symbol key: C: Clean, R: Replace, L: Lubricate, I: Inspect

|  | EM | $\begin{gathered} \hline 150 \\ K \end{gathered}$ | $\begin{gathered} \hline \hline 300 \\ K \end{gathered}$ | $\begin{gathered} \hline \hline \mathbf{4 5 0} \\ K \end{gathered}$ | Expected Life K | NOTE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SCANNER/OPTICS |  |  |  |  |  |  |
| 1st, 2nd, 3rd Mirror |  | C | C | C |  | Optics cloth |
| Reflectors |  | C | C | C |  | Optics cloth |
| White Reference Plate |  | I | I | I |  | Water |
| Scanner Guide Rails |  | C | C | C |  | Dry cloth |
| Exposure Glass | C | C | C | C |  | Dry cloth or alcohol |
| Toner Shield Glass |  | C | C | C |  | Optics cloth |
| Optics Dust Filter |  | I | R | 1 |  | Blower brush |
|  |  |  |  |  |  |  |
| AROUND THE DRUM |  |  |  |  |  |  |
| Charge Corona Wire |  | C | C | C | 300 | Dry Cloth |
| Charge Corona Casing |  | C | C | C |  | Damp cloth |
| Corona Wire Cleaner |  | C | C | C | 300 |  |
| Drum Potential Sensor |  | C | C | C |  | Blower brush |
| Charge Corona Grid |  | C | C | C | 300 | Blower brush |
| ID Sensor |  | C | C | C |  | Blower brush; initialize with SP3-001-2 after cleaning. |
| Quenching Lamp |  | C | C | C |  | Dry cloth |
| Pick-off Pawls |  | C | C | C |  | Dry cloth Replace if necessary. |
| Cleaning Blade |  |  |  |  | 300 |  |
| Cleaning Brush |  |  |  |  | 300 |  |
| Cleaning Brush Seal |  |  | C |  |  | Dry cloth |
| Cleaning Side Seals |  | 1 | 1 | 1 |  | Dry cloth |
| Cleaning Entrance Seal |  | C | C | C |  | Dry cloth Replace if necessary |
|  |  |  |  |  |  |  |
| DEVELOPMENT UNIT |  |  |  |  |  |  |
| Developer |  |  | R |  |  |  |
| Side Seals |  | I | I | 1 |  | Dry cloth or blower brush |
| Development Filter |  | R | R | R |  |  |
| Entrance Seal |  | C | C | C |  | Dry cloth or blower brush |
| Air Filter - Large/ Small |  | R | R | R |  |  |
| Drive Gears |  | C | C | C |  | Blower brush |
| Toner Bottle Holder |  | C | C | C |  | Dry cloth or vacuum cleaner |
| Toner Hopper Entrance |  | C | C | C |  | Dry cloth |
| Development Roller Shaft |  | C | C | C |  | Dry cloth or blower brush |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |


|  | EM | $\begin{gathered} \hline 150 \\ \mathrm{~K} \end{gathered}$ | $\begin{gathered} 300 \\ \mathrm{~K} \end{gathered}$ | $\begin{gathered} \hline \hline 450 \\ \mathrm{~K} \end{gathered}$ | Expected Life K | NOTE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| PAPER FEED |  |  |  |  |  |  |
| Registration Rollers |  | C | C | C |  | Water or alcohol |
| Relay Rollers |  | C | C | C |  | Water or alcohol |
| Paper Dust Remover |  | C | C | C |  | Dry cloth |
| Registration Sensor |  | C | C | C |  | Blower brush |
| Relay Sensor |  | C | C | C |  | Blower brush |
| Paper Feed Rollers <br> Pick-Up Rollers <br> Separation Rollers |  | C | C | C | 300 | Replace pick-up, feed and separation roller as a set. Check the counter value for each paper tray station (SP7-204). If the value has reached 300 K , replace the rollers. After replacing the rollers, reset the counter (SP7-816). |
| Paper Feed Guide Plate |  | C | C | C |  | Water or alcohol |
| Vertical Transport Rollers |  | C | C | C |  | Water or alcohol |
| Paper Feed Sensor |  | C | C | C |  | Blower brush |
| TRANSFER BELT UNIT |  |  |  |  |  |  |
| Transfer Belt |  | C | C | C | 450 | Dry cloth |
| Cleaning Roller Cleaning Blade |  |  |  | C | 450 |  |
| Transfer Entrance Guide Plate |  | C | C | C |  | Dry cloth |
| Belt Drive/Guide/ Bias Roller/Cleaning Roller |  | C | C | C |  | Alcohol |
| Transfer Exit Guide Plate |  | C | C | C |  | Dry cloth |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| FUSING/PAPER EXIT |  |  |  |  |  |  |
| Hot Roller |  | 1 | 1 | 1 | 200 |  |
| Hot Roller Bearings |  | 1 | 1 | 1 | 600 |  |
| Pressure Roller |  | , | 1 | 1 | 450 | Replace as a set. |
| Pressure Roller Bearings |  | 1 | 1 | 1 | 450 |  |
| Fusing Thermistor | I | 1 | 1 | 1 |  | Replace if necessary. |
| Hot Roller Strippers | C | C | C | C | 300 | Water or alcohol |
| Oil Supply Roller Bushings | I | 1 | 1 | 1 |  | Replace if necessary. |
| Pressure Roller Cleaning Roller and Bushings |  | R | R | R |  | Replace as a set. |
| Oil Supply Roller |  | R | R | R |  |  |
| Oil Supply Cleaning Roller |  | R | R | R |  |  |
| Fusing Entrance and Exit Guide Plates |  | C | C | C |  | Clean with water or alcohol |
| Transport/Exit Rollers |  |  | C |  |  | Water |
| Exit Anti-static Brush |  |  | 1 |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |


|  | EM | $\begin{gathered} 150 \\ \mathrm{~K} \end{gathered}$ | $\begin{gathered} \hline 300 \\ K \end{gathered}$ | $\begin{gathered} \hline 450 \\ K \end{gathered}$ | Expected Life K | NOTE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| DUPLEX |  |  |  |  |  |  |
| Entrance Sensor |  | C | C | C |  | Blower brush |
| Reverse Roller |  | C | C | C |  | Water or alcohol |
| Separation Rollers |  | C | C | C |  |  |
| Duplex Roller |  | C | C | C |  |  |
| Feed Rollers |  | C | C | C |  |  |
| Entrance Anti-static Brush |  | 1 | I | 1 |  |  |
| Reverse Junction Gate |  | C | C | C |  | Dry cloth |
|  |  |  |  |  |  |  |
| OTHERS |  |  |  |  |  |  |
| Ozone Filter: PCU |  |  | R |  |  |  |
| Ozone Filter: Duct |  |  | R |  |  |  |
| Filter: Vacuum |  | R | R | R |  | Blower brush |
| Used Toner Tank | 1 | I | I | I |  | Replace if necessary (about 1,000k copies). |


|  | EM |  | $\mathbf{8 0 K}$ | 160K | 240K | NOTE |
| :--- | :---: | :---: | :---: | :---: | :--- | :--- |
| ADF (the PM interval is for the number of originals that have been fed) |  |  |  |  |  |  |
| Transport Belt | C | R | R | R | Belt cleaner |  |
| Feed Belt | C | R | R | R | Belt cleaner |  |
| Separation Roller | C | R | R | R | Dry or damp cloth |  |
| Pick-up Roller | C | R | R | R | Dry or damp cloth |  |
| Sensors | C | C | C | C | Belt brush |  |
| Drive Gears |  | L | L | L | Grease G501 |  |


|  | EM | $\begin{gathered} \hline \hline 150 \\ K \end{gathered}$ | $\begin{gathered} \hline 300 \\ \mathrm{~K} \end{gathered}$ | $\begin{gathered} \hline \hline 450 \\ K \end{gathered}$ | Expected Life K | NOTE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LCT |  |  |  |  |  |  |
| Paper Feed Roller |  | C | C | C | 300 | Check the counter value for the LCT (SP7-204-5). If the value has reached 300 K , replace the rollers. After replacing the rollers, reset the counter (SP7-816-5). |
| Pick-up Roller |  | C | C | C | 300 |  |
| Separation Roller |  | C | C | C | 300 |  |
| Bottom Plate Pad |  | C | C | C |  | Dry or damp cloth |
| Paper Feed Clutch |  |  |  |  | 1,200 |  |
| Relay Clutch |  |  |  |  | 1,200 |  |
| Pick-up Solenoid |  |  |  |  | 2,400 |  |


|  | EM | $\begin{gathered} \hline 150 \\ K \end{gathered}$ | $\begin{gathered} \hline 300 \\ K \end{gathered}$ | $\begin{gathered} 450 \\ K \end{gathered}$ | Expected Life K | NOTE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 3,000-SHEET FINISHER (50-SHEET STAPLER): (B312) |  |  |  |  |  |  |
| Rollers | C | C | C | C |  | Clean with water or alcohol. |
| Brush Roller | 1 | 1 | 1 | 1 | 2,400 |  |
| Discharge Brush | C | C | C | C |  | Clean with a dry cloth. |
| Sensors | C | C | C | C |  | Blower brush |
| Jogger Fences | 1 | I | 1 | 1 |  | Replace if necessary. |
| Punch Waste Hopper | 1 | 1 | 1 | 1 |  | Empty the hopper. |


|  | EM | $\begin{gathered} 150 \\ K \end{gathered}$ | $\begin{gathered} \hline 300 \\ K \end{gathered}$ | $\begin{gathered} \hline \hline 450 \\ K \end{gathered}$ | Expected Life K | NOTE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 3,000-SHEET FINISHER (100-SHEET STAPLER): (B302) |  |  |  |  |  |  |
| Rollers | C | C | C | C |  | Clean with water or alcohol. |
| Brush Roller | 1 | 1 | 1 | 1 | 600 | Check the counter value for the total copies by copy mode for staple (SP7-304-9). If the value has reached 600 K , replace the brush roller. |
| Discharge Brush | C | C | C | C |  | Clean with a dry cloth. |
| Sensors | C | C | C | C |  | Blower brush |
| Jogger Fences | 1 | 1 | 1 | 1 |  | Replace if necessary. |
| Punch Waste Hopper | 1 | 1 | 1 | 1 |  | Empty the hopper. |


|  | EM | 150 <br> $\mathbf{K}$ | $\mathbf{3 0 0}$ <br> $\mathbf{K}$ | $\mathbf{4 5 0}$ <br> $\mathbf{K}$ | Expected <br> Life K | NOTE |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| FINISHER: (A763) | C | C | C | C |  | Clean with water or alcohol. |
| Rollers | C | I | I | I |  |  |
| Brush Roller | C | C | C | C |  | Clean with a dry cloth. |
| Discharge Brush | C | C | C | C |  | Blower brush |
| Sensors | I | I | I | I |  | Replace if necessary. |
| Jogger Fences |  |  |  |  |  |  |

## $\Rightarrow 5.2$ 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.

### 5.2.1 PM COUNTER ACCESS PROCEDURE

1) Press the following keys in sequence.

$$
\mathrm{C} / \otimes \rightarrow \square \mathbf{1} \rightarrow 0 \rightarrow \square \rightarrow \square
$$

Hold the C key for more than 3 seconds
The SP mode menu is displayed.

2) Press [PM Counter ] on the display.

3 ) The following menu appears on the display.

| SP Mode (Parts replacement) | Prev. Menu | Exit |
| :---: | :---: | :---: |
| Select Item |  |  |
| Al PM parts list | Counterist print out |  |
| Parts list for PM yield indicator | cSS Calling Seting |  |
| Parts exceedingtarget yilid |  |  |
| Clear all PM settings |  |  |

## 1. All PM Parts List

Displays all the counters for PM parts.
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 the [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.

| SP Mode (Parts replacement) |  |  |  | Prev. Menu |  | Exit |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 Riller | 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 | 0000228 | 0300K | Clear |  |
| 012 | Pick-up Roller - Tray 1 | Yes | 0000228 | 0300K | Clear |  |
| 013 | Separation Roller - Tray 1 | Yes | 0000228 | 0300k | Clear |  |
| 014 | Feed Roller - Tray 2 | Yes | 0000000 | 0300k | Clear | 01/03 |
| 015 | Pick-up Riller - Tray 2 | Yes | 0000000 | 0300k | Clear |  |
| 016 | Separation Roller - Tray 2 | Yes | 0000000 | 0300k | Clear | Previous page |
| 017 | Feed Roller - Tray 3 | Yes | 0000000 | 0300k | Clear |  |
| 018 | Pick-up Roller - Tray 3 | Yes | 0000000 | 0300k | Clear | Next page |

To clear a counter, press [Clear] on the display. The following appears.


Then press [Yes] to clear the counter.

If one of the keys in the "No" column is pressed, the following appears on the display.


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 Strippers |  | 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 |  | 0000228 | 0300k | Clear |  |
| 012 | Pick-up Roller - Tray 1 |  | 0000228 | 0300k | Clear |  |
| 013 | Separation Roller - Tray 1 |  | 0000228 | 0300k | Clear |  |
| 014 | Feed Roller - Tray 2 |  | 0000000 | 0300k | Clear | 01/01 |
| 015 | Pick-up Roller - Tray 2 |  | 0000000 | 0300k | Clear |  |
| 016 | Separation Roller - Tray 2 |  | 0000000 | 0300K | Clear | Prexious page |
| 017 | Feed Roller - Tray 3 |  | 0000000 | 0300k | Clear |  |
| 018 | Pick-up Roller - Tray 3 |  | 0000000 | 0300k | Clear | xtpage |

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.


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.


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.


Press [Print] to print out the counter list.

## 7. CSS Calling Setting (RSS Function)

This function is for Japanese machines only.

## REPLACEMENT AND ADJUSTMENT

## 6. REPLACEMENT AND ADJUSTMENT

| $\triangle$ CAUTION |
| :--- |
| Turn off the main power switch and unplug the machine before attempting <br> any of the procedures in this section. |

### 6.1 EXTERIOR

### 6.1.1 FILTERS



Ozone Filter: Duct

1. Remove the duct $[A]$ (1screw).
2. Replace the ozone fuller $[B]$.

## Filter Vacuum

1. Remove the louver [C] (1 hook).
2. Replace the vacuum filter [D].

### 6.2 DOCUMENT FEEDER

### 6.2.1 COVER REMOVAL



## Front Cover Removal

1. Remove the front cover [A] (2 screws).

## Rear Cover Removal

2. Remove the rear cover $[B]$ (2 screws).

## Left Cover Removal

1. Remove the front cover.
2. Remove the grounding wire ( 1 screw).
3. Remove the left cover [C] ( 1 screw, 1 connector).

## Upper Exit Cover Removal

1. Remove the front cover.
2. Remove the upper exit cover [D] (1 screw).


## 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



1. Open the left cover.
2. Remove the clip $[\mathrm{A}]$.
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].

### 6.2.3 FEED BELT REPLACEMENT


[E]

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



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.

### 6.2.5 SENSOR REPLACEMENT

## Entrance and Registration Sensors



## Entrance Sensor

1. Remove the left cover.
2. Remove the guide plate [A] (5 screws).
3. Replace the entrance sensor $[B]$ (1 connector).

## Registration Sensor

1. Release the transport belt unit [C].
2. Remove the sensor bracket [D] (1 screw).
3. Replace the registration sensor [E] (1 connector, 1 screw).

## Width Sensor

[B]


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



## 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





1. Remove the front cover.
2. Remove the lower two screws $[A]$ securing the transport belt assembly $[B]$.
3. Remove the upper four screws [C] securing the transport belt assembly.
4. Bend up the transport belt assembly extension.
5. Pull off the transport belt [D] and replace it.

NOTE: 1) When releasing the transport belt assembly, make sure to remove the two lower screws first.
2) When installing the transport belt, make sure that the belt runs under the belt guide spacers [E].
3) When securing the transport belt assembly with the six screws, make sure to secure the four upper screws first.

### 6.3 SCANNER UNIT

### 6.3.1 EXPOSURE GLASS



1. Open the ADF.
2. Remove the left scale $[A]$ ( 3 screws).
3. Remove the 2 screws $[B]$ holding the rear scale.
4. Slide the rear scale $[C]$ in the direction of the arrow, then remove it.
5. Remove the exposure glass [D].

NOTE: When reinstalling the exposure glass, make sure that the mark [D] is positioned at the rear left corner, as shown.

### 6.3.2 LENS BLOCK



1. Remove the exposure glass. (See Exposure Glass.)
2. Remove the lens cover [A] (11 screws).
3. Replace the lens block assembly [B] (2 screws, 3 connectors).
4. Do the scanner and printer copy adjustments. (See Replacement and Adjustment - Copy Image Adjustments.)

NOTE: When putting back the lens cover, take care not to pinch the operation panel cable.

### 6.3.3 ORIGINAL SIZE SENSORS



1. Remove the exposure glass. (See Exposure Glass.)
2. Remove the original width sensor [A] (1 screw, 1 connector).
3. Remove the lens cover [B] (11 screws).
4. Remove the original length sensors [C] (1 screw and 1 connector each).

### 6.3.4 EXPOSURE LAMP



1. Remove the exposure glass. (See Exposure Glass.)
2. Slide the 1 st scanner $[A]$ to the cutout $[B]$ in the rear scanner frame.
3. Remove the lamp cover [C] (2 screws).
4. Remove the exposure lamp [D] (1 screw, 2 connectors).

NOTE: Do not touch the glass surface of the exposure lamp with fingers.

### 6.3.5 SCANNER MOTOR / MCU



## Scanner Motor

1. Remove the scanner rear cover. (See Covers - Rear.)
2. Remove the exhaust fan ( 2 screw, 1 connector and 1 snap fit).
3. Remove the scanner motor [A] with the bracket (3 screws, 2 connectors, 1 spring).
4. Do the scanner and printer copy adjustments. (See Replacement and Adjustment - Copy Image Adjustments.)

## MCU

1. Do steps 1 and 2 of the scanner motor removal.
2. Replace the MCU [B] (4 screws and 3 connectors).

### 6.3.6 SCANNER WIRES



1. Remove the ADF.
2. Remove the following parts:

- Exposure glass [A] (See Exposure Glass.)
- Operation panel under cover [B] (See Scanner H.P Sensor.)
- Scanner rear cover [C] (2 screws)
- Original exit tray [D] (3 screws)
- Upper right cover [E] (4 screws).


3. Remove the left upper stay $[A]$ (5 screws).
4. Remove the right upper stay $[B]$ ( 5 screws).
5. Remove the shutter inner cover (see Development Unit) and swing out the toner bottle holder [C].
6. Remove the front frame [D] (6 screws).

7. Remove the ARDF support brackets [A] (4 screws each).
8. Remove the scanner upper frame [B] (4 screws).


## Rear Scanner Drive Wire

9. Remove the scanner motor and the scanner motor drive board. (See Scanner Motor and Scanner Motor Drive Board.)
10. Remove the drive pulley [A] (1 Allen screw), bearing $[B]$, and the bearing holder bracket [C] (1 screw).
11. Remove the scanner rear frame [D] (5 screws).
12. Remove the rear scanner wire bracket [no illustration] ( 1 screw).
13. Remove the cable guide [F] (1 screw).
14. Remove the tension spring [G].
15. Loosen the screw $[\mathrm{H}]$ securing the wire tension bracket $[I]$, and remove the rear scanner wire [J].
16. Remove the pulley $[K]$.


## Front Scanner Drive Wire

17. Remove the tension spring [A].
18. Loosen the screw $[B]$ securing the wire tension bracket [C], and remove the front scanner wire [D].
19. Remove the pulley [E] (1 screw).


## Reinstallation

20. While making sure of the direction, place the bead on the middle of the wire in the pulley hole. Then wind the wire (ball side) [D] clockwise 6 times, and the other side (ring side) 2 times as shown (1). Secure the pulley with tape to keep this condition.
21. Place the pulley on the scanner drive shaft.
22. Secure the pulley with the Allen screw in the position where the Allen screw hole faces up.
23. Wind the end of the new wire with the ball as shown (2), (3), and (4).
24. Wind the end of the new wire with the ring as shown (5), (6), and (7).
25. Install the tension spring on the tension bracket [E], and slightly tighten the tension bracket.

26. Install the 1st scanner and adjust the position with the positioning tools (P/N A0069104) [A].
27. Secure the 1st scanner with the scanner wire bracket $[B]$ (1 screw).
28. Fully tighten the tension bracket.
29. 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 tension bracket again.
30. Reassemble the scanner and do the scanner and printer copy adjustments (see Replacement and Adjustment - Copy Image Adjustments).

### 6.4 LASER UNIT

| $\boxed{\text { WURARNING }}$ |
| :--- |
| Turn off the main power switch and unplug the machine before attempting <br> any of the procedures in this section. Laser beams can seriously damage <br> your eyes. |

### 6.4.1 CAUTION DECAL LOCATIONS

There are three caution decals in the laser section as shown below.


### 6.4.2 LD UNIT REPLACEMENT



## $\triangle$ WARNING <br> Turn off the main power switch and unplug the machine before attempting this procedure. Laser beams can seriously damage your eyes.

1. Remove the exposure glass. (See Exposure Glass Removal.)
$\Rightarrow 2$. Remove the LD cover [A] (6 screws).
2. Replace the LD unit [B] (2 screws and 6 connectors).

NOTE: When disconnecting the cables, hold the LD unit.
4. When reinstalling, make sure that the flat cable [C] is mounted above the LD unit, and that the rotation of the unit is not interrupted.
$\Rightarrow 5$. Do SP 2-962 (process control initialization).
NOTE: Be sure that the cable does not block LD unit rotation after replacing the LD unit. If the LD unit cannot rotate smoothly to change the resolution, SC329 (LD unit home position error) may occur.

### 6.4.3 LASER BEAM PITCH ADJUSTMENT

There are two laser beam pitch adjustment procedures: one for 400 dpi , and one for 600 dpi. These adjustments use the following SP modes.

- SP2-109-1: Laser Beam Pitch Adjustment - 400 dpi
- SP2-109-2: Laser Beam Pitch Adjustment - 600 dpi
- SP2-109-3: Laser Beam Pitch Initial Setting - 400 dpi
- SP2-109-4: Laser Beam Pitch Initial Setting - 600 dpi
- SP2-902-3, no.17: Hound's Tooth Check (1-dot) - Cross Stitch - 400 dpi
- SP2-902-3, no.16: Hound's Tooth Check (1-dot) - Cross Stitch - 600 dpi

1. Perform SP2-109-8 (Beam Pitch Data Reset).
2. Input the value for 400 dpi that is printed on the LD unit into SP2-109-1. Use the value printed after "P" on the new LD unit as shown below.


NOTE: Do not use values printed after a "V".
3. Press the "Enter" key.
4. Perform SP2-109-3.
5. Print the 400-dpi test pattern onto A3 (11"x17") paper using SP2-903-3 no. 17 (cross stitch). (See Service Tables - Test Pattern Printing).
6. Write the value of SP2-109-1 on the test pattern which was input at step 2.
7. Change the value of SP2-109-1 and print another test pattern, repeating steps 2 to 5 . Print about 5 patterns with different values for SP2-109-1 (e.g. "48", "96", "192", "240").
8. Check this test pattern. If the laser beam pitch is not correct, the image looks like a black vertical stripe pattern.
NOTE: If the laser beam pitch is correct, the vertical stripe is not so noticeable. If the value is not correct, the vertical stripe pattern is darker.
9. Adjust the laser beam pitch position until the thin lines are of uniform thickness (no striping effect should appear on the printout), doing steps 2, 3, and 4. (In step 2, input a value which is estimated to be correct, then do steps 3 and 4, then if necessary go back to step 2 and try another value.)
10. After adjusting the laser beam pitch for 400 dpi, adjust the laser beam pitch for 600 dpi, using the same procedure as for 400 dpi (use the SP modes for 600 dpi).

Adjustment not complete

- Feed Direction


Adjustment complete


## $\Rightarrow$ 6.4.4 POLYGON MIRROR MOTOR REPLACEMENT



1. Turn off the main power switch and unplug the machine.
2. Remove the exposure glass. (See Exposure Glass Removal.)
3. Remove the lens cover. (See Lens Block Assembly Replacement.)
4. Remove the lens block assembly. (See Lens Block Assembly Replacement.)
5. Remove the polygon mirror motor cover [A] (2 screws).
6. Disconnect the LD unit flat cable [B].
7. Replace the polygon mirror motor [C] (3 screws and 2 connectors.)

NOTE: When reinstalling, make sure that the polygon mirror opening faces the right. Also, do not pull on the LD flat cable.
8. Do the scanner and printer copy adjustments. (See Replacement and Adjustment - Copy Image Adjustments.)

### 6.5 DRUM UNIT

### 6.5.1 DRUM POTENTIAL SENSOR REPLACEMENT



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 <br> initial setting (SP mode No. 2-962). |

### 6.5.2 DRUM MOTOR REPLACEMENT



1. Turn off the main switch.
2. Remove the rear cover and the fly wheel. (Refer to Development Motor Replacement.)
3. Loosen the tension brackets $[A]$ (2 screws).
4. Remove the timing belts $[B]$ from the drum motor's pulleys.
5. Remove the support plate [C].
6. Replace the drum motor unit [D] ( 3 screws, 1 connector).

NOTE: When re-installing the drum motor unit, re-install the support plate before attaching the timing belt and the tension bracket.

### 6.5.3 TONER OUTPUT AND RECYCLING PUMP UNIT REPLACEMENT



NOTE: Before starting the procedure, remove the drum unit and the transfer belt unit to prevent toner from dropping into the machine.

1. Turn off the main switch.
2. Remove the rear cover and fly wheel. (Refer to Development Motor Replacement.)
3. Remove the DRB board assembly [A] (2 screws).
4. Lower the I/O Board (4 screws).
5. Remove the spring $[\mathrm{B}]$.
6. Remove the toner recycling clutch bracket [C] (3 screws, 1 connector)

NOTE: When reinstalling the bracket [C], put the pin on the stopper [D] into the cutout in the clutch.
7. Remove the timing belt [E] from the drum motor's pulley.
8. Remove the bushing [F].

NOTE: Be careful not to drop the bushing.
9. Remove the by-pass feed motor. (Refer to By-pass Feed Motor/Clutch Replacement.)

10. Release the toner recycling tube [A] from the pump unit.

NOTE: When turning the end of the tube downwards, prevent the toner in it from dropping into the machine.
11. Release the air tube [B].
12. Remove the toner output and recycling pump unit [C] (2 screws, 1 pin connectors).
NOTE: The lower part of the pin (push lock) drops easily.

### 6.6 DEVELOPMENT AND TONER SUPPLY

### 6.6.1 DEVELOPMENT AND AIR DUST FILTER REPLACEMENT



1. Take out the development unit. (Refer to Development Unit Removal.)
2. Remove the toner hopper [A] (two screws).
3. Replace the development filter [B].
4. Remove the front air dust filter cover [C] (1 hook).
5. Replace the front air dust filter [D].
6. Remove the central air dust filter cover [E].
7. Replace the central air dust filter [F].

### 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 one-way clutch in 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 end sensor.
9. Turn on the main switch, then perform developer initial setting (SP mode No. 2801).

NOTE: 1) Enter the SP mode before the machine automatically starts the auto process control. If you could not enter the SP mode before this starts, do the developer initial setting after the print key turns green. Do not turn off the main switch until the developer initial setting has finished.
2) Do not make any copies with the new developer before completing the developer initial setting, otherwise toner density control will be abnormal.
3) When 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 "SC341 or 342" in the troubleshooting section.

### 6.6.3 TONER END SENSOR REPLACEMENT



1. Take out the toner hopper. (Refer to Developer Replacement.)
2. Replace the toner end sensor $[A]$.

### 6.6.4 DEVELOPMENT MOTOR REPLACEMENT



1. Turn off the main switch.
2. Remove the rear covers. (Refer to Exterior Cover Removal.)
3. Remove the harness-guide bracket $[A]$ (1 screw).
4. Remove the fly wheel $[B]$ (3 screws).
5. Remove the drum cooling fan [C].
6. Replace the development motor unit [D] (3 screws, 1 connector, and 1 hook).

### 6.7 TRANSFER BELT UNIT

### 6.7.1 TRANSFER BELT UNIT REMOVAL/INSTALLATION



## - Removal -

1. Turn off the main switch.
2. Remove the transfer belt unit prop $[A]$ ( 3 screws).
3. Disconnect the connector $[\mathrm{B}]$.
4. 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.

## - Installation -

1. While turning the lever [C] 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.

2. Attach the transfer belt unit prop ( 3 screws).

NOTE: To attach the transfer belt unit prop easily, set the following in order: lower pins [A], drive roller shaft [B], upper pins [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.

## PAPER FEED

### 6.8 PAPER FEED

### 6.8.1 PAPER TRAY REMOVAL



## Tandem Tray Removal

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

[E]
4. 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.

### 6.8.2 REAR FENCE RETURN SENSOR REPLACEMENT



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 return sensor $[B]$ (1 connector).

### 6.8.3 REAR FENCE HP SENSOR REPLACEMENT



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 back fence transport gear [B] (1 screw).
5. Move the back fence [C] to the right.
6. Remove the rear HP sensor [D] (1 connector).

## PAPER FEED

### 6.8.4 BOTTOM PAPER SENSOR REPLACEMENT



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).
5. Remove the bottom plate [C] (4 screws).
6. Disconnect the connector [D].
7. Replace the bottom paper sensor [E] (1 screw).

### 6.8.5 BOTTOM PLATE LIFT WIRE REPLACEMENT

NOTE: Before replacing the rear bottom plate lift wire, remove the front bottom plate lift wire. It is necessary to remove the shaft for replacing the rear bottom plate lift wire.

[B]

1. Remove the right tandem tray. (Refer to Paper Tray Removal.)
2. Remove the inner cover [A] (2 screws).
3. Slightly lift the front bottom plate and unhook the wire stoppers [B].
4. Remove the wire covers [C] (1 E-ring each).
5. Remove the bracket [D] (1 screw, 1 E-ring, 1 bushing).
6. Remove the gear [E].
7. Replace the bottom plate lift wire [F].


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.

### 6.8.6 TANDEM LCT 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.


1. Open the front cover.
2. Completely pull out the tandem feed tray $[A]$ to separate right tandem tray $[B]$ from the left tandem tray.
3. Remove the right tandem inner cover [C] (2 screws).
4. Re-position the side fences [D] (1 screw each).

A4: Outer slot position
LT: Inner slot position
5. Re-install the right tandem inner cover [C].

6. Remove the tray cover $[A]$ (2 screws).
7. Remove the DC motor cover $[B]$ ( 4 screws).
8. Remove the rear side fence [C] (4 screws) and re-position the rear cover [D] (2 screws).
9. Re-position the side fences [C] [E] (4 screws).

A4: Outer slot position
LT: Inner slot position
10. Re-install the DC motor cover and the tray cover.

11. Remove the rear bottom plate [A] (1 screw).
12. Re-position the return position sensor bracket [B] (1 screw). To use the paper tray for A4 size, set the screw on the left hole as shown. (For LT size, the screw should be placed on the right.)
13. Reinstall the rear bottom plate.
14. Enter System Setting in User Tools, and select the paper size that you just set the fences up for.

### 6.8.7 BY-PASS PAPER SIZE BOARD REPLACEMENT



1. Turn off the main switch.
2. Open the by-pass table and remove the feed unit cover. (Refer to Right Cover Removal.)
3. While pushing the hook [A] with a flat-head screwdriver as shown, remove the table assembly [B] (2 screws, 1 connector [C]).
4. Remove the by-pass paper size board [D] (2 screws).

5. Re-install the by-pass paper size sensor, then reassemble the by-pass feed table.
NOTE: When installing the table assembly, route the wires [A] correctly as shown.
The paper guides $[B]$ must be in the lower position as shown.
6. Perform the by-pass tray paper size correction (SP1-904) as follows.
1) Press the 1904-1 key and place the side fence [C] at the minimum paper size position (width $=100 \mathrm{~mm}$ ). Then press the Start key on the touch panel.
2) Press the 1904-2 key and place the side fence [C] at the maximum paper size position (width = A3). Then press the Start key on the touch panel.

### 6.8.8 PAPER FEED CLUTCH/RELAY CLUTCH REMOVAL



1. Turn off the main switch, then open the right front door and remove the pushlock [A].
2. Remove the toner collection bottle $[B]$.

NOTE: If the LCT is installed, remove it from the copier.
3. Remove the lower right cover. (Refer to Lower Right Cover Removal.)
4. Remove the vertical transport guide [C].

NOTE: When reinstalling the guide, rest it on the upper and lower pins [D].

5. While holding the shaft $[A]$ with an Allen key, remove the screw $[B]$, then remove the knob [C].
6. Pull out all paper trays, then remove the paper tray unit inner cover [D] (2 screws).
7. Hold the inner vertical transport guide [ E ] and pull out it ( 3 screws, 1 connector).
NOTE: When re-installing the inner vertical transport guide, make sure to set the pins [F] of the inner vertical guide into the holes [G] in the main frame.

8. Fully draw out the paper tray.
9. Disconnect the connectors [A].
10. Grasp the tray feed unit [B] and pull it out (2 screws).

NOTE: Before removing the 1st paper feed unit, remove the inner vertical transport guide. Otherwise the 1st paper feed unit may be damaged.
11. Remove the bracket [C] (1 screw).
12. Remove the paper feed clutch [D] (1 hook, 1 connector).
13. Remove the relay clutch [E] (1 connector).

NOTE: When re-installing the clutches, put the stopper [F] of the clutch on the correct hook on the bracket.

### 6.8.9 BY-PASS FEED MOTOR/CLUTCH REMOVAL



1. Turn off the main switch.
2. Remove the upper rear cover. (Refer to Upper Rear Cover Removal.)
3. Remove the bracket of the CSS board and DRB board (2 screws).
4. Remove the by-pass feed motor [A] ( 2 screws, 1 connector).
5. Remove the by-pass feed clutch $[B]$ (1 connector, 1 E-ring).

NOTE: When re-installing the by-pass feed clutch, set the clutch pin [C] in the cutout [D] of the stopper.

## PAPER FEED

### 6.8.10 REGISTRATION MOTOR REMOVAL



1. Turn off the main switch.
2. Remove the upper rear cover. (Refer to Cover Removal.)
3. Remove the bracket [A] (2 screws).
4. Remove the fly wheel $[B]$ (3 screws).
5. Remove the bracket [C] with the motor (3 screws, 1 connector).
6. Remove the registration motor [D] (3 screws, 1 timing belt, and 1 spring).

### 6.8.11 PAPER TRAY UNIT REMOVAL



To facilitate transportation, the upper part of the copier (copier main frame) [A] and the lower part of the copier (paper tray unit) [B] can be separated as follows:

1. Turn off the main switch.
2. Remove the document feeder ( 2 screws, 1 connector)
3. Remove the front cover [C]. (Refer to Front Cover Removal.)
4. Remove the rear covers [D].
5. Remove the four screws [E].
6. Remove the air tube [F].
7. Disconnect the thirteen connectors [G] (2 screws).
8. Remove the copier main frame [A] from the paper tray unit [B].

NOTE: When re-installing the copier main frame on the paper tray unit, do not pinch the cable between the copier main frame and the paper feed unit.

### 6.9 FUSING UNIT

### 6.9.1 FUSING UNIT REMOVAL



1. Turn off the main switch.
2. Open the front door.
3. Remove the stopper [A] (1 screw).
4. While releasing the lever $[B]$, pull out the fusing unit as shown.

NOTE: Hold the bottom of the fusing unit as shown.

### 6.9.2 FUSING THERMISTOR AND FUSING THERMOFUSE REPLACEMENT



## Fusing Thermistor Replacement

1. Remove the fusing unit. (Refer to Fusing Unit Removal.)
2. Remove the knob [A] (1 screw).
3. Remove the two screws that hold the fusing front cover [B].
4. Pull the lever [C], then lower the cover $[B]$ to unhook the fusing unit.
5. Remove the fusing unit upper cover [D] (1 screw).
6. Replace the thermistor [E] (1 screw, 1 connector).

NOTE: When re-assembling the fusing unit, secure the harness in the clamps correctly. Apply a little silicone oil to the point where the thermistor contacts the hot roller.

## Fusing Thermofuse Replacement

1. Remove the fusing unit upper cover [D]. (Refer to Fusing Thermistor Replacement.)
2. Disconnect the connector [F].
3. Remove the terminal bracket [G] (2 screws).
4. Disconnect the three connectors $[\mathrm{H}]$.
5. Replace the fusing thermofuse [I] (1 screw).

NOTE: When re-assembling the fusing unit, secure the harness in the clamps correctly.

### 6.9.3 FUSING LAMP REPLACEMENT



1. Remove the fusing unit. (Refer to Fusing Unit Removal.)
2. Disconnect the connector $[A]$.
3. Remove the terminal bracket $[B]$ ( 2 screws).
4. Disconnect the front connectors [C] and the rear connectors [D].
5. Remove the front fusing lamp holder [E] (1 screw) and the rear fusing lamp holder [F] (1 screw).
6. Replace the fusing lamps [G].

NOTE: At the rear terminal, make sure to connect the connectors [H] (Blue: 120V Machine, Green: 230V Machine) and white connector (from the thermofuse) [I] in the correct positions on the terminal.

### 6.9.4 HOT ROLLER REPLACEMENT



1. Remove the fusing lamps. (Refer to Fusing Lamp Replacement.)
2. Lower the fusing exit assembly $[A]$.
3. Remove the upper stay $[B]$ (4 screws).
4. Lower the lever [C] and remove the oil supply unit [D].


5. Lower the pressure spring holders $[A]$ at both sides using a screwdriver $[B]$ as a lever.
6. Remove the front and rear C-rings [C], gear [D], isolating bushings [E], and bearings [F].
NOTE: When installing a new hot roller:
1) Lubricate the inner and outer surfaces of the isolating bushings [E] with BARRIERTA L55/2 grease.
2) Lubricate the fusing drive gears and their shafts with G501grease.
3) Peel off 3 cm ( 1 inch ) from both ends of the protective sheet, and install the new hot roller.
Before applying fusing pressure, remove the rest of the protective sheet.

### 6.9.5 OIL SUPPLY/CLEANING ROLLER REPLACEMENT



1. Pull out the fusing unit.
2. While lowering the lever [A], remove the oil supply unit $[B]$.
3. Remove the springs [C].
4. Remove the bushings [D].
5. Remove the oil supply roller [E], and the cleaning roller [F].
6. Install the new cleaning roller and oil supply roller. Then reassemble the unit.

NOTE: The lot number [G] of the oil supply roller should be at the front side of the machine.

### 6.9.6 PRESSURE ROLLER CLEANING ROLLER REPLACEMENT



1. Pull out the fusing unit.
2. Remove the bottom plate $[A]$ ( 1 screw ).
3. Remove the cleaning roller unit $[B]$ ( 2 screws).
4. Remove the brackets [C] (1 screw each).
5. Remove the bushings [D].
6. Replace the cleaning roller [E].
7. Reassemble the unit.

### 6.9.7 MAGNET POSITION ADJUSTMENT



NOTE: This is to ensure that the strippers contact the hot roller.

1. Remove the fusing unit. (Refer to Fusing Unit Removal.)
2. Remove the fusing upper cover (1 screw). (Refer to Fusing Thermistor Replacement.)
3. Loosen the 2 screws [A].
4. Tighten the 2 screws $[A]$ while pushing the exit cover $[B]$ in the arrow direction.

NOTE: Do not push the exit cover too firmly because the magnetic power may weaken.
5. Check that the exit cover closes easily by opening and closing it several times.

### 6.10 PAPER EXIT/DUPLEX UNIT

### 6.10.1 1ST AND 2ND EXIT SENSOR



1. Open the front door.
2. Pull out the duplex unit.
3. Remove the left cover (see Exterior).
4. Remove the left inner cover $[A]$ ( 2 screws).
5. Remove the paper exit unit $[B]$ ( 4 screws, 1 connector).
6. Remove the 1st exit sensor [C] (1 connector).
7. Remove the 2nd exit sensor [D] (1 connector).

### 6.10.2 JOGGER MOTOR



1. Open the front door.
2. Pull out the duplex unit.
3. Remove the duplex front cover [A] (3 screws).
4. Remove the jogger motor [B] (2 screws, 1 connector).

### 6.10.3 DUPLEX ENTRANCE SENSOR



1. Open the front door.
2. Pull out the duplex unit.
3. Remove the sensor bracket [A] (2 screws).
4. Remove the duplex entrance sensor $[B]$ (1 connector).

### 6.10.4 DUPLEX TRANSPORT/DUPLEX FEED CLUTCHES


[B]


1. Open the front door.
2. Pull out the duplex unit.
3. Remove the two pulleys [A] (1 snap ring each).
4. Remove the duplex unit $[B]$.
5. Remove the duplex transport clutch [C] (1 E-ring).
6. Remove the duplex feed clutch [D] (1 E-ring).

### 6.10.5 DUPLEX TRANSPORT SENSOR 1



1. Open the front door.
2. Pull out the duplex unit.
3. Remove the screw [A].
4. Open the inverter roller unit [B] (pull the jam removal lever E4).
5. Remove the guide [C] (2 screws).
6. Remove duplex transport sensor 1 [D] (1 connector).

### 6.10.6 DUPLEX TRANSPORT SENSORS 2 \& 3



1. Open the front door.
2. Pull out and remove the duplex unit (see Duplex Transport/Duplex Feed Clutch Removal).
3. Remove the duplex front cover (see Jogger Motor Removal).
4. Remove the cover bracket [A] (2 screws).
5. Remove the center bracket $[B]$ ( 4 screws, 2 connectors).
6. Remove the jogger fences [C] (1 screw each).
7. Remove the upper duplex cover [D] (4 screws, 1 connector).
8. Remove duplex transport sensor 2 [E] (1 connector).
9. Remove the duplex transport sensor bracket [F] (1 screw).
10. Remove duplex transport sensor 3 [G] (1 connector).

## PAPER EXIT/DUPLEX UNIT

### 6.10.7 INVERTER EXIT CLUTCH



1. Remove the duplex unit.
2. Remove the inverter exit clutch [A] (1 connector).

### 6.10.8 DUPLEX INVERTER SENSOR



1. Open the front door and pull out the duplex unit.
2. Open the "E4" part [A].
3. Remove the paper guide plate ( 2 screws, 1 shoulder screw).
4. Remove the duplex inverter sensor $[B]$ (1 bracket, 1 screw, 1 connector).

### 6.11 BOARDS AND OTHER ITEMS

### 6.11.1 BICU BOARD



1. Remove the lens block assembly. (Refer to Lens Block Removal.)
2. Remove the original exit tray [A] (3 screws).
3. Remove the upper right cover [B] (4 screws).
4. Remove the right stay $[C]$ ( 6 screws).
5. Remove the BICU board [D] (7 screws, all connectors).
6. Remove the NV-RAM from the old BICU board and install it on the new board.

### 6.11.2 I/O BOARD



1. Turn off the main switch.
2. Remove the upper rear cover (Refer to Upper Rear Cover Removal.)
3. Disconnect all connectors from the I/O Board [A].
4. Remove the I/O board [A] (6 screws).

NOTE: If the screws [B] of the I/O board bracket are removed, the I/O board can be swung out.

### 6.11.3 PSU



1. Turn off the main switch.
2. Remove the upper and lower rear cover. (Refer to Upper and Lower Rear Cover Removal.)
3. Remove the harness clamps $[A]$ ( 2 screws).
4. Remove the PSU $[B]$ (6 screws, all connectors).

### 6.11.4 PAPER FEED CONTROL BOARD (PFC)

1. Turn off the main switch.

2. Remove the lower rear cover. (Refer to Lower Rear Cover Removal.)
3. Remove the Paper Feed Control Board [C] (3 screws, all connectors).

### 6.12 COPY IMAGE ADJUSTMENTS: 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.

### 6.12.1 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. 10) to print the test pattern for the following procedures.
3) Set SP 2-902-3 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: $3 \pm 2 \mathrm{~mm}$.

## 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 |
| :---: | :---: | :---: |
| Tray 1 | SP1-002-1 | $2 \pm 1.5 \mathrm{~mm}$ |
| Tray 2 | SP1-002-2 |  |
| Tray 3 | SP1-002-3 |  |
| Duplex Tray | SP1-002-5 |  |
| By-pass Tray | SP1-002-6 |  |
| LCT | SP1-002-7 |  |



A: Leading Edge Registration
B: Side-to-side Registration

## Mechanical Adjustment

NOTE: This adjustment is especially necessary if the punched hole position varies between trays.

## Tray 1



1. Loosen the screws [A].
2. Reposition the tray and tighten the screws [A].

## Tray 2



1. Loosen the screw [A].
2. Reposition the positioning plate $[B]$ and tighten the screw $[A]$.

## Tray 3



1. Loosen the 6 screws [A].
2. Reposition the side fences $[B]$ and support plate $[C]$.
3. Tighten the 6 screws.

## By-pass Tray



1. Loosen the screw [A].
2. Reposition the tray $[B]$ and tighten the screw $[A]$.

## Blank Margin

NOTE: If the leading edge/side-to-side registration can not 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 | More than 1.0 mm |
| Right edge | SP2-101-4 | More than 0.5 mm |
| Leading edge | SP2-101-1 | $3 \pm 2 \mathrm{~mm}$ |
| Left edge | SP2-101-3 | $2 \pm 1.5 \mathrm{~mm}$ |

A: Trailing Edge Blank Margin
B: Right Edge Blank Margin
C: Leading Edge Blank Margin
D: Left Edge Blank Margin


### 6.12.2 PARALLELOGRAM IMAGE ADJUSTMENT

Do the following procedure if a parallelogram type image is printed while using a trimming area pattern 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. 10). If it appears, do the following.
2. Remove the exposure glass (see Replacement and Adjustment - Exposure Glass Removal).
3. Remove the three caps $[A]$.
4. Make a note of the position of the laser unit using the scale through the hole [B].
5. Loosen the three screws [C] that hold the laser unit.

[B]

6. Adjust the laser unit position using a flat screwdriver [A] as shown.

If the right side of the trimming area pattern is down by about 1 mm as shown [B], the laser unit should be rotated about one tick mark in the direction of the black arrow as shown [C]. If the opposite side is down, adjust in the opposite direction.
NOTE: The laser unit rotates around the point [D].
7. Tighten the three screws to secure the laser unit.
8. Replace the caps and exposure glass.
9. Print the trimming area pattern to check the image. If it is still skewed, repeat steps 2 to 8.

### 6.12.3 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

## Magnification

NOTE: Use an OS-A3 test chart to perform the following
 adjustment.

## Scanner Sub Scan Magnification

## A: 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 $\pm 1 \%$.

|  | SP mode |
| :--- | :---: |
| Scanner Sub Scan Magnification | SP4-008 |

## $\Rightarrow$ 6.12.4 ADF IMAGE ADJUSTMENT

## Registration



A: Leading Edge Registration
B: Side-to-side Registration


NOTE: Make a temporary test chart as shown above 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 <br> mode) | SP6-006-2 |
| Leading Edge Registration (Single- <br> sided/Duplex: front) | SP6-006-3 |
| Leading Edge Registration (Duplex: rear) | SP6-006-4 |

### 6.13 TOUCH SCREEN CALIBRATION

After doing a memory all clear or 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 touch screen calibration mode.



## $\triangle$ CAUTION

Do not execute any of the other items in the self diagnostic menu.
2. The "Self Diagnostics Menu" screen will appear. Press the \# key to select the "Touch Screen Adj." Mode.

3. The "Touch Screen Adj." calibration screen will appear. Touch the upper left corner then the lower right corner of the panel using a pointed (but not sharp!) tool.
4. Touch a few spots on the LCD touch panel, and confirm that the marker (a small circle) appears on the screen at exactly the same location as where it is touched. If it does not, touch "Cancel" on the adjustment screen. Then repeat the calibration procedure.
5. Touch "Ok" on the adjustment screen.
6. Touch "[q] Exit" and "Execute" to exit the self diagnostics menu.

## TROUBLESHOOTING

## 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, <br> the SC can only be reset by a service <br> representative (see the note below). The <br> copier cannot be operated at all. | Enter SP mode, then turn the <br> main power switch off and <br> on. |
| B | The SC can be reset by turning the main <br> power switch off and on if the SC was caused <br> by incorrect sensor detection. | Turn the operation switch or <br> main power switch off and <br> on. <br> A level B' SC can only be <br> reset by turning the main <br> power switch off and on. |
| C | The copier can be operated as usual except <br> for the unit related to the service call. | Turn the operation switch off <br> and on. |
| D | The SC history is updated. The machine can <br> be operated as usual. | The SC will not be displayed. <br> All that happens is that the <br> 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 cause -
- Exposure lamp defective
- Lamp regulator 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
- Scanner motor drive board 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
- Scanner motor drive board defective
- Scanner home position sensor connector defective
- Scanner drive motor connector defective


## SC124: Scanner motor encoder signal error

-Definition- [B]
No encoder signal from the scanner motor
-Possible cause-

- Scanner motor connector defective
- Scanner motor defective
- MCU defective
- Scanner wire, timing belt, pulley out of position
- PSU defective


## SC125: Scanner motor speed error 1

-Definition- [D]
The scanner stops before the scanner HP sensor is on when returning.
The scanner speed when the scanner HP sensor turns on is slower than the specified speed.
-Possible cause-

- Scanner motor defective
- MCU defective
- Too much load on scanner drive


## SC126: Scanner motor speed error 2

-Definition- [B]
The scanner overruns the scanner HP sensor by more than 10 mm when returning.
-Possible cause-

- Scanner motor defective
- MCU defective
- Too small load on scanner drive


## SC127: Scanner motor encoder rotating direction error

## -Definition- [B]

The scanner moves in the opposite direction from the instructed direction when initializing.
-Possible cause-

- Scanner motor defective
- MCU defective


## SC128: Scanner motor start error

-Definition- [D]
The scanner motor speed does not reach the target speed until starting to read the original.
-Possible cause-

- Scanner motor defective
- MCU defective
- PSU defective
- Too much load on scanner drive


## SC129: Scanner motor speed control error

-Definition- [D]
The scanner speed is out of standard during scanning.
-Possible cause-

- Scanner motor defective
- PSU defective
- MCU defective
- Scanner drive defective


## SC130: SBU error

-Definition- [B]
When the main switch is turned on, the BICU cannot receive the correct signal from the SBU.
-Possible cause-

- SBU defective
- BICU defective
- Cable between SBU and BICU defective


## SC300: Charge corona output error 1

-Definition- [B]
The feedback voltage from the charge corona unit is too high.

- Possible causes -
- Charge P.P. defective
- Poor charge corona unit connection


## SC301: Charge corona output error 2

-Definition- [B]
The control PWM for the charge corona unit is too high.

- Possible causes -
- Charge P.P. defective
- Poor charge corona unit connection


## SC302: Charge corona output error 3

-Definition- [B]
The control PWM for the charge grid is too high.

- Possible causes -
- Charge P.P. defective
- Poor charge corona unit connection


## SC303: Charge corona output error 4

-Definition- [B]
The feedback voltage from the charge grid is too high.

- Possible causes -
- Charge P.P. 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
- Charge P.P. defective
- IOB defective


## SERVICE CALL CONDITIONS

## SC306: Charge corona wire cleaner error 2

-Definition- [B]
The charge corona wire cleaner motor connector is not connected.

- Possible causes -
- The charge corona wire cleaner motor connector is not connected.


## SC310: Potential sensor error 1

Definition- [D]
When calibrating the drum potential sensor at the process control initial setting, the drum potential sensor output voltage is out of specification.

- Possible causes -
- Potential sensor defective
- Poor connection between the potential sensor and the I/O board (IOB)
- IOB defective
- Poor connection between the drum unit and the I/O board (IOB)
- Development power pack defective


## SC311: Potential sensor error 2

Definition- [D]
When calibrating the drum potential sensor at the process control initial setting, the rate of change of drum potential sensor output with voltage on the drum is out of specification.

- Possible causes -
- Potential sensor defective
- Poor connection between the potential sensor and the I/O board (IOB)
- IOB defective
- Poor connection between the drum unit and the I/O board (IOB)
- Development power pack defective


## SC312: Potential sensor error 4

Definition- [D]
When adjusting the drum potential (VD) at the process control initial setting, the drum potential sensor detects that $V_{D}$ is more than $V_{G}$ (grid voltage).

- Possible causes -
- Potential sensor defective
- Poor connection between the potential sensor and the I/O board (IOB)
- IOB defective
- Poor connection between the drum unit and the I/O board (IOB)
- Development power pack defective
- Dirty or worn charge corona wire


## SC314: Potential sensor error 5

Definition- [D]
When adjusting the drum potential $\left(\mathrm{VH}_{\mathrm{H}}\right)$ for LD power adjustment during the process control initial setting, the first time the $V_{H}$ pattern is made, the drum potential sensor detects that V н is more than 500 V .

- Possible causes -
- Potential sensor defective
- Poor connection between the potential sensor and the I/O board (IOB)
- IOB defective
- Poor connection between the drum unit and the I/O board (IOB)
- LD unit defective


## SC321: No laser writing signal (F-GATE) error 1

- 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 -
- BICU board defective
- Poor connection of the printer controller
- Printer controller defective


## SERVICE CALL CONDITIONS

## SC322: 1st laser synchronization error

-Definition- [B']
The 1st laser synchronization signal cannot be detected by the main scan synchronization detector board even if the laser diodes are activated.

- Possible causes -
- Poor connection between the laser synchronization detector board and the LD unit
- Laser synchronization detector board out of position
- Laser synchronization detector board defective
- LD unit defective


## SC323: LD drive current over

-Definition- [B']
The LD drive board applies more than 110 mA to the LD.

- Possible causes -
- LD unit defective (not enough power, due to aging)
- Poor connection between the LD unit and the BICU board
- BICU defective


## SC326: 2nd laser synchronization error

## -Definition- [B]

The 2nd laser synchronization signal cannot be detected by the main scan synchronization detector board even if the laser diodes are activated.

- Possible causes -
- Poor connection between the laser synchronization detector board and the LD unit
- Laser synchronization detector board out of position
- Laser synchronization detector board defective
- LD unit defective


## SC327: LD unit home position error 1

-Definition- [B']
The LD unit home position sensor does not detect an on condition when the LD unit moves to its home position.

- Possible causes -
- LD unit home position sensor defective
- LD positioning motor defective

LD unit movement blocked because of incorrect connector routing

## SC328: LD unit home position error 2

-Definition- [B']
The LD unit home position sensor does not detect an off condition when the LD unit moves from its home position.

- Possible causes -
- LD unit home position sensor defective
- LD positioning motor defective
- LD unit movement blocked because of incorrect connector routing


## SC329: LD unit home position error 3

-Definition- [B]
When the LD unit moves to switch the laser beam pitch (except for initial movement at adjustment), the LD unit HP sensor turns on before the movement reaches the adjusted value.

## -Possible cause-

- When the main switch is on: SP2-109-3 or SP2-109-4 is not done after SP5801 is performed.
- While printing: The LD unit does not move so well because of an unexpected failure, such as the cable being pinched somewhere.
- LD unit defective


## SC330: LD unit no initial setting

-Definition- [B]
The main switch is on or a printing/copying job starts without doing SP2-109-3 or SP2-109-4 after SP5-801 is performed.
-Possible cause-

- SP2-109-3 or SP2-109-4 is not done after SP5-801 is performed.


## SERVICE CALL CONDITIONS

## SC331: LD unit home position error 4

-Definition- [B]
When the LD unit moves to switch the laser beam pitch, the LD unit HP sensor does not turn on, even when the expected time for reaching the home position comes, according to the data for the present position stored in NVRAM.
-Possible cause-

- The LD unit does not move so well because of an unexpected failure, such as the cable being pinched somewhere.
- LD unit defective
- HP sensor defective
- NVRAM defective


## SC332: LD unit present position error

-Definition- [B]
When the LD unit moves to switch the laser beam pitch, the data for the present position stored in NVRAM is out of the adjustment range.
-Possible cause-

- The LD unit does not move so well because of an unexpected failure, such as the cable being pinched somewhere.
- LD unit defective
- HP sensor defective
- NVRAM defective


## SC335: Polygonal mirror motor error 1

-Definition- [B]
The XSCRDY signal does not become low within 20 seconds after the polygonal mirror motor turns on or the polygon motor speed is changed.
-Possible cause-

- Poor cable connection to the polygonal mirror motor driver.
- Polygonal mirror motor (driver) defective
- BICU defective


## SC336: Polygonal mirror motor error 2

## -Definition- [B]

The XSCRDY signal does not become high within 20 seconds after the polygonal mirror motor turns off.
-Possible cause-

- Poor cable connection to the polygonal mirror motor driver.
- Polygonal mirror motor (driver) defective
- BICU defective


## SC337: Polygonal mirror motor error 3

-Definition- [B]
The XSCRDY signal becomes high while the polygonal mirror motor turns on, even though there was no demand for either turning off the motor or changing the motor speed.
-Possible cause-

- Poor cable connection to the polygonal mirror motor driver.
- Polygonal mirror motor (driver) defective
- BICU defective


## SC338: Polygonal mirror motor error 1

-Definition- [B]
The XSCRDY signal does not become stable within 20 seconds after the polygonal mirror motor turns on or off or the polygon motor speed is changed.
-Possible cause-

- Poor cable connection to the polygonal mirror motor driver.
- Polygonal mirror motor (driver) defective
- BICU defective


## SERVICE CALL CONDITIONS

## SC340: TD sensor output error

-Definition- [C]
The TD sensor output voltage $(\mathrm{Vt})$, which is measured during each copying process, is one of the following 10 times consecutively.

1) $\mathrm{Vt}=0.5$ volts or lower
2) $\mathrm{Vt}=4.0$ volts or higher
-Possible cause-

- TD sensor defective
- Poor connection between the TD sensor and the I/O board.
- I/O board defective

In this error condition, the toner supply is controlled using pixel count and Vsp/Vsg.

## SC341: TD sensor adjustment error 1

-Definition- [B]
During the TD sensor auto adjustment, the TD sensor output voltage $(\mathrm{Vt})$ is 2.5 volts or higher even though the control voltage is set to the minimum value (PWM = 0)

Note: When this error occurs, the indication of SP2-906-1 is 0.00 V .
-Possible cause-

- TD sensor defective
- Poor connection between the TD sensor and the I/O board.
- I/O board defective

Note: In this error condition, the toner supply is controlled using pixel count and Vsp/Vsg.

## SC342: TD sensor adjustment error 2

-Definition- [B]
During the TD sensor auto adjustment, the TD sensor output voltage (Vt) does not come in the target range ( $2.5 \pm 0.1 \mathrm{~V}$ ) within 20 seconds.

Note: When this error occurs, the indication of SP2-906-1 is 0.00 V .
-Possible cause-

- TD sensor defective
- Poor connection between the TD sensor and the I/O board.
- I/O board defective

Note: In this error condition, the toner supply is controlled using pixel count and Vsp/Vsg.

## SC345: Development bias leak

-Definition- [B]
A development bias leak signal is detected.

- Possible causes -
- Poor connection between the development bias terminal and the development P.P.
- Development P.P. defective


## SC350: ID sensor error 1

-Definition- [D]
One of the following ID sensor output voltages was detected twice consecutively when checking the ID sensor pattern.

1) $\mathrm{Vsp} \geq 2.5 \mathrm{~V}$
2) $\mathrm{Vsp}=0 \mathrm{~V}$

- Possible causes -
- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- I/O board (IOB) defective
- Charge or development power pack defective
- Dirty ID sensor
- Defect at ID sensor pattern writing area of the drum


## SERVICE CALL CONDITIONS

## SC351: ID sensor error 2

-Definition- [D]
One of the following ID sensor output voltages was detected twice consecutively when checking the ID sensor pattern.

1) $\mathrm{Vsg}<2.5 \mathrm{~V}$
2) $\mathrm{Vsg}=0 \mathrm{~V}$
3) The ID sensor output voltage is 5.0 V and the PWM signal input to the ID sensor is 0 when checking the ID sensor pattern

- Possible causes -
- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- I/O board (IOB) defective
- Charge or development power pack defective
- Dirty ID sensor
- Defect at the ID sensor pattern writing area of the drum


## SC352: ID sensor error 3

-Definition- [D]
For 2 s during the ID sensor pattern check, the ID sensor pattern edge voltage is not 2.5 V .

- Possible causes -
- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- I/O board (IOB) defective
- Charge or development power pack defective
- Dirty ID sensor
- Defect at the ID sensor pattern writing area of the drum


## SC353: ID sensor error 4

-Definition- [D]
One of the following ID sensor output voltages is detected at ID sensor initialization.

1) $\mathrm{Vsg}<4.0 \mathrm{~V}$ when the maximum PWM input (255) is applied to the ID sensor.
2) $\mathrm{Vsg} \geq 4.0 \mathrm{~V}$ 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
- I/O board (IOB) defective
- Charge or development power pack defective
- Dirty ID sensor
- Defect at the ID sensor pattern writing area of the drum


## SC354: ID sensor error 5

-Definition- [D]
Vsg falls out of the adjustment target ( $4.0 \pm 0.2 \mathrm{~V}$ ) during Vsg checking.

- Possible causes -
- ID sensor defective
- ID sensor connector defective
- Poor ID sensor connector connection
- I/O board (IOB) defective
- Charge or development power pack defective
- Dirty ID sensor
- Defect at the ID sensor pattern writing area of the drum


## SC360: Hard disk detection error 1

-Definition- [B]
When the main switch turns on, the machine does not detect the connection signal from the HDD.

## -Possible cause-

- Poor connection between the HDD and BICU
- Poor connection on the dc power connector to the HDD
- HDD defective
- BICU defective


## SERVICE CALL CONDITIONS

## SC362: Hard disk detection error 2

-Definition- [B]
When the power switch on the operation panel turns on, the machine does not detect the connection signal from the HDD.
-Possible cause-

- Poor connection between the HDD and BICU
- Poor connection on the dc power connector to the HDD
- HDD defective
- BICU defective


## SC364: Hard disk drive error

-Definition- [B]
The image data stored in the HDD 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 media check), it can be cured by doing SP4-911-2 (HDD formatting).
- HDD defective


## SC366: Hard disk bad sector maximum

-Definition - [B]
The number of bad sectors on the HDD is over the maximum number.
-Possible Cause-

- HDD defective
- NVRAM defective


## SC367: Hard disk (HDD:R) bad sector maximum

-Definition - [B]
The number of bad sectors on the HDD is over the maximum number.
-Possible Cause-

- HDD defective
- NVRAM defective

SC370: IMAC (image compression IC) input FIFO error
-Definition- [B]
An input FIFO error occurs while inputting image processing in the ASIC (IMACB), which handles image compression and image data transmission.
-Possible cause-

- BICU defective


## SC372: IMAC (image compression IC) output FIFO error

-Definition- [B]
An output FIFO error occurs while outputting image processing in the ASIC (IMACB), which handles image compression and image data transmission.
-Possible cause-

- BICU defective


## SC374: IMAC (image compression IC) modes setting error

-Definition- [B]
A mode setting error occurs by changing settings during image processing in the ASIC (IMACB), which handles image compression and image data transmission.
-Possible cause-

- BICU defective


## SC376: Data transmission error

-Definition-
A data transmission error occurred at the ASIC which controls data transmission and compression during connecting mode.
-Possible cause-

- Defective connection board
- Defective or disconnected interface cable
- Defective SBICU


## SC380: Data transmission time out (video input)

-Definition- [B]
Data input to the IC which controls data transfer and compression is not completed within 20 seconds.
-Possible cause-

- BICU defective
- SBU defective
- Printer controller defective


## SC382: Data transmission time out (video output)

-Definition- [B]
Data output from the IC which controls the data transfer and compression is not completed within 20 seconds.
-Possible cause-

- BICU defective
- LD board defective


## SC384: Data transmission time out (connect copy)

-Definition-
Data transmission to the memory does not finish properly within 20 seconds after the start of data transmission.

## -Possible cause-

- Defective connection board
- Defective or disconnected interface cable
- Defective SBICU


## SC386: Data transmission time out (Hard disk write)

-Definition- [B]
Data input to the IC which controls the data transfer and compression is not completed with in 20 seconds.
-Possible cause-

- BICU defective
- SBU defective
- Printer controller defective


## SC390: CRC error

-Definition-
Electrical noise causes sent data and received data to differ. A CRC check can detect this error.

## -Possible cause-

- Defective connection board
- Defective or disconnected interface cable


## SC391: Image storage address error

-Definition-
The SBICU receives an image data output request signal for data that is not stored in memory.
-Possible causes-

- SBICU defective


## SC400: Transfer roller leak error

-Definition- [B]
A transfer roller current leak signal is detected.

- Possible causes -
- Transfer P.P. defective
- Poor connection between the transfer current terminal and the transfer P.P.


## SC401: Transfer roller open error

-Definition- [B]
The transfer roller current feedback signal is not detected.

- Possible causes -
- Transfer P.P. defective
- Poor connection between the transfer current terminal and the transfer P.P.


## 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 power pack


## SERVICE CALL CONDITIONS

## SC440: Main motor lock

-Definition- [B]
The main motor lock signal remains low for 2 seconds while the main motor is on.

- Possible causes -
- Too much load on the drive mechanism
- Main motor defective


## SC441: Development motor lock

-Definition- [B]
The development motor lock signal remains low for 2 seconds while the development motor is on.

- Possible causes -
- Too much load on the drive mechanism
- Development motor defective


## SC493: Exhaust fan motor lock

-Definition- [B]
The exhaust fan motor lock signal remains high for 5 seconds while the exhaust fan motor is on.
-Possible cause-

- Exhaust fan motor defective
- Too much load on the fan


## SC494: Fusing exhaust fan motor lock

-Definition- [B]
The fusing exhaust fan motor lock signal remains high for 5 seconds while the fusing exhaust fan motor is on.

## -Possible cause-

- Exhaust fan motor defective
- Too much load on the fan


## SC495: Toner recycling unit error

## -Definition- [B]

The toner recycling sensor output signal does not change within 500 ms after the main motor turns on.

- Possible causes -
- Too much load on the drive mechanism
- Toner end sensor detective
- Poor connection on the sensor connector


## SC496: Toner collection bottle error

-Definition- [B]
The toner collection bottle set switch remains off when the front door is closed.

- Possible causes -
- No toner collection bottle
- Poor connection on the switch connector


## SC497: Toner recycling motor error

-Definition- [B]
The toner recycling motor connector set signal remains off for 1 second.

- Possible causes -
- Toner recycling motor defective
- Poor connection on the motor connector


## SC501: 1st tray lift malfunction

-Definition- [D]

- The lift sensor is activated before the pick-up solenoid is activated when the tray is pushed in.
- The lift sensor is not activated within 10 seconds after the tray lift motor starts lifting the bottom plate.
- The lift sensor remains activated for 1.5 seconds after the tray lift motor starts lowering the bottom plate.
- The tray down sensor is not activated within 10 seconds after the tray lift motor starts lowering the bottom plate because of a paper end condition.
-Possible cause-
- Tray lift motor defective or poor connection
- Lift sensor defective or poor connection
- Tray down sensor defective or poor connection
- Pick-up solenoid defective or poor connection


## SERVICE CALL CONDITIONS

## SC502: 2nd tray lift malfunction

## SC503: 3rd tray lift malfunction

-Definition- [D]

- The lift sensor is activated before the pick-up solenoid is activated when the tray is pushed in.
- The lift sensor is not activated within 10 seconds after the tray lift motor starts lifting the bottom plate.
- The lift sensor remains activated for 1.5 seconds after the tray lift motor starts lowering the bottom plate.
-Possible cause-
- Tray lift motor defective or poor connection
- Lift sensor defective or poor connection
- Pick-up solenoid defective or poor connection


## SC505: LCT tray malfunction (optional LCT)

-Definition- [D]

- The lift sensor is not activated within 60 seconds after the tray lift motor starts lifting the bottom plate.
- The tray down sensor is not activated within 60 seconds after the tray lift motor starts lowering the bottom plate.
- The lift sensor and tray down sensor are activated at the same time.
- The lift sensor is not activated even when the pick-up roller is still lifted up by the top of paper.
-Possible cause-
- Tray lift motor defective or poor connection
- Lift sensor defective or poor connection
- Pick-up solenoid defective or poor connection
- Paper end sensor defective


## SC510: Paper feed motor locks

-Definition- [D]

- The lock signal from the paper feed motor is detected for $3,000 \mathrm{~ms}$ during rotation.
- Poor connection is checked once when the main switch is on.
-Possible cause-
- Paper feed motor defective or poor connection
- Too much load on the drive mechanism
- Lower front door safety switch defective
- Lower front door safety switch bracket deformation


## SC511: LCT motor lock (optional LCT)

-Definition- [D]

- The lock signal from the LCT transport motor is detected for 50 ms during rotation. (The detection period does not include 300 ms of the starting up.)
- Poor connection is checked once when the main switch is on.
-Possible cause-
- LCT transport motor defective or poor connection
- Too much load on the drive mechanism


## SC515: Tandem rear fence motor error

-Definition- [D]

- When the tray is pushed in, the rear fence return sensor and the rear fence HP sensor are already on.
- The rear fence return sensor is not on within 10 seconds after the rear fence motor starts.
- The rear fence HP sensor is not on within 10 seconds after the rear fence starts moving to the home position.
-Possible cause-
- Rear fence motor defective or poor connection
- Too much load on the drive mechanism
<Note> The other trays are still available to use.


## SC516: Tandem side fence motor error

Japanese version only

## SC520: Duplex 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 or poor connection
- Too much load on the drive mechanism


## SERVICE CALL CONDITIONS

## 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 or poor connection
- Too much load on the drive mechanism


## SC530: By-pass feed motor lock

## -Definition- [C]

A by-pass feed motor lock signal is detected for more than 2 seconds during rotation.

- Possible causes -
- By-pass feed motor defective or poor connection
- Too much load on the drive mechanism


## SC531: Fusing/duplex motor lock

-Definition- [C]
A fusing/duplex motor lock signal is detected for more than 2 seconds during rotation.

- Possible causes -
- Fusing/duplex motor defective or poor connection
- Too much load on the drive mechanism


## SC541: Fusing thermistor open

-Definition- [A]
The fusing temperature detected by the thermistor is below $7^{\circ} \mathrm{C}$ for 35 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 5 minutes after the main power switch is turned on.

- Possible causes -
- Fusing thermistor defective or out of position
- Fusing lamp open
- Fusing thermofuse open
- BICU defective
- Power supply board defective
- Poor fusing unit connection


## SC543: Fusing overheat error 1 (software)

-Definition- [A]
A fusing temperature of over $230^{\circ} \mathrm{C}$ is detected for 5 seconds by the fusing thermistor.

- Possible causes -
- Fusing thermistor defective
- BICU defective
- I/O board (IOB) defective


## SC544: Fusing overheat error 1 (hardware)

-Definition- [A]
The BICU detects an overheat error even if the protection in the software does not work.

## -Possible cause-

- Fusing thermistor defective
- BICU defective
- I/O board defective


## SERVICE CALL CONDITIONS

## SC545: Fusing overheat error 2

-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]

- A change in the fusing temperature by $20^{\circ} \mathrm{C}$ or more compared with the temperature of 1 second ago occurs 2 times consecutively.
- A change in the fusing temperature by $20^{\circ} \mathrm{C}$ or more compared with the temperature of 1 second ago occurs 3 times consecutively for 1 minute.
-Possible cause-
- Poor connection on the thermistor
- Poor connection on the fusing unit connector


## SC547: Zero cross signal malfunction

-Definition- [B]

- When the main switch is on, the frequency measured by the number of zero cross signals for 500 ms is larger than 66 Hz or smaller than 45 Hz .
- It is measured 3 times consecutively for 500 ms that the interval between a zero cross signal and the next one is 7.5 ms or shorter.
-Possible cause-
- Power supply unit defective
- Noise on the ac power line


## SC590: Toner collection motor error

-Definition- [B]
The toner collection motor sensor output does not change for 3 seconds while the toner collection motor is on.

- Possible causes -
- Toner collection motor defective
- Too much load on the drive mechanism
- Poor toner collection motor connector connection
- IOB defective
- Toner collection motor sensor defective


## SC601: Communication error between BICU and MCU

-Definition- [B']
The BICU cannot communicate with the MCU board properly.

- Possible causes -
- Poor connection between the BICU and MCU
- MCU defective
- BICU defective


## SC602: Communication error between BICU and HDD controller

-Definition- [B]
The BICU cannot communicate with the HDD controller properly.

- Possible causes -
- Poor connection between the BICU board and HDD control board
- BICU board defective


## SC620: Communication error between BICU and ADF 1

-Definition- [B]
The TXD and RXD signals between BICU and ADF main board do not stabilize.

- Possible causes -
- Poor connection between the BICU board and ADF main board
- Noise on interface cable


## SC621: Communication error between BICU and ADF 2

-Definition- [B]
The TXD and RXD signals between BICU and ADF main board do not stabilize.

- Possible causes -
- Poor connection between the BICU board and ADF main board
- ADF main board defective
- BICU board defective

SC622: Communication error between BICU and ADF 3
-Definition- [B]
Software error after abnormal user operation.

- Possible causes -
- Software error


## SC625: Communication error between BICU and finisher 1

-Definition- [B]
The acknowledge signal does not come back from the finisher or mailbox to the BICU board 3 times consecutively.
-Possible cause-

- Finisher or mailbox main board defective
- BICU board defective
- Poor connection between BICU board and finisher or mailbox main board
- Noise on the interface cable


## SC626: Communication error between BICU and finisher 2

-Definition- [B]
The BICU board receives a low signal even when the communication line is connected between the BICU board and the finisher or mailbox.
-Possible cause-

- Finisher or mailbox main board defective
- BICU board defective
- Poor connection between BICU board and finisher or mailbox main board
- Noise on the interface cable

SC630: CSS (RSS) communication error between line adapter and CSS center Japan only

## SC635: Communication error between BICU and paper feed board 1

-Definition- [B]
The acknowledge signal does not come back from the paper feed board to the BICU board 3 times consecutively.
-Possible cause-

- Paper feed board defective
- BICU board defective
- Poor connection between BICU board and paper feed board
- Noise on the interface cable


## SC636: Communication error between BICU and paper feed board 2

-Definition- [B]
The BICU board receives a low signal even when the communication line is connected between the BICU board and the paper feed board.
-Possible cause-

- Paper feed board defective
- BICU board defective
- Poor connection between BICU board and paper feed board
- Noise on the interface cable


## SC700: ADF original pick-up malfunction 1

-Definition- [B]
The pick-up roller H.P sensor signal does not change after the pick-up motor has turned on.

- Possible causes -
- Pick-up roller H.P sensor defective
- Pick-up motor defective
- Timing belt out of position
- ADF main board defective


## SC701: ADF original pick-up malfunction 2

-Definition- [B']
The pick-up roller HP sensor is not activated even after the pick-up motor turns on.
-Possible cause-

- Pick-up roller HP sensor defective
- Pick-up motor defective
- ADF main board defective


## SC702: ADF feed-in motor lock

-Definition- [B']

1) The encoder signal cannot be detected within a specific time when the feedin motor is on.
2) The pulse signal from the length sensor is not detected within a specific time when the feed-in motor is on.
-Possible cause-

- Feed-in motor defective
- Length sensor defective
- Cable for length sensor or feed-in motor defective
- Main board defective


## SC703: ADF transport motor lock

-Definition- [B']
The encoder signal cannot be detected within a specific time when the transport motor is on.
-Possible cause-

- Transport motor defective
- Cable for transport motor defective
- Main board defective


## SC704: ADF feed-out motor lock

-Definition- [B']
The encoder signal cannot be detected within a specific time when the feed-out motor is on.
-Possible cause-

- Feed-out motor defective
- Cable for feed-out motor defective
- Main board defective


## SC705: ADF bottom plate motor error

-Definition- [B']

1) The bottom plate position sensor does not turn on when the bottom plate motor lifts the bottom plate.
2) The bottom plate HP sensor does not turn on when the bottom plate motor lowers the bottom plate.
-Possible cause-

- Bottom plate position sensor defective
- Bottom plate HP sensor defective
- Bottom plate motor defective
- Main board defective


## SC720: Finisher transport motor error

-Definition- [B]
The encoder pulse of the transport motor does not change state (high/low) within a certain period of time.

## -Possible cause-

- Finisher transport motor defective or poor connection
- Finisher main board defective
- Too much load on drive mechanism


## SC722: Finisher jogger motor error

-Definition- [B]

1) The finisher jogger H.P sensor remains de-activated for more than a certain time when returning to home position.
2) The finisher jogger H.P 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

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


## SERVICE CALL CONDITIONS

## SC725: Finisher stack feed-out motor error

- Definition - [B]

The stack feed-out belt H.P sensor does not activate within a certain time after the stack feed-out motor turned on.

- Possible causes -
- Stack feed-out H.P sensor defective
- Stack feed-out motor defective


## SC726: Finisher shift/lift motor error

- Definition - [B]

1) Tray shift does not finish within a certain time after the shift motor turned on.
2) The stack height sensor does not activate within a certain time after the shift tray lift motor turned on.

- Possible causes -
- Shift motor defective
- Shift tray lift motor defective


## 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


## SC729: Finisher punch motor error

- Definition - [B]

The punch H.P sensor does not activate within a certain time after the punch motor turned on.

- Possible causes -
- Punch motor defective
- Punch H.P sensor defective
- Poor punch motor connection


## SC730: Finisher stapler position motor error

- Definition - [B]

1) The stapler H.P. sensor stays on for longer than normal when the stapler motor turns on to return the stapler to its home position.
2) The stapler H.P 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 H.P sensor defective
- Poor stapler motor connection


## SC731: Finisher paper exit guide plate motor lock

-Definition- [B']
The exit plate HP sensor does not turn on within 800 ms when the exit plate returns to its home position.
-Possible cause-

- Exit plate motor defective
- Too much load to exit plate motor
- Exit plate motor connector defective
- Exit plate HP sensor defective
- Main board defective


## SC735: Finisher pre-stack motor error

-Definition- [B]
It occurs 2 times consecutively that the pre-stack HP sensor is not activated within 400 pulses after the pre-stack motor starts.
-Possible cause-

- Pre-stack HP sensor defective or poor connection
- Pre-stack motor defective
- Finisher main board defective
- Too much load on the drive mechanism


## SC736: Finisher paper exit guide plate motor error

-Definition- [B]
It occurs 2 times consecutively that the paper exit guide plate HP sensor is not activated within 750 ms after the paper exit guide plate motor starts.
-Possible cause-

- Paper exit guide plate sensor defective or poor connection
- Paper exit guide plate motor defective
- Finisher main board defective
- Too much load on the drive mechanism


## SC737: Finisher staple waste full

-Definition- [A]
The box for staple waste becomes full.
-Possible cause-

- Box is full of staple waste
- Staple waste sensor defective


## SC738: Finisher shift tray lift motor error

-Definition- [B]
It occurs 2 times consecutively that;

1) The stack height sensor is not activated within 50 seconds after the motor starts lifting the tray.
2) The stack height sensor is still activated 5 seconds after the motor starts lowering the tray.
-Possible cause-

- Stack height sensor defective or poor connection
- Shift tray lift motor defective
- Finisher main board defective
- Too much load on the drive mechanism
$\Rightarrow$ SC740: 1,000-sheet finisher error in finisher area
- Definition - [B]

Note: When this SC is displayed, check SP7-902 (SC detail). The first 2 digits indicate the type of error.

Example: $740 \underline{0100000000000000}$

## 01: Shutter movement error

1) The shutter position switch does not turn on within 1 s after the transport motor starts to turn in reverse.
2) The shutter sensor does not deactivate within 1 s after the transport motor starts to turn in reverse.
3) The shutter position switch is off when the shift tray safety switch is off.

- Possible causes -
- Transport motor defective
- Shutter position switch defective
- Shift tray safety switch defective


## 02: Exit motor error

1) After the exit motor turns on, the exit motor sensor does not send the proper signal to the finisher board.
2) The exit motor sensor does not send the clock signal to the finisher board for certain period while the exit motor is on.

- Possible causes -
- Exit motor defective
- Exit motor sensor defective


## 03: Upper exit plate movement error

1) The upper exit guide 2 switch does not turn on within 1 s after the guide plate motor turns on.
2) The upper exit guide sensor does not activate within 1s after the guide plate motor turns on.
3) The upper exit guide 2 switch does not turn on when the shift tray safety switch is off.

- Possible causes -
- Guide plate motor defective
- Upper exit guide 2 switch defective
- Upper exit guide sensor defective
- Shift tray safety switch defective


## 04: Jogger motor error

1) After the jogger motor turns on to move the jogger fence from its home position, the jogger HP sensor does not deactivate within 2s.
2) After the jogger motor turns on to return the jogger fence to its home position, the jogger HP sensor does not activate within 2s.

- Possible causes -
- Jogger motor defective
- Jogger HP sensor defective


## 05: Stapler motor error

1) After the stapler motor turns on to move the stapler unit from its home position, the stapler unit HP sensor does not deactivate within 4s.
2) After the stapler motor turns on to return the stapler unit to its home position, the stapler unit HP sensor does not activate within 4 s .

- Possible causes -
- Stapler motor defective
- Stapler unit HP sensor defective


## 06: Staple hammer motor error

1) The staple hammer HP sensor does not deactivate within 0.5 s after the staple hammer motor turns on.
2) The staple hammer HP sensor does not activate within 0.5 s after the staple hammer motor turns on.

- Possible causes -
- Staple hammer motor defective
- Staple hammer HP sensor defective


## 07: Tray lift motor error

1) The tray lift motor does not stop within 15 s after being turned on.
2) The shift tray HP sensor does not activate within 15 s after the tray lift motor turns on.
3) The shift tray upper limit switch turns on while the shift tray is being raised.
4) Lift motor sensors $1 \& 2$ do not send the clock signals to the finisher board every 200 ms while the tray lift motor is on.

- Possible causes -
- Tray lift motor defective
- Lift motor sensor 1 defective
- Lift motor sensor 2 defective
- Shift tray HP sensor defective
- Shift tray upper limit switch defective


## 08: Shift tray height sensor error

1) Abnormal communication data between finisher board and shift tray height sensor.
2) No communication between finisher board and shift tray height sensor for a certain period.
3) The finisher board detects a connection error with the connector for the shift tray height sensor.
4) Adjustment error during shift tray height sensor adjustment.

- Possible causes -
- Shift tray height sensor defective
- Finisher board defective


## 09: Back-up RAM error

The check sum is abnormal when the main switch is turned on.

- Possible causes -
- Finisher board defective


## OA: Communication error

Communication error between finisher board and booklet unit board.

- Possible causes -
- Finisher board defective
- Booklet unit board defective
- Poor connection of the interface harness


## $\Longrightarrow$ SC741: 1,000-sheet finisher error in saddle stitching area

- Definition - [B]

Note: When this SC is displayed, check SP7-902 (SC detail). The first 2 digits indicate the type of error.
Example: $741 \underline{0100000000000000}$

## 01: Positioning plate motor error

1) After the positioning plate motor turns on to move the positioning plate from its home position, the positioning plate HP sensor does not deactivate within 1.25 s.
2) After the positioning plate motor turns on to return the positioning plate to its home position, the positioning plate HP sensor does activate within 1 s .

- Possible causes -
- Positioning plate motor defective
- Positioning plate HP sensor defective


## 02: Folder roller motor error

1) The folder roller motor sensor doesn't send the clock pulse to the booklet unit board within a certain period after the folder roller motor turns on.

- Possible causes -
- Folder roller motor defective
- Folder roller motor sensor defective


## 03: Shutter guide motor error

1) After the shutter guide motor turns on to move the shutter guide from its home position, the shutter guide HP sensor does not deactivate within 0.4 s .
2) After the shutter guide motor turns on to return the shutter guide to its home position, the shutter guide HP sensor does not activate within 1 s .

- Possible causes -
- Shutter guide motor defective
- Shutter guide HP sensor defective


## 04: Booklet jogger motor error

1) After the booklet jogger motor turns on to move the booklet jogger plate from its home position, the booklet jogger HP sensor does not deactivate within 0.5 s .
2) After the booklet jogger motor turns on to return the booklet jogger plate to its home position, the booklet jogger HP sensor does not activate within 1 s .

- Possible causes -
- Booklet jogger motor defective
- Booklet jogger HP sensor defective


## 05: Stapler motor error

1) The front staple hammer HP switch does not turn off within 0.5 s after the front stapler motor turns on.
2) The front staple hammer HP switch does not turn on within 0.5 s after the front stapler motor turns on during jam recovery.
3) The rear staple hammer HP switch does not turn off within 0.5 s after the rear stapler motor turns on.
4) The rear staple hammer HP switch does not turn on within 0.5 s after the rear stapler motor turns on during jam recovery.

- Possible causes -
- Front stapler motor defective
- Front staple hammer HP switch defective
- Rear stapler motor defective
- Rear staple hammer HP switch defective


## 06: Folder plate motor error

1) After the folder plate motor turns on to return the folder plate to its home position, the folder plate HP sensor does not activate within 0.3 s .
2) After the folder plate motor turns on to move the folder plate from its home position, the folder plate HP sensor does not deactivate within 0.3 s .
3) After the folder plate motor turns on to return the folder plate to its home position, the folder plate return sensor does not deactivate within 0.3 s .
4) The folder plate return sensor does not activate within 0.3 s after the HP sensor deactivates.
5) The pulse count from the folder plate motor sensor is lower than the target minimum.

- Possible causes -
- Folder plate motor defective
- Folder plate HP sensor defective
- Folder plate return sensor defective
- Folder plate motor sensor defective


## 07: Connector error

1) The connector of the shutter guide HP sensor is not connected.
2) The connector of the folder plate HP sensor is not connected.
3) The connector of the folder plate return sensor is not connected.

- Possible causes -
- Poor connection or no connection of the shutter guide HP sensor connector
- Poor connection or no connection of the folder plate HP sensor connector
- Poor connection or no connection of the folder plate return sensor connector


## 08: Switch error

1) When the booklet entrance guide sensor, lower door sensor and booklet exit cover sensor are all activated (doors closed), the booklet entrance guide safety switch does not turn on within 1 s after a copy job or warm-up idling begins.
2) When the booklet entrance guide sensor, lower door sensor and booklet exit cover sensor are all activated (doors closed), the lower door safety switch does not turn on within 1 s after a copy job or warm-up idling begins.
3) When the booklet entrance guide sensor, lower door sensor and booklet exit cover sensor are all activated (doors closed), the booklet exit cover safety switch does not turn on within 1s after a copy job or warm-up idling begins.

- Possible causes -
- Booklet entrance guide safety switch defective
- Lower door safety switch defective
- Booklet exit cover safety switch defective


## 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 counter is not connected.

## -Possible cause-

- Mechanical total counter defective
- Mechanical total counter connector not connected


## SC951: F-gate signal error 2

-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 -
- SBICU 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


## SC956: Scanner setting ID error

-Definition- [B]
The ID that is sent from the IPU for scanner parameter setting is different from expected.
-Possible cause-

- Software error


## SC957: Scanner return ID error

-Definition- [B]
The ID that is sent from the IPU for the scanner return signal is different from expected.
-Possible cause-

- Software error


## $\Rightarrow$

## SC958: Scanner ready ID error

-Definition- [B]
The ID that is sent from the IPU for the scanner ready signal is different from expected.
-Possible cause-

- Software error


## SC959: Printer setting ID error

-Definition- [B]
The ID that is sent from the IPU for the printer setting signal is different from expected.
-Possible cause-

- Software error


## SC960: Printer return ID error

-Definition- [B]
The ID that is sent from the IPU for the printer return signal is different from expected.

## -Possible cause-

- Software error


## SC961: Printer ready ID error

-Definition- [B']
The ID that is sent from the printer controller in the printer controller printing ready condition is incorrect.

- Possible causes -
- Software defective


## SC962: Memory setting ID error

-Definition- [B’]
The ID that is sent from the memory when the IPU sent the memory ready signal is incorrect.

- Possible causes -
- Software defective


## $\Rightarrow$ <br> SC963: Memory finishing ID error

-Definition- [B']
The ID that is sent from the memory when the IPU sent the memory finish signal is incorrect.

- 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 MCU does not send the ready signal for 10 seconds after the scanning start command is sent to the MCU.
-Possible cause-

- Communication error between BICU and MCU
- MCU software defective
- Buffer is full


## SC980: HDD access error

-Definition- [B]
Incorrect parameter is sent from the BICU to the HDD controller.

- Possible causes -
- Software defective
- BICU defective


## SC982: HDD construction error

-Definition- [B']
A HDD that does not have the correct specifications has been installed.

- Possible causes -
- Insufficient memory
- Incorrect hard disk type


## SC984: HDD response error

-Definition- [B’]
The HDD controller does not generate any response when the BICU sends a read/write signal to the HDD controller.

- Possible causes -
- Software defective
- HDD defective or poor connection


## SC990: Software performance error

-Definition- [B’]
The software performs an unexpected function.

- Possible causes -
- Software defective

NOTE: When this SC occurs, the file name, address, and data will be stored in the NVRAM. This data can be checked by entering SP mode then pressing " 0 ".

Note the above data and the situation in which this SC occurs. Then report the data and conditions to your technical control center.

## $\Rightarrow 7.2$ ELECTRICAL COMPONENT DEFECTS

### 7.2.1 SENSORS

| Component (Symbol) | Connector No. | Condition | Symptom |
| :---: | :---: | :---: | :---: |
| Scanner Home Position (S1) | CN555-2 <br> (MCU) | Stays On | SC121 is displayed. |
|  |  | Stays Off | SC120 is displayed. |
| Original Width (S2) | $\begin{gathered} \hline \text { CN555-6, } 7, \\ 8 \\ \text { (MCU) } \end{gathered}$ | 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. |
| $\begin{gathered} \text { Original } \\ \text { Length-1 (S3) } \end{gathered}$ | $\begin{aligned} & \hline \text { CN555-11 } \\ & (M C U) \end{aligned}$ | 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. |
| $\begin{gathered} \text { Original } \\ \text { Length-2 (S4) } \end{gathered}$ | $\begin{aligned} & \hline \text { CN555-14 } \\ & \text { (MCU) } \end{aligned}$ | 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. |
| LD Unit Home Position (S5) | $\begin{gathered} \hline \text { CN202-8 } \\ (\mathrm{IOB}) \end{gathered}$ | Stays On | SC328 is displayed when the laser beam pitch is changed. |
|  |  | Stays Off | SC327 is displayed when the laser beam pitch is changed. |
| Drum Potential Sensor (S6) | $\begin{gathered} \text { CN206-A12 } \\ (\mathrm{IOB}) \end{gathered}$ | Open | The machine quits auto process control |
|  |  | Shorted | and enters fixed toner supply mode. |
| Toner Density (TD) (S7) | $\begin{gathered} \text { CN211-B9 } \\ \text { (IOB) } \\ \hline \end{gathered}$ | Stays On | SC340 is displayed. |
|  |  | Stays Off | SC340 is displayed. |
| $\begin{aligned} & \text { Image Density } \\ & \text { (ID) (S8) } \\ & \hline \end{aligned}$ | $\begin{gathered} \text { CN206-B11 } \\ \text { (IOB) } \\ \hline \end{gathered}$ | Open | SC352 is displayed after copying. |
|  |  | Shorted | SC350 is displayed after copying. |
| Toner End (S9) | $\begin{gathered} \text { CN211-B5 } \\ \text { (IOB) } \end{gathered}$ | Open | "Toner End" is displayed even if there is enough toner in the toner hopper. |
|  |  | Shorted | "Toner End" is not displayed even if there is no toner in the toner hopper. |
| Toner Collection Motor (S10) | CN270-7 (PFB) | Stays On | SC495 is displayed. |
|  |  | Stays Off | SC495 is displayed. |
| $\begin{gathered} \text { Toner } \\ \text { Recycling (S11) } \\ \hline \end{gathered}$ | $\begin{gathered} \text { CN207-B2 } \\ (\mathrm{IOB}) \end{gathered}$ | Stays On | SC495 is displayed. |
|  |  | Stays Off | SC495 is displayed. |
| $\begin{aligned} & \text { 1st Paper Feed } \\ & \text { (S12) } \end{aligned}$ | $\begin{gathered} \text { CN271-2 } \\ (\mathrm{PFB}) \end{gathered}$ | Stays On | "Paper Jam" is displayed even if there is no paper. |
|  |  | Stays Off | "Paper Jam" is displayed whenever a copy is made. |


| Component <br> (Symbol) | Connector <br> No. | Condition |  |
| :---: | :---: | :--- | :--- |
| 2nd Paper |  |  |  |
| Feed (S13) |  |  |  | | CN273-A2 |
| :---: |
| (PFB) |$\quad$ Stays On | "Paper Jam" is displayed even if there |
| :--- |
| is no paper. |


| Component (Symbol) | Connector No. | Condition | Symptom |
| :---: | :---: | :---: | :---: |
| Rear Fence Return (S26) | $\begin{gathered} \text { CN266-9 } \\ \text { (PFB) } \end{gathered}$ | Stays On | SC515 is displayed. |
|  |  | Stays Off | SC515 is displayed. |
| Front Side Fence Open (S27) | $\begin{gathered} \hline \text { CN265-A3 } \\ \text { (PFB) } \end{gathered}$ | Stays On | SC515 may display. |
|  |  | Stays Off | SC515 may display. |
| Front Side Fence Close (S28) | CN265-A6 (PFB) | Stays On | SC515 may display. |
|  |  | Stays Off | SC515 may display. |
| $\begin{aligned} & \text { Rear Side } \\ & \text { Fence Open } \\ & \text { (S29) } \end{aligned}$ | $\begin{aligned} & \text { CN265-A9 } \\ & \text { (PFB) } \end{aligned}$ | Stays On | SC515 may display. |
|  |  | Stays Off | SC515 may display |
| Rear Side Fence Close (S30) | $\begin{gathered} \hline \text { CN265-A12 } \\ \text { (PFB) } \end{gathered}$ | Stays On | SC515 may display |
|  |  | Stays Off | SC515 may display |
| Right TrayDown (S31) | $\begin{aligned} & \text { CN265-B3 } \\ & \text { (PFB) } \end{aligned}$ | Stays On | The bottom plate is not lowered when paper on the left tray shift to the right tray, and paper is set in the improper position. When the main switch turn on, no paper is indicated on the display even if there is paper on the right tray. |
|  |  | Stays Off | The bottom plate lift lower locks at the lowest position. |
| $\begin{aligned} & \text { Right Tray } \\ & \text { Paper (S32) } \end{aligned}$ | $\begin{aligned} & \text { CN265-B9 } \\ & (\mathrm{PFB}) \end{aligned}$ | Stays On | The bottom plate rises and falls even if there is no paper. |
|  |  | Stays Off | The bottom plate close not rise even if there is paper on the tray. |
| Left Tandem Tray Paper (S33) | $\begin{aligned} & \hline \text { CN266-11 } \\ & \text { (PFB) } \end{aligned}$ | Stays On | The rear fence moves back and forth continuously. |
|  |  | Stays Off | The paper on the left tray is not moved to the right tray. No paper is indicated event if there is paper on the left tray. |
| $\begin{gathered} \text { Duplex } \\ \text { Entrance (S34) } \end{gathered}$ | $\begin{gathered} \text { CN208-B14 } \\ (\mathrm{IOB}) \end{gathered}$ | Stays On | "Paper Jam" is displayed even if there is no paper. |
|  |  | Stays Off | "Paper Jam" is displayed whenever a copy is made. |
| Duplex Inverter (S35) | $\begin{aligned} & \text { CN208-B17 } \\ & (\text { IOB }) \end{aligned}$ | 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 (S36) | CN208-B5 <br> (IOB) | Stays On | "Paper Jam" is displayed whenever a copy is made. |
|  |  | Stays Off | "Paper Jam" is displayed even if there is no paper. |
| DuplexTransport 2(S37) | $\begin{aligned} & \text { CN208-B8 } \\ & \text { (IOB) } \end{aligned}$ | Stays On | "Paper Jam" is displayed whenever a copy is made. |
|  |  | Stays Off | "Paper Jam" is displayed even if there is no paper. |


| Component (Symbol) | Connector No. | Condition | Symptom |
| :---: | :---: | :---: | :---: |
| DuplexTransport 3(S38) | $\begin{aligned} & \text { CN208-B11 } \\ & \text { (IOB) } \end{aligned}$ | Stays On | "Paper Jam" is displayed whenever a copy is made. |
|  |  | Stays Off | "Paper Jam" is displayed even if there is no paper. |
| $\begin{gathered} \text { Duplex Jogger } \\ \text { HP (S39) } \end{gathered}$ | $\begin{gathered} \text { CN208-B2 } \\ \text { (IOB) } \\ \hline \end{gathered}$ | Stays On | SC521 is displayed. |
|  |  | Stays Off | SC520 is displayed. |
| Relay (S40) | $\begin{aligned} & \text { CN211-A8 } \\ & \text { (IOB) } \end{aligned}$ | Stays On | "Paper Jam" is displayed even if there is no paper. |
|  |  | Stays Off | "Paper Jam" is displayed whenever a copy is made. |
| Registration (S41) | $\begin{aligned} & \text { CN211-A1 } \\ & \text { (IOB) } \end{aligned}$ | 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 (S42) | $\begin{gathered} \hline \text { CN209-6 } \\ \text { (IOB) } \end{gathered}$ | 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. |
| Fusing Exit (S43) | $\begin{aligned} & \text { CN207-B8 } \\ & (\mathrm{IOB}) \end{aligned}$ | Stays On | "Paper Jam" is displayed even if there is no paper. |
|  |  | Stays Off | "Paper Jam" is displayed whenever a copy is made. |
| 1st Exit (S44) | $\begin{aligned} & \text { CN204-B2 } \\ & \text { (IOB) } \end{aligned}$ | Stays On | "Paper Jam" is displayed whenever a copy is made. |
|  |  | Stays Off | "Paper Jam" is displayed even if there is no paper. |
| 2nd Exit (S45) | $\begin{aligned} & \hline \text { CN204-B5 } \\ & \text { (IOB) } \end{aligned}$ | Stays On | "Paper Jam" is displayed whenever a copy is made. |
|  |  | Stays Off | "Paper Jam" is displayed even if there is no paper. |
| Tray Paper Limit (S46) (Option) | $\begin{aligned} & \hline \text { CN204-B8 } \\ & \text { (IOB) } \end{aligned}$ | Stays On | Paper jams may occur. |
|  |  | Stays Off | "Paper Full on Exit Tray" is displayed. |

### 7.2.2 SWITCHES

| Component (Symbol) | Connector No. | Condition | Symptom |
| :---: | :---: | :---: | :---: |
| Main Power (SW1) | $\begin{aligned} & \text { CN101-1, } 2 \\ & \text { CN111-1, } 2 \end{aligned}$ | Open | The machine does not turn on. |
|  |  | Shorted | The machine does not turn off. |
| Front Door Safety (SW3,5) | $\begin{gathered} \text { CN403-1, } 3 \\ (\text { LDU }) \end{gathered}$ | Open | SC322 is displayed. |
|  |  | Shorted |  |
| $\begin{gathered} \text { Front Door } \\ \text { Safety (SW4) } \end{gathered}$ | $\begin{gathered} \hline \text { CN152-3, 6, } \\ 7 \text { (CNB) } \end{gathered}$ | Stays On | "Close the Door" is displayed even if the front cover is closed. SC440, 441, or 531 is displayed. |
|  |  | Stays Off | "Close the Door" is not displayed even if the front cover is opened. |
| Lower Front Door Safety (SW6) | $\begin{aligned} & \text { CN268-1 } \\ & \text { (PFB) } \end{aligned}$ | Open | SC506 is displayed. |
|  |  | Shorted |  |
| Toner Collection Bottle Set (SW7) | $\begin{aligned} & \text { CN268-10 } \\ & \text { (PFB) } \\ & \text { CN270-10 } \end{aligned}$ | Open | SC 496 is displayed. |
|  |  | Shorted | No caution is displayed on the operation panel even if the toner collection bottle is set incorrectly. |
| Toner Overflow (SW8) | $\begin{aligned} & \hline \text { CN270-12 } \\ & \text { (PFB) } \end{aligned}$ | Open | "Full Used Toner Bottle" is displayed even if the toner collection bottle is not full. |
|  |  | Shorted | "Full Used Toner Bottle" is not displayed even if the toner collection bottle is full. |
| $\begin{gathered} \hline \text { Paper Size } \\ \text { (SW9) } \end{gathered}$ | $\begin{gathered} \text { CN262- } \\ 8,9,10,11,1 \\ 2 \\ \text { (PFB) } \end{gathered}$ | Open <br> Shorted | The CPU cannot detect the proper paper size, and misfeeds may occur when a copy is made. |

## $\Rightarrow$ 7.3 BLOWN FUSE CONDITIONS

| Fuse | Rating |  | Symptom when turning on the main <br> power switch |
| :--- | :--- | :--- | :--- |
|  | $\mathbf{1 1 5 V}$ | $\mathbf{2 1 0} \sim \mathbf{2 3 0 V}$ |  |
| Power Supply Board |  |  |  |
| FU101 | $12 \mathrm{~A} / 250 \mathrm{~V}$ | $6.3 \mathrm{~A} / 250 \mathrm{~V}$ | No response |
| FU102 | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | Nothing is displayed on LCD. |
| FU103 | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | SC101 is displayed. |
| FU104 | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | The ADF does not work. |
| FU105 | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | SC520 is displayed. |
| FU106 | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | SC530 is displayed after the start key is <br> pressed. |
| FU107 | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | SC542 is displayed. |

## 3,000-SHEET FINISHER B302

## 1. OVERALL MACHINE INFORMATION <br> 1.1 SPECIFICATIONS

The punch unit is an option for this machine.

Paper Size:

Paper Weight:

Paper Capacity:

No punch mode Shift Tray: A3 to A5/DLT to HLT Upper Tray: A3 to A5, A6 lengthwise, B6 lengthwise/ DLT to HLT
Punch mode 2 holes: A3 to A5/DLT to HLT 3 holes: A3, B4, A4 sideways, B5 sideways DLT, LT sideways 4 holes (Europe): A3 to A5

DLT to LT, HLT sideways 4 holes (North Europe): A3 to B5, A5 sideways DLT to LT, HLT sideways
Staple Mode A3 to B5/DLT to LT

No punch mode
No staple mode: $52 \mathrm{~g} / \mathrm{m}^{2} \sim 216 \mathrm{~g} / \mathrm{m}^{2}, 14 \sim 42 \mathrm{lb}$
Staple mode: $\quad 64 \mathrm{~g} / \mathrm{m}^{2} \sim 80 \mathrm{~g} / \mathrm{m}^{2}, 17 \sim 21 \mathrm{lb}$
Punch mode
2 holes: $52 \mathrm{~g} / \mathrm{m}^{2} \sim 163 \mathrm{~g} / \mathrm{m}^{2}, 14 \sim 42 \mathrm{lb}$
3 holes: $52 \mathrm{~g} / \mathrm{m}^{2} \sim 163 \mathrm{~g} / \mathrm{m}^{2}, 14 \sim 42 \mathrm{lb}$ 4 holes: $52 \mathrm{~g} / \mathrm{m}^{2} \sim 128 \mathrm{~g} / \mathrm{m}^{2}, 14 \sim 34 \mathrm{lb}$
Shift tray/no staple mode ( $80 \mathrm{~g} / \mathrm{m}^{2}, 20 \mathrm{lb}$ ):

|  | Punch mode | No punch mode |
| :---: | :---: | :---: |
| B5 sideways <br> A4 sideways <br> LT sideways | 2,500 sheets | 3,000 sheets |
| Other sizes | 1,500 sheets | 1,500 sheets |

Shift tray/staple mode/punch mode ( $80 \mathrm{~g} / \mathrm{m}^{2}, 20 \mathrm{lb}$ ):

|  | Pages/set | Sets |
| :---: | :---: | :---: |
| B5 sideways | 2 to 9 | 150 |
| A4 sideways | 10 to 80 | 200 to 30 |
| LT sideways | 2 to 9 | 100 |
| Other sizes | 10 to 40 | 150 to 30 |

Shift tray/staple mode/no punch mode ( $80 \mathrm{~g} / \mathrm{m}^{2}, 20 \mathrm{lb}$ ):

|  | Pages/set | Sets |
| :---: | :---: | :---: |
| B5 sideways | 2 to 9 | 150 |
| A4 sideways <br> LT sideways | 10 to 100 | 200 to 30 |
| Other sizes | 2 to 9 | 150 |
|  | 10 to 50 | 150 to 30 |

Upper tray ( $80 \mathrm{~g} / \mathrm{m}^{2}, 20 \mathrm{lb}$ ):

|  | Punch mode | No punch mode |
| :---: | :---: | :---: |
| A4/LT or smaller | 400 sheets | 500 sheets |
| Larger than A4/LT | 200 sheets | 250 sheets |

Stapler Capacity (pages/set, $80 \mathrm{~g} / \mathrm{m}^{2}, 20 \mathrm{lb}$ paper):

|  | Punch mode | No punch mode |
| :---: | :---: | :---: |
| B5 sideways <br> A4 sideways <br> LT sideways | 80 sheets | 100 sheets |
| Other sizes | 40 sheets | 50 sheets |

Staple Position:
4 positions
1-staple: 3 positions (Front, Rear, Rear-Oblique)
2-staple: 1 position

Staple Replenishment: Cartridge (5,000 staples)
Power Source:
24 Vdc (from copier)
Power Consumption:
120 W
Weight:
60 kg
Size (W x D x H):
$800 \mathrm{~mm} \times 730 \mathrm{~mm} \times 980 \mathrm{~mm}$

### 1.2 MECHANICAL COMPONENT LAYOUT



1. Upper Tray
2. Middle Transport Rollers
3. Upper Tray Exit Roller
4. Upper Transport Rollers
5. Tray Junction Gate
6. Stapler Junction Gate
7. Entrance Rollers
8. Punch Unit
9. Pre-stack Junction Gate
10. Punch Waste Hopper
11. Pre-stack Tray
12. Stack Plate
13. Staple Waste Hopper
14. Stapler
15. Alignment Brush Roller
16. Positioning Roller
17. Stack Feed-out Belt
18. Shift Tray Drive Belt
19. Lower Transport Rollers
20. Shift Tray
21. Shift Tray Exit Roller

### 1.3 ELECTRICAL COMPONENT DESCRIPTION

| Symbol | Name | Function |
| :---: | :---: | :---: |
| Motors |  |  |
| M1 | Upper Transport | Drives the entrance rollers, the middle and upper transport rollers, and upper tray exit roller. |
| M2 | Lower Transport | Drives the lower transport rollers, the alignment brush roller, and the positioning roller. |
| M3 | Jogger | Moves the jogger fence. |
| M4 | Stack Plate | Drives the stack plate. |
| M5 | Stapler | Moves the staple unit from side to side. |
| M6 | Stapler Rotation | Rotates the stapler 45 degrees. |
| M7 | Staple Hammer | Drives the staple hammer. |
| M8 | Stack Feed-out | Drives the stack feed-out belt. |
| M9 | Exit Guide | Opens and closes the upper exit guide. |
| M10 | Shift Tray Exit | Drives the exit roller for the shift tray. |
| M11 | Shift | Moves the shift tray from side to side. |
| M12 | Shift Tray Lift | Moves the shift tray up or down. |
| M13 | Punch | Drives the punch shaft and roller. |
| Sensors |  |  |
| S1 | Entrance | Detects the copy paper entering the finisher and checks for misfeeds. |
| S2 | Pre-stack Tray Paper | Determines when to turn off the pre-stack paper stopper solenoid. |
| S3 | Stapler Tray Entrance | Detects the copy paper entering the stapler tray and checks for misfeeds. |
| S4 | Jogger Fence HP | Detects the home position of the jogger fence. |
| S5 | Stapler Tray Paper | Detects the copy paper in the stapler tray. |
| S6 | Stack Plate HP | Detects the home position of the stack plate. |
| S7 | Stapler HP | Detects the home position of the staple unit for side-to-side movement. |
| S8 | Stapler Rotation HP | Detects the home position of the stapler unit for 45degree rotation. |
| S9 | Staple Hammer HP | Detects the home position of the staple hammer. |
| S10 | Cartridge Set | Detects the staple cartridge in the stapler. |
| S11 | Staple End | Detects the staples in the cartridge. |
| S12 | Staple Waste Hopper | Detects when the staple waste hopper is full. |
| S13 | Stack Feed-out Belt HP | Detects the home position of the stack feed-out belt. |
| S14 | Exit Guide Open | Detects whether the guide plate is opened or not. |
| S15 | Shift Tray Exit | Checks for misfeeds at the shift tray. |
| S16 | Stack Height 1 | Detects when the top of the copy paper stack in the shift tray is at the correct position. |
| S17 | Stack Height 2 | Detects when the top of the copy paper stack in the shift tray has become too high. |
| S18 | Upper Tray Exit | Checks for misfeeds at the upper tray. |

## ELECTRICAL COMPONENT DESCRIPTION

| Symbol | Name | Function |
| :---: | :---: | :---: |
| S19 | Upper Tray Paper Limit | Detects when the paper stack height in the upper tray is at its upper limit. |
| S20 | Shift Tray Half-turn | Detects the return position for side-to-side movement of the shift tray. |
| S21 | Shift Tray Lower Limit 1 | Detects when the shift tray is nearly at its lower limit. |
| S22 | Shift Tray Lower Limit 2 | Detects when the shift tray is at its lower limit. |
| S23 | Punch Waste Hopper | Detects when the punch waste hopper is full and detects when the punch tray is set. |
| S24 | Punch HP | Detects the home position of the punch shaft and roller. |
| S25 | Stapler Return | Detects the on timing of the stapler return solenoid. |
| Switches |  |  |
| SW1 | Front Door Safety | Cuts the dc power when the front door is opened. |
| SW2 | Shift Tray Upper Limit | Cuts the power to the shift tray lift motor when the shift tray position is at its upper limit. |
| Solenoids |  |  |
| SOL1 | Stapler Junction Gate | Drives the stapler junction gate. |
| SOL2 | Tray Junction Gate | Drives the tray junction gate. |
| SOL3 | Pre-stack Junction Gate | Drives the pre-stack junction gate. |
| SOL4 | Pre-stack Paper Stopper | Drives the pre-stack paper stopper. |
| SOL5 | Positioning Roller | Moves the positioning roller against the stapling tray. |
| SOL6 | Stapler Return | Returns the stapler to its guide from the user operation position. |
| PCBs |  |  |
| PCB1 | Main | Controls the finisher and communicates with the copier. |
| PCB2 | Punch | Passes signals between the punch unit and the finisher main board. |

## DRIVE LAYOUT

### 1.4 DRIVE LAYOUT



1. Upper Transport Roller 2
2. Upper Tray Exit Roller
3. Lower Transport Roller 2
4. Shift Tray Lift Motor
5. Shift Tray Exit Motor
6. Shift Tray Exit Roller
7. Shift Tray
8. Shift Motor
9. Staple Tray Exit Roller
10. Positioning Roller
11. Lower Transport Roller 3
12. Lower Transport Motor
13. Lower Transport Rollers 2
14. Lower Transport Roller 1
15. Transport Roller 1
16. Entrance Roller 2
17. Entrance Roller 1
18. Upper Transport Roller 1
19. Upper Transport Motor
20. Stack Feed-out Motor
21. Jogger Motor
22. Jogger Fence
23. Stack Plate Motor
24. Stapler Motor
25. Stack Feed-out Belt
26. Stapler Rotation Motor

## 2. DETAILED DESCRIPTIONS

### 2.1 TRAY AND STAPLER JUNCTION GATE

## - Upper Tray Mode -



Depending on the finishing mode, the copies are directed up, straight through, or down by the combination of the tray junction gate [A] and stapler junction gate [B]. These gates are controlled by the tray junction gate solenoid [C] and stapler junction gate solenoid [D].

## Upper Tray Mode

The stapler tray junction gate solenoid remains off and the tray junction gate solenoid turns on. The copies go up to the upper tray.

## Sort/Stack Mode

The tray junction gate solenoid and the stapler junction gate solenoid remain off. The copies are sent to the shift tray directly.

## Staple Mode

The stapler junction gate solenoid turns on. The copies go downwards to the jogger unit.

### 2.2 PAPER PRE-STACKING



This mechanism improves productivity in staple mode. It is only used when copying on A4, LT, or B5 (all sideways).
During stapling, the copier has to wait. This mechanism reduces the wait by holding the first two sheets of a job while the previous job is still being stapled. It only works during the second and subsequent sets of a multi-set copy job.
The pre-stack junction gate solenoid [A] turns on about 230 ms after the 1st sheet of paper turns on the entrance sensor, and this directs the sheet to the pre-stack tray $[B]$. (This sheet cannot be fed to the stapler yet, because the first set is still being stapled.) The pre-stack paper stopper solenoid [C] turns on about 680 ms after the 1st sheet turns on the entrance sensor. The pre-stack paper stopper [D] then stops the paper.
The pre-stack junction gate solenoid turns off 450 ms after the trailing edge of the 1st sheet passes through the entrance sensor, and the 2nd sheet is sent to the paper guide [E]. The pre-stack paper stopper is released about 50 ms after the 2nd sheet turns on the pre-stack stopper sensor [F], and the two sheets of copy paper are sent to the stapler tray. All sheets after the 2nd sheet go to the stapler tray via the paper guide [E].

### 2.3 JOGGER UNIT PAPER POSITIONING



In staple mode, each sheet of copy paper is vertically and horizontally aligned when it arrives in the jogger unit.

## Vertical Paper Alignment

Approximately 60 ms after the trailing edge of the copy passes the staple tray entrance sensor $[A]$, the positioning roller solenoid $[B]$ is energized to push the positioning roller [C] into contact with the paper. The positioning roller and alignment brush roller [D] rotate to push the paper back and align the trailing edge of the paper against the stack stopper [E].

## Horizontal Paper Alignment

When the print key is pressed, the jogger motor [F] turns on and the jogger fences [G] move to the waiting position, which is approximately 7 mm wider on both sides than the selected paper.

When the trailing edge of the paper passes the staple unit entrance sensor, the jogger motor turns on for approximately $32 \mathrm{~ms}(4.7 \mathrm{~mm})$ to move the jogger fences approximately 5 mm towards the paper. After a short time, the jogger motor turns on again approximately $18 \mathrm{~ms}(3.0 \mathrm{~mm})$ for the horizontal paper alignment then goes back to the waiting position.

## Paper Stack Correction

After the paper is aligned in the stapler tray, the stack plate motor turns $[\mathrm{H}]$ on for short time to correct the paper stack and the stack plate [I] push the paper against the staple tray.

When the next copy paper turns on the stapler tray entrance sensor, the stack plate motor turns on gain to return to its home position. The home position is detected by stack plate HP sensor [J].

### 2.4 STAPLER UNIT MOVEMENT



## Side-to-Side

The stapler motor $[A]$ moves the stapler $[B]$ from side to side. After the start key is pressed, the stapler moves from its home position to the stapling position.
If two-staple-position mode is selected, the stapler moves to the front stapling position first, then moves to the rear stapling position. However, for the next copy set, it staples in the reverse order (at the rear side first then at the front side).
After the job is completed, the stapler moves back to its home position. This is detected by the stapler HP sensor [C].


## Rotation (1)

In the oblique staple position mode, the stapler rotation motor $[\mathrm{A}]$ rotates the stapler units [B] $45^{\circ}$ to counterclockwise after it moves to the stapling position.

## Rotation (2)

When the staple end condition arises, the stapler motor moves the stapler to the front and the stapler rotation motor rotates the stapler unit to clockwise to remove the staple cartridge [C]. This allows the user to add new staples.
Once the staples have been installed, and the front door closed, the stapler unit returns to its home position. As the stapler unit is returning to the home position, the stapler return sensor [D] is activated, the return solenoid [E] turns on and it assists the guide roller [F] to return to its guide (this guide directs the stapler during rotation).

### 2.5 STAPLER


[A]

[G]

When the aligned copies are brought to the stapling position by the positioning roller and jogger fences, the staple hammer motor $[A]$ starts stapling.
During stapling, the stapler trims off the excess length [B] of the staples by lowering the cutter [C]. This excess length depends on the number of copies in the set; there will be very little for a stack containing 100 sheets. The staple waste drops into the tray [D] in the stapler. When the stapler unit returns to its home position, the tray hits the shaft [E] and the tray opens. The staple waste drops into the staple waste hopper $[\mathrm{F}]$. When the staple waste hopper is full, the actuator on its base activates the staple waste hopper sensor [G]. An SC is displayed.


The stapler has a staple end sensor $[A]$, cartridge set sensor $[B]$ and staple hammer HP sensor [C].

When a staple end or no cartridge condition is detected, a message is displayed advising the operator to install a staple cartridge. If this condition is detected during a copy job, the indication will appear, and the copy job will stop.
The staple cartridge has a clinch area [D], in which jammed staples are left. Operators can remove the jammed staples from this area.
When the operator lifts the release lever [E], the clinch area is released from the cartridge by pushing the holders [F]. The jammed staples can be removed.
The staple sheet can be feed manually by sliding the knob [G].

### 2.6 FEED-OUT



After the copies have been stapled, the stack feed-out motor [A] starts. The pawl $[B]$ on the stack feed-out belt [C] transports the set of stapled copies up and feeds it to the shift tray exit roller [D]. When stapling starts, the exit guide motor [E] opens the upper exit guide [F], which includes the upper shift tray exit roller [G], in order to feed out the leading edge of the copy set smoothly. The exit guide motor turns on again a certain time after stapling is complete, and the upper exit guide plate is lowered. Then the shift tray exit roller takes over the stack feed-out.

The on-off timing of the exit guide motor is detected by the exit guide open sensor [H].

The stack-feed-out motor turns off when the pawl actuates the stack feed-out belt home position sensor [I].

### 2.7 SHIFT TRAY UP/DOWN MOVEMENT



The shift tray lift motor $[A]$ controls the vertical position of the shift tray $[B]$ through gears and timing belts [C]. When the main switch is turned on, the tray is initialized at the upper position. The tray is moved up until stack height sensor 1 [D] is deactuated.

In sort/stack mode, if stack height sensor $2[E]$ is actuated for 2 seconds, the shift tray lift motor lowers the shift tray for 20 ms .
In staple mode, when the pawl on the stack feed-out belt reaches the upper position of the staple unit, the shift tray lift motor lowers the shift tray for 400 ms and stops for 200 ms . Then, it lifts the shift tray until stack height sensor 1 is deactuated by the feeler [F]. This means the tray lowers earlier in staple mode, to prevent the next copy suddenly exceeding the space currently available on the tray.

For both modes, the shift tray will rise until stack height sensor 1 is de-actuated when the user takes the stack of paper from the shift tray.

This machine has two shift tray lower limit sensors 1 [G], 2 [H]. Shift tray lower limit sensor 1 detects the near lower limit and sensor 2 detects the lower limit. When the actuator [I] enters sensor 1, a message will be displayed and copying will continue. When the actuator enters sensor 2 , a message will be displayed and copying will stop.
The shift tray upper limit switch [J] prevents the drive gear from being damaged if stack height sensor 1 fails. When the shift tray pushes up the shift tray positioning roller $[\mathrm{K}]$, the switch will cut the power to the shift tray lift motor.

### 2.8 SHIFT TRAY SIDE-TO-SIDE MOVEMENT



In sort/stack mode, the shift tray [A] moves from side to side to separate the sets of copies.

The horizontal position of the shift tray is controlled by the shift motor [B] and shift gear disk [C]. After one set of copies is made and delivered to the shift tray, the shift motor turns on, driving the shift gear disk and the shaft [D]. The end fence [E] is positioned by the shaft, creating the side-to-side movement.
When the shift gear disk has rotated 180 degrees (when the shift tray is fully shifted across), the cut-out in the shift gear disk turns on the shift tray half-turn sensor [F] and the shift motor stops. The next set of copies is then delivered. The motor turns on, repeating the same process and moving the tray back to the previous position.

### 2.9 PUNCH UNIT DRIVE



The punch unit makes 2 or 3 holes (depending on the type of punch unit) at the trailing edge of the paper.

The punch unit is driven by the punch motor [A]. The punch motor turns on 78 ms after the trailing edge of the paper passes through the entrance sensor $[B]$, and makes the punch holes.
The home position is detected by the punch HP sensor [C]. When the cut-out in the punch shaft gear disk [D] enters the punch HP sensor, the punch motor stops.
The punch position is adjusted as follows:

- Right to left: SP mode
- Front to rear: Spacers


### 2.10 PUNCH WASTE COLLECTION



The punch waste is collected in the punch waste hopper [A], which is under the punch unit.
When the punch waste covers the hole $[B]$ in the hopper, the punch waste hopper sensor [C] turns on and a message will be displayed after the copy job finishes.

The punch waste hopper sensor also works as the hopper set sensor. If the punch waste hopper is not set, the sensor stays away from the hole in the hopper holder [D] and a message is displayed. This message is the same as for the hopper full condition.

### 2.11 JAM CONDITIONS

1. The entrance sensor does not turn on when the copier has fed paper 426 mm after the copier exit sensor turned off.
2. The entrance sensor does not turn off when the upper transport motor has fed paper 1.5 times the paper's length after it turned on.
3. The upper tray exit sensor does not turn on when the upper transport motor has fed paper 574 mm after the entrance sensor turned on.
4. The upper tray exit sensor does not turn off when the upper transport motor has fed paper 1.5 times the paper's length after it turned on.
5. In sort/stack mode, the shift tray exit sensor does not turn on when the upper transport motor has fed paper 783 mm after the entrance sensor turned on.
6. In sort/stack mode, the shift tray exit sensor does not turn off when the upper transport motor has fed paper 1.5 times the paper's length after it turned on.
7. In staple mode, the stapler tray entrance sensor does not turn on when the upper and lower transport motor have fed paper 835 mm after the entrance sensor turned on.
8. In staple mode, the stapler tray entrance sensor does not turn off when the upper transport motor has fed paper 1.5 times the paper's length after it turned on.
9. In staple mode, the stapler tray paper sensor does not turn off within 250 pulses of the stack feed-out motor after it started.
10. In staple mode, the shift tray exit sensor does not turn off within $1,260 \mathrm{~ms}$ after the stack feed-out motor started.

## 3. SERVICE TABLES

### 3.1 DIP SWITCHES

| DPS100 |  |  |  |  |
| :---: | :---: | :---: | :---: | :--- |
| $\mathbf{1}$ | $\mathbf{2}$ | $\mathbf{3}$ | $\mathbf{4}$ |  |
| Description |  |  |  |  |
|  | 0 | 0 | 0 | Default |
| 1 | 0 | 0 | 0 | Free run: A4 sideways, staple mode |
| 0 | 1 | 0 | 0 | Free run: staple and tray shift |

NOTE: Do not use any other settings.

### 3.2 TEST POINTS

| No. | Label |  | Monitored Signal |
| :---: | :---: | :--- | :---: |
| TP100 | (5V) | +5 V |  |
| TP101 | (GND) | Ground |  |
| TP102 | (RXD) | RXD |  |
| TP103 | (TXD) | TXD |  |

### 3.3 FUSES

| No. | Function |
| :---: | :---: |
| FU100 | Protects 24 V. |

## 4. REPLACEMENT AND ADJUSTMENT

### 4.1 COVER REPLACEMENT



## Front Door

1. Remove one screw and loosen the other screw of the upper hinge for the front door [A].
2. Remove the front door $[B]$.

## Left Inner Cover

1. Remove the front door.
2. Remove the left inner cover [C] (1 screw).

## Inner Cover

1. Remove the three screws and unhook the pawls.
2. Remove the inner cover [D].


## Table

1. Slide the table $[A]$ to the right and remove it (2 screws).

## Upper Tray

1. Click the release lever $[B]$.
2. Remove the upper tray [C].

## Left Upper Cover

1. Remove the left upper cover [D].

## Left Lower Cover

1. Remove the left lower cover [E].

## Upper Cover

1. Remove the table.
2. Remove two stepped screws [F].
3. Remove the left upper cover.
4. Slide across the right cover [G] and remove it (2 screws).

## Rear Cover

1. Remove the rear cover $[\mathrm{H}]$ (2 screws).


## Shift Tray

1. Remove the left upper cover.
2. Rotate the shift tray lift gear [A] manually to lower the shift tray $[B]$
3. Remove the shift tray (4 screws).

## Front Shift Tray Cover

1. Remove the front shift tray cover [C] (1 screw).

## Rear Shift Tray Cover

1. Remove the rear shift tray cover [D] (1 screw).

### 4.2 POSITIONING ROLLER REPLACEMENT



1. Open the front door.
2. Remove the snap ring [A].
3. Release the rubber belt [B].
4. Replace the positioning roller [C].

### 4.3 ALIGNMENT BRUSH ROLLER REPLACEMENT



1. Open the front door and pull out the staple unit.
2. Remove the rear cover.
3. Remove the screw $[A]$ and a tension spring $[B]$ for the tension bracket [C], and release the tension of the timing belt.
4. Remove the pulley [D] and ball bearing [E] (1 E-ring each).
5. Remove screw $[F]$ of the inner cover [G].
6. Open the guide $[\mathrm{H}]$ and a part of the inner cover, and remove the alignment brush roller assembly [I] (1 E-ring).
7. Replace the alignment brush roller (1 E-ring, 1 ball bearing).

### 4.4 SENSOR REPLACEMENT

### 4.4.1 STACK HEIGHT 1, 2 AND EXIT GUIDE OPEN SENSOR



1. Remove the upper cover.

## Stack Height Sensors 1 and 2

2. Remove the sensor feeler $[A]$ (1 screw).
3. Remove the sensor bracket [B] (1 screw).
4. Replace the stack height sensor 1 [C] or 2 [D] (1 connector each).

## Exit Guide Open Sensor

2. Remove the sensor bracket [E] (1 screw).
3. Replace the exit guide open sensor [F] (1 connector).

### 4.4.2 UPPER TRAY PAPER LIMIT AND EXIT SENSOR



1. Remove the upper cover.

## Upper Tray Paper Limit Sensor

2. Remove the sensor cover [A] (2 screws).
3. Remove the sensor bracket [B] (1 screw).
4. Replace the upper tray paper limit sensor [C] (1 connector).

## Upper Tray Exit Sensor

2. Remove the sensor bracket [D] (1 screw).
3. Replace the upper tray exit sensor [E] (1 connector).

### 4.4.3 SHIFT TRAY EXIT SENSOR



1. Remove the upper cover.
2. Open the front door.
3. Remove the inner cover.
4. Release two springs $[A]$ of the upper exit guide $[B]$.
5. Release the link [C] from the cam and remove the upper exit guide (1 plastic clip, 1 connector).
6. Remove the guide stay [D] (2 screws).
7. Replace the shift tray exit sensor [E] (1 screw, 1 connector).

### 4.4.4 ENTRANCE AND STAPLER TRAY ENTRANCE SENSORS



## Entrance Sensor

1. Remove the finisher from the copier.
2. Remove the sensor bracket [A] (1 screw).
3. Replace the entrance sensor [B] (1 screw, 1 connector).

## Stapler Tray Entrance Sensor

1. Open the front door.
2. Remove the sensor bracket [C] (1 screw).
3. Replace the stapler tray entrance sensor [D] (1 screw, 1 connector).

### 4.4.5 PRE-STACK STOPPER SENSOR



1. Remove the rear cover.
2. Remove two plastic clips from the guide [A].
3. Open the front door.
4. Remove the left vertical transport guide $[B]$.
5. Remove the middle vertical transport guide [C] (1 connector).
6. Replace the pre-stack paper sensor [D] (1 connector).

### 4.4.6 STAPLE WASTE HOPPER SENSOR



1. Open the front door and pull out the stapler unit.
2. Remove the staple waste hopper [A] (1 plastic clip).
3. Remove the hopper holder [B] (2 E-rings).
4. Replace the staple waste hopper sensor [C] (1 connector).

### 4.4.7 STAPLER ROTATION HP AND STAPLER RETURN SENSORS



1. Remove the stapler unit.
2. Remove the stapler bracket [A] (4 screws, 2 springs).

## Stapler Rotation HP Sensor

3. Replace the stapler rotation HP sensor $[B]$ (1 connector).

## Stapler Return Sensor

3. Replace the stapler return sensor [C] (1 connector).

### 4.5 STAPLER REMOVAL



1. Open the front door and pull out the staple tray.
2. Remove the stapler unit harness cover $[A]$.
3. Remove the stapler $[B]$ (1 screw, 2 connectors).

### 4.6 PUNCH POSITION ADJUSTMENT



## Right to Left

This position is adjusted by SP modes.

## Front to Rear

The optional punch units have the following 3 spacers as accessories.
1 mm thickness: 2 pcs
2 mm thickness: 1 pc
The punch position can be adjusted by up to 4 mm by combinations of the 3 spacers.

## 3,000-SHEET FINISHER B312

## 1. OVERALL MACHINE INFORMATION <br> 1.1 SPECIFICATIONS

Paper Size:

| Tray | Modes | Sizes |
| :---: | :--- | :--- |
| Upper tray |  | A3 to A6 lengthwise, <br> DLT to HLT |
| Shift tray | Sort/stack mode | A3 to A5, DLT to LT |
|  | No sort/stack <br> mode | A3 to A6 lengthwise, <br> DLT to LT |
|  |  | A3 to B5, DLT to LT |

Paper Weight:

| Tray | Weight |
| :---: | :---: |
| Shift tray | $52 \mathrm{~g} / \mathrm{m}^{2}$ to $157 \mathrm{~g} / \mathrm{m}^{2}, 14$ to 42 lb |
| Upper tray | $52 \mathrm{~g} / \mathrm{m}^{2}$ to $157 \mathrm{~g} / \mathrm{m}^{2}, 14$ to 42 lb |
| Staple tray | $64 \mathrm{~g} / \mathrm{m}^{2}$ to $80 \mathrm{~g} / \mathrm{m}^{2}, 17$ to 21 lb |

Paper Capacity (in case of $80 \mathrm{~g} / \mathrm{m}^{2}, 20 \mathrm{lb}$ ):

| Tray | Modes | Paper size | Punch mode | No punch <br> mode |
| :---: | :---: | :--- | :--- | :--- |
|  |  | A4-S, LT-S | 2,500 sheets | 3,000 sheets |
|  |  | A5 | 100 sheets | 100 sheets |
|  | Others | 1,500 sheets | 1,500 sheets |  |
| Upper tray |  | A4/LT or smaller | 200 sheets | 250 sheets |
|  |  | Larger than A4/LT | 50 sheets | 50 sheets |
|  | One size | A4/LT or smaller | 40 sheets | 50 sheets |
|  |  | 25 sheets | 30 sheets |  |
|  | Mixed sizes | A3 and A4-S <br> DLT and LT-S | 25 sheets | 30 sheets |

(-S: Sideways)

| Tray | Modes | Paper size | Sheets/ set | Sets | Total capacity |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Shift tray | Staple <br> No punch One size | A4-S | 2 to 9 | 150 | 300 to 1,350 |
|  |  | LT-S | 10 to 50 | 300 to 60 | 3,000 |
|  |  | A4, B5-S | 2 to 9 | 150 | 300 to 1,350 |
|  |  | LT | 10 to 50 | 150 to 30 | 1,500 |
|  |  | A3, B4 | 2 to 9 | 100 | 200 to 900 |
|  |  | DLT, LG | 10 to 30 | 150 to 50 | 1,500 |
|  | Staple Punch One size | A4-S | 2 to 9 | 150 | 300 to 1,350 |
|  |  | LT-S | 10 to 40 | 250 to 63 | 2,500 |
|  |  | A4, B5-S | 2 to 9 | 150 | 300 to 1,350 |
|  |  | LT | 10 to 40 | 150 to 37 | 1,500 |
|  |  | A3, B4 | 2 to 9 | 100 | 200 to 900 |
|  |  | DLT, LG | 10 to 25 | 150 to 60 | 1,500 |
|  | Staple No punch Mixed sizes | A3 and A4-S B4 and B5-S | 2 to 30 | 50 | 100 to 1,500 |
|  | Staple Punch Mixed sizes | A3 and A4-S <br> B4 and B5-S | 2 to 25 | 50 | 100 to 1,250 |

(-S: Sideways)
Punch Unit (option):
Type

| Version | Holes | Distance <br> between holes | Diameter |
| :---: | :---: | :--- | :--- |
| American | 2 | 2.76 inches | 0.31 inches |
|  | 3 | 4.25 inches | 0.31 inches |
| European | 2 | 80 mm | 6.5 mm |
|  | 4 | $80-80-80 \mathrm{~mm}$ | 6.5 mm |
| Nordic | 4 | $21-70-21 \mathrm{~mm}$ | 6.5 mm |

Paper Size

| Type | Sizes |
| :---: | :--- |
| American 2 | A3 to A5, DLT to LT |
| American 3 | A3, B4, A4-S, B5-S, DLT, LT-S |
| European 2 | A3 to A5, DLT to LT |
| European 4 | A3, A4-S, DLT, LT-S |
| Nordic 4 | A3 to A5, DLT to LT |

(-S: Sideways)

## SPECIFICATIONS

## Paper Weight

| Type | Weight |
| :---: | :---: |
| American 2 |  |
| American 3 | $52 \mathrm{~g} / \mathrm{m}^{2}$ to $163 \mathrm{~g} / \mathrm{m}^{2}, 14$ to 42 lb |
| European 2 |  |
| European 4 | $52 \mathrm{~g} / \mathrm{m}^{2}$ to $128 \mathrm{~g} / \mathrm{m}^{2}, 14$ to 34 lb |
| Nordic 4 |  |


| Staple Position: | 4 positions <br> 1 staple: 3 positions (Front, Rear and Rear-Oblique) <br> 2 staples: 1 position |
| :---: | :---: |
| Staple Replenishment: | Cartridge (5,000 staples) |
| Power Source: | 24 Vdc (from copier) |
| Power Consumption: | 48 W (without Punch unit) 60 W (with Punch unit) |
| Dimensions (W x D x H): | $625 \times 545 \times 960 \mathrm{~mm}, 24.61 \times 21.46 \times 37.80$ inches |
| Weight: | 45 kg (without Punch unit) 47.4 kg (with Punch unit) |

ELECTRICAL COMPONENT LAYOUT

### 1.2 ELECTRICAL COMPONENT LAYOUT



1. Shift Tray Lift Motor
2. Shift Tray Exit Motor
3. Tray Junction Gate Solenoid
4. Upper Transport Motor
5. Stapler Junction Gate Solenoid
6. Pre-stack Junction Gate Solenoid
7. Pre-stack Motor
8. Main Board
9. Positioning Roller Solenoid
10. Lower Transport Motor
11. Shift Tray Lower Limit 1 Sensor
12. Shift Tray Lower Limit 2 Sensor
13. Upper Tray Paper Limit Sensor
14. Upper Tray Exit Sensor
15. Shift Tray Exit Plate HP Sensor
16. Shift Tray Exit Plate Motor
17. Shift Tray Upper Limit Switch
18. Punch Board
19. Punch Motor
20. Punch HP Sensor
21. Hopper Sensor
22. Entrance Sensor
23. Front Door Safety Switch
24. Stapler Tray Entrance Sensor
25. Shift Motor
26. Shift Tray Half-turn Sensor
27. Shift Tray Exit Sensor
28. Stack Height 2 Sensor
29. Stack Height 1 Sensor
30. Stack Feed-out Motor
31. Jogger Motor
32. Jogger Fence HP Sensor
33. Stack Feed-out Belt HP Sensor
34. Stapler Tray Paper Sensor
35. Stapler Motor
36. Stapler Rotation Motor
37. Stapler Rotation HP Sensor
38. Stapler HP Sensor
39. Staple End Switch
40. Cartridge Set Switch
41. Staple Hammer HP Sensor
42. Staple Hammer Motor

### 1.3 ELECTRICAL COMPONENT DESCRIPTION

| Symbol | Name | Function | Index No. |
| :---: | :---: | :---: | :---: |
| Motors |  |  |  |
| M1 | Upper Transport | Drives the entrance rollers, the middle and upper transport rollers, and upper tray exit roller. | 4 |
| M2 | Lower Transport | Drives the lower transport rollers, the alignment brush roller, and the positioning roller. | 9 |
| M3 | Jogger | Moves the jogger fence. | 31 |
| M4 | Stapler | Moves the staple unit from side to side. | 35 |
| M5 | Stapler Rotation | Rotates the stapler 45 degrees. | 36 |
| M6 | Staple Hammer | Drives the staple hammer. | 42 |
| M7 | Stack Feed-out | Drives the stack feed-out belt. | 30 |
| M8 | Shift Tray Exit | Drives the exit roller for the shift tray. | 2 |
| M9 | Shift | Moves the shift tray from side to side. | 25 |
| M10 | Shift Tray Lift | Moves the shift tray up or down. | 1 |
| M11 | Punch | Drives the punch shaft and roller. | 19 |
| M12 | Pre-stack | Drives the pre-stack roller. | 7 |
| M13 | Shift Tray Exit Plate | Moves the exit plate up or down. | 16 |
| Sensors |  |  |  |
| S1 | Entrance | Detects the copy paper entering the finisher and checks for misfeeds. | 22 |
| S2 | Stapler Tray Entrance | Detects the copy paper entering the staple tray and checks for misfeeds. | 24 |
| S3 | Jogger Fence HP | Detects the home position of the jogger fence. | 32 |
| S4 | Stapler Tray Paper | Detects the copy paper in the staple tray. | 34 |
| S5 | Stapler HP | Detects the home position of the staple unit for side-to-side movement. | 38 |
| S6 | Stapler Rotation HP | Detects the home position of the stapler unit for 45-degree rotation. | 37 |
| S7 | Staple Hammer HP | Detects the home position of the staple hammer. | 41 |
| S8 | Stack Feed-out Belt HP | Detects the home position of the stack feedout belt. | 33 |
| S9 | Shift Tray Exit | Checks for misfeeds at the shift tray. | 27 |
| S10 | Stack Height 1 | Detects when the top of the copy paper stack in the shift tray is at the correct position. | 29 |
| S11 | Stack Height 2 | Detects when the top of the copy paper stack in the shift tray has become too high. | 28 |
| S12 | Upper Tray Exit | Checks for misfeeds at the upper tray. | 14 |
| S13 | Upper Tray Paper Limit | Detects when the paper stack height in the upper tray is at its upper limit. | 13 |


| Symbol | Name | Function | Index No. |
| :---: | :---: | :---: | :---: |
| S14 | Shift Tray Half-turn | Detects the return position for side-to-side movement of the shift tray. | 26 |
| S15 | Shift Tray Lower Limit 1 | Detects when the shift tray is nearly at its lower limit. | 11 |
| S16 | Shift Tray Lower Limit 2 | Detects when the shift tray is at its lower limit. | 12 |
| S17 | Hopper | Detects when the punch waste hopper is full and detects when the punch tray is set. | 21 |
| S18 | Punch HP | Detects the home position of the punch shaft and roller. | 20 |
| S19 | Shift Tray Exit Plate HP | Detects the home position of the exit plate. | 15 |
| Switches |  |  |  |
| SW1 | Front Door Safety | Cuts the dc power when the front door is opened. | 23 |
| SW2 | Shift Tray Upper Limit | Cuts the power to the shift tray lift motor when the shift tray position is at its upper limit. | 17 |
| SW3 | Staple End | Detects the staples in the cartridge. | 39 |
| SW4 | Cartridge Set | Detects the staple cartridge in the stapler. | 40 |
| Solenoids |  |  |  |
| SOL1 | Tray Junction Gate | Drives the tray junction gate. | 3 |
| SOL2 | Stapler Junction Gate | Drives the stapler junction gate. | 5 |
| SOL3 | Positioning Roller | Moves the positioning roller against the stapling tray. | 10 |
| SOL4 | Pre-stack Junction Gate | Drives the pre-stack junction gate. | 6 |
| PCBs |  |  |  |
| PCB1 | Main | Controls the finisher and communicates with the copier. | 8 |
| PCB2 | Punch | Passes signals between the punch unit and the finisher main board. | 18 |

### 1.4 MECHANICAL COMPONENT LAYOUT



1. Upper Tray
2. Upper Tray Exit Roller
3. Upper Transport Roller
4. Tray Junction Gate
5. 1st Entrance Roller
6. Punch Unit
7. 2nd Entrance Roller
8. Punch Waste Hopper
9. Stapler Junction Gate
10. Lower Transport Rollers
11. Alignment Brush Roller
12. Stapler
13. Positioning Roller
14. Pre-stack Roller
15. Stack Feed-out Belt
16. Pre-stack Junction Gate
17. Middle Transport Roller
18. Shift Tray Exit Roller 19. Shift Tray

### 1.5 DRIVE LAYOUT



1. Shift Tray Exit Plate Motor
2. Shift Tray Exit Plate
3. Shift Tray Exit Roller
4. Shift Motor
5. Shift Tray
6. Alignment Brush Roller
7. Positioning Roller
8. Lower Transport Rollers 2 and 3
9. Lower Transport Motor
10. Middle Transport Roller
11. Lower Transport Roller 1
12. Shift Tray Exit Motor
13. 2nd Entrance Roller
14. 1st Entrance Roller
15. Upper Transport Roller
16. Upper Transport Motor
17. Upper Tray Exit Roller
18. Shift Tray Lift Motor
19. Stack Feed-out Motor
20. Jogger Motor
21. Jogger Fence
22. Stack Feed-out Belt
23. Stapler Motor
24. Stapler Rotation Motor

## 2. DETAILED DESCRIPTIONS

### 2.1 TRAY AND STAPLER JUNCTION GATE MECHANISM

- Upper tray mode -

- Sort/stack mode -


Depending on the finishing mode, the copies are directed up, straight through, or down by the combination of the tray junction gate $[A]$ and stapler junction gate $[B]$. These gates are controlled by the tray junction gate solenoid [C] and stapler junction gate solenoid [D].

## Upper tray mode

The tray junction gate solenoid turns on. The copies go up to the upper tray.

## Sort/stack mode

The tray junction gate solenoid and the stapler junction gate solenoid remain off. The copies are sent to the shift tray directly.

## Staple mode

The tray junction gate solenoid remains off and the stapler junction gate solenoid turns on. The copies go downwards to the jogger unit.

### 2.2 PRE-STACK MECHANISM



This mechanism improves productivity in staple mode.
During stapling, the copier has to wait. This mechanism reduces the wait by holding the first two sheets of a job while the previous job is still being stapled. It only works during the second and subsequent sets of a multi-set copy job.
The pre-stack junction gate solenoid $[A]$ turns on shortly after the 1st sheet of paper enters the finisher. This opens the junction gate [B], and directs the sheet to the pre-stack path [C]. (This sheet cannot be fed to the stapler yet, because the first set is still being stapled.)

When the sheet has passed the pre-stack roller [D], the pre-stack motor turns off to stop the sheet until the second copy comes in.

The pre-stack junction gate solenoid turns off again shortly after the trailing edge of the 1st sheet enters the finisher, and the 2 nd sheet is sent to the main paper path [E].
Then the pre-stack motor turns on again to feed the first copy that is stopped in the pre-stack path [C], and the first and second copies are delivered together to the staple tray.
All sheets after the 2nd sheet go to the stapler tray via the main paper path [E].

### 2.3 JOGGER UNIT PAPER POSITIONING MECHANISM



In staple mode, each sheet of copy paper is vertically and horizontally aligned when it arrives in the jogger unit.

## Vertical Paper Alignment

After the trailing edge of the copy passes the stapler tray entrance sensor [A], the positioning roller solenoid $[\mathrm{B}]$ is energized for 280 ms to push the positioning roller [C] into contact with the paper. The positioning roller and alignment brush roller [D] rotate to push the paper back and align the trailing edge of the paper against the stack stopper [E].

## Horizontal Paper Alignment

When the print key is pressed, the jogger motor [F] turns on and the jogger fences [G] move to the waiting position, which is 7 mm wider on both sides than the selected paper.

When the trailing edge of the paper passes the staple unit entrance sensor, the jogger motor turns on for approximately 70 ms to move the jogger fences 5 mm towards the paper. After a short time, the jogger motor turns on again approximately for 60 ms for the horizontal paper alignment then goes back to the waiting position.

### 2.4 STAPLER UNIT MOVEMENT MECHANISM



## Side-to-side:

The stapler motor [A] moves the stapler [B] from side to side. After the start key is pressed, the stapler moves from its home position to the stapling position.
If two-staple-position mode is selected, the stapler moves to the front stapling position first, then moves to the rear stapling position. However, for the next copy set, it staples in the reverse order (at the rear side first then at the front side).
After the job is completed, the stapler moves back to its home position. This is detected by the stapler HP sensor [C].

## Rotation:

In the oblique staple position mode, the stapler rotation motor [D] rotates the stapler $45^{\circ}$ after it moves to the stapling position.

### 2.5 STAPLER



The staple hammer $[A]$ is driven by the staple hammer motor $[B]$ via gears $[C]$, two cams [D], and two links [E].
When the aligned copies are brought to the stapling position by the positioning roller, alignment brush roller and jogger fences, the staple hammer motor starts. When the cams complete one rotation, the staple hammer home position sensor [F] turns on, detecting the end of the stapling operation. The staple hammer motor then stops.
There are two sensors in the stapler. One is the staple end switch [G] for detecting staple end conditions (it detects when there is only one sheet of staples left in the cartridge). The other is the cartridge set switch $[\mathrm{H}]$ for detecting whether a staple cartridge is installed.

When a staple end or no cartridge condition is detected, a message is displayed advising the operator to install a staple cartridge. If this condition is detected during a copy job, the indication will appear, but the copy job will not stop.

The staple cartridge has a clinch area [I], in which jammed staples are left. Operators can remove the jammed staples from this area.

### 2.6 FEED-OUT MECHANISM



After a set of copies has been stapled, the stack feed-out motor [A] starts rotating to drive the stack feed-out belt [B]. The pawl [C] on the belt lifts the stapled copies up and transports it to the shift tray exit rollers [D].

The shift tray exit plate $[E]$ is opened until the leading edge of the stapled copies has passed the shift tray exit rollers by a certain distance. Then the shift tray exit plate is closed and the stapled copies are fed out to the shift tray [F].

The shift tray exit plate is opened and closed by the shift tray exit plate motor [G] through a cam [H].

The stack feed-out motor stops for 300 ms until the exit rollers have completely fed out the stapled copies to the shift tray. This is to prevent the copies from being pushed out too far on the tray.
Then, the motor turns on again and stops when the pawl actuates the stack feedout belt home position sensor [I].
There are two pawls on the belt so that the productivity for a smaller number of copies for a stapled set can be kept high.

### 2.7 SHIFT TRAY UP/DOWN MECHANISM



The shift tray lift motor $[A]$ controls the vertical position of the shift tray $[B]$ through gears and timing belts [C]. When the main switch is turned on, the tray is initialized at the upper position. The tray is moved up until stack height sensor 1 [D] is deactuated.

During copying, the actuator feeler [E] gradually rises as the copy stack grows, and the actuator gradually moves towards stack height sensor 2 [F].

In sort/stack mode, if stack height sensor 2 is actuated for 3 seconds, the shift tray lift motor lowers the shift tray for 15 ms .

In staple mode, when the stack feed-out motor starts, the tray is moved down until stack height sensor 1 is actuated and then moved up until stack height sensor 1 is de-actuated. This corrects the current tray position. Then, the tray is moved down again until stack height sensor 1 is actuated to make space for the coming set of copies and then moved up until stack height sensor 1 is de-actuated. This means the tray lowers earlier in staple mode, to prevent the next copy suddenly exceeding the space currently available on the tray.
For both modes, the shift tray will rise until stack height sensor 1 is de-actuated when the user takes the stack of paper from the shift tray.
This machine has two shift tray lower limit sensors 1 [G], 2 [H]. Shift tray lower limit sensor 1 detects the near lower limit and sensor 2 detects the lower limit. When the actuator [l] enters sensor 1, a message will be displayed and copying will continue. When the actuator enters sensor 2, a message will be displayed and copying will stop.

The shift tray upper limit switch [J] prevents the drive gear from being damaged if stack height sensor 1 fails. When the shift tray pushes up the shift tray positioning roller $[\mathrm{K}]$, the switch will cut the power to the shift tray lift motor.

### 2.8 SHIFT TRAY SIDE-TO-SIDE MECHANISM



In sort/stack mode, the shift tray [A] moves from side to side to separate the sets of copies.

The horizontal position of the shift tray is controlled by the shift motor [B] and shift gear disk [C]. After one set of copies is made and delivered to the shift tray, the shift motor turns on, driving the shift gear disk and the shaft [D]. The end fence [E] is positioned by the shaft, creating the side-to-side movement.
When the shift gear disk has rotated 180 degrees (when the shift tray is fully shifted across), the cut-out in the shift gear disk turns on the shift tray half-turn sensor [F] and the shift motor stops. The next set of copies is then delivered. The motor turns on, repeating the same process and moving the tray back to the previous position.

### 2.9 PUNCH UNIT DRIVE MECHANISM



The punch unit makes 2 or 3 holes (depending on the type of punch unit) at the trailing edge of the paper.
The punch unit is driven by the punch motor [A]. The punch motor turns on 78 ms after the trailing edge of the paper passes through the entrance sensor $[B]$, and makes the punch holes.
The home position is detected by the punch HP sensor [C]. When the cut-out on the punch shaft gear disk [D] enters the punch HP sensor, the punch motor stops.
The punch position is adjusted as follows:
Right to left: SP mode
Front to rear: Spacers

### 2.10 PUNCH WASTE COLLECTION MECHANISM



The punch waste is collected in the punch waste hopper [A], which is under the punch unit.

When the punch waste covers the hole [B] in the hopper, the hopper sensor [C] turns on and a message will be displayed after the copy job finishes.
The hopper sensor also works as the hopper set sensor. If the punch waste hopper is not set, the hopper sensor moves away from the hole in the hopper holder [D] and a message is displayed. This message is the same as for the hopper full condition.

### 2.11 JAM CONDITIONS

1. The entrance sensor does not turn on within 2.0 s after the copier exit sensor turns off.
2. The entrance sensor does not turn off within 850 ms after it turns on.
3. The upper tray exit sensor does not turn on within $1,050 \mathrm{~ms}$ after the entrance sensor turns on.
4. The upper tray exit sensor does not turn off within 850 ms after it turns on.
5. In sort/stack mode, the shift tray exit sensor does not turn on within $1,345 \mathrm{~ms}$ after the entrance sensor turns on.
6. In sort/stack mode, the shift tray exit sensor does not turn off within 850 ms after it turns on.
7. In staple mode, the stapler tray entrance sensor does not turn on within 2,405 ms after the entrance sensor turns on.
8. In staple mode, the stapler tray entrance sensor does not turn off within 850 ms after it turns on.
9. In staple mode, the stapler tray paper sensor does not turn off within 466 pulses of the stack feed-out motor after it starts.
10. In staple mode, the shift tray exit sensor does not turn off within $1,260 \mathrm{~ms}$ after the stack feed-out motor starts.

## 3. SERVICE TABLES

### 3.1 DIP SWITCHES

| DPS101 |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
| Description |  |  |  |  |
|  | $\mathbf{2}$ | $\mathbf{3}$ | $\mathbf{4}$ |  |
| 1 | 0 | 0 | 0 | Default |
| 1 | 1 | 1 | 0 | Free run: one staple (rear-oblique) |

NOTE: Do not use any other settings.

### 3.2 TEST POINTS

| No. | Label | Monitored Signal |
| :---: | :---: | :--- |
| TP101 | (GND) | Ground |
| TP102 | 5V | $5 V$ |
| TP103 | TXAO | TXD |
| TP104 | RXD | RXD |

### 3.3 FUSES

| No. | Function |  |
| :---: | :--- | :--- |
| FU101 | Protects 24 V. |  |

## 4. REPLACEMENT AND ADJUSTMENT

### 4.1 COVER REPLACEMENT



## Rear Cover

1. Remove the rear cover [A] (3 screws).

## Upper Left Cover

1. Remove the upper left cover [B] (2 screws).

## Upper Cover

1. Remove the upper left cover.
2. Remove the upper cover [C] (2 screws).

## Front Door

1. Remove the upper left cover.
2. Remove the upper cover.
3. Remove the upper bracket [D] (1 screw).
4. Remove the front door [E].

## Left Front Cover

1. Remove the rear cover.
2. Remove the upper cover.
3. Remove the front door.
4. Remove the left front cover [F] (2 screws).

[G]

## Shift Tray

1. Remove the rear cover [A].
2. While holding the shift tray $[B]$, move the gear [C] to release the engagement.
3. Lower the shift tray.
4. Remove the shift tray (4 screws).

## Lower Left Cover

1. Remove the shift tray.
2. Remove the upper left cover [D].

3. Remove the upper cover [E].
4. Remove the front door [F].
5. Remove the left front cover [G].
6. Remove the lower left cover [H] (4 screws).

## Right Cover

1. Remove the right cover [I] (2 screws).

## Front Shift Tray Cover

1. Remove the front shift tray cover [J] (1 screw).

## Rear Shift Tray Cover

1. Remove the rear shift tray cover $[K]$ (1 screw).

### 4.2 POSITIONING ROLLER REPLACEMENT



1. Open the front door.
2. Remove the snap ring $[A]$.
3. Release the rubber belt [B].
4. Replace the positioning roller [C].

### 4.3 ALIGNMENT BRUSH ROLLER REPLACEMENT



1. Open the front door and pull out the jogger unit.
2. Remove the rear cover.
3. Remove the main board [A] (6 screws, all connectors).
4. Remove a screw [B] and a tension spring [C] for the tension bracket [D], and release the tension of the timing belt.
5. Remove the front side E-ring [E] and bushing [F].
6. Remove the alignment brush roller assembly.
7. Remove the timing pulley [G] (1 E-ring).
8. Replace the alignment brush roller [H] (1 spacer, 1 bushing).

### 4.4 SENSOR REPLACEMNT

### 4.4.1 STACK HEIGHT SENSOR 1 AND 2



1. Remove the upper left cover.
2. Remove the upper cover.
3. Remove the sensor feeler $[A]$ ( 1 screw, 1 connector).
4. Remove the sensor bracket [B] (1 screw).
5. Replace the stack height sensor 1 [C] or 2 [D].

### 4.4.2 UPPER TRAY PAPER LIMIT AND EXIT SENSOR



1. Remove the upper left cover.
2. Remove the upper cover.

## Upper Tray Paper Limit Sensor

3. Remove the sensor bracket [A] (1 screw).
4. Replace the upper tray paper limit sensor [B] (1 connector).

## Upper Tray Exit Sensor

3. Remove the sensor bracket [C] (1 screw).
4. Replace the upper tray exit sensor [D] (1 connector).

### 4.4.3 SHIFT TRAY EXIT SENSOR



1. Remove the rear cover.
2. Remove the upper left cover.
3. Remove the upper cover.
4. Open the front door, unhook the joint $[A]$ and remove the upper exit guide $[B]$ (1 plastic clip, 1 connector).
5. Remove the guide stay [C] (2 screws).
6. Remove the discharge brush [D] (2 screws).
7. Replace the shift tray exit sensor [E] (1 screw, 1 connector).

### 4.4.4 ENTRANCE AND STAPLER TRAY ENTRANCE SENSOR



1. Remove the finisher from the copier.

## Entrance Sensor

2. Remove the sensor bracket [A] (1 screw).
3. Replace the entrance sensor [B] (1 screw, 1 connector).

## Stapler Tray Entrance Sensor

2. Remove the sensor bracket [C] (1 screw).
3. Replace the stapler tray entrance sensor [D] (1 screw, 1 connector).

### 4.4.5 STAPLER ROTATION HP SENSOR



1. Remove the stapler unit.
2. Remove the screw $[A]$ and rotate the stapler bracket $[B]$.
3. Remove the sensor bracket [C] (1 screw).
4. Replace the stapler rotation HP sensor [D] (1 connector).

### 4.5 STAPLER REMOVAL



1. Open the front door and pull out the jogger unit.
2. Move the stapler to the front.
3. Remove the stapler [A] (1 screw, 1 connector).

### 4.6 PUNCH POSITION ADJUSTMENT



## Right to left

This position is adjusted by SP modes.

## Front to rear

The optional punch units have the following 3 spacers as accessories.
1 mm thickness: 2 pcs
2 mm thickness: 1 pc
The punch position can be adjusted by up to 4 mm by combinations of the 3 spacers.

## BOOKLET FINISHER A763

## 1. OVERALL MACHINE INFORMATION

### 1.1 SPECIFICATIONS

Paper Size:

| Tray | Modes | Sizes |  |  |
| :--- | :--- | :--- | :---: | :---: |
| Proof tray | A3 to A5, DLT to HLT |  |  |  |
| Shift tray | No staple mode | A3 to A5, DLT to HLT |  |  |
|  | Staple <br> Mode | Top or <br> bottom |  |  |
|  | A3 to B5 lengthwise, DLT to HLT |  |  |  |
|  | A3, A4 sideways, B5 sideways, <br> DLT to HLT sideways |  |  |  |
| Booklet tray |  | A3 to B5, DLT to LT |  |  |

Paper Weight:

| Tray | Weight |
| :---: | :--- |
| Stack mode | $52 \mathrm{~g} / \mathrm{m}^{2}$ to $163 \mathrm{~g} / \mathrm{m}^{2}, 14$ to 42 lb |
| Staple mode | $64 \mathrm{~g} / \mathrm{m}^{2}$ to $80 \mathrm{~g} / \mathrm{m}^{2}, 17$ to 21 lb |
| Saddle stitch mode | $64 \mathrm{~g} / \mathrm{m}^{2}$ to $80 \mathrm{~g} / \mathrm{m}^{2}, 17$ to 21 lb |
|  | $64 \mathrm{~g} / \mathrm{m}^{2}$ to $128 \mathrm{~g} / \mathrm{m}^{2}, 17$ to 34 lb (Cover sheet only) |

Paper Capacity ( $80 \mathrm{~g} / \mathrm{m}^{2}, 20 \mathrm{lb}$ ):

| Tray | Modes | Paper size | Capacity |
| :---: | :---: | :---: | :---: |
| Proof tray |  | A4-S, LT-S or shorter | 150 sheets |
|  |  | A4-L, LT-L or longer | 75 sheets |
| Shift tray | No staple | A4-S, LT-S or shorter | 147mm stack height or 1000 sheets (*) |
|  |  | A4-L, LT-L or longer | 74 mm stack height or 500 sheet ( ${ }^{*}$ ) |
|  | Staple | A4-S, LT-S or shorter | 110 mm stack height or 30 sets or 750 sheets (*) |
|  |  | A4-L, LT-L or longer | 74 mm stack height or 30 sets or 500 sheets(*) |
| Staple tray | One size Mixed sizes | 1-5 sheets | 25 sets |
|  |  | 6-10 sheets | 15 sets |
|  |  | 11-15 sheets | 10 sets |

(-L": Lengthwise ,-S: Sideways)
Staple Capacity ( $80 \mathrm{~g} / \mathrm{m}^{2}, 20 \mathrm{lb}$ ):

| Modes | Paper size | Total capacity |
| :---: | :---: | :---: |
| Staple | A4-S, LT-S or shorter | $2-50$ sheets |
|  | A4-L, LT-L or longer | $2-30$ sheets |
| Saddle stitch |  | $2-15$ sheets |

(-L": Lengthwise, -S: Sideways)

* The machine will inform the operator that the tray is full when any of the conditions are met (whichever occurs first).


## SPECIFICATIONS

| Staple Position: | Staple mode: 3 positions <br> 1 staple: 2 positions (Front, Rear) <br> 2 staples: 1 position |
| :--- | :--- |
|  | Saddle stitch mode: 1 position <br> Cartridge <br> Staple: 5000 staples <br> Saddle stitch: 2000 staples |
| Staple Replenishment: |  |
| Power Source: | 24 Vdc (from copier) |
| Power Consumption: | 60 W |
| Dimensions |  |
| (W x D x H): | $800 \times 728 \times 980 \mathrm{~mm}, 31.5 \times 28.7 \times 38.6$ inches |
| Weight: | 45 kg |

### 1.2 ELECTRICAL COMPONENT DESCRIPTION

| Symbol | Name | Function |  |  |  |  |  |
| :---: | :--- | :--- | :---: | :---: | :---: | :---: | :---: |
| Motors |  |  |  |  |  |  |  |
| M1 | Entrance | Drives the entrance roller. |  |  |  |  |  |
| M2 | Transport Roller | Drives the 1st and 2nd transport rollers. |  |  |  |  |  |
| M3 | Buffer Roller | Drives the buffer roller and the proof tray exit roller. |  |  |  |  |  |
| M4 | Jogger | Moves the jogger fence. |  |  |  |  |  |
| M5 | Stapler | Moves the stapler unit. |  |  |  |  |  |
| M6 | Staple Hammer | Drives the staple hammer in the stapler unit. |  |  |  |  |  |
| M7 | Guide Plate | Moves the upper exit guide plate up and down. |  |  |  |  |  |
| M8 | Exit Motor | Drives the exit roller. |  |  |  |  |  |
| M9 | Tray Lift | Moves the shift tray up and down. |  |  |  |  |  |
| M10 | Booklet Transport | Drives the relay roller and the positioning roller. |  |  |  |  |  |
| M11 | Positioning Plate | Moves the positioning plate up and down. |  |  |  |  |  |
| M12 | Shutter Guide | Moves the shutter guide up and down. |  |  |  |  |  |
| M13 | Booklet Jogger | Drives the jogger fences. |  |  |  |  |  |
| M14 | Front Stapler | Drives the staple hammer in the front stapler. |  |  |  |  |  |
| M15 | Rear Stapler | Drives the staple hammer in the rear stapler. |  |  |  |  |  |
| M16 | Folder Roller | Drives the folder rollers. |  |  |  |  |  |
| M17 | Folder Plate | Moves the folder plate. |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| Sensors |  | Entrance |  |  |  |  |  | | Detects copy paper entering the finisher and |
| :--- |
| detects misfeeds. |


| Symbol | Name | Function |
| :---: | :---: | :---: |
| S18 | Proof Tray Exit | Checks for misfeeds at the proof tray. |
| S19 | Proof Tray Limit | Detects when the paper stack height in the proof tray is at its upper limit. |
| S20 | Finisher Set | Detects whether the finisher is installed into the copier or not. |
| S21 | Shutter | Detects whether the shutter is closed or not. |
| S22 | Trailing Edge 1 | Detects the relay roller release timing. |
| S23 | Trailing Edge 2 | Detects the relay roller release timing. |
| S24 | Trailing Edge 3 | Detects the relay roller release timing. |
| S25 | Booklet Entrance | Check for paper misfeeds. |
| S26 | Positioning Plate Paper | Detects copy paper in the positioning plate. |
| S27 | Positioning Plate HP | Detects the home position of the positioning plate. |
| S28 | Positioning Roller | Detects whether the positioning roller is released or not. |
| S29 | Booklet Jogger HP | Detects the home position of the jogger fences in the booklet unit. |
| S30 | Front Staple End | Detects staples in the cartridge of the front stapler. |
| S31 | Rear Staple End | Detects staples in the cartridge of the rear stapler. |
| S32 | Stapler Unit Set | Detects whether the stapler unit is installed or not. |
| S33 | Shutter Guide HP | Detects the home position of the shutter guide. |
| S34 | Folder Plate HP | Detects the home position of the folder plate. |
| S35 | Folder Plate Return | Detects the return position of the folder plate. |
| S36 | Folder Plate Motor | Generates pulses to check the folder motor and its position. |
| S37 | Folder Roller Position | Detects the position of the folder roller. |
| S38 | Folder Roller HP | Detects the home position of the folder roller. |
| S39 | Folder Roller Motor | Generates pulses to check the folder roller motor and its position. |
| S40 | Booklet Exit | Checks for misfeeds at the booklet tray. |
| S41 | Booklet Tray Paper | Detects copy paper in the booklet tray. |
| S42 | Booklet Entrance Guide | Detects whether the booklet entrance guide is opened or not. |
| S43 | Lower Door | Detects whether the lower door is opened or not. |
| S44 | Booklet Exit Cover | Detects whether the booklet exit cover is opened or not. |
| Switches |  |  |
| SW1 | Upper Cover Safety | Cuts the +24 V for the motor. |
| SW2 | Shift Tray Safety | Cuts the +24 V for the motor. |
| SW3 | Shutter Position | Cuts the +24 V for the motor. |
| SW4 | Upper Exit Guide 1 | Cuts the +24 V for the motor. |
| SW5 | Upper Exit Guide 2 | Cuts the +24 V for the motor. |
| SW6 | Shift Tray Upper Limit | Cuts the +24 V for the lift motor. |


| Symbol | Name | Function |
| :---: | :---: | :---: |
| SW7 | Cartridge Set | Detects the staple cartridge in the stapler. |
| SW8 | Staple End | Detects the staples in the cartridge. |
| SW9 | Thermo | Detects the lift motor temperature. |
| SW10 | Lower Door Safety | Cuts the +24 V for the motor. |
| SW11 | Booklet Entrance Guide Safety | Cuts the +24 V for the motor. |
| SW12 | Booklet Exit Safety | Cuts the +24 V for the motor. |
| SW13 | Front Staple Hammer HP | Detects the home position of the staple hammer in the front stapler unit |
| SW14 | Rear Staple <br> Hammer HP | Detects the home position of the staple hammer in the rear stapler unit |
| Solenoids |  |  |
| SOL1 | Booklet Gate | Drives the booklet gate. |
| SOL2 | Buffer Roller Entrance Gate | Drives the buffer roller entrance gate. |
| SOL3 | Proof Tray Gate | Drives the proof tray gate. |
| SOL4 | Buffer Roller Exit Gate | Drives the buffer roller exit gate. |
| SOL5 | Transport Belt | Moves the transport belt to the stopper. |
| SOL6 | Paddle | Releases the paddle stopper. |
| SOL7 | Front Guide Release | Releases the front guide plate. |
| SOL8 | 1st Booklet Unit Gate | Drives the 1st booklet unit gate. |
| SOL3 | 2nd Booklet Unit Gate | Drives the 2nd booklet unit gate. |
| SOL4 | Relay Roller | Releases the relay roller. |
| PCBs |  |  |
| PCB1 | Finisher | Controls the upper unit. |
| PCB2 | Lift Motor Sensor | Generates pulses to check the lift motor, to control lift motor position, and to detect the motion direction of the shift tray. |
| PCB3 | Booklet Unit | Controls the booklet unit. |
| PCB4 | Trailing Edge Sensor | Detects the relay roller release timing. |
| Others |  |  |
| HR1 | Stapler Interface | Interfaces the stapler and the finisher board. |
|  |  |  |

### 1.3 MECHANICAL COMPONENT LAYOUT



1. Shift Tray
2. Shutter
3. Lower Exit Roller
4. Upper Exit Guide
5. 2nd Transport Roller
6. Proof Tray
7. Buffer Roller Exit Gate
8. Buffer Roller
9. Proof Tray Gate
10. Buffer Roller Entrance Gate
11. Booklet Gate
12. 1st Transport Roller
13. Stapler Unit
14. Transport Belt

15. Booklet Unit Entrance Roller
16. 1st Booklet Unit Gate
17. 2nd Booklet Unit Gate
18. Anvil
19. Folder Plate
20. Positioning Plate
21. Shutter Guide
22. Booklet Tray
23. Exit Guide
24. Positioning Roller
25. Folder Roller
26. Relay Roller
27. Booklet Stapler Unit

## 2. DETAILED DESCRIPTIONS

### 2.1 JUNCTION GATE MECHANISM

### 2.1.1 SHIFT TRAY MODE

## A4ILT sideways or shorter



The booklet gate $[A]$ and buffer roller entrance gate $[B]$ are closed and the copy paper goes directly to the shift tray [C].

## Longer than A4 sideways



The booklet gate, proof tray gate [D], and buffer roller exit gate [E] are closed, and the buffer roller entrance gate is opened. The copy paper passes over the buffer roller [F]. This paper path creates a distance between copies.

### 2.1.2 PROOF TRAY MODE

The booklet gate $[A]$ is closed. The buffer roller entrance gate $[B]$ and proof tray gate $[C]$ are open. The copy paper goes to the proof tray [D].


### 2.1.3 BOOKLET STITCH MODE

The booklet gate is opened and the copy paper goes to the booklet unit.


### 2.2 PRE-STACK MECHANISM

This mechanism improves productivity in staple mode and shift mode.
During stapling, the copier has to wait. This mechanism reduces the wait by holding the first two sheets of a job while the previous job is still being stapled. It only works during the second and subsequent sets of a multi-set copy job.


The buffer roller entrance gate $[A]$ and buffer roller exit gate $[B]$ are opened. Then, the 1st sheet of paper goes around the buffer roller [C].


When the 2nd copy [D] comes to the buffer roller, the buffer roller exit gate is closed. The two sheets of paper go to the shift tray [E] or staple tray [F].


### 2.3 PAPER SHIFT MECHANISM


[A]


[A]

In sort and stack mode, only the 1st sheet of copy paper from the 2nd set is shifted to the front to separate each set of copies.
When the copy paper comes into the staple tray $[A]$, the upper exit guide $[B]$ (which contains the upper exit roller) opens. The paper switches back to the stopper [C]. Then the front guide release solenoid [D] turns on and the front guide [E] is released, the shift motor moves jogger fence [F] to the front, and the copy paper shifts to the front by 30 mm .

After copy paper has been shifted, the upper exit guide closes and the lower exit roller [G] turns in the opposite direction to feed out the copy paper.

### 2.4 PAPER POSITIONING MECHANISM

[F]


When the trailing edge of the 1st copy paper passes the 2nd transport roller [A], the lower exit roller [B] stops and turns in reverse. At the same time, the upper guide plate motor turns on and opens the upper exit guide [C]. The copy paper is sent to the stopper [D] by the lower exit roller and feed belt [E], and it is aligned by the jogger motor.
The feed belt solenoid [F] turns on to move the feed belt to the stopper. This function prevents excessive buckling of the paper between belt and stopper.
The paddles [G] send the paper to the stopper starting from the 2nd copy paper. When the trailing edge of the 2nd copy paper passes the 2nd transport roller, the paddle solenoid $[\mathrm{H}]$ turns on and the drive from the transport roller transmits to the paddle shaft.

### 2.5 STAPLER UNIT MOVEMENT MECHANISM

### 2.5.1 DRIVE

The stapler motor [A] drives the stapler unit drive gear [B] via a timing belt. The stapler unit guide has a rack gear [C]. The stapler unit moves along the rack gear via the stapler unit [D] drive gear.


### 2.5.2 MOVEMENT

## Front and Rear Stapling

When the print key is pressed, the stapler unit moves to the center. The stapler unit moves to the front (or rear) stapling position when the copy paper comes into the finisher and stays until the copy job finishes. It returns to home position when the job is finished.


## Two-position Stapling

When the print key is pressed, the stapler unit moves to the center. The stapler unit moves to the rear stapling position first and moves to the front stapling position when stapling. Then it goes back to the center until the copy job finishes. It returns to home position when the job is finished.


### 2.6 STAPLER





[F]

The staple hammer motor [A] drives the cam [B] via 2 gears [C, D] and the guide roller on the staple hammer moves on the cam [D]. When the guide roller moves to the highest position on the cam, the copy paper is stapled.
The stapler unit contains the cartridge set switch [E], staple end switch [F] and staple position sensor [G].
The staple position sensor detects whether the staple sheet has come to the staple unit or not.

### 2.7 SHIFT TRAY MECHANISM



The guide gear $[A]$ on which the shift tray is mounted is driven by the lift motor $[B]$ via gear [C].

The finisher board detects the direction of the motor rotation and motor position using the lift motor sensors 1 [D] and 2 [E].

The lift motor contains a thermoswitch [F]. When it detects $73.5^{\circ} \mathrm{C}$, the finisher board stops the lift motor until its temperature reaches approximately $40^{\circ} \mathrm{C}$.

The shutter position switch [G] cuts the lift motor power for safety when the upper exit guide plate opens.
The shift tray height sensor $[\mathrm{H}]$ detects the distance between the sensor and the top of the copy paper on the shift tray.

### 2.8 BOOKLET UNIT GATE MECHANISM



There are two junction gates $[A]$ and three paper sensors $[B]$ at the entrance area of the booklet unit.

Depending on paper size, the appropriate gate solenoid(s) [C] are energized to close the gate(s) in order to transport paper to the positioning plate [D] through a suitable paper path.

This is done for the following reasons:

- To detect the trailing edge of paper with the correct sensor.
- To prevent the leading edge of the next sheet from hitting the trailing edge of the previous sheets on the positioning plate.

The following tables show the relation between paper sizes and solenoids/sensors:

|  | A3, 11" $\mathbf{x 1 7 "}$ | B4, 11" $\mathbf{x 1 4 "}$ | A4, 81/2" $\times 11 "$ |
| :--- | :---: | :---: | :---: |
| 1st Solenoid (Gate) | OFF (Opened) | ON (Closed) | ON (Closed) |
| 2nd Solenoid (Gate) | OFF (Opened) | OFF (Opened) | ON (Closed) |


|  | A3, 11" $\mathbf{x ~ 1 7 " ~}$ | B4, 11" $\times$ 14" | A4, 81/2" $\times$ 11" |
| :--- | :---: | :---: | :---: |
| Trailing Edge Sensor 1 | ON | ON | ON |
| Trailing Edge Sensor 2 | OFF | ON | ON |
| Trailing Edge Sensor 3 | OFF | OFF | ON |

### 2.9 RELAY ROLLER AND POSITIONING PLATE MECHANISM

When the first sheet of paper comes to the booklet unit, the booklet transport motor turns on to drive the relay roller [A]. The two relay rollers are out of contact with each other before the paper comes. When the leading edge of the paper passes trailing edge sensor 1 , the relay roller solenoid is energized to make the two relay rollers contact each other to transport the paper to the positioning plate $[B]$. When the trailing edge of the paper comes to the trailing edge sensor that the paper passes last, the relay roller solenoid is de-energized. This solenoid on/off cycle is done for each sheet of paper.


Before paper comes, the positioning plate moves up from the home position to a position that is suitable for the selected paper size in order that the middle of the paper just comes to the stapling position.

The positioning plate motor drives the positioning plate using pulse counts.
Only when the first sheet of paper reaches the positioning plate, the positioning plate sensor [C] detects the paper.


### 2.10 POSITIONING ROLLER MECHANISM



The booklet transport motor also drives the positioning roller [A] to vertically align paper against the positioning plate $[B]$.

The positioning roller is not round but elliptical in shape so that it moves away from the paper while the paper is being horizontally aligned.
The positioning roller sensor [C] detects the actuator [D] on the roller shaft to determine the rotation of the positioning roller. When the sensor is de-actuated, the roller is away from the paper and the jogger fences [E] start moving.

### 2.11 BOOKLET UNIT JOGGER MOVEMENT MECHANISM



When the start key is pressed, the booklet jogger motor turns on to move the jogger fences [A] to the waiting positions that are 10 mm from each of the paper side edges.

Each time a sheet of paper reaches the positioning plate [B], the jogger fences move toward the paper to align the paper once. The fences move back a short distance and move forward again the paper to align for the second time. Then, the fences go back to the waiting position.
When the last sheet is aligned, the fences stay at the aligning positions during stapling.

### 2.12 BOOKLET STAPLER UNIT



There are two staplers whose positions are fixed.
When the jogger fences finish aligning the last sheet, the jogger fences stay at the aligning positions and stapling starts. The two staplers do not operate at the same time, the rear stapler operates first, then the front one. This is for the following reasons:

- To prevent paper from becoming waved in the area between the two stapled positions.
- To minimize necessary electric power.

The staple hammer HP switch in each stapler detects a stapling cycle and the staple end sensor detects the presence of staples in the cartridge.
The stapler unit, including the two staplers, can be pulled out to enable staple cartridge replacement or jam removal. The stapler unit set sensor detects when the stapler unit is back in the right position.

### 2.13 PAPER FOLDER MECHANISM



The positioning plate moves down from the stapling position to a position such that the middle of the paper just comes to the folding position. It depends on the paper size.

At the same time, the shutter guide motor moves the shutter guide, which is covering the folder rollers to prevent paper arriving at the positioning plate from being caught by the rollers, down to the home position.
Shortly after that, the folder plate motor and the folder roller motor start rotating. The folder plate $[A]$ moves to push the middle of the stapled sheets of paper toward the folder rollers $[B]$ until the folder plate return sensor [C] is de-actuated. Then, the folder plate comes back to the home position.
After that, the folder rollers and booklet exit roller feed the paper to the booklet tray.

## PAPER FOLDER MECHANISM

In the case of 10 sheets or more of A4 or $81 / 2^{\prime \prime} \times 11^{\prime \prime}$ paper, folding is done twice for 20 mm of the leading edge to fold the paper more firmly.

When the leading edge of the folded paper passes 20 mm from the folder rollers, the folder roller motor reverses to feed the paper back 20 mm . During this action, the folder plate stays at the return position. (Figure A763D561)
Then, the folder roller motor rotates forward again to feed the set of papers out and the folder plate goes back to the home position. (Figure A763D562)

## 3. INSTALLATION

### 3.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box against the following list.
Description ..... Q'ty

1. Upper Tray ..... 1
2. Shift Tray ..... 1
3. Tapping Screw -M4 x 6 ..... 1
4. Rail Ass'y ..... 1
5. Joint Bracket. ..... 1
6. Tapping Screw - M4 x 16 ..... 2
7. Rail Bracket ..... 1
8. Tapping Screw - M4 x 6 ..... 1
9. Harness Cover ..... 1
10. Sensor Feeder ..... 1


### 3.2 INSTALLATION PROCEDURE



## $\triangle$ CAUTION <br> Keep the power cord unplugged when starting the following procedure.

1. Unpack the finisher and remove the tapes and shipping retainers.


2. Open the front under door and pull out the staple unit $[A]$.
3. Remove the stapler unit lock plate $[B]$ (1 screw).
4. Push in the stapler unit and shut the front lower door.
5. Remove the right lower cover [C] (4 screws).
6. Remove the front pressure release bracket [D] (1 screw).
7. Remove the rear pressure release bracket [E] (1 screw).

8. Set the hooks $[A]$ of the shift tray $[B]$ in the notches in the shift tray bracket, and secure the tray with two $\mathrm{M} 4 \times 6$ screws.
9. Connect the shift tray sensor harness [C].
10. Install the harness cover [D] (2 hooks).


11. Install the upper tray [A] (2 pins).
12. Attach the sensor feeler $[B]$ (2 pins).
13. Install the joint bracket [F] on the left side of the copier (4 screws).
14. Attach the rail [C] to the rail bracket [D] as shown.
15. Install the rail bracket $[E]$ on the left lower cover of the copier (2 screws).

16. Secure the rail $[B]$ to the booklet finisher with 1 M 4 screw.
17. Align the finisher on the joint bracket and lock the 2 hooks [ $C$ ] of the finisher on the joint bracket.
18. Connect the finisher cable [D] to the copier.
19. Plug in the power cord and turn the main switch on, and perform stapler initial setting as follows.
1) Enter User Program mode.
2) Press System Settings.
3) Press Basic Page 2.
4) Press Staple Initialization.
5) Press the OK key.

## 4. REPLACEMENT AND ADJUSTMENT

### 4.1 REMOVAL

### 4.1.1 UPPER DOOR



1. Open the upper door $[A]$.
2. Remove the lower hinge $[B]$ (1 screw).
3. Push up the upper door and remove it.

### 4.1.2 UPPER REAR COVER



1. Hold up the proof tray and open the top cover [A].
2. Unhook the upper rear cover $[B]$ and remove it ( 3 screws).

### 4.1.3 LOWER REAR COVER

1. Remove the lower rear cover [C] (4 screws).

### 4.1.4 TOP COVER



1. Hold up the upper tray $[A]$ and open the top cover $[B]$.
2. Push the hooks [C] of the top cover and remove it.

### 4.1.5 UPPER INNER COVER



1. Open the upper door.
2. Remove the upper inner cover [A] (1 screw).

### 4.1.6 SHIFT TRAY UNIT



1. Remove the upper and lower rear covers.
2. Disconnect the connector $[A]$ and remove the grounding wire $[B]$ (1 screw).
3. Unhook the two stoppers [C] and remove them.
4. Remove the slide guide [D] by pulling it up.
5. Remove the shift tray unit [E] by pulling it up.

NOTE: When reinstalling the shift tray unit, release the clutch gear [F] of the tray lift motor by carefully inserting a screwdriver.

### 4.1.7 UPPER SHIFT GUIDE



1. Remove the slide guide and shift the shift tray unit down by releasing the clutch gear of the tray lift motor (see Shift Tray Unit Removal).
2. Remove the upper shift guide [A] (6 screws ( $5 \times \mathrm{M} 4,1 \times \mathrm{M} 3$ )).

### 4.1.8 LOWER SHIFT GUIDE



1. Remove the shift tray unit.
2. Remove the lower shift guide $[A]$ ( 2 connectors, 6 screws ( $3 \times \mathrm{M} 4,3 \times \mathrm{M} 3)$ ).

### 4.1.9 EXIT UNIT



1. Remove the shift tray unit, and the upper and lower shift guides.
2. Disconnect the connector $[A]$ and remove the screw $[B]$ that secures the transport belt unit [C].
3. Disconnect the 4 connectors [D].
4. Hold up the exit unit [E] and remove it with the transport belt unit (3 screws, 1 clamp).
NOTE: When installing the exit unit, make sure to position the exit unit guide plate (black) [F] over the transport guide plate [G].

### 4.1.10 BUFFER ROLLER UNIT




[E]

1. Remove the upper rear cover and the top cover.
2. Disconnect the connector $[A]$.
3. Remove the upper shift guide [B] (6 screws) and the guide holder [C] (2 screws).
4. Unhook the shafts [D], and remove the buffer roller unit [E] (2 clamps).

### 4.1.11 STAPLER



1. Open the upper front door.
2. Slide the stapler $[A]$ towards the front.
3. Remove the stapler ( 1 screw, 1 connector [B]).
4. Remove the cover [C] from the stapler (2 screws).

### 4.1.12 FINISHER BOARD



1. Remove the upper rear cover.
2. Remove the finisher board [A] (4 screws, 19 connectors). NOTE: Do the following adjustments after replacing the board:

- Shift tray height
- Jogger fence position
- Stapling position


### 4.1.13 BOOKLET UNIT



1. Remove the following items.

- Upper and lower rear covers.
- Shift tray unit.
- Lower shift guide.

2. Remove the lower right cover [A] (4 screws).
3. Remove the folder roller knob [B] (1 stepped screw).
4. Remove the lower inner cover [C] and lower door [D] (5 screws).

5. Remove the grounding wire $[A]$ (1 screw) and upper booklet exit guide $[B]$ (2 screws).
6. Open the lower booklet exit guide [C] and remove it (1 L-pin [D], 2 connectors [E]).
7. Remove the right front and right rear covers $[F, G]$ ( 2 screws each).
8. Disconnect the two connectors $[\mathrm{H}]$.
9. Remove the two joints [I] and then pull out the booklet unit [J] from the right side (3 screws).

### 4.1.14 FOLDER ROLLERS



1. Remove the booklet unit
2. Remove the drive unit [A] (4 connectors [B], 3 screws [C]).
3. Remove the front and rear tension springs [D].

4. Remove the gears $[A]$ and ball bearings $[B]$ (4 C-rings).
5. Remove the front and rear tighteners [C] (1 stepped screw each).

6. Remove the jogger plates $[A]$ (1 screw each).
7. Slide the folder rollers $[B]$ to the front and remove them.

### 4.1.15 FOLDER PLATE



## Removal

1. Remove the following items

- Lower right cover (see "Booklet Unit Removal")
- Folder roller knob (see "Booklet Unit Removal")
- Lower door and lower inner cover (see "Booklet Unit Removal")
- Booklet board

2. Release the harness [A] from the clamps.
3. Insert two positioning screws $[B]$ in the holes provided in the folder table [C].
4. Tighten the screws until the ends touch the securing plate [D] for the folder plate.
5. Remove the folder plate [E] and the securing plate (3 screws).

## Reinstalling

[B]


[A, B]


1. Line up the two small holes $[\mathrm{A}]$ in the folder plate with the two small protrusions on the bottom of the securing plate [B]. Then, push the two protrusions through the holes.
Note: Be sure that the three screw holes are also lined up.
2. Temporarily fix the two plates together by attaching two strips of electrical tape
[C] along the line where they meet (see the illustration).
NOTE: 1) Be sure to fold the two strips back toward you so that they can easily be removed.
2) Be careful not to attach the tape too close to the three screw holes.
3. Reattach the two plates $[\mathrm{A}, \mathrm{B}]$ to the folder table [D] (3 screws).

NOTE: Tighten these three screws while holding the securing plate against the two positioning screws [E] that were installed in step 3 of the "Removal" procedure.
4. Remove the two strips of tape.

### 4.1.16 BOOKLET STAPLER UNIT

## Removal


[C]


1. Remove the lower door and inner cover (see "Booklet Unit Removal").
2. Remove the guide roller $[A]$ and shaft $[B]$ (1 E-ring).
3. Pull out the booklet stapler unit [C].

REMOVAL



[B]

## Adjustment

1. Remove the booklet stapler cover [A] (3 screws).
2. Remove the three paper guides $[B]$ ( 1 screw each).
3. Loosen the two screws on each of the anvils [C].

[A]

[C]
4. Insert the anvil positioning plate $[A]$ into the staple slot of the stapler [B]. NOTE: The anvil positioning plate is stored in the booklet stapler cover [C].
5. Rotate the gear to move down the stapler. Then align the anvil positioning plate and the anvil [D]. Then secure the anvils (2 screws each).

### 4.1.17 BOOKLET BOARD



1. Remove the lower right cover [ A ] (4 screws).
2. Remove the booklet board [B] (4 screws, 14 connectors).

NOTE: After replacing the board, adjust the booklet stapling position.

### 4.1.18 POSITIONING PLATE UNIT



1. Remove the booklet board (4 screws, 14 connectors).
2. Slide the paper positioning unit [C] to the right and remove it (2 screws, 2 connectors [D]).

### 4.1.19 1ST AND 2ND BOOKLET UNIT GATES


[B]

[E]


1. Remove the upper and lower rear covers.
2. Release the two tension springs $[A]$ of the booklet entrance guide $[B]$.
3. Remove the booklet unit gate solenoids [C] (1 screw and 1 spring each).
4. Pull out the link of the solenoid [D].
5. Remove the booklet unit gates $[E]$.

### 4.2 ADJUSTMENT

### 4.2.1 SHIFT TRAY HEIGHT



Dip Switch 3


After replacing the finisher board or shift tray height sensor, always do this adjustment.

1. Remove the upper rear cover.
2. Turn on dip switches $3-1$ and -4 on the finisher board.
3. Put blank paper (A4/81/2" $\times 11^{\prime \prime}$ ) on the shift tray.
4. Press switch 1 (SW1) on the finisher board.

The finisher automatically adjusts the shift tray height when switch 1 is pressed.

- After performing the adjustment, the shift tray will return to home position.
- During the adjustment, LED 1 flashes. After performing the adjustment, LED 1 turns on and remains on.
- If the automatic adjustment fails, the finisher stops and LED 1 turns off.

5. Turn off dip switches 3-1 and -4, then turn off the copier main switch.

### 4.2.2 JOGGER FENCE POSITION



After replacing the finisher board or if a paper alignment fault occurs, do this adjustment.
Doing this adjustment once will affect all paper sizes.

1. Remove the upper rear cover.
2. Turn on dip switch 3-1 on the finisher board.
3. Press the following switch on the finisher board.

Using A4: Switch 1 (SW1)
Using 81/2" x 11": Switch 2 (SW2)

- After pressing the switch, the upper exit unit will open and the jogger fences will move to the A4 or $81 / 2^{\prime \prime} \times 11^{\prime \prime}$ position.

4. Place 10 sheets of $A 4 / 81 / 2^{\prime \prime} \times 11$ " paper between the jogger fences and push them until they touch the shutters.
5. Adjust the jogger fence position by pressing switch 1 or 2.

- Switch 1: Move to the front ( $0.35 \mathrm{~mm} / \mathrm{press}$ )
- Switch 2: Move to the rear ( $0.35 \mathrm{~mm} /$ press)

6. Press switches 1 and 2 simultaneously to store the adjustment data.

- After pressing the switches, the upper exit unit will close.

7. Turn off dip switch $3-1$, then turn off the copier main switch.

### 4.2.3 STAPLING POSITOIN



Dip Switch 3


After replacing the finisher board, do this adjustment. Doing this adjustment once will affect all paper sizes and all stapling positions.

1. Remove the upper rear cover.
2. Turn on dip switches $3-1$ and -2 on the finisher board.
3. Press the following switch on the finisher board.

Using A4: Switch 1 (SW1)
Using 81/2" x 11": Switch 2 (SW2)

- After pressing the switch, the upper exit unit will open and the transport belt will rotate.

4. Within five seconds after pressing the switch, place one sheet of $A 4 / 81 / 2^{\prime \prime} \times 11^{\prime \prime}$ paper between the jogger fences and push it until it touches the shutter. When the staple tray paper sensor detects the paper, the stapler will staple (rear, 1 point).
5. Take out the stapled paper manually and check the staple position.

Staple position: Good $\rightarrow$ Turn off dip switches 3-1 and -2 to end the procedure.
Staple position: No good $\rightarrow$ Change the staple position by doing the following steps.
6. Adjust the staple position by pressing switch 1 or 2 .

Switch 1: Move the front ( $0.3 \mathrm{~mm} /$ press)
Switch 2: Move to the rear ( $0.3 \mathrm{~mm} / \mathrm{press}$ )
7. Press switches 1 and 2 simultaneously to store the adjustment data. After pressing the switches, check the staple position again.
8. Turn off dip switches 3-1 and -2, then turn off the copier main switch.

### 4.2.4 BOOKLET STAPLING POSITION



Dip Switch 1



After replacing the booklet board, dip switches $1-6,-7,-8$ on the new board must be set up the same way as on the old board.

1. Remove the lower right cover (see "Booklet Unit Removal") and lower rear cover.
2. Turn on dip switches 1-1 and -2 on the booklet board.
3. Tape the actuators of the booklet entrance guide sensor (S42) and the booklet entrance guide safety switch (SW11), so that S42 and SW11 remain actuated.
4. Press switch 2 (SW2) on the booklet board.

- After pressing the switch, the booklet transport motor (M10) will start to rotate.

5. Put a mark on the trailing edge of some $\mathrm{A} 3 / 11^{\prime \prime} \times 17$ " paper (two sheets).

6. Open the booklet entrance guide [A], then slide in the two sheets of paper [B] until their leading edges touch the positioning plate.
7. Press switch 2 on the booklet board.

- The booklet finisher makes a booklet automatically.


| Dip switch $1-6,-7,-8$ setting |  |  | Adjustment ( $0.25 \mathrm{~mm} /$ step) |
| :---: | :---: | :---: | :---: |
| -6 | -7 | -8 |  |
| OFF | ON | ON | +3 |
| OFF | ON | OFF | +2 |
| OFF | OFF | ON | +1 |
| OFF | OFF | OFF | 0 |
| ON | OFF | ON | -1 |
| ON | ON | OFF | -2 |
| ON | ON | ON | -3 |
| ON | OFF | OFF | Do not use |

8. Measure the distance (L) between the stapling position and the folder position.
9. Adjust the stapling position with dip switches $1-6,-7,-8$. Inputting a lower value than the current setting moves the stapling position towards the leading edge. Adjusting by 1 step moves the stapling position 0.25 mm.

## Example 1:

To move the stapling position 1 mm towards the leading edge.
If dip switch 1 is currently set to +2 , set the dip switch to reflect -2 (this moves the stapling position 4 steps towards the leading edge).

## Example 2:

To move the stapling position 0.75 mm away from the leading edge. If dip switch 1 is currently set to -1 , set the dip switch to reflect +2 (this moves the stapling position 3 steps away from the leading edge).
10. Turn off dip switched 1-1 and -2 , then turn off the copier main switch.

## COPIER CONNECTION KIT B322

## 1. SPECIFICATIONS

| Copy Speed: | Max:140 cpm (A4 / 8 ½ " x 11" sideways) |
| :---: | :---: |
|  | (Two 70 cpm machines) |
|  |  |
|  | (One 70 cpm machine and one 55 cpm machine) |
|  | Max: 110 cpm (A4 / $8112 \mathrm{l} \times 11 \mathrm{l}$ ( sideways) |
|  | (Two 55 cpm machines) |
| Copy Number Input: | 1 to 999 |

## 2. DETAILED DESCRIPTIONS

### 2.1 OVERVIEW



This kit connects two A292 copiers, two A293 copiers or A292 and A293 copier. If the user wishes to have two copiers work on one copy job, the user starts the job on one copier. The copy job will also be made on the other copier.
The copier on which the user pressed the "Connect" key on the display is known as the "Master Unit" and the other copier is the "Sub Unit".
Features for the job can only be selected on the master unit.
There is no restriction on the two connected copiers and their configurations (70 cpm copier or 55 cpm copier, with finisher or without finisher etc). However, with some combinations, the available functions are limited.
NOTE: The printer function cannot use the copy connect mode.

### 2.2 BASIC OPERATION

After pressing the start key, all originals are read and stored on the HDD. At the same time, the data is sent to the slave unit and stored on its HDD.

After reading all originals, the master and slave units will begin printing. The CPU separates the job for both units. So, they finish at about same time.
The way that the copies are fed out depend on the copy mode, as follows.

### 2.2.1 NO SORT AND NO STAPLE MODE

$=$ Master Unit $=$
Exit from the copy of the 1st original, face down.
= Slave Unit =
Exit from the copy of the last original, face up.
Example:
Number of originals: 6, 1 -sided to 1 -sided copy mode, Number of copies: 3

| Master Unit |  | Slave Unit |  |
| :---: | :---: | :---: | :---: |
| FFVFV | 3rd original - 3rd copy | AXAAE | 4th original - 1st copy |
| FVFVF | 3rd original - 2nd copy | AAAAA | 4th original - 2nd copy |
| FVFVF | 3rd original - 1st copy | AAAAA | h original - 3rd copy |
| $\nabla \nabla \nabla \nabla \nabla$ | 2nd original - 3rd copy | AAAAA | th original - 1st copy |
| FVFVF | 2nd original - 2nd copy | AXAAA | th original - 2nd copy |
| FVFVF | original - 1st copy | AAAAA | h original - 3rd copy |
| $\nabla \nabla \nabla \nabla \nabla$ | - 3rd copy | AAAAE | h original - 1st copy |
| FVFVF | original - 2nd copy | AXAAA | h original - 2nd copy |
| FVFVF | 1st original - 1st copy | AAAAE | h original - 3rd copy |

Face down, $\mathbf{A}$ : Face up
NOTE: The output quantity on the master and slave units depends on the paper feed tray position, image rotation, and copy speed. If more than two copies are made from an original, sometimes one of the copies (for example, copies of the 4th original) will print on different units (in the above example, the 1st copy of the 4th original may be made on the master instead of the slave).

### 2.2.2 SORT, STAPLE MODE

The copies exit face down for both units.

## Example:

Number of originals: 3, 1-sided to 1-sided copy mode, Number of sets: 6


3rd set - 3rd copy

| Slave Unit |  |
| :---: | :---: |
| FVFVF | 6th set - 3rd copy |
| FVFVF | 6th set - 2nd copy |
| 大VFVF | 6th set - 1st copy |
| VFVFV | 5th set - 3rd copy |
| FVFVF | 5th set - 2nd copy |
| $\nabla \nabla \nabla \nabla \nabla$ | 5th set - 1st copy |
| FVFVF | 4th set - 3rd copy |
| FVFVF | 4th set - 2nd copy |
| VFVFV | 4th set - 1st copy |

Face down

NOTE: The output quantity (sets) made by the master and slave units depends on the paper feed tray position, image rotation, and copy speed. A set of copies will not be divided between the two machines. For example, if paper runs out on one machine, the other machine will continue to work on other sets of copies, but will not complete any unfinished sets for the machine that ran out of paper.

### 2.2.3 OPERATION IN IRREGULAR CONDITIONS

## Paper end during copying

When a machine enters the paper end condition, it stops and "add paper" is displayed. The other machine continues to make copies. The rest of the copy job is transferred to the other machine.

If paper is replenished before the end of the job, the machine will automatically start. If the machine was part of the way through a set of copies, it will finish that set first. Then, if there are any sets still remaining, they will be re-allocated to both machines.

## Copy tray full

When copy tray is full, the machine stops and "paper is full" is displayed. If this occurs on the sub unit, it is displayed on the master unit also. The other machine continues with the rest of the job.

If the copies are removed from the copy tray before the end of the job, the machine will automatically start. If the machine was part of the way through a set of copies, it will finish that set first. Then, if there are any sets still remaining, they will be reallocated to both machines.

## Paper jam

When a paper jam occurs, the following indicators are displayed.

1) "Paper jam" is displayed on the master unit.
2) The machine having the jam condition is indicated on the master unit.
3) The jam position is displayed on the machine which has the paper jam.

When a machine has a paper jam, it stops and the above indicators are displayed. The other machine continues with the rest of the job.
If the jam is removed before the end of the job, the machine will automatically start. If the machine was part of the way through a set of copies, it will finish that set first. Then, if there are any sets still remaining, they will be re-allocated to both machines.

LG KIT B375

## 1. LG KIT (B375)

### 1.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box against the following list:
Description ..... Q'ty

1. LG Tray Frame ..... 1
2. LG Tray Cover ..... 1
3. LG Bottom Plate ..... 1
4. Securing Plate ..... 2
5. Philips Pan Head Screw - M4 x 6 ..... 6
6. Tapping Bind Screw - M4 x 6 ..... 4

### 1.2 INSTALLATION PROCEDURE



1. Open the LCT cover $[A]$ and while covering the paper position sensor $[B]$ and paper near end sensor [C] with your hand, press the tray down switch [D] to lower the tray bottom plate to its lowest position.
2. Turn off the copier main switch.
3. Remove the LCT cover (1 screw).
4. Remove the LCT right cover [E] (2 screws).
5. Remove the LCT right stay [F] (4 screws).

6. Attach the securing plates $[A]$ to the LCT paper tray $[B]$ (2 screws each).
7. Mount the LG paper tray to the securing plates [C] (2 screws each).
8. Remove the side fence [D] of the LG tray frame [E] (1 screw).
9. Insert the positioning pin [F] to the LCT and secure the LG tray frame (2 screws).

10. Remove the front and rear side fences from the LCT [A] (1 screw each).
11. Position the LCT and LG tray side fences $[A, B]$ to $L G$ paper size and secure them (1 screw each).
12. Install the LCT right cover [C] and LG tray cover [D] (3 screws).
13. Turn on the copier main switch and input the LG paper size with SP5-019.
14. Turn off the copier main switch. After perform the LCT initialization, turn off the copier main switch and remove the LCT right cover.
15. Reposition the down sensor [E] from original position to LG size paper positioning $[F]$ which is 82 cm higher than original position ( 1 screw ).
NOTE: The down sensor repositioning procedure should be done after reposition the side fences.

## TECHNICAL SERVICE BULLETINS

RTCOEM TECHNICAL SERVICE BULLETIN

## APPLICABLE MODEL:

GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: SERVICE MANUAL - INSERT

## GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:
The revised areas have been highlighted by an arrow $\Rightarrow$.

- 2-36
- 2-50
- 2-79
- 2-80
- 4-79
- 5-2 and 5-4

> Updated Information (Drum Unit)
> Updated Information (Development Mechanism)
> Updated Information (Duplex Tray Feed Mechanism)
> Updated Information (Basic Duplex Feed Operation)
> Updated Information (Download NVRAM Data to the BICU)
> Updated Information (PM Table)

### 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 $100^{\circ} \mathrm{C}$ and SP3901 is on).

1) Potential Sensor Calibration
2) VSG Adjustment
3) $V G($ Grid Voltage) Adjustment
4) LD Power Adjustment
5) VREF Update
6) Density Adjustment

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 "Development and Toner Supply" section for more details.

### 2.6.2 DEVELOPMENT MECHANISM



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 -120 V ) and white areas are at a high negative charge (about -900 V ).
$\Rightarrow$ The development roller is given a negative bias (-550 V) 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.

### 2.10.4 BASIC DUPLEX FEED OPERATION

## $\Rightarrow$ Longer than A4 / Letter lengthwise (8.5 x 11 L)

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 $[\mathrm{B}]$ in the illustration shows the order of sheets of copy paper (if shaded, this indicates the second side).

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

2. The first 2 sheets go into the duplex unit


| Mode No.(Class 1, $2 \Rightarrow 3$ ) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 5-923 | Edge Erase Standard |  |  |  |  |
|  |  |  |  | Selects the standard for edge erase. <br> 0 : The margin is erased from the original data. 1: The margin is erased from the data sent to the laser diode. <br> Note that the output resulting from each of the settings will be different when reduction or enlargement is used. | 0: Original <br> 1: Paper |
| 5-924 | Adjust Margin for each Original |  |  |  |  |
|  | 1 | Adjust margin for each original |  | Selects whether or not Margin per Original is enabled. <br> No: Images are shifted with a binding margin during image writing. <br> Yes: The margin is applied during scanning. NOTE: After Yes has been selected, the "per original" key is displayed. | $\begin{aligned} & \text { Range: Yes } \\ & \text { or No } \end{aligned}$ |
|  |  | Per original priority |  | Selects whether or not Margin per Original is enabled as default. This setting is given priority over SP5-924-01. | Range: On or Off |
| 5-954 | Copy Server Password Display |  |  |  |  |
|  |  |  |  | Selects whether to display the password when a file with a password is selected on the copy server. | Normal Display password |
| 5-965 | All Copy Server File Delete |  |  |  |  |
|  |  |  |  | Delete the all copy server files. | Start Cancel |
| 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. | Start |
|  | 2 | SP |  | Prints the SP mode data list. See the "System Parameter and Data Lists" section for how to print the lists. | Start |
| 5-990 | SMC Print |  |  |  |  |
|  | 3 | User Program |  | Prints the UP mode data list. See the "System Parameter and Data Lists" section for how to print the lists. | Start |
|  | 4 | Logged Data |  | Prints the machine status history data list See the "System Parameter and Data Lists" section for how to print the lists. | Start |
| 6-006 | DF Registration Adjustment |  |  |  |  |
|  | 1 | Side-to-Side | * | Adjusts the printing side-to-side registration in the ADF mode. | $\begin{aligned} & \hline-3 \sim+3 \\ & 0.1 \mathrm{~mm} / \mathrm{step} \\ & +0.0 \mathrm{~mm} \end{aligned}$ |
|  | 2 | Leading Edge (Thin Original) | * | Adjusts the original stop position. | $\begin{array}{\|l\|} \hline-29 \sim+29 \\ 0.18 \\ \mathrm{~mm} / \mathrm{step} \\ +\mathbf{0 . 0 ~ m m} \\ \hline \end{array}$ |
|  | 3 | Leading Edge (Duplex-front) | * | Adjusts the original stop position against the original left scale in one-sided original mode. | $\begin{array}{\|l} \hline-29 \sim+29 \\ 0.18 \\ \mathrm{~mm} / \mathrm{step} \\ +\mathbf{0 . 0 ~ m m} \\ \hline \hline \end{array}$ |


|  | EM | $\begin{gathered} \hline 150 \\ \mathrm{~K} \end{gathered}$ | $\begin{gathered} 300 \\ \mathrm{~K} \end{gathered}$ | $\begin{gathered} \hline \hline 450 \\ \mathrm{~K} \end{gathered}$ | Expected Life K | NOTE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| PAPER FEED |  |  |  |  |  |  |
| Registration Rollers |  | C | C | C |  | Water or alcohol |
| Relay Rollers |  | C | C | C |  | Water or alcohol |
| Paper Dust Remover |  | C | C | C |  | Dry cloth |
| Registration Sensor |  | C | C | C |  | Blower brush |
| Relay Sensor |  | C | C | C |  | Blower brush |
| Paper Feed Rollers <br> Pick-Up Rollers <br> Separation Rollers |  | C | C | C | 300 | Replace pick-up, feed and separation roller as a set. Check the counter value for each paper tray station (SP7-204). If the value has reached 300 K , replace the rollers. After replacing the rollers, reset the counter (SP7-816). |
| Paper Feed Guide Plate |  | C | C | C |  | Water or alcohol |
| Vertical Transport Rollers |  | C | C | C |  | Water or alcohol |
| Paper Feed Sensor |  | C | C | C |  | Blower brush |
| TRANSFER BELT UNIT |  |  |  |  |  |  |
| Transfer Belt |  | C | C | C | 450 | Dry cloth |
| Cleaning Roller Cleaning Blade |  |  |  | C | 450 |  |
| Transfer Entrance Guide Plate |  | C | C | C |  | Dry cloth |
| Belt Drive/Guide/ Bias Roller/Cleaning Roller |  | C | C | C |  | Alcohol |
| Transfer Exit Guide Plate |  | C | C | C |  | Dry cloth |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| FUSING/PAPER EXIT |  |  |  |  |  |  |
| Hot Roller |  | 1 | 1 | 1 | 200 |  |
| Hot Roller Bearings |  | 1 | 1 | 1 | 600 |  |
| Pressure Roller |  | , | 1 | 1 | 450 | Replace as a set. |
| Pressure Roller Bearings |  | 1 | 1 | 1 | 450 |  |
| Fusing Thermistor | I | 1 | 1 | 1 |  | Replace if necessary. |
| Hot Roller Strippers | C | C | C | C | 300 | Water or alcohol |
| Oil Supply Roller Bushings | I | 1 | 1 | 1 |  | Replace if necessary. |
| Pressure Roller Cleaning Roller and Bushings |  | R | R | R |  | Replace as a set. |
| Oil Supply Roller |  | R | R | R |  |  |
| Oil Supply Cleaning Roller |  | R | R | R |  |  |
| Fusing Entrance and Exit Guide Plates |  | C | C | C |  | Clean with water or alcohol |
| Transport/Exit Rollers |  |  | C |  |  | Water |
| Exit Anti-static Brush |  |  | 1 |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |


|  | EM | $\begin{gathered} \hline 150 \\ K \end{gathered}$ | $\begin{gathered} \hline 300 \\ K \end{gathered}$ | $\begin{gathered} 450 \\ K \end{gathered}$ | Expected Life K | NOTE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 3,000-SHEET FINISHER (50-SHEET STAPLER): (B312) |  |  |  |  |  |  |
| Rollers | C | C | C | C |  | Clean with water or alcohol. |
| Brush Roller | 1 | 1 | 1 | 1 | 2,400 |  |
| Discharge Brush | C | C | C | C |  | Clean with a dry cloth. |
| Sensors | C | C | C | C |  | Blower brush |
| Jogger Fences | 1 | I | 1 | 1 |  | Replace if necessary. |
| Punch Waste Hopper | 1 | 1 | 1 | 1 |  | Empty the hopper. |


|  | EM | $\begin{gathered} 150 \\ K \end{gathered}$ | $\begin{gathered} \hline 300 \\ K \end{gathered}$ | $\begin{gathered} \hline \hline 450 \\ K \end{gathered}$ | Expected Life K | NOTE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 3,000-SHEET FINISHER (100-SHEET STAPLER): (B302) |  |  |  |  |  |  |
| Rollers | C | C | C | C |  | Clean with water or alcohol. |
| Brush Roller | 1 | 1 | 1 | 1 | 600 | Check the counter value for the total copies by copy mode for staple (SP7-304-9). If the value has reached 600 K , replace the brush roller. |
| Discharge Brush | C | C | C | C |  | Clean with a dry cloth. |
| Sensors | C | C | C | C |  | Blower brush |
| Jogger Fences | 1 | 1 | 1 | 1 |  | Replace if necessary. |
| Punch Waste Hopper | 1 | 1 | 1 | 1 |  | Empty the hopper. |


|  | EM | 150 <br> $\mathbf{K}$ | $\mathbf{3 0 0}$ <br> $\mathbf{K}$ | $\mathbf{4 5 0}$ <br> $\mathbf{K}$ | Expected <br> Life K | NOTE |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| FINISHER: (A763) | C | C | C | C |  | Clean with water or alcohol. |
| Rollers | C | I | I | I |  |  |
| Brush Roller | C | C | C | C |  | Clean with a dry cloth. |
| Discharge Brush | C | C | C | C |  | Blower brush |
| Sensors | I | I | I | I |  | Replace if necessary. |
| Jogger Fences |  |  |  |  |  |  |

RTCOEM TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A292/A293-002
07/13/2000

## APPLICABLE MODEL:

GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: SERVICE MANUAL - INSERT

## GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

NOTE: The following updates to the SP Mode Table require ROM ver 2.94.
PAGES:

The revised areas have been highlighted by an arrow $\Rightarrow$.

- 4-18 through 21
- 4-47 through 53B
- 4-65

Updated Information (SP Tables)
Updated Information (SP Tables)
Updated Information (SP Tables)



| Mode No. <br> (Class $1,2 \& 3)$ <br> 2 |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 2-965 | Toner Pump Adjustment |  |  |  |  |
|  | 1 | First Toner Waste Adjustment | * | Factory use only | $\begin{aligned} & \hline 0 \sim 100 \\ & 1 \mathrm{~g} / \mathrm{step} \\ & \mathbf{3 g} \end{aligned}$ |
|  | 2 | After First Toner Waste | * | Factory use only | $\begin{aligned} & 0 \sim 100 \\ & 1 \mathrm{~g} / \mathrm{step} \\ & 3 \mathrm{~g} \\ & \hline \end{aligned}$ |
|  | 3 | Pump Clutch On Time | * | Factory use only | $\begin{aligned} & 0 \sim 5 \\ & 1 / \text { step } \\ & 2 \mathrm{~s} \end{aligned}$ |
|  | 4 | Pump Motor On Time | * | Factory use only | $\begin{aligned} & \hline 0 \sim 20 \\ & 1 \mathrm{~s} / \mathrm{step} \\ & 6 \mathrm{~s} \end{aligned}$ |
|  | 5 | Return to First Toner Waste | * | Factory use only | $\begin{aligned} & 0 \sim 50 \\ & 1 \text { time/step } \\ & 30 \text { times } \end{aligned}$ |
| 2-965 | Toner Pump Adjustment |  |  |  |  |
|  | 6 | Aggregate of Toner Waste |  | Factory use only |  |
| 2-966 | Periodical Auto Process Control |  |  |  |  |
|  |  |  |  | When both the following conditions exist, auto process control and charge corona wire cleaning will be done automatically. <br> 1. The main switch was not turned off since 24 hours after the last auto process control was done. <br> 2. A copy job has finished. | OFF: No ON: Yes |
| 2-967 | Auto Image Density Adjustment |  |  |  |  |
|  |  |  |  | During the auto process control after the main switch is turned on, the toner amount in the development unit is checked and adjusted using the ID sensor. | OFF: No ON: Yes |
| 2-970 | Transfer Belt Resistance Value Display |  |  |  |  |
|  |  |  |  | XX.XM <br> Unit is $\Omega$ <br> Very High $\rightarrow 190 \leftarrow$ High $\rightarrow 90 \leftarrow$ <br> Standard $\rightarrow 25 \leftarrow$ Low $\rightarrow 15 \leftarrow$ Very Low |  |
| 2-971 | Output Value Measured Between Copies |  |  |  |  |
|  | 1 | Voltage |  | Displays the measurement condition of value in SP2-970. |  |
|  | 2 | Current |  |  |  |








| $$ |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 5-923 | Edge Erase Standard |  |  |  |  |
|  |  |  |  | Selects the standard for edge erase. <br> 0 : The margin is erased from the original data. <br> 1: The margin is erased from the data sent to the laser diode. <br> Note that the output resulting from each of the settings will be different when reduction or enlargement is used. | 0: Original <br> 1: Paper |
| 5-924 | Adjust Margin for each Original |  |  |  |  |
|  | 1 | Adjust margin for each original |  | Selects whether or not Margin per Original is enabled. <br> No: Images are shifted with a binding margin during image writing. <br> Yes: The margin is applied during scanning. NOTE: After Yes has been selected, the "per original" key is displayed. This key must be pressed to activate the mode. | Range: Yes or No |
|  | 2 | Per original priority |  | Selects whether or not Margin per Original is enabled as default. This setting is given priority over SP5-924-01. | Range: On or Off |
| 5-954 | Copy Server Password Display |  |  |  |  |
|  |  |  |  | Selects whether to display the password when a file with a password is selected on the copy server. | Normal Display password |
|  |  |  |  | If you forget the password, select "1" to check it. |  |
| 5-965 | All Copy Server File Delete |  |  |  |  |
|  |  |  |  | Delete the all copy server files. | Start Cancel |
| 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. | Start |
|  | 2 | SP |  | Prints the SP mode data list. <br> See the "System Parameter and Data Lists" section for how to print the lists. | Start |
| 5-990 | SMC Print |  |  |  |  |
|  | 3 | User Program |  | Prints the UP mode data list. See the "System Parameter and Data Lists" section for how to print the lists. | Start |
|  | 4 | Logged Data |  | Prints the machine status history data list. See the "System Parameter and Data Lists" section for how to print the lists. | Start |
| 6-006 | DF Registration Adjustment |  |  |  |  |
|  | 1 | Side-to-Side | * | Adjusts the printing side-to-side registration in the ADF mode. | $\begin{aligned} & \hline-3 \sim+3 \\ & 0.1 \mathrm{~mm} / \mathrm{step} \\ & +0.0 \mathrm{~mm} \end{aligned}$ |
|  | 2 | Leading Edge (Thin Original) | * | Adjusts the original stop position. | $\begin{aligned} & \hline-29 \sim+29 \\ & 0.18 \\ & \mathrm{~mm} / \text { step } \\ & +0.0 \mathrm{~mm} \\ & \hline \end{aligned}$ |
|  | 3 | Leading Edge (Duplex-front) | * | Adjusts the original stop position against the original left scale in one-sided original mode. | $\begin{aligned} & \hline-29 \sim+29 \\ & 0.18 \\ & \mathrm{~mm} / \mathrm{step} \\ & +0.0 \mathrm{~mm} \\ & \hline \end{aligned}$ |


| Mode No.(Class 1, 2 \& 3) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 6-006 | 4 | Reading Edge (Duplex-rear) | * | Adjusts the original stop position against the original left scale in two-sided original mode. | $\begin{aligned} & -29 \sim+29 \\ & 0.1 \mathrm{~mm} / \mathrm{step} \\ & +\mathbf{0 . 0 \mathrm { mm }} \end{aligned}$ |
| 6-007 | ADF Input Check |  |  |  |  |
|  | 1 | Group 1 |  | Displays the signals received from sensors and switches of the ADF. <br> See the "Input Check" section for details. |  |
|  | 2 | Group 2 |  | Displays the signals received from sensors and switches of the ADF. <br> See the "Input Check" section for details. |  |
| 6-008 | ADF Output Check |  |  |  |  |
|  |  |  |  | Turns on the electrical components of the ADF individually for test purposes. <br> See the "Output Check" section for details. |  |
| 6-009 | ADF Free Run (Two-sided original) |  |  |  |  |
|  | 1 |  |  | Performs an ADF free run in two-sided original mode. Press " 1 " to start. | $\begin{aligned} & \text { Off } \\ & \text { On } \end{aligned}$ |
|  |  |  |  | This is a general free run controlled from the copier. For more detailed free run modes, see the 'Test Points/Dip Switches/LEDs' section. |  |
| 6-016 | Adjust Motor Speed |  |  |  |  |
|  |  |  |  | Adjust the speed of the feed-in, transport and feed-out motors. Perform this SP when replacing the Main Board or above motors. |  |
| 6-020 | ADF Speed Adjustment |  |  |  |  |
|  |  |  | * | When the customer points out noise form the ADF, use this to adjust the ADF speed to low. | High speed: 70 cpm Low Speed: 55 cpm |
| 6-105 | Stapling Position Adjustment |  |  |  |  |
|  |  |  | ${ }^{+}$ | Adjusts the stapling position in the main scan direction | $\begin{array}{\|l\|} \hline-3.5 \sim+3.5 \\ 0.5 \mathrm{~mm} / \mathrm{step} \\ \mathbf{+ 0 . 0 \mathrm { mm }} \\ \hline \end{array}$ |
|  |  |  |  | A larger value causes the stapling position to shift outward. |  |
| 6-113 | Punch Hole Adjustment |  |  |  | Rev. 06/2000 |
|  | 1 | 2-Holes |  | Adjusts the punch hole position in the subscan direction for the punch unit with two punch holes. | $\begin{aligned} & -7.5 \sim+7.5 \\ & 0.5 \mathrm{~mm} / \text { step } \\ & 0 \mathrm{~mm} \end{aligned}$ |
|  |  |  |  | A larger value shifts the punch holes towards the edge of the paper. |  |
|  | 2 | 3-Holes |  | Adjusts the punch hole position in the subscan direction for the punch unit with three punch holes. | $-7.5 ~+7.5$ $0.5 \mathrm{~mm} / \mathrm{step}$ 0 mm |
|  |  |  |  | A larger value shifts the punch holes towards the edge of the paper. |  |



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| Mode No. <br> (Class $1,2 \& 3$ ) |  | Function | Settings |
| :---: | :---: | :---: | :---: |
| 7-906 | Clear Original Number of Each size |  |  |
|  |  | Resets all counters of SP7-202. | Start |
| 7-907 | Clear Job Number of Each size |  |  |
|  |  | Resets all counters of SP7-306. | Start |
| 7-908 | Document : Clear Original Number |  |  |
|  |  | Resets all counters of SP7-002-2. | Start |
| 7-920 | Document Server : Clear Scanned Storage |  |  |
|  |  | Resets the counter of SP7-320. | Start |
| 7-921 | Document Server : Clear Original Number of Each Size |  |  |
|  |  | Resets all counters of SP7-321. | Start |
| 7-923 | Document Server : Clear Print Number of Each Copy |  |  |
|  |  | Resets all counters of SP7-323 | Start |
| 7-924 | Document Server : Clear Print Job Logging |  |  |
|  |  | Resets all counters of SP7-324 | Start |
| 7-925 | Document Server : Clear Print Job Page Distribution |  |  |
|  |  | Resets all counters of SP7-325 | Start |
| 7-926 | Document Server : Clear Print Job File Distribution |  |  |
|  |  | Resets all counters of SP7-326 | Start |
| 7-927 | Document Server : Clear Print Job Set Distribution |  |  |
|  |  | Resets all counters of SP7-327. | Start |
| 7-928 | Document Server: Clear Copy Number of Each Job |  |  |
|  |  | Resets all counters of SP7-328 | Start |
| 7-990 | Display the detail information for SC990 |  |  |
|  | $\begin{array}{ll}001 & \text { Filename } \\ 002 & \text { Line Number }\end{array}$ <br> 003 Value | Displays the detail information for SC990. |  |

## BULLETIN NUMBER: A292/A293-003

## APPLICABLE MODEL:

GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: LOW IMAGE DENSITY

## SYMPTOM:

Low image density on copies for units with low copy volume (20K to 30 K after installation).

## CAUSE:

The Fusing Fan Motor stops when the low power timer is met ( 60 secs). The copier enters Energy Saver Mode and because the Fusing Lamp remains on to maintain the Hot Roller temperature, the temperature of the areas surrounding the unit also rises. The resulting heat can damage the toner that is stored in the bottle above the fusing unit causing some of the toner's ingredients to separate. The altered toner is then sent to the Development Unit and is mixed in with the developer causing developer chargeability to drop. This results in low image density. The heat damage is especially susceptible on low copy volume machines because the toner remains in the bottle for an extended periods of time.

## SOLUTION:

The BICU Firmware has altered the off-timing of the Fusing Fan Motor. The off-timing has been delayed so the Fusing Fan will have time to remove the hot air around the Toner Bottle.

- On newly installed machines, upgrade the BICU Firmware to version 3.5.1 (Level "E") during installation.
- On field machines that do not exhibit a low image density symptom, upgrade the BICU Firmware to version 3.5.1 (Level "E") during the next visit.
- On field machines that exhibit a low image density symptom perform the following procedure:

1. Upgrade the BICU Firmware to version 3.5.1 (Level "E").
2. Replace the developer.
3. Replace the Toner Bottle.
4. Clean the toner from the Toner Hopper.

The BICU Firmware revision E (file name A292REVE.EXE) can be downloaded through the Ricoh Technical Services FTP Site http://tsc.ricohcorp.com.

NOTE: Refer to Facts Line Bulletin \# FLOO2 for more information about the FTP Internet Web Site.

RECOM TECHNICAL SERVICE BULLETIN

## APPLICABLE MODEL:

GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: SERVICE MANUAL - INSERT

## GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

## PAGES:

The revised areas have been highlighted by an arrow $\Rightarrow$.

- viii
- 2-17
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- 4-66
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- 6-73
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Updated Information (Test pattern Printing)
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### 2.3.2 SBU



The CCD converts the light reflected from the original into an analog signal. The CCD line has 7,500 pixels and the resolution is $600 \mathrm{dpi}(23.6$ lines $/ \mathrm{mm}$ ).
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 BICU board through the LVDS (Low Voltage Differential Signaling). The LVDS is a noise-resistant interface.

| Mode No. <br> (Class 1, 2 \& 3) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 4-912 | Text/Photo Separation Setting |  |  |  |  |
|  | 17 | Half Tone Separation Level | * Selects the dot screen detection level. <br> 0. Setting of SP4-921-008~015 <br> 1. Letter priority - strong <br> 2. Letter priority - weak <br> 3. Standard <br> 4. Photo priority - weak <br> 5. Photo priority - strong <br> Do not use ' 0 '; this is for factory use only. |  | $\begin{aligned} & 0 \sim 5 \\ & 1 / \text { step } \\ & 3 \end{aligned}$ |
|  | 18 | Effective <br> Magnification <br> Ratio |  | Selects the maximum magnification that can be used with dot screen detection. | $\begin{aligned} & 100 \sim 400 \\ & 1 / \text { step } \\ & 109 \end{aligned}$ |
| 5-009 | Language Selection |  |  |  |  |
|  |  |  |  |  |  |
| 5-019 | Tray Paper Size Selection |  |  |  |  |
|  | 5 | LCT | + | Selects the paper size in the optional LCT. | $\begin{aligned} & \text { A4 } \\ & \text { LT } \\ & \text { B5 } \end{aligned}$ |
| 5-024 | mm/inch Display Selection |  |  |  |  |
|  |  |  | * | Selects what unit is used. | $\begin{aligned} & \text { 0: mm } \\ & \text { 1: inch } \end{aligned}$ |
|  |  |  |  | After selecting the unit, turn the main power switch off and on. |  |
| 5-104 | A3/DLT Double Count |  |  |  |  |
|  |  |  |  | Specifies whether the counter is doubled for A3/11"x17" paper. <br> If "1" is selected, the total counter and the current user code counter count up twice when $A 3 / 11$ "x17" paper is used. | $\begin{aligned} & \text { No } \\ & \text { Yes } \end{aligned}$ |
| 5-106 | ID Shift Level |  |  |  |  |
|  | 6 | ADS Level Selection |  | Selects the image density level that is used in ADS mode. | $\begin{aligned} & 1 \sim 7 \\ & 1 \text { notch /step } \\ & 4 \end{aligned}$ |
| 5-112 | Non-standard Paper Selection |  |  |  |  |
|  |  |  |  | Selects whether a non-standard paper size can be input for tray 2 (universal tray) or not. <br> If "1" is selected, the customer will be able to input a non-standard paper size using a UP mode. | $\begin{aligned} & \text { No } \\ & \text { Yes } \end{aligned}$ |
| 5-113 | Optional Counter Type |  |  |  |  |
|  |  |  |  | Select the option counter type. <br> 0. None <br> 1. Key card (Japan only) <br> 2. Key card (Count down type) <br> 3. Pre-paid card <br> 4. Coin lock <br> 5. Key card (Japan only) | $\begin{aligned} & 0 \sim 5 \\ & 1 / \text { step } \\ & 0 \end{aligned}$ |

### 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.

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

$\Rightarrow$| No. | Test Pattern | No. | Test Pattern |
| :---: | :--- | :---: | :--- |
| 0 | None | 7 | Vertical Strips |
| 1 | Vertical Lines (1-dot) | 8 | Grayscale (Vertical) |
| 2 | Vertical Lines (2-dots) | 9 | Grayscale (Horizontal) |
| 3 | Horizontal Line (1-Dot) | 10 | Cross Pattern |
| 4 | Horizontal Line (2-Dots) | 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)

$\Rightarrow$| No. | Test Pattern | No. | Teat Pattern |
| :---: | :--- | :---: | :--- |
| 0 | None | 13 | 16 Grayscales (Vertical) |
| 1 | Vertical Line (1-dot) | 14 | 16 Grayscales (Vert./Hor.) |
| 2 | Horizontal Line (1-dot) | 15 | 16 Grayscales (Vert./Hor Overlay) |
| 3 | Vertical Line (2 dot) | 16 | Hound'sTooth Check (1-Dot, 600dpi) |
| 4 | Horizontal Line (2-dot) | 17 | Hound'sTooth Check (1-Dot, 400dpi) |
| 5 | Grid Pattern (Single-dot) | 18 | Horizontal Line (1-Dot)(Reverse Order <br> ofLD1 \& LD2) |
| 6 | Grid Pattern (Double-dot) | 19 | Grid Pattern (1-Dot)(Reverse Order of <br> LD1 \& LD2) |
| 7 | Independent Pattern (1-Dot) | 20 | Grid Pattern (2-Dot)(Reverse Order of <br> LD1 \& LD2) |
| 8 | Full Dot Pattern | 21 | Independent Pattern (1-Dot)(Reversed <br> Order of LD1 \& LD2) |
| 9 | Black Band | 22 | Blank Page |
| 10 | Trimming Area | 23 | Grid Pattern (1-dot) (Overlaying <br> Outside Data) |
| 11 | Argyle Pattern | 24 | Trimming Area (Overlaying Outside <br> Data) |
| 12 | 16 Grayscales (Horizontal) |  |  |

### 4.3.4 DOWNLOAD NVRAM DATA TO THE BICU

1. Turn off the main power switch.
2. Remove the flash memory card cover [A].
3. Plug the flash memory card $[B]$ into the card slot.
NOTE: Make sure that the surface printed "A" faces upwards.
4. Turn on the main power switch.
5. Enter SP Mode.

6. Open the front door.

NOTE: Do not close the front door until the download finishes.
7. Select SP5-825-***.

001: All data
002: User tools (UP mode) data

NOTE: 1) Data of SP7-003 and SP7-006 are not downloaded.
2) When you select "001", no data is downloaded if the serial number on the BICU is not the same as the one on the flash card.

8. Press "Start".
9. Exit SP Mode.
10. Turn off the main switch.
11. Pull out the flash memory card.

### 6.4.2 LD UNIT REPLACEMENT



## $\triangle$ WARNING <br> Turn off the main power switch and unplug the machine before attempting this procedure. Laser beams can seriously damage your eyes.

1. Remove the exposure glass. (See Exposure Glass Removal.)
$\Rightarrow 2$. Remove the LD cover [A] (6 screws).
2. Replace the LD unit [B] (2 screws and 6 connectors).

NOTE: When disconnecting the cables, hold the LD unit.
4. When reinstalling, make sure that the flat cable [C] is mounted above the LD unit, and that the rotation of the unit is not interrupted.
$\Rightarrow 5$. Do SP 2-962 (process control initialization).
NOTE: Be sure that the cable does not block LD unit rotation after replacing the LD unit. If the LD unit cannot rotate smoothly to change the resolution, SC329 (LD unit home position error) may occur.

### 6.4.3 LASER BEAM PITCH ADJUSTMENT

There are two laser beam pitch adjustment procedures: one for 400 dpi , and one for 600 dpi. These adjustments use the following SP modes.

- SP2-109-1: Laser Beam Pitch Adjustment - 400 dpi
- SP2-109-2: Laser Beam Pitch Adjustment - 600 dpi
- SP2-109-3: Laser Beam Pitch Initial Setting - 400 dpi
- SP2-109-4: Laser Beam Pitch Initial Setting - 600 dpi
- SP2-902-3, no.17: Hound's Tooth Check (1-dot) - Cross Stitch - 400 dpi
- SP2-902-3, no.16: Hound's Tooth Check (1-dot) - Cross Stitch - 600 dpi

1. Perform SP2-109-8 (Beam Pitch Data Reset).
2. Input the value for 400 dpi that is printed on the LD unit into SP2-109-1. Use the value printed after "P" on the new LD unit as shown below.


NOTE: Do not use values printed after a "V".
3. Press the "Enter" key.
4. Perform SP2-109-3.
5. Print the 400-dpi test pattern onto A3 (11"x17") paper using SP2-903-3 no. 17 (cross stitch). (See Service Tables - Test Pattern Printing).
6. Write the value of SP2-109-1 on the test pattern which was input at step 2.
7. Change the value of SP2-109-1 and print another test pattern, repeating steps 2 to 5 . Print about 5 patterns with different values for SP2-109-1 (e.g. "48", "96", "192", "240").
8. Check this test pattern. If the laser beam pitch is not correct, the image looks like a black vertical stripe pattern.
NOTE: If the laser beam pitch is correct, the vertical stripe is not so noticeable. If the value is not correct, the vertical stripe pattern is darker.
9. Adjust the laser beam pitch position until the thin lines are of uniform thickness (no striping effect should appear on the printout), doing steps 2, 3, and 4. (In step 2, input a value which is estimated to be correct, then do steps 3 and 4, then if necessary go back to step 2 and try another value.)
10. After adjusting the laser beam pitch for 400 dpi, adjust the laser beam pitch for 600 dpi, using the same procedure as for 400 dpi (use the SP modes for 600 dpi).

Adjustment not complete

- Feed Direction


Adjustment complete


## $\Rightarrow$ 6.4.4 POLYGON MIRROR MOTOR REPLACEMENT



1. Turn off the main power switch and unplug the machine.
2. Remove the exposure glass. (See Exposure Glass Removal.)
3. Remove the lens cover. (See Lens Block Assembly Replacement.)
4. Remove the lens block assembly. (See Lens Block Assembly Replacement.)
5. Remove the polygon mirror motor cover [A] (2 screws).
6. Disconnect the LD unit flat cable [B].
7. Replace the polygon mirror motor [C] (3 screws and 2 connectors.)

NOTE: When reinstalling, make sure that the polygon mirror opening faces the right. Also, do not pull on the LD flat cable.
8. Do the scanner and printer copy adjustments. (See Replacement and Adjustment - Copy Image Adjustments.)

### 6.13 TOUCH SCREEN CALIBRATION

After doing a memory all clear or 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 touch screen calibration mode.


## $\triangle$ CAUTION

Do not execute any of the other items in the self diagnostic menu.
2. The "Self Diagnostics Menu" screen will appear.

Press the \# key to select the "Touch Screen Adj." Mode.

3. The "Touch Screen Adj." calibration screen will appear. Touch the upper left corner then the lower right corner of the panel using a pointed (but not sharp!) tool.
4. Touch a few spots on the LCD touch panel, and confirm that the marker (a small circle) appears on the screen at exactly the same location as where it is touched. If it does not, touch "Cancel" on the adjustment screen. Then repeat the calibration procedure.
5. Touch "Ok" on the adjustment screen.
6. Touch "[q] Exit" and "Execute" to exit the self diagnostics menu.

## SC380: Data transmission time out (video input)

-Definition- [B]
Data input to the IC which controls data transfer and compression is not completed within 20 seconds.
-Possible cause-

- BICU defective
- SBU defective
- Printer controller defective


## SC382: Data transmission time out (video output)

-Definition- [B]
Data output from the IC which controls the data transfer and compression is not completed within 20 seconds.
-Possible cause-

- BICU defective
- LD board defective


## SC384: Data transmission time out (connect copy)

-Definition-
Data transmission to the memory does not finish properly within 20 seconds after the start of data transmission.

## -Possible cause-

- Defective connection board
- Defective or disconnected interface cable
- Defective SBICU


## SC386: Data transmission time out (Hard disk write)

-Definition- [B]
Data input to the IC which controls the data transfer and compression is not completed with in 20 seconds.
-Possible cause-

- BICU defective
- SBU defective
- Printer controller defective


## SUBJECT：PARTS CATALOG UPDATES

## GENERAL：

The following parts updates are being issued for all A292／A293 Parts Catalogs．
－UPDATE 1：Bracket－I／O Board－To ensure proper grounding，a grounding plate has been added to the I／O Board Bracket．Please update your Parts Catalog with the following information．


## UNITS AFFECTED：

A292／A293 Serial Number cut－ins were not available at time of publication．

Tech Service Bulletin No. A292/A293-005
Page 2 of 4

- UPDATE 2: Cleaning Roller Gears - To improve uneven density in half tone areas, the number of teeth on the Cleaning Roller Gears have been changed. The Gears must be replaced as a set. Please update your Parts Catalog with the following information.

Transfer Section 1 - Page 92
Transfer Section 2 - Page 94


|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| AB014104 | AB014175 | Cleaning Roller Gear - 50Z | 1 | 3/S | 93 | 8 |
| AB014093 | AB014176 | Cleaning Roller Gear - 37Z | 1 | 3/S | 95 | 31 |

## UNITS AFFECTED:

A292/A293 Serial Number cut-ins were not available at time of publication.

- UPDATE 3: DC Solenoid Ass'y - To prevent "dog ears" when using Legal paper, the Bracket for the DC Solenoid has been modified. Please update your Parts Catalog with the following information.

Inverter \& Duplex Unit 4 - Page 108


|  | REFERENCE |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |  |  |  |
| A2934781 | A2934782 | DC Solenoid Ass'y | 1 | 1 | 109 | 3 |  |  |  |

## UNITS AFFECTED:

A292/A293 Serial Number cut-ins were not available at time of publication.

Tech Service Bulletin No. A292/A293-005
Page 4 of 4

- UPDATE 4: Duplex Roller - To prevent the edges of the copy from being dirty when making a duplex copy, the material of the Duplex Roller has been changed. Please update your Parts Catalog with the following information.

Inverter \& Duplex Unit 5 - Page 110


## UNITS AFFECTED:

A292/A293 Serial Number cut-ins were not available at time of publication.

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

BULLETIN NUMBER: A292/A293 - 005 REISSUE $\star$
APPLICABLE MODEL:
GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: PARTS CATALOG UPDATES

## GENERAL:

The following parts updates are being issued for all A292/A293 Parts Catalogs.

- UPDATE 1: Bracket - I/O Board - To ensure proper grounding, a grounding plate has been added to the I/O Board Bracket. Please update your Parts Catalog with the following information.


|  |  | , |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| A2935850 | A2935845 | Bracket - I/O Board | 1 | 1 | 129 | 15 |

## UNITS AFFECTED:

$\star$ All A292/A293 copiers manufactured after the Serial Numbers listed below will have the new style Bracket I/O Board installed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Gestetner 3355 | H 4705300449 |
| Gestetner 3370 | H 4805300002 |
| Ricoh AFICIO 551 | H 4705300389 |
| Ricoh AFICIO 700 | H 4805200624 |
| Savin 2055DP | H 4705300449 |
| Savin 2070DP | H 4805300002 |

Continued...

Tech Service Bulletin No. A292/A293 - 005 REISSUE $\star$ Page 2 of 4

- UPDATE 2: Cleaning Roller Gears - To improve uneven density in half tone areas, the number of teeth on the Cleaning Roller Gears have been changed. The Gears must be replaced as a set. Please update your Parts Catalog with the following information.

Transfer Section 1 - Page 92
Transfer Section 2 - Page 94


|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| AB014104 | AB014175 | Cleaning Roller Gear - 50Z | 1 | 3/S | 93 | 8 |
| AB014093 | AB014176 | Cleaning Roller Gear - 37Z | 1 | 3/S | 95 | 31 |

## UNITS AFFECTED:

All A292/A293 copiers manufactured after the Serial Numbers listed below will have the new style Cleaning Roller Gears installed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Gestetner 3355 | H 4705500301 |
| Gestetner 3370 | H 4805500001 |
| Ricoh AFICIO 551 | H 4705400515 |
| Ricoh AFICIO 700 | H 4805500001 |
| Savin 2055DP | H 4705500301 |
| Savin 2070DP | H 4805500001 |

Tech Service Bulletin No. A292/A293 - 005 REISSUE $\star$

## Page 3 of 4

- UPDATE 3: DC Solenoid Ass'y - To prevent "dog ears" when using Legal paper, the Bracket for the DC Solenoid has been modified. Please update your Parts Catalog with the following information.

Inverter \& Duplex Unit 4 - Page 108


|  |  | REFERENCE |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| A2934781 | A2934782 | DC Solenoid Ass'y | 109 | 3 |  |  |

## UNITS AFFECTED:

All A292/A293 copiers manufactured after the Serial Numbers listed below will have the new style DC Solenoid Assembly installed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Gestetner 3355 | H4705300393 |
| Gestetner 3370 | H4805300002 |
| Ricoh Aficio 551 | H4705300001 |
| Ricoh Aficio 700 | H4805200623 |
| Savin 2055DP | H4705300393 |
| Savin 2070DP | H4805300002 |

Tech Service Bulletin No. A292/A293 - 005 REISSUE $\star$
Page 4 of 4

- UPDATE 4: Duplex Roller - To prevent the edges of the copy from being dirty when making a duplex copy, the material of the Duplex Roller has been changed. Please update your Parts Catalog with the following information.

Inverter \& Duplex Unit 5 - Page 110


REFERENCE

| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| :---: | :---: | :--- | :---: | :---: | :---: | :---: |
| AF020498 | AF020533 | Duplex Roller | 1 | 1 | 111 | 10 |

## UNITS AFFECTED:

All A292/A293 copiers manufactured after the Serial Numbers listed below will have the new style Duplex Roller installed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Gestetner 3355 | H 4705200160 |
| Gestetner 3370 | H 4805200255 |
| Ricoh AFICIO 551 | H 4705300001 |
| Ricoh AFICIO 700 | H 4805200578 |
| Savin 2055DP | H 4705200160 |
| Savin 2070DP | H 4805200255 |

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

## APPLICABLE MODEL:

GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: SERVICE MANUAL - INSERT

## GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

## PAGES:

The revised areas have been highlighted by an arrow $\Rightarrow$.

- 3-38
- 6-73 through 78

Updated Information (Copy Connector Kit Installation)
Updated Information (Copy Image Adjustments)

12. Install the other copy connector kit in the other machine.
13. Connect the two machines with the cable $[A]$ and secure it with clamps $[B]$ (1 screw each).
14. Check the operation.
$\Rightarrow$ NOTE: To enable the Connect Copy Feature:

1. Select User Tools.
2. Select Copy/Document Server Features
3. Select Count Manager
4. Set Connect Copy Master to YES.

## Blank Margin

NOTE: If the leading edge/side-to-side registration can not 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 | More than 1.0 mm |
| Right edge | SP2-101-4 | More than 0.5 mm |
| Leading edge | SP2-101-1 | $3 \pm 2 \mathrm{~mm}$ |
| Left edge | SP2-101-3 | $2 \pm 1.5 \mathrm{~mm}$ |

A: Trailing Edge Blank Margin
B: Right Edge Blank Margin
C: Leading Edge Blank Margin
D: Left Edge Blank Margin


### 6.12.2 PARALLELOGRAM IMAGE ADJUSTMENT

Do the following procedure if a parallelogram type image is printed while using a trimming area pattern 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. 10). If it appears, do the following.
2. Remove the exposure glass (see Replacement and Adjustment - Exposure Glass Removal).
3. Remove the three caps $[A]$.
4. Make a note of the position of the laser unit using the scale through the hole [B].
5. Loosen the three screws [C] that hold the laser unit.

[B]

6. Adjust the laser unit position using a flat screwdriver [A] as shown.

If the right side of the trimming area pattern is down by about 1 mm as shown [B], the laser unit should be rotated about one tick mark in the direction of the black arrow as shown [C]. If the opposite side is down, adjust in the opposite direction.
NOTE: The laser unit rotates around the point [D].
7. Tighten the three screws to secure the laser unit.
8. Replace the caps and exposure glass.
9. Print the trimming area pattern to check the image. If it is still skewed, repeat steps 2 to 8.

### 6.12.3 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

## Magnification

NOTE: Use an OS-A3 test chart to perform the following
 adjustment.

## Scanner Sub Scan Magnification

## A: 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 $\pm 1 \%$.

|  | SP mode |
| :--- | :---: |
| Scanner Sub Scan Magnification | SP4-008 |

## $\Rightarrow$ 6.12.4 ADF IMAGE ADJUSTMENT

## Registration



A: Leading Edge Registration
B: Side-to-side Registration


NOTE: Make a temporary test chart as shown above 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 <br> mode) | SP6-006-2 |
| Leading Edge Registration (Single- <br> sided/Duplex: front) | SP6-006-3 |
| Leading Edge Registration (Duplex: rear) | SP6-006-4 |

### 6.13 TOUCH SCREEN CALIBRATION

After doing a memory all clear or 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 touch screen calibration mode.



## $\triangle$ CAUTION

Do not execute any of the other items in the self diagnostic menu.
2. The "Self Diagnostics Menu" screen will appear. Press the \# key to select the "Touch Screen Adj." Mode.

3. The "Touch Screen Adj." calibration screen will appear. Touch the upper left corner then the lower right corner of the panel using a pointed (but not sharp!) tool.
4. Touch a few spots on the LCD touch panel, and confirm that the marker (a small circle) appears on the screen at exactly the same location as where it is touched. If it does not, touch "Cancel" on the adjustment screen. Then repeat the calibration procedure.
5. Touch "Ok" on the adjustment screen.
6. Touch "[q] Exit" and "Execute" to exit the self diagnostics menu.

## APPLICABLE MODEL:

GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: SERVICE MANUAL - INSERT

## GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow $\Rightarrow$.

- 4-96 and 97

Updated Information (Test Points/Dip Switches/LEDs)

### 4.5.4 VARIABLE RESISTORS

ADF Main Board

| Number | Function |
| :---: | :--- |
| VR100 | Adjusts the original stop position for the single-sided original at <br> no skew correction mode. |
| VR101 | Adjusts the original stop position for the double-sided original. |

### 4.5.5 LEDS

## BICU

| Number | Monitored Signal |
| :---: | :--- |
| LED101 | Blinking : Normal <br> Stays on or off : CPU defective |
| LED103 | Turns on when the main power switch on. |
| LED104 | Blinking : Normal <br> Stays on or off : HDD abnormal |

Paper Feed Board

| Number | Monitored Signal |
| :---: | :--- |
| LED101 | Turns on 500ms interval : Normal (software) <br> Turns on 200ms interval : Software error <br> Stays on of off : Paper feed board defective |

ADF Main Board O: ON \&

| LED100 | LED101 | LED102 |  |
| :---: | :---: | :---: | :---: |
| $\bigcirc$ | - | - | Entrance Sensor Jam |
| - | $\bigcirc$ | - | Registration Sensor Jam |
| $\bigcirc$ | $\bigcirc$ | - | Exit Sensor Jam |
| - | - | $\bigcirc$ | Inverter Sensor Jam |
| $\bigcirc$ | - | $\bigcirc$ | Jammed paper not removed: <br> Between entrance sensor + registration sensor |
| $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | Jammed paper not removed: On the exposure glass |
| $\pm$ | - | - | Feed-in Motor Abnormal |
| - | 2 | - | Transport Motor Abnormal |
| - | - | 2 | Feed-out Motor Abnormal |
| 2 | 2 | - | Pick-up Motor Abnormal |
| - | 2 | 2 | Bottom Plate Motor Abnormal |
| \% | \& | * | DF Position (Open) |
| \& | - | \& | APS Sensor ON |
| \% | - | - | Normal |

## $\Rightarrow 4.6$ SPECIAL TOOLS AND LUBRICANTS

### 4.6.1 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 |

### 4.6.2 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 |

## APPLICABLE MODEL:

GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: SERVICE MANUAL - INSERT

## GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:
The revised areas have been highlighted by an arrow $\Rightarrow$.

- vi and viii
- 4-98 through 100
- 7-34 through 51

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### 4.7 FIRMWARE HISTORY

### 4.7.1 A292/A293 FIRMWARE MODIFICATION HISTORY

| A292/A293 BICU FIRMWARE MODIFICATION HISTORY |  |  |  |
| :---: | :---: | :---: | :---: |
| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION |
| Initial Production | A2937553 B | Initial Production | 3.0 |
| Note: <br> 1) The LCDC ROM A2935203C is required for BICU firmware version 3.1 (A2937564, A2937565 and A2937566). <br> 2) Version 3.1 requires the printer controller. <br> 1. Language <br> The following items have been changed from English to the language selected: <br> 1) Stamp Setting <br> Note: For Portuguese and Polish, the Stamp setting is still displayed in English. <br> The correction for this will be included in the next software update. <br> 2) Language Priority button <br> 2. A3/DLT Double Count corrected for Copy counter and Printer counter When making A3/DLT copies, the Copy and Printer Counters do not count up by 2, <br> even if A3/DLT Double Count has been set. <br> Note: The Total Counter correctly counts up by 2 . <br> 3. Key counter in connect copy mode. When the key counter is removed from the machine during a copy job in connect copy mode, both copiers will stop and display "paper jam". <br> 4. Slip-Sheet Mode It is possible to select "Copy" or "Blank" from the operation panel in Slip-Sheet Mode. | A2937553 C | Not Available | 3.1 |

8. 8K/16K Paper Size (China/Taiwan)
8K/16K paper size can be fed from Trays
2 and 3 by selecting 3:CH in SP5131
"Paper Size Type Selection".
Note: The factory default for SP5131 is
3:CH in models for China and Taiwan.



## SC736: Finisher paper exit guide plate motor error

-Definition- [B]
It occurs 2 times consecutively that the paper exit guide plate HP sensor is not activated within 750 ms after the paper exit guide plate motor starts.
-Possible cause-

- Paper exit guide plate sensor defective or poor connection
- Paper exit guide plate motor defective
- Finisher main board defective
- Too much load on the drive mechanism


## SC737: Finisher staple waste full

-Definition- [A]
The box for staple waste becomes full.
-Possible cause-

- Box is full of staple waste
- Staple waste sensor defective


## SC738: Finisher shift tray lift motor error

-Definition- [B]
It occurs 2 times consecutively that;

1) The stack height sensor is not activated within 50 seconds after the motor starts lifting the tray.
2) The stack height sensor is still activated 5 seconds after the motor starts lowering the tray.
-Possible cause-

- Stack height sensor defective or poor connection
- Shift tray lift motor defective
- Finisher main board defective
- Too much load on the drive mechanism
$\Rightarrow$ SC740: 1,000-sheet finisher error in finisher area
- Definition - [B]

Note: When this SC is displayed, check SP7-902 (SC detail). The first 2 digits indicate the type of error.

Example: $740 \underline{0100000000000000}$

## 01: Shutter movement error

1) The shutter position switch does not turn on within 1 s after the transport motor starts to turn in reverse.
2) The shutter sensor does not deactivate within 1 s after the transport motor starts to turn in reverse.
3) The shutter position switch is off when the shift tray safety switch is off.

- Possible causes -
- Transport motor defective
- Shutter position switch defective
- Shift tray safety switch defective


## 02: Exit motor error

1) After the exit motor turns on, the exit motor sensor does not send the proper signal to the finisher board.
2) The exit motor sensor does not send the clock signal to the finisher board for certain period while the exit motor is on.

- Possible causes -
- Exit motor defective
- Exit motor sensor defective


## 03: Upper exit plate movement error

1) The upper exit guide 2 switch does not turn on within 1 s after the guide plate motor turns on.
2) The upper exit guide sensor does not activate within 1s after the guide plate motor turns on.
3) The upper exit guide 2 switch does not turn on when the shift tray safety switch is off.

- Possible causes -
- Guide plate motor defective
- Upper exit guide 2 switch defective
- Upper exit guide sensor defective
- Shift tray safety switch defective


## 04: Jogger motor error

1) After the jogger motor turns on to move the jogger fence from its home position, the jogger HP sensor does not deactivate within 2s.
2) After the jogger motor turns on to return the jogger fence to its home position, the jogger HP sensor does not activate within 2s.

- Possible causes -
- Jogger motor defective
- Jogger HP sensor defective


## 05: Stapler motor error

1) After the stapler motor turns on to move the stapler unit from its home position, the stapler unit HP sensor does not deactivate within 4s.
2) After the stapler motor turns on to return the stapler unit to its home position, the stapler unit HP sensor does not activate within 4 s .

- Possible causes -
- Stapler motor defective
- Stapler unit HP sensor defective


## 06: Staple hammer motor error

1) The staple hammer HP sensor does not deactivate within 0.5 s after the staple hammer motor turns on.
2) The staple hammer HP sensor does not activate within 0.5 s after the staple hammer motor turns on.

- Possible causes -
- Staple hammer motor defective
- Staple hammer HP sensor defective


## 07: Tray lift motor error

1) The tray lift motor does not stop within 15 s after being turned on.
2) The shift tray HP sensor does not activate within 15 s after the tray lift motor turns on.
3) The shift tray upper limit switch turns on while the shift tray is being raised.
4) Lift motor sensors $1 \& 2$ do not send the clock signals to the finisher board every 200 ms while the tray lift motor is on.

- Possible causes -
- Tray lift motor defective
- Lift motor sensor 1 defective
- Lift motor sensor 2 defective
- Shift tray HP sensor defective
- Shift tray upper limit switch defective


## 08: Shift tray height sensor error

1) Abnormal communication data between finisher board and shift tray height sensor.
2) No communication between finisher board and shift tray height sensor for a certain period.
3) The finisher board detects a connection error with the connector for the shift tray height sensor.
4) Adjustment error during shift tray height sensor adjustment.

- Possible causes -
- Shift tray height sensor defective
- Finisher board defective


## 09: Back-up RAM error

The check sum is abnormal when the main switch is turned on.

- Possible causes -
- Finisher board defective


## OA: Communication error

Communication error between finisher board and booklet unit board.

- Possible causes -
- Finisher board defective
- Booklet unit board defective
- Poor connection of the interface harness


## $\Longrightarrow$ SC741: 1,000-sheet finisher error in saddle stitching area

- Definition - [B]

Note: When this SC is displayed, check SP7-902 (SC detail). The first 2 digits indicate the type of error.
Example: $741 \underline{0100000000000000}$

## 01: Positioning plate motor error

1) After the positioning plate motor turns on to move the positioning plate from its home position, the positioning plate HP sensor does not deactivate within 1.25 s.
2) After the positioning plate motor turns on to return the positioning plate to its home position, the positioning plate HP sensor does activate within 1 s .

- Possible causes -
- Positioning plate motor defective
- Positioning plate HP sensor defective


## 02: Folder roller motor error

1) The folder roller motor sensor doesn't send the clock pulse to the booklet unit board within a certain period after the folder roller motor turns on.

- Possible causes -
- Folder roller motor defective
- Folder roller motor sensor defective


## 03: Shutter guide motor error

1) After the shutter guide motor turns on to move the shutter guide from its home position, the shutter guide HP sensor does not deactivate within 0.4 s .
2) After the shutter guide motor turns on to return the shutter guide to its home position, the shutter guide HP sensor does not activate within 1 s .

- Possible causes -
- Shutter guide motor defective
- Shutter guide HP sensor defective


## 04: Booklet jogger motor error

1) After the booklet jogger motor turns on to move the booklet jogger plate from its home position, the booklet jogger HP sensor does not deactivate within 0.5 s .
2) After the booklet jogger motor turns on to return the booklet jogger plate to its home position, the booklet jogger HP sensor does not activate within 1 s .

- Possible causes -
- Booklet jogger motor defective
- Booklet jogger HP sensor defective


## 05: Stapler motor error

1) The front staple hammer HP switch does not turn off within 0.5 s after the front stapler motor turns on.
2) The front staple hammer HP switch does not turn on within 0.5 s after the front stapler motor turns on during jam recovery.
3) The rear staple hammer HP switch does not turn off within 0.5 s after the rear stapler motor turns on.
4) The rear staple hammer HP switch does not turn on within 0.5 s after the rear stapler motor turns on during jam recovery.

- Possible causes -
- Front stapler motor defective
- Front staple hammer HP switch defective
- Rear stapler motor defective
- Rear staple hammer HP switch defective


## 06: Folder plate motor error

1) After the folder plate motor turns on to return the folder plate to its home position, the folder plate HP sensor does not activate within 0.3 s .
2) After the folder plate motor turns on to move the folder plate from its home position, the folder plate HP sensor does not deactivate within 0.3 s .
3) After the folder plate motor turns on to return the folder plate to its home position, the folder plate return sensor does not deactivate within 0.3 s .
4) The folder plate return sensor does not activate within 0.3 s after the HP sensor deactivates.
5) The pulse count from the folder plate motor sensor is lower than the target minimum.

- Possible causes -
- Folder plate motor defective
- Folder plate HP sensor defective
- Folder plate return sensor defective
- Folder plate motor sensor defective


## 07: Connector error

1) The connector of the shutter guide HP sensor is not connected.
2) The connector of the folder plate HP sensor is not connected.
3) The connector of the folder plate return sensor is not connected.

- Possible causes -
- Poor connection or no connection of the shutter guide HP sensor connector
- Poor connection or no connection of the folder plate HP sensor connector
- Poor connection or no connection of the folder plate return sensor connector


## 08: Switch error

1) When the booklet entrance guide sensor, lower door sensor and booklet exit cover sensor are all activated (doors closed), the booklet entrance guide safety switch does not turn on within 1 s after a copy job or warm-up idling begins.
2) When the booklet entrance guide sensor, lower door sensor and booklet exit cover sensor are all activated (doors closed), the lower door safety switch does not turn on within 1 s after a copy job or warm-up idling begins.
3) When the booklet entrance guide sensor, lower door sensor and booklet exit cover sensor are all activated (doors closed), the booklet exit cover safety switch does not turn on within 1s after a copy job or warm-up idling begins.

- Possible causes -
- Booklet entrance guide safety switch defective
- Lower door safety switch defective
- Booklet exit cover safety switch defective


## 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 counter is not connected.

## -Possible cause-

- Mechanical total counter defective
- Mechanical total counter connector not connected


## SC951: F-gate signal error 2

-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 -
- SBICU 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


## SC956: Scanner setting ID error

-Definition- [B]
The ID that is sent from the IPU for scanner parameter setting is different from expected.
-Possible cause-

- Software error


## SC957: Scanner return ID error

-Definition- [B]
The ID that is sent from the IPU for the scanner return signal is different from expected.
-Possible cause-

- Software error


## $\Rightarrow$

## SC958: Scanner ready ID error

-Definition- [B]
The ID that is sent from the IPU for the scanner ready signal is different from expected.
-Possible cause-

- Software error


## SC959: Printer setting ID error

-Definition- [B]
The ID that is sent from the IPU for the printer setting signal is different from expected.
-Possible cause-

- Software error


## SC960: Printer return ID error

-Definition- [B]
The ID that is sent from the IPU for the printer return signal is different from expected.

## -Possible cause-

- Software error


## SC961: Printer ready ID error

-Definition- [B']
The ID that is sent from the printer controller in the printer controller printing ready condition is incorrect.

- Possible causes -
- Software defective


## SC962: Memory setting ID error

-Definition- [B’]
The ID that is sent from the memory when the IPU sent the memory ready signal is incorrect.

- Possible causes -
- Software defective


## $\Rightarrow$ <br> SC963: Memory finishing ID error

-Definition- [B']
The ID that is sent from the memory when the IPU sent the memory finish signal is incorrect.

- 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 MCU does not send the ready signal for 10 seconds after the scanning start command is sent to the MCU.
-Possible cause-

- Communication error between BICU and MCU
- MCU software defective
- Buffer is full


## SC980: HDD access error

-Definition- [B]
Incorrect parameter is sent from the BICU to the HDD controller.

- Possible causes -
- Software defective
- BICU defective


## SC982: HDD construction error

-Definition- [B']
A HDD that does not have the correct specifications has been installed.

- Possible causes -
- Insufficient memory
- Incorrect hard disk type


## SC984: HDD response error

-Definition- [B’]
The HDD controller does not generate any response when the BICU sends a read/write signal to the HDD controller.

- Possible causes -
- Software defective
- HDD defective or poor connection


## SC990: Software performance error

-Definition- [B’]
The software performs an unexpected function.

- Possible causes -
- Software defective

NOTE: When this SC occurs, the file name, address, and data will be stored in the NVRAM. This data can be checked by entering SP mode then pressing " 0 ".

Note the above data and the situation in which this SC occurs. Then report the data and conditions to your technical control center.

## $\Rightarrow 7.2$ ELECTRICAL COMPONENT DEFECTS

### 7.2.1 SENSORS

| Component (Symbol) | Connector No. | Condition | Symptom |
| :---: | :---: | :---: | :---: |
| Scanner Home Position (S1) | CN555-2 <br> (MCU) | Stays On | SC121 is displayed. |
|  |  | Stays Off | SC120 is displayed. |
| Original Width (S2) | $\begin{gathered} \hline \text { CN555-6, } 7, \\ 8 \\ \text { (MCU) } \end{gathered}$ | 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. |
| $\begin{gathered} \text { Original } \\ \text { Length-1 (S3) } \end{gathered}$ | $\begin{aligned} & \hline \text { CN555-11 } \\ & (M C U) \end{aligned}$ | 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. |
| $\begin{gathered} \text { Original } \\ \text { Length-2 (S4) } \end{gathered}$ | $\begin{aligned} & \hline \text { CN555-14 } \\ & \text { (MCU) } \end{aligned}$ | 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. |
| LD Unit Home Position (S5) | $\begin{gathered} \hline \text { CN202-8 } \\ (\mathrm{IOB}) \end{gathered}$ | Stays On | SC328 is displayed when the laser beam pitch is changed. |
|  |  | Stays Off | SC327 is displayed when the laser beam pitch is changed. |
| Drum Potential Sensor (S6) | $\begin{gathered} \text { CN206-A12 } \\ (\mathrm{IOB}) \end{gathered}$ | Open | The machine quits auto process control |
|  |  | Shorted | and enters fixed toner supply mode. |
| Toner Density (TD) (S7) | $\begin{gathered} \text { CN211-B9 } \\ \text { (IOB) } \\ \hline \end{gathered}$ | Stays On | SC340 is displayed. |
|  |  | Stays Off | SC340 is displayed. |
| $\begin{aligned} & \text { Image Density } \\ & \text { (ID) (S8) } \\ & \hline \end{aligned}$ | $\begin{gathered} \text { CN206-B11 } \\ \text { (IOB) } \\ \hline \end{gathered}$ | Open | SC352 is displayed after copying. |
|  |  | Shorted | SC350 is displayed after copying. |
| Toner End (S9) | $\begin{gathered} \text { CN211-B5 } \\ \text { (IOB) } \end{gathered}$ | Open | "Toner End" is displayed even if there is enough toner in the toner hopper. |
|  |  | Shorted | "Toner End" is not displayed even if there is no toner in the toner hopper. |
| Toner Collection Motor (S10) | CN270-7 (PFB) | Stays On | SC495 is displayed. |
|  |  | Stays Off | SC495 is displayed. |
| $\begin{gathered} \text { Toner } \\ \text { Recycling (S11) } \\ \hline \end{gathered}$ | $\begin{gathered} \text { CN207-B2 } \\ (\mathrm{IOB}) \end{gathered}$ | Stays On | SC495 is displayed. |
|  |  | Stays Off | SC495 is displayed. |
| $\begin{aligned} & \text { 1st Paper Feed } \\ & \text { (S12) } \end{aligned}$ | $\begin{gathered} \text { CN271-2 } \\ (\mathrm{PFB}) \end{gathered}$ | Stays On | "Paper Jam" is displayed even if there is no paper. |
|  |  | Stays Off | "Paper Jam" is displayed whenever a copy is made. |


| Component <br> (Symbol) | Connector <br> No. | Condition |  |
| :---: | :---: | :--- | :--- |
| 2nd Paper |  |  |  |
| Feed (S13) |  |  |  | | CN273-A2 |
| :---: |
| (PFB) |$\quad$ Stays On | "Paper Jam" is displayed even if there |
| :--- |
| is no paper. |


| Component (Symbol) | Connector No. | Condition | Symptom |
| :---: | :---: | :---: | :---: |
| Rear Fence Return (S26) | $\begin{gathered} \text { CN266-9 } \\ \text { (PFB) } \end{gathered}$ | Stays On | SC515 is displayed. |
|  |  | Stays Off | SC515 is displayed. |
| Front Side Fence Open (S27) | $\begin{gathered} \hline \text { CN265-A3 } \\ \text { (PFB) } \end{gathered}$ | Stays On | SC515 may display. |
|  |  | Stays Off | SC515 may display. |
| Front Side Fence Close (S28) | CN265-A6 (PFB) | Stays On | SC515 may display. |
|  |  | Stays Off | SC515 may display. |
| $\begin{aligned} & \text { Rear Side } \\ & \text { Fence Open } \\ & \text { (S29) } \end{aligned}$ | $\begin{aligned} & \text { CN265-A9 } \\ & \text { (PFB) } \end{aligned}$ | Stays On | SC515 may display. |
|  |  | Stays Off | SC515 may display |
| Rear Side Fence Close (S30) | $\begin{gathered} \hline \text { CN265-A12 } \\ \text { (PFB) } \end{gathered}$ | Stays On | SC515 may display |
|  |  | Stays Off | SC515 may display |
| Right TrayDown (S31) | $\begin{aligned} & \text { CN265-B3 } \\ & \text { (PFB) } \end{aligned}$ | Stays On | The bottom plate is not lowered when paper on the left tray shift to the right tray, and paper is set in the improper position. When the main switch turn on, no paper is indicated on the display even if there is paper on the right tray. |
|  |  | Stays Off | The bottom plate lift lower locks at the lowest position. |
| $\begin{aligned} & \text { Right Tray } \\ & \text { Paper (S32) } \end{aligned}$ | $\begin{aligned} & \text { CN265-B9 } \\ & (\mathrm{PFB}) \end{aligned}$ | Stays On | The bottom plate rises and falls even if there is no paper. |
|  |  | Stays Off | The bottom plate close not rise even if there is paper on the tray. |
| Left Tandem Tray Paper (S33) | $\begin{aligned} & \hline \text { CN266-11 } \\ & \text { (PFB) } \end{aligned}$ | Stays On | The rear fence moves back and forth continuously. |
|  |  | Stays Off | The paper on the left tray is not moved to the right tray. No paper is indicated event if there is paper on the left tray. |
| $\begin{gathered} \text { Duplex } \\ \text { Entrance (S34) } \end{gathered}$ | $\begin{gathered} \text { CN208-B14 } \\ (\mathrm{IOB}) \end{gathered}$ | Stays On | "Paper Jam" is displayed even if there is no paper. |
|  |  | Stays Off | "Paper Jam" is displayed whenever a copy is made. |
| Duplex Inverter (S35) | $\begin{aligned} & \text { CN208-B17 } \\ & (\text { IOB }) \end{aligned}$ | 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 (S36) | CN208-B5 <br> (IOB) | Stays On | "Paper Jam" is displayed whenever a copy is made. |
|  |  | Stays Off | "Paper Jam" is displayed even if there is no paper. |
| DuplexTransport 2(S37) | $\begin{aligned} & \text { CN208-B8 } \\ & \text { (IOB) } \end{aligned}$ | Stays On | "Paper Jam" is displayed whenever a copy is made. |
|  |  | Stays Off | "Paper Jam" is displayed even if there is no paper. |


| Component (Symbol) | Connector No. | Condition | Symptom |
| :---: | :---: | :---: | :---: |
| DuplexTransport 3(S38) | $\begin{aligned} & \text { CN208-B11 } \\ & \text { (IOB) } \end{aligned}$ | Stays On | "Paper Jam" is displayed whenever a copy is made. |
|  |  | Stays Off | "Paper Jam" is displayed even if there is no paper. |
| $\begin{gathered} \text { Duplex Jogger } \\ \text { HP (S39) } \end{gathered}$ | $\begin{gathered} \text { CN208-B2 } \\ \text { (IOB) } \\ \hline \end{gathered}$ | Stays On | SC521 is displayed. |
|  |  | Stays Off | SC520 is displayed. |
| Relay (S40) | $\begin{aligned} & \text { CN211-A8 } \\ & \text { (IOB) } \end{aligned}$ | Stays On | "Paper Jam" is displayed even if there is no paper. |
|  |  | Stays Off | "Paper Jam" is displayed whenever a copy is made. |
| Registration (S41) | $\begin{aligned} & \text { CN211-A1 } \\ & \text { (IOB) } \end{aligned}$ | 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 (S42) | $\begin{gathered} \hline \text { CN209-6 } \\ \text { (IOB) } \end{gathered}$ | 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. |
| Fusing Exit (S43) | $\begin{aligned} & \text { CN207-B8 } \\ & (\mathrm{IOB}) \end{aligned}$ | Stays On | "Paper Jam" is displayed even if there is no paper. |
|  |  | Stays Off | "Paper Jam" is displayed whenever a copy is made. |
| 1st Exit (S44) | $\begin{aligned} & \text { CN204-B2 } \\ & \text { (IOB) } \end{aligned}$ | Stays On | "Paper Jam" is displayed whenever a copy is made. |
|  |  | Stays Off | "Paper Jam" is displayed even if there is no paper. |
| 2nd Exit (S45) | $\begin{aligned} & \hline \text { CN204-B5 } \\ & \text { (IOB) } \end{aligned}$ | Stays On | "Paper Jam" is displayed whenever a copy is made. |
|  |  | Stays Off | "Paper Jam" is displayed even if there is no paper. |
| Tray Paper Limit (S46) (Option) | $\begin{aligned} & \hline \text { CN204-B8 } \\ & \text { (IOB) } \end{aligned}$ | Stays On | Paper jams may occur. |
|  |  | Stays Off | "Paper Full on Exit Tray" is displayed. |

### 7.2.2 SWITCHES

| Component (Symbol) | Connector No. | Condition | Symptom |
| :---: | :---: | :---: | :---: |
| Main Power (SW1) | $\begin{aligned} & \text { CN101-1, } 2 \\ & \text { CN111-1, } 2 \end{aligned}$ | Open | The machine does not turn on. |
|  |  | Shorted | The machine does not turn off. |
| Front Door Safety (SW3,5) | $\begin{gathered} \text { CN403-1, } 3 \\ (\text { LDU }) \end{gathered}$ | Open | SC322 is displayed. |
|  |  | Shorted |  |
| $\begin{gathered} \text { Front Door } \\ \text { Safety (SW4) } \end{gathered}$ | $\begin{gathered} \hline \text { CN152-3, 6, } \\ 7 \text { (CNB) } \end{gathered}$ | Stays On | "Close the Door" is displayed even if the front cover is closed. SC440, 441, or 531 is displayed. |
|  |  | Stays Off | "Close the Door" is not displayed even if the front cover is opened. |
| Lower Front Door Safety (SW6) | $\begin{aligned} & \text { CN268-1 } \\ & \text { (PFB) } \end{aligned}$ | Open | SC506 is displayed. |
|  |  | Shorted |  |
| Toner Collection Bottle Set (SW7) | $\begin{aligned} & \text { CN268-10 } \\ & \text { (PFB) } \\ & \text { CN270-10 } \end{aligned}$ | Open | SC 496 is displayed. |
|  |  | Shorted | No caution is displayed on the operation panel even if the toner collection bottle is set incorrectly. |
| Toner Overflow (SW8) | $\begin{aligned} & \hline \text { CN270-12 } \\ & \text { (PFB) } \end{aligned}$ | Open | "Full Used Toner Bottle" is displayed even if the toner collection bottle is not full. |
|  |  | Shorted | "Full Used Toner Bottle" is not displayed even if the toner collection bottle is full. |
| $\begin{gathered} \hline \text { Paper Size } \\ \text { (SW9) } \end{gathered}$ | $\begin{gathered} \text { CN262- } \\ 8,9,10,11,1 \\ 2 \\ \text { (PFB) } \end{gathered}$ | Open <br> Shorted | The CPU cannot detect the proper paper size, and misfeeds may occur when a copy is made. |

## $\Rightarrow$ 7.3 BLOWN FUSE CONDITIONS

| Fuse | Rating |  | Symptom when turning on the main <br> power switch |
| :--- | :--- | :--- | :--- |
|  | $\mathbf{1 1 5 V}$ | $\mathbf{2 1 0} \sim \mathbf{2 3 0 V}$ |  |
| Power Supply Board |  |  |  |
| FU101 | $12 \mathrm{~A} / 250 \mathrm{~V}$ | $6.3 \mathrm{~A} / 250 \mathrm{~V}$ | No response |
| FU102 | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | Nothing is displayed on LCD. |
| FU103 | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | SC101 is displayed. |
| FU104 | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | The ADF does not work. |
| FU105 | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | SC520 is displayed. |
| FU106 | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | SC530 is displayed after the start key is <br> pressed. |
| FU107 | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | $6.3 \mathrm{~A} / 125 \mathrm{~V}$ | SC542 is displayed. |

BULLETIN NUMBER: A292/A293-009
09/20/2000
APPLICABLE MODEL:
GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: PARTS CATALOG UPDATES

## GENERAL:

The following parts updates are being issued for all A292/A293 Parts Catalogs.

- UPDATE 1: Tapping Screws - Correct the illustration as shown below. Please update your parts catalogs with the following information.


| OLD PART NO. | NEW PART NO. | REFERENCE |  |  |  |  |  |  |
| :---: | :---: | :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| 04340080 | 04340082 W | Tapping Screw $-\mathrm{M} 4 \times 8$ | QTY | PAGERIPTION | ITEM |  |  |  |
| -- | $04503008 B$ | Tapping Screw $-\mathrm{M} 3 \times 8$ | - | 15 | 103 |  |  |  |

Continued...

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- UPDATE 2: Philips Pan Head Screw - M3x6 - Please update your parts catalogs with the following information.

|  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | PAGE | ITEM |
| 03530060B |  | Philips Pan Head Screw - M3x6 | - | 33 | 103 |
|  | 03530030B | Philips Truss Head Screw - M3x3 | - |  |  |

- UPDATE 3: Cushion - 0.5 - Please update your parts catalogs with the following information.

|  | REFERENCE |  |  |  |  |
| :---: | :---: | :--- | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | PAGE | ITEM |
| $54421924-2$ | Exposure Glass Cushion | 2 | 41 | 16 |  |

- UPDATE 4: Exposure Glass Cushion - Please update your parts catalogs with the following information.


|  |  | REFERENCE |  |  |
| :---: | :--- | :---: | :---: | :---: |
| PART NUMBER | DESCRIPTION | QTY | PAGE | ITEM |
| 54421924 | Exposure Glass Cushion | 2 | 65 | $16^{*}$ |

* Denotes new item number.

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## Page 3 of 3

- UPDATE 5: Cleaning Entrance Seal - $3 \times 345 \times 2$ - Please update your parts catalogs with the following information.


|  |  | REFERENCE |  |  |
| :---: | :---: | :---: | :---: | :---: |
| PART NUMBER | DESCRIPTION | QTY | PAGE | ITEM |
| AA153088 | Cleaning Entrance Seal $-3 \times 345 \times 2$ | 1 | 91 | $26^{*}$ |

* Denotes new item number.
- UPDATE 6:

Tapping Bind Screw - M4x12 \& Clamp-. Items 114 and 115 were omitted from the parts listing. Please update your parts catalogs with the following information


|  |  | REFERENCE |  |  |
| :---: | :--- | :---: | :---: | :---: |
| PART NUMBER | DESCRIPTION | QTY | PAGE | ITEM |
| 11050199 | Clamp | - | 127 | 114 |
| $04140120 B$ | Tapping Bind Screw - M4x12 | - | 127 | 115 |

## SUBJECT: PARTS CATALOG UPDATES

## GENERAL:

The following parts updates are being issued for all A292/A293 Parts Catalogs.

- UPDATE 1: NV-RAM Minus Counter - The NV-RAM Minus Counter (P/N

A2939099) $($ Counter $=9990000)$ has been registered as a service part in place of IC-SRAM M48Z128Y-85PM (P/N 14075050). The table for the BICU Board has been changed as shown in the tables below.
Please update your parts catalog with the following information.
BICU BOARD (A292/A293)

| SYMBOL |  |
| :---: | :---: |
| NO. | INDEX <br> NO. |
| IC111 | 142 |
| IC112 | 140 |
| IC113 | 126 |
| IC114 | 132 |
| IC115 | 133 |
| IC116 | 117 |
| IC117 | 132 |
| IC118 | 127 |
| IC119 | 139 |
| IC120 | 145 |


| SYMBOL <br> NO. | INDEX <br> NO. |
| :---: | :---: |
| IC111 | 142 |
| IC112 | 140 |
| IC113 | 126 |
| IC114 | 132 |
| IC115 | 133 |
| IC116 | $\mathbf{2 2 4}=>$ |
| (Socket) | $\mathbf{1 1 7}$ |
| IC117 | 132 |
| IC118 | 127 |
| IC119 | 139 |
| IC120 | 145 |

REFERENCE

| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 14075050 | - | IC-SRAM M48Z128Y-85PM | $1 \rightarrow 0$ | - | 159 | 224 |
| - | A2939099 | NV-RAM Minus Counter | 1 | 1 | 157 | $5^{*}$ |

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- UPDATE 2: 1st Scanner Unit- Due to a request from the vendor, the Scanner Frame and the Front and Rear Side Plates for the 1st Scanner are no longer available. If any of these parts should fail, replace the 1st Scanner Unit Assembly (P/N A2931731). Please update your parts catalog with the following information.


|  |  |  |  | REFERENCE |  |  |  |  |
| :---: | :---: | :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | PAGE | ITEM |  |  |  |
| A2931732 | - | 1st Scanner Frame | $1 \rightarrow 0$ | 45 | 21 |  |  |  |
| A2931733 | - | Front Side Plate - 1st Scanner | $1 \rightarrow 0$ | 45 | 16 |  |  |  |
| A2931734 | - | Rear Side Plate - 1st Scanner | $1 \rightarrow 0$ | 45 | 19 |  |  |  |
| - | A2931731 | 1st Scanner Unit Assembly | 1 | 45 | $26^{*}$ |  |  |  |

* Denotes new item number.
- UPDATE 3: Hexagon Headless Set Screw - M4x4 - The parts illustration incorrectly identified the Set Screw for the Flange Fly Wheel as item 103. Please correct the illustration and update your parts catalog with the following information.


|  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: |
| PART NUMBER | DESCRIPTION | QTY | PAGE |
| ITEM |  |  |  |
| $05740040 E$ | Hexagon Headless Set Screw - M4x4 | n | 121 |

* Denotes new item number.

Continued...

Tech Service Bulletin No. A292/A293-010

## Page 3 of 3

- UPDATE 4: Compression Spring- To ensure that the Transfer Belt releases from the Drum, the Compression Spring has been removed. Please update your parts catalog with the following information.


| REFERENCE |  |
| :--- | :--- |
| PAGE | ITEM |
| 95 | 22 |

## UNITS AFFECTED:

All A292/A293 copiers manufactured after the Serial Numbers listed below will have the Compression Spring removed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Gestetner | H4705100281 |
| Gestetner | H4805100181 |
| Ricoh | H4705000001 |
| Ricoh | H 4805000001 |
| Savin | H 4705100281 |
| Savin | H 4805100181 |

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

## APPLICABLE MODEL:

GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: SERVICE MANUAL - INSERT

## GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow $\Rightarrow$.

- 4-101 through 103

Updated Information (Firmware History)

A292/A293 BICU FIRMWARE MODIFICATION HISTORY

| A292/A293 BICU FIRMWARE MODIFICATION HISTORY |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| DESCRIPTION OF MODIFICATION |  |  |  | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION |
| Corrections / Updates: <br> 1. New Copy Feature and SP Mode (SP5971) Added <br> 1) New Copy Feature: Enhance Density Mode <br> This feature has been added to ensure that image density does not drop while making multiple copies of originals with a high percent of solid black areas. <br> To set effective original density and number of copies for multi-copy mode, use SP5971 (see below). To add the Enhance Density Key to the display panel and to control the level, perform the following procedure: <br> (1) Press the User Tools/Counter key. <br> (2) Press the Copy/Document Server Features Key. <br> (3) Open General Features, screen $3 / 3$. <br> (4) Select one of the Shortcut Keys from F1-F5. <br> (5) Register the Enhance Density Key. <br> (6) Open General Features, screen $1 / 3$. <br> (7) Select the setting for <br> 2) New SP Mode: SP5971 (Enhance Copy Setting): <br> The following settings apply to Enhance Density Mode: |  |  |  | A2937553 E | Not Available | 3.5.1 |
| Mode No.$5971$ | Enhance Copy Setting Function $\quad$ Setting |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  | 2 | Effective Original Density |  | Selects the original image ratio at which the mode is activated (calc. from setting). |  | $\begin{aligned} & 1 \sim 60 \% \\ & 1 \% \text { step } \\ & 4 \% \end{aligned}$ |
|  | 3 | Effective Multiple Copy | Selects the sheet number at which mode is activated with multi-copy jobs (calc. from setting). |  |  | 1 ~ 50sheets 1 sheet step 3 sheets |


| A292/A293 BICU FIRMWARE MODIFICATION HISTORY |  |  |  |
| :---: | :---: | :---: | :---: |
| DESCRIPTION OF MODIFICATION | FIRMWARE LEVEL | SERIAL NUMBER | FIRMWARE VERSION |
| 3. Fusing Unit Fan Motor Off-Timing Change <br> To ensure that the hot air around the toner bottle is properly removed, the fusing unit fan motor will be kept on whenever the 24 V is being supplied. <br> Therefore, it will turn off only when the main switch or operation switch is turned off or when the machine is shut down by the AutoOff function. <br> 4. Word Correction <br> Some display language words and phrases have been corrected or improved. |  |  |  |
| Corrections / Updates: <br> 1. New SP Mode (SP5970) for EB-70 (Printer controller) The following setting applies when the EB-70 printer controller is installed. | A2937553 F | Not Availbale | 3.6 |
| Function |  |  | Setting |
| Printer Installed |  |  |  |
|  | Selects whethe controller is inst | EB-70 printer d or not. | $\begin{aligned} & \text { 0: No } \\ & \text { 1: Yes } \end{aligned}$ |
| 2. Some Part of Image Missing in Tab Stock when Printing from Document Server <Symptom> <br> When files in the Document Server are printed onto Tab Stock, the image is not rotated even though tab stock can be set sideways only. This is because the documents are saved lengthwise only in the Document Server. <br> <Modification> <br> The error has been corrected. |  |  | Continue ... |


$\Rightarrow$| A292/A293 BICU FIRMWARE MODIFICATION HISTORY |  |  |  |
| :--- | :---: | :---: | :---: |
|  | DESCRIPTION OF MODIFICATION | FIRMWARE <br> LEVEL | SERIAL <br> NUMBER | | FIRMWARE |
| :---: |
| VERSION |$|$| 3.Malfunction with Printer Dot Edge <br> Parameter Setting when Printing from <br> Document Server <br> <Symptom> <br> When edge smoothing is off, the line <br> thickness is not changed when the <br> printer dot edge parameter setting <br> (SP2114) is changed. <br> <Modification> <br> The error has been corrected. |  |  |
| :--- | :--- | :--- |

## BULLETIN NUMBER: A292/A293 - 012

10/11/2000

## APPLICABLE MODEL: <br> GESTETNER - 3355/3370 <br> RICOH - AFICIO 551/700 <br> SAVIN - 2055DP/2070DP

## SUBJECT: SERVICE MANUAL - INSERT

## GENERAL:

The Service Manual page listed below must be replaced with the page supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow $\Rightarrow$.

- 4-74

Updated Information (NVRAM - Ram Replacement)

### 4.2.7 MEMORY ALL CLEAR (SP5-801)

NOTE: Memory All Clear mode resets all the settings stored in the NVRAM to their default settings except the following:

- Electrical total counter value (SP7-003-1)
- Machine serial number (SP5-811)
- Plug \& Play Brand Name and Production Name Setting (SP5-907)

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.

| NV-RAM is not defective | NV-RAM is defective |
| :--- | :--- |
| 1. Print out all SMC data lists (SP 5-990-1). | 1. If possible, print out all SMC data lists (SP 5- <br> 990-1). |
| 2. Upload the NVRAM data from the BICU to the <br> flash memory card (SP 5-824). | 2. Turn the main power switch off. |
|  | 3. Replace the NV-RAM Minus Counter. |
| 3. Turn the main power switch off. | 4. Replace the developer because the TD initial <br> data is missing if the NV-RAM is defective. |
| 4. Replace the NV-RAM Minus Counter. | 5. Perform memory all clear (SP 5-801). |
| 5. Perform memory all clear (SP 5-801). NOTE 1 | 6. Turn the main power switch off and on. |
| 6. Turn the main power switch off and on. | 7. Calibrate the LCD touch panel. |
| 7. Calibrate the LCD touch panel. | 8. Perform the TD initial setting (SP 2-963). <br> Note: Do this step before the machine <br> automatically starts the Auto Process Control <br> (within approximately 2 minutes after the main <br> switch is turned on). |
| 8. Input the machine serial number (SP 5-811). | 9. Input the machine serial number (SP 5-811). |
| 9. Download the NVRAM data from the flash <br> memory card to the BICU (SP 5-825). Or, <br> referring to the SMC data lists, re-enter any <br> value which has been changed from its factory <br> setting. | 10. Adjust the laser beam pitch (SP 2-109). |
|  | 11. Perform the printer and scanner registration <br> adjustments. (See Replacement and <br> Adjustment - Copy Image - Adjustments) |
| 10. Download the stamp data from the flash <br> memory card (SP5-829). | 12. Referring to the SMC data lists, re-enter any <br> value which has been changed from its factory <br> setting. |
| 11. Check the copy quality and the paper path | 13. Download the stamp data from the flash <br> memory card (SP5-829). |
| and do any necessary adjustments. |  |

## BULLETIN NUMBER: A292/A293-013

10/18/2000

## APPLICABLE MODEL:

GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: APPLICATION BOARD

## GENERAL:

The part number for the Application Board was incorrect in the Parts Catalog. The following part correction is being issued for all A292/A293 Parts Catalogs.


|  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| INCORRECT | CORRECT | DESCRIPTION | QTY | PAGE | ITEM |
| PART NO. | PART NO. | A2931463 | Application Board | 1 | 19 |
| A2291463 | A293 | 22 |  |  |  |

RTEDM TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER: A292/A293 - 014
10/30/2000

## APPLICABLE MODEL:

GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: SERVICE MANUAL - INSERT

## GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

## PAGES:

The revised areas have been highlighted by an arrow $\Rightarrow$.

- 3-27
- 4-61
- 10-1

Updated Information (Punch Unit Installation)
Updated Information (Service Program Mode)
Updated Information (A763 Specifications)


Installation
8. Install the sensor bracket [A] (1 short stepped screw, 1 spring).
9. Connect the cables $[B]$.

NOTE: 1) The cable binders [C] must not be between the cable clamps [D].
2) The cable binder [ E ] must be positioned to the left of the cable clamp.
10. When a three-punch-hole-unit is installed: Change switch 1 of DIP SW 100 on the punch drive board to ON.
11. Slide the hopper [F] into the finisher.
12. Reassemble the finisher and attach it to the copier. Then check the punch unit operation.


## 1. OVERALL MACHINE INFORMATION

### 1.1 SPECIFICATIONS

Paper Size:

| Tray | Modes | Sizes |  |  |
| :--- | :--- | :--- | :---: | :---: |
| Proof tray | A3 to A5, DLT to HLT |  |  |  |
| Shift tray | No staple mode | A3 to A5, DLT to HLT |  |  |
|  | Staple <br> Mode | Top or <br> bottom |  |  |
|  | A3 to B5 lengthwise, DLT to HLT |  |  |  |
|  | A3, A4 sideways, B5 sideways, <br> DLT to HLT sideways |  |  |  |
| Booklet tray |  | A3 to B5, DLT to LT |  |  |

Paper Weight:

| Tray | Weight |
| :---: | :--- |
| Stack mode | $52 \mathrm{~g} / \mathrm{m}^{2}$ to $163 \mathrm{~g} / \mathrm{m}^{2}, 14$ to 42 lb |
| Staple mode | $64 \mathrm{~g} / \mathrm{m}^{2}$ to $80 \mathrm{~g} / \mathrm{m}^{2}, 17$ to 21 lb |
| Saddle stitch mode | $64 \mathrm{~g} / \mathrm{m}^{2}$ to $80 \mathrm{~g} / \mathrm{m}^{2}, 17$ to 21 lb |
|  | $64 \mathrm{~g} / \mathrm{m}^{2}$ to $128 \mathrm{~g} / \mathrm{m}^{2}, 17$ to 34 lb (Cover sheet only) |

Paper Capacity ( $80 \mathrm{~g} / \mathrm{m}^{2}, 20 \mathrm{lb}$ ):

| Tray | Modes | Paper size | Capacity |
| :---: | :---: | :---: | :---: |
| Proof tray |  | A4-S, LT-S or shorter | 150 sheets |
|  |  | A4-L, LT-L or longer | 75 sheets |
| Shift tray | No staple | A4-S, LT-S or shorter | 147mm stack height or 1000 sheets (*) |
|  |  | A4-L, LT-L or longer | 74 mm stack height or 500 sheet ( ${ }^{*}$ ) |
|  | Staple | A4-S, LT-S or shorter | 110 mm stack height or 30 sets or 750 sheets (*) |
|  |  | A4-L, LT-L or longer | 74 mm stack height or 30 sets or 500 sheets(*) |
| Staple tray | One size Mixed sizes | 1-5 sheets | 25 sets |
|  |  | 6-10 sheets | 15 sets |
|  |  | 11-15 sheets | 10 sets |

(-L": Lengthwise ,-S: Sideways)
Staple Capacity ( $80 \mathrm{~g} / \mathrm{m}^{2}, 20 \mathrm{lb}$ ):

| Modes | Paper size | Total capacity |
| :---: | :---: | :---: |
| Staple | A4-S, LT-S or shorter | $2-50$ sheets |
|  | A4-L, LT-L or longer | $2-30$ sheets |
| Saddle stitch |  | $2-15$ sheets |

(-L": Lengthwise, -S: Sideways)

* The machine will inform the operator that the tray is full when any of the conditions are met (whichever occurs first).

BULLETIN NUMBER: A292/A293-015<br>11/06/2000<br>APPLICABLE MODEL:<br>GESTETNER - 3355/3370<br>RICOH - AFICIO 551/700<br>SAVIN - 2055DP/2070DP

## SUBJECT: ADF MAIN CONTROL BOARD

## GENERAL:

The following changes have been made to the ADF Main Control Board:

1. If the Motor locks, a surge of current flows through the Motor Driver Circuit on the ADF Main Control Board, which may cause damage to the circuit. The current capacitance of the circuit has been increased to protect the circuit in the event of a surge.
2. During the production process, it was found that some ADF Main Control Boards had a relatively narrow adjustment range for the Transport Drive Motor speed. In some cases, the Motors could not reach the target adjustment speed. The defective boards were not installed in the ADF Units. Therefore, the same symptom will not occur on production machines released from the factory. To ensure the proper functionality of the ADF Main Control Board, IC \#NJM4151 on the ADF Main Control Board has been modified as follows:


Tech Service Bulletin No. A292/A293-015
Page 2 of 2
The following parts updates are being issued for all A292/A293 Parts Catalogs.

|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| B3015500 | B3015510 | ADF Main Control Board | 1 | 1 | 37 | 22 |

## UNITS AFFECTED:

A292/A293 Serial Number cut-ins were not available at time of publication.

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

BULLETIN NUMBER: A292/A293 - 015 REISSUE $\star$ APPLICABLE MODEL:<br>GESTETNER - 3355/3370<br>RICOH - AFICIO 551/700<br>SAVIN - 2055DP/2070DP

11/17/2000

## SUBJECT: ADF MAIN CONTROL BOARD

## GENERAL:

The following changes have been made to the ADF Main Control Board:

1. If the Motor locks, a surge of current flows through the Motor Driver Circuit on the ADF Main Control Board, which may cause damage to the circuit. The current capacitance of the circuit has been increased to protect the circuit in the event of a surge.
2. During the production process, it was found that some ADF Main Control Boards had a relatively narrow adjustment range for the Transport Drive Motor speed. In some cases, the Motors could not reach the target adjustment speed. The defective boards were not installed in the ADF Units. Therefore, the same symptom will not occur on production machines released from the factory. To ensure the proper functionality of the ADF Main Control Board, IC \#NJM4151 on the ADF Main Control Board has been modified as follows:


Tech Service Bulletin No. A292/A293 - 015 REISSUE $\star$ Page 2 of 2

The following parts updates are being issued for all A292/A293 Parts Catalogs.

|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| B3015500 | B3015510 | ADF Main Control Board | 1 | 1 | 37 | 22 |

## UNITS AFFECTED:

All A292/A293 copiers manufactured after the Serial Numbers listed below will have the new style ADF Main Control Board installed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Gestetner 3355 | H4705600353 |
| Gestetner 3370 | H4805600003 |
| Ricoh AFICIO 551 | H4705600064 |
| Ricoh AFICIO 700 | H4805600101 |
| Savin 2055DP | H4705600353 |
| Savin 2070DP | H4805600003 |

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

## APPLICABLE MODEL:

GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: SERVICE MANUAL - INSERT

## GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

## PAGES:

The revised areas have been highlighted by an arrow $\Rightarrow$.

- iv
- $3-39 \& 40$

Updated Information (Table of Contents)
Updated Information (Copy Tray Type 700 Installation)
2.10.4 BASIC DUPLEX FEED OPERATION ..... 2-80
Longer than A4 / Letter lengthwise ..... 2-80
2.11 ENERGY SAVER MODES ..... 2-83
2.11.1 LOW POWER MODE ..... 2-83
Entering low power mode ..... 2-83
What happens in low power mode ..... 2-83
Return to stand-by mode ..... 2-83
INSTALLATION
3. INSTALLATION PROCEDURE ..... 3-1
3.1 INSTALLATION REQUIREMENTS ..... 3-1
3.1.1 ENVIRONMENT ..... 3-1
3.1.2 MACHINE LEVEL ..... 3-1
3.1.3 MINIMUM SPACE REQUIREMENTS ..... 3-2
3.1.4 POWER REQUIREMENTS ..... 3-2
3.2 COPIER (A229/A293) ..... 3-3
3.1.1 ACCESSORY CHECK. ..... 3-3
3.1.2 INSTALLATION PROCEDURE ..... 3-4
3.3 LCT (A698) ..... 3-14
3.3.1 ACCESSORY CHECK ..... 3-14
3.3.2 INSTALLATION PROCEDURE ..... 3-15
3.4 3,000-SHEET FINISHER (B312) ..... 3-20
3.4.1 ACCESSORY CHECK ..... 3-20
3.4.2 INSTALLATION PROCEDURE ..... 3-21
3.5 PUNCH UNIT INSTALLATION (A812) FOR B312 FINISHER ..... 3-24
3.5.1 ACCESSORY CHECK ..... 3-24
3.5.2 PUNCH UNIT INSTALLATION ..... 3-25
3.6 FINISHER (B302) ..... 3-28
3.6.1 INSTALLATION PROCEDURE ..... 3-28
3.7 PUNCH UNIT INSTALLATION (A812) FOR B302 FINISHER ..... 3-31
3.7.1 ACCESSORY CHECK ..... 3-31
3.1.2 PUNCH UNIT INSTALLATION ..... 3-32
3.8 KEY COUNTER INSTALLATION ..... 3-35
3.9 COPY CONNECTOR KIT INSTALLATION ..... 3-36
3.10 COPY TRAY TYPE 700 INSTALLATION ..... 3-39
SERVICE TABLES
4. SERVICE TABLES ..... 4-1
4.1 GENERAL CAUTIONS ..... 4-1
4.1.1 DRUM ..... 4-1
4.1.2 DRUM UNIT ..... 4-1
4.1.3 TRANSFER BELT UNIT ..... 4-2
4.1.4 SCANNER UNIT ..... 4-2
4.1.5 LASER UNIT ..... 4-2
4.1.6 CHARGE CORONA ..... 4-3

### 3.10 COPY TRAY TYPE 700 INSTALLATION

### 3.10.1 ACCESSORY CHECK

Check the accessories in the box against the following list.

## Description Q'ty

1. Copy Tray ........................................................................... 1
2. Tray Paper Limit Sensor Assembly...................................... 1
3. Cap - 222 ............................................................................. 4
4. Connector Cap .................................................................... 1
5. Philips Tapping Screw - M4x8............................................. 2

### 3.10.2 INSTALLATION PROCEDURE

1) Remove the left cover [A] (2 screws).
[A]

2) Slide the collars (black) [B] into the holes in the rubber rollers [C] of the exit drive roller.

$\Rightarrow$
3) Remove the shorting connector $[A]$.
4) Install the tray paper limit sensor assembly [B].

[B]
5) Reinstall the left cover.
6) Install the four caps ( $\phi 22$ ) [C] and the connector cap [D].
7) Install the copy tray [E].


RTEDEM TECHNICAL SERVICE BULLETIN

## BULLETIN NUMBER: A292/A293-017

11/17/2000

## APPLICABLE MODEL:

GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: SERVICE MANUAL - INSERT

## GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

## PAGES:

The revised areas have been highlighted by an arrow $\Rightarrow$.

- 4-11
- 4-15
- 4-28
- 4-40
- 4-41
- 4-42
- 4-44
- 4-45
- 4-46
- 4-64
- 4-65

> Updated Information (SP Mode)
> Updated Information (SP Mode)
> Updated Information (SP Mode)
> Updated Information (SP Mode)
> Updated Information (SP Mode)
> Updated Information (SP Mode)
> Updated Information (SP Mode)
> Updated Information (SP Mode)
> Updated Information (SP Mode)
> Updated Information (SP Mode)
> Updated Information (SP Mode)

| Mode No.(Class 1, 2 \& 3) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1-007 | By-pass Feed Paper Size Display |  |  |  |  |
|  |  |  |  | Displays the paper width sensor data for the by-pass feed table. <br> 132 : A3 <br> 133 : A4 Lengthwise <br> 134 : A5 Lengthwise <br> 141 : B4 Lengthwise <br> 142 : B5 Lengthwise <br> 160 : DLT <br> 164 : LG <br> 166 : LT Lengthwise <br> 172 : HLT Lengthwise |  |
| 1-008 | Duplex Fence Position Adjustment |  |  |  |  |
|  |  |  |  | Adjusts the position of the fence (side-toside position with reference to paper feed). | $\begin{aligned} & 0 \sim-2 \\ & 0.5 \mathrm{~mm} / \mathrm{step} \\ & -1.0 \mathrm{~mm} \end{aligned}$ |
| 1-103 | Fusing Idling |  |  |  |  |
|  |  |  | * | Selects whether fusing idling is done or not. <br> If fusing is incomplete on the 1st and 2nd copies, change the setting to a longer time. This may occur if the room is cold. Refer to "Detailed Section Descriptions Fusing Temperature Control" for more details. | 0: 51/2 min. <br> 1: 10 min . <br> 2: 15 min . <br> 3: No idling |
| $1-104$ | Fusing Temperature Control |  |  |  |  |
|  |  |  | * | Selects the fusing temperature control mode. <br> After changing the setting, turn the main switch off and on. | On/Off control Phase control |
| 1-105 | Fusing Temperature Adjustment |  |  |  |  |
|  | 1 | By-pass | * | Adjusts the fusing temperature for paper fed from a by-pass tray. | $\begin{aligned} & 170 \sim 200 \\ & 1^{\circ} \mathrm{C} / \text { step } \\ & 185^{\circ} \mathrm{C} \\ & \hline \end{aligned}$ |
|  | 2 | OHP | * | Adjusts the fusing temperature for OHP sheets fed from the by-pass feed unit. | $\begin{aligned} & +10 \sim-10^{\circ} \mathrm{C} \\ & 1^{\circ} \mathrm{C} / \text { step } \\ & 0\left(165^{\circ} \mathrm{C}\right) \end{aligned}$ |
|  | 3 | Thick Paper | * | Adjusts the fusing temperature for thick paper fed from the by-pass feed unit. | $\begin{aligned} & +5 \sim-10^{\circ} \mathrm{C} \\ & 1^{\circ} \mathrm{C} / \text { step } \\ & 0\left(195^{\circ} \mathrm{C}\right) \\ & \hline \end{aligned}$ |
| 1-106 | Fusing Temperature Display |  |  |  |  |
|  |  |  |  | Displays the fusing temperature. |  |
|  |  |  |  |  |  |




| Mode No. <br> (Class 1, 2 \& 3) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 4-903 | Filter Setting |  |  |  |  |
|  | 85 | Scanner Gamma Selection Text/Photo Mode |  | 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 used. <br> 1: Scanner gamma for 'Normal' is used. <br> 2: Scanner gamma for 'Text Priority' is used. | $\begin{aligned} & 0 \sim 2 \\ & 1 / \text { step } \\ & 1 \end{aligned}$ |
| 4-904 | IPU Setting -1 |  |  |  |  |
|  | 1 | Laser Pulse Positioning in Text and Text/Photo | * | Selects whether or not laser pulse positioning control is used in text and text/photo modes Do not change the value. | $\begin{aligned} & \text { 0: Off } \\ & \text { 1: On } \end{aligned}$ |
|  | 2 | Gradation Processing Selection Photo | S | Selects the gradation processing procedure. <br> 0 : Three-gradation error diffusion <br> 1: Four-gradation error diffusion <br> 2: 8" $\times 8^{\prime \prime}$ dither matrix <br> 3: $6^{\prime \prime} \times 6^{\prime \prime}$ dither matrix <br> 4: 4" $\times 4^{\prime \prime}$ dither matrix <br> A larger dither matrix gives coarser reproduction of halftones. This SP is ignored unless the user selects 'Service Mode' in UP mode. | $\begin{aligned} & 0 \sim 4 \\ & 1 \end{aligned}$ |
|  | 4 | Forced Binary Mode | S | 1: Binary processing is done for all image modes. | $\begin{aligned} & \text { 0: No } \\ & \text { 1: Yes } \end{aligned}$ |
|  | 6 | Smoothing Filter Level in Photo Mode | S | Selects the smoothing filter level in photo mode. <br> 0 : None <br> 1: Weak <br> 5: Strong | $\begin{aligned} & 0 \sim 5 \\ & 2 \end{aligned}$ |
|  | 7 | Texture Erase Filter Level in Text Mode | S | 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 | $\begin{aligned} & 0 \sim 2 \\ & 0 \end{aligned}$ |


| Mode No.(Class 1, 2 \& 3) |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: |
| 4-904 | IPU Setting -1 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  | 20 | Thin Line Mode in Laser Writing - Text | Selects thin line mode level in laser writing for text mode. <br> 0 : None <br> 1: Weak <br> 2: Medium <br> 3: Strong | $\begin{aligned} & 0 \sim 3 \\ & 2 \end{aligned}$ |
|  | 22 | Thin Line Mode in Laser Writing Text/Photo | Selects thin line mode level in laser writing for text/photo mode. <br> 0 : None <br> 1: Weak <br> 2: Medium <br> 3: Strong | $\begin{aligned} & 0 \sim 3 \\ & 2 \end{aligned}$ |
|  | 23 | Thin Line Mode in Laser Writing - Pale | Selects thin line mode level in laser writing for pale mode. <br> 0 : None <br> 1: Weak <br> 2: Medium <br> 3: Strong | $\begin{aligned} & 0 \sim 3 \\ & 2 \end{aligned}$ |



| Mode No.(Class 1, 2 \& 3) |  |  |  | Function | Settings |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 4-911 | HDD |  |  |  |  |
|  | 1 | HDD Media Check |  | Checks for bad sectors on the hard disk that develop during machine use. This takes 4 minutes. <br> This SP mode should be done when an abnormal image is printed. There is no need to do this at installation as the hard disk firmware already contains bad sector information, and damage is not likely during transportation. <br> Bad sectors detected with this SP mode will be stored in the NVRAM with the bad sector data copied across from the firmware. If the machine detects over 50 bad sectors, SC361 will be generated. At this time, use SP4-911-2. | Start |
|  | 2 | HDD Formatting |  | Formats the hard disk. This takes 4 minutes. <br> Do not turn off the main power switch during this process. |  |
|  | 6 | HDD Bad Sector Information Reset |  | Resets the bad sector information which is stored in the NVRAM. <br> This SP should be used when the hard disk is replaced. | Start |
|  | 7 | HDD Bad Sector Display | * | Displays the number of bad sectors there are on the hard disk. <br> If the machine detects a total of over 50 bad sectors on the disk, SC361 will be generated. At this time, use SP4-911-2. | Total: 0 <br> Copy: 0 <br> Printer: 0 <br> Copy Server: <br> 0 |
|  | 8 | HDD Model Name Display |  | Displays the model name of the HDD. <br> If the HDD is not installed or the HDD connector is not connected, SC360 will be displayed. However, the user can make single copies. |  |

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| Mode No. | Function | Settings |
| :---: | :---: | :---: |
| (Class $1,2 \& 3)$ |  |  |




| Mode No. <br> (Class 1, 2 \& 3) |  | Function | Settings |
| :---: | :---: | :---: | :---: |
| 7-906 | Clear Original Number of Each size |  |  |
|  |  | Resets all counters of SP7-202. | Start |
| 7-907 | Clear Job Number of Each size |  |  |
|  |  | Resets all counters of SP7-306. | Start |
| 7-908 | Document : Clear Original Number |  |  |
|  |  | Resets all counters of SP7-002-2. | Start |
| 7-920 | Document Server: Clear Scanned Storage |  |  |
|  |  | Resets the counter of SP7-320. | Start |
| 7-921 | Document Server : Clear Original Number of Each Size |  |  |
|  |  | Resets all counters of SP7-321. | Start |
| 7-923 | Document Server : Clear Print Number of Each Copy |  |  |
|  |  | Resets all counters of SP7-323 | Start |
| 7-924 | Document Server : Clear Print Job Logging |  |  |
|  |  | Resets all counters of SP7-324 | Start |
| 7-925 | Document Server : Clear Print Job Page Distribution |  |  |
|  |  | Resets all counters of SP7-325 | Start |
| 7-926 | Document Server : Clear Print Job File Distribution |  |  |
|  |  | Resets all counters of SP7-326 | Start |
| 7-927 | Document Server : Clear Print Job Set Distribution |  |  |
|  |  | Resets all counters of SP7-327. | Start |
| 7-990 | Display the detail information for SC990 |  |  |
|  | 001 Filename <br> 002 Line Number <br> 003 Value | Displays the detail information for SC990. |  |

TECHNICAL SERVICE BULLETIN

BULLETIN NUMBER:

## APPLICABLE MODEL:

GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: PARTS CATALOG UPDATES

## GENERAL:

- UPDATE 1: Transfer Unit - To improve uneven density in half tone areas the Cleaning Roller Gears (Item No. 8 page 93 \& Item No. 31 page 95) were changed. Please refer to Technical Service Bulletin A292/A293 - 005, since these gears were part of an assembly the part number for the Transfer Belt Unit and Transfer Casing Unit have been changed.



## UNITS AFFECTED:

A292/A293 Serial Number cut-in not available at time of publication.

Tech Service Bulletin No. A292/A293-018
Page 2 of 2

- UPDATE 2: Original Length Sensor - To ensure the detection of the original length, a filter has been added to the sensor.


|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| AW010078 | A2941843 | Photosensor with Filter - H50 | 2 | 1 | 41 | 8 |

## UNITS AFFECTED:

A292/A293 Serial Number cut-in not available at time of publication.

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :--- | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

BULLETIN NUMBER: A292/A293-019<br>11/20/2000<br>APPLICABLE MODEL:<br>GESTETNER - 3355/3370<br>RICOH - AFICIO 551/700<br>SAVIN - 2055DP/2070DP

## SUBJECT: LOW IMAGE DENSITY

## SYMPTOM:

Low image density on copies caused by low copy volume made on machine around 20 to 30 K after installation.

## CAUSE:

The Fusing Fan Motor stops when the low power timer runs out ( 60 sec ) and the machine enters Energy Saver Mode. Because the Fusing Lamp remains on in order to maintain hot roller temperature, the temperature of the areas surrounding the unit rises. The resulting heat can damage the toner that is stored in the bottle above the Fusing Unit, causing some of the toner's constituents to separate out. The altered toner is then sent to the Development Unit and is mixed in with the developer, causing developer chargeability to drop. This results in low image density on copies.

This heat damage occurs on low copy volume machines, as the toner remains in the bottle for extended period of time.

## SOLUTIONS:

## Firmware:

The off timing of the Fusing Fan Motor has been delayed to remove the hot air around the Toner Bottle.

## Hardware:

As an added measure, a Heat Insulator will be installed between the front frame of the Scanner Unit and Toner Bottle to ensure that the toner is not damaged, even if the internal temperature should rise.

## Newly Installed Machines:

Upgrade the BICU firmware to ver 3.5.1 or later at installation.

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Page 2 of 2

## Field machines which have no low ID problem:

Please upgrade the BICU firmware to ver 3.5.1 at the next field visit.

The PCB ROM revision 'F' version 3.6 (file name A292REVF.EXE) can be downloaded through the Technology Solution Center FTP Site http://tsc.ricohcorp.com.

NOTE: Refer to Publication Bulletin \# 023 for more information about the FTP Internet Web Site.

## Field machines which have low ID problem:

1. Upgrade the BICU firmware to ver 3.5.1.
2. Replace the developer.
3. Replace the toner bottle.
4. Remove and clean the toner in the Toner Hopper.

BULLETIN NUMBER: A292/A293 - 020
11/28/2000
APPLICABLE MODEL:
GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: PARTS CATALOG UPDATES

## GENERAL:

The following parts updates are being issued for all A292/A293 Parts Catalogs.

- UPDATE 1: Toner Bottle Holder - If the Shutter Cover is not hung on the hook of the Right Inner Cover, machine vibration may cause the Inner Shutter to move and cover the entrance to the Toner Hopper. To secure the Shutter Cover in place, a boss ( $\phi 2, h=2$ ) has been added to the Cover. When installing the Right Inner Cover, be sure to place the boss in the Guide Rail as shown in the illustration below. Please update your Parts Catalog with the following information.


Right Inner Cover
Hook: Right Inner Cover
Boss: Shutter Cover

|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| A2933201 | A2933205 | Toner Bottle Holder Ass'y (NRG/SVN) | 1 | 1 | 77 | 1 |
| A2933202 | A2933206 | Toner Bottle Holder Ass'y (RIC LT) | 1 | 1 | 77 | 1 |
| A2933203 | A2933207 | Toner Bottle Holder Ass'y (RIC EU) | 1 | 1 | 77 | 1 |
| A2933204 | A2933208 | Toner Bottle Holder Ass'y (INF/LAN) * | 1 | 1 | 77 | 1 |

* See Update 2 for further changes to P/N A2933208.

Continued...

Tech Service Bulletin No. A292/A293-020
Page 2 of 4

## UNITS AFFECTED:

A292/A293 Serial Number cut-in not available at time of publication.

- UPDATE 2: Caution Decal - A Caution Decal has been added to the Toner Bottle Holder Assembly. The Decal has been applied to the change made in Update 1 and affects P/N A2933208. Please update your Parts Catalog with the following information.


|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| A2933208 | A2933209 | Toner Bottle Holder Ass'y | 1 | 1 | 77 | 1 |
| A2293223 | A2933237 | Bottle Holder | 1 | 1 | 77 | 14 |
| - | A2933238 | Decal - Caution | 1 | - | 77 | 37 * |

* Denotes new item number.


## UNITS AFFECTED:

A292/A293 Serial Number cut-in not available at time of publication.

## Page 3 of 4

- UPDATE 3: Left Scale Sheet - To ensure that the Left Scale fits the exposure glass correctly, the width of the Left Scale Sheet has been changed from 15.5 mm to 14.5 mm . Please update your Parts Catalog with the following information.


|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| A1931752 |  | Left Scale Guide | 1 | 1 | 41 | 3 |
|  | $\rightarrow$ A2931793 | Left Scale Sheet | 1 | 1 | 41 | 3 |

## UNITS AFFECTED:

A292/A293 Serial Number cut-in not available at time of publication.

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Page 4 of 4

- UPDATE 4: Gear- $32 Z$ - To improve the reliability, Gear-32Z with the one-way clutch has been changed. Please update your Parts Catalog with the following information.


|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| AB014155 | AB013778 | Gear - 32Z | 1 | 1 | 63 | 20 |

## UNITS AFFECTED:

A292/A293 Serial Number cut-in not available at time of publication.

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

## BULLETIN NUMBER: A292/A293 - 020 REISSUE $\star$

12/22/2000

## APPLICABLE MODEL:

GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: PARTS CATALOG UPDATES

## GENERAL:

The following parts updates are being issued for all A292/A293 Parts Catalogs.

UPDATE 1: Toner Bottle Holder - If the Shutter Cover is not hung on the hook of the Right Inner Cover, machine vibration may cause the Inner Shutter to move and cover the entrance to the Toner Hopper. To secure the Shutter Cover in place, a boss ( $\phi 2, \mathrm{~h}=2$ ) has been added to the Cover. When installing the Right Inner Cover, be sure to place the boss in the Guide Rail as shown in the illustration below. Please update your Parts Catalog with the following information.


Right Inner Cover
Hook: Right Inner Cover
Boss: Shutter Cover

|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| A2933201 | A2933205 | Toner Bottle Holder Ass'y (NRG/SVN) | 1 | 1 | 77 | 1 |
| A2933202 | A2933206 | Toner Bottle Holder Ass'y (RIC LT) | 1 | 1 | 77 | 1 |
| A2933203 | A2933207 | Toner Bottle Holder Ass'y (RIC EU) | 1 | 1 | 77 | 1 |
| A2933204 | A2933208 | Toner Bottle Holder Ass'y (INF/LAN) * | 1 | 1 | 77 | 1 |

* See Update 2 for further changes to P/N A2933208.

Continued...

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Page 2 of 4

## UNITS AFFECTED:

All A292/A293 copiers manufactured after the Serial Numbers listed below will have the new style Toner Bottle Holder Ass'y installed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Gestetner 3355 | H4705400242 |
| Gestetner 3370 | H4805400429 |
| Ricoh AFICIO 551 | H4705400391 |
| Ricoh AFICIO 700 | H4805500001 |
| Savin 2055DP | H4705400242 |
| Savin 2070DP | H4805400429 |

- UPDATE 2: Caution Decal - A Caution Decal has been added to the Toner Bottle Holder Assembly. The Decal has been applied to the change made in Update 1 and affects P/N A2933208. Please update your Parts Catalog with the following information.


|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| A2933208 | A2933209 | Toner Bottle Holder Ass'y | 1 | 1 | 77 | 1 |
| A2293223 | A2933237 | Bottle Holder | 1 | 1 | 77 | 14 |
| - | A2933238 | Decal - Caution | 1 | - | 77 | 37 * |

[^4]Continued...

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## UNITS AFFECTED:

A292/A293 Serial Number cut-in not available at time of publication.

- UPDATE 3: Left Scale Sheet - To ensure that the Left Scale fits the exposure glass correctly, the width of the Left Scale Sheet has been changed from 15.5 mm to 14.5 mm . Please update your Parts Catalog with the following information.


|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| A1931752 |  | Left Scale Guide | 1 | 1 | 41 | 3 |
|  | $\rightarrow$ A2931793 | Left Scale Sheet |  |  |  |  |

## UNITS AFFECTED:

All A292/A293 copiers manufactured after the Serial Numbers listed below will have the new style Left Scale Guide installed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Gestetner 3355 | H 4705700002 |
| Gestetner 3370 | H 4805700001 |
| Ricoh AFICIO 551 | H 4705700331 |
| Ricoh AFICIO 700 | H 4805600339 |
| Savin 2055DP | H 4705700002 |
| Savin 2070DP | H 4805700001 |

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- UPDATE 4: Gear- $\mathbf{3 2 Z}$ - To improve the reliability, Gear-32Z with the one-way clutch has been changed. Please update your Parts Catalog with the following information.


|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| AB014155 | AB013778 | Gear - 32Z | 1 | 1 | 63 | 20 |

## UNITS AFFECTED:

All A292/A293 copiers manufactured after the Serial Numbers listed below will have the new style Gear $32 Z$ installed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Gestetner 3355 | H 4705600638 |
| Gestetner 3370 | H 4805600004 |
| Ricoh AFICIO 551 | H 4705600648 |
| Ricoh AFICIO 700 | H 4805600101 |
| Savin 2055DP | H 4705600638 |
| Savin 2070DP | H 4805600004 |

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

## APPLICABLE MODEL:

GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: IMAGE QUALITY OF HALF TONES AND GRAY SCALES

## SYMPTOM:

The image quality of half tones or gray scale areas on printouts are not clear or sharp enough.

## SOLUTION:

1. Recommend customers to set the Edge Smoothing function to the OFF position in the printer driver when printing. The default setting of the Edge Smoothing function for each driver language and printer controller type is as follows:

| Driver Language | Controller Type A | Controller Type B |
| :---: | :---: | :---: |
| PCL5e | ON | OFF |
| PCL6 | ON | OFF |
| PostScript3 | OFF | OFF |

2. Change the Printer Dot Edge parameter in the printer SP mode (Printer SP - Settings - Printer Dot Edge Parameter) from "Normal" (default) to "SP Mode".

NOTE: With this change, the print line width can be thickened. This change is valid only when the Edge Smoothing function is set to "OFF".
3. Change Copy SP2114 (Printer Dot Edge parameter setting) to the original settings.

| SP Number | Original Setting |
| :---: | :---: |
| SP2114-1 | 7 |
| SP2114-2 | 7 |
| SP2114-3 | 11 |
| SP2114-4 | 7 |

4. If the customer likes even thicker line width, change Copy SP2114 (Printer Dot Edge parameter setting) from the original settings to the thicker settings.

| SP Number | Original Setting | Thicker Setting |
| :---: | :---: | :---: |
| SP2114-1 | 7 | 10 |
| SP2114-2 | 7 | 10 |
| SP2114-3 | 11 | 15 |
| SP2114-4 | 7 | 10 |

NOTE: Do not set any other combinations of the four settings other than in the above table. Otherwise an unexpected image appears on printouts. This SP is only valid when the Edge Smoothing function is set to "OFF" and the Printer Dot Edge Parameter in the printer SP Mode is set to "SP Mode".

BULLETIN NUMBER: A292/A293-022<br>APPLICABLE MODEL: A292/A293<br>GESTETNER - 3355/3370<br>RICOH - AFICIO 551/700<br>SAVIN - 2055DP/2070DP

01/15/2001

## SUBJECT: SERVICE CODE 337

## SYMPTOMS:

SYMPTOM 1: A Service Code 337 occurs intermittently during a copy/print job or at power up.
SYMPTOM 2: A Service Code 337 is not displayed but is recorded in the service code logging data.

## CAUSES:

CAUSE 1: A Capacitor had failed on the BICU Board.
CAUSE 2: When the Main Switch is turned "OFF" the 24 vdc is removed before the 5 vdc . This may cause a Service Code 337 to occur. Since this occurs when the machine is being turned "OFF", there is no Service Code 337 displayed, but the code is still recorded in the logging data.

## SOLUTIONS:

SOLUTION 1: Replace the BICU Board (P/N: A2937552).
NOTE The part number has not changed.
SOLUTION 2: Update the firmware to level " H " version 3.11.1 or higher.
NOTE SYMPTOM 2 does not require the replacement of the BICU Board. System 2 only requires the firmware to be updated to Level " $H$ " version 3.11 .1 or higher.

The firmware revision "H" version 3.11 .1 (file name A292REVH.EXE) can be downloaded through the Technology Solution Center FTP Site http://tsc.ricohcorp.com.

NOTE Refer to Facts Line Bulletin \# FLOO2 and Publication Bulletin \#023 for more information about the FTP Internet Web Site and EPROM / Flash Card Exchange program.

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## UNITS AFFECTED:

All A292/A293 copiers manufactured after the Serial Numbers listed below will have the new style BICU Board installed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Ricoh Aficio 551 | H4705500174 to H4705500177, H4705500179, H4705500182, H4705500184, H4705500185, H4705500188, H4705500189 to H4705500206, <br> H4705500210 to H4705500216, H4705500230, H4705500234, H4705500236, H4705500237, H4705500240, H4705500249, H4705500257, H4705500260, H4705500263, H4705500266, H4705500267, H4705500282, H4705500284, H4705500291, H4705500294, H4705500296, H4705500297, H4705500299, H4705500526 to H4705500716. <br> H4705600001 to H4705600196, H4705600198, H4705600199, H4705600201, H4705600203, H4705600205, H4705600228, H4705600232, H4705600234, H4705600240, H4705600264, H4705600272, H4705600647 to H4705600860. <br> H4705700331 to H4705700775. H4705800301 to H4705800800, <br> H4705800901 to H4705801050. H4705900166, H4705900169 to H4705900220, <br> H4705900222 to H4705900225, H4705900227 to H4705900241, <br> H4705900244 to H4705900255, H4705900257 to H4705900319, <br> H4705900321 to H4705900324, H4705900326 to H4705900462, <br> H4705900464 to H4705900598, H4705900601 to H4705900615, <br> H4705900617 to H4705900629, H4705900631 to H4705900635, <br> H4705900637 to H4705900639, H4705900641, H4705900644, <br> H4705900646 to H4705900650, H4705900652 to H4705900663, <br> H4705900665 to H4705900668, H4705900670 to H4705900678, H4705900680, <br> H4705900682, H4705900684 to H4705900701, H4705900703 to H4705900706, <br> H4705900708 to H4705900710, H4705900712, H4705900714 to H4705900717, <br> H4705900719 to H4705900725, H4705900727, H4705900729, H4705900731, H4705900732, H4705900734, H4705900735, H4705900737, H4705900738, <br> H4705900740 to H4705900754, H4705900756 to H4705900780, <br> H4705900782 to H4705900789, H4705900791 to H4705900798, <br> H4705900800 to H4705900816, H4705900819 to H4705900821, H4705900824, H4705900825, H4705900827 to H4705900831, H4705900834 to H4705900845, H4705900850, H4705900852, H4705900854 to H4705900856, H4705900858, H4705900860 to H4705900868, H4705900871 to H4705900873, H4705900878, H4705900897, H4705900906, H4705900916, H4705900983, H4705901060, H4705901062, H4705901088, H4705901099, H4705901105, H4705901120, H4705901125. |
| Ricoh <br> Aficio 700 | $\begin{aligned} & \text { H4805500046 to H4805500427, H4805500429, H4805500431 to H4805500472, } \\ & \text { H4805600101 to H4805600201, H4805600203 to H4805600207, } \\ & \text { H4805600209 to H4805600499, H4805700311 to H4805700328, } \\ & \text { H4805700330 to H4805700615, H4805800001 to H4805800155, } \\ & \text { H4805800326 to H4805800705. } \end{aligned}$ |
| Savin 2055DP <br> Gestetner $3355$ | ```H4705500301 to H4705500308, H4705500311 to H4705500331, H4705500333, H4705500431, H4705500435, H4705500440, H4705500443, H4705500452, H4705500465, H4705500476, H4705500477, H4705500484, H4705500487, H4705500489, H4705500525, H4705600417 to H4705600420, H4705600423 to H4705600439, H4705600441 to H4705600446, H4705600448 to H4705600646, H4705700001 to H4705700330, H4705800001 to H4705800300, H4705800801 to H4705800900, H4705900001 to H4705900164.``` |

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| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Savin 2055DP <br> Gestetner 3355 | H4705500301 to H4705500308, H4705500311 to H4705500331, H4705500333, <br> H4705500431, H4705500435, H4705500440, H4705500443, H4705500452, H4705500465, H4705500476, H4705500477, H4705500484, H4705500487, H4705500489, H4705500525, H4705600417 to H4705600420, H4705600423 to H4705600439, H4705600441 to H4705600446, H4705600448 to H4705600646, H4705700001 to H4705700330, H4705800001 to H4705800300, H4705800801 to H4705800900, H4705900001 to H4705900164. |
| Savin 2070DP <br> Gestetner $3370$ | H4805500473 to H4805500652, H4805600001 to H4805600100, H4805700001 to H4805700125, H4805700127 to H4805700144, H4805700146 to H4805700150, H4805700152 to H4805700154, H4805700156 to H4805700191, H4805700193 to H4805700198, H4805700200 to H4805700202, H4805700205 to H4805700208, H4805700211 to H4805700213, H4805700219 to H4805700221, H4805700223, H4805700225, H4805700227 to H4805700232, H4805700235 to H4805700238, H4805700240 to H4805700257, H4805700259 to H4805700269, H4805700271 to H4805700277, H4805700279 to H4805700310, H4805800156 to H4805700163, H4805800165 to H4805800170, H4805800172 to H4805800187, H4805800189, H4805800191, H4805800192, H4805800194, H4805800195, H4805800197 to H4805800199, H4805800201 to H4805800256, H4805800258 to H4805800325, H4805900002, H4805900005 to H4805900007, H4805900009 to H4805900027, H4805800029, H4805900031, H4805900033, H4805900034, H4805900036, H4805900039, H4805900041 to H4805900057, H4805900059 to H4805900063, H4805900065 to H4805900075, H4805900077, H4805900079, H4805900080, H4805900083, H4805900084, H4805900086 to H4805900090, H4805900092, H4805900093, H4805900095 to H4805900100, H4805900103, H4805900105, H4805900109 to H4805900112, H4805900114, H4805900116 to H4805900130, H4805900132 to H4805900149, H4805900151 to H4805900189, H4805900191 to H4805900195, H4805900197, H4805900199, H4805900200, H4805900202, H4805900206, H4805900209, H4805900210, H4805900212 to H4805900214. |

## RETURN PROCESS:

The Technology Solutions Center has established an assertive program for the return of all BICU Boards that exhibit the SC337 phenomenon. The program is simple but requires the cooperation of each location to ensure a smooth flow of returned boards. In an effort to meet the demand for replacement BICU Boards we request your cooperation to identify priority machines exhibiting the Service Code 337-Symptom 1 problem. Please indicate machines that are a priority by marking an " $X$ " in the priority column on the BICU Board Return Authorization form.

## RETURN AUTHORIZATION:

Fax the completed form to $\mathbf{7 1 4 - 5 6 6 - 2 6 8 0}$ to obtain a Material Return Authorization Number.

## REPLACEMENT BICU BOARDS:

Ricoh Electronics Inc. will contact your location by fax with the MRA number and automatically ship replacement BICU Boards based on the count submitted on the attached MRA Form.

## FINAL RETURNS:

Package all BICU Boards for return to the address provided. Ricoh Electronics INC. will maintain a balance between what was shipped as replacements and what was actually returned. Include a copy of the MRA Form inside and outside of the return package.

## RETURN TO:

```
Ricoh Electronics Inc.
Mr. Minh C La
1101 Bell Ave
Tustin, Ca 92780-6428
```


## BILLING:

The servicing location is required to return all defective BICU Boards within 14 business days of receiving replacement boards or they will be billed for the parts. If the quantity of returned boards is less than the quantity shipped to your location, REI will begin the billing process for the normal cost for the BICU Boards within 14 days.

## DEADLINE:

## This program expires on 12/31/01.

## MRA FORM FOR THE BICU BOARD EXCHANGE

MRA \# $\qquad$

## INSTRUCTIONS:

Fill in the serial numbers for each affected machine and fax the form to 714-566-2680. Upon receipt of your MRA number, return each BICU Board to the address listed below:

Ricoh Electronics Inc.
Attn: Mr. Minh C La
1101 Bell Ave
Tustin, Ca 92780-6428
714-566-2680
Include A Copy of the MRA Form inside And Out Side of the Returned Package

## BICU BOARD MATERIAL RETURN AUTHORIZATION FORM

Dealership: $\qquad$
Ship to Address: $\qquad$
Contact: $\qquad$
Main Phone \# $\qquad$
Fax Phone \#: $\qquad$

Account \#: $\qquad$
Please indicate machines that are a priority by marking an " $x$ " in the priority column.

|  | Priority | Copier Serial Numbers <br> (FOR DEALER USE ONLY) | Boards Sent Out <br> From REI <br> (For REI USE ONLY) | Boards Returned <br> From Dealer <br> (For REI USE ONLY) |
| :--- | :--- | :--- | :--- | :--- |
| 1. |  |  |  |  |
| 2. |  |  |  |  |
| 3. |  |  |  |  |
| 4. |  |  |  |  |
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| 8. |  |  |  |  |
| 9. |  |  |  |  |
| 10. |  |  |  |  |
| 11. |  |  |  |  |
| 12. |  |  |  |  |
| 13. |  |  |  |  |
| 14. |  |  |  |  |
| 15. |  |  |  |  |

GESTETNER - 3355/3370
RICOH - Aficio 551/700
SAVIN - 2055DP/2070DP

SUBJECT: NVRAM REMOVAL, REPLACEMENT AND HANDLING PROCEDURE

## SYMPTOM:

NVRAM data is erased or pins are damaged during removal and replacement.

## CAUSE:

Improper removal and handling of the NVRAM.

## SOLUTION:

The following steps should be followed to help avoid damaging the NVRAM during the removal and replacement process.

CAUTION: The NVRAM contains an internal battery, so please observe the following guidelines when removing, handling and replacing the NVRAM:

## NVRAM REMOVAL:

NOTE: Before NVRAM removal, please review the NVRAM download procedure in the field service manual on page 4-79 and 4-80.

1. Before NVRAM replacement, the main power switch machine must be turned 'OFF' and must be left plugged in to the wall outlet. The machine is left plugged in to ensure that the frame of the machine is electrically grounded.
2. To eliminate the possibility of electrical static discharge (ESD) buildup in the body, touch a metal portion of the machine prior to handling any electronic components.
3. Remove the BICU Board from the machine, placing it on a non-conductive surface. If not, this may result in the loss of all the data stored inside the NVRAM.
4. Insert a small flat-head (standard) screwdriver into the space between the NVRAM casing and the NVRAM socket (at both ends where there are no pins) and lift it up on both ends with the screwdriver. Then, remove it by hand.


CAUTION: Use extreme care NOT to touch any of the NVRAM pins with the screwdriver or insert the screwdriver too far under the NVRAM where the BICU Board could be damaged. Since the NVRAMs casing is made of a resin (plastic), it is necessary to take extra care when removing it so that the casing doesn't break.

## NVRAM REPLACEMENT:

NOTE: It is important to pay close attention to the following steps when Inserting the NVRAM.

1. Before handling and installing the NVRAM, to eliminate the possibility of electrical static discharge (ESD) buildup in the body, touch a metal portion of the machine prior to handle NVRAM.
2. Ensure the NVRAM is oriented correctly on the BICU Board and in the socket by locating the Index Notch on both the NVRAM and BICU Board (see photo to the right).
3. Ensure that all of the pins on both sides of the NVRAM have been properly set in their holes before fully seating it into the socket.
4. Press downward on the NVRAM chip using even pressure, to ensure a proper fit and to avoid damaging to the pins.


Index Notch Location on the BICU Board

## BULLETIN NUMBER: A292/A293-024

# SAVIN - 2055DP/2070DP 

## SUBJECT: PAPER JAM IN THE INVERTER SECTION

## SYMPTOM:

During copying, a jam occurs in the inverter section.

## CAUSE:

Defective upper exit guide plate (A2294472) An extra rib was added to some of the guide plates during the molding process at the factory. The extra rib may interfere with the exit guide pawl causing the inverter section to jam.

## SOLUTION:

## PRODUCTION COUNTERMEASURE:



The mold of the exit guide plate has been changed.

## FIELD COUNTERMEASURE PROCEDURE:

1. Turn off the main power switch.
2. Open the front cover.
3. Remover the stopper $[A](1$ screw $)$.
4. While releasing the lever $[B]$, pull out the fusing unit $[\mathrm{C}]$ as shown.
NOTE: Hold the bottom of the fusing unit as shown.

[B]
Continued...

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5. Open the upper exit guide plate (Lever E2) and inspect the guide plate.

- If the guide plate does not have the extra rib, no further action is required.
- If the guide plate has the extra rib then performed the field modification in step 6.

Good
This guide plate does not have the extra rib, no further action is required.

[E]


## Page 3 of 3

## UNITS AFFECTED:

All A292/A293 copiers manufactured after the Serial Numbers listed below will have the new style upper exit guide plate installed during production.

| MODEL NAME | SERIAL NUMBER |
| :--- | :--- |
| Gestetner 3355 | H4715001857 $\sim$ |
| Gestetner 3370 | H4815001141 $\sim$ |
| Ricoh Aficio 551 | H4715001857 $\sim$ |
| Ricoh Aficio 700 | H4815001141 $\sim$ |
| Savin 2055DP | H4715001857 $\sim$ |
| Savin 2070DP | H4815001141 $\sim$ |

## UNITS AFFECTED WITH EXTRA RIB:

All A292/A293 copiers manufactured with the Serial Numbers listed below may have the upper exit guide plate installed with the extra rib during production.

| Model Name | Serial Number |
| :---: | :---: |
| Gestetner 3355 | $\begin{aligned} & \text { H4706001191~1300, H4714900561~0940 } \\ & \text { H4715000397~0916 } \end{aligned}$ |
| Gestetner 3370 | H4814900186 ~ 0405, H4815000001~0300 |
| Ricoh Aficio 551 | H4706000276 ~ 1190, H4714900001~0560 H4714900941~1637, H4715000001~0396 H4715000917 ~ 1856 |
| Ricoh Aficio 700 | H4806000191~440, H4814900001~0185 H4814900406 ~ 0980, H4815000301~1140 |
| Savin 2055DP | $\begin{aligned} & \hline \text { H4706001191~1300, H4714900561~0940 } \\ & \text { H4715000397~0916 } \end{aligned}$ |
| Savin 2070DP | H4814900186 ~ 0405, H4815000001~0300 |

## BULLETIN NUMBER: A292/A293 - 025

07/13/2001
APPLICABLE MODEL:
GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: PARTS CATALOG UPDATES

## GENERAL:

The following parts updates are being issued for all A292/A293 Parts Catalogs.

- UPDATE 1: Left/Right Holders - To prevent the left or right holder from breaking in the middle, the shape of the pressure roller cleaning rollers have been changed. The strength of the holders have been increased by a factor of 1.65. Please update your A292/A293 Parts Catalog with the following information.


|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| A0974126 | A2944077 | Left Holder (120 V) | 1 | 0 | 97 | 10 |
| A0974129 | A2944078 | Right Holder (120 V) | 1 | 0 | 97 | 7 |

NOTE: These parts can be replaced individually but the modification is effective only when both holders are replaced as a pair.

## UNITS AFFECTED:

A92/A293 Serial Number cut-in not available at time of publication.

- UPDATE 2: Rear Drum Seal - To standardize the rear drum seal with other models, the rear drum seal has been changed. Please update your A292/A293 Parts Catalog with the following information.



## UNITS AFFECTED:

A92/A293 Serial Number cut-in not available at time of publication.

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

## BULLETIN NUMBER: A292/A293 - 025 REISSUE $\star$ <br> APPLICABLE MODEL:

08/21/2001

GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: PARTS CATALOG UPDATES

## GENERAL:

The following parts updates are being issued for all A292/A293 Parts Catalogs.

## - UPDATE 1: Left/Right Holders - To prevent the left or right holder from breaking in the middle, the shape of the pressure roller cleaning rollers have been changed. The strength of the holders have been increased by a factor of 1.65. Please update your A292/A293 Parts Catalog with the following information.



|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| A0974126 | A2944077 | Left Holder (120 V) | 1 | 0 | 97 | 10 |
| A0974129 | A2944078 | Right Holder (120 V) | 1 | 0 | 97 | 7 |

NOTE: These parts can be replaced individually but the modification is effective only when both holders are replaced as a pair.

## UNITS AFFECTED:

A92/A293 Serial Number cut-in not available at time of publication.

```
Tech Service Bulletin No. A292/A293 - 025 REISSUE \(\star\)
Page 2 of 2
```

- UPDATE 2: Rear Drum Seal - To standardize the rear drum seal with other models, the rear drum seal has been changed. Please update your A292/A293 Parts Catalog with the following information.


|  |  |  |  |  | REFERENCE |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| A134 2392 | A294 3572 | Rear Drum Seal | 1 | 0 | 91 | 6 |

## UNITS AFFECTED:

All A292/A293 copiers manufactured after the Serial Numbers listed below will have the new style rear drum seal installed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :---: |
| Gestetner 3355 | H4715200832 |
| Gestetner 3370 | H4815200918 |
| Ricoh AFICIO 551 | H4715200411 |
| Ricoh AFICIO 700 | H4815200192 |
| Savin 2055DP | H4715200832 |
| Savin 2070DP | H4815200918 |

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

## APPLICABLE MODEL:

GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: SERVICE MANUAL - INSERT

## GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow $\Rightarrow$.

- 4-94 Updated Information (Dip Switches - Main Board)


### 4.5 TEST POINTS/DIP SWITCHES/LEDS

### 4.5.1 DIP SWITCHES

ADF Main Board

| DPS100 |  |  |  |  | Description |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 2 | 3 | 4 |  |
|  |  | 0 | 0 | 0 | Normal operating mode |
|  |  | 0 | 0 | 1 | Motor Test: Transport motor - Forward |
|  |  | 0 | 1 | 0 | Motor Test: Transport motor - Reverse |
|  |  | 0 | 1 | 1 | Motor Speed Adjustment (Automatic) |
|  |  | 1 | 0 | 0 | Original stop position adjustment - Single-sided original mode (No original skew correction) |
|  |  | 1 | 0 | 1 | Original stop position adjustment - Double sided original mode |
|  |  | 0 | 0 | 0 | Free Run: Single-sided original mode with skew correction |
|  |  | 0 | 1 | 0 | Free Run: Single-sided original mode without skew correction |
|  |  | 1 | 1 | 0 | Free Run: Double-sided original mode |
| Others |  |  |  |  | Do not select |

"SADF" LED turns on when one of the DIP switches is on.
MCU: All the dip switches should be OFF. Do not change the settings.

### 4.5.2 TEST POINTS

BICU

| Number | Monitored Signal |
| :---: | :--- |
| TP113 | GDN |
| TP123 | 5 VE |
| TP136 | Not used |
| TP143 | Not used |

Paper Feed Board

| Number | Monitored Signal |
| :---: | :--- |
| TP101 | Ground |
| TP102 | +24 V |
| TP103 | Ground |
| TP104 | +5 V |

I/O Board

| Number | Monitored Signal |
| :---: | :--- |
| TP104 | +12 V |
| TP154 | +5 V |
| TP155 | Ground |
| TP162 | +24 V |
| TP163 | Ground |
| TP172 | -12 V |
| TP173 | +24 VINT |

## SUBJECT：TANDEM TRAY ENHANCEMENT KIT

## SYMPTOMS：

－Right tray does not lift up．
－Left tray back fence is damaged．

## CAUSES：

## Right Tray Does Not Lift Up：

The side fences re－open after the tray has been closed，causing the tray not to lift up（even when paper has been loaded）．
This has a tendency to happen when the tray is forcibly closed，in which case the paper in the tray will shift to the left from this shock（causing the side fences to re－open）．This can also occur if the customer mis－loads the paper in the right tray．


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Page 2 of 3

## Left Tray Back Fence Is Damaged:

The shock of closing the left tray (or paper mis-load) causes the right tray side fences to open, which in turn causes the left back fence to move to the right (attempting to shift the paper over to the right tray). When there is paper in the right tray, the left back fence is damaged from the resulting resistance.


## SOLUTIONS:

## PRODUCTION COUNTERMEASURE:

## Right Tray Does Not Lift Up:

A cushion (shock absorber) has been added to the right rear inner cover of the right tray.

## Left Tray Back Fence Is Damaged:

The mask ROM software for the tandem tray has been changed so that the left tray back fence does not move, even when the right tray side fences are open.

Tech Service Bulletin No. A292/A293-027
Page 3 of 3

## FIELD COUNTERMEASURE:

## Install the Tandem Tray Enhancement Kit (P/N A2939900), which contains the following parts:

- Inner Cover - Right Rear (with cushion)

The shape of this part has been changed. In addition, a cushion has been added to this part for shock absorption.

When the tray is closed, the cushion contacts the rear side plate. As a result, even if the tray is forcefully pushed in, the cushion will absorb the shock and prevent the side fences from re-opening.


- IC - HD6433294C82P (On the Paper Feed Control Board)

The left tray can only move when the right tray is in its lowest position and there is no paper in the right tray.

## UNITS AFFECTED:

All A292/A293 copiers manufactured after the Serial Numbers listed below will have the new parts installed during production.

| MODEL NAME | SERIAL NUMBER |
| :---: | :--- |
| Gestetner 3355 | H 4715400151 |
|  | H 4715500222 |
| Gestetner 3370 | H 4815400001 |
|  | H 4815500001 |
| Ricoh Aficio 551 | H 4715301184 |
|  | H 4715500127 |
| Ricoh Aficio 700 | H 4815400341 |
|  | H 4815500122 |
| Savin 2055DP | H 4715400151 |
|  | H 4715500222 |
| Savin 2070DP | H 4815400001 |
|  | H 4815500001 |

## BULLETIN NUMBER: A292/A293-028

09/19/2001

## APPLICABLE MODEL:

GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: PARTS CATALOG UPDATES

## GENERAL:

The following part catalog updates are being issued for all A292/A293 Parts Catalogs.

- UPDATE 1: Belt Unit Knob - To improve ease of operation, a cover has been added to the belt unit knob.


| REFERENCE |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |
| A0963960 | A2933960 | Belt Unit Knob | 1 | 1 | 139 | 16 |

- UPDATE 2: Optical Housing Assembly - As per field request, the optical housing assembly has been registered as a service part.


|  |  | REFERENCE |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| NEW PART NUMBER | DESCRIPTION | QTY | PAGE | ITEM |
| A2931871 | Optical Housing Assembly | 1 | 49 | $35^{*}$ |

## *DENOTES NEW ITEM NUMBER

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :--- | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |

## APPLICABLE MODEL:

GESTETNER - 3355/3370
RICOH - AFICIO 551/700
SAVIN - 2055DP/2070DP

## SUBJECT: SERVICE MANUAL - INSERT

## GENERAL:

The Service Manual pages listed below must be replaced with the pages supplied. Each bulletin package contains 1 set of replacement pages.

PAGES:

The revised areas have been highlighted by an arrow $\Rightarrow$.

- vi
- 5-5 to 5-10

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4.5.3 FUSES ..... 4-95
4.5.4 VARIABLE RESISTORS ..... 4-96
4.5.5 LEDS ..... 4-96
4.6 SPECIAL TOOLS AND LUBRICANTS ..... 4-96
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4.6.2 LUBRICANTS ..... 4-96
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PREVENTIVE MAINTENANCE
5. PREVENTIVE MAINTENANCE SCHEDULE ..... 5-1
5.1 PM TABLE ..... 5-1
5.2 PM COUNTER ..... 5-5
REPLACEMENT AND ADJUSTMENT
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6.2 DOCUMENT FEEDER ..... 6-2
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Width Sensor ..... 6-8
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## $\Rightarrow 5.2$ 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.

### 5.2.1 PM COUNTER ACCESS PROCEDURE

1) Press the following keys in sequence.

$$
\mathrm{C} / \otimes \rightarrow \square \mathbf{1} \rightarrow 0 \rightarrow \square \rightarrow \square
$$

Hold the C key for more than 3 seconds
The SP mode menu is displayed.

2) Press [PM Counter ] on the display.

3 ) The following menu appears on the display.

| SP Mode (Parts replacement) | Prev. Menu | Exit |
| :---: | :---: | :---: |
| Select Item |  |  |
| Al PM parts list | Counterist print out |  |
| Parts list for PM yield indicator | cSS Calling Seting |  |
| Parts exceedingtarget yilid |  |  |
| Clear all PM settings |  |  |

## 1. All PM Parts List

Displays all the counters for PM parts.
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 the [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.

| SP Mode (Parts replacement) |  |  |  | Prev. Menu |  | Exit |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 Riller | 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 | 0000228 | 0300K | Clear |  |
| 012 | Pick-up Roller - Tray 1 | Yes | 0000228 | 0300K | Clear |  |
| 013 | Separation Roller - Tray 1 | Yes | 0000228 | 0300k | Clear |  |
| 014 | Feed Roller - Tray 2 | Yes | 0000000 | 0300k | Clear | 01/03 |
| 015 | Pick-up Riller - Tray 2 | Yes | 0000000 | 0300k | Clear |  |
| 016 | Separation Roller - Tray 2 | Yes | 0000000 | 0300k | Clear | Previous page |
| 017 | Feed Roller - Tray 3 | Yes | 0000000 | 0300k | Clear |  |
| 018 | Pick-up Roller - Tray 3 | Yes | 0000000 | 0300k | Clear | Next page |

To clear a counter, press [Clear] on the display. The following appears.


Then press [Yes] to clear the counter.

If one of the keys in the "No" column is pressed, the following appears on the display.


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 Strippers |  | 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 |  | 0000228 | 0300k | Clear |  |
| 012 | Pick-up Roller - Tray 1 |  | 0000228 | 0300k | Clear |  |
| 013 | Separation Roller - Tray 1 |  | 0000228 | 0300k | Clear |  |
| 014 | Feed Roller - Tray 2 |  | 0000000 | 0300k | Clear | 01/01 |
| 015 | Pick-up Roller - Tray 2 |  | 0000000 | 0300k | Clear |  |
| 016 | Separation Roller - Tray 2 |  | 0000000 | 0300K | Clear | Prexious page |
| 017 | Feed Roller - Tray 3 |  | 0000000 | 0300k | Clear |  |
| 018 | Pick-up Roller - Tray 3 |  | 0000000 | 0300k | Clear | xtpage |

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.


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.


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.


Press [Print] to print out the counter list.

## 7. CSS Calling Setting (RSS Function)

This function is for Japanese machines only.

RTEDEN TECHNICAL SERVICE BULLETIN

## APPLICABLE MODEL:

GESTETNER - $3355 / 3370$
RICOH - AFICIO 551/700/551P/700P
SAVIN - 2055DP/2070DP

## SUBJECT: SERVICE MANUAL - INSERT

## GENERAL:

Ricoh is pleased to announce the immediate availability of the Ricoh Aficio 551P \& 700P (Printer Versions) Digital Imaging Systems with an embedded Fiery EB-70 Controller. These systems are designed to deliver increased productivity for the most demanding workgroup or production-oriented environments.

The Service Manual pages listed below must be replaced with the pages supplied.
Each bulletin package contains 1 set of replacement pages.
PAGES:

- LEGEND

Service Manual - Additional models added (Aficio 551P/700P)

- LEGEND

Parts Catalog - Additional models added (Aficio 551P/700P)

## LEGEND

| PRODUCT CODE | COMPANY |  |  |
| :---: | :---: | :---: | :---: |
|  | GESTETNER | RICOH | SAVIN |
| A292 | 3355 | Aficio 551 | 2055DP |
| A293 | 3370 | Aficio 700 | 2070DP |
| A292 <br> w/G594 Controller | -- | Aficio 551P | -- |
| A293 <br> w/G594 Controller | -- | Aficio 700P | -- |

## DOCUMENTATION HISTORY

| REV. NO. | DATE | COMMENTS |
| :---: | :---: | :---: |
| $*$ | $5 / 2000$ | Original Printing |
|  |  |  |
|  |  |  |
|  |  |  |

## LEGEND

| PRODUCT CODE | COMPANY |  |  |
| :---: | :---: | :---: | :---: |
|  | GESTETNER | RICOH | SAVIN |
| A292 | 3355 | Aficio 551 | 2055DP |
| A293 | 3370 | Aficio 700 | 2070DP |
| A292 w/G594 Controller | -- | Aficio 551P | -- |
| A293 w/G594 Controller | -- | Aficio 700P | -- |
|  |  |  |  |
| A698 | Large Capacity Tray - RT37 |  |  |
| B302 | 3,000 Sheet Finisher -SR810 |  |  |
| B312 | 3,000 Sheet Finisher - SR740 |  |  |
| A763 | Booklet Finisher - SR750 |  |  |
| B333/B322 | Copy Tray/Connector Kit Type 700 |  |  |
| A812 | Punch Unit Type 850 |  |  |
| B375 | LG Kit |  |  |
| G594 | EB70 Pinter Controller |  |  |

## DOCUMENTATION HISTORY

| REV. NO. | DATE | COMMENT |
| :---: | :---: | :--- |
| $*$ | $05 / 2000$ | First Printing |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

## BULLETIN NUMBER: B322-001

08/28/2000

## APPLICABLE MODEL:

GESTETNER - COPY CONNECTOR TYPE 700 for 3355/3370
RICOH - COPY CONNECTOR TYPE 700 for AFICIO 551/700
SAVIN - COPY CONNECTOR TYPE 700 for 2055DP/2070DP

## SUBJECT: INTERFACE CABLE

## GENERAL:

To meet UL standards, the Interface Cable has been changed. The Clamp has also changed. The following parts updates are being issued for all B322 Parts Catalogs.


|  | REFERENCE |  |  |  |  |  |  |  |
| :---: | :---: | :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| OLD PART NO. | NEW PART NO. | DESCRIPTION | QTY | INT | PAGE | ITEM |  |  |
| B3285050 | B3225070 | Interface Cable | 1 | $3 / \mathrm{S}$ | 3 | 6 |  |  |
| 11050389 | 11050034 | Clamp | 2 | $3 / \mathrm{S}$ | 3 | 106 |  |  |

## UNITS AFFECTED:

B322 Serial Number cut-in not available at time of publication.

## INTERCHANGEABILITY CHART:

| 0 | OLD and NEW parts can be used in both OLD and <br> NEW machines. | 2 | NEW parts CAN NOT be used in OLD machines. <br> OLD parts can be used in OLD and NEW machines. |
| :---: | :--- | :---: | :--- |
| 1 | NEW parts can be used in OLD and NEW machines. <br> OLD parts CAN NOT be used in NEW machines. | 3 | OLD parts CAN NOT be used in NEW machines. <br> NEW parts CAN NOT be used in OLD machines. |
| $3 / S$ | Must be installed as a set on units manufactured prior to the S/N cut-in. On units manufactured after the S/N cut-in or <br> previously modified, use the new part numbers individually. |  |  |


[^0]:    ADF
    "Rating voltage of Output Connector for Accessory; Max. DC 24 V"

[^1]:    $\triangle$ CAUTION
    Properly place the LCT on the plate [B] of the LCT connector.
    12. Insert the two pins [C] on the LCT connector into the two holes on the LCT.
    13. Secure the LCT to the LCT connector (3 screws).
    14. Set the cap [D] in the front screw access hole.

[^2]:    . CAUTION
    Unplug the main machine power cord before starting the following procedure.

[^3]:    * Denotes new item number.

[^4]:    * Denotes new item number.

