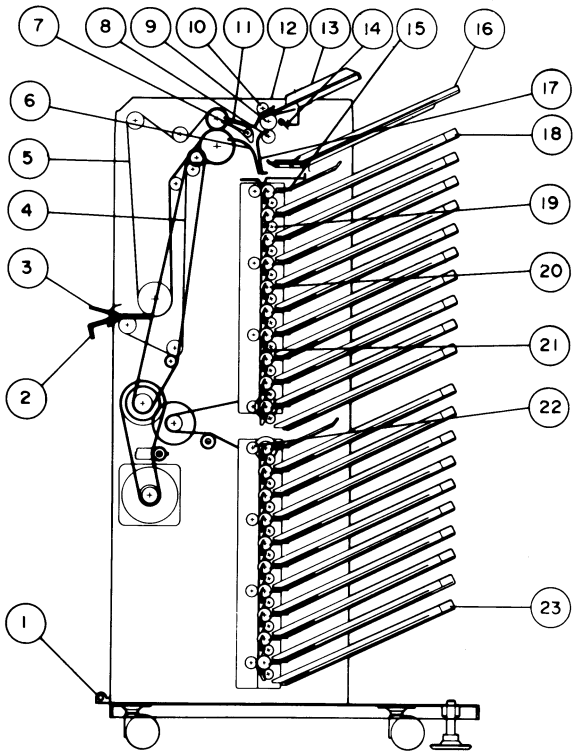
SPECIFICATIONS

Configuration:	Console
Paper Transport System:	Belt/Roller
Number of Bins:	20 + Proof Tray
Paper Size:	Maximum A3 or 11" x 17" Minimum A5 or 5½" x 8½"
Bin Capacity:	Sort -- 70 sheets/bin Stack -- 50 sheets/bin
Proof Tray Capacity:	250 sheets
Manual Feed Tray:	Inserted sheets counted by the copier
Dual Sort Mode:	Two groups of 10 bins each
Power Source:	100V, 50/60 Hz, (from copier)
Maximum Power Consumption:	130 watts
Dimensions (W x D x H)	510 x 655 x 997 (mm) 17.3 x 25.7 x 39.2 (inches)
Weight:	83.1 kg (182.6 lb)
Main Copier Interface:	Docking pins, signal cable

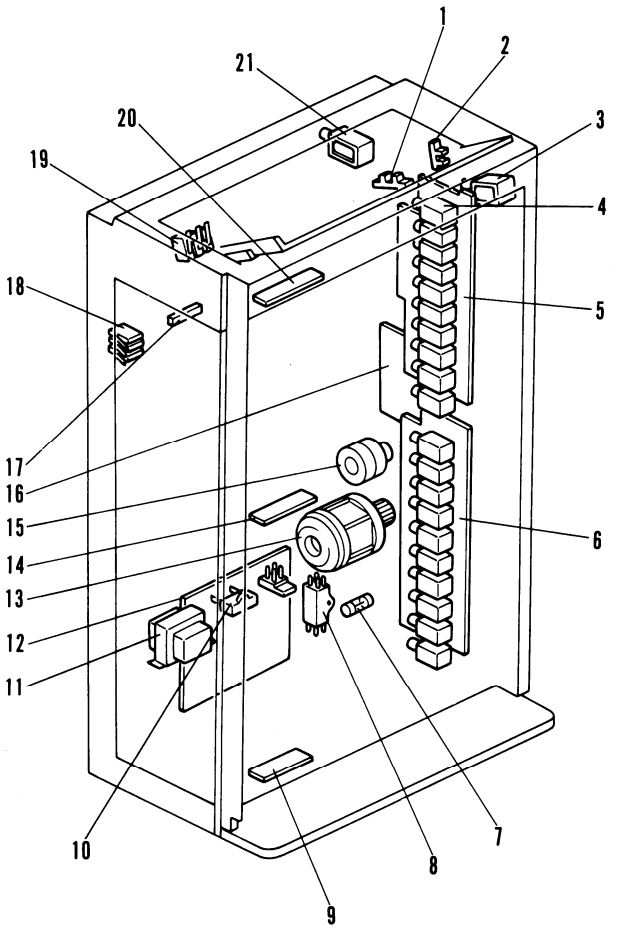
MECHANICAL COMPONENT LAYOUT



(Front View)

1. Docking Pins
2. Lower Entrance Guide Plate
3. Upper Entrance Guide Plate
4. Lower Transport Belts
5. Upper Transport Belts
6. Turn Guide
7. Turn Gate
8. Lower Exit Rollers
9. Upper Exit Rollers
10. Manual Feed Rollers
11. Upper Guide Plate
12. Manual Feed Stopper
13. Manual Feed Table
14. Anti-static Brush (Exit)
15. Anti-static Brush (Bins)
16. Proof Tray
17. Exit Guide Plate
18. First Bin
19. Bin Feed-in Rollers
20. Distribution Rollers (Drive)
21. Bin Gate
22. Distribution Rollers (Driven)
23. 20th Bin

ELECTRICAL COMPONENT LAYOUT

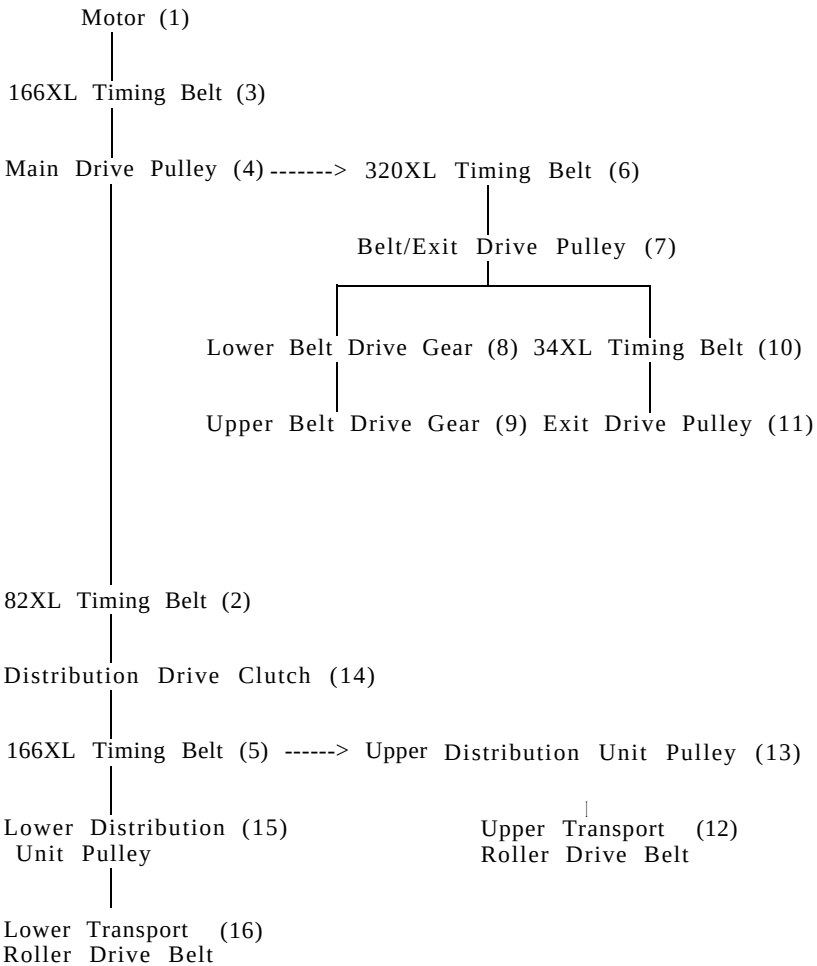


1. Exit Sensor
2. Manual Feed Sensor
3. Manual Feed solenoid
4. Bin solenoid (x 19)
5. Upper solenoid Board
6. Lower solenoid Board
7. Fuse
8. Noise Filter
9. Lower Bin/Jam Sensor Board
10. Motor Capacitor
11. Step-down Transformer
12. Main Board
13. Sorter Motor
14. Sensor LED Board
15. Distribution Drive Clutch
16. Sensor Interface Board
17. Timing Sensor
18. Front Door Safety Switch
    (x 2 115 V Version)
    (x 3 220/240 V Version)
19. Top Cover Safety Switch
    (x 2 115 V Version)
    (x 3 220/240 V Version)
20. Upper Bin/Jam Sensor Board
21. Turn Gate solenoid

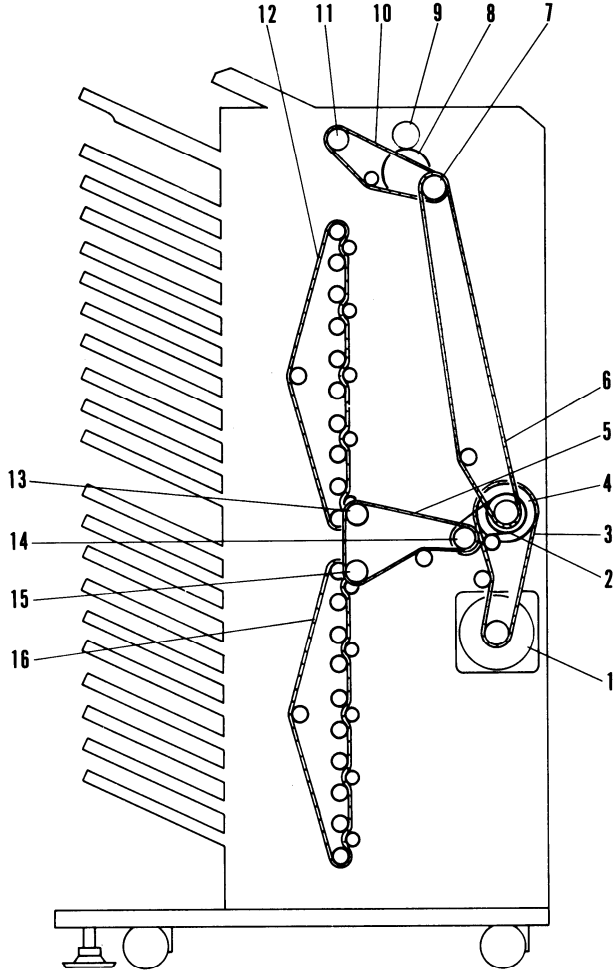
SORTER DRIVE

The drive power distribution mechanism is shown in the illustration on the facing page.

The drive train is as follows:



- Drive Layout -



ELECTRICAL COMPONENT DESCRIPTIONS

Motor

Sorter (M-l):	Drives the sorter.

Clutch

Distribution Drive (MC-l):	Drives the transport rollers.

Solenoids

Bins (SOL-1 to -19):	Directs the copy paper into the appropriate bin.
Turn Gate (SOL-20):	Directs the copy paper into the the sorter for sorting and stacking.
Manual Feed (SOL-21):	Energizes when copies are inserted in the manual feed entrance.

Switches

Front Door Safety Switches (MS1 - 3):	De-energizes the motor when the front door is open.
Top Cover Safety Switches (MS4 - 5):	De-energizes the motor when the top cover is open.

Sensors

Exit Sensor (S-2):	Serves as a jam detector for copies exiting sorter (proof tray).
Lower Bin Copy Sensor (S-5):	Detects the presence of paper in the lower bins.
Lower Jam Sensor (S-7):	Jam Detector
Manual Feed (S-3):	Senses paper in the manual feed section. Starts manual feed operation.
Timing (S-l):	Energizes the appropriate bin solenoid. Also serves as a jam detector.
Upper Bin Copy Sensor (S-4):	Detects the presence of paper in the upper bins.
Upper Jam Sensor (S-6):	Jam Detector

Circuit Boards

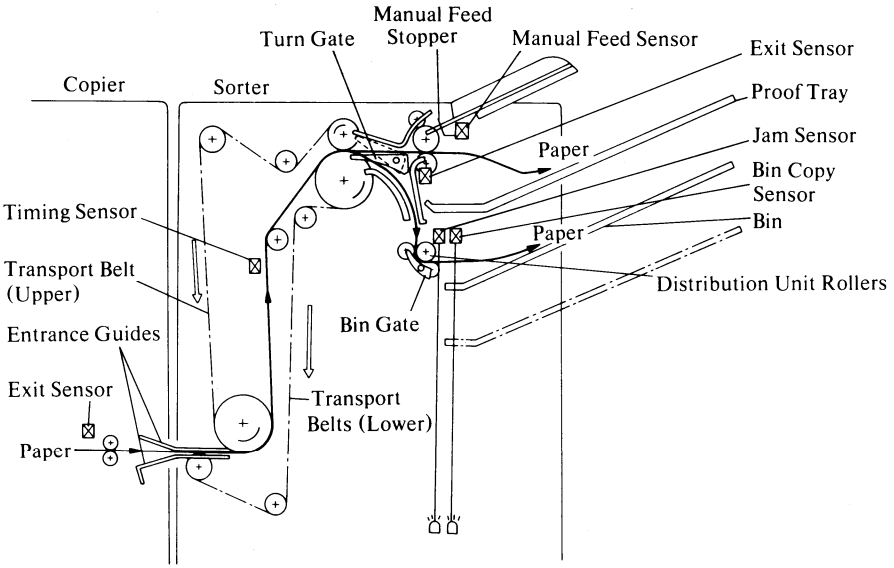
Lower Solenoid (PCB-1):	Holds the lower bank of bin gate solenoids.
Main (PCB-2):	Controls all sorter functions.
Sensor Interface (PCB-3):	LEDs on this board light when bin jam sensors are activated.
Sensor LED (PCB-4):	Light source for bin jam sensors.
Upper Solenoid (PCB-5):	Holds the upper bank of bin gate solenoids.

Others

Transformer (O-l):	Steps down 100 volts ac to 29 volts ac and 8 volts ac.
Noise Filter (O-2):	Removes electrical noise generated by the copier and sorter.

MECHANICAL OPERATION

1. Basic Operation



(Front View)

Copies coming out of the copier pass through the entrance guides, and are delivered to the turn gate by the upper and lower transport belts.

The turn gate directs the copies either to the sorter bins or to the proof tray.

- Normal Mode -

The sorter motor turns on and the transport belts start turning when the start key is pressed. The turn gate solenoid stays off, so copies are directed to the proof tray. The exit sensor detects transport and exit jams when in normal mode.

- Sort/Stack Mode -

When copies activate the copier exit sensor, the distribution drive clutch turns on and starts turning the transport rollers. At the same time. the turn gate solenoid turns on and moves the turn gate up to direct copies to the sorter bins. When copies activate the timing sensor, the appropriate bin solenoid turns on and the bin gate drops down into the paper path to direct the paper into the bin.

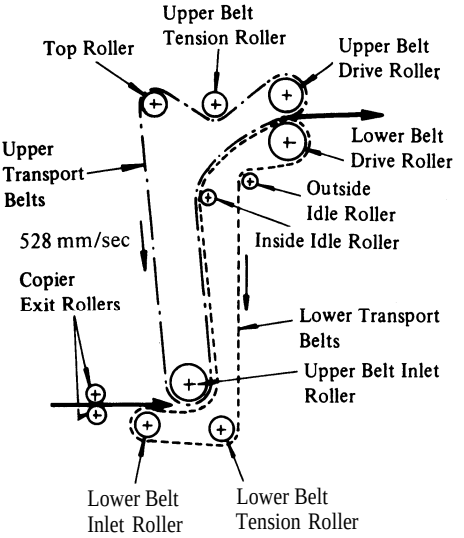
If a copy jams before entering the bin, the turn gate solenoid turns off, and the following sheets are directed to the proof tray. The copier automatically corrects the copy count displayed on the operation panel to show only the number of copies in the bins.

- Manual Feed Mode -

The manual feed entrance can be used for job recovery; that is, it can be used to feed in any sheets directed to the proof tray after a sorter jam. It can also be used to feed inserts to the bins.

When paper is inserted in the manual feed entrance, the manual feed sensor turns on. The turn gate solenoid, the drive motor, the distribution drive clutch, and the appropriate bin solenoid all turn on. Shortly later, the manual feed solenoid turns on to lower the manual feed stopper, and allows inserted sheets to be fed to the appropriate bin.

2. Transport Belt Mechanism



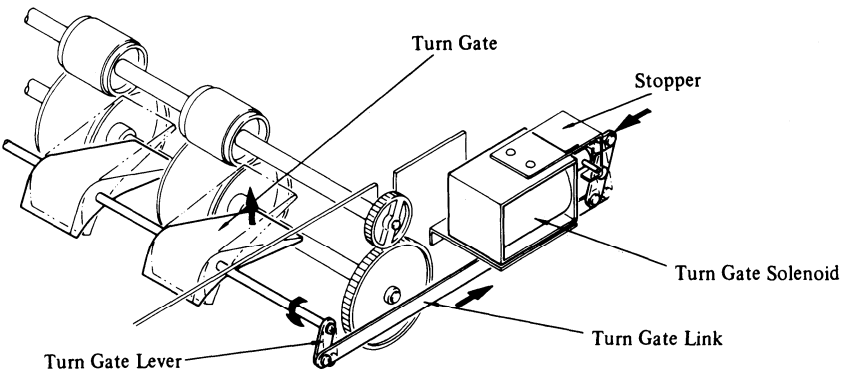
(Front View)

Copies are transported from the copier exit to the turn gate by two sets of belts, upper and lower belts (6 belts each). These belts are in contact with each other and move at the same speed.

When copies pass through the sorter entrance guides, they are sandwiched between the two sets of transport belts and are delivered to the turn gate.

The transport belts move at 528 mm/s, which is 1.4 times as fast as the copier's process speed (380 mm/s). The copier's exit rollers are mounted on one-way bearings to allow the copies to be pulled out by the transport belts.

3. Turn Gate

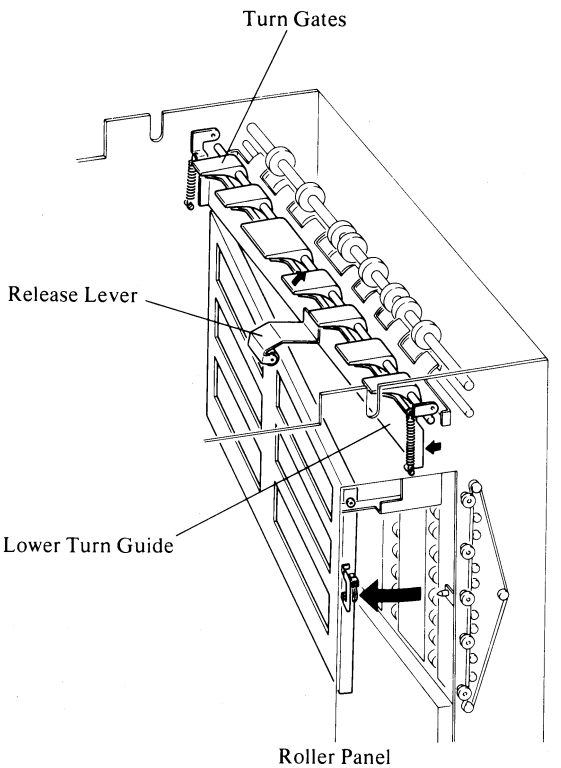


(Rear View)

When in the normal feed mode, the turn gate solenoid stays off, and the turn gate remains flat. Therefore, sheets can pass over the gate to the proof tray.

When the turn gate solenoid turns on in the sort/stack/manual feed modes, the turn gate link rotates the gate lever, causing the turn gate to cut into the paper path to direct sheets down to the sorter bins. When the solenoid turns off, gravity rotates the turn gate down.

4. Misfeed Clearance Release Mechanism

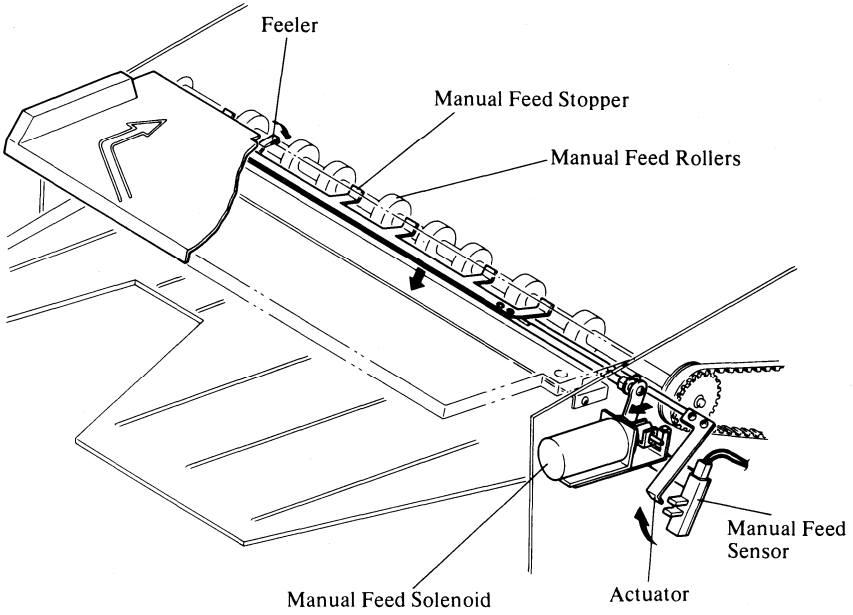


(Front View)

The roller panels of the upper and lower distribution units can be opened for easy removal of misfed paper.

When the roller panel of the upper distribution unit is opened, it also opens the turn guides. As the panel swings to the left, it pushes up the release lever of the lower turn guide, causing the lower turn guide to open to the left. The turn gate rotates clockwise at the same time.

5. Manual Feed



(Rear View)

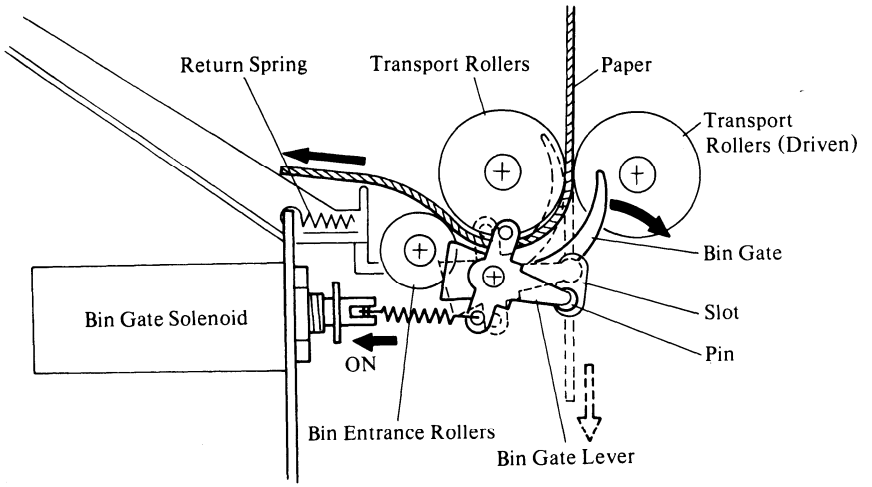
Manual feed is effective when the copier is in sort or stack mode.

When a sheet of paper is inserted in the manual feed entrance, it presses down the feeler, and the manual feed sensor turns on. At the same time, the turn gate solenoid, the drive motor, the distribution drive clutch, and the appropriate bin solenoid all turn on.

A moment later, the manual feed solenoid turns on and pulls the manual feed stopper down, allowing the paper to enter between the manual feed rollers. The paper is then fed and delivered to the bin.

The manual feed solenoid turns off when the manual feed sensor turns off. However, the drive motor, clutch, turn gate solenoid, and bin gate solenoid stay on until the paper passes over the bin jam sensor.

6. Bin Gate Operation



(Rear View)

The top 19 bins use the turn gate mechanism to direct paper into the sorter bins.

When a solenoid is off, the return spring holds the bin gate out of the paper path, allowing the copy to pass to the lower bins.

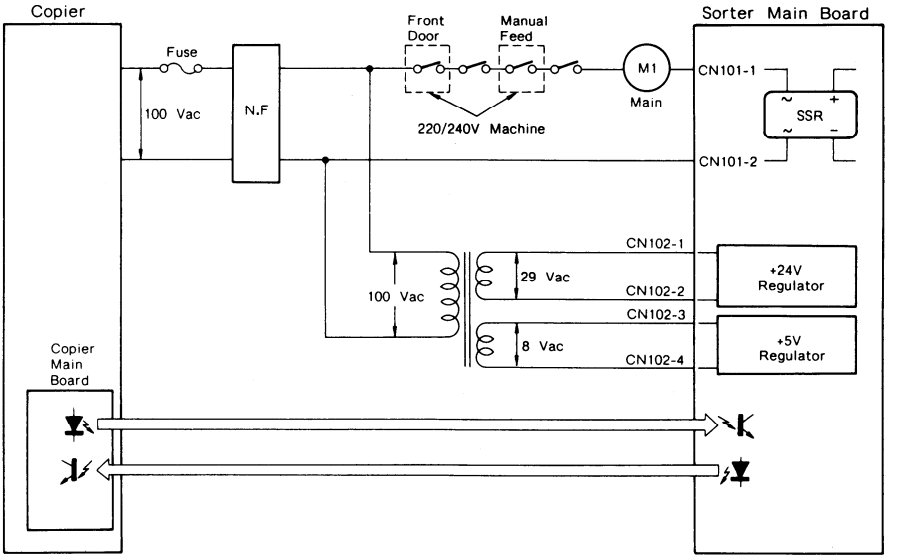
To direct paper into a bin, the bin solenoid turns on and rotates the bin gate lever clockwise. The bin gate then moves into the paper path and deflects the paper into the bin.

A pin on the bin gate lever is set in a slot in the machine's side plate. This slot sets the rotation limits of the bin gates. No bin gate adjustment is required, because the gate always rotates until the pin contacts the end of the slot.

The 20th bin does not have a solenoid. Its bin gate is held open by a spring hooked to the bottom of the bin gate lever.

ELECTRICAL OPERATION

1. Interface with The Copier and AC Power



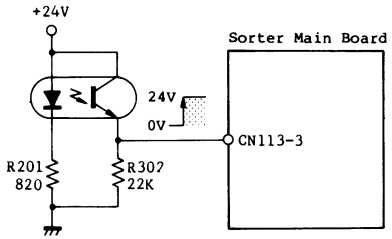
The sorter has its own CPU which controls all of the sorter functions. The sorter communicates with the copier through a serial interface bus. Fiber optic cables are used for the serial interface bus because they are unaffected by electrical noise.

When the main switch is turned on, the copier applies 100 volts ac to the sorter. A step-down transformer supplies 29 volts ac and 8 volts ac.

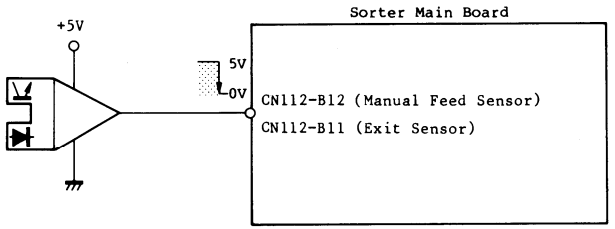
The 29-volt and 8-volt ac inputs go to full wave rectifiers on the main board. The dc voltages output by these rectifiers are regulated to +24 volts and +5 volts respectively.

2. Timing, Exit, and Manual Feed Sensors

– Timing Sensor –



– Exit and Manual Feed Sensor –



- Timing Sensor -

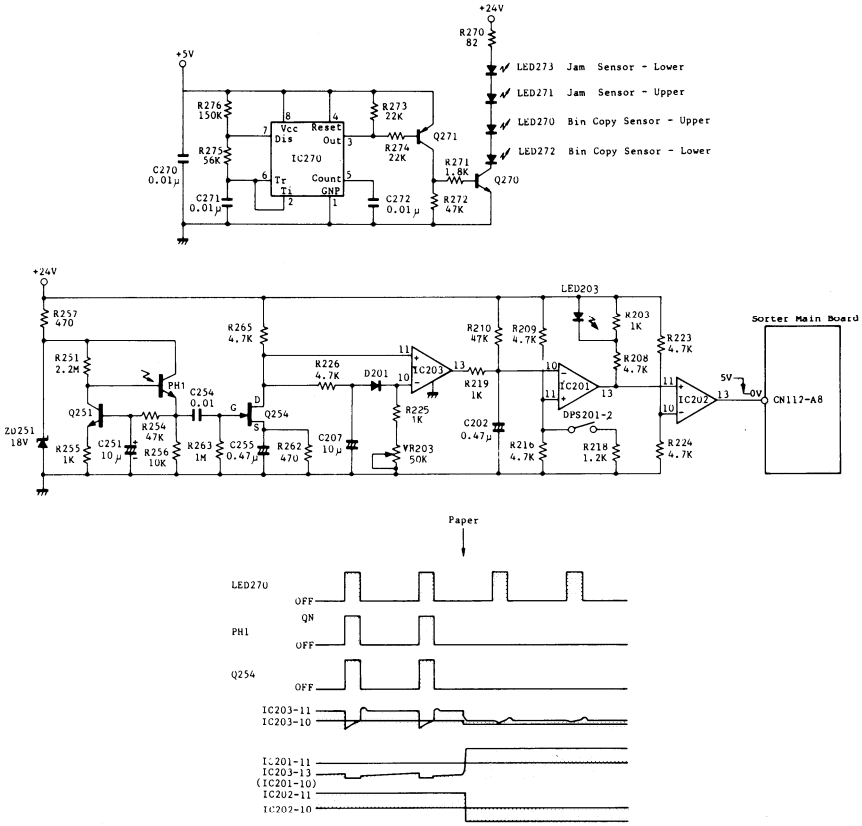
The timing sensor is a reflective photosensor. When the paper reaches the timing sensor, the phototransistor turns on and applies HIGH to CN113-3.

- Exit and Manual Feed Sensor -

Exit sensor and manual feed sensor are photointerrupters and have the same kind of circuit. When the photointerrupter is not blocked (on), it applies +5 volts to the main board. When the photointerrupter is blocked (off), the connected main board pin becomes 0 volts.

Exit sensor is used to check for jam at sorter exit.

3. Bin and Jam Sensors



The bin copy sensors (upper and lower) detect copy paper in the bins. The jam sensors (upper and lower) check that copy paper is fed to the bins and also count copies as they enter the bins.

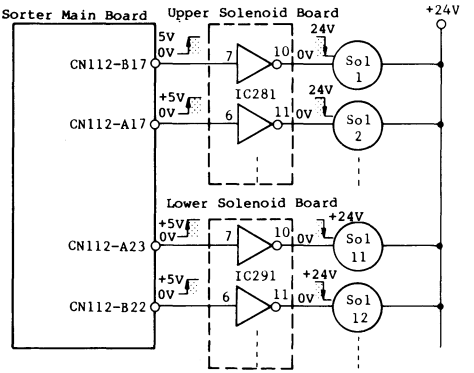
The circuit description for all four sensors is the same (except for connector numbers and pin numbers). So, we will discuss only the upper bin copy sensor circuit (shown above).

When there is no paper in the sorter bins, LED-270 on the sensor LED board activates PH1. PH1 turns on Q254, which causes IC203 pin 10 to be greater than pin 11. IC203 pin 13 then goes LOW. IC201 pin 10 is then lower than pin 11, causing pin 13 of IC201 to output HIGH. Pin 11 of IC202 is then higher than pin 10; so, IC202 pin 13 goes HIGH. This HIGH signal at CN112-A8 informs the sorter main board that no paper is present.

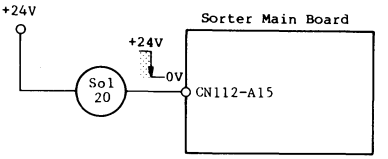
When paper enters a bin, the phototransistor (PH1) turns off. This causes the circuit to output a LOW signal to CN112-A8. The sorter main board determines that paper is in the bins.

4. Bin and Turn Gate Solenoids

– Bin Solenoid –



– Turn Gate Solenoid –



- Bin Solenoids -

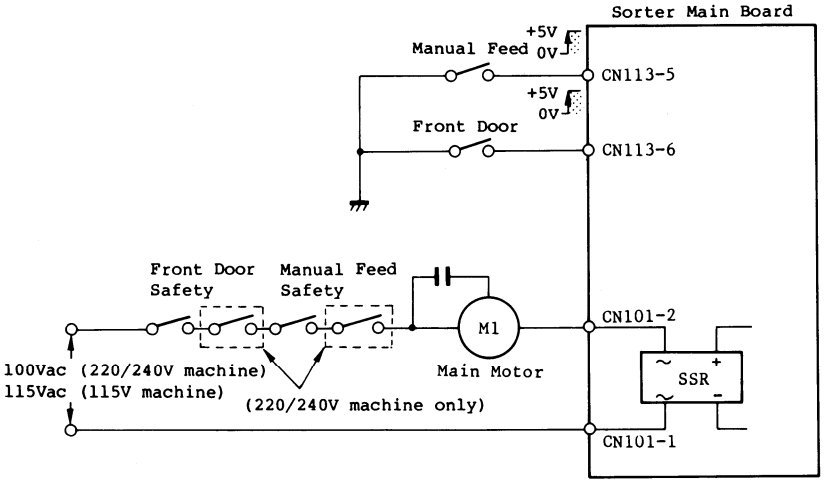
The bin solenoids are powered by +24 volts. To energize one of the solenoids, the main board applies a HIGH signal to the appropriate driver IC (inverter).

The bin solenoid turns on when the timing sensor turns on. Solenoid off timing is decided by bin number.

- Turn Gate Solenoid -

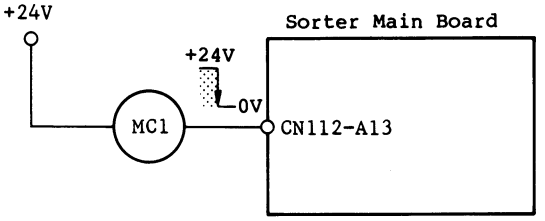
The turn gate solenoid is actuated when in sort or stack mode. When the leading edge of the paper activates the exit sensor of copier, the sorter's CPU supplies a LOW signal at CN112-A15 to energize the turn gate solenoid. Turn gate solenoid off timing is determined by paper size and bin number.

5. Safety Switches



When the top cover or front cover is opened, the respective safety switch opens the 100 volt ac line to the sorter motor. At the same time, CN113-5 (top cover safety) or CN113-6 (front door safety) changes from 0 volts to +5 volts, informing the sorter's CPU that a cover is open. The sorter CPU sends the OPEN COVER signal to the copier CPU, and the copier CPU then turns on the Close Cover indicator.

6. Distribution Drive Clutch



The main board turns on the distribution drive clutch by supplying a LOW signal at CN112-A13. On and off timing is the same as that of the turn gate solenoid.

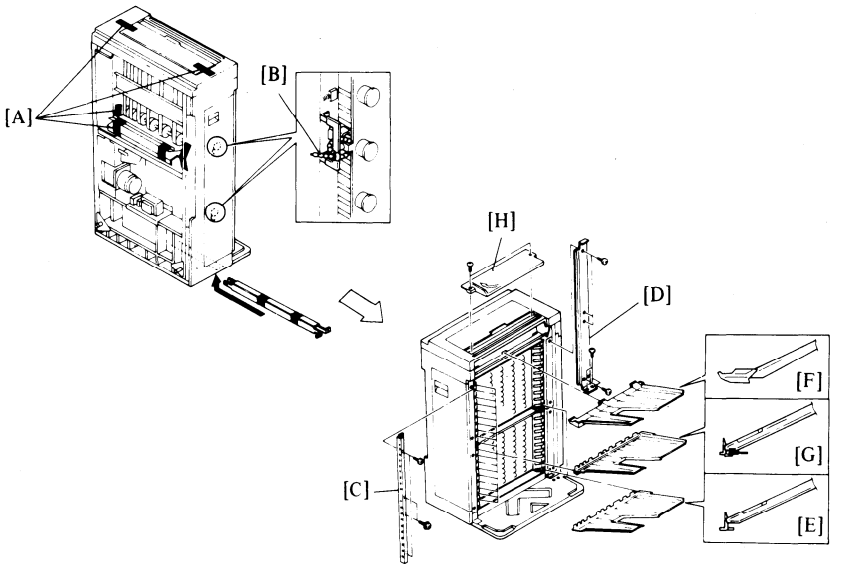
INSTALLATION

1. Accessory Check

Check the quantity and condition of the accessories in the box according to the New Equipment Condition Report (N.E.C.R.) or the following list:

DESCRIPTION	Q'TY
1) Proof Tray	1
2) Tray Without Antistatic Brush	2
3) Tray With Antistatic Brush	18
4) Manual Feed Tray	1
5) Screw (M4 x 8mm)	2
6) Fixing Bracket	1
7) Screw (M4 x 8mm)	4
8) Ground Wire Mark Decal	1
9) Fiber Optic Cable	2
10) Leveling Shoe	2
11) Ground Screw	1
12) Tooth Washer	1
13) Chain	1
14) Screw (M4 x 6mm)	1
15) Operating Instructions	1
16) Installation Procedure	1
17) N.E.C.R.	1
18) Envelope for N.E.C.R. (U.S.A.)	1
19) Multiple Language Decals (Europe)	1

2. Installation Procedure



CAUTION: Turn off the copier main switch.

1. Remove all external strips of tape [A], styrofoam block and cut the two cable ties [B] securing the roller panel.

2. Remove the bin number bracket [C] (2 screws and 2 ground screws) and the distribution unit support bracket [D] (7 screws).

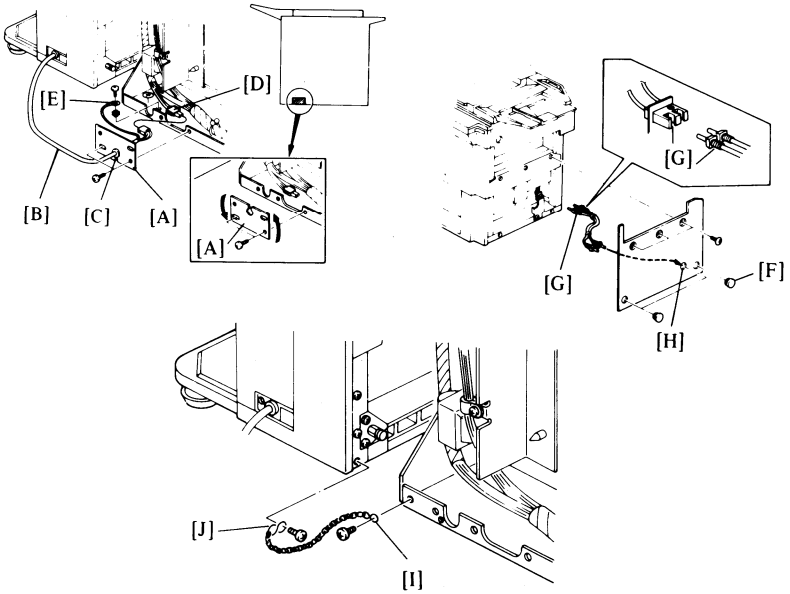
3. Install the bins as follows:

   a) Set the two bin trays [E] that do not have antistatic brushes at the 10th and 20th bin positions.
   b) Set the proof tray [F] in the top position.
   c) Set the bin trays with antistatic brushes [G] in the other positions.

4. Reinstall the bin number bracket.

5. Reinstall the distribution unit support bracket.

6. Install the manual feed table [H] (2 screws).



7. Remove the lower rear cover (2 screws) from the copier.

8. Remove the cover plate [A] from the copier (2 screws).

9. Pass the sorter power cord [B] through the cover plate with the cord stopper [C]. Then, install the cover plate inverted (2 screws).

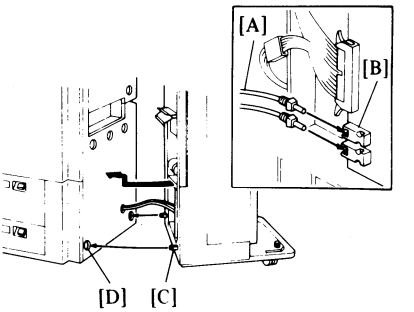
10. Connect the sorter power cord to the plug [D] of the copier.

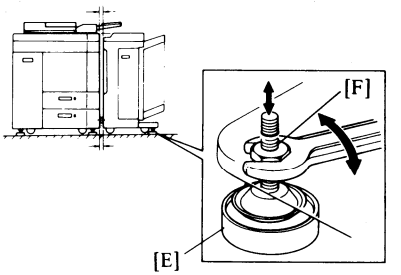
11. Secure the ground wire [E] the copier base (1 ground screw and 1 tooth washer). Stick the ground decal beside the ground screw.

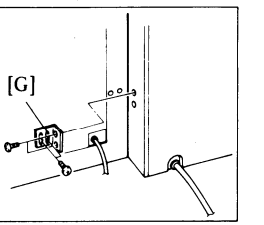
12. Remove the three plastic caps [F] from the lower right cover and pass the fiber optics cables [G] through the upper opening [H]. Then connect the fiber optic cable to the relaying terminals. (Connect the brown fiber optic cable to the terminal marked with a brown spot.)

13. Fix one end of the chain [I] to the copier (l screw). Fix the other end of the chain [J] to the sorter using the screw securing the sorter side plate and base plate.

14. Reinstall the copier cover.







15. Connect the fiber optic cables [A] to the cable terminals [B] on the sorter main board.

CAUTION: When docking the sorter to the copier, open the copier to prevent damage to the sorter entrance guide plate.

16. Dock the sorter with the copier. Make sure the docking pins [C] are seated firmly in the notches [D] in the copier frame. Close the copier top unit.

17. Insert the leveling shoes [E] under the sorter feet [F]; then, level the sorter and align it with the copier by screwing down the feet.

18. Install the fixing bracket [G] (4 screws: M4 x 6mm).

19. Check the sorter operation.

20. Complete the N.E.C.R.

SERVICE TABLES

1. Sorter Main Board

- Test Point Table -

Number	Function
TP101	+24V
TP102	+5V
TP103	GND

- LED Table -

Number	Function
LED101	Exit Sensor ON
LED102	Upper Entry Jam Sensor ON
LED103	Upper Bin Copy Sensor ON
LED104	Closed Front Door
LED105	Closed Manual Feed Cover
LED106	Timing Sensor ON
LED107	Lower Entry Jam Sensor ON
LED108	Lower Bin Copy Sensor ON
LED109	Not Used
LED110	Not Used
LED111	Not Used
LED112	Manual Feed Sensor ON
LED113	Not Used
LED114	+5V
LED115	+24V

- DIP SW. Table -

DPS101 1 2 3 4 5 6	FUNCTION
1 0 0 0 0 0	2nd Sorter is installed
0 0 0 0 1 0	Free Run
0 0 0 0 0 1	Free Run Using Paper

- Fuse Table -

Number	Protection
FU101	Input Voltage (8 Vac)
FU102	Input Voltage (29 Vac)

2. Sorter Interface Board

- Test Point Table -

Number	Specification
TP201	+24V
TP202	GND

- VR Table -

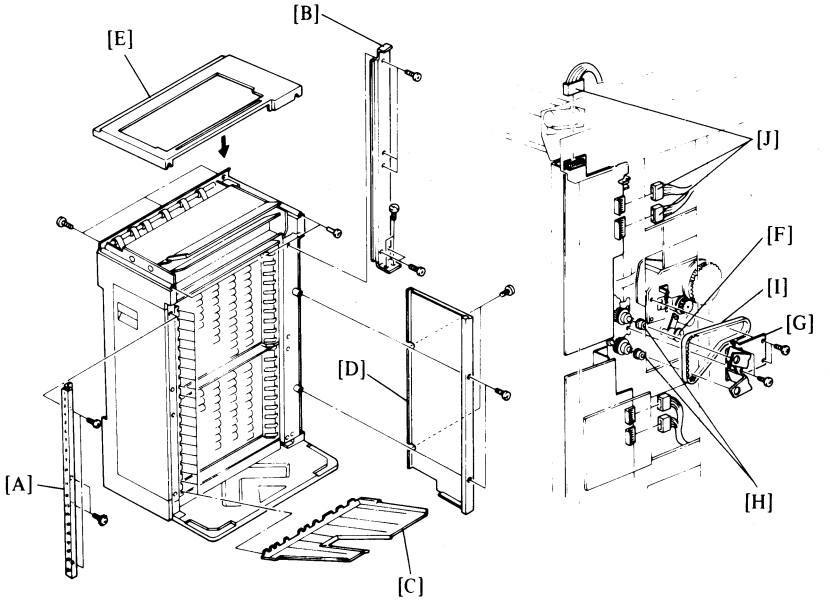
Number	Function
VR201	Upper Entry Jam Sensor Adjustment
VR202	Lower Entry Jam Sensor Adjustment
VR203	Upper Bin Copy Sensor Adjustment
VR204	Lower Bin Copy Sensor Adjustment

- DIP SW Table -

DPS201 -1	DPS201 -2	FUNCTION
1	0	Lower Entry Jam and Bin Copy Sensor Adjustment
0	1	Upper Entry Jam and Bin Copy Sensor Adjustment

REPLACEMENT AND ADJUSTMENT

1. Distribution Unit Removal



1. Turn off the copier main switch and undock the sorter from the copier.

2. Remove the bin number bracket [A] (2 screws and 2 ground screws) and the distribution unit support bracket [B] (7 screws).

3. Remove all the bins [C].

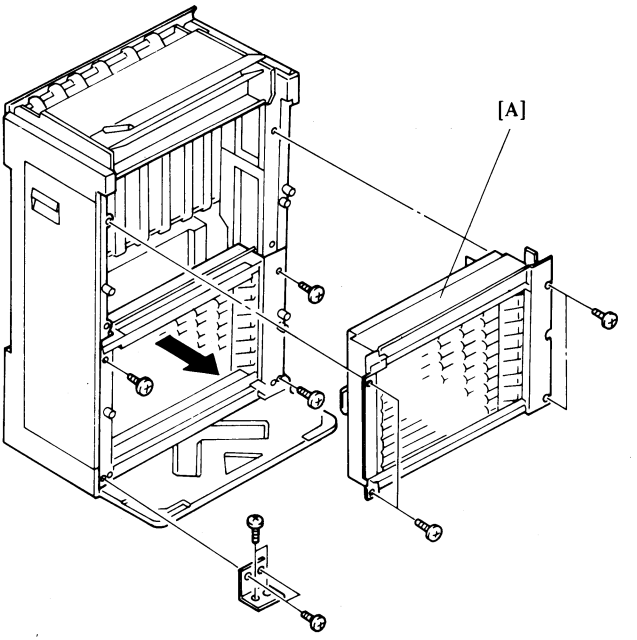
4. Remove the rear cover [D] (4 screws) and the top cover [E] (5 screws).

5. Release the belt tensioner [F] and remove the following parts:

   a) Link bracket [G] (4 screws)
   b) Bearings [H]
   c) Timing belt 166XL [I]

6. Disconnect the three connectors [J] from the upper distribution unit.

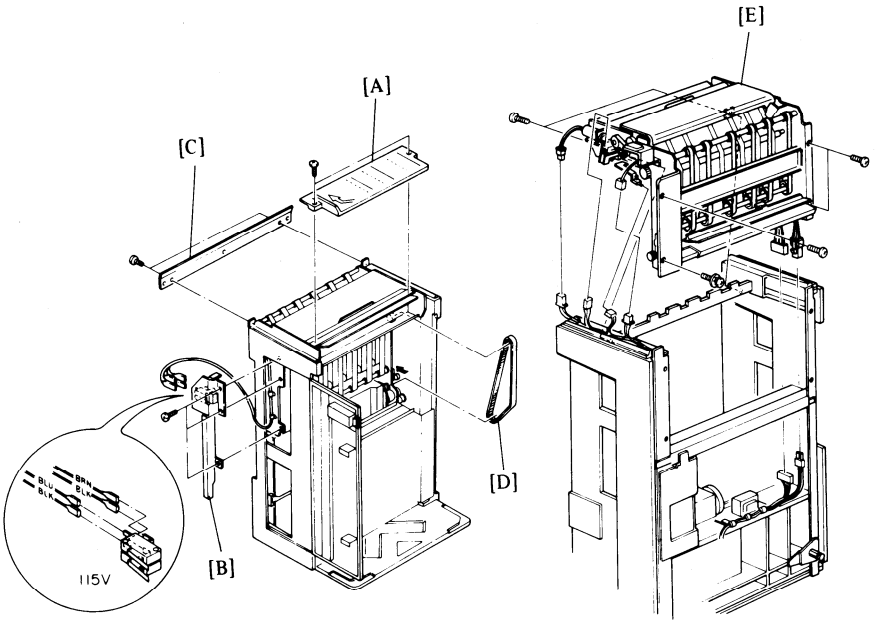
   NOTE: When disconnecting, apply pressure to the connectors, not the wires.



7. Remove the upper distribution unit [A] (4 screws).
8. Remove the lower distribution unit (7 screws and 2 connectors).
9. Check/adjust the transport roller drive belt tension.

   7.0 ± 1.0 mm deflection at 200 g (upper)
   6.0 ± 1.0 mm deflection at 200 g (lower)

2. Transport Unit Removal



1. Remove the upper distribution unit.

2. Remove the following parts:

   a) Manual feed table [A] (2 screws)
   b) Front door safety switch bracket [B] (3 screws and 4 connectors)
   c) Top cover support bracket [C] (2 screws)
   d) Timing belt 320XL [D]

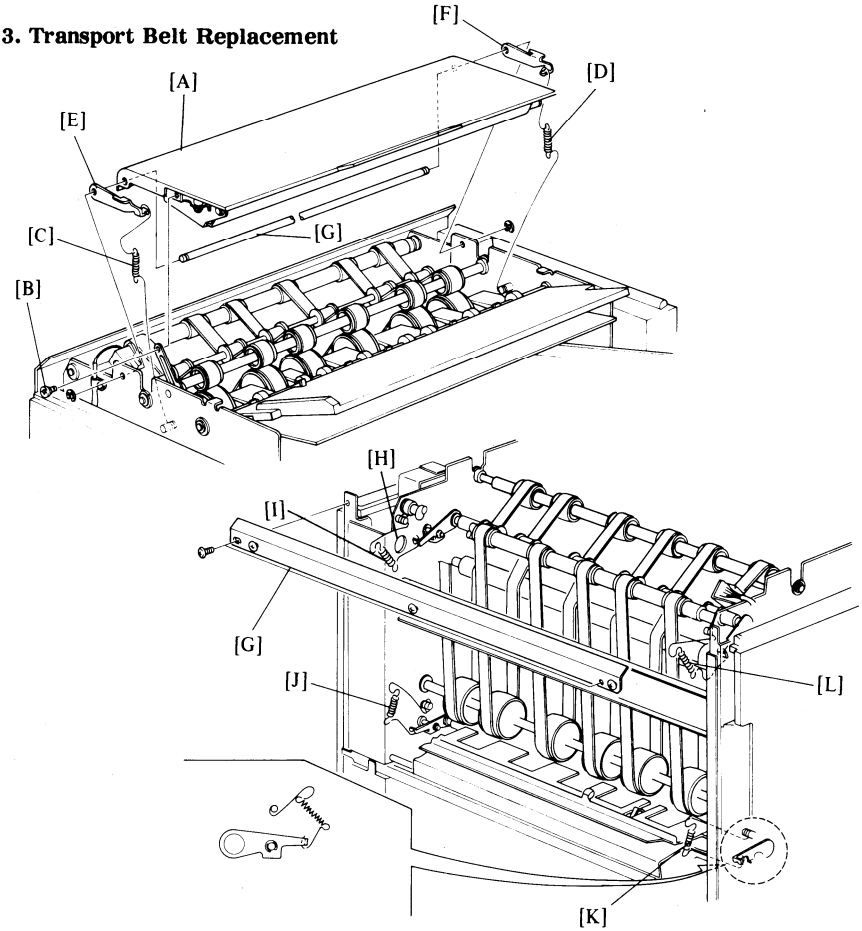
   CAUTION: Make sure the 4 connectors for the front door safety switch are installed as shown. If they are not installed correctly, the sorter main board will be damaged.

5. Remove the transport unit [E] (5 screws, 1 ground screw, and 6 connectors).

   NOTE: After disconnecting the two connectors from the power supply, pass the connectors inside the side frame brace as shown.

6. Reassemble.

3. Transport Belt Replacement



1. Turn off the copier's main switch and undock the sorter from the copier.

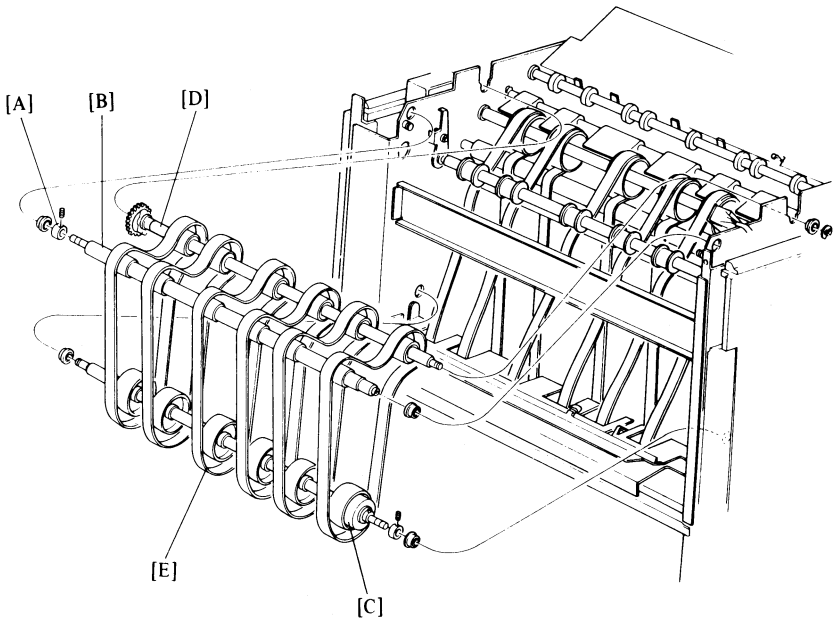
   CAUTION: During this procedure there will be three sets of springs removed. Do not mix up the sets; they are different.

2. Remove the top cover (5 screws).

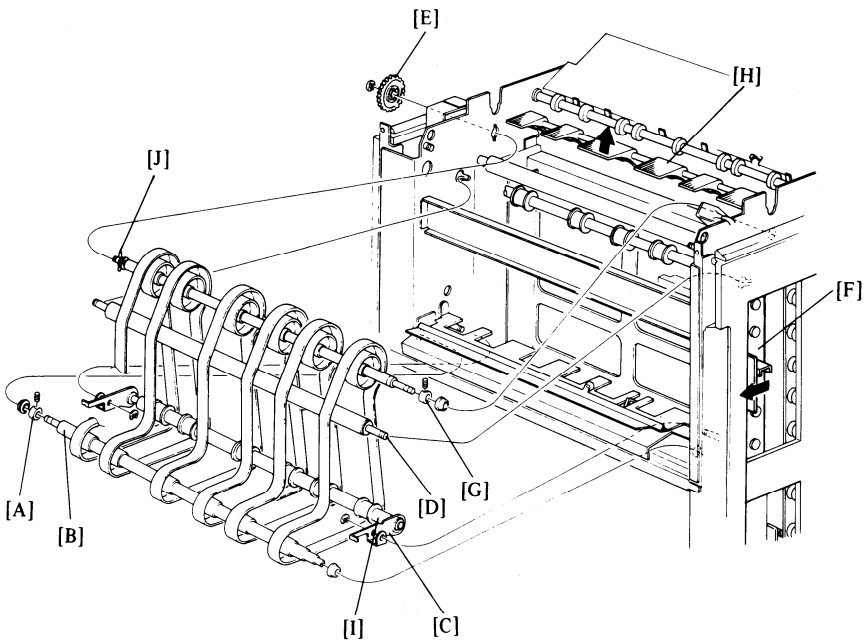
3. Remove the manual feed cover [A]:

   a) One shoulder screw [B]
   b) Two pressure springs [C,D]
   c) Two pressure plates [E,F] (2 E-rings)
   d) Manual feed cover shaft [G]

4. Remove the top cover support bracket [H] (2 screws) and the 4 belt tension springs [I,J,K,L].



5. Loosen the Allen screw of the collar [A] and remove the top roller shaft [B].
6. Remove the upper belt entrance roller shaft [C] in the same way.
7. Lift up the upper belt drive roller shaft [D] and remove it.
8. Replace the upper transport belts [E].



9. Loosen the Allen screw of the collar [A] and remove the lower belt entrance roller shaft [B].

10. Remove the lower belt tension roller shaft along with the pressure arms [C] (2 E-rings).

11. Remove the inside idle roller shaft [D].

12. Remove the lower belt drive gear [E] (1 E-ring).

13. Open the roller panel [F] of the upper distribution unit.

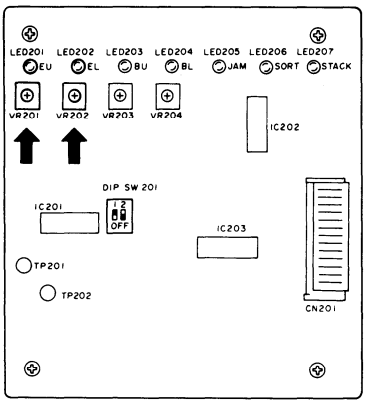
14. Loosen the Allen screw of the collar [G] and, while holding up the turn gate [H], remove the lower belt drive roller shaft [I].

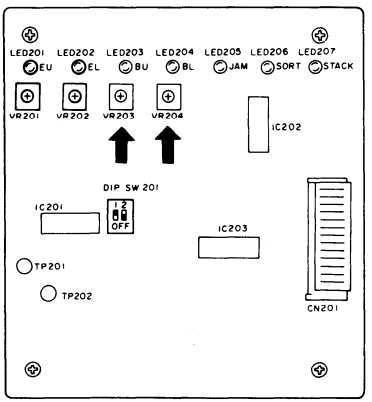
NOTE: The lower belt drive roller shaft [H] has a pin [J] on the end of the shaft. Align the pin with the cut-out in the frame of the sorter.

15. Replace the lower transport belts.

16. Reassemble.

4. Jam Sensor and Bin Copy Sensor Adjustment





NOTE: When replacing the sensor interface board, the following adjustments must be performed:

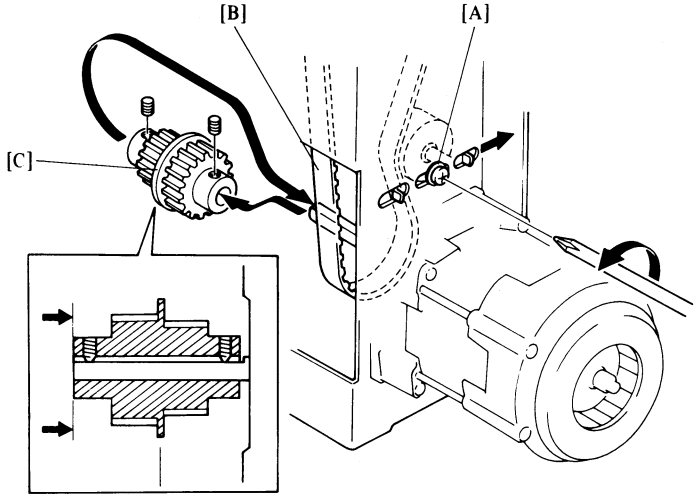
- Jam Sensor -

1. Remove the rear cover (4 screws) and all paper from the bins.
2. Turn on DIP SW201-1 on the sensor interface board.
3. Adjust VR201 (Upper Jam Sensor) to the point where LED201 just turns off.
4. Adjust VR202 (Lower Jam Sensor) to the point where LED202 just turns off.
5. Turn off DIP SW201-1.

- Bin Copy Sensor -

6. Turn on DIP SW201-2 on the sensor interface board.
7. Adjust VR203 (Upper Bin Copy Sensor) to the point where LED203 just turns off.
8. Adjust VR204 (Lower Bin Copy Sensor) to the point where LED204 just turns off .
9. Turn off DIP SW201-2.
10. Check that the LEDs turn on when paper enters the bins.
11. Reassemble.

5. 50Hz/60Hz Modification



1. Loosen the belt tension bracket screw [A] and release the 166XL timing belt [B] from the main motor pulley.

2. Loosen the two Allen screws and remove the main motor pulley [C].

3. Reverse the main motor pulley and install it so that it is flush with the end of the main motor shaft.

4. Adjust the main drive belt tension. There should be 6.0 ± 1.0 mm deflection of the belt when 200 grams pressure is applied.