TOSHIBA

# SERVICE MANUAL
## SORTER
# MG-2009

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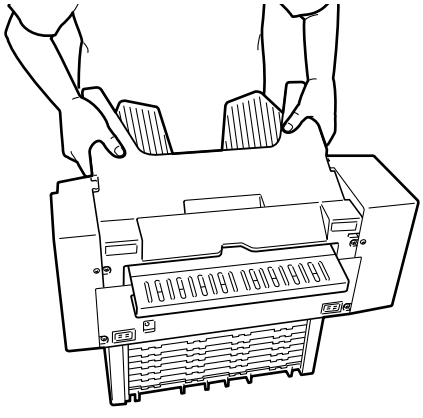
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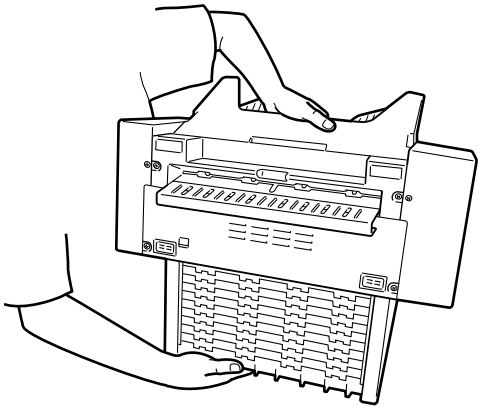
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## General Precautions for Installation/Servicing/Maintenance

1. When installing the Sorter MG-2009 to the Plain Paper Copier, be sure to follow the instructions described in the “Unpacking/Set-Up Procedure for the MG-2009” booklet which comes with each unit of the MG-2009.
2. The MG-2009 should be installed by an authorized/qualified person.
3. Before starting installation, servicing or maintenance work, be sure to unplug the copier first.
4. When servicing or maintaining the MG-2009, be careful about the rotating or operating sections such as gears, pulleys, sprockets, cams, belts, etc.
5. When parts are disassembled, reassembly is basically the reverse of disassembly unless otherwise noted in this manual or other related materials. Be careful not to assemble small parts such as screws, washers, pins, E-rings, toothed washers to the wrong places.
6. Basically, the machine should not be operated with any parts removed or disassembled.
7. Delicate parts for preventing safety hazard problems (such as breakers, thermofuses, fuses, door switches, sensors, etc. if any) should be handled/installed/adjusted correctly.
8. Use suitable measuring instruments and tools.
9. During servicing or maintenance work, be sure to check the serial No. plate and other cautionary labels (if any) to see if they are clean and firmly fixed. If not, take appropriate actions.
10. The PC board must be stored in an antic-electrostatic bag and handled carefully using a wristband, because the ICs on it may be damaged due to static electricity.
11. For the recovery and disposal of used MG-2009s, consumable parts and packing materials, it is recommended that the relevant local regulations/rules should be followed.
12. As the method of lifting the sorter, there are the following 2 types.





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# CHAPTER 1

# GENERAL DESCRIPTION


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# I. FEATURES

## 1. Designed to be light in weight and compact in size.

Compared with the existing 20-bin sorters, the Sorter MG-2009 is designed so that its parts are not only lighter but also fewer, while ensuring the same stacking performance. In addition, the sorter provides higher reliability as well as serviceability.

## 2. Supports various types of host copiers.

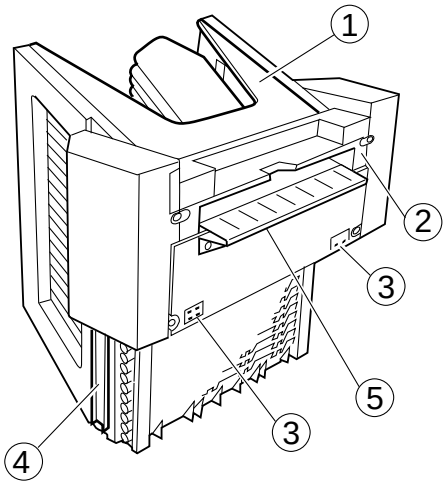
The use of a straight paper path has enabled accommodation of various types of host copiers.

# II. SPECIFICATIONS

<table>
<tr><th>Item</th><th>Specifications</th><th>Remarks</th></tr>
<tr><td>Number of bins</td><td>20</td><td></td></tr>
<tr><td>Types of modes</td><td>Non-sort, sort, group</td><td></td></tr>
<tr><td>Method of stacking</td><td>Face-up, moving bin slot, two-way sorting</td><td></td></tr>
<tr><td>Size of paper</td><td>A5-R/ST-R to A3/LD<br>Postcard (A6-R; non-sort mode only)</td><td></td></tr>
<tr><td>Volume of stacking</td><td>Non-sort: (Cascade)<br>100 sheets — A5-R/ST-R<br>600 sheets — A4/LT<br>500 sheets — A3/LD, LG, A4-R/LT-R<br><br>Sort:<br>50 sheets — A4/LT, A4-R/LT-R<br>25 sheets — A3/LD, LG<br><br>Group:<br>30 sheets — A4/LT<br>25 sheets — A3/LD, LG, A4-R/LT-R</td><td>Plain paper (64~80g/m$^{2)}$</td></tr>
<tr><td>Method of installation</td><td>Fixed type, Rail kit type (option)</td><td></td></tr>
<tr><td>Dimensions</td><td>342 (W) × 530 (D) × 492 (H) mm</td><td></td></tr>
<tr><td>Weight</td><td>16 kg</td><td></td></tr>
<tr><td>Power supply</td><td>24 V (from copier)</td><td></td></tr>
</table>

# III. NAMES OF PARTS

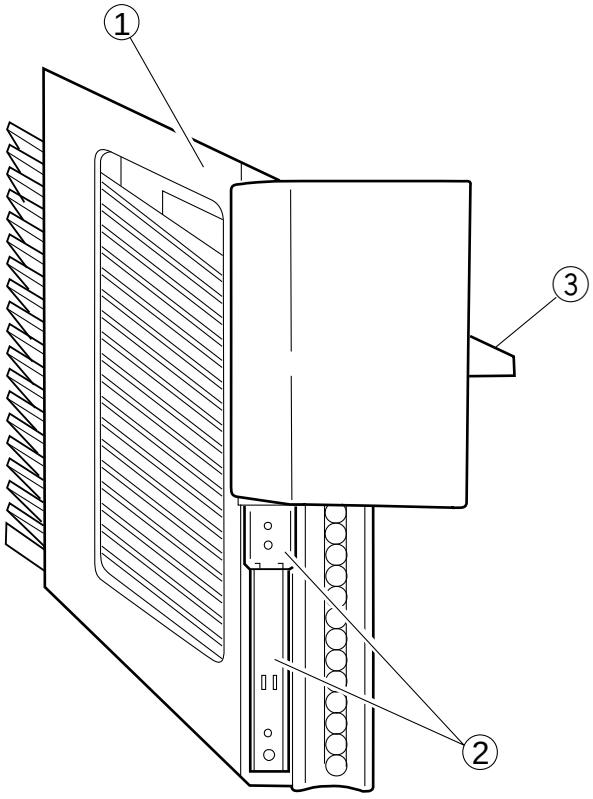
## A. External View




① Bin unit
② Feeding guide unit
③ Latch magnet
④ Rail
⑤ Entrance guide

**Figure 1-301**

## B. Cross Section




① Bin unit
② Rail
③ Entrance guide

**Figure 1-302**

# IV. OPERATIONS

## A. During Copying Operation

### 1. Outline

While the copier is in use, the sheets are delivered to the bin unit according to the mode selected on the copier's control panel:

**a. Non-Sort Mode**

In this mode, the sheets are delivered to bin No. 1.

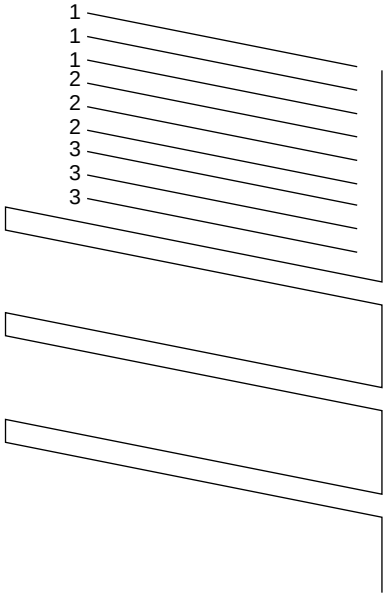



**Figure 1-401**

**b. Sort Mode**

In this mode, the delivered sheets are sorted by the bin unit.

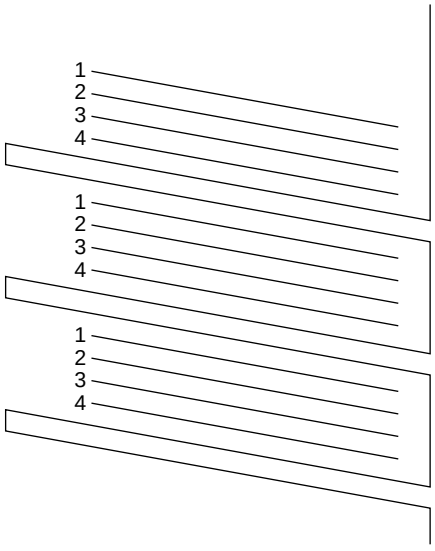



**Figure 1-402**

**c. Group Mode**

In this mode, the sheets are group-sorted by the bin unit.

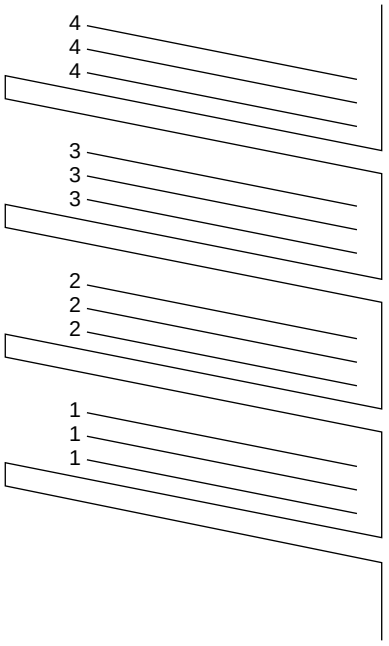



**Figure 1-403**

## B. Removing Jams

**Fixed type**

1) Check the sorter bins and remove any misfed paper from there.

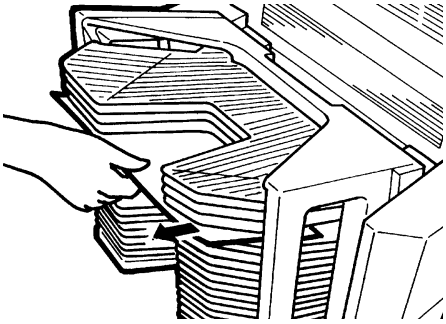


**Figure 1-404**

2) Open the front cover, raise the upper unit and remove any misfed paper from inside the copier.

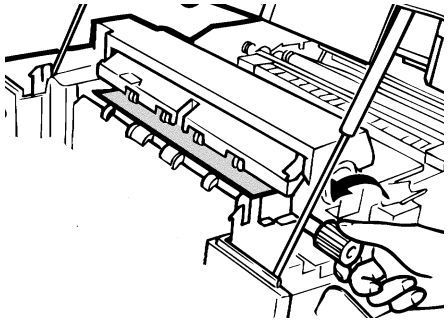


**Figure 1-405**

**Caution:** Be careful as the fuser unit may be HOT.

**Rail kit type: option**

1) Hold the section indicated in Figure 1-406, and detach the sorter from the copier.

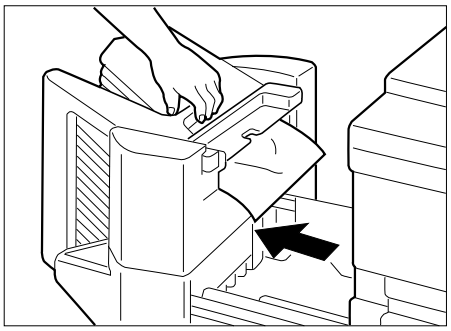


**Figure 1-406**

2) Remove the jam.

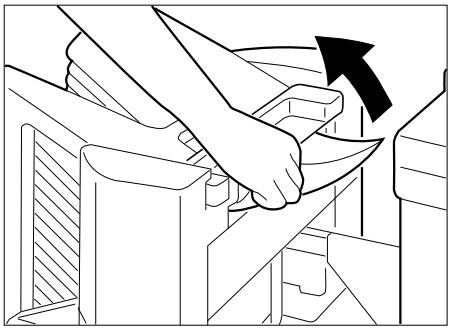


**Figure 1-407**

3) If the jam can be seen from the bin side, insert the hand from the bin side and pull out the jam.
4) Set the sorter to the copier.

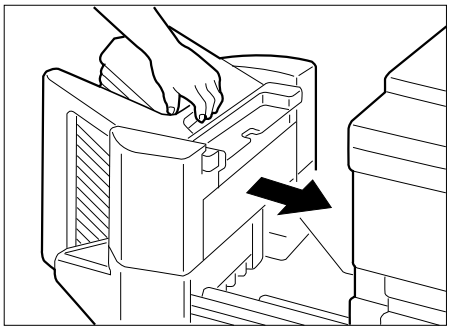


**Figure 1-408**

# CHAPTER 2

# OPERATIONS AND TIMING


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# I. BASIC CONSTRUCTION

## A. Functional Construction

The sorter consists of three functional blocks: drive system, feeding assembly drive system, and control system. (See Figure 2-101 for a functional diagram.)

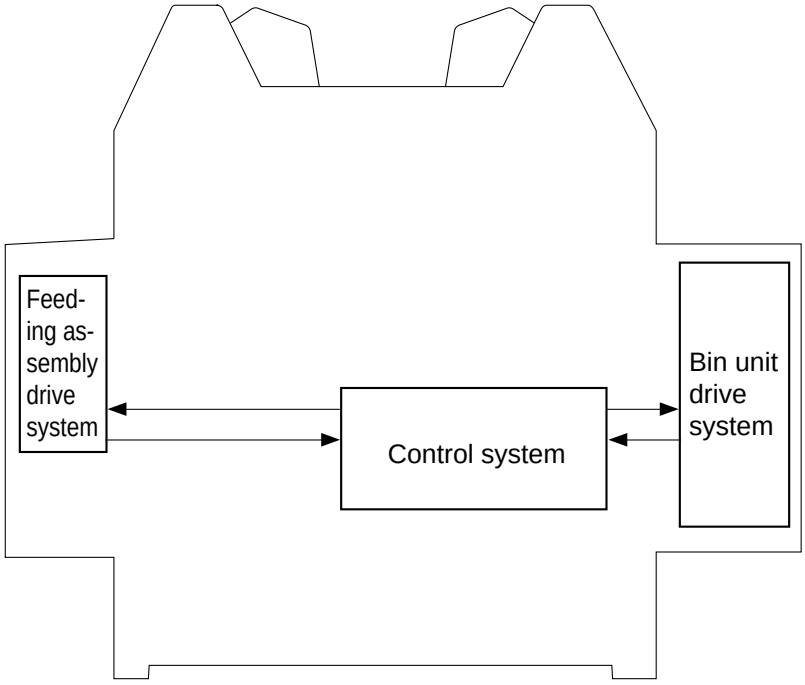



**Figure 2-101**

## B. Outline of the Electrical Circuitry

The sorter's electrical mechanisms are controlled by the sorter controller PCB, which possesses a built-in microprocessor.

Figure 2-102 shows the relationship among the sorter's electrical circuits and the functions of the ICs.

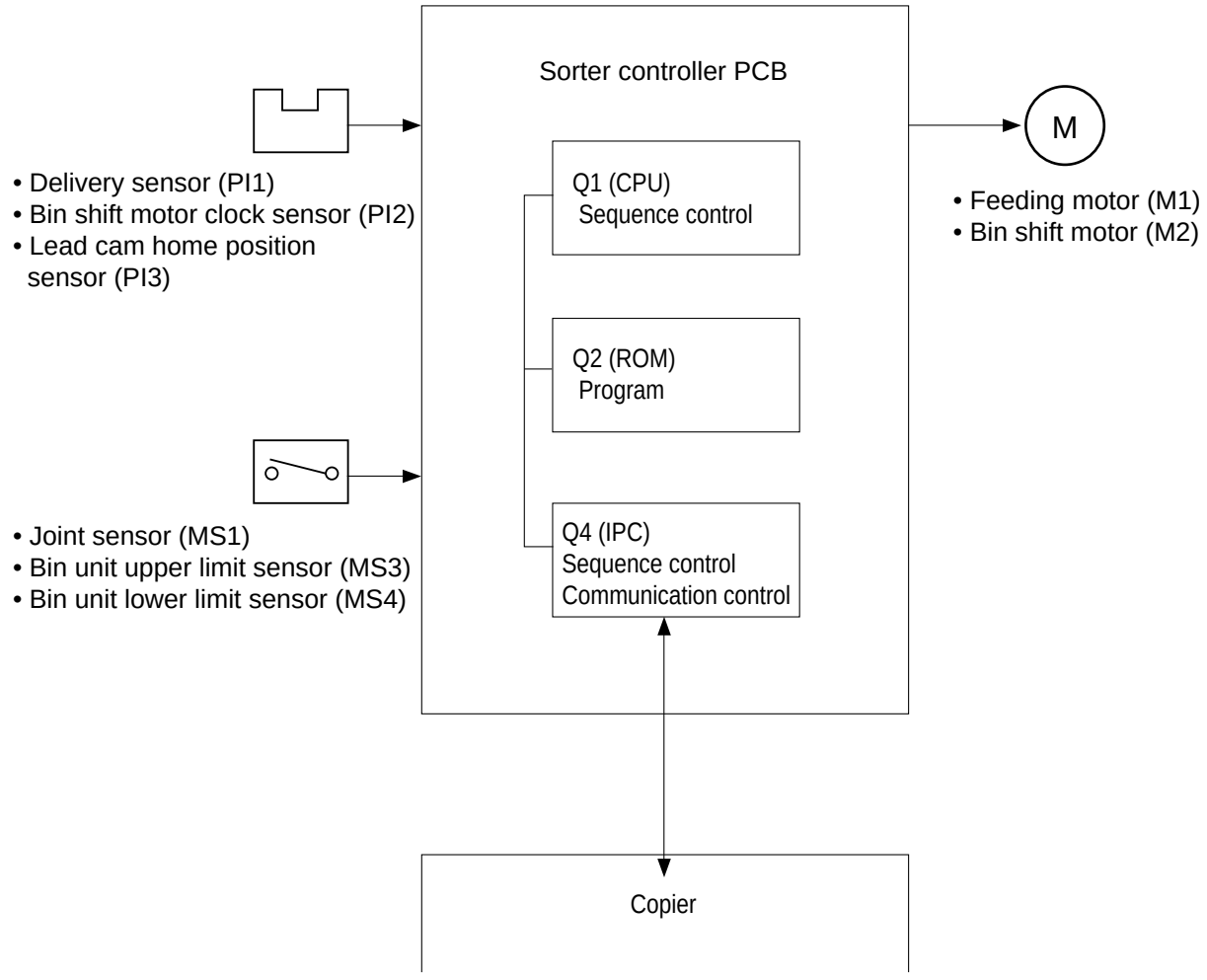



**Figure 2-102**

# C. Inputs to and Outputs from the Tray Controller

## 1. Inputs to the Sorter Controller PCB

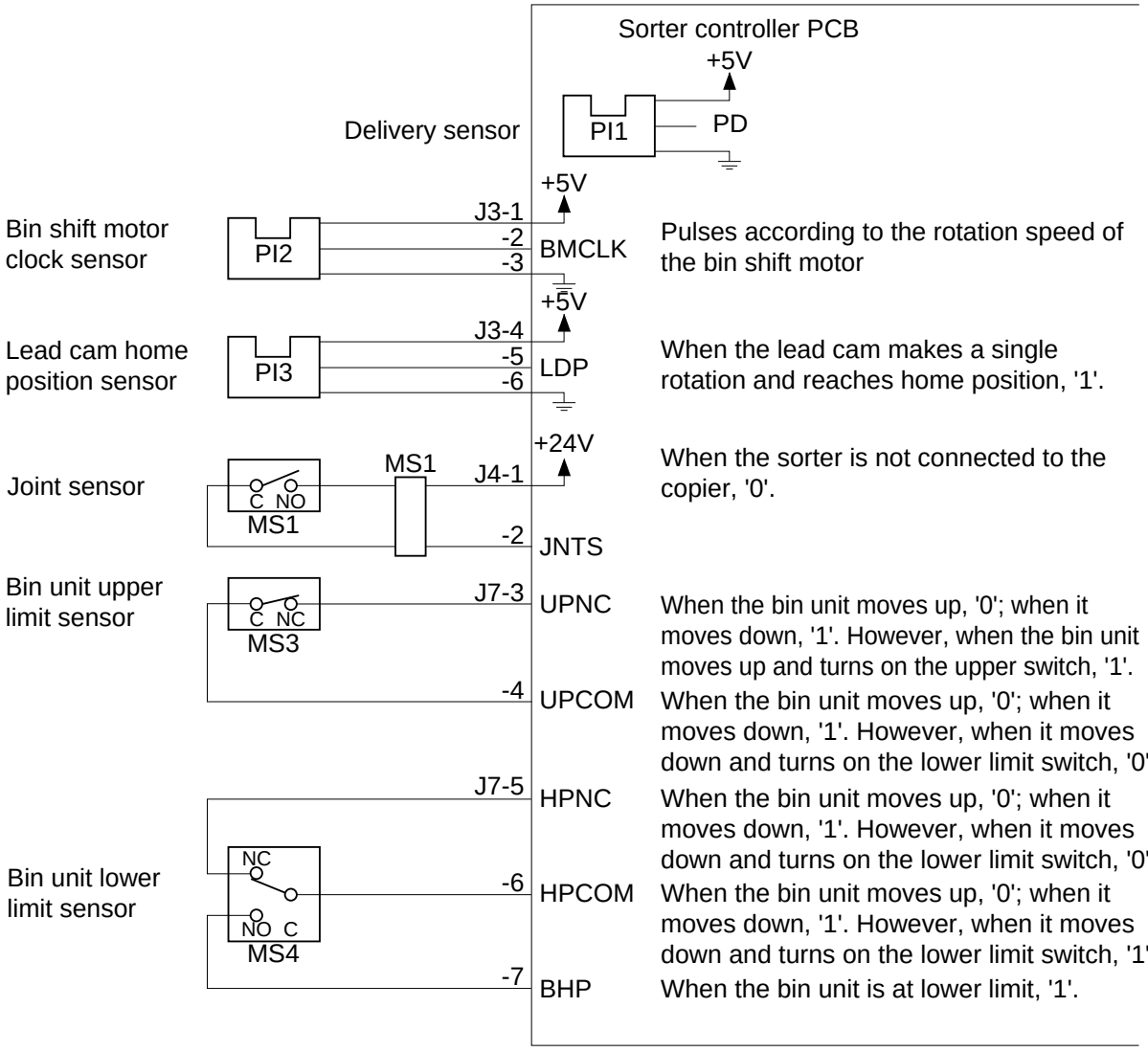



**Figure 2-103**

## 2. Outputs from the Sorter Controller PCB

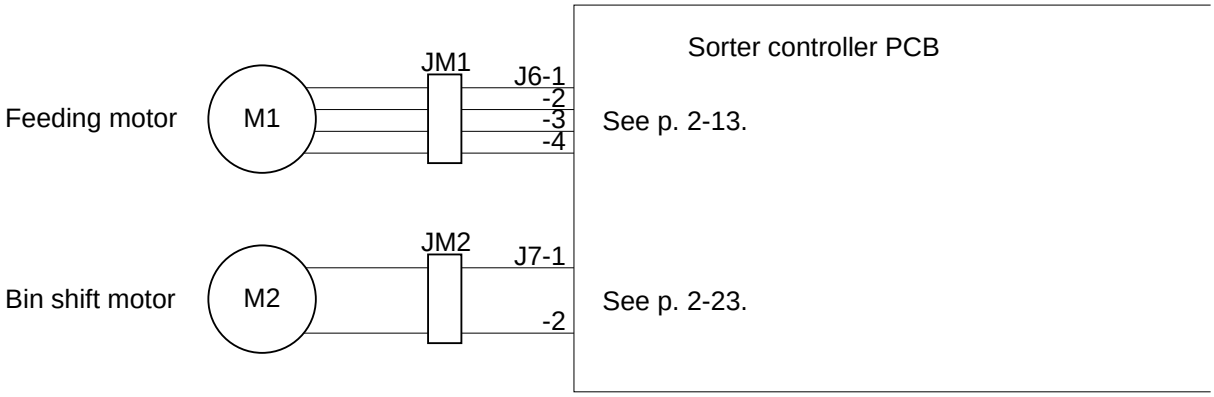



**Figure 2-104**

# D. Communication with the Copier

## 1. Outline

The state signal and data are exchanged between the CPU(Q1)/IPC(Q4) on the sorter-controller circuit board and the copier as shown in Figure 2-105. These communication operation is controlled by each microprocessor.

**Caution:**
When the self diagnosis mechanism has been activated because of an error in communication, turn off the copier once; then, detach the sorter from the copier, and turn on the copier to continue making copies.

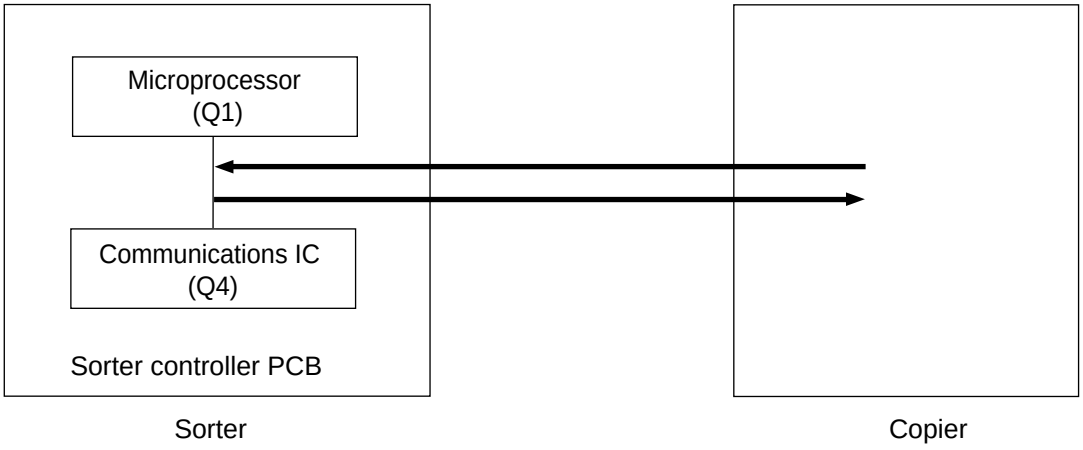



**Figure 2-105**

# II. BASIC OPERATIONS

## A. Bin Shift

The sorter has the following modes, each of which is selected on the copier's control panel:

- Non-Sort Mode
  When non-sort mode is selected, the bins lower to the lower limit, and sheets will be continuously delivered to the first bin.

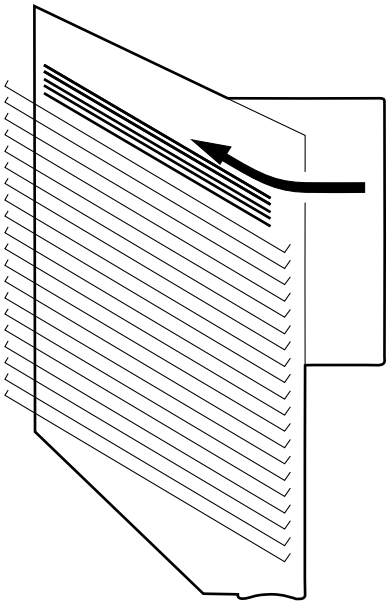


**Figure 2-201**

- Sort Mode
- Group Mode
  When sort/group mode is selected, the bins are moved up and down to suit the delivery of sheets.
  Sorting in which sheets are sorted by moving up the bins by a single bin is called normal sorting.
  Sorting in which sheets are sorted by moving down the bins by a single bin is called reverse sorting.

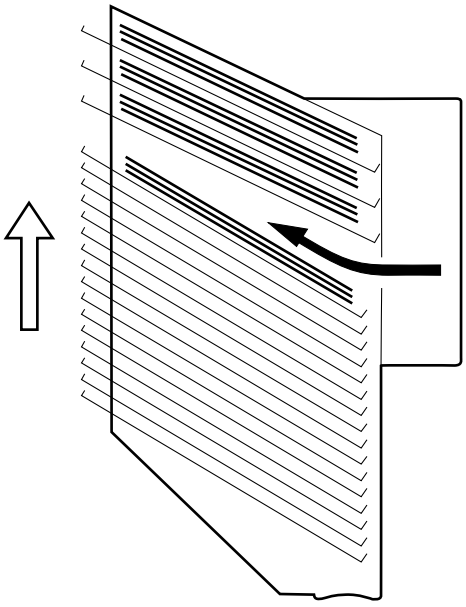


**Figure 2-202 Normal Sorting**

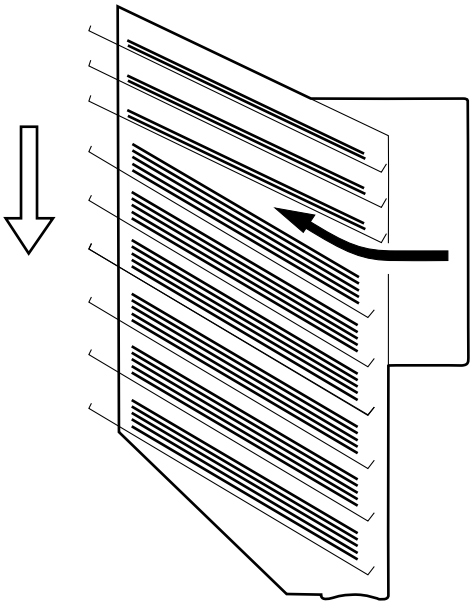


**Figure 2-203 Reverse Sorting**

The home position of the bin unit is where the bin unit has moved up for a single rotation of the lead cam starting from the lowest point (lower limit sensor ON).

# B. Basic Operations

The sorter operates as follows under each mode:

## 1. Non-Sort Mode

1. The copier's Copy Start key is pressed.

⇩

2. The bins move to the bottommost position.

⇩

3. Sheets are delivered.

■ Sequence of Basic Operations in Non-Sort Mode
- 3 copies

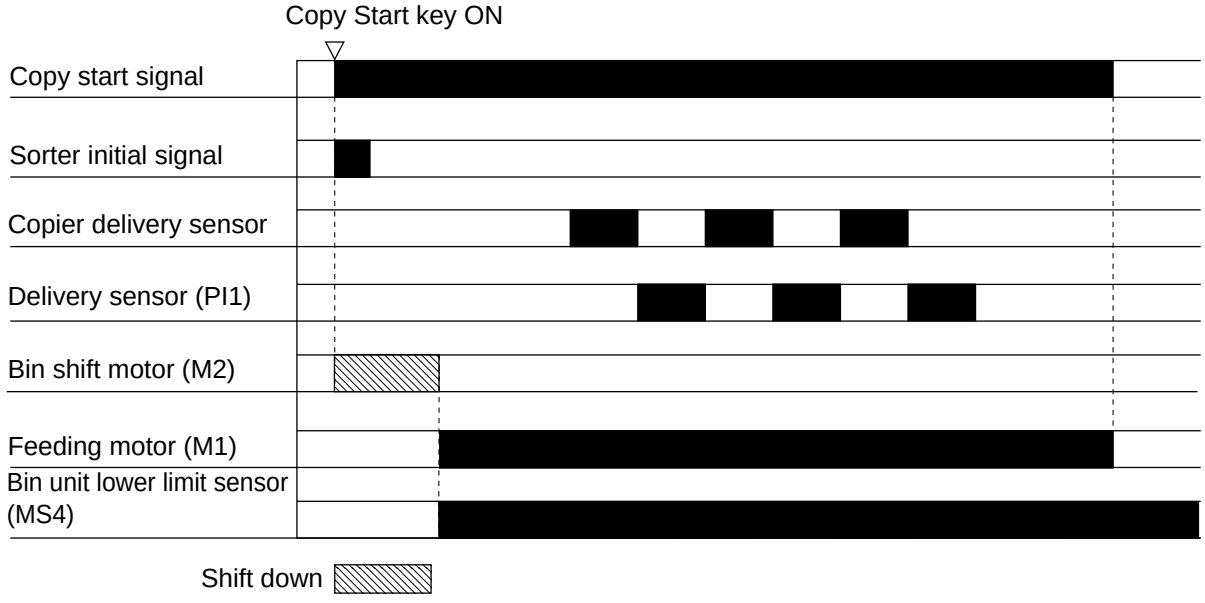



**Figure 2-204**

## 2. Sort Mode

1. The copier's Copy Start key is pressed.

⇩

2. The bins move to home position.

⇩

3. A copy is delivered to the first bin.

⇩

4. The bins move up by a single bin.

⇩

5. Steps 3 and 4 are repeated for each delivery for as many times as necessary. (Sorting is normal sorting.)

⇩

6. The original is replaced, and reverse sorting starts.

⇩

7. Steps 3 through 6 are repeated for as many originals as there are.

⇩

8. As many copies as are set are made.

■ Sequence of Basic Operations in Sort Mode
- A4, 2 Originals, 2 Copies

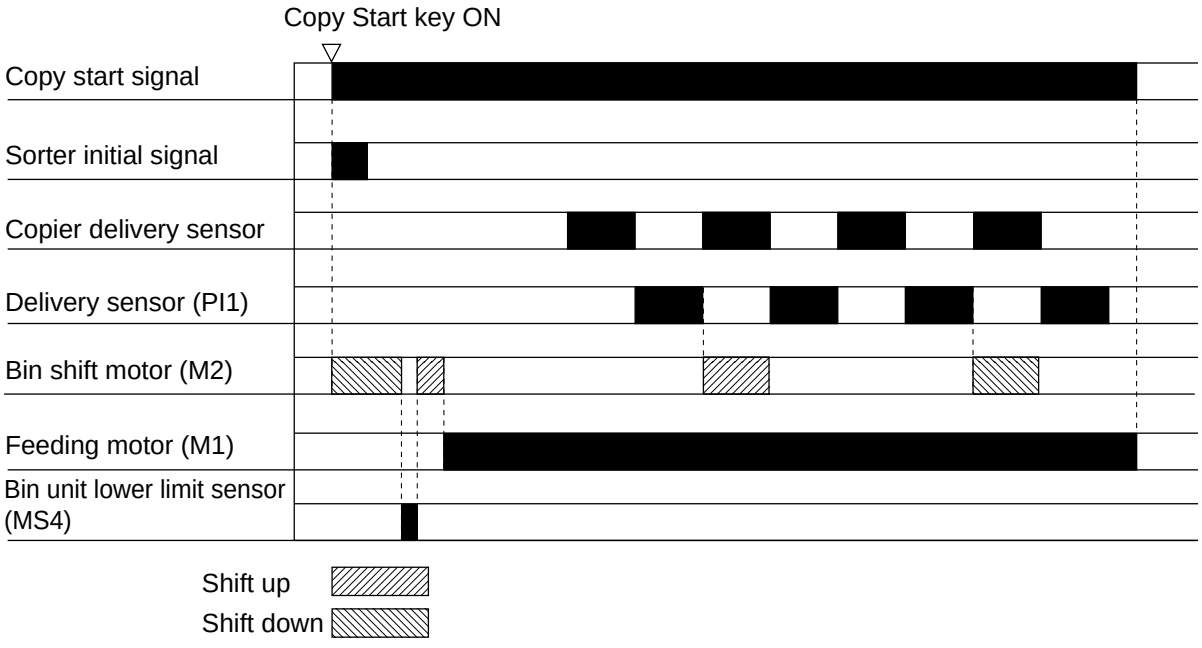



**Figure 2-205**

## 3. Group Mode

1. The copier's Copy Start key is pressed.

⇩

2. The bins move to home position.

⇩

3. As many copies as set are delivered.

⇩

4. The original is replaced, and the bins are shifted by a single bin.

⇩

5. Steps 3 and 4 are repeated for as many originals as there are.

⇩

6. Copying operation ends.

■ Sequence of Basic Operations in Group Mode
- A4, 2 Originals, 2 Copies

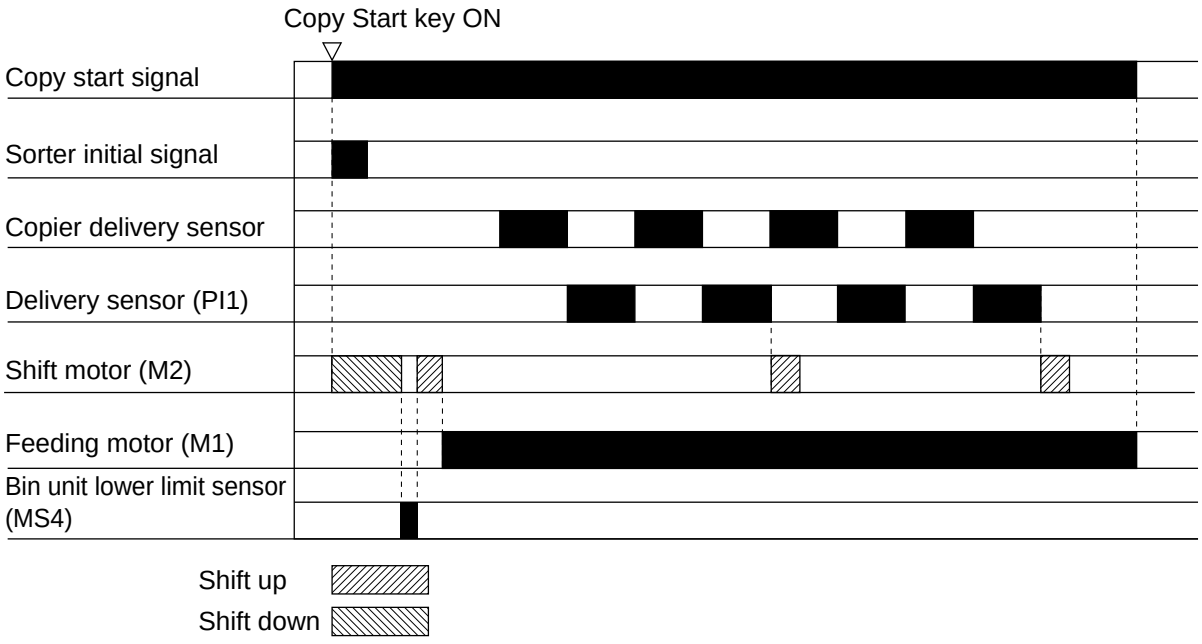



**Figure 2-206**

# III. FEEDING DRIVE SYSTEM

## A. Outline

### 1. Basic Construction

Figure 2-301 shows the basic construction of the feeding system.

A sheet forwarded by the copier is moved to the bin unit by the feeding roller rotated by the drive of the feeding motor (M1).

The movement of sheets is detected by the delivery sensor (PI1) on the sorter controller PCB.

The motor is a stepping motor, an its drive is controlled by the pulses from the motor driver IC (Q5) on the sorter controller PCB.

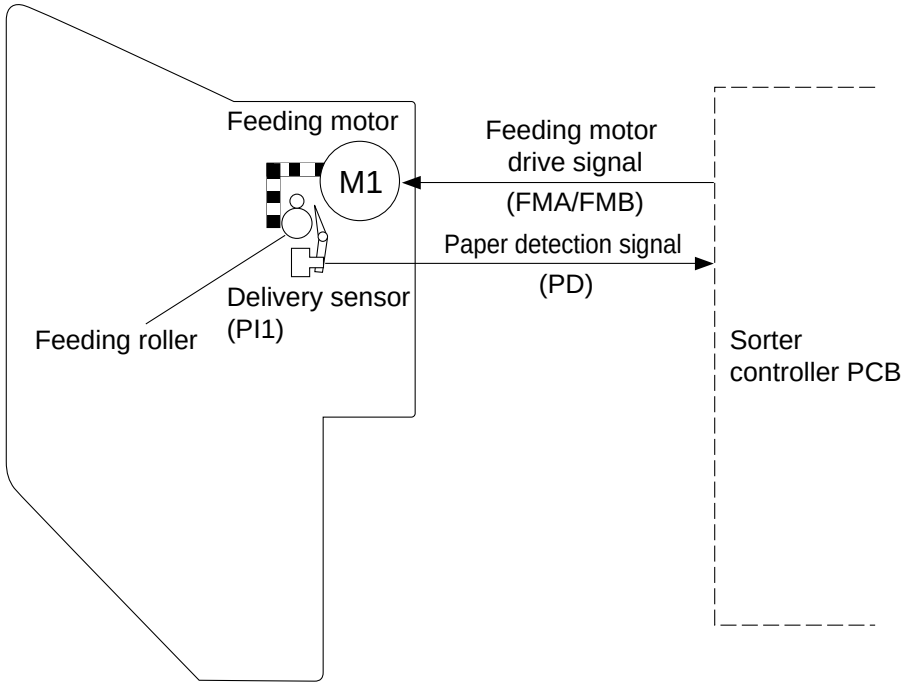



**Figure 2-301**

## 2. Overstacking (bin unit)

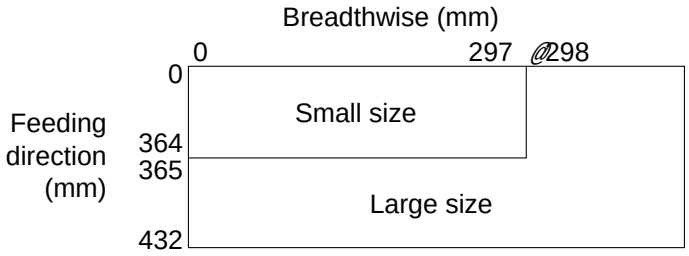
The number of sheets that may be accommodated by each bin is limited as follows for each mode. Any excess condition will be referred to as overstacking, causing some types of host copiers to issue an alert on the message display.

| Non-sort mode | Maximum stacking |
|---|---|
| A5 | 100 sheets |
| Small size | 600 sheets |
| Large size | 500 sheets |

| Sort mode | Maximum stacking |
|---|---|
| Small size | 50 sheets |
| Large size | 25 sheets |

| Group mode | Maximum stacking |
|---|---|
| Small size | 30 sheets |
| Large size | 25 sheets |

Size classification (group mode)




When the specified stacking capacity per bin is exceeded in reference to the copy count, the sorter will operate as follows:

**Note:** A4-R and LT-R sized paper are treated as large-sized paper in the group mode.

**a. Non-Sort Mode (Cascade mode)**

In non-sort mode, when the total number of copies reaches 101 or more, after the last one of sheets which can be loaded has been discharged to the first bin, remaining sheets are loaded into the second bin and subsequent.

■ A4, 2 Originals, 70 Copies

1. The Copy Start key is pressed.

⇩

2. 70 sheets are delivered to the first bin.

⇩

3. The original is replaced, and the 30th sheet is delivered to the first bin.

⇩

4. As many copies as set are made.

**b. Group Mode**

Regardless of whether the DF is used or not used, the copier will not start copying operation in response to a press on the Copy Start key if a count higher than the specified stacking capacity is set; instead, the copier will issue an alert.

**c. Sort Mode**

Regardless of whether the DF is used or not used, the copier will suspend copying operation when it has delivered the sheet in excess of the stacking capacity.

■ A4, 51 Originals

1. Sorting is started.



2. The operation is suspended once when the 50th sheet is delivered to each of sort bins.
   After all sheets have been removed from each of bins and the mode has been changed, when the Copy Start key is pressed, the operation will be resumed.
   (Some copiers resume operation automatically.)

# B. Jams

The sorter sends the jam signal (JAM) to the copier when it detects a jam. In response, the copier will stop copying operation and indicates the “SORTER MISFEED” message on the control panel.

When the jam has been removed and the Copy Start key is pressed once again, the remaining copies (jam recovery) will be made automatically and delivered to the bins.

If a jam occurs in the copier, on the other hand, operation will stop when all sheets moving through the sorter have been delivered to the appropriate bins.

**Reference:**

Paper jamming can be cleared by opening and closing the front cover of the copier.

## 1. Feeding Delay Jam

The copier’s delivery sensor (PI1) does not detect paper with 2.5 sec after it has detected paper (PDP=1).

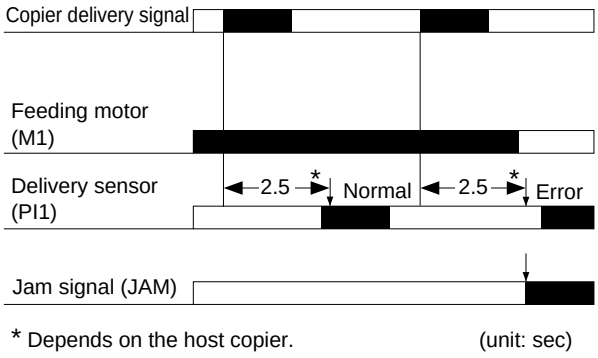
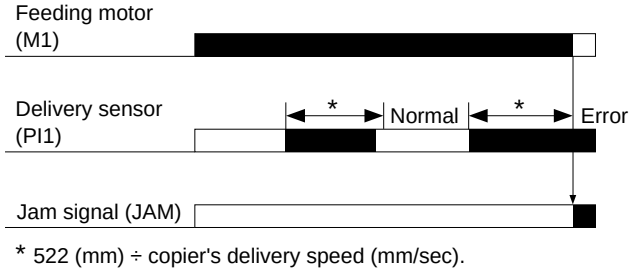



**Figure 2-302**

## 2. Feeding Stationary Jam

After the delivery sensor (PI1) has detected paper, the paper does not move past the sensor within a specific period of time.




* 522 (mm) ÷ copier's delivery speed (mm/sec).

**Figure 2-303**

## 3. Power-On Jam (remaining jam paper)

The JAM signal will be generated if the delivery sensor is ON when the copier's power switch is turned on.

## 4. Joint Open Jam

The JAM signal will be generated if the sorter is detached from the copier during operation.

# IV. BIN UNIT DRIVE SYSTEM

## A. Outline

Figure 2-401 shows the construction of the bin unit.

In the bin unit drive system, each of the bins inside the bin unit is moved up and down to sort sheets being delivered.

The home position of the bin unit is where the bins have moved up for a single rotation of the lead cam starting from the lower limit (bin unit lower limit sensor MS4 ON).

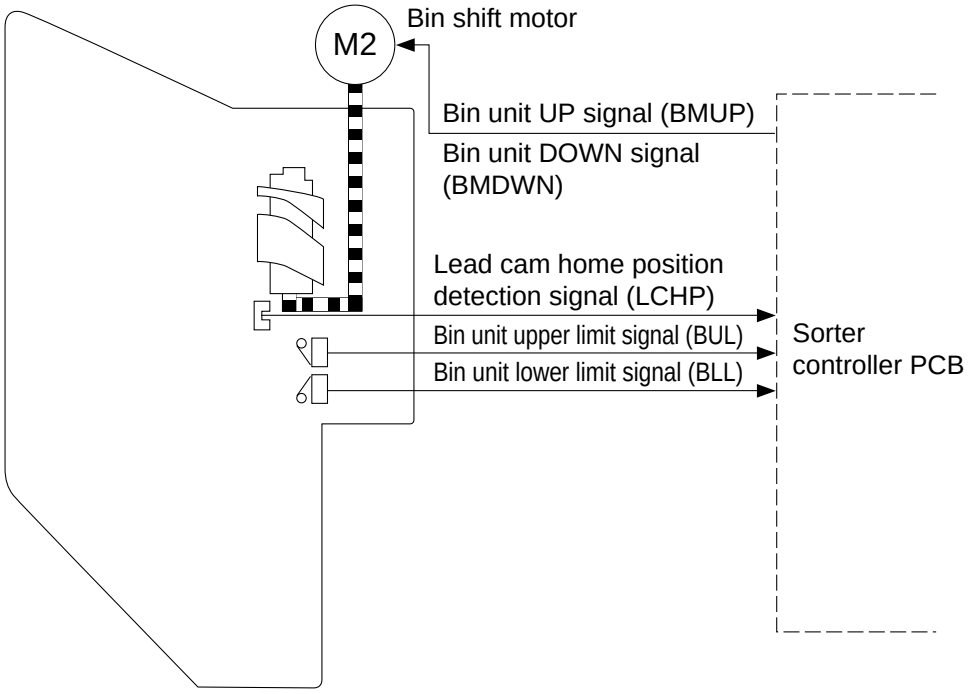



**Figure 2-401**

# B. Bin Unit

## 1. Construction of the Bin Unit

Figure 2-402 shows the construction of the bin unit.

As shown, the dummy rolls found at the bottom of the front and the rear are constructed as part of the bin unit and are fixed in place on both ends of the bin frame.

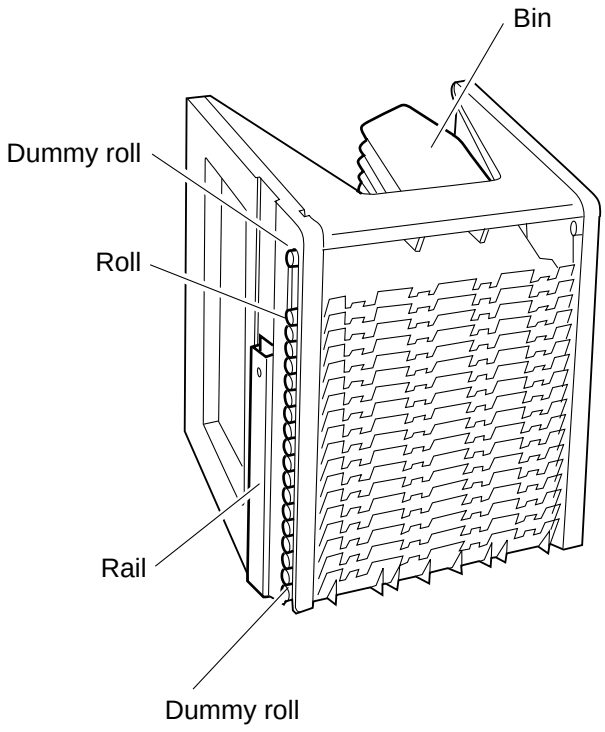



**Figure 2-402**

## 2. Movement of the Lead Cam

The lead cams are installed to the front and the rear, one each, so that they engage with the rolls of the bin unit, and they are rotated by the drive of the bin shift motor (M2) capable of rotating in both directions.

When the lead cams rotate and, as a result, the rolls move up and down along the lead cam grooves, the bin frame and the bins connected to the rolls move up or down.

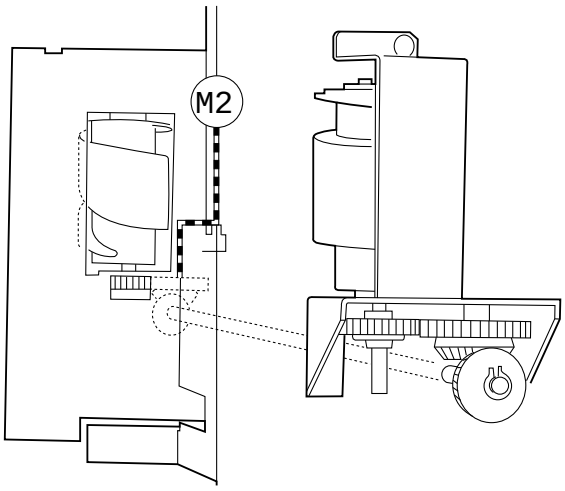



Figure 2-403

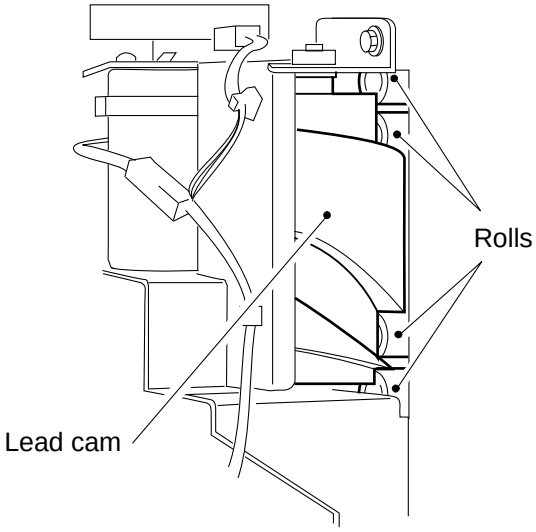



Figure 2-404

## 3. Bin Unit Lower Limit Sensor (MS4)

The home position of the bin unit is detected when the bin position detecting assembly installed to the bin unit presses the bin unit lower limit sensor (MS4).

To move the bin unit to home position, the bins are lowered until the bin unit lower limit sensor (MS4) is turned on and then moved up for a single rotation of the lead cam.

## 4. Bin Unit Upper Limit Sensor (MS3)

If an error causes the bin unit to move up and then press the bin unit upper limit sensor (MS3), the bin shift motor (M2) will be stopped.

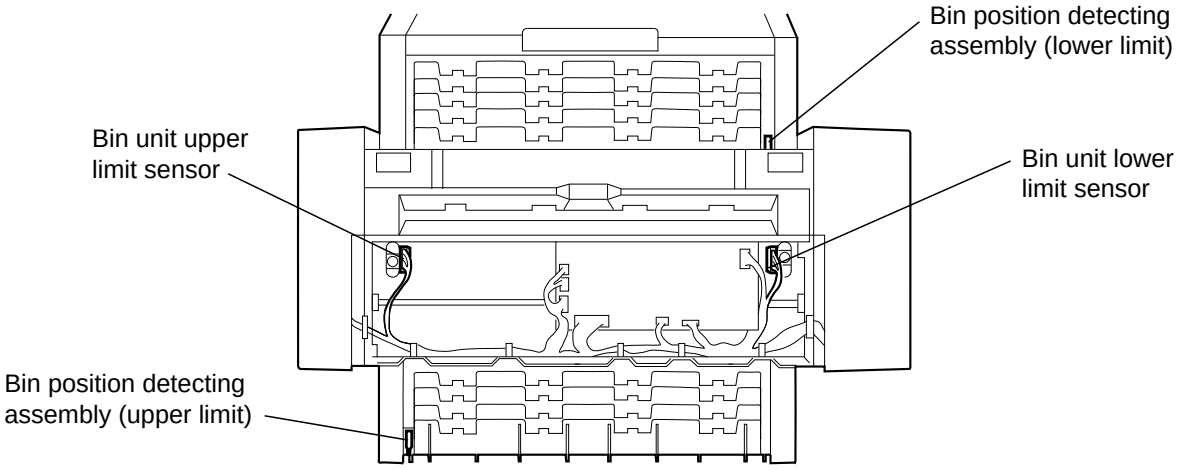



**Figure 2-405**

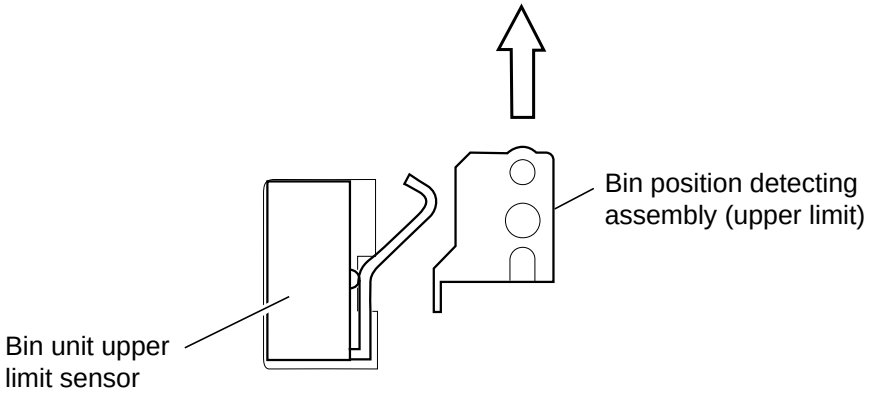


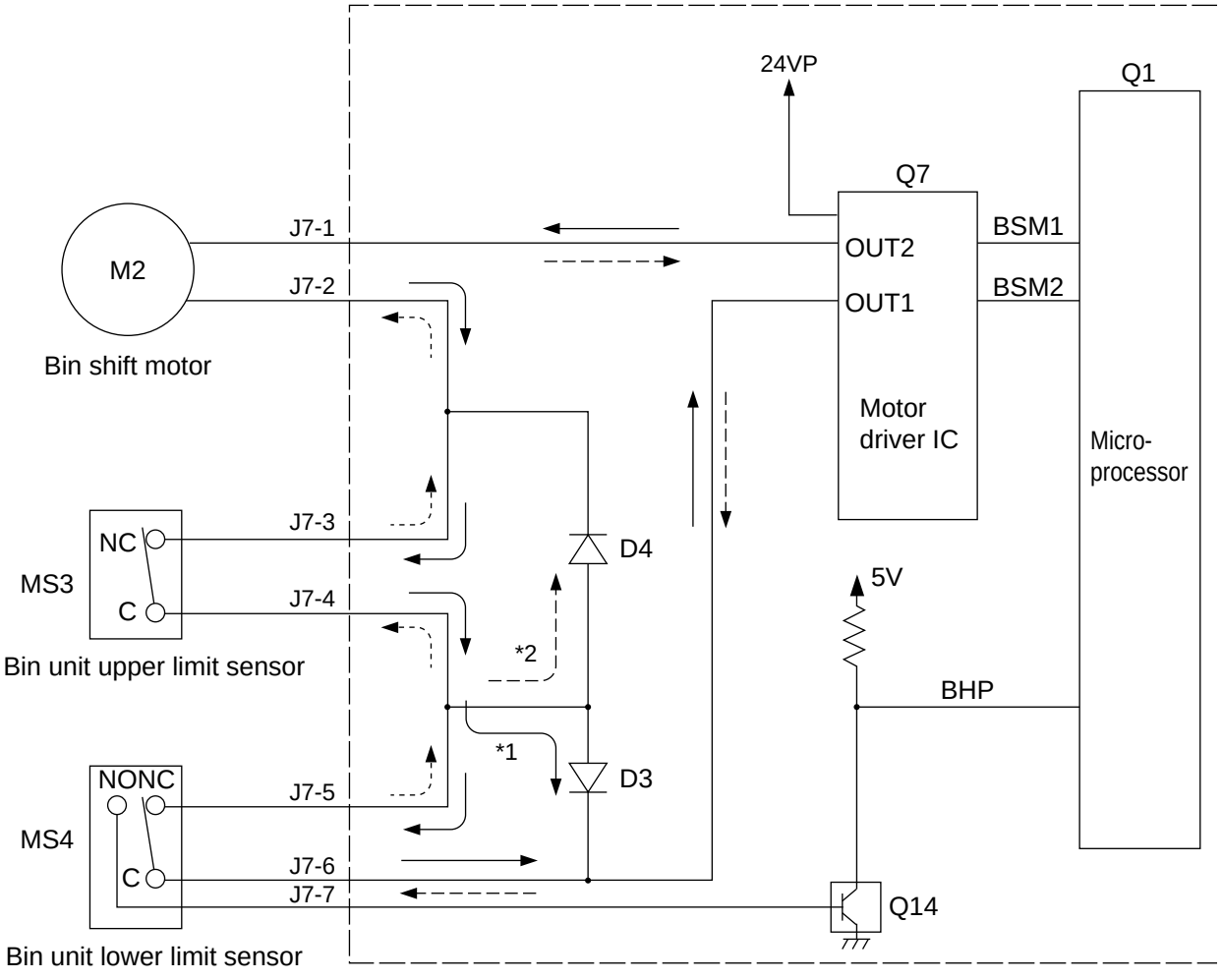

**Figure 2-406**

# C. Bin Shift Motor Control

## 1. Outline

The bin shift motor (M2) is a DC motor and is controlled to rotate either clockwise or counterclockwise based on the combination of drive signals from the microprocessor.

The bins move up when the motor rotates clockwise and down when it rotates counterclockwise. The bin shift motor rotates when the bin unit upper limit sensor (MS3) and the bin unit lower limit sensor (MS4) are OFF (closed).




The arrows show the flow of current.

- The bin shift motor rotates clockwise (up).
- The bin shift motor rotates counterclockwise (down).

*1 : The flow of current when the bin unit lower limit sensor is ON (open).

*2 : The flow of current when the bin unit upper limit sensor is ON (open).

**Figure 2-407**

## 2. Bin Movement and Bin Shift Signals

| Microprocessor signal | | Driver IC output | | Bin movement |
|---|---|---|---|---|
| BSM1 | BSM2 | OUT1 | OUT2 | |
| 0 | 1 | 0V | 24V | The bin shift motor rotates clockwise, and the bins move up. |
| 1 | 0 | 24V | 0V | The bin shift motor rotates counterclockwise, and the bins move down. |
| 0 | 0 | 0V | 0V | The bin shift motor stops, and the bins stop. |

**Table 2-401**

**a. Moving Up the Bins**

To move up the bins, the microprocessor (Q1) sends the bin shift motor control 1 signal (BSM1=0) and the bin shift motor control 2 signal (BSM2=1) to the motor driver IC (Q7).

The motor driver IC sends 24 V to OUT2 and 0 V to OUT1 according to these signals. As such, the current flows in the direction of the arrow shown in Figure 2-407, causing the bin shift motor (M2) to rotate clockwise and moving up the bins.

**b. Moving Down the Bins**

To move down the bins, the microprocessor (Q1) sends the bin shift motor control 1 signal (BSM1=1) and the bin shift motor control 2 signal (BSM2=0).

The motor driver IC sends 0 V to OUT2 and 24 V to OUT 1 according to these signals. As such, the current flows in the direction of the dashed arrow shown in Figure 2-407, causing the bin shift motor (M2) to rotate counterclockwise and lowering the bins.

## D. Stopping the Bins

The bin shift motor (M2) stops when the microprocessor (Q1) generates the bin shift motor control 1 signal (BSM1=0) and the bin shift motor control 2 signal (BSM2=0).

If an error turns on the bin unit upper limit sensor (MS3) or the bin unit lower sensor (MS4), the current circuit of the bin motor will be shut off to stop the bins. (In response, the copier will issue an error indication.)

**a. Moving Up the Bins in Response to the Activation of the Bin Unit Lower Limit Sensor**

To move up the bins after the bin unit lower limit sensor (MS4) has turned on (open), the current from the bin unit upper limit sensor (MS3) is made to flow through the diode 3 (D3). (See Figure 2-407.)

**b. Moving Down the Bins in Response to the Activation of the Bin Unit Upper Limit Sensor**

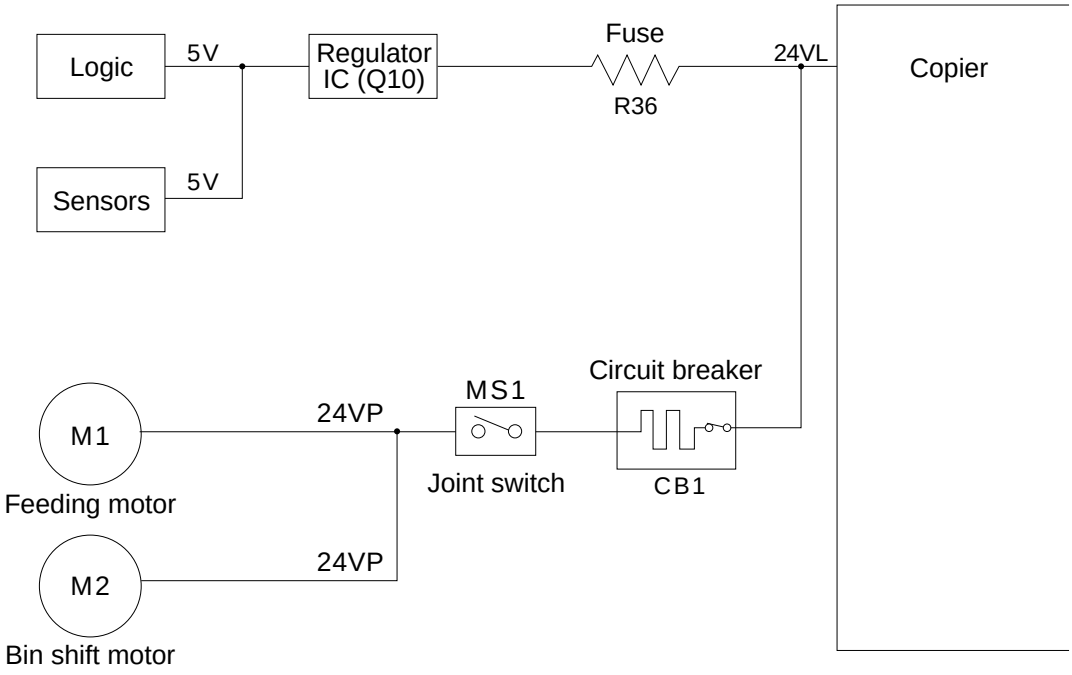
To move down the bins after the bin unit upper limit sensor (MS3) has turned on (open), the current from the bin unit lower limit sensor (MS4) is made to flow thought the diode 4 (D4). (See Figure 2-407.)

# V. POWER SUPPLY

Figure 2-501 shows the route of power supply inside the sorter.

The sorter is supplied with power by the copier.

The supply power for the logic system (5 V) is generated from 24V power and is controlled by the regulator IC on the sorter controller PCB.




- 24VL: 24V power supply from the copier.
- 24VP: 24V power supply from the copier through a circuit breaker and a joint switch.

**Figure 2-501**

# CHAPTER 3

# MECHANICAL SYSTEM

**In order to ensure and maintain the full working order of the machine and to preserve your safety and the safety of others, observe the safety guidelines as set out below.**

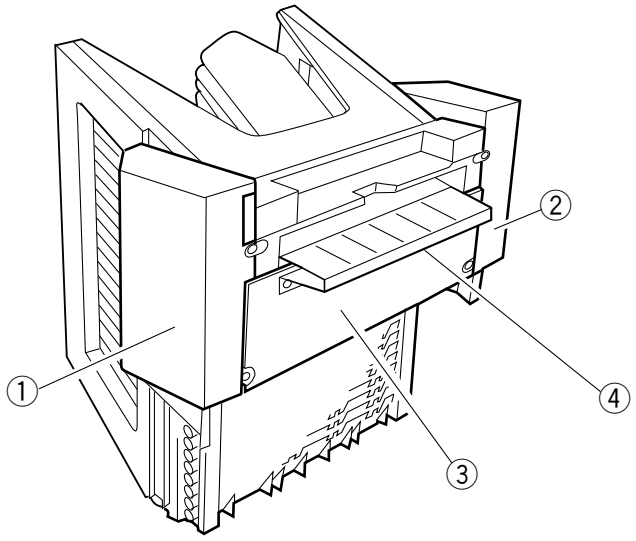
1. **⚠ Always unplug the power cord from the outlet for safety before disassembly or reassembly work.**
2. **Group the screws by type (length and diameter) and location.**
3. **The fixing screw for the grounding wire is fitted with a tooth washer to ensure electric continuity; sure to use the tooth washer for reassembly.**
4. **As a rule, avoid operating the machine with any of its parts removed.**
5. **Unless otherwise noted, re-assembly is the reverse of disassembly.**


I. EXTERNALS .....3-1
A. External Covers .....3-1
II. SORTER .....3-2
A. Removing the Bin Unit .....3-2
B. Removing the Bins .....3-4
C. Removing the Bin Upper/ Lower Limit Switch .....3-6
D. Removing the Feeding Roller .....3-7

# I. EXTERNALS

## A. External Covers

Remove the covers as necessary when cleaning, inspecting, or repairing the inside of the sorter. (The number in parentheses indicates the number of mounting screws used.)




① Front cover (1)
② Rear cover (2)
③ Right cover (2)
④ Entrance guide (2)

**Figure 3-101**

# II. SORTER

## A. Removing the Bin Unit

1) Detach the sorter from the copier and remove the entrance guide; then, place the sorter on its side.
2) Remove the front cover and the rear cover.
3) Remove the three mounting screws ①, and remove the lead cam front unit ②.
4) Remove the three mounting screws ③, and remove the lead cam rear unit ④.

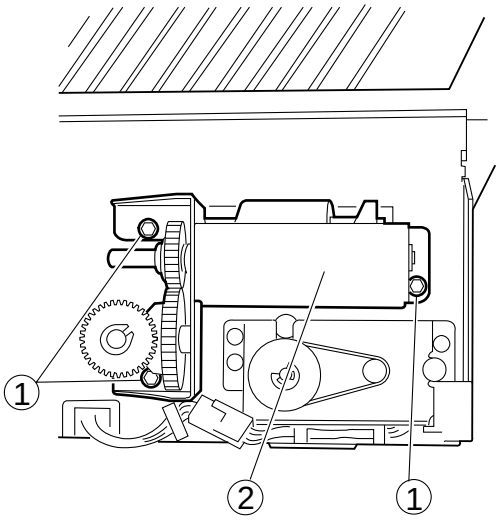



Figure 3-201

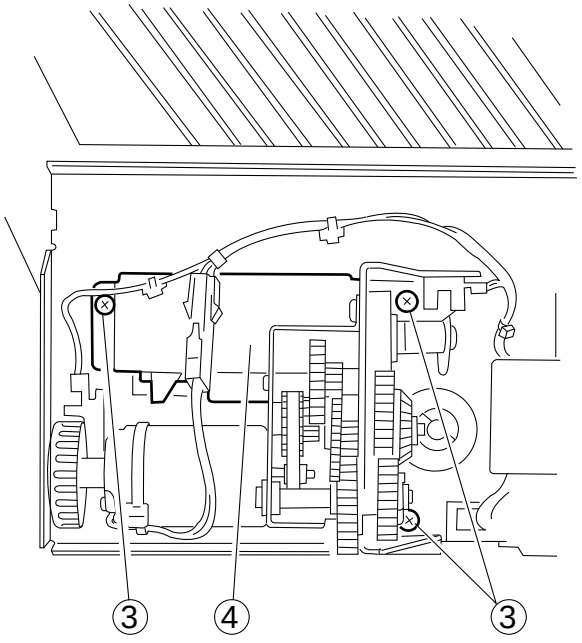



Figure 3-202

5) Remove the mounting screws ⑤ (2 at front, 2 at rear), and remove the bin unit ⑥.

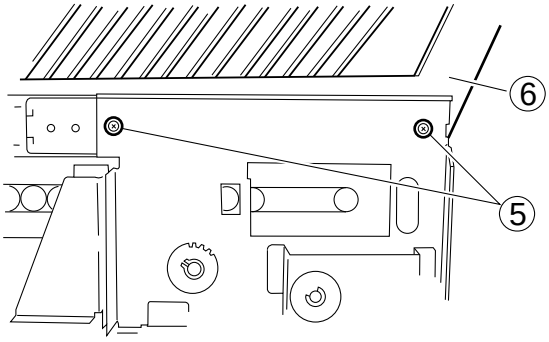



Figure 3-203

■ Installing the Bin Unit

1) With the bin unit at its bottommost position, install the lead cam unit at an angle with the joint of the metal plate of the lead cam at the marking.
   Check to make sure that the front ③ and the rear ④ are as indicated in Figure 3-205.
2) After installation, rotate the clock disk ⑤ of the bin shift motor to make sure that the bin unit moves up and down in horizontal direction.

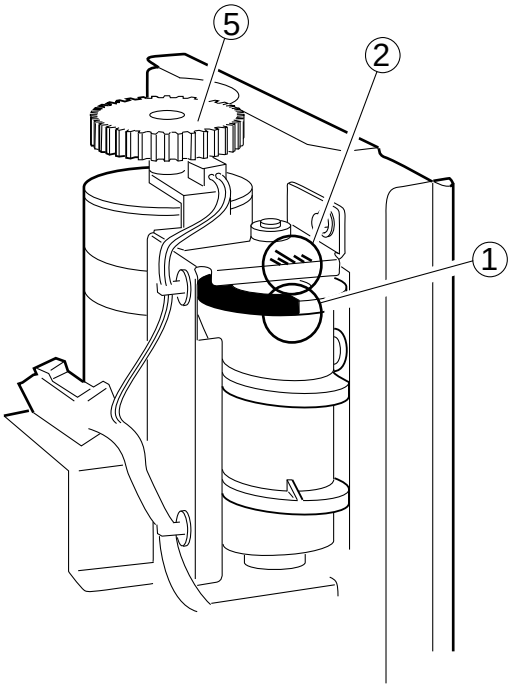



Figure 3-204

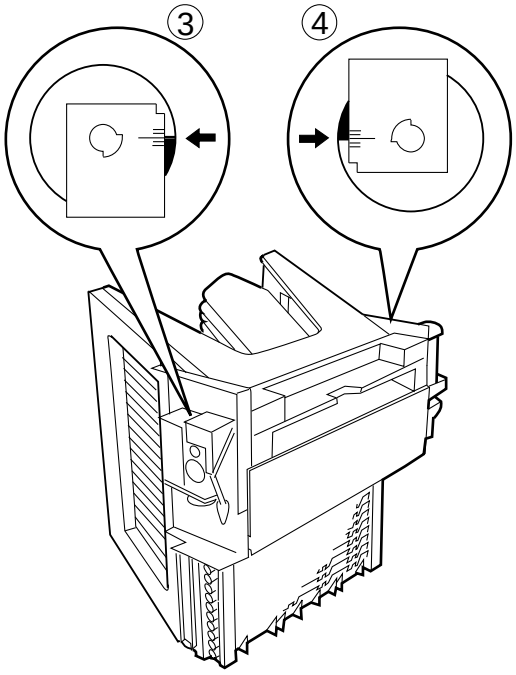



Figure 3-205

## B. Removing the Bins

1) Detach the bin unit from the sorter. (See A. Removing the Bin Unit)
2) Remove the two screws ② and remove the rail ①.
3) Remove the three screws ④ and remove the bin front cover ③.

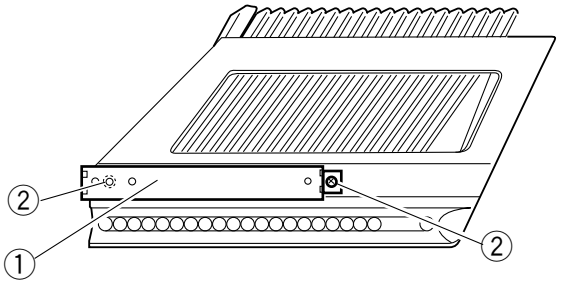



Figure 3-206

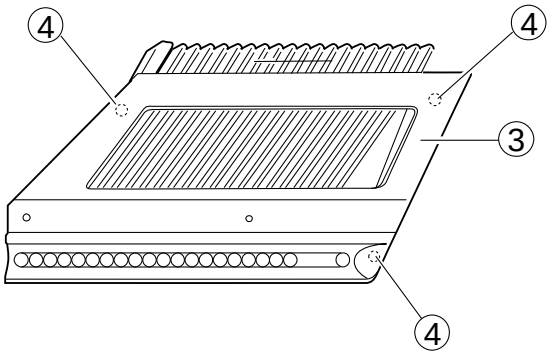



Figure 3-207

4) Remove the nineteen bin rolls ⑤ with a screw driver.
5) Remove the three screws ⑦ and remove the bin front frame ⑥.
6) Remove the bin rolls in the opposite side and pull out the bins from the frame(s).

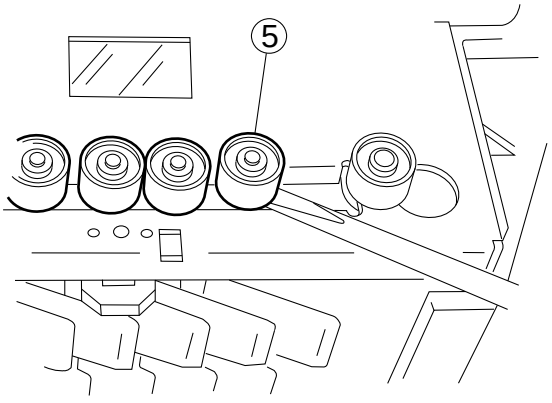



Figure 3-208

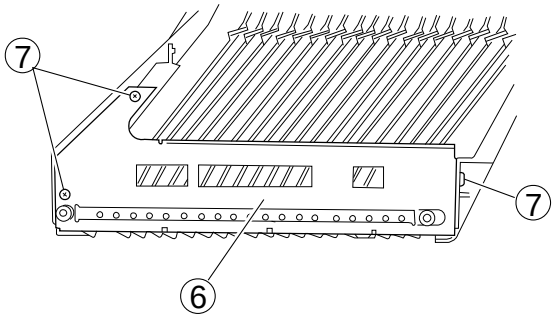



Figure 3-209

**Caution:**
The bin rolls are reusable once, but all the bin rolls removed should be replaced with new ones further time.

■ Adjusting the Height of the Bin Rolls

The bottom dummy roll is of an eccentric construction, allowing adjustment of the height of the bin roll and ultimately enabling adjustment of the height of contact between the tip of the lead cam and the bin roll.

If you have replaced the bin roll or re-installed it, check the dimensions; as necessary, change the angle at which the dummy roll is installed to adjust.

## 1. Making Adjustments

Place the bin unit upright, and measure the distance between the top dummy roll ① and the bin roll ②. If the distance is too large, turn the bottom dummy roll ③ counterclockwise (Figure 3-210) so that the distance is as close to 43.3 mm as possible. (Turn it clockwise if the distance is too small.)

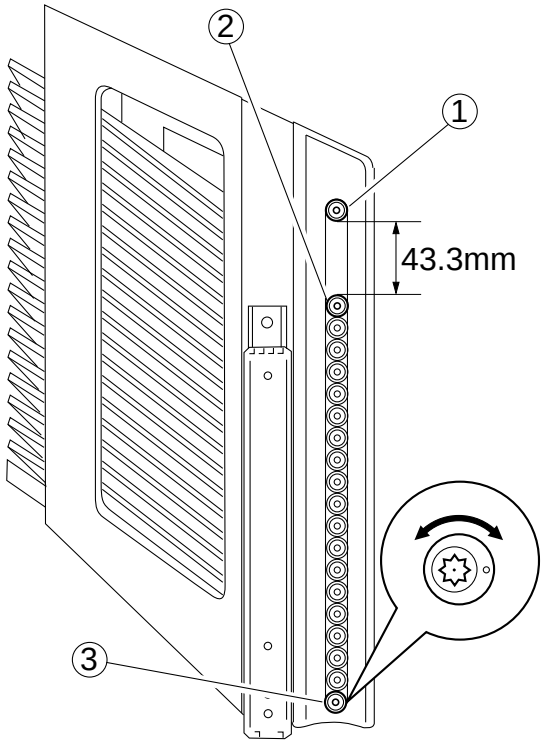



**Figure 3-210**

## C. Removing the Bin Upper/Lower Limit Switch

1) Remove the right cover.
2) Remove the screw ②, and remove the lower limit switch ①.
3) Remove the screw ④, and remove the upper limit switch ③.

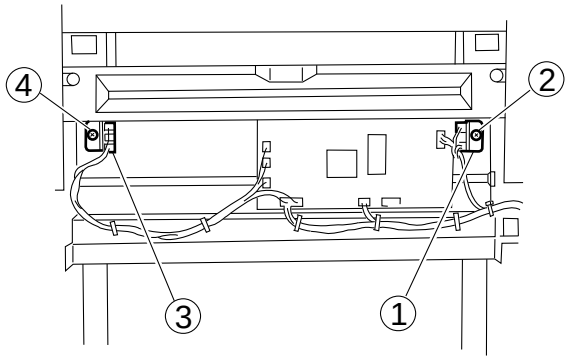



**Figure 3-211**

## D. Removing the Feeding Roller

1) Remove the four screws ③, and remove the right cover ① and the feeding guide ②.
2) Remove the lead cam front unit, lead cam rear unit, and bin unit. (See p. 3-2.)
3) Lift the lock assembly ⑤ of the rear end guide ④, and shift it downward to remove.

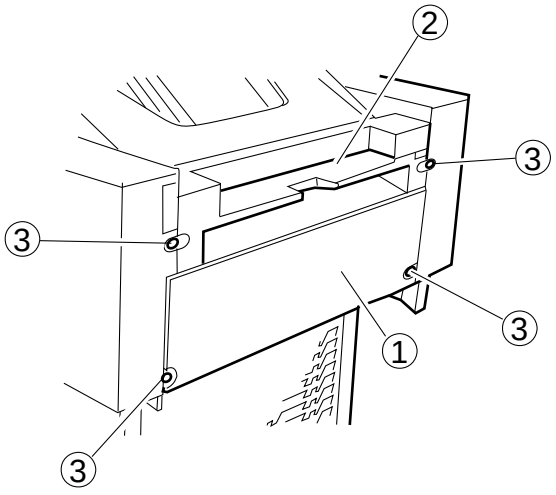



**Figure 3-212**

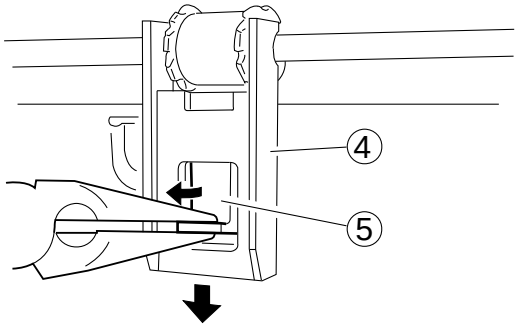



**Figure 3-213**

4) Remove the E-ring ⑥ from the rear.
5) Remove the parallel pin ⑦ from the front, and remove the gear ⑧.
6) Remove the feeding roller ⑨.

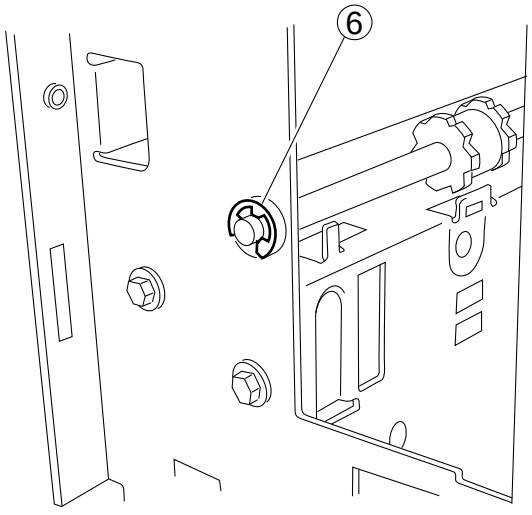



**Figure 3-214**

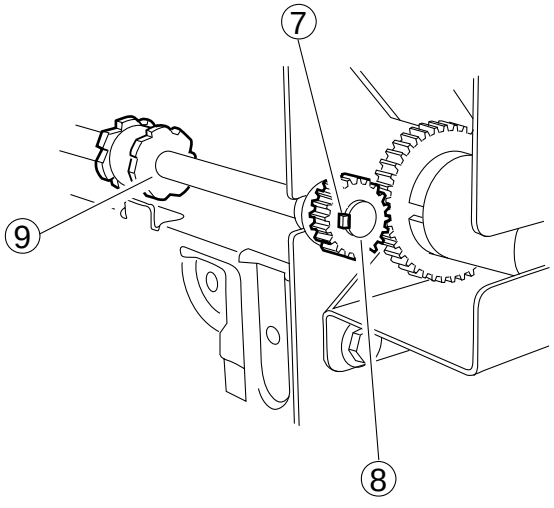



**Figure 3-215**

# CHAPTER 4

# MAINTENANCE AND INSPECTION

I. PERIODICALLY REPLACED PARTS .....4-1
II. CONSUMABLES AND DURABLES .....4-1
III. SCHEDULED SERVICING CHART .....4-1

# I. PERIODICALLY REPLACED PARTS

The sorter does not have parts that must be replaced on a periodical basis.

# II. CONSUMABLES AND DURABLES

The sorter does not have parts that require replacement because of deterioration or damage once or more during the period of warranty.

# III. SCHEDULED SERVICING CHART

△ : Clean ● : Replace × : Oil □ : Adjust ◎ : Check

| No. | Parts | Maintenance Interval | Remarks |
|---|---|---|---|
| | | *See Note** | |
| 1 | Bin | △ | |
| 2 | Bin roll | △ | |
| 3 | Bin cam | △ | |

** Apply the copier's minimum maintenance interval to the maintenance interval of the sorters.*

# CHAPTER 5

# TROUBLESHOOTING


I. SPECIFICATION AND ADJUSTMENTS....5-1
A. Mechanical System .....5-1
II. TROUBLESHOOTING MALFUNCTIONS .....5-2
A. Troubleshooting Malfunctions.....5-2
III. ARRANGEMENT OF THE ELECTRICAL PARTS .....5-4
IV. VR/LED/CHECK PIN DIAGRAM BY PCB .....5-5
A. Sorter Controller PCB .....5-5
B. Functions of the DIP Switch.....5-6

# I. SPECIFICATION AND ADJUSTMENTS

## A. Mechanical System

### 1. Before replacing the part, carry out the following adjustment.

| Part | Action |
|---|---|
| Bins & bin rolls | Adjusting the height of bin rolls |

### 2. Adjusting the height of the bin rolls

The bottom dummy roll is of an eccentric construction, allowing adjustment of the height of the bin roll and ultimately enabling adjustment of the height of contact between the tip of the lead cam and the bin roll.

If you have replaced the bin roll or re-installed it, check the dimensions; as necessary, change the angle at which at dummy roll is installed to adjust.

■ Making adjustments

Placing the bin unit upright, and measure the distance between the top dummy roll ① and the bin roll ②. If the distance is too large, turn the bottom dummy roll counterclockwise (Figure 5-101) so that the distance is as close to 43.3 mm as possible. (Turn it clockwise if the distance is too small.)

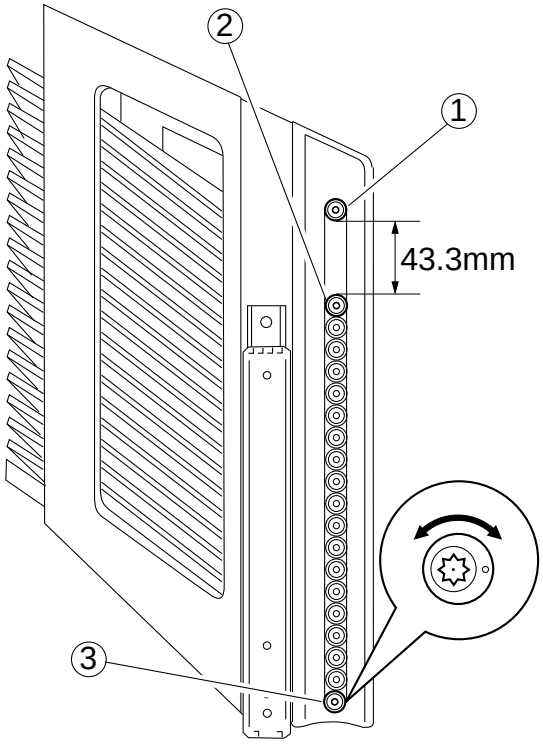



**Figure 5-101**

# II. TROUBLESHOOTING MALFUNCTIONS

## A. Troubleshooting Malfunctions

### 1 Serial communication error

| Cause | Step | Checks | Yes/No | Action |
|---|---|---|---|---|
| Communication cable (to copier) | 1 | Is the communication cable to the copier connected properly? | NO | Connect the cable properly. |
| Circuit breaker (CB1) | 2 | Press the circuit breaker (CB1) on the sorter controller PCB. Is the problem corrected? | YES | End. |
| Resistance (R36; sorter controller PCB) | 3 | Is there electrical continuity between both terminals of the resistor (R36) on the sorter controller PCB? (about 2.2Ω) | NO | Replace the sorter controller PCB. |
| 24V power supply | 4 | Set the meter to the DC range. Is the voltage between J1-1 (+) and J1-2 (–) on the sorter controller PCB about 24 V? | NO | Check the 24V power supply of the copier. |
| Sorter controller PCB | 5 | Replace the sorter controller PCB. Is the problem corrected? | YES | End. |
| DC controller PCB (copier) | | | NO | Replace the copier's DC controller PCB. |

## 2 Bin unit shift error

| Cause | Step | Checks | Yes/No | Action |
|---|---|---|---|---|
| | 1 | Press SW1 or SW2 on the sorter controller PCB. Does the bin unit move up or down? | YES | Go to step 4. |
| Lead cam drive gear | 2 | Is the lead cam drive gear installed properly? | NO | Install it properly. |
| Bin shift motor (M2) | 3 | Disconnect J7 from the sorter controller PCB. Is the resistance between J7-1 and J7-2 on the harness side about 8Ω? | NO | Check the wiring to the bin shift motor (M2); if normal, replace the bin shift motor. |
| Lead cam HP sensor (PI3) | 4 | Does the voltage between J3-5 (+) and J3-6 (–) on the sorter controller PCB alternate between 5 and 0 V when the lead cam is operating? | YES | Replace the lead cam HP sensor (PI3). |
| Sorter controller PCB | | | NO | Replace the sorter controller PCB. |

# III. ARRANGEMENT OF THE ELECTRICAL PARTS

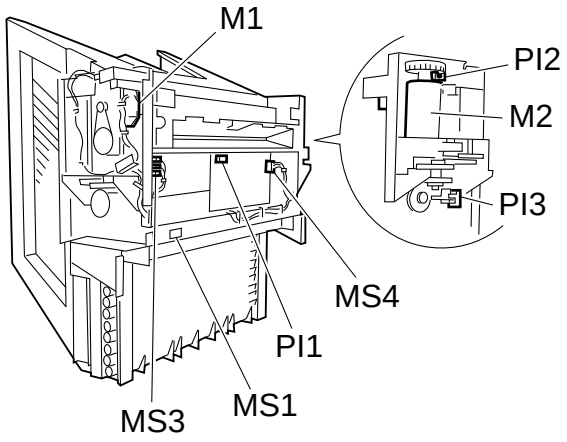
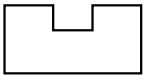
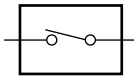



**Figure 5-301**

| Symbol | Name | Notation | Description |
|---|---|---|---|
|  | Photointerrupter | PI1<br>PI2<br>PI3 | Delivery detection<br>Bin shift motor clock detection<br>Lead cam home position detection |
|  | Microswitch | MS1<br>MS3<br>MS4 | Copier connection detection<br>Bin unit upper limit detection<br>Bin unit lower limit detection |
|  | Motor | M1<br>M2 | Feeding motor<br>Bin shift motor |

# IV. VR/LED CHECK PIN DIAGRAM BY PCB

Variable registers (VR), LEDs and check pins are attached to the sorter. Some of which are required to serve in the market and showned below.

Do not adjust the others not mentioned here, because they are for exclusive use of the factory and we have to adjust them with special tools & measures on a high degree of precision.

**Caution:**

1. Please note that LED is alive when the machine is switched on and LED is still aline when the machine is switched off.
2. Adjustable VR . . . . . .
3. Unadjustable VR . . . . . .

## A. Sorter Controller PCB

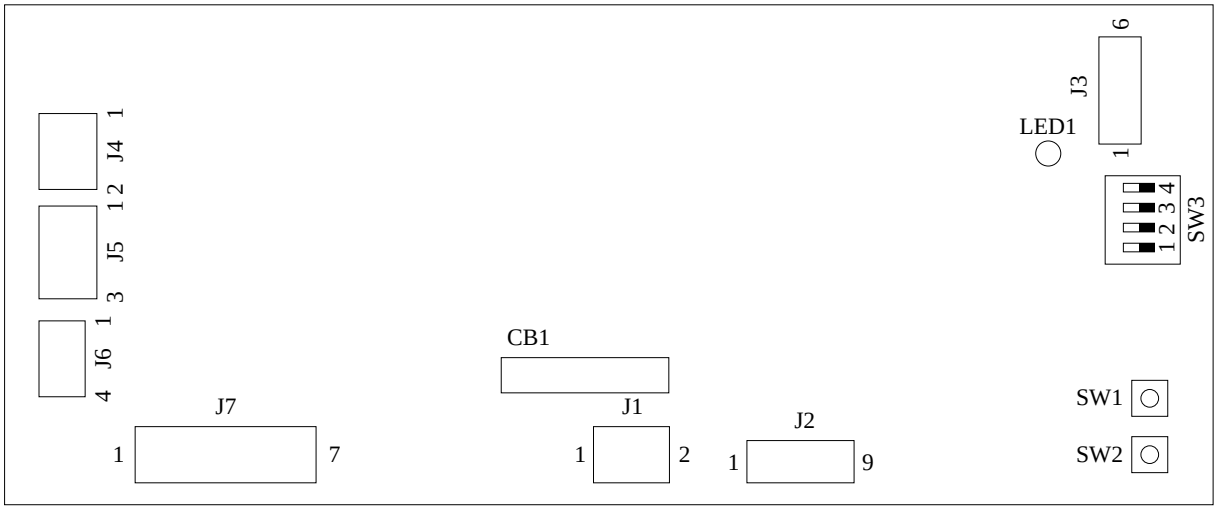
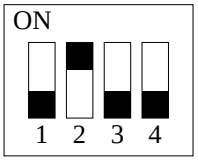



**Figure 5-401**

| Number | Items | Description |
|---|---|---|
| SW1 | Push switch | Moves the bin unit up |
| SW2 | | Moves the bin unit down |
| SW3 | DIP switch | Selects the modes (See next page) |

## B. Functions of the DIP Switch

The functions of the DIP switch (SW3) on the sorter controller PCB are as follows:

| Item | SW3 setting | Description |
|---|---|---|
| Normal operation |  | When all switches are turned off, the sorter becomes a normal copy operation state. |
| Shortening mode of bin initial time |  | The return time from the 20th bin to the home position is accelerated by initializing bins. |
| Aging operation mode |  | After the setup of the dip switch, this mode begins the function by turning the power on, and be stopped by turning the joint switch or the power off. |

**Note:** When switching the dip switch (SW3), be sure to turn the power switch of the copier off.

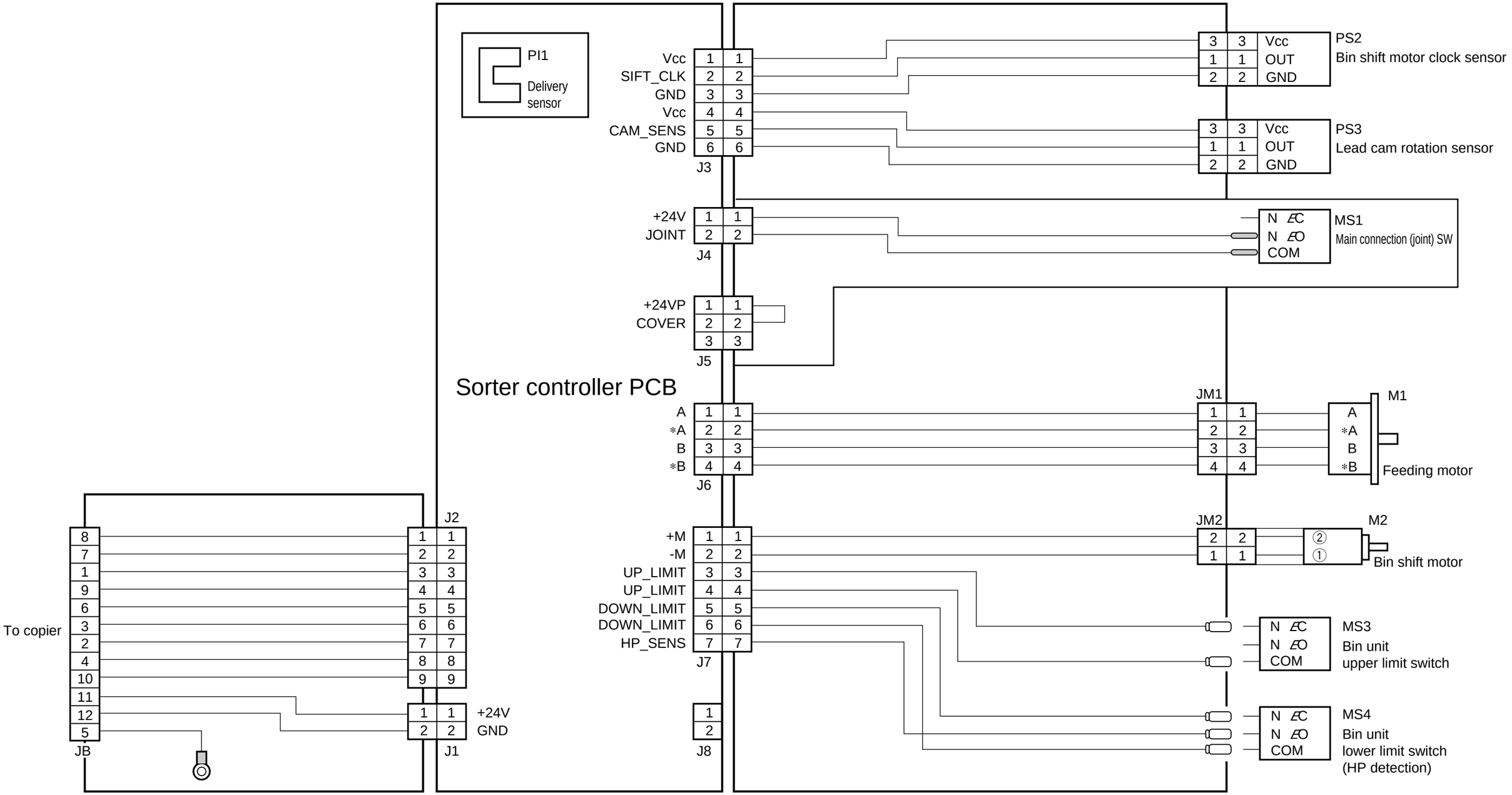
# APPENDIX

A. SIGNALS AND ABBREVIATIONS .....A-1
B. GENERAL CIRCUIT DIAGRAM.....A-2
C. SORTER CONTROLLER PCB .....A-3
D. SOLVENTS AND OILS.....A-6

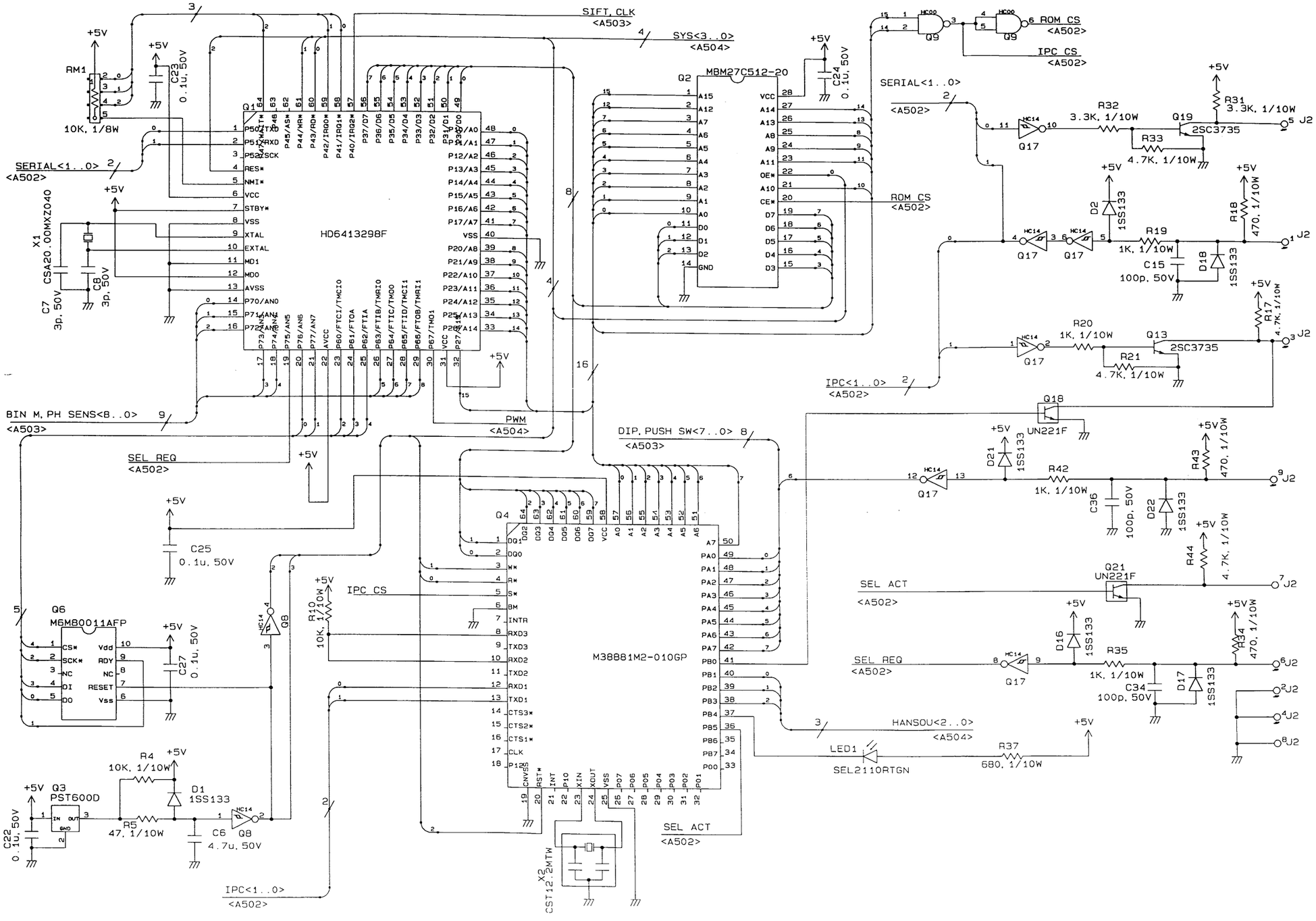
# A. SIGNALS AND ABBREVIATIONS

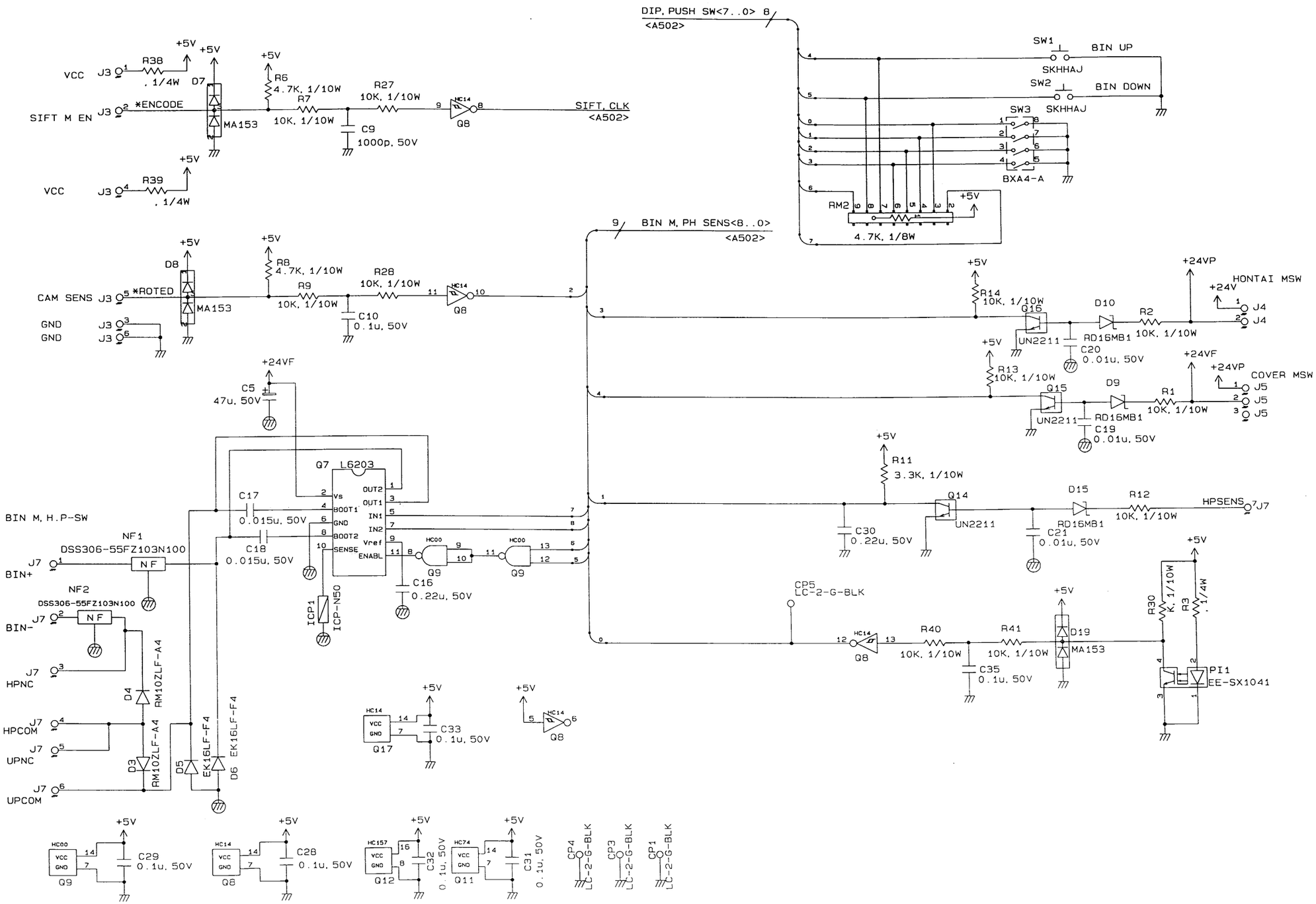
| | |
|---|---|
| BHP | Bin Home Position signal |
| BMCLK | Bin Shift Motor Clock signal |
| LDP | Lead Cam Home Position signal |
| PD | Paper Detection signal |
| JNTS | Joint signal |
| BSM1 | Bin Shift Motor (1) Control command |
| BSM2 | Bin Shift Motor (2) Control command |
| BSMD | Bin Shift Motor Drive command |
| FM_*CW/CCW | Feeder Motor Control command |
| FMCCC1 | Feeder Motor (1) Current Control command |
| FMCCC2 | Feeder Motor (2) Current Control command |
| FMA | Feeder Motor (A) Drive command |
| FMB | Feeder Motor (B) Drive command |

# B. GENERAL CIRCUIT DIAGRAM

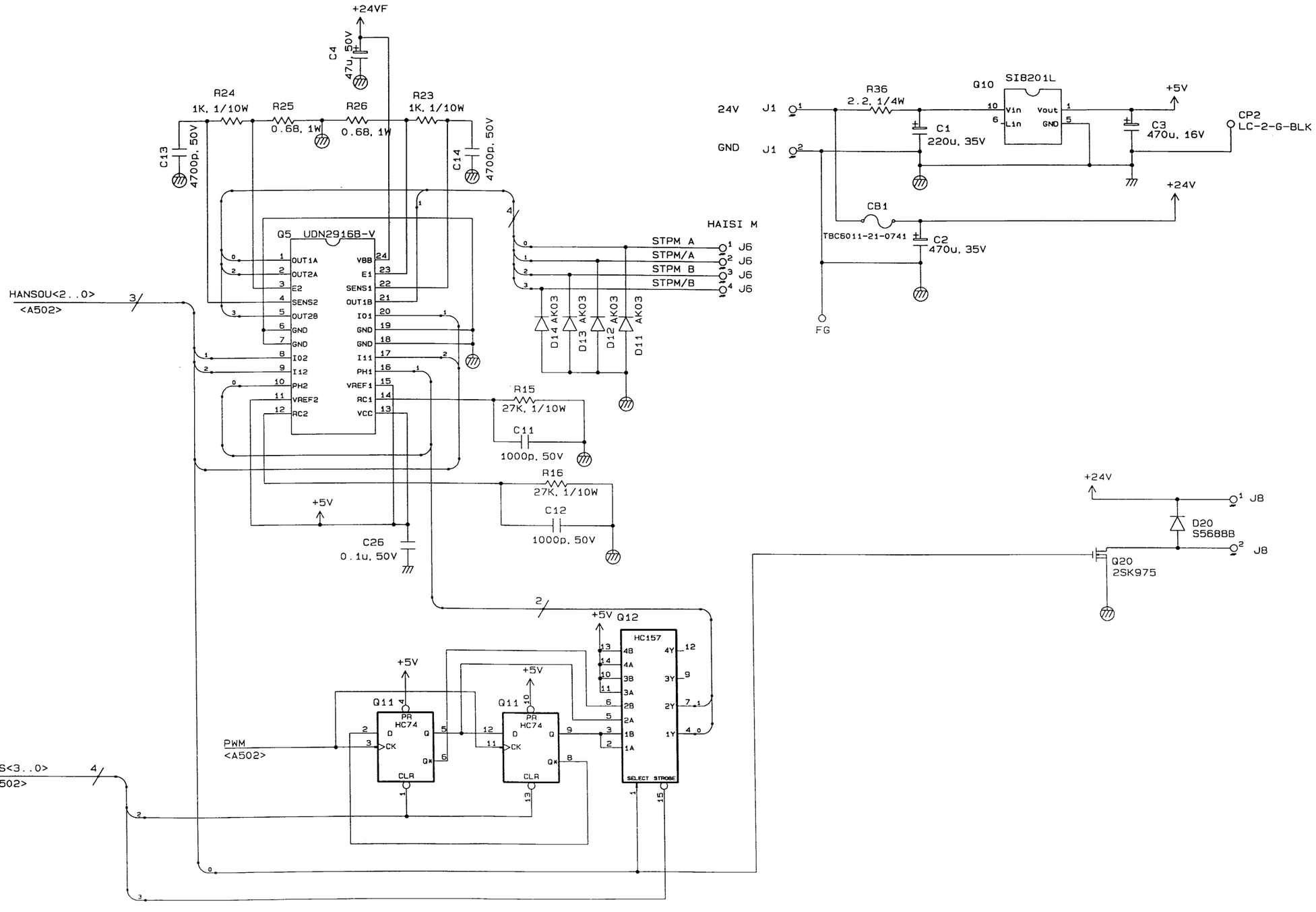


# C. SORTER CONTROLLER PCB (1/3)




DIP, PUSH SW<7..0> 8
<A502>
SW1
BIN UP
SKHHAJ
SW2
BIN DOWN
SW3 SKHHAJ
BXA4-A
RM2
4.7K, 1/8W
+5V
VCC
J3
R38
. 1/4W
D7
*ENCODE
SIFT M EN
MA153
R6
4.7K, 1/10W
R7
10K, 1/10W
R27
10K, 1/10W
C9
1000p, 50V
Q8
SIFT, CLK
<A502>
R39
. 1/4W
BIN M, PH SENS<8..0>
<A502>
D8
*ROTED
CAM SENS
GND
R8
4.7K, 1/10W
R9
10K, 1/10W
R28
10K, 1/10W
C10
0.1u, 50V
+24VF
C5
47u, 50V
Q7 L6203
OUT2
OUT1
IN1
IN2
Vref
ENABL
Vs
BOOT1
GND
BOOT2
SENSE
C17
0.015u, 50V
C18
0.015u, 50V
C16
0.22u, 50V
ICP1
ICP-N50
BIN M, H.P-SW
NF1
DSS306-55FZ103N100
NF2
DSS306-55FZ103N100
NF
BIN+
BIN-
HPNC
HPCOM
UPNC
UPCOM
D4
RM10ZLF-A4
D3
RM10ZLF-A4
D5
EK16LF-F4
D6
EK16LF-F4
Q17
C33
0.1u, 50V
Q8
Q9
C29
0.1u, 50V
C28
0.1u, 50V
Q12
C32
0.1u, 50V
Q11
C31
0.1u, 50V
CP4
CP3
CP1
LC-2-G-BLK
R14
10K, 1/10W
Q16
UN2211
D10
RD16MB1
R2
10K, 1/10W
+24VP
+24V
HONTAI MSW
J4
C20
0.01u, 50V
R13
10K, 1/10W
Q15
UN2211
D9
RD16MB1
R1
10K, 1/10W
COVER MSW
J5
C19
0.01u, 50V
R11
3.3K, 1/10W
Q14
UN2211
D15
RD16MB1
R12
10K, 1/10W
HPSENS
J7
C30
0.22u, 50V
C21
0.01u, 50V
CP5
LC-2-G-BLK
R40
10K, 1/10W
R41
10K, 1/10W
C35
0.1u, 50V
D19
MA153
R30
K, 1/10W
R3
. 1/4W
PI1
EE-SX1041

## SORTER CONTROLLER PCB (3/3)



# D. SOLVENTS AND OILS

| No. | Name | Use an Object |
|---|---|---|
| 1 | Alcohol | Cleaning:<br>e.g., glass, plastic, rubber parts; external covers |
| 2 | Lubricant | Drive, friction parts |