Service and Maintenance Manual

EF-1

Envelope Feeder for
FS-1500[A]/FS-3500[A]
Revision 1.1

KYOCERA

Revision 1.00 May, 1993
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Revision 1.1 Aug., 1993 (at KEI, Irving)

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 harmfuil 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 Kyocera envelope feeder. The information in this manual contains the following chapters:

Chapter 1: General information

Chapter 2: Maintenance

Chapter 3: Envelope specifications

Chapter 4: Parts catalog

Chapter 5: Hardware notes

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

This chapter explains basic considerations and precautions to be observed when reparing, maintaining and inspecting the envelope feeder EF-1. The precautions are fairly extensive; however, to prevent accidents, it is very important that the service person read the precautions carefully, and observe them at all times.

At the end of the chapter, specifications for the product are provided.

1.2. Product description

The EF-1 is an envelope feeder for the Kyocera page printers. By installing the envelope feeder on the printer, the printer prints on a wide variety of different envelope sizes. The EF-1 feeds envelopes automatically, making it easy to print on large quantities of envelopes at one time.

The envelope feeder includes a motor and rollers to feed paper into the printer, and the built-in electronics for controlling the motor. Technical explanation for the electronics circuits is made in chapter 5, *Hardware Notes*, in this manual.

Topics covering the installation and operations of the printer are fully detailed in the paper envelope feeder's *User's Manual*.

1.2.1. Original packing list

The paper handler/stacker package contains each of the following items in the indicated quantities.

HS-1 paper handler/stacker, 1

Instruction manual (English, German, French, Italian, Spanish), 1

1.2.2. Names of parts

The envelope feeder has the following parts as shown in figure on next page.

Release buttons: Press both of these buttons to release the hooks when removing the envelope feeder from the printer.

Weight roller: Presses downward on the top of a stack of envelopes loaded into the feeder.

Feed roller: Picks up one envelope at a time from the stack in the stack tray and feeds it into the printer.

Paper guides: Adjust to the size of the envelopes to keep them centered in the stack tray.

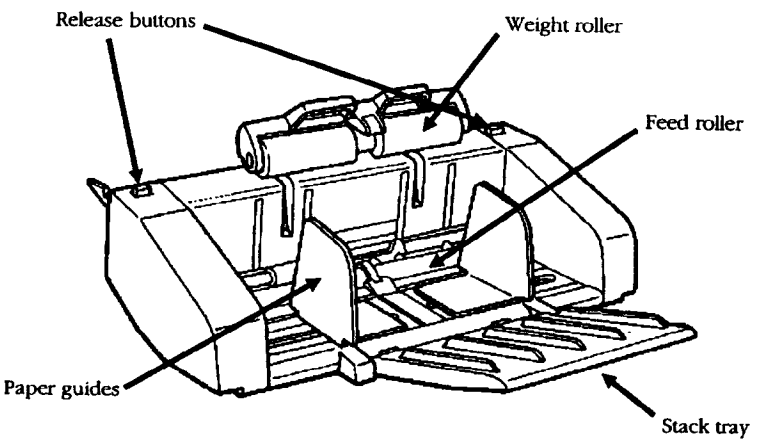
Stack tray: Holds a stack of envelopes.

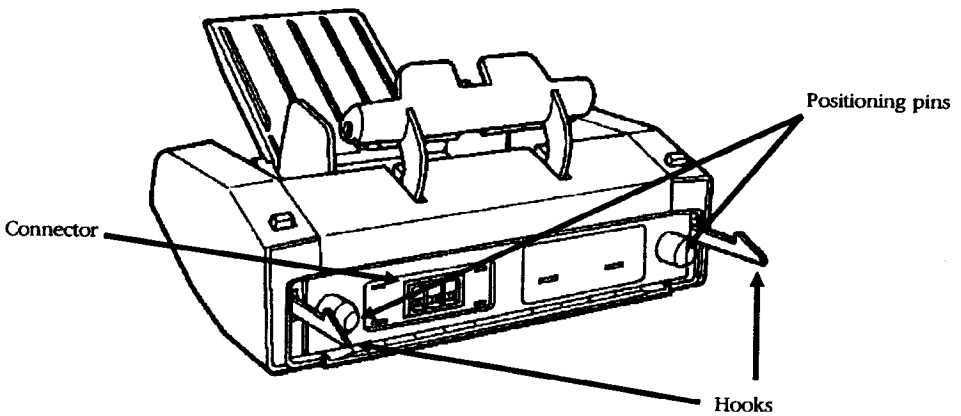
Hooks: Fasten the envelope feeder to the printer.

Positioning pins: When you install the envelope feeder, these pins fit into two holes in the front of the printer.

Connector: When you install the envelope feeder, this connector fits onto a mating connector located on the front of the printer.

FIG. 1.1. ENVELOPE FEEDER FRONT AND REAR VIEWS





1.3. Precautions concerning service and maintenance

Only a qualified technician should perform service on the equipment, 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. Precautions

Always observe the following precautions when maintaining or inspecting the paper handler/stacker.

When performing any maintenance or inspection procedure, first unplug the power cord. Make sure that the printer power is turned off before replacing circuit boards or electrical components in the paper handler/stacker.

To prevent electrostatic discharge damage to electrical circuits, be sure to wear an antistatic band when handling the circuit boards.

Be particularly careful when reconnecting the power after having repaired or replaced a component that has the potential for causing an electric shock.

If the paper handler/stacker is to be transported or stored for a lengthy period of time, the unit should be packed in its original packaging.

If packed in their original packaging, these units can be stacked five high for up to six months. They should not be stacked sideways or upside down, however.

Store the paper handler/stacker in a cool, dark, dry area. Avoid storage in dusty areas.

Ship units out on a first in, first out basis.

1.3.2. Replacement parts

Be sure to use only Kyocera-recommended supplies and components. Kyocera assume no liability in the event of damage resulting from the use of unauthorized components.

1.3.3. Notes concerning paper storage

Use of paper with a high moisture content in the envelope feeder can adversely affect printing quality through the occurence of paper jams, wrinkling, and other difficulties. Observe the following paper handling guidelines.

Store paper in a dry place. Do not place paper directly on a damp floor.

Do not stand paper on end for storage. Stack paper horizontally on a flat surface.

After loading paper in the paper cassette, store any leftover paper in the original wrapping or a plastic bag.

Refer to chapter 3 for specifications concerning the type of paper (envelope) that can be used with the envelope feeder and the printer.

1.4. Specifications

1.4.1. Mechanical specifications

ITEM	SPECIFICATION
Device type	Envelope feeder
Paper feed	Friction feed by roller; feed is from bottom of the stack.
Forms and sizes	Monarch(3-7/8" x 7-1/2" or 98 mm x 190 mm) Business (Commercial 10) (4-1/8" x 9-1/2" or 104 mm x 241 mm) International DL (110 mm x 220 mm) International C5 (162 mm x 229 mm) Commercial 9 (3-7/8" x 8-7/8" or 98 mm x 225 mm) Commercial 6-3/4 (3-5/8" x 6-1/2" or 92 mm x 165 mm)
Paper transport direction	Lengthwise feed, with side to be printed facing upward.
Capacity	Max. stack height of 40 mm
Size changing	Universal feeder
Power supply	Supplied from printer
Noise	Max. 55 dB(A) during paper feed
Dimensions	60H x 210W x 210D mm, 2.36 x 8.27 x 8.27 in (not including stack tray)
Weight	1.5 kg, 3.3 lbs
Environmental conditions	Temp: 10-35°C (50-95°F) Humidity: 20-80% (no condensation)

1.4.2. Paper specifications

Requirements for paper to be used are more fully detailed in chapter 3.

ITEM	SPECIFICATION
Weight	70 to 90 g/m^2 (19 to 27 lbs/ream)
Squareness of corners	90°±0.3°
Moisture content	4% to 6%
Paper storage	Temp: 10-35°C (50-95°F) Humidity: 20—80% RH
Paper curl	Height: Max 5 mm (measured from floor of envelope feeder) Radius: Min 100 mm

Chapter 2: Maintenance

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2.1. Introduction

This chapter explains the following subjects:

Section 2.2 explains with illustrations the disassembly procedures required to replace parts.
Section 2.3 explains procedures for cleaning those parts which require periodic cleaning.

2.2. Disassembly procedures

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

Before beginning any disassembly procedure, be sure to read the notes below:

- Before removing the feeder from the printer, be sure to turn off the printer power.
- 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 self-tapping screws can cause damage to screw holes. Do not tighten screws excessively.
- When removing or installing circuit boards, wear a gounrded wrist strap to protect against damage due to discharge of static electricity.

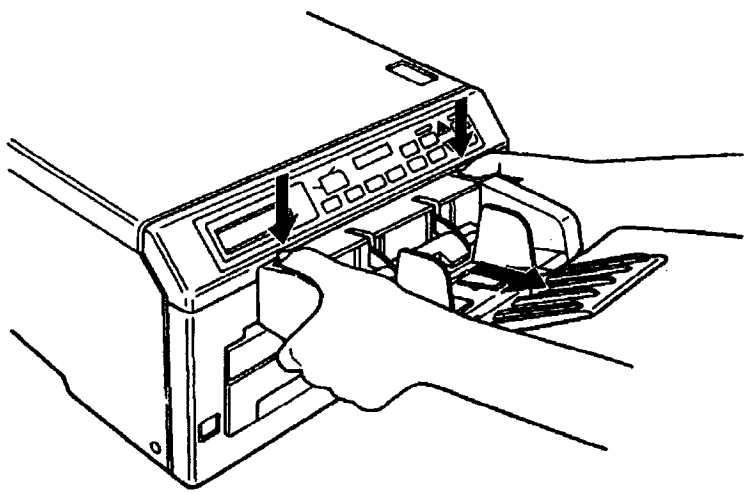
Before proceeding, make sure printer power is switched off. Remove the face-up stack tray from the paper handler/stacker. Remove the feeder from the printer's rear panel.

2.2.1. Removing the envelope feeder from the printer

CAUTION: Before removing the envelope feeder, turn printer power off.

To remove the envelope feeder from the printer, simultaneously press both of the release buttons and pull the feeder straight away from the front of the printer.

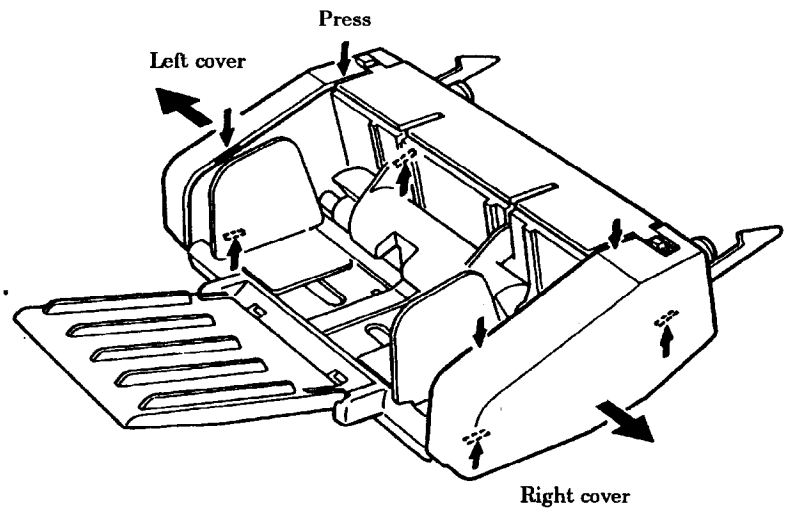
FIG. 2.1. REMOVING THE ENVELOPE FEEDER FROM PRINTER



2.2.2. Removing the covers

To disassemble the feeder, begin by removing the left and right covers. No tools are necessary to remove the covers. Press on the parts indicated by small arrows in Figure 2.1. below.

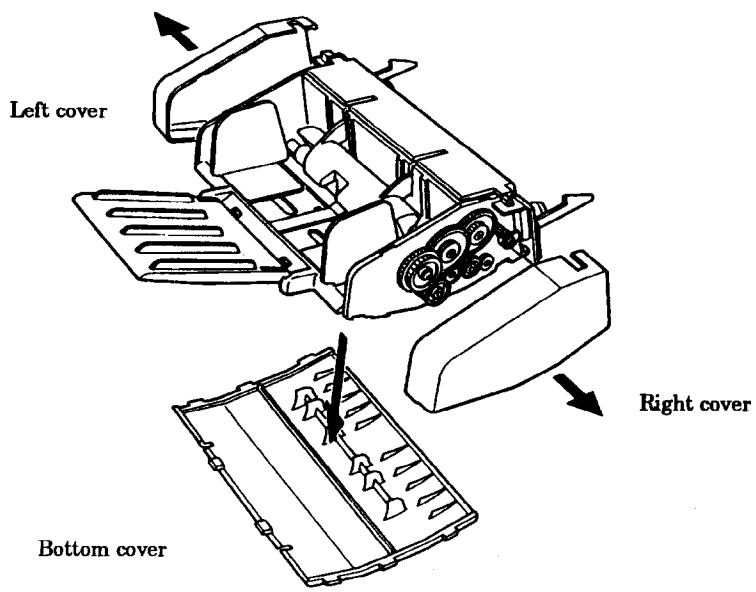
FIG. 2.3. REMOVING THE COVERS



2.2.3. Removing the bottom cover

To remove the bottom cover, first remove the left and right covers. Follow the procedures provided above.

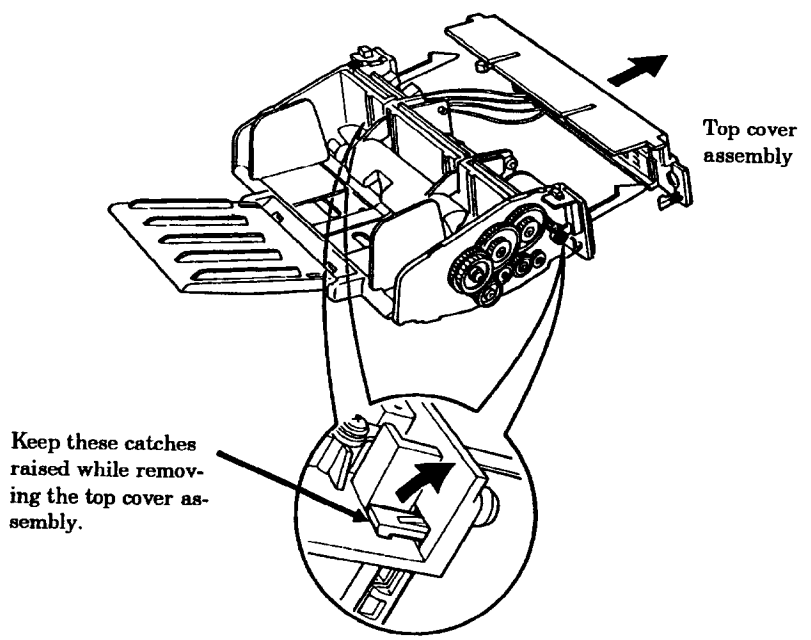
FIG. 2.2. REMOVING THE BOTTOM COVER



2.2.4. Removing the top cover assembly

The left, right, and the bottom covers must be removed before removing the top cover assembly by following procedures previously provided. Release two catches of the top cover assembly as shown below.

FIG. 2.4. REMOVING THE TOP COVER ASSEMBLY

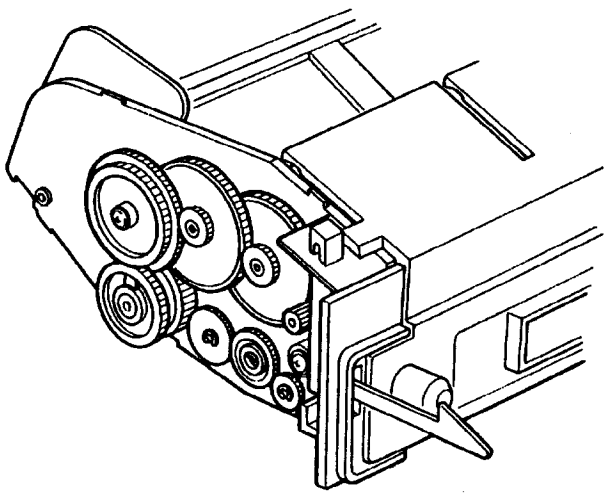


2.2.5. Drive gear arrangement

Figure 2.5. shows arrangement of the drive gears.

NOTE: The gears need no periodic lubrication.

FIG. 2.5. GEARS ARRANGEMENT

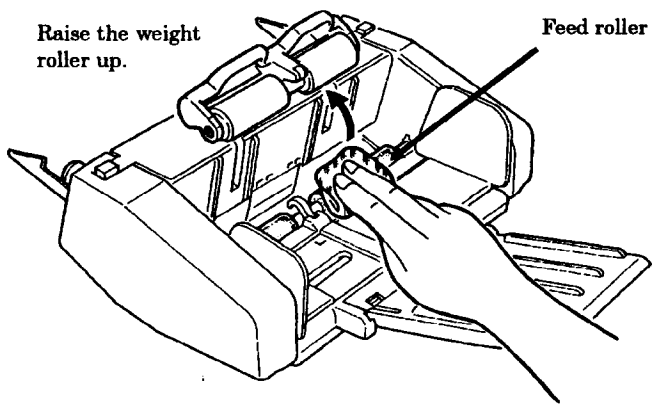


2.3. Cleaning procedures

After the envelope feeder has been used for a certain period of time, tiny paper scraps and dust will begin to accumulate on the feed roller. Because these scraps and dust will hamper paper feeding, periodic cleaning is necessary using the procedure explained below.

Clean the feed roller with a cloth moistened with alcohol.

FIG. 2.6. CLEANING THE FEED ROLLER



Chapter 3: Envelope specifications

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3.1. Introduction

An envelope is a much more complex object than a single sheet of paper. For this reason, it is important to print using envelopes of appropriate type, construction, and quality. Also, envelopes must be properly stored in order to avoid deterioration of their quality.

When selecting envelopes, use the guidelines given below.

NOTE: Printing and feeding performance may be affected by factors other than the ones explained here. Before purchasing envelopes in quantity, it is advisable to test performance of the particular type being considered. Remember that consistent performance depends on use of good envelope handling and storage practices, as well as upon suitable type, construction, and quality.

3.1.1. Envelope sizes

The standard envelope sizes that can be feed from the envelope feeder are listed in the following table. The number of envelopes you can load into the feeder at one time varies according to the thickness of the envelopes, but the height of the stack should not exceed 40 mm, or about 1.5".

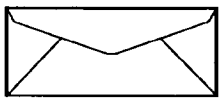
TABLE 3.1. STANDARD ENVELOPE SIZES

DESIGNATION	SIZE
Monarch	3-7/8" x 7-1/2" or 98 mm x 190 mm
Business (Commercial #10)	4-1/8" x 9-1/2" or 104 mm x 241 mm
International DL	110 mm x 220 mm
International C5	162 mm x 229 mm
Commercial 9	3-7/8" x 8-7/8" or 98 mm x 225 mm
Commercial 6-3/4	3-5/8" x 6-1/2" or 92 mm x 165 mm

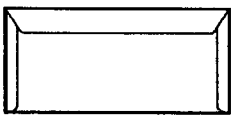
3.1.2. Construction

Envelopes should have sharply-creased folds and accurately joined corner edges. Make sure that there are no more than two thicknesses of paper at the end of the envelope that feeds into the printer first. Also make sure that envelopes are tightly constructed; envelopes of loose or baggy construction are much more prone to jamming.

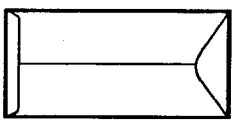
Many different envelope types and styles can be used with the envelope feeder. However, printing and feeding performance tends to vary according to the type of envelope construction.



Commercial or official envelopes These are envelopes with diagonal seams and standard gummed flaps. This is the type of envelope most commonly used in the America and Europe. Feeding and printing performance with this type of envelope is generally good.



Envelopes with double-sided vertical seams at the ends of the envelope Although this type of envelope also generally feeds reliably, they are somewhat more prone to jamming than envelopes with diagonal seams.



Envelopes with a center seams and folded end flap This type of envelope performs reliably, provided that envelopes are loaded so that the end with the folded flap feeds into the printer first.

3.1.3. Paper quality

The paper of which envelopes are constructed should be plain bond paper of good quality, preferably with a straight grain orientation. Paper with a diagonal grain is more likely to wrinkle and crease on its way through the printer. The paper should have a pulp content of at least 80%, and should have a moisture content of 4 to 6%.

The paper used in envelopes should have a basis weight of 70 to 100 g/m^2 (19 to 27 lbs/ream).

Before printing on envelopes made of embossed or glossy paper, test printing performance.

3.1.4. Adhesives

Do not use envelopes having an encapsulated liquid adhesive.

Envelopes with peel-off strips and pressure-sensitive adhesive are not recommended, both because such envelopes are more prone to jamming and because the adhesive may not be able to withstand the heat and pressure of the fusing rollers.

WARNING: Adhesives that cannot withstand the heat and pressure of fusing can possibly damage the fusing rollers, and may also generate hazardous fumes. If in doubt as to whether a particular envelope's adhesive is compatible with your printer, consult with your envelope supplier or dealer.

3.1.5. Envelope storage

Store envelopes in a clean, dust-free environment, out of direct sunlight. Temperature in the storage area should be maintained in the range from 50 to 95 degrees Fahrenheit (10 to 35 degrees Celsius), and relative humidity should be kept between 20 and 80 percent. When

storing envelopes, leave them in the original carton in which they are supplied by the manufacturer.

3.1.6. Envelopes to avoid

Avoid using any of the following kinds of envelopes.

- Envelopes having an encapsulated liquid adhesive.
- Envelopes with metal fasteners or tie strings.
- Envelopes with transparent windows, holes, perforations, or cutouts.
- Envelopes that have exposed adhesive surfaces.
- Envelopes with a peel-off sealing string.
- Envelopes made using paper, pigment, adhesive, or other material that will degenerate or release hazardous gases when subjected to a temperature of up to 190 degrees Fahrenheit (88 degrees Celsius) for more than 1 second.
- Envelopes made of a double thickness of paper.
- Avoid envelopes that are bent at the edges, or which are curled, dirty, torn, or contaminated with lint, clay, or paper shreds.
- Envelopes made of deeply embossed paper.
- Envelopes with a very smooth or glossy finish.

Chapter 4: Parts catalog

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4.1. Introduction

This chapter lists the major parts of the product and shows exploded view of the major assemblies.

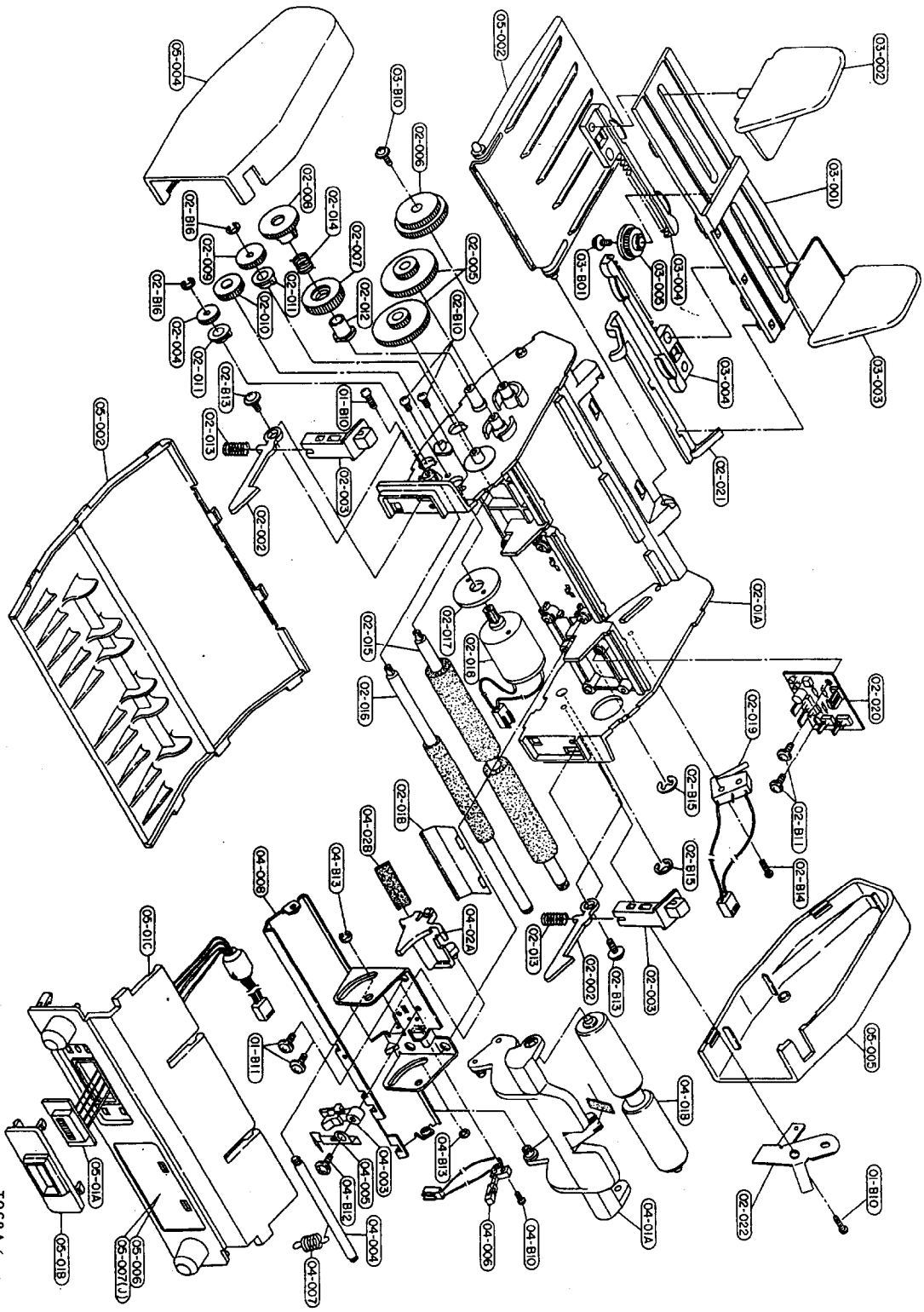
The headings in the parts tables are explained below.

- **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 product.

4.1.1. Ordering

- Recommended parts are those parts printed in **bold letters** in the lists. Part codes for other pats are shown only for reference purposes. To avoid errors in parts orders, always speficy the following information.
- Part description
- Part code
- Quantity required
- Reference number in the exploded view

4.2. Exploded view



REF.	PART CODE	DESCRIPTION	QTY	REMARKS
01-B10	5MBSPP3006NZ	PAN HEAD SCREW (+)	2	
01-B11	5MBTP43008BZ	TP TAP SCREW (+)	2	
02-001	5SNSP0008507	FRAME SUB ASSY	1	
02-002	**5SNSP0008510**	**HOOK**	**2**	
02-003	5SNSP0008511	BUTTON RELEASE	2	
02-004	5SNSP0008512	GEAR Z12	1	
02-005	5SNSP0008513	GEAR Z23-Z63	2	
02-006	5SNSP0008514	GEAR Z27-Z58	1	
02-007	5SNSP0008515	GEAR Z26A	1	
02-008	5SNSP0008516	GEAR Z26B	1	
02-009	5SNSP0008517	GEAR Z18	1	
02-010	5SNSP0008518	GEAR Z19	1	
02-011	5SNSP0008520	BUSHING A	2	
02-012	5SNSP0008521	BUSHING B	1	
02-013	5SNSP0008523	SPRING B	2	
02-014	5SNSP0008524	SPRING CLUTCH	1	
02-015	**5SNSP0008525**	**ROLLER ASSY A**	**1**	
02-016	**5SNSP0008528**	**ROLLER ASSY B**	**1**	
02-017	5SNSP0008554	PAD MOTOR	1	
02-018	**5SNSP0008555**	**DC MOTOR ASSY**	**1**	
02-019	**5SNSP0008556**	**SENSOR ASSY A**	**1**	
02-01A	5SNSP0008508	FRAME	1	
02-01B	5SNSP0008509	PLATE CONTROL	1	
02-020	**5SNSP0008558**	**PWB MAIN**	**1**	
02-021	**5SNSP0008536**	**LEVER SENSOR**	**1**	
02-022	**5SNSP0008827**	**SPRING EARTH**	**1**	
02-B10	5MBSPP3006NZ	PAN HEAD SCREW (+)	2	
02-B11	5MBTP42606BZ	TP TAP SCREW (+)	2	
02-B13	5MBTP43008BZ	TP TAP SCREW (+)	2	
02-B14	5MBTPB2012BZ	BIND TAP SCREW (+)	1	
02-B15	5MBCE5060XSW	E STOP RING	2	
02-B16	5MBCE3060XSW	E STOP RING	2	
03-001	5SNSP0008532	PLATE CENTER	1	
03-002	**5SNSP0008533**	**PLATE GUIDE R**	**1**	
03-003	**5SNSP0008534**	**PLATE GUIDE L**	**1**	
03-004	5SNSP0008535	RACK	2	
03-005	5SNSP0008519	GEAR Z19	1	
03-B10	5MBTP42606BZ	TP TAP SCREW (+)	1	
04-001	5SNSP0008537	ARM ASSY	1	
04-002	**5SNSP0008543**	**SEPARATER ASSY**	**1**	
04-003	**5SNSP0008542**	**HOLDER WEIGHT**	**1**	
04-004	5SNSP0008546	SHAFT LATCH	1	
04-005	5SNSP0008560	SPRING PAD	1	
04-006	**5SNSP0008557**	**SENSOR ASSY B**	**1**	
04-007	5SNSP0008522	SPRING A	1	
04-008	5SNSP0008541	CHANNEL SENSOR	1	
04-01A	5SNSP0008538	ARM	1	
04-01B	5SNSP0008539	SHAFT WEIGHT	1	

REF.	PART CODE	DESCRIPTION	QTY	REMARKS
04-02A	5SNSP0008544	HOLDER SEPARATER	1	
04-02B	5SNSP0008545	PAD SEPARATER	1	
04-B10	5MBSPP1706NB	PAN HEAD SCREW (+)	1	
04-B12	5MBTP43008BZ	TP TAP SCREW (+)	1	
04-B13	5MBCE2040XSW	E STOP RING	2	
05-001	5SNSP0008547	COVER TOP ASSY	1	
05-002	**5SNSP0008550**	**COVER UNDER**	**1**	
05-003	**5SNSP0008551**	**TRAY STACKER**	**1**	
05-004	**5SNSP0008552**	**COVER RIGHT**	**1**	
05-005	**5SNSP0008553**	**COVER LEFT**	**1**	
05-006	5MVVSEF1***1	LABEL SERIAL	1	
05-007	5MVVSEF1J**1	LABEL SERIAL (J)	1	
05-01A	5SNSP0008548	COVER TOP	1	
05-01B	5SNSP0008549	HOLDER CONNECTOR	1	
05-01C	**5SNSP0008559**	**PWB CONNECTOR ASSY**	**1**	

MISCELLANEOUS PARTS

	5KKMEF1***01	MASTER CARTON EF-1	1	
	5KKSEF1***01	OUTER CARTON EF-1	1	
	5SNSP0008668	SIDE PAD L	1	
	5SNSP0008669	SIDE PAD R	1	
	5SNSP0008670	PAD TOP	1	
	5KKSEF1J**01	OUTER CARTON (J)	1	
	5KKMEF1J**01	MASTER CARTON (J)	1	

Chapter 5: Hardware notes

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5.1. Introduction

This chapter describes the operation of the electrical circuits in the envelope feeder. Schematic diagram of the feeder's driver board is shown in section 5.2. The overall printing timing including all the relevant printer commands is charted in section 5.3.

5.1.1. Connector configuration

The printer system uses the following signals for feeder interface. At the connector that mates with the printer's envelope feeder receptacle, the pins are assigned as follows.

Connector seen at the front of the printer

1 10

PIN NO.	SIGNAL NAME	DESCRIPTION	DIRECTION
1	No connection		
2	+24V	+24V power	Input
3	$\overline{\text{EMOTR}}$	Motor is on if low.	Input
4	$\overline{\text{EVUNT}}$	Feeder is detected if low.	Output
5	No connection		
6			
7	$\overline{\text{EPAPR}}$	No paper is detected if low.	Output
8	GND	Ground	
9	No connection		
10	GND	Ground	

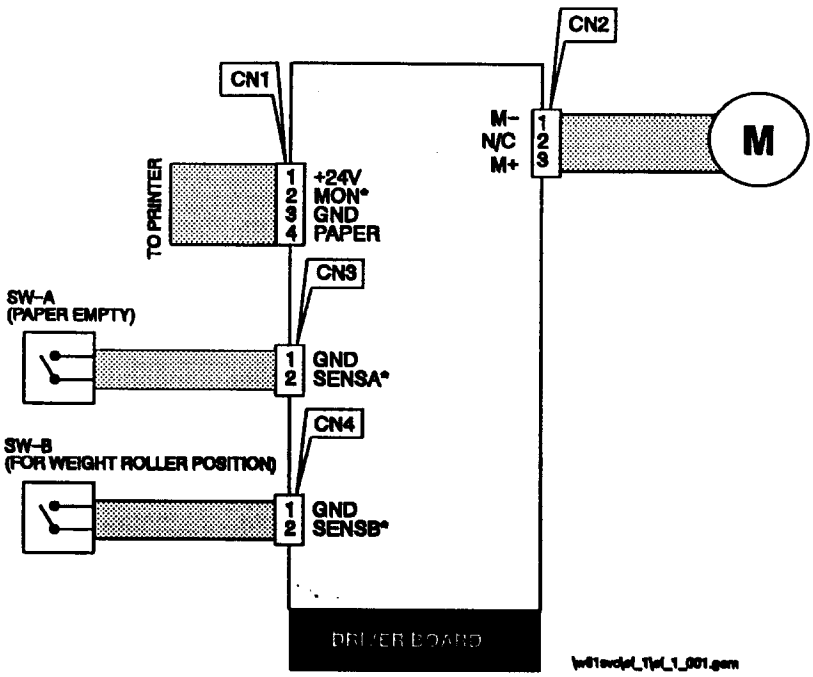
The $\overline{\text{EVUNT}}$ signal is used to recognize the installation of the envelope feeder. The printer recognizes that the envelope feeder is installed when the $\overline{\text{EVUNT}}$ signal level is low and allows the feeder to be selectable on the printer's control panel (MODE SELECT). When the feeder is loaded with envelopes, the $\overline{\text{EPAPR}}$ signal becomes high. At the reception of print request, the printer sets the $\overline{\text{EMOTR}}$ signal to be low which in turn starts to revolve the feeder's motor in the interval of 2.25 seconds. The top of the paper then comes to be pinched by the printer's manual feed rollers.

CAUTION: Pins of the interface connector on the envelope feeder are neighbored on each other in a very small pitch. Therefore, care should be taken to avoid an accidental contact between the pins. Especially, short-circuiting pins 2 and 3 can destroy U1 (M54566) on the printer's connector board, deactivating the feeder motor.

5.1.2. Board wiring

Figure 5.1. on next page shows the feeder's board wiring.

FIG. 5.1. BOARD WIRING

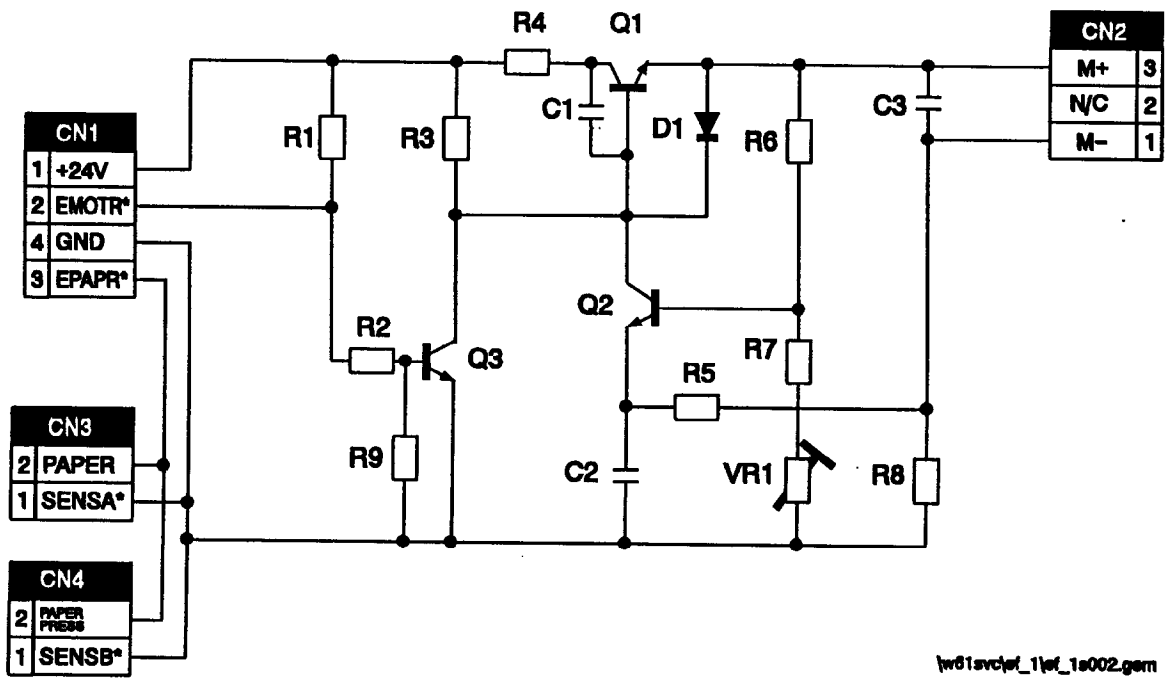


The connector described in the previous section connects to CN1 on the driver board. Switch SW-A is used to detect the presence of envelopes in the stack tray. Switch SW-B determines if the weight roller is set down to press the envelope stack.

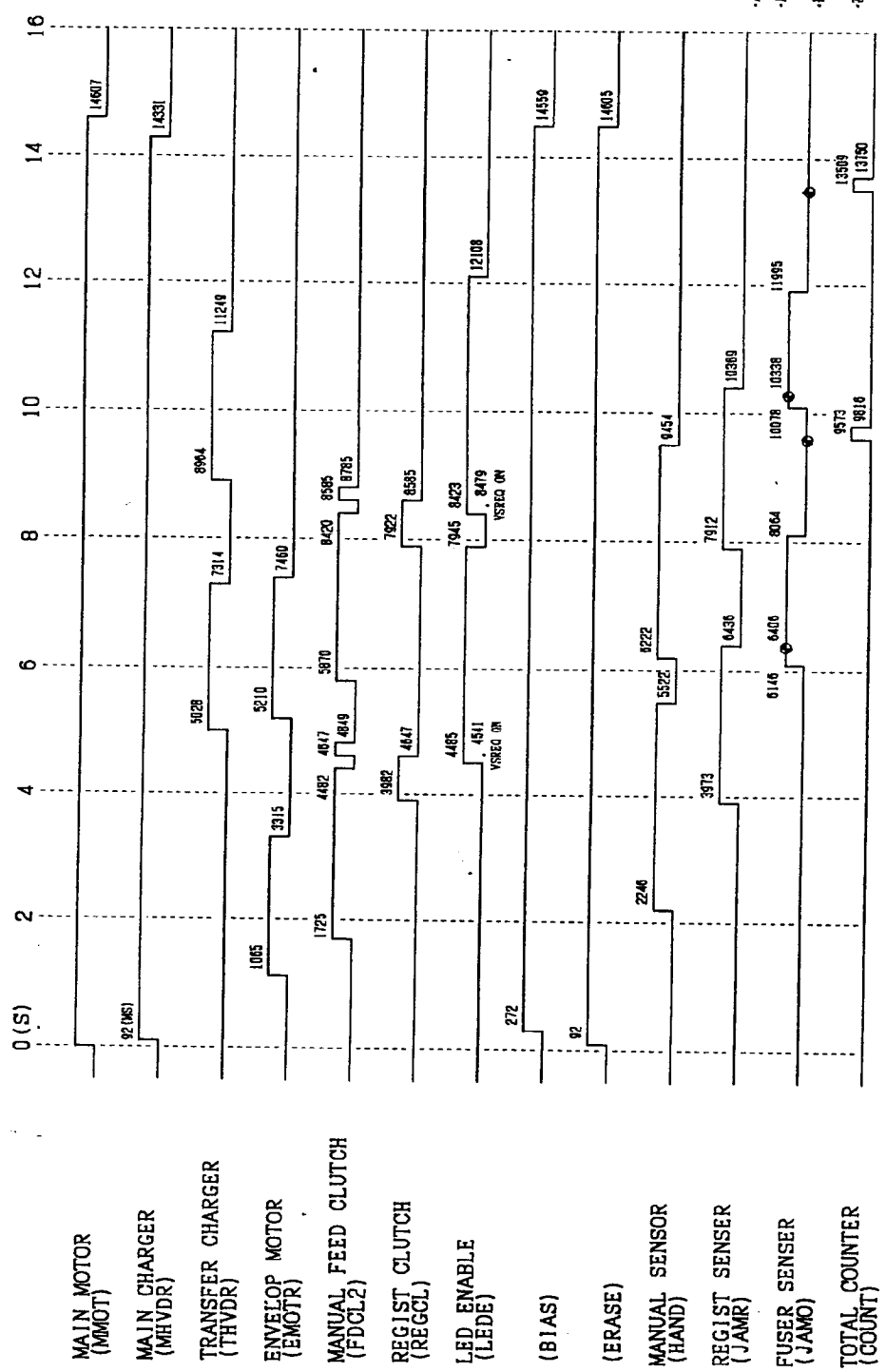
Details of the driver board is provided on the next page.

5.2. Schematic diagram

FIG. 5.2. DRIVER BOARD SCHEMATIC DIAGRAM



5.3. Printing timing chart



Chapter 6: Troubleshooting

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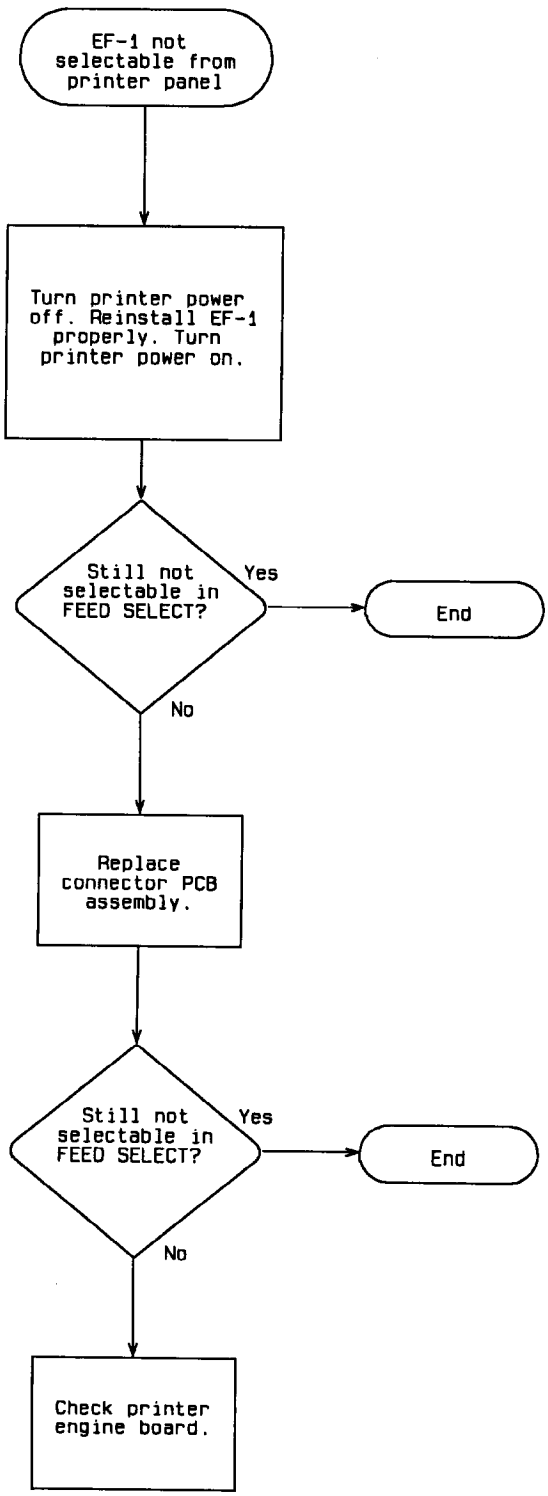
6.1. Introduction

This chapter explains procedures for identifying and correcting problems (troubleshooting).

6.2. Troubleshooting flowcharts

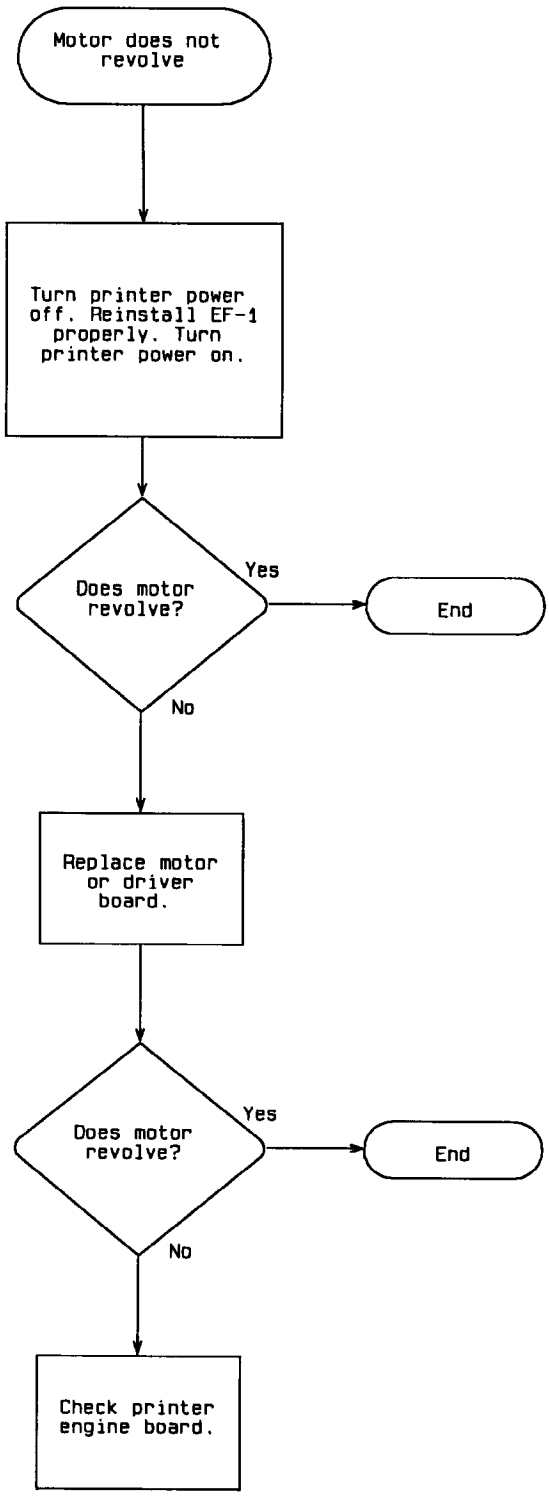
Envelope feeder unselectable

6.2.1. Envelope feeder unselectable from printer

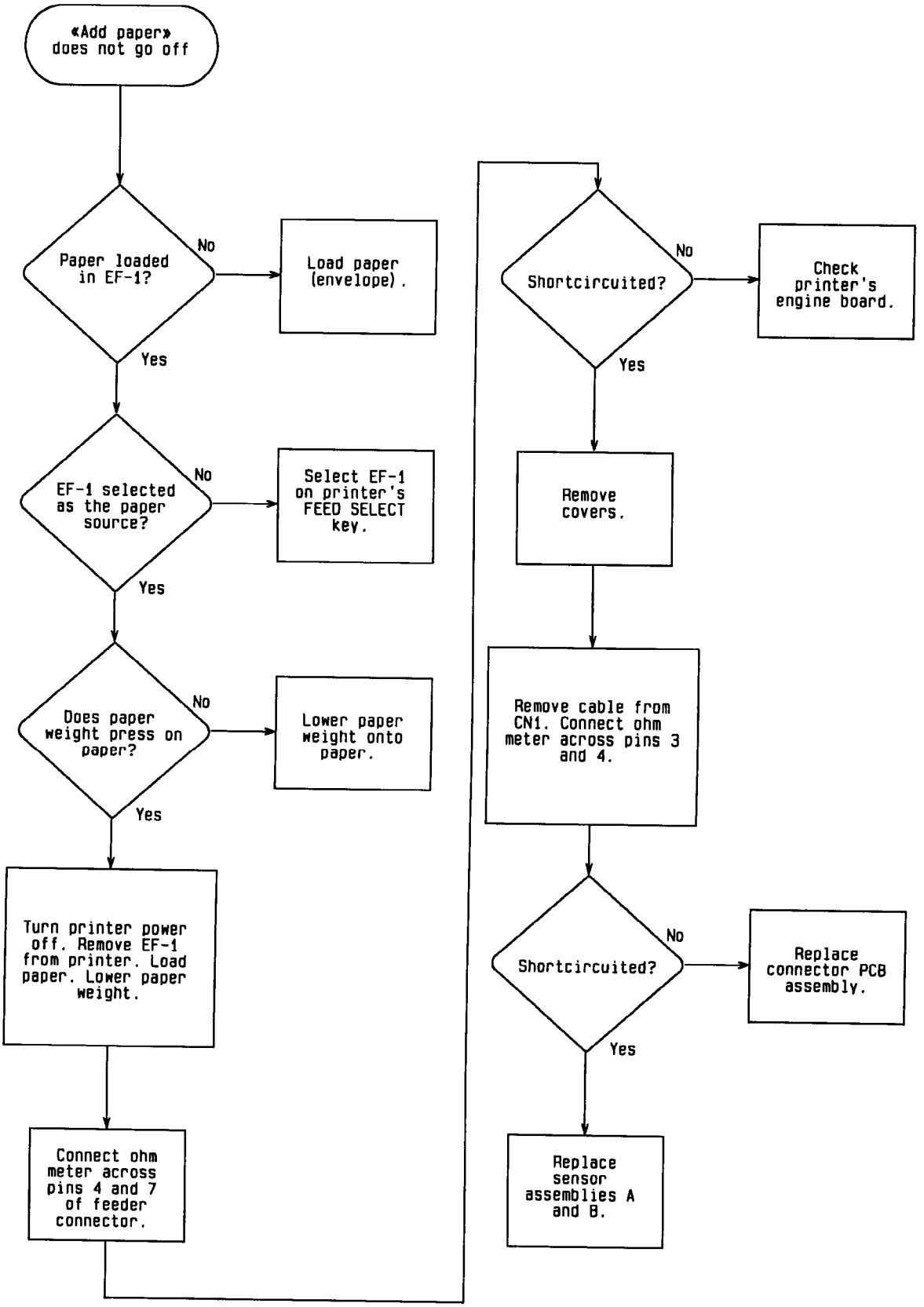


6.2.2. Motor does not revolve

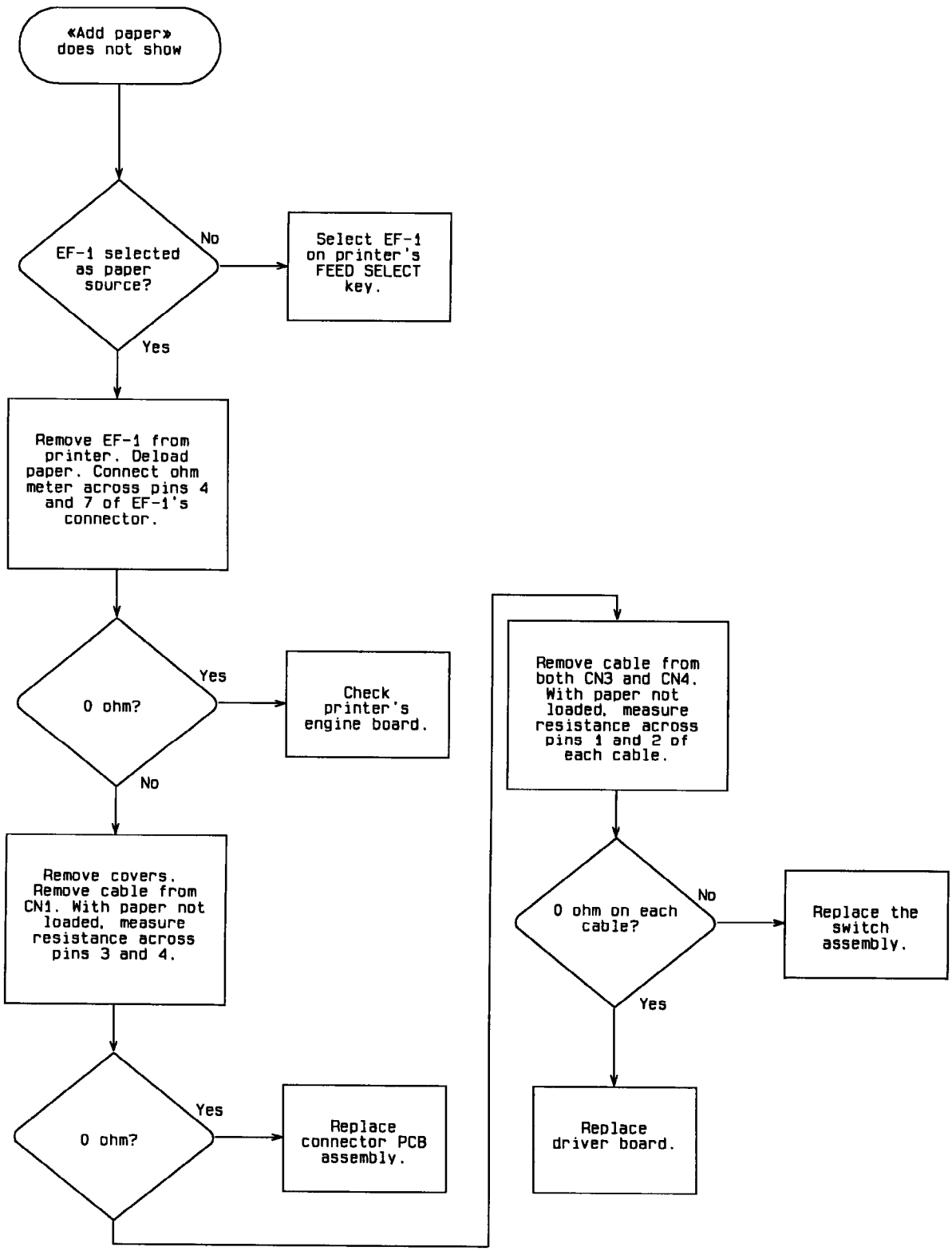
Motor does not revolve



6.2.3. *Add paper* does not go off when selecting EF-1



6.2.4. *Add paper* does not show



6.2.5. Feeder does not feed paper

Feeder does not feed paper