

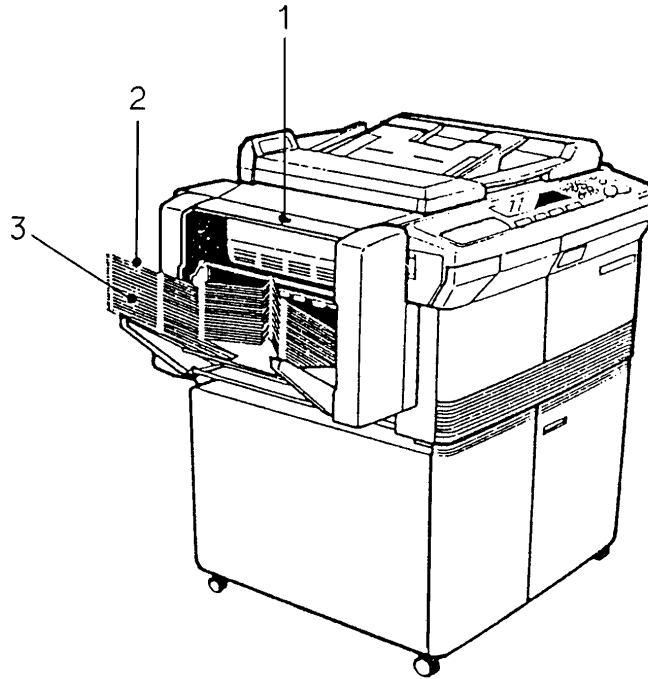
**SORTER**

**– CS230 –**

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# 1. SORTER EXTERIOR



## 1. Top Button

Push it when clearing jammed paper from the sorter.

## 2. Top Bin Tray

The delivered copies are stacked here while sort or stack mode is not in use. Also, when interrupt mode is used while the sorter is operating, all copies are delivered to the top bin tray.

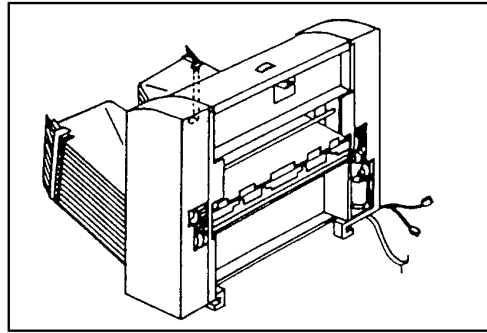
## 3. Bin Trays

When the sorter is operating, copies are delivered to the bin trays according to the sort or stack modes.

## 2. SORTER INSTALLATION

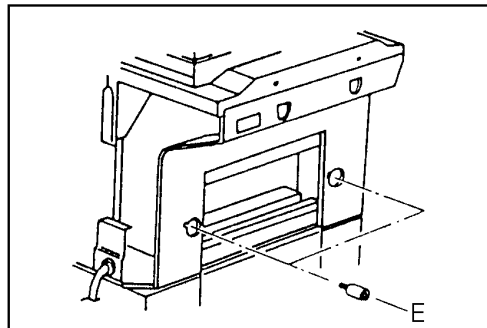
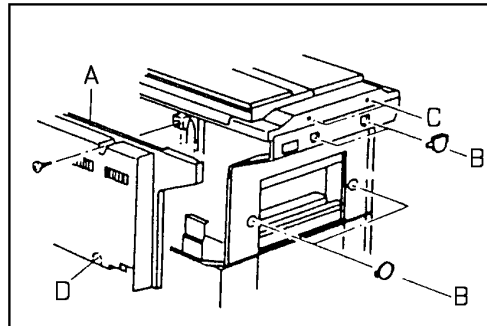
### 2.1 ACCESSORY CHECK

1. Sorter Adapter .....	1
2. Mount Stay.....	1
3. Hinge Bracket: Front.....	1
4. Hinge Bracket: Rear .....	1
5. Mounting Stud Screw.....	2
6. Screw M4 x 25 .....	2
7. Screw M4 x 6 .....	2
8. Cable Clamp 5N .....	1
9. Tapping Screw M4 x 10.....	2
10. Tapping Screw M4 x 6.....	5

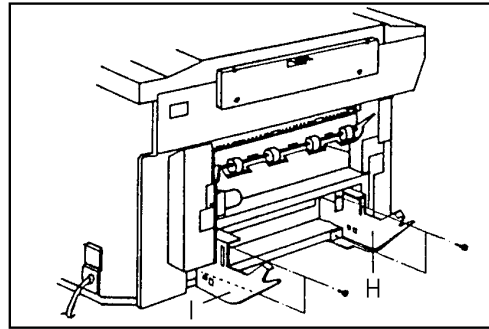
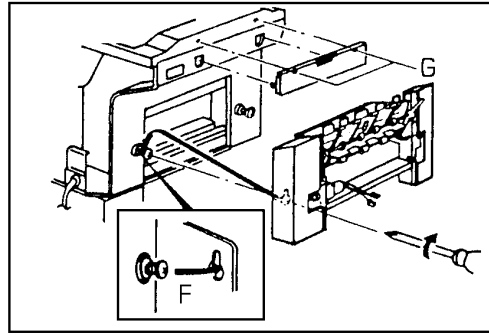


### 2.2 INSTALLATION PROCEDURE

1. Turn off the main switch and unplug the power supply cord of the copier.
2. Remove the rear cover [A] of the copier (4 screws).
3. Remove the four plastic caps [B] from the left cover.
4. Remove the two screws [C] from the top cover.
5. Cut off the cap [D] on the rear cover with cutting pliers.
6. Screw in the two mounting stud screws [E].
7. Screw two M4 x 6 screws halfway into the mounting studs.

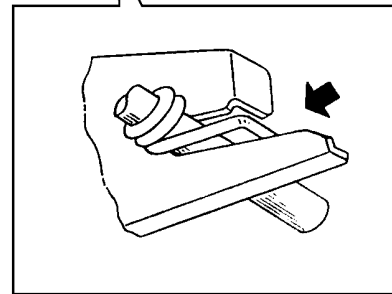
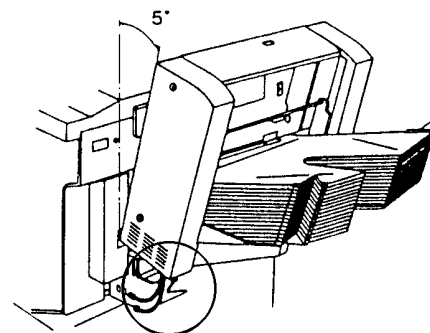


8. Hook the sorter adapter [F] on the screws, and tighten the screws to fix the adapter.
9. Install the mount stay on the copier with two screws (M4 x 25) [G].
10. Install the front and rear hinge brackets [H, I] on the copier with four screws (M4 x 6 - Tapping).

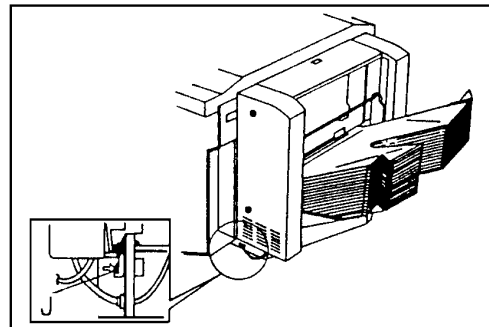


11. Attach the sorter to the hinge brackets by positioning the lower support shaft in the fork shaped groove of the hinge bracket. Tilt the sorter at an angle of 5 degrees while setting it in the bracket.

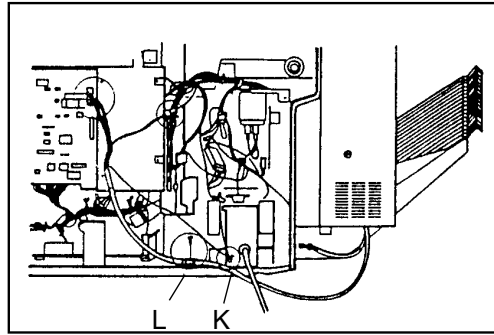
**NOTE:** Make sure that the hook of the tension spring is properly positioned on the bracket.



12. Install two tapping screws (M4 x 10 - Tapping) [J] on the front and rear lower bracket of the sorter.
13. Feed the connectors (2P, 3P) of the sorter into the square holes in the rear hinge bracket from the rear side. Connect two connectors from the sorter adapter with these connectors.



14. Connect the sorter dc harness as follows:
  - 11P to CN103 on the main board.
  - 4P to 4P white connector from the copier dc harness.
15. Secure the sorter grounding wire to the power cord bracket [K], using the original screw.
16. Fix the sorter harness to the copier base plate with the cable clamp [L] (M4 x 6 - Tapping screw).
17. Replace the rear cover.
18. Check the operation of the hinge brackets.
19. Plug in the copier and turn on the main switch.
20. Access SP mode. (  $\diamond$  +  $\odot$  →  $\odot$  )
21. Enter SP No. 28 and change the setting from "10" to "11".  
(# → 28 → # → 0 → 0 → #)
22. Leave SP mode (  $\diamond$  ).
23. Check the operation of the sorter.



### **3. SPECIFICATIONS**

Number of Bins: 20 bins

Type: Attachment type

Paper Size: Maximum A3, 11" x 17"  
Minimum B6, 5 1/2" x 8 1/2"

Paper Weight: 60 to 90 g/m<sup>2</sup>

Bin Capacity: Sort 35 sheets/A4, 20 sheets/B4, 15 sheets/A3  
Stack 30 sheets/A4, 15 sheets/B4, 10 sheets/A3

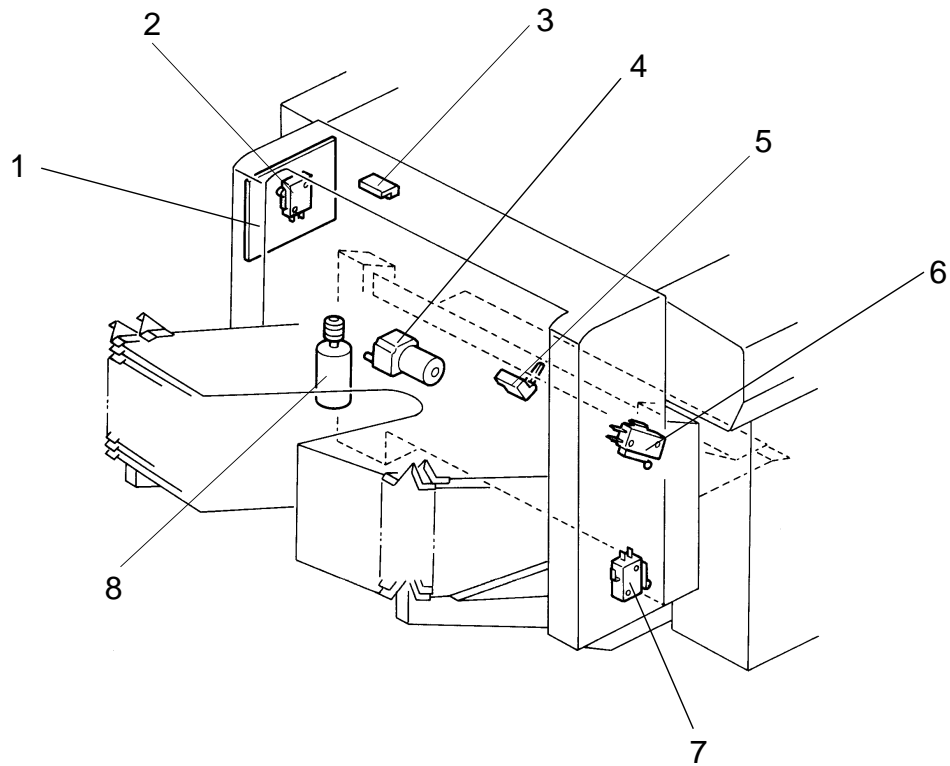
Top Bin Capacity: 100 sheets (all sizes)

Power Source: +5 volts and +24 volts from the copier.

Dimensions: 465 (W) x 304 (D) x 338 (H)

Weight: 9.5 kg

## 4. ELECTRICAL COMPONENT LAYOUT



1. Sorter Control Board

2. Upper Limit Switch

3. Sorter Cover Switch (Reed Switch)

4. Feed Motor (Sorter Adapter)

5. Paper Sensor (Sorter Adapter)

6. 1/3 Revolution Switch

7. Bin Home Position Switch

8. Bin Drive Motor



## **5. BASIC OPERATION**

### **5.1 OPERATION SUMMARY**

#### **– Clear Mode –**

When the main switch of the copier is turned on, all the bins are lowered to the home position. When the Start key is pressed, the top bin shifts to the receiving position. This mode is called Clear Mode. In this mode, all copies are stacked on the top bin. The sorter also assumes the clear mode when either the interrupt mode or the manual feed mode is selected.

Sorter operation begins when a sheet of copy paper actuates the fusing exit sensor. At this time, the feed motor of the sorter adapter energizes. When the paper exits onto the sorter bin, the paper sensor is de-activated and the feed motor is then de-energized. The copier main board monitors the paper sensor through the sorter control board to check for paper misfeeds.

#### **– Sort Mode –**

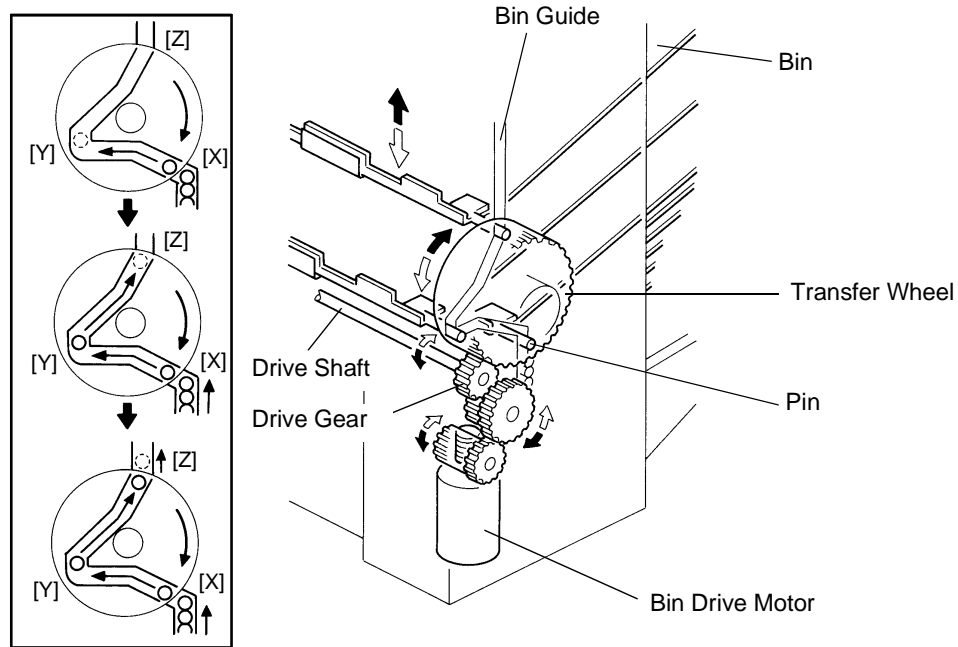
Pressing the sorter key once shifts the copier to the sort mode. In this mode, all copies of the first original are delivered to separate bins starting from the top. The copies of the second original are delivered to the same bins, but starting from the bottom. The copies of the third original start from the top and so on.

The bin drive motor turns on to advance the bins one step, 205 milliseconds after the copy has gone through the paper sensor. If the Clear/Stop or Sorter key is pressed during the sort mode, all bins shift to the home position.

#### **– Stack Mode –**

Pressing the Sorter key twice shifts the copier to the stack mode. In this mode, all copies of the first original are delivered to the top bin, all copies of the second original are delivered to the second bin, and so on. The bin drive motor turns on to advance the bin one step, 205 milliseconds after the last copy of the original has gone through the paper sensor. If the sorter key is pressed during stack mode, all bins shift to the home position.

## 5.2 BIN DRIVE MECHANISM

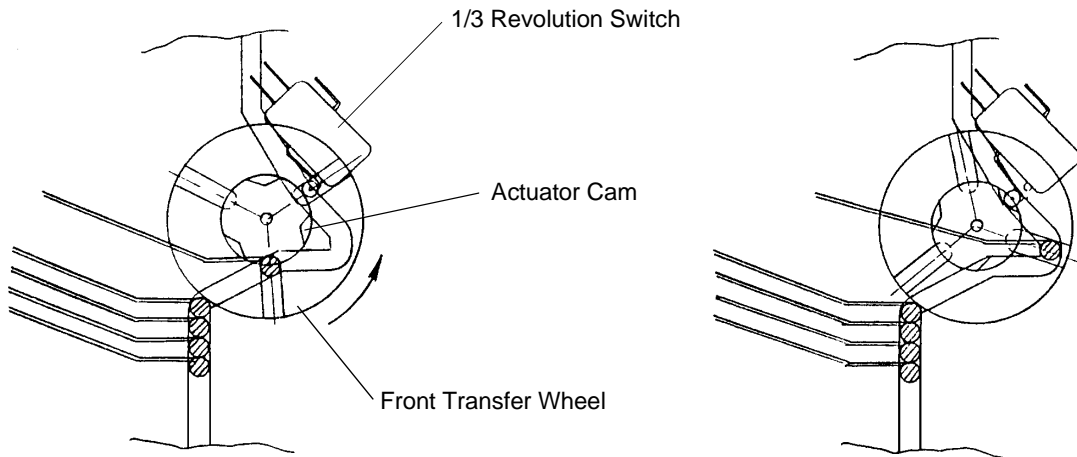


The bin drive mechanism moves the bins up and down to receive copies under the direction of the copier CPU. The main components of this mechanism are the bin drive gear, the transfer wheel, and the bins themselves.

Pins on either side of each bin are inserted into the front and rear slots called bin guides. The bins slide up and down along the bin guides. The bin guide has a special shape at the middle as shown in the figure: X, Y, and Z. The position "Y" is the receiving position for copies. When moving up the bins, the position "X" is the bin inlet and "Z" is the bin outlet. On the other hand when moving down the bins, the function of "X" and "Y" is opposite.

When the bin drive motor is energized, the drive gear is driven via idle gears. Then the front and rear drive gears on the same shaft turn the front and rear transfer wheels together.

The transfer wheels have three slots in them 120 degrees apart. The transfer wheels turn 120 degrees each time. As the transfer wheels turn, these slots catch the pins of the bin at the bin inlet and move the bin to the receiving position "Y". When the transfer wheels turn again, the bin at the receiving position is carried to the bin outlet and the next bin is carried from the bin inlet to the receiving position.

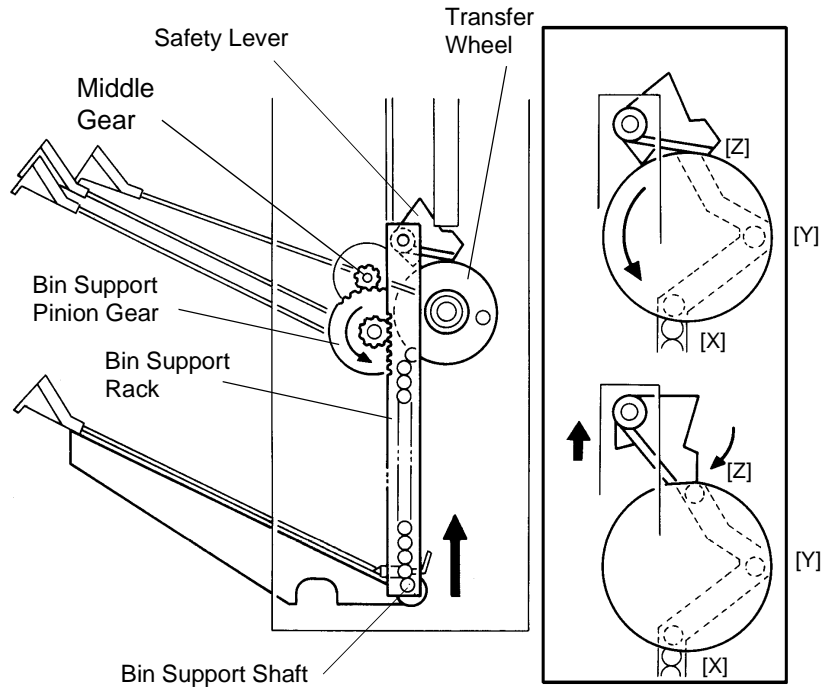


The CPU monitors the position of the bins through pulses generated by the micro switch (1/3 revolution switch) and the actuator cam on the front transfer wheel. The actuator cam has three grooves 120 degrees apart. As the front transfer wheel turns, the ridge on the actuator cam activates the 1/3 revolution switch. When the bins are properly positioned, the groove in the actuator cam deactivates the switch and the bin drive motor stops turning.

When the copier main switch is turned on, all the bins are lowered until the bin home position switch is activated. Then the top bin is moved up to the receiving position when the Start key is pressed, or Sort/Stack mode is selected.

There is an upper limit switch at the top of the rear bin guide for safety. If the 1/3 revolution switch fails to stop the transfer wheels and the top bin reaches the upper limit switch, the bin drive motor is stopped.

## 5.3 BIN SUPPORT MECHANISM



When the transfer wheels turn, the bin support racks are also moved up and down via the middle gears and the bin support pinion gears. The bin support racks are engaged with the bin support shaft that is at the bottom and all the bins are seated on this bin support shaft. Therefore, when the transfer wheel moves a bin up or down, the other bins are moved up or down together.

The top of the bin support rack is engaged with the safety lever which moves in the rails mounted along the bin guide. The safety lever limits the distance between the top bin and the bottom bin to prevent the bins from coming off the bin guides, especially when a customer takes out the copies from the bins. The safety lever touches the pin of the top bin whenever there are bins above the transfer wheels. However, when the top bin is placed at the receiving position "Y", the safety lever slides around the transfer wheel and blocks the bin outlet slot "Z" as shown (top right of the above drawing).

## 5.4 TRANSFER WHEEL MECHANISM

The transfer wheel has three pairs of blocks (6 blocks in total). Each pair of blocks makes one slot and deals with one bin at a time. The blocks are moved in and out by the ridges around the transfer wheel shaft.

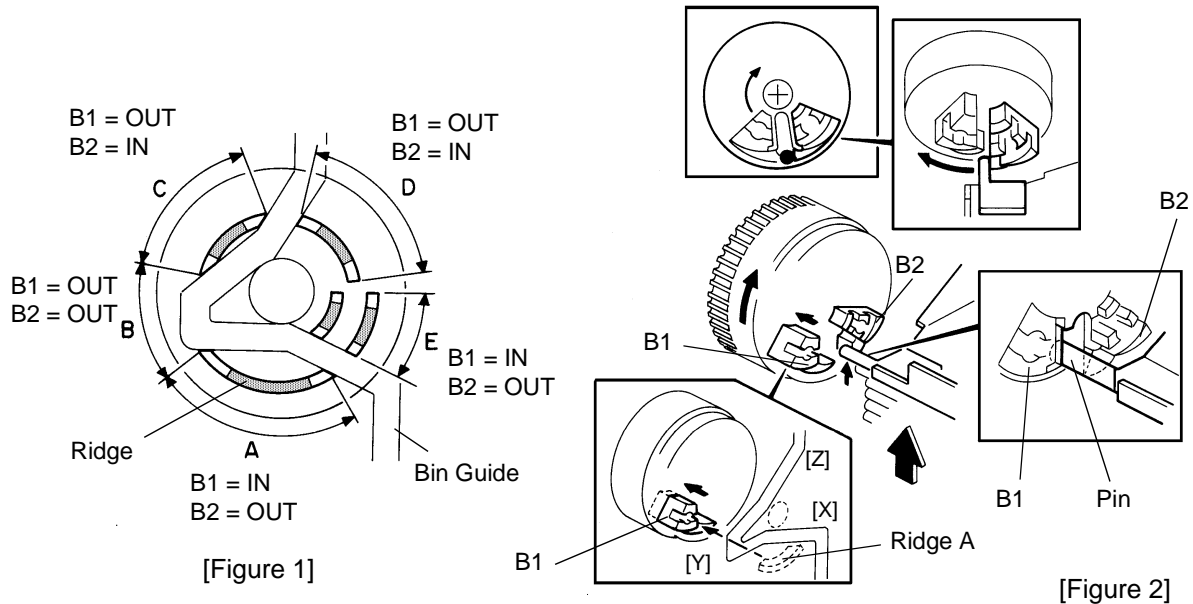
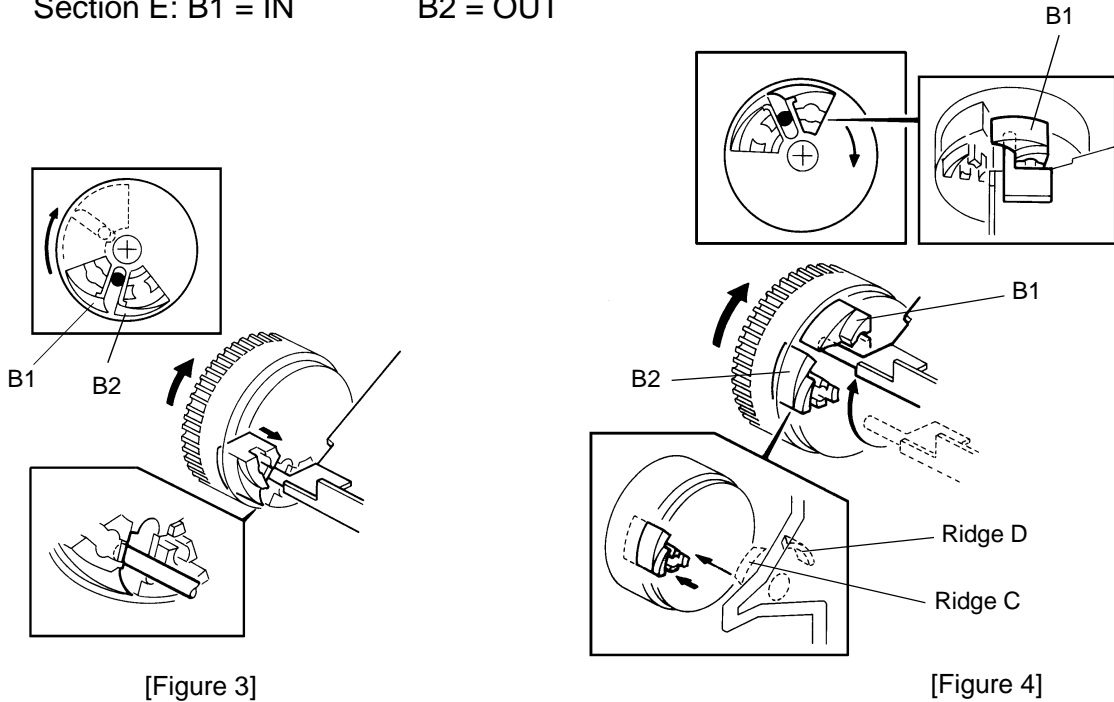
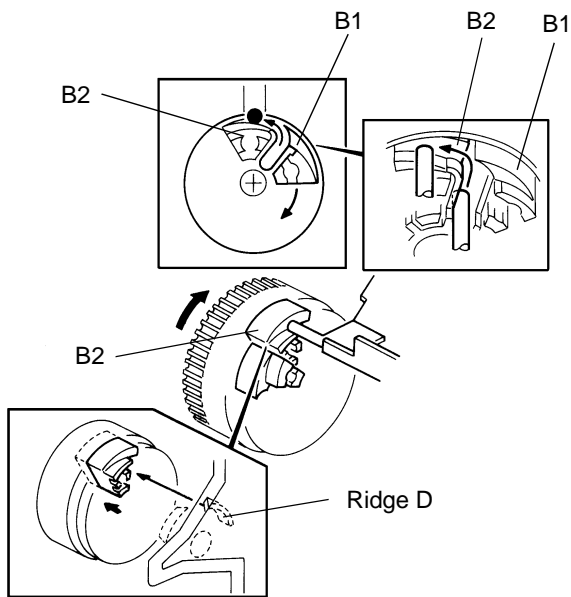


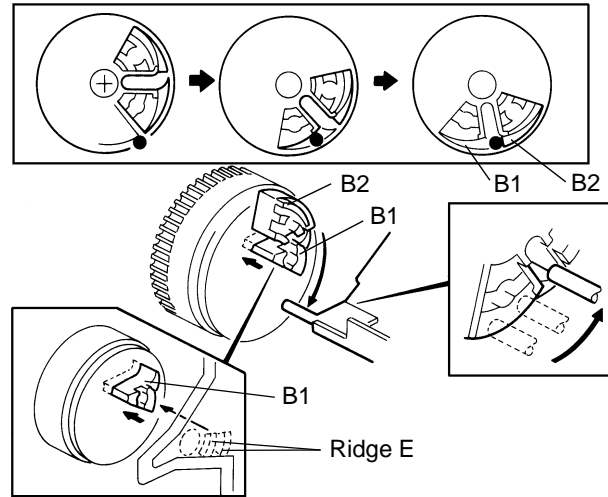
Figure 1 shows the ridges and the bin guide. The area around the transfer wheel is divided into 5 sections (A, B, C, D, and E). A pair of blocks consists of Block 1 (B1) and Block 2 (B2) as shown in figure 2. Because ridges are placed at different diameter around the transfer wheel shaft, the blocks B1 and B2 move in and out as the transfer wheel rotates them through the five sections, as follows:

Section A:	B1 = IN	B2 = OUT
Section B:	B1 = OUT	B2 = OUT
Section C:	B1 = OUT	B2 = IN
Section D:	B1 = OUT	B2 = IN
Section E:	B1 = IN	B2 = OUT





[Figure 5]



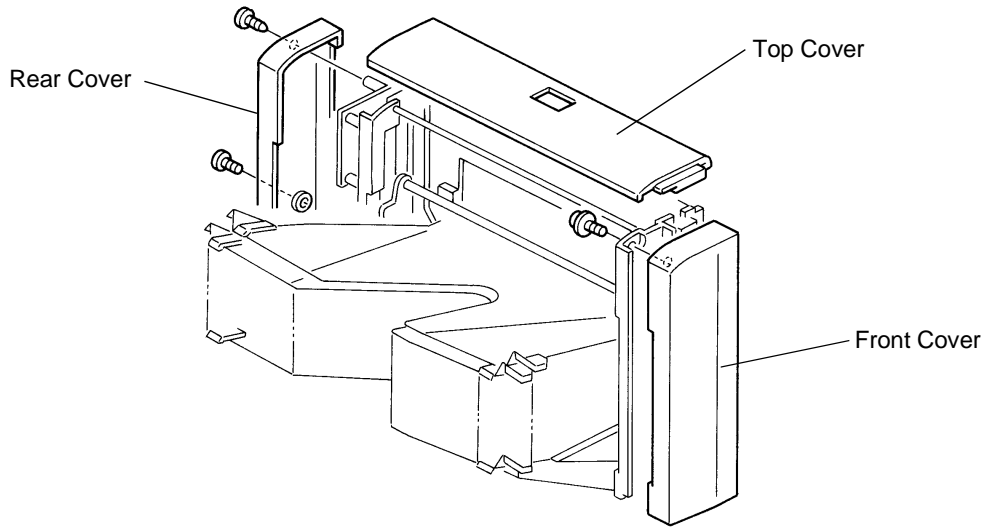
[Figure 6]

Figures 2 to 6 show the relationship between the ridges, the blocks B1 and B2, the bin guide, and the bin's pin, corresponding to the rotation of the transfer wheel through the 5 sections. When moving the bins up, B1 is in and B2 is out while the transfer wheel is catching the bin's pin at the bin inlet [X] (sections E and A). When the bin is placed at the receiving position [Y], both B1 and B2 are out (section B). While the bin is being carried to the bin outlet [Z], B1 is out and B2 is in (section C and D).

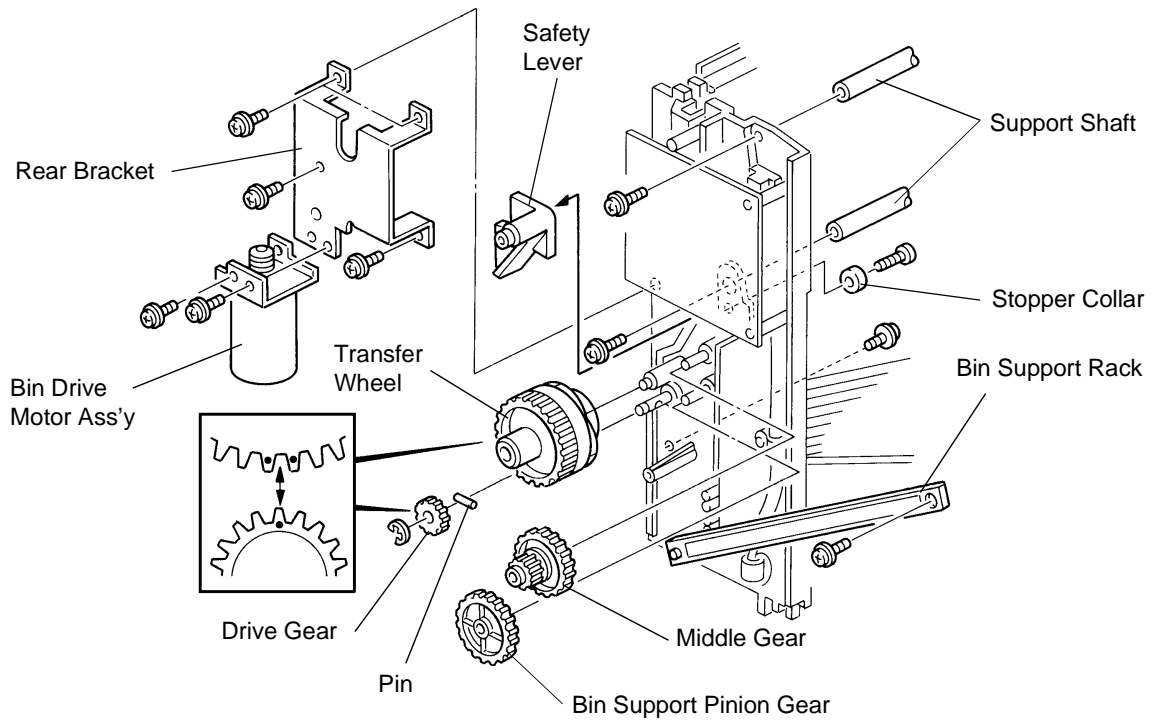
The blocks are carefully shaped so that minimum force is required to pass the bin's pin through the bin outlet to the bin guide slot above the transfer wheel. This is the reason why a dc motor can be used in this model instead of a powerful ac motor to move all the bins.

# 6. REPLACEMENT

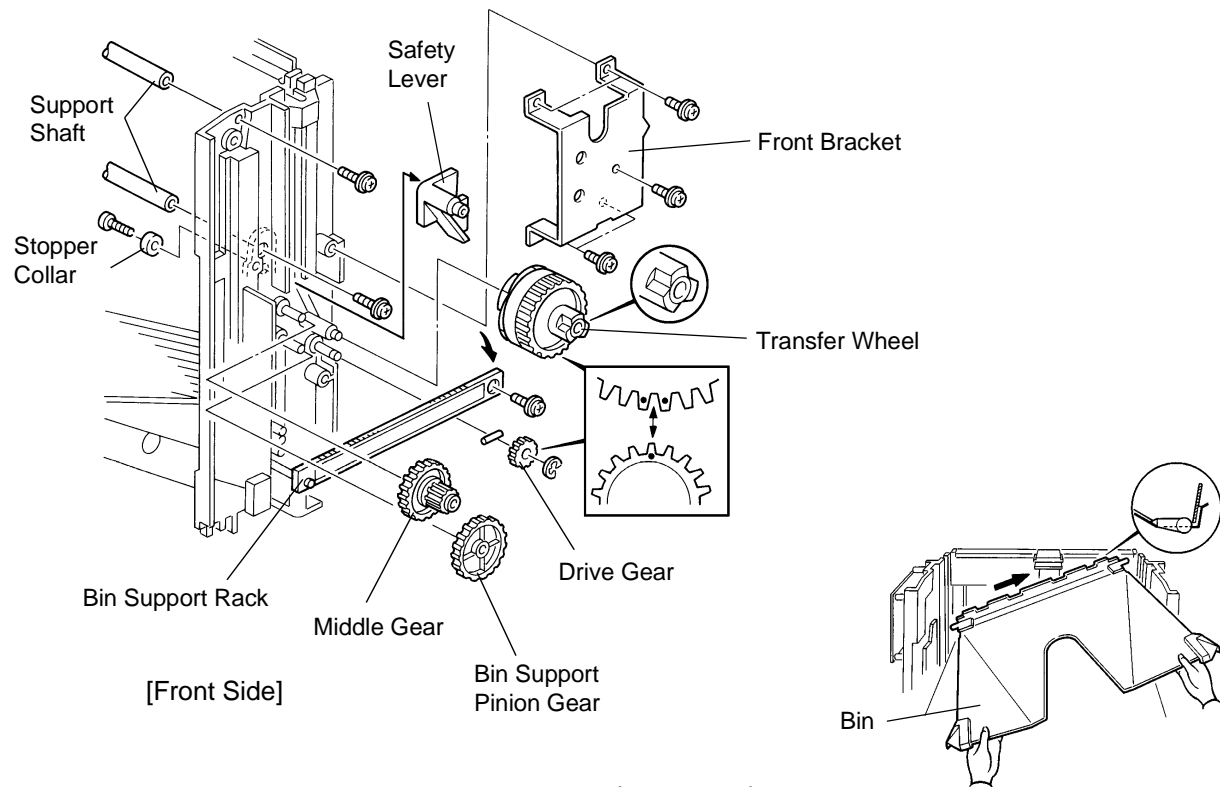
## 6.1 BIN REPLACEMENT



1. Remove the sorter from the copier.
2. Remove the front cover (1 screw) and the rear cover (2 screws).
3. Lift off the top cover.



[Rear Side]



4. Remove the bin drive motor assembly (3 screws).
5. Remove the rear bracket (4 screws).
6. Remove the front bracket (5 screws).
7. Remove the front and rear bin support pinion gears.
8. Remove the front and rear safety levers (1 screw each).
9. Move the front and rear bin support racks off the gears.
10. Remove the front and rear middle gears.
11. Remove the front and rear drive gears (1 E-ring each).  
**NOTE:** Be careful not to lose the pins.
12. Remove the front and rear transfer wheels.
13. Remove the 2 support shafts (2 screws each).
14. Remove the 2 stopper collars (1 screw each).
15. Lift up the bins along the bin guide slots and take them out from the sorter one by one.
16. Apply Grease G501 on the pins of the new bins and reassemble the sorter.  
**NOTE:**
  - Only the top bin has mylars at the bin entrance.
  - When installing the drive gears on the shaft, make sure that the dot-marked tooth of the drive gear engages with the dot-marked teeth of the transfer wheel as shown.
  - When tightening the bin support rack to the safety lever, keep a small gap between the rack and the lever for smooth movement.