

**20 BIN SORTER  
(MINI)  
(Machine Code: A423)**

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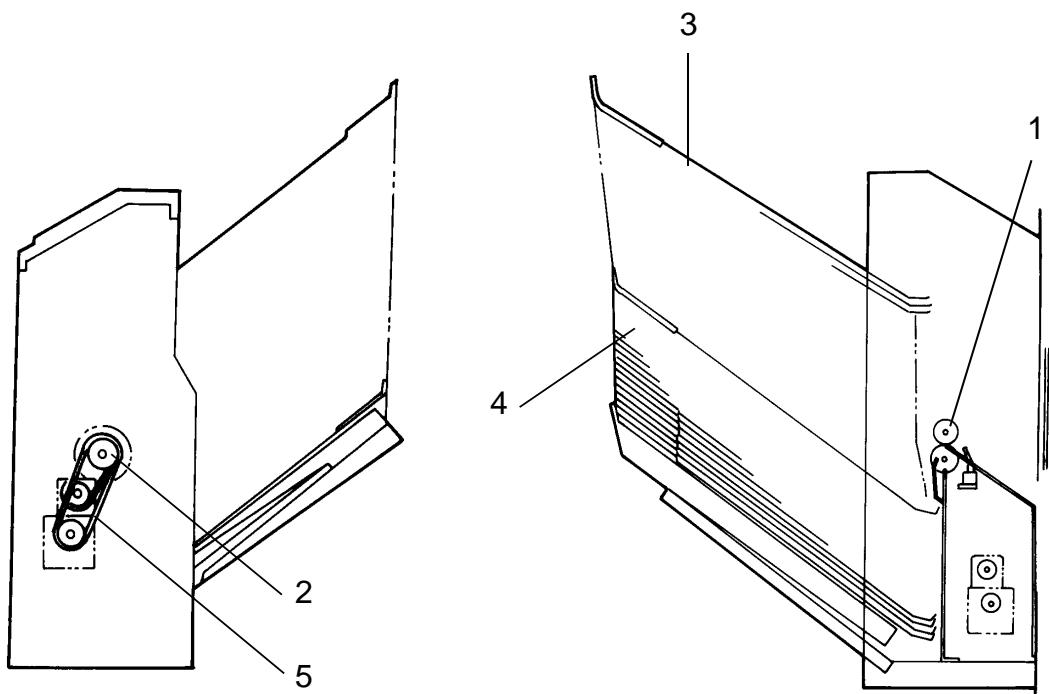
## 1. SPECIFICATIONS

Paper Size for Bins:	Maximum A3, 11" x 17" Minimum A5, 5 $\frac{1}{2}$ " x 8 $\frac{1}{2}$ "
Paper Weight:	52 to 90 grams (14 to 24 lb)
Number of Bins:	20 bins + proof tray
Bin Capacity:	Sort Mode: 30 sheets/A4 (8 $\frac{1}{2}$ " x 11") 15 sheets/B4 (8 $\frac{1}{2}$ " x 14") 10 sheets/A3 (11" x 17")
	Stack Mode 30 sheets/A4 (8 $\frac{1}{2}$ " x 11") 10 sheets/B4 (8 $\frac{1}{2}$ " x 14") 10 sheets/A3 (11" x 17")
Proof Tray Capacity:	100 sheets (all sizes)
Power Source:	100 V, 50/60 Hz, 0.6 A (from copier)
Power Consumption:	60 W
Dimensions: (W x D x H)	346 mm x 474 mm x 338 mm 13.6" x 18.7" x 13.3"
Weight:	12.7 kg (28.3 lb)

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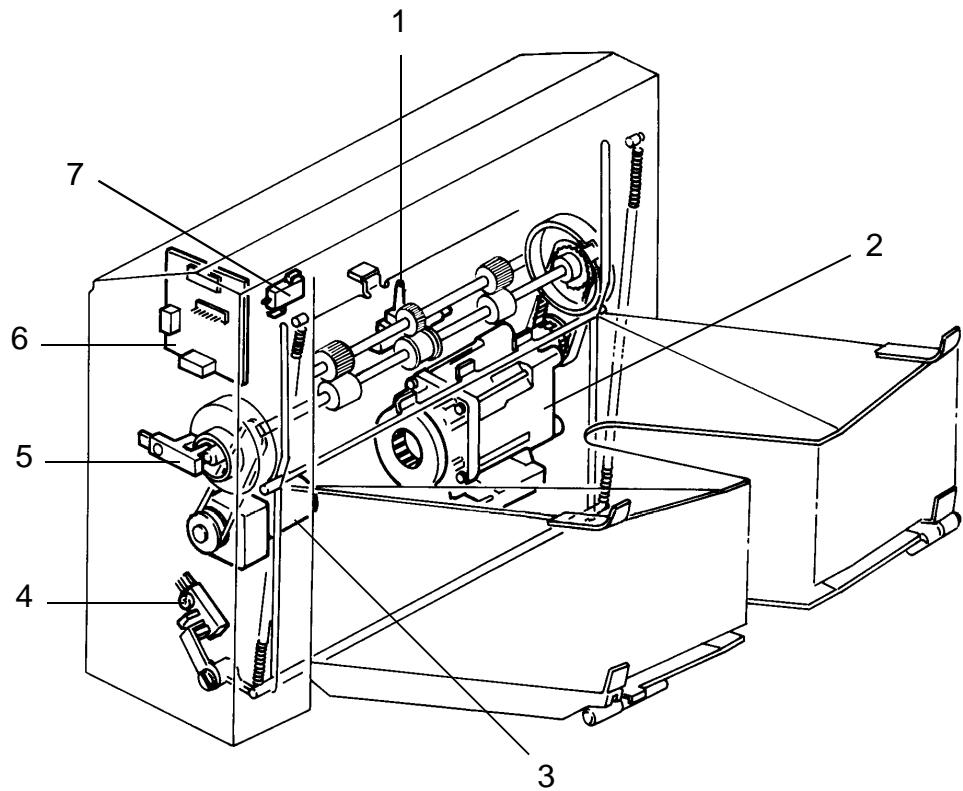
## 2. MECHANICAL COMPONENT LAYOUT



1. Exit Rollers
2. Bin Drive Wheel
3. Proof Tray
4. Bins
5. Roller Drive Belt

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### 3. ELECTRICAL COMPONENT LAYOUT



1. Paper Sensor (S1)
2. Wheel Drive Motor (M1)
3. Roller Drive Motor (M2)
4. Bin Home Position Sensor (S2)
5. Wheel Sensor (S3)
6. Sorter Board (PCB1)
7. Cover Safety Switch (SW1)

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## 4. ELECTRICAL COMPONENT DESCRIPTIONS

Index No.	Name	Function	Symbol
<b>Motors</b>			
2	Wheel Drive Motor	Drives the wheel that changes the bin positions	M1
3	Roller Drive Motor	Drives all rollers in the sorter paper path	M2
<b>Sensors</b>			
1	Paper Sensor	Misfeed detection for the sorter	S1
4	Bin Home Position Sensor	Detects when all bins are in the down position (home)	S2
5	Wheel Sensor	Detects each 1/2 turn of the wheel (1 bin changed for each 1/2 turn)	S3
<b>Switch</b>			
7	Cover Safety Switch	Detects when sorter cover is opened	SW1
<b>Printed Circuit Board</b>			
6	Sorter Board	Controls all sorter functions. Communicates with I/O control PCB through the interface PCB	PCB1

## 5. BASIC OPERATION

### 5.1 CLEAR MODE

When the main switch of the copier is turned on, the sorter automatically assumes a clear mode condition. It also changes to a clear mode condition if the sort or stack mode is recalled or if the interrupt key is pressed. In a clear mode condition, all copies are stacked on the proof tray.

Sorter operation starts when a sheet of copy paper activates the copier exit sensor. At this time the roller drive motor energizes. The roller drive motor de-energizes when the paper exits the copier and the paper sensor is deactivated. The paper sensor signal is sent to the copier through an interface board to check for paper misfeed. The wheel drive motor does not turn on when in the clear mode.

### 5.2 SORT MODE

After the sort mode is selected by pressing the Sorter key, the wheel drive motor turns on to move the proof tray up. When the first sheet of paper activates the copier exit sensor, the roller drive motor turns on. Shortly after the paper sensor turns off (420 ms later), the wheel drive motor turns and advances the bins one step. When the wheel sensor is activated, the wheel drive motor turns off.

### 5.3 STACK MODE

As in the sort mode, the roller drive motor turns on when the first sheet of paper actuates the copier exit sensor. All copies of the copy run are then fed to the first bin. When the final copy passes the paper sensor, the wheel drive motor turns on and advances the bins one step.

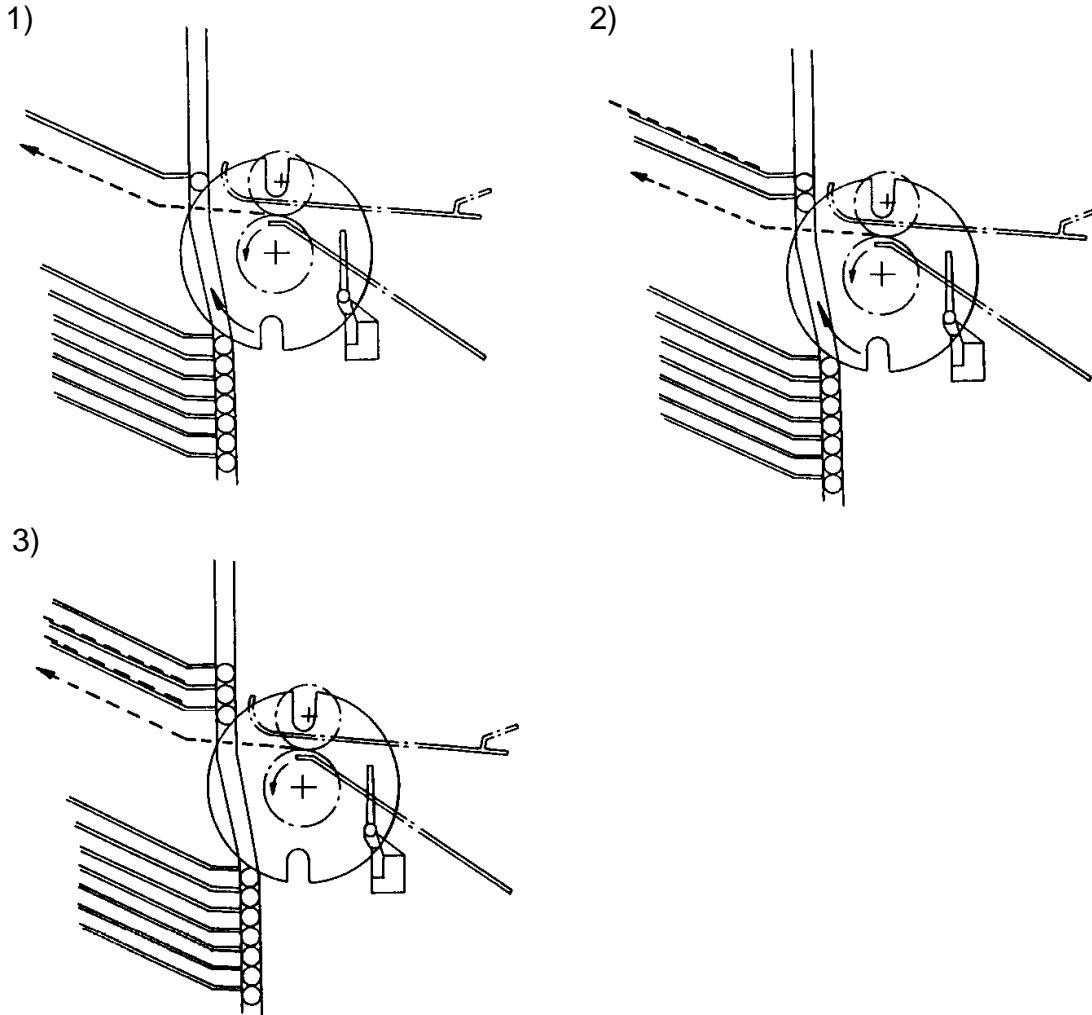
There are no limits on the number of copies that can be entered up to the full 999 copy limit of the copier. However, the physical capacity of the bins is a good deal less. (See "Bin Capacity" in the specifications.)

When all 20 bins have been used, the wheel drive motor turns on until all the bins have been lowered (including the proof tray).

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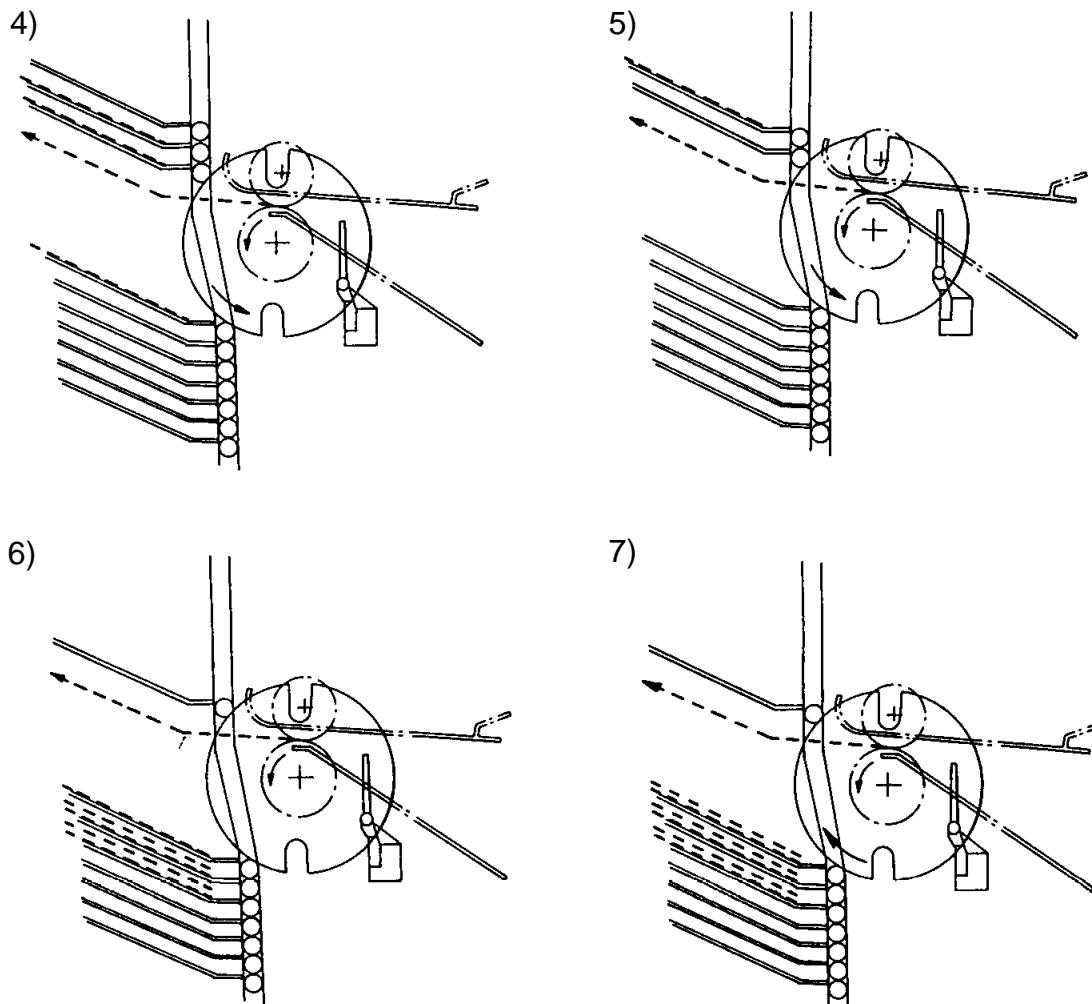
## 6. EXAMPLE OF SORT MODE OPERATION



"3" copies entered/Start key pressed 3 times.

**- Start Key ON -**

- 1) The first copy feeds to the first bin. After the paper sensor turns off, the wheel drive motor turns on and moves the first bin up.
- 2) The same action as #1.
- 3) The third copy feeds to the third bin. The wheel drive motor does not turn on after the paper sensor turns off. (The sorter will stay at this position until auto-reset or until copying resumes.)



**- Start Key ON -**

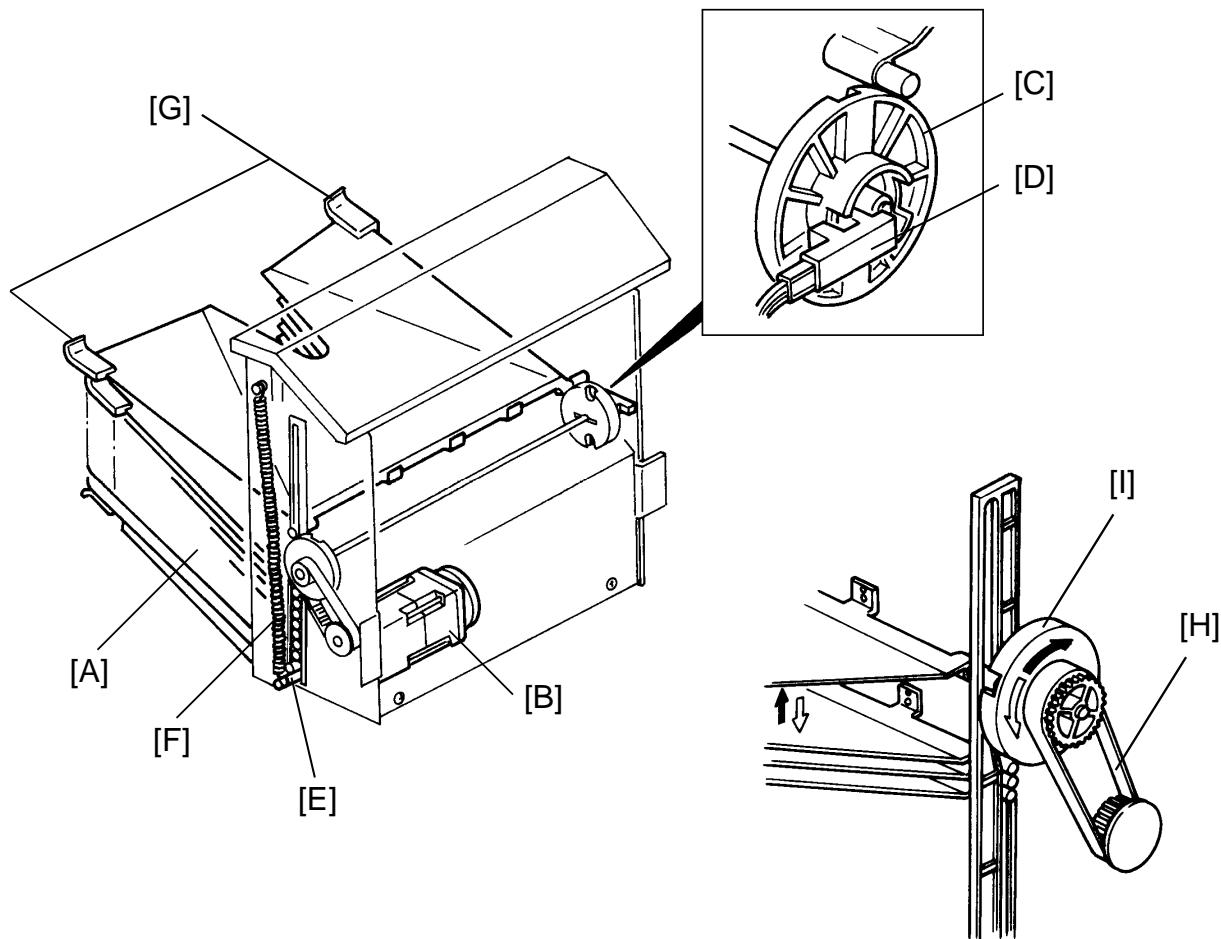
- 4) The first copy is fed to the third bin. After the paper sensor turns off, the wheel drive motor turns on and moves the second bin down.
- 5) The same as #4.
- 6) The third copy is fed to the first bin. The wheel drive motor does not turn on after the paper sensor turns off.

**- Start Key ON -**

- 7) The first sequence (1, 2, and 3) is repeated.

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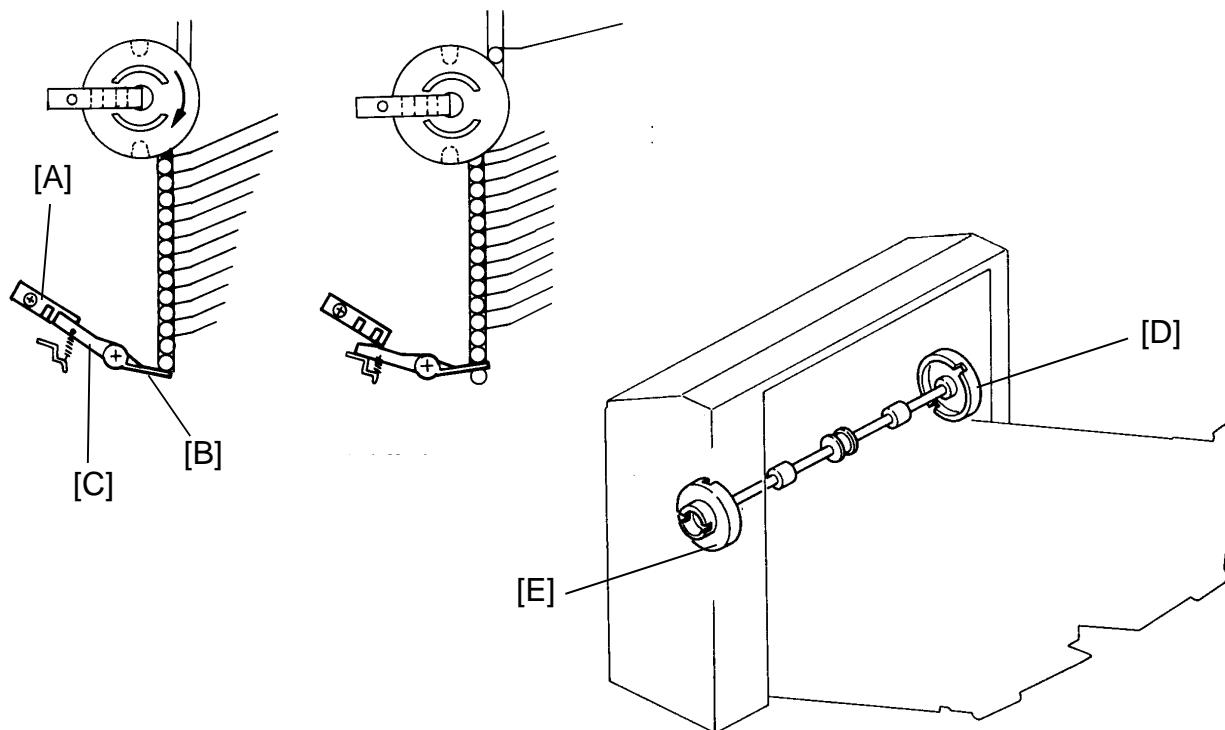
## 7. BIN DRIVE MECHANISM



The bin drive mechanism moves the bins [A] up and down to receive copies under the direction of the copier CPU. The main components in this mechanism are the wheel drive motor [B], the two transfer wheels [C], the wheel sensor [D], and the bins themselves.

Pins on either side of each bin are inserted into slots in the sorter side frame. The pins slide up and down in these slots. The bins rest on each other with the lower one resting on the lift bar [E]. The springs [F], on either end of the lift bar, lift it up forcing the bin pins against the transfer wheels. Plastic spacers [G] on both ends of the bin keep the bins separated.

To move the bins up, the bin drive motor turns clockwise (as viewed from the front). A timing belt [H] turns the transfer wheels [I].



The transfer wheels have two slots in them 180 degrees apart. As the transfer wheels turn, these slots engage the pins of the bins and lift them up. Each time the transfer wheels turn 180 degrees, they raise one bin.

The CPU counts the bins using the wheel sensor. A cylindrical actuator on the front transfer wheel turns the wheel sensor on and off. This actuator has two notches that are 180 degrees apart. The wheel sensor turns on each time one of the slots passes through the sensor.

To move the bins down, the CPU reverses the bin drive motor and the above process reverses.

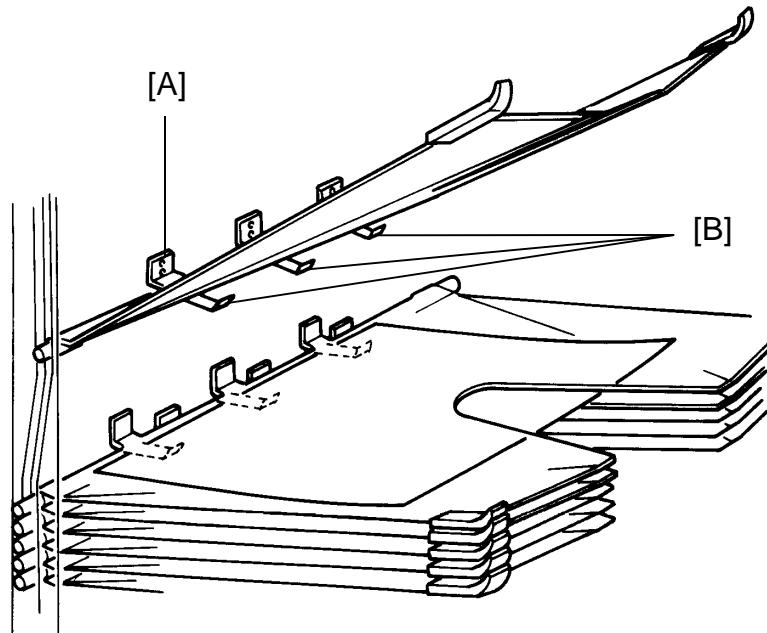
The home position sensor [A] is located at the lower rear end of the sorter. When all the bins are lowered, the lift bar [B] presses down on the actuator [C], actuating the sensor. The CPU checks the sensor whenever the power is turned on. At this time, if the bins are not in the home position, the home position sensor is deactivated the CPU will return the sorter bins to the home position.

The mounting position is about 18.5 degrees off between the front transfer wheel [D], and the rear transfer wheel [E]. Therefore, the front and rear of the bins do not rise simultaneously thus avoiding unusual noises and also reducing load.

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## 8. BINS



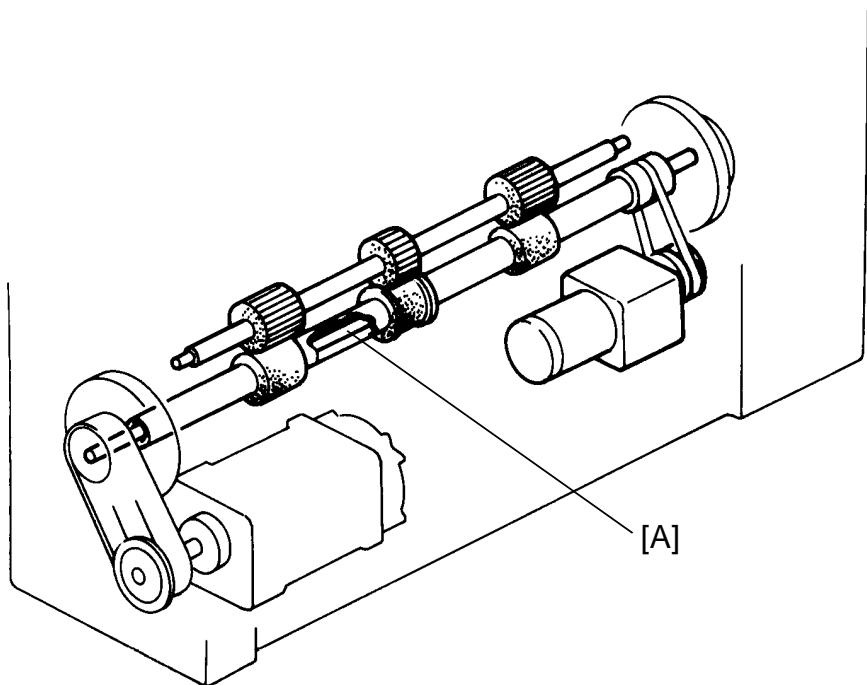
The proof tray and the twenty bins are all basically the same. Formed out of thin flexible steel plate, they have spacers on the left end to hold them apart and pins at the front and rear of the right end, which are inserted in guide slots in the sorter frame.

On the right edge, the bins have stoppers [A] which prevent copies from sliding back into the sorter after they have been fed out. The pattern of these stoppers is different for even and odd numbered bins.

Three leaf springs [B] on the underside of each bin hold the copies flat in the underlying bin.

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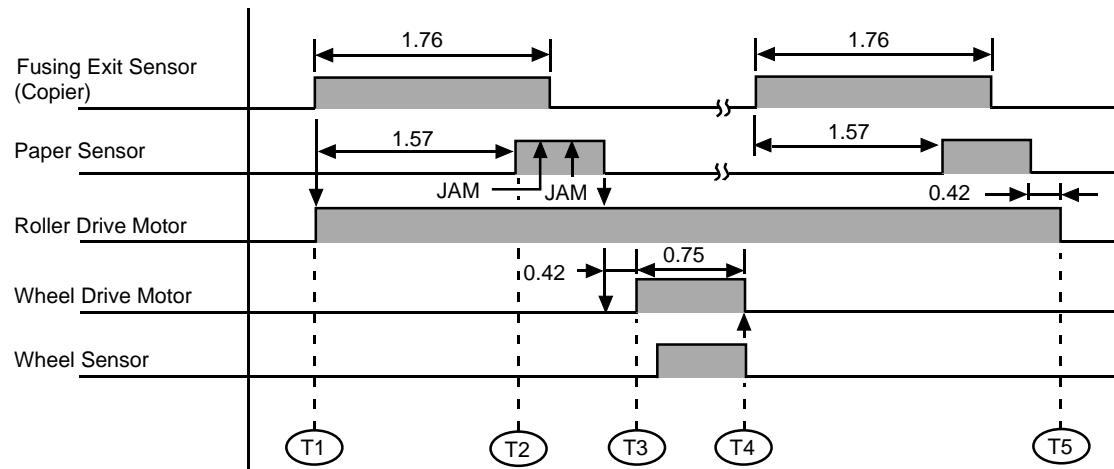
## 9. EXIT ROLLERS



The exit roller shaft is hollow and is mounted on the transfer wheel shaft [A] (coaxial). When the copy actuates the copier's exit sensor, the CPU sends a signal to the sorter to turn on the roller drive motor. The roller drive motor turns off at the same time as the copier main motor.

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## 10. ELECTRICAL TIMING



- T1: When a sheet of copy paper activates the fusing exit sensor, the roller drive motor starts rotating.
- T2: 1.57 seconds after turning on the fusing exit sensor, the paper sensor turns ON.
- T3: 0.42 second after the paper sensor turns OFF, the wheel drive motor starts rotating and shifts the bin.
- T4: When the wheel sensor is actuated, the wheel drive motor turns OFF.
- T5: 0.42 second after the paper sensor turns OFF, the roller drive motor stops.

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## 11. INSTALLATION (FT4227/5233 SERIES)

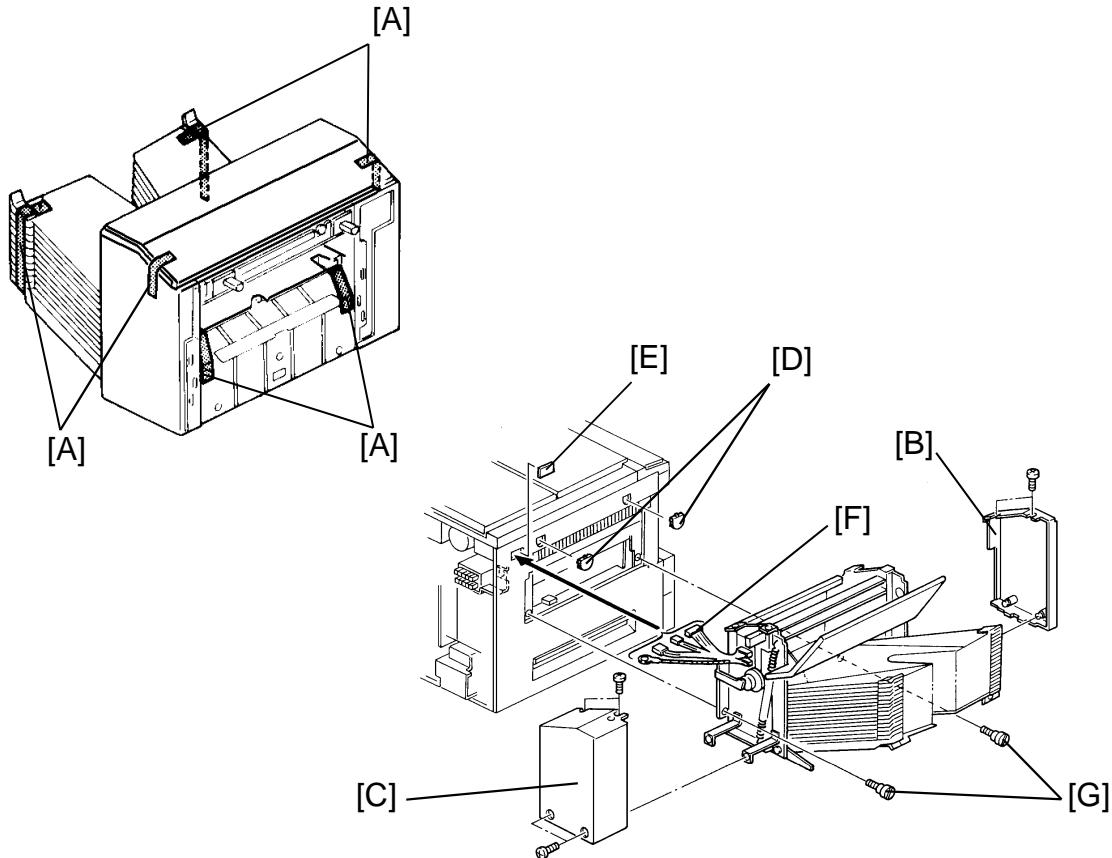
### 11.1 ACCESSORY CHECK

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

1. Installation Procedure .....	1
2. New Equipment Condition Report (-17, -27 machines only) .....	1
3. Envelope for NECR (-17 machine only) .....	1
4. Thumb Screw .....	1
5. Grounding Screw .....	1
6. Star Washer .....	1
7. Multilingual Decal (-25, -26, -27 machines only) .....	1

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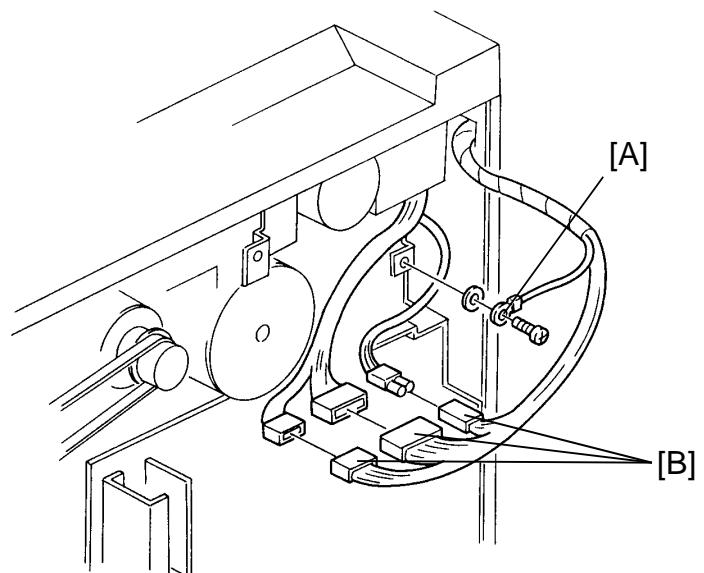
## 11.2 INSTALLATION PROCEDURE



**CAUTION: Unplug the copier power cord before starting the following procedure.**

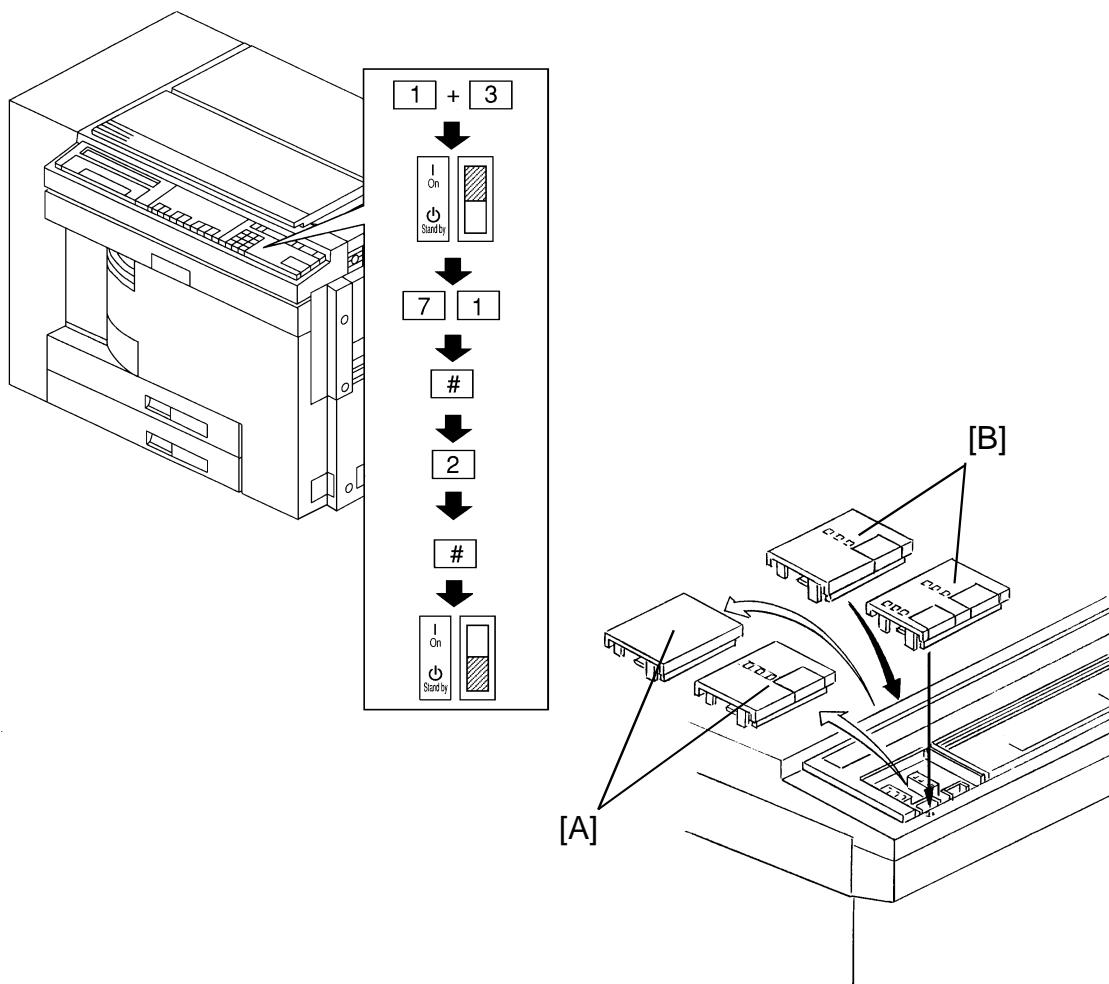
**NOTE:** • The sorter adapter (A328) should be installed before the sorter is installed.

1. Remove the strips of tape [A].
2. Remove the front sorter cover [B] (2 screws) and rear sorter cover [C] (4 screws).
3. Remove the cover plates [D] with cutting pliers and the plastic cap [E].
4. Mount the sorter on the copier. Insert the two mounting studs into the docking holes, and pass the harness [F] through the access hole.
5. Attach the sorter unit to the copier with the two thumb screws [G].



6. Secure the sorter protective earth wire [A] (1 screw and toothed washer).
7. Connect the three connectors [B] as follows:
  - 2P red to 2P red free
  - 4P white to 4P white free
  - 11P white to 11P white free

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8. Reinstall all the covers.
9. Plug in the copier power cord.
10. While pressing both 1 and 3 on the operation panel number keys, turn on the main switch in order to access the SP mode.
 

**NOTE:** Release the number keys after confirming that the call service indicator and the copy counter number "0" are blinking.
11. Enter 71 using the number keys and then press the enter key.
12. Enter 2 using the number keys and then press the enter key.
13. Turn off the main switch.
14. Remove the left plastic cover [A] on the operation panel and install the sorter key top and cover [B] instead.
 

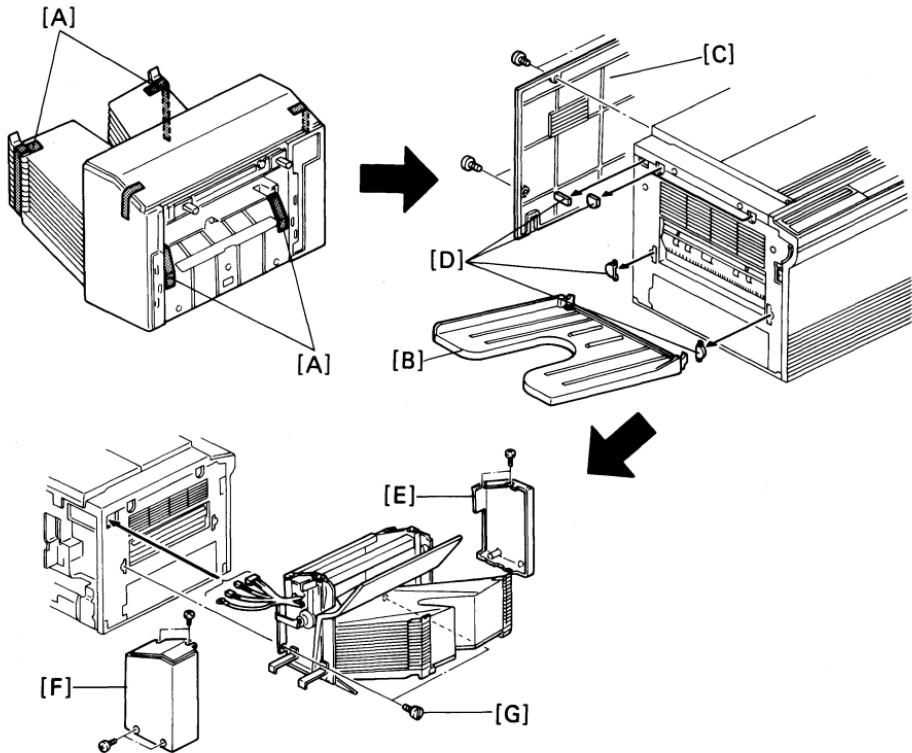
**NOTE:** The sorter key top and cover are provided as an accessory for the copier.
15. Turn on the main switch and check the sorter's operation.

## **12. ACCESSORY CHECK (FT4460)**

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

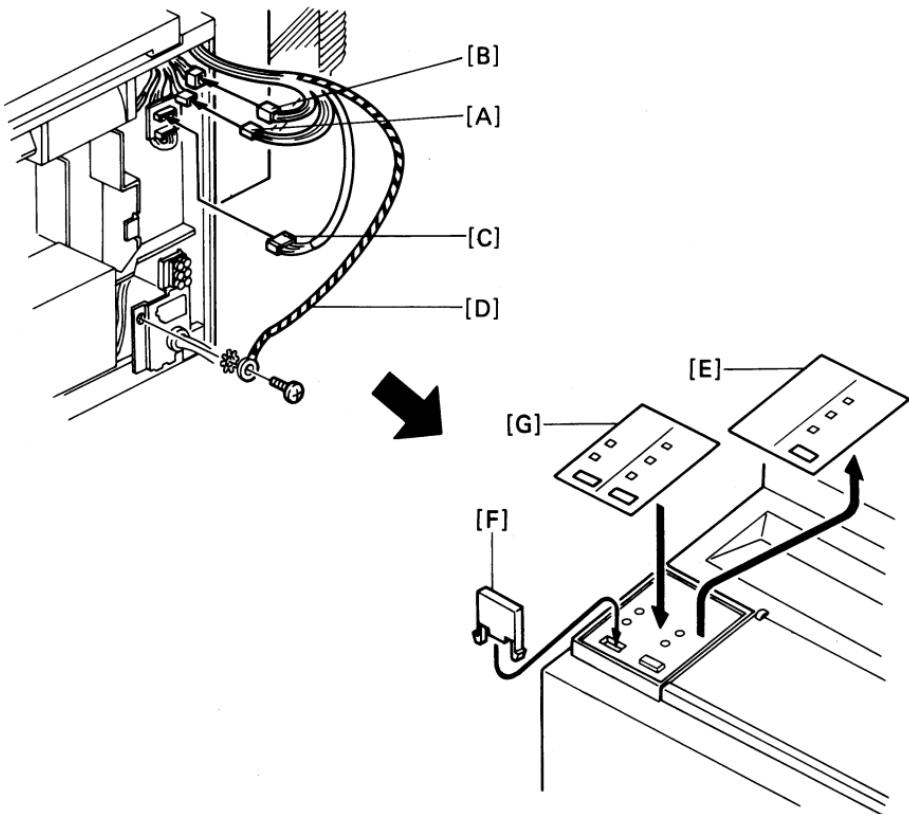
1. Installation Procedure.....	1
(115V - English only / 220V - Five Languages)	
2. New Equipment Condition Report .....	1
3. Envelope for NECR (115V only) .....	1
4. Thumb Screw .....	2
5. Grounding Screw .....	1
6. Star Washer.....	1
7. Multilingual Decal (220/240V only) .....	1

## 13. INSTALLATION PROCEDURE (FT4460)



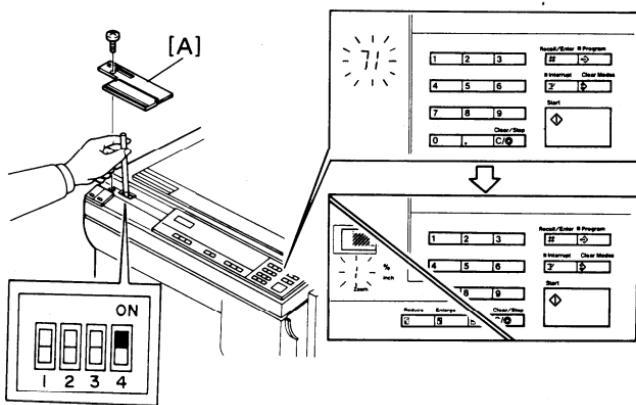
**NOTE:** Install the sorter unit after the optional date printer and the document feeder have been installed.

1. Turn off the main switch and unplug the power supply cord of the copier.
2. Remove the strips of shipping tape [A].
3. Remove the receiving tray [B] and rear cover [C] of the copier (4 screws).
4. Remove the 5 plastic caps [D].
5. Remove the front sorter cover [E] (2 screws) and rear sorter cover [F] (4 screws).
6. Mount the sorter on the copier. Insert the two mounting studs into the docking holes, and pass the harness through the access hole.
7. Attach the sorter unit to the copier with the two thumb screws [G].



8. Connect the sorter ac harness [A] (free red 2P connector).
9. Connect the sorter dc harness [B] (white 4P connector).
10. Connect the sorter harness [C] (CN2, white 11P connector).
11. Secure the sorter ground wire [D] (1 screw and star washer).
12. Mount the sorter covers and copier rear cover.
13. Remove the sheet [E] on the left end of the operational panel, and insert the sorter key top [F] into the key hole. Then, stick on the sorter panel sheet [G].

**NOTE:** The sorter panel sheet and sorter key top are copier accessories.



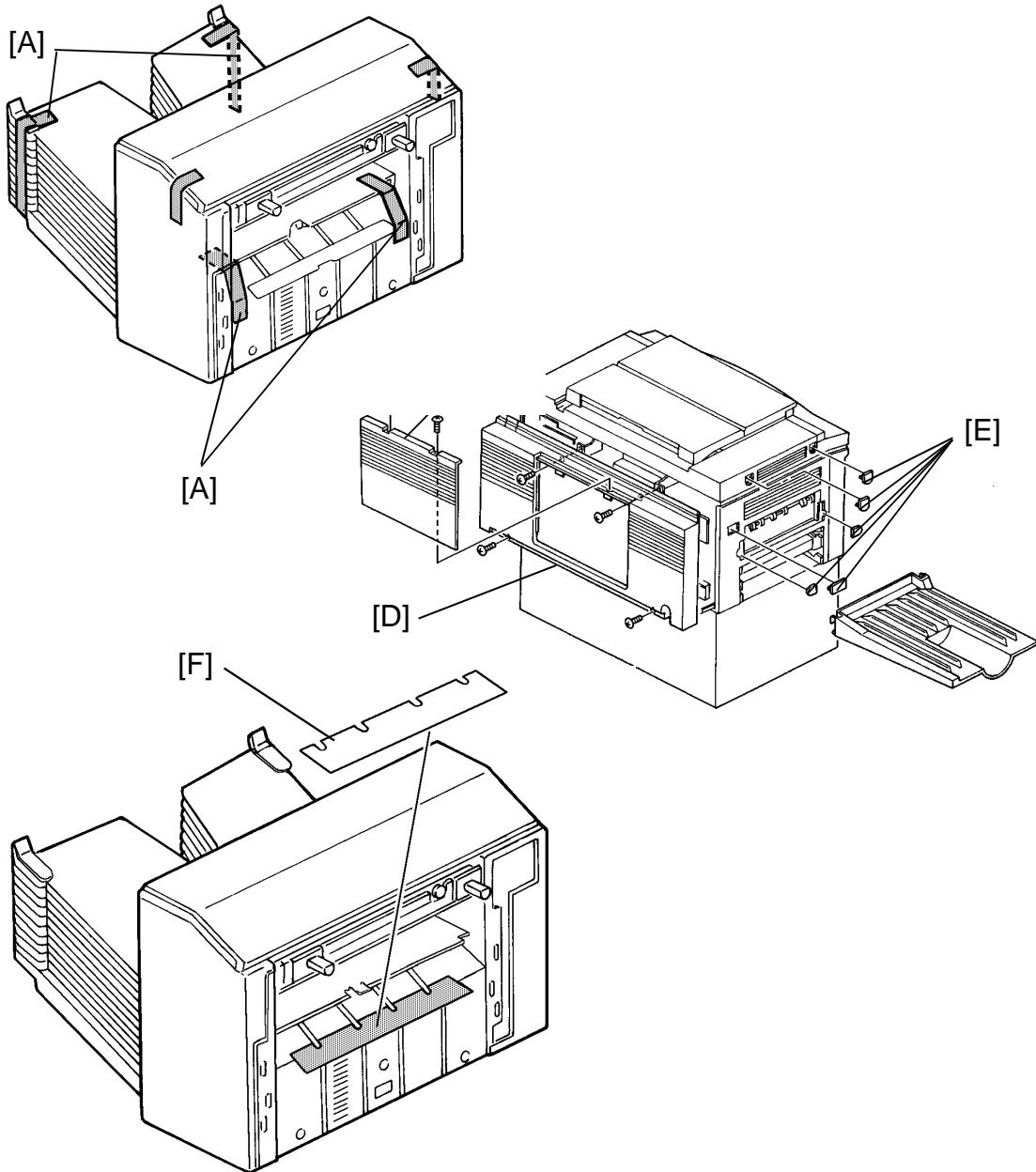
14. Remove the key cover [A] (1 screw).
15. Plug in the power cord of the copier and turn on the main switch.
16. Turn on DIP SW 1-4 under the operation panel.
17. Enter "71" in the copy counter using number keys, then press the "#" key.
18. Enter "1" in the magnification ratio indicator using number keys, then press the "#" key.
19. Turn off DIP SW 1-4 under the operation panel.
20. Install the key cover.
21. Check the sorter's operation and fill out the New Equipment Condition Report.

## **12. ACCESSORY CHECK (NC100)**

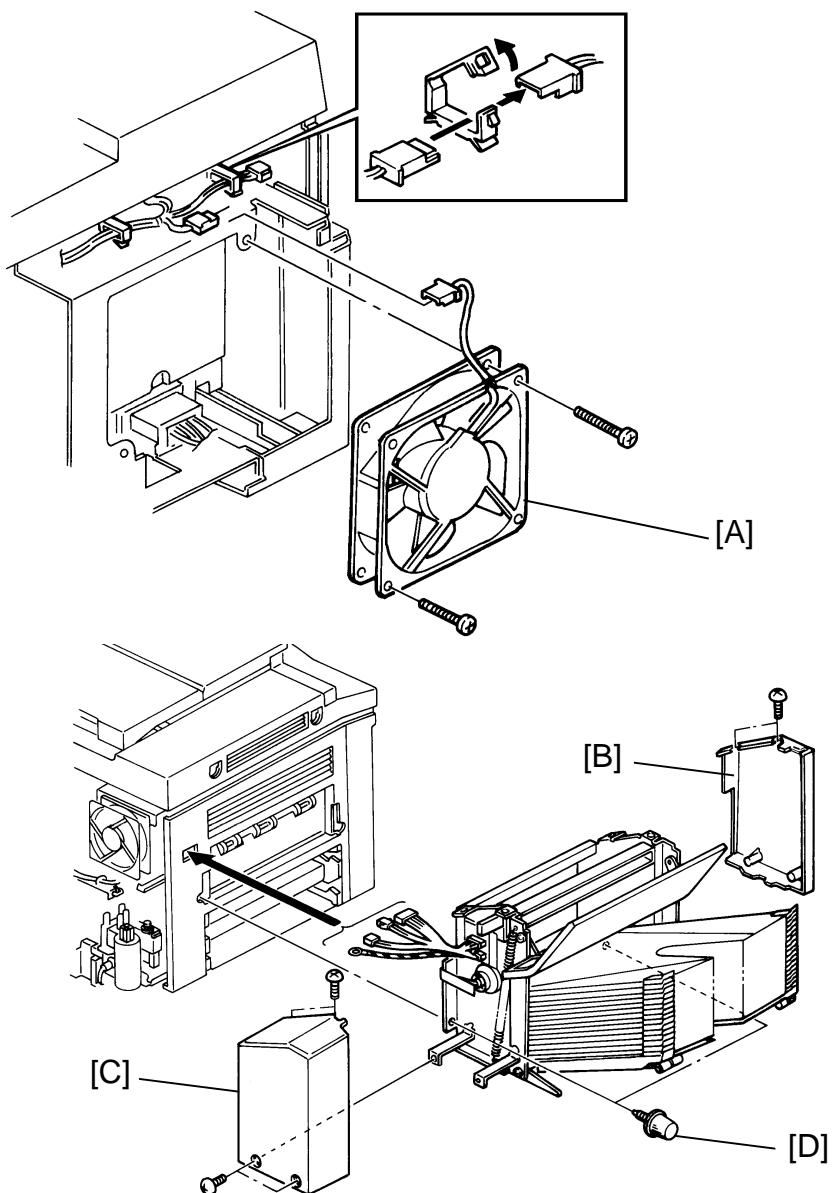
Check the quantity and condition of the accessories in the box according to the following list:

1. Installation Procedure.....	1
2. New Equipment Condition Report .....	1
(17 and 27 machines)	
3. Envelope for NECR (17 machine only) .....	1
4. Thumb Screw .....	2
5. Grounding Screw .....	1
6. Star Washer.....	1
7. Multilingual Decal (16, 25, 26 and 27 machines) ....	1
8. Transport Mylar (for A030) .....	1

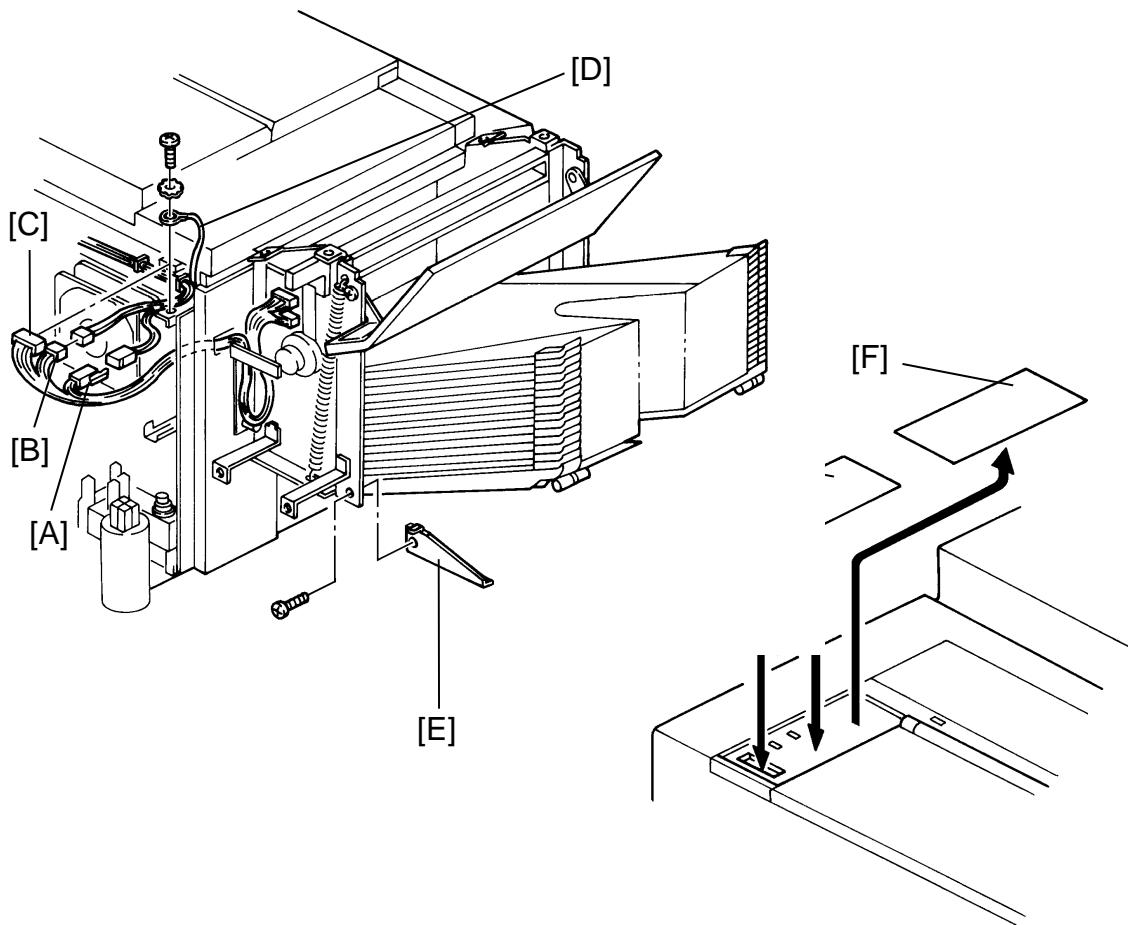
## 12.1 INSTALLATION PROCEDURE (for Machine Code: A030)



1. Turn off the main switch and unplug the power supply cord of the copier.
2. Remove the strips of shipping tape [A].
3. Remove the receiving tray [B], toner collection bottle cover [C] (2 screws) and rear cover of the copier [D] (5 screws).
4. Remove the 5 plastic caps [E].
5. Stick the transport mylar [F] to the sorter as shown.



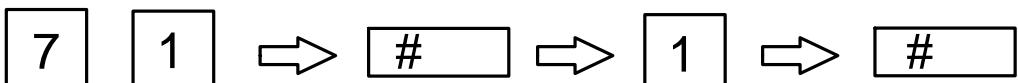
6. Remove the fusing exhaust fan [A] (2 screws, 1 connector).
7. Remove the front sorter cover [B] (2 screws) and rear sorter cover [C] (4 screws).
8. Mount the sorter on the copier. Insert the two mounting studs into the docking holes, and pass the harness through the access hole.
9. Fix the sorter unit to the copier with the two thumb screws [D].



10. Connect the sorter AC harness [A] (free red 2P connector), DC harness [B] (white 4P connector) and harness [C] (CN2, white 11P connector).
11. Secure the sorter ground wire [D] (1 screw and star washer).
12. Remove the bracket [E] (1 screw).
13. Mount the sorter covers, fusing fan exhaust and copier covers.
14. Remove the sheet [F] on the left end of the operational panel, and insert the sorter key top [G] into the key hole. Then, stick on the sorter panel sheet [H].

**NOTE:** The sorter panel sheet and sorter key top are copier accessories.

15. Enter SP mode. Then, enter sorter mode as follows:



16. Leave SP mode by pressing the Clear Modes key.

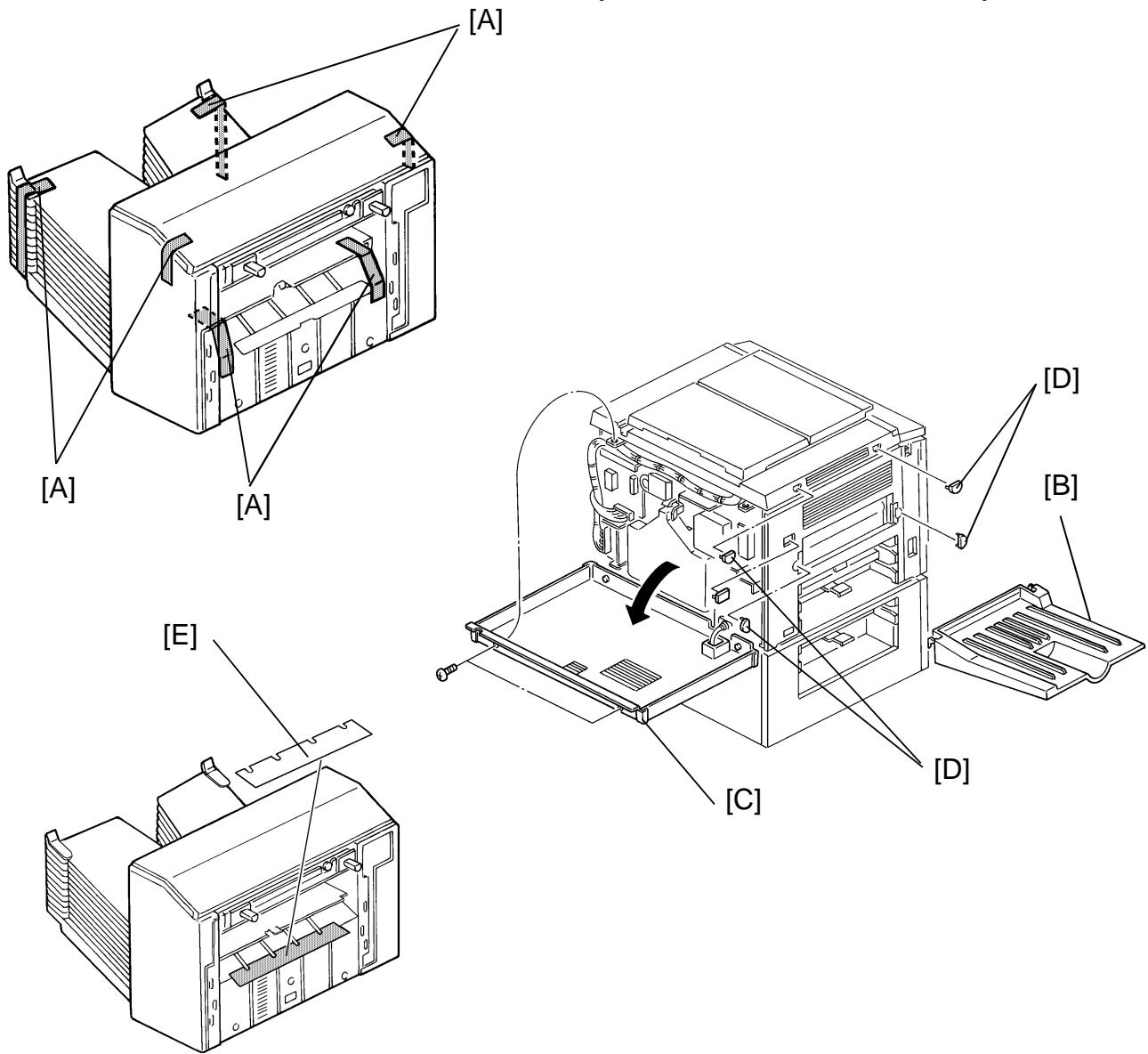
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## 12. ACCESSORY CHECK (NC305)

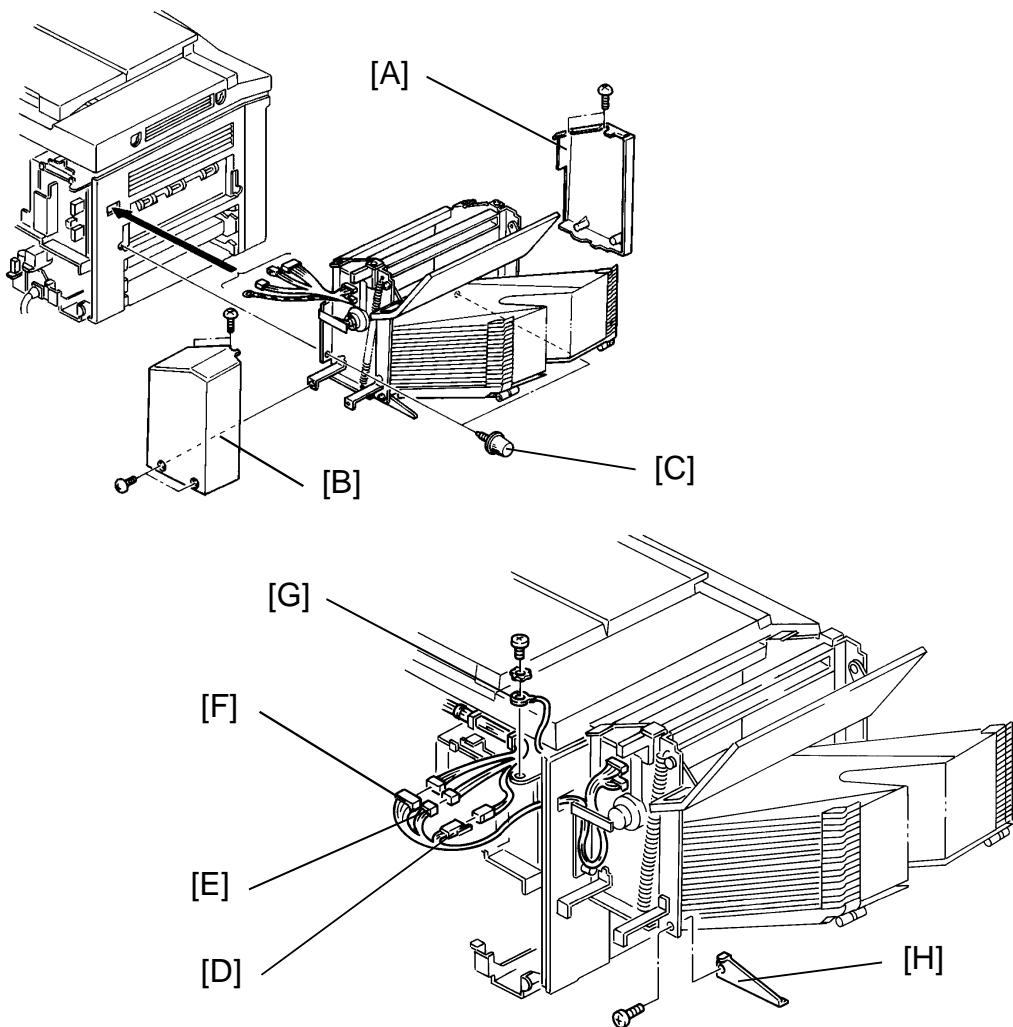
Check the quantity and condition of the accessories in the box according to the following list:

1. Installation Procedure .....	1
2. New Equipment Condition Report .....	1
(17 and 27 machines)	
3. Envelope for NECR (17 machine only) .....	1
4. Thumb Screw .....	2
5. Grounding Screw .....	1
6. Star Washer.....	1
7. Multilingual Decal (16, 25, 26 and 27 machines) .....	1
8. Transport Mylar (for A030/A072) .....	1

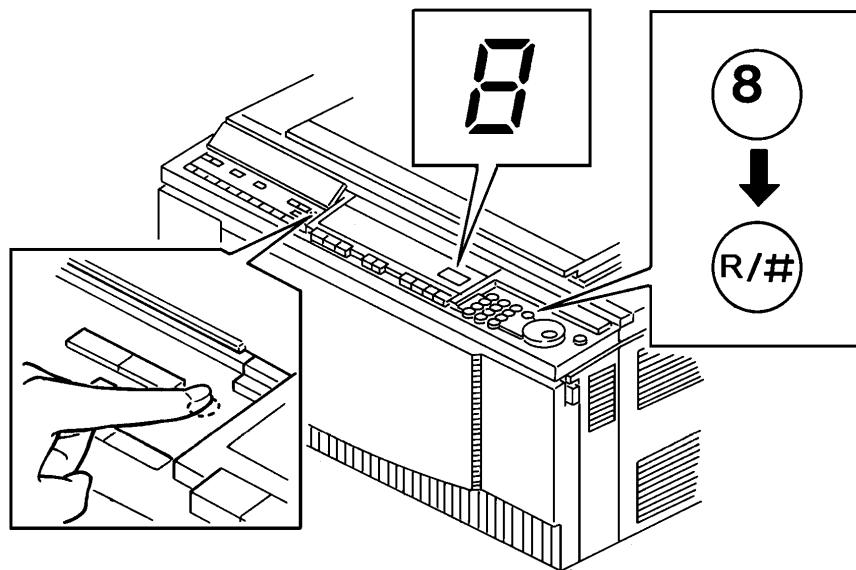
## 12.1 INSTALLATION PROCEDURE (for Machine Code: A072)



1. Turn off the main switch and unplug the power supply cord of the copier.
2. Remove the strips of shipping tape [A].
3. Remove the receiving tray [B], and open the rear cover [C] (2 screws).
4. Remove the five plastic caps [D].
5. Stick the transport mylar [E] to the sorter as shown.



6. Remove the front sorter cover [A] (2 screws) and rear sorter cover [B] (4 screws).
7. Mount the sorter on the copier. Insert the two mounting studs into the docking holes, and pass the harness through the access hole.
8. Fix the sorter unit to the copier with the two thumb screws [C].
9. Connect the sorter AC harness [D] (free red 2P connector), DC harness [E] (white 4P connector) and harness [F] (CN2, white 11P connector).
10. Secure the sorter ground wire [G] (1 screw and star washer).
11. Remove the bracket [H] (1 screw).
12. Mount the sorter covers and copier cover.



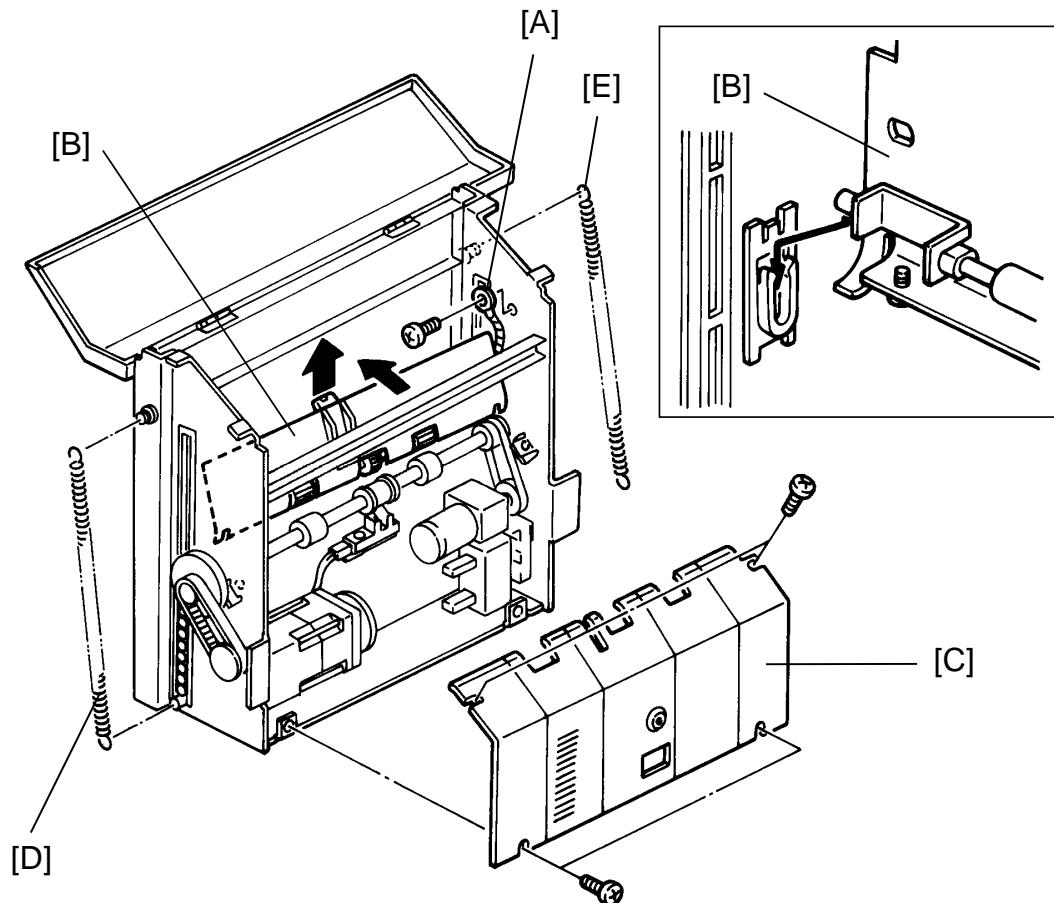
13. Enter SP mode. Then, enter sorter mode as follows:



14. Leave SP mode by pressing the Clear Modes Key.

## 12. REPLACEMENT AND ADJUSTMENT

### 12.1 EXIT ROLLER AND O-RING REPLACEMENT

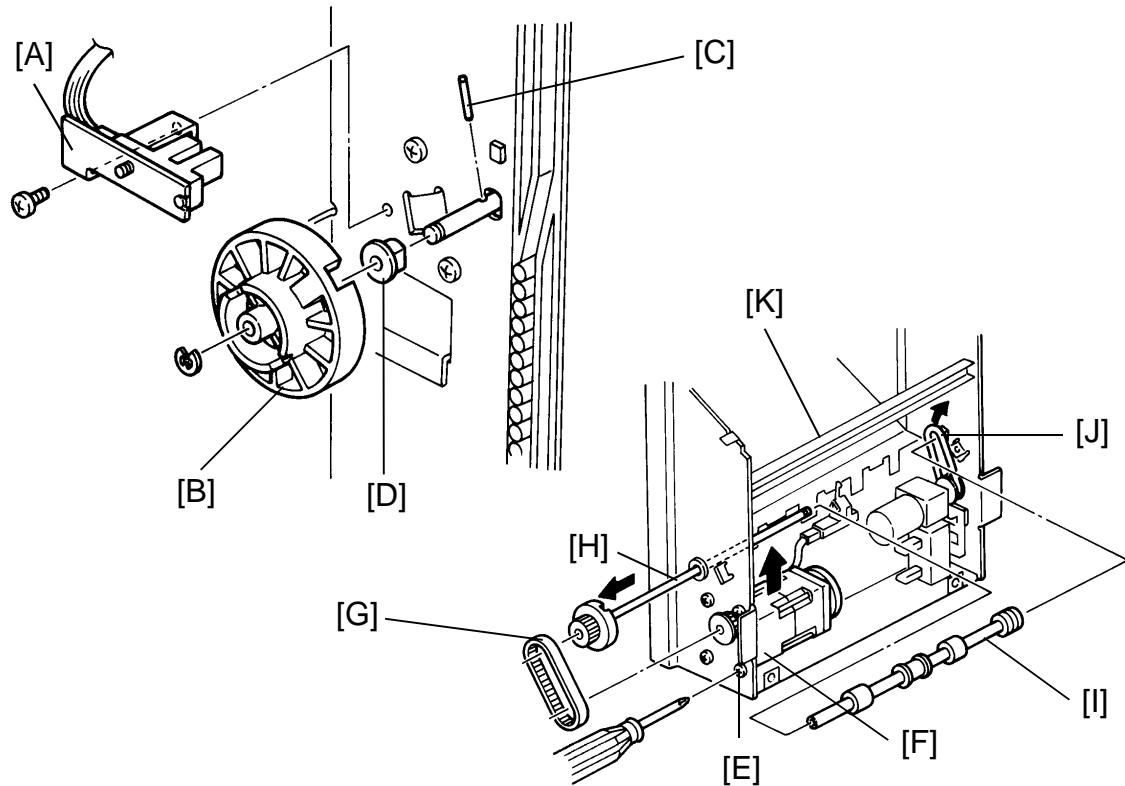


1. Remove the sorter from the copier.
2. Remove the front and rear covers (2 screws each).
3. Remove the ground wire [A] of the upper guide plate [B] (1 screw).
4. Swing the guide plate up, then remove it by carefully pulling it up.
5. Remove the inner cover [C] (4 screws).
6. Unhook the front [D] and rear [E] pressure springs.



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**CAUTION: Do not damage the paper sensor [K] when removing the exit roller.**



7. Remove the wheel sensor assembly [A] (1 screw).
8. Remove the rear transfer wheel [B] (1 E-ring).

**NOTE:** Be sure not to lose the pin [C] for the wheel.

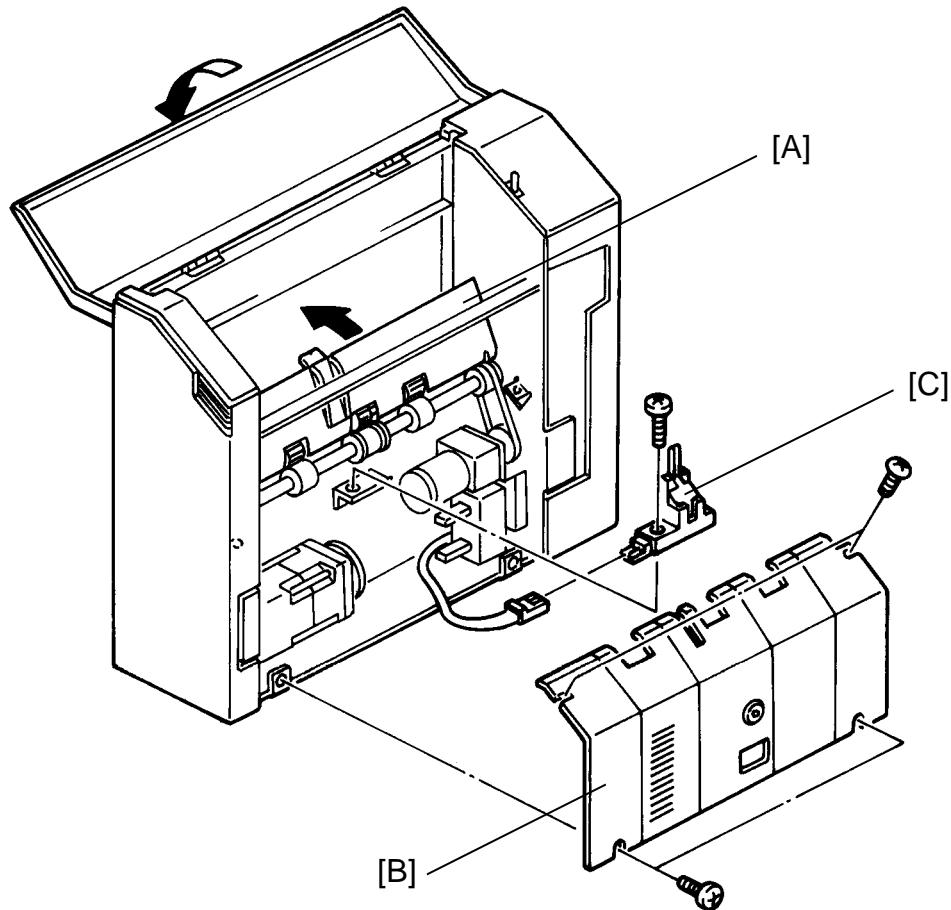
9. Remove the pin and bushing [D].
10. Loosen the four mounting screws [E] of the wheel drive motor [F].
11. Lift the wheel drive motor and slip off the timing belt [G].
12. Slide off the wheel drive shaft [H] and remove the exit roller [I] and O-ring [J].
13. Replace the exit roller and O-ring, then reassemble.

**NOTE:**

- a) When reinstalling the wheel sensor assembly, be sure that the sensor does not touch the wheel.
- b) When remounting the wheel drive motor, adjust the timing belt tension. (See Timing Belt Tension Adjustment.)

## 12.2 PAPER SENSOR REPLACEMENT

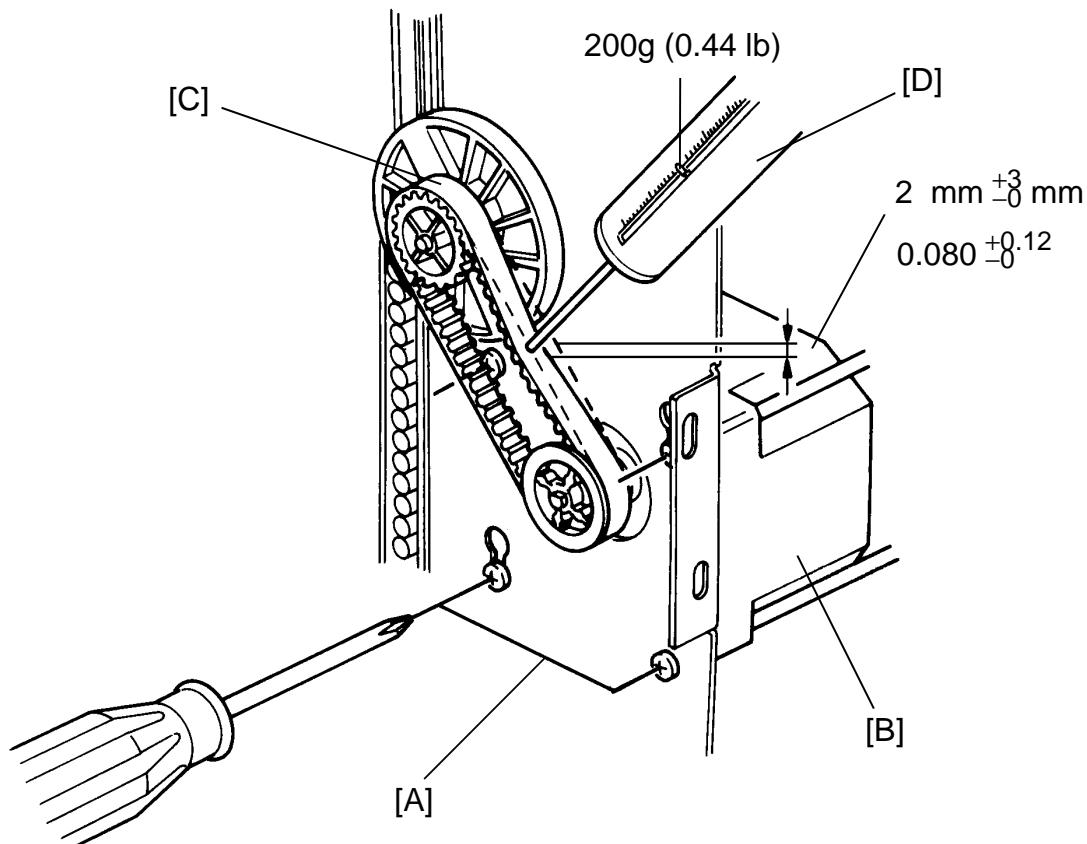
**CAUTION: To avoid damaging the sensor, do not over-tighten the sensor mounting screw.**



1. Remove the sorter from the copier.
2. Swing up the guide plate [A].
3. Remove the inner cover [B] (4 screws).
4. Replace the paper sensor [C] (1 screw and 1 connector) and reassemble.

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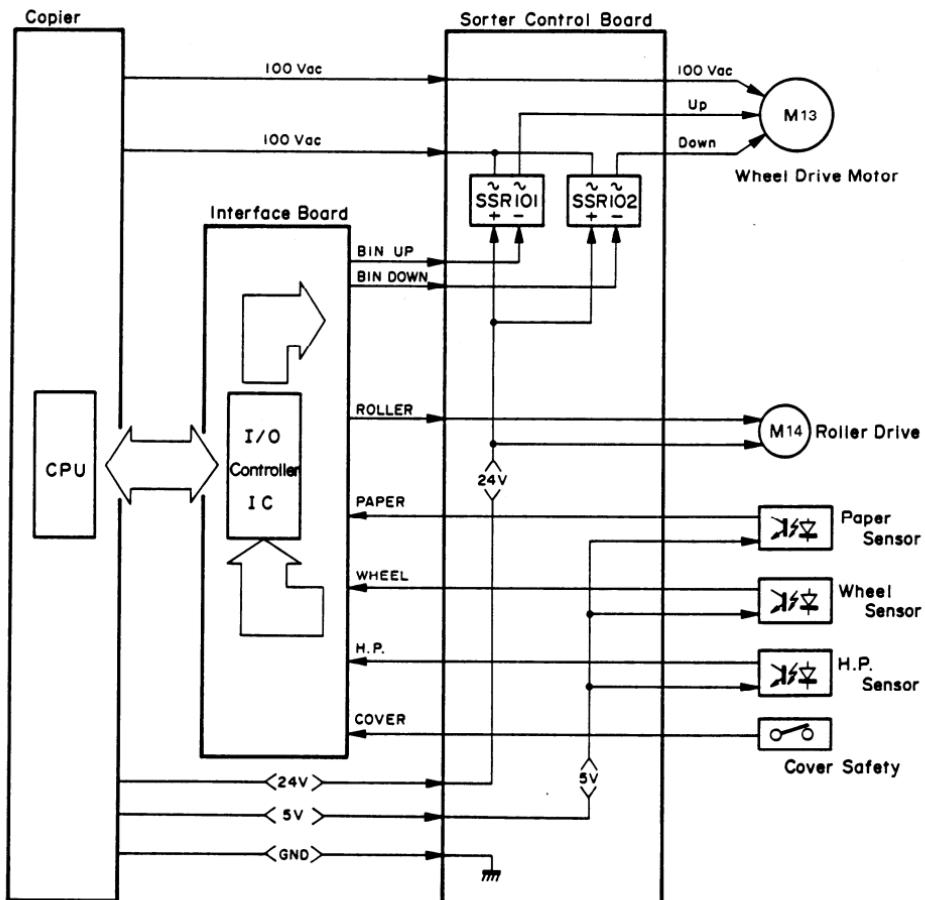
## 12.3 TIMING BELT TENSION ADJUSTMENT



**ADJUSTMENT STANDARD:** 2 mm  $^{+3}_{-0}$  mm; 0.080  $^{+0.12}_{-0}$  inches  
(deflection at 200 g (0.44 lb) pressure)

1. Remove the front cover.
2. Loosen the four mounting screws [A] of the wheel drive motor [B].
3. Press the timing belt [C] with a tension gauge [D] as shown in the figure and adjust the tension by repositioning the wheel drive motor.

## 13. ELECTRICAL CONTROL (FT4460)



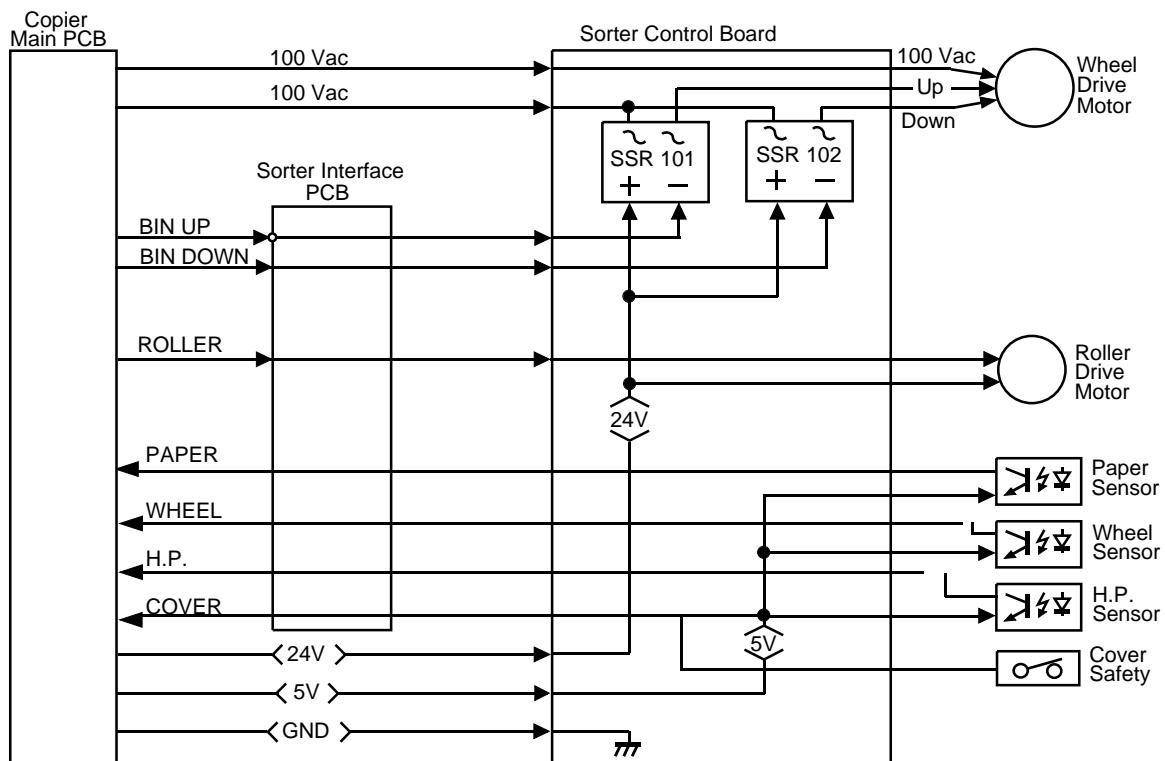
The copier I/O control PCB controls all the functions of the sorter through the interface board.

The copier supplies 100 volts ac to the wheel drive motor and the SSRs. SSR 101 turns the wheel drive motor to move the bins up and SSR 102 is for the down operation.

The copier supplies two dc power levels, +5 volts and +24 volts, for the dc components.

Signals from the sensors and the safety switch are sent to the copier I/O control PCB through the interface board. The copier I/O control PCB operates motors and SSRs.

## 13. ELECTRICAL CONTROL (NC100)

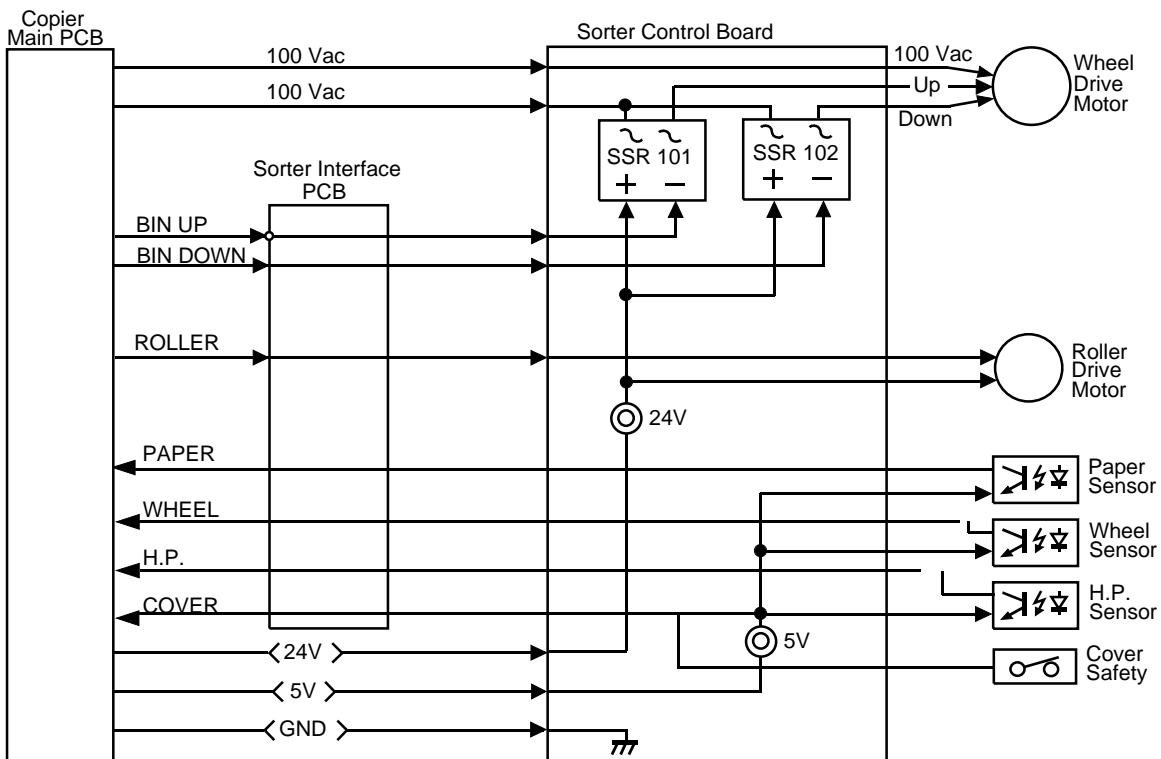


The copier supplies 100 volts ac to the wheel drive motor and the SSRs. SSR 101 turns the wheel drive motor to move the bins up and SSR 102 is for the down operation.

The copier supplies two dc power levels, +5 volts and +24 volts, for the dc components.

Signals from the sensors and the safety switch are sent to the copier main PCB. The copier main PCB controls motors and SSRs.

## 13. ELECTRICAL CONTROL (NC305)



The copier supplies 100 volts ac to the wheel drive motor and the SSRs. SSR 101 turns the wheel drive motor to move the bins up and SSR 102 is for the down operation.

The copier supplies two dc power levels, +5 volts and +24 volts, for the dc components.

Signals from the sensors and the safety switch are sent to the copier main PCB. The copier main PCB controls motors and SSRs.

## 4. SORTER

H-7

H-8

P/W

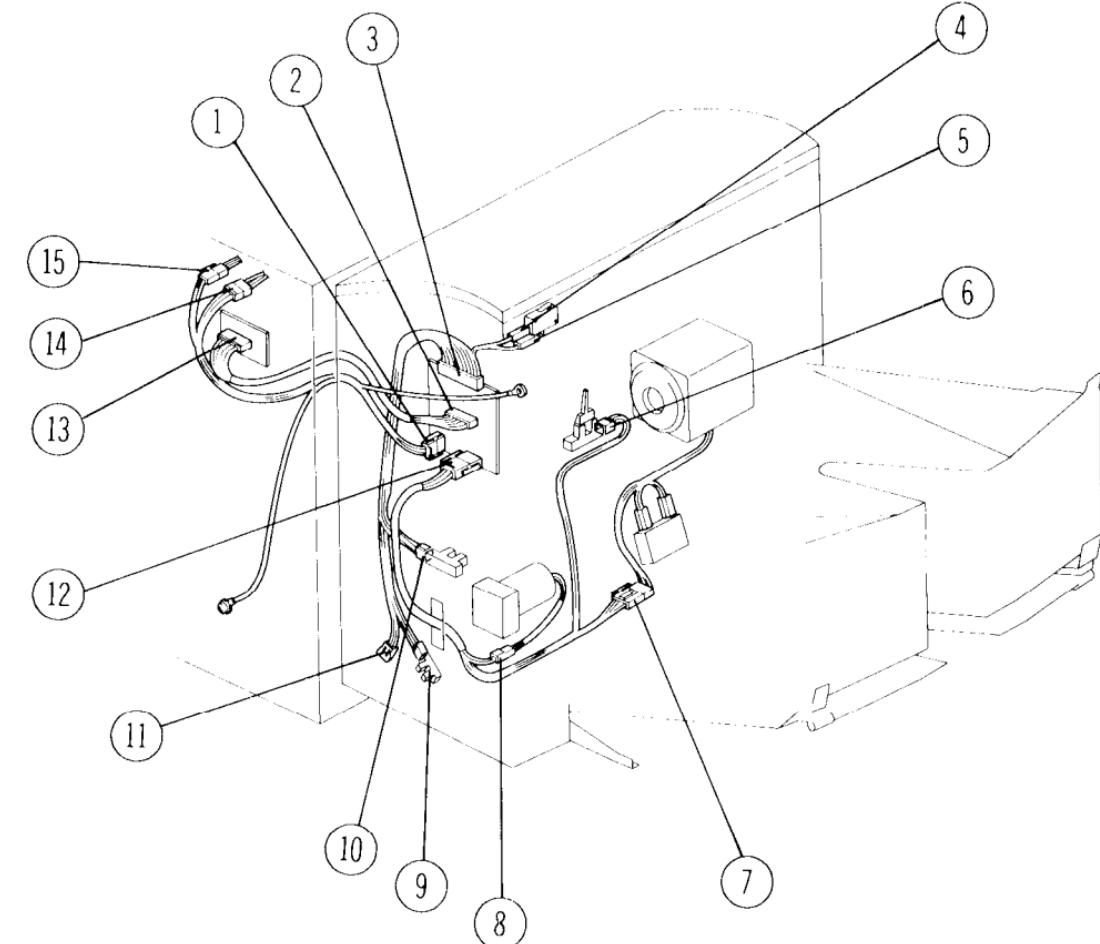
P/W

P/W

P/W

P/W

H-6



## 4. SORTER

Index No.	CN. No.	Component	Type	P to P
1.	<b>CN101</b>	Sorter Board	2P/W	H-7
2.	CN103	Sorter Board	12P/R	G-617
3.	CN 104	Sorter Board	15P/W	H-6
4.	T1	Cover Safety Switch	1P/W	H-7
5.	T2	Cover Safety Switch	1P/W	H-7
6.	CN116	Paper Sensor	3P/w	H-8
7.	CN117	Wheel Drive Motor	3P/W	H-7
8.	CN115	Roller Drive Motor	3P/W	ti-8
9.	CN113	H.P. Sensor	3P/W	ti-9
10.	<b>CN111</b>	Wheel Sensor	3P/W	H-8
11.	CN114	(Relay Drive Motor)	2P/W	ti-8
12.	CN102	Sorter Board	3P/W	H-7
13.	CN2	Sorter Interface Harness	11P/W	G-6/7
14.	CN902	Sorter DC Harness	4P/W	F-6
15.	CN3	Sorter AC Harness	2P/R	H-6