PR2 *plus*

SERVICE MANUAL

Code XZAC4219-03

PUBLICATION ISSUED BY:

Olivetti S.p.A.
Documentazione
77, Via Jervis - 10015 Ivrea (Italy)

Printed in Italy at

INDEX

FOREWORD

This manual is intended for technicians responsible for installing, servicing and repairing the appliance concerned.

SUMMARY

This manual comprises the following chapters.

- Chapter 1: PRESENTATION OF THE MACHINE
- Chapter 2: OPERATING CONTROLS
- Chapter 3: GENERAL PRESCRIPTIONS FOR INSTALLATION
- Chapter 4: SELF-TEST, SET-UP AND CALIBRATION
- Chapter 5: MACHINE DIAGNOSTICS GUIDE
- Chapter 6: ELECTRICAL INTERCONNECTIONS
- Chapter 7: PREVENTIVE MAINTENANCE
- Chapter 8: MECHANICAL ADJUSTMENTS
- Chapter 9: REMOVAL-REASSEMBLY OF PARTS

PRE-REQUISITES

The approach to the topics covered in this manual requires knowledge of similar products.

REFERENCES

Spare parts catalogue XZAC3455

DISTRIBUTION: General

SECOND EDITION: October 2007

1. PRESENTATION OF THE MACHINE

1.1 INTRODUCTION

The PR2 *plus* is a medium-range specialized printer for the banking environment able to handle documents (both multi-copy and not) and passbooks for deposit/withdrawal transactions.

This highly versatile printer can also be used for Public Administration front-office transactions or in Post Offices. It can be configured with a horizontal magnetic unit for read/writing of horizontal magnetic stripes or with a horizontal magnetic unit and MICR (Magnetic Ink Character Reader) unit to read the lines of code printed on checks. It can also use various interface and emulation configurations.

The PR2 *plus* is the evolution, in terms of quality and performance, of the PR2E and guarantees complete compatibility of firmware and accessories with this.

The performance improvements of the PR2 *plus* in relation to the PR2 E are outlined briefly below:

- Faster printing and throughput using a 2295 Hz printhead
- Extension of the interfaces on the motherboard
- 1 USB 2.0
- 1 ECP parallel port
- 1 fast RS 232
- Compatibility with retail interface boards
- Longer-life print ribbon (10M char)
- Console with LCD option
- Gray and black casing with open key
- Multi-range power supply unit
- F/R 600 dpi color scanner (available in July 2007)
- Compliance of components with European WEEE / ROHS Directives
- Supporting SW for use with standard environments Twain driver)
- Availability of a model with MICR without horizontal magnetic unit

1.1.1 FACTORY CONFIGURATION

The various factory configurations of the PR2 *plus* are illustrated below:

VERSION	CONFIGURATION
PR2 *plus* 10	Basic model with RS232, Parallel and USB ports
PR2 *plus* 12	PR2 *plus* 10 with horizontal magnetic unit
PR2 *plus* 12 M	PR2 *plus* 12 with MICR reader

1.2 TECHNICAL DATA

1.2.1 PRINT UNIT

The printing device consists of a needle matrix head with overheating protection sensor fitted on the transport carriage; contrast is provided by a spring-loaded deformation bar that permits adaptation of vertical position to document thickness at the printing position.

Other features include faster speed of the printhead, increased to a maximum shooting frequency of 2295 Hz, and a new ribbon with a life of 10 million characters.
The PR2 *plus* printing device consist of a needle matrix printhead that operates in serial mode and is fitted with a overheating safety sensor. If the critical temperature threshold is exceeded, printing is interrupted.

To prevent this situation, it will be possible in future to introduce a forced ventilation device. The printer also features an operating mode that, when a predefined temperature is reached, slows printing until the printhead returns to normal conditions at which point printing restarts at normal speed.

Snap replacement of the printhead is not envisaged.

1.2.2 CHARACTERISTICS OF THE PRINTHEAD

Technology	Impact needle matrix
Number of needles	24
Needle diameter	0.25mm
Matrix geometry	losange
Frequency	2295 Hz
Max. nominal speed	560 cps at 10cpi
Heat protection	PTC
Printhead life	›400 million dots/needle ›150 million characters
MCBF	4 x 10^9 dots

1.2.3 FONT AND CHARACTER SET

A new Very High Speed Draft (VHSD) mode at 10 cpi has been introduced. All character generators, fonts and codepages available in the various emulations and versions are preloaded in the basic version (including the DAECO).

Printing speed and definition

Mode	CPS	Copies	Matrix (V x H)	Definition (V x H)
VHSD	560	1+1	24 x 4 +3+1	1/80” H 1/180” V
HSD	510	1+2	24 x 4 +3+2	1/90” H 1/180” V
Draft	370	1+4	24 x 5 +4+3	1/120” H 1/180” V
NLQ	185	1+5	24 x 18+6	1/240” H 1/180” V
LQ	125	1+6	24 x 36	1/360” H 1/180” V
BIM (min.)	2000 (dps)			1/120” H 1/180” V
BIM (max.)	2000 (dps)			1/360” H 1/180” V

The new VHSD (Very High Speed Draft) mode has been introduced on the PR2 *Plus*.

Attributes

Available fonts (depending on the active emulation)

Alphanumeric	native
	roman
	sans serif
	courier
Optical reading	OCR-A
	OCR-B single-row

Barcodes

Maximum packing of the barcode (module) depends on the dimensions of the needle of the printhead. Modules from 0.25 mm and multiple integers are possible.

Types of barcodes supported

EAN 8	Code 39
EAN 13	2 of 5 interleaved
UPC-A	2 of 5 industrial
UPC-E	Codabar

Preloaded codepages (depending on the active emulation)

Descrizione del codepage			Disponibilità del codepage nelle emulazioni									
			STD					DAECO				
ID	CP	Nome Convenzionale	2845	Oli	PP	4722	SNI	2845	Oli	PP	4722	SNI
1		Std 15 OCA	Y	-	-	-	-	Y	-	-	-	-
2		Std 15 ISL	Y	-	-	-	-	Y	-	-	-	-
10		Std 15 International	Y	Y	-	-	-	Y	Y	-	-	-
20		Std 15 Germany	Y	Y	-	-	-	Y	Y	-	-	-
30		Std 15 Portugal	Y	Y	-	-	-	Y	Y	-	-	-
40		Std 15 Spain	Y	Y	-	-	-	Y	Y	-	-	-
50		Std 15 Denmark-Norway	-	Y	-	-	-	-	Y	-	Y	-
60		Std 15 France	Y	Y	-	-	-	Y	Y	-	Y	-
70		Std 15 Italy	Y	Y	-	-	-	Y	Y	-	-	-
80		Std 15 Sweden-Finland	Y	Y	-	-	-	Y	Y	-	-	-
90		Std 15 Switzerland	Y	Y	-	-	-	Y	Y	-	-	-
100		Std 15 England	Y	Y	-	-	-	Y	Y	-	-	-
110		Std 15 USA-ASCII	Y	Y	-	-	-	Y	Y	-	-	-
120		Std 15 Latin Farsi	-	-	-	-	-	-	-	-	-	-
130		Std 15 Latin Arabic	-	-	-	-	-	-	-	-	-	-
140		Std 15 Latin Greek	Y	Y	-	-	-	Y	Y	-	-	-
150		Std 15 Latin Hebrew	Y	Y	-	-	-	Y	Y	-	Y	-
170		Std 15 Spain 2	Y	Y	-	-	-	Y	Y	-	-	-
180		Std 15 Russian	-	Y	-	-	-	-	Y	-	-	-
200		Std 15 Yugoslavia	Y	Y	-	-	-	Y	Y	-	-	-
210		Std 15 User 1	-	-	-	-	-	-	-	-	-	-

ID	CP	Nome Convenzionale	2845	Oli	PP	4722	SNI	2845	Oli	PP	4722	SNI
220		Std 15 User 2	-	-	-	-	-	-	-	-	-	-
230		Std 15 User 3	-	-	-	-	-	-	-	-	-	-
240		Std 15 User 4	-	-	-	-	-	-	-	-	-	-
250		Std 15 Standard 28	-	-	-	-	-	-	-	-	-	-
300		Std 15 Hilal	-	-	-	-	-	-	-	-	-	-
310		Std 15 Magreb	-	-	-	-	-	-	-	-	-	-
320		Std 15 Daisy Arabic	-	-	-	-	-	-	-	-	-	-
330		Std 15 Daisy Greek	-	-	-	-	-	-	-	-	-	-
400		Std 15 Standard 21	-	-	-	-	-	-	-	-	-	-
410		Std 15 TCV 370	Y	Y	-	-	-	Y	Y	-	-	-
500		Std 15 Canada BOM	Y	Y	-	-	-	Y	Y	-	Y	-
510		Std 15 Denmark SDC	Y	Y	-	-	-	Y	Y	-	-	-
513		Std 15 Kanji	-	-	-	-	-	-	-	-	-	-
520		Std 15 Turkish	Y	Y	-	-	-	Y	Y	-	-	-
530		Std 15 Arabic	-	Y	-	-	-	-	Y	-	-	-
540		Std 15 Canada CIBC	Y	Y	-	-	-	Y	Y	-	Y	-
600	600	ISO 8859/1 Latin 1	-	Y	Y	Y	Y	-	Y	Y	Y	-
602	602	ISO 8859/9 Turkish	-	Y	Y	Y	Y	-	Y	Y	Y	-
605	605	ISO 8859/2 Latin 2	-	Y	Y	Y	Y	-	Y	Y	Y	-
610		ISO 8859/3 Latin 3	-	-	-	-	-	-	-	-	-	-
613		ISO 8859/4 Latin 4	-	-	-	-	-	-	-	-	-	-
615	615	ISO 8859/5 Cyrillic	-	Y	Y	Y	Y	-	Y	Y	Y	-
617	617	ISO 8859/15 Euro	-	Y	Y	Y	Y	-	Y	Y	Y	-
620	620	ISO 8859/6 Arabic	-	Y	Y	Y	-	-	Y	Y	Y	-
623	623	ISO 8859/7 Greek	-	Y	Y	Y	Y	-	Y	Y	Y	-
625	625	ISO 8859/8 Hebrew	-	Y	Y	Y	Y	-	Y	Y	Y	-
640	1252	1252 PC-WIN Latin 1	-	Y	Y	Y	Y	-	Y	Y	-	-
641	1255	1255 PC-WIN Hebrew	-	Y	Y	Y	Y	-	-	-	-	-
642	1254	1254 PC-WIN Turkish	-	2066	2066	-	-	-	-	-	-	-
643	1253	1253 PC-WIN Greek	-	A	A	-	-	-	-	-	-	-
644	1257	1257 PC-WIN Baltic	-	2041	2041	-	-	-	-	-	-	-
645	1250	1250 PC-WIN Latin 2	-	Y	Y	Y	Y	-	Y	Y	-	-
646	1256	1256 PC-WIN Arabic	-	2051	2051	-	-	-	-	-	-	-
647	1258	1258 PC-WIN Vietnam	-	2025	2025	-	-	-	-	-	-	-
648	874	874 PC-WIN Thai	-		-	Y	2039	-	-	-	-	-
649	875	875 Thai	-	-	-	-	2039	-	-	-	-	-
650	876	876 Thai	-	-	-	-	2039	-	-	-	-	-
651	877	877 Thai	-	-	-	-	2039	-	-	-	-	-
655	1251	1251 PC-WIN Cyrillic	-	Y	Y	-	Y	-	Y	Y	-	-
680	680	Oli-Unix	-	Y	Y	Y	-	-	Y	Y	Y	-
700	437	International	-	Y	Y	Y	Y	-	Y	Y	Y	-
701	220	220 Spain	-	Y	Y	Y	Y	-	Y	Y	Y	-
710	865	865 Nordic	-	Y	Y	Y	-	-	Y	Y	Y	-
711	711	Denmark-Norway	-	Y	Y	Y	-	-	Y	Y	Y	-
712	712	Denmark 2 (OPE)	-	Y	Y	Y	-	-	Y	Y	Y	-
714		Sina	-	2086	2086	2058	-	-	-	-	-	-
715		Iransys	-	2086	2086	2058	-	-	-	-	-	-
716		Sayeh	-	2086	2086	2058	-	-	-	-	-	-
717		Ciba	-	2086	2086	2058	-	-	-	-	-	-
720	860	860 Portughese	-	Y	Y	Y	Y	-	Y	Y	Y	-
730	863	863 Canadian French	-	Y	Y	Y	-	-	Y	Y	Y	-
740	850	850 Latin 1	-	Y	Y	Y	Y	-	Y	Y	Y	-

ID	CP	Nome Convenzionale	2845	Oli	PP	4722	SNI	2845	Oli	PP	4722	SNI
741	858	858 Latin Euro	-	Y	Y	Y	Y	-	Y	Y	Y	-
742	857	857 Turkish	-	Y	Y	Y	Y	-	Y	Y	Y	-
750	852	852 Latin 2	-	Y	Y	Y	Y	-	Y	Y	Y	-
760	853	853 Latin 3	-	-	-	-	-	-	-	-	-	-
770	851	851 Greek	-	Y	Y	Y	Y	-	Y	Y	Y	-
771	210	210 Greek	-	Y	Y	Y	Y	-	Y	Y	Y	-
772	869	869 Greek	-		-	Y	-	-	-	-	-	-
780	855	855 Cyrillic	-	Y	Y	Y	Y	-	Y	Y	Y	-
781	862	862 Hebrew	-	Y	Y	Y	Y	-	Y	Y	Y	-
782	864	864 Arabic	-	Y	Y	Y	-	-	Y	Y	Y	-
783	866	866 Cyrillic	-	Y	Y	Y	Y	-	Y	Y	Y	-
784		Table persian	-	-	-	-	-	-	-	-	-	-
790	868	868 Urdu	-	-	-	Y	-	-	-	-	-	-
800	877	Table num OCR-B	-		-	Y	-	-	-	-	-	-
810	876	OCR-A	-		-	Y	-	-	-	-	-	-
900		Table Korea	-	-	-	-	-	-	-	-	-	-
901		Table Korea 2	-	-	-	-	-	-	-	-	-	-
910		Table China	-	-	-	-	-	-	-	-	-	-
920		Table Taiwan	-	-	-	-	-	-	-	-	-	-
921		Table Taiwan 2	-	-	-	-	-	-	-	-	-	-
922		Table Taiwan 3	-	-	-	-	-	-	-	-	-	-
930		Table ASMO 449	-	-	-	-	-	-	-	-	-	-
931		Table ASMO 449 plus	-	-	-	-	-	-	-	-	-	-
940		Table pointed numbers	-	-	-	-	-	-	-	-	-	-
941		TCVN3	-	2025	2025	-	-	-	-	-	-	-
942		Vietnam 1C	-	2025	2025	-	-	-	-	-	-	-
943		Vietnam 1S	-	2025	2025	-	-	-	-	-	-	-
944		Vietnam 2C	-	2025	2025	-	-	-	-	-	-	-
945		Vietnam 2S	-	2025	2025	-	-	-	-	-	-	-
998	998	7PIX	-	Y	-	Y	-	-	Y	Y	-	-
998	998	OCR-A	-	-	-	-	Y	-	-	-	-	-
999	999	COD597	-	Y	-	Y	-	-	Y	Y	-	-
999	999	OCR-B	-	-	-	-	Y	-	-	-	-	-

Legend :

Y currently present in the emulation indicated
A **to be added**
xxxx number of the PNS that implements it, to be added in the basic version
- not present

Direction of printing

normal	automatic on document feeder
rotated by 270°	rotation command

Character attributes

Normal	double width
boldface	double height
subscripts	double height and width
superscripts	horizontal and vertical zoom
italics	

1.2.4 PRINT RIBBON

The product is equipped with a disposable ribbon cartridge compatible with the PR2 E. It has been designed so that the operator, following the instructions provided in the manual and also on the container of the new ribbon, can carry out replacement operations without coming into contact with the inked ribbon. The body of the ribbon is personalized with the Olivetti logo.

Color	Black
Pigmentation	Carbon free
Ribbon life	10 million characters (draft mode, 40% contrast)
Number of ribbons year	1.9
Number of ribbons life	9.4
Packaging	Waterproof with protection box

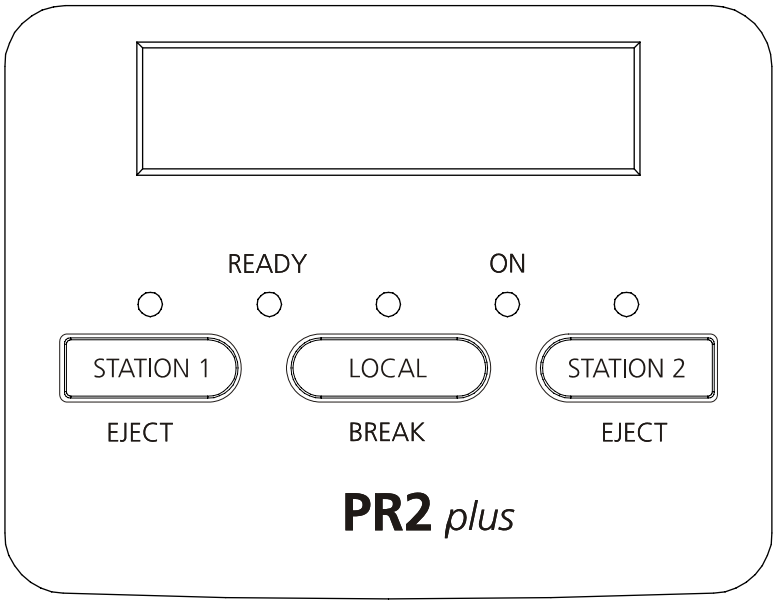
1.2.5 POWER SUPPLY UNIT

- Voltage 100÷240 VAC ± 10%
- Frequency 50/60 Hz
- Output 40V ± 3%
- Type of appliance class 1 (with ground)
- 2P+G input connector to IEC/CEE 22 standards
- Separate power cord
- Cable length between 1.8 and 2.5 m
- Maximum power requirement 170W

The product must comply with the requirements of the “Energy Star” mark.

1.2.6 CONSOLE

The PR2 Plus console comprises 3 keys, 5 leds and a display.
The indications and commands are the same as those of the PR2 E.
In emulations that permit this, it imitates the behavior of the display of the machine emulated; in other cases, it shows error messages, machine status, setup options.



Display

- Type: dot matrix alphanumeric
- Lighting: back-lit
- Capacity: 2 lines of 16 characters
- Target font: able to manage characters defined by the user (including Arabic, Chinese, etc.)

1.2.7 MOTHERBOARD

- Basic memory of 2 Mb expandable to 4 Mb (factory only)
- The following are present on the motherboard:
- 1 EIA standard RS 232 C port
- 1 IEEE 1284 standard parallel port
- 1 USB 2.0 port with own power supply
- 1 expansion slot for Ethernet, WI-FI, RS232 interface. Installation at user level.

1.2.8 HORIZONTAL MAGNETIC UNIT

This device can read/write horizontal magnetic stripes. It consists of a mobile magnetic printhead that operates across the insertion slot with a specific controlled-movement mechanism.

It operates across the entire insertion slot of the printer and does not involve any particular constraints as regards positioning of the passbook inserted.

The operation on the stripe is carried out exerting controlled pressure on the passbook to guarantee uniform distance between the printhead and the magnetic support.

Characteristics:

R/W reference standards	DIN ISO 32744 IBM 3604 ANSI
alignment	autoborder
error rate	<1/10000 (after three automatic retries)

1.2.9 VERTICAL MAGNETIC UNIT

This device can read/write vertical magnetic stripes. It comprises a fixed-position R/W head and approach movement to the stripe. It can be installed to the left or right of the paper path, as required by the customer. The passbook must be inserted against the respective side of feeder.

Characteristics:

R/W reference standards	Binary coded decimal Olivetti
Alignment method	manual and autoborder
Introduction side	right or left (version)
error rate	<1/10000 (after three automatic retries)

1.2.10 MICR READER

A new model is envisaged that integrates only the MICR (without horizontal magnetic unit) whose electronics are integrated in the scanner board.

The reader, located inside printer, operates crosswise to the direction of movement of the paper.

It comprises a read head able to operate also on passbook magnetic stripes, fitted on a specific mechanism that guarantees correct traverse during work phases.

The read range is equal to the size of the slot. A position restriction on the right-hand side of the feeder is accepted. If present, this restriction must be highlighted by a graphic sign on the top lip of the slot.

The interpretation SW must be able to recognize the font of the check being read automatically (objective).

CHARACTERISTICS	FONT	CODING
Fonts recognized	CMC7	ISO 1004-1992 part one, E 13b ISO 1004-1992 part two
Spacing	CMC7, E13B	8 cpi
Reading mode	Autoriconoscimento font	
Reader position	Lato inferiore passaggio paper	

1.2.11 THROUGHPUT

Data recorded with the machine connected via RS232 at 9600 Baud

DOCUMENT	MODE	PAGES / HOUR
54 lines of text at 40 CRT	HSD	283
	Draft	262
	NQL	162
54 lines of text at 80 CRT	HSD	211
	Draft	182
	NQL	106
Banking document 210x80mm	HSD	1161
	Draft	1125
	NQL	857
Banking document 210x240	HSD	562
	Draft	507
	NQL	378
Bank statement	HSD	160
	Draft	160
	NQL	90
ECMA letter	HSD	305
	Draft	281
	NQL	194

1.2.12 EMULATIONS

The following emulations are possible:

- Olivetti
- IBM
- Wincor

1.2.13 SCANNER

A fast color scanner with a resolution of 600 dpi is included.

The scanner features a fixed lower image acquisition element (CIS) and a mobile upper element that moves from the top down when activated. This action makes it possible for the printer to maintain the same throughput, in terms of documents managed, as the standard PR2 *plus*.

When only the upper element is present, a specific closing element replaces the shape of the lower scanning element. The layout of the two scanners takes into account the fact that it must be possible to activate these at the same time, eliminating optical disturbances (shadow images) that may occur with particular types of paper.

Two specific models are planned, the first with upper CIS at the paper passage (F), the second with both CIS (F/R).

Compatibility with a shades of gray CIS equipped with infra-red lighting is planned (RG-IR, option for non-standard products).

Scanner technical data

type of scanner	contact
technology	CIS
resolution	600 dpi
illumination	set of leds
type of illumination	red, green, blue (RGB)
method of lighting	monochrome or color (RGB) (factory alternative, monochrome and infrared)
type of light control	SW controlled
light intensity	SW controlled
image acquisition	- white black - 16 shades of gray - 256 shades of gray - RGB (color) or IR factory alternative - legacy mode (200 dpi, PR2 E compatible)
CIS physical width	216 mm
scanning width	max. 210 mm
number of pixels	4960
scanning speed	10 inch/s grayscale single side 8 inch/s grayscale double side 3.3 inch/s color single side (double side requires two passes)
horizontal scanner position	aligned with the left-hand side of the slot
scanning format	(W) 65÷210 mm (H) 70÷297 mm
type of documents handled	constant thickness
double scanner operativity	concurrent (grayscale) or subsequent
available memory	8 MB or above
transmission	superimposed on scanning
type of interface used	Parallel ECP - USB 2.0
control of threshold value for black/white	managed with specific command
image format output	BIT stream

1.3 CERTIFICATIONS AND APPROVALS

1.3.1 CERTIFICATIONS AND APPROVALS 230V POWER SUPPLY UNIT VERSION

Safety	
CE Marking: compliance with standards	EN 60950

Electromagnetic Compatibility		
CE Marking: compliance with standards	EN 55022	
	EN 55024	
	EN 61000-3-2	(harmonics)
	EN 61000-3-3	(flicker)

Environmental Compatibility	
Recycling: Directive	WEEE (2002/96/EC)
Hazardous substances: directive	ROHS (2002/95/EC)

1.3.2 CERTIFICATIONS AND APPROVALS 115V POWER SUPPLY UNIT VERSION

Safety	
International Marks: compliance with standards	C-TUV/NRTL-US

Electromagnetic Compatibility	
FCC Marking	Class A

1.3.3 ENVIRONMENTAL SPECIFICATIONS

Reference standards		
Operating	Temperature	+15 ÷ +35 °C
	Humidity	35 ÷ 85 % (without condensation)
Stand-by	Temperature	-10 ÷ +60 °C
	Humidity	10 ÷ 90 % (without condensation)

1.4 DOCUMENTS THAT CAN BE HANDLED BY THE BASIC MACHINE

1.4.1 SINGLE FORM

Width	65 x 245 mm
Length	297 x 70
Single sheet thickness	0.07 ÷ 0.28 mm
Single sheet weight	60 ÷ 160 gr/m^2
Chemical paper copies	1+4 (medium weight) LQ: 1+6
Carbon paper copies	1+4 (medium weight) LQ: 1+6

1.4.2 PASSBOOK WITH VERTICAL BINDING

Width max. (open)	241 mm
Width min. (open)	150 mm
Length max.	220 mm
Length min.	85 mm

1.4.3 PASSBOOK WITH HORIZONTAL BINDING

Width max.	241 mm
Width min.	150 mm
Length max. (open)	220 mm
Length min. (open)	165 mm

1.4.4 OTHER CHARACTERISTICS

Max. thickness (open)	1.8 mm
Max. diff. In thickness between pages	1.2 mm
Cover thickness	0.2 ÷ 0.5 mm
Type of binding permitted	thread seam
Joining radius of outer corners	3 ÷ 14 mm

1.5 ACCESSORIES

This paragraph describes the accessories available for the PR2 *plus* printer.

1.5.1 RIBBON CARTRIDGE IN NYLON SNUG CART - BLACK

Ribbon cartridge for needle printhead, with life of 10 million characters.
The cartridge is installed lifting the upper cover of the printer, with automatic positioning of the carriage, with machine ON or manual positioning with machine OFF, and lifting the print unit using the specific lever.

1.5.2 RIBBON CARTRIDGE IN NYLON SNUG CART - INDELIBLE

Same as the BLACK NYLON SNUG CART but with indelible ink.

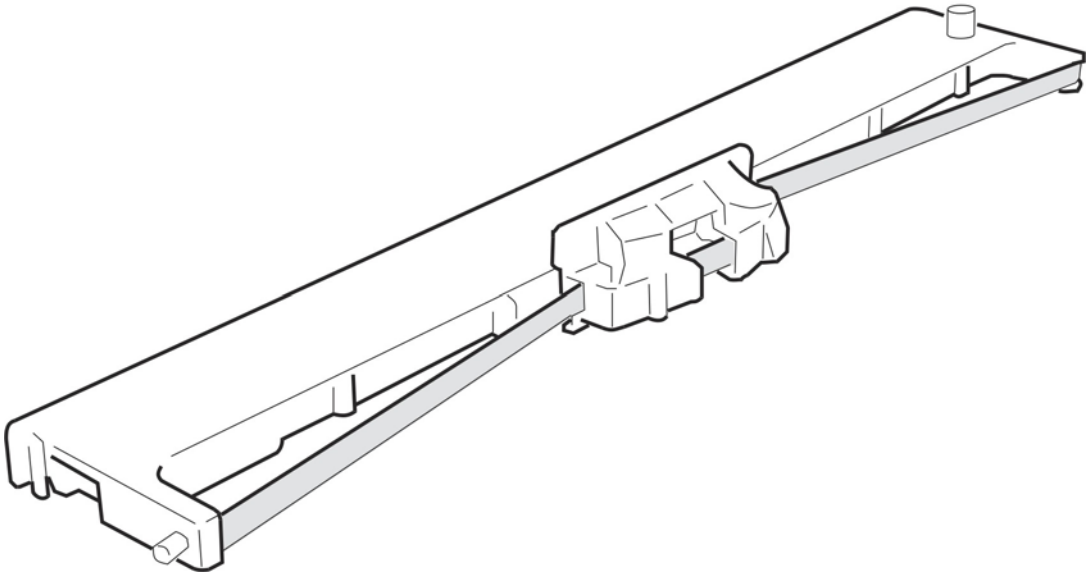


Figure 1-1

1.6 LOCATION OF MAIN COMPONENTS

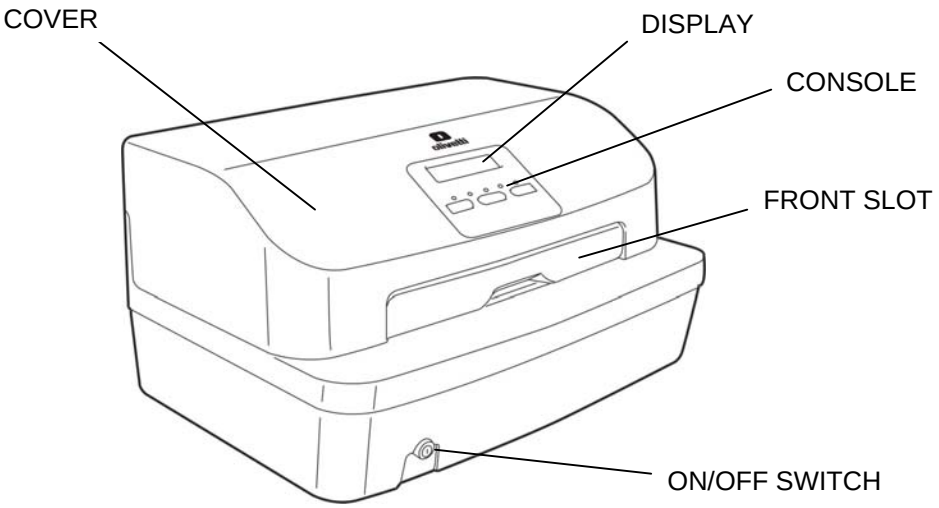


Figure 1-2

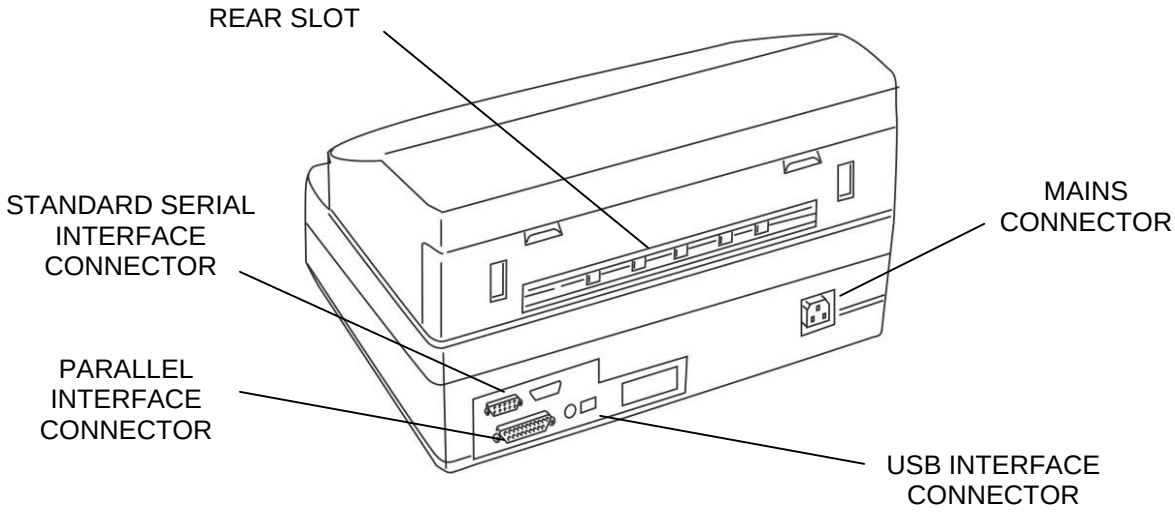


Figure 1-3

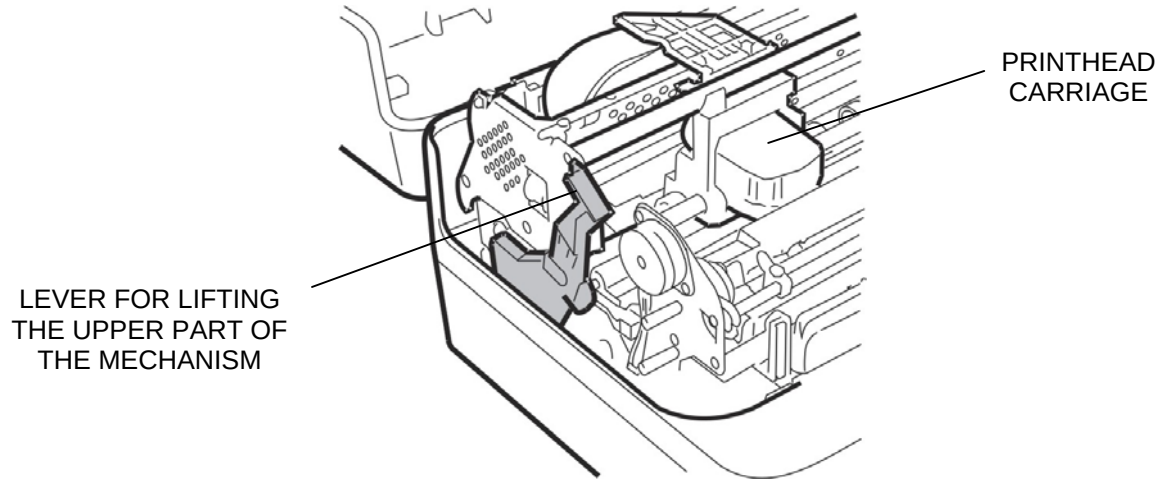


Figure 1-4

1.7 LOCATION OF MAIN COMPONENTS INSIDE THE MACHINE

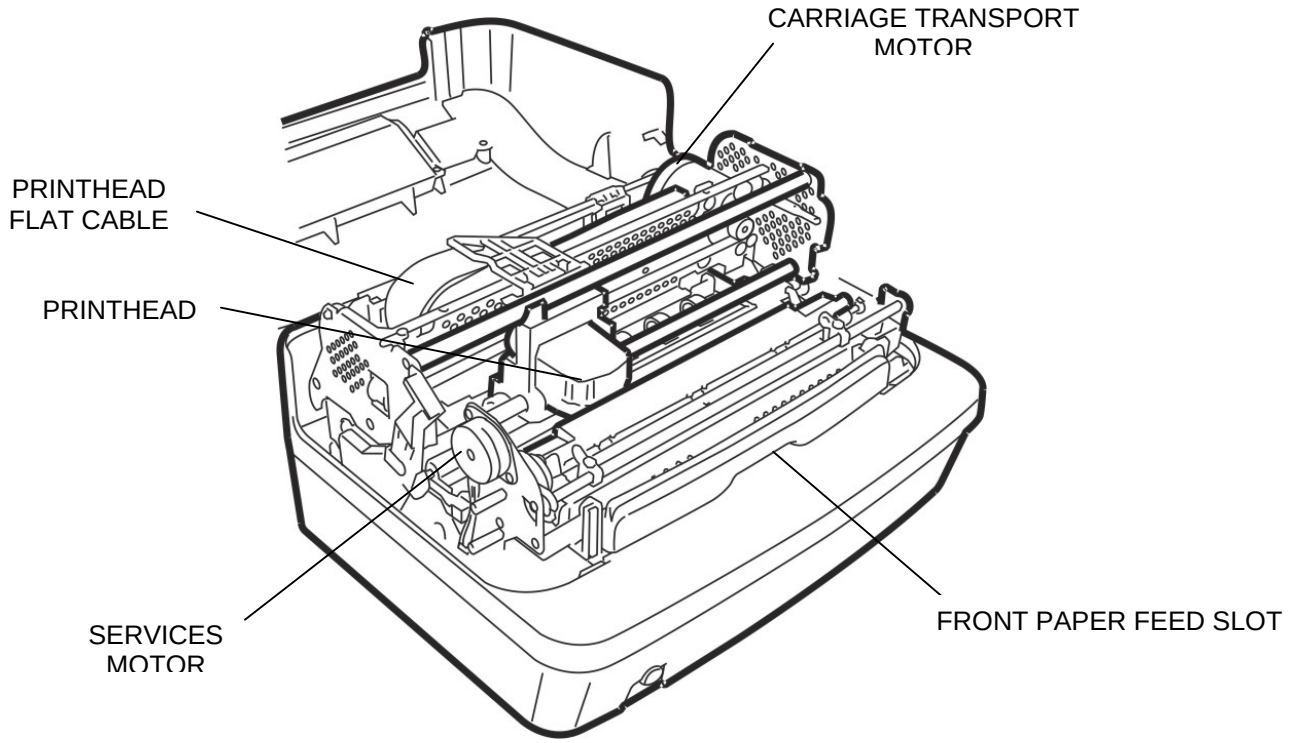


Figure 1-5

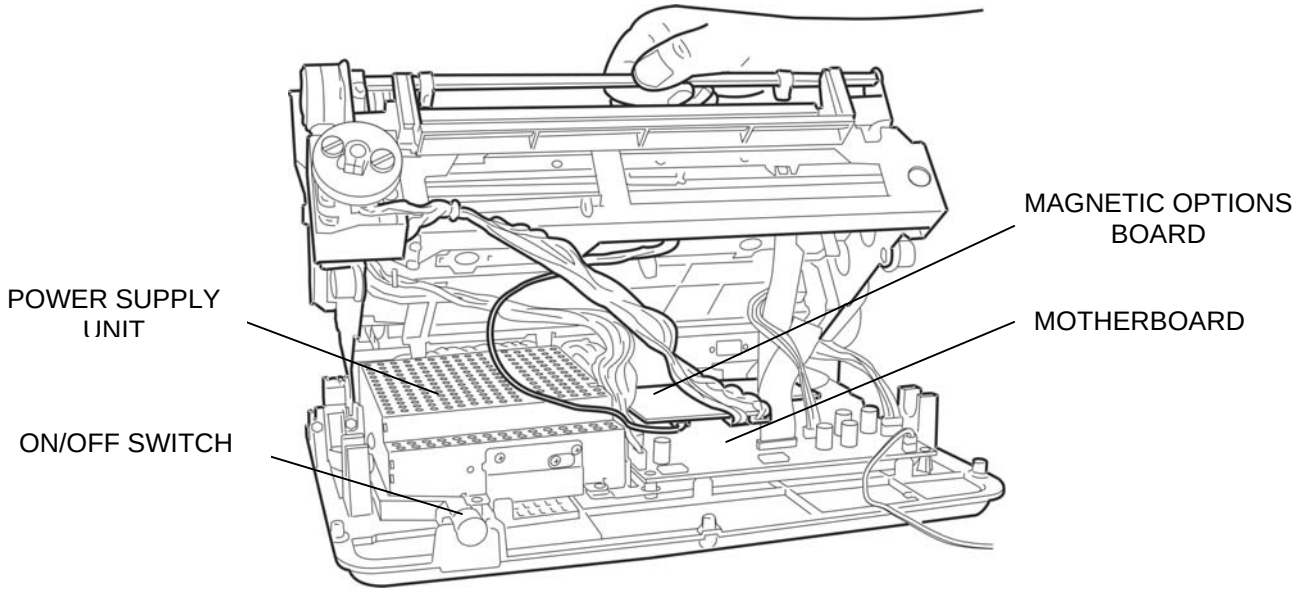
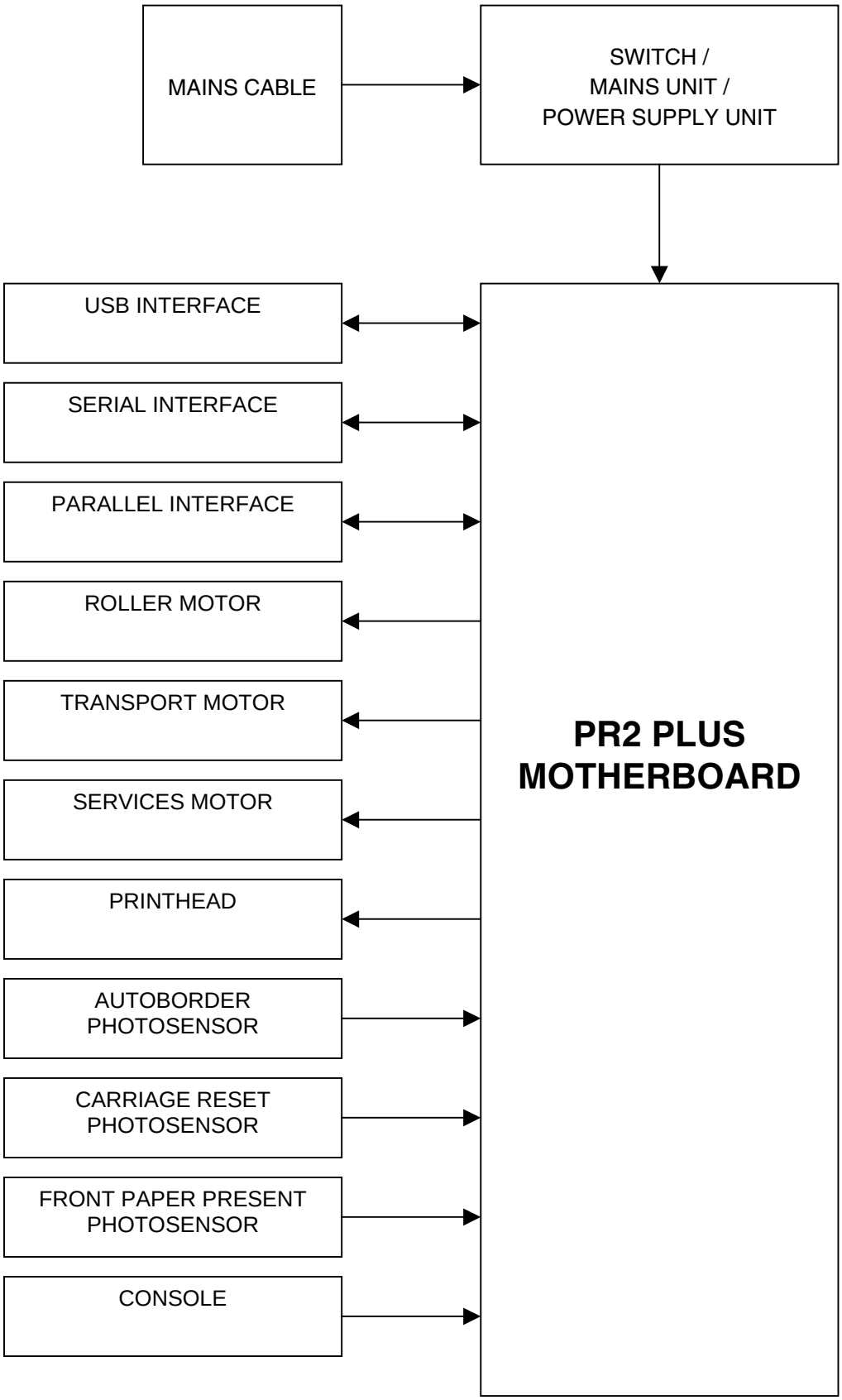


Figure 1-6

1.8 GENERAL BLOCK DIAGRAM



1.9 FIRMWARE AND CHARACTER GENERATORS

1.9.1 FIRMWARE OF MACHINE

In addition to that separate from the generator and from the set characters, the management firmware of the printer is controlled independently in load operations in order to facilitate immediate access for modifications to the characters area.
The basic memory of the printer is a 1-MB Flash EPROM on which the management FW, character generators and characters sets are held and can be replaced on line.
A second Flash EPROM (optional) with the same capacity, able to contain complex character sets or high volumes of macros and logos, can be installed on the motherboard.

The machine firmware comprises the following emulations:

- Olivetti environment: STD 12/14 controlled protocol with native PR2 E environment and PR40+ and PR2845 emulation. Industry standard emulation IBM Proprinter II and Proprinter X24.
- IBM environment: Emulation protocol 9068 with coverage of the 4722 model, Industry standard emulation IBM Proprinter II and Proprinter X24.
- Wincor-Nixdorf environment: Emulation protocol SNI 4915 with coverage of models 4905, Industry standard emulation EPSON LQ 2550.

1.9.2 CHARACTER SETS

System level compatibility for each character set extends the environments listed below:

ENVIRONMENT	CHARACTER SET
PC/DOS	CP SET, CODE PAGE
WINDOWS 2.X, 3.0; OS/2; UNIX	ISO 8859/X
WINDOWS 3.1	CP SET
OLIVETTI	STD 15

Each emulation present on the machine includes one or ore character sets. The character sets present in each emulation are listed in the table below:

EMULATION	CHARACTER SET
OLIVETTI	CP SET, STD 15 Olivetti, ISO
IBM	CP SET, ISO

1.9.3 MODE AND CHARACTER FONTS

The characteristics of the various print modes are listed below:

	10 cpi	12 cpi	15 cpi
H.S.D. (High Speed Draft)	350 cps	314 cps	327 cps
DRAFT	260 cps	260 cps	260 cps
N.L.Q. (Near Letter Quality)	130 cps	130 cps	130 cps
L.Q. (Letter Quality)	86 cps	104 cps	131 cps

The reference standards for the printable optical characters are as follows:

Font	Coding standard	Dimensions/std form	Print specifications
OCR A	EUROBANKING	ISO 1073/1	ISO 1831
OCR B	EUROBANKING	ISO 1073/2	ISO 1831

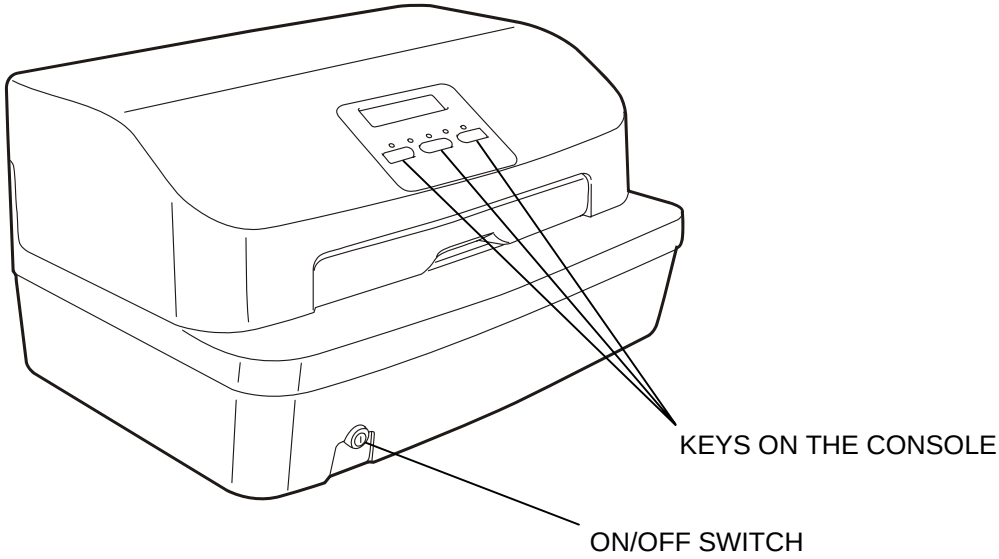
Relationship between writing styles and emulation environment:

Emulations	Writing styles	Selection
PR50/PR2845	HSD, DRAFT, NLQ1, NLQ2, LQ2, OCRA, OCRB	FROM SET-UP
	DRAFT, NLQ1	FROM LINE
PR50/PR40+	HSD, DRAFT, NLQ1, NLQ2, LQ2, OCRA, OCRB	FROM SET-UP
	DRAFT, NLQ1, OCRA, OCRB	FROM LINE
PR2 E	HSD, DRAFT, NLQ1, NLQ2, LQ2, OCRA, OCRB	FROM SET-UP
	HSD, DRAFT, NLQ1, NLQ2, LQ2, OCRA, OCRB, ITALIC DRAFT ITALIC NLQ1, ITALIC NLQ2, ITALIC LQ2	FROM LINE
IBM PP II/X24	HSD, DRAFT, NLQ1, NLQ2, LQ2	FROM SET-UP
	DRAFT, NLQ1	FROM LINE

2. OPERATING CONTROLS

The operating controls of the machine are as follows:

- on/off switch
- keys on the console
- lever for lifting the upper part of the mechanism.



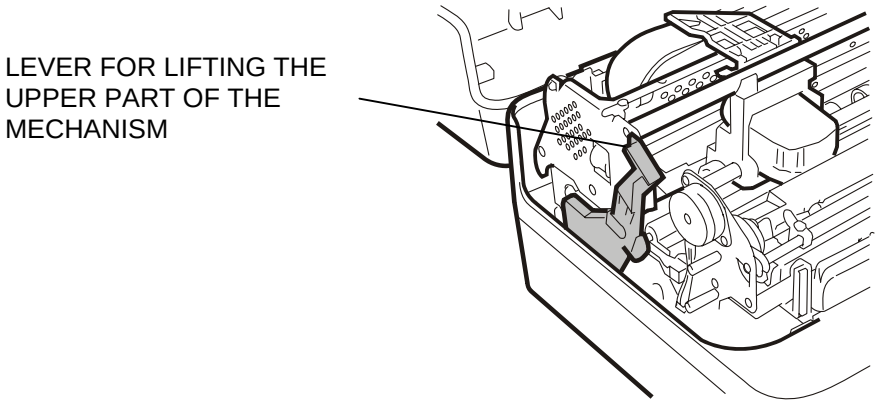


Figure 2-1 Operating controls

2.1 ON/OFF SWITCH

The on/off switch of the machine is of the two-position type. The switch is operated by a mechanism that runs cross the machine in a lengthwise direction.

2.2 CONSOLE

The console of the machine comprises five leds and three keys.

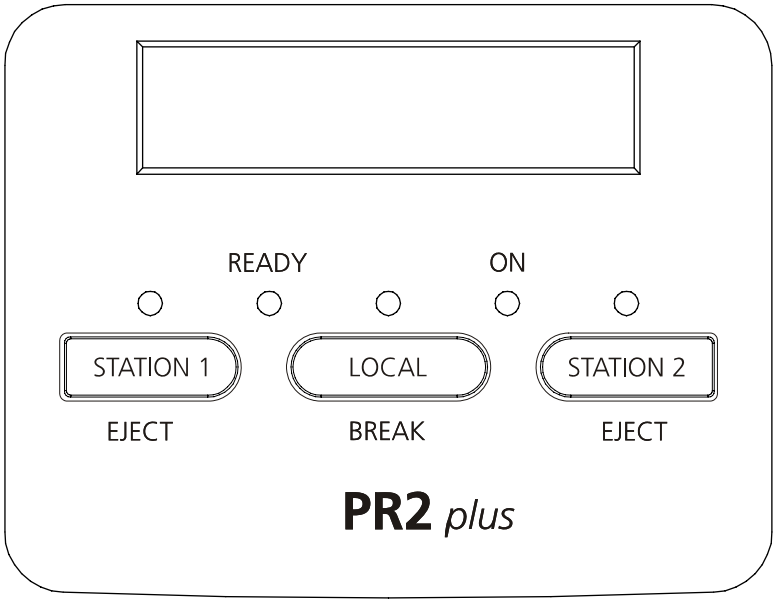


Figure 2-2 Console

During machine set-up (par. 4.2) or calibration (par. 4.3), the keys perform different functions according to the various procedures.

2.2.1 MEANING OF THE KEYS ON THE CONSOLE

The keys perform the following functions:

STATION 1: Books operator 1 (Olivetti STD 12/14) or assigns the printer to operator 1 (*)

STATION 2: Books operator 2 (Olivetti STD 12/14) or assigns the printer to operator 2 (*)

LOCAL/BREAK: Switches the printer between on-line and off-line status

EJECT (ST. 1): Ejects the document of operator 1 or ejects the document present (*)

EJECT (ST. 2): Ejects the document of operator 2 (*)

(*) According to the emulation selected.
The various machine states are accessed holding down one or more keys during printer power-on and reset. If the top cover is raised and the console is activated during the machine power-on and reset phase, the meaning of the leds changes.

The following table indicates the meaning of the keys in both situations.

Local	ST. 1	ST. 2	Cover	MACHINE STATUS open
		X		PRINT TEST
	X	X		Set-up
	X		X	Paper removal procedure
X	X		X	Printer set to on-line firmware update (on Flash-EPROM)
X	X	X	X	Access to the following procedures: a) Calibration of the photosensors b) Setting of "User TOF" c) Setting of LH margin d) Measurement of document or passbook length e) Calibration of print alignments f) Printing of the calibration of the photosensors
X			X	Cover open signal disabled

2.2.2 MEANING OF THE LEDS ON THE CONSOLE

When the leds are on, they indicate the following machine states:

ON: Machine on

READY: Printer on line/receiving or document present (*)

LOCAL: Machine in LOCAL mode (off-line)

STATION 1: *Indicator on:* Waiting for document from operator 1 (Olivetti STD 12/14) or machine assigned to operator 1 or document present (*)
Flashing indicator: Waiting for document from operator 1 or data present in the buffer (*)

STATION 2: *Indicator on:* Waiting for document from operator 2 (Olivetti STD 12/14) or machine assigned to operator 2 or document present (*)
Flashing indicator: Waiting for document from operator 2

(*) According to the emulation selected

2.2.3 ERROR MESSAGES

The various configurations of the leds (except for the ON led that is always lit) and their meanings are shown in the table below.

Faults are classified as follows:

- Non-recoverable fault. Blocks the machine and is eliminated only by switching off the printer and carrying out the necessary repairs.

- Fault that can be recovered by the operator eliminating the problem (paper jam) and then pressing the ST1 key with the cover open.

2.2.3.1 LIGHTING OF THE LEDS ACCORDING TO FAULT DETECTED

	LEDS				
FAULT	**ON**	**READY**	**ST1**	**LOCAL**	**ST2**
POWER SUPPLY UNIT FAULT	OFF	OFF	OFF	OFF	OFF
Fault on board: - Eprom - ROM - Microprocessor	ON	OFF	OFF	OFF	OFF
Fault on: - Fuses - Driver - Motors	ON	ON	ON	ON	ON
Fault on actuations board	The motors do not perform any movement				

2.3 MEANING OF THE KEYS AND LEDS IN IBM 9068 EMULATION (4722)

This paragraph describes the meaning of the keys and leds when the PR2 *plus* is in IBM 4722 emulation.

2.3.1 MEANING OF THE KEYS

The keys perform the following functions:

LOCAL/BREAK	Switches the printer between On-line and Off-line status
STATION 1/EJECT	Assigns the printer to operator 1. Key monitored via SW.
STATION 2/EJECT	Assigns the printer to operator 2. Key monitored via SW.

Pressing of the STATION 2/EJECT key during the power-on phase permits printing of the "Self-test".

2.3.2 MEANING OF THE LEDS

The leds indicate the following machine states:

ON	Green led, indicates that the machine is on.
READY	Yellow led, indicates that the printer is on-line and a document is present.
LOCAL	Yellow led, indicates that the printer is off-line.
STATION 1	Yellow led, indicates that the printer is assigned to operator 1.
STATION 2	Yellow led, indicates that the printer is assigned to operator 2.

As the buttons and the leds are managed via SW, their meaning and use may vary according to the application SW.

2.4 MEANING OF THE KEYS AND LEDS IN SNI 4915 (4904) EMULATION

This paragraph describes the meaning of the keys and leds when the PR2 *plus* is in SNI 4915 (4904) emulation.

2.4.1 MEANING OF THE KEYS

The keys perform the following functions:

LOCAL/BREAK	Switches the printer between On-line and Off-line status
STATION 1/EJECT	Assigns the printer to operator 1 and ejects the document of operator 1.
STATION 2/EJECT	Assigns the printer to operator 2 and ejects the document of operator 2.

Pressing of the STATION 2/EJECT key during the power-on phase permits printing of the "Self-test".

2.4.2 MEANING OF THE LEDS

The leds indicate the following machine states:

ON	Green led, indicates that the machine is on.
READY	Yellow led, indicates that the printer is on-line.
LOCAL	Yellow led, indicates that the printer is off-line.
STATION 1	Yellow led, flashing, indicates that the printer is waiting for the document from operator 1, on indicates that a document is present.
STATION 2	Yellow led, flashing, indicates that the printer is waiting for the document from operator 2, on indicates that a document is present.

For this version of the PR2 *plus ,* a specific console different from the standard product is available.

2.5 MEANING OF THE KEYS AND LEDS IN IBM PROPRINTER II/X24 - EPSON LQ 2550 EMULATION

This paragraph describes the meaning of the keys and leds when the PR2 *plus* is in IBM Proprinter II/X24, EPSON LQ 2550 emulation.

2.5.1 MEANING OF THE KEYS

The keys perform the following functions

LOCAL/BREAK	Switches the printer between On-line and Off-line status
STATION 1/EJECT	Ejects the document present.
STATION 2/EJECT	Not used

Pressing of the STATION 2/EJECT key during the power-on phase permits printing of the "Self-test".

2.5.2 MEANING OF THE LEDS

The leds indicate the following machine states:

ON	green led, indicates that the machine is on.
READY	yellow led, indicates that the printer is on-line.
LOCAL	yellow led, indicates that the printer is off-line.
STATION 1	yellow led, flashing, indicates that data are present in the buffer, on indicates that a document is present.
STATION 2	No indication

For this version of the PR2 *plus ,* a specific console different from the standard product is available.

2.6 LEVER FOR LIFTING THE UPPER PART OF THE MECHANISM

The lever used to raise the upper part of the mechanism, positioned on the left-hand side of the machine, makes it possible to lift the mechanism and to access the paper path inside the machine, with the possibility of recovering a jammed document without having to switch off the printer.

To access the lever, lift the cover of the machine rotating this to its stop position

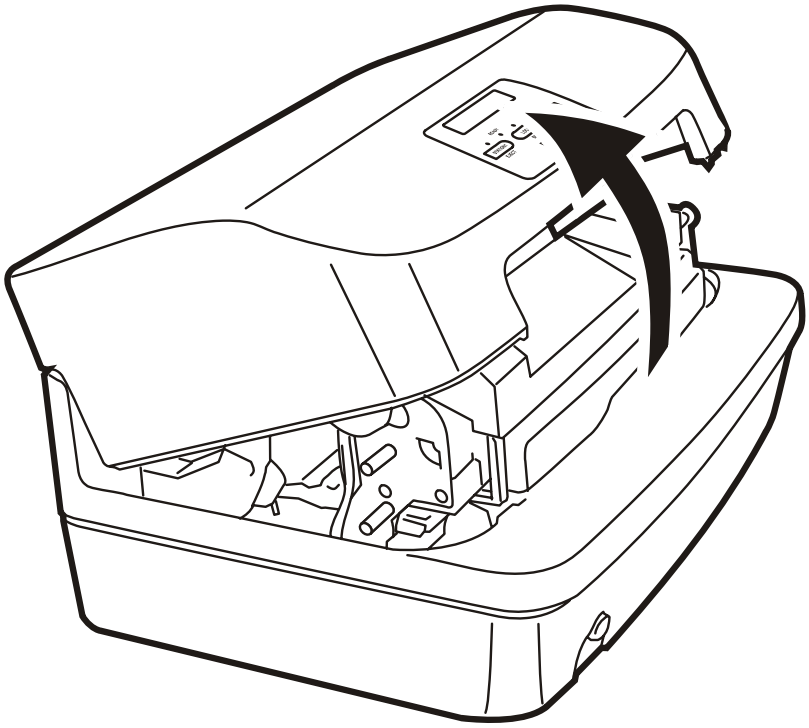


Figure 2-3 Opening of the cover

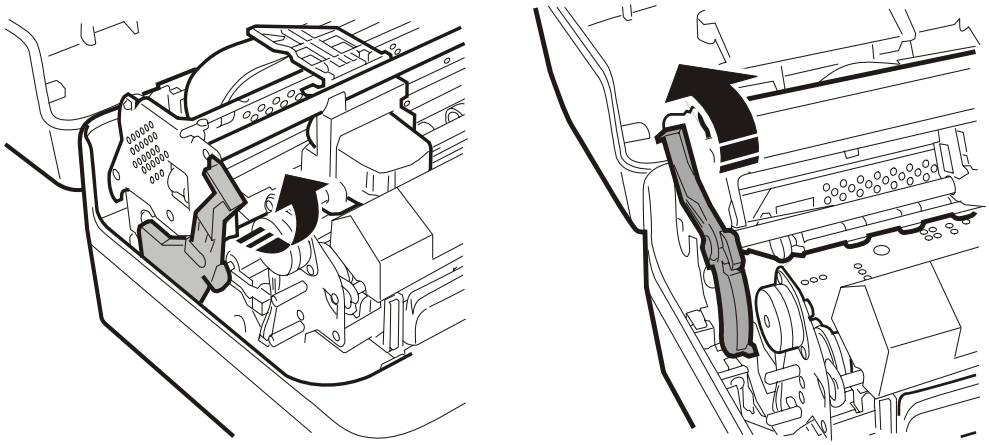


Figure 2-4 Lever for lifting the upper part of the mechanism

Bringing the lever to its end of stroke position lifts the upper part of the mechanism, permitting access to the document feed zone

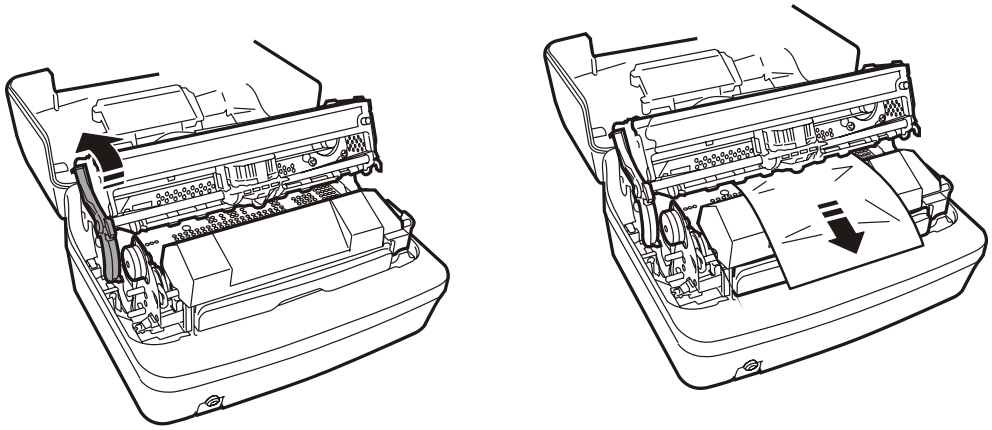


Figure 2-5 Extraction of jammed document

3. GENERAL PRESCRIPTIONS FOR INSTALLATION

For optimal functioning of the printer and to avoid servicing for causes not ascribable to the product, comply with the prescriptions indicated below.

3.1.1 POWER SUPPLY

Check that the outlet to which the printer is connected has a ground connection and is suitably scaled to provide the power required by the machine. An outlet without a ground connection may cause malfunctions and generate safety problems.

Do not connect the printer to power supply lines shared with appliances that may cause electrical disturbances and excessive variations in voltage (fans and air conditioners, large photocopiers, lift and goods-lift motors, radio TV transmitters and signal generators, high frequency safety devices, etc.).

Normal office machines (calculators, typewriters, small photocopiers, terminals and PC) may be connected on the same line provided that they do not cause too many disturbances.

3.1.2 ENVIRONMENTAL CONDITIONS

The environmental conditions in which the product may remain for an indefinite time are those indicated by AB quality objectives: normal, conditioned office environment (ambient temperature 15/35 ^{0}C, relative humidity 15/85% HU).

Variations in environmental conditions such as to cause condensation must be avoided both during storage and functioning. Dust, dirt and smoke may cause excess wear of moving parts, short-circuits (in the presence of high humidity) and read/write errors during the various operations. High temperatures and low levels of humidity may cause problems due to static electricity.

3.1.3 SITING OF THE MACHINE

The printer must be installed on a flat, firm, vibration-free surface.

Do not install the printer close to ventilation systems, sources of heat or points exposed directly to the rays of the sun.

Do not obstruct the ventilation slots of the printer.

If the machine is fitted inside a cabinet, check good ventilation to avoid dangerous overheating.

Install the machine in a position that does not prevent removal of documents along the paper paths.

3.2 UNPACKING AND INSTALLATION OF THE MACHINE

3.2.1 UNPACKING

Check the contents of the packing.

This must contain:

- PR2 *plus* printer
- Mains cable
- User manual
- Ribbon cartridge
- Sheet for cleaning the magnetic printhead for models with this option (not indicated in the figure below).

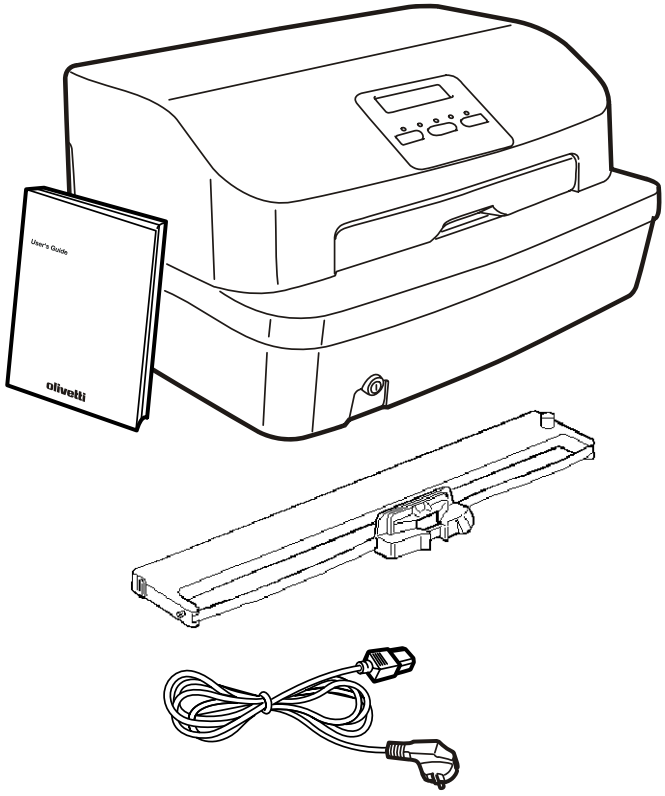


Figure 3-1 Contents of the packaging

Unpacking and preparation of the printer for use:

- Remove the machine from the bag.
- Completely open the upper cover of the printer passing this over the stops so that it is positioned horizontally (illustration A in the following figure).
- Rotate the two red plastic brackets used for transport which block the print carriage in the forward position (illustration B in the figure below).
- Lift the upper part of the mechanism (illustration C in the following figure), then remove the two clips (in the order 1-2-3 in the following figure).

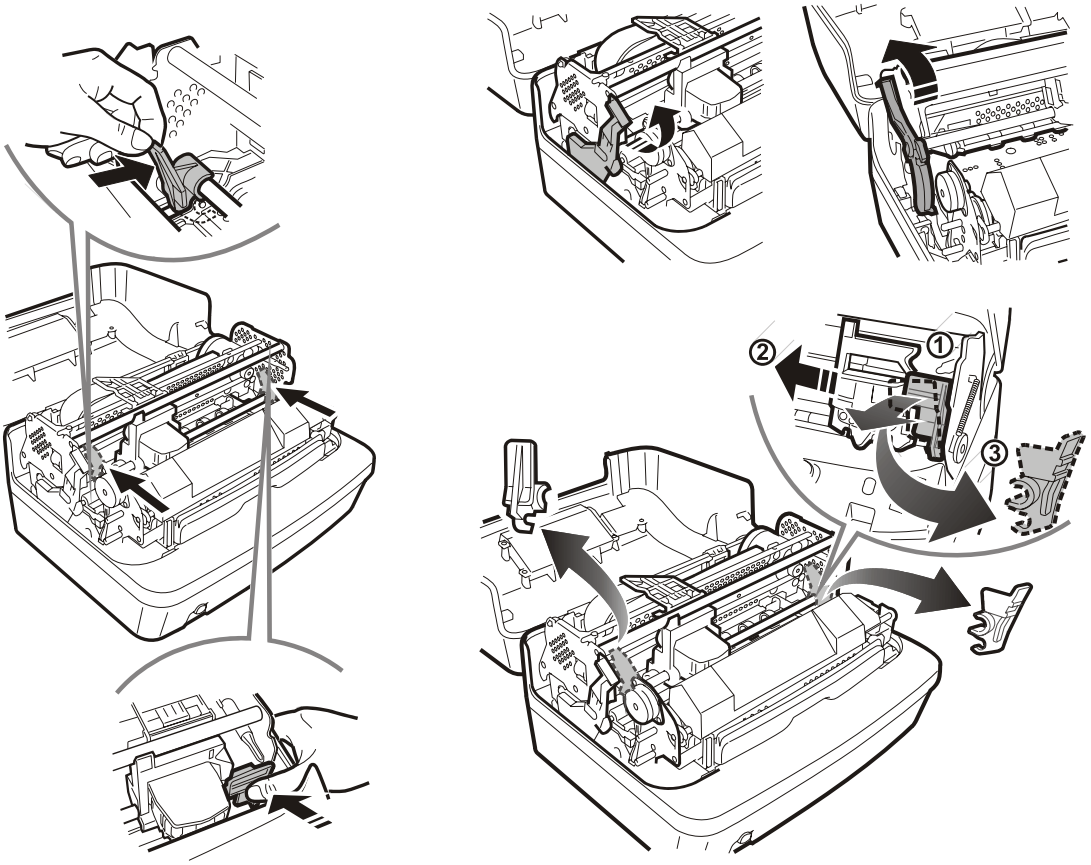


Figure 3-2 Removal of transport blocking devices

- Check that the printer has not been damaged during transport
- Install the ribbon cartridge.
- Close the machine.

3.2.2 INSTALLATION OF THE MACHINE

Position the machine where it is to be used, checking compliance with the indications provided in paragraph 3.1.

Make sure that the voltage indicated on the dataplate matches that of the local power supply. Connect the mains cable and switch on the printer.

Check power-on through the mechanism reset phase and lighting up of the ON led on the console.

If other Leds apart from the ON led remain on, consult paragraph 2.2.3 "Error messages ".

3.3 OFF-LINE TEST

A print test can be carried out to check functioning of the printer before connecting it to the system.

3.3.1 ACTIVATION AND DE-ACTIVATION OF THE PRINT TEST

To activate the test, proceed as follows:

- Switch off the printer.
- Switch on the printer holding down the STATION 2/EJECT key of the console.
- At the end of the initialization phase, insert an A4 format sheet in the introduction slot until the paper alignment photosensor is activated.

The machine automatically feeds the sheet and prints the test. The sheet is ejected automatically at the end of the test. To repeat printing, simply insert a new sheet.

To de-activate print test mode, switch off the printer.

3.3.2 CONTENTS OF THE PRINT TEST

The print test provides the following information:

- The release and version of the firmware and of the character generator installed
- Visual checking of correct functioning of the 24 needles of the printhead (Needle test)
- The configuration of the printer
- The parameters set for IBM-PP and Olivetti emulations
- To de-activate the test, switch off the printer.

An example of the information returned by the test is provided on the next page. The contents of the test depend on the FW release installed on the printer.

```
FW REL. 3.30 VER. 102      CG VER. 000


Needles test:
                                                               | |
                 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2   O E
1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4   D V

CONFIG.

DRAFT SPEED:      NORMAL
LQ TYPE:          NLQ1
PAPER WIDTH:      FIRST LINE
BUZZER:           Y
INTERFACE:        DUAL
RS1 EMULATION:    OLIVETTI
BAUD RATE:        9600
BIT/CHAR:         8
PARITY:           NONE
STOP BIT:         1
DSR:              Y
DCD:              Y
CX  EMULATION:    IBM
STROBE ACTIVE:    Y
PAP.EDGE DETEC.:  N
SPECIAL FORMS:    N


IBM-PP
EMULATION:        P.P.II
PASSBOOK:         Y
BINDING:          VERTICAL
SIDE:             L
CHAR SET:         PC
PC CHAR SET:      437 (INT)
PC TABLE:         TABLE 2
CHAR DEFINITION:  DRAFT
CPI:              10
LF=LF+CR:         N
CR=CR+LF:         N
ZERO SLASH:       N
LINE LENGHT:      80
FORM LENGTH:      12
BOF IBM-PP LIKE:  Y
TOF IBM-PP LIKE:  Y


OLIVETTI
EMULATION:        PR2E
PASSBOOK:         Y
BINDING:          VERTICAL
SIDE:             L
CHAR SET:         OLIVETTI
OLI. CHAR SET:    ST15INT
CHAR DEFINITION:  DRAFT
CPI:              10
COMPRESSED:       16.6
VERTICAL RESOL.:  1/240inch
LF=LF+CR:         N
LINE LENGHT:      90
REPLY SYNCRON.:   N
STATUS REQUEST:   NO WAIT
```

Figure 3-3 Example of print test

3.4 CONNECTION TO THE SYSTEM

In its basic configuration, the printer is equipped with an RS 232C serial port, a USB 2.0 port and a Centronics parallel port.
A second RS 232C serial port (optional) is available if the printer is to operate in dual serial port mode.

3.4.1 RS 232C SERIAL INTERFACE (STANDARD)

Connect the serial cable to the connector on the back of the machine.

From Set-up, program the following interface parameters:

BAUD RATE; BIT/CHAR; PARITY; STOP BIT; DSR and DCD.

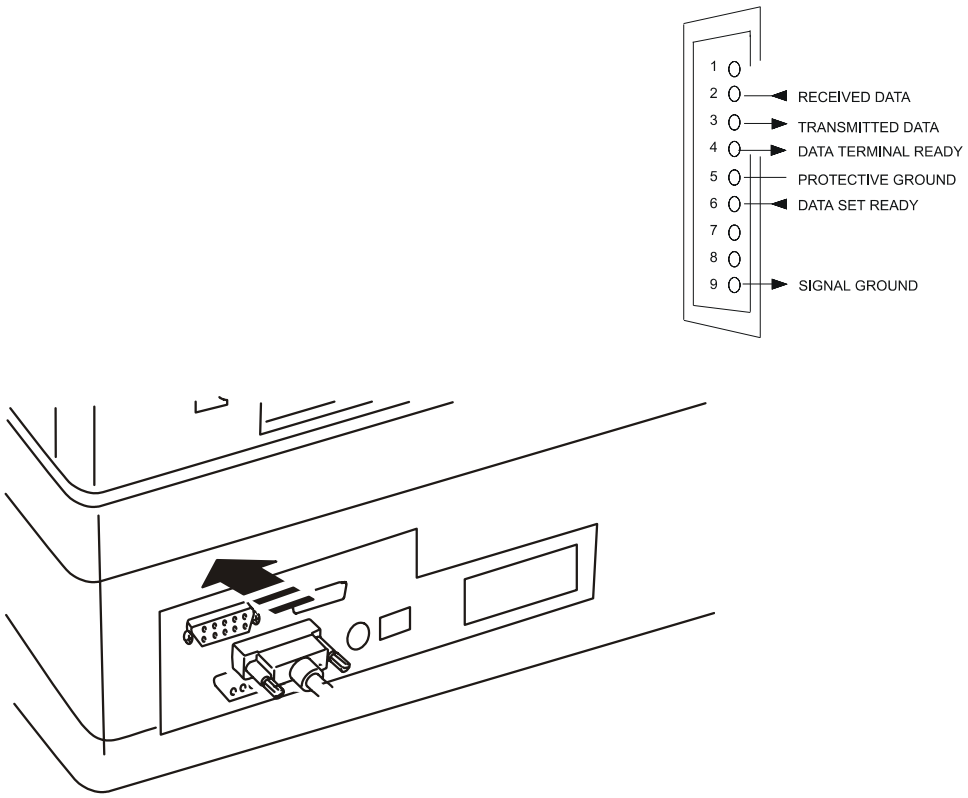


Figure 3-4 Standard RS232C serial interface

3.5 FINAL TEST

After connecting the printer to the system, check the interface parameters. The PR2 *plus* is configured with a resident run-in test useful for checking the result of ordinary maintenance operations. To run the test, proceed as follows:

Switch on the PR2 *plus* by pressing the STATION 2/EJECT with the cover open. After reset, the READY led remains on; close the cover and insert an A4 format sheet (self-test printout). After ejection, press the LOCAL/BREAK and STATION 2/EJECT keys at the same time (RUN-IN test). The test lasts approx. 45' and vertical bars are printed. In this way, the efficiency of the mechanism and electronics are tested as in production. Switch off the machine to exit from run-in.

3.6 OPERATOR INFORMATION

At the end of installation, the Technician must provide the Operator with various information in order to use the machine and to replace the cartridge and to eliminate paper jams without any problems. For this purpose, a practical demonstration of the following operations is recommended:

- Use of the console, interpretation of the error messages and, where possible, unblocking of the machine.
- How to insert the and documents from the feed slot, stressing the importance of not using creased or torn documents or with protruding backs. Explain the method of insertion of the paper (automatic alignment) and of the passbook (manual alignment).
- Replacement of the ribbon cartridge.
- Extraction of a jammed document from the machine using the mechanism lift lever.
- How to insert a check and slip in the check reader option, stressing the importance of using documents that are not torn, creased, folded, stapled or clipped.

Stress the importance of correct internal ventilation and that the various ventilation slots of the printer must not be blocked by forms or documents.

Remind the operator that correct use of the machine guarantees optimal functioning in time. If faults occur, contact Technical Assistance immediately.

3.7 OPERATING PROCEDURES

3.7.1 INSERTION OF THE DOCUMENT WITH AUTOMATIC ALIGNMENT

The resting surface of the casing facilitates introduction of documents in the machine.

- With the printer on, place the document at the center of the front slot and insert it in the feed slot.
- Release the document as soon as the automatic alignment system is activated.

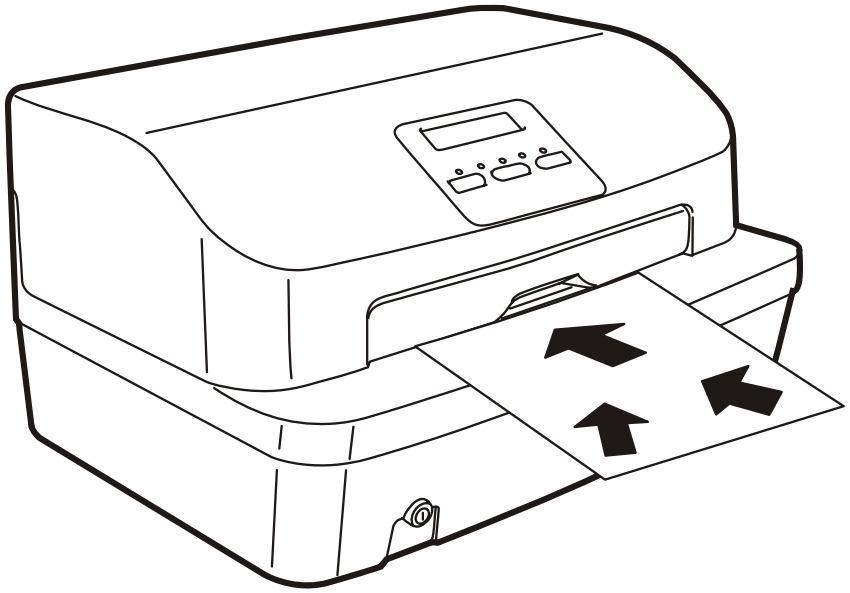


Figure 3-5 Automatic introduction of the document

3.7.2 INSERTION OF THE PASSBOOK

Before inserting a passbook, fold this along the back until it remains completely opened in a horizontal position and check for any creased or torn pages in order to avoid poor quality printing and wrinkling of the pages during introduction.

The passbook must be placed open on the supporting surface with the magnetic stripe facing down.

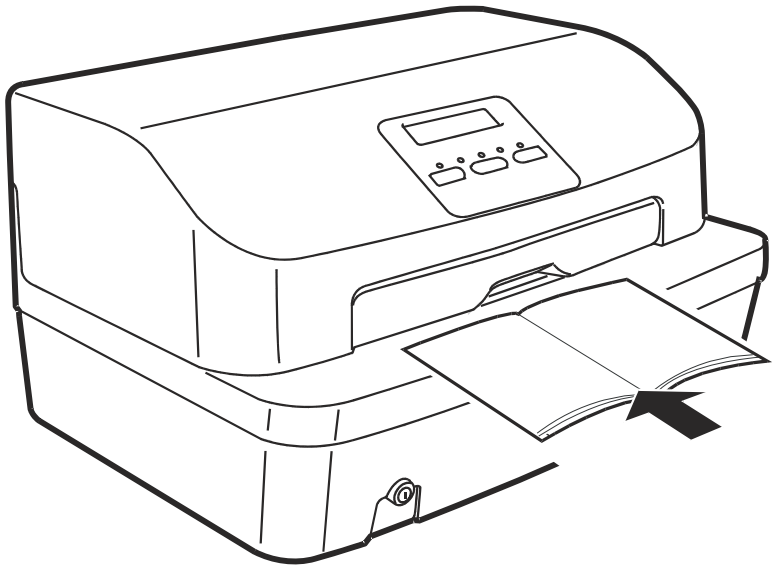


Figure 3-6 Manual introduction of the passbook

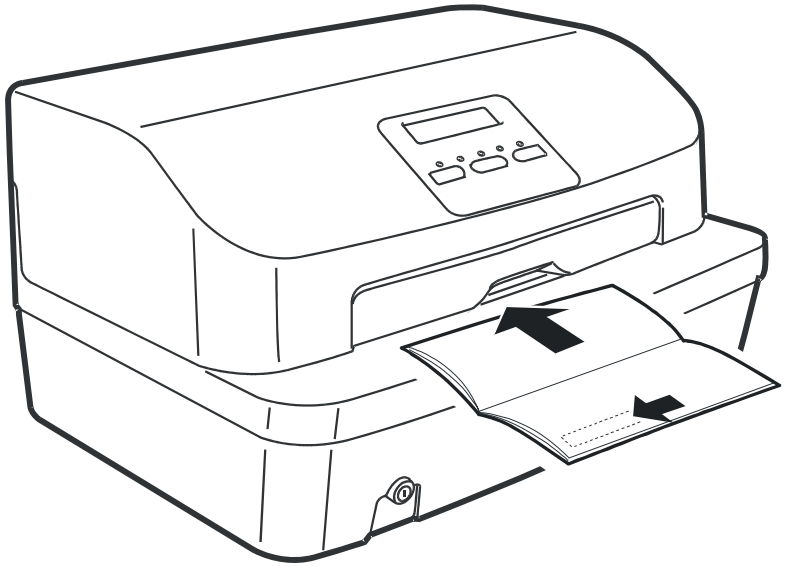


Figure 3-7 Manual introduction of the passbook with magnetic stripe

3.7.3 INTRODUCTION OF DOCUMENT FOR HORIZONTAL MAGN./ MICR READING

A reference stripe for insertion of the check is provided on the front part of the cover.

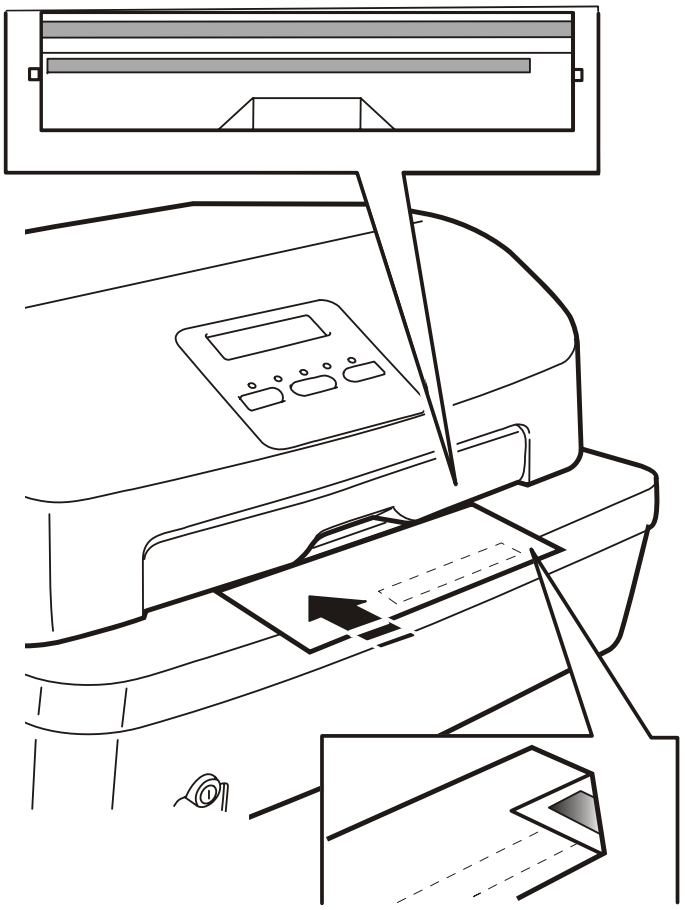


Figure 3-8 References for check insertion

3.7.4 EJECTION OF DOCUMENTS

According to the application program, documents may be ejected as follows:

- Returning these to where they were introduced manually (feed slot)
- From the rear slot of the machine, starting from the front feed slot.

The documents ejected from the front feed slot:

- If less than 100 mm in length, are abandoned by the drive rollers
- If they are 100 mm or more long, they remain grasped by the last pair of rollers so that sheet does not slip off the front resting surface.

3.7.5 REPLACEMENT OF THE RIBBON CARTRIDGE

The ribbon cartridge must be replaced when printing is faded or incomplete, or in the case of frequent optical reading errors of printed documents. This procedure must be carried out with the machine off; however, if necessary, it can also be carried out with the machine on.

3.7.5.1 REPLACEMENT OF THE RIBBON CARTRIDGE WITH THE PRINTER OFF

Proceed as follows to change the cartridge:

- Switch off the machine.
- Open the upper cover of the printer, lifting it up.
- Lift the upper unit using the specific lever.

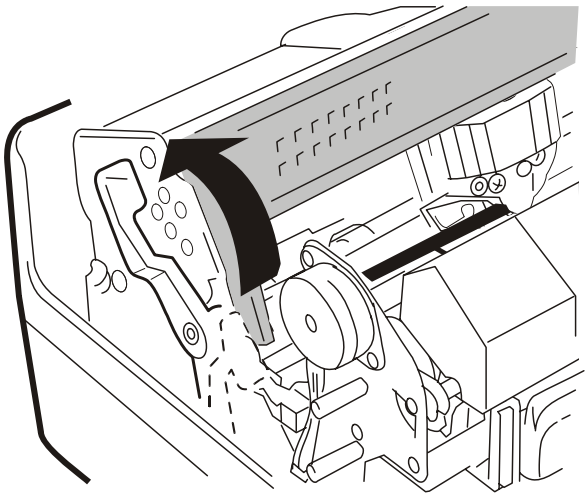


Figure 3-9 Lifting of the upper unit of the mechanism

- Push the ribbon guide down until it is released from the print cartridge.
- Remove the old cartridge, pulling it outwards.

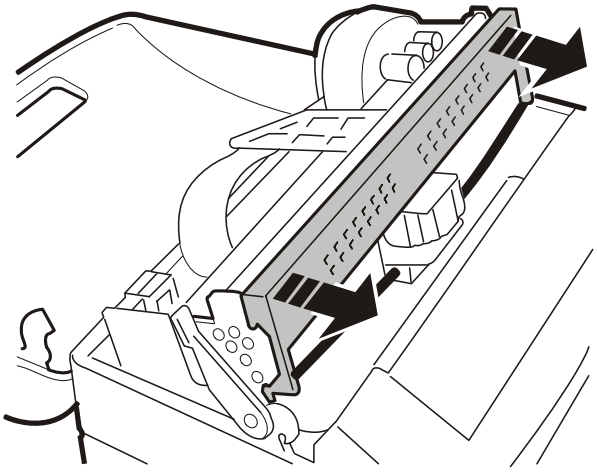


Figure 3-10 Removal of the ribbon cartridge

- Insert the cartridge in the feed gears, attaching this on the two sides and making sure that the pin (1) is inserted in the respective hole of the ribbon feed knob.

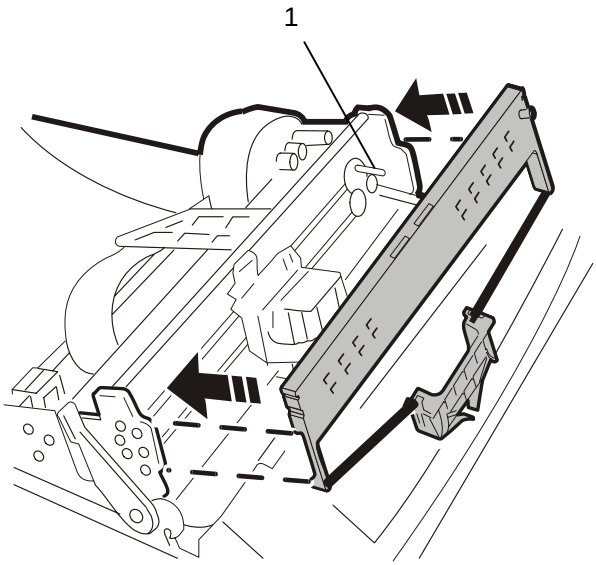


Figure 3-11 Attaching the cartridge to the structure

- Insert the ribbon guide from the front and then lift it so as to fasten it on the two flexible pins in the open slots of the cartridge on the back of the print roller (a click is heard).

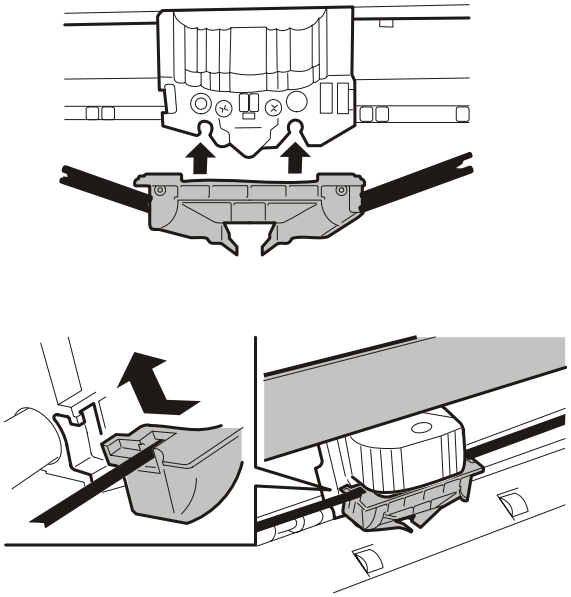


Figure 3-12 Attachment of the ribbon guide

- Turn the knob of the cartridge in an anticlockwise direction (2) until the ribbon is taut and then remove the tab (3).

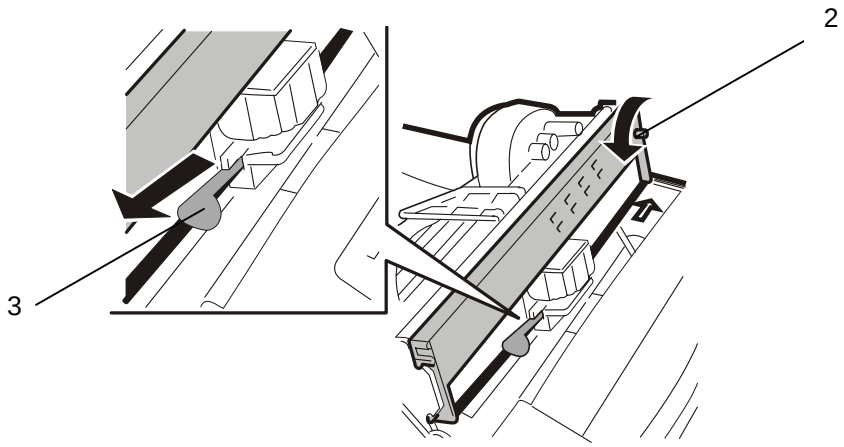


Figure 3-13 Removal of the tab

- Using the specific lever, completely lower the internal upper unit containing the printhead and ribbon cartridge.
- Close the cover of the printer.
- Switch on the machine.

3.7.5.2 REPLACEMENT OF THE RIBBON CARTRIDGE WITH MACHINE ON

The ribbon cartridge may be replaced with the machine on, as explained below:

- Open the cover of the printer; printing is blocked automatically.
- Using the specific lever, lift the internal upper unit of the machine.
- Remove the old cartridge and replace it with the new cartridge as described above.
- Using the specific lever, lower the internal upper unit.
- Close the cover of the printer.

Note: DO NOT move the printhead manually.

3.7.6 PAPER JAM

The paper may jam along the path inside the machine.

Jamming may be caused by:

- Paper path obstructed (scraps of paper, for example)
- Paper fed crosswise
- Weight or format outside permitted limits
- Paper in bad conditions: creased, misshapen or in poor condition
- Paper with metal staples or paper clips (this condition may seriously damage the machine)
- Multicopy forms with incorrectly glued sheets.

Possible areas of jamming:

- initial feed area from front feeder
- internal area of the printer
- rear area towards the documents outfeed.

3.7.6.1 PAPER JAM IN THE FRONT FEEDER AREA

To remove a document that has jammed in the area of the front feeder, pull the document out carefully so as to avoid damaging it.

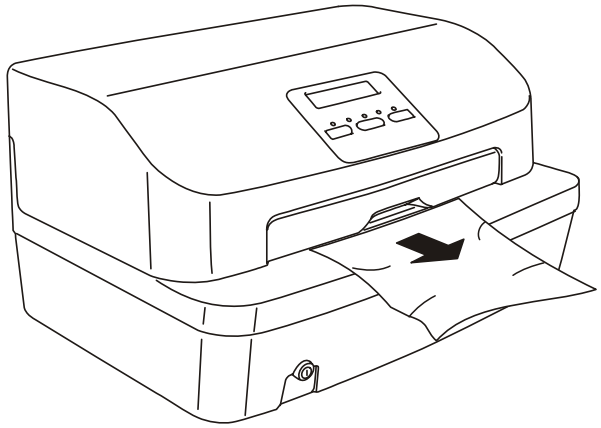


Figure 3-14 Removal of a document in the area of the front feeder

3.7.6.2 PAPER JAM INSIDE THE PRINTER

To remove a document that has jammed from inside the printer, proceed as follows:

- Without switching off the machine, open the cover of the machine
- Using the specific lever, lift the internal upper unit of the machine
- Recover the document that has jammed, pulling it carefully.

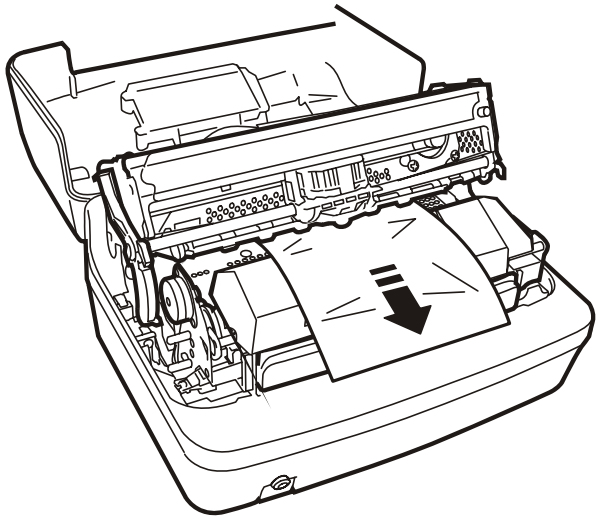


Figure 3-15 Removal of document from inside the printer

If scraps of paper remain jammed in inaccessible internal parts, these can be removed as follows:

1. Open the cover and switch on the printer with STATION 1/EJECT pressed.
2. Wait for the acoustic signal.
3. Pressing STATION 1/EJECT and/or STATION 2/EJECT, the paper will be moved forward and back so that it is possible to remove the scraps of paper that have jammed.
4. Switch off the machine and close the cover before switching the printer on.

3.7.6.3 PAPER JAM IN THE AREA OF THE REAR SLOT

To remove a document in the area close to the rear slot, this can be recovered without opening the machine as above, but pulling it carefully towards the outside in order to avoid damage.

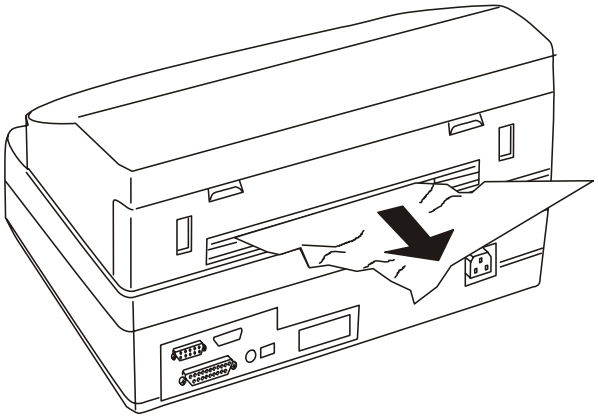


Figure 3 - PR2 *plus – Removal of the document in the area of the rear slot*

4. SELF-TEST, SET-UP AND CALIBRATION

4.1 POWER-ON SELF-TEST

The PR2 *plus* features a set of diagnostic tests that are activated automatically at power-on.

Any FW or HW faults are highlighted by leds on the console.

POWER-ON DIAGNOSTICS FOR PR2 E – PR2 PLUS

TYPE OF FAULT	LED RDY	LED ST1	LED LOC	LED ST2
Carriage Motor	BLK	BLK	OFF	OFF
Services Motor	BLK	OFF	OFF	OFF
Intro photosensor jam	BLK	OFF	OFF	BLK
Magnetic unit reset	OFF	BLK	OFF	BLK
EEPROM, HW setup	OFF	OFF	BLK	BLK
EEPROM, SW setup	OFF	OFF	BLK	OFF
Photosensor calibration procedure	BLK	BLK	BLK	BLK
Banked RAM diagnostics	OFF	OFF	OFF	BLK
ASIC diagnostics	OFF	BLK	BLK	BLK
Head hot or PTC fault/Flash not written (automatic DLL)	ON	ON	BLK	ON

At the end of the self-test phase, if no errors have been detected, the printer switches to READY status (ON and READY leds on the console on).

4.2 MACHINE SET-UP

The set-up environment is reserved for service engineers and programmers as certain parameters that can be selected are used to specialize the machine or the option installed and must not be modified. Incorrect modification by the operator could cause malfunctioning of the printer.

4.2.1 SET-UP ACTIVATION

To access the set-up environment, switch off the machine and then switch it on again holding down the ST1 (Station 1) and ST2 (Station 2) keys of the console.

At the end of the reset phase, insert an A4 format sheet in the front slot: the machine will print the meaning of the keys in this environment on one line.

The flow charts that indicate the possibility of access to the various parts of the set-up are provided below.

4.2.2 SUPPORTING SOFTWARE

The Software tools are produced using suitable instruments and languages for insertion of the product in the environments where is connected.

Drivers

Are built on Olivetti native protocol. They comprise the enter range of capabilities that can be managed by Industry Standard applications.

- reference command set STD 12/14 PR2 *plus*
- DLL-Drivers provided WIN NT 4.x/2000, WIN 95/98
- Environment DLL WOSA

Set-up management software

The specific on-line set-up management program includes display of the situation of product settings and the possibility of operating on all available parameters, including handshaking parameters.

Font and logo management software

This program makes it possible to construct unusual graphic types or particular fonts.

4.2.2.1 PARAMETERS OF THE CONFIGURATION MODE MENU

DRAFT SPEED: NORMAL - HIGH	Determines the type of draft that can be activated via SW and by default.
LQ TYPE: NLQ1 - NLQ2 - LQ2	Determines the type of LQ that can be activated via SW and by default
PAPER WIDTH: FIRST LINE – PROGRAMMABLE	Determines the document width measurement position.
BUZZER: N – Y	Switches the buzzer on/off
INTERFACE: RS 232 (1) – OPTIONAL – DUAL	The optional interfaces are: - PARALLEL (compatible with DUAL) - RS 232 (2) (compatible with DUAL) - USB

(if) RS232C (1)

EMULATION: OLIVETTI – IBM	Default emulation of the port.
BAUD RATE: 9600 - 4800 - 2400 - 1200	Data transmission/reception speed.
BIT/CHAR: 7 - 8	Data format at 7 or 8 bits.
PARITY: NONE - ODD - EVEN	Type of parity control.
STOP BIT: 1 - 2	Number of stop bits.
DSR: N - Y	Data Set Ready managed or not
DCD: N - Y	Data Carrier Detector managed or not.

PAPER EDGE DETECTION: N - Y	If enabled (Y), does not permit printing of lines wider than the sheet inserted. In the Olivetti environment, a jam (ESC r 1) is also generated. For reasons tied to the electronic HW, the width of the document is measured automatically only during the insertion phase. For this reason, if the sheet introduced is of variable width, the different size cannot be detected during the printing phase.
SPECIAL FORMS: N - Y	If enabled (Y), each paper movement is carried out with the printhead off the sheet. In this way, it is possible to handle forms at the lowest limits of specified weight, avoiding creasing the form
SAVE PARAMETERS: Y - N	Save settings selected or not

IBM Menu

EMULATION: P.P. II - X 24	Selection of IBM emulation
(if) X24	
AGM: N – Y	Enables/disables the AGM function.
PASSBOOK: N - Y	Indicates whether the printer is enabled or not to handle passbooks.
(if) Passbook Y	
BINDING: VERTICAL - HORIZONTAL	Linked to the “PASSBOOK: Y”. item, selects the type of binding of the passbook (horizontal or vertical). If horizontal binding is selected, during printing on the passbook, the head will exit the passbook close to the binding so as to improve feeding.
SIDE: L - R	Selecting “R (Right)”, SW compatibility with the PR50 with Right alignment is obtained. Selecting “L (Left)” SW compatibility with the PR50 with Left alignment is obtained.
CHAR SET: PC - ISO	Selection of the character generator.

(if) PC CHAR SET:

DK/N	
DK	
210	(GR)
220	(E)
437	(INT)
850	(LATIN 1)
851	(GREEK)
852	(LATIN 2)
855	(CYRILLIC)
857	(LATIN 5)
858	(LATIN EURO)
860	(P)
862	(THE)
863	(CANADIAN FRENCH)
864	(ARABIC)
865	(NORDIC)
866	(CYRILLIC)
1250	(PC WIN Latin2)
1252	(PC WIN Latin1)

(if) ISO SET:

OLI-UNIX
ISO 8859/1
ISO 8859/2
ISO 8859/5
ISO 8859/6
ISO 8859/7
ISO 8859/8
ISO 8859/9
ISO 8859/15

PC TABLE: TABLE 1 - TABLE 2	Selection of the table of the character generator.
CHAR DEFINITION: LQ - DRAFT	Selection of print definition.
CPI: 10 - 12 - 17.1	Selection of printing pitch, expressed in number of characters per inch.
LF + CR: N - Y	Selects or not automatic carriage return on reception of a linefeed command
CR + LF: N – Y	Selects or not automatic carriage return each time a carriage return command is received.
ZERO SLASH: N - Y	Enables/disables printing of the zero slash.
LINE LENGTH: 80 - 90	Selection of the maximum length of the print line, expressed in number of characters at 10 cpi.
FORM LENGTH: 11 - 12	Selection of the maximum form length, expressed in inches.
BOTTOM MARGIN IBM-PP LIKE: N - Y	Selects the type of bottom margin of the form (BOF) for the document managed. N - The value of the bottom margin will be 4.23 mm. Y - The value of the bottom margin will be 13.7 mm.

TOP MARGIN IBM-PP LIKE: N - Y	Selects the type of top margin of the page (TOF) for the document managed. N - The value of the top margin will be between 4.23 mm (defined through calibration) for documents and 7.4 mm for passbooks. Y - The value of the top margin will be 4.3 mm for documents and 7.4 for passbooks.
PNS SELECTION: N - Y	Selecting (Y) permits access to the selection menu of the PNS in the IBM environment.

(if) ISO SET:

PNS # 4192: N - Y	If enabled, on reception of a Form Feed, ejection is performed regardless of the form length selected.
PNS # 4501: N - Y	Selects spacing of 1/5“.
SAVE PARAMETERS: Y - N	Saves or not the settings selected.

Olivetti Menu

EMULATION: PR2 E - PR40	Selection of OLIVETTI emulation
(if) PR40+	
LINE BUFFER PR40 LIKE: N - Y	Setting of reception buffer as PR40 (1K byte) or 8 K byte.
TOP MARGIN PR40 LIKE: N - Y	Management of TOF with fixed mechanical top margin (PR 40) or adjustable.
(if) PR2 E	
PASSBOOK: N - Y	Enables the printer to manage passbooks.
(if) Passbook Y	
BINDING: VERTICAL - HORIZONTAL	Depends on the “PASSBOOK: Y” item. Selects the type of binding of the passbook (horizontal or vertical). If horizontal binding is selected, during printing on the passbook, the head will exit from the passbook close to the binding, in order to improve feeding of the passbook.
SIDE: L - R	Selecting “R (Right)”, SW compatibility with the PR50 with right-hand alignment is obtained. Selecting “L (Left)” SW compatibility with the PR50 with left-hand alignment is obtained
CHAR GENERATOR: IBM/PC - OLIVETTI	selects the character generator.
(if) IBM CHAR SET: PC - ISO	IBM emulation character set both PC and ISO regardless of selection.

(if) PC CHAR SET:

DK/N
DK
210 (GR)
220 (E)
437 (INT)
850 (LATIN 1)
851 (GREEK)
852 (LATIN 2)
855 (CYRILLIC)
857 (LATIN 5)
858 (LATIN EURO)
860 (P)
862 (THE)
863 (CANADIAN FRENCH)
864 (ARABIC)
865 (NORDIC)
866 (CYRILLIC)
1250 (PC WIN Latin2)
1252 (PC WIN Latin1)

(if) ISO SET:

OLI-UNIX
ISO 8859/1
ISO 8859/2
ISO 8859/5
ISO 8859/6
ISO 8859/7
ISO 8859/8
ISO 8859/9
ISO 8859/15

(if) OLIVETTI CHAR SET:

INT
USA
D
P
E
E2
DK/N
F
I
S/SF
CH
UK
YU
THE
GR
CND
STD 31
SDC
TR
ARABIC
USSR
CIBC

CHAR DEFINITION: DRAFT - LQ - OCRA - OCRB	Selection of print definition.
CPI: 5 - 10 - 12 - 15 - 16.6 - 17.1	Selection of printing pitch.
COMPRESSED: 16,6 – 17,1	Defines the spacing selected with ESC >
VERTICAL RESOLUTION: 1/216" - 1/240"	Selection of vertical resolution.
LF + CR: N - Y	Selects or not execution of an automatic carriage return on reception of a line feed command.

LINE LENGTH: 90 - 94	Selection of the maximum width of the print line, expressed in number of characters at 10 cpi.
PRINTER REPLY SYNCRONIZED: N – Y	Management of the DSR in transmission.
STATUS REQUEST: NO WAIT – WAIT	This parameter determines the timing of the status reply to an ESC j command. Selecting NO WAIT, the reply will be provided as soon as possible and in parallel with printing or paper movements. Selecting WAIT, the status reply will be provided at the end of printing.

(if the "horizontal magnetic option is present)

OPTION HORIZONTAL MSRW	Message indicating that the option has been installed. There is no selection and the next selection is printed after this title. If the hor. magn. / MICR option is present, "+ MICR" is shown beside "MSRW".

STANDARD: DIN/ISO - ANSI - IBM 3604	Sets the magnetic standard.

(if) IBM 3604

END-SENTINEL: C - F	Sets the closing code.
DISPLACEMENT: STANDARD +10 +20	Sets the position of the magnetic stripe.
DUPLICATE: N - Y	Sets or not duplication of the field.
DOUBLE FIELD CHECK: N - Y	Sets or not control on the two fields recorded.
RETRY: 3 - 1	Sets read retries.
STRIPE HANDLING: NORMAL – FAST	Permits fast or normal management of the magnetic stripe. In the case of normal management, each time the magnetic stripe is read or written, passbook width is measured in order to establish the precise position of the stripe. In fast management, the width of the passbook is measured once only with the procedure described in the specific chapter and no measurements are made during reading or writing of the stripe, thus increasing speed of management of the stripe.

(if) SIDE: R

AFF: STD - USA	Selects the width of the print line.
LINE BUFFER PR2845 LIKE: N - Y	Sets the width of the reception buffer to 2845 (512 Byte) or 8 K bytes.
NATION: INT USA D P E E2 DK/N F I S/SF CH UK YU THE GR CND STD 31 SDC TR IS	

CHAR DEFINITION: DRAFT - LQ	Selection of print definition
CPI: 10 - 12	Selection of printing pitch
LF: 1/5" - 1/6"	Selection of line feed
WARNING: END OF PAPER - PHOTO SENSORTOP	Selection of paper out or cover photosensor message.

TOP OF FORM: 1 – 2	Selects the first or second printable line.
STATUS REQUEST: NO WAIT – WAIT	This parameter determines the timing of the status reply to an ESC j command. Selecting NO WAIT, the reply will be provided as soon as possible and in parallel with printing or paper movements. Selecting WAIT, the status reply will be provided at the end of printing.
SAVE PARAMETER? : Y – N	Saves or not the settings selected in the section of the SET-UP.

4.3 SETTINGS

4.3.1 CALIBRATION OF THE PHOTOSENSORS

Machine photosensors are calibrated in the production phase. Changes in the electrical characteristics of the photosensors or the use of particular paper may require further calibration at the customer site.

Machine photosensors that must be calibrated are:

- “Paper present” photosensors
  Consist of two leds and two photo-receivers and are the first to detect insertion of the document in the front slot. The light beam is transmitted by optical fibers.
- “Front paper alignment “ photosensors
  Housed in the same mechanical unit as the paper present photosensors, indicated in this manual as front photosensors group.
  The front paper alignment photosensors check alignment of the document before this moves close to the printhead. They consist of four leds and the same number of photo-receivers, all coupled by optical fibers.
- "Autoborder" photosensor
  Is fitted on the printhead and detects the presence of the paper in order to measure the position of the first print column. This photosensor also permits (if selected from set-up) control of printing interrupt functions if the paper is narrower than the print line sent by the system.

The position in the machine of the individual photosensors is illustrated in the figure on the next page.

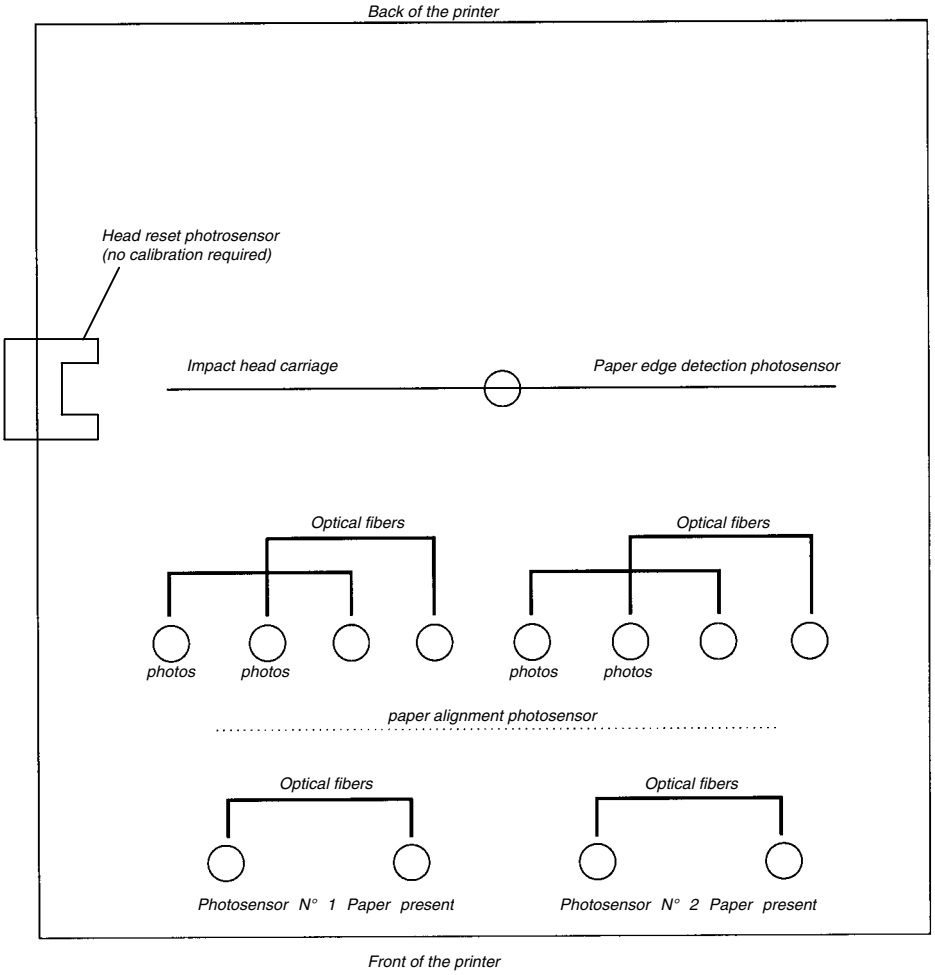
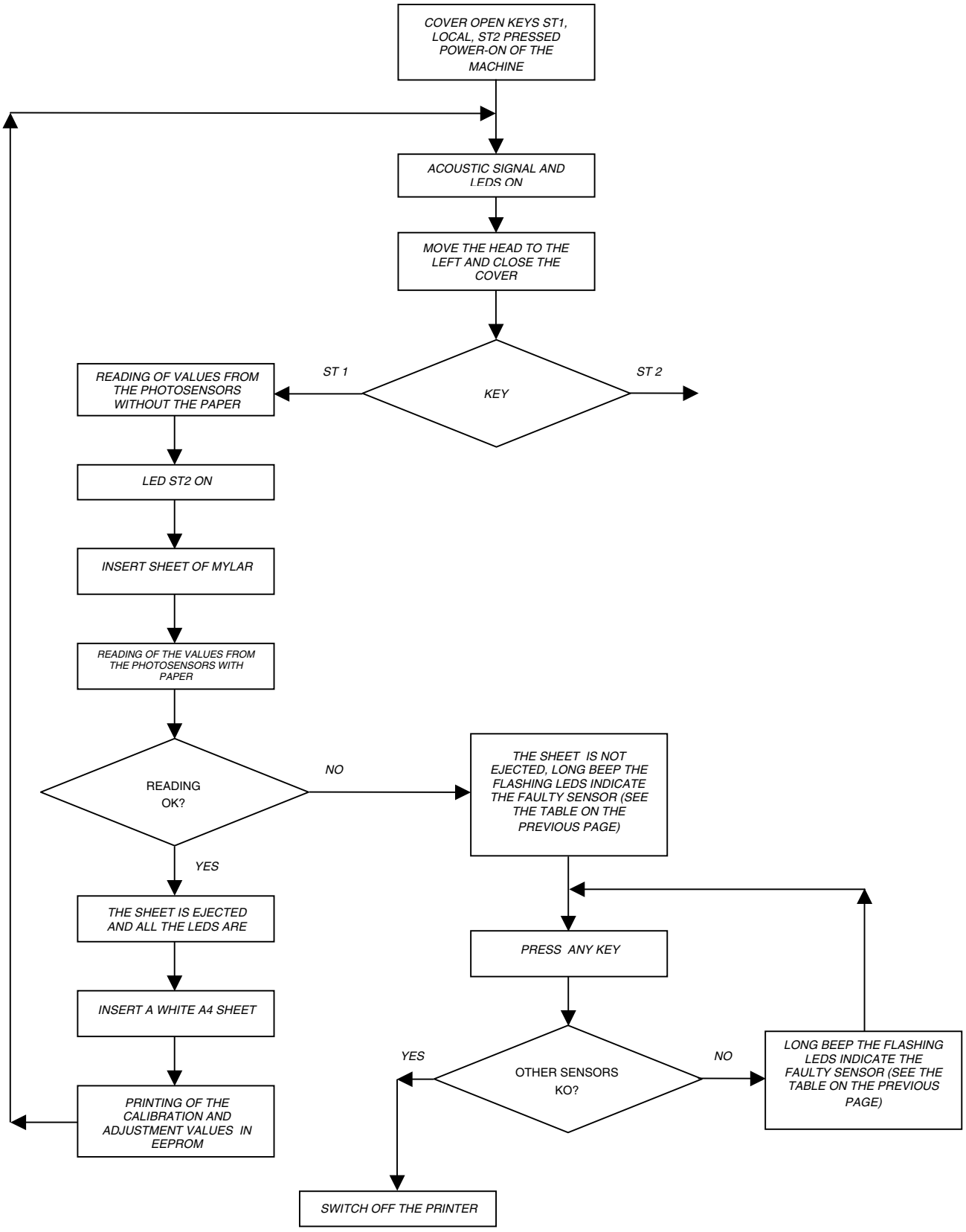


Figure 4-1 Position of machine photosensors

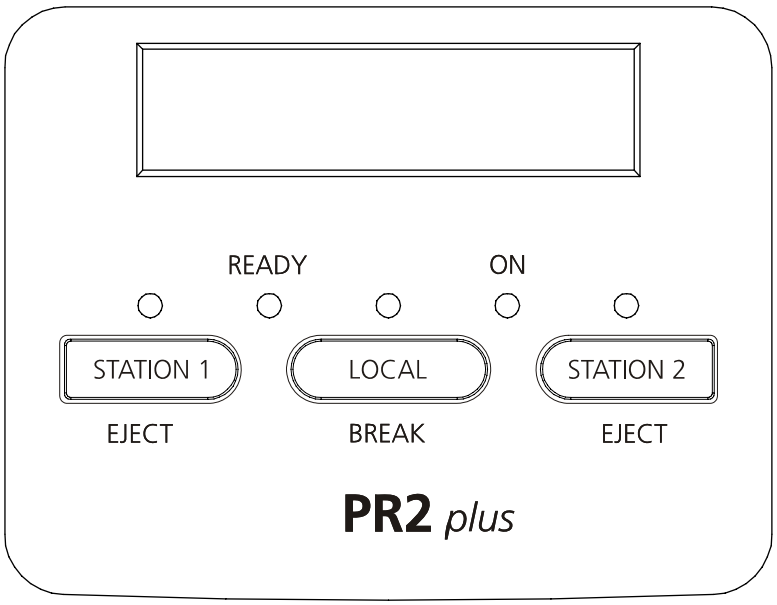
The block diagram for calibration of the photosensors is shown below.



To carry out the photosensor calibration procedure, proceed as follows:

1. **Switch on the printer with the cover open holding down the three console buttons.**
2. **Wait for the acoustic signal that indicates access to the calibration and adjustment procedure.**
3. **Manually position the head towards the left-hand side and close the cover.**
4. **Press the button of Station 1 twice to access the menu.**
5. **After this phase, the sensors will have saved the current values with paper not present.**
6. **Insert a 0.25-mm thick sheet of mylar in "landscape" position in the front slot. In this phase, the paper motor continues to turn, forcing the sheet against the combs.**
7. **Press the button of Station 2. Wait for the end of the movement that introduces and ejects the sheet. If, after ejection of the sheet, there are no faults, the console leds will remain off; subsequent re-insertion of a sheet of A4 format paper will permit printing of the values read and selected for each individual photosensor.**

If calibration fails, the faulty photosensor will be indicated by the configurations of the leds. Pressing one the console button highlights any other faulty photosensors. If calibration is not completed correctly, it will not be possible to make the other calibrations or measurements. If calibration is successful, insert a sheet of A4 format paper in order to print the calibration values. The parameters to be checked are indicated in the table below.



photosensor	1 Paper No (mV.)	2 Paper Yes (mV.)	Average val. (mV.)	Current (mA.)
photo n. 1 front paper present	XXXX	XXXX	XXXX	XX
photo n. 2 front paper present	XXXX	XXXX	XXXX	XX
photo n. 1 front. paper align.	XXXX	XXXX	XXXX	XX
photo n. 3 front paper align.	XXXX	XXXX	XXXX	XX
photo n. 2 front paper align.	XXXX	XXXX	XXXX	XX
photo n. 4 front paper align.	XXXX	XXXX	XXXX	XX
photo rear paper present	XXXX	XXXX	0	0
photo paper top edge	A XXXX	B XXXX		

3

Parameters to be checked

1) MINIMUM ACCEPTABLE VALUE 4500

2) VALUE ≤ 1500

3) B – A 2500 MINIMUM ACCEPTABLE VALUE

Make a further check inserting a check format form code 152136J at the two ends and in the center of the slot with the shorter side parallel to the axis of the photosensors (checking correct functioning of these).

Note: The parameters indicated above are for guidance and reference purposes in order to know the functioning range in which the PR2 *plus* is positioned with regard to acceptability of the documents.

4.3.1.1 PRINTING OF PHOTOSENSOR CALIBRATION VALUES

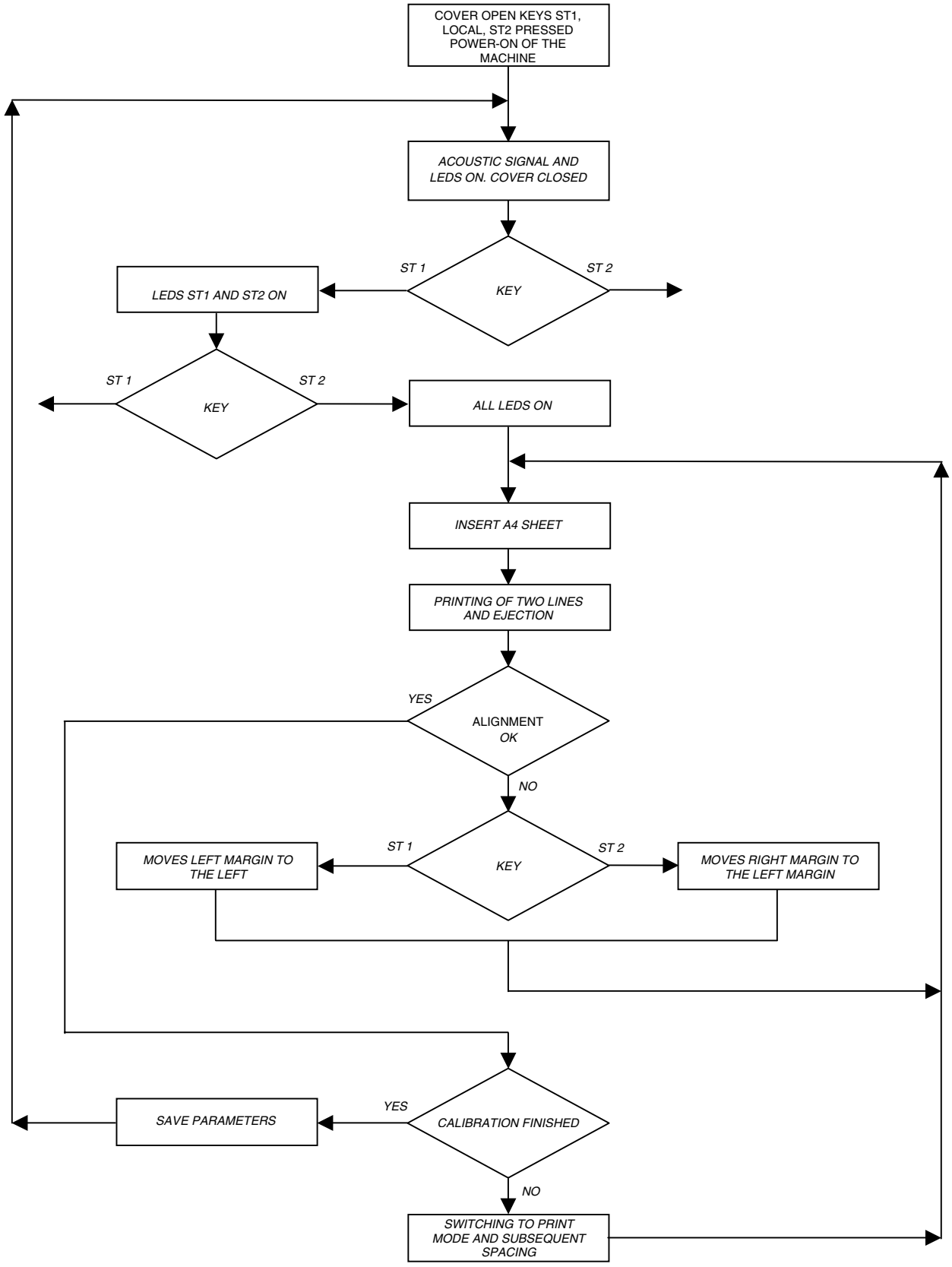
The calibration values of the photosensors are printed in order to obtain a reference between the previous calibration and that carried out subsequently.

To calibrate the alignments, proceed as follows.

1. **Switch on the printer with the cover open and holding down the three buttons on the console.**
2. **Wait for the acoustic signal that indicates access to the calibration and adjustment procedure, then close the cover.**
3. **Press the STATION 1 button.**
4. **Press the LOCAL button.**
5. **At the end of reset, introduce an A4 sheet.**
6. **The form will be introduced, printed and automatically ejected. The printer moves automatically to the next calibration.**

4.3.2 CALIBRATION OF BIDIRECTIONAL PRINTING ALIGNMENT

The block diagram for calibration of print alignment is provided below.



Note: Change of mode and spacing is carried out automatically.

Calibration of alignments makes it possible to recover any misalignment during bidirectional printing caused by possible mechanical tolerances of the printer. After entering the calibration procedure, this will be carried out for the following print modes:

- High Speed Draft 10 cpi
- Draft 10 cpi
- Draft 12 cpi
- Near letter quality 10 cpi
- Letter quality 10 cpi

There are two types of calibration for each print mode. One type for printing of lines without tabulations and one for printing of lines with tabulations. For this reason, two types of specific texts will be printing for each print mode to be calibrated.

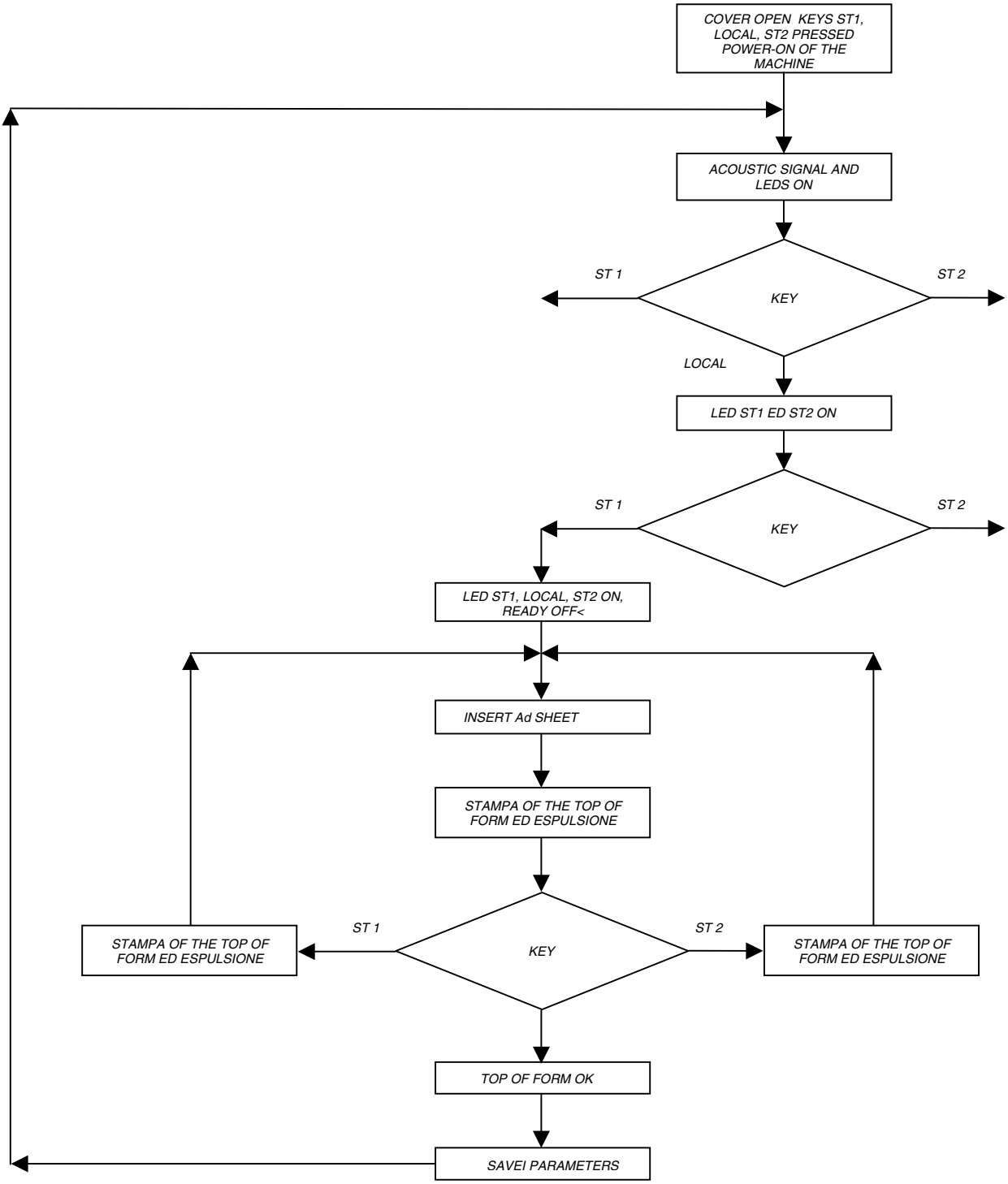
To calibrate the alignments, proceed as follows.

1. **Switch on the printer with the cover open holding down the three console buttons.**
2. **Wait for the acoustic signal that indicates access to the calibration and adjustment procedure, close the cover.**
3. **Press the Station 1 button.**
4. **Press the Station 2 button.**
5. **After this phase, the three console buttons will be active. Use Station 1 to anticipate the start of printing or Station 2 to delay this.**
6. **Pressing, before point 5), the buttons of Station 1 and Station 2, default values presumably close to the correct values will be saved for all the modes.**
7. **Insert an A4 sheet in the front slot to check print alignment status.**
8. **Press Station 1 and/or Station 2 to calibrate the alignments.**
9. **Repeat points 7 and 8 until calibration has been completed.**
10. **Press the "Local" button twice to save the alignment value permanently for the current mode and to move automatically to the next calibration.**

Calibration ends pressing all three the buttons at the same time, returning to the main menu.

4.3.3 CALIBRATION OF THE TOP OF FORM (TOF)

The block diagram for calibration of the top edge of form (TOF) is given below.



This calibration makes it possible to set the distance between the top edge of the document and the first print line.

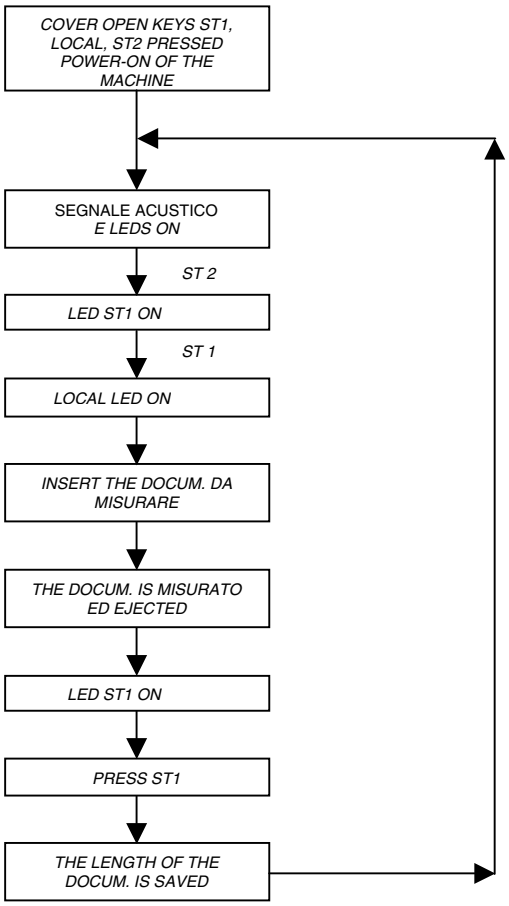
This adjustment is activated only if, in the set-up of PR40+ emulation, “N” is selected for the "TOP MARGIN PR40 LIKE" item.

To carry out this calibration, proceed as follows:

1. **Switch on the printer with the cover open holding down the three console buttons.**
2. **Wait for the acoustic signal that indicates access to the calibration and adjustment procedure.**
3. **Press the Local button and wait until the end of the machine reset procedure.**
4. **Press the Station 1 button. After this phase the three console buttons will be active. With Station 1, it will be possible reduce the TOF or to increase this with Station 2.**
5. **Insert an A4 sheet in the front slot to check the status of the current TOF. This check is made printing a specific text. If the current TOF is too “high”, printing may be carried out off the sheet.**
6. **Press Station 1 and/or Station 2 to decrease or increase the TOF.**
7. **Repeat points 6. and 7. until calibration has been completed.**
8. **Press the “Local” button twice to permanently save the TOF and to move automatically to the next calibration.**

4.3.4 CALIBRATION OF THE LEFT MARGIN

The block diagram for calibration of the left margin is provided below



This calibration makes it possible to set the distance between the left-hand edge of the document and the first character printed.

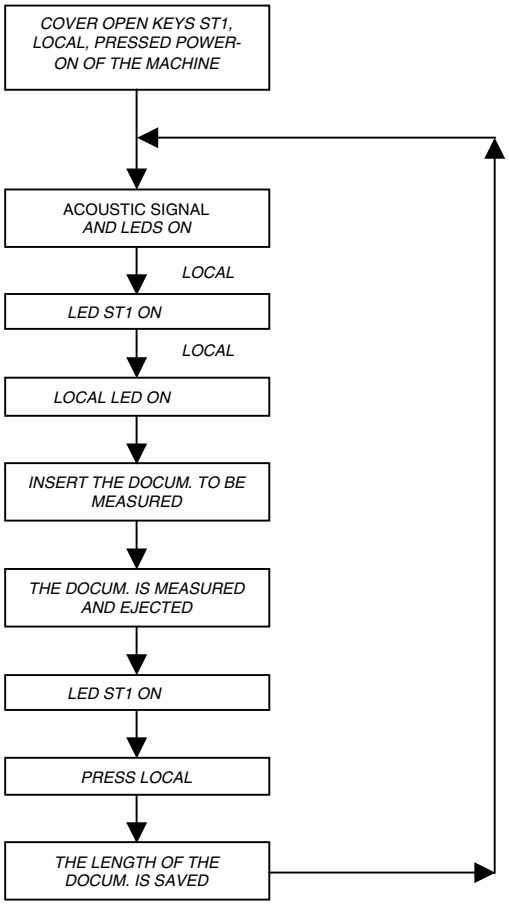
The value of the left-hand margin will always be used without the need for configurations from Set-up.

To carry out this calibration, proceed as follows:

1. **Switch on the printer with the cover open holding down the three console buttons.**
2. **Wait for the acoustic signal that indicates access to the calibration and adjustment procedure.**
3. **Press the Local button and wait until the end of the machine reset procedure.**
4. **Press the Station 2 button.**
5. **Press the Station 1 button until a long two-tone signal is heard (different from the previous signals).**
6. **Insert an A4 sheet and wait for the page to be printed. Check that the left-hand margin is set to the measurement required.**
7. **The minimum distance between the left-hand edge of the document and start of the character must be max. 0.5 mm with calibration from console completely to the left. If this situation does not occur, revise adjustment of the photosensor.**
8. **Check as described in point 7.**
9. **Pressing the Station 2 button, bring the left-hand margin towards the right until the set measurement of 6.95 ± 0,55 mm of the TEMPLATE code 473284Z is reached (check carried out inserting an A4 sheet).**
10. **Press the Local button twice.**

4.3.5 MEASUREMENT OF DOCUMENT LENGTH

The block diagram for measurement of the length of the form is provided below.



It is necessary to measure the width of the form to permit faster management of the magnetic stripe of the passbooks. Selecting, via set-up, the "STRIPE HANDLING: FAST" item, the value read with the form measurement procedure will be used to determine the position of the magnetic stripe and for positioning of the stripe above the magnetic head (without having to make several measurements of passbook width). This considerably reduces passbook management time. If this type of management is to function correctly, the same passbooks as measured must be used.

To carry out this calibration, proceed as follows:

1. **Switch on the printer with the cover open holding down the three console buttons.**
2. **Wait for the acoustic signal that indicates access to the calibration and adjustment procedure.**
3. **Press the Local button and wait for the end of the machine reset procedure.**
4. **Insert an A4 sheet in the front slot and press Station 1. The sheet will be introduced and ejected automatically.**
5. **If necessary, repeat point 5.**
6. **Press the “Local” button to permanently save the value of the form width measured and to move automatically to the next calibration.**

4.3.6 CHECKING OF SIGNAL SKEW

This check must be carried out with the machine completely assembled, presetting and specifying the magnetic device present on the machine in the Setup phase.

The source of signals must be only the following sheet:

- AMPLITUDE AND SKEW SAMPLE code 713483R for horizontal magnetic device.

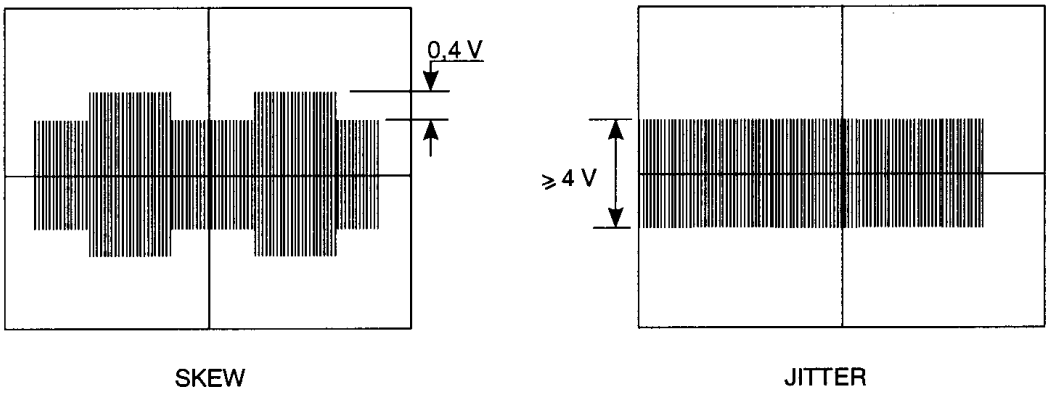


Figure 4-2 View of board

Using an oscilloscope with memory, proceed as follows.

- Insert the "Amplitude and Skew Sample" sheet code 751884Z in the slot from the Skew Control side. Record the signal read during movement of the head from right to left. The signal recorded must not have a spread of more than 0.4 V. No action is required.
- Insert the "Amplitude and Skew Sample" sheet code 751884Z in the slot from the Jitter/Ampl. side. Record the signal read during movement of the head from right to left. If the signal recorded does not reach the value 4V, replace the head unit.

4.3.7 CHECKING OF SIGNAL AMPLITUDE

This check must be carried out in the same way as the previous check. Insert the sample sheet, suitably oriented, so as to read the jitter and amplitude sample stripe; the printer will perform a read cycle before ejecting the sheet. Using an oscillograph with memory, check amplitude of the signal read which must be uniform and with a value of not less than 4V peak-to-peak for both magnetic devices.

The check must be carried out during the movement from right to left in the horizontal magnetic device.

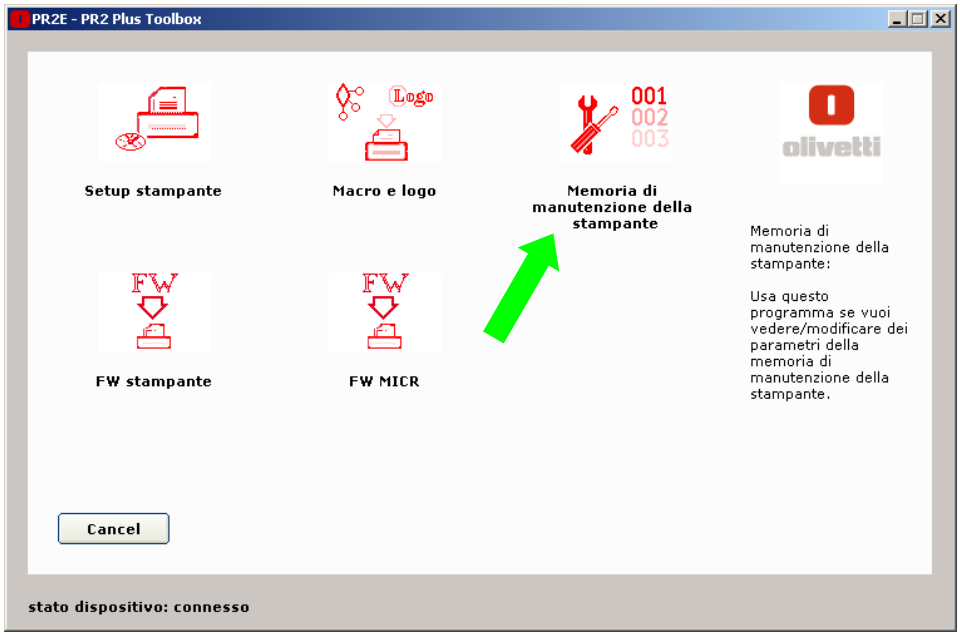
4.4 MAINTENANCE MEMORY

Accessing the serial number fields of the PR2 Plus and using the Toolbox (version 1.10_08 and higher) it is possible to read various data regarding its use from the printer.
These data refer to the life of the printer (non-resettable data) and the life of any parts replaced following technical operations (resettable data).

Note: Before installing the Toolbox, it is essential to remove any previous installation version from the Host.

The following operations must be carried out to view the Maintenance Memory:

- Start the Toolbox application and select the *Resource Kit* icon.
- **Select the** Printer Maintenance Memory **icon.**



- Enter the password(s) for read or write access to the data.

Note: The data of the Maintenance Memory can be read on all models of the PR2 Plus, in the entire serial number field ***1.xxx.xxx*** and from serial number ***4.602.809*** of serial number field ***4.xxx.xxx***.
Application on all the remaining serial numbers is not allowed.

4.5 OPERATIONS TO LOAD THE FIRMWARE

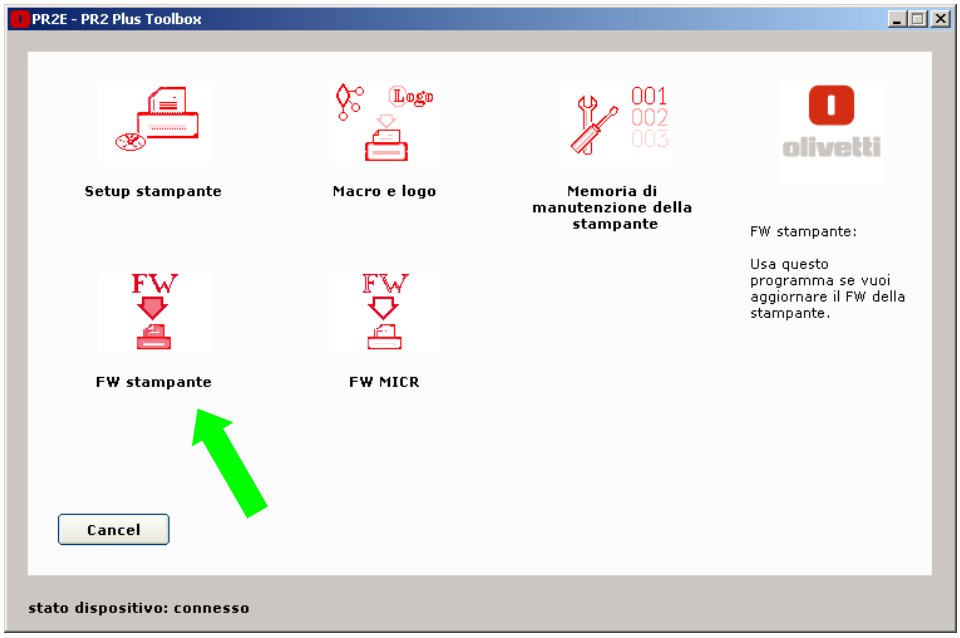
On all models of the PR2 Plus, to update the firmware release, the Toolbox (version 1.10_08 and higher) must be installed.

Note: Before installing the Toolbox, it is essential to remove any previous installation version from the Host.

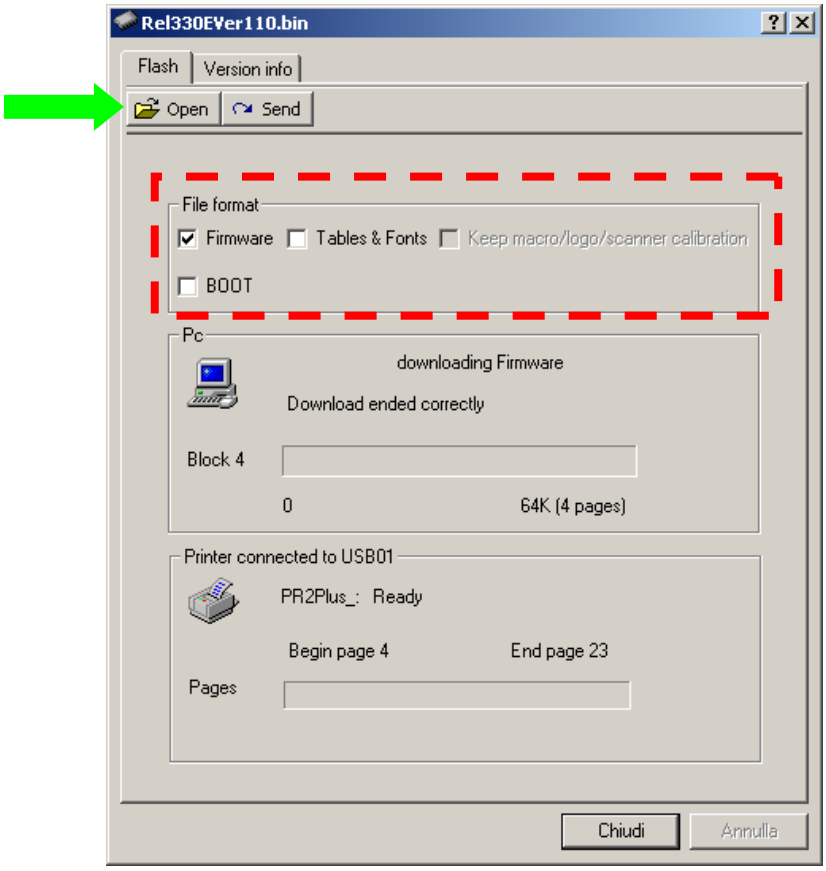
For reasons of speed, it is advisable to update the firmware release using the USB port.

Proceed as indicated below:

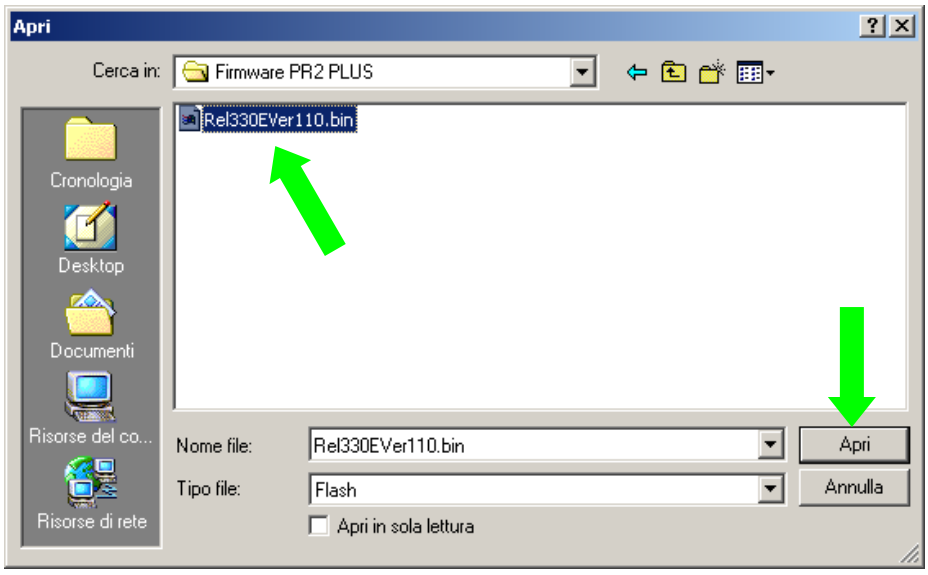
- Switch on the PR2 Plus holding down the ***Station 2*** key in order to print the ***Self Test*** and check that the machine is set for USB data exchange (see ***Interface*** item). Otherwise, set the machine Set Up parameter correctly (par. 4.2).
- Switch off the printer.
- Switch the printer on again after checking that it is connected to the Host via the USB cable.
- Start the **Toolbox** application and select the ***Resource Kit*** icon.
- Select the ***printer FW*** icon



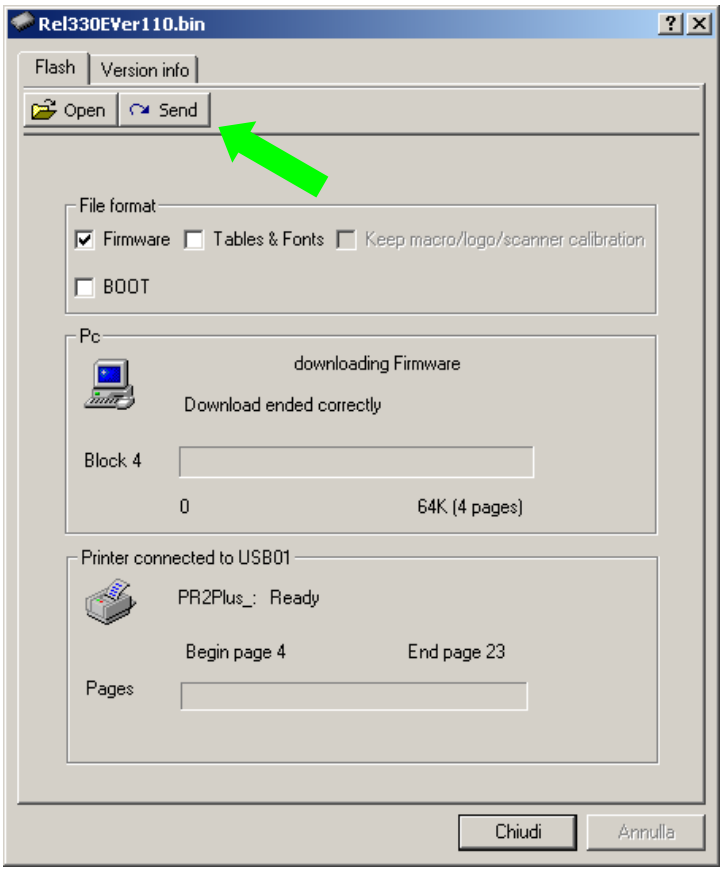
- Check that only the **Firmware** item has been selected in the **File Format** area.
- Select the **Open** key.



- Select the file containing the firmware to be transferred, confirming this with the Open key.



- Select the **Send** key and wait until transfer of the firmware has been completed.



- Calibrate the photosensors (par. 4.3.1).
- Print the **Self Test** again, checking that the firmware release is that required.

At this point, the printer is ready to operate.

5. MACHINE DIAGNOSTICS GUIDE

5.1 METHOD

A technique for carrying out the operation is described below that may guide the less expert service engineer.

5.1.1 ANALYSIS OF OCCURRENCE OF THE FAULT

The operator who has detected a malfunction is able to provide information about operating status and the error signals output by the printer when the fault occurred.

Repetition of the fault, where possible, may make it easier to trace the problem.

For diagnostic purposes, it is important to check whether the fault is repetitive or occasional.

5.1.2 ANALYSIS OF OPERATING CONDITIONS

WORKING ENVIRONMENT

Certain problems may be caused by the environment if this is too cold, hot or damp.

The machine must not be positioned close to air conditioning system outlets or exposed to the rays of the sun.

Check that the internal ventilation slots are not obstructed especially if the printer is installed in a cabinet.

Certain forms, documents or office accessories placed close to the machine may reduce internal ventilation with consequent overheating.

ACCESSORIES AND FORMS

Check that the accessories fitted on the machine are original and in good condition.

Check that the documents inserted in the printer comply with machine specifications and are in good condition.

OPERATING STATUS OF THE PRINTER

Check for any dirt or paper and ink on inside parts of the machine that may affect the performance of the various devices.

Check for any internal damage due to insertion of documents with paper-clips, metal staples, pins or sample holders.

Check lubrication of all parts for which this is prescribed.

5.1.3 IDENTIFYING THE PROBLEM

Examining all the information gathered (from the Operator, printer error signals, analysis of documents on which the fault has been encountered, repetition of the error when the machine is started, etc.), trace and isolate the problem that has occurred on the machine and which must be eliminated.

In some cases, the fault may be caused by more than one problem: it is important therefore to separate the various problems and deal with these one by one.

5.1.4 TRACING THE CAUSE

According to your experience, and referring to information provided in this chapter, follow a logical path to trace the fault, from the most likely cause to the most remote possibility, until you have identified the faulty part.

5.1.5 ELIMINATION OF THE FAULT

Carry out the repair so that the machine can carry out all its functions

In this phase, the information provided in chapters 6, 7, 8, 9 may be of help.

5.1.6 TESTING OF THE MACHINE

Once the machine has been repaired, carry out a general cleaning and complete test of the machine (paragraph 3.5), possibly with the Operator present, to check that the problem has been eliminated and that no other faults have occurred.

5.2 CLASSIFICATION OF FAULTS

To facilitate tracing of faults, these have been divided into:

- **5.3** faults at power-on
- **5.4** faults during writing of the document
- **5.5** faults during handling of the document
- **5.6** faults during read/writing the magnetic stripe.

The most frequent faults encountered and possible remedies are listed for each group.

The classifications provided cannot cover all the faults that may occur; if the fault is not amongst those classified, it may be useful to refer to the description of a similar fault.

5.3 FAULTS AT POWER-ON

POSSIBLE CAUSE	FAULT			
	The machine does not switch on	The self-test indicates a fault on the Motherboard	The self-text indicates an error in the mechanics	The machine does not connect with the system
Mains voltage absent/incorrect	**X**			
Mains cable damaged	**X**			
Mains cable only partially inserted	**X**			
Fuse blown	**X**			
Fault in the power supply unit	**X**			
Motherboard fault		**X**		**X**
Fault in the front photosensors			**X**	
Fault in the carriage photosensor			**X**	
Fault in the rear photosensor			**X**	
Machine cover open			**X**	
Document jammed in machine			**X**	
Problems on interface connections				**X**
Line problems on the interface				**X**
Incorrect set-up				**X**

5.4 FAULTS DURING WRITING OF THE DOCUMENT

	FAULT					
POSSIBLE CAUSE	The printhead does not write	Printing is faded	Writing with stains	Incomplete writing	Writing disabled	Misshapen writing with irregular spacing
Ribbon cartridge missing	**X**	**X**				
Ribbon to be replaced (out)		**X**				
Ribbon cartridge not inserted correctly	**X**	**X**		**X**		
Incorrect set-up parameters					**X**	**X**
Irregular movement of the carriage	**X**					**X**
Closing levers open	**X**	**X**		**X**	**X**	
Printhead fault	**X**			**X**		
Paper photosensor fault	**X**				**X**	**X**
Printhead flat cable fault	**X**			**X**	**X**	**X**
Transport motor fault	**X**					**X**
Motherboard fault	**X**			**X**		
Adjustment of the document drive belt					**X**	
Adjustment of roller-needles	**X**	**X**	**X**	**X**		
Adjustment of ribbon-needle protection tab	**X**	**X**	**X**	**X**		
Adjustment of paper photosensor	**X**				**X**	**X**
Adjustment of the print bar	**X**	**X**				
Adjustment of the band					**X**	
Adjustment of gears per rollers					**X**	
Adjustment of front pressure rollers					**X**	
Adjustment of carriage drive belt					**X**	**X**

5.5 DOCUMENT MOVEMENT DEFECTS

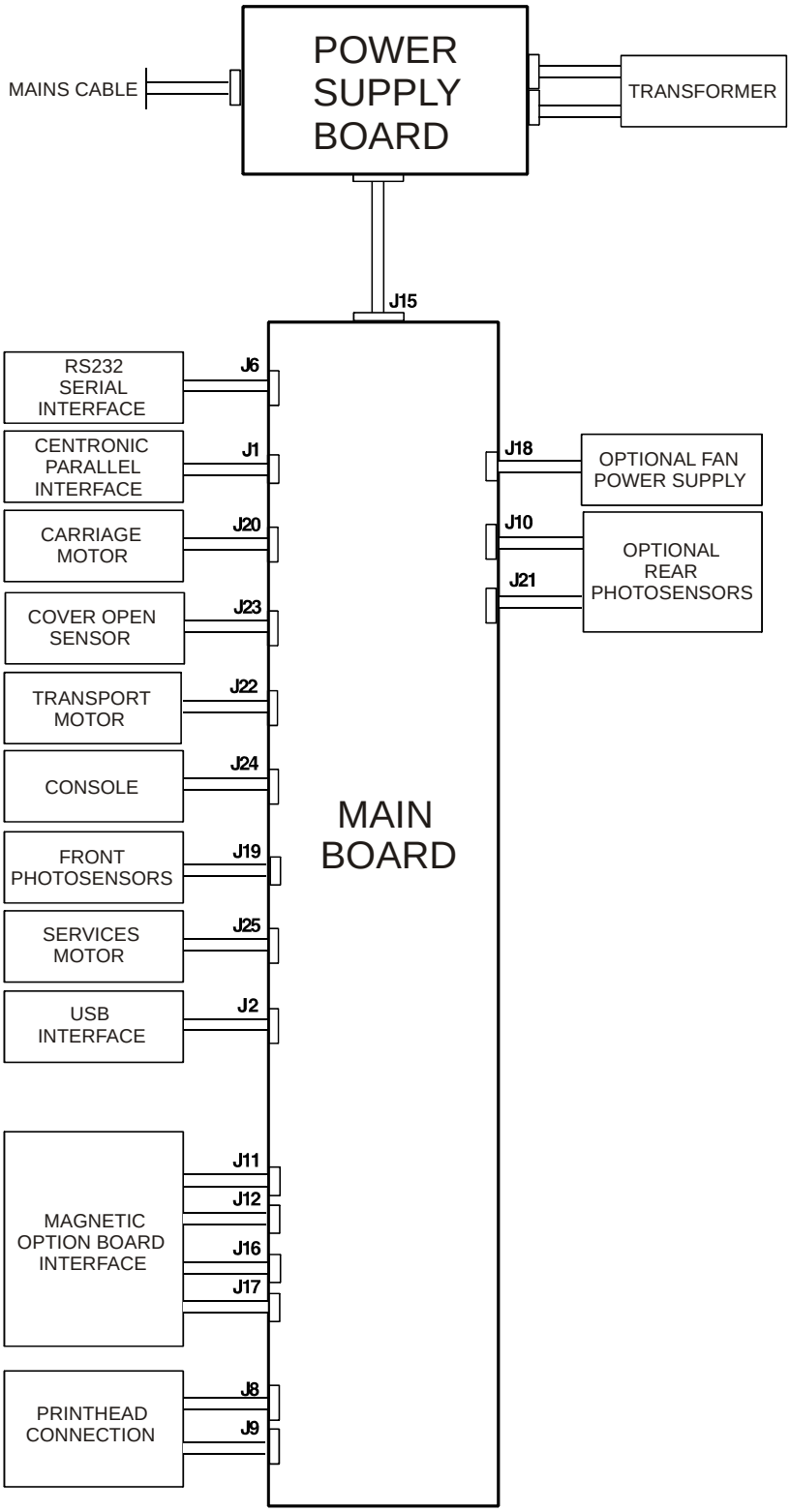
	FAULT			
POSSIBLE CAUSE	The machine does not introduce/eject the document	The document is fed crookedly	The document is wrinkled	The document has irregular line feeds
Document not acc. to specs	X	X	X	X
Document ruined	X	X	X	X
Closing levers open		X	X	X
Front photosensors fault	X			
Paper photosensor fault	X			
Rear photosensor fault	X			
Service motor fault	X			
Paper feed motor fault	X			X
Motherboard fault	X			
Adjustment document feed belt			X	
Adjustment roller-needles			X	
Adjustment ribbon-needle protection tab			X	
Adjustment paper photosensor	X		X	
Adjustment print bar			X	
Adjustment band			X	
Adjustment gears per rollers				X
Adjustment front pressure rollers				

5.6 FAULTS DURING READ/WRITING OF THE MAGNETIC STRIPE

	FAULT
POSSIBLE CAUSE	Read/write errors of the horizontal magnetic unit
Incorrect set-up	**X**
Passbook damaged	**X**
Incorrect insertion of passbook in machine	**X**
Magnetic printhead dirty	**X**
Magnetic printhead fault	**X**
Paper feed motor fault	**X**
Magnetic unit board fault	**X**
Motherboard fault	**X**
Magnetic printhead movement motor fault	**X**

6. ELECTRICAL INTERCONNECTIONS

6.1 GENERAL INTERCONNECTION DIAGRAM (MACHINES WITH SERIAL NUMBER 8.xxx.xxx)



6.2 MOTHERBOARD (MACHINES WITH SERIAL NUMBER 8.xxx.xxx)

An RS232 serial interface, a Centronics parallel interface and a USB interface are integrated in the board.

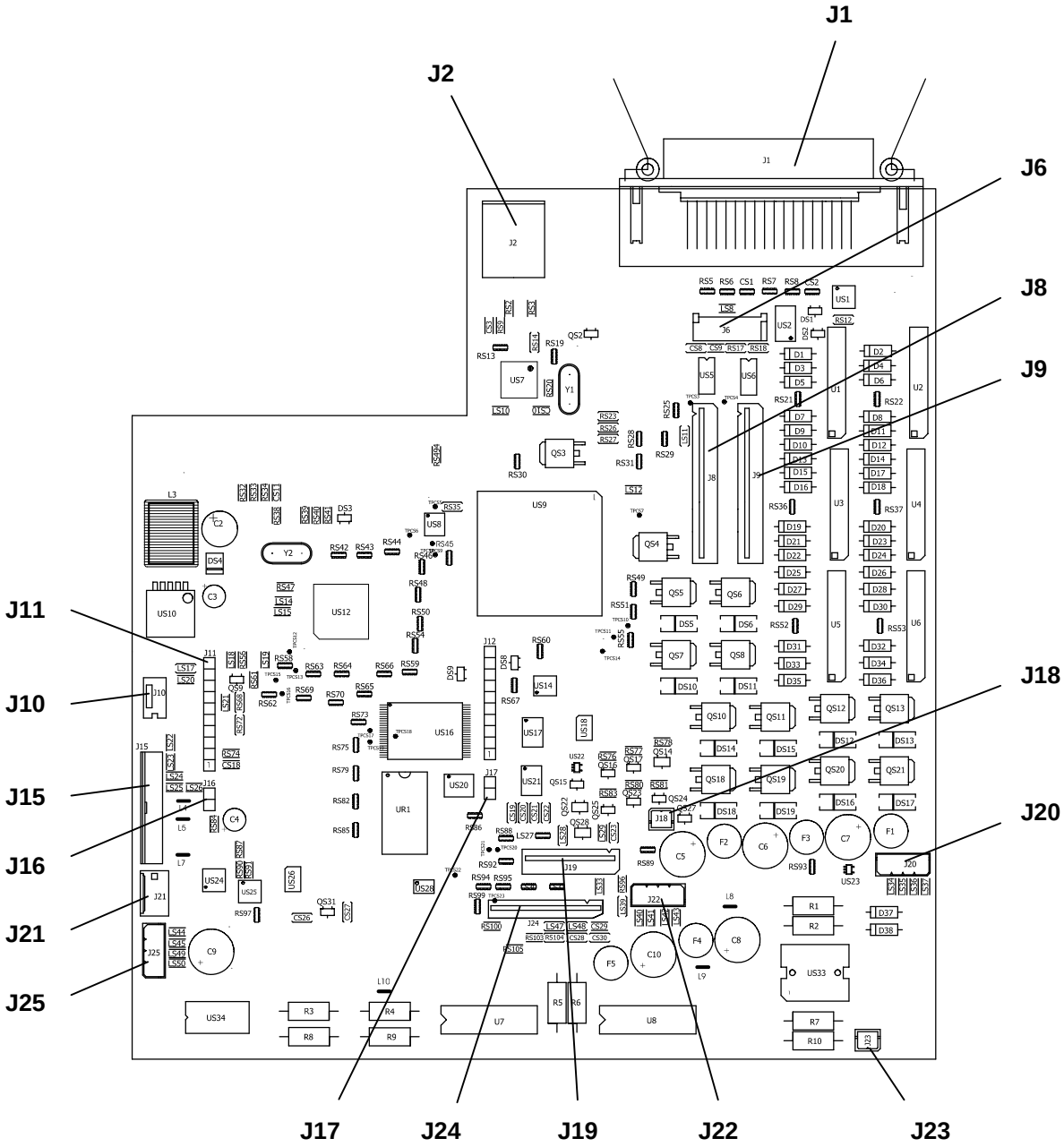
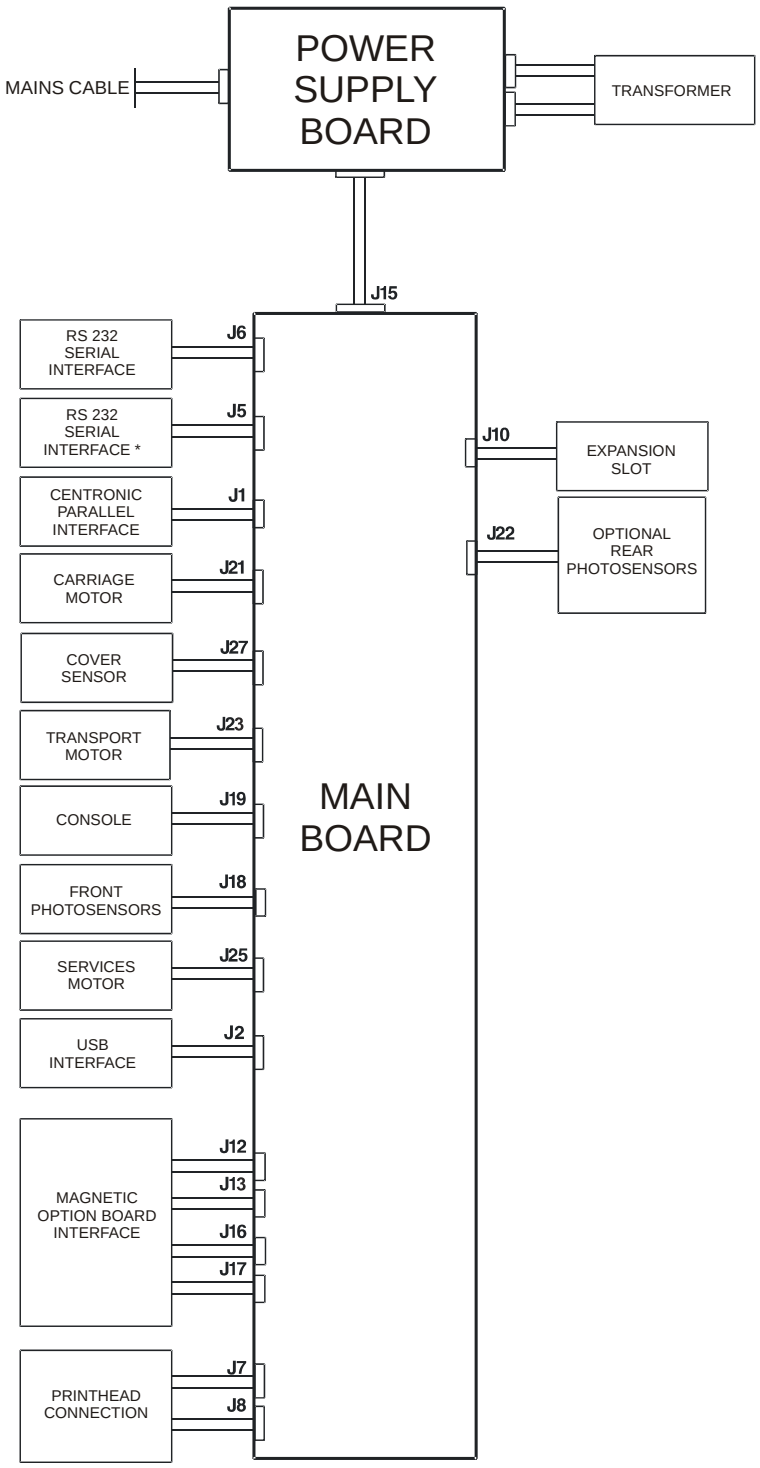


Figure 6-1 PR2 *plus motherboard*

6.3 GENERAL INTERCONNECTION DIAGRAM (MACHINES WITH SERIAL NUMBER 1.xxx.xxx)



* Version with 2 RS232 serial interfaces.

6.4 MOTHERBOARD (MACHINES WITH SERIAL NUMBER 1.xxx.xxx)

A Centronics parallel interface and a USB interface are integrated on the board.

6.4.1 VERSION WITH 1 RS232 SERIAL INTERFACE

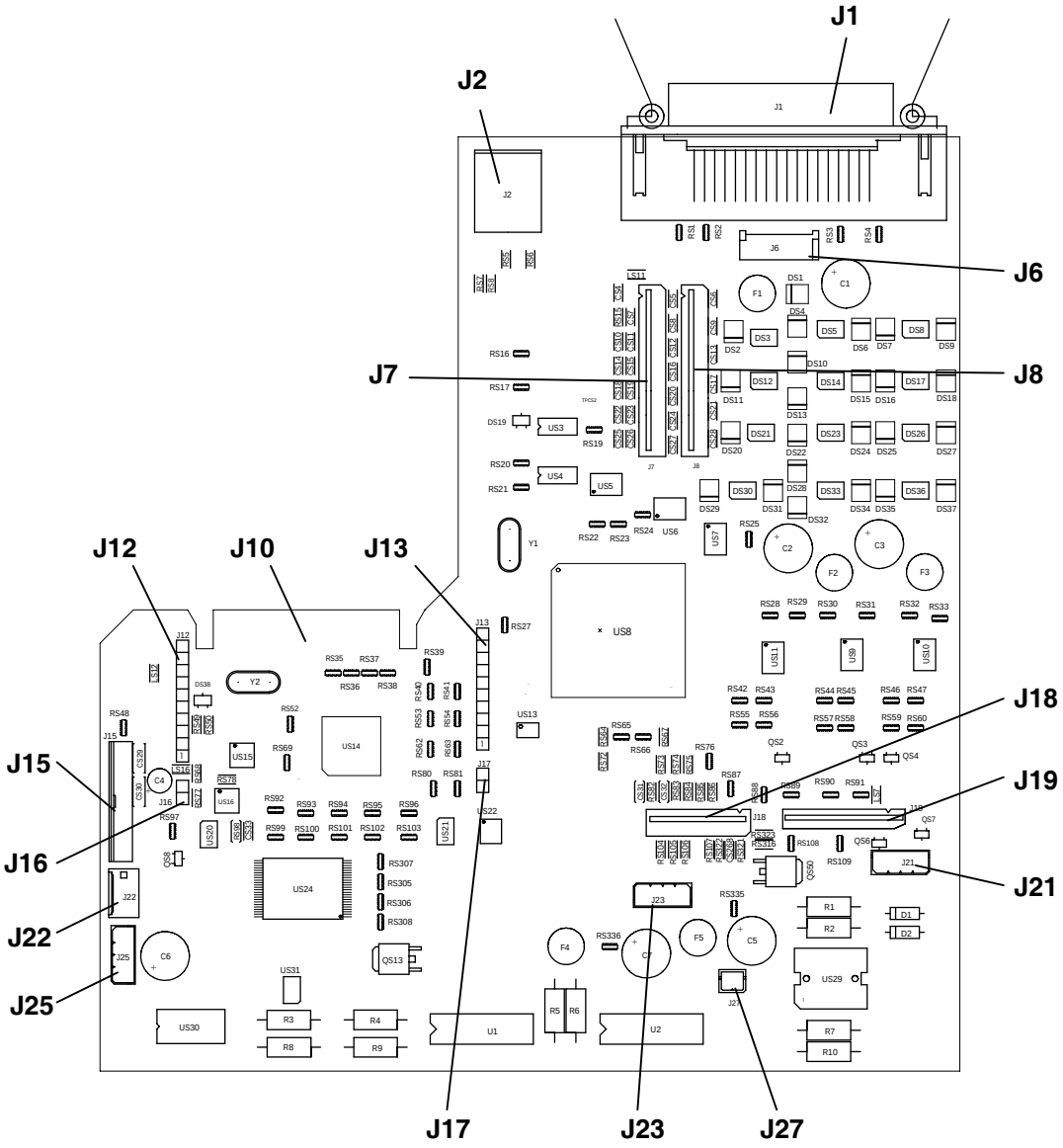


Figure 6-2 Motherboard PR2 plus (version with 1 RS232 serial interface)

6.4.2 VERSION WITH NO. 2 RS232 SERIAL INTERFACES

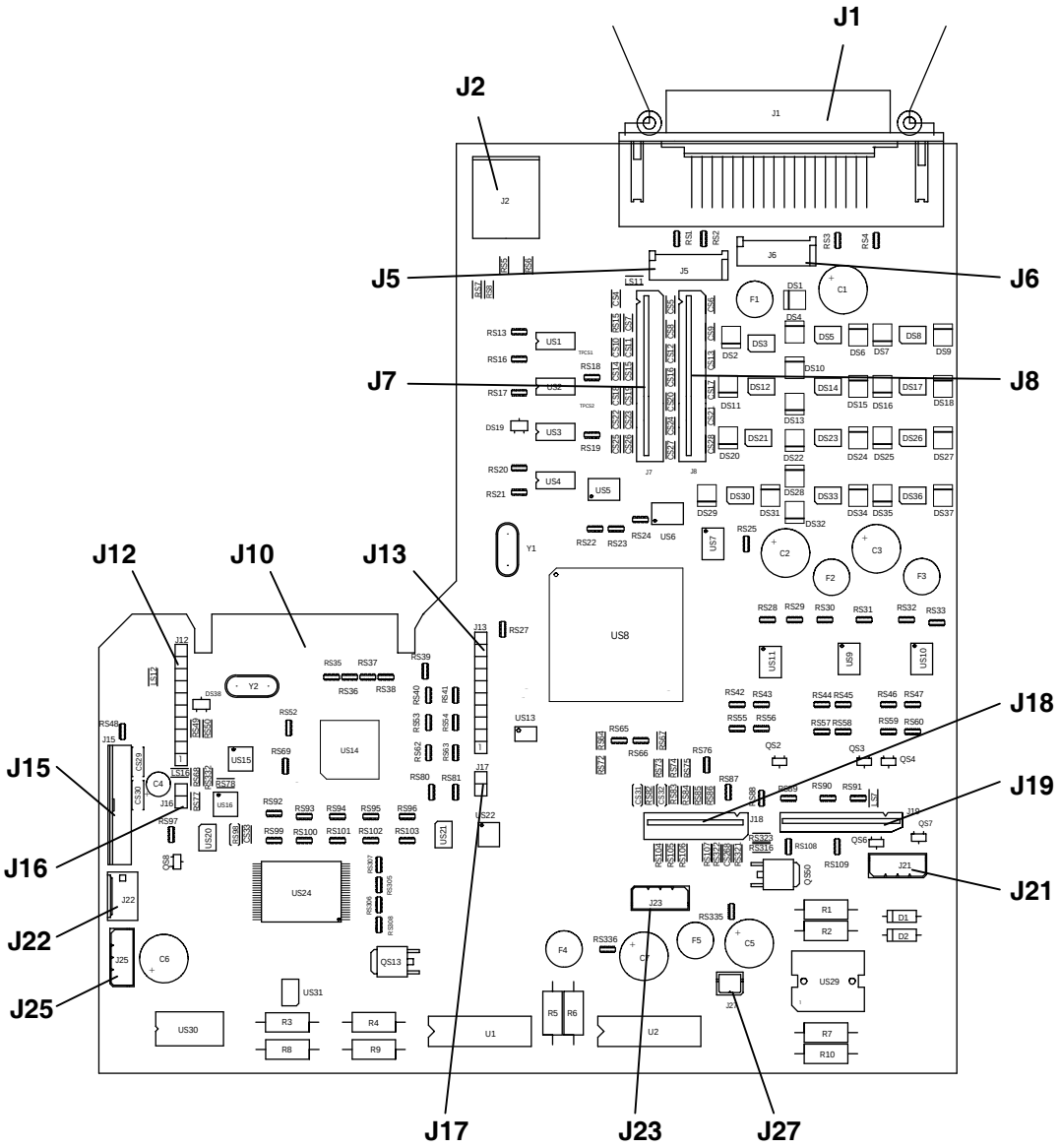


Figure 6-3 Motherboard PR2 plus (version with 2 RS232 serial interfaces)

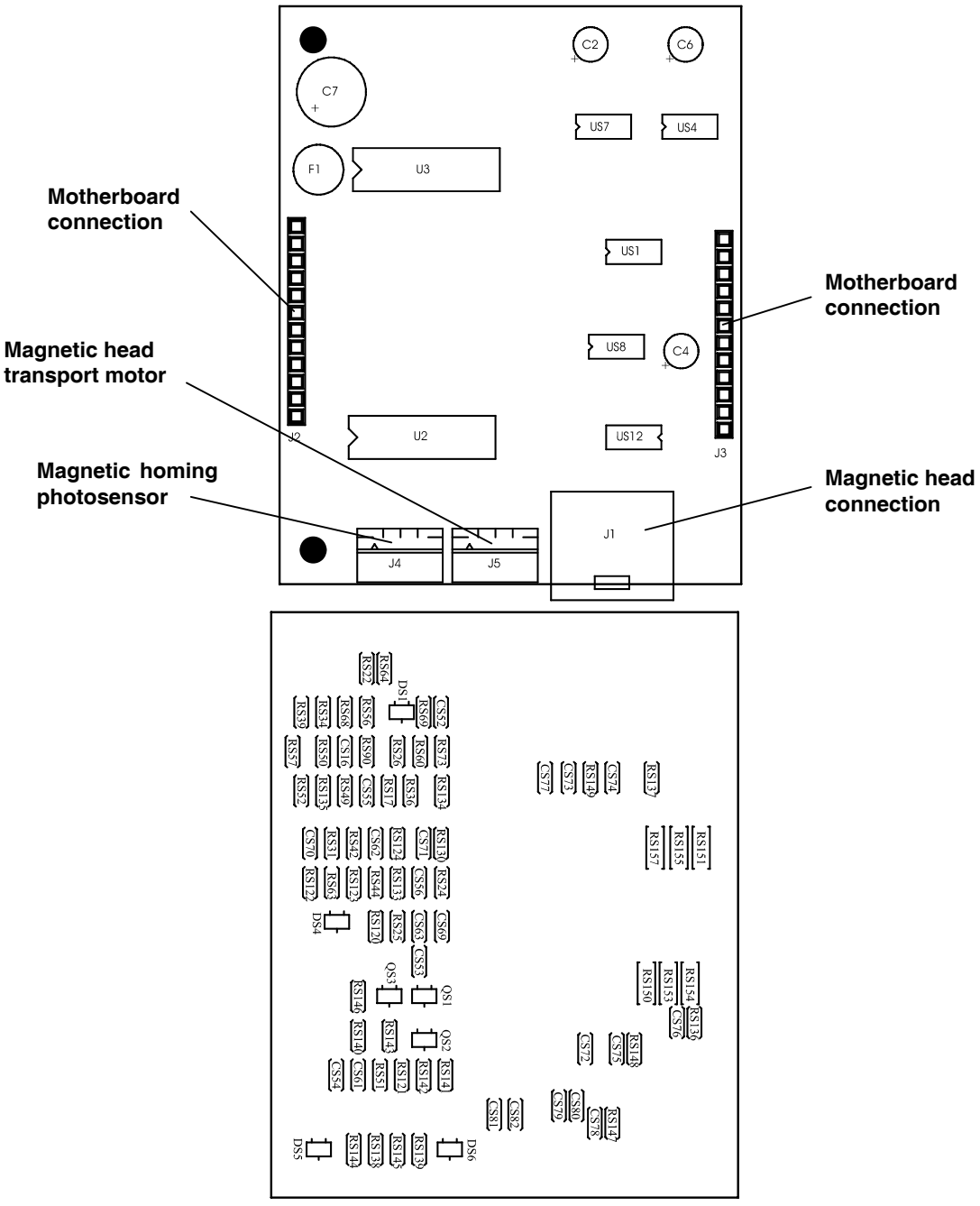
6.5 MAGNETIC OPTION BOARD

The following board relating to the magnetic option present can be installed on the motherboard

- PR2MAGN for management of the horizontal magnetic option

The option installed is managed by the FW according to parameters defined in the machine set-up.

6.5.1 VIEW OF THE BOARD AND POSITION OF THE CONNECTORS



6.6 CONSOLE

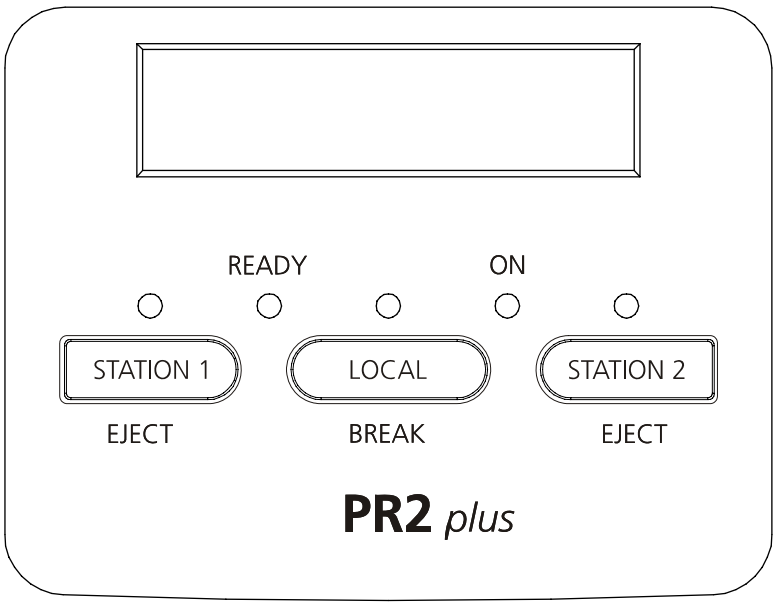


Figure 6-4 Console

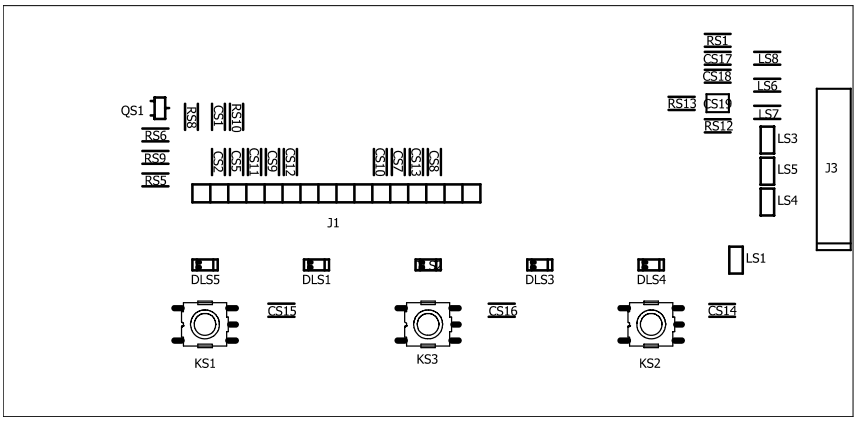


Figure 6-5 Console board

6.7 ALIPR2 PLUS

Two codes may be assigned to the PR2 Plus power supply unit according to the mains voltage (115 V or 230 V) for which they are set. The value of fuse F1 also varies according to mains voltage.

6.7.1 POWER SUPPLY UNIT

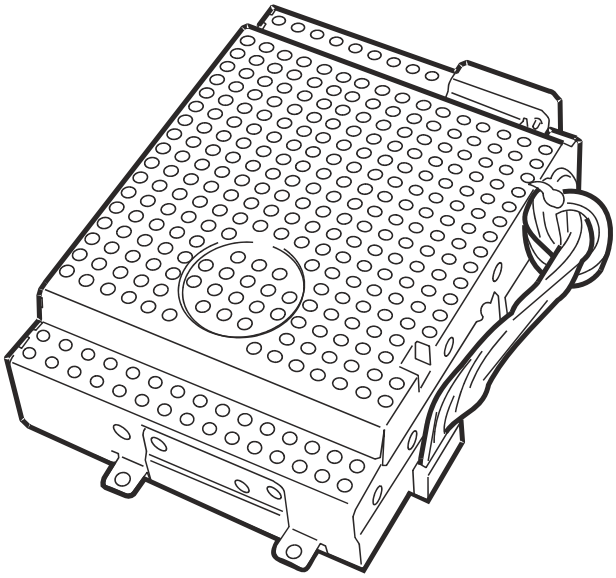


Figure 6-6 Power supply unit

6.7.2 SIGNALS OF THE CONNECTORS AND VALUES OF THE FUSE

F1 Fuse 250V 3.15A

J1
(EXTERNAL POWER SUPPLY)

1	*VAC*
2	*GND*
3	*VAC*

J2
(MOTHERBOARD POWER SUPPLY)

1	*ROUT*
2	*-12V*
3	*+12V*
4	*+5V*
5	*GND*
6	*GND*
7	*GND*
8	*35V*
9	*35V*

7. PREVENTIVE MAINTENANCE

7.1 CLEANING

For correct functioning of the printer, it is advisable to clean parts of the machine periodically and after each servicing.

7.1.1 CLEANING OF THE CASING

Switch off the printer, disconnect it from the power outlet and clean the casing with a damp cloth; do not use corrosive substances such as solvents, alcohol, benzene or products with abrasive components.

7.1.2 CLEANING OF THE PAPER PATHS

Clean all paper paths including the paper feed rollers of the insertion slot, taking care to remove any scraps of ribbon or paper that may be deposited on parts and also any foreign objects.

7.1.3 CLEANING OF THE MAGNETIC READ HEAD

For cleaning, use the specific card (code 751498E) furnished with printers equipped with magnetic horizontal + MICR unit.

Cleaning may be carried out using an automated procedure or manually by the service engineer.

AUTOMATED PROCEDURE

With a specific software procedure, the system informs the user that the printer must be cleaned and triggers a dummy magnetic transaction.

If not provided by the system, cleaning instructions are furnished on the cleaning card.

Cleaning using the automated procedure is usually carried out the operator.

MANUAL PROCEDURE

This type of cleaning is carried out by the service engineer outside the scheduled operations established by the automated procedure.

A read magnetic stripe system command must be invoked also in this case.

Insert the cleaning card facing in the right direction inside the feed slot; the machine will perform a read attempt and, at the end of this, will eject the card and indicate an error.

To restore normal operating conditions, switch the printer off and on again.

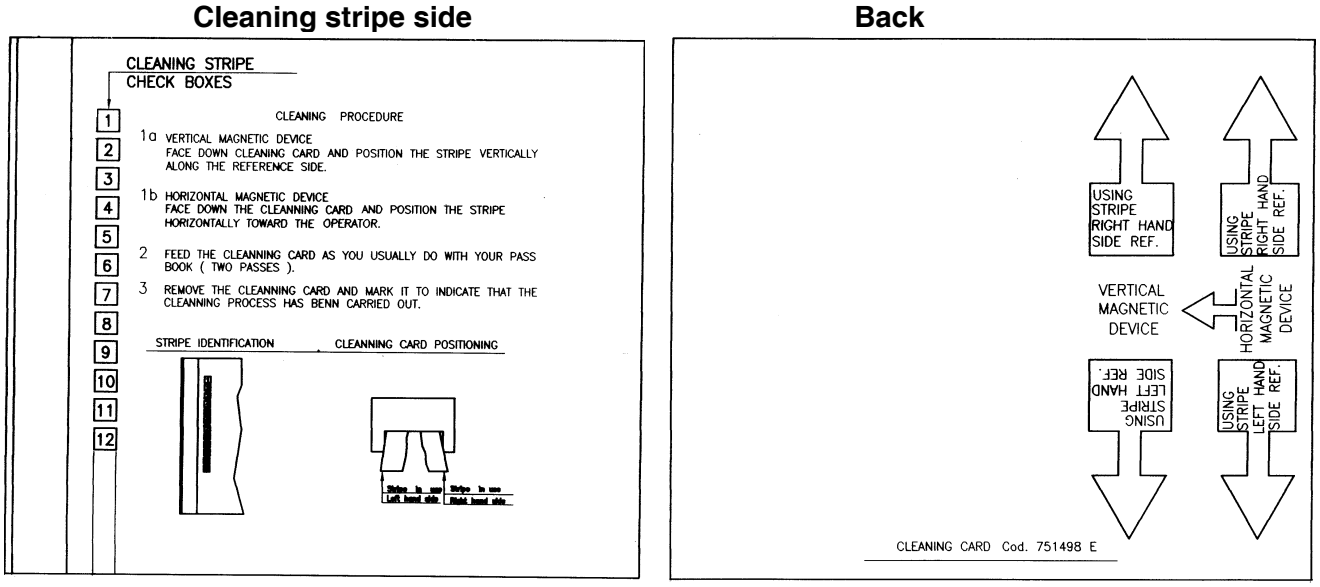


Figure 7-1 Magnetic head cleaning card

7.2 MAINTENANCE

A brush installed in the right-hand inner part of the mechanism cleans the paper edge detection photosensor, located close to the printhead. Brush life is the same as that of the printer. Exceptionally, if dust accumulates on the paper photosensor in the meantime, it is advisable to replace the brush.

7.3 LUBRICATION

Although relubrication is not required during the life of the machine, the service engineer should check this at each intervention, referring to the tables of parts to be lubricated.

7.3.1 BASIC MACHINE LUBRICATION POINTS

DESCRIPTION	CODE	GREASE	OIL
Print carriage sliding shafts			**X**
Felt of the carriage	473150E		**X**
Paper feed gears		**X**	
Cam in the contact areas with:	473072X	**X**	
comb support pin	473076T	**X**	
pressure bridge roller	473074Z	**X**	
Hole of the roller shaft contact bushes	473170A	**X**	
and band shaft	473171X	**X**	
Central pressing device in the shaft contact area	473167T		**X**
Bushes in the shaft contact area	473087P	**X**	
	474953Y	**X**	
Motor gears	473069C	**X**	
gear	473071W	**X**	
gearing of the cam	473072X	**X**	
gear of the assy	473174S	**X**	
	473180V		
Gearing of the pulley	473017Q	**X**	
Attachment zone leaf spring	473182K	**X**	
Hole of the ribbon feed lance with support pin	473159B	**X**	
Pin of the belt take-up unit with idler pulley	473149H	**X**	
Alignment roller shaft assy	474987K	**X**	
in the torsion bar contact area	473091K		
in the guide zones of the conveyor	473186P		
	474951W		
Rubber in sight in the shock-absorber assy hole	475871K	**X**	

- Grease: Code 150337 M MAGNALUBE - E
- Oil: Code 757283 C - oil FOMBLIN Y 06 (perfluoro polyether) Supplier: Ausimont Montedison Group

DESCRIPTION	CODE	GREASE	OIL
Print crossbar in the zones:	395115R	X	
Left-hand pin and ballast	473049G	X	
Guide hole central pin		X	
RH fork pin contact		X	
Inside of the holes for crosswise adjustment screws		X	

7.3.2 HORIZONTAL MAGNETIC UNIT/MICRO LUBRICATION POINTS

DESCRIPTION	CODE	GREASE	OIL
Upper carriage sliding shaft (moderately, applying a drop to the sides of the shaft)		X	
Coupling between the pin and roller cage of the idler pulley		X	
Coupling between flap and pins on which this rotates		X	
Coupling between the toothed sector and its pin		X	
Sector-flap bevel pair gear		X	
Sloping surface of the carriage which controls the flap closing lever		X	
Inside of the pressure device control cam		X	

- Grease: Code 150337 M MAGNALUBE - E
- Oil: Code 757283 C - oil FOMBLIN Y 06 (perfluoro polyether) Supplier: Ausimont Montedison Group

8. MECHANICAL ADJUSTMENTS

To facilitate consultation, each adjustment is divided into:

- **Machine status**. Describes the status of the printer required to make the adjustment.
- **Conditions to be checked**. Indicates the points, values and tolerances to be complied with for correct functioning of kinematics.
- **Operating procedure**. Lists the operations to be carried out to make the adjustment.
- **Notes**. Provide any references to adjustment sequences or checks.

8.1 ADJUSTMENT OF DOCUMENT DRIVE BELT

MACHINE STATUS:
Not significant.

CONDITIONS TO BE CHECKED:
Cogged belt (1) tensioned so as to obtain a deflection of 2.9 mm with a force of 200 g applied at the center of the span..

PROCEDURE:
Loosen the lock nuts of the motor (2), establish conditions required and tighten the nuts (1).

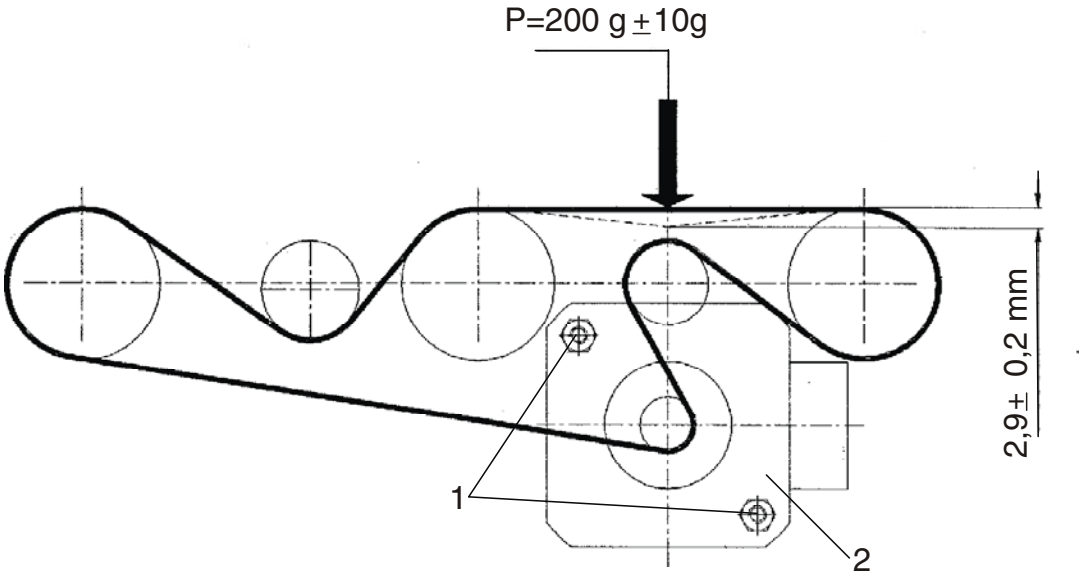


Figure 8-1

8.2 ADJUSTMENT OF PRINTHEAD AND PROBES

MACHINE STATUS:

Photosensor in axis with head needles.

CONDITIONS TO BE CHECKED:

Distance between roller/ribbon protection bracket and needle profile.

PROCEDURE:

Position the probes, roller (1) and ribbon protection bracket (2) so as to obtain the positions indicated in the figure in relation to the needle profile and fasten these. Secure the photosensor (3) in contact with the reference profile. Check correct symmetry of the “windows” (4) of the photosensor with needle head axis (5).

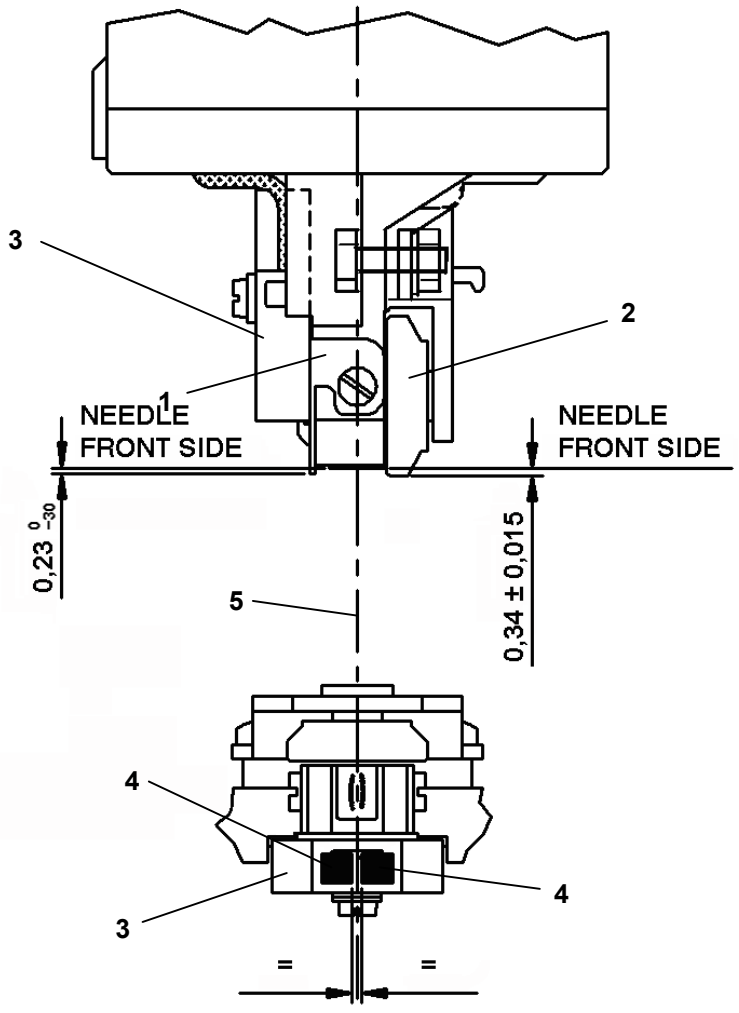


Figure 8-2

8.3 ADJUSTMENT OF THE PRINT BAR (MACHINES WITH SERIAL NUMBER 8.xxx.xxx)

MACHINE STATUS:

Printhead positioned co-axially with the axis of the screw used to make the adjustment.

CONDITIONS TO BE CHECKED:

Distance of 0.4 - 0.5 mm between print bar (2) and feeler roller (3).

PROCEDURE:

Bring the print unit to the writing position; then, using the two screws (1), adjust the print bar (2) in contact with the feeler roller (3), positioning the head (4) in axis with the screw.

Lift the print unit and move the print bar (2) up by 0.35 – 0.45 mm, operating on the screw (1) and checking movement with a comparator (5) positioned on the axis of the screw.

Repeat the operation on the other screw, from the opposite side of the structure.

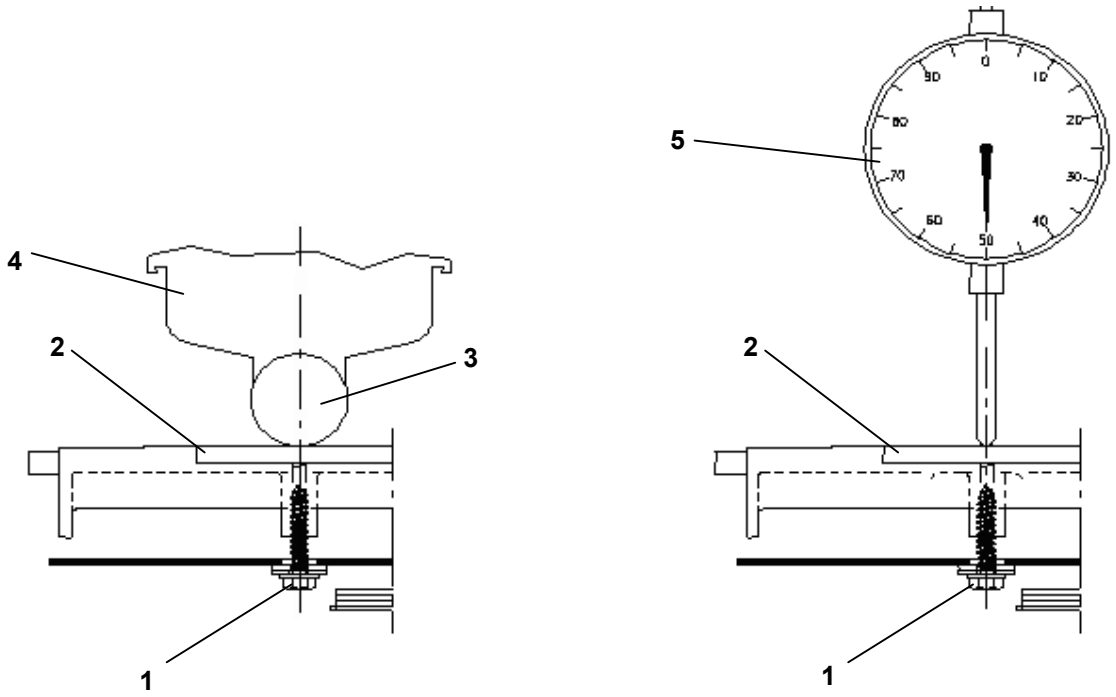


Figure 8-3

8.4 ADJUSTMENT OF THE PRINT BAR (MACHINES WITH SERIAL NUMBER 1.xxx.xxx)

MACHINE STATUS:

Printhead positioned co-axially with the axis of the screw used to make the adjustment.

CONDITIONS TO BE CHECKED:

Distance of 0.4 - 0.5 mm between print bar (2) and feeler roller (3).

PROCEDURE:

Bring the print unit to the writing position; then, using the four screws (1), adjust the print bar (2) in contact with the feeler roller (3), positioning the head (4) in axis with the screw.

Lift the print unit and move the print bar (2) up by 0.35 – 0.45 mm, operating on the two screws (1) and checking movement with a comparator (5) positioned on the axis of the screw.

Repeat the operation on the other two screws, from the opposite side of the structure.

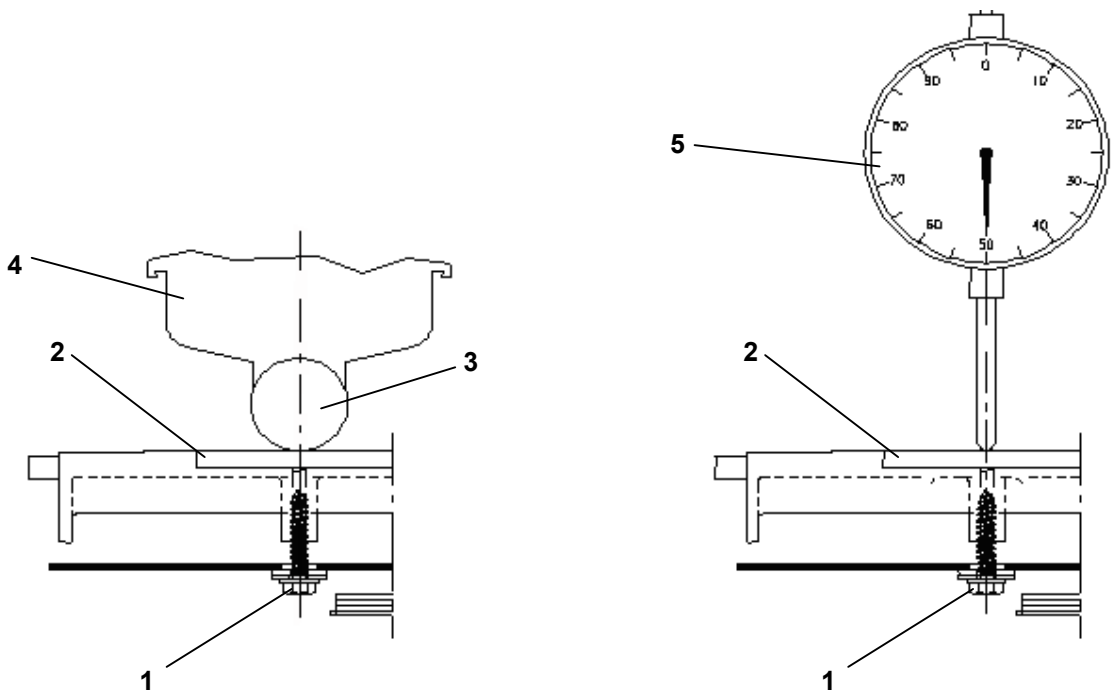


Figure 8-4

8.5 ADJUSTMENT OF PRINT BAR PARALLELISM AND LEAF SPRING LOAD ON BASIC MACHINE (MACHINES WITH SERIAL NUMBER 8.xxx.xxx)

MACHINE STATUS:

Machine off without casing.

CONDITIONS TO BE CHECKED:

Check print bar parallelism and leaf spring load.

PROCEDURE:

The bar perpendicularity adjustment lever can be pre-regulated with tool code 9600303 according to drawing code 395130U.

For manual adjustment of head/print bar parallelism, back off the studs (2) and rotate in a counterclockwise direction to bring the bar close to the front part of the matrix; rotate in a clockwise direction to bring the bar close to the rear part of the matrix.

The parallelism indicator (3) can be used to check whether the corrections have been made.

To modify the load of the leaf spring, operate on the self-locking adjustment nuts (4).

Move the carriage completely to the left and, using a comparator, push the print bar close to the feeler roller with a dynamometer. A load of 350 g ± 20 g must correspond to a movement of 0.35 – 0.45 mm. Repeat the procedure on the right of the bar.

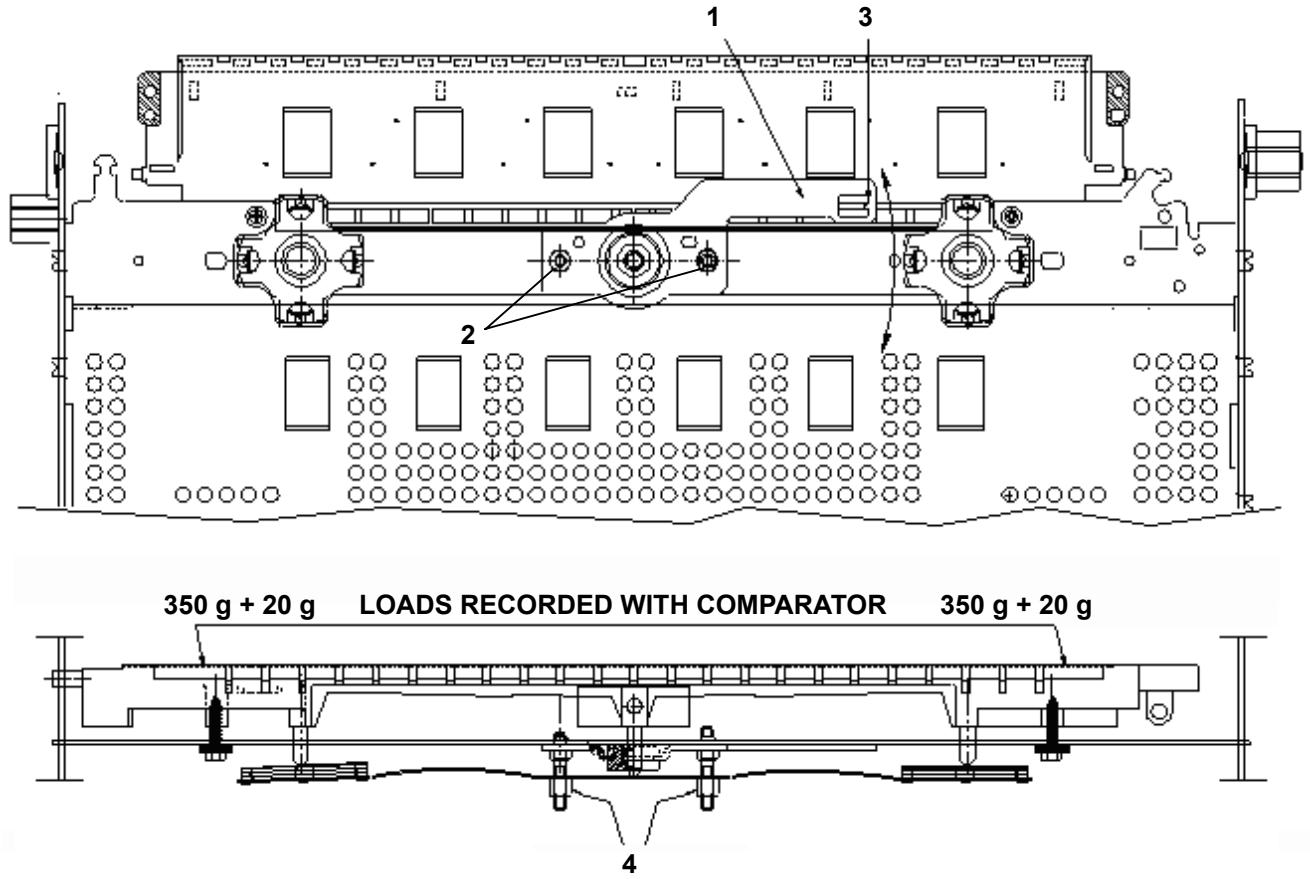


Figure 8-5

8.6 ADJUSTMENT OF PRINT BAR PARALLELISM (MACHINES WITH SERIAL NUMBER 1.xxx.xxx)

MACHINE STATUS:

Machine off without casing.

CONDITIONS TO BE CHECKED:

Check print bar parallelism.

PROCEDURE:

The bar perpendicularity adjustment lever (1) can be pre-regulated with tool code 9600303 according to drawing code 395130U.

For manual adjustment of the parallelism between the head and the print bar, rotate studs (2) counter clockwise to move the bar close to the front of the matrix; rotate clockwise to move the bar to the rear of the matrix.

The parallelism indicator (3) can be used to check whether the corrections have been made.

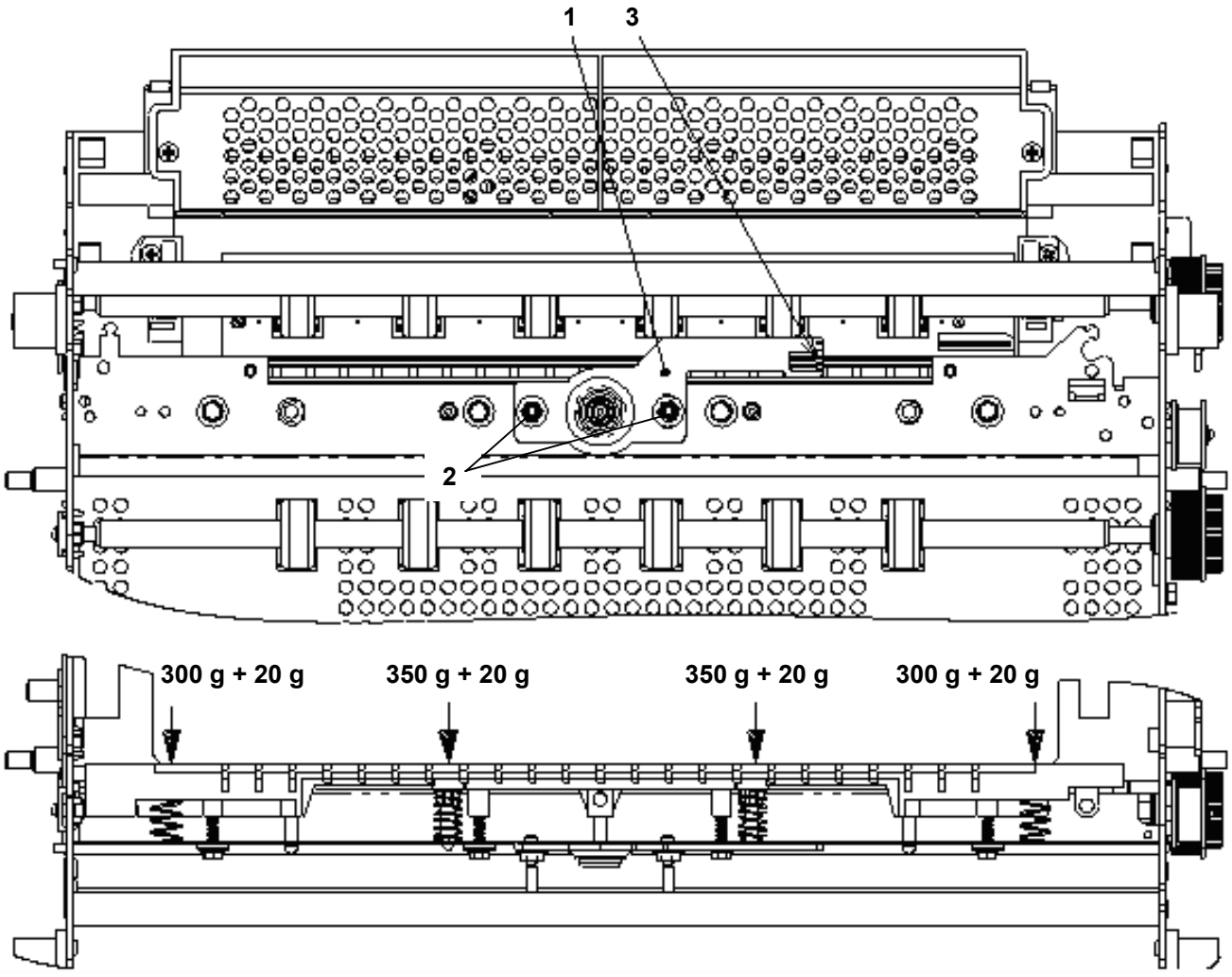


Figure 8-6

8.7 CHECK ON OPENING OF FRONT BAND

MACHINE STATUS:
Rear structure closed and carriage completely to the right.

CONDITIONS TO BE CHECKED:
Distance between the front band and print bar.

PROCEDURE:
After checking correct adjustment of the band (as indicated in the paragraph above), close the rear structure and move the carriage to the right. Using a probe, check that the point of the band is positioned at a distance of between 8 and 11 mm from the print bar, measuring this at 5 - 6 cm from the left-hand edge of the print carriage.

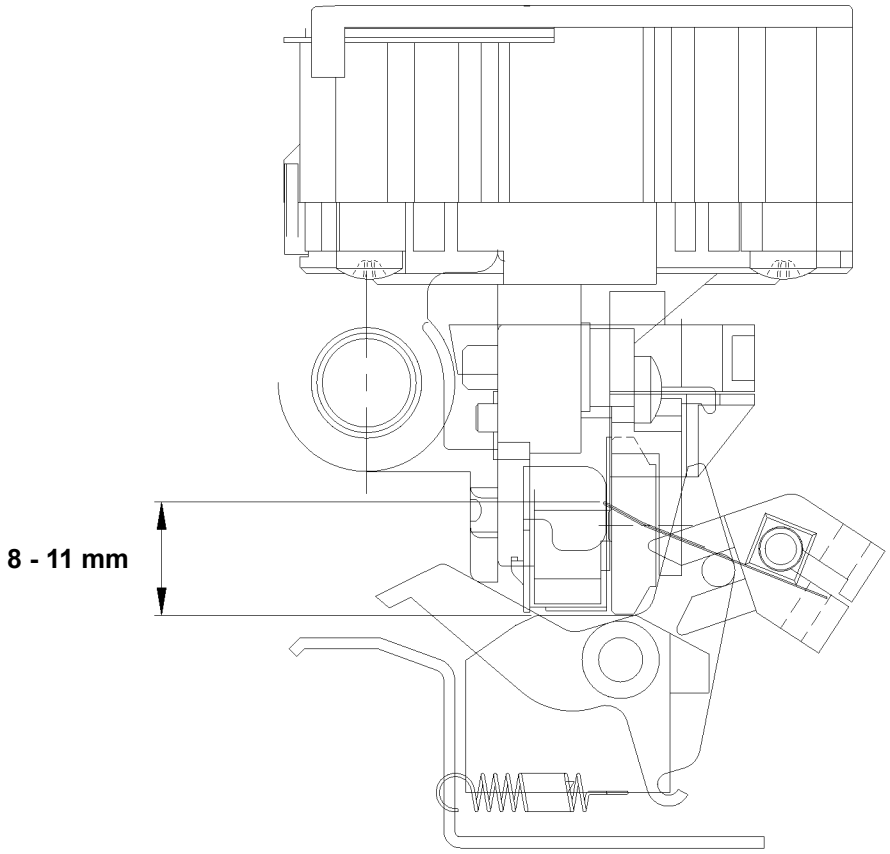


Figure 8-7

8.8 ADJUSTMENT OF ROLLER GEARS

MACHINE STATUS:
Upper part of the mechanism closed.

CONDITIONS TO BE CHECKED:
Maximum radial play between sprocket wheels (1) and (2) • 0.2 mm.

PROCEDURE:
Insert the specific tool code 2000500 between the hole of the gear (2) and the gear pin (1) and torque the two screws (3) to 6 $\pm$ 0.5 Kgcm. Check that the play required is guaranteed on complete rotation of the gears.

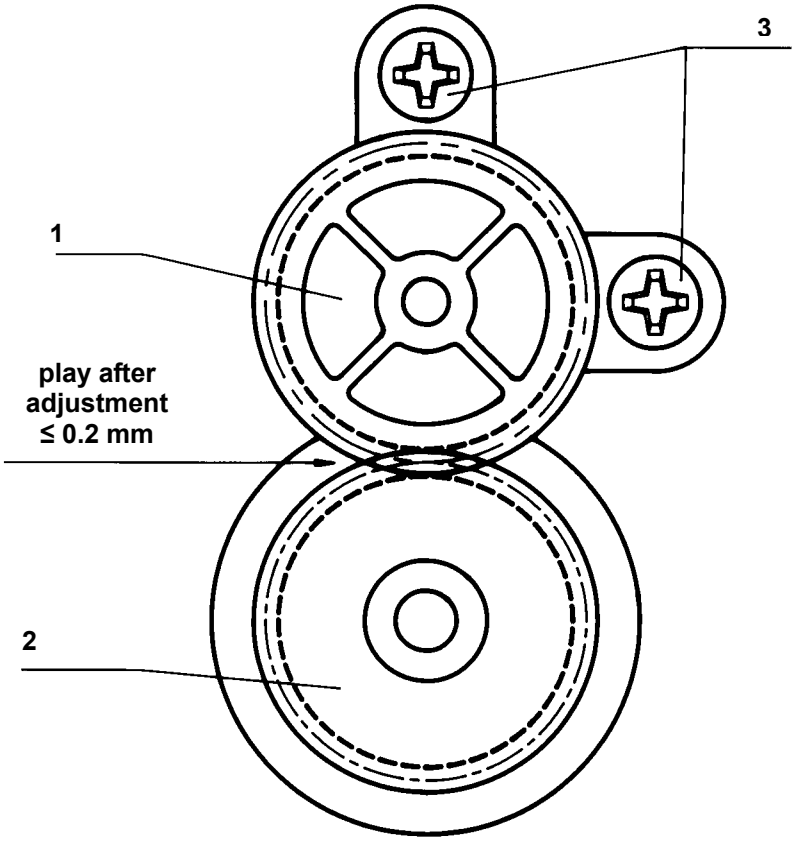


Figure 8-8

Note: Make this adjustment on both pairs of gears present on the machine.

8.9 ADJUSTMENT OF FRONT PRESSURE ROLLERS

MACHINE STATUS:

Services cam with minimum lift zone facing towards the feeler roller.

CONDITIONS TO BE CHECKED:

Check play between the pressure roller (7) and the services cam (6).

PROCEDURE:

Insert a 0.5-mm thick probe (1) between the pressure (7) and drive (8) rollers. Operating on the shaft (2), position the three levers (3) in contact with the springs. Insert the tool (4) on the central lever. The pressure roller bridge (5) must be free to move into position without interference when in contact with the minimum radius of the cam (6). Torque the screw of the pressure roller bridge to 20 Kgcm holding the roller in contact with the minimum radius of the cam.

Remove the probe and, without changing phasing, check for slight play between the roller and cam (without loading the springs). When the probe is inserted again, there must be no play.

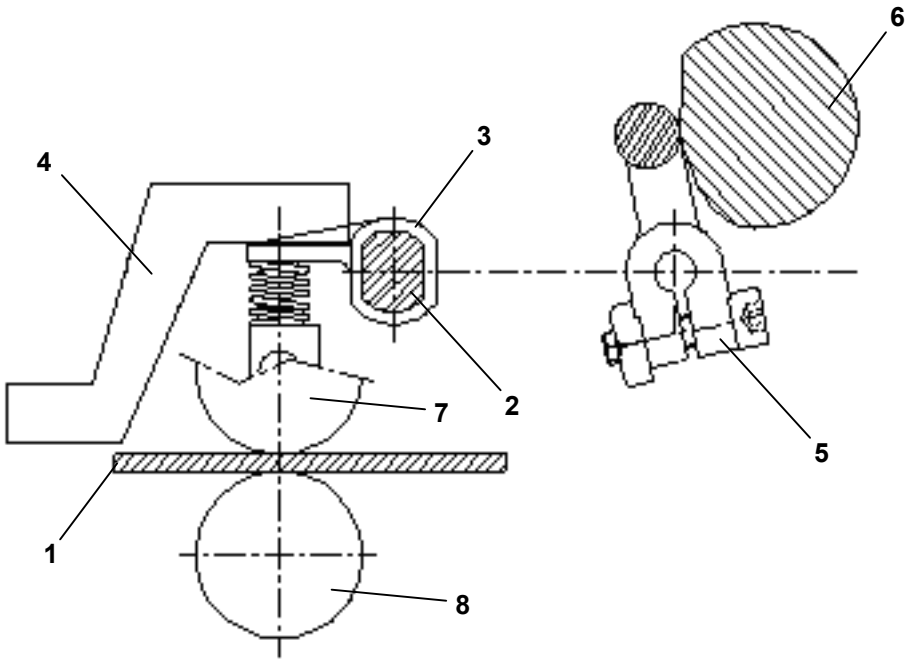


Figure 8-9

Note: The adjustment value may vary for certain non-standard products.

8.10 ADJUSTMENT OF BAND OPENING

MACHINE STATUS:

With part of the upper mechanism in the work position and the print carriage in contact with the left-hand side, orient and secure the lever (1) on the band shaft leaving a clearance of 1.5 mm between crank and rocker arm (in relation to the profile of the carriage).

With the upper part of the mechanism raised and lever (1) in contact with the control pin of the lifting lever (2).

CONDITIONS TO BE CHECKED:

A distance of between 5 and 8 mm between the edge of the band (3) and the center of the print bar.

PROCEDURE:

Operate on the lock-screw (4) of the lever (1) on the band shaft.

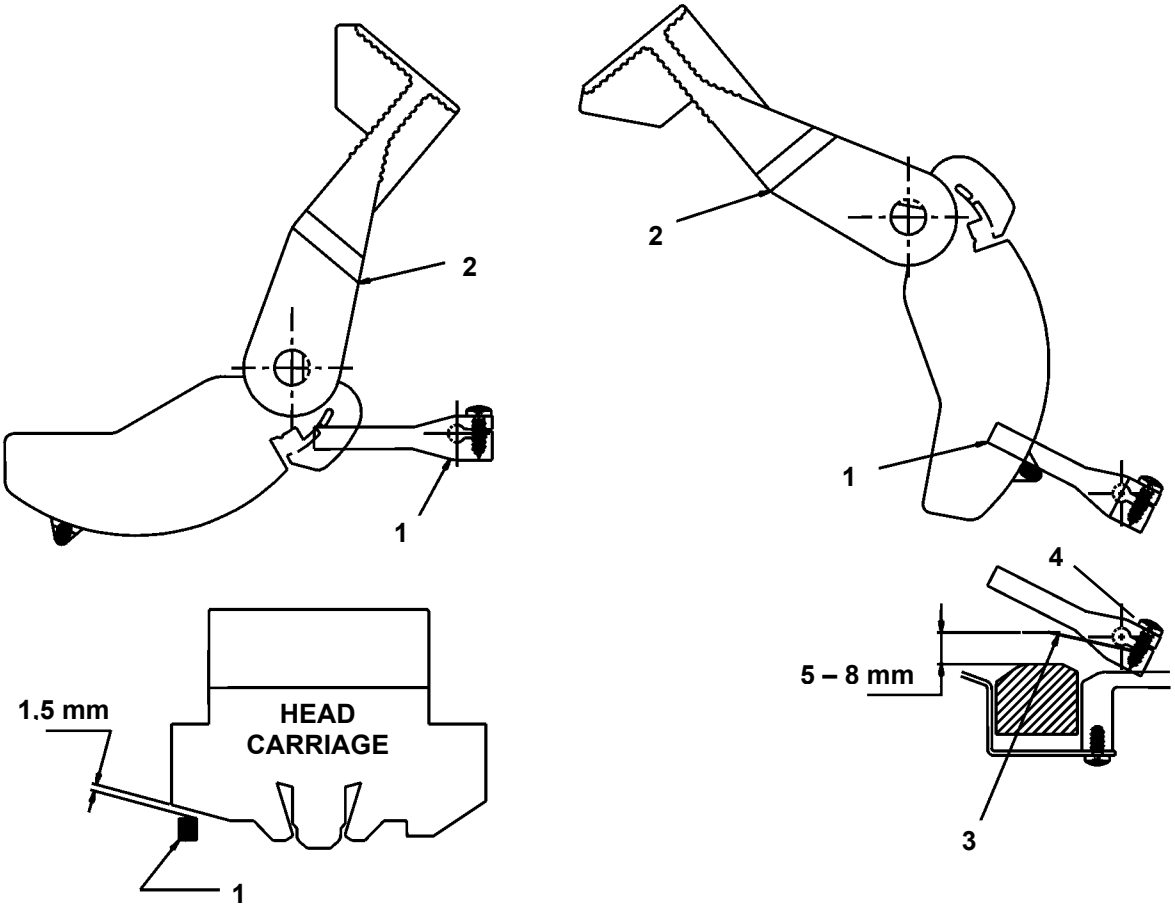


Figure 8-10

Note: This adjustment must be carried out after adjusting the print bar and band.

8.11 ADJUSTMENT OF HORIZONTAL MAGNETIC/MICR DRIVE BELT TENSION

MACHINE STATUS:

Read/write carriage in reset position (end of stroke motor side).

CONDITIONS TO BE CHECKED:

Cogged belt (1) tensioned so as to obtain a deflection of 5 mm with a load of 60 g applied at the center of the stroke of the carriage. Make the recording with the carriage in the reset position (left-hand end of stroke – motor side).

PROCEDURE:

Loosening the lock-screws, move the motor (2) until the conditions required are obtained and then tighten the screws.

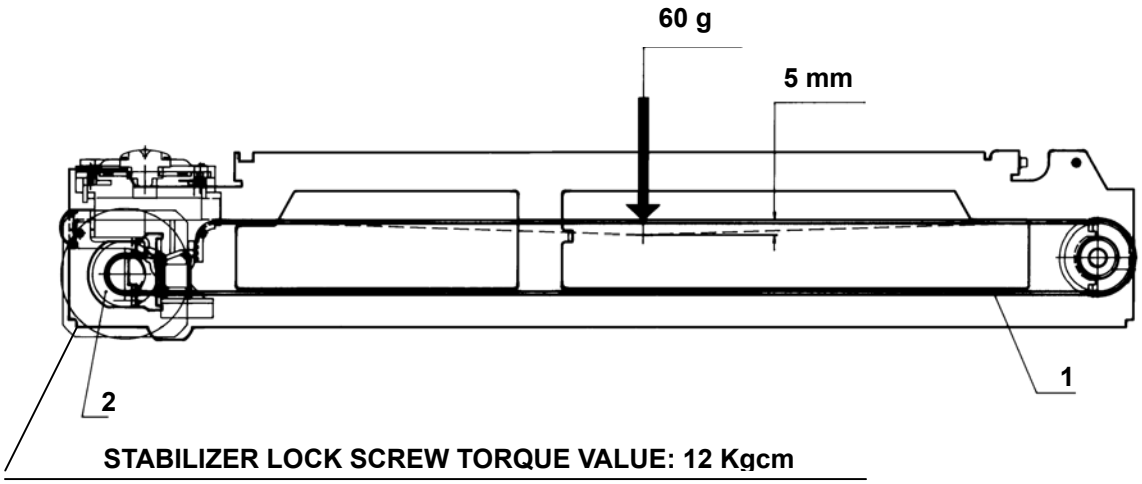


Figure 8-11

8.12 ADJUSTMENT OF HORIZONTAL MAGNETIC/MICR CLOSING FLAP

MACHINE STATUS:

Read/write carriage in reset position (end of stroke motor side) and screw (1) which joins the semi tie-rods loosened.

CONDITIONS TO BE CHECKED:

Co-planarity between the closing flap and the front surface of the structure.

PROCEDURE:

Position the flap (2) in contact with the slot (3) operating in the compartment between the fork and toothing of the semi tie-rods (4); then, tighten the screw (1).

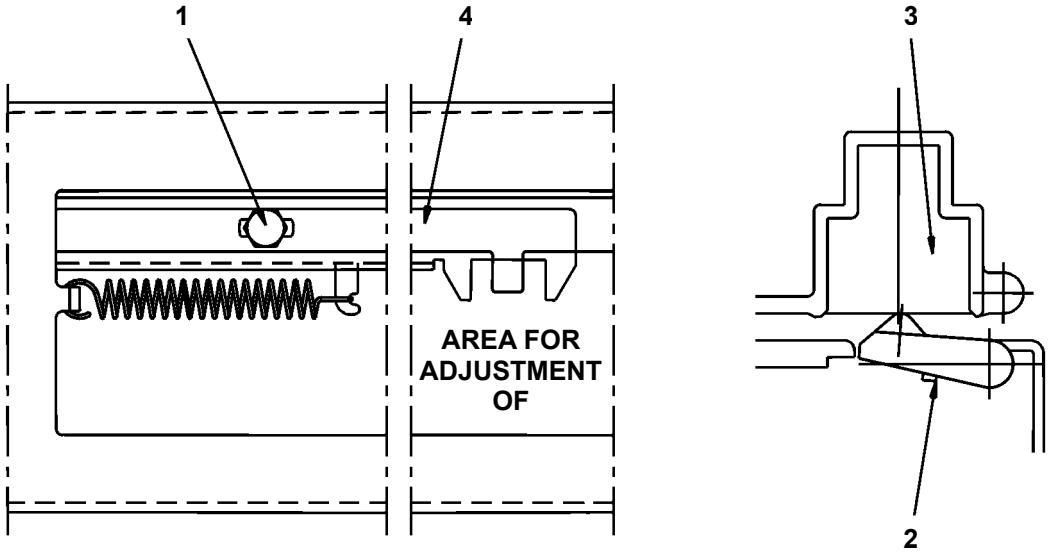


Figure 8-12

8.13 POSITIONING OF HORIZONTAL MAGNETIC/MICR PRESSURE ROLLER

MACHINE STATUS:

Pin of the bridge (4) on its minimum radius.

With regard to the above, position the pressure roller (1) inside the conveyor (2) with a recess of 0.5-1 mm and, then phase the cam (3) so as to bring the pin of the bridge (4) on its minimum radius. With its screw (5) fasten the bridge on the shaft (check that the recess of the pressure roller is across the entire paper path).

CONDITIONS TO BE CHECKED:

Pressure roller in work position.

PROCEDURE:

Rotate the cam so as to bring the pin of the bridge (4) on its maximum radius; then check that with the pressure roller resting on the paper sliding surface, there is play in the coupling of point "A".

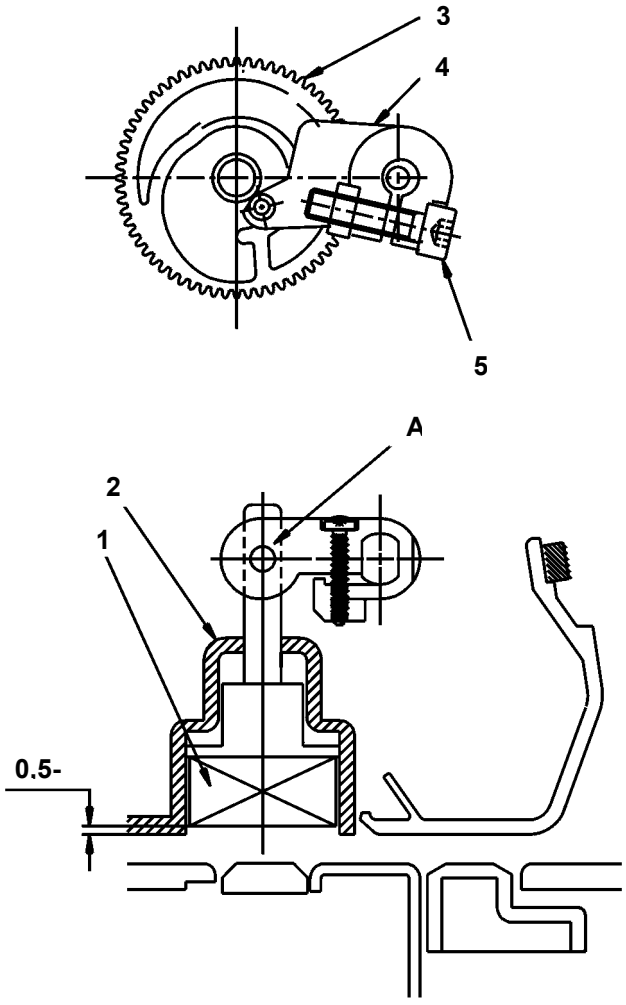


Figure 8-13

8.14 POSITIONING OF GROUP ON THE HORIZONTAL MAGNETIC/MICR STRUCTURE

MACHINE STATUS:
Insignificant.

CONDITIONS TO BE CHECKED:
Co-planarity between the closing flap of the magnetic unit and the paper conveyor of the slot.

PROCEDURE:
Position the slots (1) in the half cut-outs (2) present on the sides of the machine.
Draw up the lock-screws slightly (3).
Push up the structure of the magnetic unit until it is in contact both to the right and left (against the paper conveyor).
Torque the lock-screws to 8 Kgcm.

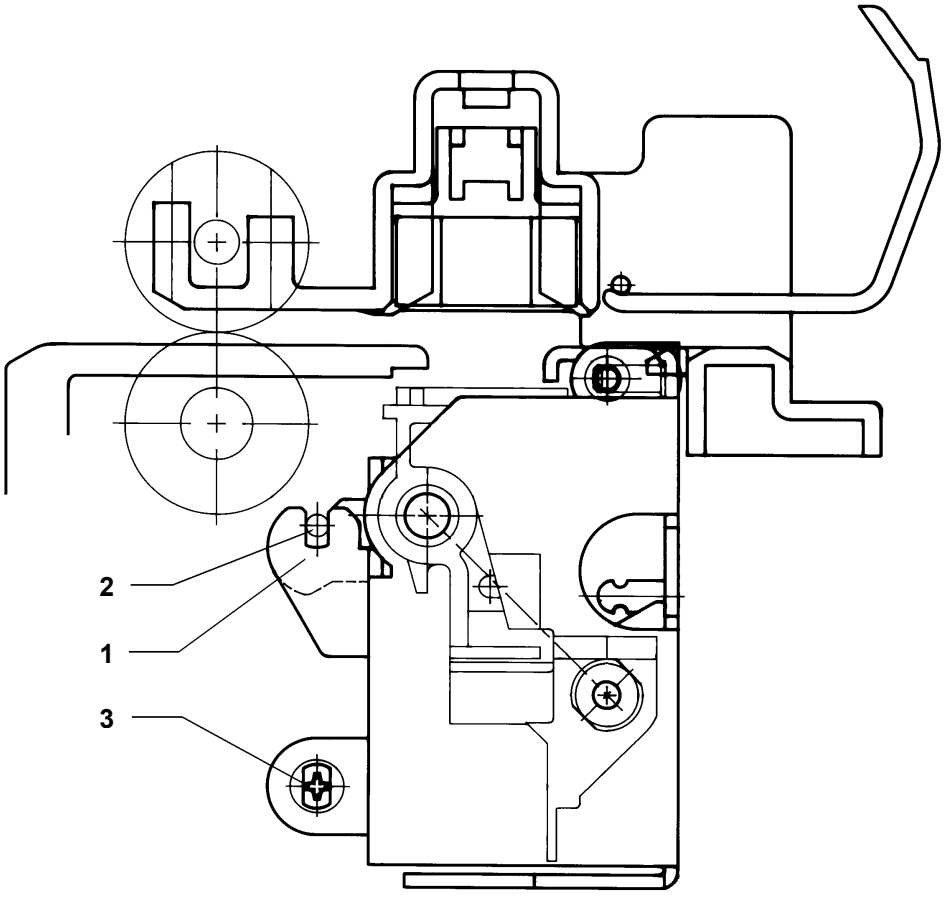


Figure 8-14

9. REMOVAL/REASSEMBLY OF PARTS

Each removal operation is described as follows:

Reference to any previous removal operations so as to reverse the disassembly procedure.
Phases of the operation described in sequence.

Notes: Indicate any references to adjustments to be made after reassembly, warnings or prescriptions to be complied with

9.1 PRIOR WARNINGS

- For maximum safety, before carrying out any part disassembly operation, switch off the printer and disconnect it from the mains.
- Perform all the operations in a clean, free area.
- Follow the procedure carefully; do not remove parts that must not be disassembled..
- Place the parts removed in a clean place where they cannot be mislaid.
- After replacing parts, check that these have not become misshapen during assembly; if necessary, restore initial conditions.
- Part reassembly operations must be carried out reversing the disassembly procedure.
- Make sure that all the connectors are correctly inserted.
- After the operation, relubricate where indicated
- If the motherboard is replaced, update the firmware to the latest release (par. 4.5), carry out the installation set-up (chapter 4) and calibrate electro-mechanical parts from the console (chapter 4).
- If the power supply unit is replaced, check that the mains voltage of the spare part matches the value indicated on the electrical dataplate of the printer.
- On completion of the operation, carry out a test to check the printer for any malfunctions.

9.2 DISASSEMBLY/REASSEMBLY OPERATIONS OF THE BASIC MACHINE

9.2.1 DISASSEMBLY/REASSEMBLY OF THE CONSOLE

- Open the top cover of the machine.
- Back off the two lock-screws (1) and remove the cover of the flat cable.
- Disconnect the flat cable (2) from the console.
- Back off the four lock-screws (3) and remove the console from the cover.
- Back off the four lock-screws (4) to separate the console (5) from the support.

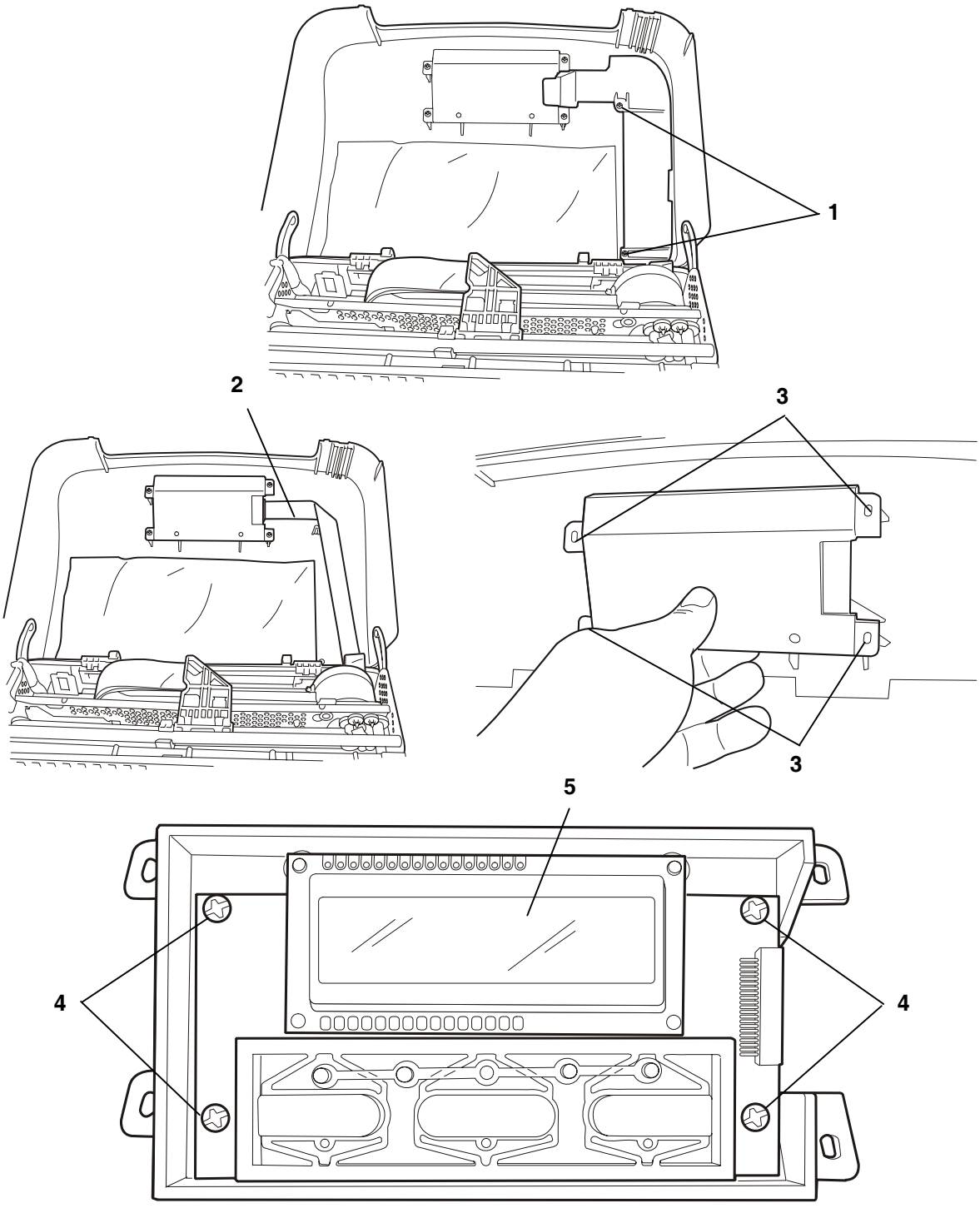


Figure 9-1

9.2.2 DISASSEMBLY/REASSEMBLY OF THE COVER

- Open the top cover of the machine.
- Disconnect the flat cable of the console, as explained in the previous paragraph.
- Release the pins of the cover (1) from the guides.
- Using a tool (for example, a screwdriver) exert pressure on the hinges (2) and extract the cover.

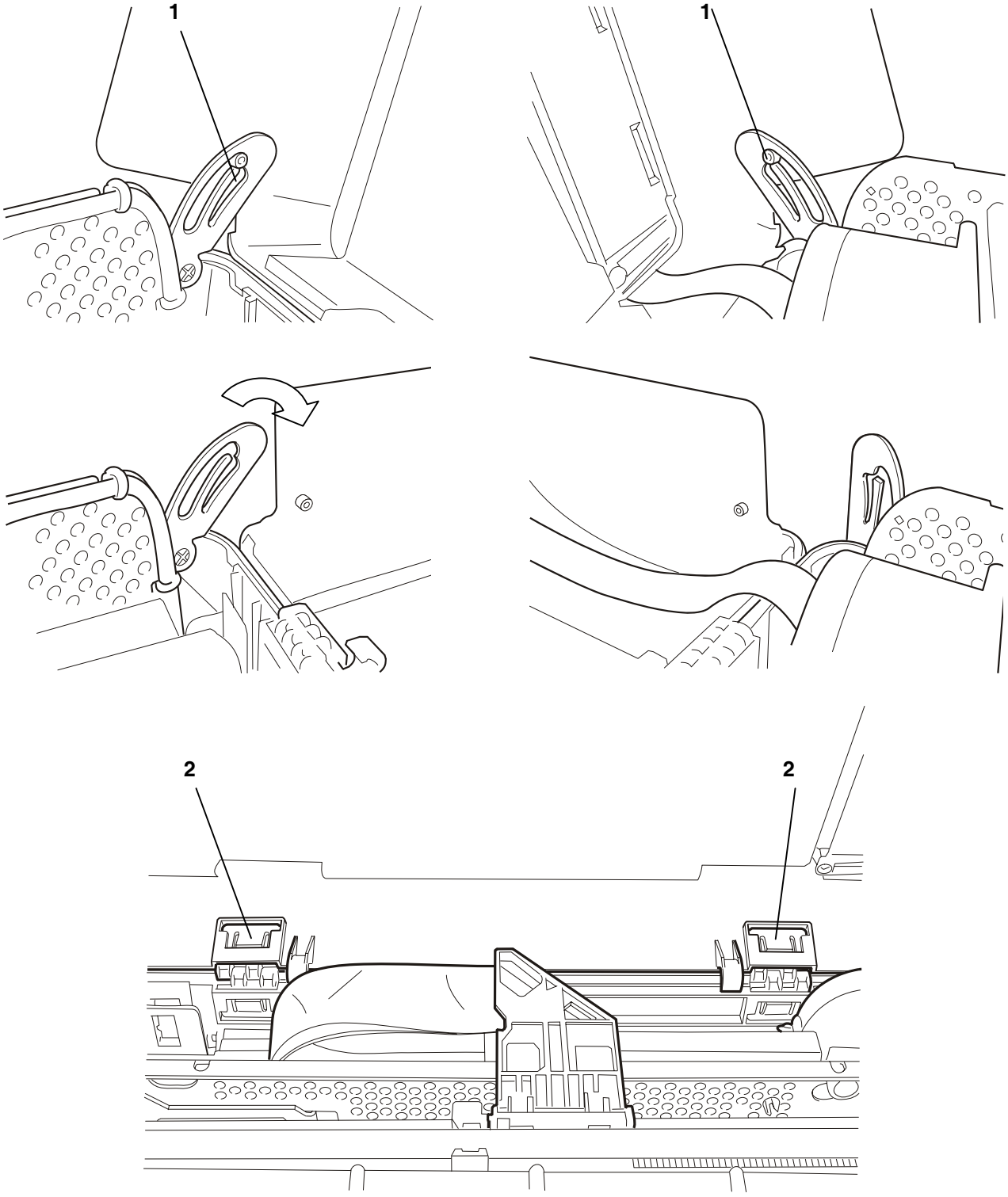


Figure 9-2

9.2.3 DISASSEMBLY/REASSEMBLY OF THE CASING

- Open the top cover of the machine (or, if necessary, remove it completely as explained above).
- Release the pins (1) of the sound-absorbing material (2) and remove it.
- Extract the front slot (3).
- Using a pointed tool, exert pressure on the four points (4) of the casing as shown in the figure.

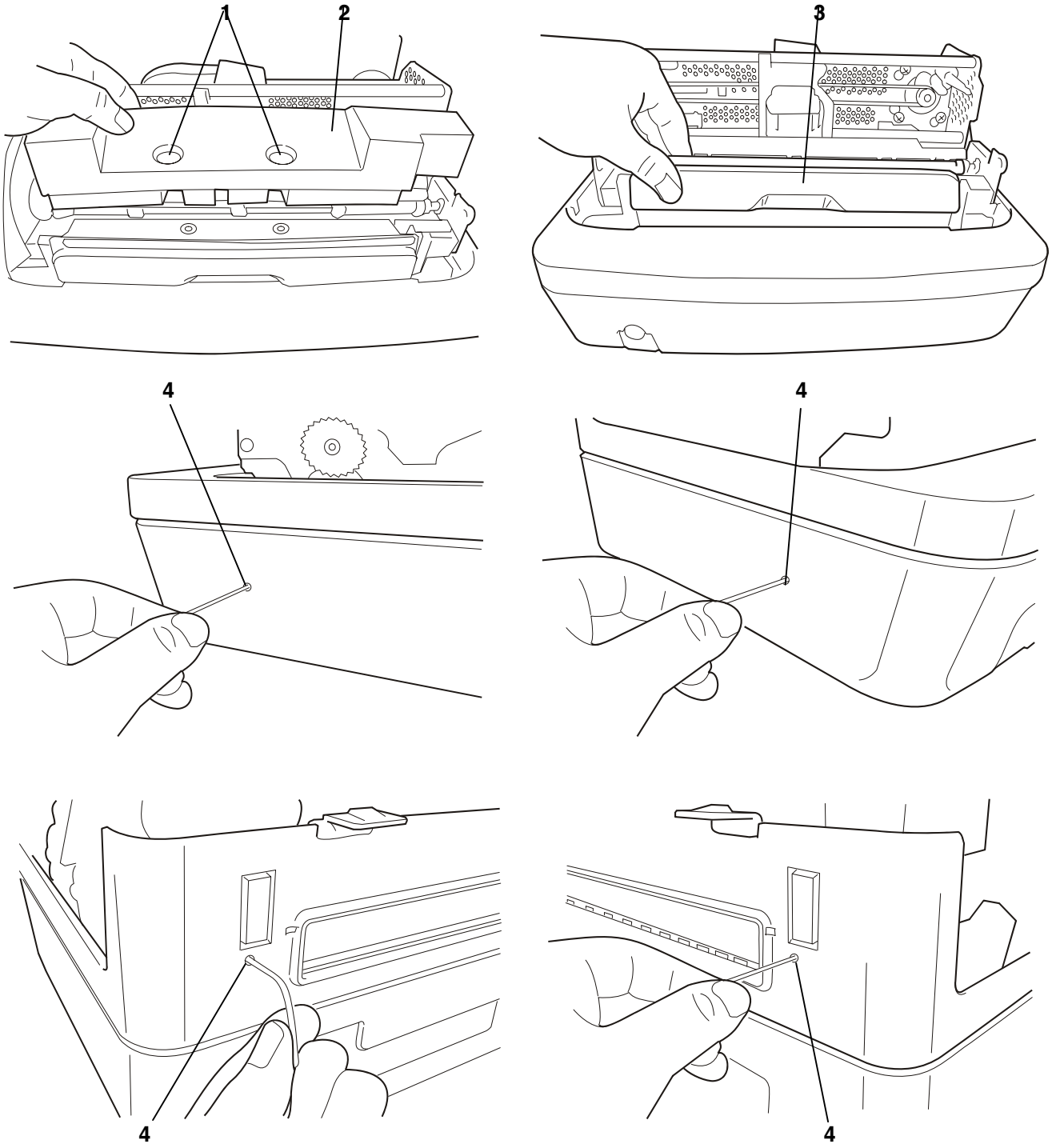


Figure 9-3

- Lift the casing and place it to the side of the machine, as shown in the figure.
- Back off the two screws (5) of the cover open switch and remove it.

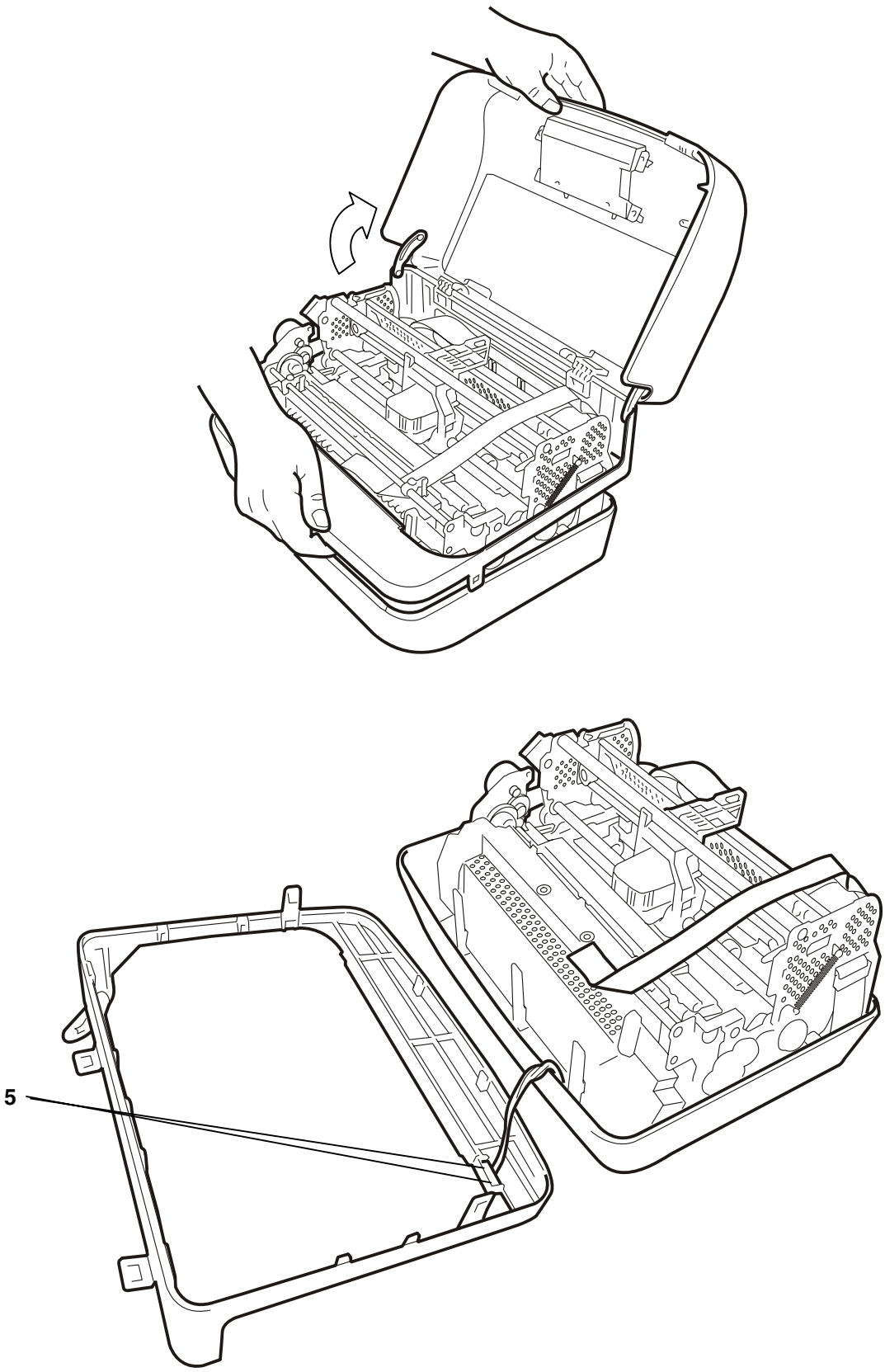


Figure 9-4

- Working from the lower side of the machine, back off the five lock-screws (6) of the baseplate.
- Move the power supply switch (7) to the ON position.
- Remove the baseplate as shown in the figure.

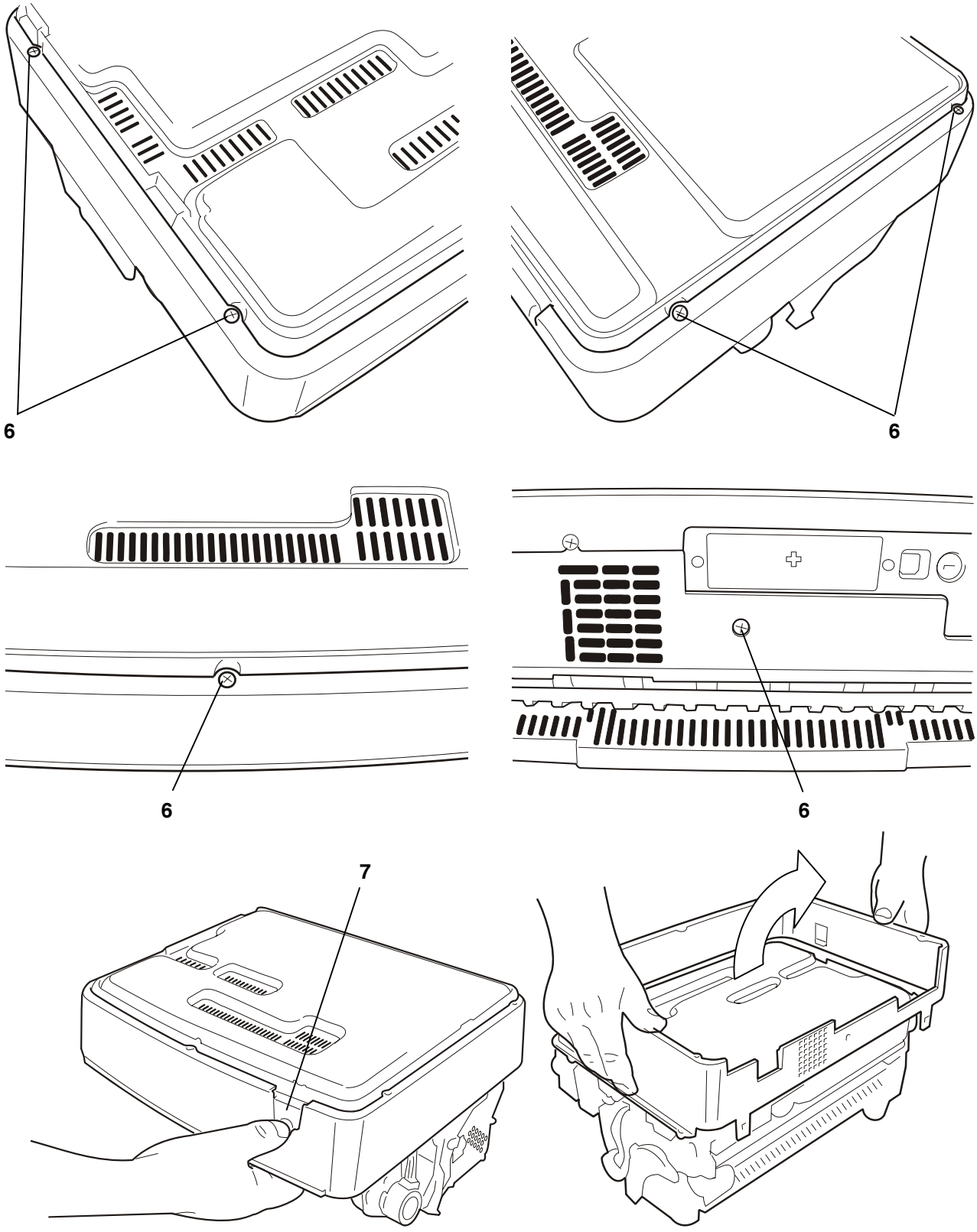


Figure 9-5

9.2.4 DISASSEMBLY/REASSEMBLY OF THE MECHANISM

- Disconnect the console and remove the casing as described above.
- On both sides, back off the lock-screws (1) of the tabs that fasten the front rubber pads so that these can be removed from their housing.
- From the front, lift the entire mechanism from the baseplate and rotate it partially so as to access the connectors of the motherboard
- Disconnect all the connection cables of the mechanism to the motherboard, except for the motherboard - power supply unit connection cable.

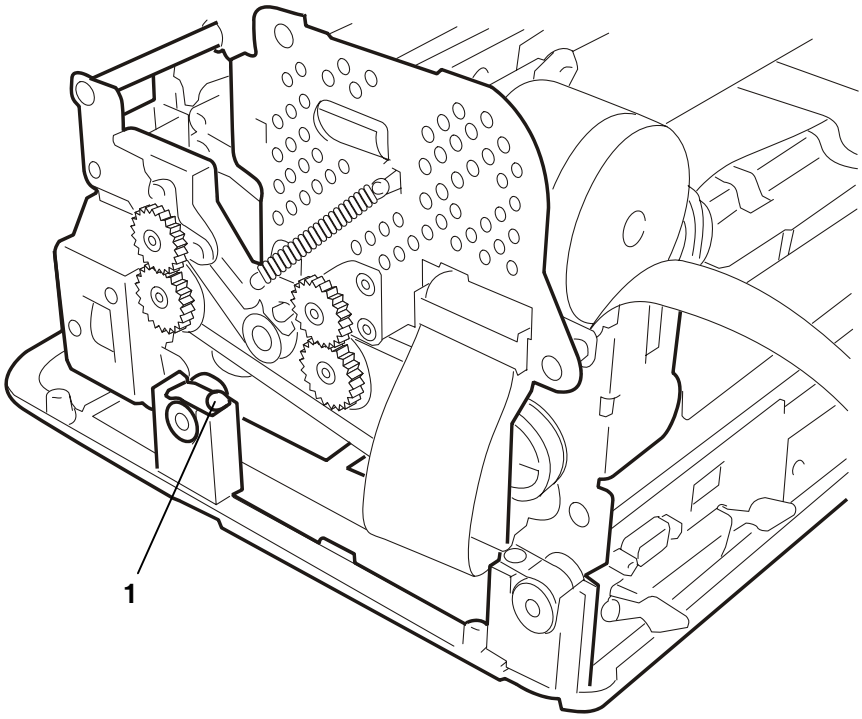


Figure 9-6

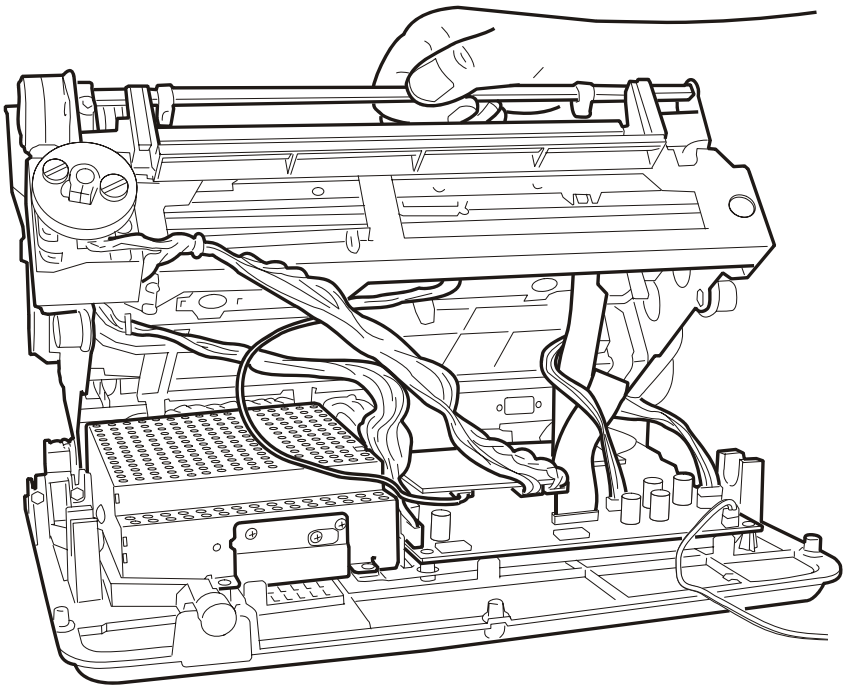


Figure 9-7 Machines with serial number 8.xxx.xxx

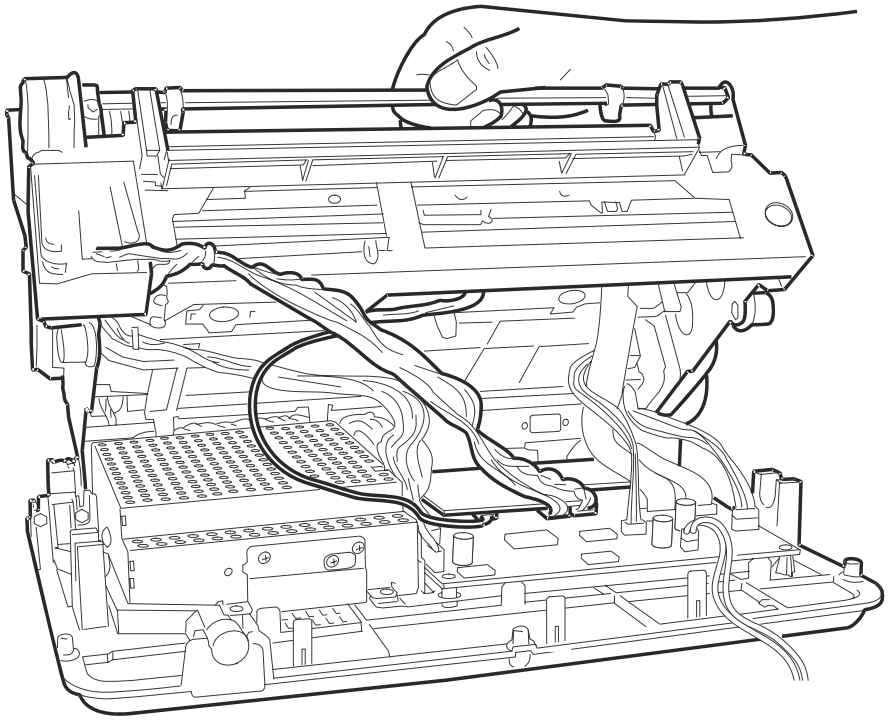


Figure 9-8 Machines with serial number 1.XXX.XXX

- Loosen the lock-screws (2) of the tabs that fasten the rear rubber pads so that these can be removed from their housing.
- Back off the screw (3) that fastens the ground cables.
- Lift the mechanism and separate it from the baseplate.

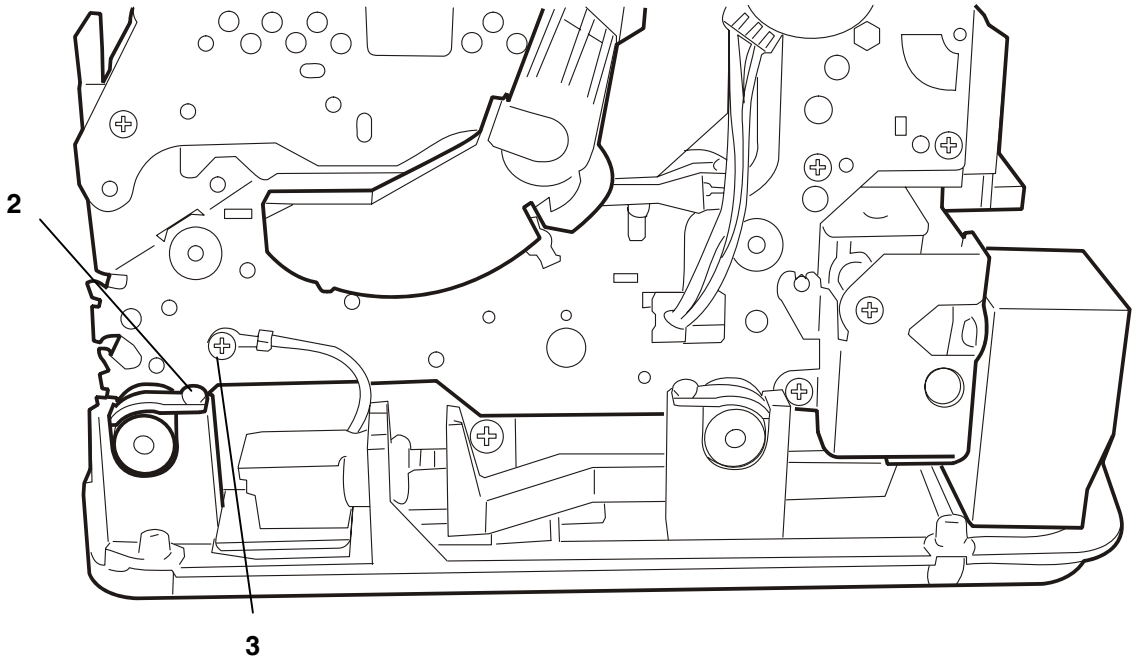


Figure 9-9

9.2.5 DISASSEMBLY/REASSEMBLY OF THE FLAT CABLES OF THE PRINTHEAD

- Remove the casing as explained above.
- Free the cable clip (1) on the right-hand side of the structure, unclipping it from the inside (2) of the structure.
- Remove the sound-proofing material (3).
- Loosen the lock-screw (4) of the rear cable clip, rotate the cable clip and free the flat cable.
- Rotate the flat cable support connected to the printhead (5) upwards to its stopping point.
- Slide out the mylar (6) from the lower part of the flat cable support, then free the flat cable from the clips of the support.

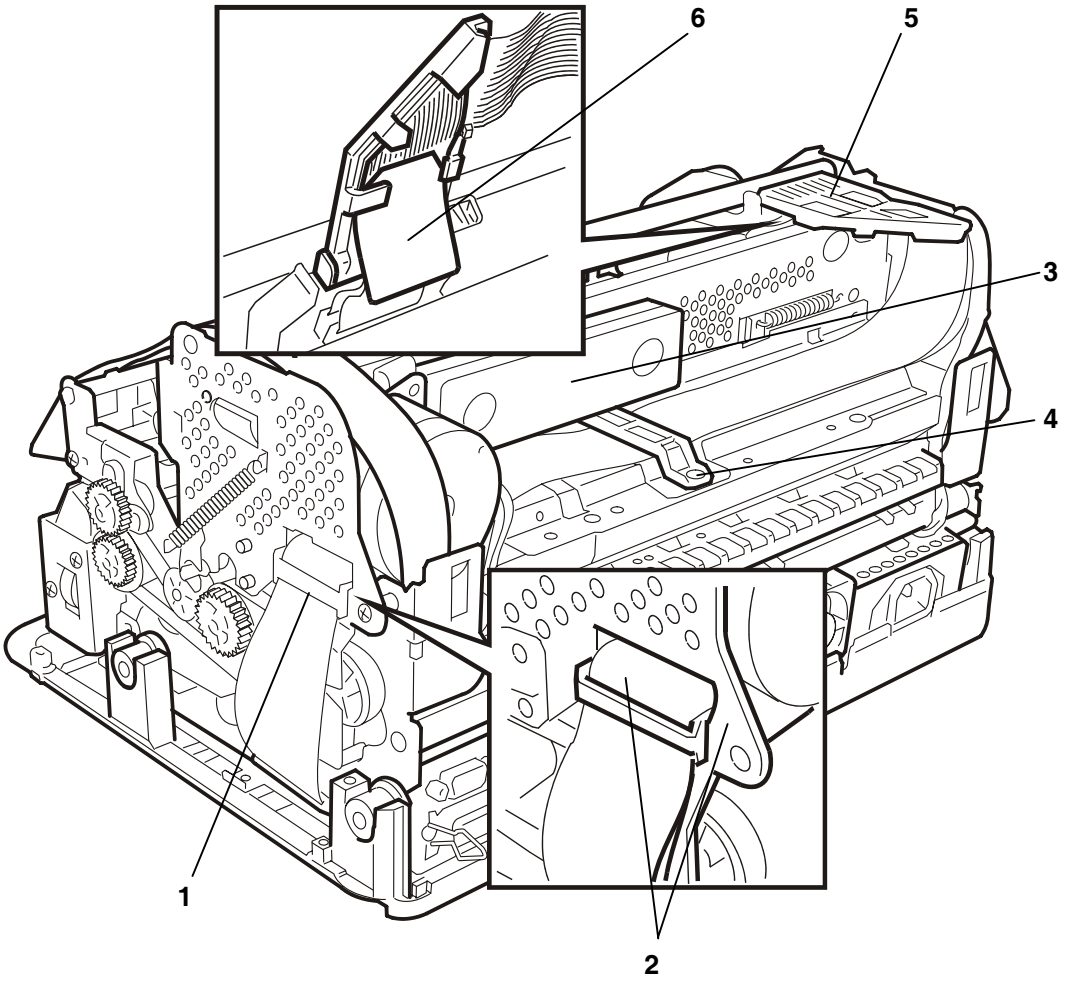


Figure 9-10

- Remove the printhead, unscrewing the two screws (7).
- Slide out the two flat cables from the respective connectors (8) on the printhead.

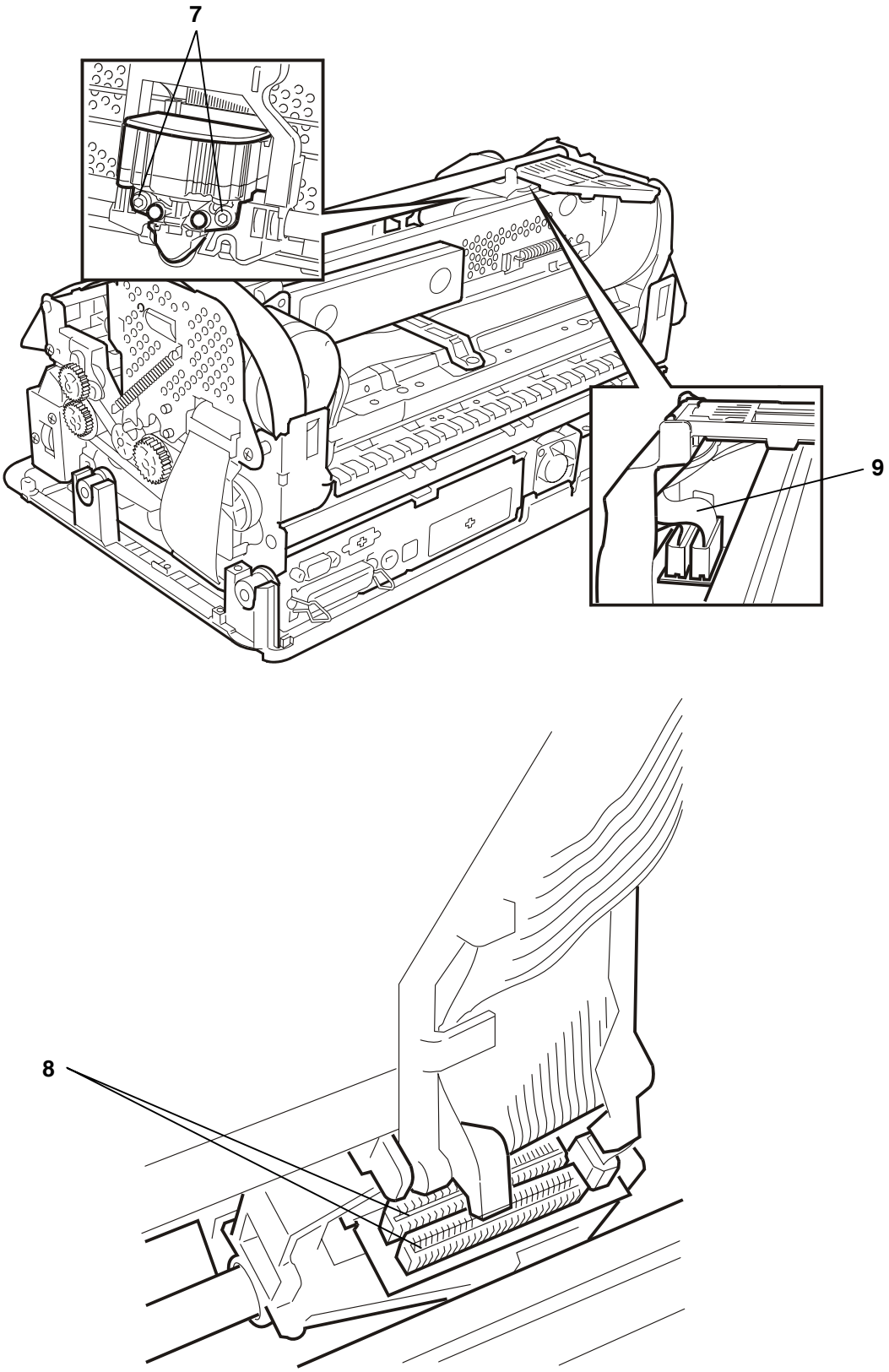


Figure 9-11

Warning: When reassembling the flat cable on the printhead, check that the path (9) indicated in the figure has been restored and that it does not interfere with the ribbon rewind gears which could cause irreparable damage to this during functioning of the machine.

9.2.6 DISASSEMBLY/REASSEMBLY OF THE PRINTHEAD

- Open the top cover and lift the upper part of the mechanism.
- Remove the print cartridge.
- Back off the two lock-screws (1) of the printhead.
- Partially slide out the printhead from the carriage and disconnect the two flat cables (2) from the connectors on the printhead.

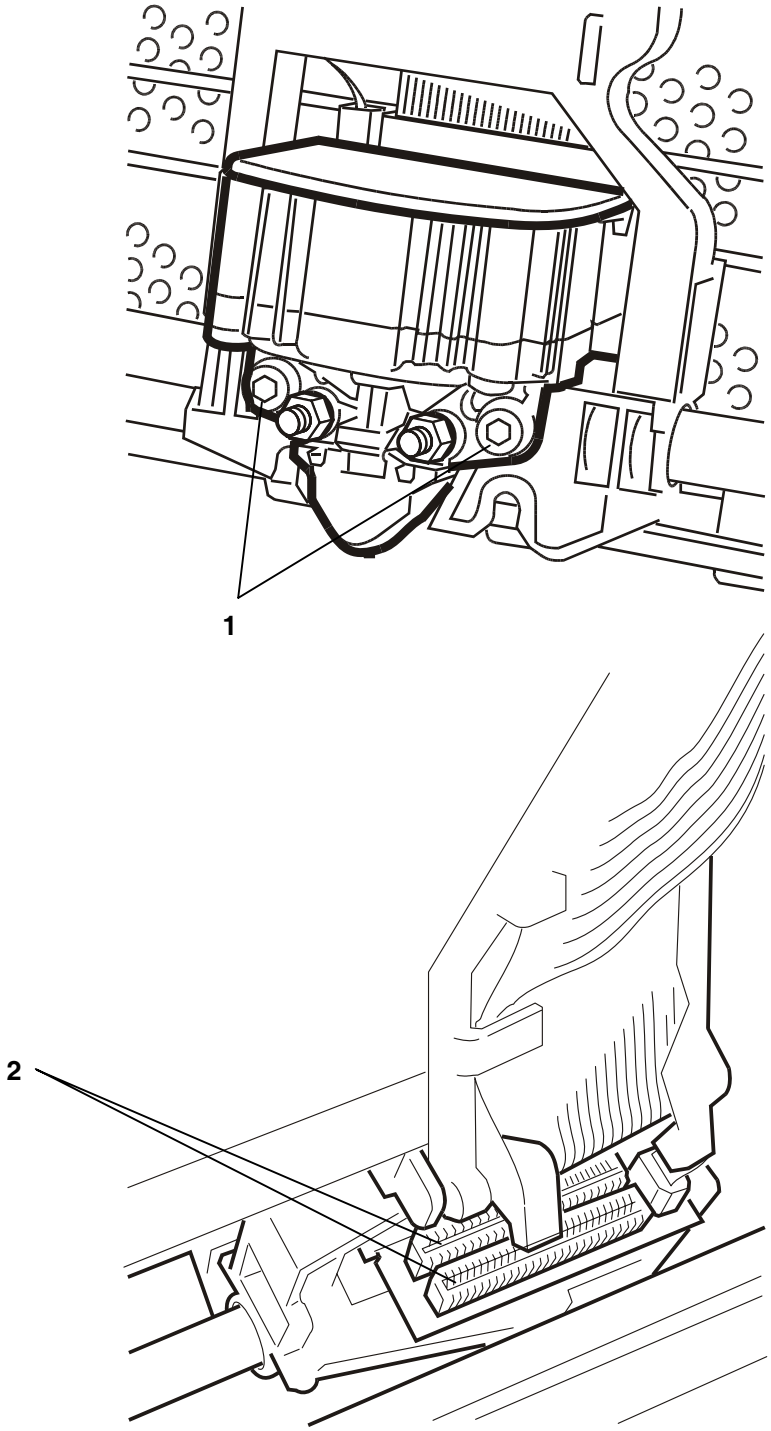


Figure 9-12

Note: Following reassembly of the printhead, calibrate the printhead photosensor.

9.2.7 DISASSEMBLY/REASSEMBLY OF THE PRINTHEAD PHOTOSENSOR

- Remove the printhead as explained above.
- Back off the lock-screw (1) of the printhead photosensor then extract the photosensor from its housing.
- Disconnect the flat cable of the photosensor from the connector (2) on the printhead.
- Replace the old photosensor with the new one, taking care to position it against the support plate (3), then tighten the screw.

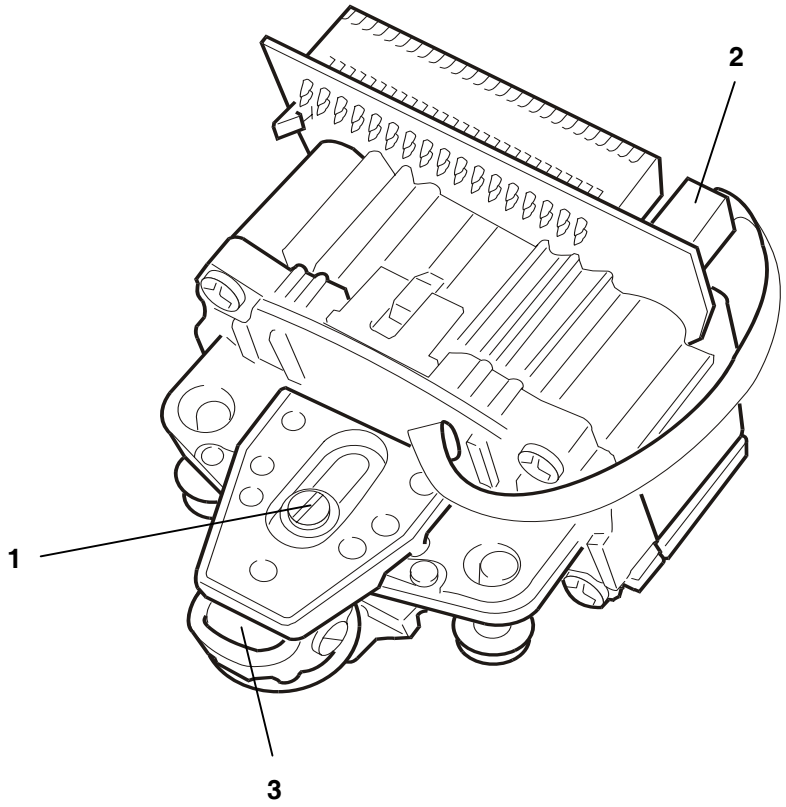


Figure 9-13

Note: Following reassembly of the printhead, calibrate the printhead photosensor.

9.2.8 DISASSEMBLY/REASSEMBLY OF THE UPPER PART OF THE MECHANISM

- Remove the casing as explained above
- From the front, lift the entire mechanism from the baseplate and rotate it partially so as to access the connectors of the motherboard.
- Disconnect the connection cables of the printhead and of the carriage reset photosensor from the motherboard. Free the wire of the carriage reset photosensor from the plastic clips.
- Disconnect the connector (1) from the carriage transport motor.
- Lift the upper part of the mechanism using the specific levers.
- Back off the two rear side hinge pins (2) to disconnect the upper part of the mechanism.

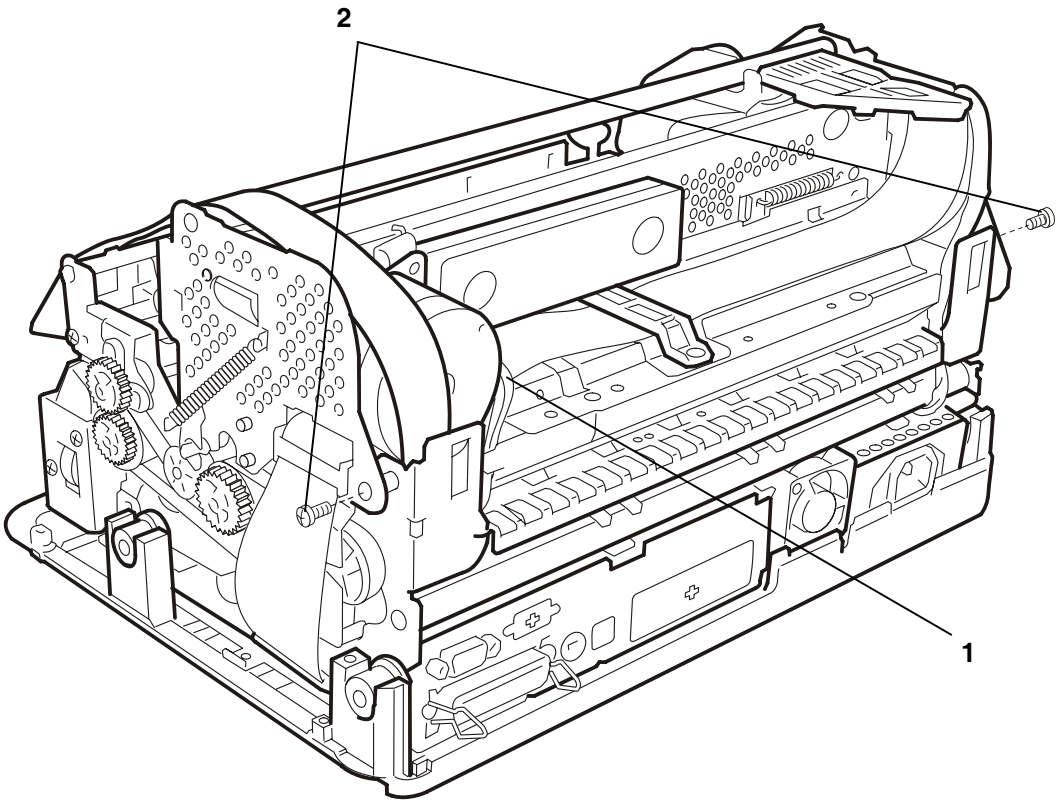


Figure 9-14

Note: During reassembly, make sure that the cables are passed through the related compartments and check adjustment of the roller gear (par. 8.8).

9.2.9 DISASSEMBLY/REASSEMBLY OF THE PAPER FEED MOTOR

- Remove the mechanism as explained above.
- Loosen the two lock nuts (1) of the motor and remove the document drive belt from the pulleys.
- Loosen the nuts and extract the motor.

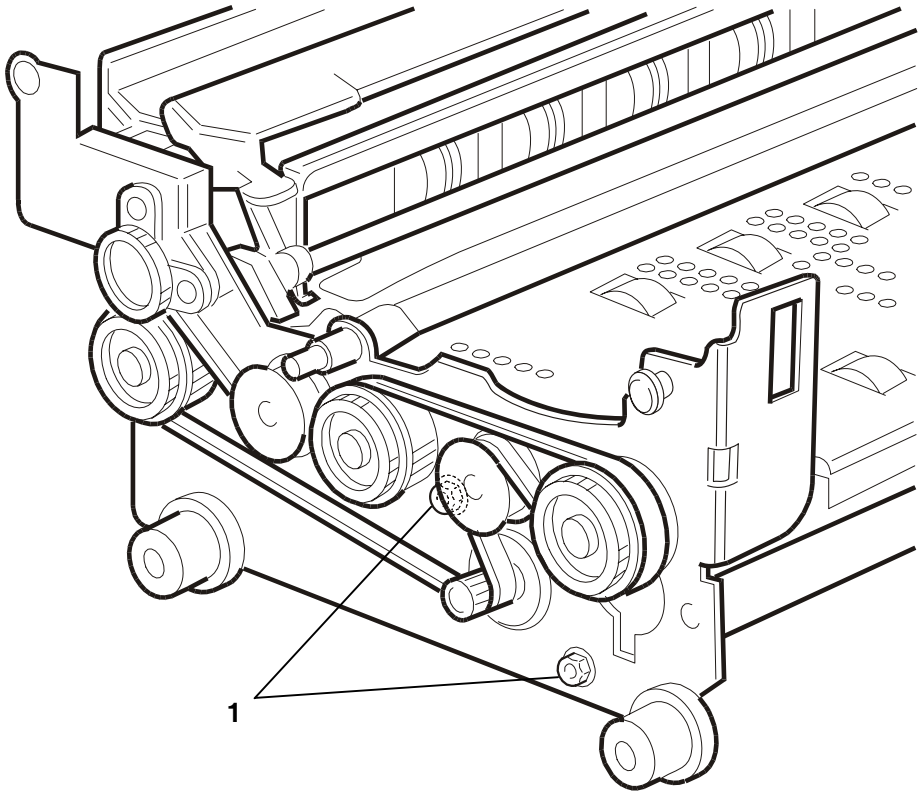


Figure 9-15

Note: During reassembly, adjust the document drive belt (par. 8.1).

9.2.10 DISASSEMBLY/REASSEMBLY OF THE PRINTHEAD MOVEMENT MOTOR

- Remove the upper part of the mechanism as explained above.
- Loosen the lock-screw (1) of the idler pulley support slide and release the carriage movement belt from the motor pinion.
- Unhook the flat cable of the printhead loosening the screw (2), then back off the three special lock-screws (3) and extract the printhead movement motor from its housing, taking care not to damage the ribbon feed gears.

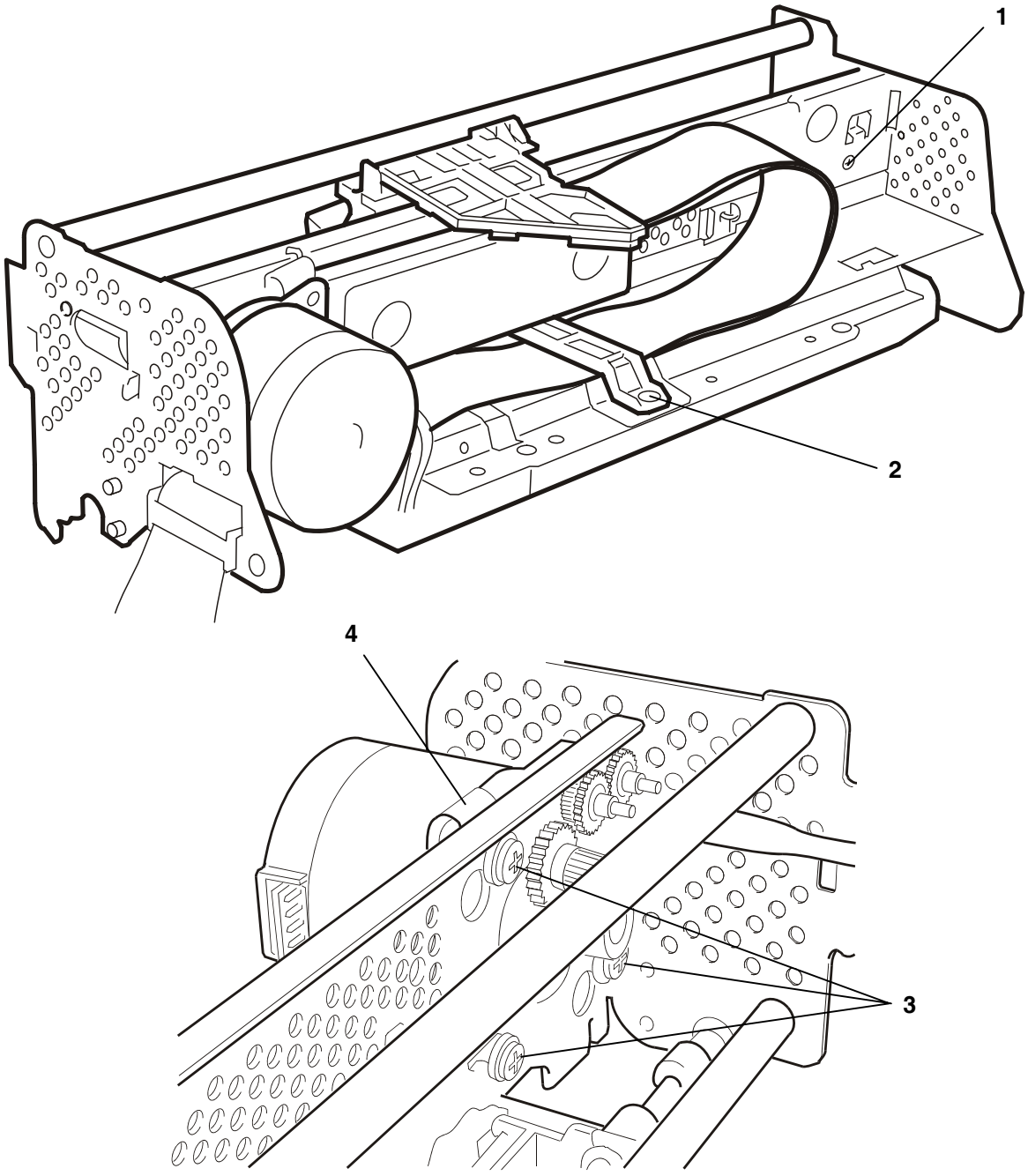


Figure 9-16

Note: During reassembly, correctly reposition the ground clip (4) and adjust the carriage drive belt (par. 8.11).

9.2.11 DISASSEMBLY/REASSEMBLY OF THE CARRIAGE RESET PHOTOSENSOR

- Remove the casing as explained above.
- From the front, lift the entire mechanism from the baseplate and rotate it partially so as to access the connectors on the motherboard.
- Disconnect the cable of the carriage reset photosensor from the motherboard, releasing it from the related plastic clips.
- Cut the cable clips (1) and, backing off the screw (2), disassemble the photosensor.

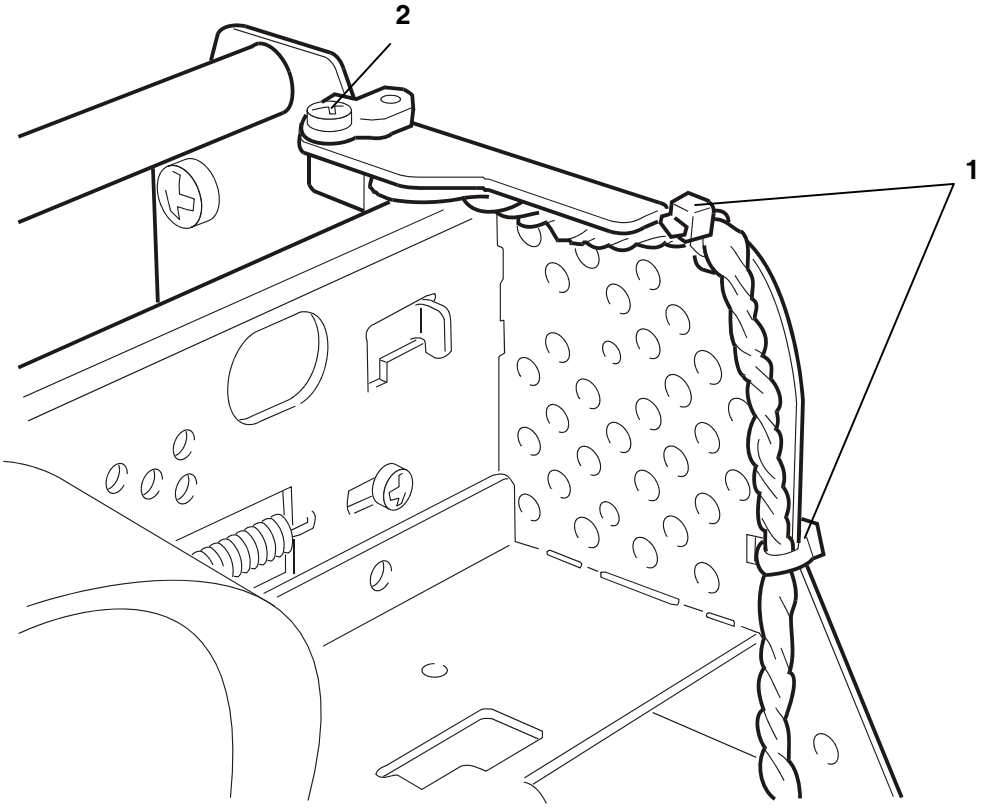


Figure 9-17

Note: During reassembly, restore the cable clips.

9.2.12 DISASSEMBLY/REASSEMBLY ROLLER SUPPORT TRAY

- Remove the casing as explained above.
- Remove the mechanism, separating it from the baseplate as explained above.
- Free the wire of the carriage reset photosensor from the plastic clips (1).

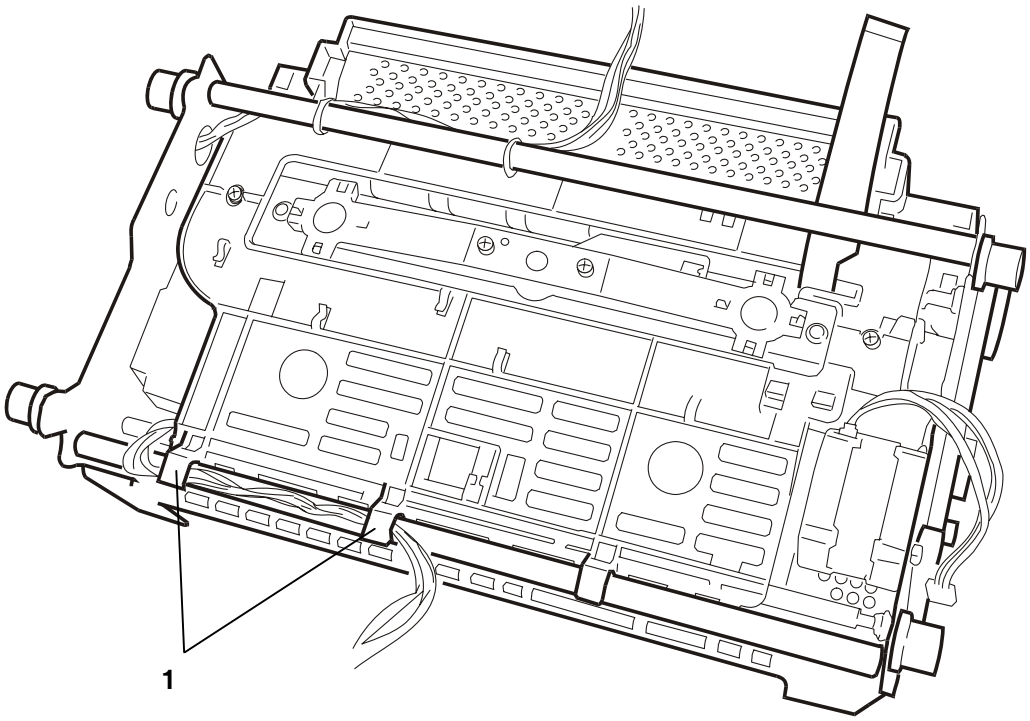


Figure 9-18 Machines with serial number 8.xxx.xxx

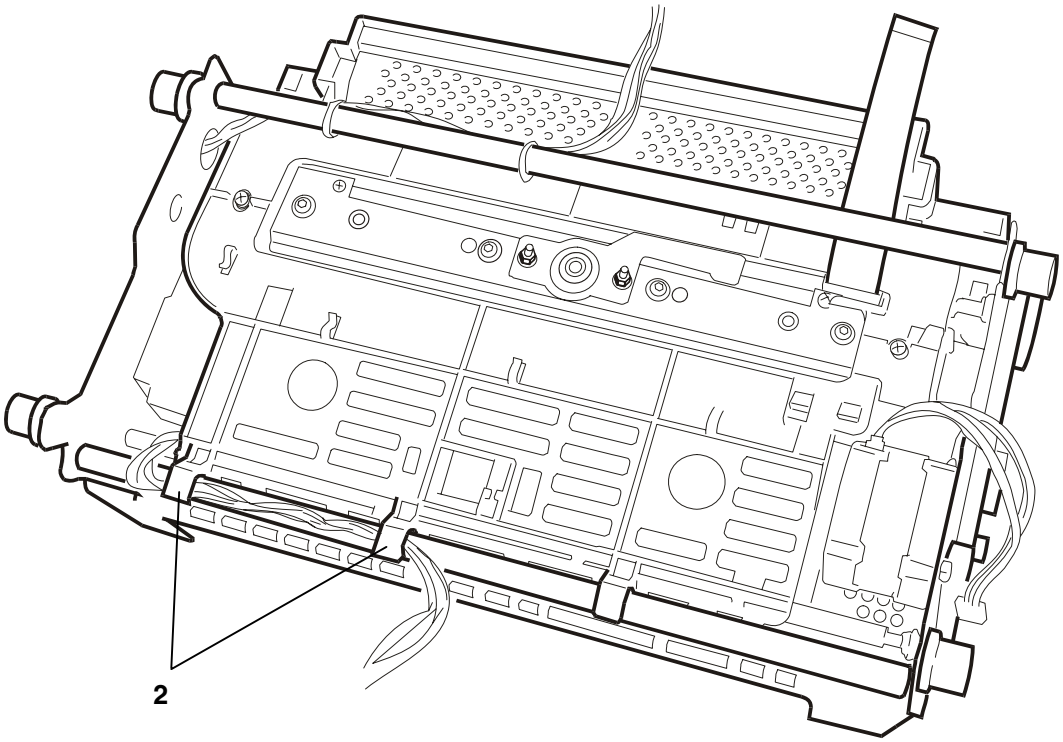


Figure 9-19 Machines with serial number 1.XXX.XXX

- Remove the upper part of the mechanism as explained above.
- Back off the 4 screws (2) and remove the tray, taking care not to lose the transmission coupling (3) and the sound-proofing of the tray.

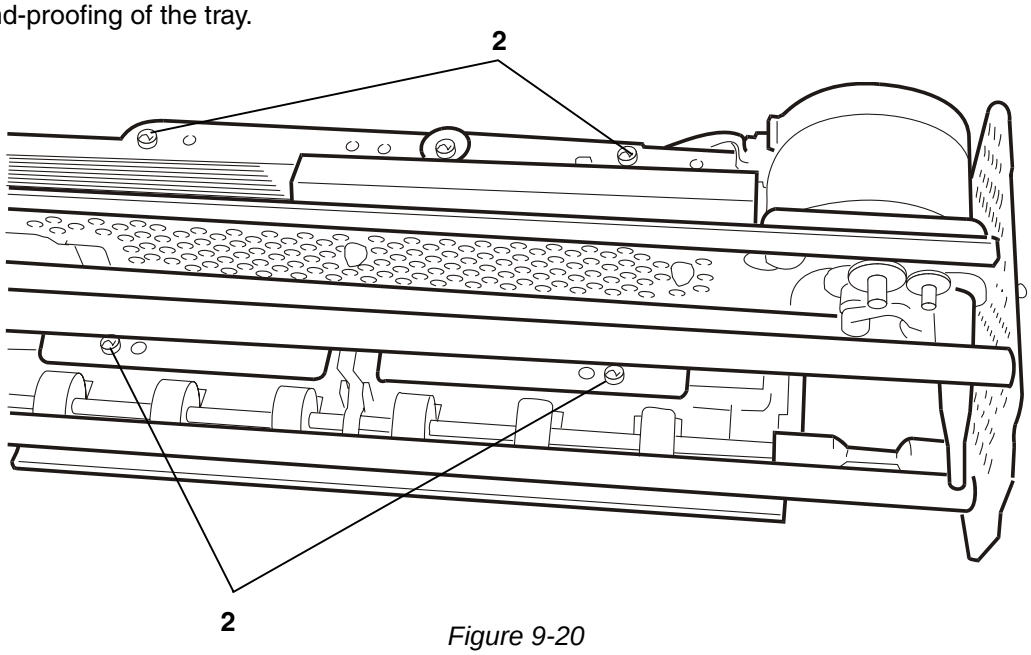


Figure 9-20

Note: During reassembly, check correct positioning of the transmission coupling and of the sound-proofing before tightening the screws.

9.2.13 DISASSEMBLY/REASSEMBLY OF THE SERVICES MOTOR

- Remove the casing as explained above.
- From the front, lift the entire mechanism from the baseplate and rotate it partially so as to access the connectors of the motherboard.
- Disconnect the cable that connects the services motor to the motherboard.
- Back off the two screws (1) that fasten of the motor to the left-hand side structure and remove it from the machine.

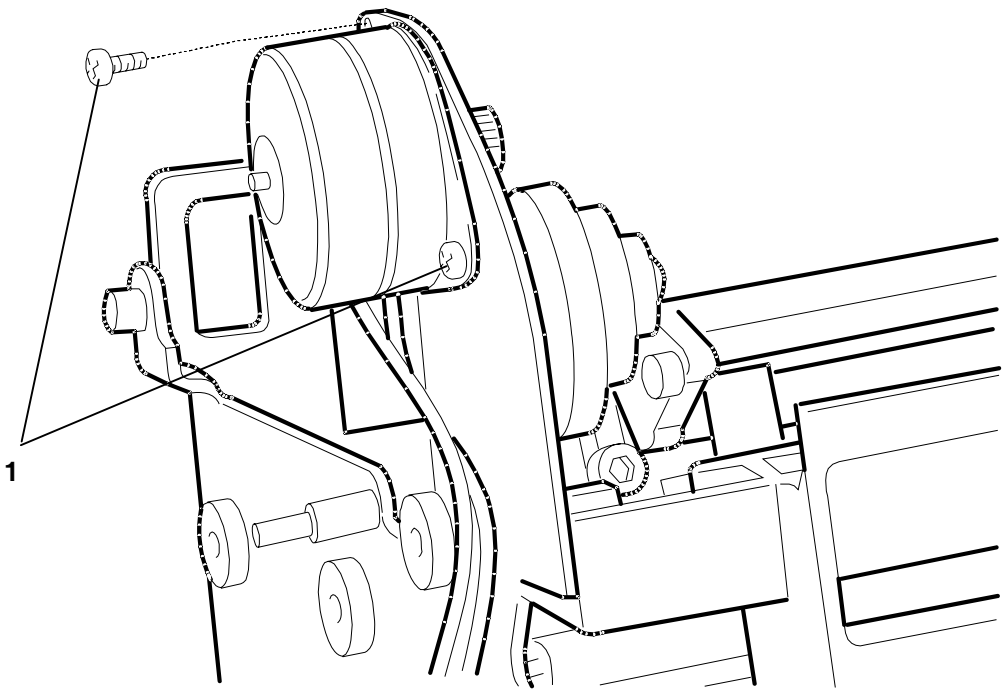


Figure 9-21

9.2.14 DISASSEMBLY/REASSEMBLY OF THE FEEDER PHOTOSENSORS

- Remove the mechanism as explained above.
- Remove the upper part of the mechanism as explained above.
- Remove the roller guard, removing the related M3 lock-screws (1).

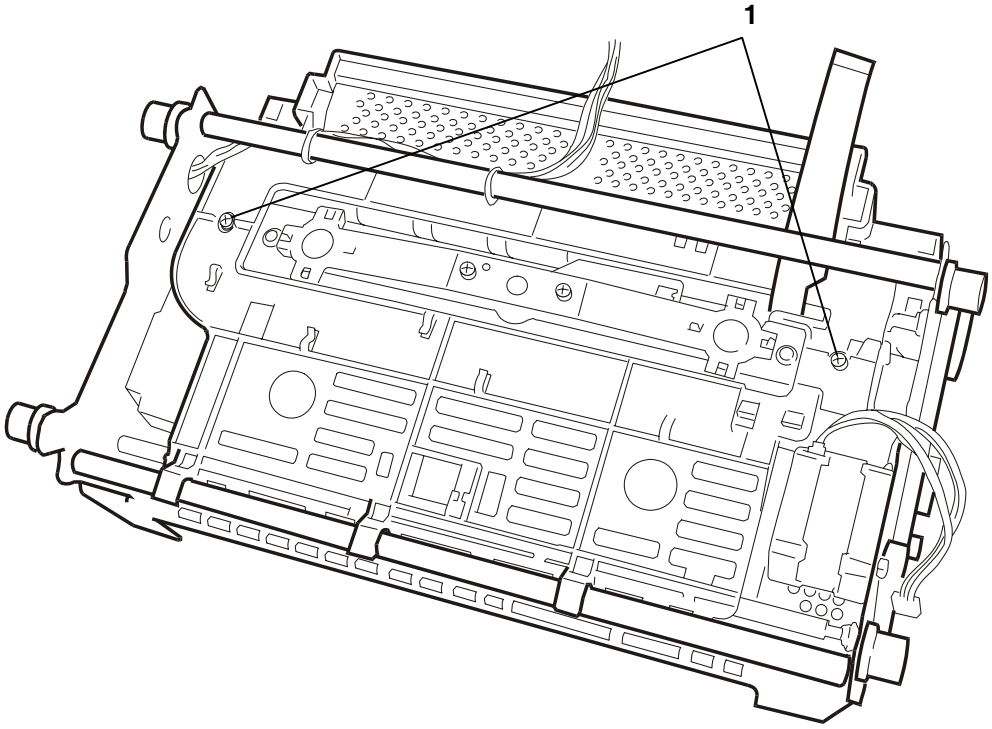


Figure 9-22 Machines with serial number 8.xxx.xxx

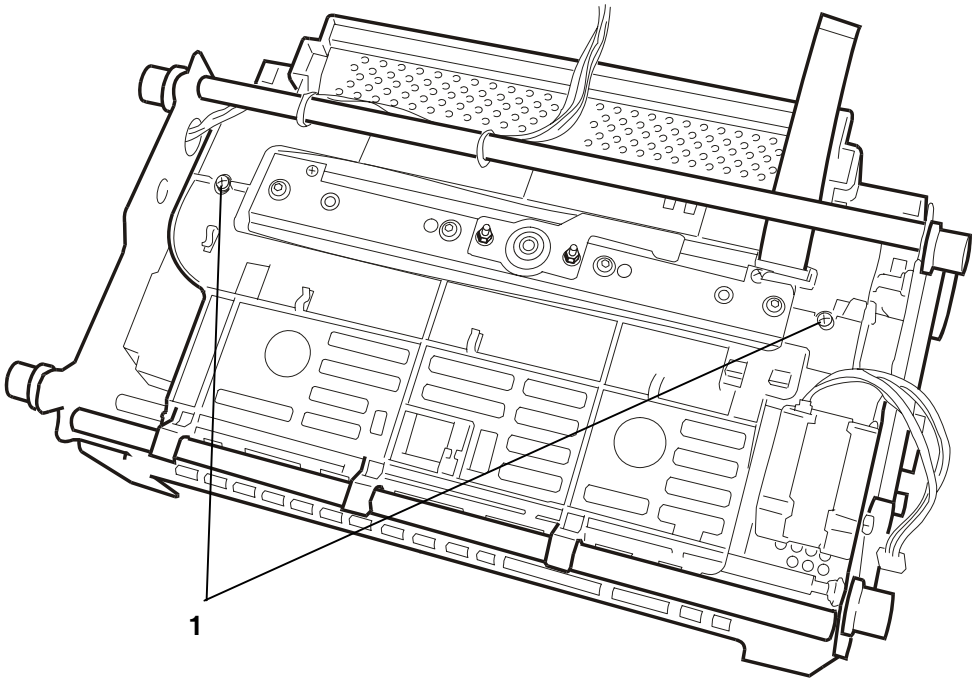


Figure 9-23 Machines with serial number 1.XXX.XXX

- Release the two springs (2) and slide out the document stop combs from their guides, after straightening the two tabs that prevent sliding out of the paper (3).

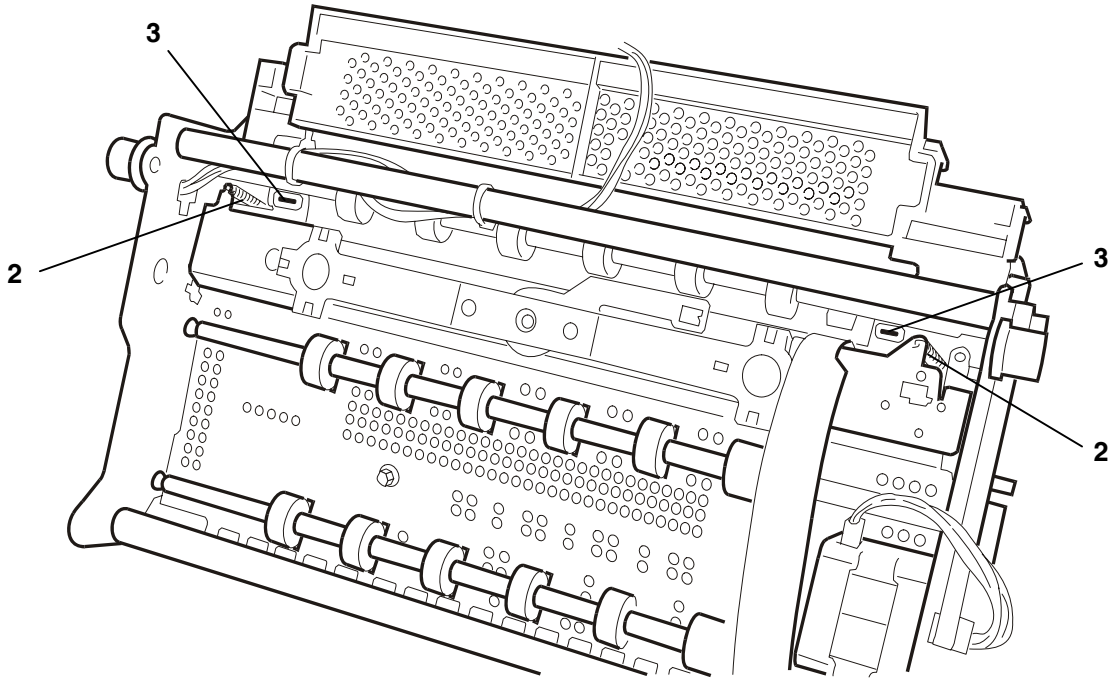


Figure 9-24 Machines with serial number 8.xxx.xxx

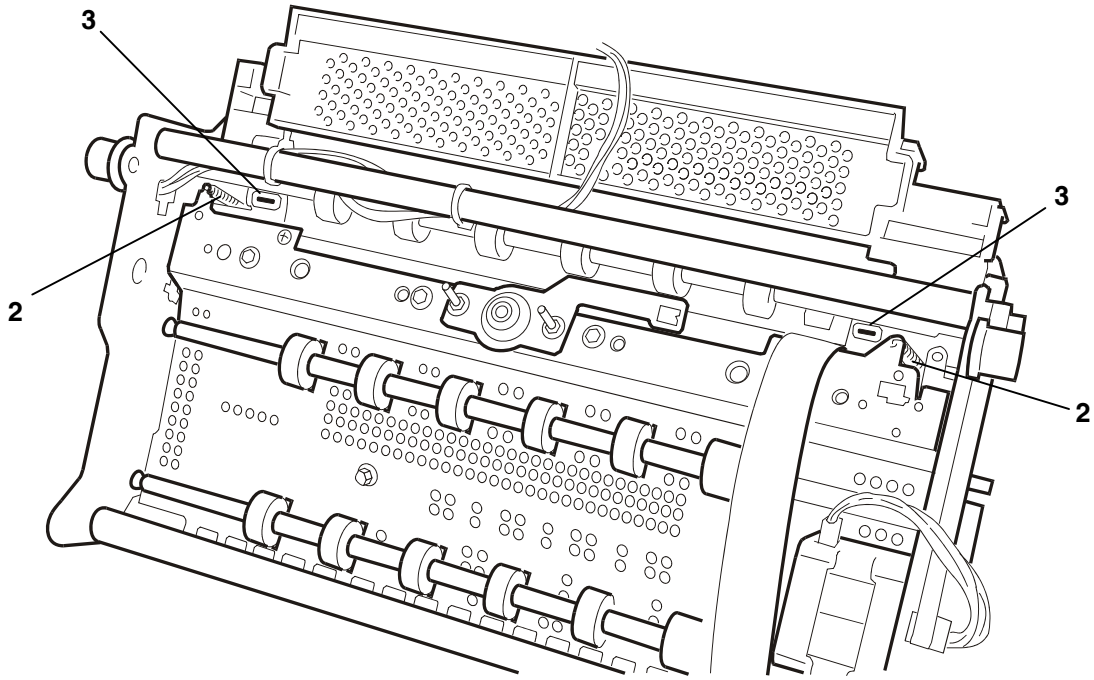


Figure 9-25 Machines with serial number 1.XXX.XXX

- Release the bush (4) of the shaft and remove the bracket (5) of the alignment pressure rollers, then remove the entire group (6).

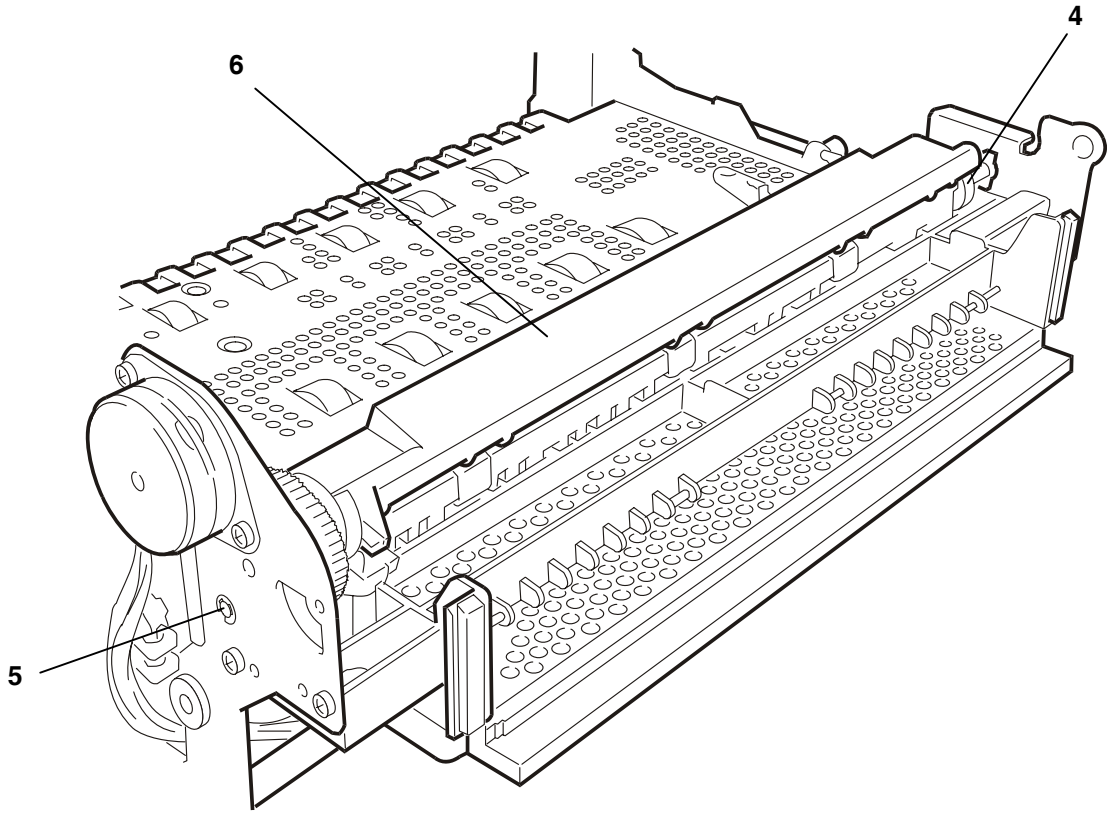


Figure 9-26

- Back off the six lock-screws (7) of the conveyor (8).

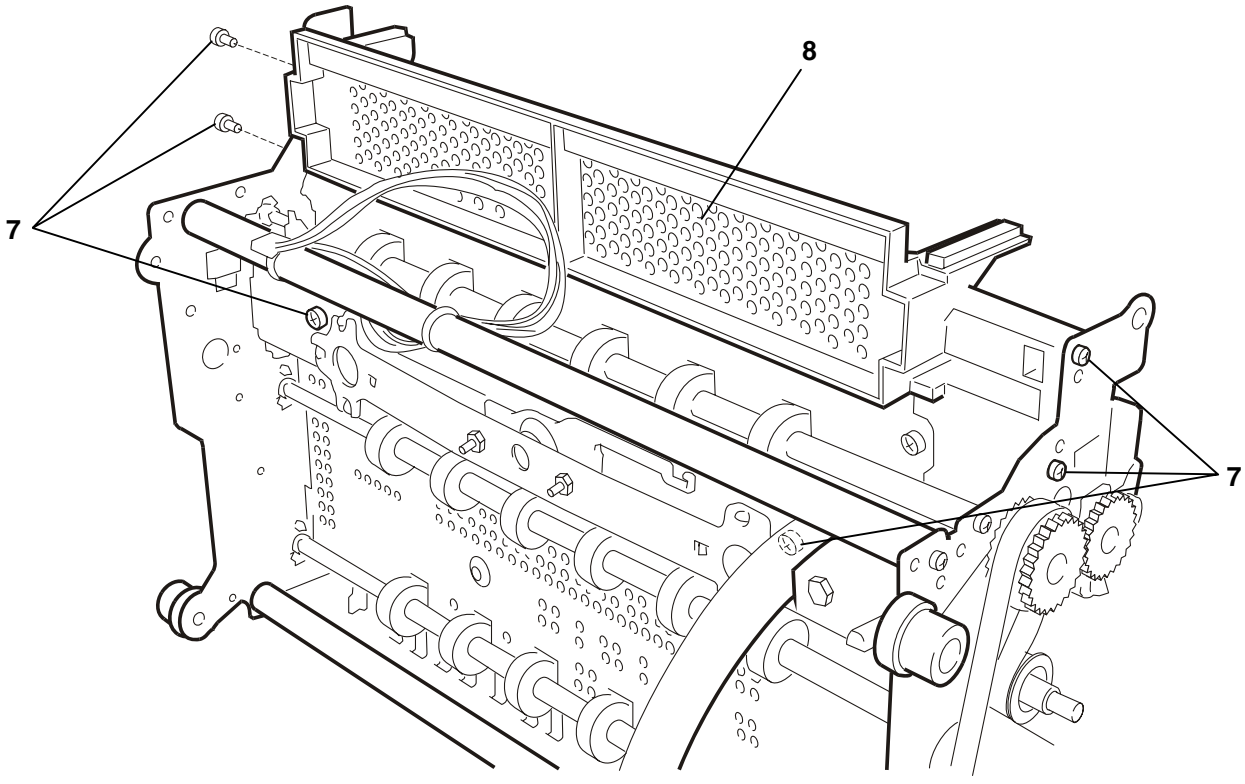


Figure 9-27 Machines with serial number 8.xxx.xxx

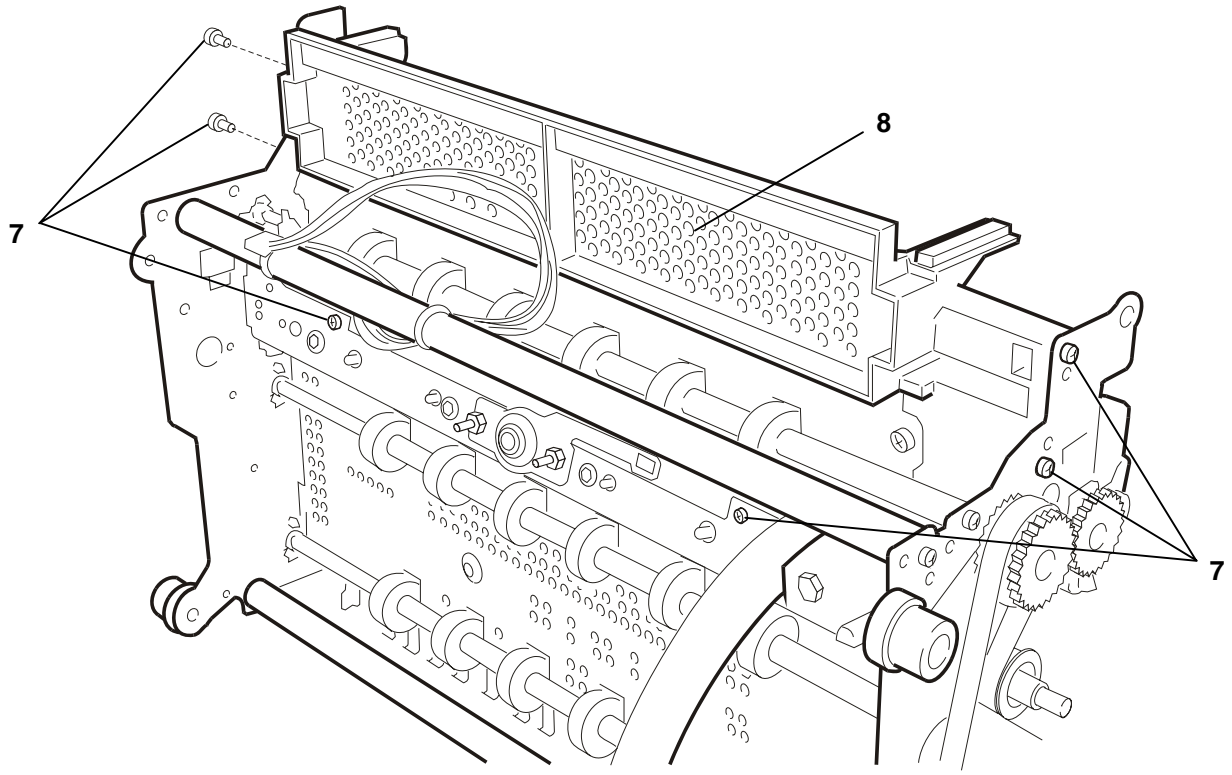


Figure 9-28 Machines with serial number 1.XXX.XXX

- Back off the two lock-screws (9) of the photosensor support (10) and remove it.

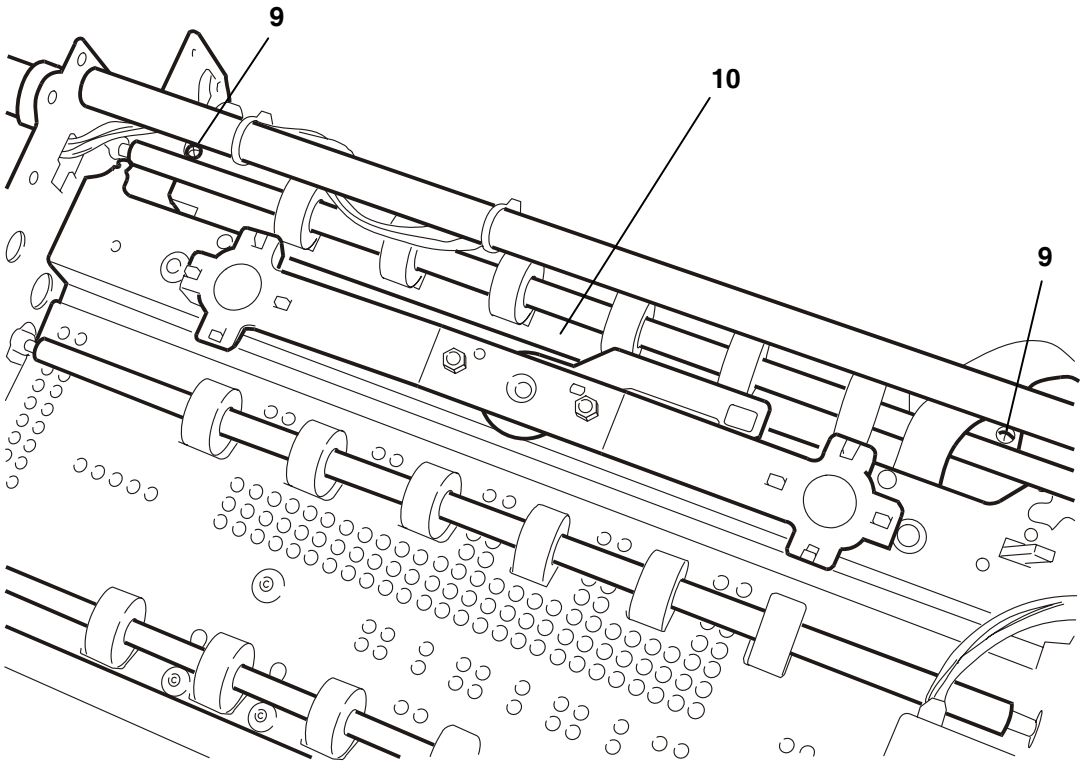


Figure 9-29 Machines with serial number 8.xxx.xxx

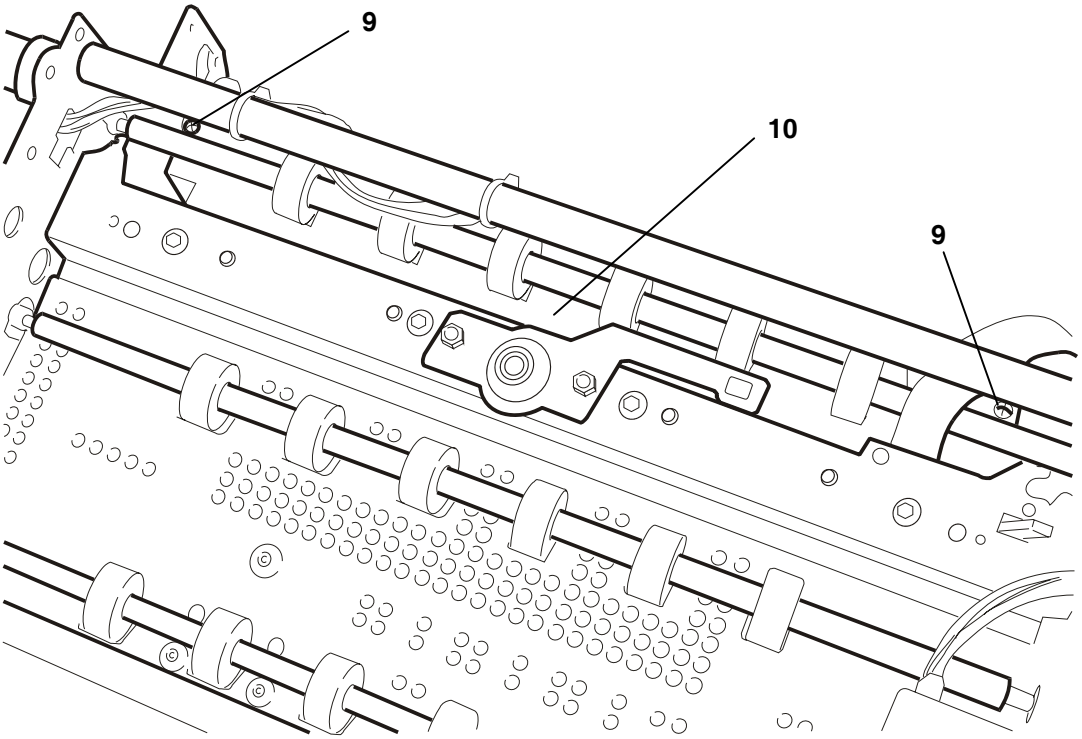


Figure 9-30 Machines with serial number 1.XXX.XXX

Note: When reassembling the conveyor, make sure that the coupling has been fitted before refitting the pressure roller assy.

During reassembly, do not fasten the photosensor support until the conveyor has been fastened, as the conveyor has two reference pins for the photosensor support.

During reassembly, adjust the front pressure rollers (par. 8.9), opening of the strip (par. 8.10) and calibration of the photosensors (par. 4.3.1).

9.2.15 DISASSEMBLY/REASSEMBLY OF THE PLATEN (MACHINES WITH SERIAL NUMBER 8.xxx.xxx)

- Remove the casing as explained above.
- From the front, lift the entire mechanism from the baseplate and rotate it partially so as to access the connectors of the motherboard.
- Disconnect all the cables except for those of the printhead.
- Back off the two lock-nuts (1) of the platen and slide it out from above.

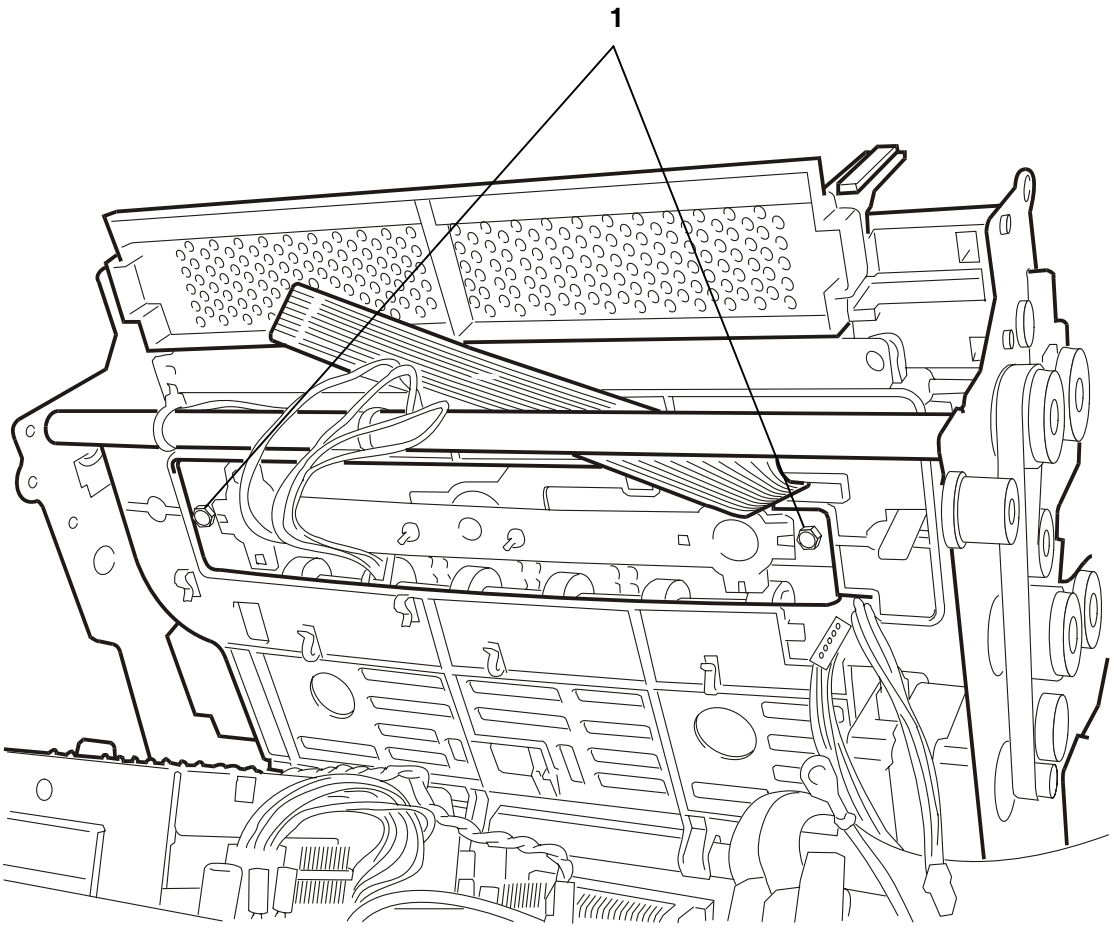


Figure 9-31

Note: After reassembly, adjust printhead/platen distance (par. 8.3).

9.2.16 DISASSEMBLY/REASSEMBLY OF THE PLATEN (MACHINES WITH SERIAL NUMBER 1.XXX.XXX)

- Remove the casing as explained above.
- From the front, lift the entire mechanism from the baseplate and rotate it partially so as to access the connectors of the motherboard.
- Disconnect all the cables except for those of the printhead.
- Back off the four lock-nuts (1) of the platen and slide it out from above.

Note: Particular attention must be paid to correct assembly/disassembly of the four springs applied to the four screws (the two central springs are shorter than the other two side springs).

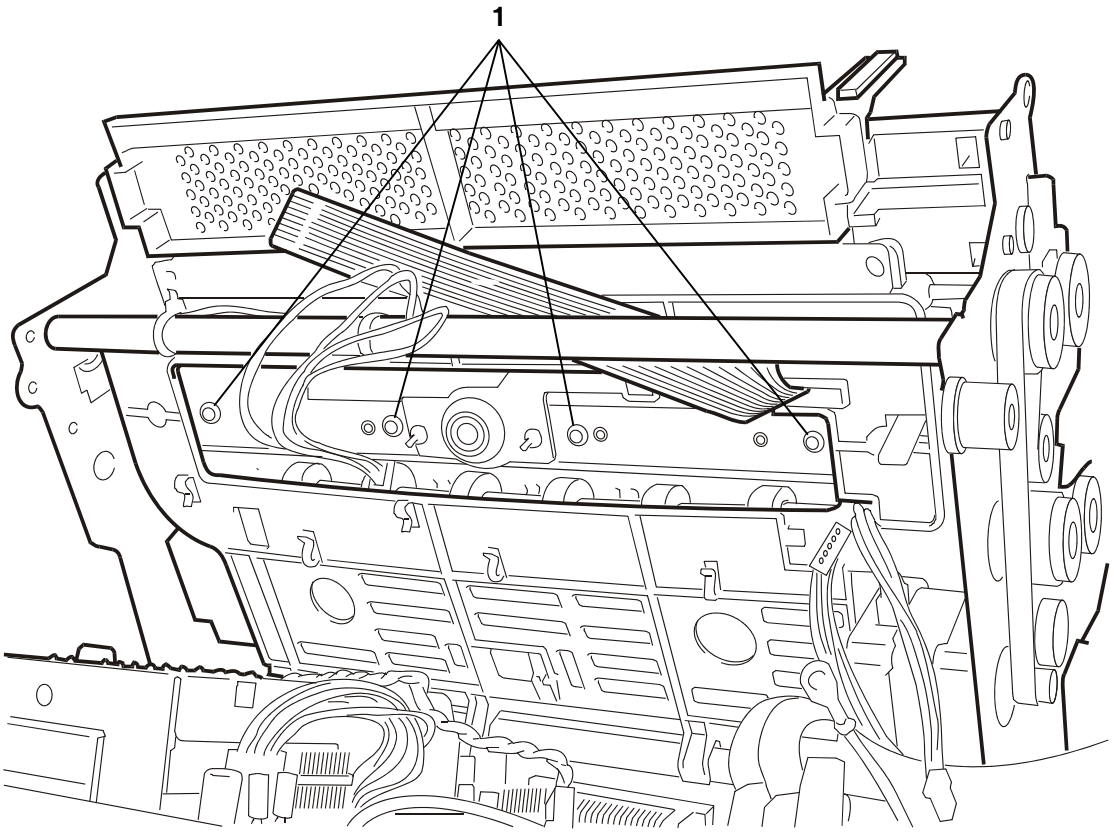


Figure 9-32

Note: After reassembly, adjust printhead/platen distance (par. 8.4).

9.2.17 DISASSEMBLY/REASSEMBLY OF THE MOTHERBOARD (MACHINES WITH SERIAL NUMBER 8.xxx.xxx)

- Switch off the machine and disconnect the power cord.
- Remove the casing as explained above.
- Detach all the connections to the motherboard and disassemble the mechanism as explained above.
- Disconnect the power cord (1) that connects the motherboard to the mains unit
- Remove magnetic options option (2).

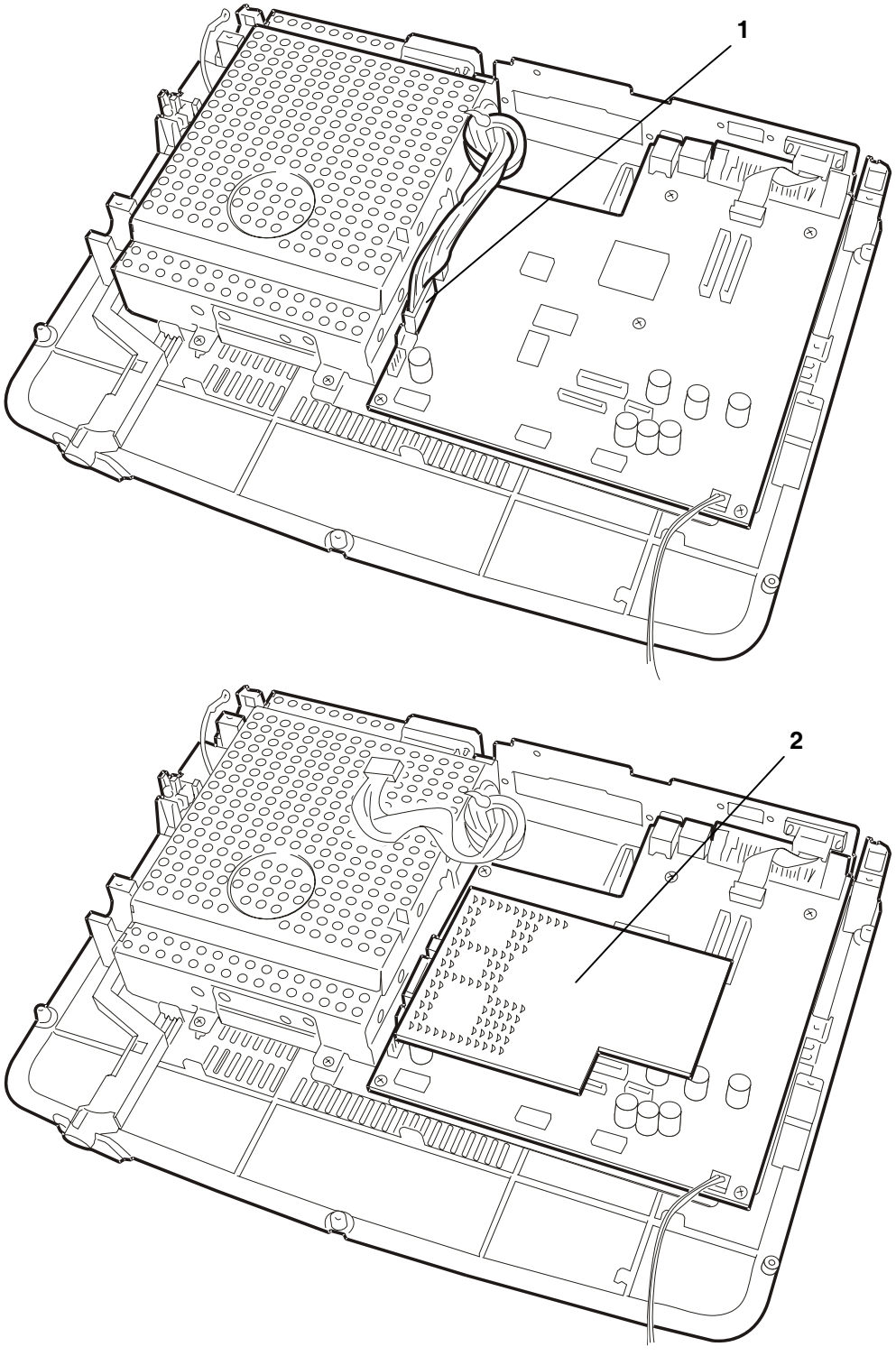


Figure 9-33

- Back off the six lock-screws (3) of the motherboard.
- Back off the two fasteners (4) of the standard serial interface connector.
- Back off the two screws (5) of the Centronics interface connector.
- Extract the motherboard from the baseplate of the printer.

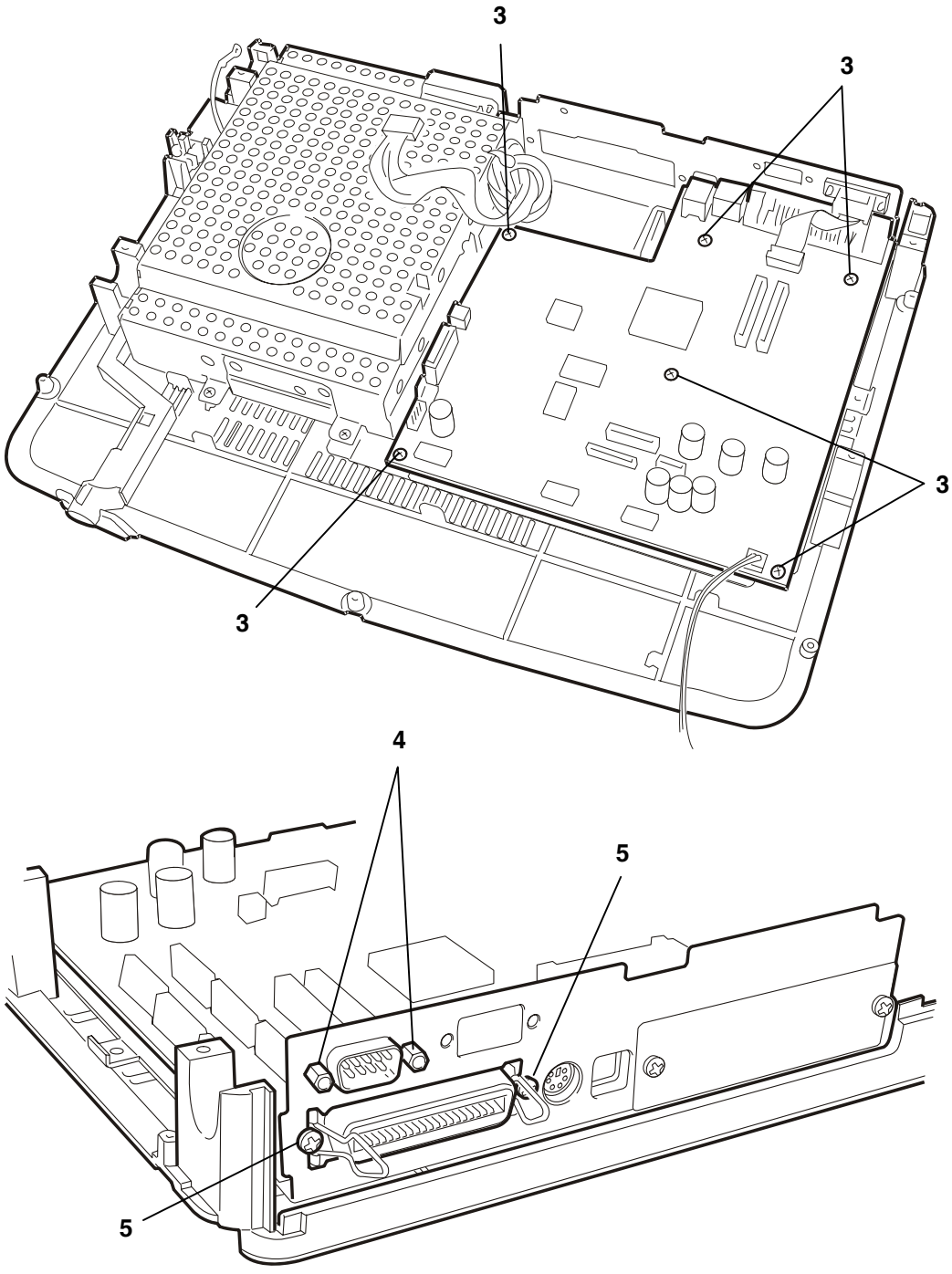


Figure 9-34

Note: During the reassembly of the metal sheet (4), fasten this from outside the supporting plate of the motherboard.

If the board is replaced, update the firmware according to the last release (par. 1.9.1), carry out the installation set-up (chapter 4) and calibrate the photosensors (par. 4.3.1).

9.2.18 DISASSEMBLY/REASSEMBLY OF THE MOTHERBOARD (MACHINES WITH SERIAL NUMBER 1.XXX.XXX)

- Switch off the machine and disconnect the power cord.
- Remove the casing as explained above.
- Detach all the connections to the motherboard and disassemble the mechanism as explained above.
- Disconnect the power cord (1) that connects the motherboard to the mains unit
- Remove magnetic options option (2).

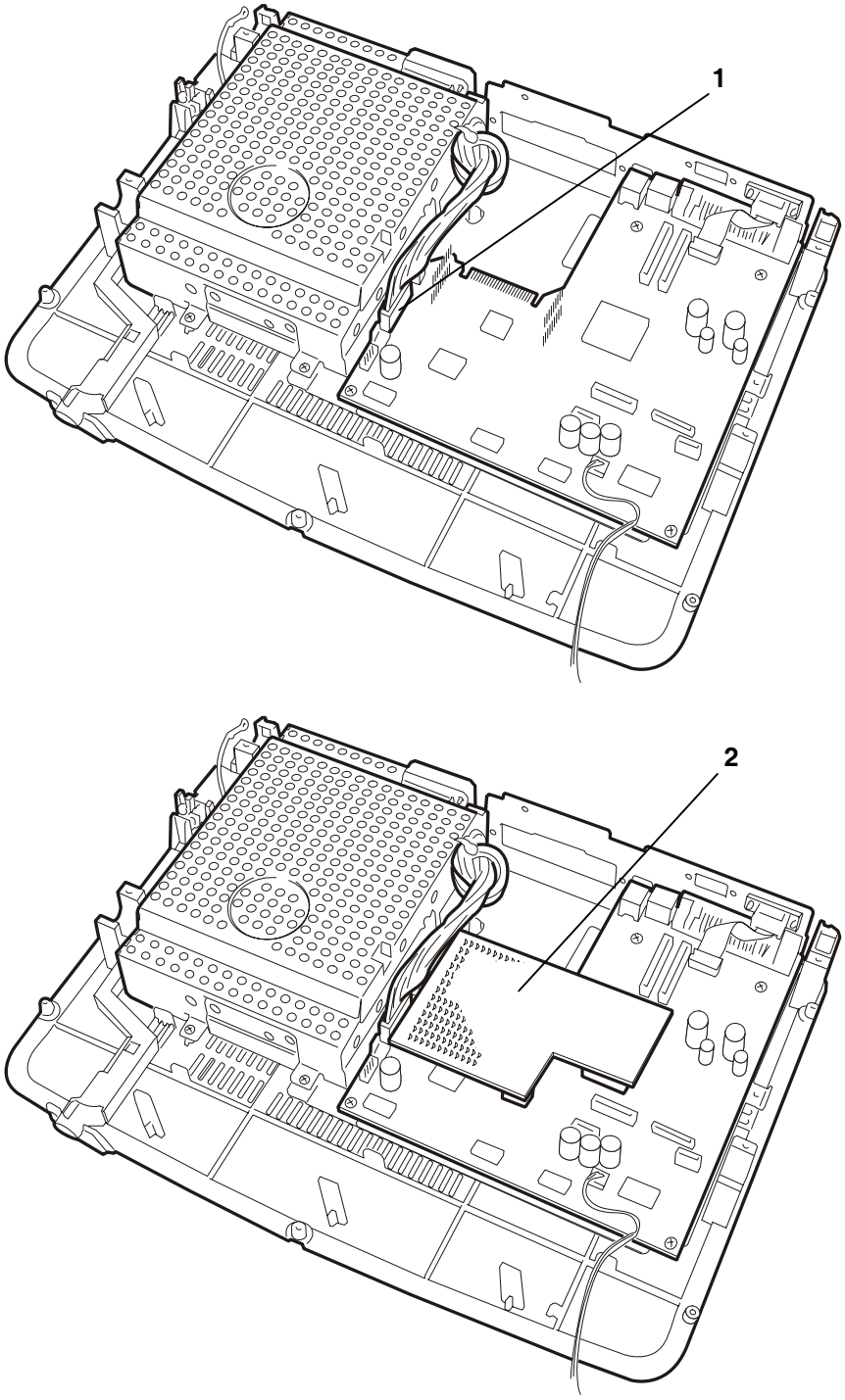


Figure 9-35

- Back off the four lock-screws (3) of the motherboard.
- Disconnect the cable (4) of the standard serial interface and, if present disconnect the cable of the optional serial interface.
- Back off the two screws (5) of the Centronics interface connector.
- Extract the motherboard from the baseplate of the printer.

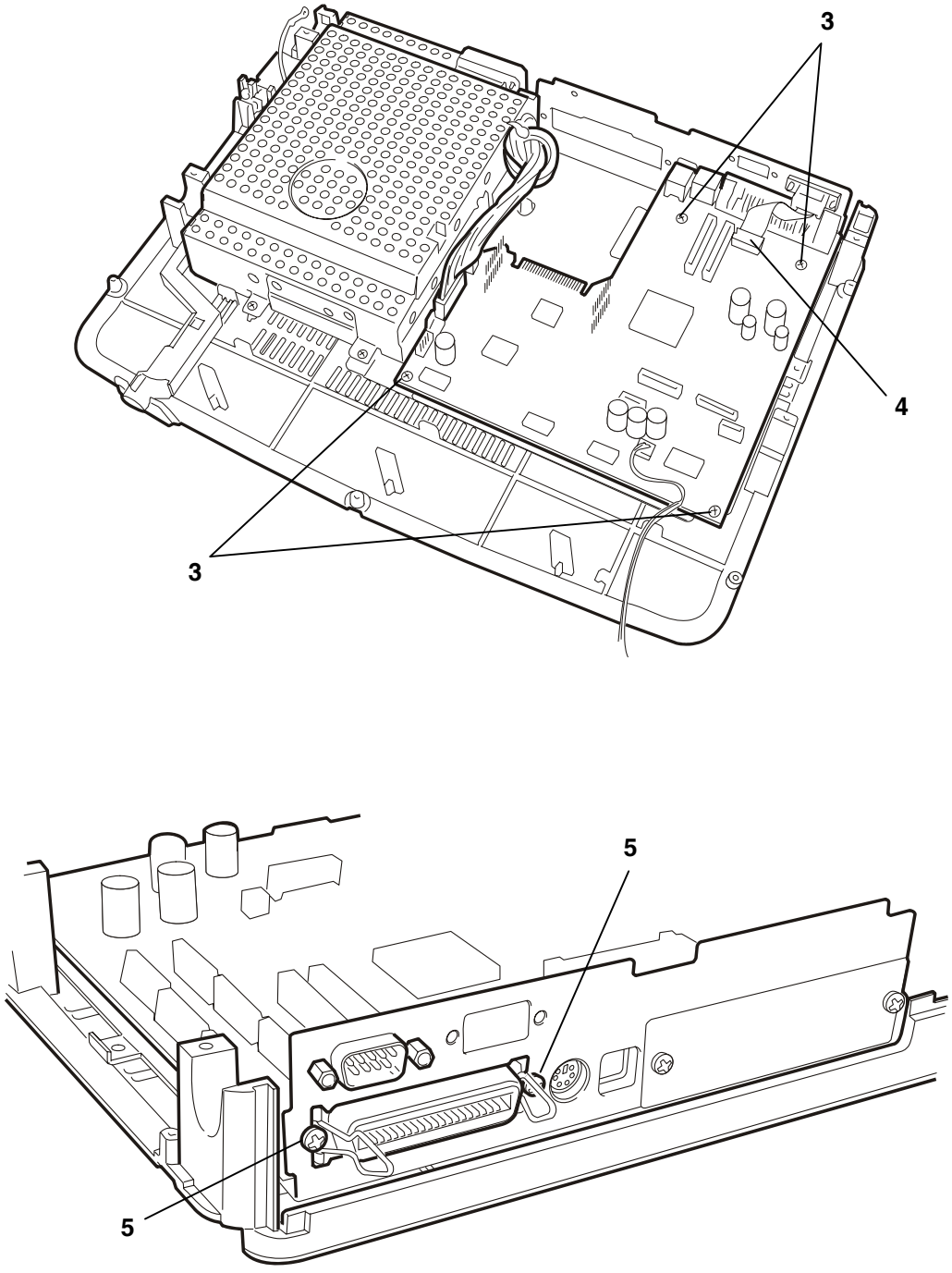


Figure 9-36

Note: During the reassembly of the metal sheet (4), fasten this from outside the supporting plate of the motherboard.

If the board is replaced, update the firmware according to the last release (par. 1.9.1), carry out the installation set-up (chapter 4) and calibrate the photosensors (par. 4.3.1).

9.2.19 DISASSEMBLY/REASSEMBLY OF THE FAN POWER SUPPLY UNIT

- Switch off the machine and disconnect the power cord.
- Remove the casing as explained above.
- Detach all the connections to the motherboard and disassemble the mechanism as explained above.
- Back off the two lock-screws (1) of the fan.
- Disconnect the power cord (2) and extract the power supply unit fan.

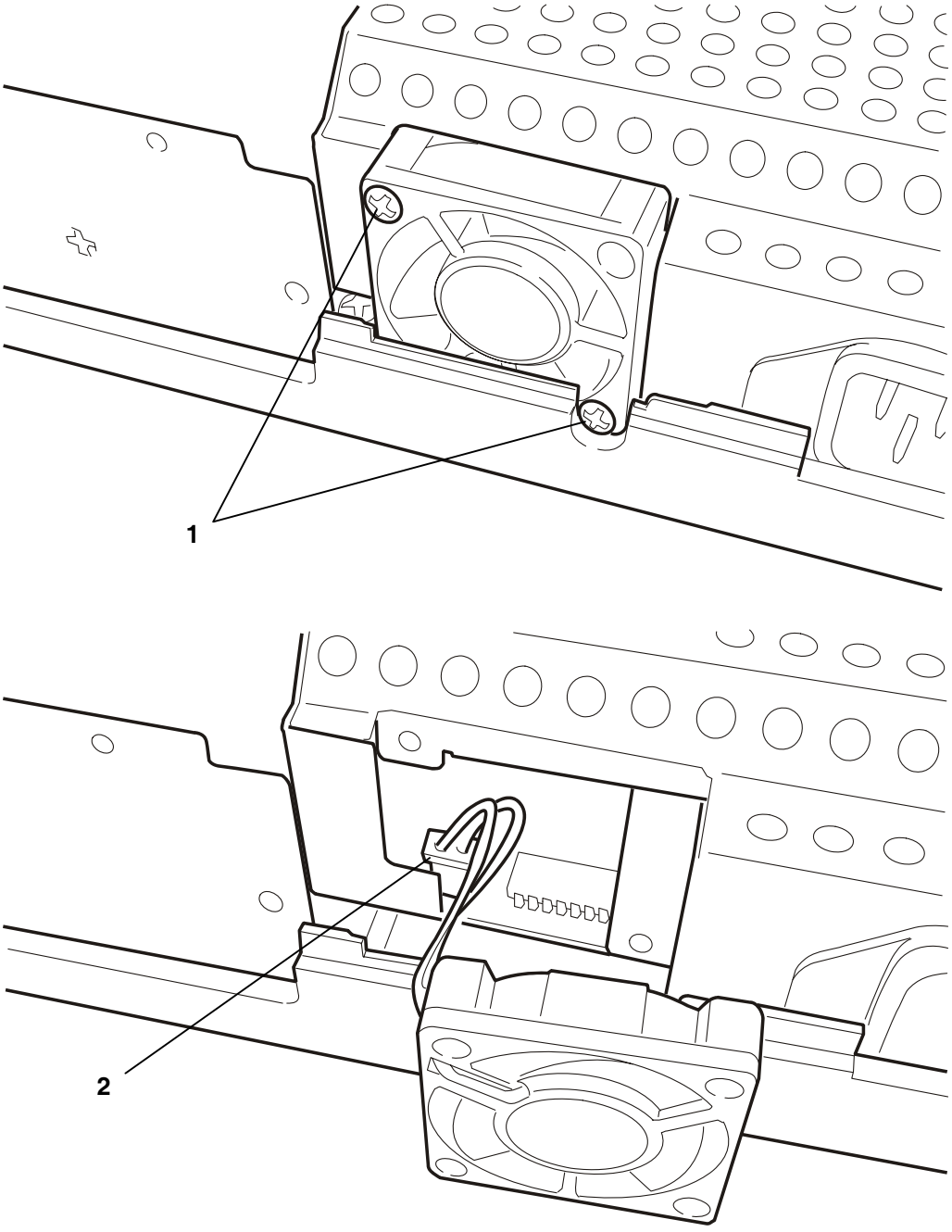


Figure 9-37

9.2.20 DISASSEMBLY/REASSEMBLY OF THE POWER SUPPLY UNIT

Note: If the fuse inside the power supply unit has blown, replace the entire unit as some of the components on the power supply unit board could be faulty.

- Switch off the machine and disconnect the power cord.
- Remove the casing as explained above.
- Detach all the connections to the motherboard and disassemble the mechanism as explained above.
- Disconnect the power cord (1) that connects the motherboard to the mains unit.

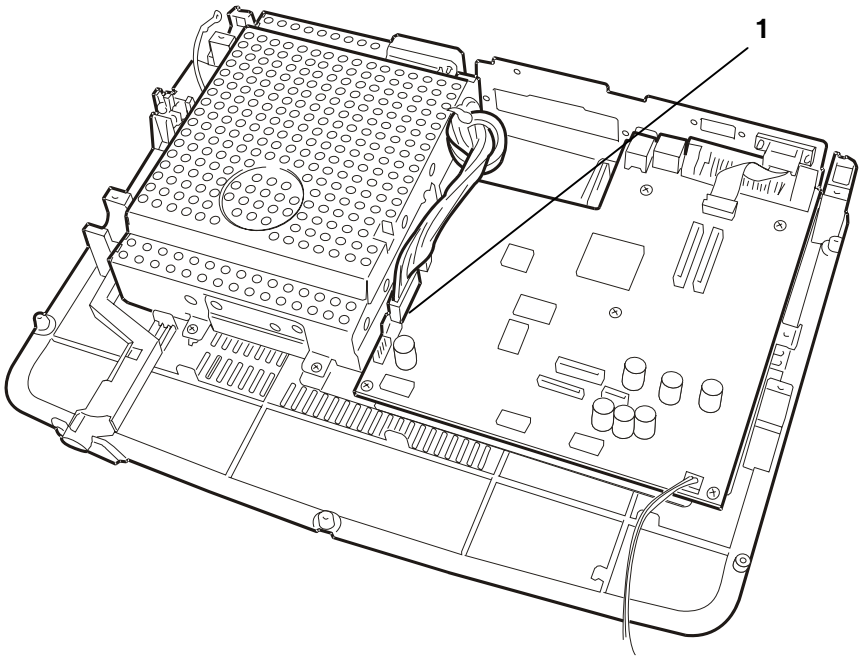


Figure 9-38 Machines with serial number 8.xxx.xxx

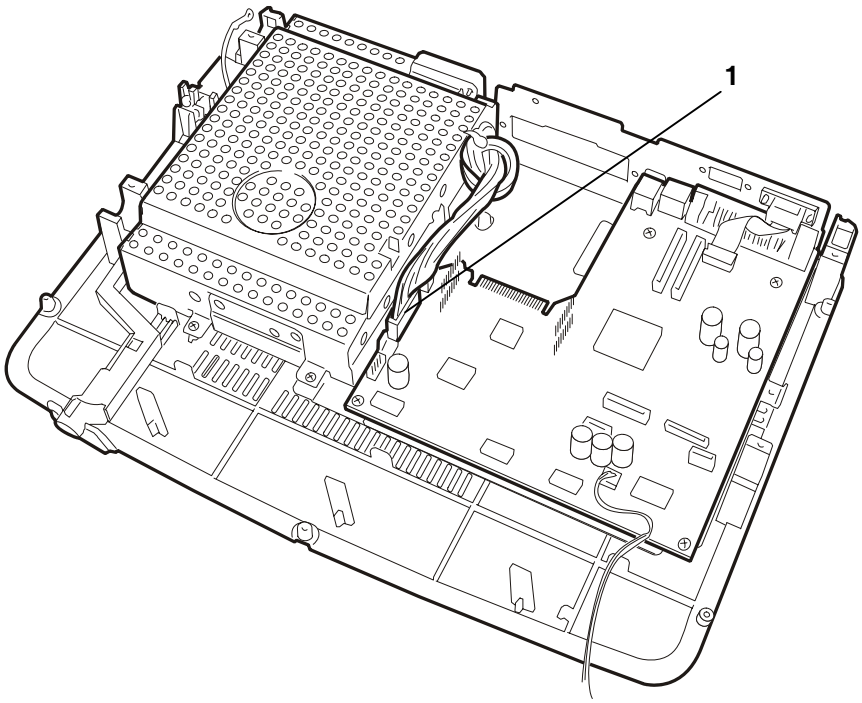


Figure 9-39 Machines with serial number 1.XXX.XXX

- Loosen the 2 lock-screws (2) of the switch.
- Back off the four lock-screws (3) of the power supply unit, also removing the ground cables.
- Extract the power supply unit.

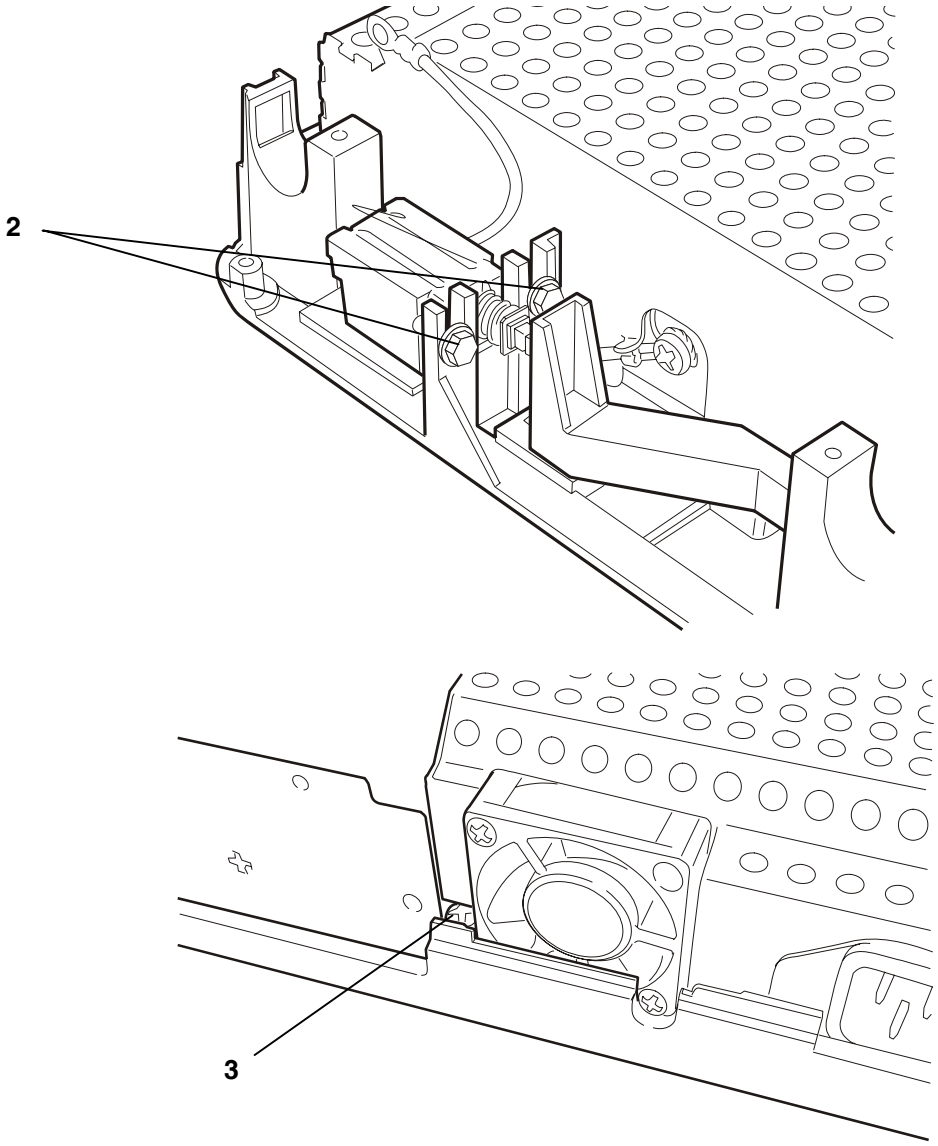


Figure 9-40

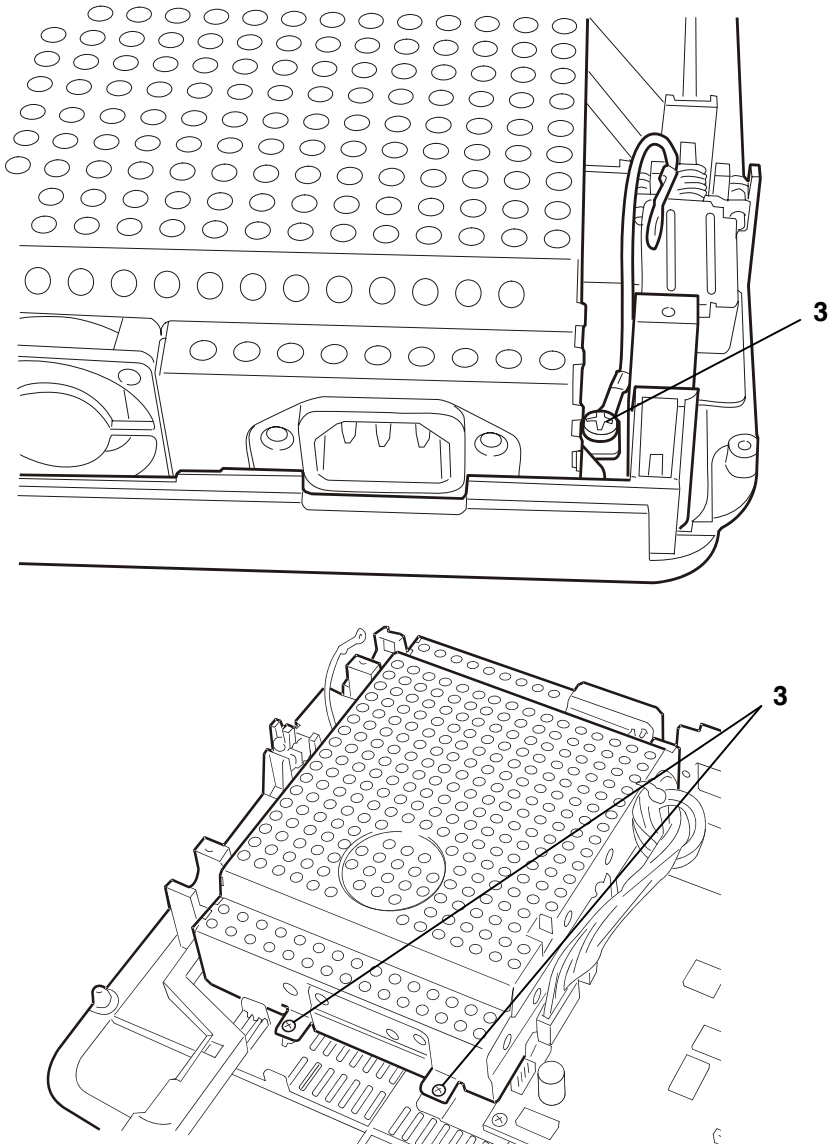


Figure 9-41

Note: During reassembly, pay particular attention to correct repositioning of the ground cables. If the unit is replaced, check that the power voltage is correct.

9.3 DISASSEMBLY/REASSEMBLY OF BASIC MACHINE OPTIONS

9.3.1 DISASSEMBLY/REASSEMBLY OF THE HORIZONTAL MAGNETIC/MICR

- Remove the casing as described above.
- From the front, lift the entire mechanism from the baseplate and rotate it partially so as to access the connectors on the horizontal magnetic board (1).
- Detach the connectors of the cables connected to the horizontal magnetic board.
- Back off the two lock-screws (2) that fasten the assy to the structure of the machine and disassemble the option.

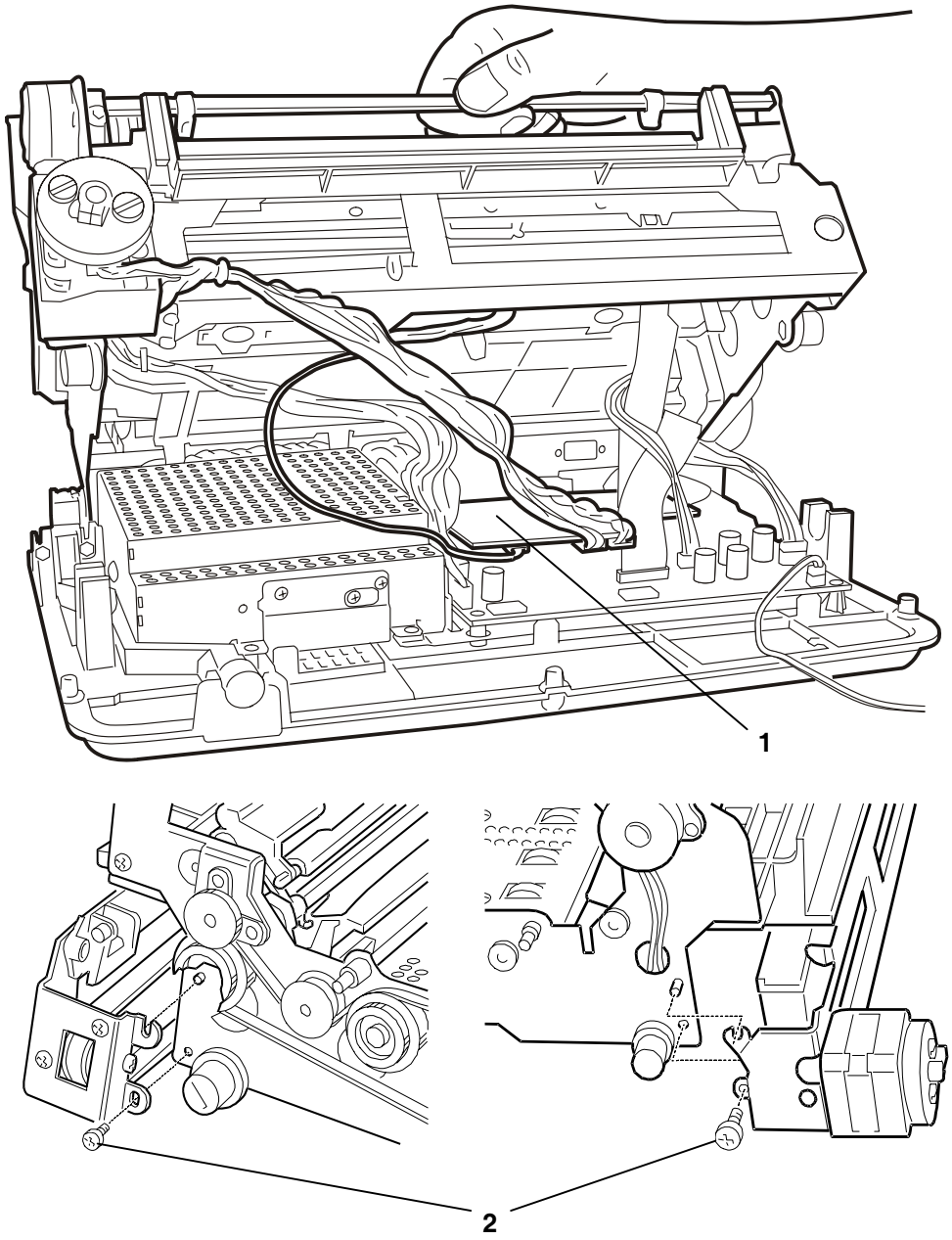


Figure 9-42 Machines with serial number 8.xxx.xxx

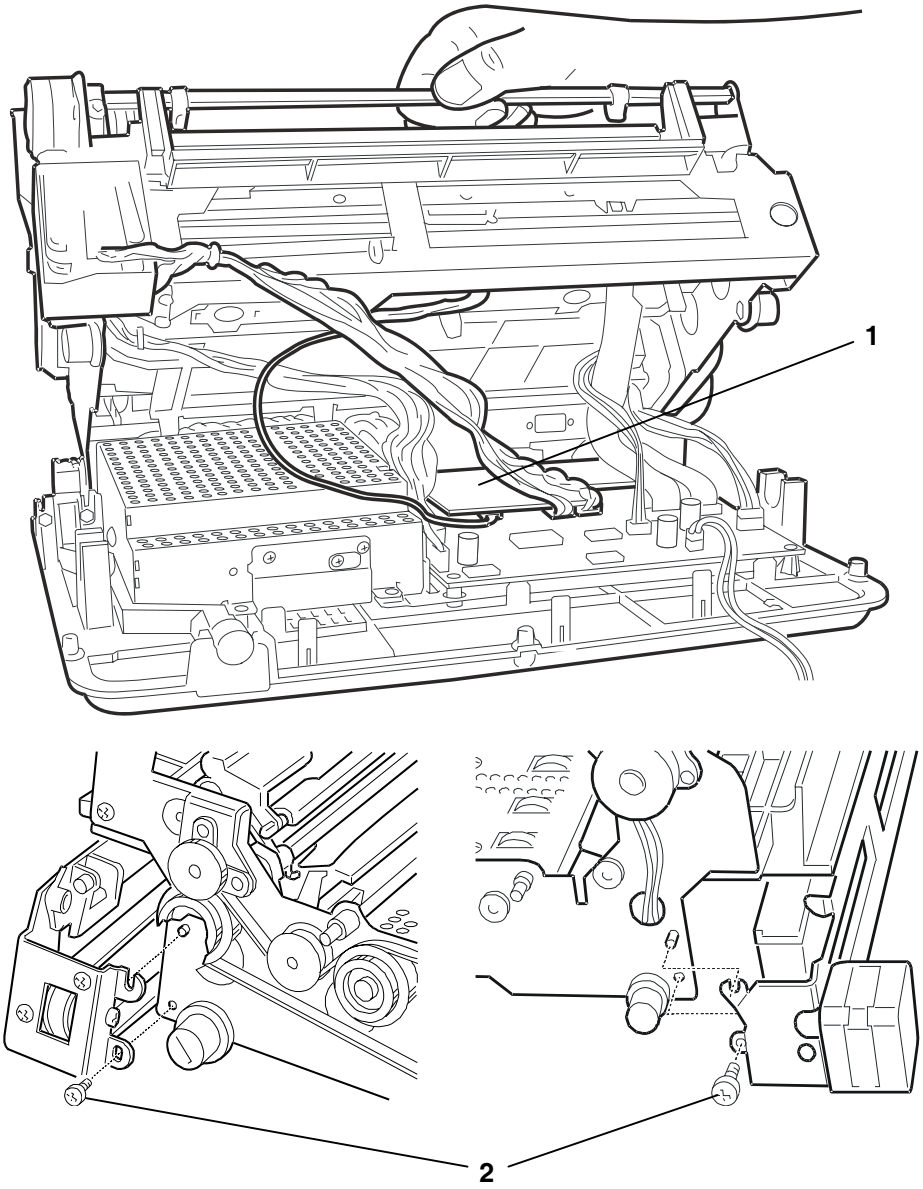


Figure 9-43 Machines with serial number 1.XXX.XXX

Note: During reassembly, adjust positioning of the assy on the structure (par. 8.14).

9.3.2 DISASSEMBLY/REASSEMBLY OF THE HORIZONTAL MAGNETIC /MICR MOTOR

- Remove the casing as explained above.
- Remove the horizontal magnetic/MICR assy as explained above.
- Disconnect the cable motor from magnetic options board.
- Loosen the two nuts (1) and remove the motor with related protection shield.

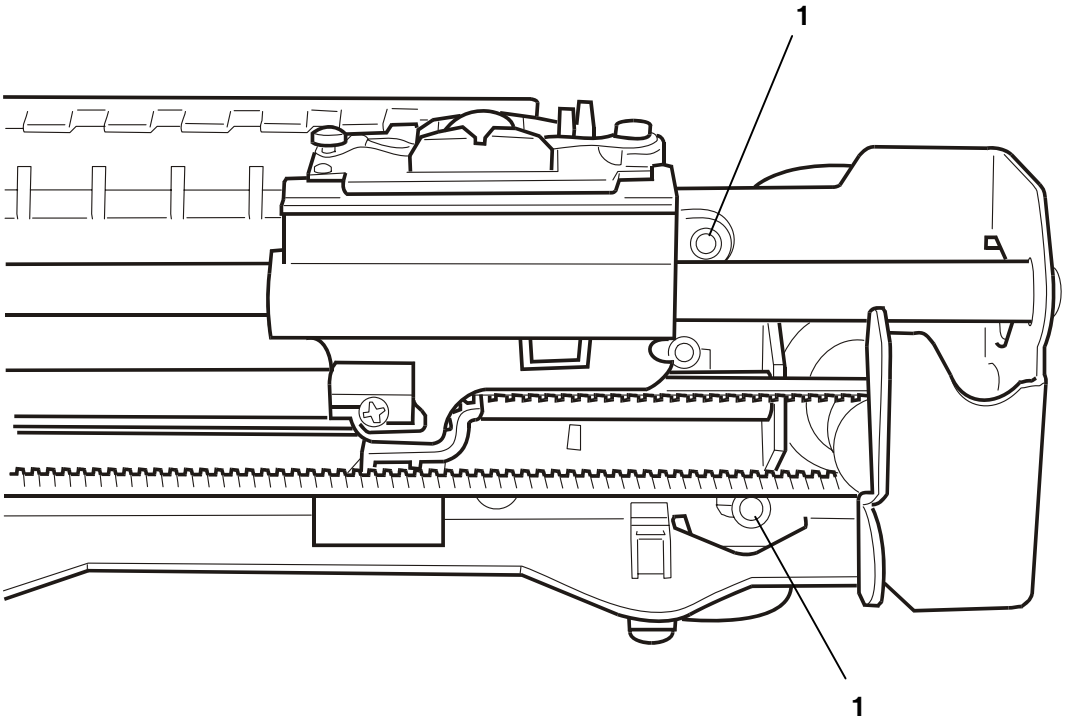


Figure 9-44

9.3.3 DISASSEMBLY/REASSEMBLY OF THE HORIZONTAL MAGNETIC /MICR PRINTHEAD ASSY

- Remove the casing as explained above.
- Remove the horizontal magnetic/MICR assy as explained above.
- Loosen the screw (1) and free the signals cable
- Loosen the screws (2) and extract the MICR printhead (3).

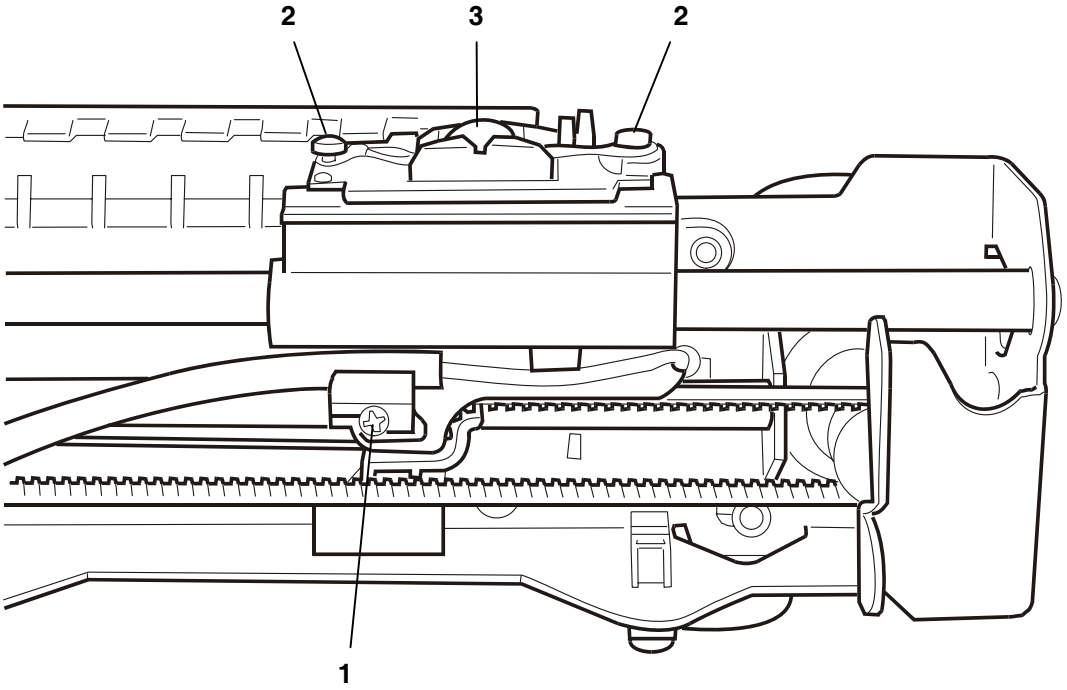


Figure 9-45

UPDATING STATUS

DATE	UPDATED PAGES	PAGES	CODE
04/2007	1st EDITION	142	XZAC4219
05/2007	2nd EDITION	154	XZAC4219
10/2007	3th EDITION	160	XZAC4219-03