Service and Maintenance Manual

SO-6

Sorter/Stacker
Revision 1.2

KYOCERA

Revision 1.00 April, 1993
Revision 1.10 June, 1993: Replaced pages 4-8, 4-9, 5-20 through 5-28

NOTICE

The information in this manual is subject to change without notification. Additional pages may be inserted in future editions. The reader is asked to excuse any technical inaccuracies or typographical errors in the present edition.

No responsibility is assumed if accidents occur while the service person is following the instructions in this manual.

INFORMATION

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures.

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the manufacturer for compliance could void the user's authority to operate the equipment.

IMPORTANT NOTICE TO SERVICE PERSON

Before attempting service on the equipment, including disassembling, re-assembling, troubleshooting, and adjustment, read this manual carefully. During performing service, use extreme care to avoid possible electric shock hazard, burn, and human injuries. Make sure the printer is not provided with any safety facilities other than those primarily intended for the safety of users.

PREFACE

This manual contains information pertaining to service and maintenance of the STR-1 sorter/stacker. The information in this manual contains the following chapters:

Chapter 1: General information

Chapter 2: Maintenance

Chapter 3: Paper specifications

Chapter 4: Parts catalog

Chapter 5: Hardware notes

Appendix: Schematic diagrams

Legend

Throughout the manual:

Warning denotes precautions which, if ignored, could result in personal injury, and/or irrevocable damage to the equipment.

Note denotes precautions which, if ignored, could result in damage to the equipment.

Chapter 1: General information

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1.1. General

The sorter model SO-6 is intended for use with the following printer models:

FS-1500/A
FS-3500/A

(The /A represents the units produced for the U.S. and Canada.)

The sorter is an auxiliary unit with 15 paper receiving trays. Mounted underneath the printer, it enables printed pages to be sorted in various ways. Topics covering the installation and operations of the printer are fully detailed in the sorter's *User's Manual*.

1.2. Product description

The sorter model SO-6 is intended for use with the printer model FS-1500/A or FS-3500/A. It is an auxiliary unit with 15 paper trays. Mounted underneath the printer, the sorter enables prnted pages to be sorted in various ways.

1.2.1. Original packing list

The sorter package contains each of the following items in the indicated quantities.

- ❖ SO-6 sorter, 1
- ❖ Power cable, 1
- ❖ Stabilizers (brackets), 3
- ❖ Thumb screws for the stabilizers, 3
- ❖ Instruction manual, 1

1.2.2. Names of parts

The sorter has the following parts. See figure 1 on next page.

«Connector» When you install the optional sorter, this connector plugs into a connector located inside the bottom of the printer (or of the optional paper feeder or duplexer, if used together with the optional sorter).

«Positioning pins» When you install the optional sorter, these pins fit into two holes in the bottom of the printer (or of the optional paper feeder or duplexer, if used together with the optional sorter).

«Bulk tray» This tray receives 500 printed pages at a maximum,

in face-down stack.

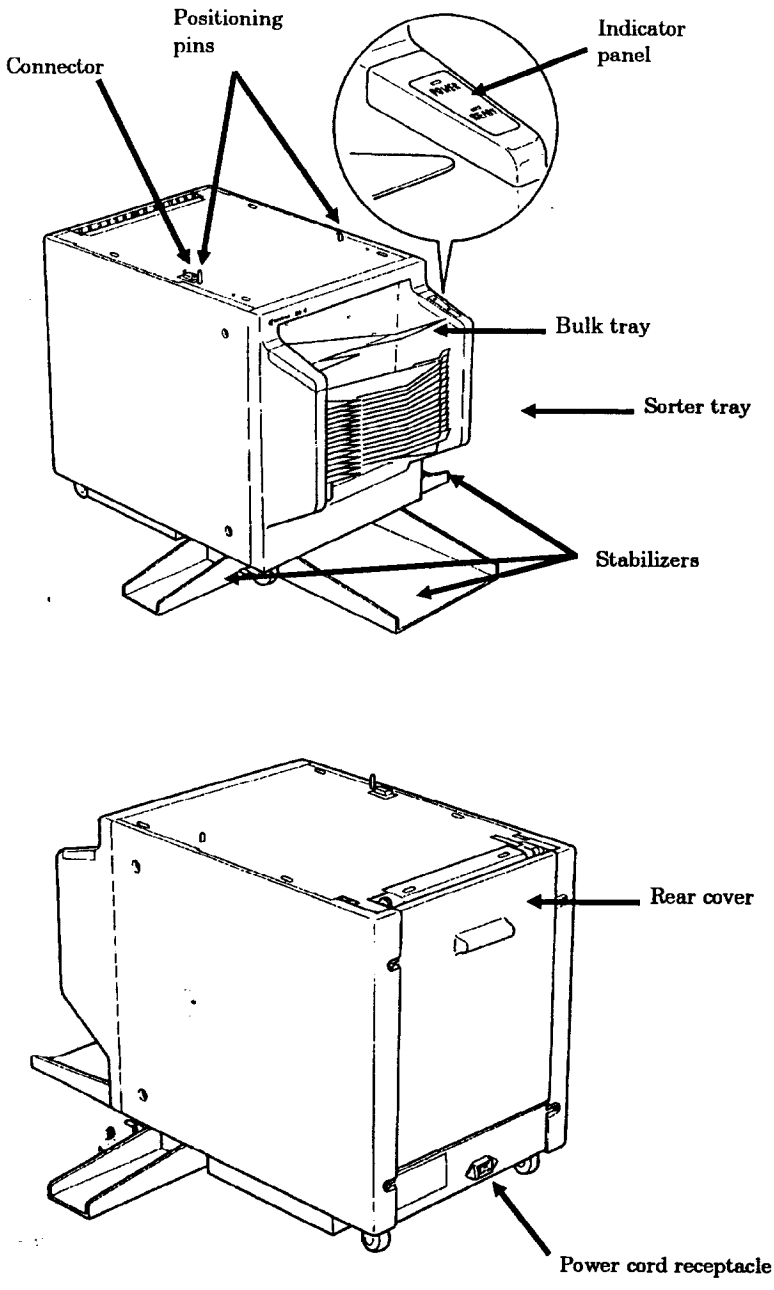
«Sorter trays» These are 15 trays that hold 50 pages each.

«Indicator panel» This indicates that the sorter is powered (**POWER**), and that the sorter is ready for use (**READY**).

«Rear cover» This cover opens to allow clearing paper jams.

«Stabilizers» These three stabilizers prevent the sorter and the printer to accidentally tumble down. The installation of the stabilizers must be made only by a qualified Kyocera dealer.

FIG. 1.1. SORTER PARTS



1.2.3. Installing the stabilizers

To ensure that the sorter and the printer (and other option units, if installed together) will not tumble down, the stabilizers must be mounted onto the bottom of the sorter. Three stabilizers and thumb screws for mounting them are included with the sorter package.

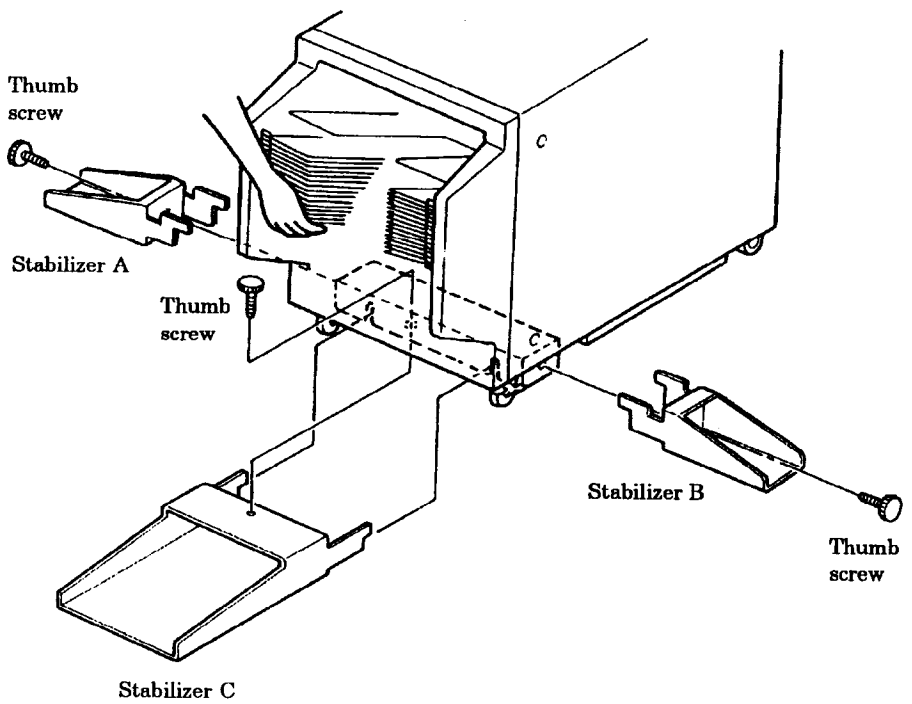
The installation of the stabilizers is to be performed only by a Kyocera-qualified service technician. Kyocera shall not be liable for any damage caused by improper installation of the equipment.

WARNING! Do not use sorter without first installing the stabilizers. If the stabilizers are not installed, the printer and the sorter unit may tumble, causing injury to person or serious damage to the printer and the sorter.

To install the stabilizers, proceed as follows.

1. Disconnect the sorter's power cable from the AC outlet, if connected already.
2. Fit the stabilizer A to the left end of the base at the bottom of the sorter, securing it using the thumb screw.
3. Fit the stabilizer B to the right end of the base at the bottom of the sorter, securing it using the thumb screw.
4. Fit the stabilizer C to the front side of the base at the bottom of the sorter, securing it using the thumb screw. Insert the thumb screw into the hole located under the bottom tray of the sorter by slightly raising the trays.

FIG. 1.2. INSTALLING THE STABILIZERS



1.3. Precautions on service and maintenance

Only a qualified technician should perform service on the sorter, who is familiar with fundamental safety countermeasures as dictated for all electronics technicians. Observe the following precautions during service and maintenance of the sorter. These are to prevent the possible personal injuries to the technician and the damage to the equipment.

1.3.1. Power source

The sorter has its own AC power inlet. AC power should be available near the equipment and easily accessible. Observe the following precautions regarding AC power.

CAUTION: The sorter has no power switch provided as the printer's power switch simultaneously turns on and off the sorter. Therefore, before plugging in the sorter power cord, the printer's power switch must be turned off.

- ❖ Use only the power source voltage conforming to the sorter's rated power voltage. Plugging the sorter to an inappropriate voltage source will severely damage the sorter.
- ❖ Disconnect both the printer's and the sorter's power cord from power before attempting removal or replacement of the electrical components and the printed-circuit board in the sorter.
- ❖ In connecting the sorter power, exercise an extreme care in handling the power supply or any other electric parts which may give an electric shock.
- ❖ To avoid possible electrical shock, extreme caution must be exercised in handling the power cord and any other electrical part.

1.3.2. Static

Use antistatic (discharging) tools, e.g., an antistatic wrist belt, when handling the printed-circuit boards to discharge the human body.

1.3.3. Replacement parts

Replace the components with only the Kyocera's recommended components. Use of non-recommended parts will void the sorter's warranty. Recommended parts are those printed in **bold letters** in the Parts Catalog in this manual.

1.4. Paper

The sorter may not be used to receive the paper not satisfying the requirements below.

The special types of paper such as overhead-projection film (OHP), envelopes, adhesive-backed label, etc., must not be delivered to the sorter. These types can result in jams, misfeeds, and paper waste, and in extreme cases can damage the sorter. The paper having a strong tendency of curl in one direction should also be avoided.

NOTE: Kyocera assume no liability for problems that occur when paper not satisfying these requirements is used with the sorter.

Item	Specification
Weight*	60 to 90 g/m^2 (16 to 24 lbs/ream)
Thickness	0.086 to 0.110 mm (3.4 to 4.3 mils)
Dimensional accuracy	±0.7 mm (±0.0276 inches)
Squareness of corners	90° ±0.2°
Moisture content	4% to 6%
Direction of grain	Long grain
Pulp content	80% or more

REFERENCE: (*) If the duplexer is used with the sorter, the weight of paper to be used should be 70 g/m^2 or greater.

1.5. Specifications

ITEM	SPECIFICATION
Applicable printers	Kyocera FS-1500/A and FS-3500/A
Number of paper trays	1 (Bulk tray) and 15 (Sorter trays)
Paper size	Letter (8.5 x 11 inches) ISO A4 (21 x 29.7 cm) Legal (8.5 x 14 inches) JIS B5 (12.8 x 25.7 cm) JIS A5 (14.8 x 21 cm)
Paper capacity	50 pages each (Sorter trays) of thickness 0.1 mm 500 pages (Bulk paper receiving tray) of thickness 0.1 mm
Environmental requirements	Temperature: 10°C to 35°C (50°F to 90.5°F) Humidity: 20% to 80% RH Optimum conditions: 20°C, 65% RH Altitude: Max. 2000m (6500 feets) Illumination: Max. 1500 lux
Power requirements	120 V, 60Hz, max. 1 A 220 — 240 V, 50Hz/60Hz, max. 0.5 A max. allowable voltage fluctuation; ± 10% max. allowable frequency fluctuation; ± 2%
Power consumption	Max. 40 W
Noise	Max. 65 dB (A) when sorting (excl. peak values) Max. 50 dB (A) when feeding (excl. peak values) (Measured 1 m from the outside of the sorter, sorter unit only)
Dimensions	17.5" (44.6 cm) high x 13.6" (34.5 cm) wide x 19" (48 cm) deep
Weight	66.2 lbs. (30 kg)

Chapter 2: Maintenance

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2.1. Introduction

This chapter explains the followiing subjects:

Section 2.2 explains with illustrations the procedures required to disassemble the sorter for replacement of parts. Section 2.3 explains how to clean those parts which require periodic cleaning. Section 2.4 explains how to adjust the tension of the driving belts.

2.2. Disassembly procedures

This section provides procedures for disassembling of the sorter. When replacing parts for which there is no specific procedure described, refer to the exploded view shown in chapter 3.

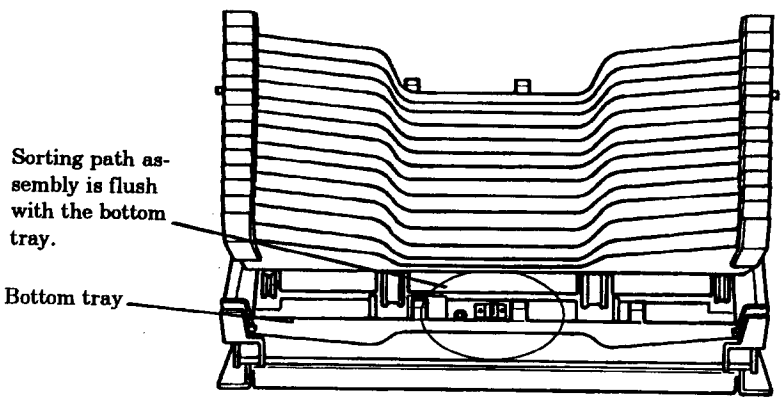
Before starting, be sure to read the notes below.

- ❖ Before removing the sorter from the printer (the printer is mouted atop the sorter.), be sure to turn off printer power and disconnect the power cord of both the sorter and the printer.
- ❖ Be sure to use the correct screws when installing a component. Using incorrect screws can result in the threads of the screws being stripped, which may lead in turn to other problems. Frequent insertion and removal of selftapping screws can cause damage to screw holes. Do not tighten secrews excessively.
- ❖ When removing or installing circuit boards, wear a grounded wrist strap to protect against damage due to discharge of static electricity.

2.2.1. Selecting the bottom tray for service

For the sorter to be ready for disassembly, the sorter must be set to select the bottom (15th) tray by using the manner explained on next page. Figure below shows the sorter set to select the bottom tray.

FIG. 2.1. SORTER SET TO BOTTOM TRAY



The outlet slot of the sorting path assembly lowers to the bottom position so that the paper is delivered into the bottom tray.

The easiest way to select the bottom tray is to use the printer's MODE SELECT function while the sorter is yet installed with the printer. To select the bottom tray using MODE SELECT, proceed as follows:

1. Make sure the printer and sorter are properly setup and connected to power source.
2. Turn printer power on. This simultaneously turns on sorter power.
3. When the printer's message display shows **Ready**, press the MODE SELECT key.
4. Press + or - key repeatedly until the message display shows **Sorter mode>**.
5. Press the > (FORM FEED) key. The message display indicates >Manual elevate. The number below this message indicates the tray at which the sorter's internal paper exit mechanism is currently parked (usually the first tray).
6. Press the ENTER key. The message display indicates a blinking question mark (?).
7. Press the + or - key repeatedly so that the number changes to 15.
8. Press the ENTER key. The internal paper exit mechanism moves to the bottom tray.
9. Press the MODE SELECT key. The message display returns to **Ready**.
10. Turn printer power off.

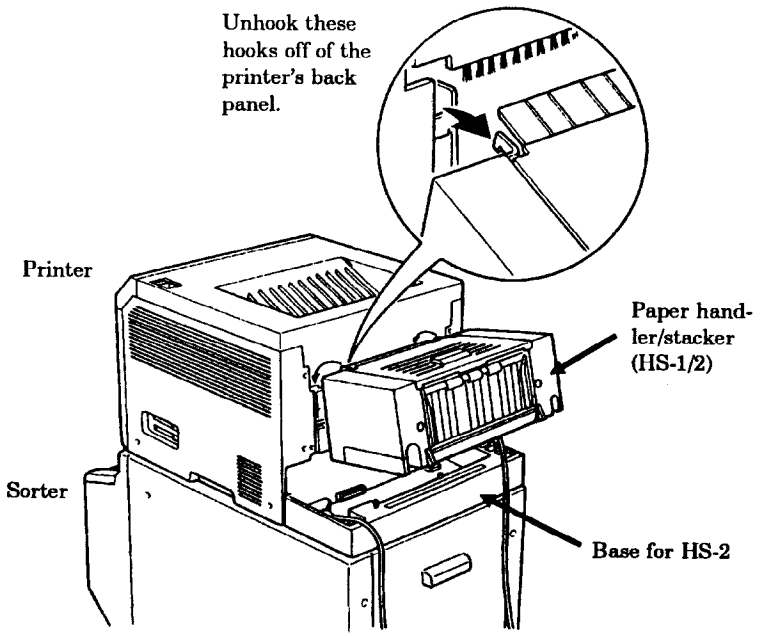
After the printer is turned off, the sorter stays at the bottom tray. Go to the next section and remove the sorter from the printer.

2.2.2. Removing the sorter from the printer

To start disassembly, begin with removing the paper handler/stacker from the printer. To remove the paper handler/stacker, see Figure 2.2. on next page.

CAUTION: Before proceeding, turn printer power off and disconnect the power cord of both the sorter and the printer. Also, make sure that the sorter is set to select the bottom tray as instructed in section 2.2.1. above.

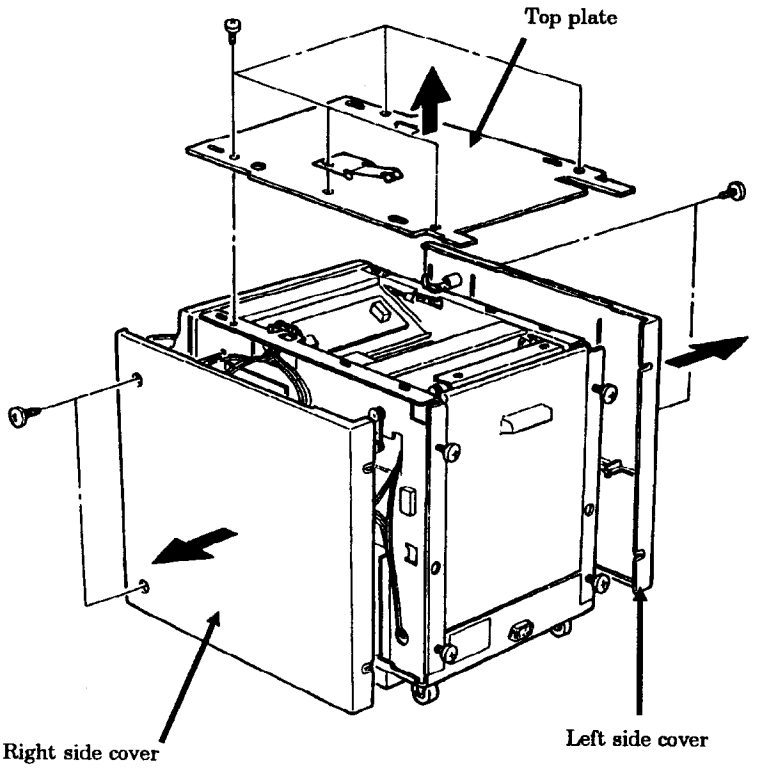
FIG. 2.2. REMOVING THE PAPER HANDLER/STACKER



2.2.3. Removing the covers

To remove the top plate, left, and right covers, remove screws as shown below. Note that the left and right covers are the same ones.

FIG. 2.3. REMOVING COVERS



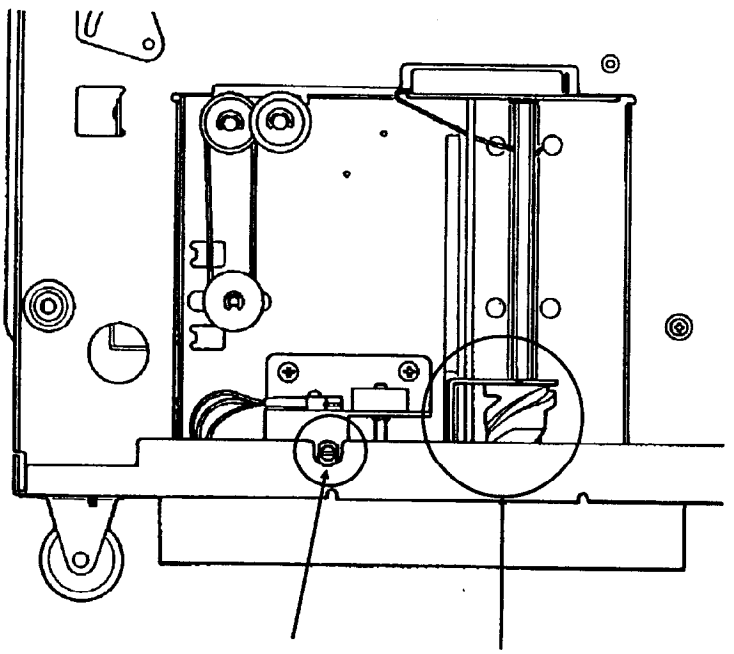
2.2.4. Removing the sorter assembly and the main frame assembly

This step explains how to remove the main frame assembly from the sorter assembly. Removing the sorter assembly will particularly be required when replacing the damaged sorter trays, for example.

Before removing the sorter assembly, the sorter must be set to the bottom tray by following section 2.2.1. If, for some reason, it is not practical to set the sorter to select the bottom tray by using the printer's MODE SELECT feature (e.g. the sorter has been removed from the printer and not powered), follow the steps below:

1. Remove all covers as instructed in section 2.2.3.
2. See Figure 2.4. below. Using a flat blade screwdriver, rotate the manual elavator knob **counterclockwise** so that the elavation screw comes to the **bottom** position.

FIG. 2.4. MOVING THE SORTING PATH ASSEM. IN HOME POS.



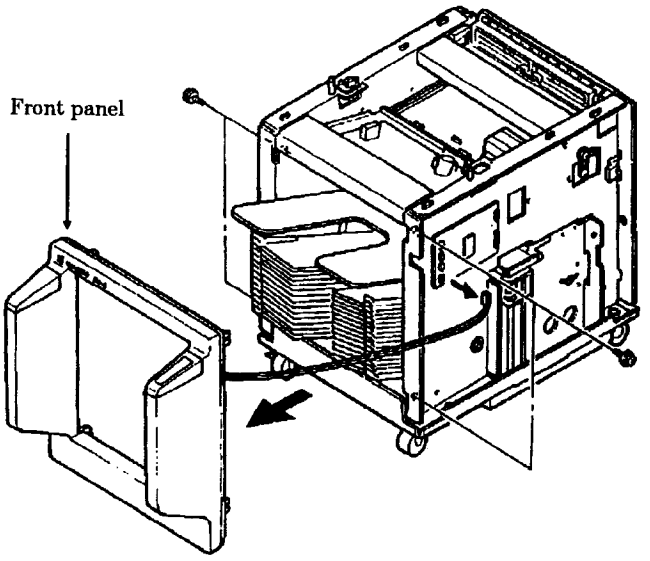
This lets the sorting path assembly to be flush with the bottom [No. 15] tray. See Figure 2.1.

NOTE: Do not rotate the manual elavator knob too far to the bottom. Refrain from rotating the knob when the sorting path assembly has reached the bottom of the sorter assembly.

To remove the sorter assembly and the main frame assembly, proceed as follows.

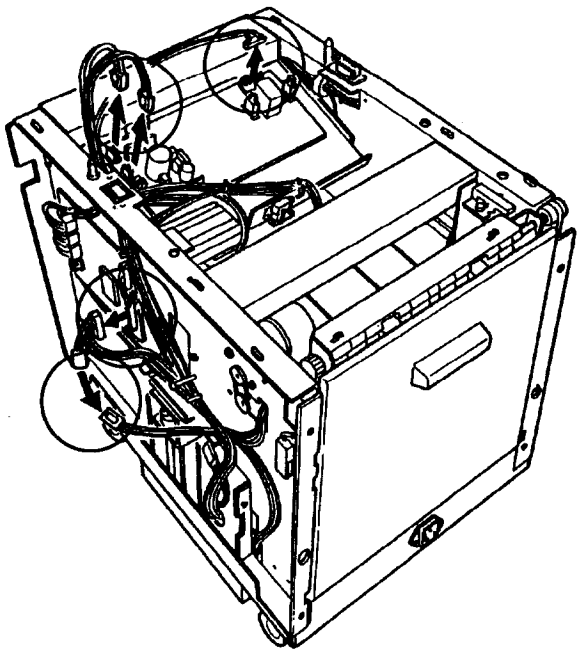
1. Loosen four screws that secure the front panel to the main frame. Remove the front panel from the main frame.

FIG. 2.5. REMOVING THE FRONT PANEL



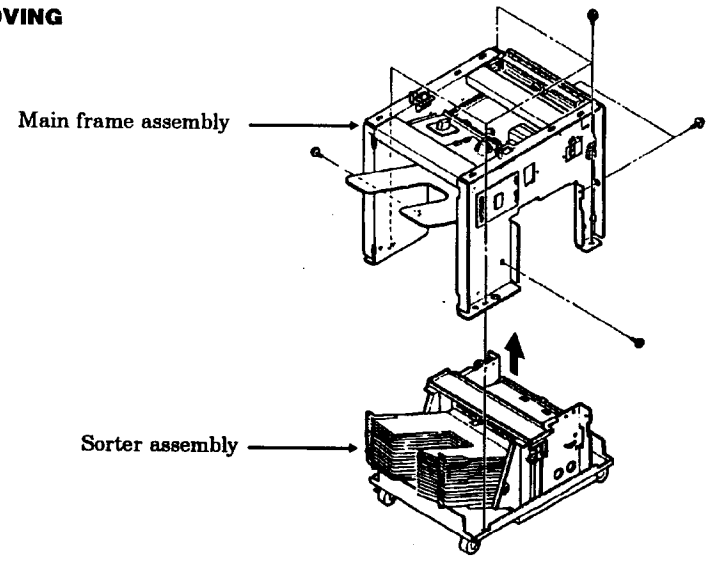
2. Disconnect connectors as shown in Figure 2.6. Cut and remove the wire clamps if necessary.

FIG. 2.6. DISCONNECTING CONNECTORS FOR REMOVAL



3. To remove the main frame assembly from the sorter assembly, remove six screws as shown below.

FIG. 2.7. REMOVING SCREWS FOR REMOVING SORTER ASSEM.



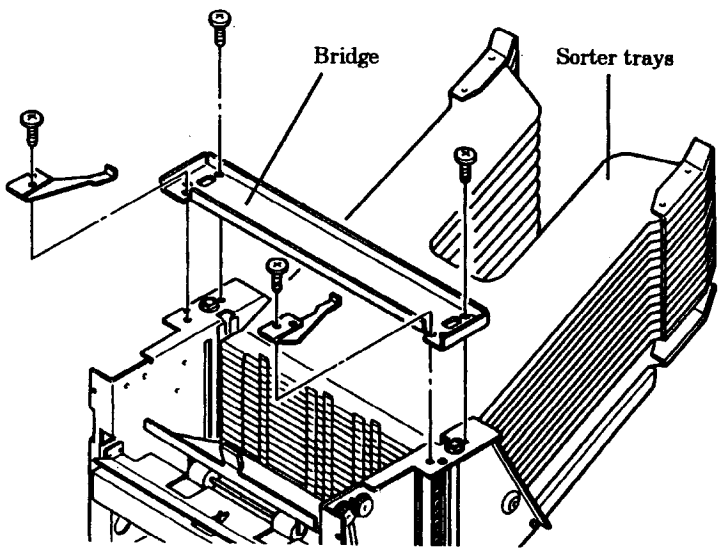
4. Hold the main frame assembly and lift up to remove it from the sorter aseembly.

2.2.5. Removing the sorter trays

This section instructs on how to remove the sorter trays for replacement, etc. To remove sorter trays, follow section 2.2.5. above and remove the main frame assembly from the sorter assembly.

1. Remove four screws that secure the bridge as shown below. Remove the bridge.

FIG. 2.8. REMOVING THE BRIDGE



2.3. Cleaning procedures

After the sorter has been used for a certain period of time, tiny paper scraps and dust will begin to accummulate on the parts explained below. Because these scraps and dust will hamper paper sorting operation, periodic cleaning is necessary using the procedure which follows.

2.3.1. Paper-empty sensor

The paper-empty sensor is located on the sorting path outlet. The empty sensor is likely to be hampered by scraps and dust.

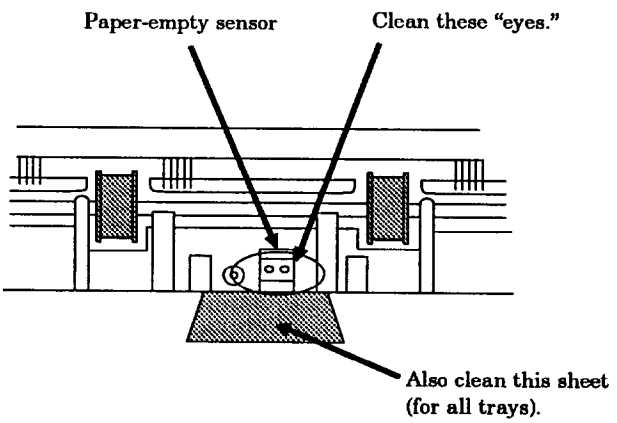
Rotate the manual elevator knob clockwise with a flat blade screwdriver so that the sorting path outlet comes up to the 15th (top) tray. Clean the two "eyes" of the sensor using a cottom swab slightly soaked in alcohol.

Then clean the black plastic sheet in front of the sensor (on every tray). To clean the sheet, proceed as follows.

Rotate the manual elevator knob clockwise with a flat blade screwdriver so that the sorting path outlet comes up to the top tray. Clean the black plastic sheet on the top tray from the front side of the sorter.

Rotate the manual elevator knob counterclockwise so that the sorting path outlet comes down to the next to the top (second) tray. Open the rear cover. Clean all the other trays from the rear of the sorter repeating the above procedures.

FIG. 2.11. CLEANING THE PAPER-EMPTY SENSOR



2.4. Adjustment of the belt tension

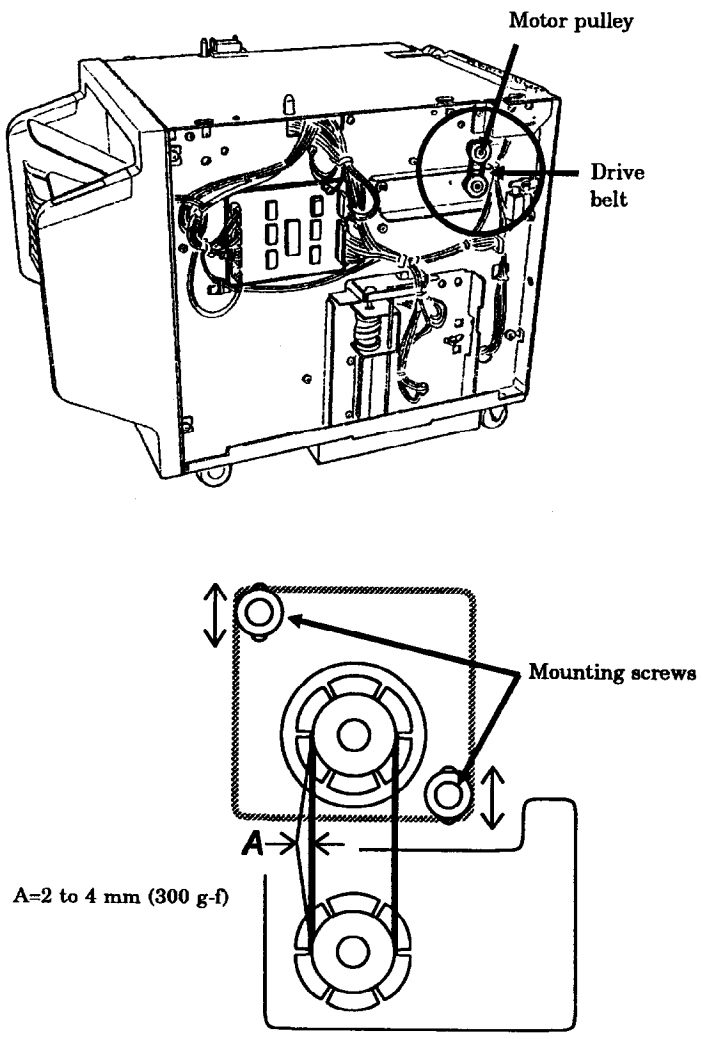
The sorter has sevaral driving belts. For the optimum sorter performance, the tension of the belts should be specifically adjusted to the proper values.

2.4.1. Drive belt

The drive belt is located on the right side of the sorter frame. The tension of the belt is adjusted by moving the mounting position of the motor back and forth as follows.

1. Apply a force of 300 g-f to the center of the belt.
2. The flexure length of the belt should be 2 to 4 mm. If necessary, loosen the screws securing the motor and adjust the tension of the belt.

FIG. 2.12. ADJUSTING THE DRIVE BELT TENSION

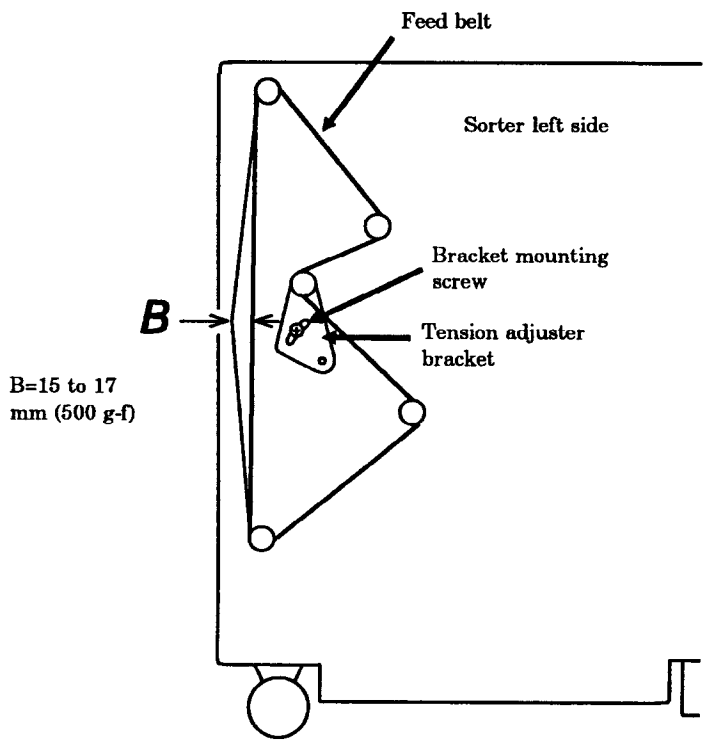


2.4.2. Feed belt

The drive belt is located on the left side of the sorter frame. The tension of the belt is adjusted by moving the tension adjuster bracket back and forth as follows.

1. Apply a force of 500 g-f to position B on the belt.
2. The flexure length of the belt should be 15 to 17 mm. If necessary, loosen the screws securing the tension adjuster bracket and adjust the tension of the belt.

FIG. 2.13. ADJUSTING THE FEED BELT TENSION



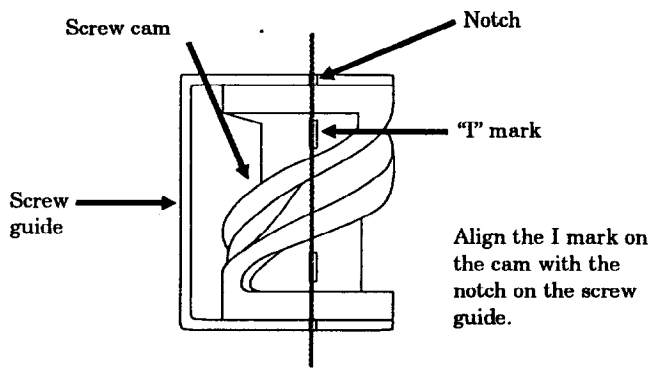
2.4.3. Tray feed belt

The tray feed belt is located at the bottom of the sorter. The procedures for tension adjustment below also includes steps for ensuring synchronization of the screw cam and the sensor cam. An M4 hexagon wrench is required in the following steps.

1. Set the sorting path assembly to select the top (1st) tray. Refer to section 2.2.4.
2. Loosen the hexagon screw as shown in Figure 2.14.

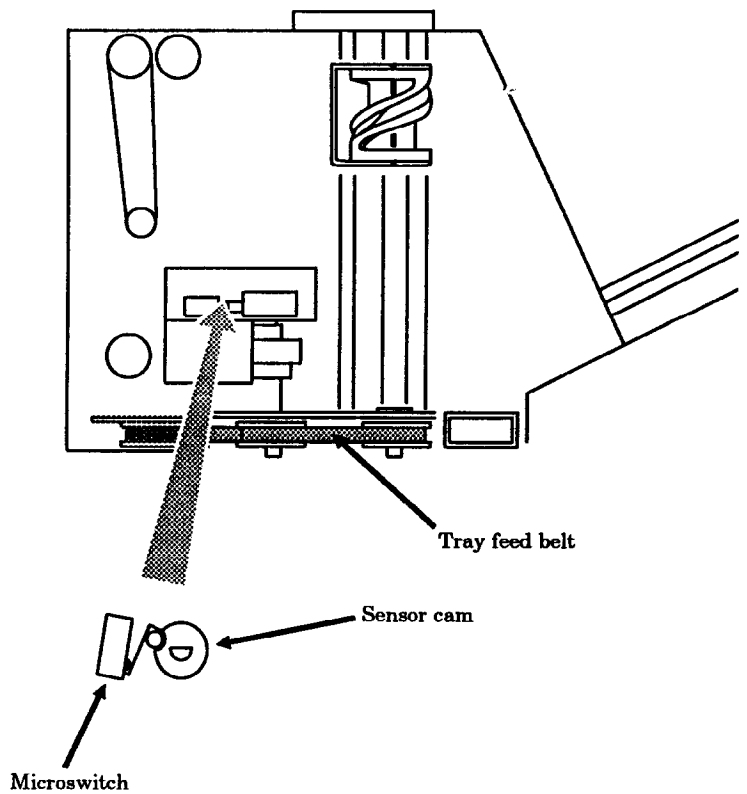
3. Rotate the screw cam on the left and right sides of the sorter assembly so that the "I" mark on the cam align with the notch on the screw guide.

FIG. 2.14. OBTAINING SCREW CAM ALIGNMENT



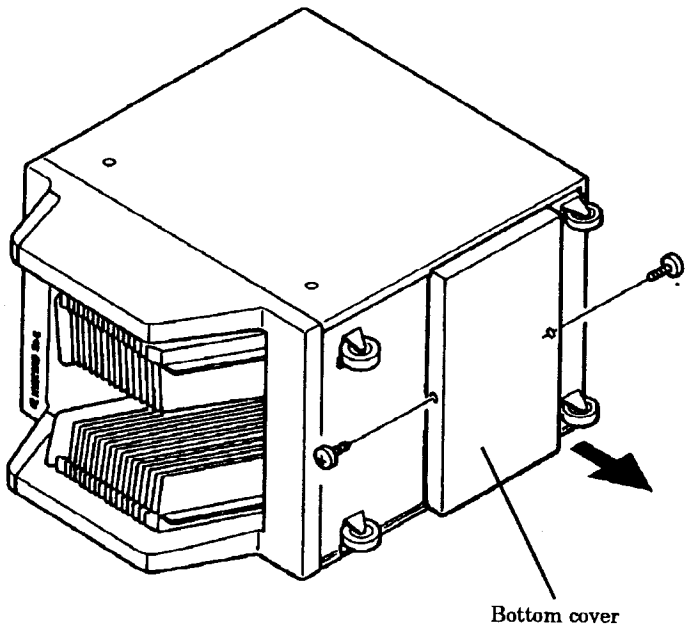
4. With the screw cam positioned correctly as above, make sure that the sensor cam is held by the micro switch arm as shown below.

FIG. 2.15. OBTAINING SENSOR CAM ALIGNMENT



5. Remove the bottom cover of the sorter by removing two screws. This allows access to the tray feed belt.

FIG. 2.17. REMOVING THE BOTTOM COVER



6. Apply a force of 500 g-f to position C on the belt as shown below. The flexure length of the belt should be 10 to 13 mm. To adjust the tension, loosen the hexagon screw shown in Figure 2.18. Then, move the adjuster pulley back and forth as shown below.

FIG. 2.18. TRAY FEED BELT TENSION

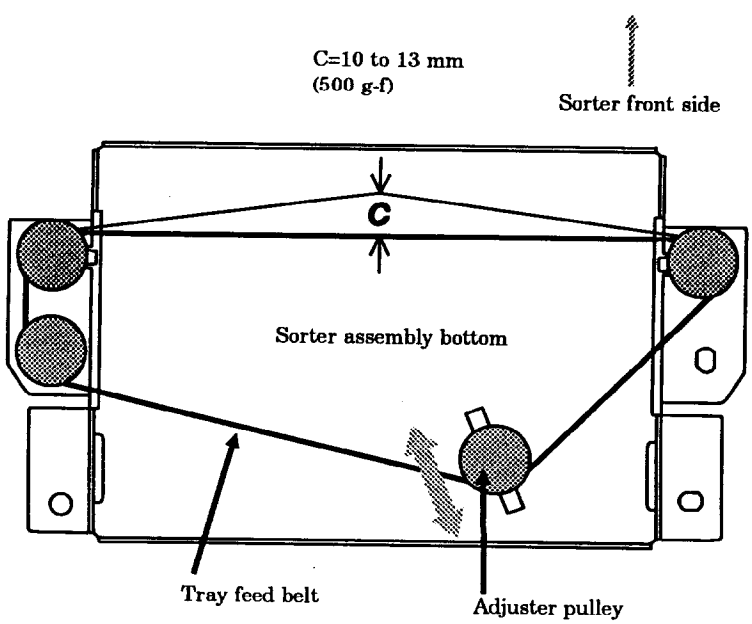
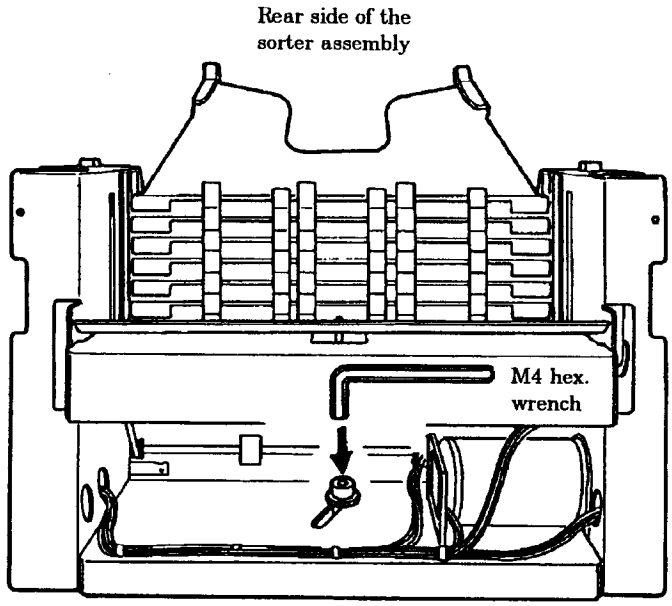


FIG. 2.19. LOOSENING THE HEXAGON SCREW FOR TRAY FEED B.



Turn the hex. screw counterclockwise to loosen.

Chapter 3: Parts catalog

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3.1. Introduction

This chapter lists the main parts of the sorter and shows exploded view of the major assemblies. The heading in the parts list tables are explained bellow.

REF.: The reference number that corresponds to the part in the exploded view.

PART CODE: The part code of the part.

DESCRIPTION: The name and model of the part.

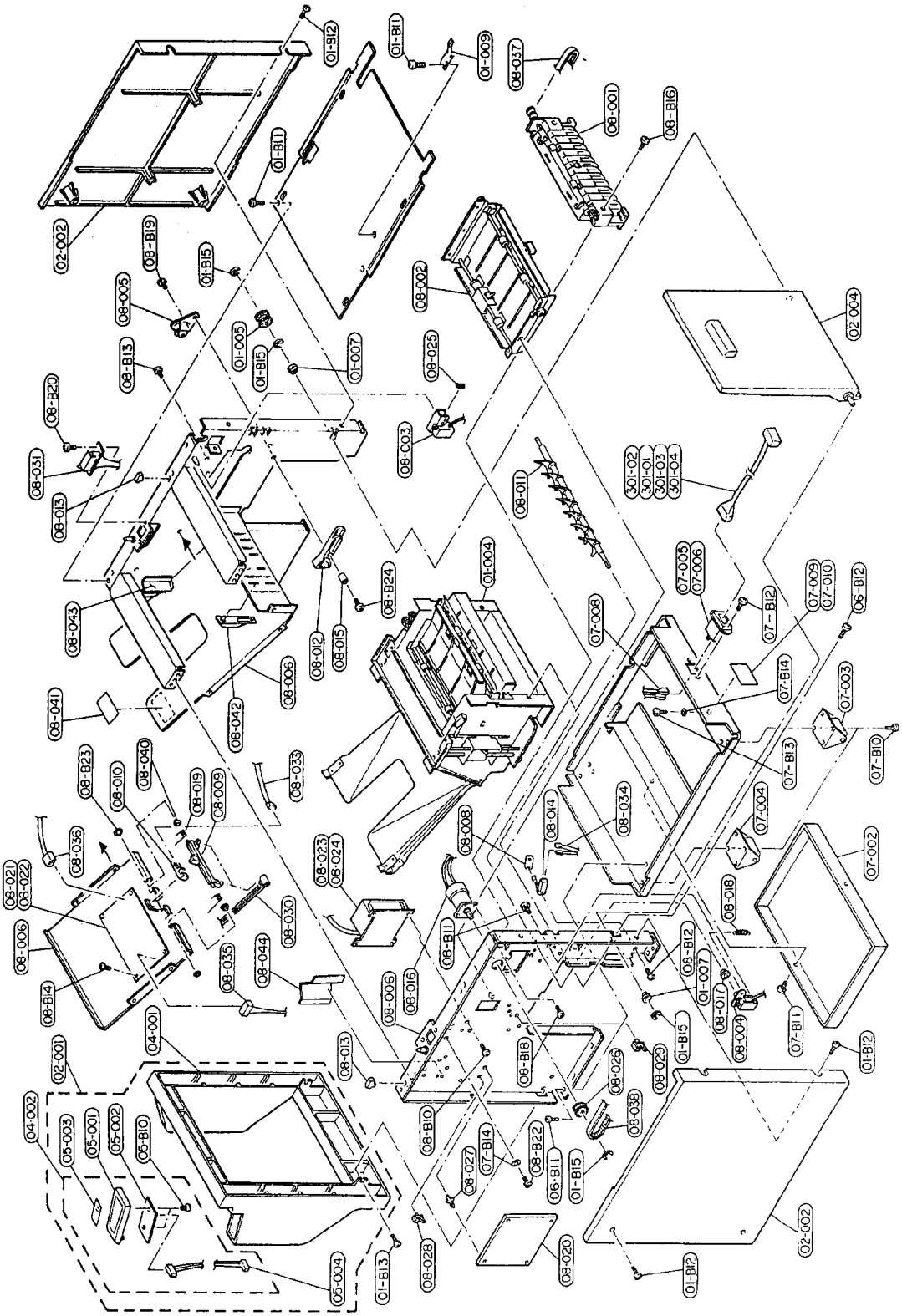
QTY: The quantity of that particular part used in the sorter.

Recommended parts: A recommended part is bold-faced in the row.

3.1.1. Ordering

Recommended parts are those parts printed in bold letters the parts list. Part codes for other parts are shown only for reference purposes. To avoid errors in part orders, always specify the part description, part code, quantity required, and the reference number in the exploded view.

3.2. Overall


01-B12
01-B11
01-009
08-037
08-001
08-B16
02-002
08-B19
01-B15
08-005
08-002
02-004
08-B13
01-005
01-B15
01-007
08-025
08-B20
08-003
08-031
08-013
30-02
30-01
30-03
30-04
08-011
01-004
07-005
07-006
07-009
07-010
06-B12
07-B12
07-008
08-B24
08-043
08-012
08-015
07-B14
08-006
07-003
08-041
08-042
07-B13
07-B10
08-B23
08-040
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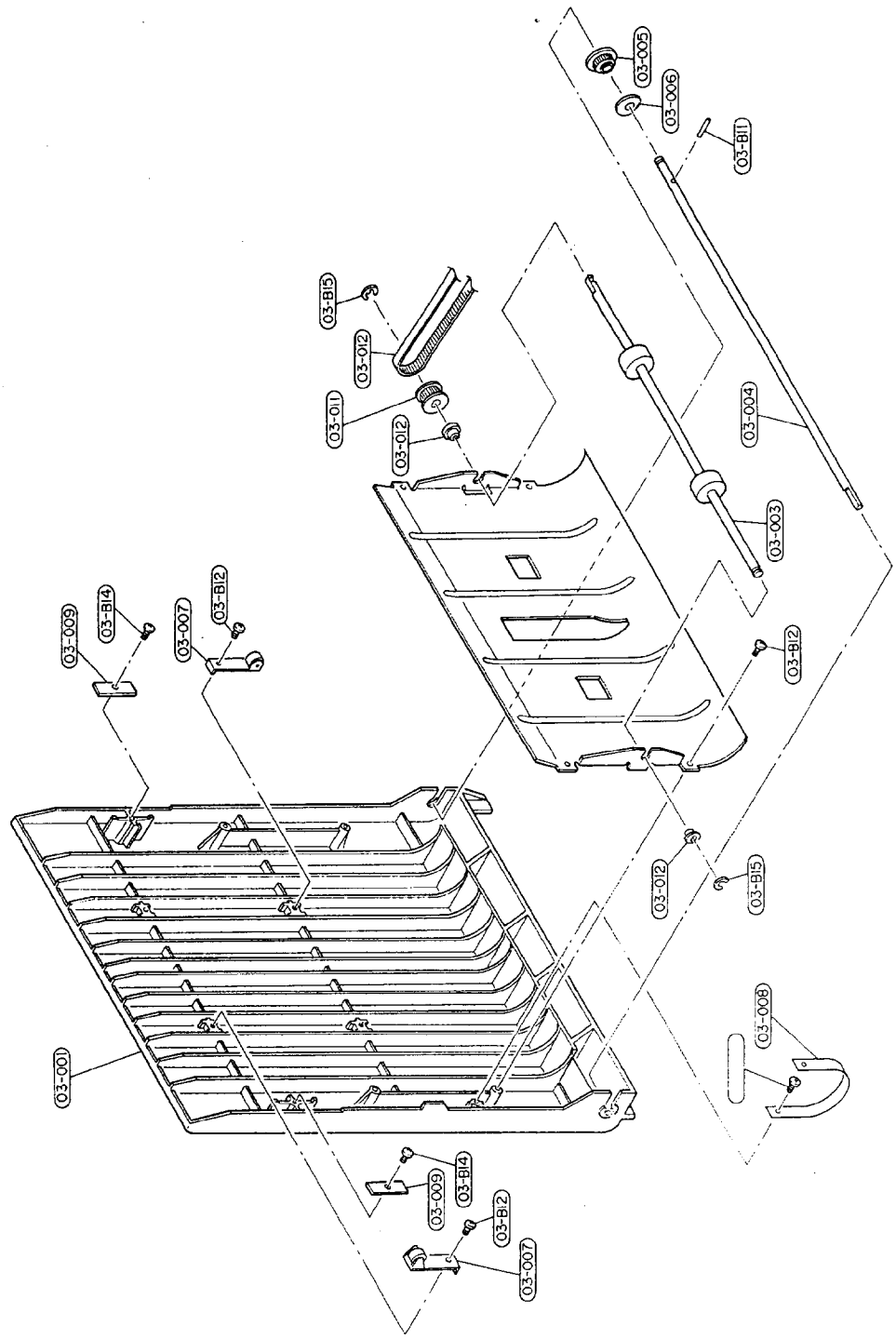
08-038
08-B10
05-003
05-001
05-002
05-B10
08-B22
06-B11
01-B15
08-027
07-B14
08-028
08-020
02-002
05-004
01-B13
01-B12

Ref. #	Part Code	Description	Quantity	Remarks
01-001	5SNSP0009118	COVER ASSY	1	
01-002	5SNSP0009521	CABINET ASSY	1	
01-004	5SNSP0009121	SORTER ASSY	1	
01-005	5SNSP0009099	PULLEY FEED T26, CVER	1	
01-006	5SNSP0009100	BELT DRIVE T400, CVER	1	
01-007	5SNSP0009101	BUSHING REAR, COVER	2	
01-009	5SNSP0009222	PLATE EARTH	1	
01-B11	5MBTPB3006TB	BIND T.T SCREW (+)	5	
01-B12	5MBTPB4010TN	BIND T.T SCREW (+)	8	
01-B13	5MBTP44008TZ	TP TAP SCREW (+)	4	
01-B14	5MBTPP4010PZ	PAN T.T SCREW (+)	2	
01-B15	5MBCE5060XSW	E STOP RING, COVER	2	
02-001	5SNSP0009122	COVER FRONT ASSY	1	
02-002	5SNSP0009109	COVER L, R	2	
02-003	5SNSP0009110	PLATE TOP	1	
02-004	5SNSP0009115	COVER REAR ASSY	1	
04-001	5SNSP0009048	COVER FRONT	1	
04-002	5SNSP0009111	COVER PANEL ASSY	1	
05-001	5SNSP0009112	COVER PANEL	1	
05-002	**5SNSP0009113**	**PWB PANEL**	**1**	
05-003	5SNSP0009114	SHEET PANEL	1	
05-004	5SNSP0009172	CONN. CORD S00756, PWB	1	
05-B10	5MBTPB3006PZ	BIND T.T SCREW (+), PWB	1	
06-001	5SNSP0009522	FRAME ASSY	1	
06-003	5SNSP0009523	BASE ASSY,	1	
06-B11	5MBSQ44008NB	TP DEL TITE SCREW (+)	4	
06-B12	5MBSPB4008NB	BIND HEAD SCREW (+)	2	
07-001	5SNP0009092	BASE	1	
07-002	5SNSP0009093	COVER BASE	1	
07-003	5SNSP0009094	CASTER A	2	
07-004	5SNSP0009081	CASTER B	2	
07-005	5SNSP0009555	INLET, 100V	1	
07-007	5SNSP0009084	CABLE EARTH A	1	
07-008	5SNSP0009184	CONN. CORD S00754	1	
07-009	5MVVSSO6J**1	SER. NO. PLATE (U)	1	
07-B10	5MBTPB4008TB	BIND T.T SCREW (+)	10	
07-B11	5MBTPB3006TB	BIND T.T SCREW (+)	2	
07-B12	5MBTPB3006TB	BIND T.T SCREW (+)	2	
07-B13	5MBSPA4008NS	CAGE SCREW (+)	1	
07-B14	5MBWG40855SN	OT. LOCK WASHER	1	
08-001	**5SNSP0009085**	**GUIDE ENTER ASSY**	**1**	
08-002	**5SNSP0009086**	**UPPER PASS ASSY**	**1**	
08-003	**5SNSP0009087**	**SOLENOID ASSY A**	**1**	
08-004	**5SNSP0009074**	**SOLENOID ASSY B**	**1**	
08-005	**5SNSP0009194**	**PLATE TENSION ASSY**	**1**	

Ref. #	Part Code	Description	Quantity	Remarks
08-006	5SNSP0009075	FRAME MAIN ASSY	1	
08-007	5SNSP0009076	PLATE PWB	1	
08-008	5SNSP0009077	PLATE NUT	1	
08-009	**5SNSP0009078**	**ACTUATOR 1**	**1**	
08-010	**5SNSP0009079**	**SENSOR**	**1**	
08-011	**5SNSP0009067**	**GUIDE FLAP**	**1**	
08-012	**5SNSP0009068**	**LEVER SAFETY**	**1**	
08-013	5SNSP0009069	HOLDER	6	
08-014	5SNSP0009070	MICRO SW	1	
08-015	5SNSP0009071	SPACER	1	
08-016	**5SNSP0009072**	**MOTOR FEED ASSY**	**1**	
08-017	5SNSP0009060	BUSHING FLAP	2	
08-018	5SNSP0009061	SPRING SOL B	1	
08-019	5SNSP0009062	SPRING ACTUATOR	2	
08-020	**5SNSP0009063**	**PWB CONTROLLER**	**1**	
08-021	**5SNSP0009064**	**PWB DRIVER**	**1**	
08-023	5SNSP0009518	TRANS ASSY, 100V	1	
08-025	5SNSP0009047	SPRING SOL A	1	
08-026	5SNSP0009055	PULLEY FEED T26, MOT.	1	
08-027	5SNSP0009056	LOCKING CARD SPACER	4	
08-029	5SNSP0009058	WIRE SADDLE B, WS-3NS	2	
08-030	5SNSP0009079	ACTUATOR 2 ASSY	2	
08-031	**5SNSP0009182**	**CONN. CORD S00752**	**1**	
08-032	5SNSP0009183	CONN. CORD S00753	1	
08-033	5SNSP0009185	CONN. CORD S00755	1	
08-034	5SNSP0009173	CONN. CORD S00757	1	
08-035	5SNSP0009174	CONN. CORD S00758	1	
08-036	5SNSP0009175	CONN. CORD S00759	1	
08-037	**5SNSP0009059**	**BELT DRIVE T 400**	**1**	
08-038	**5SNSP0009046**	**BELT DRIVE T 67**	**1**	
08-039	5SNSP0009047	SPRING SOL A	1	
08-040	5SNSP0009097	BUSHING FLANGE	2	
08-041	5MVVL761WN31	LABEL CAUTION TRAY	1	
08-042	5SNSP0009619	SUPPORT PAPER	2	
08-043	5SNSP0009621	GUIDE PAPER L	1	
08-044	5SNSP0009620	GUIDE PAPER R	1	
08-B10	5MBSPB4006NZ	BIND HEAD SCREW (+)	2	
08-B11	5MBSPB3004NZ	BIND HEAD SCREW (+)	2	
08-B12	5MBSPB3016NZ	BIND HEAD SCREW (+)	2	
08-B13	5MBSPB3006NZ	BIND HEAD SCREW (+)	2	
08-B14	5MBTPB3006TB	BIND T.T SCREW (+)	4	
08-B15	5MBTPB3006TB	BIND T.T SCREW (+)	2	
08-B16	5MBTPB3006TB	BIND T.T SCREW (+)	2	
08-B17	5MBTPB3006TB	BIND T.T SCREW (+)	4	
08-B18	5MBTP43006TB	TP TAP. SCREW (+), FEED	2	
08-B19	5MBTP44006TB	TP TAP. SCREW (+)	1	
08-B20	5MBTPB3008TB	BIND T.T SCREW (+)	2	
08-B21	5MBTP44008TB	TP TAP SCREW (+)	4	
08-B22	5MBSPA4008NS	CAGE SCREW (+), EARTH	1	
08-B23	5MBCS2025XSP	CS STOP RING	2	
08-B24	5MBTPB4010TZ	BIND T.T. SCREW (+)	1	

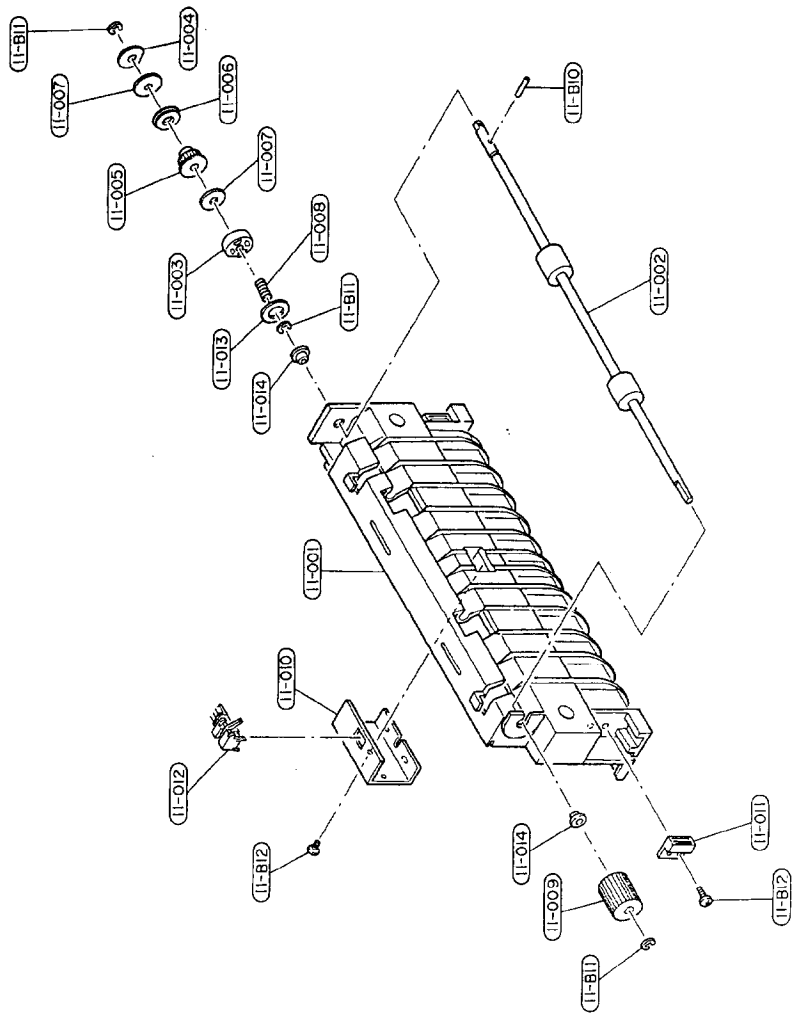
Ref. #	Part Code	Description	Quantity	Remarks
09-001	5SNSP0009195	SOLENOID A, KEEP		
09-002	5SNSP0009196	CHANGE PASS LEVER	1	
09-B10	5MBP3020WXSP	SPRING PIN	1	
10-001	5SNSP0009049	SOLENOID B, LATCH	1	
10-002	5SNSP0009050	ARM PATH CHANGE	1	
10-B10	5MBP2010WXSP	SPRING PIN	1	

3.3. Rear cover assembly



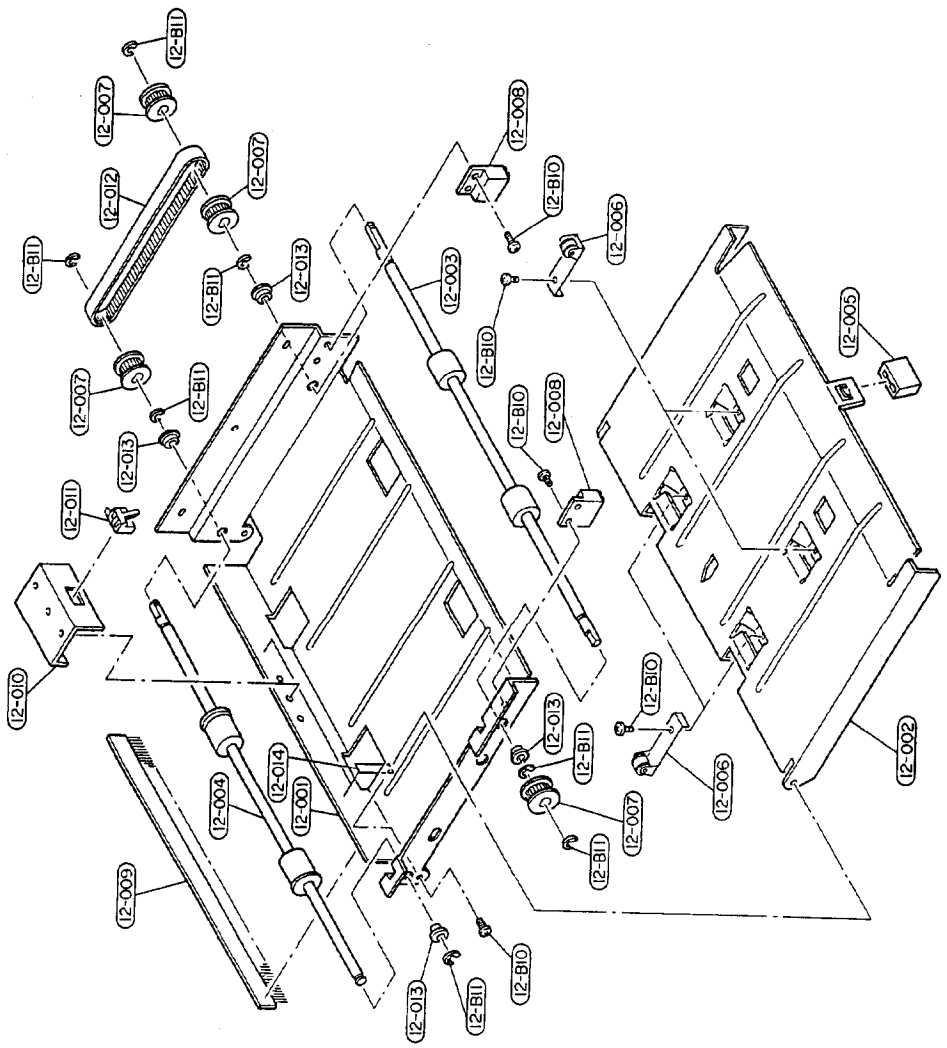
Ref. #	Part Code	Description	Quantity	Remarks
03-001	5SNSP0009102	COVER REAR	1	
03-002	5SNSP0009103	GUIDE PAPER REAR	1	
03-003	5SNSP0009104	ROLL FEED REAR	1	
03-004	5SNSP0009105	SHAFT DRIVE REAR	1	
03-005	5SNSP0009106	PULLEY CLUTCH T26	1	
03-006	5SNSP0009107	FLANGE PULLEY A	1	
03-007	5SNSP0009625	PINCH ROLLER ASSY 2	4	
03-008	5SNSP0009095	STAY COVER REAR	1	
03-009	5SNSP0009096	PLATE MAGNET	2	
03-010	5SNSP0009097	BUSHING FLANGE	2	
03-011	5SNSP0009099	PULLEY FEED T26	1	
03-012	**5SNSP0009098**	**BELT FEED T140**	**1**	
03-B11	5MBP1608WPLD	PARALLEL PIN	1	
03-B12	5MBTPB3006PZ	BIND T.T SCREW (+)	4	
03-B13	5MBTPB3008PZ	BIND T.T SCREW (+)	5	
03-B14	5MBTPS2608PZ	FLAT T.T SCREW (+)	2	
03-B15	5MBCE5060XSW	E STOP RING, SHAFT	3	

3.4. Entrance guide assembly



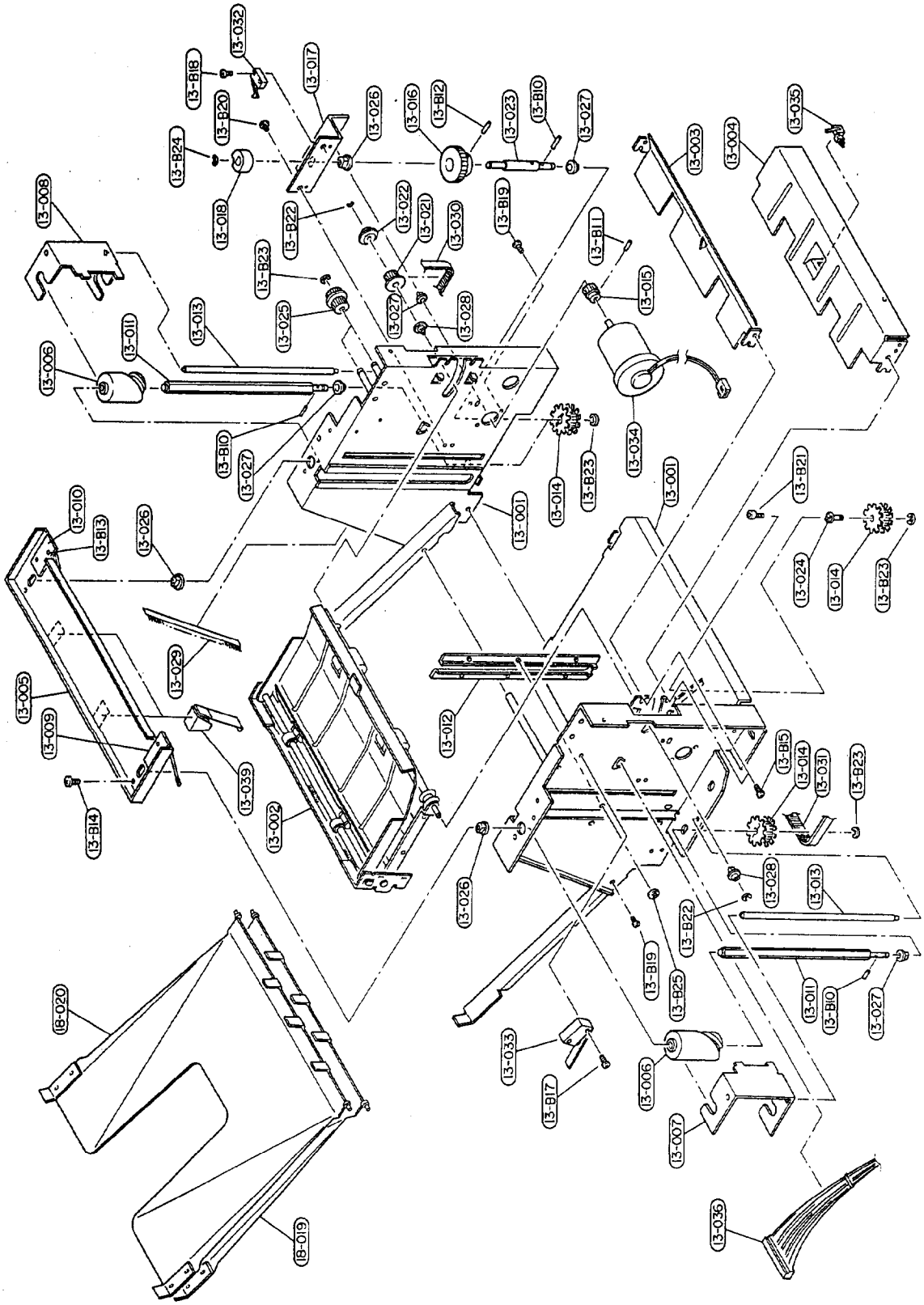
Ref. #	Part Code	Description	Quantity	Remarks
11-001	**5SNSP0009051**	**GUIDE ENTER**	**1**	
11-002	5SNSP0009052	ROLL REAR ENT	1	
11-003	5SNSP0009039	DISC DRIVE A	1	
11-004	5SNSP0009040	DISC DRIVE B	1	
11-005	5SNSP0009106	PULLEY CLUTCH T26	1	
11-006	5SNSP0009107	FLANGE PULLEY A	1	
11-007	5SNSP0009041	DISC CLUTCH	2	
11-008	5SNSP0009042	SPRING PLUNGER	1	
11-009	**5SNSP0009043**	**GEAR Z20**	**1**	
11-010	5SNSP0009044	BKT PASS SENSOR	1	
11-011	**5SNSP0009073**	**MAGNET CATCH**	**2**	
11-012	**5SNSP0009045**	**SENSOR FEED**	**1**	
11-013	5SNSP0009032	SPACER CLUTCH	1	
11-014	5SNSP0009097	BUSHING FLANGE	2	
11-015	5SNSP0009177	CONN. CORD S00761	1	
11-B10	5MBP2010PXLJ	PARALLEL PIN H7	1	
11-B11	5MBCE5060XSW	E STOP RING	3	
11-B12	5MBTPB3008PZ	BIND T.T SCREW (+)	5	

3.5. Upper path assembly



Ref. #	Part Code	Description	Quantity	Remarks
12-001	5SNSP0009033	GUIDE PATH UPPER	1	
12-002	5SNSP0009034	GUIDE PATH LOWER	1	
12-003	5SNSP0009035	ROLL PATH UP ENT	1	
12-004	5SNSP0009036	ROLL PATH UP EXIT	1	
12-005	5SNSP0009037	KNOB	1	
12-006	5SNSP0009108	PINCH ROLLER ASSY	4	
12-007	**5SNSP0009055**	**PULLEY FEED T26**	4	
12-008	5SNSP0009073	MAGNET CATCH	2	
12-009	5SNSP0009038	BRUSH DISCHARGE STK	1	
12-010	5SNSP0009044	BKT PASS SENSOR	1	
12-011	5SNSP0009045	SENSOR FEED	1	
12-012	5SNSP0009098	BELT FEED T140	1	
12-013	5SNSP0009097	BUSHING FLANGE	4	
12-014	5SNSP0009622	SHEET EXIT UP	2	
12-B10	5MBTPB3008TZ	BIND T.T SCREW (+)	11	
12-B11	5MBCE5060XSW	E STOP RING	7	

3.6. Sorter assembly



Ref. #	Part Code	Description	Quantity	Remarks
13-001	5SNSP0009123	STR FRAME ASSY	1	
13-002	**5SNSP0009124**	**SORTING PATH ASSY**	**1**	
13-003	5SNSP0009125	GUIDE STR ENT UP	1	
13-004	5SNSP0009126	GUIDE STR ENT LO	1	
13-005	5SNSP0009127	TIE PLATE	1	
13-006	**5SNSP0009128**	**SCREW**	**2**	
13-007	5SNSP0009129	GUIDE SCREW R	1	
13-008	5SNSP0009130	GUIDE SCREW L	1	
13-009	5SNSP0009132	PLATE SPRING R	1	
13-010	5SNSP0009131	PLATE SPRING L	1	
13-011	5SNSP0009133	SPLINE	2	
13-012	5SNSP0009134	SLOT LINER	2	
13-013	5SNSP0009135	SHAFT SLIDE	2	
13-014	**5SNSP0009136**	**PULLEY BIN DRIVE T20**	**4**	
13-016	**5SNSP0009138**	**WORM WHEEL**	**1**	
13-017	5SNSP0009139	BKT SENSOR CAM	1	
13-018	**5SNSP0009140**	**SENSOR CAM**	**1**	
13-019	**5SNSP0009141**	**TRAY A**	**6**	
13-020	**5SNSP0009142**	**TRAY B**	**7**	
13-021	**5SNSP0009143**	**PULLEY SLIP T28**	**1**	
13-022	5SNSP0009144	FLANGE PULLEY B	1	
13-024	5SNSP0009146	SHAFT TENSION	1	
13-025	**5SNSP0009147**	**GEAR IDLE Z28-T32**	**2**	
13-026	5SNSP0009148	BUSHING B	3	
13-027	5SNSP0009149	BUSHING A	4	
13-028	5SNSP0009150	BUSHING DRIVE	2	
13-029	5SNSP0009151	BRUSH DISCHARGE TRY	1	
13-030	**5SNSP0009152**	**BELT FLAT**	**1**	
13-031	**5SNSP0009153**	**BELT BIN DRIVE T400**	**1**	
13-032	**5SNSP0009154**	**SW CAM SENS**	**1**	
13-033	**5SNSP0009155**	**SW LIMIT TOP**	**1**	
13-034	**5SNSP0009156**	**BIN MOTOR ASSY**	**1**	
13-035	5SNSP0009045	SENSOR FEED	1	
13-036	5SNSP0009176	CONN. CORD S00760	1	
13-037	5SNSP0009223	TRAY TOP	1	
13-038	5SNSP0009224	TRAY BOTTOM	1	
13-039	5SNSP0009623	BIN PRESS ASSY	2	
13-B10	5MBP2518WPLD	PARALLEL PIN	3	
13-B11	5MBP2516WXSP	SPRING PIN	1	
13-B12	5MBP3018WXSP	SPRING PIN	1	
13-B13	5MBTPB3006PB	BIND T.T SCREW (+)	2	
13-B14	5MBTPB3006PB	BIND T.T SCREW (+)	2	
13-B15	5MBTPB3006PB	BIND T.T SCREW (+)	2	
13-B16	5MBTPB3006PB	BIND T.T SCREW (+)	2	
13-B17	5MBTPB3016PB	BIND T.T SCREW (+)	2	
13-B18	5MBTPB2310PB	BIND T.T SCREW (+)	2	

Ref. #	Part Code	Description	Quantity	Remarks
13-B19	5MBSPB4006NB	BIND HEAD SCREW (+)	2	
13-B20	5MBTPB4006PB	BIND T.T SCREW (+)	2	
13-B21	5MBSHM4008NB	HEXA SKT HEAD BOLT	1	
13-B22	5MBCE3060XSW	E STOP RING	2	
13-B23	5MBCE5060XSW	E STOP RING	6	
13-B24	5MBCE6080XSW	E STOP RING	1	
13-B25	5MBCS4025XSP	CS STOP RING	12	

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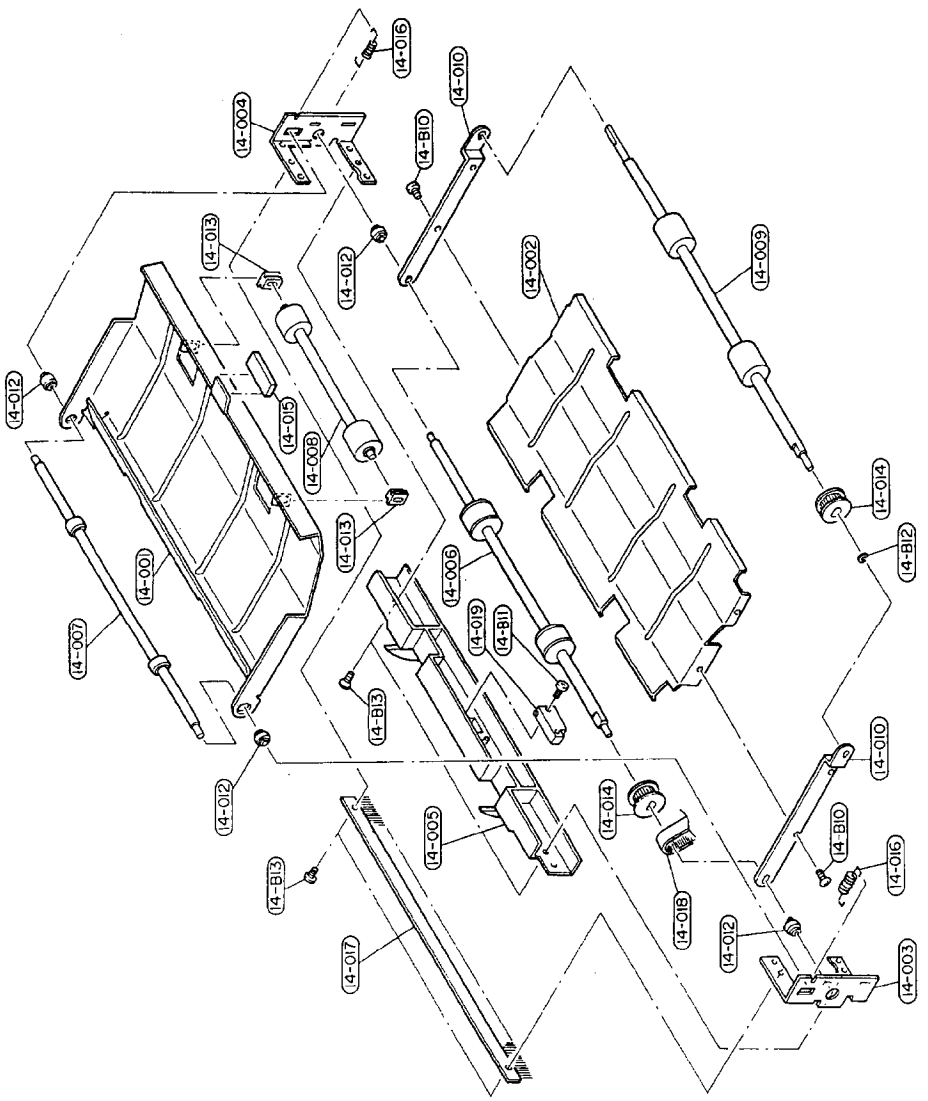
3.7. Sorting path assembly



Ref. #	Part Code	Description	Quantity	Remarks
14-001	**5SNSP0009159**	**UPPER GUIDE STR**	**1**	
14-002	5SNSP0009158	LOWER GUIDE STR	1	
14-003	5SNSP0009160	00000BKT SCREW GUIDE L	1	
14-004	5SNSP0009161	BKT SCREW GUIDE R	1	
14-005	5SNSP0009162	FRAME STR EXIT	1	
14-006	5SNSP0009163	ROLL STR EXIT DRIVE	1	
14-007	5SNSP0009164	ROLL STR EXIT	1	
14-008	5SNSP0009165	ROLL STR ENT DRIVE	1	
14-009	5SNSP0009166	ROLL STR ENT	1	
14-010	5SNSP0009167	ARM L	1	
14-011	5SNSP0009168	ARM R	1	
14-012	5SNSP0009169	BUSHING ROLL DRIVE	4	
14-013	5SNSP0009170	BUSHING ROLL	2	
14-014	**5SNSP0009171**	**PULLEY STR T28**	**2**	
14-015	5SNSP0009037	KNOB	1	
14-016	5SNSP0009179	SPRING EJECT	1	
14-017	5SNSP0009180	BRUSH DISCHARGE STR	1	
14-018	5SNSP0009098	BELT FEED T140	1	
14-019	**5SNSP0009181**	**SENSOR EMPTY**	**1**	
14-B10	5MBTPB3006TB	BIND T.T SCREW (+)	4	
14-B11	5MBTPB3018PB	BIND T.T SCREW (+)	1	
14-B12	5MBCE5060XSW	E STOP RING	1	
14-B13	5MBSPB3006NB	BIND HEAD SCREW (+)	4	

Chapter 4: Hardware notes

Table of Contents

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4.1. Introduction

This chapter explains the operation of the electrical circuits in the sorter. Procedures for hardware troubleshooting are also included in this chapter. Schematic diagrams are provided in Appendix. The schematic diagram should be referred to along with the explaination in the following pages.

The electrical system of the sorter can be functionally divided in the following two parts:

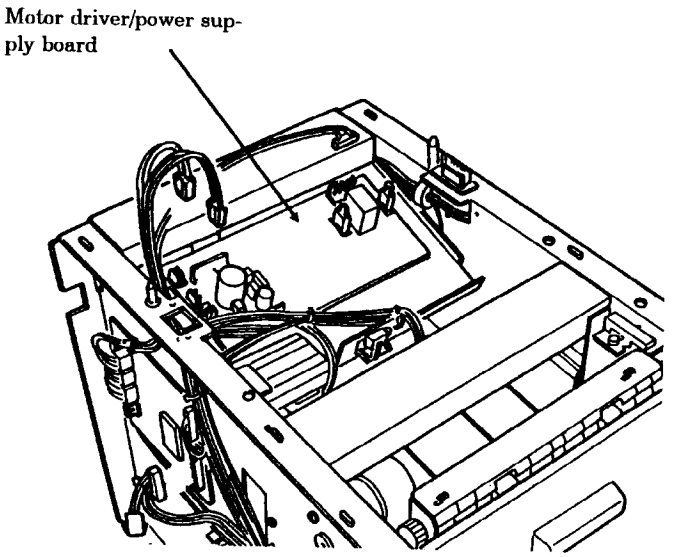
- ❖ Power supply and motor driver
- ❖ Controller

These two parts are mounted on separate boards. Details on each part follow are explained on the following pages.

4.2. Power supply/motor driver

See Figure 4.1. below. The motor driver/power supply board is located on the top of the sorter, inside the top panel.

FIG. 4.1. LOCATION OF POWER SUPPLY/DRIVER BOARD



4.2.1. Power supply

See Figure 4.2. on next page.

The sorter has no power switch provided as the printer's power switch simultaneously activates the sorter's power supply. When printer power turns on, the +5V DC reaches at pin #3 of the interface connector. It activates and closes relay RL1 on the motor driver/power supply board which in turn connects the primary power (120 or 220 V AC) to transformer T1. The power supply section produces both the +5 V and +24 V DC and feeds them accordingly to the respective circuits. Regulater IC1 is provided for the +5V power supply.

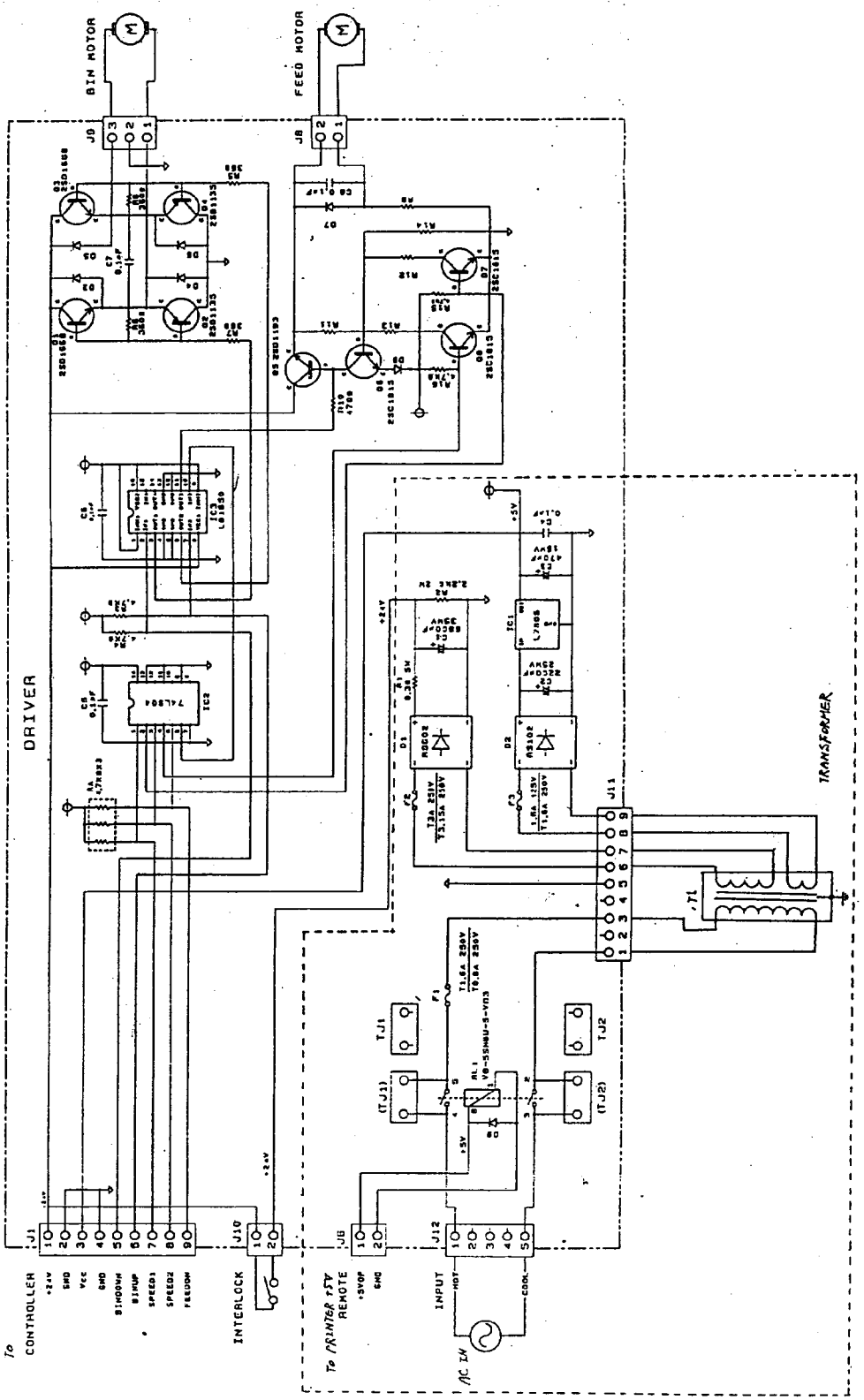
4.2.2. Motor driver

See Figure 4.2. on next page.

The motor driver receives commands for driving the bin motor and feed motor from the controller board through connecotor J1.

The *feed* motor is located on the top of the sorter, inside the top panel. The feed motor drives the feed roller for feeding paper arriving from the printer towards the sorting path exit. Power voltage for this motor is regulated by means of resistors R11 and R13 on the power supply/motor driver board so as to obtain a constant 16 V DC source. The feed motor turns on when the level of pin #9 of J1 ($\overline{\text{FEEDON}}$) becomes low.

FIG. 4.2. POWER SUPPLY/DRIVER SCHEMATIC DIAGRAM

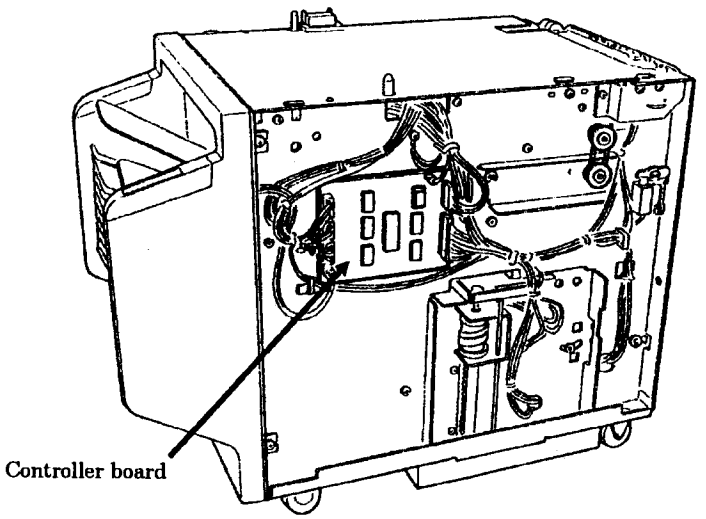


The *bin* motor is located in the sorter assembly and drives the screw cams for elevation of the trays revolving in either forward or reverse direction. The base signal (BINDOWN) of transistors Q1 and Q2 and the base signal (BINUP) of transistors Q3 and Q4 determine the mode of the motor revolution: The sorter assembly goes down when the level of pin #5 of J1 (BINDOWN) becomes low; the sorter assembly goes up when the level of pin #6 (BINUP) becomes low.

4.3. Controller

The controller board is located on the right inside of the sorter as show in Figure 4.3. below.

FIG. 4.3. LOCATION OF THE CONTROLLER BOARD



A 4-bit CPU (μPD75004) is used in the controller to manage controlling the following devices, while keeping contact with the printer using the serial communcation method.

- Solenoid driver
- Printer interface
- Sensor controller

Details on each of these devices follow.

4.3.1. Solenoid driver

The sorter has two solenoids: SL1 is located as shown in Figure 4.4. below and changes the paper path according to the simultaneous activation of the duplexer (DU-1); SL2 is located as shown in Figure 4.5. It selects and deselects the sorter's bulk stacker tray (located above the first, top tray).

See Figure 4.6. If the sorter is used together with the duplexer for duplex printing, the CPU IC1 turns the $\overline{\text{DPSON}}$ signal low, which in turn energizes SL2 to allow the paper to be fed into the duplexer.

The solenoid SL1 is kept energized by means of a pulse signal of several hundreds millisecond. Paper is sorted in the sorter trays when $\overline{\text{SBPON}}$ is low; and when $\overline{\text{SBPOFF}}$ is low, paper is stacked in the bulk stacker tray.

FIG. 4.4. SOLENOIDS SL1 AND SL2

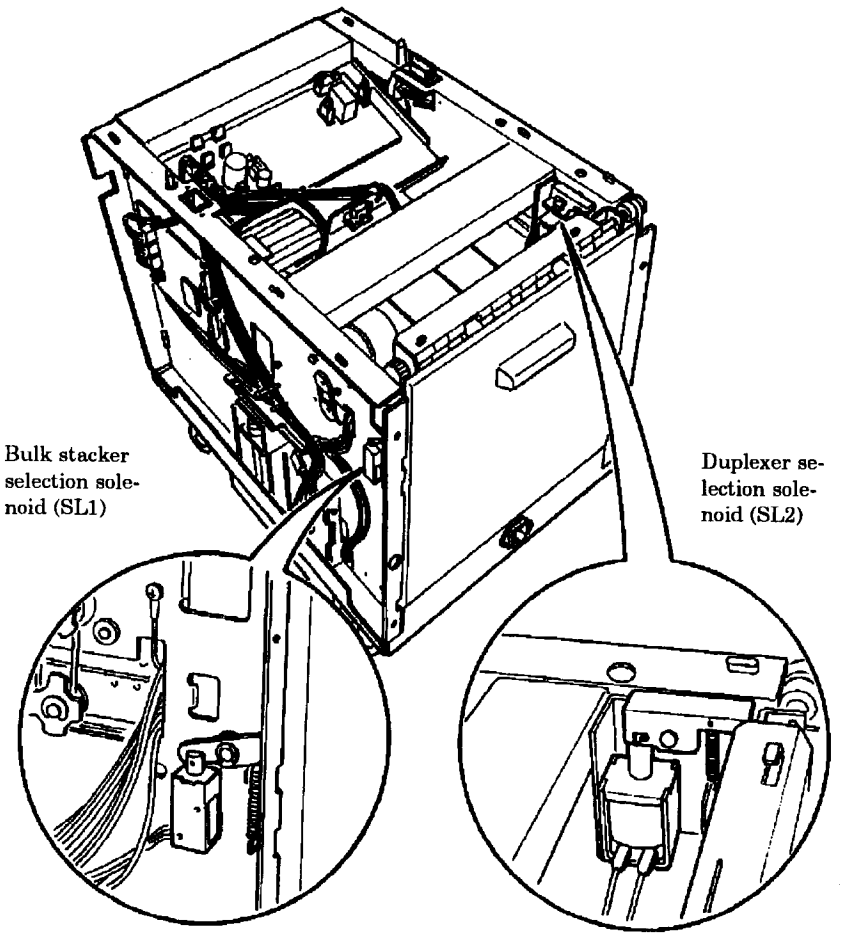
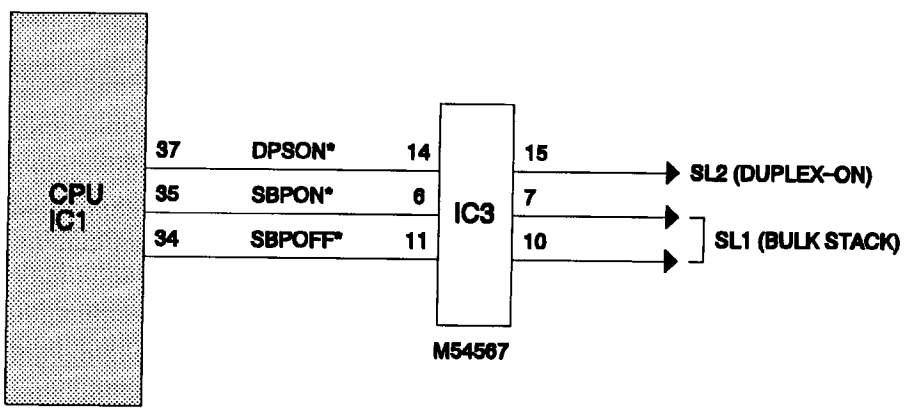


FIG. 4.5. SOLENOID CONTROL SIGNALS



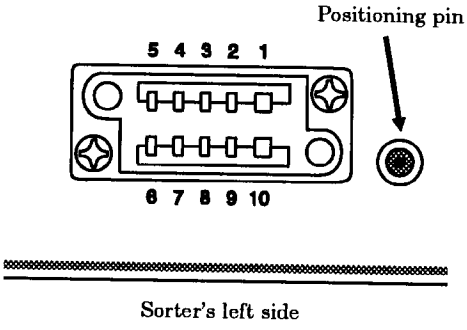
4.4. Printer interface

This section provides information regarding the sorter's interface to the printer.

4.4.1. Connector configuration

The sorter and the printer exchange signals between each other through connector J7 which is mounted on top of the sorter. The names and the functions of the signals handled by the sorter are as follows.

FIG. 4.6. SORTER CONNECTOR AND PIN ASSIGNMENT



PIN	SIGNAL	DESCRIPTION
1	SENS	Duplexer's feed path sensor (open collector) output (+24V if duplexer is installed above the sorter)
2	$\overline{\text{SCKD}}$	Serial clock
3	+5V	+5V power
4	$\overline{\text{READY}}$	Hand shake signal
5	SEL0	Select bit 0
6	SEL1	Select bit 1
7	SEL2	Select bit 2
8	SID	Sorter output data
9	SOD	Sorter input data
10	GND	Ground

Signals SEL0, SEL1, and SEL2 are used by the printer to select and deselect the sorter. The sorter is selected as the paper destination when SEL0 is "1," SEL1 is "0," and SEL2 is "1."

All levels are of C-MOS level. Pulled-up for input and open-circuited for output. The clock-synchronous serial interface configuration is used with the maximum synchronization clock of 200 kHz.

4.4.2. Sorter CPU I/O interface

Table 4.1. below shows signals used by the sorter's CPU (μPD75004) for its I/O interface.

TABLE 4.1. SORTER CPU I/O SIGNALS

CPU PIN	SIGNAL	DESCRIPTION	LOGIC (MEANING)	INPUT/OUTPUT
12	SOD (SI)	Printer's communication command		Input
14	$\overline{\text{SCKD}}$	Communication clock		
19	$\overline{\text{BINHOME}}$	Home position sensing for sorter trays	Home position	
18	$\overline{\text{CAMON}}$	Sensing movement of sorter trays	Moving	
17	$\overline{\text{RCOPN}}$	Rear cover status	Cover open	
25	DSENS	Paper feeding in duplexer	No paper	
24	$\overline{\text{SOIN}}$	Paper detection in sorter's paper inlet	Paper detected	
23	$\overline{\text{NSBIN}}$	Paper detection in bulk tray	Paper detected	
22	$\overline{\text{SBIN}}$	Paper detection in sorting tray	Paper detected	
33	$\overline{\text{NSBEMP}}$	Paper empty detection in bulk tray	Paper empty	
32	$\overline{\text{NSBFULL}}$	Paper full in bulk tray	Paper full	
31	$\overline{\text{SBEMP}}$	Paper empty in sorting tray	Paper empty	
32	$\overline{\text{SBFULL}}$	Paper full in sorting tray	Paper full	
29—27	SEL0—SEL2	Sorter activation bits		
11, 10	DIPSW1—DIPSW2	Sorter mode selection bits; "1" for both bits (at power on)		
13	SID (S0)	Status to printer (communication)		Output
9	$\overline{\text{READY}}$	Ready to send status	Ready	
41	$\overline{\text{BINUP}}$	Sorting path moving up	Moving up	
40	$\overline{\text{BINDOWN}}$	Sorting path moving down	Moving down	
39	$\overline{\text{FEED}}$	Feed motor status	On	
38	$\overline{\text{RDYLED}}$	READY indicator status	On	
37	$\overline{\text{DPSON}}$	Path selection/duplexer	To duplexer	
36	—	Not used		
35	$\overline{\text{SBPON}}$	Paper path selection	To sorting trays	
34	$\overline{\text{SBPOFF}}$	Paper path selection	To bulk tray	
6	$\overline{\text{HVER}}$	Host printer accommodation	FS-3500/A	
7	—	Not used		

The following table shows port assignment for the sorter's CPU (μPD75004).

TABLE 4.2. SORTER CPU PIN ASSIGNMENT

PORT	BIT 3	2	1	0
Port0	SI	SO	SCK	—
Port1	—	$\overline{\text{RCOPN}}$	$\overline{\text{CAMON}}$	$\overline{\text{BINHOME}}$
Port2	$\overline{\text{SBIN}}$	$\overline{\text{NSBIN}}$	$\overline{\text{SOIN}}$	$\overline{\text{DSENS}}$
Port3	$\overline{\text{HVER}}$	$\overline{\text{VLOW}}$	—	$\overline{\text{READY}}$
Port4	$\overline{\text{RDYLED}}$	FEED	$\overline{\text{BINDOWN}}$	$\overline{\text{BINUP}}$
Port5	$\overline{\text{SBPOFF}}$	$\overline{\text{SBPON}}$	—	$\overline{\text{DPSON}}$
Port6	$\overline{\text{SBFULL}}$	$\overline{\text{SBEMP}}$	$\overline{\text{NSBFULL}}$	$\overline{\text{NSBEMP}}$
Port7	—	SEL2	SEL1	SEL0
Port8	—	—	DIPSW2	DIPSW1

4.5. Sensors

The sorter has sensors provided for controlling paper transportation and detection of paper jam. The following sensors are used:

TABLE 4.3. SORTER CPU PIN ASSIGNMENT

SENSOR (REF POSITION IN FIG. 3.8.)	SENSOR SIGNAL	FUNCTION	TYPE OF SENSOR	LOGIC
Sorter trays				
Sorter tray empty sensor (A)	$\overline{\text{SBE}}$	Mounted directly on the sorting path exit and detects the presence of paper in each tray.	Reflection photo-sensor	If paper exists in the tray, the level of pin #31 of CPU IC1 becomes low.
Paper feed sensor (B)	$\overline{\text{SOIN}}$	Mounted at the paper inlet of the sorter. Detects the paper fed and occurence of paper jam; provides various timings for sorter control.	Phto interrupter	Pin #24 of CPU IC1 turns to low while paper is sensed.
Sorter tray feed sensor (C)	$\overline{\text{SBIN}}$	Located at the sorter tray exit. Detects timing of paper exit and occurence of paper jam.	Photo interrupter	Pin #22 of CPU IC1 turns to low if paper exists.
Sorter tray home position sensor (D)	$\overline{\text{BINHOME}}$	Detects the home position for the sorter trays.	Microswitch	Pin #19 of CPU IC1becomes low when in the home position.
Sorter tray activation sensor (E)	$\overline{\text{CAMON}}$	Detects the current position of each sorter tray. The microswitch sensor closes when the tray comes down to the specific position.	Microswitch	Pin #18 of CPU IC1 becomes low when the tray is in the correct position.
Bulk tray				
Bulk tray paper-full sensor (F)	$\overline{\text{NSBFULL}}$	Detects if the bulk tray becomes full (approximately 500 sheets0.	Photo interrupter	Pin #32 of CPU IC1 becomes low when the bullk tray is full.
Bulk tray paper feed sensor (G)	$\overline{\text{NSBIN}}$	Mounted at the exit of the bulk tray; detects the timing for paper exit and occurence of paper jam.	Photo interrupter	Pin #32 of CPU IC1 becomes low when paper exists at the exit of the bulk tray.

4.6. Error messages

The printer looks after itself and shows various error codes starting with the **Call Service person** message if a defect is found during operation. The error messages pertaining to use of the sorter together with the printer are as follows.

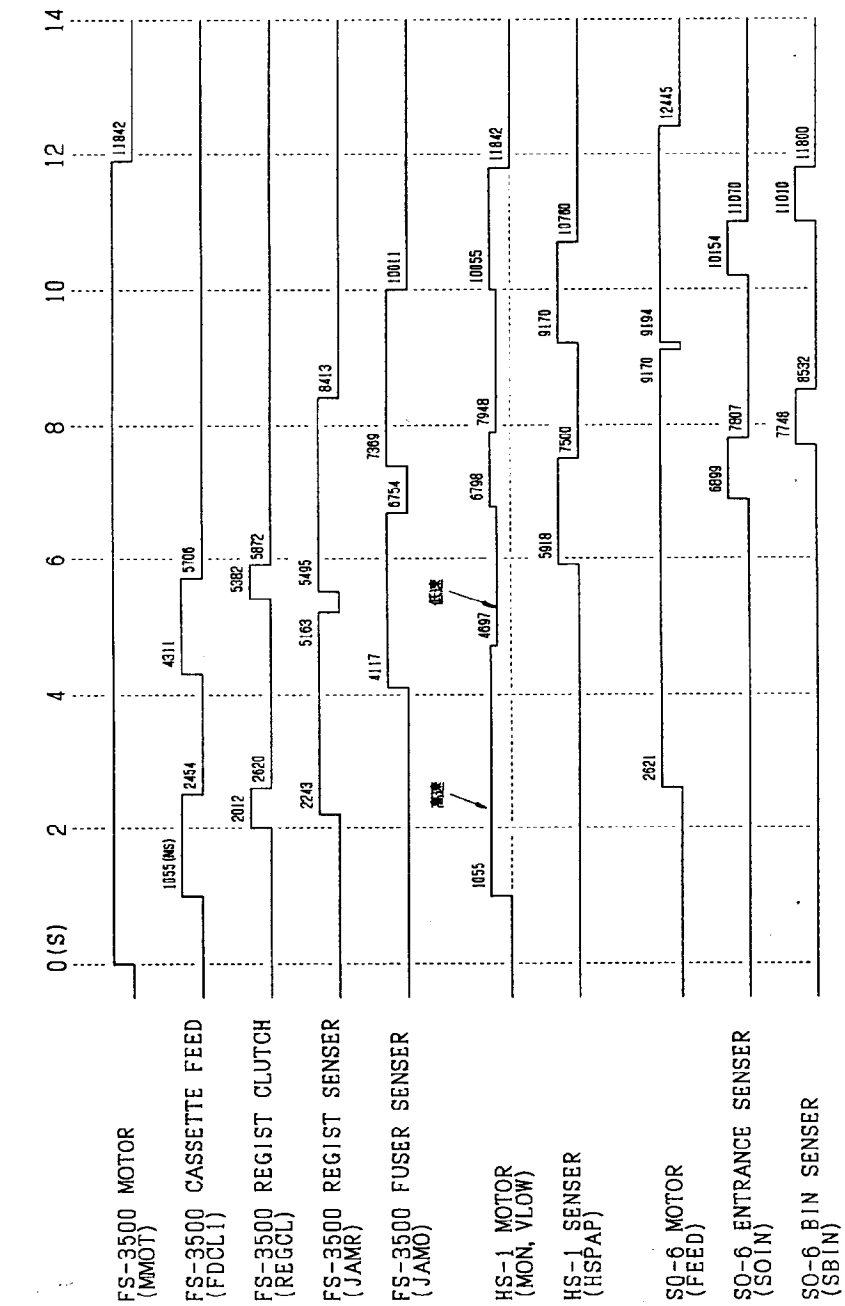
TABLE 4.4. ERROR CODES REGARDING SORTER

ERROR CODE	MEANING	SUGGESTED REMEDY
C4	Defect in communication between the sorter and the printer engine	Replace the printer's engine board. Replace the sorter's controller board. Replace the connector of sorter.
C5	Error during self-diagnostics of sorter	Replace the sorter's motor(s). Replace the sorter's board(s). Tray(s) accidentallys tuck—replace tray(s).
C6	Defect at power-up in communication between the sorter and the printer engine	Replace the printer's engine board. Replace the sorter's controller board. Replace the connector of sorter.

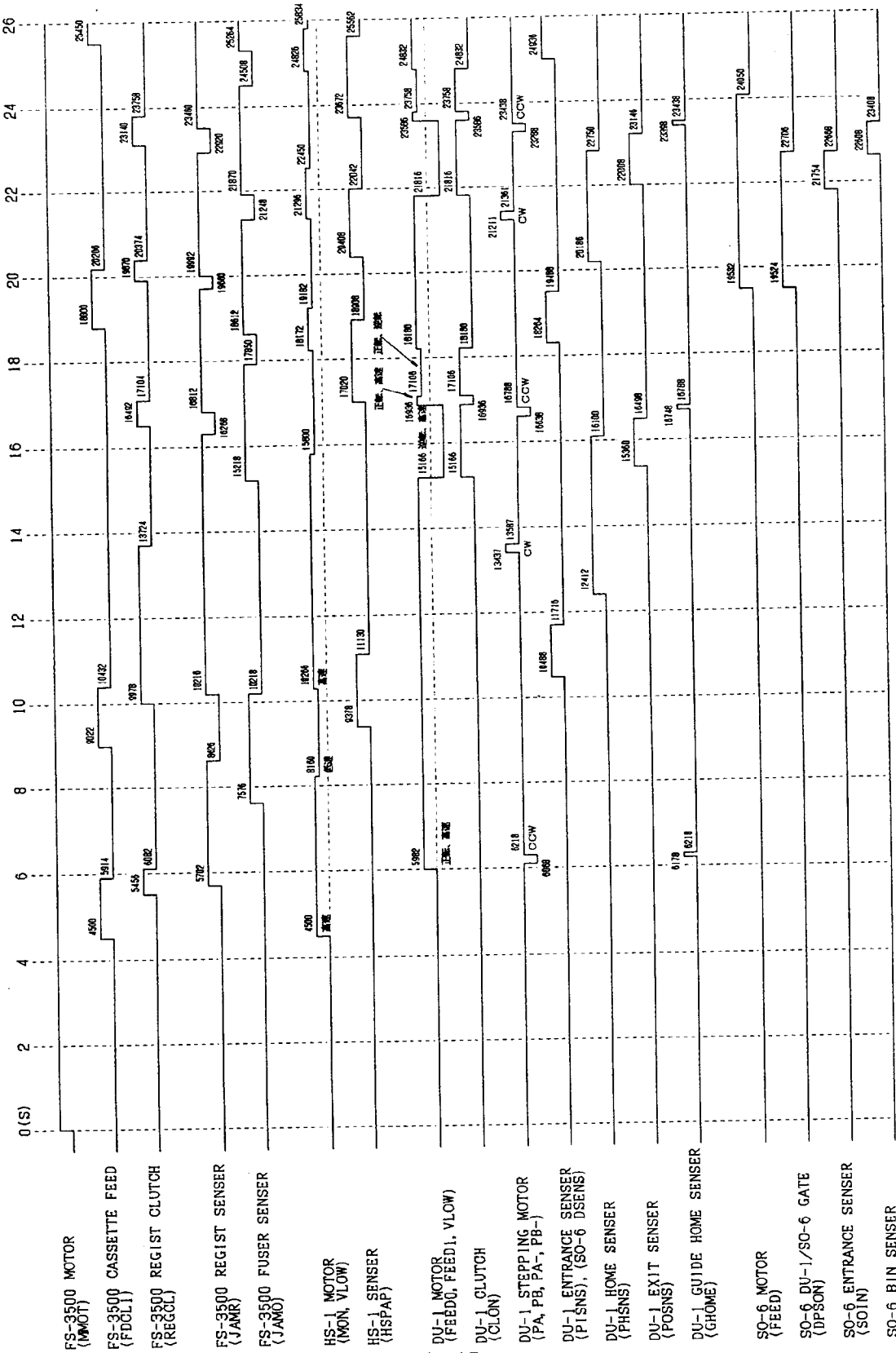
For other error codes, refer to printer's SERVICE MANUAL.

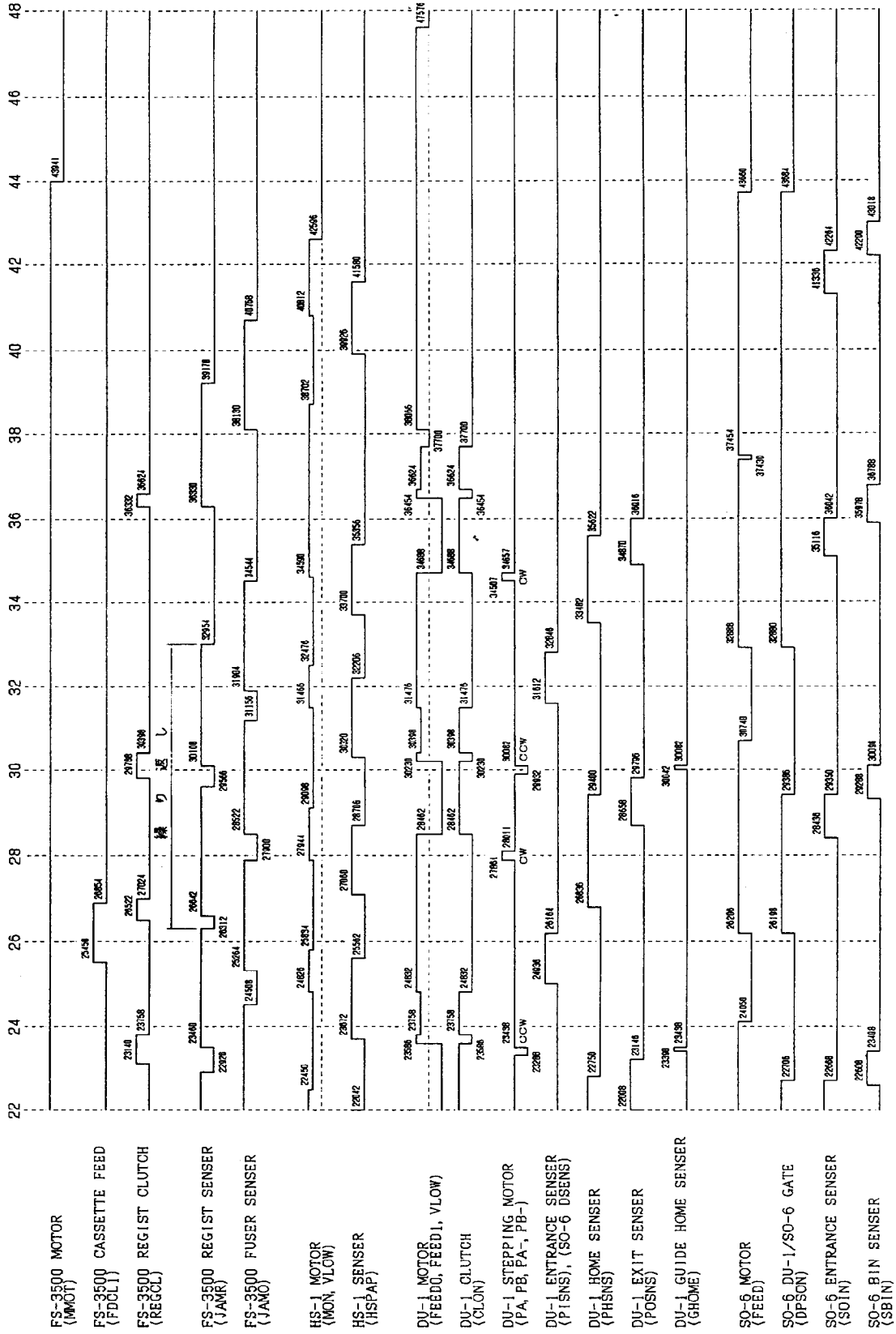
4.7. Printing timing charts

FS-3500/SO-6, A4



FS-3500/DU-1/SO-6, A4 (CONTINUED TO NEXT PAGE)




22
24
26
28
30
32
34
36
38
40
42
44
46
48
FS-3500 MOTOR (MMOT)
FS-3500 CASSETTE FEED (FDCLT)
FS-3500 REGIST CLUTCH (REGCL)
FS-3500 REGIST SENSER (JAMR)
FS-3500 FUSER SENSER (JAMO)
HS-1 MOTOR (MON, VLOW)
HS-1 SENSER (HSPAP)
DU-1 MOTOR (FEEDC, FEED1, VLOW)
DU-1 CLUTCH (CLON)
DU-1 STEPPING MOTOR (PA, PB, PA-, PB-)
DU-1 ENTRANCE SENSER (PISNS), (SO-6 DSENS)
DU-1 HOME SENSER (PHSNS)
DU-1 EXIT SENSER (POSNS)
DU-1 GUIDE HOME SENSER (GHOME)
SO-6 MOTOR (FEED)
SO-6 DU-1/SO-6 GATE (DPSON)
SO-6 ENTRANCE SENSER (SOIN)
SO-6 BIN SENSER (SBIN)
CW
CCW

Chapter 5: Troubleshooting

Table of Contents

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5.1. Introduction

This chapter explains procedures for identifying and correcting sorter problems (troubleshooting). Most of problems concerning the sorter may arise from defects in the interface with the printer as the sorter is directly controlled by the printer electronics. The *Analyzing basic symptoms* section (5.2.1.) on next page allows to determine whether the problem is caused by a defect in the interface with the printer or in the sorter's power supply.

This chapter covers the following troubleshooting procedures.

- Power supply/front panel problem
- Interface problem
- Driving unit (paper transportation) problem
- Sensor problem
- Error messages
- Paper jam

The diagram indicating the locations of the sensors is attached at the end of section 5.2.

5.1.1. Notes on power

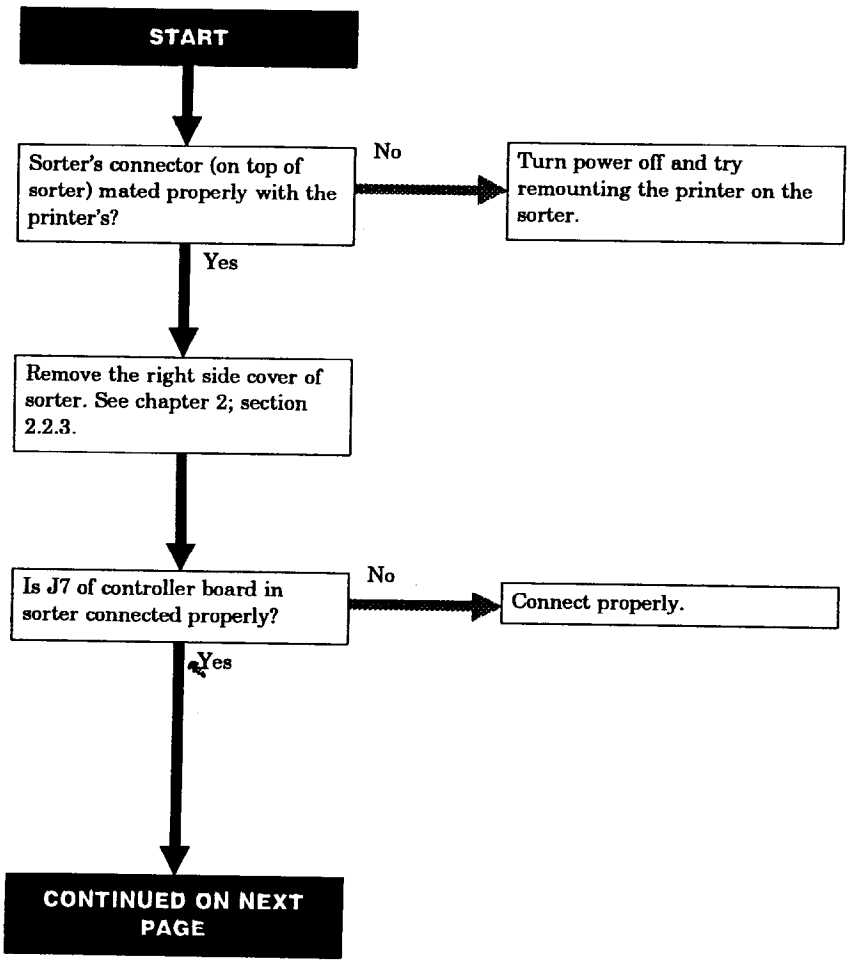
The driver board includes AC circuit. To avoid electrical shock hazard, a great care should be exercised when handling the driver board and other AC cablings. Unless instructed to be plugged to the power source, the sorter's power cord must be disconnected from power.

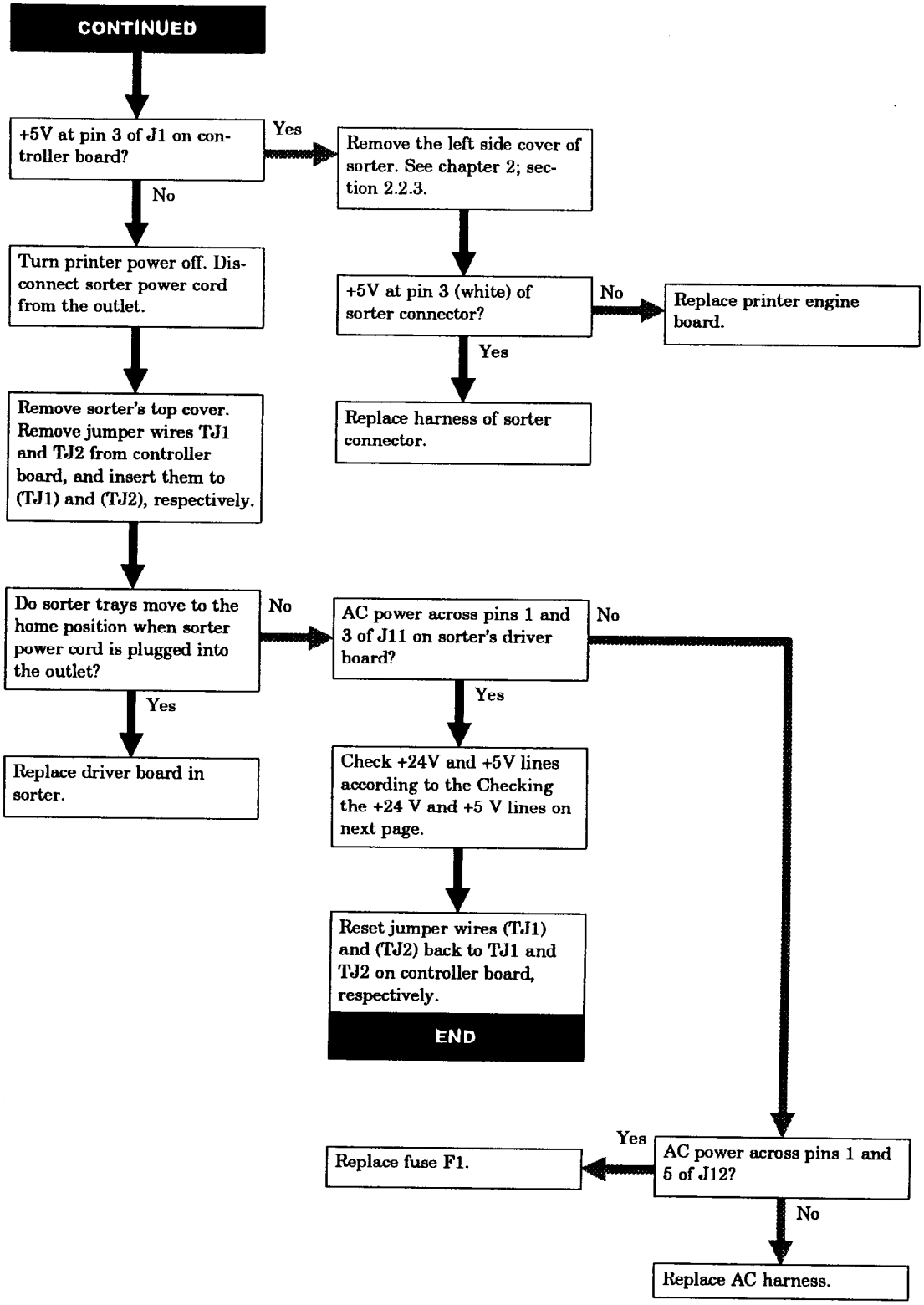
5.2. Troubleshooting

When a sorter malfunction occurs, begin troubleshooting by going through the following flowchart.

5.2.1. Analyzing basic hardware symptoms

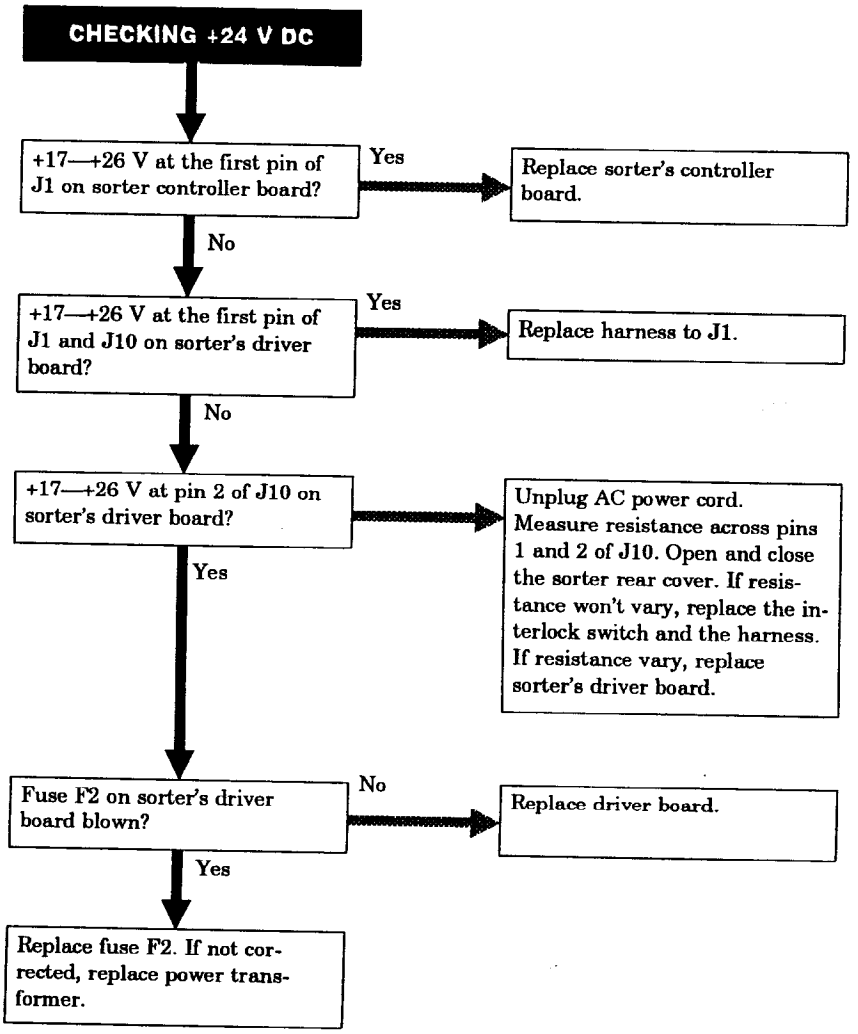
Following this chart allows analyzing basic problems concerning the sorter hardware. The sorter should be left installed to the printer in normal manner while following the flowchart.

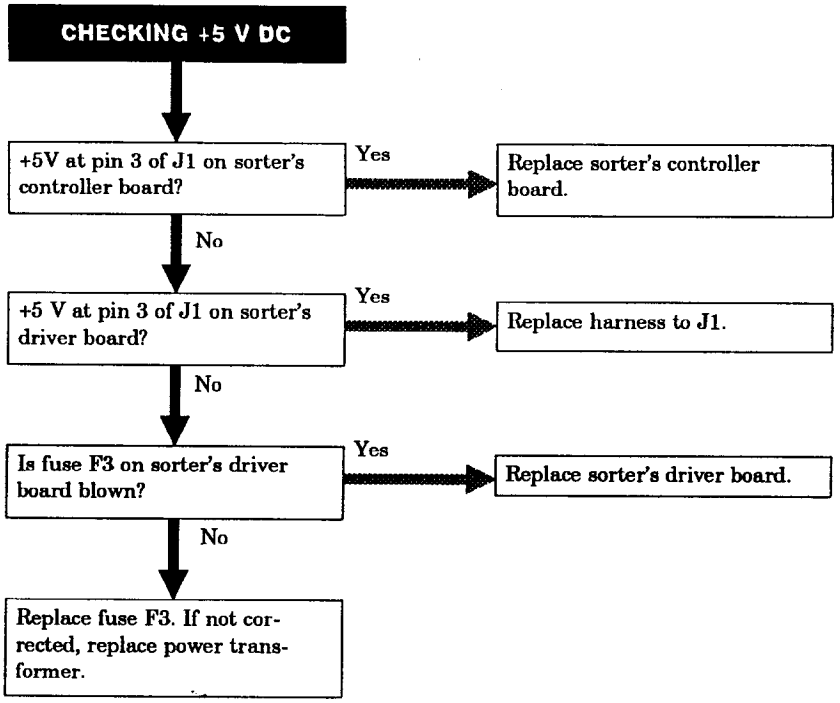



CONTINUED
+5V at pin 3 of J1 on controller board?
Yes
No
Remove the left side cover of sorter. See chapter 2; section 2.2.3.
Turn printer power off. Disconnect sorter power cord from the outlet.
+5V at pin 3 (white) of sorter connector?
No
Replace printer engine board.
Yes
Remove sorter's top cover. Remove jumper wires TJ1 and TJ2 from controller board, and insert them to (TJ1) and (TJ2), respectively.
Replace harness of sorter connector.
Do sorter trays move to the home position when sorter power cord is plugged into the outlet?
No
AC power across pins 1 and 3 of J11 on sorter's driver board?
No
Yes
Yes
Replace driver board in sorter.
Check +24V and +5V lines according to the Checking the +24 V and +5 V lines on next page.
Reset jumper wires (TJ1) and (TJ2) back to TJ1 and TJ2 on controller board, respectively.
END
Yes
Replace fuse F1.
AC power across pins 1 and 5 of J12?
No
Replace AC harness.

5.2.2. Checking the +24 V and +5 V lines

The following two charts allow checking whether the DC power lines are correctly routed.




CHECKING +5 V DC
+5V at pin 3 of J1 on sorter's controller board?
Yes
Replace sorter's controller board.
No
+5 V at pin 3 of J1 on sorter's driver board?
Yes
Replace harness to J1.
No
Is fuse F3 on sorter's driver board blown?
Yes
Replace sorter's driver board.
No
Replace fuse F3. If not corrected, replace power transformer.

5.2.3. Power supply/front indicator panel problem

POWER SUPPLY PROBLEM

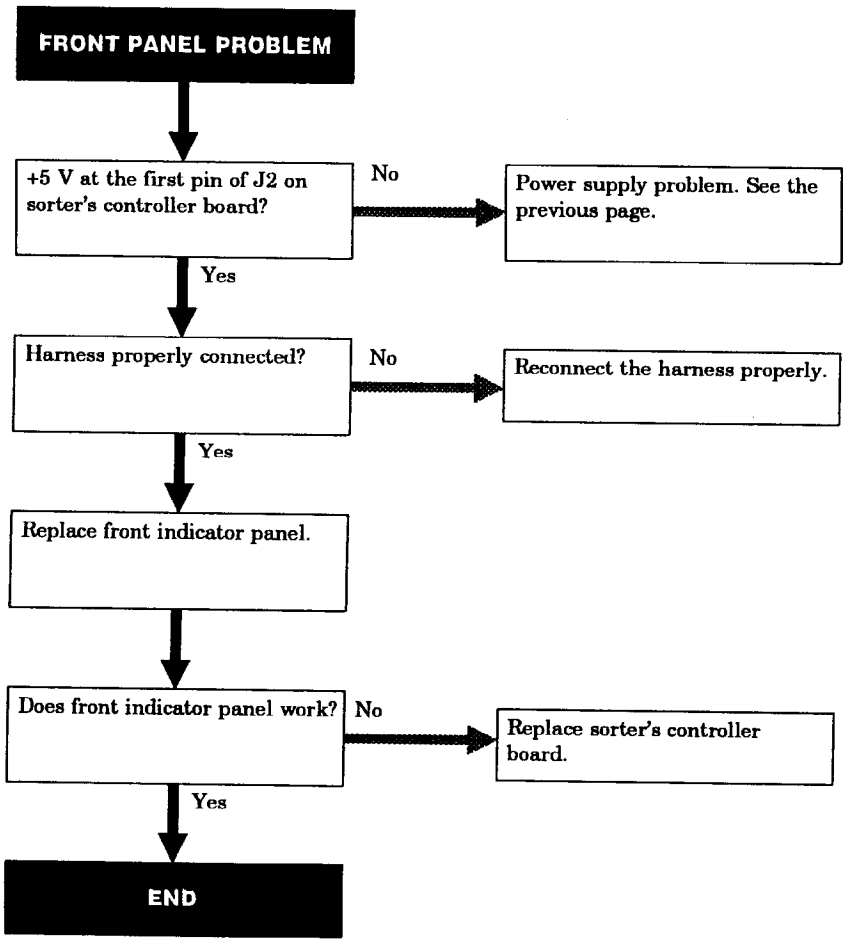
Power supply problem can mainly caused by the following two causes.

- ❖ Defect in the interface with the printer
- ❖ Defect in the power supply circuit

Troubleshooting to these items can be executed by following section 5.2.1., *Analyzing basic hardware symptoms*, previously explained.

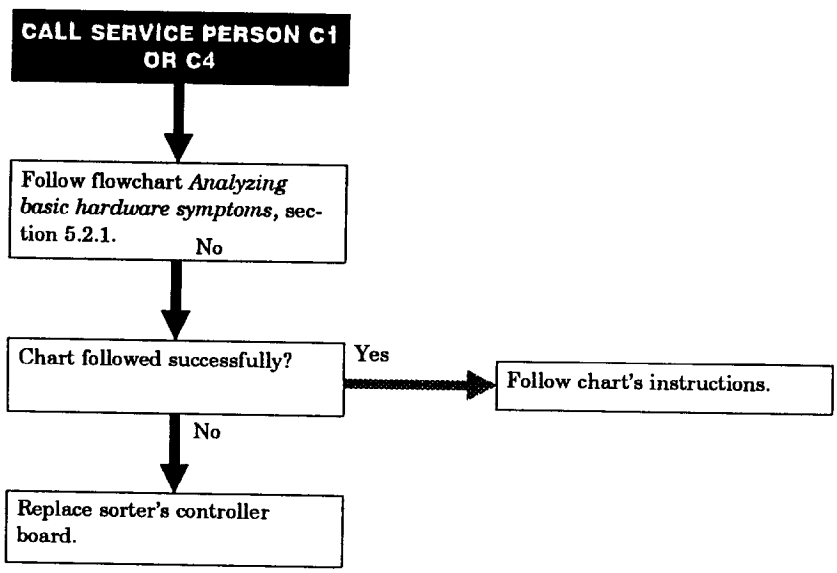
FRONT PANEL PROBLEM

To isolate problems regarding the sorter's front indicator panel, use the chart below.



5.2.4. Interface problem

Interface problems are implied by a printer's front panel message *Call Service person C1 or C4*. To act with these messages, follow section 5.2.1. *Analyzing basic hardware symptoms*, then use the chart below.

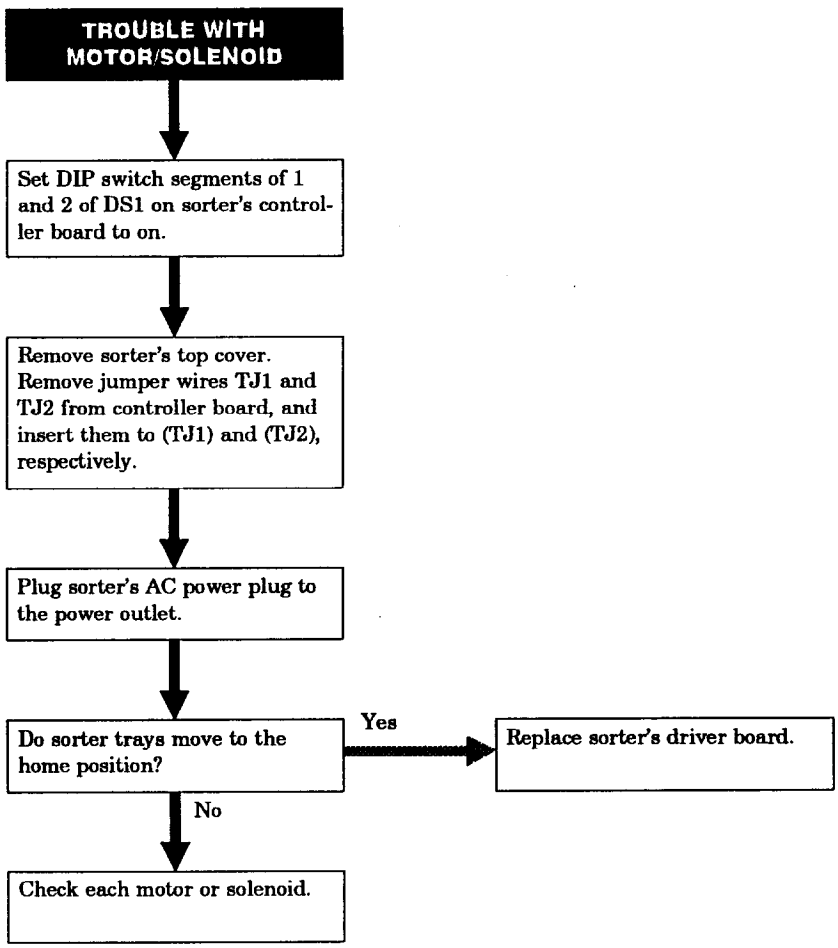


5.2.5. Mechanical problem

The sorter's main mechanical component are listed as follows:

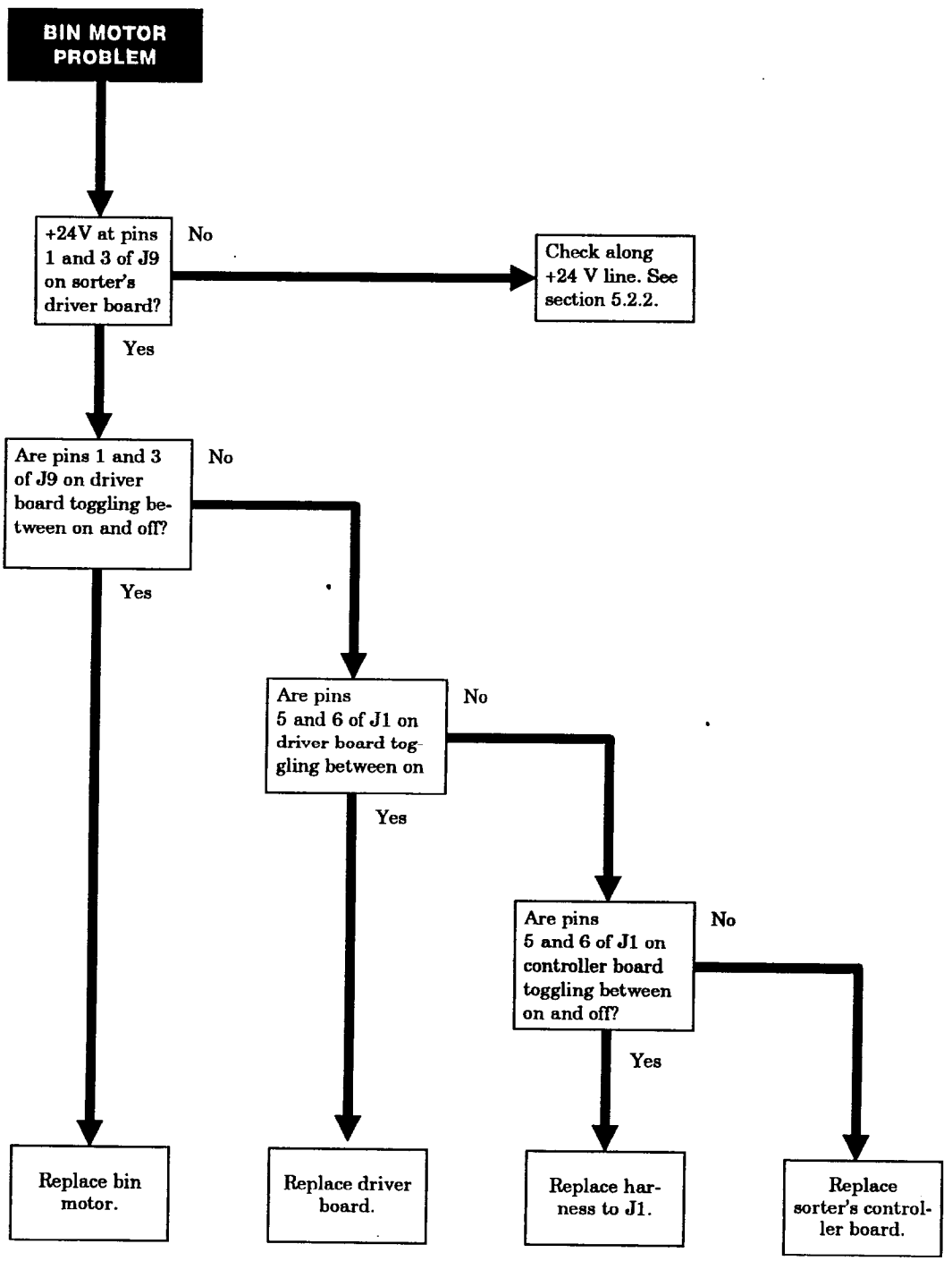
- ❖ Bin motor
- ❖ Feed motor
- ❖ Solenoid A (for switching paper to sorter or duplexer)
- ❖ Solenoid B (for switching sorter and bulk tray)

The following flowchart can be used for problems concerning any of above component. Before investigating on each component, follow this chart first.

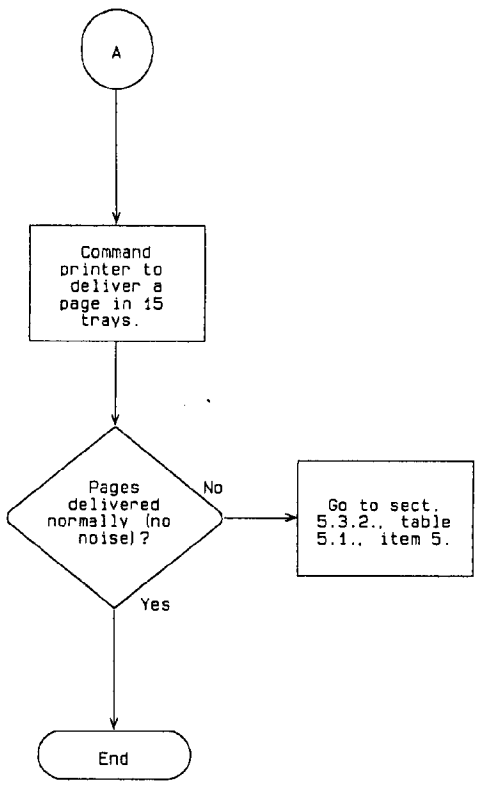


When troubleshooting is finished, reset jumper wires (TJ1) and (TJ2) back to TJ1 and TJ2 on controller board, respectively.

5.2.6. Bin motor problem



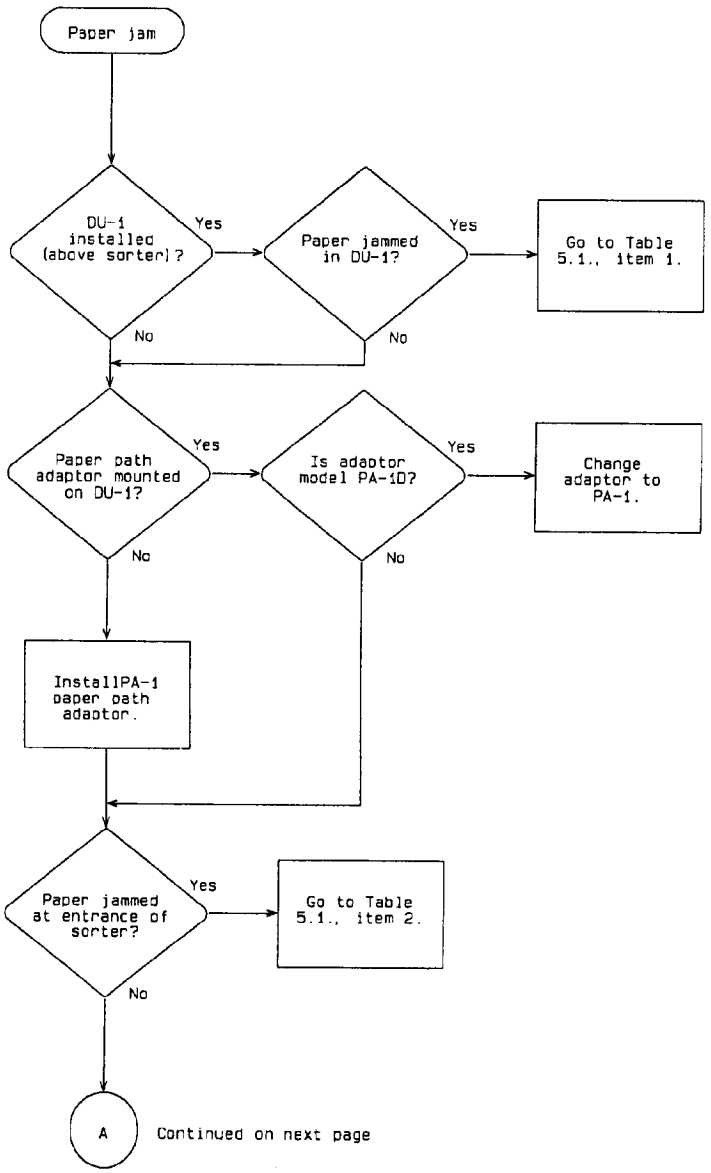
Analyzing paper jam problem--Continued



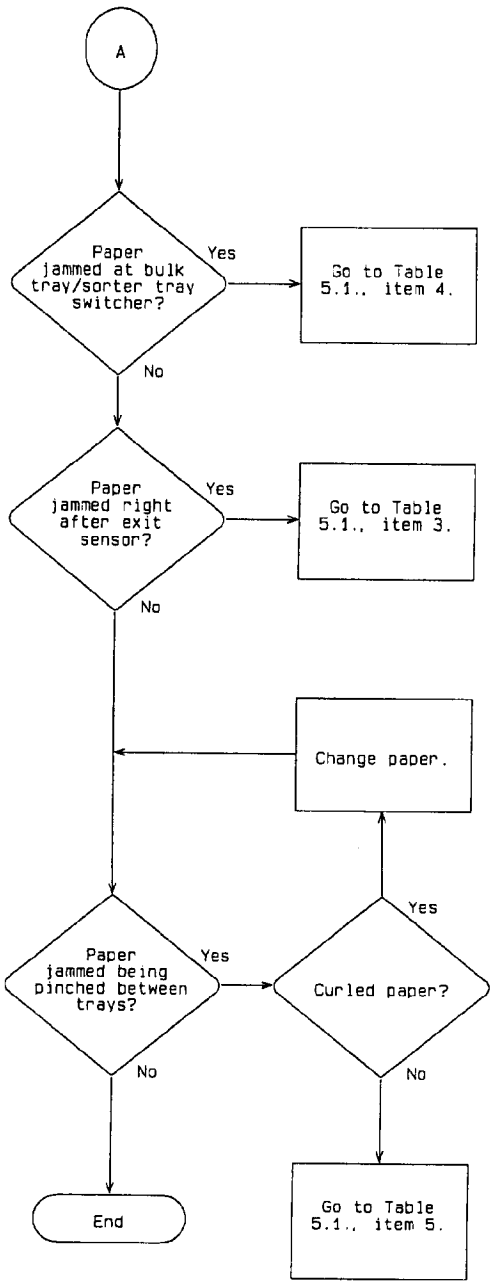
5.3.2. Analyzing paper jam problems

Follow the flowchart below when instructed to do so while following the *Analyzing paper jam problem—basic* flowchart (section 5.3.1.). This flowchart will in turn lead you to the specific remedy as tabled in Table 5.1.

Analyzing paper jam problems - 1



Analyzing paper jam problems - 2



The table below summarizes various symptoms and remedies for paper jam problems. Use this table according to the directions obtained by following the *Analyzing paper jam problems* flowchart.

TABLE 5.1. REMEDIES FOR PAPER JAM PROBLEMS

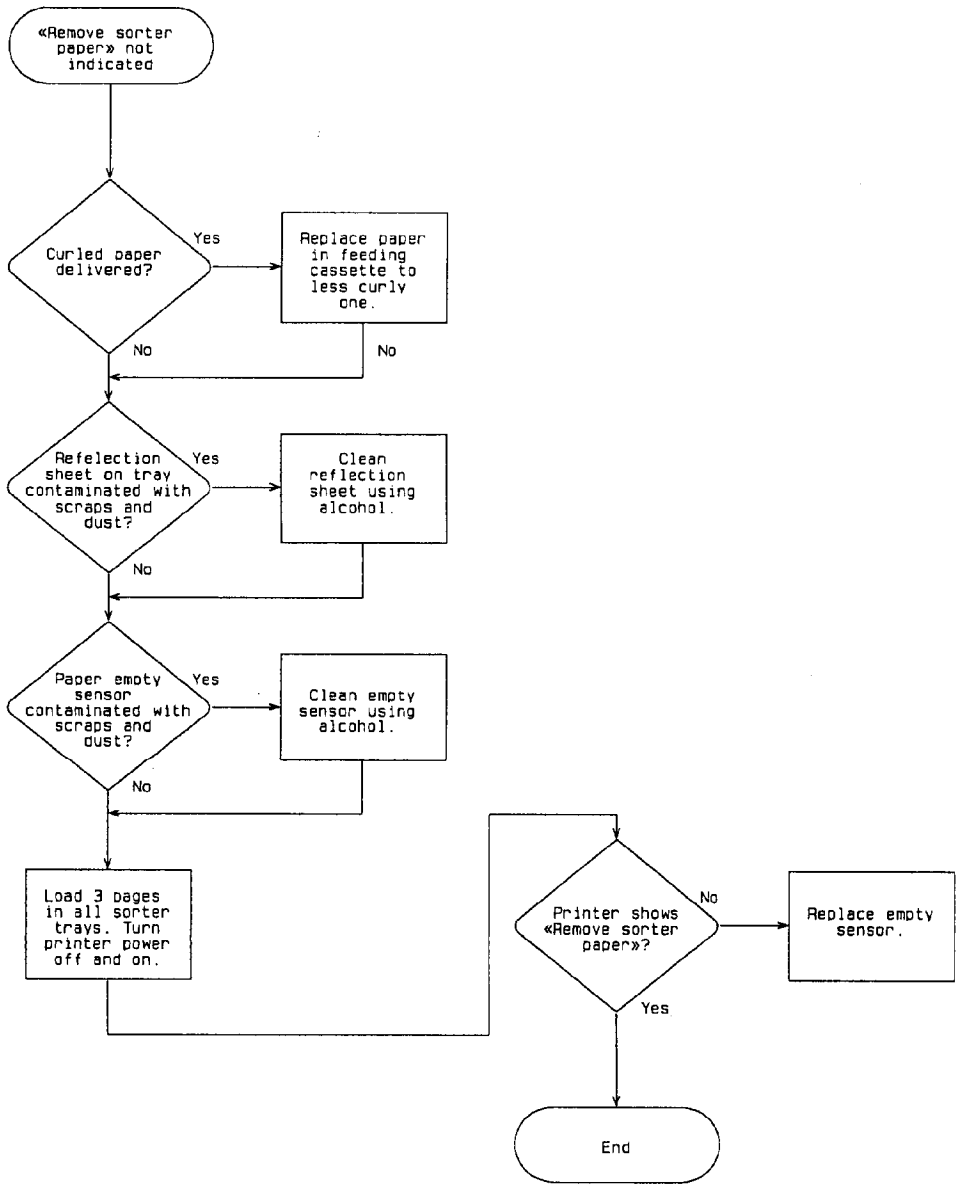
ITEM	SYMPTOM	CAUSE	SUGGESTED REMEDY
1	Paper missed to enter sorter but entered duplexer and jammed.	Defective sorter/ duplexer switching solenoid.	Check solenoid assembly if it operates properly. Replace solenoid assembly if necessary.
		Defective duplexer switching flap.	Check the flap switching lever at duplexer bottom if it operates properly. Replace the flap switching lever if necessary.
		After executing remedy, confirm sorter and duplexer work properly by running sorter in self test mode. To set test mode of sorter, move jumper wires from TJ1/TJ2 to (TJ1/TJ2) on driver board, and set DIP switches DS-1 and DS-2 on main board to the on position.	
2	Paper trapped at the entrance of sorter.	Paper path adaptor PA-1 is not mounted on sorter (if paper feeder [PF-5] is mounted above sorter), or paper path adaptor PA-1D is mounted on sorter.	Obtain and install the correct PA-1.
		Sorter's entrance roller (or PA-1 roller) did not revolve due to excessive disc clutch effect.	Replace disc clutch assembly.
		Loose driving belt tension or belt not hooked properly.	Hook belt properly and adjust the tension properly.
		Defective feed motor.	Confirm motor and driving mechanism work properly by running sorter in self test mode. To set test mode of sorter, move jumper wires from TJ1/TJ2 to (TJ1/TJ2) on driver board, and set DIP switches DS-1 and DS-2 on main board to the on position. Replace feed motor if necessary.
3	Paper jammed after clearing sensor.	Defective sensor(s). See Figure 5.1. for location of sensors.	Clean sensor. Check sensor actuator for smooth elevation.
			Operate sorter in self test mode. [Move jumper wires from TJ1/TJ2 to (TJ1/TJ2) on driver board, and set DIP switches DS-1 and DS-2 on main board to the on position.] Feed A5 paper. Check if sensors work. Replace sensor(s) if necessary.
4	Paper jammed (or mis-fed) at bulk/sorter switching flap.	Defective bulk/sorter switching flap/solenoid.	Operate sorter in self test mode. [Move jumper wires from TJ1/TJ2 to (TJ1/TJ2) on driver board, and set DIP switches DS-1 and DS-2 on main board to the on position.] Feed A5 paper. Check if bulk/sorter switching solenoid work. Replace flap/solenoid if necessary.

ITEM	SYMPTOM	CAUSE	SUGGESTED REMEDY
5	Paper jammed being pinched between sorter trays.	Excessively curled paper delivered.	Try reversing paper in source paper cassette. Replace paper.
		Damaged paper retaining (mylar) sheets on each tray.	Check all sorter trays if retaining (mylar) sheets are properly fitted (Use manual elevating mode.) Replace sorter tray if necessary.
		Defective empty sensor (recognizing no paper in a tray, allowing more than 50 pages enter the tray).	Load paper (more than 3 sheets) in each sorter tray. Turn printer power on. See if printer display shows Remove sorter paper. If not, follow flowchart Checking paper empty sensor on next page.
		Slowed-down tray elevation causing timing error of paper feeding and tray selection.	Operate sorter in self test mode. [Move jumper wires from TJ1/TJ2 to (TJ1/TJ2) on driver board, and set DIP switches DS-1 and DS-2 on main board to the on position.] Time the period needed for changing from tray 1 to tray 15. Depending on operating power source voltage, this should be less than: 5.2 sec. (AC 120V), 5.7 sec. (AC 220V), or 5.0 sec. (AC 240V).

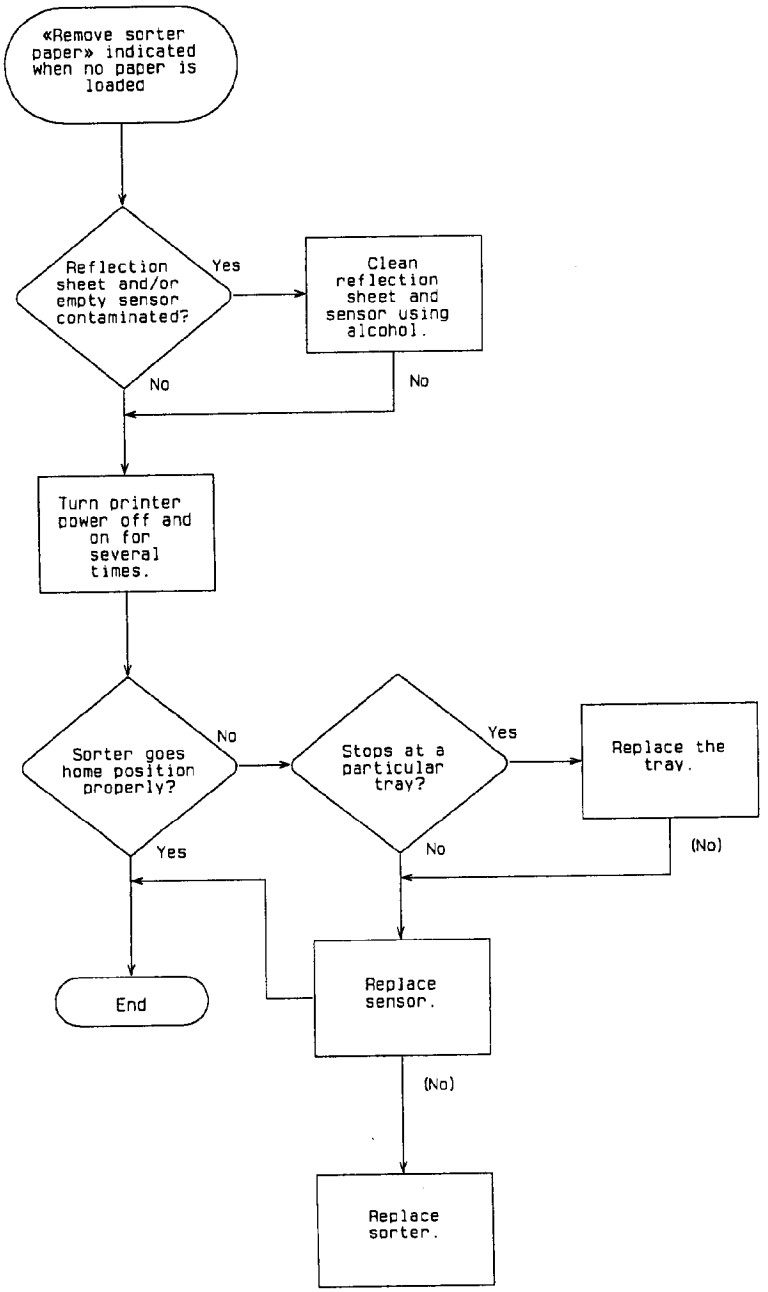
5.3.3. Paper empty sensor problem

Follow the flow chart below when instructed to do so while following the *Analyzing paper jam problem—basic* flowchart (section 5.3.1.). This flowchart will in turn lead you to the specific remedy in Table 5.2.

Paper empty sensor problem--1



Paper empty sensor problem--2



The table below summerzies symptoms and remdies for paper empty sensor problems. Use this table according to the directions in the Paper empty sensor problem flowchart (section 5.3.3.).

TABLE 5.2. REMEDIES FOR PAPER EMPTY SENSOR PROBLEMS

ITEM	SYMPTOM	CAUSE	SUGGESTED REMEDY
1	Sorter does not recognize paper in the tray. (e.g. Sorter does not show Remove sorter paper while paper is present at power up.)	The far end of the paper in the tray is excessively curled (See Figure 5.2.)	Change to paper with less tendency to curl.
		The sensing area at the far end of the paper is printed with solid black.	Avoid printing in the paper empty sensing area. (See Figure 5.2.)
		Sensor is contaminated with paper scraps and dust.	Clean the paper empty sensor using alcohol.
		Defective paper empty sensor.	Replace the paper empty sensor.
2	Sorter errorneously recognizes paper while no paper is present in the tray.	Sensor is contaminated with paper scraps and dust.	Clean the paper empty sensor using alcohol.
		Tray's refelection sheet is positioned in wrong part.	Affix the reflection sheet in the correct position.
		Defective paper empty sensor.	Replace the paper empty sensor.

FIG. 5.2. PAPER EMPTY SENSOR