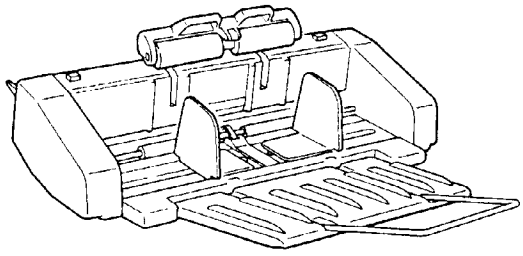
SERVICE MANUAL

KYOCERA

February 1995

UF-1 Universal Feeder



Export edition/revision 1.00

UF-1 Service Manual
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Export Edition
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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.

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

Interference cable to the computer shall be used with shielded circular cable.

RADIO INTERFERENCE REQUIREMENT IN EUROPEAN COUNTRIES

The option universal feeder UF-1 is intended for use with the printer models FS-1550, FS-1600, FS-3400, and FS-3600, which are type tested and categorized as Class B computing devices in accordance with the EN55022 rules. Devices in the Chass B category may cause interference to radio or television reception, particularly in residential installation.

IMPORTANT NOTICE TO SERVICE PERSON: SAFETY INFORMATION

Before attempting service on the apparatus, 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 Kyocera universal feeder model UF-1. This manual is comprised of the following chapters:

Chapter 1 General information

Chapter 2 Maintenance

Chapter 3 Paper selection

Chapter 4 Parts catalog

Chapter 5 Hardware notes

LEGEND

Throughout the chapters, WARNING denotes the precaution which, if ignored, could result in personal injury, and/or irrevocable damage to the printer. NOTE denotes precautions which, if ignored, could result in damage to the apparatus.

Chapter 1: General information

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1.1. General

This chapter explains basic considerations and precautions to be observed when repairing, maintaining and inspecting the UF-1 universal feeder. 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 UF-1 is the optional universal feeder for the current Ecosys series of Kyocera page printers. By installing the universal feeder on the printer, the printer prints on a wide variety of different paper sizes. The UF-1 feeds paper automatically, making it easy to print on large numbers of pages at one time.

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

1.2.1. Original packing list

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

- ❖ One UF-1 universal feeder
- ❖ One instruction manual
- ❖ Two guide caps that fit inside the printer (see page 1—6)

1.2.2. Names of parts

The universal feeder has the following parts as shown in the figures on next page.

RELEASE BUTTONS: Press both of these buttons to release the hooks when removing the universal feeder from the printer.

WEIGHT ROLLER: Presses downward on the top of a stack of paper loaded into the feeder.

FEED ROLLER: Picks up one sheet of paper at a time from the stack in the stack tray and feeds it into the printer.

PAPER GUIDES: Adjust to the width of the paper to keep them centered in the stack tray.

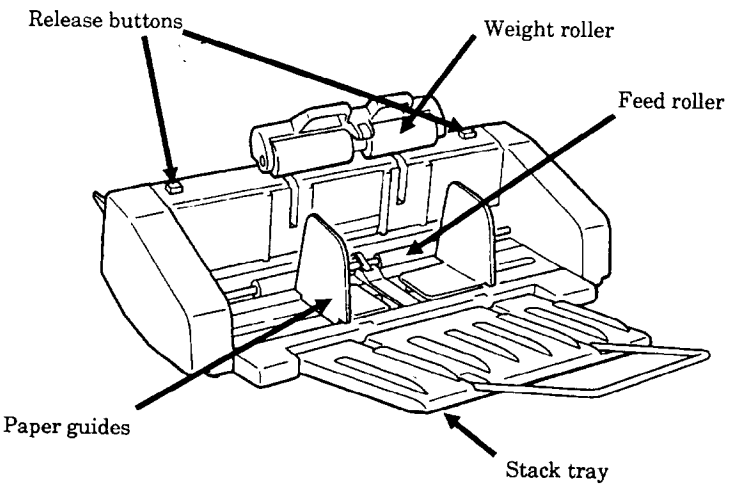
STACK TRAY: Holds a stack of paper.

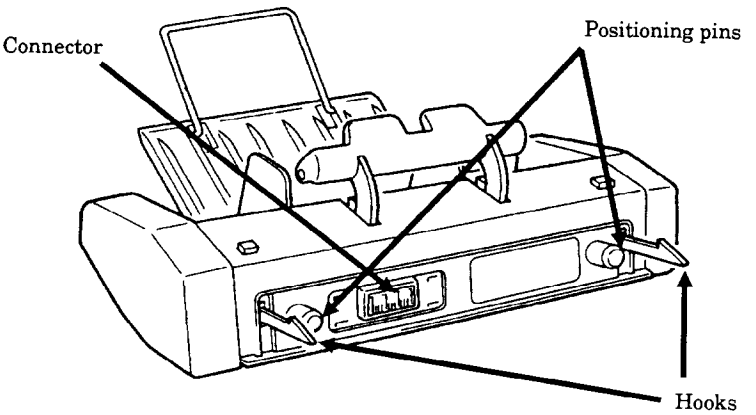
SUPPORT WIRE: Provides support for longer paper lengths.

HOOKS: Fasten the envelope feeder to the printer.

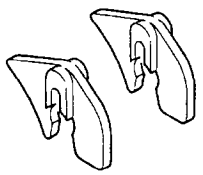
POSITIONING PINS: When you install the universal feeder, these pins fit into two holes in the front of the printer.

FIG. 1.1. ENVELOPE FEEDER FRONT AND REAR VIEWS

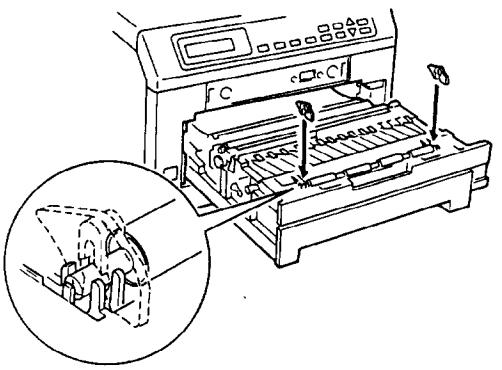




CONNECTOR: When you install the universal feeder, this connector fits onto a mating connector located on the front of the printer.



Guide caps: These fit over the ends of the manual feed roller shaft inside the printer.



To install the guide caps, pull out the printer's paper feed unit. Fit the supplied guide caps over the end of the manual feed roller shaft as shown.

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 feeder. 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 universal feeder.

- ❖ 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 universal feeder.
- ❖ 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 universal feeder 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 universal feeder 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 the supplies and components recommended by Kyocera. We 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 universal feeder can adversely affect printing quality through the occurrence 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 universal feeder and the printer.

1.4. Specifications

1.4.1. Mechanical specifications

Item	Specification
Device type	Universal feeder
Paper feed	Friction feed by roller; feed is from bottom of the stack.
Forms and sizes	A5 (148mm x 210mm) B5 (182mm x x 257mm) A4 (210μμ x 297mm) Letter (8-1/2" x 11") Executive (7-$^{1}/_{4}$" x 10–$^{1}/_{2}$")
Paper transport direction	Lengthwise feed, with side to be printed facing upward.
Capacity	Max. stack height of 10 mm
Size changing	Universal feeder
Power supply	Supplied from printer
Noise	Max. 55 dB(A) during paper feed
Dimensions	3.1 x 10.7 x 6.1 in. (61H x 272W x 157D mm) (not including stack tray)
Weight	2.4 lbs (1.1 kg)
Environmental conditions	Temp: 50—90.5° F (10—32.5° C) 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	17 to 40 lbs/ream (64 to 151 g/m^2)
Thickness	3.4 to 7.9 mils (0.086 to 0.20 mm)
Squareness of corners	90 °± 0.2 °
Curl	Inream flat within 4mm
Packaging	Moisture-proof ream wrapping required
Moisture content	4% to 6%
Direction of grain	Long
Paper storage	Temp: 50—95° F (10—35° C) Humidity: 20—80% RH

Chapter 2: Maintenance

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2.2.5. Drive gear arrangement , 2—5
2.3. Cleaning procedures , 2—6

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 grounded wrist strap to protect against damage due to discharge of static electricity.
- Before proceeding, make sure printer power is switched off. Remove the feeder from the printer's front panel as explained below.

2.2.1. Removing the universal feeder from the printer

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

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

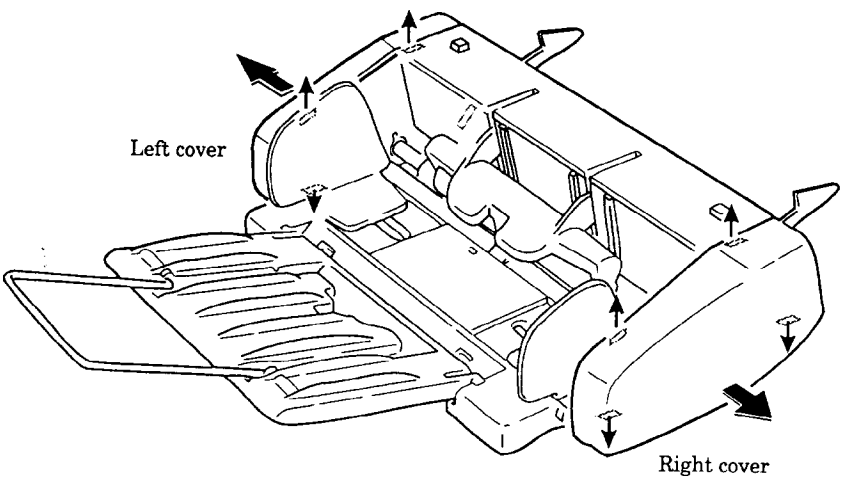
FIG. 2.1. REMOVING THE UNIVERSAL FEEDER FROM PRINTER

2.2.2. Removing the covers

To disassemble the feeder, begin by removing the left and right covers. Use a small flat blade screwdriver, inserting it between the cover and the chassis at the points indicated by the small arrows in Figure 2.2. below.

NOTE: When removing the right cover, be careful not to let the gears behind the right cover accidentally fall down. In case the gears fell, refer to section 2.2.5 to properly reassemble them.

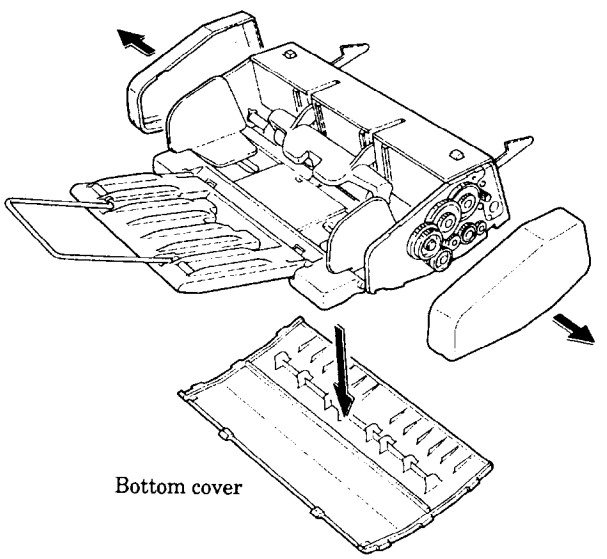
FIG. 2.2. REMOVING THE COVERS



2.2.3. Removing the bottom cover

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

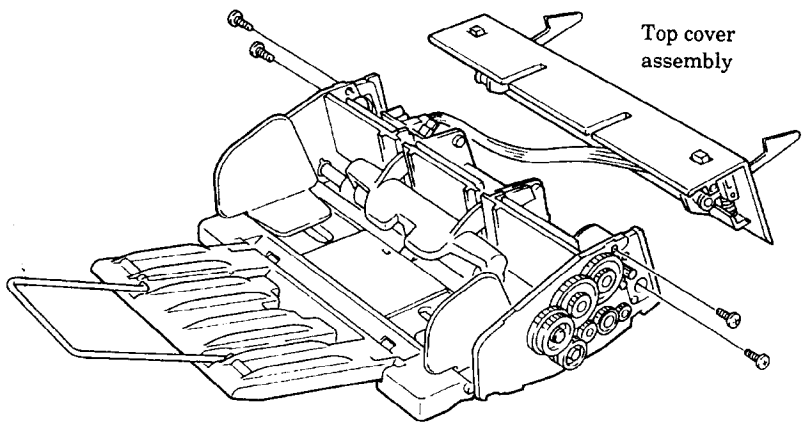
FIG. 2.3. REMOVING THE BOTTOM COVER



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

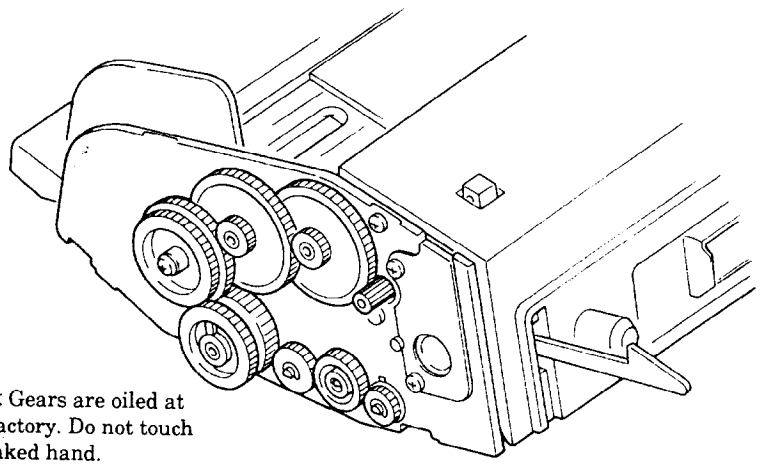


2.2.5. Drive gear arrangement

Figure 2.5. shows arrangement of the drive gears.

NOTE: The gears need no periodic lubrication.

FIG. 2.5. GEARS ARRANGEMENT



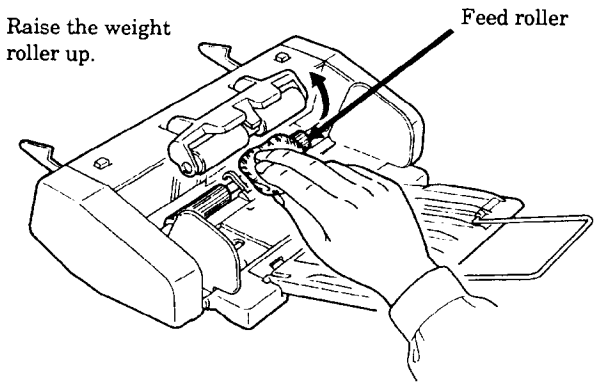
NOTE: Gears are oiled at the factory. Do not touch by naked hand.

2.3. Cleaning procedures

After the universal 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: Paper selection

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3.1. General guidelines

The universal feeder is designed for use with various special types of print media, such as adhesive-backed labels and thick paper. It may not be used to print on paper not satisfying the requirements below.

NOTE: The manufacturer assumes no liability for problems that occur when paper not satisfying these requirements is used with the paper feeder.

Selection of the right paper is important. The wrong paper can result in jams, misfeeds, curl, poor print quality, and paper waste, and in extreme cases can damage the paper feeder and/or the printer. The guidelines given below will increase the productivity of your office by ensuring efficient, trouble-free printing and reducing wear and tear on the paper feeder and the printer.

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3.2. Paper specifications

The following table summarizes the basic paper specifications.

TABLE 3.1. PAPER SPECIFICATION

Item	Specification
Weight	Plain paper: 64 to 90 g/m^2 (17 to 24 lbs./ream) Thick paper: 90 to 135 g/m^2 (24 to 36 lbs./ream) Label: 104 to 151 g/m^2 (28 to 40 lbs./ream)
Thickness	0.086 to 0.20 mm (3.4 to 7.9 mils)
Squareness of corners	90± 0.2°
Curl	Inream flat within 4 mm
Packaging	Moisture-proof ream wrapping required
Moisture content	4 to 6%
Direction of grain	Long-grain
Pulp content	80% or more

NOTE: The universal feeder accommodates a wide range of paper weights. However, make sure that the paper weight also conforms to the specifications set forth for the printer.

3.3. Selecting the right paper

IMPORTANT: The UF-1 is not designed for use with envelopes. Never attempt to feed envelopes using the UF-1.

Printer printing is a process involving light beam, electrostatic discharge, toner, and heat. In addition, as the paper passes through the printer it undergoes considerable sliding, bending, and twisting motions. A high- quality printing paper matching the requirements withstands all these stresses, enabling the paper feeder and the printer to turn out clean, crisp printed copy consistently.

Remember that all paper is *not* the same. Some of the factors to consider when selecting paper for use with the paper feeder are as follows:

CONDITION OF THE PAPER

Avoid using paper that is bent at the edges, curled, dirty, torn, or contaminated with lint, clay, or paper shreds.

Use of paper in these conditions can lead to illegible printing, misfeeding, and paper jams, and can shorten the life of the paper feeder and the printer. In particular, avoid using paper with a surface coating or other surface treatment. The paper should have as smooth and even a surface as possible.

PAPER SIZE

The universal feeder accommodates the following paper sizes.

- A5 to A4 sizes
- Letter size
- Executive size
- B5 size

Since the printer does not recognize the size of the paper currently loaded in the universal feeder, it assumes that all paper fed from the universal feeder is Letter size (8-1/2 by 11 inches). You can use the SPSZ (Set Paper SiZe) command of the PRESCRIBE command language to tell the printer the size of the paper. Refer to the printer's User's Manual.

SMOOTHNESS

The paper should have a smooth, uncoated surface. Paper with a rough or sandy surface can cause voids in the printed output. Paper that is too smooth, however, can cause multiple feeding and fogging problems. (Fogging is a gray background effect.)

BASIS WEIGHT

Basis weight is the weight of a standard quantity of paper. In the traditional system the standard quantity is a ream consisting of 500 sheets measuring 17 × 22 inches each. In the metric system the standard quantity is 1 square meter.

Paper that is too light or too heavy can cause misfeeding, jams, and premature wear of the paper feeder and the printer. Uneven paper weight can cause multiple feeds, print defects, poor toner fusing, blurring, and other print quality problems. The proper weight is 64 to 151 g/m^2 (17 to 40 lbs/ream).

MOISTURE CONTENT

Moisture content is defined as the percent ratio of moisture to the dry mass of the paper. Moisture can affect the paper's appearance, feedability, curl, electrostatic properties, and toner fusing characteristics.

The moisture content of the paper varies with the relative humidity in the room. When the relative humidity is high and the paper absorbs moisture, the paper edges expand, becoming wavy in appearance. When the relative humidity is low and paper loses moisture, the edges shrink and tighten, and print contrast may suffer.

Wavy or tight edges can cause misfeeding and alignment anomalies. The moisture content of the paper should be 4% to 6%.

To ensure the proper moisture content it is important to store the paper in a controlled environment. Some tips on moisture control are:

- Store paper in a cool, dry location.
- Keep the paper in its wrapping as long as possible. Rewrap paper that is not in use.
- Store paper in its original carton. Place a pallet etc. under the carton to separate it from the floor.

- ❖ After removing paper from storage, let it stand in the same room as the printer for 48 hours before use.
- ❖ Avoid leaving paper where it is exposed to heat, sunlight, or damp.

3.3.1. Paper storage

When the paper feeder is not to be used for a long time of period, the paper must be removed from the feeder and wrapped in moisture-proof paper for storage.

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

Chapter 5: Hardware notes

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5.1. Introduction

This chapter describes the operation of the electrical circuits in the universal 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 universal 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	

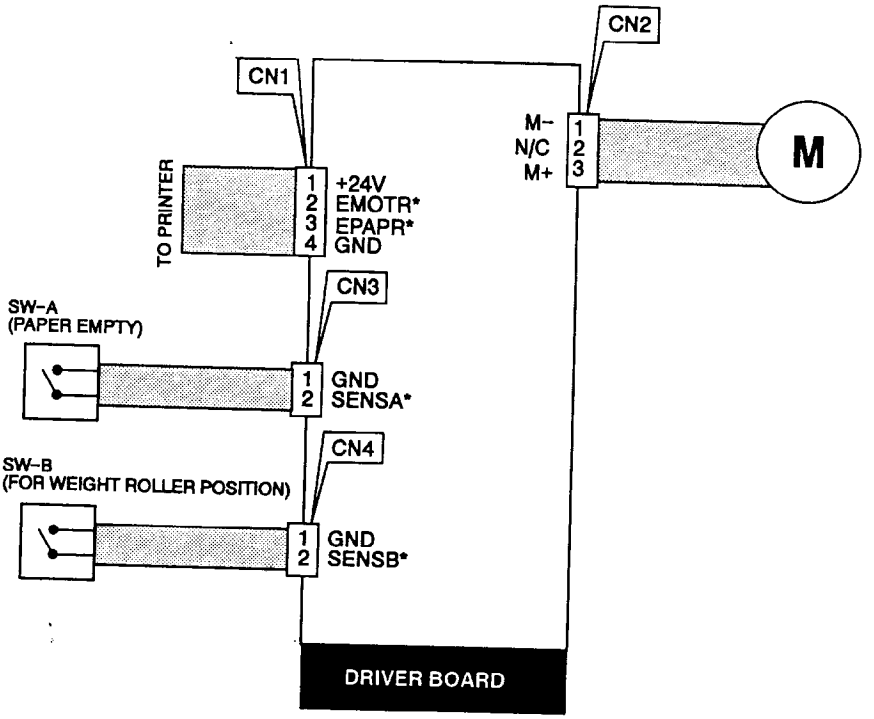
The $\overline{\text{EVUNT}}$ signal is used to recognize the installation of the universal feeder. The printer recognizes that the universal feeder is installed when the $\overline{\text{EVUNT}}$ signal level is low and allows the feeder to be selectable on the printer's control panel (MODE SELECT). When the feeder is loaded with paper, 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 universal 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

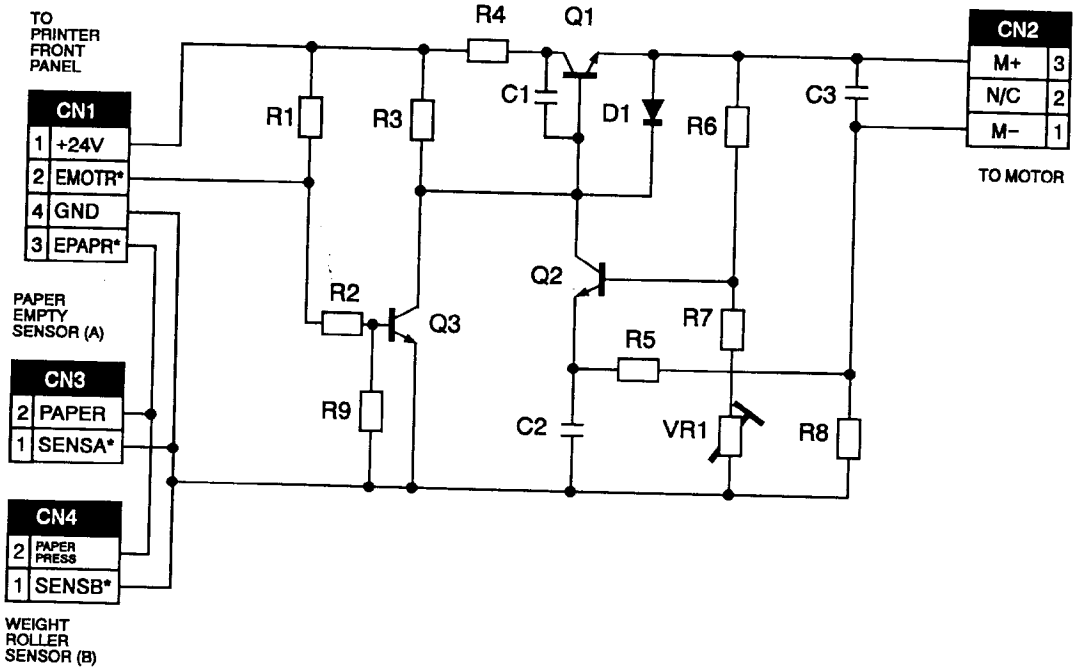


The connector described in the previous section connects to CN1 on the driver board. Switch SW-A is used to detect the presence of envelopes in the stack tray. Switch SW-B determines if the weight roller is set down to press the paper stack.

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

5.2. Schematic diagram

FIG. 5.2. DRIVER BOARD SCHEMATIC DIAGRAM



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6.1. Introduction

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

6.2. Paper jam

If a jam occurs during paper feeding and the jammed paper remains in the universal feeder, raise the weight roller to where it locks in the up position, then remove the jammed paper.

If the jammed paper is inside the printer, turn off the power and remove the universal feeder. Then open the printer's paper feed unit and remove the jammed paper.

If you clear the jam without turning off the power, you can reset the paper jam error by opening and closing the printer's top cover or the paper feed unit. Otherwise, the error is reset when you turn on the power.

Reinstall the universal feeder, if necessary, then raise the weight roller to where it locks in the up position, load paper into the feeder, and gently lower the weight roller. The printer then warms up and goes on-line. Printing resumes automatically if you cleared the jam without turning off the power. Otherwise, you may need to re-start the print job.

6.2.1. Other errors

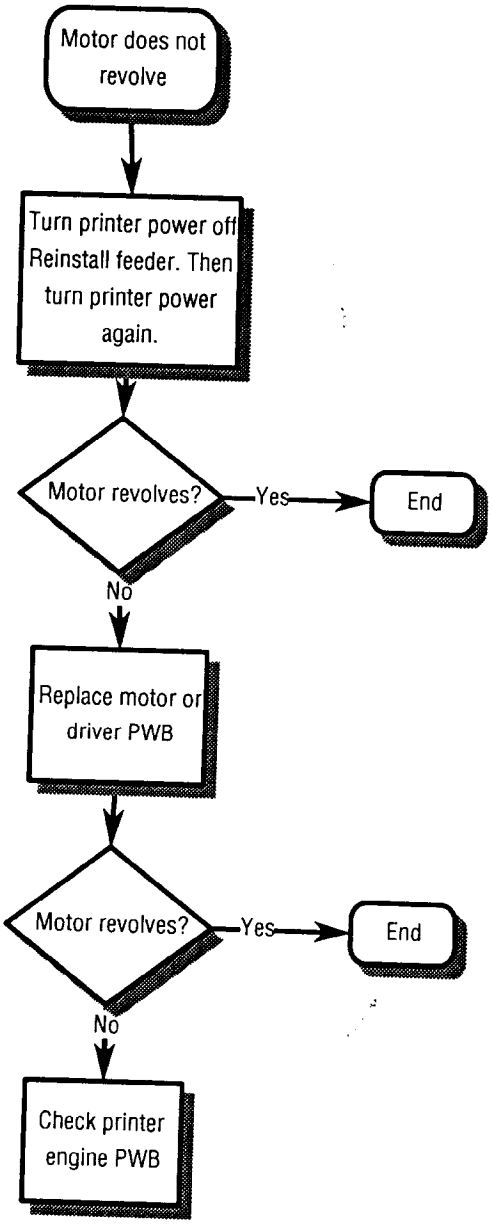
If paper transport problems are frequently experienced, check for the conditions indicated in the table below.

TABLE 6.1. GENERAL PROBLEMS

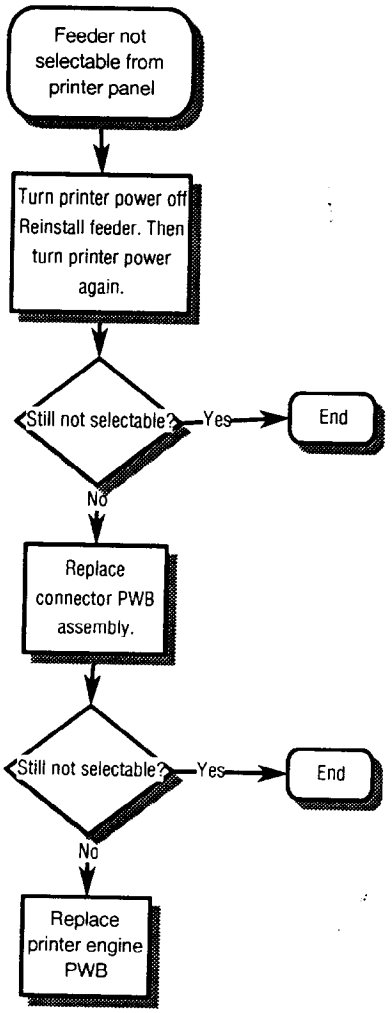
SYMPTOM	POSSIBLE CAUSE		REMEDY	
Paper does not feed smoothly from the feeder.	1	Has the universal feeder been loaded with too much paper?	1	The maximum capacity of the universal feeder is a stack of 10 mm in height. Remove any quantity in excess of this limit.
	2	Does paper have a very slick surface coating or a rough, textured finish, or is the paper very thick?	2	Try changing the type of paper. Make sure that the paper you are using matches the specifications given in elsewhere in this manual.
	3	Are the edges of the stack properly aligned?	3	Remove the paper from the universal feeder, realign the edges, then set the paper back into the universal feeder.
	4	Is the paper wrinkled or torn?	4	Replace the paper with new paper that is in good condition.
	5	Is the feed roller contaminated with oil or paper dust?	5	Clean the roller with a cloth moistened with alcohol.
Paper does not feed into the printer at all.	1	Is the universal feeder properly mounted on the printer?	1	Refer to the Installation section of this manual and make sure that the optional universal feeder has been properly installed.
	2	The printer may be malfunctioning.	2	Check whether paper feeds properly from the printer's paper feed cassette. If not, the printer may be malfunctioning. Contact your dealer for advice.

6.3. Troubleshooting flowcharts

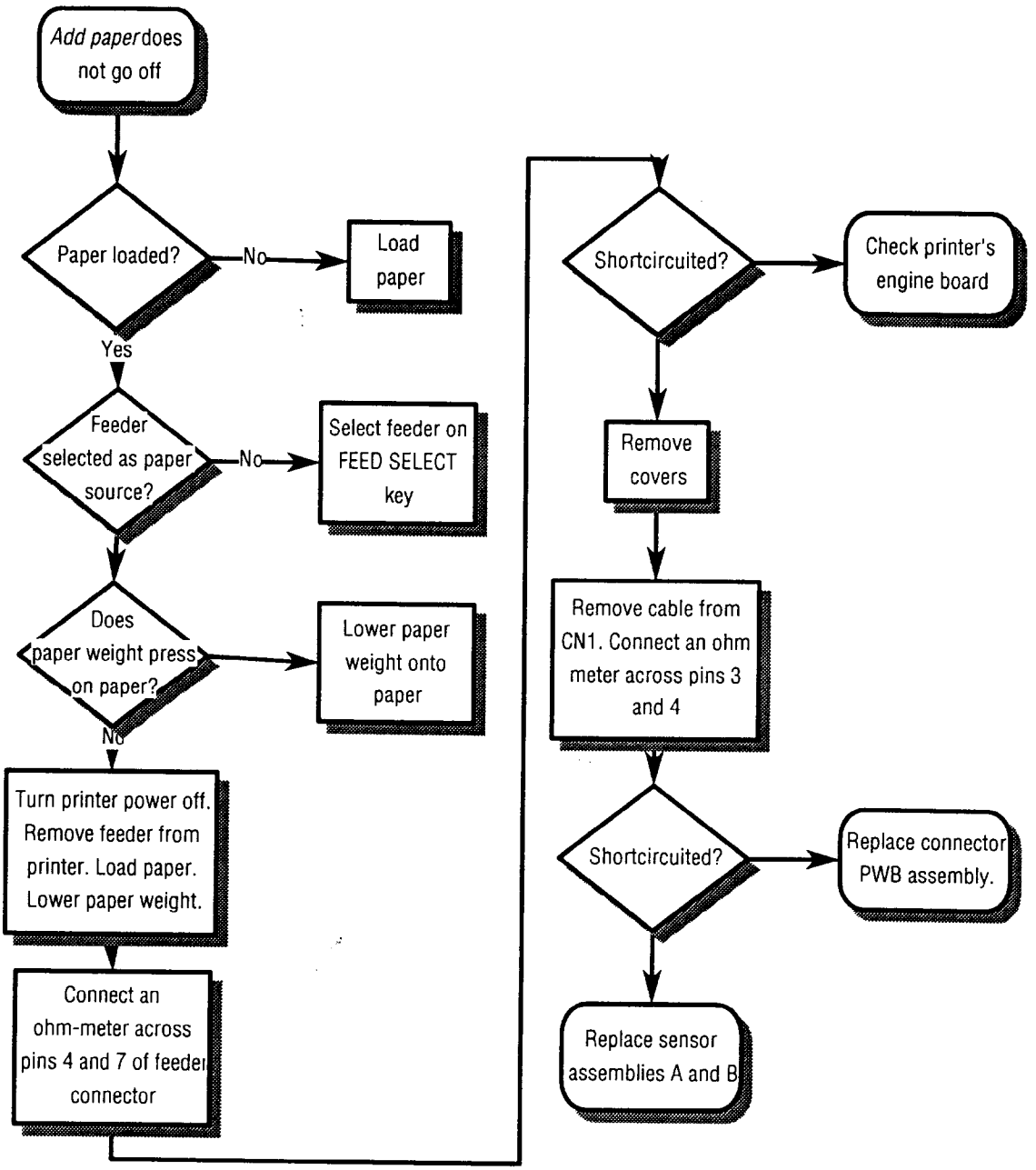
6.3.1. Universal feeder unselectable from printer



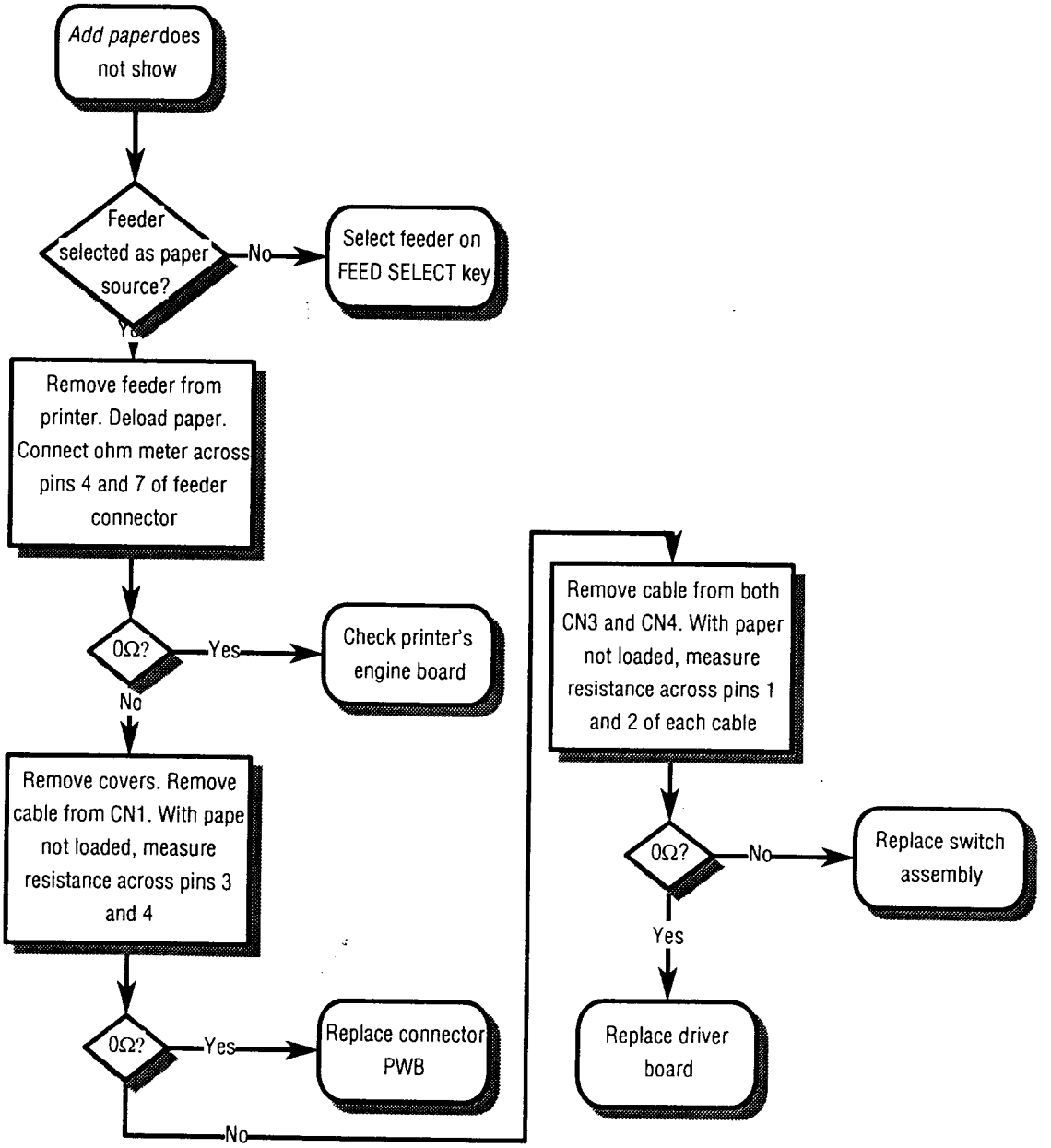
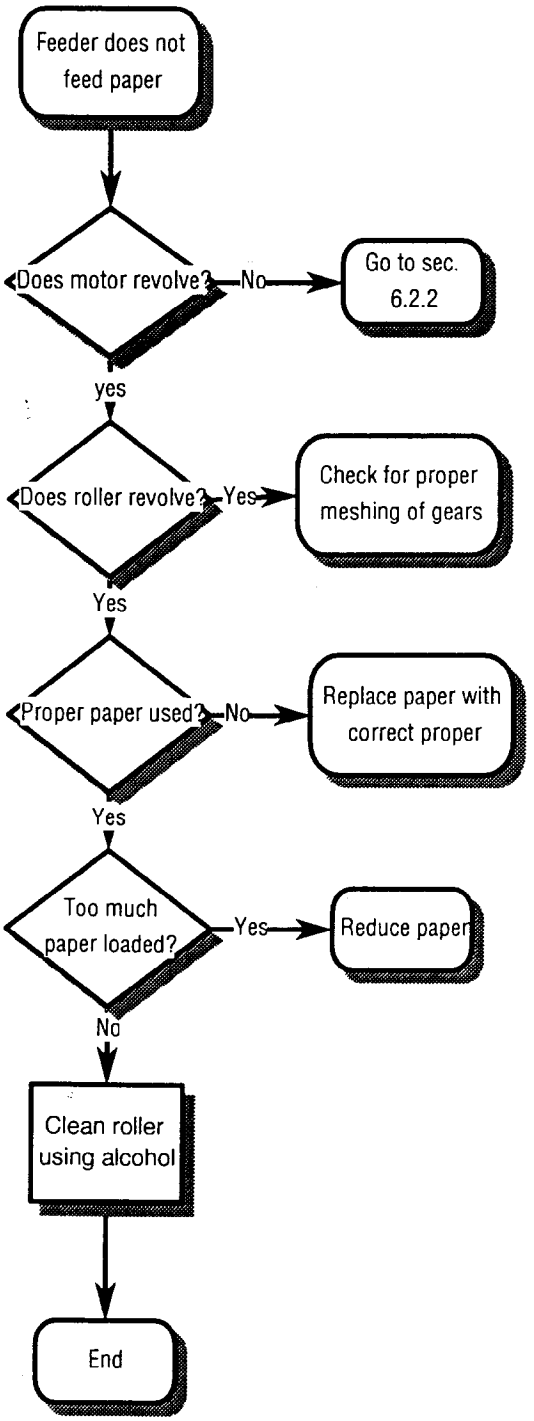
6.3.2. Motor does not revolve



6.3.3. *Add paper* does not go off when selecting UF-1



6.3.4. *Add paper* does not show



6.3.5. Feeder does not feed paper