Document Insertion Unit-F1

Service Manual
Application
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Caution
Use of this manual should be strictly supervised to avoid disclosure of confidential information.
### Explanation of Symbols

The following symbols are used throughout this Service Manual.

<table>
<thead>
<tr>
<th>Symbols</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Check" /></td>
<td>Check.</td>
</tr>
<tr>
<td><img src="image" alt="Check visually" /></td>
<td>Check visually.</td>
</tr>
<tr>
<td><img src="image" alt="Check the noise" /></td>
<td>Check the noise.</td>
</tr>
<tr>
<td><img src="image" alt="Disconnect the connector" /></td>
<td>Disconnect the connector.</td>
</tr>
<tr>
<td><img src="image" alt="Connect the connector" /></td>
<td>Connect the connector.</td>
</tr>
<tr>
<td><img src="image" alt="Remove the cable/wire from the cable guide or wire saddle" /></td>
<td>Remove the cable/wire from the cable guide or wire saddle.</td>
</tr>
<tr>
<td><img src="image" alt="Set the cable/wire to the cable guide or wire saddle" /></td>
<td>Set the cable/wire to the cable guide or wire saddle.</td>
</tr>
<tr>
<td><img src="image" alt="Remove the screw" /></td>
<td>Remove the screw.</td>
</tr>
<tr>
<td><img src="image" alt="Tighten the screw" /></td>
<td>Tighten the screw.</td>
</tr>
<tr>
<td><img src="image" alt="Remove the claw" /></td>
<td>Remove the claw.</td>
</tr>
<tr>
<td><img src="image" alt="Insert the claw" /></td>
<td>Insert the claw.</td>
</tr>
<tr>
<td><img src="image" alt="Use the bundled part" /></td>
<td>Use the bundled part.</td>
</tr>
<tr>
<td><img src="image" alt="Push the part" /></td>
<td>Push the part.</td>
</tr>
<tr>
<td><img src="image" alt="Plug the power cable" /></td>
<td>Plug the power cable.</td>
</tr>
<tr>
<td><img src="image" alt="Turn on the power" /></td>
<td>Turn on the power.</td>
</tr>
</tbody>
</table>

The following rules apply throughout this Service Manual:

1. Each chapter contains sections explaining the purpose of specific functions and the relationship between electrical and mechanical systems with reference to the timing of operation.

   In the diagrams, \[\text{path}\] represents the path of mechanical drive; where a signal name accompanies the symbol, the arrow indicates the direction of the electric signal. The expression "turn on the power" means flipping on the power switch, closing the front door, and closing the delivery unit door, which results in supplying the machine with power.

2. In the digital circuits, '1' is used to indicate that the voltage level of a given signal is "High", while '0' is used to indicate "Low". (The voltage value, however, differs from circuit to circuit.) In addition, the asterisk (*) as in "DRMD*" indicates that the DRMD signal goes on when '0'.

   In practically all cases, the internal mechanisms of a microprocessor cannot be checked in the field. Therefore, the operations of the microprocessors used in the machines are not discussed: they are explained in terms of from sensors to the input of the DC controller PCB and from the output of the DC controller PCB to the loads.

The descriptions in this Service Manual are subject to change without notice for product improvement or other purposes, and major changes will be communicated in the form of Service Information bulletins.

All service persons are expected to have a good understanding of the contents of this Service Manual and all relevant Service Information bulletins and be able to identify and isolate faults in the machine.
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Safety Precautions

- Points to Note About Turning Off the Main Power Switch
- Notes Before it Works Serving
Points to Note About Turning Off the Main Power Switch

This machine has two switches related to power supply, the Power switch and the breaker.
Turning on the Power switch powers this machine.
The breaker detects an excess current and electric leakage to protect you against an electric shock.

MEMO:
Explain to the customer that the breaker must be checked once or twice a month and the result must be recorded.
Notes Before it Works Serving

CAUTION:
At servicing, be sure to turn off the power source according to the specified steps and disconnect the power plug.

CAUTION:
Do not turn off the power switch when downloading is under way. Turning off the main power switch while downloading is under way can disable the machine.
Product Outline

- Features
- Specifications
- Names of Parts
Features

- A free-standing inserter with a reversal feature, supporting a set of two large tray bins.
- Each tray has a capacity of 200 sheets.
## Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper pickup method</td>
<td>Auto paper pickup/delivery</td>
<td>Upward separation by a cassette separation roller</td>
</tr>
<tr>
<td>Paper pickup mode</td>
<td>Single-sided</td>
<td>automatic reversal mode supported</td>
</tr>
<tr>
<td>Paper types</td>
<td>Plain paper, recycled paper, colored paper, heavy paper, coated paper</td>
<td></td>
</tr>
<tr>
<td>Paper size</td>
<td>Upper tray/low tray/B5 to 13” x 19.2”</td>
<td>Feed direction to 139.7 to 482.6 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Width direction to 98.4 to 330.2 mm</td>
</tr>
<tr>
<td>Paper weighing</td>
<td>52g/m² to 300g/m²</td>
<td></td>
</tr>
<tr>
<td>Loading capacity</td>
<td>Loading height: Up to 24mm</td>
<td>Defined on the basis of 80g/m² paper</td>
</tr>
<tr>
<td></td>
<td>Upper tray: 200 sheets/low tray: 200 sheets</td>
<td></td>
</tr>
<tr>
<td>Reference</td>
<td>Center reference</td>
<td></td>
</tr>
<tr>
<td>Mixed paper loading</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Operator console</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>Document loading LED available</td>
<td></td>
</tr>
<tr>
<td>Size detection feature</td>
<td>Supported</td>
<td>Length: Photointerrupters (Upper tray: 1/Low tray: 2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Width: Slide variable resistors (Upper tray: 1/Low tray: 1)</td>
</tr>
</tbody>
</table>
Names of Parts

External View (Front)

- Upper tray
- Upper cover
- Low tray
- Front upper cover

External View (Rear)

- Power switch
- Rear cover
- Rear upper cover
- Rear low cover
- Leakage breaker

F-1-1

F-1-2
External View (Internal)

- Horizontal feed guide
- Jam clearing lever (through-feed unit)

F-1-3
Technology

- Basic Configuration
- Controls
- Jam Detection
- Power Supply
- Work of service
Basic Configuration

Functional Configuration
The components of this fold unit are organized into three major blocks: tray unit, Paper feed unit, and Feed unit.

Overview of Electrical Circuitry
The machine’s sequence of operations is controlled by the DC controller PCB. The DC controller PCB is a CPU used to interpret input signals from sensors and host machine and generate signals to drive such loads as motors and clutches at such times as programmed in advance.
Component Configuration

Roller Layout

![Diagram of Roller Layout]

Sensor Layout

It describes only all optical sensors on the feed path.

- S3 Upper tray regist sensor
- S7 Low tray regist sensor
- S8 Middle feed sensor
- S9 Upper tray empty sensor
- S12 Low tray empty sensor
- S16 Reverse timing sensor
- S17 Reverse sensor
- S18 Reverse entrance sensor
- S20 Entrance sensor
- S21 Delivery sensor 2
Drive Configuration

M1  Tray Paper feed motor
M2  Upper tray lift motor
M3  Low tray lift motor
M4  Drive switchover motor
M5  Entrance motor 1
M6  Reverse motor
CL1 Upper tray regist clutch
CL2 Low tray regist clutch
SOL1 Reverse solenoid

Basic movement outline

Surface insert operation

Transfers the paper loaded in the inserter tray to the downstream equipment so the upper surface of the paper will face up.

*Paper is fed from tray via a reversing pass to the straight pass.
# Back insert operation

Transfers the paper loaded in the inserter tray to the downstream equipment so the upper surface of the paper will face down.

*Paper is fed directly to the straight pass.

---

# Inserter pickup tray switch operation

You can have paper fed from either of the two inserter trays chosen at your option.
Various Modes of Control

Outline of operations

When a paper feed signal is received from the host machine after paper is loaded in the tray, the following three sequences of operations are performed:

1. Sequence of surface insert operation
2. Sequence of back insert operation
3. Sequence of inserter pickup tray switch operation

Sequence of surface insert operation

The following operations are performed when two papers are fed from the inserter paper feed unit.

(1) First paper feeding for separation
- The upper tray lift motor turns in the reverse direction at a speed of 533 pps to move the paper feed tray upward.
- The upper tray pick sensor turns on to stop the upper tray lift motor.
- For plain paper, the tray paper feed motor turns in the reverse direction at a speed of 500 mm/s to start separating the paper in the tray. For thick paper, the tray paper feed motor turns in the reverse direction at a speed of 250 mm/s to start separating the paper in the tray.
- For the upper tray, the tray paper feed motor stops when the paper has been fed 14.7 [mm] since the registration sensor turned on. For the lower tray, the tray paper feed motor stops when the paper has been fed 19.1 mm since the registration sensor turned on.
- The upper tray lift motor turns in the normal direction at a speed of 533 pps to move the paper feed tray 9 pls downward.
(2) First paper feeding for reversal
- The tray feed motor turns in the normal direction at a speed of 400 mm/s and the reverse motor turns in the normal direction at a speed of 400 mm/s to start feeding the paper to the reversal standby position.
- For the upper tray, the tray paper feed motor stops when the paper has been fed 64.6 [mm] since the registration sensor turned off. For the lower paper feed tray, the tray paper feed motor stops when the paper has been fed 10.3 mm since the registration sensor turned off.
- The reversal motor stops when the paper has been fed 19.2 mm since the reverse sensor turned off.

(3) Second paper feeding for separation
- After the paper feed motor stops as mentioned above, the upper tray lift motor turns in the reverse direction at a speed of 533 pps to move the paper feed tray upward.
- The upper tray pick sensor turns on to stop the upper tray lift motor.
- For plain paper, the tray paper feed motor turns at a speed of 500 mm/s to start separating the paper in the tray. For thick paper, the motor turns in the reverse direction at a speed of 250 mm/s to start separating the paper in the tray.
- For the upper tray, the tray paper feed motor stops when the paper has been fed 14.7 [mm] since the registration sensor turned on. For the lower tray, the tray paper feed motor stops when the paper has been fed 19.1 mm since the registration sensor turned on.
- The upper tray lift motor turns in the normal direction at a speed of 533 pps to move the paper feed tray 9 pls downward.

(4) First paper feeding to standby position
- The reverse motor turns in the reverse direction at a speed of 800 mm/s to start feeding the paper to the standby position.
- When the paper has been fed 51.2 mm since the reverse timing sensor turned on, the reverse motor stops.
- When the paper has been fed 12.3 mm since the delivery sensor 2 turned on, an Eject signal is sent.
(5) First paper feeding to horizontal feed block
- When an Entry signal for the first paper is received, the entrance motor 1 turns in the reverse direction at the same speed as that of the motor in the host machine and the reverse motor turns in the reverse direction at the same speed as that of the motor in the host machine, thus feeding the paper to the horizontal feed block.
- When the paper has been fed 51.2 mm since the reverse timing sensor was turned off, the reverse motor stops.

(6) Second paper feeding for reversal
- After the reverse feed motor stops as mentioned above, the tray feed motor turns in the normal direction at a speed of 400 mm/s and the reverse motor turns in the normal direction to start feeding the paper to the standby position.
- In case of paper feed from the upper tray, the tray paper feed motor stops when the paper has been fed 64.6 mm since the registration sensor turned off. In case of paper feed from the lower tray, the tray paper feed motor stops when the paper has been fed 10.3 mm since the registration sensor turned off.
- The reverse motor stops when the paper has been fed 19.2 mm since the reverse sensor turned off.
(7) Second paper feeding to standby position
- The reverse motor turns in the reverse direction at a speed of 800 mm/s to start feeding the paper to the standby position.
- The reverse motor stops when the paper has been fed 51.2 mm since the reverse timing sensor turned on.

(8) Second paper feeding to horizontal feed block
- When an Entry signal for the second paper is received, the time specified to allocate a the pace between the first and second papers is taken, the entrance motor 1 turns in the reverse direction at the same speed as that of the motor in the host machine, and the reverse motor turns in the reverse direction at the same speed as that of the motor in the host machine, thus feeding the paper to the horizontal feed block.
- An Eject signal is sent when the paper has been fed 12.3 mm since the delivery sensor 2 turned on.
Sequence of back insert operation

The following operations are performed when two papers are fed from the inserter paper feed unit.

(1) First paper feeding for separation
- The upper tray lift motor turns in the reverse direction at a speed of 533 pps to move the paper feed tray upward.
- The upper tray pick sensor turns on to stop the upper tray lift motor.
- For plain paper, the tray paper feed motor turns in the reverse direction at a speed of 500 mm/s to start separating the paper in the tray. For thick paper, the tray paper feed motor turns in the reverse direction at a speed of 250 mm/s to start separating the paper in the tray.
- For the upper tray, the tray paper feed motor stops when the paper has been fed 14.7 [mm] since the registration sensor turned on. For the lower tray, the tray paper feed motor stops when the paper has been fed 19.1 mm since the registration sensor turned on.
- The upper tray lift motor turns in the normal direction at a speed of 533 pps to move the paper feed tray 9 pls downward.

(2) First paper feeding to standby position
- The tray paper feed motor turns in the normal direction at a speed of 800 mm/s to start feeding the paper to the standby position.
- In case of paper feed from the upper tray, the tray paper feed motor stops when the paper has been fed 64.6 mm since the registration sensor turned off. In case of paper feed from the lower tray, the tray paper feed motor stops when the paper has been fed 10.3 mm since the registration sensor turned off.
- The reverse motor stops when the paper has been fed 51.2 mm since the reverse timing sensor turned on.
(3) Second paper feeding for separation
- After the paper feed motor stops as mentioned above, the upper tray lift motor turns in the reverse direction at a speed of 533 pps to move the paper feed tray upward.
- The upper tray pick sensor turns on to stop the upper tray lift motor.
- For plain paper, the tray paper feed motor turns at a speed of 500 mm/s to start separating the paper in the tray. For thick paper, the motor turns in the reverse direction at a speed of 250 mm/s to start separating the paper in the tray.
- For the upper tray, the tray paper feed motor stops when the paper has been fed 14.7 mm since the registration sensor turned on. For the lower tray, the tray paper feed motor stops when the paper has been fed 19.1 mm since the registration sensor turned on.
- The upper tray lift motor turns in the normal direction at a speed of 533 pps to move the paper feed tray 9 pls downward.

(4) First paper feeding to horizontal feed block
- When an Entry signal for the first paper is received, the entrance motor 1 turns in the reverse direction at the same speed as that of the motor in the host machine and the reverse motor turns in the reverse direction at the same speed as that of the motor in the host machine, thus feeding the paper to the horizontal feed block.
- The reverse motor stops when the paper has been fed 51.2 mm since the reverse timing sensor was turned off.
- An Eject signal is sent when the paper has been fed 12.3 mm since the delivery sensor 2 turned on.

(5) Second paper feeding to standby position
- After the reverse feed motor stops as mentioned above, the tray paper feed motor turns in the normal direction at a speed of 800 mm/s to start feeding the paper to the standby position.
- In case of paper feed from the upper tray, the tray paper feed motor stops when the paper has been fed 64.6 mm since the registration sensor turned off. In case of paper feed from the lower tray, the tray paper feed motor stops when the paper has been fed 10.3 mm since the registration sensor turned off.
- The reverse motor stops when the paper has been fed 51.2 mm since the reverse timing sensor turned on.
Sequence of inserter pickup tray switch operation

This section describes switching of the upper tray to the lower tray that take place when two papers are fed to the upper tray and one paper is fed to the lower tray respectively from the inserter paper feed unit.

1. Upper tray paper feeding for separation
- The upper tray lift motor turns in the reverse direction at a speed of 533 pps to move the paper feed tray upward.
- The upper tray pick sensor turns on to stop the upper tray motor.
- For plain paper, the tray paper feed motor turns in the reverse direction at a speed of 500 mm/s to start separating the paper in the upper tray. For thick paper, the tray paper feed motor turns in the reverse direction at a speed of 250 mm/s to start separating the paper in the upper tray.
- The tray paper feed motor stops when the paper has been fed 14.7 mm since the upper tray registration sensor turned on.
- The tray lift motor turns in the normal direction at a speed of 533 pps to move the paper feed tray 9 pls downward.

(6) Second paper feeding to horizontal feed block
- When an Entry signal for the second paper is received, the time specified to allocate a the pace between the first and second papers is taken, the entrance motor 1 turns in the reverse direction at the same speed as that of the motor in the host machine, and the reverse motor turns in the reverse direction at the same speed as that of the motor in the host machine, thus feeding the paper to the horizontal feed block.
- The reverse motor stops when the paper has been fed 51.2 mm since the reverse timing sensor was turned off.
- An Eject signal is sent when the paper has been fed 12.3 mm since the delivery sensor 2 turned on.
(2) Upper tray paper feeding to standby position or upper tray paper feeding for reversal
* The figure shows feeding of the paper to the standby position.
- In case of reverse side insertion, the paper is fed to the standby position following the right side insertion sequence. In case of reverse side insertion, the paper is fed to the standby position following the reverse side insertion sequence.

(3) Switching between paper feed trays
- The tray paper feed motor stops when the paper has been fed 64.6 mm since the trailing edge of the paper in the upper tray has turned off the registration sensor.
  At this time, the drive switchover motor turns in the normal direction at a speed of 533 pps.
- The drive switchover motor stops when the paper has been fed 32 pls (2mm) since the drive switchover HP sensor turned on.

(4) Lower tray paper feeding for separation
- The lower tray motor turns in the reverse direction at a speed of 533 pps to move the paper feed tray upward.
- The lower tray pick sensor turns on to stop the lower tray lift motor.
- For plain paper, the tray paper feed motor turns in the reverse direction at a speed of 500 mm/s to start separating the paper in the lower tray. For thick paper, the tray paper feed motor turns in the reverse direction at a speed of 250 mm/s to start separating the paper in the lower tray.
- The tray paper feed motor stops when the paper has been fed 19.1 mm since the lower tray registration sensor turned on.
- The lower tray lift motor turns in the normal direction at a speed of 533 pps to lower the paper feed tray 9 pls downward.
(5) Lower tray paper feeding to standby position or lower tray paper feeding for reversal
* The figure shows feeding of the paper to the standby position.
- In case of reverse side insertion, the paper is fed to the standby position following the right side insertion sequence. In case of reverse side insertion, the paper is fed to the standby position following the reverse side insertion sequence.

(6) Switching between paper feed trays
- The tray paper feed motor stops when the paper has been fed 10.3 mm since the trailing edge of the paper in the lower tray has turned off the registration sensor.
- At this time, the drive switchover motor turns in the reverse direction at a speed of 533 pps.
- The drive switchover motor stops when the paper has been fed 275 pls since the drive switchover HP sensor turned off.

(7) Upper tray paper feeding for separation.
(1) Same as the Description is omitted.
Jam Detection

Overview

The following paper sensors are used to detect whether paper is present and whether paper is fed normally.

- S3 Upper tray registration sensor
- S7 Lower tray registration sensor
- S8: Middle feed sensor
- S9: Upper tray empty sensor
- S12: Lower tray empty sensor
- S16: Reverse timing sensor
- S17: Reverse sensor
- S18: Reverse entrance sensor
- S20: Entrance sensor
- S21: Delivery sensor 2
The detection sensor and detection timing, and displayed code are indicated as follows.

<table>
<thead>
<tr>
<th>Jam type</th>
<th>Sensor</th>
<th>Detection timing</th>
<th>Displayed code</th>
</tr>
</thead>
<tbody>
<tr>
<td>EntryStart time-out jam</td>
<td>-</td>
<td>EntryStart OFF is not detected even when the specified time has lapsed since EntryStartAck ON was replied.</td>
<td>2FC0</td>
</tr>
<tr>
<td>EjectStartAck time-out jam</td>
<td>-</td>
<td>EjectStartAck ON is not detected even when the specified time has lapsed since EjectStartAck ON was reported. EjectStartACK OFF is not detected even when the specified time has lapsed since EjectStart OFF was reported.</td>
<td>2FC1</td>
</tr>
<tr>
<td>Upper tray empty jam</td>
<td>S9</td>
<td>An attempt is made to feed paper from the upper tray when no paper is loaded in the upper tray.</td>
<td>2FC2</td>
</tr>
<tr>
<td>Lower tray empty jam</td>
<td>S12</td>
<td>An attempt is made to feed paper from the lower tray when no paper is loaded in the lower tray.</td>
<td>2FC3</td>
</tr>
<tr>
<td>Cover open jam</td>
<td>-</td>
<td>The front cover is opened during inserter operation or the inserter top cover is opened during inserter operation.</td>
<td>2300</td>
</tr>
<tr>
<td>Power-on jam</td>
<td>-</td>
<td>Paper is detected in the unit at power-on or start of mechanism initialization.</td>
<td>2400</td>
</tr>
<tr>
<td>Error prevention jam</td>
<td>-</td>
<td>A jam is caused without causing an error when a problem is detected.</td>
<td>2C01</td>
</tr>
<tr>
<td>Emergency stop jam</td>
<td>-</td>
<td>The inserter stops operating upon reception of an emergency stop signal.</td>
<td>2FC4</td>
</tr>
<tr>
<td>Entrance sensor delay jam</td>
<td>S20</td>
<td>The entrance sensor does not detect paper even when the specified time has lapsed since a paper handover request signal was received.</td>
<td>20E0</td>
</tr>
<tr>
<td>Entrance sensor 2 delay jam</td>
<td>S21</td>
<td>Delivery sensor 2 does not detect paper (in the horizontal paper feed mode) even when the specified time has lapsed since the entrance sensor detected paper, or delivery sensor 2 does not detect paper even when the specified time has lapsed since paper was inserted from the inserter.</td>
<td>20E2</td>
</tr>
<tr>
<td>Registration sensor jam</td>
<td>S3, S7</td>
<td>The registration sensor corresponding to the paper feed tray does not detect paper even when the specified time has lapsed since paper fed from the inserter started.</td>
<td>20E4</td>
</tr>
<tr>
<td>Middle feed sensor delay jam</td>
<td>S8</td>
<td>The middle feed sensor does not detect paper even when the specified time has lapsed since paper feed to the reversal unit standby position started.</td>
<td>20E5</td>
</tr>
<tr>
<td>Reverse entrance sensor delay jam</td>
<td>S18</td>
<td>The reverse entrance sensor does not detect paper even when the specified time has lapsed since the middle feed sensor detected paper.</td>
<td>20E6</td>
</tr>
<tr>
<td>Reverse sensor delay jam</td>
<td>S17</td>
<td>The reverse sensor does not detect paper even when the specified time has lapsed since the reverse entrance sensor detected paper (in the reverse insertion mode), or the reverse sensor does not detect paper even when the specified time has lapsed since paper feed to the reversal unit standby position started after switchback.</td>
<td>20E7</td>
</tr>
<tr>
<td>Reverse timing sensor delay jam</td>
<td>S16</td>
<td>The reverse timing sensor does not detect paper even when the specified time has lapsed since the reverse entrance sensor detected paper (in the straight insertion mode), or the reverse timing sensor does not detect paper even when the specified time has lapsed since the reverse sensor detected paper (in the reverse insertion mode).</td>
<td>20E8</td>
</tr>
<tr>
<td>Entrance sensor stationary jam</td>
<td>S20</td>
<td>Paper does not pass by the entrance sensor even when the specified time has lapsed since the entrance sensor detected paper.</td>
<td>21E0</td>
</tr>
<tr>
<td>Delivery sensor 2 stationary jam</td>
<td>S21</td>
<td>Paper does not pass by the delivery sensor 2 even when the specified time has lapsed since the delivery sensor 2 detected paper.</td>
<td>21E2</td>
</tr>
<tr>
<td>Registration sensor stationary jam</td>
<td>S3, S7</td>
<td>Paper does not pass the registration sensor corresponding to the paper feed tray even when the specified time has lapsed since paper feed to the reversal unit standby position started.</td>
<td>21E4</td>
</tr>
<tr>
<td>Middle feed sensor stationary jam</td>
<td>S8</td>
<td>Paper does not pass by the middle feed sensor even when the specified time has lapsed since paper passed by the registration sensor corresponding to the paper feed tray.</td>
<td>21E5</td>
</tr>
<tr>
<td>Reverse entrance sensor stationary jam</td>
<td>S18</td>
<td>Paper does not pass by the reverse entrance sensor even when the specified time has lapsed since paper passed by the middle feed sensor.</td>
<td>21E6</td>
</tr>
<tr>
<td>Reverse sensor stationary jam</td>
<td>S17</td>
<td>Paper does not pass by the reverse sensor even when the specified time has lapsed since the reverse sensor detected paper (in the reverse insertion mode), or paper does not pass by the reverse sensor even when the specified time has lapsed since the reverse sensor detected paper at the start of paper feed to the reversal unit standby position after switchback.</td>
<td>21E7</td>
</tr>
<tr>
<td>Reverse timing sensor stationary jam</td>
<td>S16</td>
<td>Paper does not pass by the reverse timing sensor even when the specified time has lapsed since paper insertion started.</td>
<td>21E8</td>
</tr>
</tbody>
</table>
Power Supply

The external AC power supplied to this machine passes through the filter PCB, and the filtered AC power is converted to 24 VDC. The 24 VDC is supplied to the DC control PCB from which it is supplied to the load-related parts (motors, solenoids, fans, and clutches) as it is or converted to 5 VDC or 3.3 VDC by the DC-DC to be supplied to logic-related parts (sensors).

Protection Function

The power supply PCB incorporates a primary-side, secondary-side overcurrent, and overvoltage protection circuits.

Each of load-related 24V lines has a fuse. If overcurrent or overvoltage occurs in a load (motor, etc.) due to a trouble such as a short circuit, the fuse blows to actuate the protection mechanism.

Each of logic-related 5V/3.3V lines also has a fuse to actuate the protection mechanism.
Work of service

Scheduled Servicing

When the endurance time of a part expires soon, replace and/or clean it as required.

<table>
<thead>
<tr>
<th>Item</th>
<th>Part name</th>
<th>Expected service life</th>
<th>Qty</th>
<th>Operation</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Periodically replaced parts</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumable parts</td>
<td>Through-pass inlet antistatic needle</td>
<td>6,000,000 sheets</td>
<td>2</td>
<td>Replace</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Through-pass outlet antistatic needle</td>
<td>6,000,000 sheets</td>
<td>2</td>
<td>Replace</td>
<td></td>
</tr>
<tr>
<td></td>
<td>pickup roller (upper/lower)</td>
<td>100,000 sheets</td>
<td>4</td>
<td>Replace</td>
<td></td>
</tr>
<tr>
<td></td>
<td>separation roller (upper/lower)</td>
<td>100,000 sheets</td>
<td>2</td>
<td>Replace</td>
<td></td>
</tr>
<tr>
<td></td>
<td>feed roller (upper/lower)</td>
<td>100,000 sheets</td>
<td>2</td>
<td>Replace</td>
<td></td>
</tr>
<tr>
<td></td>
<td>torque limiter (upper/lower)</td>
<td>1,000,000 sheets</td>
<td>2</td>
<td>Replace</td>
<td></td>
</tr>
<tr>
<td></td>
<td>electromagnetic clutch (upper/lower)</td>
<td>1,000,000 sheets</td>
<td>2</td>
<td>Replace</td>
<td></td>
</tr>
<tr>
<td></td>
<td>solenoid assembly</td>
<td>1,000,000 sheets</td>
<td>1</td>
<td>Replace</td>
<td></td>
</tr>
<tr>
<td>Periodically serviced parts</td>
<td>pickup roller (upper/lower)</td>
<td>40,000 sheets</td>
<td>4</td>
<td>Cleaning</td>
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<tr>
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<td>separation roller (upper/lower)</td>
<td>40,000 sheets</td>
<td>2</td>
<td>Cleaning</td>
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<td>Cleaning</td>
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<tr>
<td></td>
<td>torque limiter (upper/lower)</td>
<td>40,000 sheets</td>
<td>2</td>
<td>Cleaning</td>
<td></td>
</tr>
</tbody>
</table>

Upgrading

Flash ROM is used for IC3 (CPU) on the master controller PCB. Rewrite this IC when upgrading.

There are two ways to upgrade:

- Upgrading from the host machine (using USB memory or service support tool)
3 Periodic Servicing

- Periodic services items
<table>
<thead>
<tr>
<th>№</th>
<th>Category</th>
<th>Part name</th>
<th>Part number</th>
<th>Qty</th>
<th>Interval</th>
<th>Remarks</th>
<th>Adjusted/not adjusted</th>
<th>Counter</th>
<th>Reference</th>
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<tbody>
<tr>
<td>1</td>
<td>Feed unit</td>
<td>Through-pass inlet antistatic needle</td>
<td>FL3-1472</td>
<td>2</td>
<td>CR/6,000,000sheet</td>
<td></td>
<td>No</td>
<td>DRBL-2&gt;IS-ELM1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Through-pass outlet antistatic needle</td>
<td>FL3-1470</td>
<td>2</td>
<td>CR/6,000,000sheet</td>
<td></td>
<td>No</td>
<td>DRBL-2&gt;IS-ELM2</td>
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</tr>
<tr>
<td>3</td>
<td>Paper feed</td>
<td>pickup roller (upper)</td>
<td>4A3-3870</td>
<td>2</td>
<td>CR/6,000,000sheet</td>
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<td>DRBL-2&gt;IS-P-RL1</td>
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<tr>
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<td>separation roller (upper)</td>
<td>4A3-3868</td>
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<td>CR/100,000sheet</td>
<td></td>
<td>No</td>
<td>DRBL-2&gt;IS-S-RL1</td>
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<td>5</td>
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<td>4A3-3869</td>
<td>1</td>
<td>CR/100,000sheet</td>
<td></td>
<td>No</td>
<td>DRBL-2&gt;IS-F-RL1</td>
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<tr>
<td>6</td>
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<td>4A3-3888</td>
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<td>DRBL-2&gt;IS-TQLM1</td>
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<tr>
<td>7</td>
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<td>4H3-0290</td>
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<td>CR/1,000,000sheet</td>
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<td>No</td>
<td>DRBL-2&gt;IS-CL1</td>
<td></td>
</tr>
<tr>
<td>8</td>
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<td>pickup roller (lower)</td>
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<td>CR/100,000sheet</td>
<td></td>
<td>No</td>
<td>DRBL-2&gt;IS-P-RL2</td>
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<td>No</td>
<td>DRBL-2&gt;IS-S-RL2</td>
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<td>4A3-3869</td>
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<td>CR/100,000sheet</td>
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<td>No</td>
<td>DRBL-2&gt;IS-F-RL2</td>
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<td>4H3-0290</td>
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<td>No</td>
<td>DRBL-2&gt;IS-CL2</td>
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<td>13</td>
<td>Feed unit</td>
<td>Reversal solenoid assembl</td>
<td>FL2-7191</td>
<td>1</td>
<td>CR/1,000,000sheet</td>
<td></td>
<td>No</td>
<td>DRBL-2&gt;IS-RV-SL</td>
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<tr>
<td>14</td>
<td>Paper feed</td>
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<td>4A3-3870</td>
<td>2</td>
<td>CR/40,000sheet</td>
<td>Clean it with a cloth wetted with water and squeezed tightly.</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>separation roller (upper)</td>
<td>4A3-3868</td>
<td>1</td>
<td>CR/40,000sheet</td>
<td>Clean it with a cloth wetted with water and squeezed tightly.</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>feed roller (upper)</td>
<td>4A3-3869</td>
<td>1</td>
<td>CR/40,000sheet</td>
<td>Clean it with a cloth wetted with water and squeezed tightly.</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>pickup roller (lower)</td>
<td>4A3-3870</td>
<td>2</td>
<td>CR/40,000sheet</td>
<td>Clean it with a cloth wetted with water and squeezed tightly.</td>
<td>No</td>
<td>No</td>
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<td>18</td>
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<td>separation roller (lower)</td>
<td>4A3-3868</td>
<td>1</td>
<td>CR/40,000sheet</td>
<td>Clean it with a cloth wetted with water and squeezed tightly.</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td></td>
<td>feed roller (lower)</td>
<td>4A3-3869</td>
<td>1</td>
<td>CR/40,000sheet</td>
<td>Clean it with a cloth wetted with water and squeezed tightly.</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>
Parts Replacement/Cleaning Procedure

- List of Parts
- External / Internal Covers
- Main Units
- Consumable Parts Requiring Periodic Replacement and Cleaning Points
- Motors / PCBs
- Sensors
## List Of Parts

### External / Internal Covers

<table>
<thead>
<tr>
<th>№</th>
<th>Name</th>
<th>Part No.</th>
<th>Refer to</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rear Upper Cover</td>
<td>FC9-1851/FC9-1776</td>
<td>4-6</td>
</tr>
<tr>
<td>2</td>
<td>Rear Lower Cover</td>
<td>FC9-1766</td>
<td>4-7</td>
</tr>
<tr>
<td>3</td>
<td>Front Upper Cover</td>
<td>FC9-1764/FC9-1767/FC6-5697</td>
<td>4-7</td>
</tr>
<tr>
<td>4</td>
<td>Front Inner Cover</td>
<td>FC9-1765</td>
<td>4-8</td>
</tr>
<tr>
<td>5</td>
<td>Rear Cover</td>
<td>FC9-1882</td>
<td>4-9</td>
</tr>
<tr>
<td>6</td>
<td>Front Cover</td>
<td>FC9-1881</td>
<td>4-10</td>
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</tbody>
</table>

[Diagram of parts F-4-1, F-4-2, F-4-3]
### Consumable Parts Requiring Periodic Replacement and Cleaning Points

<table>
<thead>
<tr>
<th>№</th>
<th>Name</th>
<th>Part No.</th>
<th>Refer to</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Through-pass inlet antistatic needle</td>
<td>FL3-1472</td>
<td>-</td>
</tr>
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<td>2</td>
<td>Through-pass outlet antistatic needle</td>
<td>FL3-1470</td>
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<td>3</td>
<td>Inserter pickup roller (upper)</td>
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<td>4-15</td>
</tr>
<tr>
<td>4</td>
<td>Inserter separation roller (upper)</td>
<td>4A3-3868</td>
<td>4-16</td>
</tr>
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<td>5</td>
<td>Inserter feed roller (upper)</td>
<td>4A3-3869</td>
<td>4-17</td>
</tr>
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<td>6</td>
<td>Inserter torque limiter (upper)</td>
<td>4A3-3888</td>
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</tr>
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<td>7</td>
<td>Inserter pickup roller (lower)</td>
<td>4A3-3870</td>
<td>4-16</td>
</tr>
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<td>Inserter separation roller (lower)</td>
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<td>4-17</td>
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<td>Inserter feed roller (lower)</td>
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<td>4-18</td>
</tr>
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<td>Inserter torque limiter (lower)</td>
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<td>Inserter electromagnetic clutch (upper)</td>
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<td>Inserter electromagnetic clutch (lower)</td>
<td>4H3-0290</td>
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<td>Reversal solenoid assembly</td>
<td>FL2-7191</td>
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<td>Name</td>
<td>Part No.</td>
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<td>-------------------------------------</td>
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<td>M1</td>
<td>Tray Paper feed motor</td>
<td>FK2-4580</td>
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<td>M2</td>
<td>Upper tray lift motor</td>
<td>FH5-1040</td>
<td>4-23</td>
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<td>M3</td>
<td>Low tray lift motor</td>
<td>FH5-1040</td>
<td>4-23</td>
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<td>M4</td>
<td>Drive switchover motor</td>
<td>FH5-1041</td>
<td>4-22</td>
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<td>M5</td>
<td>Entrance motor 1</td>
<td>FK2-4582</td>
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<td>M6</td>
<td>Reverse motor</td>
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<td>SW1</td>
<td>Front upper cover open/close switch</td>
<td>4H1-6449</td>
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<td>SW2</td>
<td>Upper cover open/close switch</td>
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<td>Power supply switch</td>
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<td>CL1</td>
<td>Upper tray regist clutch</td>
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<td>CL2</td>
<td>Low tray regist clutch</td>
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<td>SOL1</td>
<td>Reverse solenoid</td>
<td>FH6-5136</td>
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<td>Fan</td>
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<td>Breaker</td>
<td>FH7-7625</td>
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<td>PCB1</td>
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<td>Low tray LED PCB</td>
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<td>PCB3</td>
<td>DC controller PCB</td>
<td>FM3-9731</td>
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<td>Option controller PCB</td>
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<td>Arcnet PCB</td>
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<td>S1</td>
<td>Drive switchover sensor</td>
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<td>S2</td>
<td>Upper tray pick sensor</td>
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<td>S3</td>
<td>Upper tray regist sensor</td>
<td>WG8-5696</td>
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<td>S4</td>
<td>Upper tray lower limit sensor</td>
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<td>Low tray pick sensor</td>
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<td>S9</td>
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<td>Upper tray width sensor</td>
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<td>Upper tray last paper sensor</td>
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<td>Low tray last paper sensor 2</td>
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<td>Reverse timing sensor</td>
<td>WG8-5696</td>
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</tr>
<tr>
<td>S17</td>
<td>Reverse sensor</td>
<td>WG8-5696</td>
<td>-</td>
</tr>
<tr>
<td>S18</td>
<td>Reverse entrance sensor</td>
<td>WG8-5696</td>
<td>-</td>
</tr>
<tr>
<td>S19</td>
<td>Inserter open/close sensor</td>
<td>WG8-5696</td>
<td>-</td>
</tr>
<tr>
<td>S20</td>
<td>Entrance sensor</td>
<td>WG8-5696</td>
<td>-</td>
</tr>
<tr>
<td>S21</td>
<td>Delivery sensor 2</td>
<td>WG8-5696</td>
<td>-</td>
</tr>
</tbody>
</table>
External/Internal Covers

Removing the Rear Upper Cover

1) Remove four screws to remove the rear upper cover.
Removing the Rear Lower Cover

1) Remove the rear upper cover.  
(Refer to: 4-6)

2) Remove four screws to remove the rear lower cover.

Removing the Front Upper Cover

1) Open the front upper cover.

2) Remove two resin E-rings to remove the upper front cover.
Removing the Front Inner Cover

1) Open the front upper cover.

2) Holding the jam removal lever, open the transfer guide.

3) Remove two screws to remove the front inner cover (small).

4) Remove five screws to remove the front inner cover.

F-4-10

F-4-11

F-4-12

F-4-13
Removing the Inserter Rear Cover

1) Remove two screws to remove the inserter rear cover.

---

Changing the Inserter Top Cover Open/Close Angle

1) Remove the rear cover. (Refer to 4-9)

2) Remove one screw, remove the inserter top cover angle regulating shaft, and then open the top cover.
**Removing the Inserter Front Cover**

1) Remove the inserter rear cover. *(Refer to: 4-9)*
2) Increase the inserter top cover open/close angle. *(Refer to: 4-9)*
3) Remove two screws to remove the inserter front cover.

**Changing the Middle Guide Open/Close Angle**

1) Remove the inserter rear cover. *(Refer to: 4-9)*
2) Increase the inserter top cover open/close angle. *(Refer to: 4-9)*
3) Remove two screws to remove the inserter front cover.

![Image of inserter front cover removal](image-url)

![Image of middle guide angle change](image-url)
Changing the Inserter Open Angle

1) Remove the inserter rear cover. [Refer to 4-9]

2) Remove one screw to remove the support plate 1.

3) Remove one screw to remove the cover.

4) Remove one screw to remove the support plate 2.
Removing the Main Unit

Removing the Upper Tray Unit

1) Remove the rear cover.  (Refer to: 4-9)
2) Increase the top cover open/close angle.  (Refer to: 4-9)
3) Remove the front cover.  (Refer to: 4-10)

4) Remove four screws and three connectors to remove the upper tray unit.
**Removing the Lower Tray Unit**

1) Remove the rear cover.  
   [(Refer to: 4-9)]
2) Increase the top cover open/close angle.  
   [(Refer to: 4-9)]
3) Remove the front cover.  
   [(Refer to: 4-10)]
4) Remove the upper tray unit.  
   [(Refer to: 4-12)]
5) Remove four screws and one connector to remove the lower tray unit.

**Removing the Inserter Pickup Unit**

1) Remove the inserter rear cover.  
   [(Refer to: 4-9)]
2) Increase the inserter open angle.  
   [(Refer to: 4-11)]
3) Remove two screws, one clamp, and 11 connectors to remove the interface cable.
4) Remove two screws from the hinge.

5) Remove two stepped screws, and then slide the inserter pickup unit backward, and then lift it to remove it.
Removing the Inserter pickup rollers (upper)

1) Remove the rear cover.  
   (Refer to: 4-9)
2) Increase the top cover open/close angle.  
   (Refer to: 4-9)

3) Remove two screws to remove the front transfer guide.

4) Remove two resin E-rings to remove two inserter pickup rollers (upper)

F-4-27

F-4-28
Removing the Inserter pickup roller (lower)

1) Remove the rear cover.  
   *(Refer to 4-9)*
2) Increase the top cover open/close angle.  
   *(Refer to 4-9)*
3) Increase the middle guide open/close angle.  
   *(Refer to 4-10)*
4) Remove two resin E-rings to remove two inserter pickup rollers (lower).

Removing the Inserter separation roller (upper)

1) Remove the rear cover.  
   *(Refer to 4-9)*
2) Increase the top cover open/close angle.  
   *(Refer to 4-9)*
3) Remove five screws to remove the transfer guide.
4) Remove two E-rings and one bearing to remove the inserter separation roller (upper).
Removing the Inserter separation roller (lower)

1) Remove the rear cover.  
   (Refer to 4-9)
2) Increase the top cover open/close angle.  
   (Refer to 4-9)
3) Increase the middle guide open/close angle.  
   (Refer to 4-10)
4) Remove five screws to remove the transfer guide.
5) Remove two E-rings and one bearing to remove the inserter separation roller (lower).

Removing the Inserter feed roller (upper)

1) Remove the rear cover.  
   (Refer to 4-9)
2) Increase the top cover open/close angle.  
   (Refer to 4-9)
3) Remove one spring, two resin E-rings, and two bearings to remove the pickup roller unit.
4) Remove one spring, two resin E-rings, and two bearings to remove the pickup roller unit.
5) Remove three E-rings, one pickup roller, and one lever to remove the inserter feed roller (upper).
Removing the Inserter feed roller (lower)

1) Remove the rear cover.  
   (Refer to: 4-9)
2) Increase the top cover open/  
   close angle.  
   (Refer to: 4-9)
3) Increase the middle guide  
   open/close angle.  
   (Refer to: 4-10)
4) Remove six screws to remove the rear transfer  
   guide.
5) Remove one spring, two resin E-rings, and two  
   bearings to remove the pickup roller unit.
6) Remove three E-rings, one pickup roller, and one lever to  
   remove the inserter feed roller (lower).

Removing the Inserter torque limiter (upper)

1) Remove the rear cover.  
   (Refer to: 4-9)
2) Increase the top cover open/  
   close angle.  
   (Refer to: 4-9)
3) Remove five screws to remove the transfer guide.
4) Remove three E-rings, one gear, one parallel pin, two bearings,  
   and one separation roller to remove the inserter torque limiter  
   (upper).
Removing the Inserter torque limiter (lower)

1) Remove the rear cover.  
   (Refer to 4-9)  
2) Increase the top cover open/close angle.  
   (Refer to 4-9)  
3) Increase the middle guide open/close angle.  
   (Refer to 4-10)  
4) Remove five screws to remove the transfer guide.  
5) Remove three E-rings, one gear, one parallel pin, two bearings, and one separation roller to remove the inserter torque limiter (lower).

Removing the Inserter electromagnetic clutch (upper)

1) Remove the rear cover.  
   (Refer to 4-9)  
2) Increase the top cover open/close angle.  
   (Refer to 4-9)  
3) Increase the middle guide open/close angle.  
   (Refer to 4-10)  
4) Remove one screw and one connector, and the remove the inserter electromagnetic clutch (upper).
Removing the Inserter electromagnetic clutch (lower)

1) Remove the rear cover.  
(Refer to 4-9)
2) Increase the top cover open/close angle.  
(Refer to 4-9)
3) Increase the middle guide open/close angle.  
(Refer to 4-10)
4) Remove one screw and one connector, and the remove the inserter electromagnetic clutch (lower).
Removing the Motor

Removing the Tray Pickup Motor (M1)

1) Remove the rear cover.
(Refer to: 4-9)

2) Remove one connector and two wire saddles to remove the harness from the harness guide.

3) Remove four screws, one belt, and one spring to remove the tray pickup motor unit.

4) Remove two screws and one connector to remove the tray pickup motor.
Removing the Drive Switchover Motor (M4)

1) Remove the rear cover. (Refer to 4-9)

2) Remove four connectors and two clamps.

2) Loosen one screw to remove the harness guide.

4) Remove three screws to remove the drive switchover motor unit.

5) Remove two screws to remove the drive switchover motor.
Removing the Upper Tray Lift Motor (M2)

1) Remove the rear cover.  
   (Refer to 4-9)

2) Remove two screws and one connector to remove the upper tray lift motor.

Removing the Lower Tray Lift Motor (M3)

1) Remove the rear cover.  
   (Refer to 4-9)

2) Remove two screws and one connector to remove the lower tray lift motor.
Removing the PCB

Removing the DC Controller PCB

1) Remove the rear cover. (Refer to 4-9)

2) Remove one screw, three locking supports, and all connectors on the PCB, and then remove the DC controller PCB.
Removing the Upper Tray LED PCB

1) Remove the upper tray unit.  
(Refer to: 4-12)

2) Remove two screws to remove the LED cover.

3) Remove one screw and one connector to remove the upper tray LED PCB.

Removing the Lower Tray LED PCB

1) Remove the upper tray unit.  
(Refer to: 4-12)

2) Remove the lower tray unit.  
(Refer to: 4-13)

3) Remove four screws to remove the tray bottom cover (large).

4) Remove four screws to remove the tray lower inner cover.
5) Remove two screws to remove the LED cover.

6) Remove one screw and one connector to remove the lower tray LED PCB.
## Removing the Sensor

### Removing the Upper tray empty sensor (S9)

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>Remove the rear cover. <em>(Refer to: 4-9)</em></td>
</tr>
<tr>
<td>2)</td>
<td>Increase the top cover open/close angle. <em>(Refer to: 4-9)</em></td>
</tr>
<tr>
<td>3)</td>
<td>Remove the front cover. <em>(Refer to: 4-10)</em></td>
</tr>
<tr>
<td>4)</td>
<td>Remove the upper tray unit. <em>(Refer to: 4-12)</em></td>
</tr>
<tr>
<td>5)</td>
<td>Remove one screw to remove the sensor cover.</td>
</tr>
<tr>
<td>6)</td>
<td>Remove one connector to remove the upper tray empty sensor.</td>
</tr>
</tbody>
</table>

![Diagram F-4-62](image1) ![Diagram F-4-63](image2)
Removing the Upper tray width sensor (S10)

1) Remove the rear cover. (Refer to 4-9)
2) Increase the top cover open/close angle. (Refer to 4-9)
3) Remove the front cover. (Refer to 4-10)
4) Remove the upper tray unit. (Refer to 4-12)

5) Remove two screws to remove the tray lower cover (small).

6) Remove two screws and one connector to remove the upper tray width sensor.

MEMO: After replacing with the upper tray width sensor with a new one, adjust the sensor output value in the service mode.
## Removing the Upper tray last paper sensor (S11)

1. Remove the rear cover. *(Refer to: 4-9)*
2. Increase the top cover open/close angle. *(Refer to: 4-9)*
3. Remove the front cover. *(Refer to: 4-10)*
4. Remove the upper tray unit. *(Refer to: 4-12)*
5. Remove two screws to remove the tray lower cover (small).

![Image F-4-65](image)

6. Remove one connector to remove the Upper tray last paper sensor.

![Image F-4-66](image)

---

## Removing the Low tray empty sensor (S12)

1. Remove the rear cover. *(Refer to: 4-9)*
2. Increase the top cover open/close angle. *(Refer to: 4-9)*
3. Remove the front cover. *(Refer to: 4-10)*
4. Remove the upper tray unit. *(Refer to: 4-12)*
5. Remove the lower tray unit. *(Refer to: 4-12)*
6. Remove four screws to remove the tray lower cover (large).
7. Remove four screws to remove the tray lower cover (inner).

![Image F-4-67](image)

![Image F-4-68](image)
Removing the Low tray width sensor (S13)

1) Remove the rear cover.  
(Refer to: 4-9)
2) Increase the top cover open/close angle.  
(Refer to: 4-9)
3) Remove the front cover.  
(Refer to: 4-10)
4) Remove the upper tray unit.  
(Refer to: 4-12)
5) Remove the lower tray unit.  
(Refer to: 4-12)
6) Remove four screws to remove the tray lower cover (large).  
7) Remove four screws to remove the tray lower cover (inner).
Removing the Low tray last paper sensor 1 (S14)

1) Remove the rear cover.
   (Refer to: 4-9)
2) Increase the top cover open/close angle.
   (Refer to: 4-9)
3) Remove the front cover.
   (Refer to: 4-10)
4) Remove the upper tray unit.
   (Refer to: 4-12)
5) Remove the lower tray unit.
   (Refer to: 4-12)

6) Remove four screws to remove the tray lower cover (large).

7) Remove four screws to remove the tray lower cover (inner).

MEMO:
After replacing with the low tray width sensor with a new one, adjust the sensor output value in the service mode.
8) Remove two screws to remove the tray lower cover (small).

9) Remove one connector to remove the low tray last paper sensor1.

Removing the Low tray last paper sensor 2 (S15)

1) Remove the rear cover.  
   (Refer to: 4-9)
2) Increase the top cover open/close angle.  
   (Refer to: 4-9)
3) Remove the front cover.  
   (Refer to: 4-10)
4) Remove the upper tray unit.  
   (Refer to: 4-12)
5) Remove the lower tray unit.  
   (Refer to: 4-12)
6) Remove four screws to remove the tray lower cover (large).
7) Remove four screws to remove the tray lower cover (inner).
8) Remove two screws to remove the tray lower cover (small).

9) Remove two screws to remove the sensor unit.

10) Remove one connector to remove the low tray last paper sensor 2.
Adjustment at Time of Parts Replacement
Adjustment at Time of Parts Replacement

- Inserter opening/closing adjustment (after replacing the inserter unit)

  <Pre-check>
  Close the inserter and check whether the positioning pin [1] enters the frame hole in at the bottom of the inserter. (If the pin enters the frame hole by the inserter's own weight although it does not enter the hole smoothly, it is OK.)

  If the positioning pin does not enter the hole, adjust the inserter position by adjusting the position of the hinge's adjusting plate following the procedure below.

  <Adjustment Method>
  1. Loosen two screws to remove the rear cover.
  2. Remove one screw to remove the retaining plate.
  3. Remove one screw to remove the cover.
  4. Remove one screw to remove the retaining plate.
  5. Open the inserter, and then loosen the two hinge fixing screw (M4) [1].
6. Loosen the two screws securing the hinge.

7. Remove the nut cap, loosen the hexagon nut, and turn the adjusting screw using an Allen wrench. Make adjustment with reference to the marks on the front plate. Turning the adjusting screw by one scale mark (1 mm) moves the front of the inserter 4.6 mm to the left/right.
   - Turning the adjusting screw clockwise moves the plate forward and moves the inserter to the leftward.
   - Turning the adjusting screw counterclockwise moves the plate backward and moves the inserter to the rightward.

8. Tighten the two hinge fixing screws.

9. Repeat step 7 until the positioning pin enters the frame hole completely.
Inserter height adjustment (after replacing the inserter unit)

<Pre-check>
With the inserter closed, check whether the gap between the right side of the inserter and the finisher is within ±1 mm at the front and back (A and B). If it is not within ±1 mm, make the height adjustment as the following procedure.

<Adjustment method>
1. Remove the rear cover.
2. Increase the top cover open/close angle. Remove one screw to remove the upper cover angle restriction shaft [1]. Open the top cover.
3. Loosen two screws to remove the front cover.
5. Using an Allen wrench [1], turn the adjusting screw to adjust the gap between the right side of the inserter pickup unit and the inserter base is within 1 mm at the front and back. Turning the adjusting screw by one scale [4] mark (1 mm) moves the inserter pickup unit 1 mm upward/downward.
   - Turning the adjusting screw clockwise moves the inserter pickup unit upward.
   - Turning the adjusting screw counterclockwise moves the downward.
6. Tighten the screw and hexagon nut.
7. Adjust the height of the left adjusting mechanism to the same mark as that of the right height adjusting mechanism.
8. After completion of the adjustment, reassemble the disassembled parts.

---

**Document tray width adjustment (after replacing the document width sensor)**

1. Remove the rear cover.
2. Set the DIP switch as shown below, turn on the SW1 (push switch), and then turn on the inserter. (Note: Keep pressing the SW1 for at least 2 seconds after turning on the power.) After switching between modes, turn off the power and then turn it on again.

<table>
<thead>
<tr>
<th>DIPS W (■ ON □ OFF)</th>
<th>Test mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8</td>
<td>Tray control adjustment</td>
</tr>
</tbody>
</table>

3. Place A4-size paper on the inserter upper tray in the landscape orientation, and move the side guide plates so that they touch the side edges of the paper.
4. Press the SW1 (to complete the first adjustment).
5. Place A4-size paper on the inserter upper tray in the portrait orientation, and move the side guide plates so that they touch the side edges of the paper.
6. Press the SW1 (to complete the second adjustment).

7. Place A4-size paper on the inserter lower tray in the landscape orientation, and move the side guide plates so that they touch the side edges of the paper.
8. Press the SW1 (to complete the third adjustment).
9. Place A4-size paper on the inserter lower tray in the portrait orientation, and move the side guide plates so that they touch the side edges of the paper.
10. Press the SW1 (to complete the fourth adjustment).

## Top cover positioning pin adjustment (after replacing the top cover)

### <Pre-check>
If you cannot lock the inserter top cover or it is difficult to lock it after replacing the top cover or top cover unit, adjust the positioning pin following the procedure mentioned below.

### <Adjustment method>
1. Remove the rear cover.
2. Increase the top cover open/close angle.
3. Loosen two screws [1] and one screw [2].
4. Twist the top cover with both hands while twisting it slightly, and move the adjusting plate with reference to the marks [3]. Next, secure the adjusting plate using a screw [2].
5. Close the top cover to check whether it closes smoothly. If it does not open/close smoothly, repeat step 4.
6. Tighten the three temporary jointed screws [1].
Installation

- Making Pre-installation Checks
- Checking Bundled Components
- Unpacking
- Installation Procedure
Making Pre-installation Checks

The following conditions are required for the installation site. It is recommended to make a preliminary inspection of the installation site before delivering the equipment to the user.

Checking the Power Supply

The machine must be connectable to the outlet that can supply the rated voltage +10/-15% at the specified ampere or higher.

120V - 230V 1A

Checking the Installation Space

The following illustration describes the necessary space for the maintenance.

1105 mm

1000 mm or more

F-6-1
Cautions at the Time of Installation

1. Turn off the host machine.

**CAUTION**

Make sure to perform the following works sequentially on the connected equipment before installation.

1) Press and hold the power switch on the operation panel of the host machine for 3 seconds or longer.
2) Operate the touch panel following the shutdown sequence displayed on the LCD on the operation panel.
3) When the message indicating that the options can be turned off is displayed on the LCD on the operation panel after start of the shutdown sequence, turn off the main power manually.
4) Unplug the power cable of the host machine from the outlet.

2. About the Installation

This equipment is approx. 55.0kg, so it should require two or more personnel to install.
Checking Bundled Components

- [1] RS tight screw (M4x8) [8pcs.*1]
- [3] Positioning pin [1pce.]
- [4] Binding-head screw (M4x10) [2pcs.]
- [5] Shunt cable [1pce.]
- [6] Power cord (US/EUR/UK)*2
  - 120V model: 1pce.
  - 220V model: 1pce.
  - 230V model: 3pce.
- [8] Index label [2pcs.]
- [9] Don’ts Form Label [1pce.]

*1: The six screws are used for Finisher-AF1/Saddle Finisher-AF2
The eight screws are used for Finisher-AG1/Saddle Finisher-AG2

*2: Use the correct power cord to match the location/area of installation. Make sure not to leave unused power cord at the site.

Used for connecting to finisher AF1/saddle finisher AF2
- [10] ARCNET connection T-connector [1pce.]

Used for connecting to finisher AG1/saddle finisher AG2
- [12] Interface cable [1pce.]
- [13] W-sems screw (M4×12) [1pce.]
- [14] Clamp [1pce.]
- [15] Switch blindfold cover [1pce.]
- [16] Wire saddle [1pce.]

---

F-6-2
How to Utilize This Installation Procedure

When Using the Contained Parts (Bundled Components in the Shipping Carton)

After unpacking, confirm the parts contained in the package by referring to the illustration of “Bundled Components” described in this procedure.

The below symbol appears on the illustration in some steps when the parts contained in the shipping carton are to be used.

Mind this symbol to be aware the parts contained in the shipping carton are to be used.

Symbols in the Illustration

The frequently-performed operations/works are described with symbols in this procedure. Check the description below.

- Screw
- Connector
- Harness
- Tighten
- Remove
- Connect
- Disconnect
- Connect/Secure
- Disconnect/Free
- Prohibition (Good/Bad)
- Checking instruction
  - Good
  - Bad
  - Check
  - Visual check
  - Sound check

Instruction on direction (front/rear, top/bottom)

- FRONT VIEW
- REAR VIEW
- TOP VIEW
- BOTTOM VIEW

- Push
- Connect to the outlet
- Turn ON the switch
- Copy
- Remove the projection
- Fit in the projection
- Release/remove the claw
- Fit in/attach the claw
Unpacking Procedure

1) Take out the accessory box from the package.

**CAUTION**
Leave the four cushioning materials attached to the inserter in position.
Removing the cushioning materials could result in a deformation of the mounting portion or elsewhere.

**MEMO**
The equipment ships, secured by tapes, cushioning and other materials to protect it from vibration and impact during transit. Remove all such tapes and cushioning materials as instructed below before installing the equipment.
(Keep all the shipping fixtures and cushioning materials in a safe place for later reuse in reshipping the equipment, as for relocation and repairs.)
2) Allow a team of least two workers at least to lift and erect the inserter, along with the cushioning materials.

CAUTION:
- Raising the inserter by holding its main unit might result in a deformed or damaged cabinet.
- The inserter is so heavy (weighing 55.0 kg) that it should require a team of two workers at least to handle.

3) Remove the pallet, and cushioning materials shown in the figure. Then, put the plastic cover down.

4) Elevate the front and rear casters lightly in this order and remove cushioning materials. Then, remove the plastic cover and packaging tapes.
Installation Procedure

Preparation for Connected Equipment

1) Secure the two bundled clamp plates and positioning pin to the main unit each with two bundled RS tight screws (M4 x 8). At this time, secure the supplied ground plate along with the rear latch catch.
Connecting to Connected Equipment

**CAUTION**

Check that the connected equipment is switched off and unplugged from the wall outlet.

1) Stow the left overturning prevention stay by removing a wing screw and lifting the stay up.

2) After stowing the overturning prevention stay, clamp it with the wing screw removed.

3) Stow the right overturning prevention stay by removing a wing screw and then clamp it with the wing screw removed.

4) Install the inserter in position by inserting the positioning pin into the hole on the inserter.
5) With the front upper cover open, remove one screw and press the lock lever to hook on the bearing clip. Reinstall the screw removed to secure the lock lever.

6) Close the front cover.
**Height/Inclination Checks**

**Height Check**

**MEMO**
An improperly adjusted height or inclination could result in jams frequently occurring at the paper folding unit inlet.

1) Check to see if there is a height difference of 0±3mm between the right upper surface [1] of the paper folding unit and the left upper surface [2] of the connected equipment.

![Diagram](F-6-16)

**Inclination Check**

1) Check that the difference of vertical clearances at the two positions as shown in the figure. F-1-17 is within 0±2mm.

![Diagram](F-6-17)
2) Check that the difference of vertical clearances at the two positions as shown in the figure. F-1-18 is within 0±2mm.

Height Adjustment

If the height and inclination of the inserter and the connected equipment are not within their tolerances, adjust them in these steps:

1) Remove the wrench from the front upper cover.
2) Turn the nut [1] on the front caster assembly (connected equipment side) clockwise to loosen it. Then turn the nut [2] to adjust the height.

MEMO:
- Turn the nut [2] counterclockwise to lower and clockwise to heighten.

3) Turn the nut [1] on the rear caster assembly (connected equipment side) clockwise to loosen it. Then turn the nut [2] to adjust the height.

MEMO:
- Turn the nut [2] counterclockwise to lower and clockwise to heighten.
- After making the adjustment, tighten the front and rear nuts [1] on the inserter.
### Inclination Adjustment

#### Step 1
1. Turn the nut [1] on the front caster assembly (connected equipment side) clockwise to loosen it. Then turn the nut [2] to adjust the height.

**MEMO:**
- Turn the nut [2] counterclockwise to lower and clockwise to heighten.

#### Step 2
2. With the nut [1] on the rear caster assembly (paper ejection side) being loosened, turn the nut [2] to adjust the height. When the adjustment is complete, tighten the nut [1].

**MEMO:**
- Turn the nut [2] counterclockwise to lower and clockwise to heighten.
- After making the adjustment, tighten the front and rear nuts [1] on the inserter.

#### Step 3
3. Return the wrench to the front upper cover.
Installing/Replacing Cables

Connecting the Interface Cable (ARCNET cable connection)

1) Remove the terminating connector from the main unit coaxial connector by turning it in the direction of arrow.

2) Insert the bundled ARCNET cable into the main unit coaxial connector and turn it in the direction of arrow to connect.

3) Insert the bundled ARCNET cable into the bundled T-connector and turn it in the direction of arrow to connect.

4) Insert the T-connector into the inserter terminal and turn it in the direction of arrow to connect.

Because ARCNET cable connections could make the electrical contact erratic, be sure to connect the ARCNET cable by fully turning it to its end.
Replacing the Interface Cable/
Mounting the Power Switch
Blindfold Plate
(Connecting to Finisher AG1
/Saddle Finisher AG2)

1) Remove four screws to remove the rear upper cover.

2) Remove two connectors from the board.

3) Stow the two connectors removed in the wire saddles or bundle guide.

4) Secure the bundled Interface cable with the bundled nylon clamps and one W-sems screw (M4x12).
5) Stow the Interface cable in the bundle guide/wire saddles. Plug the Interface cable connector in the terminal connector on the PCB.

6) Lift the paper feed unit and remove the two screws to remove the right upper cover.

7) Remove two screws from the right upper cover to remove the switch cover.

8) Attach the bundled power switch blindfold plate to the right upper cover with two screws.
9) Reinstall the right upper covered removed with two screws.

10) Cut out the blindfold plate on the rear upper cover with side cutter.

11) Reinstall the rear upper cover removed with four screws.

12) Connect the installed interface cable to the finisher with two bundled RS tight screws (M4x8). (Refer to an Finisher-AG1/saddle Finisher-AG2 Installation Procedure)
13) Attach the bundled wire saddle to the rear lower cover.

14) Stow the excess length of the interface cable connected to the downstream finisher into the wire saddle.

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**Connecting the Power Cord**

**CAUTION**

Use the correct power cord to match the location/area of installation. Make sure not to leave unused power code at the user site.

1) Insert the bundled power cord into the inserter to connect. Insert the plug end of the power cord into an external power outlet.
Connecting the Shunt Cable

- 1) Attach the bundled shunt cable at the rear bottom of the inserter and the connected equipment using two bundled binding-head screws (M4x10).

Labeling

- 1) Affix the bundled three kinds of labels at the illustrated positions.
Making Checks after Completion of Installation Work

Bring back the following parts which are no longer necessary:

1) When connected to the finisher –AF1/saddle finisher-AF2
   - Interface cable 1pce.
   - Clamp 1pce.
   - W-Sems Screw(M4x12) 1pce.
   - Wire saddle 1pce.
   - RS tight Screw(M4x8) 2pcs.
   - Switch blindfold cover 1pce.

2) When connected to the finisher-AG1/saddle finisher-AG2
   - ARCNET cable 1pce.
   - T-connector 1pce.

Operation Checks

1) After completion of installation, first turn on the Inserter(Connecting to Finisher AF1/Saddle Finisher AF2) and next turn on the host machine.
2) Enter the service mode to specify the connection order. Select COPIER>Option>ACCPST-D>ACC1-8. Select one of ACC1 to ACC8 for which “inserter” is displayed, and then specify the Inserter connection order.
3) Turn off the host machine and Inserter(Connecting to Finisher AF1/Saddle Finisher AF2) in this order.
4) Turn on the Inserter (Connecting to Finisher AF1/Saddle Finisher AF2) and host machine in this order.
5) In the operation check mode, check for Surface insert operation.
Appendix

- Service Tools
- General Circuit Diagram
# Service Tools

## Solvents and Oils

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Uses</th>
<th>Composition</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vic Clean</td>
<td>Cleaning: e.g., glass, plastic, rubber parts, external covers</td>
<td>Hydrocarbon (fluorine family), Alcohol, Surface activating agent, Water</td>
<td>Do not bring near fire. Procure locally. Isopropyl alcohol may be substituted.</td>
</tr>
</tbody>
</table>

## Special Tools

None
DC controller PCB

Entrance motor 1

Reverse timing sensor

Reverse sensor

Reverse entrance sensor

Front upper cover open/close switch

Inserter open/close sensor

Entrance sensor

Delivery sensor 2

Reverse motor

Reverse solenoid