Industrial Bar Code Printers

M-8485S / M-8490S
M-8459S / M-8460S

OEM Print Engine
Service Manual

P/N 9001032C

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Warning: This equipment complies with the requirements in Part 15 of FCC rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and TV reception requiring the operator to take whatever steps are necessary to correct the interference.

Contents

This manual is divided into 2 parts:

Part 1. M-8485S / M-8490S
Serial Numbers 70699999 and less

Part 2. M-8485S / M-8490S / M-8459S / M-8460S
Serial Numbers 70700000 and above

M-8485S / M-8490S

Part 1

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M-8485S / M-8490S

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Part 2

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Section

1

Part 1

Overview and Specifications

1-1 Overview

The SATO "S" Series Thermal Transfer Printer Engines are designed to be integrated into high performance on-site labeling systems. All printer parameters are user programmable, using front panel controls and DIP switches. All popular bar codes and 13 human-readable fonts, including a vector font, are resident in memory providing literally thousands of type styles and sizes.

The major difference between the M-8485S and the M-8490S is the resolution of the head. The M-8485S with its 203 dpi head provides an economical labeling solution for most applications. It will print on labels from 1 inch wide x .25 inches long to 5.25 inches wide x 14 inches long using internal memory. Labels up to 5.25 inches wide x 49.2 inches long can be printed by installing a PCMCIA memory card option. The maximum print width is 5.0 inches.

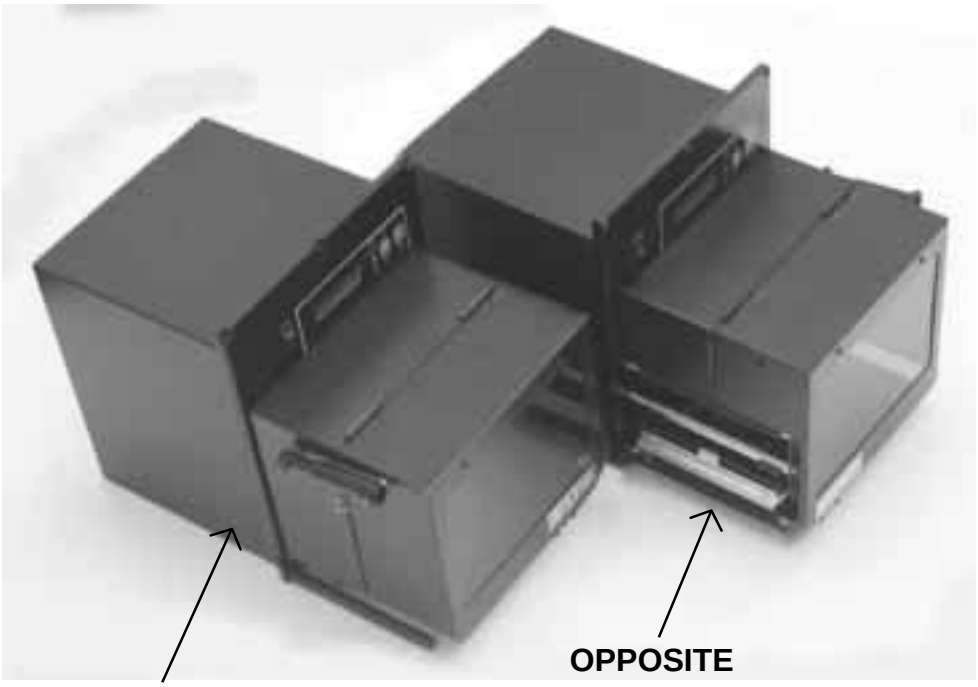
The M-8490S provides a higher print resolution, 305 dpi, to give laser quality printing. It is useful when higher resolution is needed for detailed graphic images. It will print on labels from 1 inch wide x .25 inches long to 5.25 inches x 14 inches long using internal memory. Labels up to 5.25 inches wide X 32.8 inches long can be printed by installing a PCMCIA memory card option. The maximum print width is 4.4 inches.

Step-by-step maintenance instructions are described in this manual. It is recommended that you become familiar with each section before installing and maintaining the printer.

Checks, adjustments and replacements require standard metric tools. Other equipment is listed where needed.

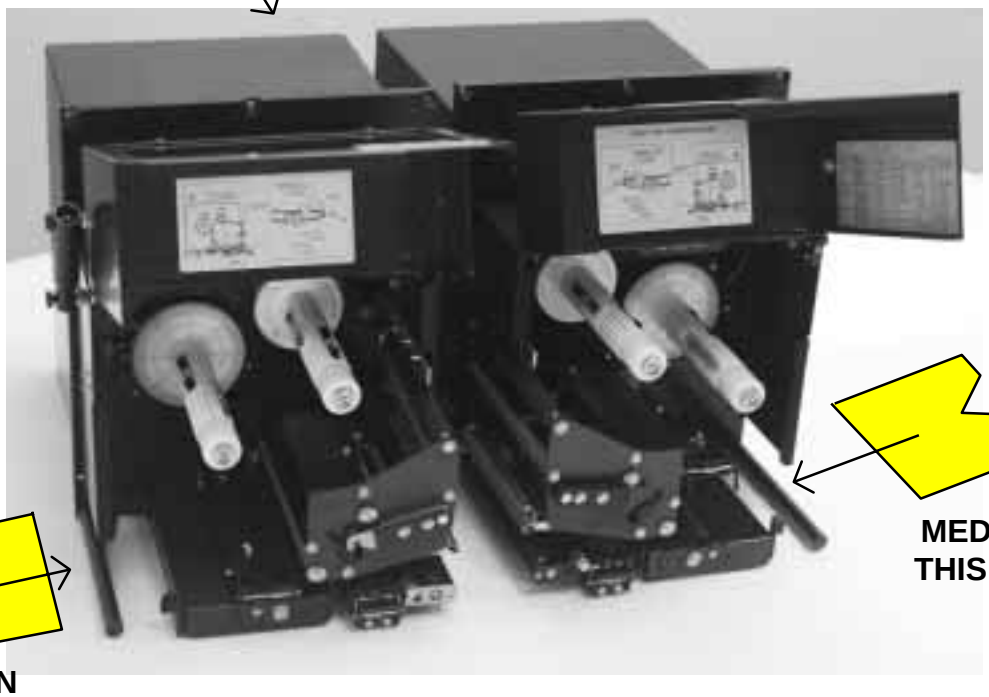
Part 1

1-2 Comparison – Standard and Opposite Hand Units



STANDARD UNIT

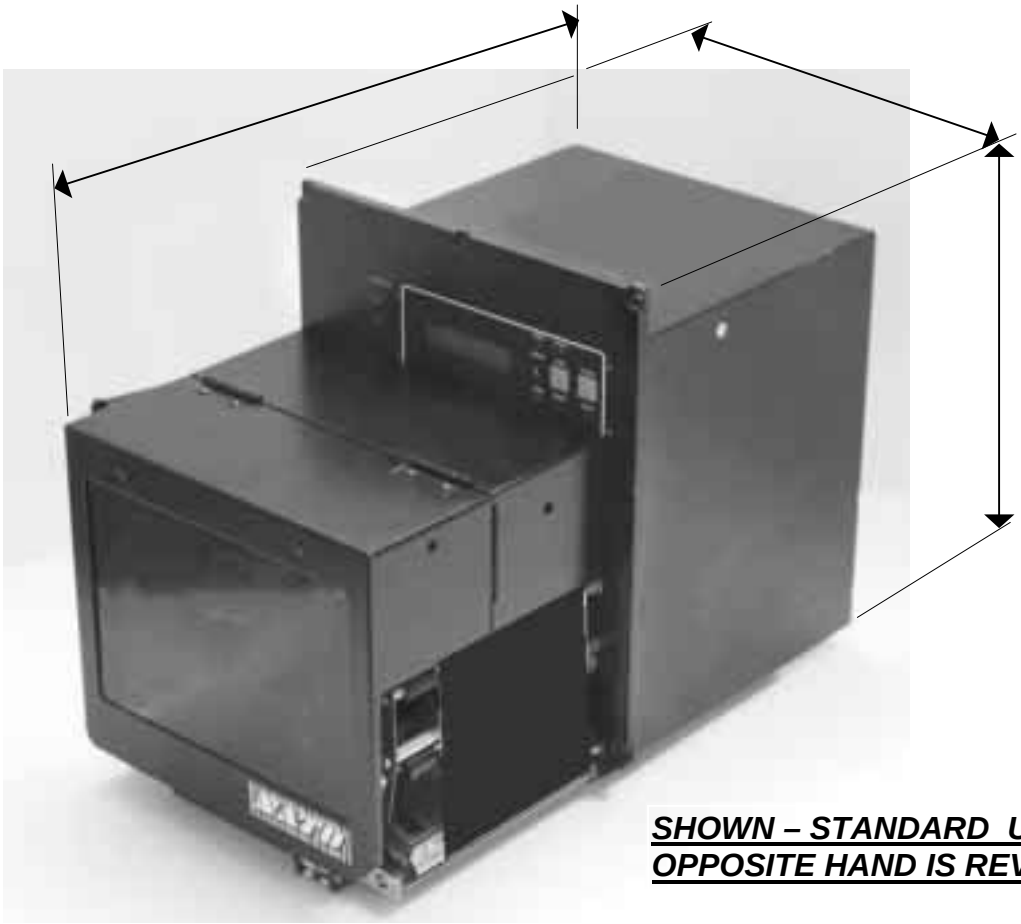
OPPOSITE HAND UNIT



MEDIA IN THIS SIDE

MEDIA IN THIS SIDE

1-3 Overall Dimensions



SHOWN – STANDARD UNIT
OPPOSITE HAND IS REVERSED

SPECIFICATION	M-8485S/M-8490S
DIMENSIONS	
Width	9.65 in. (245 mm)
Depth	16.1 in. (408 mm)
Height	11.8 in. (300 mm)
Weight	25.0 lbs (11.34 Kg)
POWER REQUIREMENTS	
Voltage	100 - 115 V (+/- 10 %) 220 V (+/- 10 %) 50/60 Hz (+/- 1%)
Power Consumption	50 Watts Idle 700 Watts Max

Part 1

1-4 Components

DIP SWITCH PANEL

LABEL AND
RIBBON LOADING
DIAGRAM

DIP SWITCH
CONFIGURATION
TABLE

OPERATION PANEL

RIBBON UNWIND

RIBBON REWIND

RIBBON

LABEL EDGE GUIDE

PLATEN ROLLER

MEDIA HOLD DOWN

MEDIA OUT

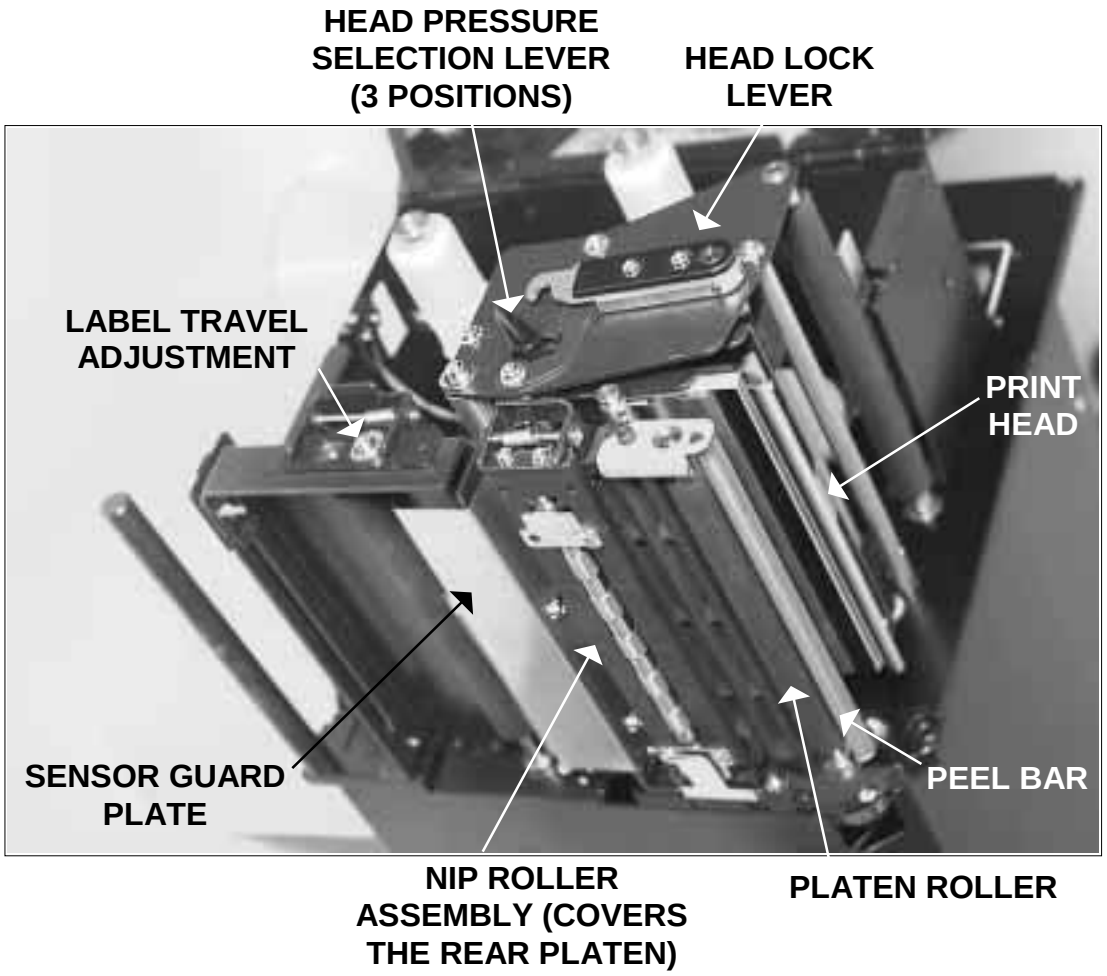
HEAD PRESSURE
ADJUST

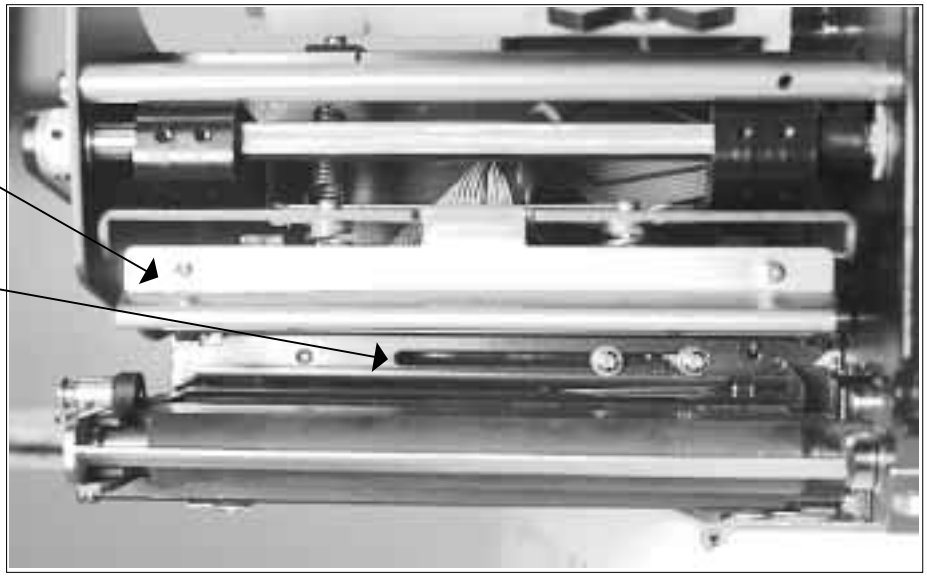
HEAD LOCK
LEVER

NIP ROLLER LATCH

SHOWN – STANDARD UNIT
OPPOSITE HAND IS REVERSED

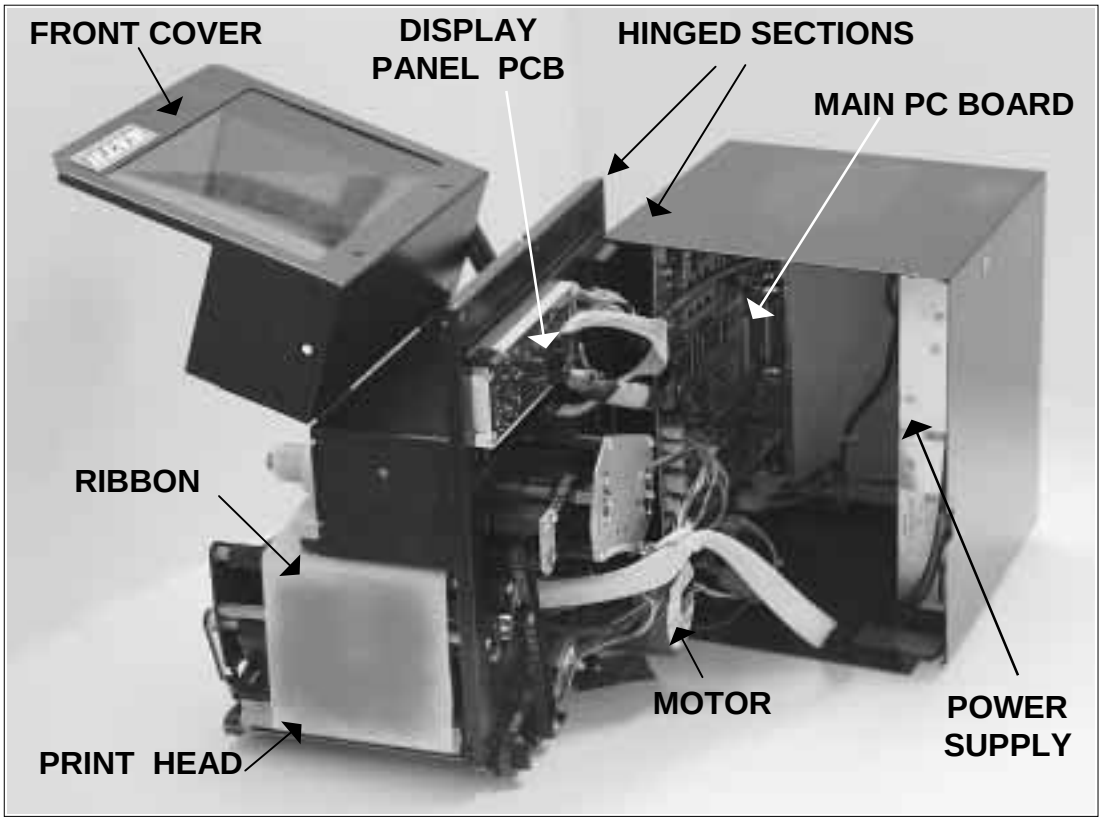
1-4 Components (Cont.)

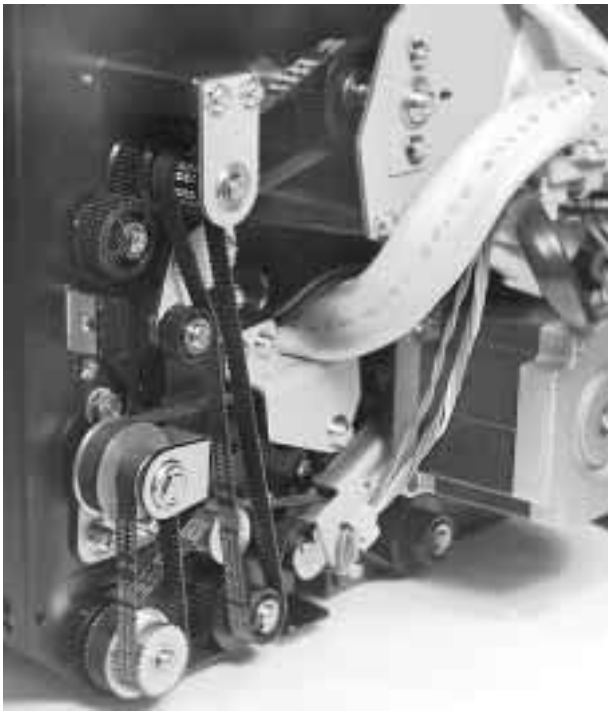




Part 1

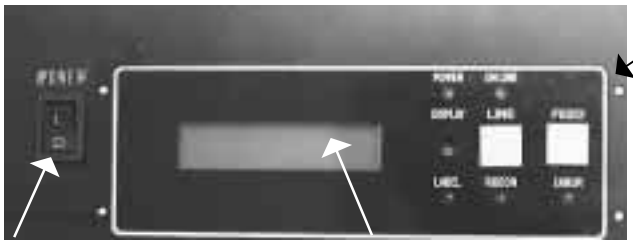
1-4 Components (Cont.)





M-8485S **BELT & GEAR ARRANGEMENTS** **M-8490S**

1-5 Operation Panel



CONTROL KEYS & INDICATORS

POWER ON/OFF SWITCH

LCD DISPLAY

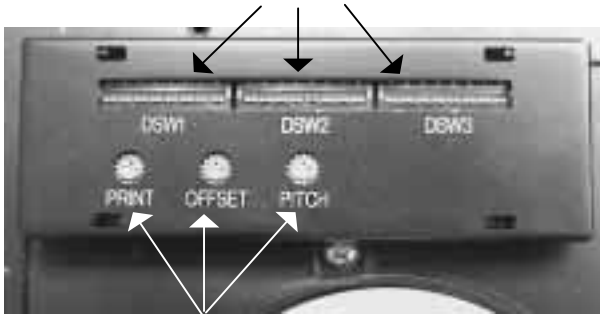
OPERATION PANEL

LCD Display	2 Line x 16 Character display
LABEL LED	Illuminated when label is out
RIBBON LED	Illuminated when ribbon is out
ERROR LED	Illuminated when errors have occurred
ON-LINE LED	Illuminated when printer is On-Line
LINE KEY	Switches the printer On-Line or Off-Line. Can also be used as a Pause function key to stop label during the printing process.
FEED KEY	To feed one blank label

1-6 Dip Switch Panel

The DIP Switch panel is located inside the printer in the mechanical section above the unwind/rewind spindles and contains three 8-position DIP switches and three adjustment potentiometers. Adjustment procedures for these are listed in Section 2, Configuration.

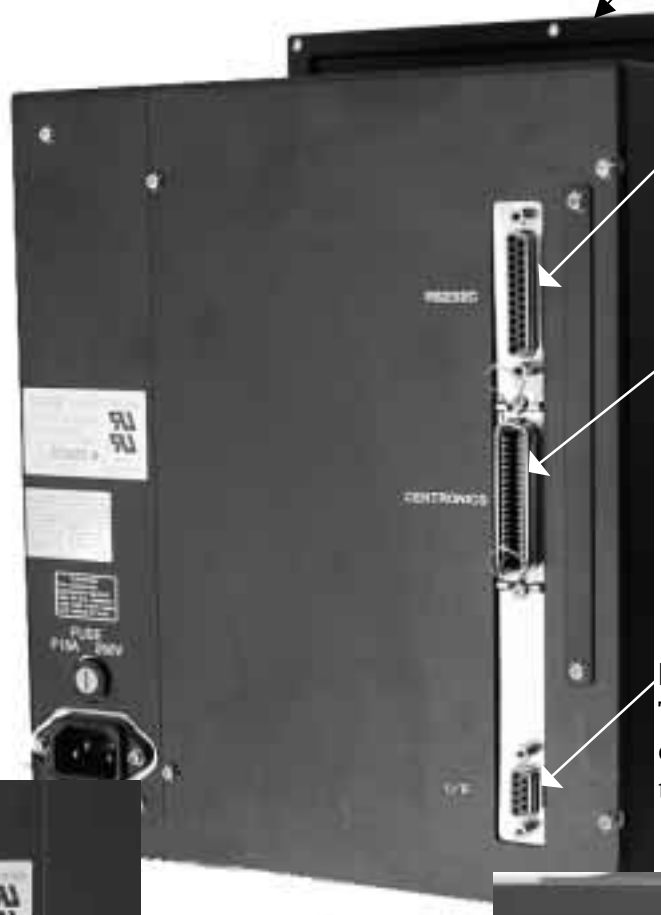
DIP SWITCHES



POTENTIOMETERS

Part 1

1-7 Input/Output Connections (Rear Panel)



SERVICE PANEL

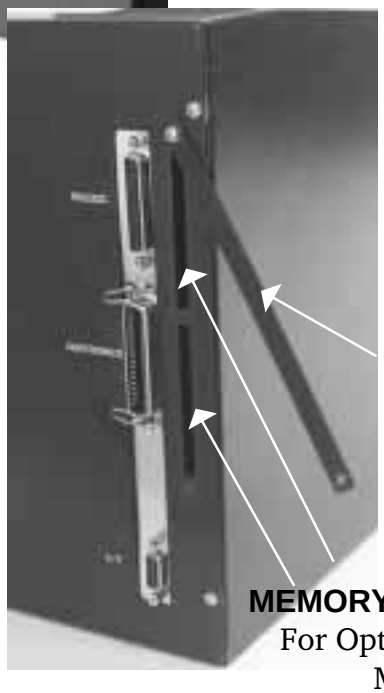
SERIAL I/F CONNECTOR
Connects to the RS-232C serial port of the host.

PARALLEL I/F CONNECTOR
Connects to the Centronics parallel port of the host.

EXT CONNECTOR
This is an external signal connector for interfacing with the label applicator system.

AC FUSE
To protect the printer from abnormal power input.
Type 15A/250V.

AC INPUT CONNECTOR
To input 115V 50/60 Hz. Use the power cable provided.



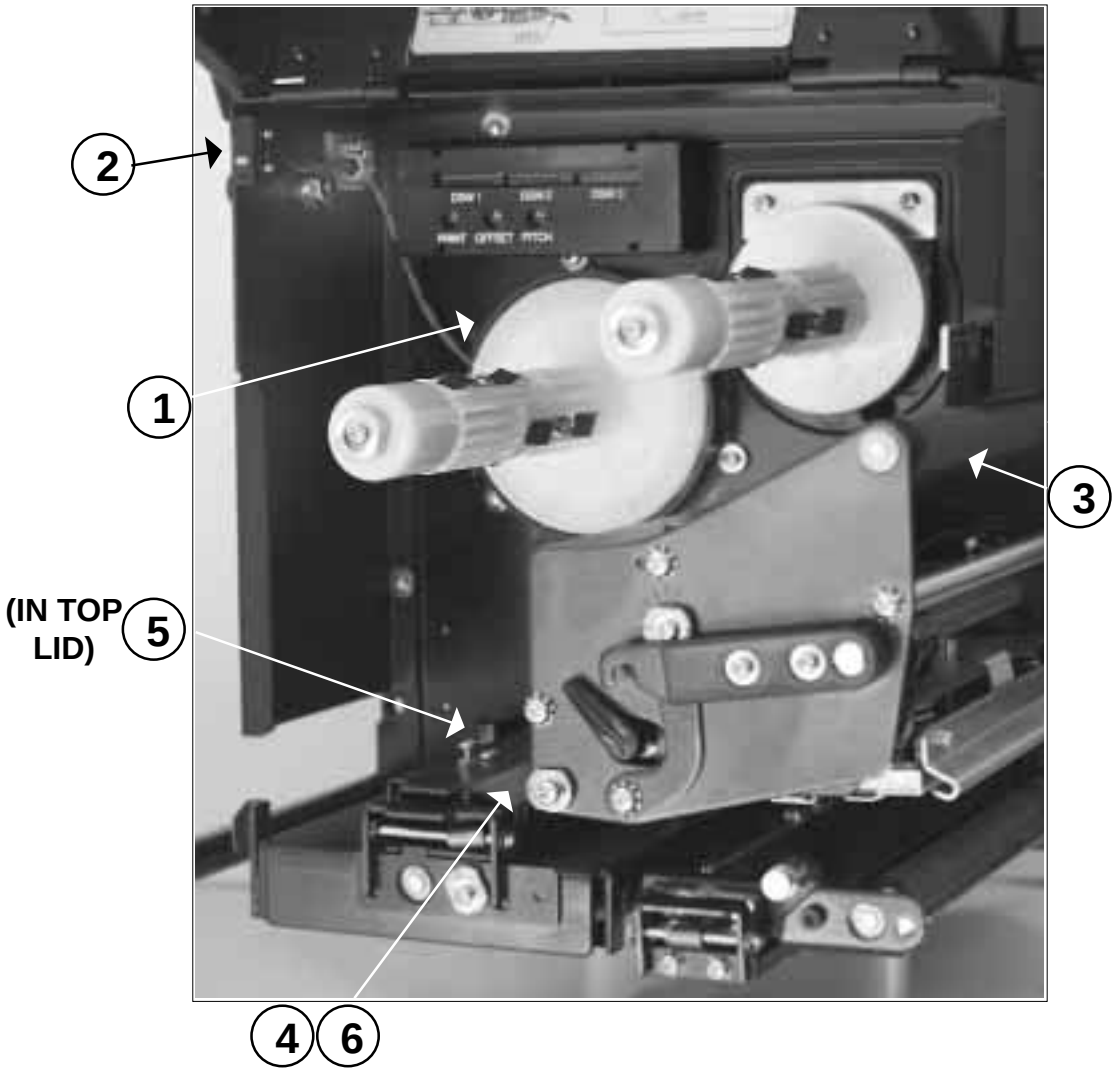
MEMORY CARD SLOT COVER

MEMORY CARD SLOTS
For Optional PCMCIA Memory

1-8 Switches and Sensors

The M-8485S/M-8490S printers contain six switches and sensors:

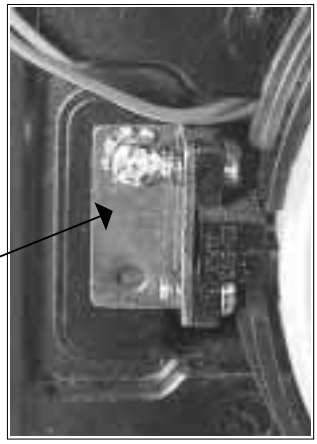
ITEM	DESCRIPTION	REFER SECTION
1	Ribbon Motion Sensor	Section 6-11
2	Cover Open Switch	Section 6-12
3	Head Open Switch	Section 6-13
4	Label Gap (Bot ½) & "Eye-Mark" Sensors	Section 6-14
5	Label Gap (Top ½)	Section 6-15
6	Label Out Sensor	Section 6-16



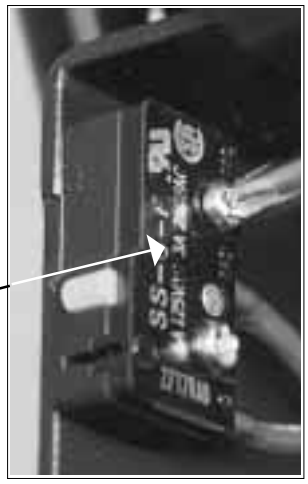
SENSORS AND SWITCHES

Part 1

1-8 Switches and Sensors (Cont.)



1



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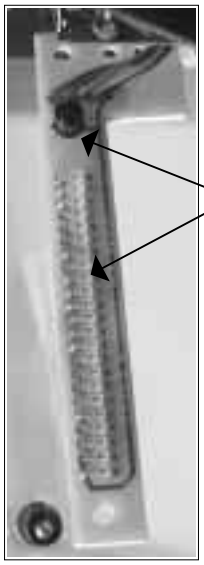

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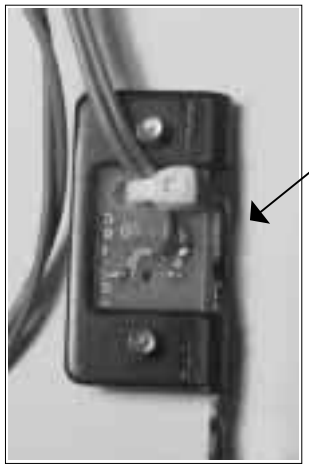
"Eye-MARK" LABEL GAP BOTTOM 1/2



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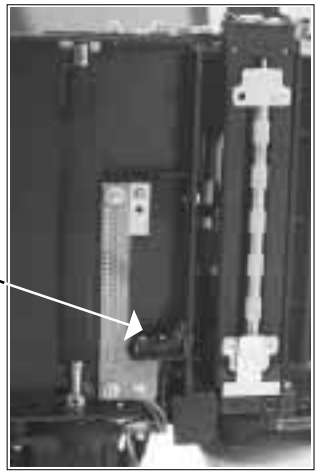
LABEL GAP TOP 1/2



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1-9 Ribbon

Use only SATO thermal transfer ribbons which were formulated expressly for use in all SATO printers. Use of other than approved ribbons may result in unsatisfactory print quality and/or damage to the print head and may void your warranty.

1-10 Installation Considerations

Printer operation can be affected by the printer environment. The location of the printer should be free from dust, humidity and sudden vibrations. To obtain optimum results from the printer module, avoid locations influenced by:

- Direct or bright sunlight since bright light will make the label sensor less responsive and may cause the label to be sensed incorrectly.
- Excessive warm or cold temperatures can cause electrical problems within the printer. (See Section 3 - Specifications).

POWER REQUIREMENTS	
Voltage	100-115V (+/- 10%) 220V (+/- 10%) 50/60 Hz (+/- 1%)
Power Consumption	50W Idle 700W Operating

1-11 Print

SPECIFICATION	M-8485S	M-8490S
PRINT		
Method	Direct or Thermal Transfer	
Speed (User Selectable)	4 to 10 ips 100 to 250 mm/s	4 to 8 ips 100 to 200 mm/s
Print Module (Dot Size)	.0049 in. .125 mm	.0033 in. .083 mm
Resolution	203 dpi 8 dpmm	305 dpi. 12 dpmm
Maximum Print Width	5.0 inches 128 mm	4.4 inches 112 mm
Maximum Print Length	14 inches 356 mm	14 inches 356 mm
Maximum Print Length with 2MB Memory Card	49.2 in. 1249 mm	32.8 in. 833 mm

Part 1

1-12 Media , Sensing and Ribbons

SPECIFICATION	M-8485S/M8490S
MEDIA	
Minimum Width	1.0 in. (25 mm)
Minimum Length	.25 in. (6 mm) Labels
Maximum Width	5.25 in. (134 mm)
Type	Die Cut Labels
Caliper (thickness)	.010 in. (.25 mm)
Max. Unwind torque	8.8 lbs (4 Kg) with 5 in wide labels
SENSING	
See-Thru for labels	Adjustable
Reflective “Eye-Mark”	Fixed
RIBBON	
Maximum Width	5.25 in. (134 mm)
Length	1968 ft. (600 M)
Wind	Ink-In
Thickness	4.5 micron, Face in Wind

1-13 Controls and Signals, Adjustments

SPECIFICATION	M-8485S/M-8490S
On-Line	LED
Power	LED
Label	LED
Ribbon	LED
Error	LED
LCD Panel	2 Line x 16 Character
Label Feed Switch	Front Panel
On/Off Switch	Front Panel
Power On/Off Switch	Front Panel

POTENTIOMETER ADJUSTMENTS	
Print Darkness	Inside Panel
Pitch	Inside Panel
Offset	Inside Panel
Display	Front Panel

1-14 Interface Connections

INTERFACE CONNECTIONS	
Parallel (AMP 36 pin)	Centronics Compatible
Serial (DB25S)	RS232C (2400 to 19.2K bps)
Serial Protocol	Hardware Flow Control (Ready/Busy) Software Flow Control (X-On/X-Off) Bi-directional (ENQ/Response)
Data Transmission	ASCII Format

1-15 Processing

SPECIFICATION	M-8485S/M-8490S
PROCESSING	
CPU	32 BIT RISC
ROM	1 MByte
DRAM	2 MByte

1-16 Character Fonts

SPECIFICATION	M-8485S/M-8490S
MATRIX FONTS	
U Font	(5 dots W x 9 dots H) Helvetica
S Font	(8 dots W x 15 dots H) Univers Condensed Bold
M Font	(13 dots W x 20 dots H) Univers Condensed Bold
XU Font	(5 dots W x 9 dots H) Helvetica

1-16 Character Fonts (Cont)

SPECIFICATION	M-8485S/M-8490S	
MATRIX FONTS		
XS Font	(17 dots W x 17 dots H) Univers Condensed Bold	
XM Font	(24 dots W x 24 dots H) Univers Condensed Bold	
OA Font	(15 dots W x 22 dots H) OCR-A	(22 dots W x 33 dots H) OCR-A
OB Font	(20 dots W x 24 dots H) OCR-B	(30 dots W x 36 dots H) OCR-B
AUTO SMOOTHING FONTS		
WB Font	(18 dots W x 30 dots H)	
WL Font	(28 dots W x 52 dots H)	
XB Font	(48 dots W x 48 dots H) Univers Condensed Bold	
XL Font	(48 dots W x 48 dots H) Sans Serif	
VECTOR FONT		
	Proportional or Fixed Spacing Font Size 50 x 50 dots to 999 x 999 dots 10 Font Variations	
DOWNLOADABLE FONTS		
	True TypeFonts with Optional Memory Card	
CHARACTER CONTROL		
	Expansion up to 12 x in either the X or Y coordinates Character Pitch control Line Space control Journal Print facility 0^0, 90^0 ,180^0 and 270^0 Rotation	

1-17 Bar Codes and Other Features

SPECIFICATION	M-8485S/M-8490S	
SYMBOLOGIES		
	Bookland (UPC/EAN Supplemental) EAN-8, EAN-13 CODABAR Code 39 Code 93 Code 128 Interleaved 2 of 5	Industrial 2 of 5 Matrix 2 of 5 MSI POSTNET UCC/EAN-128 UPC-A and UPC-E Data Matrix Maxicode PDF417
Ratios	1:2, 1:3, 2:5 User definable bar widths	
Bar Height	4 to 600 dots, User programmable	
Rotation	0^0, 90^0, 180^0 and 270^0	
OTHER FEATURES		
Sequential Numbering	Sequential numbering of both numerics and bar codes	
Custom Characters	RAM storage for special characters	
Graphics	Full dot addressable graphics, SATO Hex/Binary or .PCX formats	
Form Overlay	Form overlay for high-speed editing of complex formats	

1-18 Optional Accessories

ACCESSORY	M-8485S/M-8490S
Memory Expansion	Two slots for PCMCIA Memory Cards (up to 2MB each). Can be used for Graphic File storage, print buffer expansion, format storage and downloaded TrueType fonts.
Calendar	An internally mounted Date/Time clock that can be used to date/time stamp labels at the time of printing.
Face-Out Label Sensor	Top-mounted sensor for reflective “Eye-Marks” printed on the face of the label.

1-19 Environment & Approvals

ENVIRONMENTAL	
Operating Temperature	41^0 to 104^0F (5^0 to 40^0C)
Storage Temperature	-0^0 to 104^0F (-20^0 to 40^0C)
Operating Humidity	15-85 % RH, non-condensing
Storage Humidity	Max 90% RH, non-condensing
Electrostatic Discharge	8KV
REGULATORY APPROVALS	
Safety	UL, CSA
RFI/EMI	FCC Class A

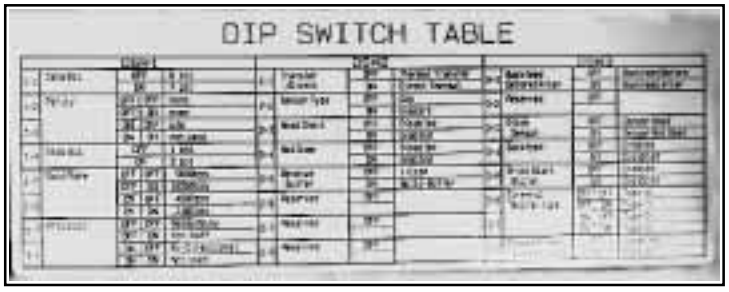
Configuration

2-1 Dip Switch Settings

Three DIP switches DSW1, DSW2, and DSW3 are located in the mechanical section of the printer and is accessed through the front door. These switches can be used to set:

- RS232C TRANSMIT/RECEIVE PARAMETERS
- THERMAL TRANSFER OR DIRECT THERMAL MODE
- LABEL SENSOR ENABLE/DISABLE
- HEAD CHECK MODE
- HEX DUMP MODE
- RECEIVE BUFFER SIZE
- OPERATION MODE

DIP Switch Panel



DIP SWITCH TABLE IS LOCATED ON BACK SIDE OF FRONT DOOR

Part 1

2-1 Dip Switch Settings (Cont.)

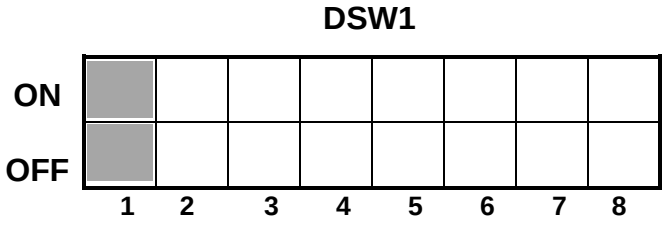
Each switch is an eight position "toggle" switch. The ON position is always to the top. To set the switches, first power the unit Off, then position the DIP switches. After placing the switches in the desired positions, power the printer back on. The switch settings are read by the printer electronics during the power up sequence. They will not become effective until the power is cycled.

RS232 Transmit/Receive Setting

Data Bit Selection (DSW1-1)

This switch sets the printer to receive either 7 or 8 bit data bits for each byte transmitted.

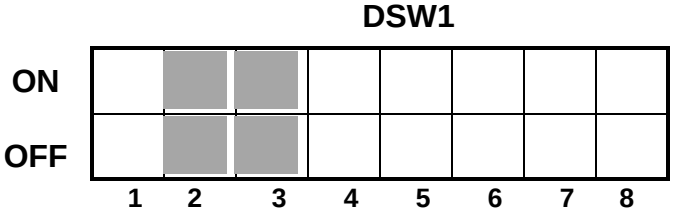
DSW1-1	SETTING
OFF	8 Data Bits
ON	7 Data Bits



Parity Selection (DSW1-2, DSW1-3)

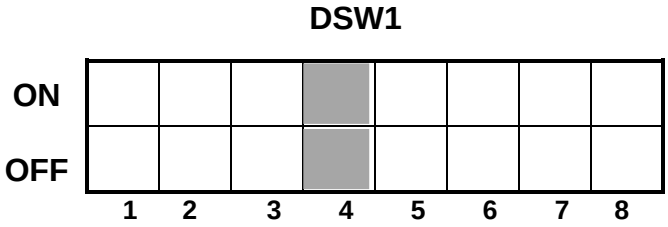
These switches select the type of parity used for error detection.

DSW1-2	DSW1-3	SETTING
OFF	OFF	No Parity
OFF	ON	Even
ON	OFF	Odd
ON	ON	Not Used



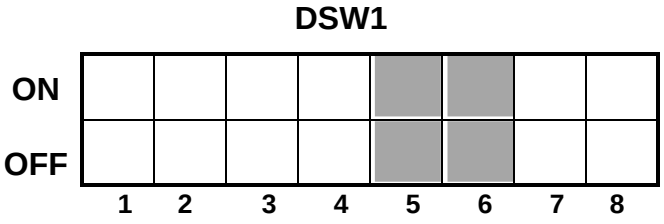
Stop Bit Selection (DSW1-4)
Selects the number of stop bits to end each byte transmission.

DSW1-4	SETTING
OFF	1 Stop Bit
ON	2 Stop Bits



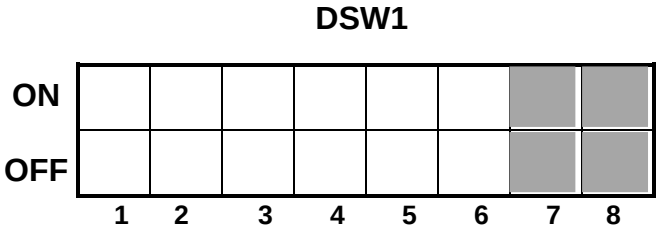
Baud Rate Selection (DSW1-5, DSW1-6)
Selects the data rate (bps) for the RS232 port.

DSW1-5	DSW1-6	SETTING
OFF	OFF	9600
OFF	ON	19200
ON	OFF	4800
ON	ON	2400



Protocol Selection (DSW1-7, DSW1-8)
Selects the flow control and status reporting protocols.

DSW1-7	DSW1-8	SETTING
OFF	OFF	Rdy/Bsy
OFF	ON	Xon/XOff
ON	OFF	Bi-Com
ON	ON	Not Used



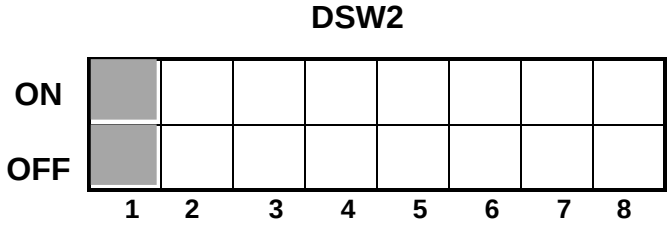
Part 1

Printer Set Up

Print Mode Selection (DSW2-1)

Selects between direct thermal printing on thermally sensitive paper and thermal transfer printing using a ribbon.

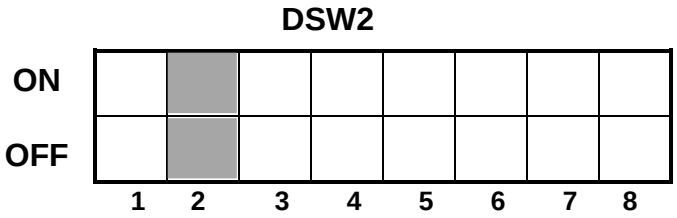
DSW2-1	SETTING
OFF	Therm Xfr
ON	Direct Therm



Sensor Type Selection (DSW2-2)

Selects between the use of a label gap or a reflective "Eye-Mark" detector.

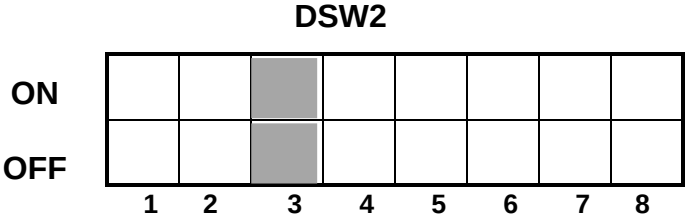
DSW2-2	SETTING
OFF	Gap
ON	"Eye-Mark"



Head Check Selection (DSW2-3)

When selected, the printer will check for head elements that are electrically malfunctioning.

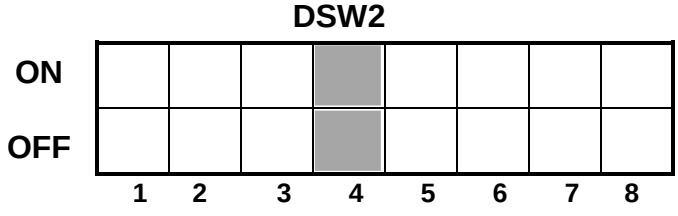
DSW2-3	SETTING
OFF	Disabled
ON	Enabled



Hex Dump Selection (DSW2-4)

Selects Hex Dump mode. Refer to Section 8-8.

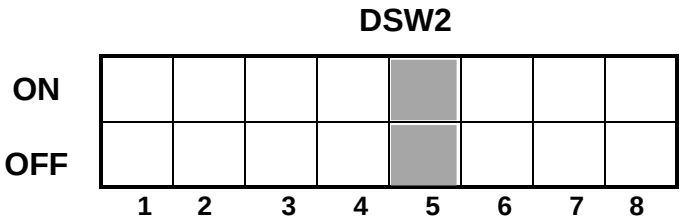
DSW2-4	SETTING
OFF	Disabled
ON	Enabled



Receive Buffer Selection (DSW2-5)

Selects the operating mode of the receive buffer.

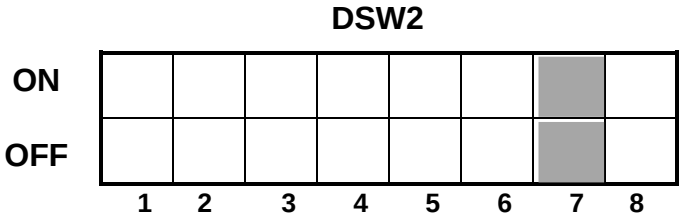
DSW2-5	SETTING
OFF	Single Job
ON	Multi Job



Protocol Control Code Selection (DSW2-7)

Selects the command codes used for protocol control.

DSW2-7	SETTING
OFF	Standard
ON	Non-Std.



Reserved for Future Use (DSW2-6, DSW3-2)

NOTE: The Centronics (Parallel) communications port is always enabled regardless of the settings for the RS232 port. There are no settings for Centronics. Both the Centronics and the RS232 ports are active at all times. Care should be taken to ensure that data is not transmitted to both ports simultaneously as the received message will be corrupted.

Selecting Protocol Control Codes

Protocol control codes are the special control characters that prepare the printer to receive instructions. For example, the **<ESC>** character tells the printer that a command code will follow and the **<ENQ>** character asks for the printer status.

There are two pre-defined sets of Protocol Control codes to choose from. Each set is made up of six special characters. The ***Standard Protocol Control*** codes are non-printable characters, and the ***Non-Standard Protocol Control*** codes are printable characters. The Non-Standard set may be useful on host computers using protocol converters or in an application where non-printable ASCII characters cannot be sent from the host. This manual uses the Standard Protocol Control codes for all of the examples. Alternately, the user may define and download a set of custom Protocol Control Codes.

Note: If the data being sent to the printer is "Standard" and the printer is set to "Non-Standard" the printer will do nothing.

The Protocol Control codes are selected by a DIP switch DSW2-7 on the front panel.

Part 1

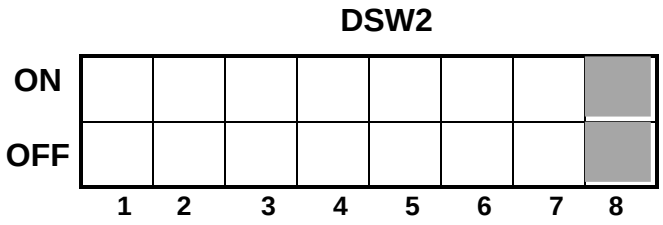
Selecting Protocol Control Codes (Cont.)

CONTROL CHARACTER	STANDARD DSW2-7 OFF	NON-STANDARD DSW2-7 ON	DESCRIPTION
STX	02 Hex	7B Hex = {	Start of Data
ETX	03 Hex	7D Hex = }	End of Data
ESC	1B Hex	5E Hex = ^	Command code to follow
Null	00 Hex	7E Hex = ~	Cutter command
ENQ	05 Hex	40 Hex = @	Get printer status, Bi-Com mode
Can	18 Hex	21 Hex = !	Cancel print job, Bi Com mode
Off-Line	40 Hex	5D Hex =]	Take printer Off-Line

M8400 Emulation Mode (DSW2-8)

For emulating M8400 software. Should be used only if problems are encountered when using existing M8400 software. Note: This setting is not valid for the M-8490S.

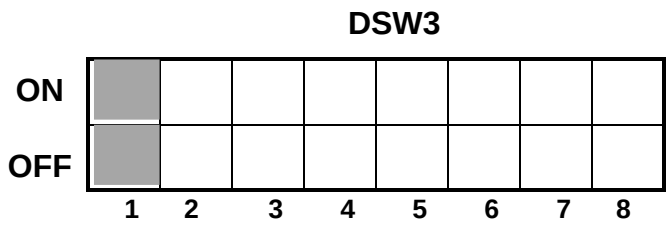
DSW2-8	SETTING
OFF	Disabled
ON	Enabled



Backfeed Selection (DSW3-1)

Backfeed is used to correctly position the label for application and then retract the next label to the proper print position. This operation can be performed immediately after a label is printed or immediately prior to the printing of the next label.

DSW3-1	SETTING
OFF	Backfeed before print
ON	Backfeed after print



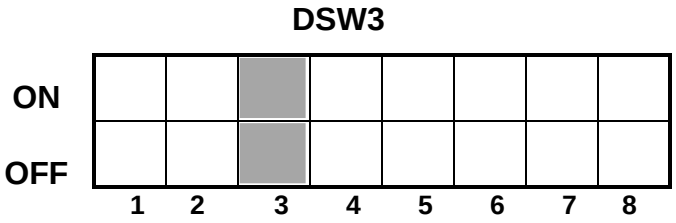
Reserved for Future Use (DSW2-6, DSW3-2)

NOTE: The Centronics (Parallel) communications port is always enabled regardless of the settings for the RS232 port. There are no settings for Centronics. Both the Centronics and the RS232 ports are active at all times. Care should be taken to ensure that data is not transmitted to both ports simultaneously as the received message will be corrupted.

Label Sensor Selection (DSW3-3)

Enables or disables the Label Sensor. If the Sensor is enabled, it will detect the edge of the label and position it automatically. If it is disabled, the positioning must be under software control using Line Feed commands.

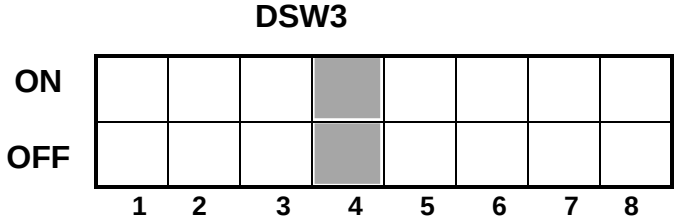
DSW3-3	SETTING
OFF	Sensor Used
ON	Sensor Not Used



Back Feed Selection (DSW3-4)

When Back-Feed is enabled, the printer will position the last printed label for dispensing and retract it to the correct print position before printing the next label. The amount of backfeed offset is adjustable.

DSW3-4	SETTING
OFF	Enabled
ON	Disabled



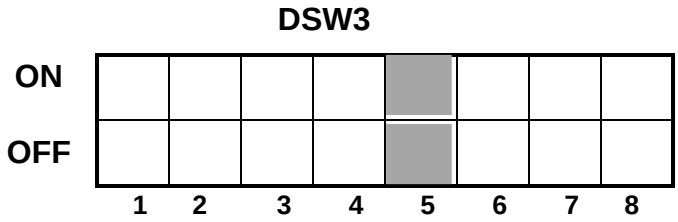
External Signal Interface

The EXT connector on the printer rear panel is intended for use with the external printer accessories such as label rewinders or applicators. The DB-9S type connector provides a choice of four different output signals along with various error conditions.

EXT Print Start Signal Selection (DSW3-5)

Allows an external device to initiate a label print for synchronization with the applicator.

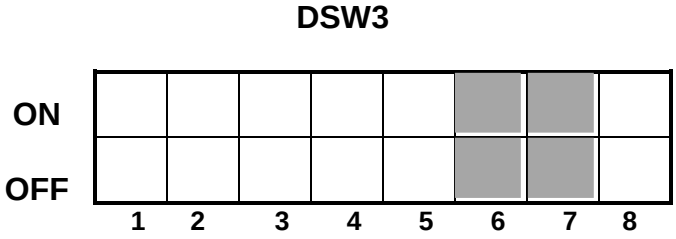
DSW3-5	SETTING
OFF	Enabled
ON	Disabled



External Signal Type Selection (DSW3-6, DSW3-7)

Both the polarity and signal type (level or pulse) of the external print synchronizing signal can be selected. See Section 3-6 for a description of signal types.

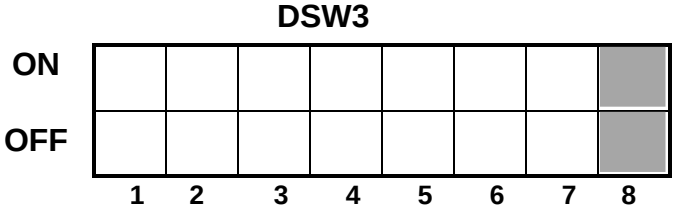
DSW3-6	DSW3-7	SETTING
Off	Off	Type 4
Off	On	Type 3
On	Off	Type 2
On	On	Type 1



Repeat Print via External Signal (DSW3-8)

Allows the applicator to reprint the current label in the print buffer.

DSW3-8	SETTING
OFF	Disabled
ON	Enabled



> ***Note:*** *The DIP Switch functions listed incorporate the latest firmware revisions at the time of printing.*

2-2 Default Settings

Switch Selections

All switches are placed in the ***Off*** position (default) for shipping. This will result in the following operating configuration:

Communications: 8 data bits, no parity, 1 Stop bit, 9600 Baud
Protocol: Ready/Busy
Sensor: Gap Sensor
Receive Buffer: Single Job
Mode: Batch/continuous
Label Sensor: Sensor Used
Back feed: Disabled
External Signals: Disabled

Software Default Settings

The printer stores the software settings upon receipt and uses them until they are again changed by receipt of a command containing a new setting. These settings are stored in non-volatile RAM and are not affected by powering the printer off. The printer may be reset to use the default software settings by depressing the **LINE** and **FEED** keys simultaneously while powering the printer on. This will result in the following default configuration:

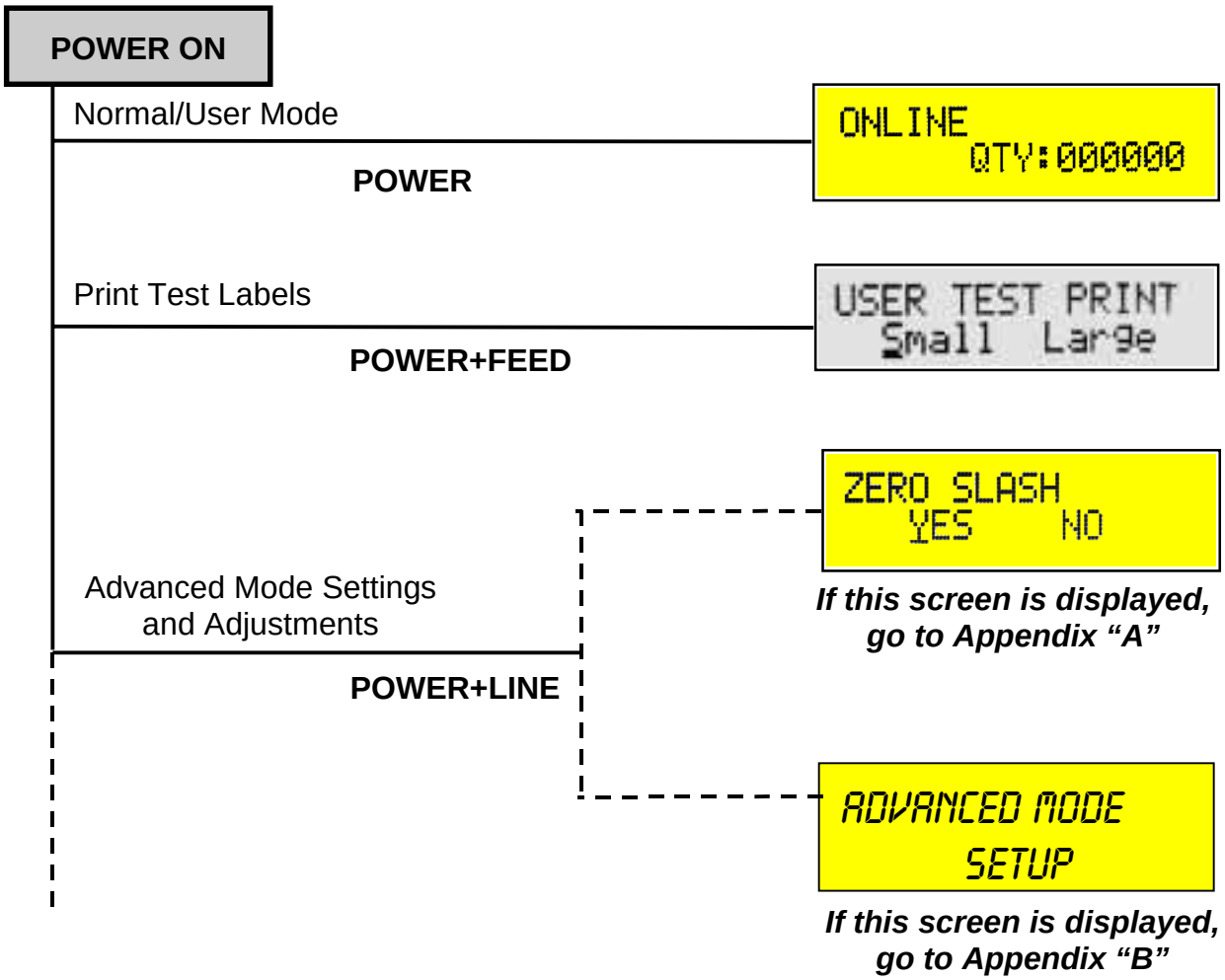
	M-8485S	M-8490S
Print Darkness	2	2
Print Speed	6 inches per second	6 inches per second
Print Reference	Vertical = 0001, Horizontal = 0001	
Zero	Slash	
Auto On Line	Enabled	

Once the default operation is completed, a "SATO DEFAULT COMPLETED" message will be displayed on the LCD panel and a single audible signal will be heard. The printer should be powered off while this message is being displayed. This saves the default settings in the EEPROM where they will be automatically loaded the next time the printer is powered on.

Printer Adjustments (Refer to Appendix "A" or Appendix "B")

Part 1

The LCD Panel is used in conjunction with the ***LINE*** and ***FEED*** switches by the operator to manually enter printer configuration settings. Many of the settings can also be controlled via software commands and in the case of conflict between software and control panel settings, the printer will always use the last valid setting.



Section

3

Part 1

Interface Specifications

3-1 Overview

This section explains the interface specifications for the M-8485S and M-8490S printers. These specifications include detailed information on how to properly interface your printer with your host system and includes data about the following:

- INTERFACE TYPES
- USING THE RECEIVE BUFFER
- RS232C SERIAL INTERFACE
- CENTRONICS PARALLEL INTERFACE
- I/F CONNECTOR

3-2 Interface Types

In order to provide flexibility in communicating with a variety of host computer systems, the M-8485S and M-8490S printers can be configured for operation with either parallel or serial data transfers. Both a parallel Centronics and a serial RS232 interface are supplied with the standard printer.

The Centronics Parallel interface will probably be the most useful in communicating with IBM PCs and compatibles. The RS232C Serial interface allows connectivity to a number of other hosts. For instructions on how to properly configure the printer for either of these interface types, see the printer configuration instructions in Section 2 of this manual.

NOTE: Both the Centronics and RS232C interfaces are active at the same time, i.e. data can be received on either one, however no provision is made for port contention. If data is transmitted to both ports simultaneously, it will cause the data in the receive buffer to be corrupted.

WARNING: Never connect or disconnect interface cables or use a switch box with power applied to either the host or the printer. This may cause damage to the interface circuitry in the printer/host and is not covered by warranty.

Part 1

3-3 The Receive Buffer

The M-8485S and M-8490S printers have the ability to receive a data stream from the host in one of two ways. The receive buffer may be configured to accept one print job at a time or multiple print jobs. The single job print buffer is generally used by software programs that wish to maintain control of the job print queue so that it can move a high priority job in front of ones of lesser importance. The multiple job buffer, on the other hand prints all jobs in the order they are received by the printer, and the order of printing cannot be changed.

Single Job Buffer

The printer receives and prints one job at a time. Each job must not exceed 64 K bytes.

Multi Job Buffer

The printer is able to continuously receive print jobs, compiling and printing other jobs at the same time. It acts much like a "print buffer" to maximize the performance of the host and the printer. The Multi Job Buffer mode is selected with DSW2-5. When using the RS232 Serial interface, the Multi Job Buffer uses either the **Ready/Busy** with **DTR** (pin 20) or **X-On/X-Off** flow control protocols. See these sections for more details. With an empty receiving buffer, the status of **DTR** is "high" (or an **X-On** status if using **X-On/X-Off**), meaning the printer is ready to receive data. When the receive buffer is holding 62K bytes of data (2K bytes from being full), **DTR** will go "low" (or an **X-Off** is sent) indicating the printer can no longer receive data. This condition is called "Buffer Near Full". See Figure 3-1.

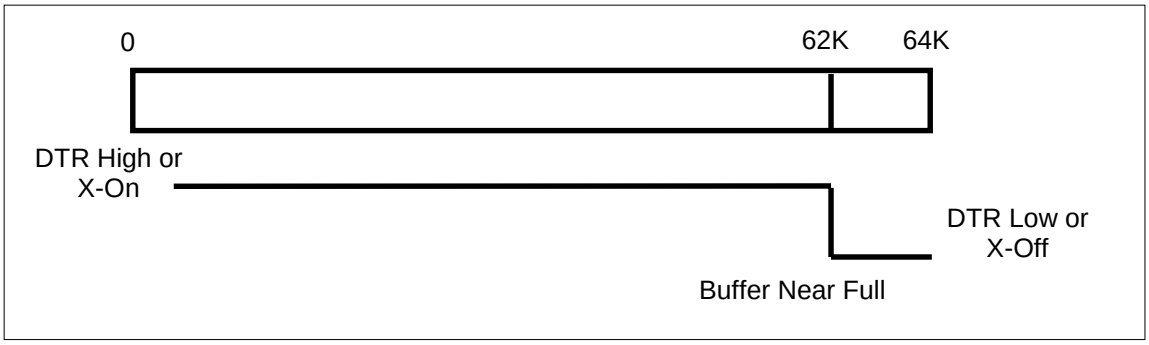


Fig. 3-1

Multi Job Buffer (Cont.)

The receiving buffer will not be able to receive more data again until a "Buffer Available" condition occurs. This takes place when the receiving buffer has emptied so that only 56K bytes of data are being held (8K bytes from being full). At this time, **DTR** will go "high" or an **X-On** is sent to tell the host that it can again receive data. See Figure 3-2.

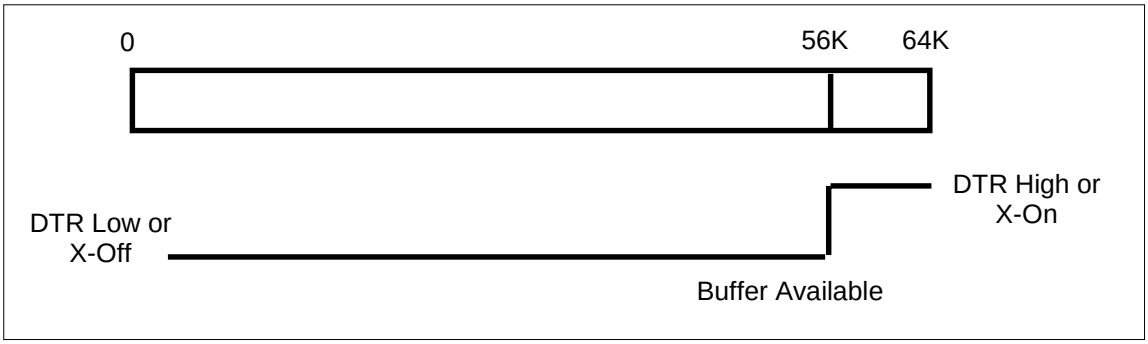


Fig. 3-2

All printer error conditions (i.e., label out, ribbon out) will cause the printer to go busy (**DTR** "low" or **X-Off**) until the problem is corrected and the printer is placed on-line. The printer will also be busy if taken off-line from the front panel.

Part 1

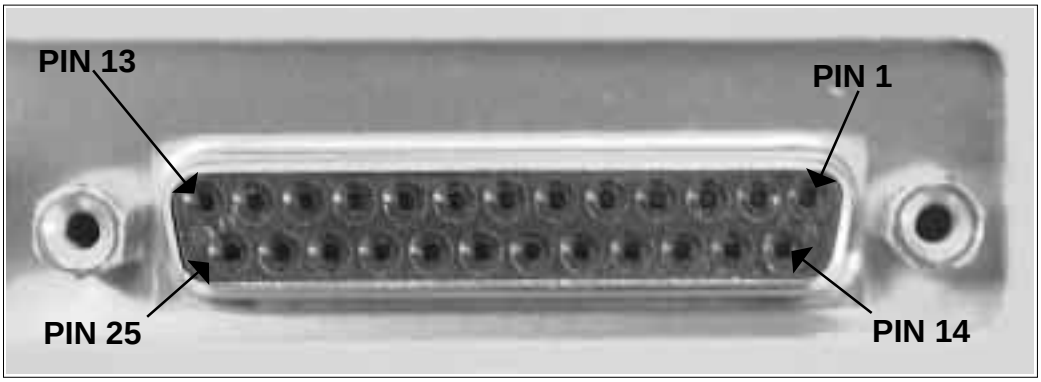
3-4 RS232C Serial Interface

General Specifications

Asynchronous ASCII	Half-duplex communication. Ready/Busy Hardware Flow Control Pin 20, DTR Control Pin 4, RTS Error Condition X-On/X-Off Software Flow Control. Bi-Directional communication (ENQ/Response)
Data Transmission Rate	2400, 4800, 9600 and 19200 bps
Character Format	1 Start Bit (fixed) 7 or 8 data bits (selectable) Odd, Even or No Parity (selectable) 1 or 2 Stop bits (selectable)

Electrical Specifications

Connector	DB-25S (Female)



Cable	DB-25P (Male), 50 ft. maximum length. For cable configuration, refer to cable requirements appropriate to the RS232C protocol chosen.
Signal Levels	High = +5V to +12V Low = -5V to -12V

3-4 RS232C Serial Interface (Cont.)

Pin Assignments

RS232C Interface Signals

PIN	DIRECTION	SIGNAL DESCRIPTION
1	Reference	FG (Frame Ground)
2	To Host	TD (Transmit Data) - Data from the printer to the host computer. Sends X-On/X-Off characters or status data (Bi-Directional protocol).
3	To Printer	RD (Receive Data) - Data to the printer from the host computer.
4	To Host	RTS (Request to Send) Used with Ready/Busy flow control to indicate an error condition. RTS is high and remains high unless the print head is open, (in this case, RTS would return to the high state after the print head is closed and the printer is placed back on-line) or an error condition occurs during printing (e.g., ribbon out, label out).
5	To Printer	CTS (Clear to Send) - When this line is high, the printer assumes that data is ready to be transmitted. The printer will not receive data when this line is low. If this line is not being used, it should be tied high (to pin 4).
6	To Printer	DSR (Data Set Ready) - When this line is high, the printer will be ready to receive data. This line must be high before data is transmitted. If this line is not being used, it should be tied high (to pin 20).
7	Reference	SG (Signal Ground).
20	To Host	DTR (Data Terminal Ready) - This signal applies to Ready/Busy flow control. The printer is ready to receive data when this pin is high. It goes low when the printer is off-line, either manually or due to an error condition, and while printing in the Single Job Buffer mode. It will also go low when the data in the buffer reaches the Buffer Near Full level.

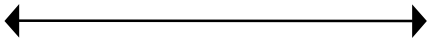
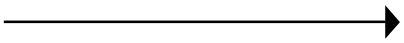
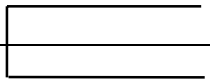
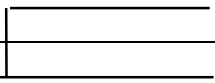
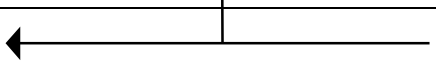
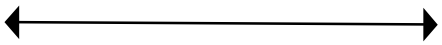
Part 1

3-4 RS232C Serial Interface (Cont.)

Ready/Busy Flow Control

Ready/Busy is the hardware flow control for the serial interface on the printer. By raising/lowering the voltage level on Pin 20 of the RS232 port, the printer notifies the host when it is ready to receive data. Pin 4 (RTS) and Pin 20 (DTR) are the important signals on the printer for this method of flow control. The host must be capable of supporting this flow control method for it to function properly.

Cable Requirements

HOST	INTERCONNECTION	PRINTER
FG		1 FG (Frame Ground)
TD		3 RD (Receive Data)
		4 RTS (Request to Send)
		5 CTS (Clear to Send)
		6 DSR (Data Set Ready)
*		20 DTR (Data Terminal Ready)
SG		7 SG (Signal Ground)

* This connection at the host side of the interface would depend upon the pin that is being used as the Ready/Busy signal by the driving software. Typically on a PC, it would be either CTS (pin 5) or DSR (pin 6) on a DB-25 connector.

3-4 RS232C Serial Interface (Cont.)

X-On/X-Off Flow Control

X-On/X-Off flow control must be used whenever hardware (Ready/Busy) flow control is not available or desirable. Instead of a voltage going high/low at pin 20, control characters representing "Printer Ready" (X-On = 11 hexadecimal) or "Printer Busy" (X-Off = 13 hexadecimal) are transmitted by the printer on pin 2 (Transmit Data) to the host. In order for this method of flow control to function correctly, the host must be capable of supporting it. **X-On/X-Off** operates in a manner similar to the function of pin 20 (**DTR**) as previously explained. When the printer is first powered on and goes on-line, an **X-On** is sent out. In the Single Job Buffer mode, when the printer receives a print job, it transmits an **X-Off** and begins printing. When it is done printing, it transmits an **X-On**. In the Multi Job Buffer mode, the printer sends an **X-Off** when the "Buffer Near Full" level is reached and a **X-On** when the data level of the buffer drops below the "Buffer Available" mark. When the printer is taken off-line manually, it transmits an **X-Off** indicating it cannot accept data. When it is placed back on line manually, it sends an **X-On**, indicating it is again available for receipt of data. If an error occurs during printing (paper out, ribbon out), the printer sends nothing in the Single Job Buffer mode since the last character transmitted was an **X-Off**. When the error is cleared and the printer resumes printing, no **X-On** is sent until the current job is completed and the printer is once again read to receive the next job. If it is in the Multi Job Buffer mode, it sends an **X-Off** as soon as an error condition is detected. When the error is cleared and the printer is placed back on-line, it transmits an **X-On** indicating it is again ready to accept data.

Upon power up, if no error conditions are present, the printer will continually send **X-On** characters at five millisecond intervals until it receives a transmission from the host.

Cable Requirements

HOST	INTERCONNECTION	PRINTER
FG	◄——————►	1 FG (Frame Ground)
RD	◄——————	2 TD (Transmit Data)
TD	——————►	3 RD (Receive Data)
	——┐	4 RTS (Request to Send)
	——┘	5 CTS (Clear to Send)
	——┐	6 DSR (Data Set Ready)
	——┘	20 DTR (Data Terminal Ready)
SG	◄——————►	7 SG (Signal Ground)

Part 1

3-4 RS232C Serial Interface (Cont.)

Bi-Directional Communications

This is a two-way communications protocol between the host computer and the printer, thus enabling the host to check printer status. When this protocol is selected, there is no busy signal from the printer (pin 20, **DTR**, is always high). The host must request the complete status from the printer, including ready/busy. Whenever the host requests printer status, it transmits an **ENQ** to the printer and the printer will respond with its status within five milliseconds. If printing, it will respond upon finishing the current label, then resume printing. In order for this protocol to work properly, pin 6 (**DTR**) and pin 5 (**CTS**) must be held high by the host. One way to ensure these pins are always in the correct state is to tie pin 20 (**DTR)** to pin 6 (**DSR**) and pin 4 (**RTS**) to pin 5 (**CTS**) at the printer end of the cable.

Cable Requirements

HOST	INTERCONNECTION	PRINTER
FG	◄——————►	1 FG (Frame Ground)
RD	◄——————	2 TD (Transmit Data)
TD	——————►	3 RD (Receive Data)
	┌————	4 RTS (Request to Send)
	┌————	5 CTS (Clear to Send)
	┌————	6 DSR (Data Set Ready)
	┌————	20 DTR (Data Terminal Ready)
SG	◄——————►	7 SG (Signal Ground)

If a **CAN** (18 hexadecimal) is received by the printer, it will cancel the current print job and clear all data from the receive buffer.

3-5 Centronics Parallel Interface

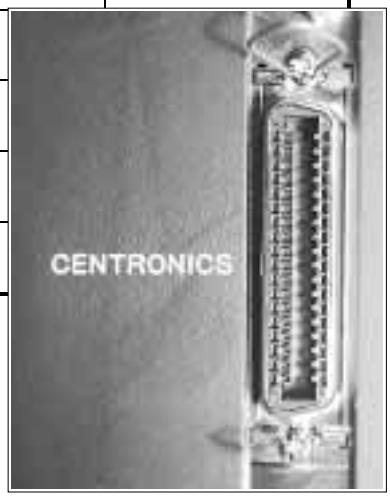
Electrical Specifications

Printer Connector	AMP 57-40360 (DDK) or equivalent
Cable Connector	AMP 57-30360 (DDK) or equivalent
Cable Length	10 ft. or less
Signal Level	High = +2.4V to +5.0V Low = 0V to -0.4V

3-5 Centronics Parallel Interface (Cont.)

Centronics Parallel Interface Pin Assignments

PIN	SIGNAL	DIRECTION	PIN	SIGNAL	DIRECTION
1	$\overline{\text{STROBE}}$	To Printer	19	STROBE Return	Reference
2	DATA 1	To Printer	20	DATA 1 Return	Reference
3	DATA 2	To Printer	21	DATA 2 Return	Reference
4	DATA 3	To Printer	22	DATA 3 Return	Reference
5	DATA 4	To Printer	23	DATA 4 Return	Reference
6	DATA 5	To Printer	24	DATA 5 Return	Reference
7	DATA 6	To Printer	25	DATA 6 Return	Reference
8	DATA 7	To Printer	26	DATA 7 Return	Reference
9	DATA 8	To Printer	27	DATA 8 Return	Reference
10	$\overline{\text{ACK}}$	To Printer	28	ACK Return	Reference
11	BUSY	To Host	29	BUSY Return	Reference
12	PTR ERROR	To Host	30	PE Return	Reference
13	SELECT	To Host	31		
14			32	$\overline{\text{FAULT}}$	To Host
15			33		
16			34		
17	FG	Frame Ground	35		
18	+5V (Z=24K ohm)		36		



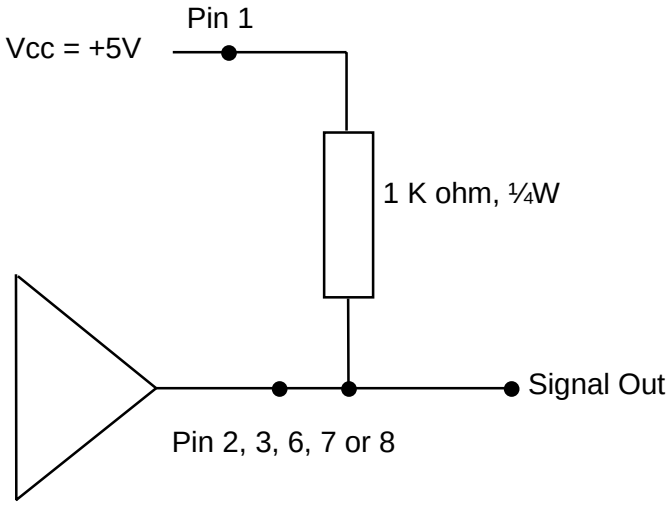
Part 1

3-6 I/F Connector

PIN Assignments

PIN	DIRECTION	SIGNAL DESCRIPTION
1	To Host	Vcc -+5V
2	To Host	Ribbon Near End - This pin goes high when the amount of ribbon on the unwind shaft is approximately 46 feet (14 m). The output will be low when the ribbon is completely out.
3	To Host	Error - This pin goes low when the printer detects an error condition such as head open or receiving buffer full.
4	To Printer	Reprint - The last label will be reprinted when this signal is received.
5	To Printer	Print Start - The printer will print one label when this pin is pulled to ground. This signal must be enabled by placing switch DSW3-5 on the Control Panel in the OFF position.
6	To Host	End Print - It is used to drive an applicator or other external device requiring synchronization with the print cycle. You may choose between four types of output signals using control panel DSW3-6 and DSW3-7 selections.
7	To Host	Label Out - This pin goes low (OV) when a label out error exists.
8	To Host	Ribbon Out - This pin goes low when the ribbon is out.
9	Reference	Signal Ground

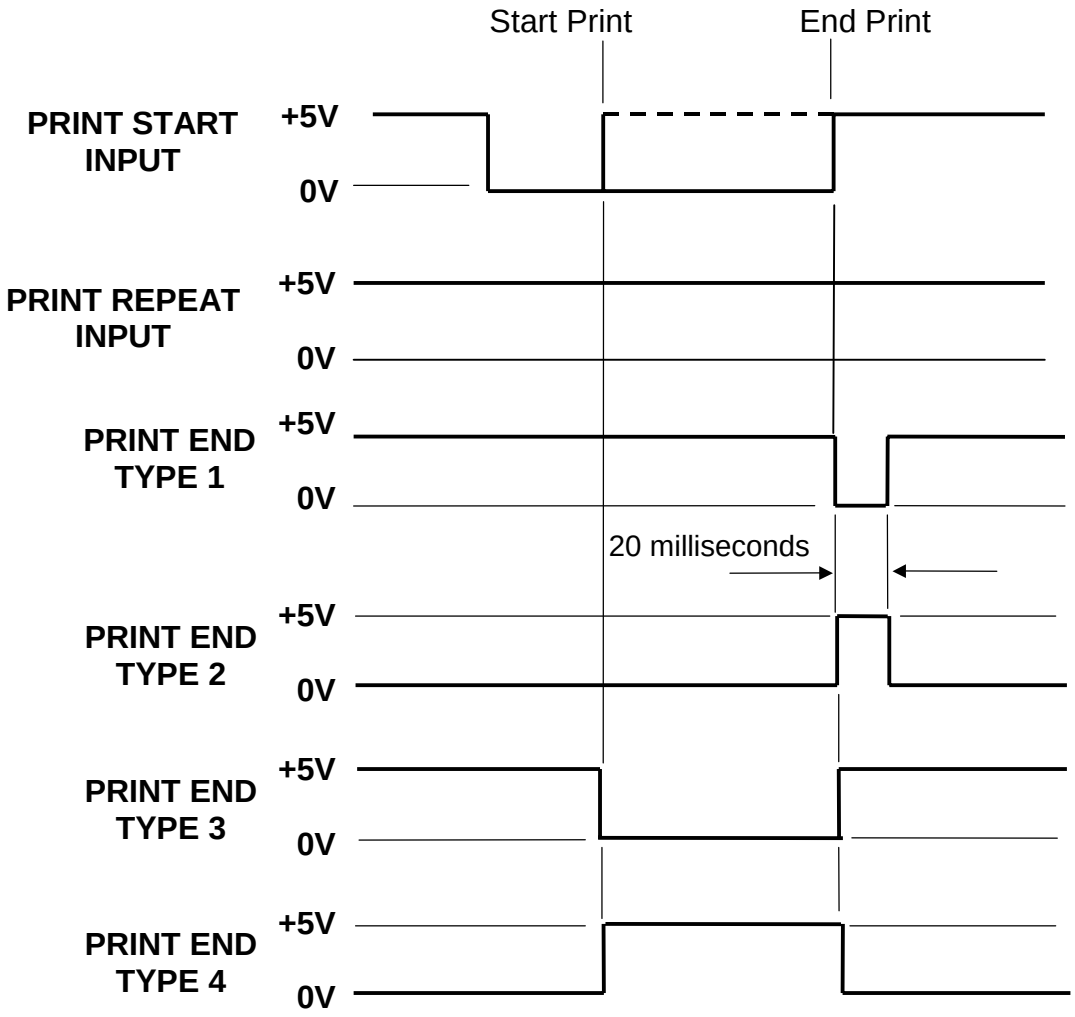
NOTE: The signals on pins 2, 3, 6, 7 and 8 each have an open collector output. These pins normally measure +.07V maximum when a true condition exists. If a false condition occurs, the voltage will drop to 0V. To achieve a signal level of +5V, you must add a 1K ohm, ¼ W pull-up resistor between the open collector output pin and Vcc (pin 1) as illustrated. This will provide a signal level of +5V for a true condition and 0V when a false condition exists. The maximum voltage that can be applied to these pins is +50V and the maximum current they can sink is 500 milliamps.



External Output Signal Types (Pin #6)

3-6 I/F Connector (Cont.)

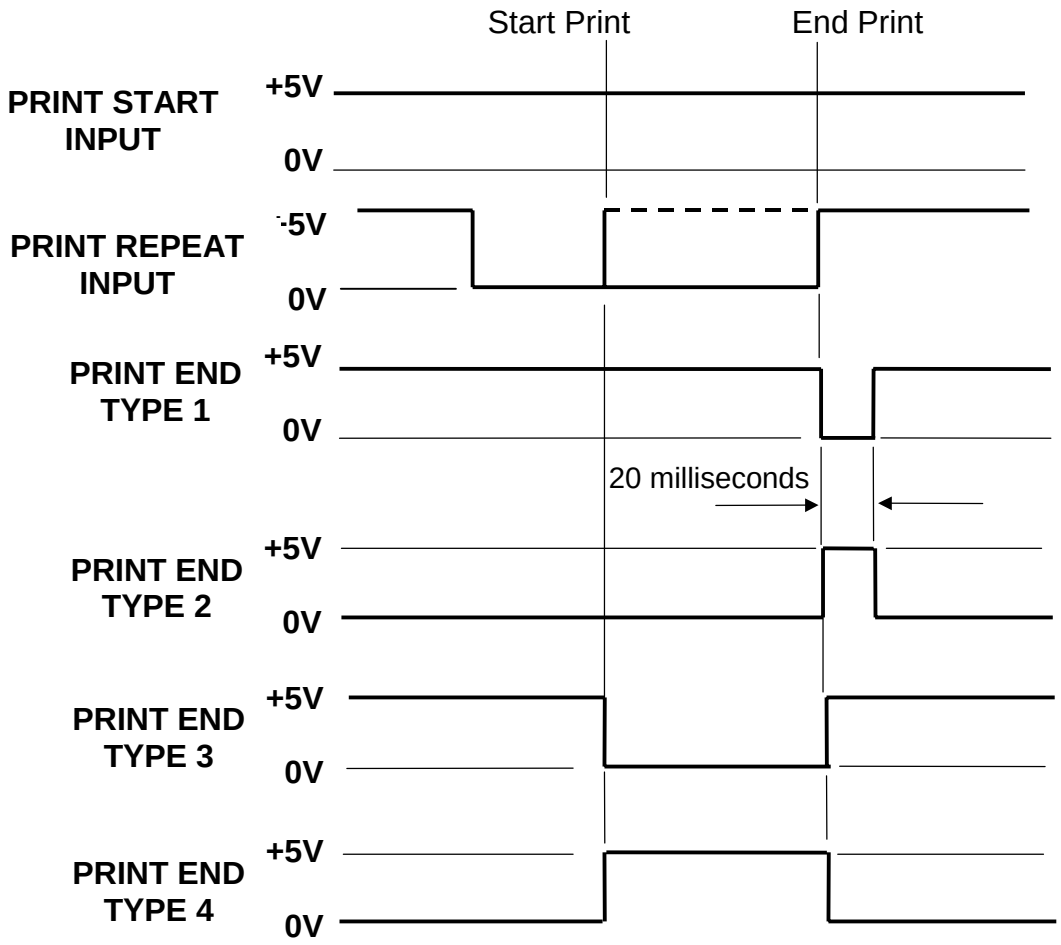
STANDARD OPERATION



Part 1

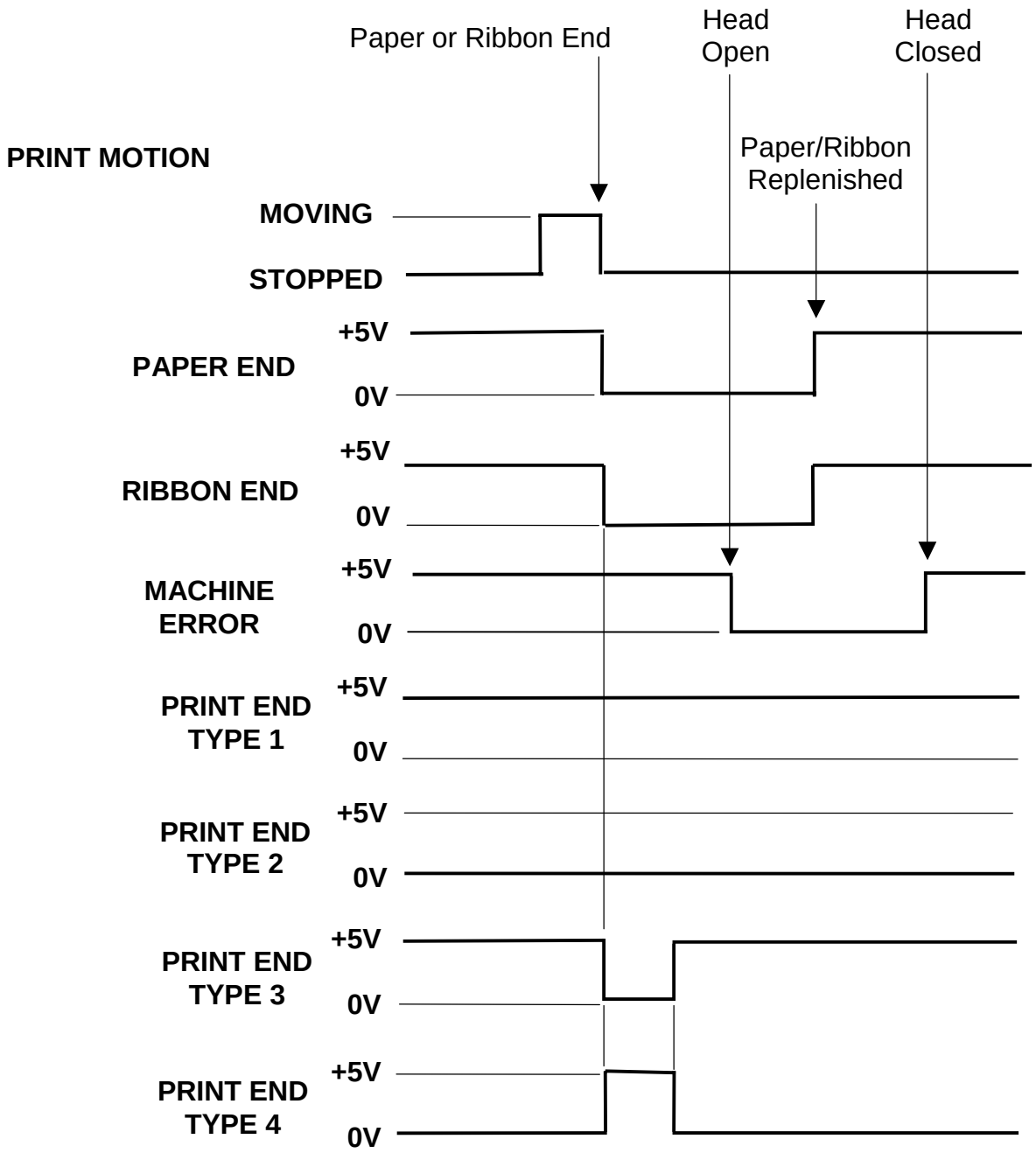
3-6 I/F Connector (Cont.)

REPEAT PRINT



3-6 I/F Connector (Cont.)

ERROR SIGNALS



Part 1

Section

4

Part 1

Electrical Checks and Adjustments

4-1 Overview

This chapter describes how to check M-8485S and M-8490S voltage levels and adjust threshold sensor voltages.

The M-8485S and M-8490S power supply converts 125 VAC into regulated DC voltages. The printer uses: +5V, +12V, -12V and +24V. These DC voltages are not adjustable, however you can measure these DC voltages at test points located on the PCB. If a voltage is out of specification, the power supply must be replaced. Section 4-2 contains procedures for measuring DC voltage levels. Power supply removal and replacement procedures are located in Section 6-4.

You can adjust threshold voltage levels for label sensors. These adjustments are made to allow for variations in the characteristics of the labels used with the printer. If you cannot calibrate the label sensor voltage level within the specified voltage range, you should reposition the label sensor by following the adjustment procedures included in this section. After completing the label sensor adjustment procedures, perform the label sensor voltage level adjustment procedure.

You can check or adjust:

- Power Supply
- Label Pitch Sensor
- Ribbon Sensor
- Pitch Offset Sensor

Part 1

4-2 Power Supply Checks

Required Equipment:	• DC Voltmeter • #2 Phillips Screwdriver

To check voltage levels, first check the Main fuses (6-3) and replace if necessary, then perform the following steps:

STEP	PROCEDURE
1.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to the main PCB. ***Fig. 4-1***
2.	Connect the printer AC power cord to a grounded AC outlet. Place the power switch in the OFF position.
3.	On the main circuit board attach the DC voltmeter negative lead to the test point labeled **CH1** (Ground) on the main circuit board. Attach the DC voltmeter positive lead to the corresponding voltage test point and place the power switch in the ON position. Refer to table ***Fig. 4-2, and 4-3***.
4.	Confirm voltages are correct. If not then replace power supply. Refer to Section 6-4.
5.	After performing tests, close the cabinet and replace locking screw.

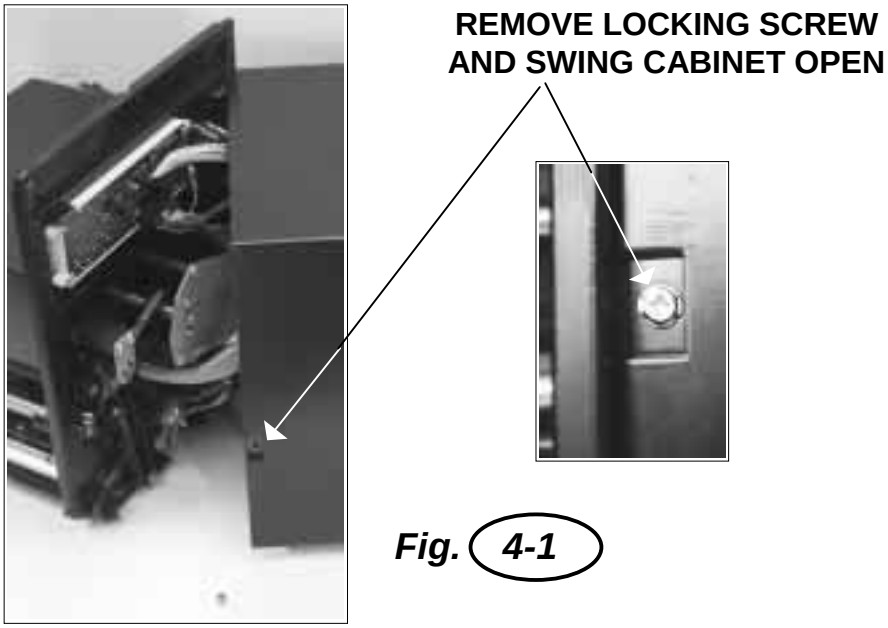


Fig. 4-1

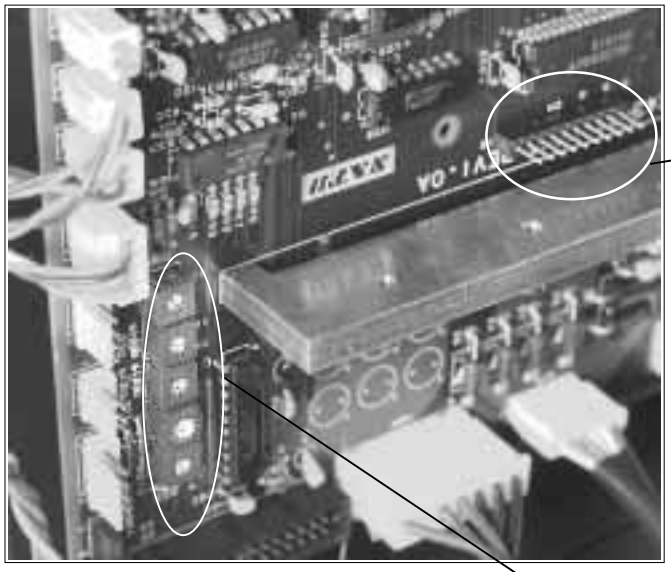
Part 1

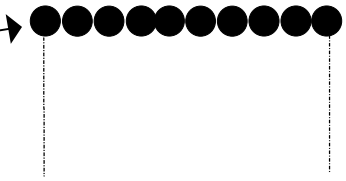
4-2 Power Supply Checks

Test Points	Nominal Voltage	Range
CH1 & CH3	+4.8 to +5.2V	+5V
CH1 & CH4	+11.4 to +12.6	+12V
CH1 & CH5	-11-4 to -12.6	-12V
CH1 & CH6	+23.5 to +24.5	+24V

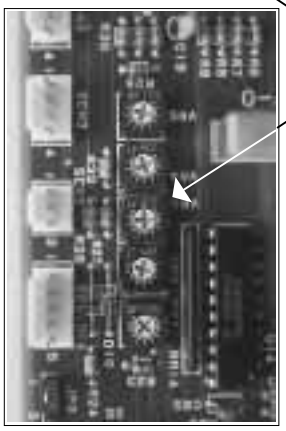
Fig. 4-2

NOTE: The power supply voltages are not adjustable. All voltages must read within +/- 10% of the nominal value for correct operation of the printer.

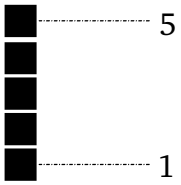




MAIN CIRCUIT BOARD



POTENTIOMETERS VR1 - VR5



Figs. 4-3

Part 1

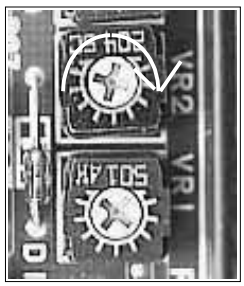
4-3 See Thru Label Pitch Sensor Adjustment

Required Equipment:	• DC Voltmeter • Small flathead screwdriver (for potentiometer adjustment)

IMPORTANT! Use pressure sensitive label stock that is rated for use with thermal transfer printers using see thru (transmissive) sensing.

To adjust the Reflective Label Pitch Sensor voltage, perform the following steps:

STEP	PROCEDURE
1.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to the main PCB. ***Fig. 4-1***
2.	Connect the printer AC power cord to a grounded AC outlet. Place the power switch in the OFF position.
3.	On the main circuit board attach the DC voltmeter negative lead to the test point labeled **CH1** (Ground) on the main circuit board. Attach the DC voltmeter positive lead to **CH8** on the main circuit board and place the power switch in the ON position. Refer to table ***Fig. 4-2, and Fig. 4-3***
4.	**LOW LEVEL ADJUSTMENT (GAP):** Position the label gap or a strip of backing sheet in the sensor's field of view. Adjust **VR2** to set the voltage under +0.5V. (*Ref. LOW LEVEL(GAP) = under +0.5V)*. ***Fig. 4-4*** NOTE: Sensor is adjustable and can be moved for holes and notches.
5.	**HIGH LEVEL ADJUSTMENT**: Position a label in the sensor's field of view. Check the difference over +2.0 between the high and low level. If the voltage reading is not over +2.0 repeat Step 4. (*Ref. HIGH LEVEL (Label) - LOW LEVEL (GAP) >/= +2.0V) Level difference should be set as maximum.*
6.	Repeat the above procedures to set the voltage to the maximum.



VR2 (PIN 1 & 8)
ROTATE CLOCKWISE

Fig. 4-4

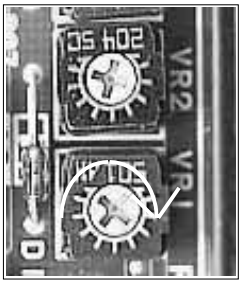
Part 1

4-4 Reflective Label Pitch Sensor Adjustment

Required Equipment:	• DC Voltmeter • Small flathead screwdriver (for potentiometer adjustment)

To adjust the Reflective Label Pitch Sensor voltage, perform the following steps:

STEP	PROCEDURE
1.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to the main PCB. ***Fig. 4-1***
2.	Load a roll of label stock with "Eye-Marks" into the printer. Leave the head lock lever in the open position.
3.	Connect the printer AC power cord to a grounded AC outlet. Place the power switch in the OFF position.
4.	On the main circuit board attach the DC voltmeter negative lead to the test point labeled **CH1** (Ground) on the main circuit board. Attach the DC voltmeter positive lead to **CH7** on the main circuit board and place the power switch in the ON position. Refer to table ***Fig. 4-2, and Fig. 4-3***
5.	**LOW LEVEL ADJUSTMENT:** Position the non-reflective "I-Mark" printed on the reverse side of the label backing in the sensor's field of view. Adjust **VR1** to set the voltage under +0.8V. (*Ref. LOW LEVEL except "Eye-Mark" = under +0.8V.)* ***Fig. 4-5*** NOTE: Sensor is fixed at center point.
6.	**HIGH LEVEL ADJUSTMENT**: Position a label in the sensor's field of view. Check the difference over +2.0 between the high and low level. If the voltage reading is not over +2.0 repeat Step 5. (*Ref. HIGH LEVEL with "Eye-Mark" - LOW LEVEL (except "Eye-Mark" >/= +2.0V.)*
7.	Repeat the above procedures to set the voltage to the maximum.



VR1 (PIN 1 & 7)
ROTATE CLOCKWISE

Fig. 4-5

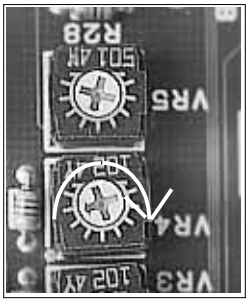
Part 1

4-5 Ribbon Sensor Adjustment

Required Equipment:	• DC Voltmeter • Small flathead screwdriver (for potentiometer adjustment)

STEP	PROCEDURE
1.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to the main PCB. ***Fig. 4-1***
2	Connect the printer AC power cord to a grounded AC outlet. Place the power switch in the OFF position.
3.	On the main circuit board attach the DC voltmeter negative lead to the test point labeled **CH1** (Ground) on the main circuit board. Attach the DC voltmeter positive lead to **CH10** on the main circuit board and place the power switch in the ON position. Refer to table ***Fig. 4-2 and Fig. 4-3.***
4.	On the main circuit board, turn **VR4** clockwise to the maximum position. ***Fig. 4-6***
5.	Turn the ribbon unwind boss spindle slowly until the lowest possible voltage reading is displayed on the voltmeter. If the voltage reading is not equal to or less than +0.5 VDC, adjust **VR4** to obtain that reading.

NOTE: Ribbon does not need to be loaded for this adjustment.



VR4 (PIN 1 & 10)
ROTATE CLOCKWISE

Fig. 4-6

Part 1

4-6 Pitch Offset Sensor Adjustment

Pitch Offset is adjusted with the **VR5** potentiometer and is a factory setting. The range is between +1.5 and -1.5. ***Fig. 4-7***

VR5

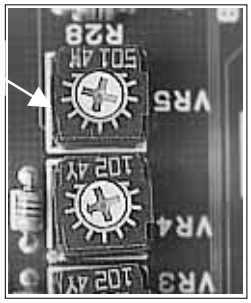


Fig. 4-7

Part 1

Section

5

Part 1

Mechanical Adjustments

5-1 Overview

The M-8485S and M-8490S printers contain adjustable mechanical sub-assemblies. This means that during your regular maintenance, your service technicians are able to make adjustments to reset the printer to factory specifications thereby ensuring optimum performance of your printer.

The main mechanical sub-assemblies are:

- Ribbon Unwind/Rewind Assembly
- Ribbon Guide Roller Assembly
- Print Head Assembly
- Drive Belt Assembly

In this section you will find procedures for:

- Ribbon Clutch Adjustments
- Ribbon Guide Plate Adjustment
- Print Head Balance Adjustment
- Print Head Alignment
- Timing Belt Tension Adjustments
- Nip Roller Adjustment
- Feed Roller Adjustment
- Peel Bar Adjustment
- Ribbon Unwind/Rewind Shaft Adjustment

Part 1

5-2 Ribbon Clutch Adjustments

Excessive ribbon unwind and rewind tension will result in variable ribbon motion and could be the cause of print quality problems.

Follow the procedures 5-2.1 and 5-2.2 to verify that the ribbon unwind and rewind tensions are within specification or if adjustment of either clutch is necessary.

Required Equipment: FOR 5-2.1 & 5-2.2	• 1 Kg Tension Gauge • Ribbon Core, empty • String • 12 mm Wrench • #2 Phillips Screw Driver

These instructions are for Standard Unit spindles: Opposite Hand Unit spindles are reversed.

5-2.1 Ribbon Unwind Clutch Adjustment

To adjust the Ribbon Unwind Clutch, perform the following steps:

STEP	PROCEDURE
1.	Remove the ribbon if installed.
2.	Place an empty ribbon core on the ribbon unwind spindle. Attach the free end of the string to the tension gauge. ***Fig. 5-1, 5-2***
3.	Wind the string tightly around the ribbon core in a single layer and in a clockwise direction. Attach the free end of the string to the tension gauge.
4.	Gradually lift the tension gauge, pulling the string to unwind it from core. Once the spindle begins to move, the gauge should indicate 600 to 800 grams of tension. Excessive or insufficient tension must be corrected by adjusting the ribbon unwind clutch. ***Fig. 5-1, 5-2*** To adjust the clutch, loosen the set screw and move the adjust nut CW for more tension and CCW for less tension. Tighten the set screw and repeat Steps 3 and 4 until the correct tension is achieved.

Part 1

5-2 Ribbon Clutch Adjustments

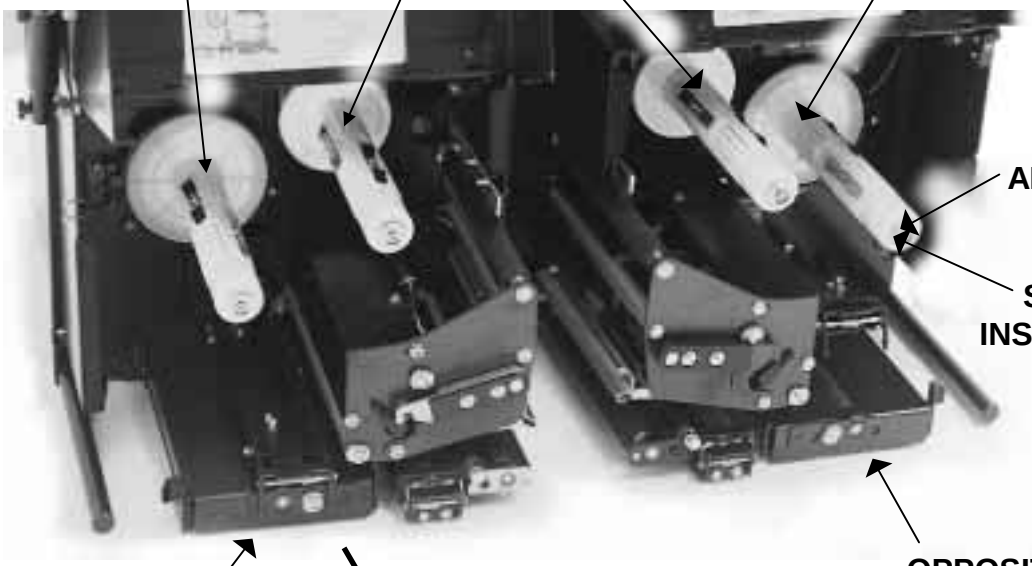


Fig. 5-1

STANDARD UNIT SHOWN, UNWIND & REWIND SPINDLES ARE OPPOSITE ON OPPOSITE HAND UNIT

Figs. 5-2

5-2.2 Ribbon Rewind Clutch Adjustment

These instructions are for Standard Unit spindles: Opposite Hand Unit spindles are reversed.

To adjust the Ribbon Rewind Clutch, perform the following steps:

STEP	PROCEDURE
1.	Connect the power cable to the printer and AC outlet. Place the printer's power switch to the ON position.
2.	Place an empty ribbon core on the ribbon wind spindle. Attach the free end of the string to the tension gauge. ***Fig. 5-1***
3.	Wind the string tightly around the ribbon core in a single layer and in a CCW direction. Attach the free end of the string to the tension gauge.
4.	Gradually lift the tension gauge, pulling the string to unwind it from the core. Once the spindle begins to move, the gauge should indicate from 500 to 700 grams of tension. Excessive or insufficient tension must be corrected by adjusting the ribbon unwind clutch. ***Fig. 5-1, 5-2*** To adjust the clutch, loosen the set screw and move the adjust nut to get the correct tension. Tighten the set screw and repeat Steps 3 and 4 until the correct tension is achieved.

5-3 Ribbon Guide Plate Adjustment

Required Equipment:	• #2 Phillips screwdriver • 10 mm Open End Wrench

If the ribbon is not smooth across the guide plate (ribbon wrinkle) and adjustment is required, perform the following steps:

STEP	PROCEDURE
1.	Check for even ribbon tension by watching the ribbon movement under the guide plate as it moves upward toward the ribbon rewind spindle. If it appears uneven, proceed to Step 2. ***Fig. 5-3 and 5-4***
2.	Loosen the (2) retaining screws and reposition the guide plate. Retighten the screws. ***Fig. 5-5***
3.	Recheck the ribbon alignment and print. If results are not satisfactory or if wrinkles appear behind the head, adjust the Ribbon Shaft Eccentric Nut (Fig. 5-6) with a 10 mm wrench and Phillips Screwdriver. For additional refinement, perform Ribbon Clutch Adjustment (Section 5-2), Print Head Balance Adjustment (Section 5-4) and/or Print Head Alignment (Section 5-5).

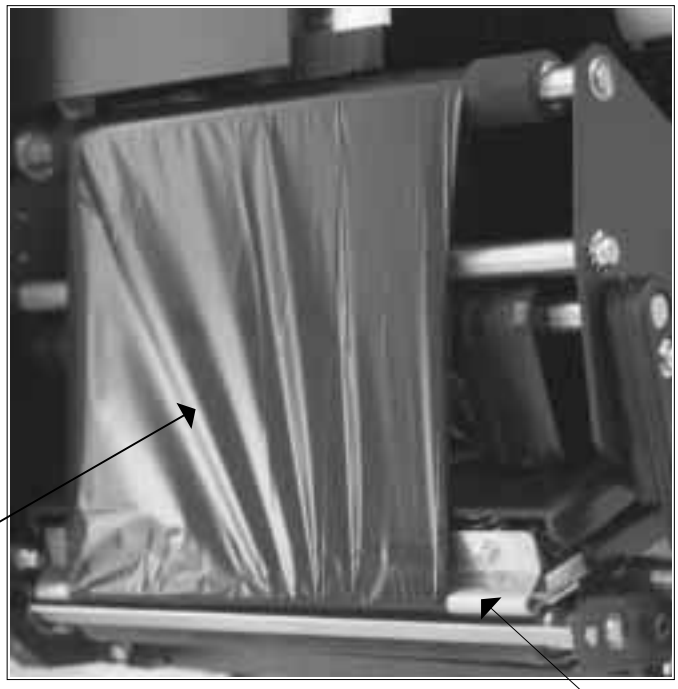
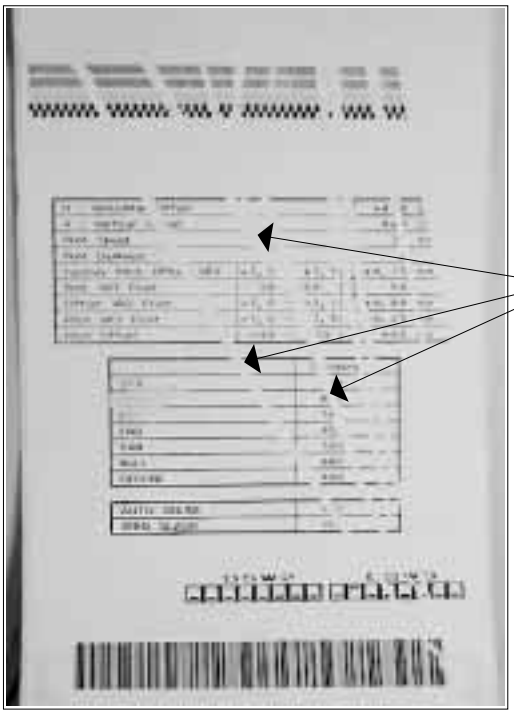


Fig. 5-3

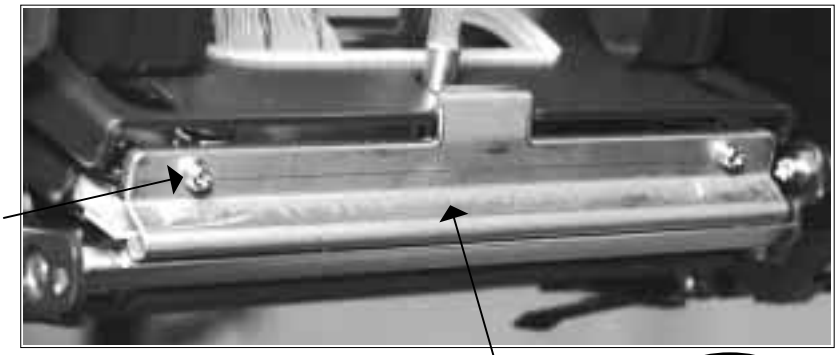
Part 1

5-3 Ribbon Guide Plate Adjustment



DIAGONAL VOIDS (WHITE STREAKS) THAT "WALK" ACROSS LABEL, CAUSED BY RIBBON WRINKLE

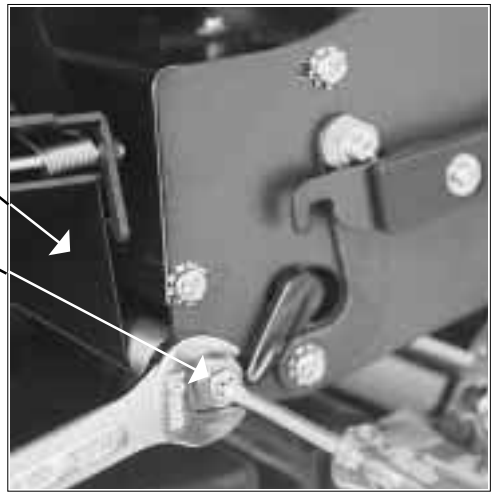
Fig. 5-4



RETAINING SCREWS

GUIDE PLATE

Fig. 5-5



RIBBON

IF WRINKLES APPEAR BEHIND THE PRINT HEAD, ADJUST RIBBON SHAFT ECCENTRIC NUT WITH WRENCH AND PHILLIPS SCREWDRIVER

Fig. 5-6

5-4 Print Head Balance Adjustment

Required Equipment:	• #2 Phillips Screwdriver • 10 mm Open End Wrench

To optimize print quality, perform the following steps to adjust the print head balance, using head pattern as a guide:

STEP	PROCEDURE
1.	Load the ribbon and label stock into the printer.
2.	Loosen screw holding spacer plate to side frame. Hold eccentric nut along flats with 10 mm wrench and loosen holding screw. Turn the eccentric nut clockwise to increase the density of the inner side of the image/label. Turn the eccentric nut counter-clockwise to increase the density of the print on the outside of the image/label. ***Fig. 5-7***
3.	Hold the eccentric nut in place with the 10 mm wrench and tighten the screw. Do not turn the eccentric nut beyond the adjustment marks. Refer to sample labels for adjustment conditions. ***Fig. 5-8***

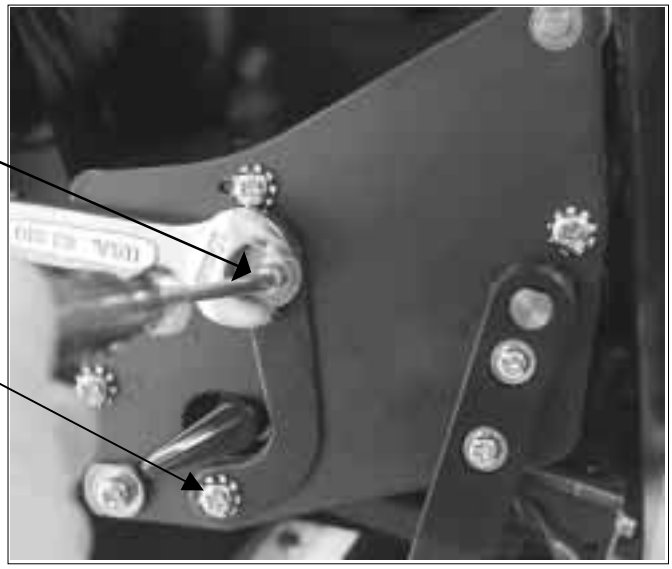
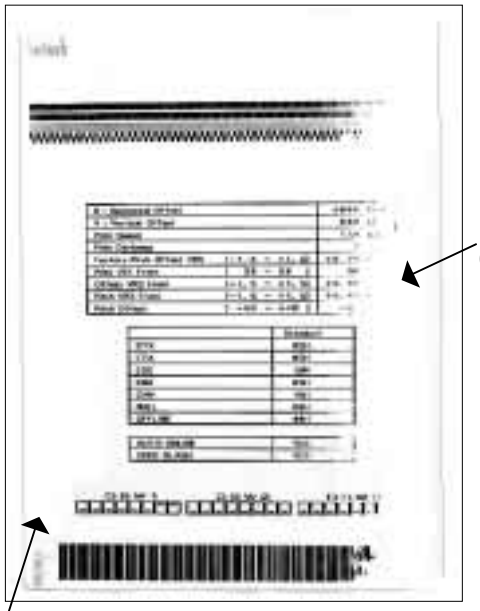


Fig. 5-7

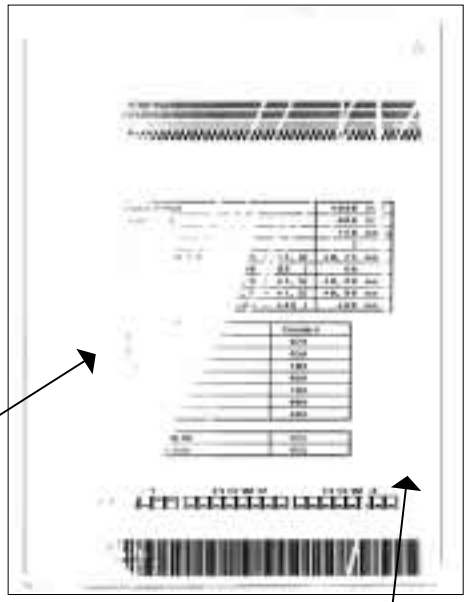
Part 1

5-4 Print Head Balance Adjustment



LIGHT PATTERN
ON THE INSIDE

LIGHT PATTERN
ON THE OUTSIDE



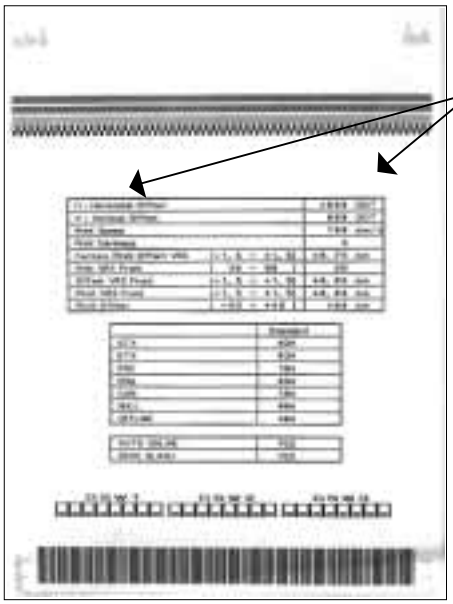
HEAVY PATTERN
ON THE OUTSIDE

FEED
DIRECTION

HEAVY PATTERN
ON THE INSIDE

EXCESSIVE PRESSURE ON THE OUTSIDE

EXCESSIVE PRESSURE ON THE INSIDE



PATTERN DENSITY
EVEN BOTH SIDES

CORRECT ADJUSTMENT

Figs. 5-8

Part 1

5-5 Print Head Alignment

Required Equipment:	• #2 Phillips Screwdriver • Flat Head Screwdriver

To adjust the print head alignment and make print quality consistent across label, perform the following steps:

STEP	PROCEDURE
1.	Loosen the (2) guide plate screws on the print head, one on the right side and one on the left. Loosen center post screw. ***Fig. 5-9A & 5-9B***
2.	Move the position of the adjustment plate forward or backward by turning the flat head screwdriver in the adjustment slots. ***Fig. 5-10***
3.	Tighten all the screws. Refer to sample labels for adjustment conditions. ***Fig. 5-11***

LOOSEN SCREWS ON PRINT HEAD TWO PLACES

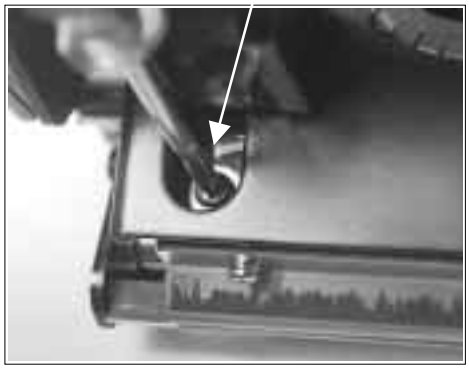


Fig. 5-9A

REMOVE CENTER POST SCREW

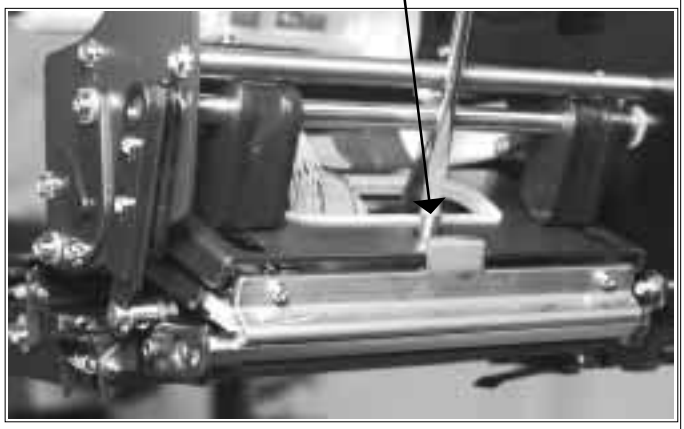
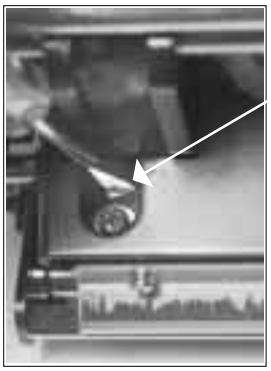


Fig. 6-9B



SCREWDRIVER IN SLOTS OF HEAD ADJUSTMENT PLATE

Fig. 5-10

Part 1

5-5 Print Head Alignment

BOTTOM EDGE OF BAR CODE

EDGE OF LABEL

SHOWN WITH IMPROPER ALIGNMENT

BOTTOM EDGE OF BAR CODE IS SHOWN NOT PARALLEL WITH LABEL EDGE

BOTTOM EDGE OF BAR CODE AND LABEL EDGE ARE PARALLEL

SHOWN WITH PROPER ALIGNMENT

Figs. 5-11

Part 1

5-6A Timing Belt Tension Adjustment for the M-8485S

Required Equipment:	• 500g Tension Gauge • #2 Phillips Screwdriver

STEP	PROCEDURE
1.	Push the center of each timing belt with the tension gauge and note the tension reading when the each belt is moved 1 to 2mm. Refer to ***Fig. 5-12*** to identify Belts "A", "B" and "C" and Brackets #1, #2 and #3.
2.	If the tension reading from Belt "B" is not within range of 500g, reposition bracket #2. Tighten screws when belt tension is correct. ***Fig. 5-13***
3.	If the tension reading from Belt "C" is not within range of 500g, reposition bracket #3. Tighten screws when belt tension is correct. ***Fig. 5-14***
4.	If the tension reading from Belt "A" is not within range of 500g, reposition bracket #1. The screws are accessible from the media side of the printer. Tighten screws when belt tension is correct. ***Fig. 5-15 & 5-16***

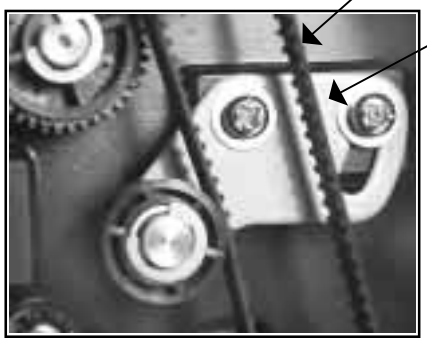


Fig. 5-13

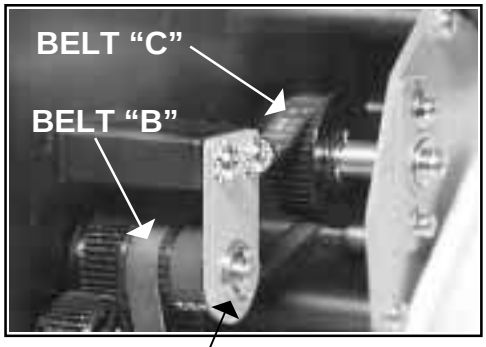


Fig. 5-14

Part 1

5-6A Timing Belt Tension Adjustment for the M-8485S

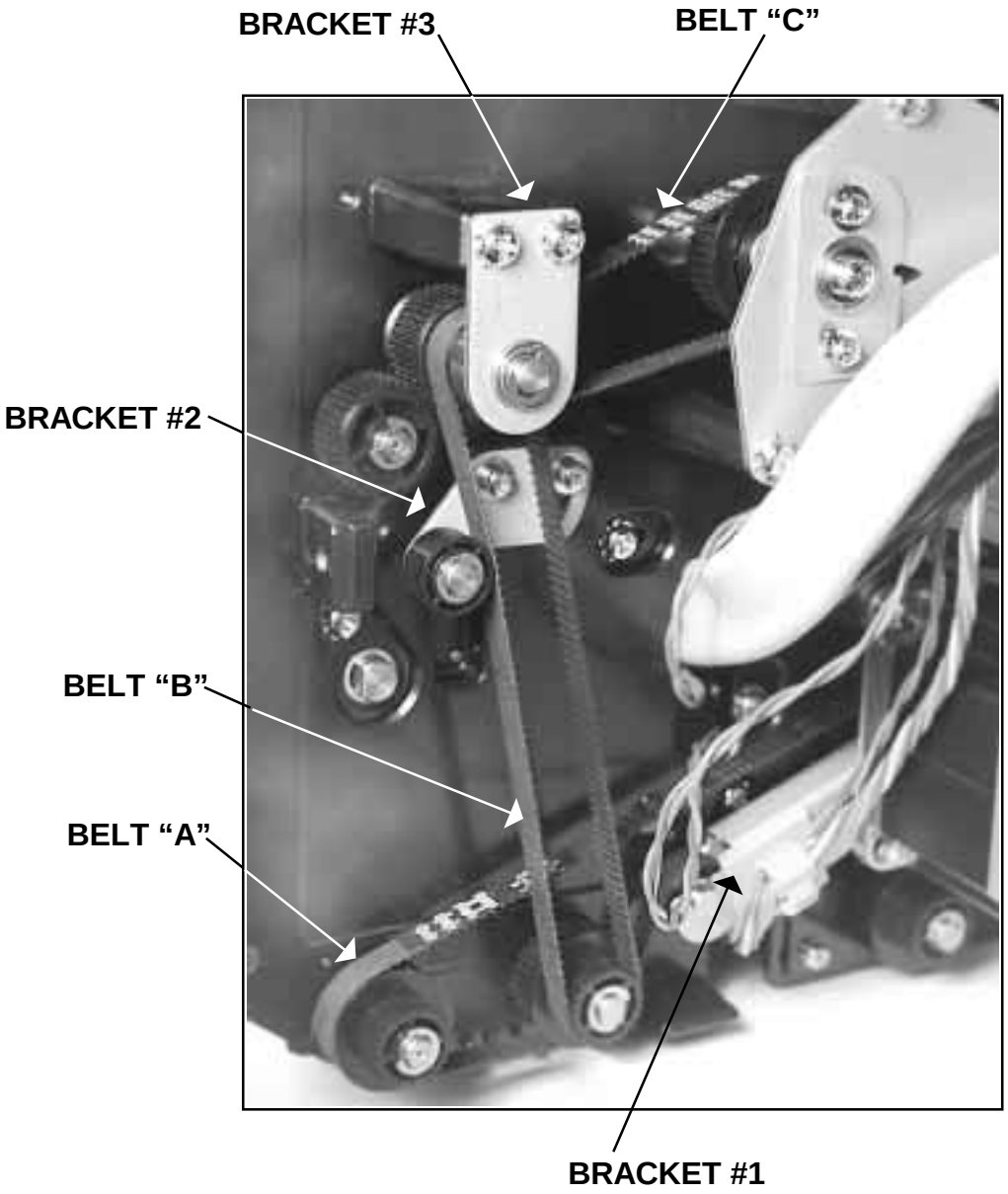
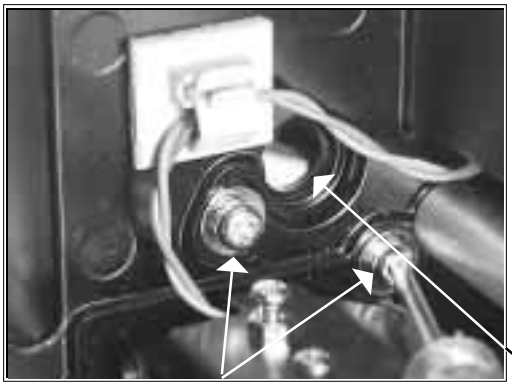


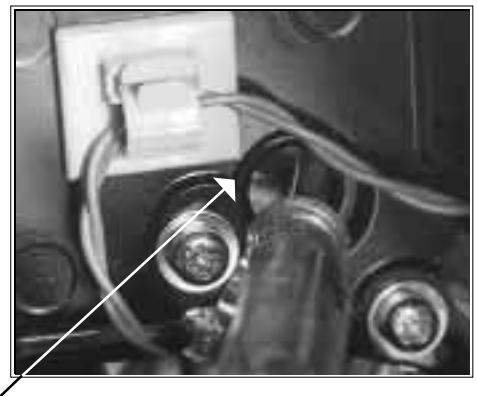
Fig. *5-12*

Part 1

5-6A Timing Belt Tension Adjustment for the M-8485S



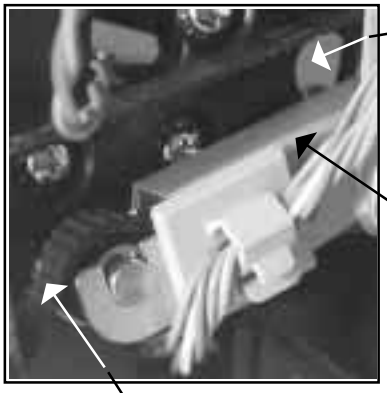
(2) ADJUSTMENT SCREWS FOR BRACKET #1



ACCESS HOLE TO ADJUST BRACKET #1 WITH SCREWDRIVER

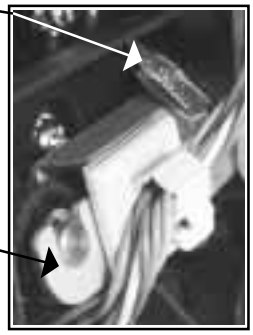
Figs. 5-15

MEDIA SIDE



ACCESS HOLE TO ADJUST BRACKET #1 WITH SCREWDRIVER (OPPOSITE SIDE)

BRACKET #1



BELT "A"

BELT SIDE

Figs. 5-16

Part 1

5-6B Timing Belt Tension Adjustment for the M-8490S

Required Equipment:	• 500g Tension Gauge • #2 Phillips Screwdriver

STEP	PROCEDURE
1.	Refer to ***Fig. 5-17*** to identify belts and brackets. Push the center of each timing belt with the tension gauge and note the tension reading when the each belt is moved 1 to 2mm.
2.	If the tension reading of each belt is not within range of 500g, reposition the holding bracket. Tighten screws when belt tension is correct. ***Fig. 5-18, 5-19, 5-20, 5-21 and 5-22***

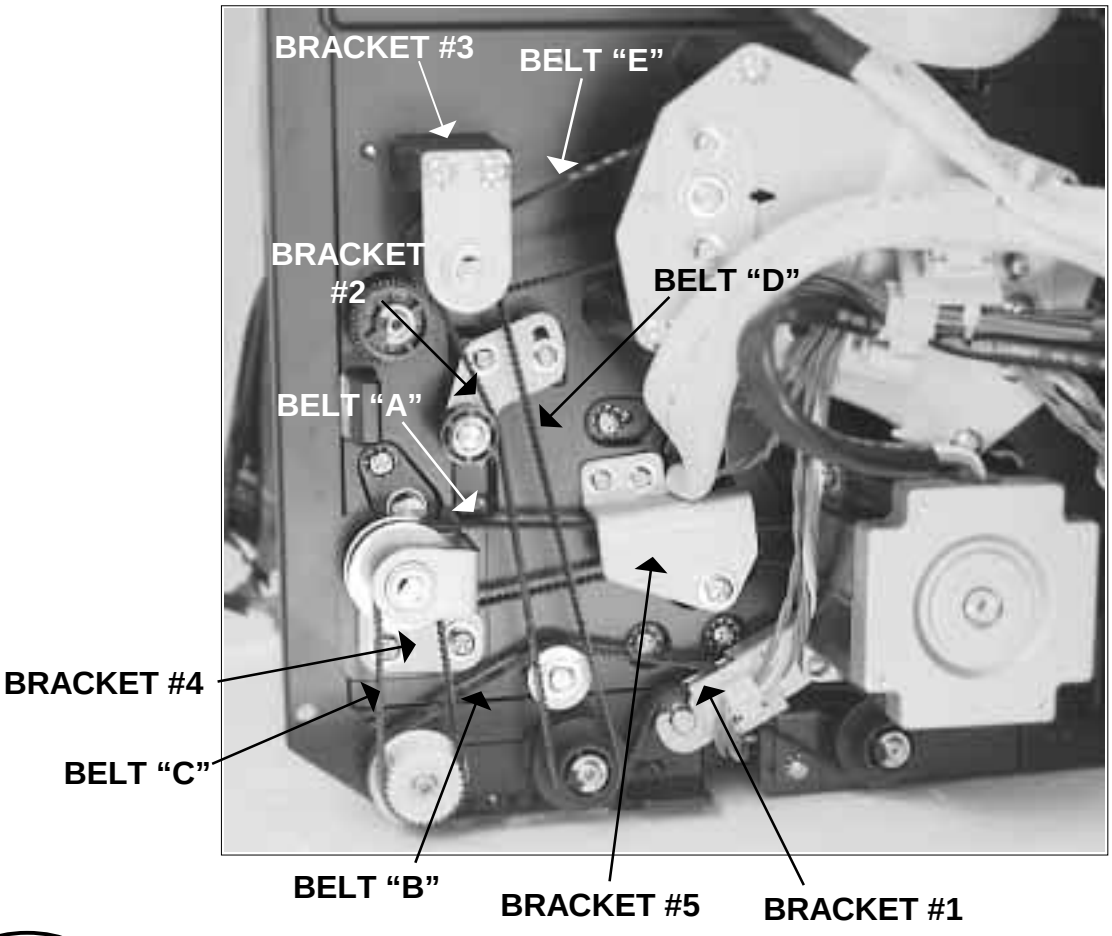


Fig. ***5-17***

Part 1

5-6B Timing Belt Tension Adjustment for the M-8490S

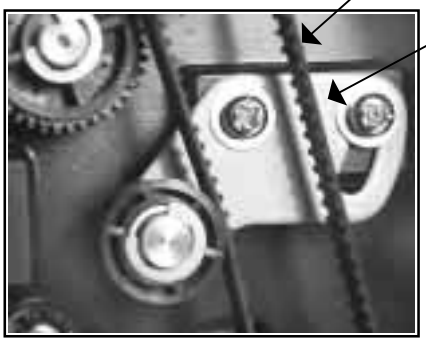


Fig. 5-18

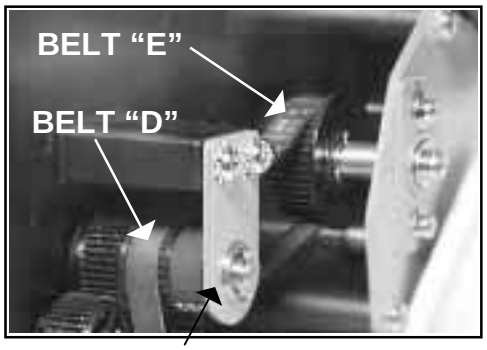
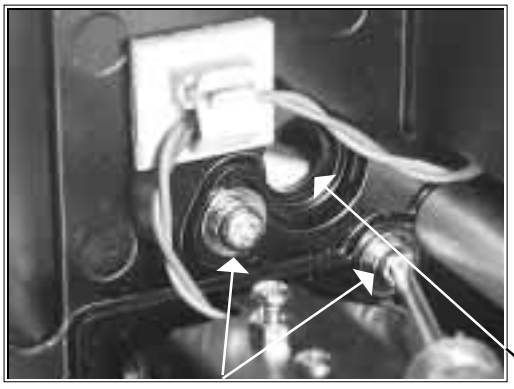
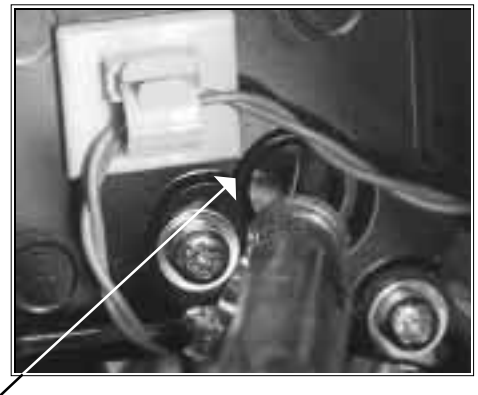


Fig. 5-19

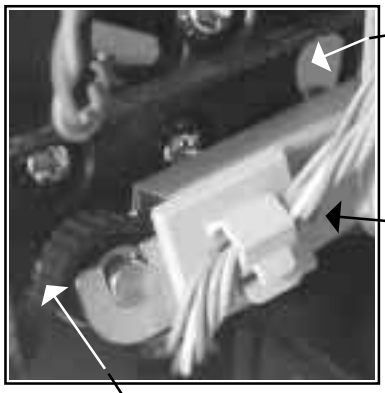




Figs. 5-20

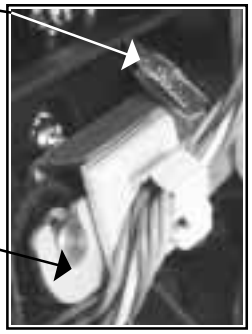
Part 1

5-6B Timing Belt Tension Adjustment for the M-8490S



ACCESS HOLE TO ADJUST BRACKET #1 WITH SCREWDRIVER (OPPOSITE SIDE)

BRACKET #1

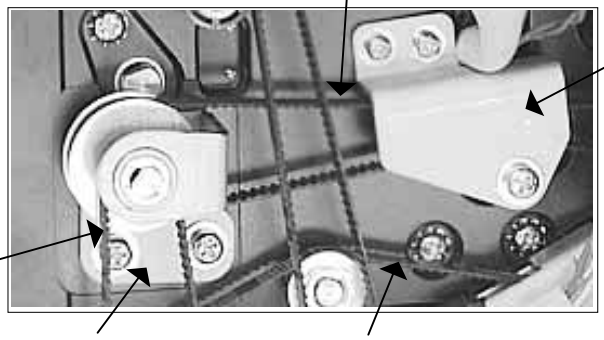


BELT "B"

BELT SIDE

Figs. 5-21

BELT "A"



BRACKET #5

BELT "C"

BRACKET #4

BELT "B"

Fig. 5-22

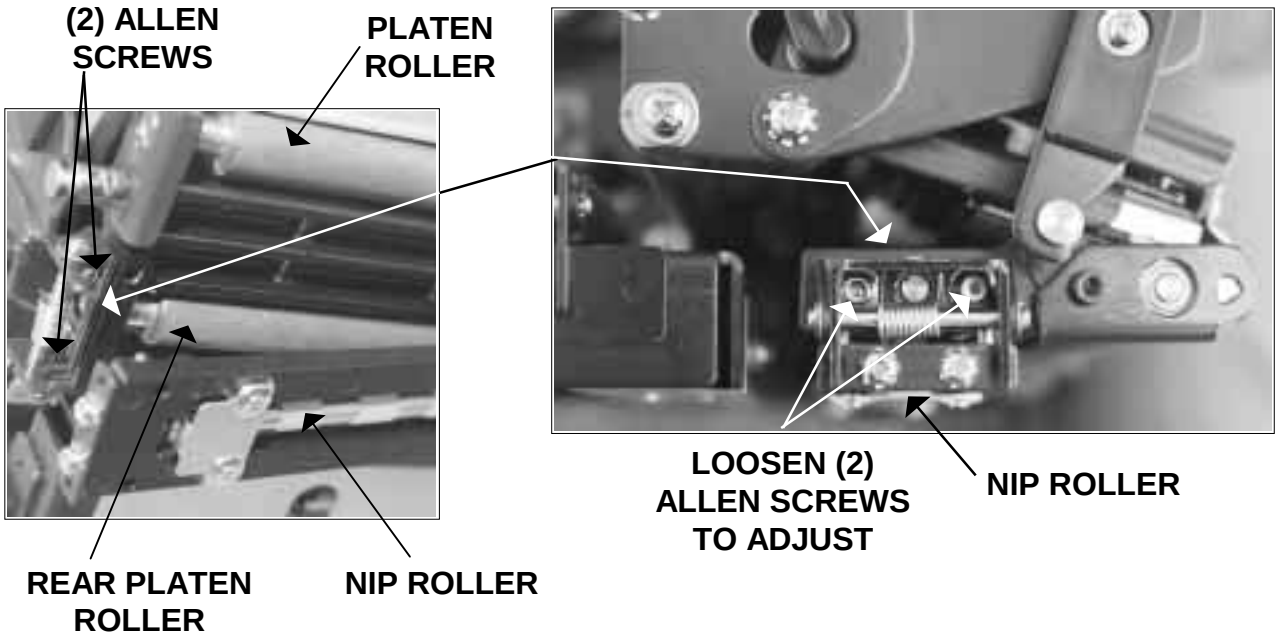
Part 1

5-7 Nip Roller Adjustment

Required Equipment:	• 1.5 mm Allen Wrench

To adjust the Nip Roller perform the following steps:

STEP	PROCEDURE
1.	Place backing paper between the rear platen roller and the nip roller. Pull the backing paper through the Nip Roller Assembly.
2.	The tension for both the inside and outside should be equal and the backing paper should not move forward without corresponding movement of the nip roller.
3.	To adjust the nip roller tension and increase pressure on the outside of the nip roller, loosen the Allen screws on the nip roller bracket/latch and pull up on the bracket. Push down on the nip roller bracket to decrease pressure on the outside of the nip roller. ***Fig. 5-23***



Figs. 5-23

Part 1

5-8 Feed Roller Adjustment (Label Tracking)

Required Equipment:	• 10 mm Open End Wrench • #2 Phillips Screwdriver

Used for fine tuning. Adjusts pressure between upper and lower rollers.

STEP	PROCEDURE
1.	To increase pressure between the upper and lower rollers, adjust the two screws on the media lid. Adjust the height of the screws to 5 mm. ***Fig. 5-24***
2.	Load the ribbon and label stock into the printer.
3.	Loosen the set screw and turn the eccentric nut CW or CCW. ***Fig. 5-25*** Rotating CW moves the Feed Roller Assembly forward and labels will track towards the inside. Rotating CCW moves the Feed Roller Assembly backward and labels will track towards the outside. Tighten the (2) screws after adjusting.

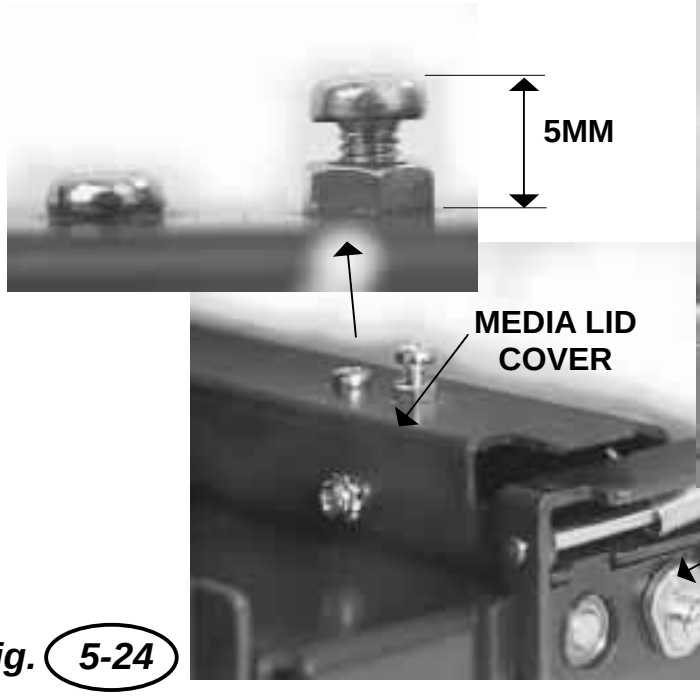


Fig. 5-24

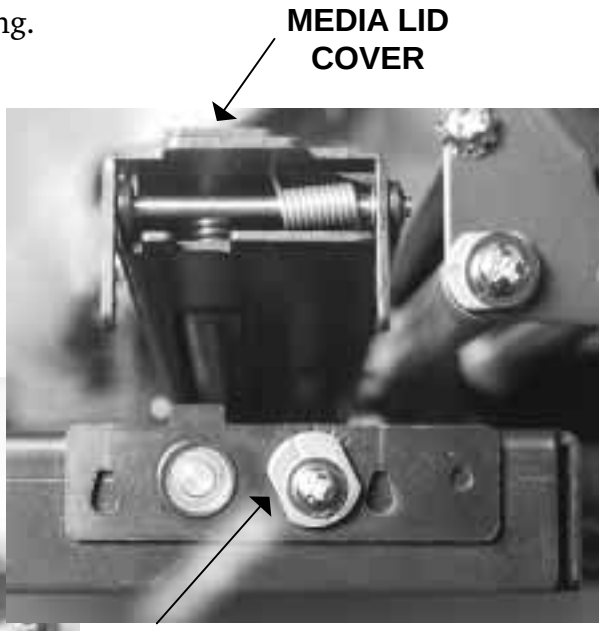


Fig. 5-25

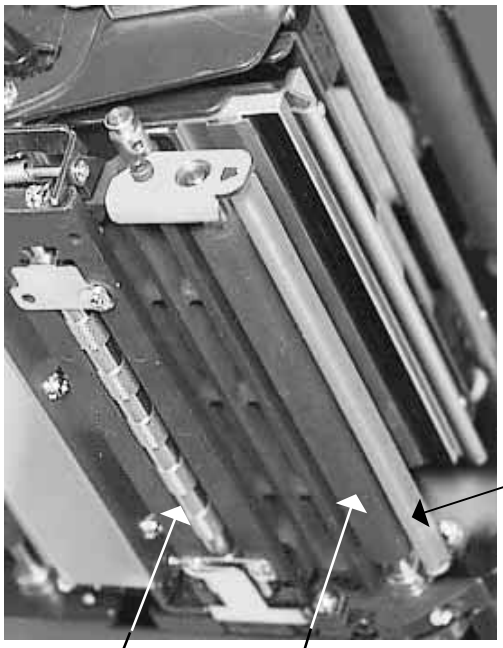
Part 1

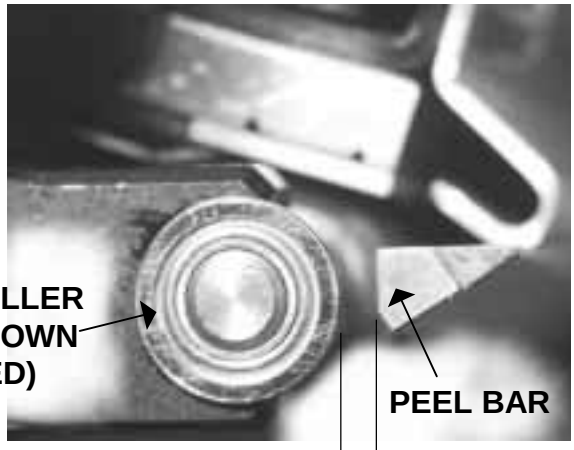
5-9 Peel Bar Adjustment

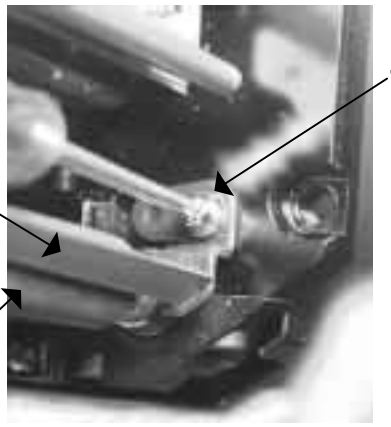
Required Equipment:	• 5.5 mm Open End Wrench • #2 Phillips Screwdriver

The distance between the dispense bar and the platen roller should be 0.5 - 1mm and equal on both the inside of the platen/peel bar and the outside of the platen peel bar. To adjust, perform the following:

STEP	PROCEDURE
1.	Loosen the set screw and turn the eccentric nut to get an equal distance between the platen roller and the peel bar. ***Figs. 5-26***







Figs. 5-26

Part 1

5-10 Ribbon Unwind/Rewind Shaft Adjustment

To adjust the Ribbon Unwind/Rewind Shaft tension perform the following steps:

STEP	PROCEDURE
1.	Check for even/smooth ribbon tension at the ribbon unwind spool as the ribbon travels downward past the print head. If it appears to be uneven, proceed to Step 3.
2.	Check for even/smooth ribbon tension at the ribbon unwind spool as the ribbon travels upward from under the print head. If it appears to be uneven, proceed to Step 3. ***NOTE: Before attempting Step 3, be sure the Ribbon Guide Plate has first been adjusted (Section 5-3).***
3.	Loosen the set screws on the adjustment plate ***Fig. 5-27.*** Insert a flat blade screwdriver into the adjustment slot and adjust for even/smooth ribbon tension at the ribbon unwind/rewind spool/shaft. ***Note: The ribbon unwind/rewind shafts should be parallel to each other and perpendicular to the base frame of the printer.*** ***The ribbon unwind/rewind shaft adjustment may affect the timing belt adjustment (Section 5-6). Readjust if required.***

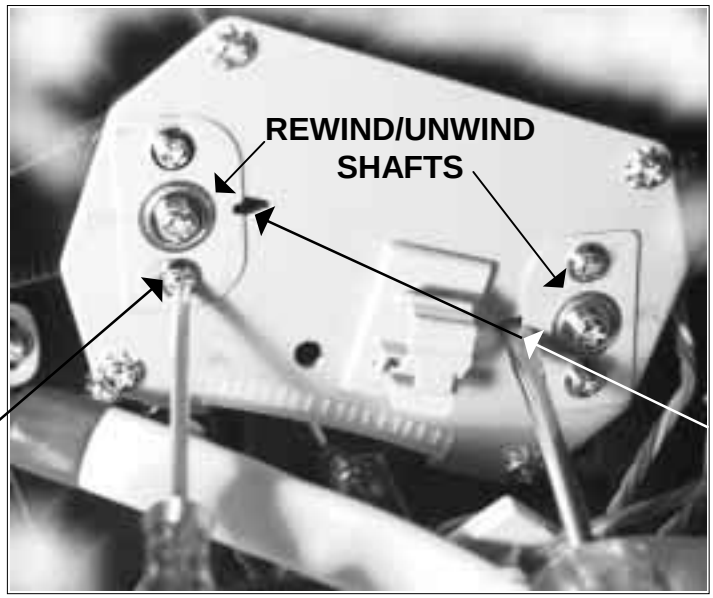


Fig. 5-27

Section

6

Part 1

Replacement Procedures

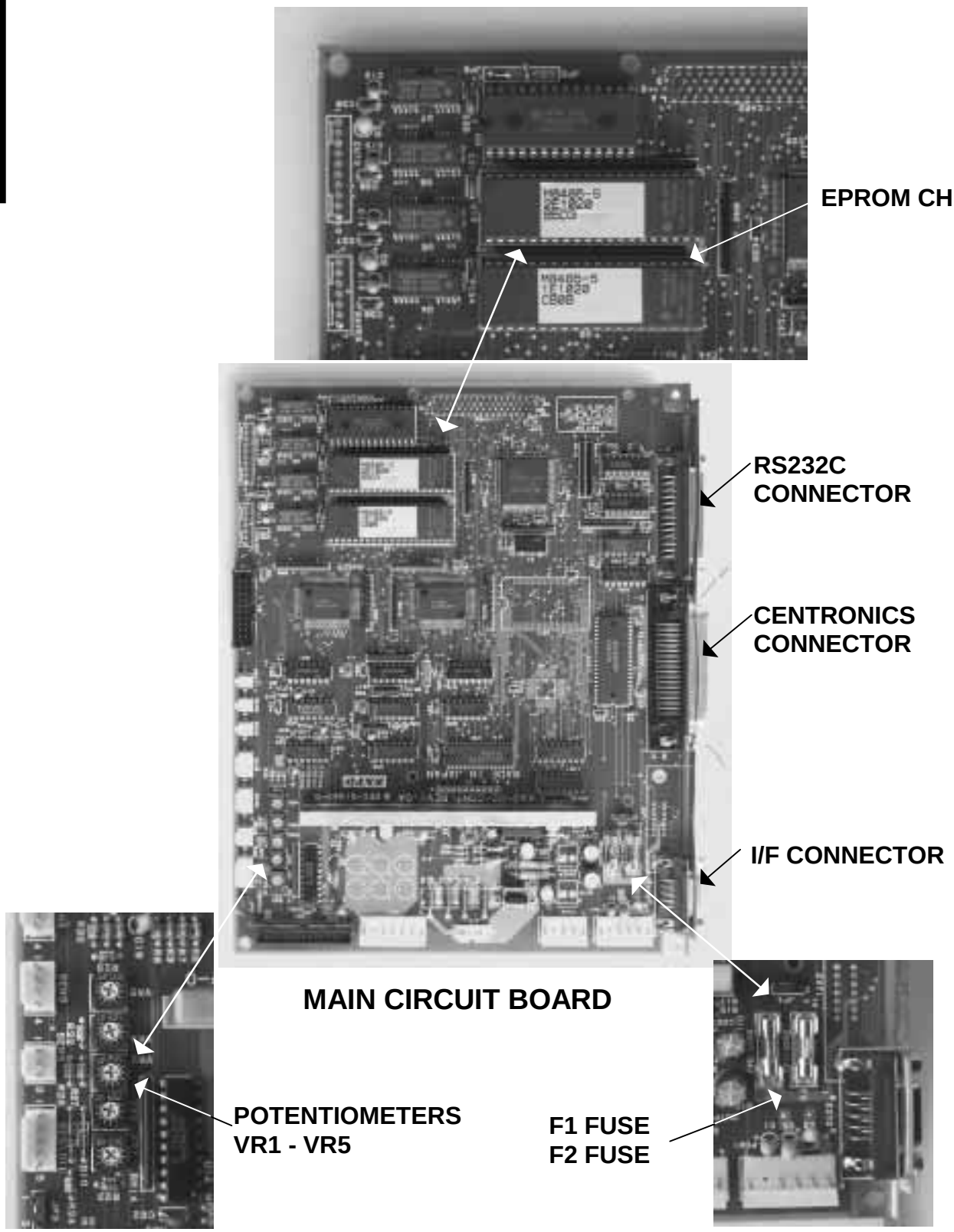
6-1 Overview

The printers contain replaceable components and sub-assemblies. This chapter contains step-by-step instructions for removing and replacing the following components and sub-assemblies.

- Fuses
- Power Supply
- Main Circuit Board
- LCD Display Panel Label Sensor
- Dip Switch Panel
- Stepper Motor
- Timing Belts
- Ribbon Clutch Washers
- Ribbon Motion Sensor
- Cover Open Switch
- Head Open Switch
- Label Gap Sensors
- Label Out Sensor
- Platen
- Print Head

Part 1

6-2 Main Circuit Board Layout



Part 1

6-3 Replacing Fuses

Fuse replacement is described in the following section.

- 6-3.1 Removing and Replacing the Main Power Fuse
- 6-3.2 Removing and Replacing the +5V Fuse or+24VDC External Fuse

> NOTE: Before replacing a fuse, determine the cause of the overload condition.

6-3.1 Removing and Replacing the Main Power Fuse

Required Equipment: F15 Amp, 250 V Fuse

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	On the back of the printer locate the fuse cap. Unscrew the fuse cap and remove the defective fuse.
3.	Replace the fuse with one of equal rating (F15 Amp, 250 V) and screw the fuse cap back. ***Do not use a fuse with a higher rating. Fig. 6-2***
4.	Reconnect the power cable.

Fig. 6-2

Part 1

6-3 Replacing Fuses

6-3.2 Removing and Replacing the +5V Or +24V FUSE(s)

Required Equipment:	• 1 Amp, 250 V Fuse (+5V) or • 3 Amp, 250 V Fuse (+24VDC)

To remove and replace the interior fuse(s) perform the following steps:

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove (4) screws securing the back panel to the cabinet. ***Fig. 6-3***
3.	Locate and replace defective fuse(s) with one of equal rating. ***Do not use a fuse with a higher rating. Fig. 6-4***
4.	Replace the back panel.
5.	Reconnect the power cable.

Fig. 6-3

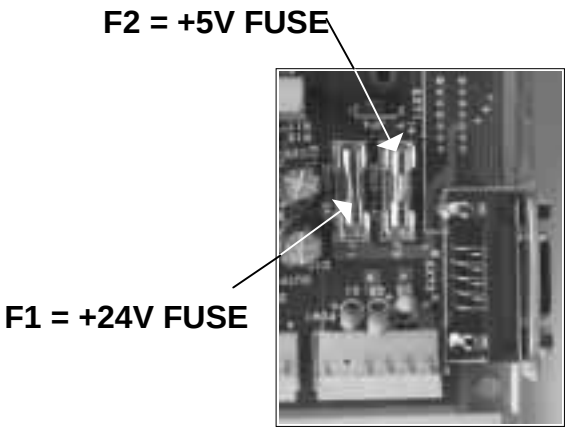


Fig. 6-4

6-4 Replacing the Power Supply

The Power Supply is a non-repairable component with no service parts and is replaced as a complete assembly.

To remove and replace the Power Supply, perform the following steps:

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to mechanical and electrical sections. ***Fig. 6-5***
3.	Remove (4) screws securing the back panel to the cabinet. ***Fig. 6-6***
4.	Remove (2) screws holding the power supply to the back of the cabinet and (1) screw from inside of the cabinet. ***Fig. 6-7 and Fig. 6-8***
5.	Detach (5) connections from the Power Supply. ***Fig. 6-9 & 6-10***
6.	Remove the defective power unit through the back opening.
7.	Replace the power supply. Reattach connections and screws previously removed.
8.	Replace the back panel.
9.	Close the printer sections and replace locking screw.
10.	Reconnect the power cable.

Part 1

6-4 Replacing the Power Supply

REMOVE LOCKING SCREW
AND SWING CABINET OPEN

Fig. 6-5

REMOVE (4)
PANEL SCREWS

BACK OF CABINET
MECHANICAL SECTION

Fig. 6-6

Part 1

6-4 Replacing the Power Supply

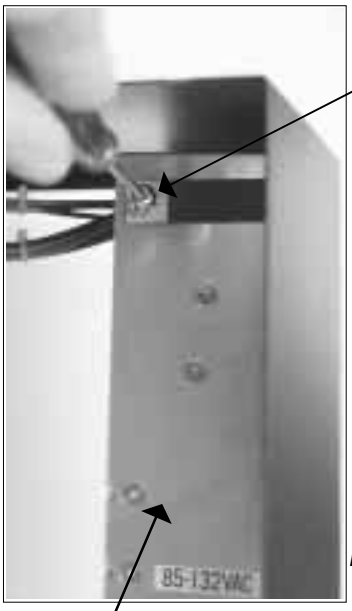


Fig. 6-7

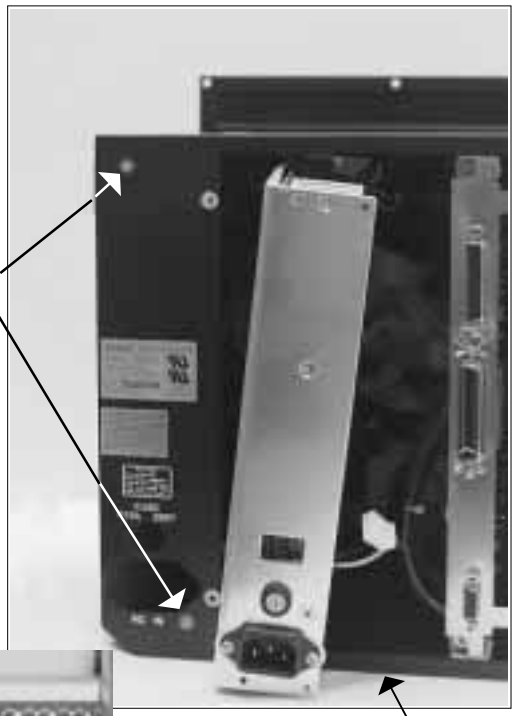
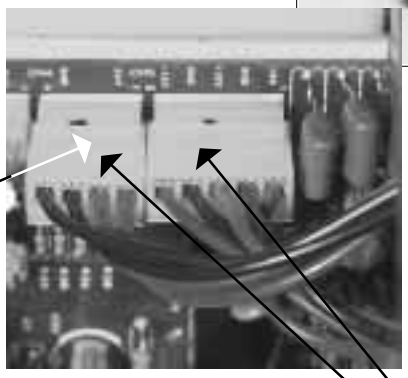


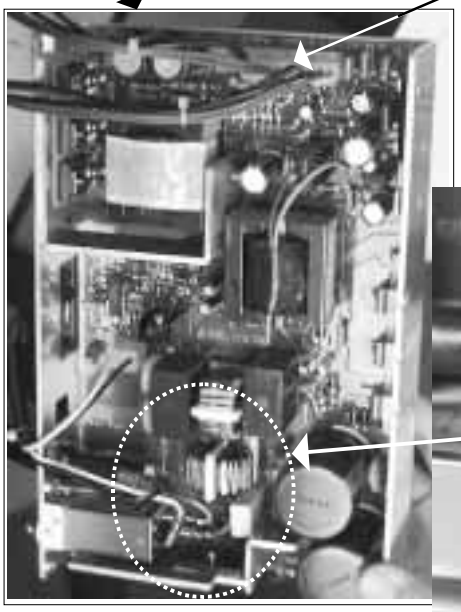
Fig. 6-8

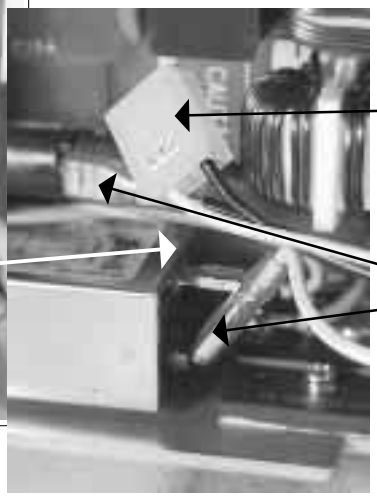
POWER SUPPLY



REMOVE POWER SUPPLY THROUGH OPENING

Fig. 6-10





DETACH (3) CONNECTORS FROM POWER SUPPLY

DETACH (2) SPADE CONNECTORS FROM POWER SUPPLY

Fig. 6-9

Part 1

6-5 Replacing the Main Circuit Board

The Main Circuit Board contains the control electronics for the printer and is located within the back cabinet.

NOTE: Many of the components on these boards are extremely susceptible to damage by static electricity. To avoid damage from static electricity, do not unpack new circuit boards from anti-static bags until instructed to do so.

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove (4) screws securing the panel to the back of the cabinet. ***Fig. 6-11***
3.	Remove screw from the cabinet side to allow the printer halves to swing open for access to the electrical section of the unit. ***Fig. 6-12***
4.	Note cable connections locations, then disconnect all cables from the PCB board. ***Fig. 6-13A***
5.	Remove (4) screws to detach the PCB from the printer, (2) near side and (2) far side. Note that one screw secures a ground wire. Note location for reassembly. Carefully dislodge and remove board from the cabinet. ***Fig. 6-13B***
6.	Carefully remove and save the EPROM chips from the defective PCB. Install the chips in the same location(s) on the new PCB. ***Fig. 6-13A*** Note: Make sure the marks on the EPROM(s) are aligned correctly with the socket.
7.	Reinstall the PCB using screws previously removed. Reattach the cables.
8.	Replace the back panel.
9.	Close the printer halves and replace the locking screw.
10.	Reconnect the power cable.
11.	Reset printer to factory defaults. Refer to Section 7-1.

Part 1

6-5 Replacing the Main Circuit Board

Fig. 6-11

Fig. 6-12

Part 1

6-5 Replacing the Main Circuit Board

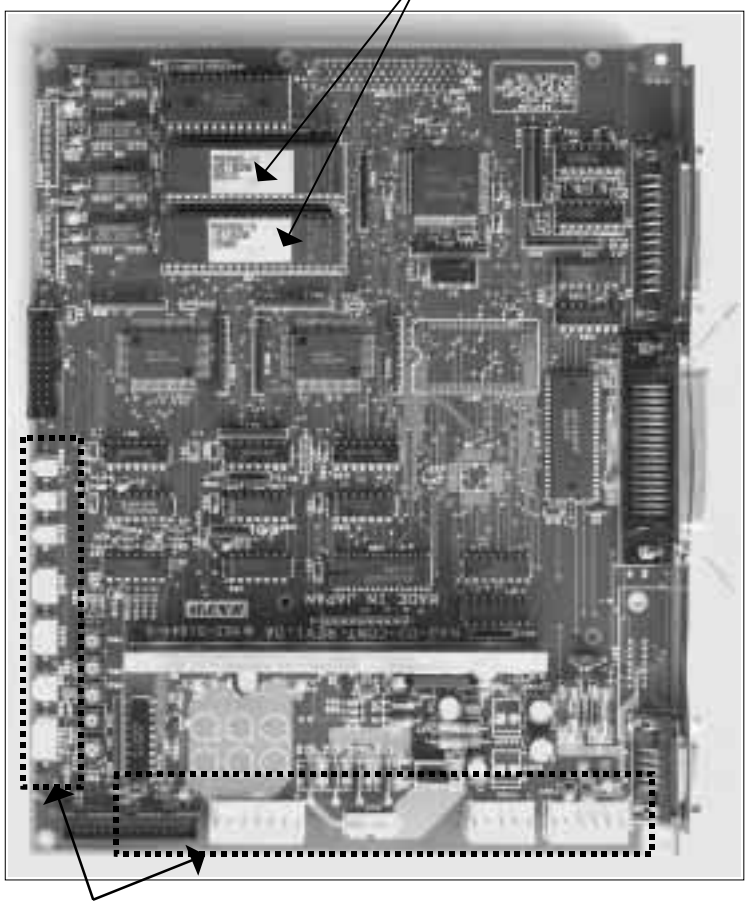
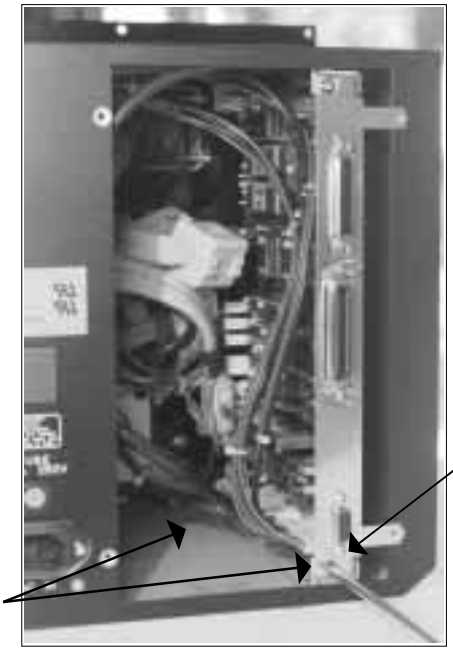


Fig. 6-13A



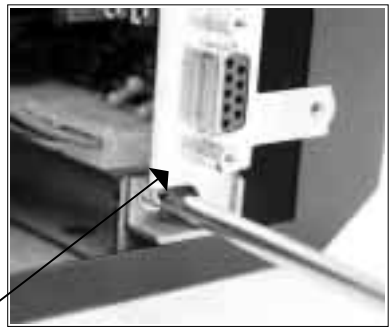


Fig. 6-13B

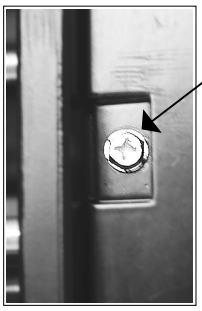
6-6 Replacing the LCD Display Panel

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to the display panel. ***Fig. 6-14***
3.	Detach (2) connectors from display panel PCB.
4.	Remove (4) panel mounting screws. Note that one screw secures a ground wire. Note location for reassembly. ***Fig. 6-15***
5.	Remove and replace the LCD Display Panel. Reattach the connectors.
6.	Close the printer halves and replace the locking screw.
7.	Reconnect the power cable.

NOTE: This display panel can be rotated by 180° for ease of reading if necessary.

Part 1

6-6 Replacing the LCD Display Panel

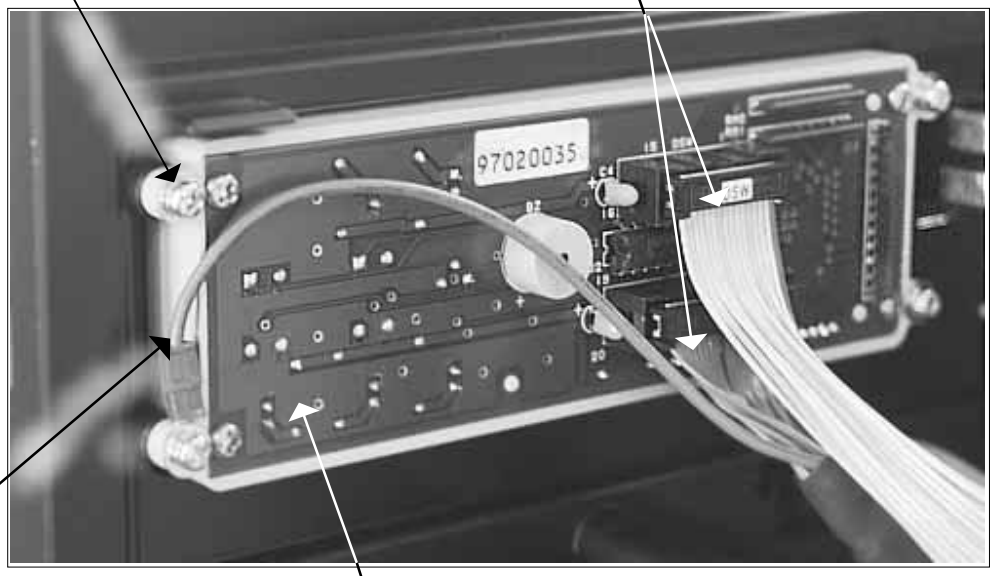


REMOVE LOCKING SCREW
AND SWING CABINET OPEN

Fig. 6-14

DETACH (2)
CONNECTORS

(4) MOUNTING
SCREWS



GROUND WIRE

LCD DISPLAY PANEL

Fig. 6-15

6-7 Replacing the Dip Switch Panel

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Raise the lid on the mechanical side of the printer.
3.	Snap off the cover from the Dip Switch Panel. ***Fig. 6-16***
4.	Remove (2) screws holding the panel to the cabinet. ***Fig. 6-17***
5.	Detach cable connection to the panel. ***Fig. 6-18***
6.	Remove and replace the Dip Switch Panel. Reattach the connection.
7.	Reconnect the power cable.

Fig. 6-16

COVER

DIP SWITCH PANEL

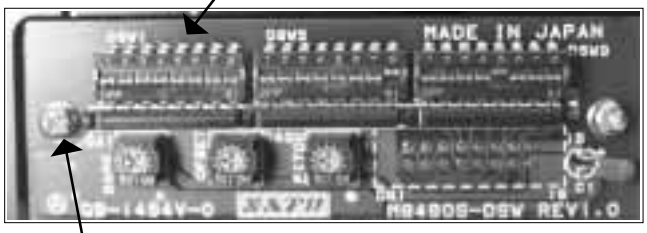
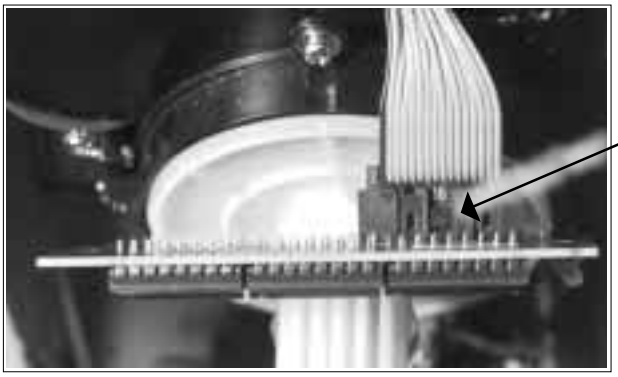


Fig. 6-17

REMOVE (2) SCREWS



CABLE CONNECTION

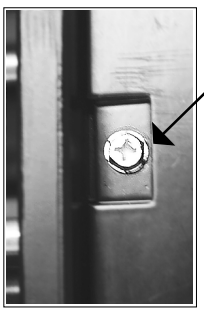
Fig. 6-18

Part 1

6-8 Replacing the Stepper Motor

The stepper motor is used to transmit motion to the print mechanism for precise print positioning. The stepper motor transmits torque to the label feed roller, the platen roller, the ribbon feed roller, and the ribbon rewind spindle via a series of toothed pulleys and timing belts.

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to the stepper motor. ***Fig. 6-19***
3.	Loosen belt idler pulley which is in contact with belt from motor. Refer to Section 5-6A for M-8485S and Section 5-6B for M-8490S.
4.	Remove (2) mounting screws attaching the stepper motor to the frame. Remove motor to dislodge pulley from belt. ***Fig. 6-20, 6-21***
5.	Detach the cable from the cable holder. Disconnect the "STP" cable connector from the main PCB and remove the motor. ***Fig. 6-22***
6.	Replace the motor and remount to the frame. Reconnect the "STP" cable connector to the PCB and reattach the cable to the cable holder.
7.	Adjust belt tension as outlined in Section 5-6.
8.	Close the printer halves and replace the locking screw.
9.	Reconnect the power cable.

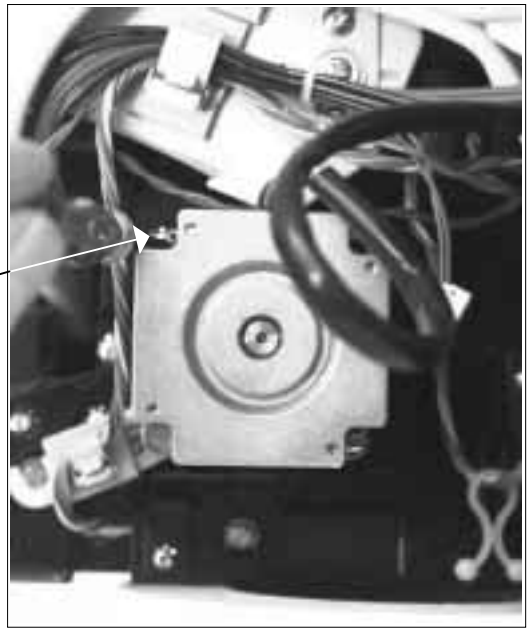


REMOVE LOCKING SCREW AND SWING CABINET OPEN

Fig. 6-19

Part 1

6-8 Replacing the Stepper Motor



(2) SCREWS MOTOR TO FRAME

Fig. 6-20

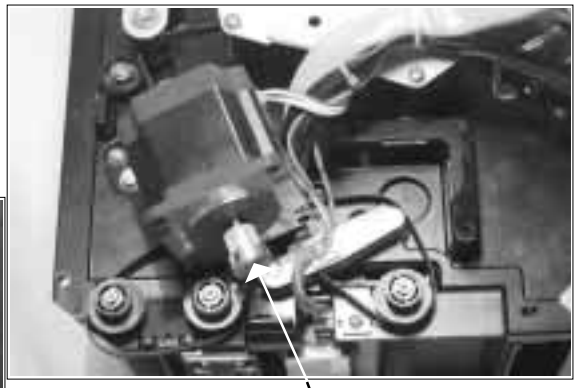


Fig. 6-21

MOTOR, SHAFT, AND PULLEY LOOSEN BELT IDLER SEE SECTION 5-6

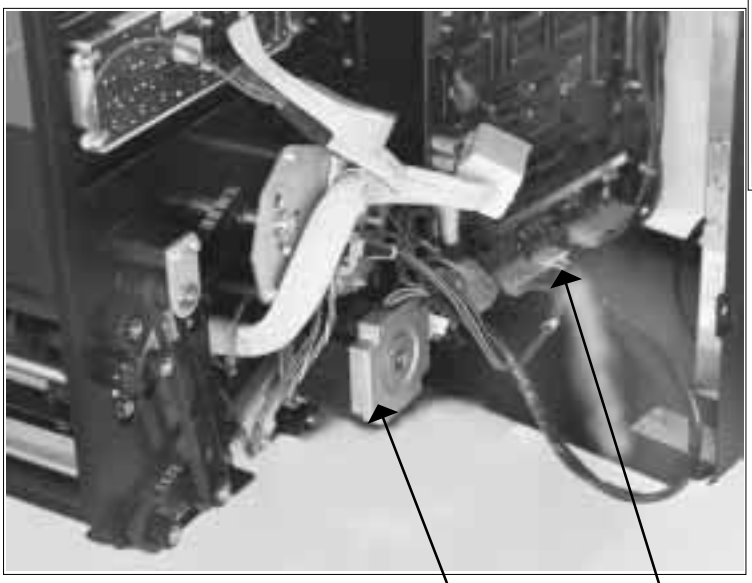


Fig. 6-22

STEPPER MOTOR

DETACH CABLE FROM CABLE HOLDER AND DISCONNECT "STP" CONNECTOR FROM MAIN PCB

Part 1

6-9A Replacing the Timing Belts for the M-8485S

Three timing belts used in this printer are arranged as follows:

Starting at the stepper motor:
Belt "A" - From the motor to front and rear platen rollers to idler pulley "A" to feed roller and back to motor. ***Fig. 6-23A & 23B***

Belt "B & C" - From rear platen roller to three level idler gear "B". The first level of idler gear "B" meshes with ribbon roller gear. The second level of idler gear "B" is connected to the rear platen. The third level of idler gear "B" is connected to the rewind spindle via Belt "C". ***Fig. 6-23C & 23D***

Idler pulley "C" is used for adjusting tension on belt "B".

FOR BELT "A"

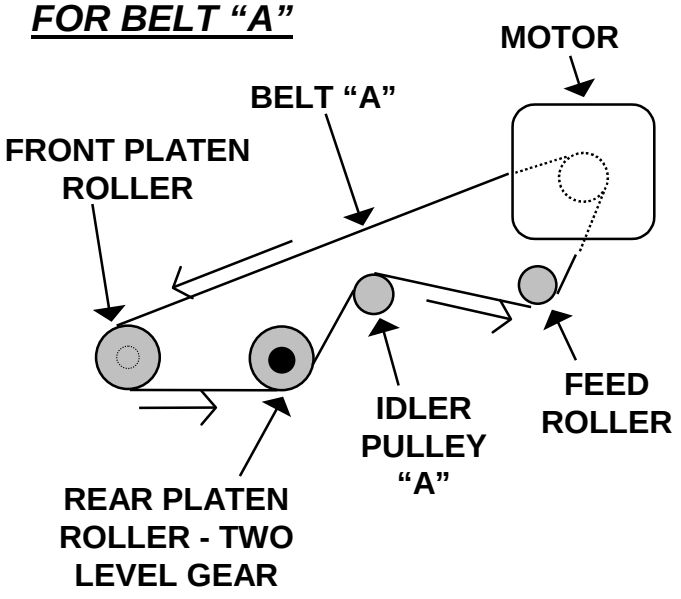


Fig. 6-23A

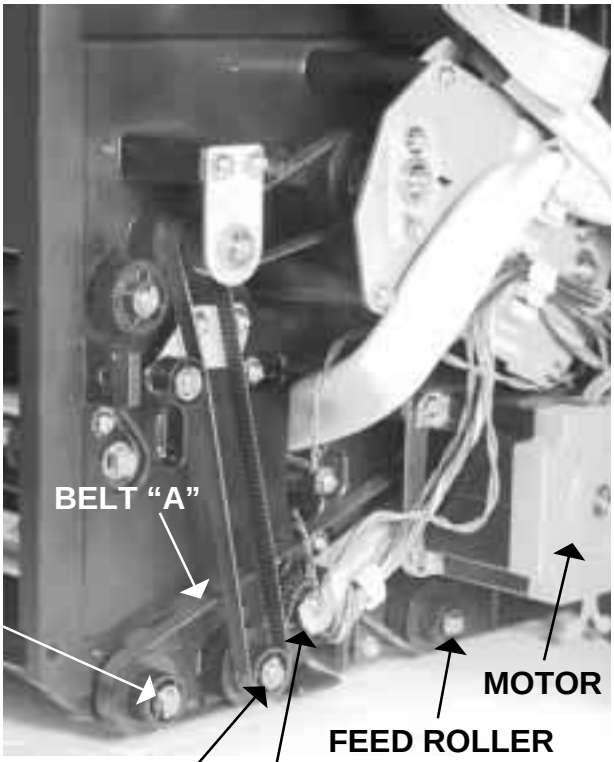


Fig. 6-23B

Part 1

6-9A Replacing the Timing Belts for the M-8485S

FOR BELTS "B & C"

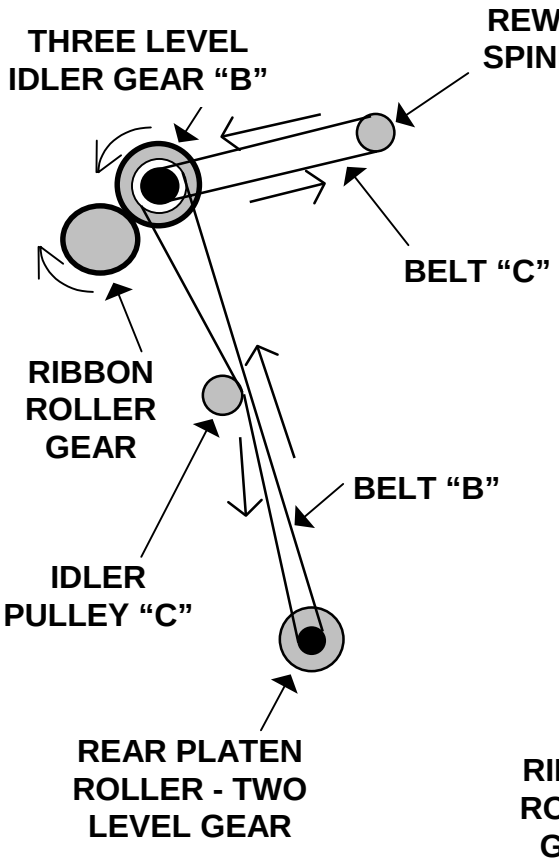


Fig. 6-23C

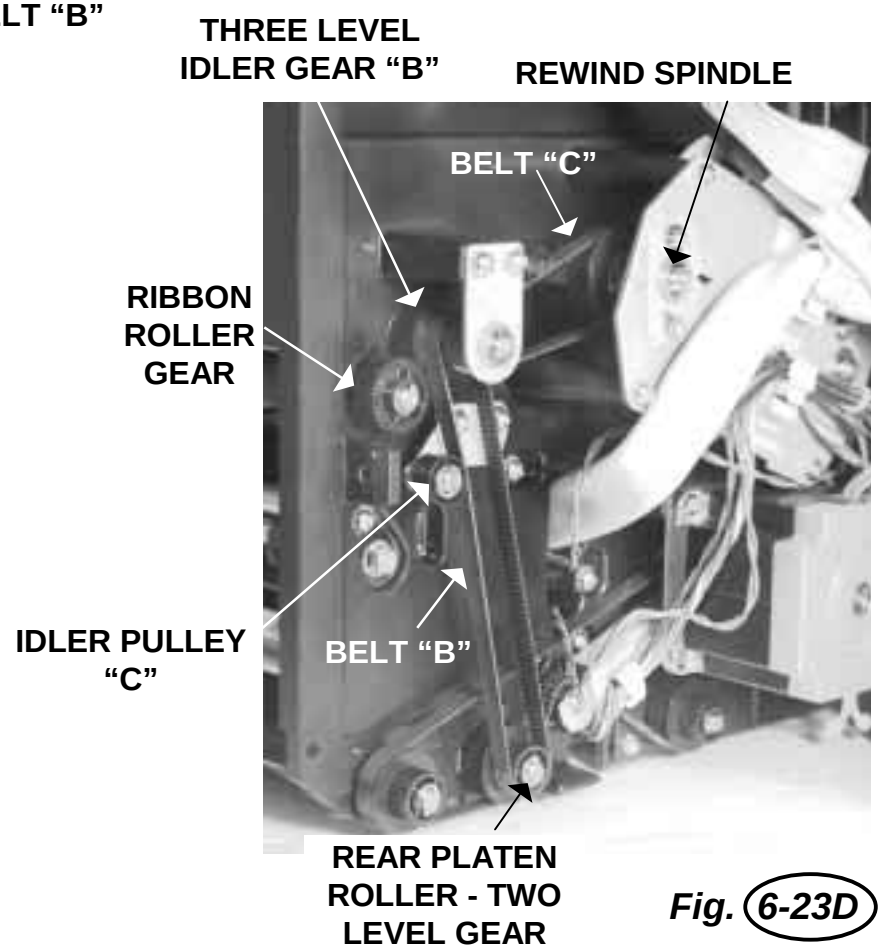


Fig. 6-23D

Part 1

6-9A Replacing the Timing Belts for the M-8485S

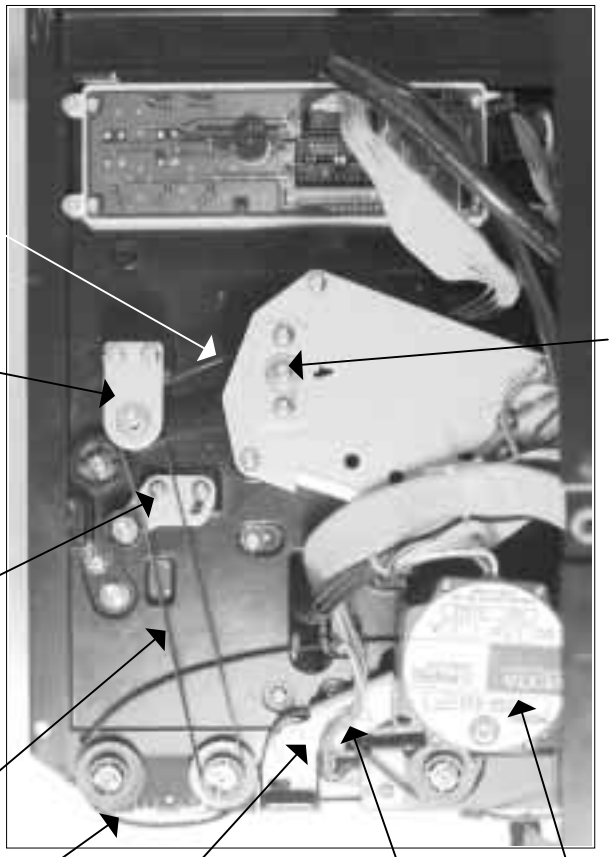
FOR BELTS "A, B & C"

STEP	PROCEDURE
1.	Refer to Section 6-8 and perform Steps 1-4 to remove and dislodge the motor from the frame and from Belt "A". Do not detach wire connections from motor. Belts "C", "B" and "A" are removed in sequence.
2.	Remove (2) screws from idler gear "B" bracket and the center screw holding the ribbon rewind spindle. Use wrench on opposite end of shaft (in the mechanical section) to prevent the shaft from slipping. Pull shaft back towards the mechanical section, just enough so that Belt "C" slides off the end of the shaft. Remove Belt "C" from both pulleys. ***Figs. 6-23A to 6-23F***
3.	Loosen (2) screws from idler pulley "C". Remove Belt "B" from both pulleys.
4.	From the mechanical section, remove holding idler pulley "A" mounting bracket screw. Detach the bracket and maneuver Belt "A" from pulleys and the gears. Replace belts as required. Replace screws previously removed. Secure wire bundle in clamp.
5.	Refer to Section 6-8 and remount the motor and attaching hardware to the frame.
6.	Adjust the belt tension as outlined in Section 5-6A.
7.	Close the printer halves and replace the locking screw.
8.	Reconnect the power cable.

Part 1

6-9A Replacing the Timing Belts for the M-8485S

FOR BELTS "A, B & C"

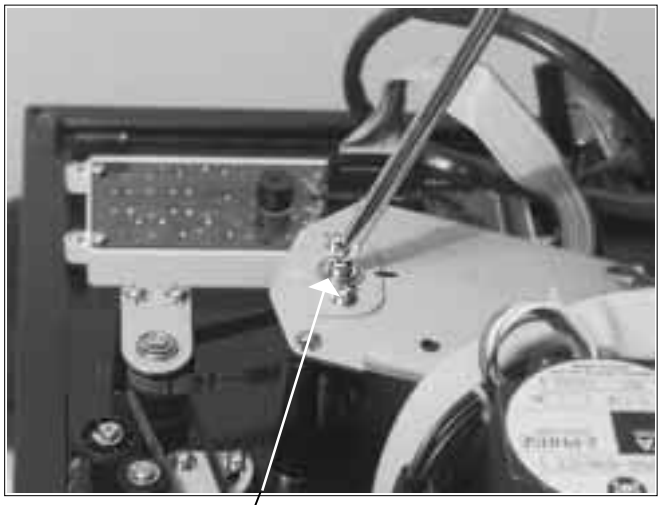


Figs. 6-23E

Part 1

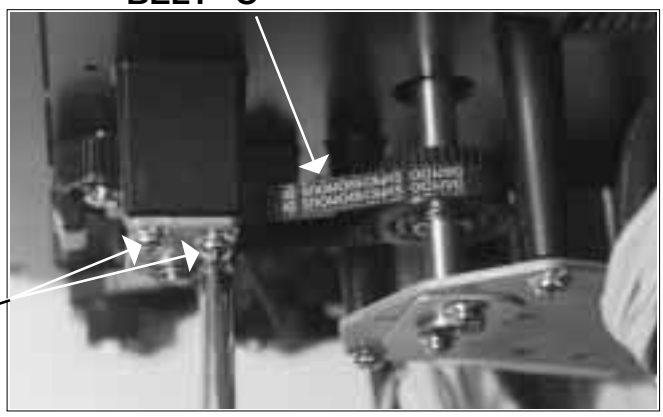
6-9A Replacing the Timing Belts for the M-8485S

FOR BELT "C"



REMOVE CENTER SCREW

SLIDE OFF BELT "C"



REMOVE (2) SCREWS FROM IDLER GEAR BRACKET "B"

Figs. 6-23F

6-9B Replacing the Timing Belts for the M-8490S

Five timing belts used in this printer are arranged as follows:

Starting at the stepper motor:
Belt "A" - From the motor to the first level of idler gear "C" to idler pulley "C" and back to motor. ***Fig. 6-24A & 24B***

Belt "B" - From feed roller to idler gear "D" to first level of front platen roller gear to first level of rear platen roller gear to idler pulley "A" back to feed roller. ***Fig. 6-24A & 24B***

Belt "C" - Joins the front platen roller gear to the two level gear "C" and is used as a "step- down" in transmitting torque to the front platen roller.

Belt "D & E" - From rear platen roller to three level idler gear "F". The first level of idler gear "F" meshes with ribbon roller gear. The second level of idler gear "F" is connected to the rear platen. The third level of idler gear "F" is connected to the rewind spindle via Belt "E".

Idler pulley "E" is used to adjust tension on belt "D".

FOR BELTS A & B

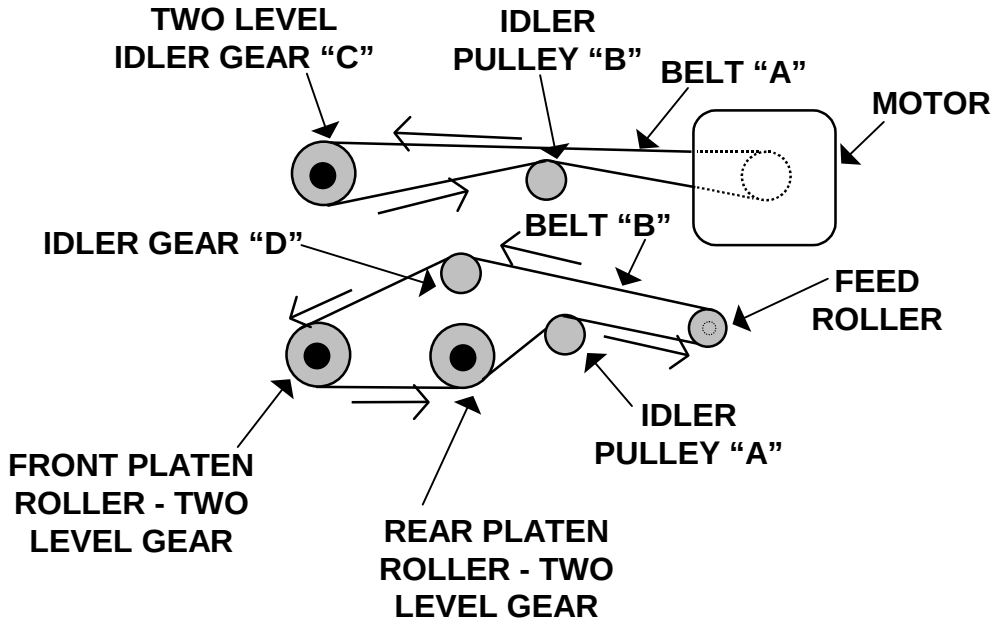


Fig. 6-24A

Part 1

6-9B Replacing the Timing Belts for the M-8490S

FOR BELTS "A & B"

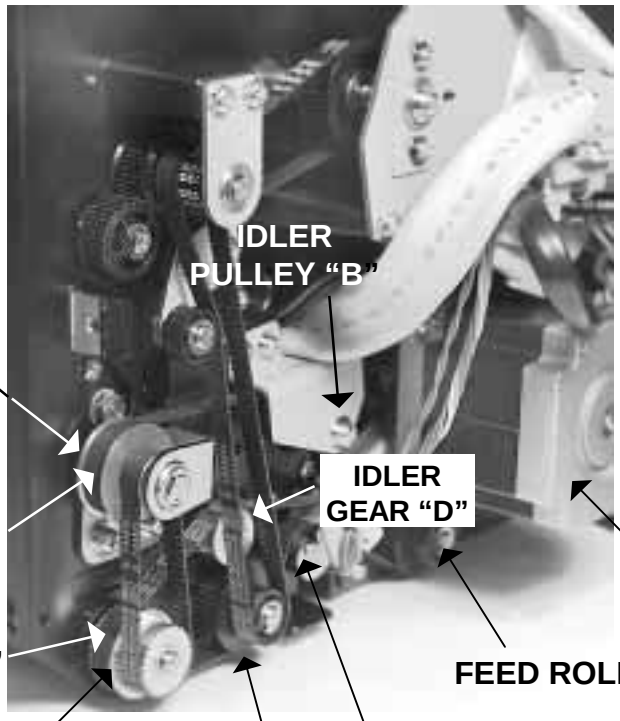


Fig. 6-24B

Part 1

6-9B Replacing the Timing Belts for the M-8490S

FOR BELTS "C, D & E"

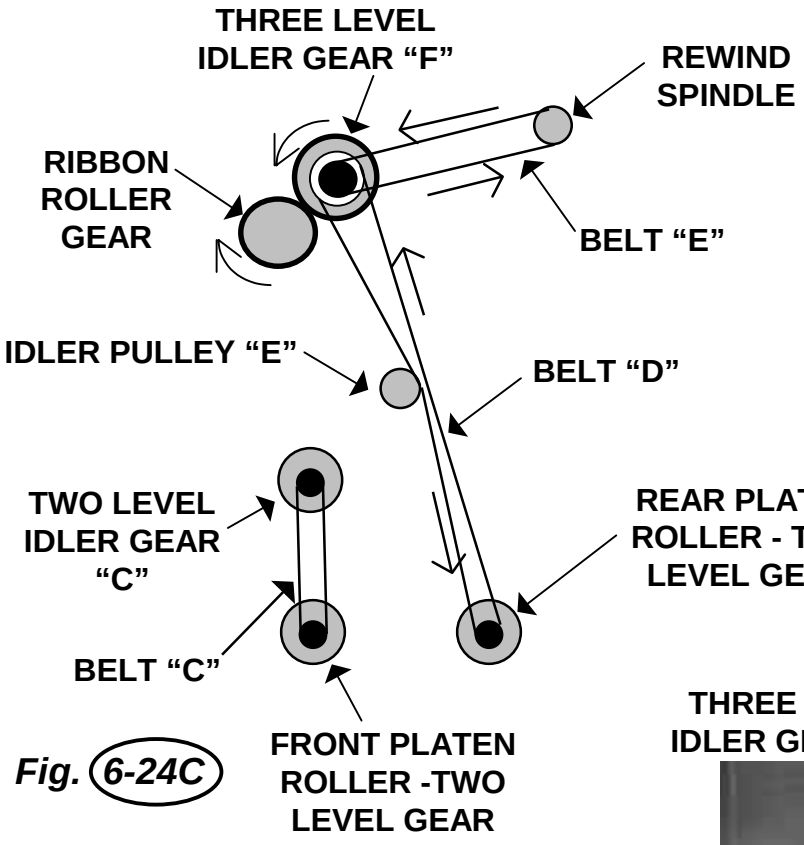


Fig. 6-24C

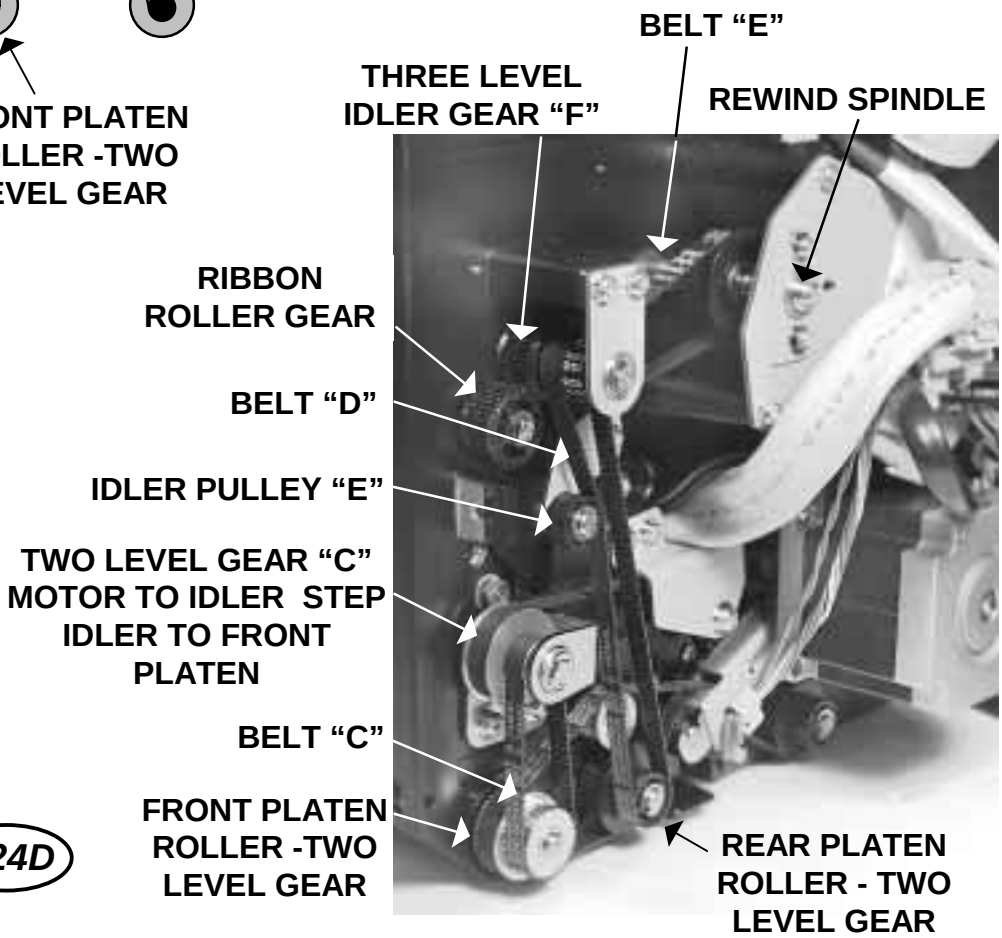


Fig. 6-24D

Part 1

6-9B Replacing the Timing Belts for the M-8490S

FOR BELTS A, B, C, D & E

STEP	PROCEDURE
	TO REMOVE BELTS "A & C"
1.	Remove (2) motor mounting screws to dislodge motor from frame. Slide off belt "A" from motor gear and pull through idler pulley "B" mounting bracket. ***Fig. 6-24E, F, H, J, & K***
2.	Remove (2) screws to dislodge idler "C" bracket from frame. Belt "A" will slide free of printer. Slide off belt "C" from front platen roller gear. Belt "C" will still be enclosed in the "C" bracket. To remove belt "C", remove snap ring from end of gear mounting shaft to disassemble and free belt "C". ***Fig. 6-24H, J, K & L***
	TO REMOVE BELTS "D & E"
	Remove (2) screws from idler gear bracket "F" to detach from frame. ***Fig. 6-24M***
	Slide off belt "E" from gear "F". Belt "E" will still be attached to ribbon rewind spindle. Remove center screw holding the ribbon rewind spindle. ***Fig. 6-24N***
	Use wrench on opposite end of shaft (in the mechanical section) to prevent the shaft from slipping. ***Fig. 6-24P***
	Pull shaft back towards the mechanical section, just enough so that belt "E" slides off the end of the shaft. Remove belt "E" from gears. Slide belt "D" from gear "F" and the rear platen gear. ***Fig. 6-24R***
	TO REMOVE BELT "B"
	From the mechanical section, remove the screw holding idler pulley "A" mounting bracket. Detach the bracket and maneuver Belt "B" from pulley and gears. ***Fig. 6-24G***
1.	**AFTER BELT MAINTENACE HAS BEEN PERFORMED**
	Replace belts as required. Remount motor, pulleys, gears and attaching hardware.
2.	Adjust belt tension as outlined in Section 5-6B.
3.	Close the printer halves and replace the locking screw.
4.	Reconnect the power cable.

Part 1

6-9B Replacing the Timing Belts for the M-8490S

FOR BELTS A, B, C, D & E

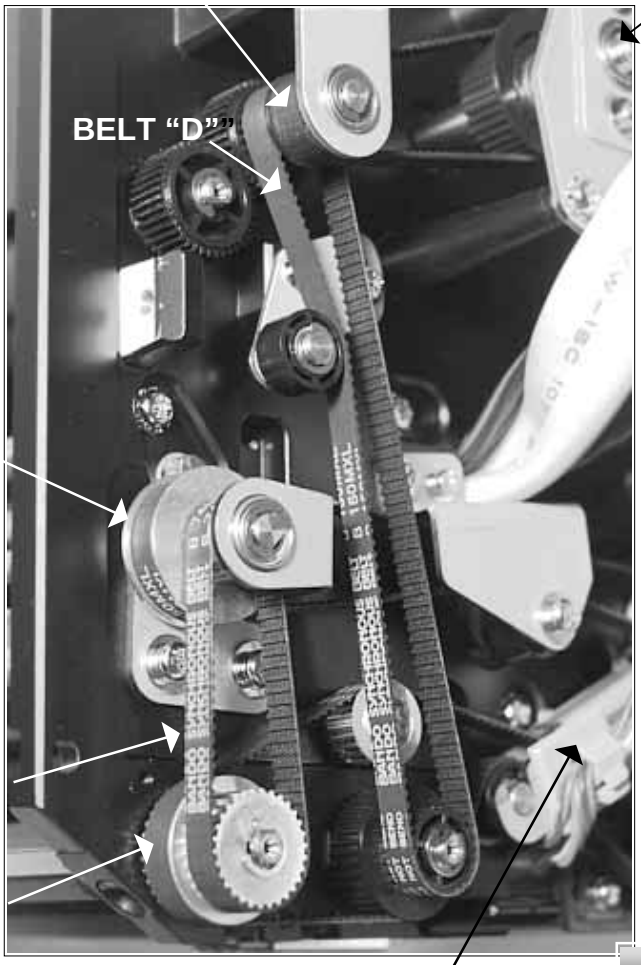
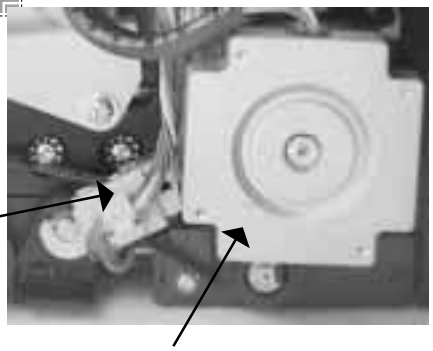


Fig. 6-24E



IDLER PULLEY "A"BRACKET REMOVE SCREW FROM OPPOSITE SIDE OF PRINTER FOR REMOVING BELT "B"

Fig. 6-24F

REMOVE (2) MOTOR MOUNTING SCREWS TO DISLODGE MOTOR FROM FRAME

Fig. 6-24G

Part 1

6-9B Replacing the Timing Belts for the M-8490S

FOR BELTS A & C

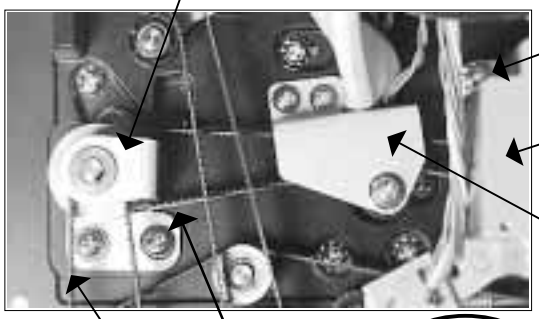


Fig. 6-24H

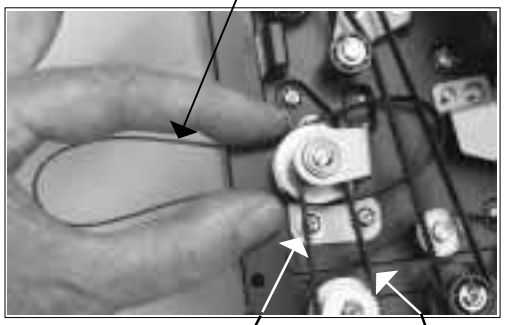


Fig. 6-24J

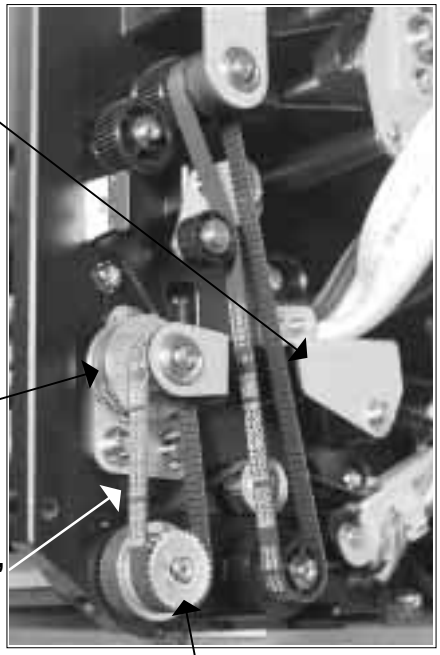


Fig. 6-24K

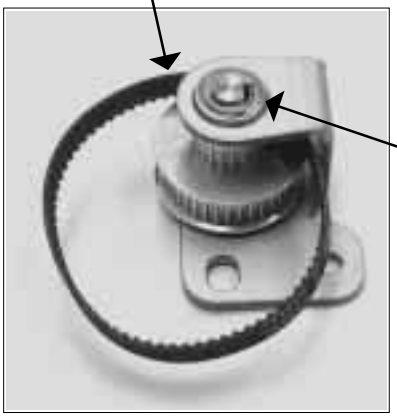


Fig. 6-24L

Part 1

6-9B Replacing the Timing Belts for the M-8490S

FOR BELTS D & E

REMOVE CENTER SCREW

Fig. 6-24N

REMOVE (2) SCREWS FROM IDLER GEAR BRACKET "F"

SLIDE OFF BELT "E"

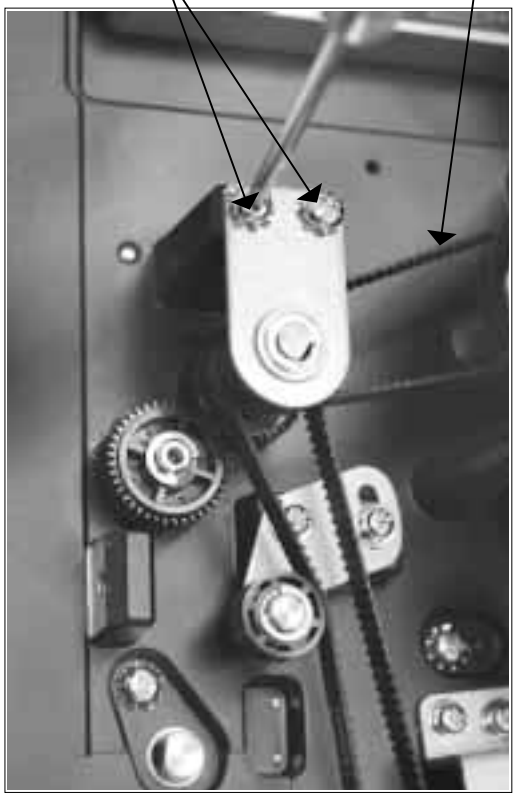
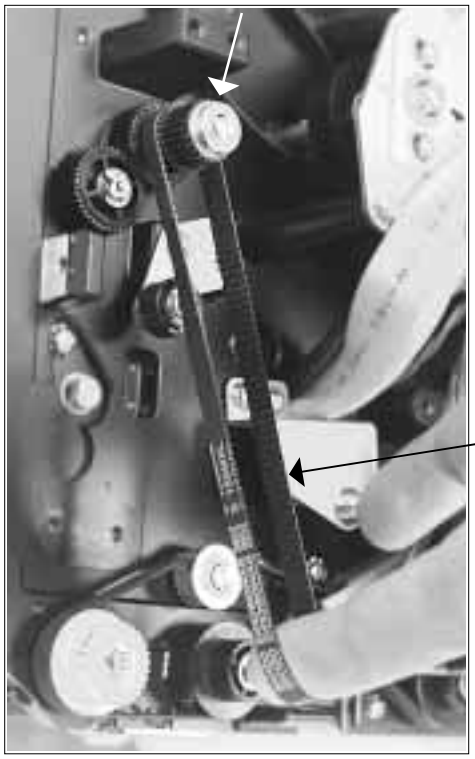


Fig. 6-24M

IDLER GEAR "F"



SLIDE OFF BELT "D"

Fig. 6-24R

USE WRENCH TO PREVENT SHAFT FROM SLIPPING WHEN REMOVING BELT "E"

Fig. 6-24P

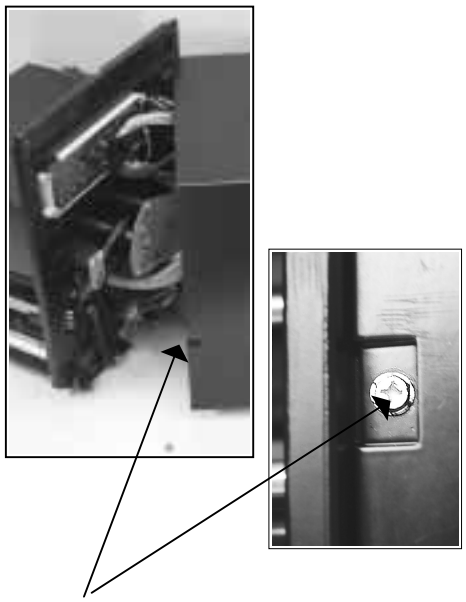
Part 1

6-10 Replacing the Ribbon Drive Clutch Washers

Both the ribbon unwind and the rewind drive spindles incorporate a friction clutch assembly to control tension. The friction washers within these clutch assemblies are replaceable. The procedure is identical for both the off-wind and the on-wind clutch assemblies.

To disassemble the spindles, perform the following steps:

STEP	PROCEDURE
1a.	Switch the printer OFF and disconnect the power cable.
2a.	Raise the lid on the mechanical side of the printer.
3a.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to mechanical and electrical sections. ***Fig. 6-25***
4a.	Remove the following parts from two spindle shafts (in order): ***Fig. 6-26***



REMOVE LOCKING SCREW AND SWING CABINET OPEN

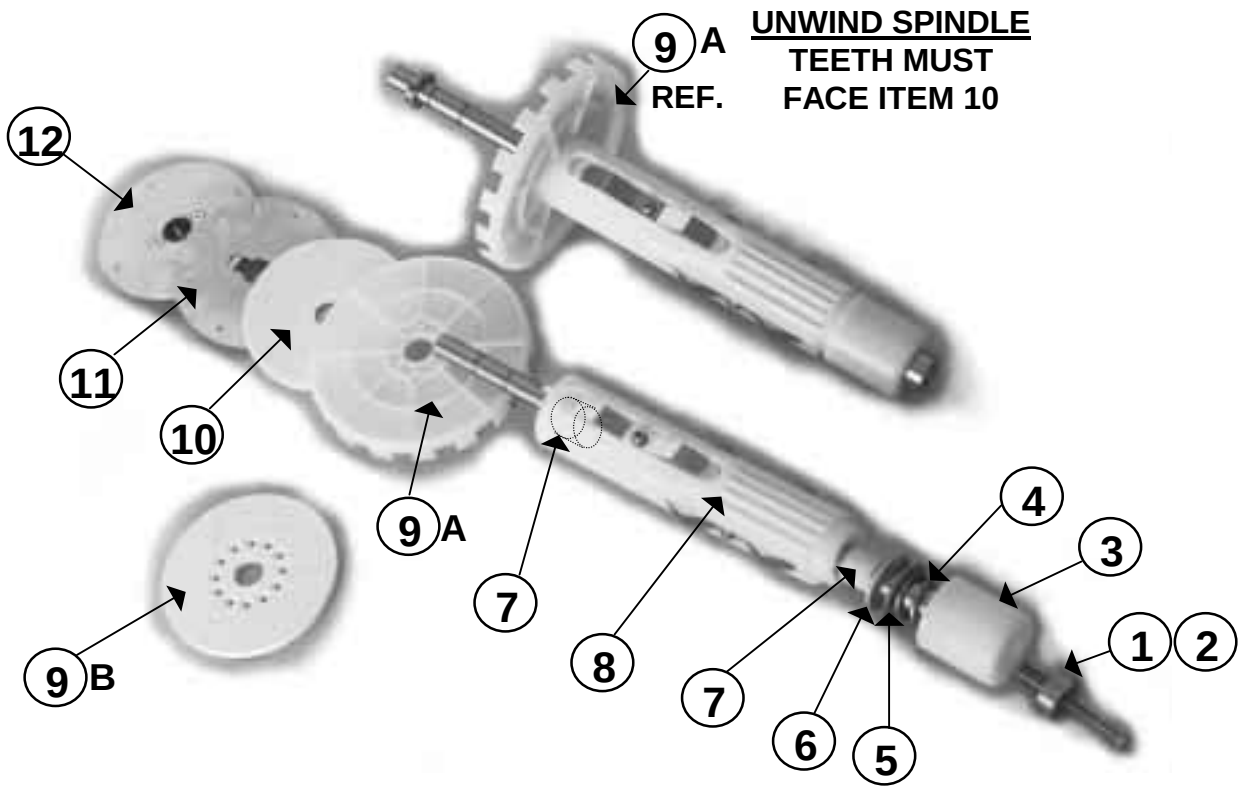
Fig. 6-25

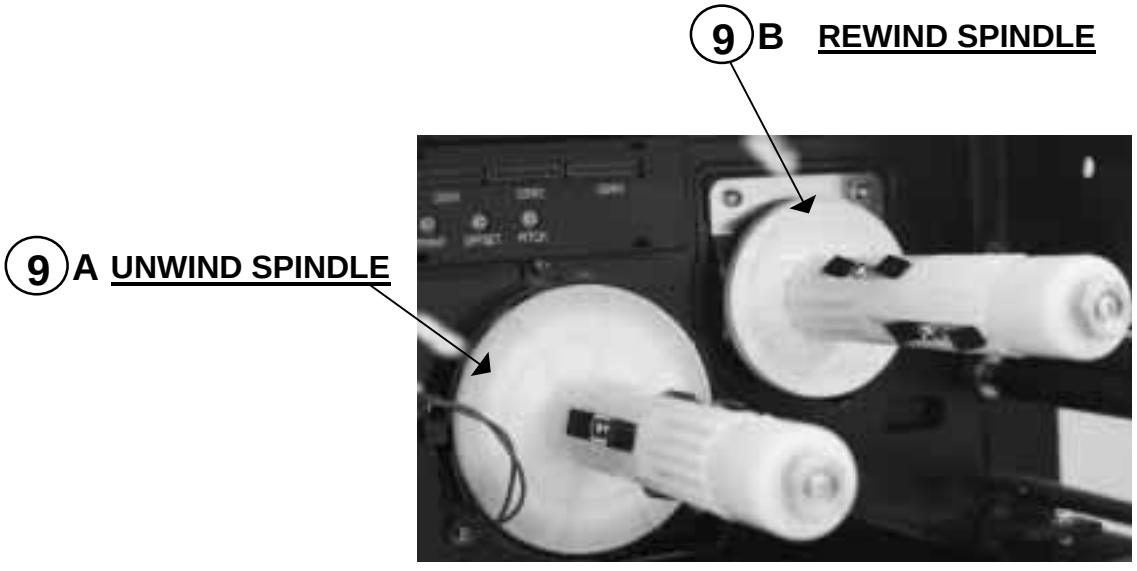
ITEM N0.	DESCRIPTION	QTY EA ASSY
1.	Screw	(1)
2.	Adjustment Nut	(1)
3.	Stopper Collar	(1)
4.	Spring	(1)
5.	Disc	(1)
6.	Oil- less Dry Metal Washer	(1)
7.	Collar	(2)
8.	Ribbon Boss	(1)
9A & 9B	Disc Plate (Different)	(1)
10.	Friction Washer	(1)
11. Hold Plate		(1)
12. Back Plate		(1)

NOTE: Disassemble one spindle at a time so that the other can be used for reference.

Part 1

6-10 Replacing the Ribbon Drive Clutch Washers





COMPONENTS SHOWN ASSEMBLED

Figs. ***6-26***

Part 1

6-10 Replacing the Ribbon Drive Clutch Washers

To replace parts and reassemble the spindles, perform the following steps:
Refer to ***Fig. 6-26.***

STEP	PROCEDURE
1b.	To each spindle install Item 11 Plate with teeth facing outward and align the plate with the peg on the Ribbon Shaft Flange.
2b.	Install Item 10 Felt Friction Washer onto the Ribbon Shaft and slide it against Item 11 Plate.
3b.	Install (1) ea. Item 9A or 9B Rewind and Unwind Disc Plates onto Item 8 Ribbon Bosses. Align the hole in the Disc Plates over the pegs on Item 8. The teeth/slots on the unwind disc plate must be facing away from the Ribbon Boss. Install this assembly onto the Ribbon Shaft and slide it against the felt friction washer.
4b.	Install Item 6 Oil-less Dry Metal Washer onto the ribbon shaft with the copper side facing inward (the black carbon side will face outward). Align Item 6 Washer with the peg on #8 Ribbon Boss.
5b.	Install Item 5 Disc onto the ribbon shaft with the smooth side facing Item 6 Washer, (one side of the disc is smooth and the other side has sharp edges).
6b.	Install Item 4 Spring onto the ribbon shaft.
7b.	Install Item 3 Stopper Collar onto the ribbon shaft.
8b.	Screw the Item 2 Adjustment Nut clockwise into the end of the ribbon shaft.
9b.	Replace #1 Screw and tighten.
10b.	Close the printer halves and replace the locking screw. Lower the lid.
11b.	Reconnect the power cable.

NOTE: Do not over-tighten the adjustment nut since this screw is used to adjust the clutch tension. Adjust the clutch tension as outlined in Section 5-2.

6-11 Replacing the Ribbon Motion Sensor

To remove and replace the Ribbon Motion Sensor, perform the following steps:

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to mechanical and electrical sections. ***Fig. 6-27***
3.	Raise the lid on the mechanical side of the printer.
4.	Remove the dip switch cover. ***Fig. 6-29***
5.	Remove (3) screws and the ring from around the unwind spindle. ***Fig. 6-29***
6.	Twist open the cable tie and unplug SEN4 connector from the PCB. ***Fig. 6-28 & 6-30***
7.	Remove sensor mounting screw and push the sensor through the access hole. ***Fig. 6-29 & 6-31***
8.	Remove (2) screws holding sensor to the mounting bracket. ***Fig. 6-32***
9.	Replace sensor and reattach to the mounting bracket. Feed sensor connector back through the access hole and reattach to SEN4 on the PCB. Attach the sensor bracket to the frame.
10.	Replace the ring and screws removed in Step 5. Replace the dip switch cover.
11.	Close the printer cabinet and replace the locking screw.
12.	Reconnect the power cable.

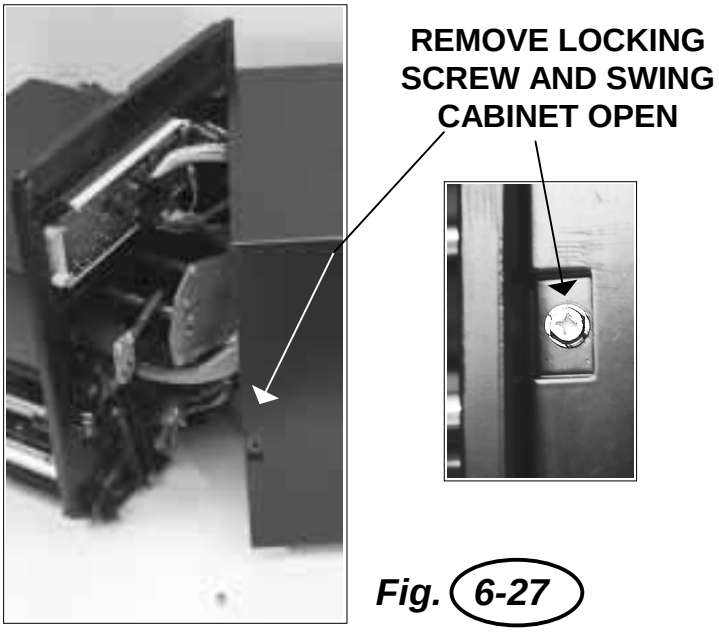
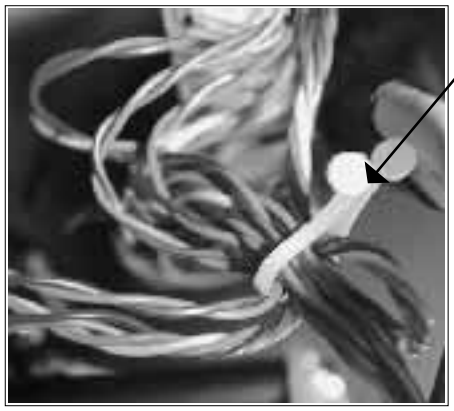


Fig. 6-27

Part 1

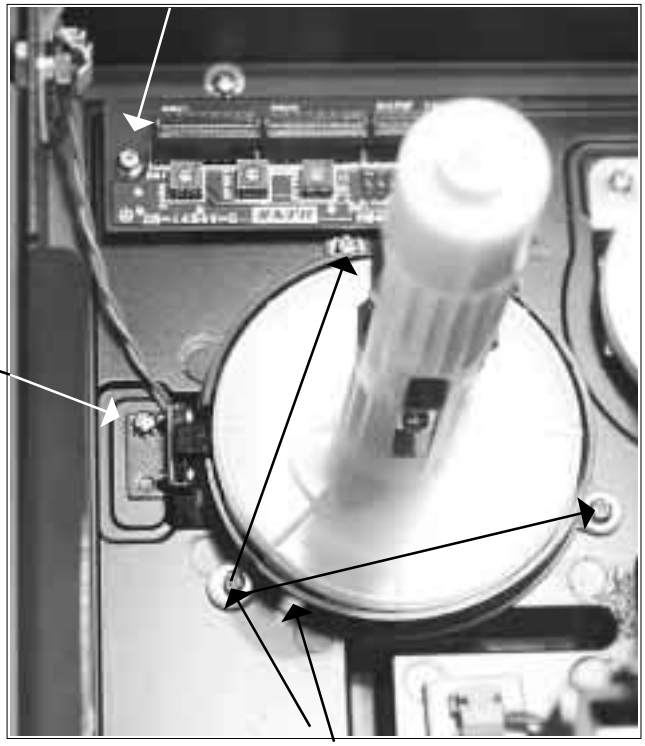
6-11 Replacing the Ribbon Motion Sensor



TWIST OPEN CABLE TIE

Fig. 6-28

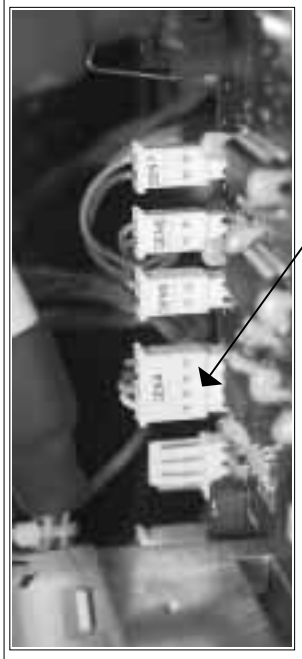
REMOVE DIP SWITCH COVER (SHOWN REMOVED)



REMOVE MOUNTING SCREW

REMOVE (3) SCREWS AND RING

Fig. 6-29



UNPLUG SEN4 CONNECTOR FROM PCB

Fig. 6-30

PUSH CONNECTOR SEN4 THROUGH ACCESS HOLE

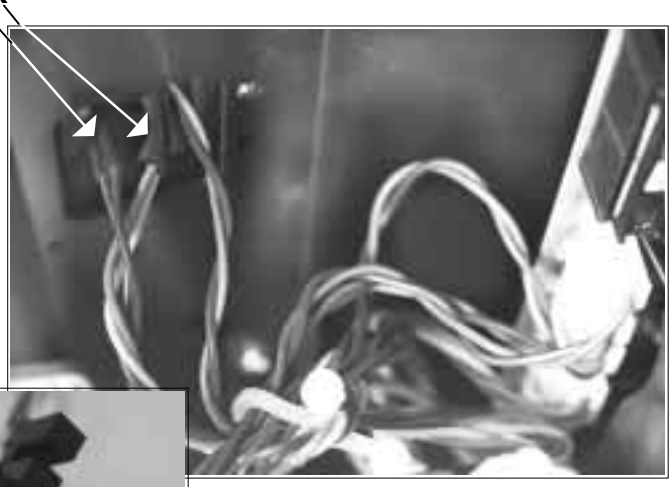
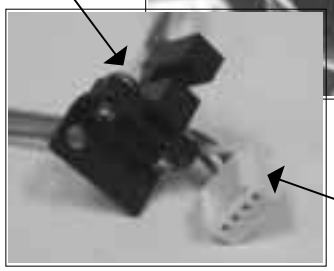


Fig. 6-31

(2) SCREWS ATTACHING SENSOR TO BRACKET



CONNECTOR TO PCB

Fig. 6-32

6-12 Replacing the Cover Open Switch

To remove and replace the Cover Open Switch, perform the following steps:

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to mechanical and electrical sections. ***Fig. 6-33***
3.	Raise the lid on the mechanical side of the printer.
4.	Twist open cable tie. Unplug SEN 6 connector from the PCB. ***Fig. 6-34 & 6-35***
5.	Detach ferrite core filter if one is attached to SEN 5 & 6 ***(M8490S)*** and cut ties.
6.	Remove the screw securing the ribbon motion sensor and move the sensor just enough to allow the connector SEN 6 on the end of the sensor to slide through the access hole. ***Fig. 6-36 & 6-37***
7.	Remove (2) screws holding sensor to the cabinet side. ***Fig. 6-38***
8.	Replace sensor and reattach to the cabinet side. Feed sensor connector back through the access hole. Replace ties and reattach ferrite core filter if necessary to SEN 5 & 6 ***(M8490S).***
9.	Reattach SEN 6 to PCB.
10.	Remount the ribbon motion sensor removed in Step 6.
11.	Close the printer cabinet and replace locking screw.
12.	Reconnect the power cable.

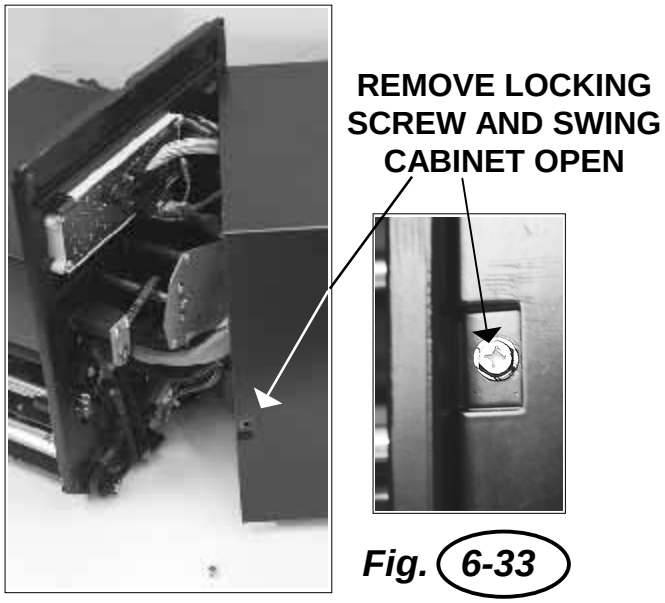


Fig. ***6-33***

Part 1

6-12 Replacing the Cover Open Switch

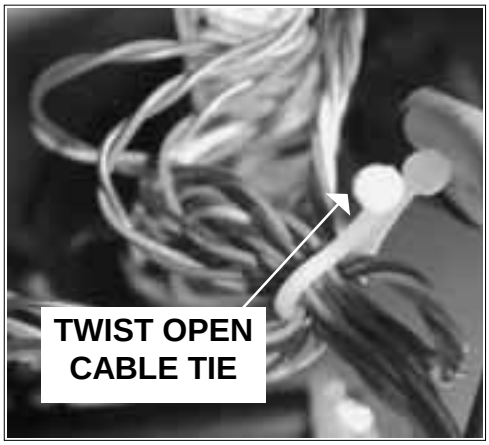
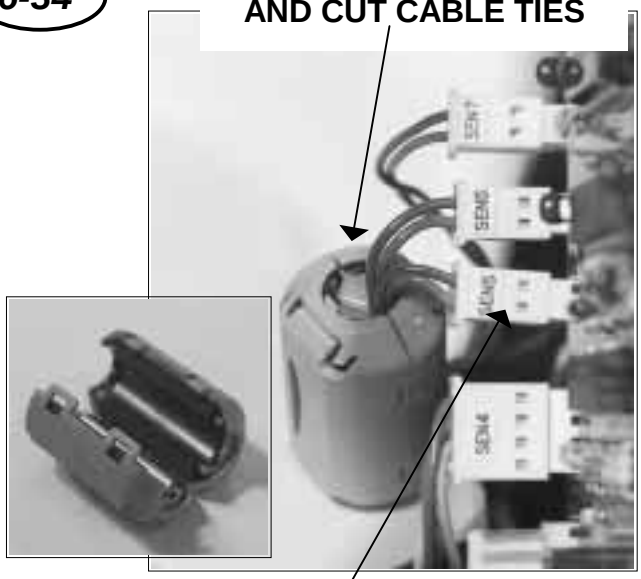


Fig. 6-34

DETACH FERRITE CORE FILTER IF IT IS ATTACHED TO SEN 6 & 5 (M-8490S) AND CUT CABLE TIES



UNPLUG SEN 6 CONNECTOR FROM PCB

Fig. 6-35

REMOVE MOUNTING SCREW FROM RIBBON MOTION SENSOR

Fig. 6-36

(2) SCREWS ATTACHING SENSOR TO CABINET

Fig. 6-38

PULL SEN 6 THROUGH ACCESS HOLE

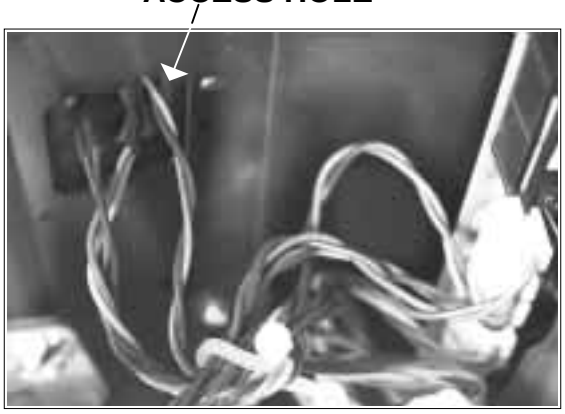
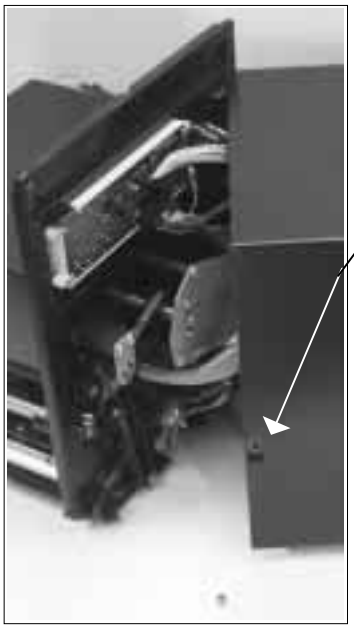


Fig. 6-37

6-13 Replacing the Head Open Switch

To remove and replace the Head Open Switch, perform the following steps:

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to mechanical and electrical sections. ***Fig. 6-39***
3.	Raise the lid on the mechanical side of the printer.
4.	Remove (2) screws holding sensor to the cabinet side. ***Fig. 6-40***
5.	Twist open cable holder and unsnap cable stay. Unplug SEN 5 connector from the PCB. ***Fig. 6-41 & 6-42***
6.	Detach ferrite core filter if one is attached to SEN 5 & 6 ***(M8490S)*** and cut ties.
7.	Pull the sensor back so that the connector SEN5 is drawn through the access opening. ***Fig. 6-43***
8.	Replace sensor and reattach to the cabinet side. Feed sensor connector back through the access hole. Replace ties and reattach ferrite core filter if necessary to SEN 5 & 6 ***(M8490S).***
9.	Reattach SEN 5 to PCB.
10.	Close the printer cabinet and replace the locking screw.
11.	Reconnect the power cable.

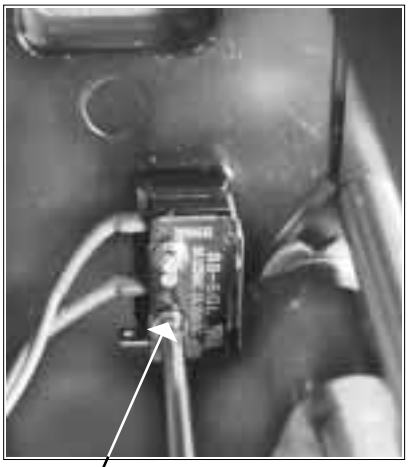


REMOVE LOCKING SCREW AND SWING CABINET OPEN

Fig. 6-39

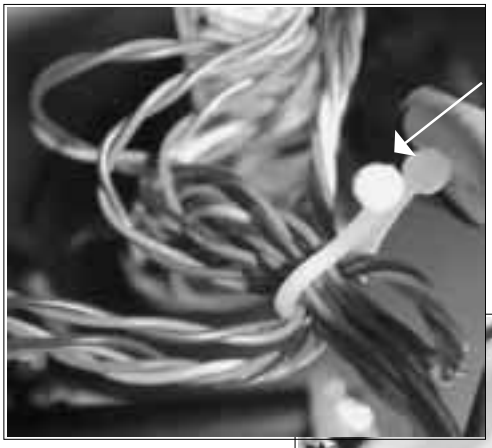
Part 1

6-13 Replacing the Head Open Switch

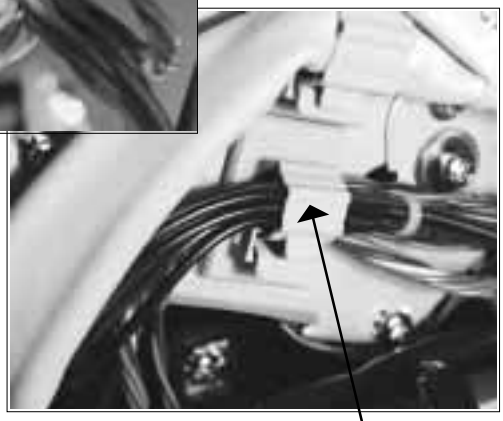


(2) SCREWS ATTACHING SENSOR TO CABINET

Fig. 6-40



TWIST OPEN CABLE TIE



UNSNAP CABLE HOLDER

Fig. 6-41

PULL SEN 5 CONNECTOR THROUGH ACCESS OPENING

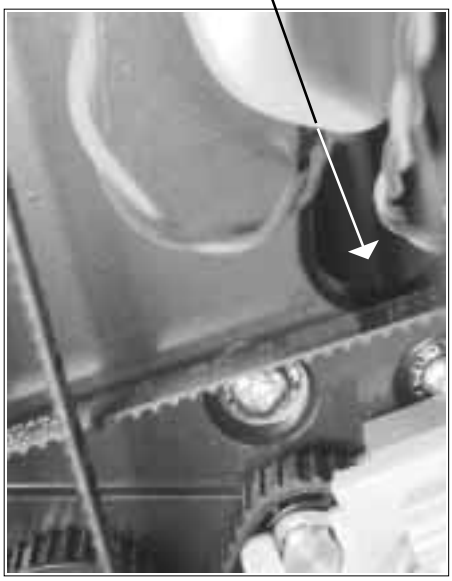
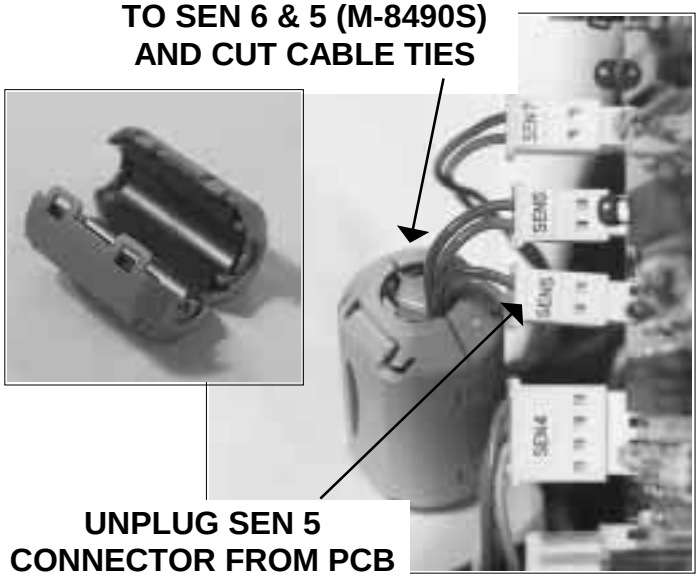


Fig. 6-43

DETACH FERRITE CORE FILTER IF IT IS ATTACHED TO SEN 6 & 5 (M-8490S) AND CUT CABLE TIES



UNPLUG SEN 5 CONNECTOR FROM PCB

Fig. 6-42

6-14 Replacing Label Gap Sensor Board (Bottom ½) and "Eye-Mark" Sensor (Reflective) Board

The bottom ½ of the Label Gap Sensor and the "Eye-Mark" Sensor is combined on one phenolic board. Access to replace is from the under side of the printer.

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to the inside of the printer. Place the printer so that the back side of the unit is resting on a flat surface and the access lid is facing up. ***Fig. 6-43 & 6-44***
3.	Raise the lid.
4.	Push down the latch lever and carefully remove the nip roller assembly. The opposite end of the assembly is positioned in place with a guide pin and spring retaining plate. ***Fig. 6-44, 6-45, & 6-46***
5.	Loosen (2) screws to detach cover plate enclosing the board with the bottom ½ of the Label Gap Sensor and the "Eye-Mark" Sensor. ***Fig. 6-47***
6.	Remove (2) screws, (2) spacers and (1) plastic shield holding the Label Gap Sensor to the frame. ***Fig. 6-48***
7.	Unsnap the cable tie and unplug SEN1 from the PCB. ***Fig. 6-49 & 6-50***
8.	Pull the sensor back so that the connector SEN1 is drawn through the frame opening.
9.	Remove and replace the sensor module. Reattach SEN1 to the PCB.
10.	Replace parts previously removed.
11.	Close the printer cabinet and replace the locking screw. Close the lid.
12.	Reconnect the power cable.

REMOVE LOCKING SCREW AND SWING CABINET OPEN

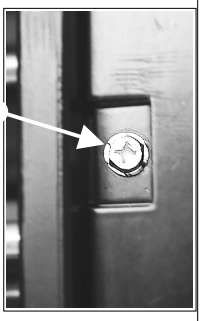
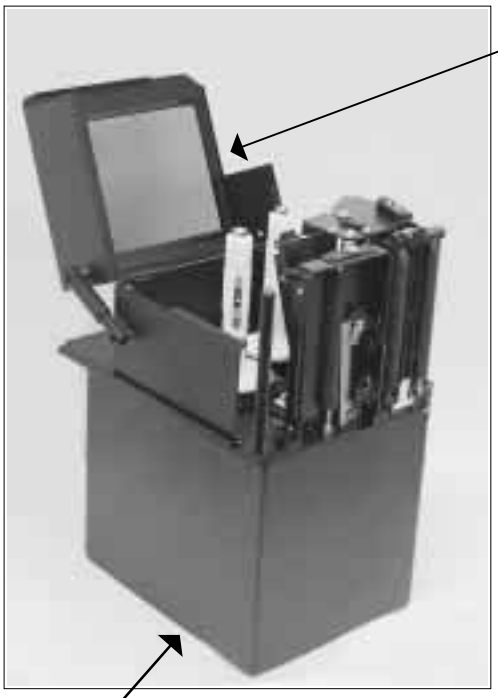


Fig. 6-43

Part 1

6-14 Replacing Label Gap Sensor Board (Bottom ½) and "Eye-Mark" Sensor (Reflective) Board



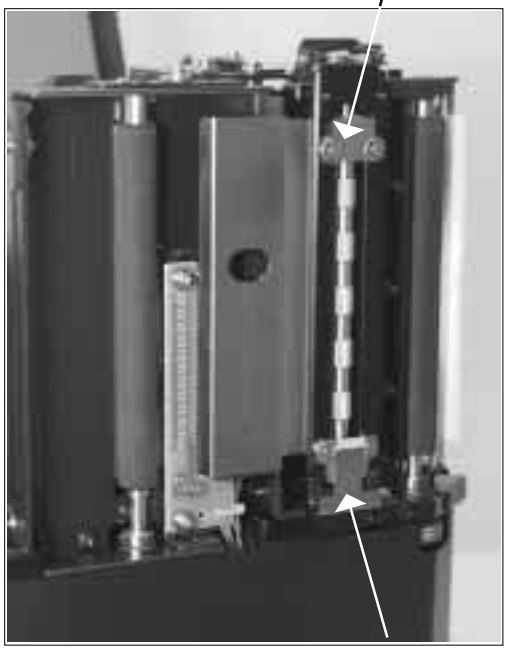


Fig. 6-44

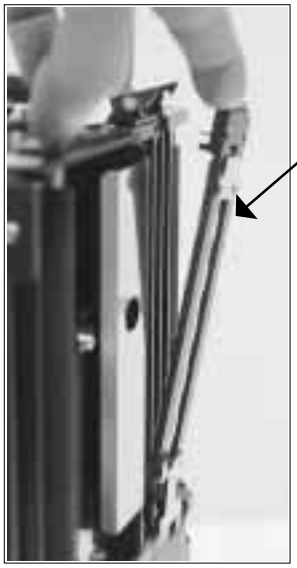


Fig. 6-45

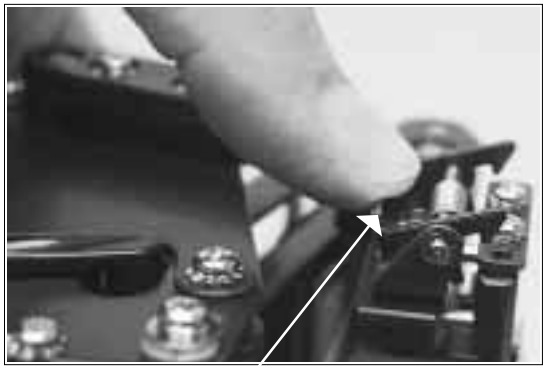


Fig. 6-46

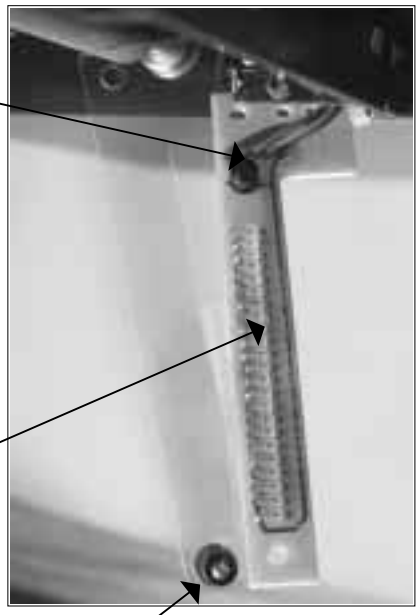
Part 1

6-14 Replacing Label Gap Sensor Board(Bottom ½) and "Eye-Mark" Sensor (Reflective) Board

LOOSEN (2) SCREWS AND REMOVE COVER PLATE

Fig. 6-47

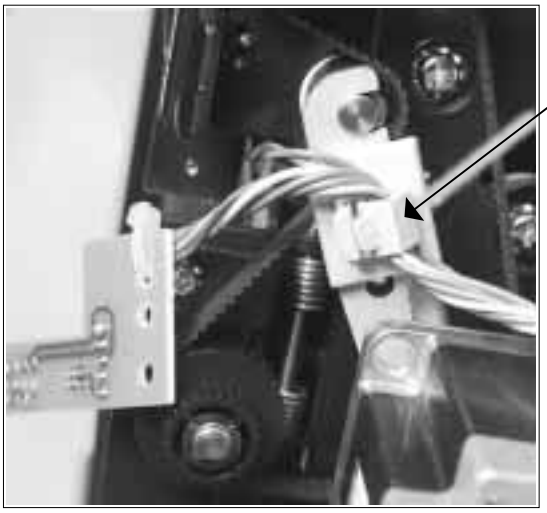
"Eye-MARK" SENSOR (REFLECTIVE)



LABEL GAP SENSOR (BOTTOM ½)

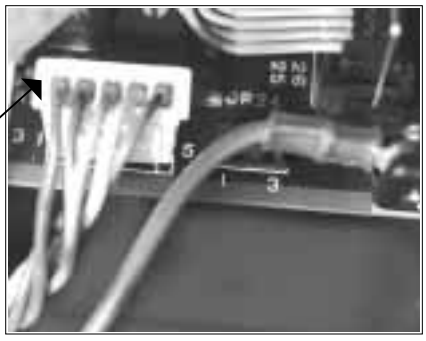
REMOVE (2) SCREWS, (2) SPACERS, AND PLASTIC SHIELD

Fig. 6-48



UNSNAP CABLE STAY

Fig. 6-49



UNPLUG SEN1 CONNECTOR FROM PCB

Fig. 6-50

Part 1

6-15 Replacing the Label Gap Sensor (Top ½)

Access to top ½ of the Label Gap Sensor replace is through the front of the printer.

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to mechanical and electrical sections. ***Fig. 6-51***
3.	Raise the lid on the mechanical side of the printer. ***Fig. 6-52***
4.	Remove (2) screws from side of media hold down. Carefully wiggle off cover to expose sensor module. ***Fig. 6-53 & 6-54***
5.	Insert screwdriver between head components and platen to remove (2) screws holding the sensor module to the bottom portion of the media hold down frame. ***Fig. 6-55, & 6-56***
6.	Remove (2) screws holding the sensor to the sensor bracket. ***Fig. 6-57 & 6-58***
7.	Unsnap the cable holder and unplug SEN2 from the PCB. ***Fig. 6-59 & 6-60.***
8.	Pull the sensor back so that the connector SEN2 is drawn through the access opening. ***Fig. 6-61***
9.	Remove and replace the sensor module. Feed sensor connector back through the access opening and reattach SEN2 to the PCB.
10.	Replace parts previously removed.
11.	Close the printer cabinet and replace the locking screw.
12.	Reconnect the power cable.

Part 1

6-15 Replacing the Label Gap Sensor (Top ½)

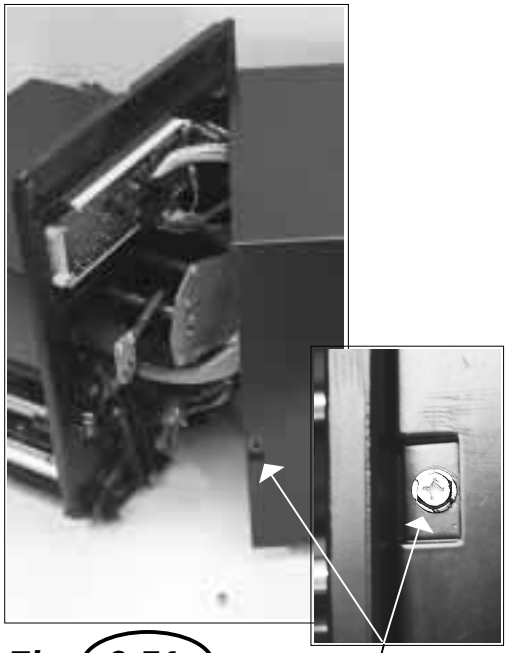


Fig. 6-51

REMOVE LOCKING SCREW AND SWING CABINET OPEN

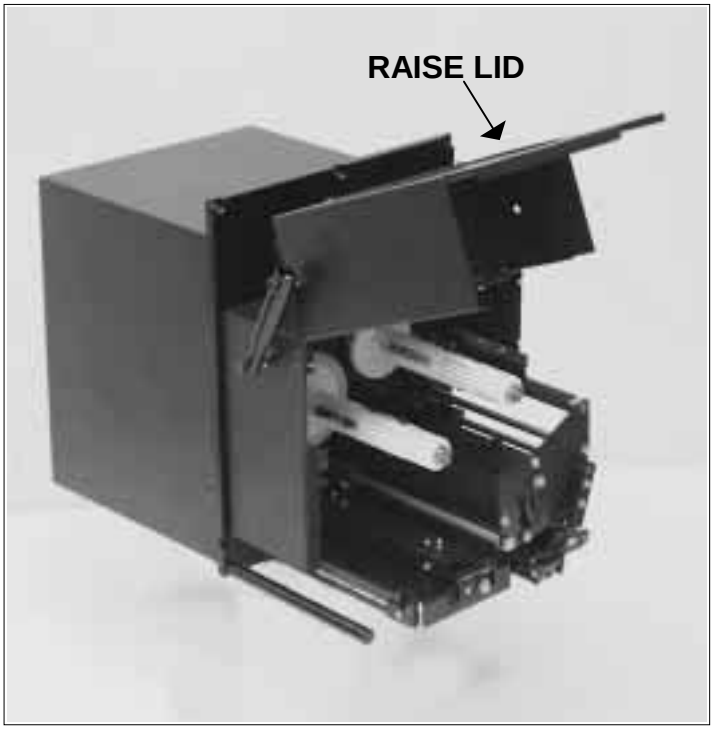
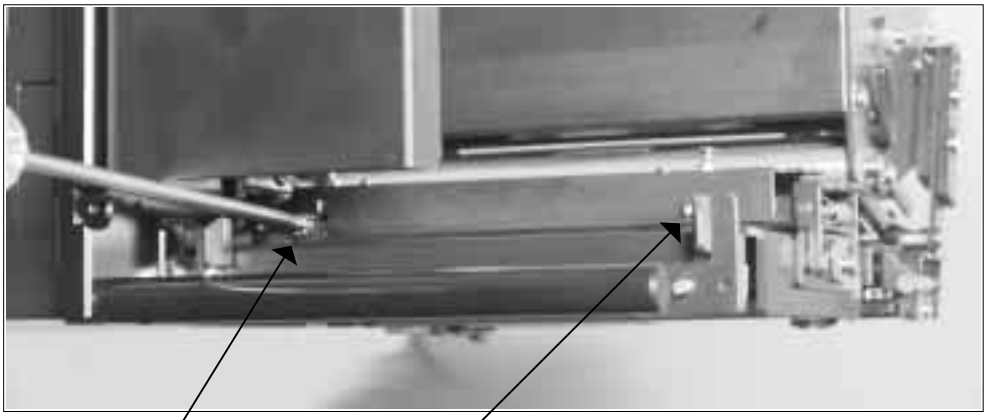
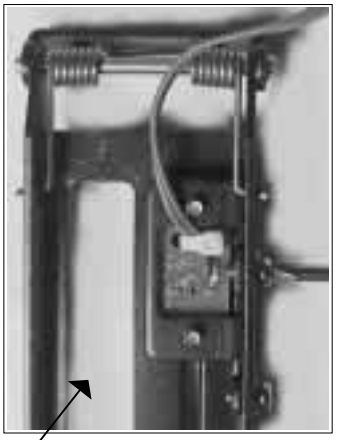


Fig. 6-52



REMOVE (2) SCREWS AND WIGGLE OFF MEDIA HOLD DOWN COVER

Fig. 6-53



MEDIA HOLD DOWN TOP COVER SHOWN REMOVED

Fig. 6-54

Part 1

6-15 Replacing the Label Gap Sensor (Top ½)

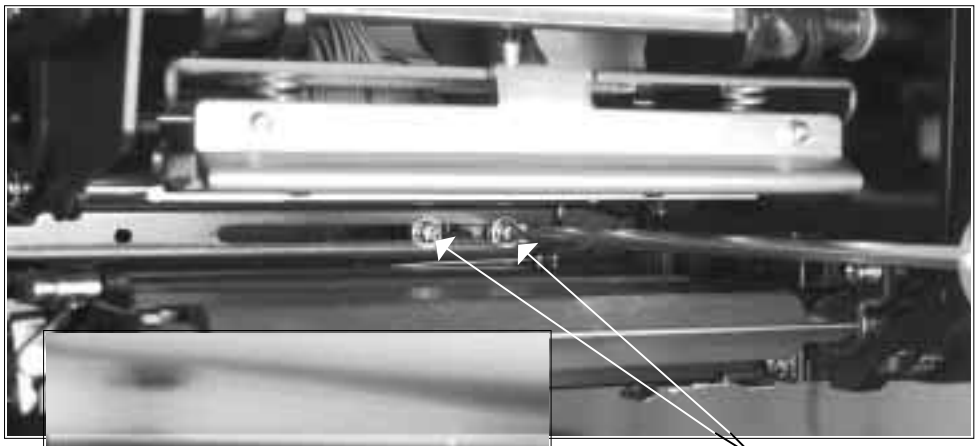


Fig. 6-55

CAREFULLY SLIDE SCREW DRIVER THROUGH SPACE AND REMOVE (2) SCREWS

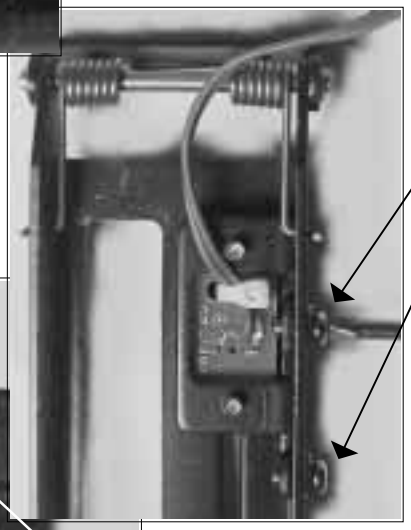
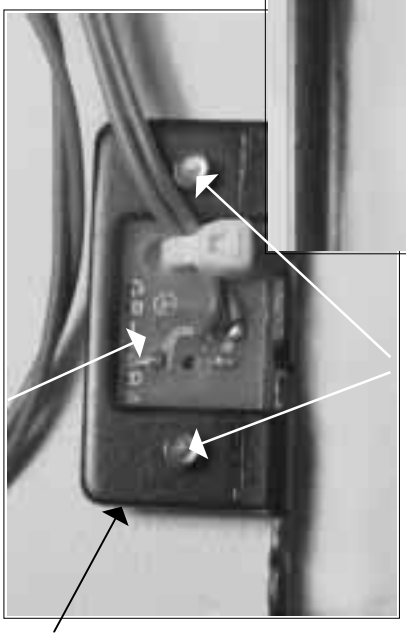


Fig. 6-56



SENSOR

REMOVE (2) SCREWS AND LIFT LABEL GAP SENSOR FROM BRACKET

Fig. 6-57

SENSOR BRACKET

6-15 Replacing the Label Gap Sensor (Top ½)

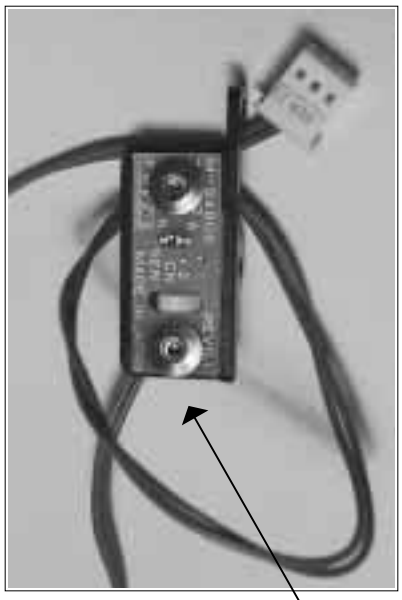


Fig. 6-58

LABEL GAP SENSOR (TOP ½) SHOWN REMOVED FROM THE SENSOR BRACKET

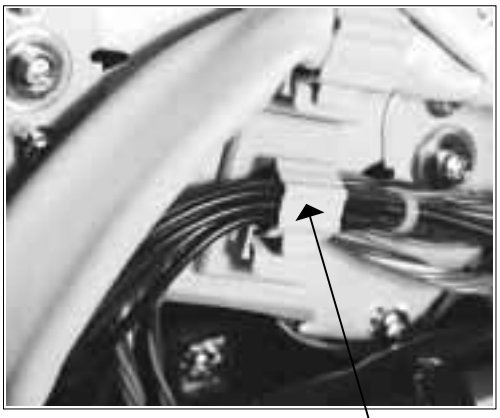
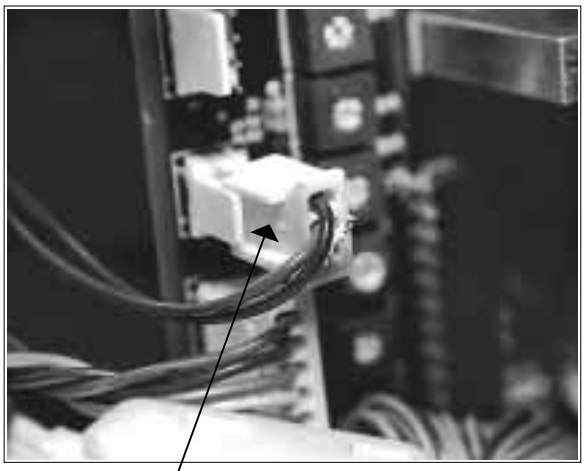


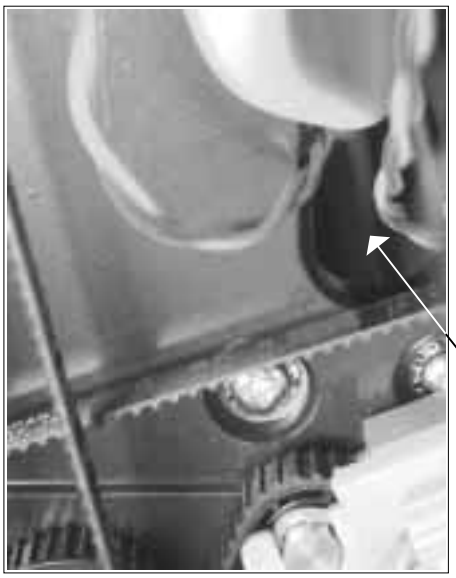
Fig. 6-59

UNSNAP CABLE HOLDER



UNPLUG SEN2 CONNECTOR FROM PCB

Fig. 6-60



PULL SEN2 CONNECTOR THROUGH ACCESS OPENING

Fig. 6-61

Part 1

6-16 Replacing the Label Out Sensor

Access to the Label Out Sensor is from the under side of the printer.

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Place the printer so that the back side of the unit is resting on a flat surface and the access lid on the mechanical side is facing up. ***Fig. 6-62***
3.	Open the access lid.
4.	Push down the latch lever and carefully remove the nip roller assembly. The opposite end of the assembly is positioned in place with a guide pin and spring retaining plate. ***Fig. 6-63, 6-64, & 6-65***
5.	Loosen (2) screws to detach cover plate enclosing the Label Out Sensor and the bottom ½ of the Label Gap Sensor. ***Fig. 6-66***
6.	Remove (1) screw holding the Label Out Sensor to the frame. ***Fig. 6-67, & 6-68***
7.	Remove (2) screws holding the sensor module to the bracket. ***Fig. S6-69***
8.	Unsnap cable holder and unplug connector SEN7 from the PCB. ***Fig. S6-70***
9.	Draw the sensor cable (connector attached) through the clearance hole in the frame.
10.	Remove and replace the sensor module. Reattach connector SEN7 to the PCB.
11.	Replace parts previously removed in Steps 4-8.
12.	Reconnect the power cable.

Part 1

6-16 Replacing the Label Out Sensor

Fig. 6-62

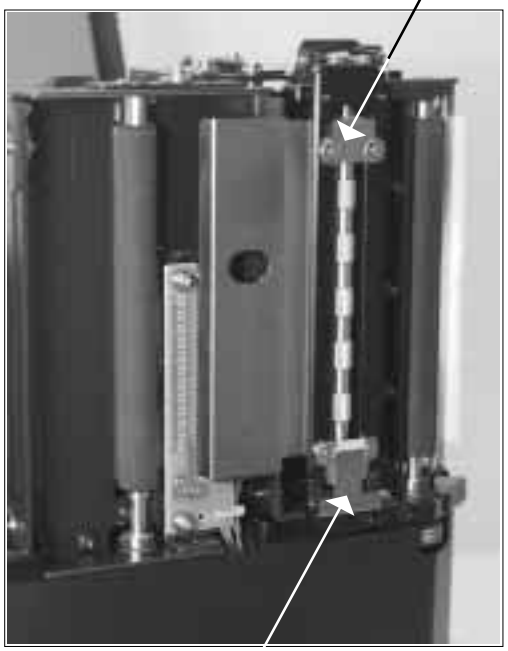


Fig. 6-63

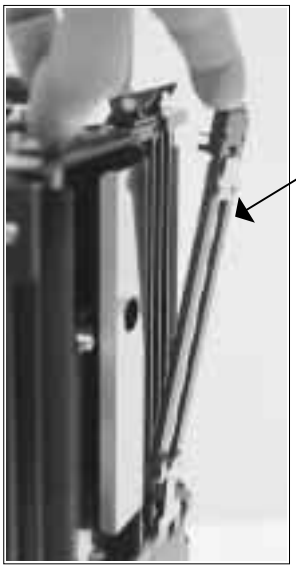


Fig. 6-65

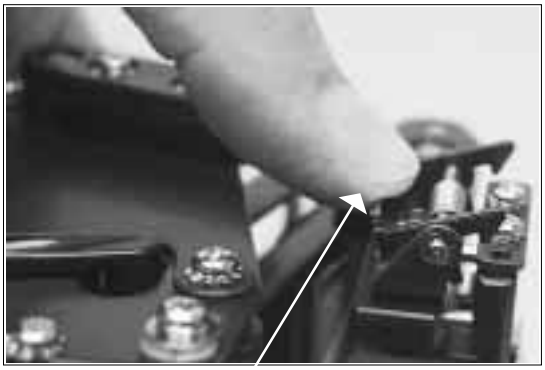


Fig. 6-64

Part 1

6-16 Replacing the Label Out Sensor

LOOSEN (2) SCREWS AND REMOVE COVER PLATE

Fig. 6-66

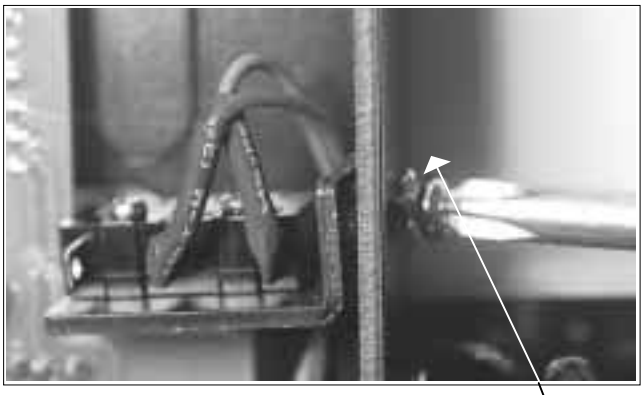


Fig. 6-67

REMOVE (1) SCREW TO DETACH LABEL OUT SENSOR FROM FRAME

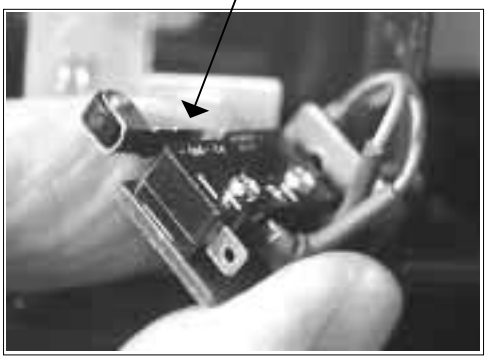
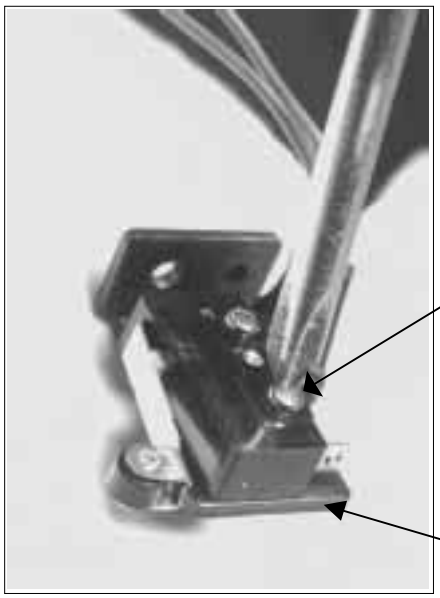


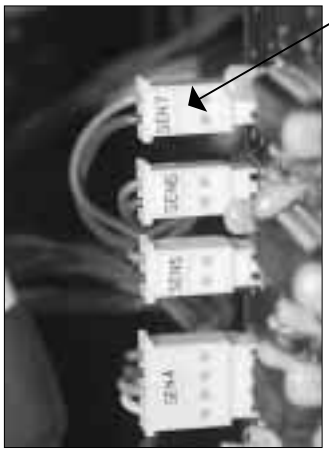
Fig. 6-68



REMOVE (2) SCREWS TO DETACH SENSOR MODULE FROM BRACKET

BRACKET

Fig. 6-69



UNPLUG SEN7 CONNECTOR FROM PCB

Fig. 6-70

6-17 Replacing the Platen

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to mechanical and electrical sections. Place the printer so that the back side of the unit is resting on a flat surface and the access lid on the mechanical side is facing up. ***Fig. 6-70***
3.	Open the access lid.
4.	Push down the latch lever and carefully remove the nip roller assembly. The opposite end of the assembly is positioned in place with a guide pin and spring retaining plate. ***Fig. 6-71, 6-72, & 6-73***
5.	Unlatch head lock lever if engaged. ***Fig. 6-74***
6.	Remove Allen screw attaching bracket to platen. ***Fig. 6-75***
7.	Reposition printer for access to the motor. Loosen (2) motor mounting screws to free belts from platen and feed rollers. ***Fig. 6-76***
8.	Remove (4) Allen screws attaching platen stay to back plate. ***Fig. 6-77 & 6-78***
9.	Carefully lift out platen and components. ***Fig. 6-79 & 6-80***
10.	Remove components, (“E” clip, gears, supporter collar) from platen roller. Note position of collar for reassembly.
11.	Replace the platen roller and reattach the components from the old platen roller removed in Step 10. Reposition collar.
12.	Reassemble parts previously removed in Steps 4-8.
13.	Remount the motor and adjust belt tension as outlined in Section 5-6.
14.	Close the printer halves and replace the locking screw.
15.	Reconnect the power cable.

Part 1

6-17 Replacing the Platen

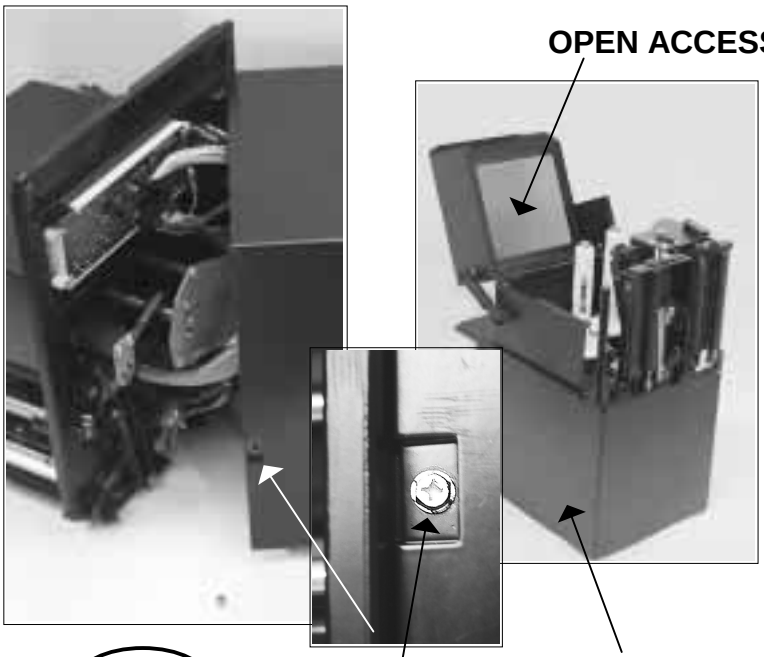


Fig. 6-70

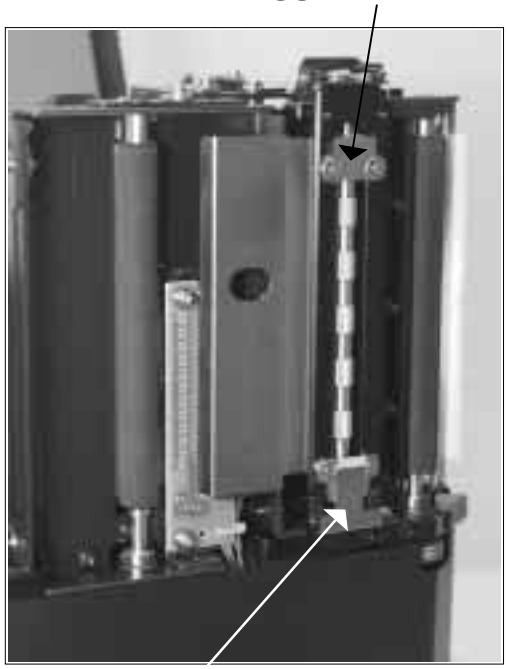


Fig. 6-71

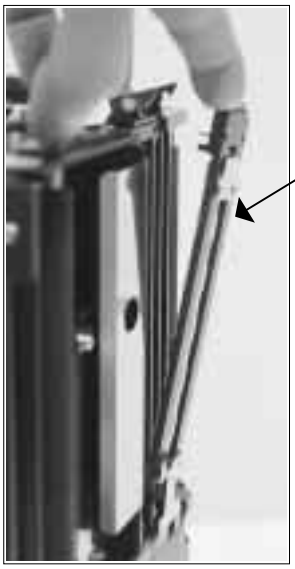


Fig. 6-73

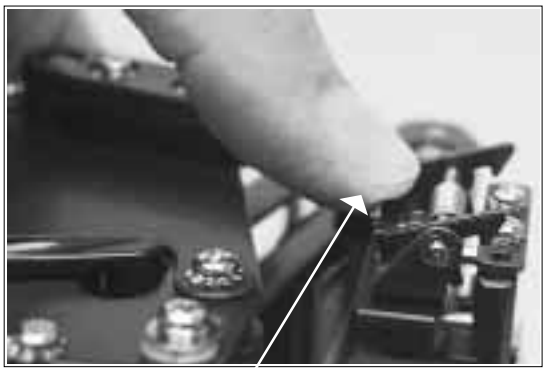


Fig. 6-72

Part 1

6-17 Replacing the Platen

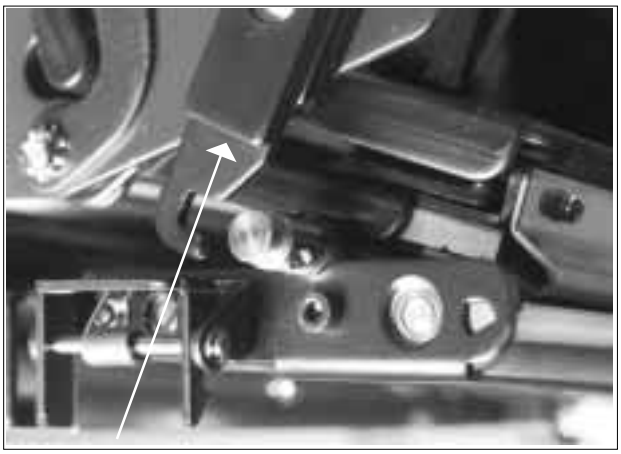
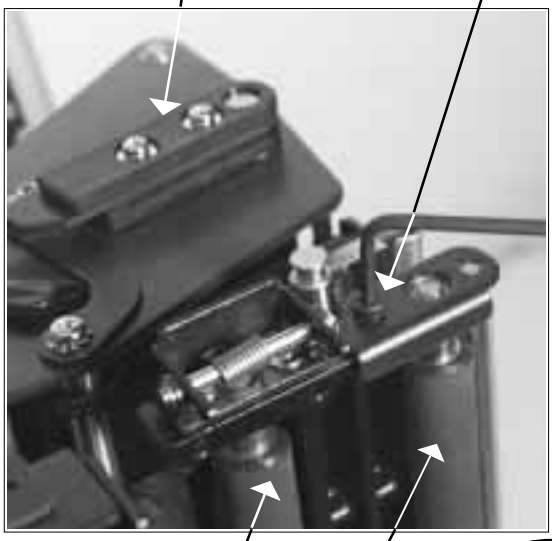


Fig. 6-74

UNLATCH HEAD LOCK LEVER

HEAD LOCK LEVER

REMOVE ALLEN SCREW ATTACHING BRACKET TO PLATEN



FEED ROLLER

Fig. 6-75

PLATEN ROLLER

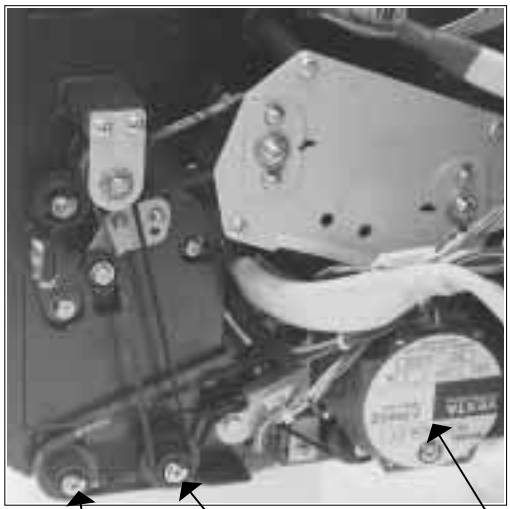


Fig. 6-76

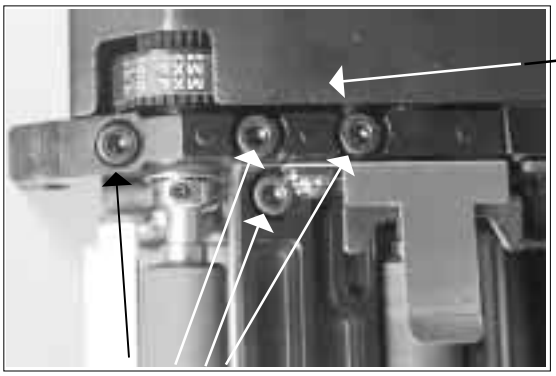
PLATEN ROLLER

FEED ROLLER

STEPPER MOTOR - LOOSEN (2) SCREWS TO FREE BELTS FROM PLATEN AND FEED ROLLERS

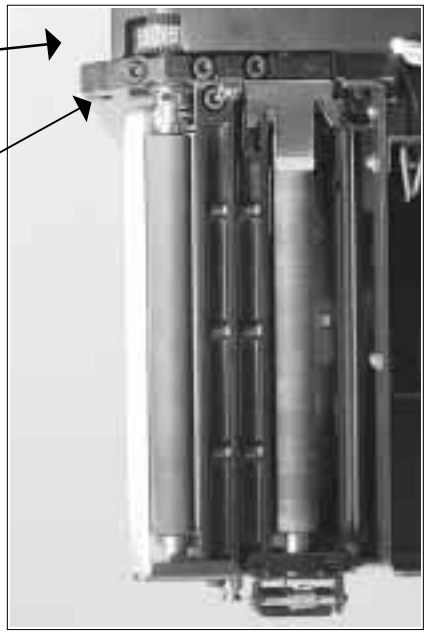
Part 1

6-17 Replacing the Platen



REMOVE (4) ALLEN SCREWS

Fig. 6-77



PLATEN STAY

Fig. 6-78

PLATEN AND FEED ROLLERS ARE IDENTICAL)

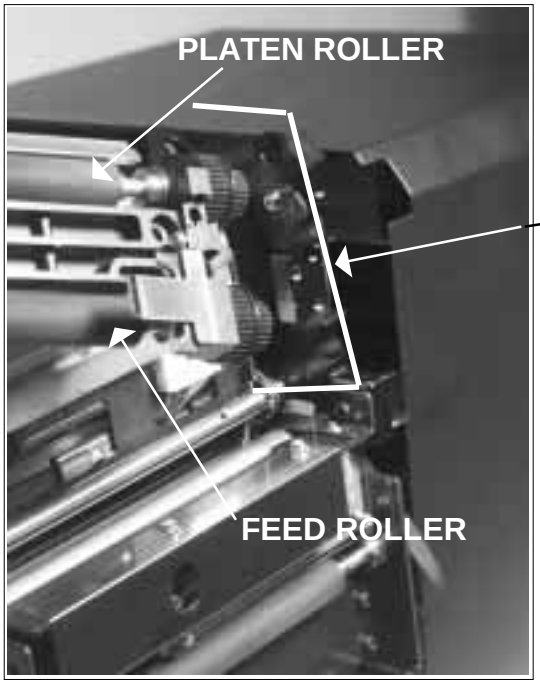
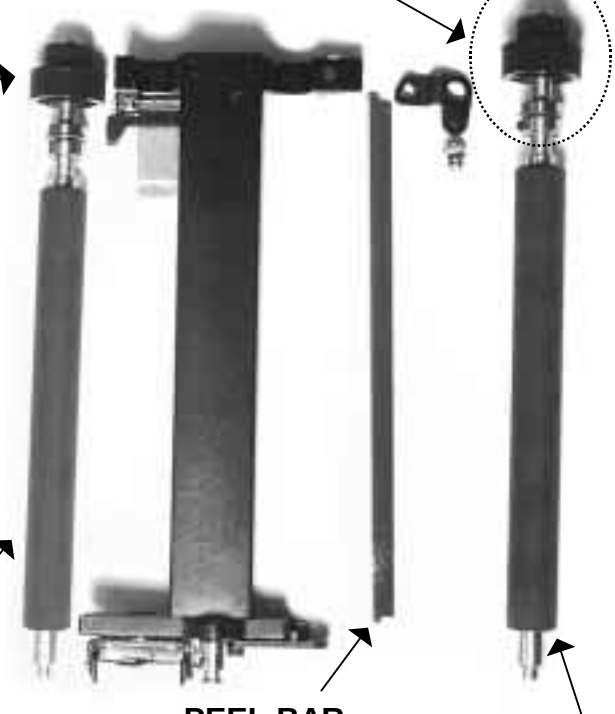


Fig. 6-79

REMOVE COMPONENTS AND INSTALL ON NEW PLATEN



PLATEN COMPONENTS

Fig. 6-80

VIEWS ARE FROM UNDERSIDE OF PRINTER

6-18 Replacing the Print Head

The print head can be easily replaced. No critical adjustments are required. Before replacing the print head, check the head counter values by printing a test pattern.

To remove and replace the print head perform the following steps:

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Open the access lid.
3.	Engage the head lock lever and remove the center stud holding the head bracket to the thermal head. ***Fig. 6-81***
4.	Disengage the head lock lever and drop down the head. ***Fig. 6-81***
5.	Carefully disconnect the print head data cable and the print head power cable and remove the print head. ***Fig. 6-82***
6.	Install the new print head by reconnecting the print head data cable and the print head power cable to the print head.
7.	Engage the head lock lever and position the print head so that the alignment pins seat into the head recesses. ***Fig. 6-83***
8.	Insert the center stud through the bracket and into the head. Tighten the stud securely.
9.	Close the printer and replace the locking screw. Close the lid.
10.	Reconnect the power cable.

Before returning the printer to normal service, you should perform the following steps:

- Head Counter Clear
- Confirm that the head cables are connected and do not touch the head. Also confirm that you can open and close the head without restriction and that the ribbon guide plate adjustment is correct.
- Print test pattern.

CAUTION: ***Do not remove or loosen the two screws on either side of the center screw. Fig. 6-84***

CAUTION: ***Head is very fragile and can be easily scratched so handle carefully.***

Part 1

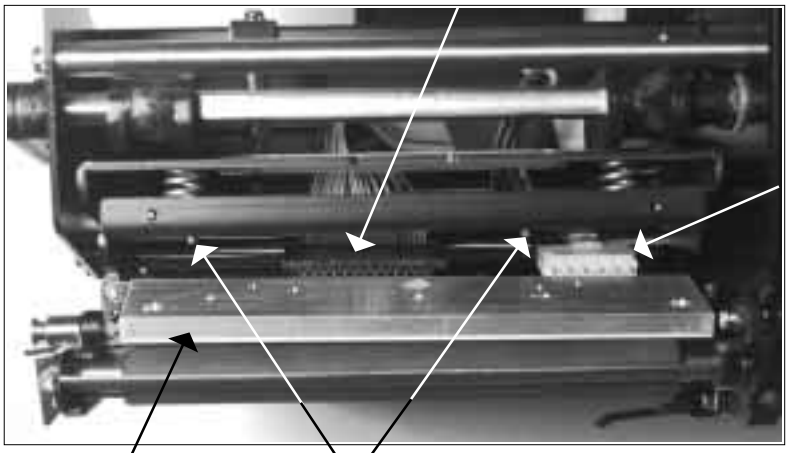
6-18 Replacing the Print Head

REMOVE CENTER STUD WITH
FLAT BLADE SCREW DRIVER

HEAD LOCK LEVER
ENGAGE / DISENGAGE

Fig. 6-81

DATA CABLE



POWER CABLE

PRINT HEAD

ALIGNMENT
PINS

Fig. 6-82

Part 1

6-18 Replacing the Print Head

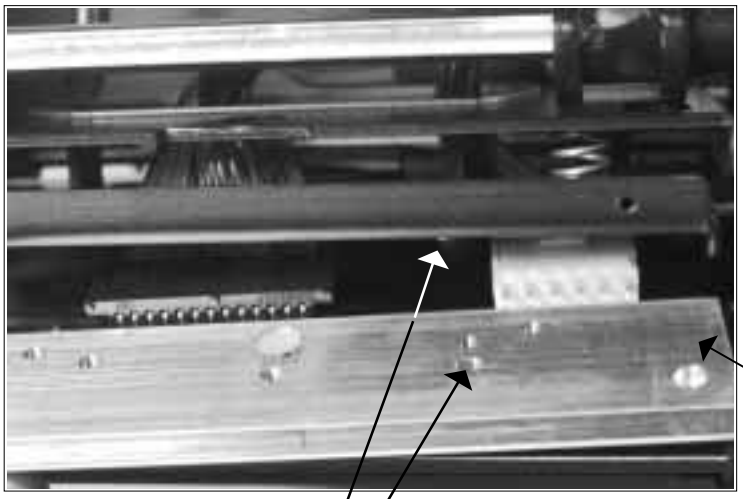


Fig. 6-83

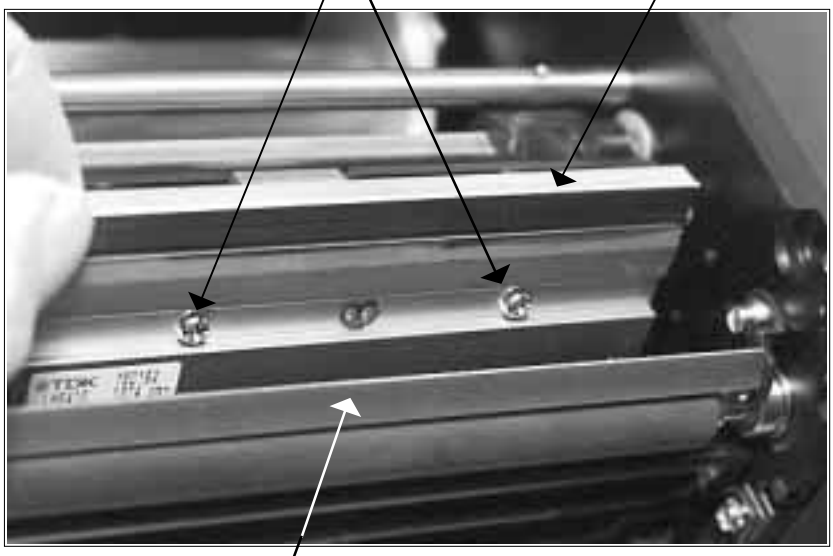


Fig. 6-84

Part 1

Factory Resets

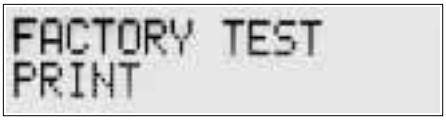
7.1 Resetting the Printers

M-8485S
TEST PRINT

M-8490S
TEST PRINT

Part 1

7-1 Resetting the Printers

STEP	PROCEDURE
1.	Record all current dip switch positions, then place all switches in the off position.
2.	Place DSW1-7, DSW1-8 and DSW2-5 switches in the ON (up) position.
3.	Place the print head in the OPEN position, keeping both the **LINE & FEED** keys depressed power on the printer.
4.	Upon hearing the audible tone, release the **LINE & FEED** keys. Place the print head back in the CLOSED position and DSW2-5 in the OFF position (down).
5.	Verify display: 
6.	Press the **LINE** key to initialize reset. After a slight pause, (1) blank will feed out followed by a factory test print. ***Warning:*** *This test activates all the heating elements on the print head and therefore should be used for testing purposes only, to avoid damaging the print head, especially when performed with labels less than the full width of the print head.*
7.	Press the **FEED** key to stop printing.
8.	Place the printers power switch to the Off position, and return all switches to their original positions.

Section

8

Part 1

Troubleshooting

8-1 Overview

The design of SATO M-8485S and M-8490S printers is based upon proven technology and reliable components. When a problem occurs, the solution can be easily traced using the troubleshooting tables in this section. This table list symptoms, probable causes, and suggested corrective actions. Many of the suggested corrective actions include references to a section or paragraph found elsewhere in this manual where more complete descriptions and procedures may be found.

Both print quality and general operational problems are listed in the troubleshooting table.

Make sure the basics have been checked before deciding you are unable to proceed any further. To help you this section has been divided into the following parts:

- Initial Checklist
- Centronics Parallel Interface
- RS232C Serial Interface
- Error Signals
- Troubleshooting Tables
- Head Pattern Examples
- Hex Dump Diagnostic Labels

Part 1

8-2 Initial Checklist

If you are unable to produce output on your printer, check the following before deciding you are unable to proceed any further.

1. Is the printer powered up and ON-LINE?

2. Do any of the Front Panel LEDs indicate an error condition? If this light is ON, it may indicate the print head assembly is open.

3. Is the Print Head and the Label Hold Down in the down and latched position?

Other areas that may need looking at include:

8-3 Troubleshooting the Centronics (Parallel) Interface

1. Is the IBM parallel printer cable connected securely to your parallel port (DB-25S Female) on the PC and to the Centronics connector on the printer?

   Warning: Never connect or disconnect interface cables (or use a switch box) with power applied to either the printer or the host. This may cause damage to the interface circuitry and is not covered by warranty.

2. Is there more than one parallel interface port on your PC (LPT1, LPT2, etc.)? If so, make sure you are sending data out the correct port.

3. When you send the print job to the printer, and it does not respond, do you get an error message on your PC that says “Device Fault” or something similar?

   This may mean that the computer doesn’t know the printer is there. Verify that:

   a. Both ends of the cable are securely inserted into their respective connectors.

   b. The printer is ON-LINE.

   c. The cable is not defective. There are other things that can cause this error message on your computer, but at this stage, a defective cable may be one of the reasons.

4. When you send the print job to the printer and it does not respond, and there is no error message on the PC:

   a. Check your data stream for some of the basics. Is your job framed as follows?

   <ESC>A—DATA---<ESC>Z

   b. Verify that you've included all required parameters in the data stream.

   c. Verify the following:

   - You have not typed a "0" (zero) for an "O" (letter) or vice-versa.
   - You have not missed any **<ESC>** characters where they're needed.
   - Make sure all printer command codes are capital letters.
   - Your protocol codes are set for Standard or Non-Standard and your data stream is consistent with these.

5. If you've checked all of the above and the printer still isn't printing, you may want to try a Receive Buffer Hex Dump to determine what (if anything) the printer is receiving from your computer. See Hex Dump Diagnostic Labels, Section 8-8.

   The Centronics port is now listening for incoming data. Send your print job. The printer will now print (only once) a Hexadecimal (Hex) Dump of everything it received from the host computer. Each 2-digit hexadecimal character represents a character the printer received. It may be tedious, but now you can analyze and troubleshoot the data stream.

6. While checking the Hex Dump printout, if you notice 0D 0A (Carriage Return and Line Feed) characters throughout. The command string should be continuous. CR or LF characters are not allowed between the Start Command (<ESC>A) and the Stop Command (<ESC>Z). If you are using BASIC, it may be adding these characters automatically as the line wraps. Adding a "width" statement to your program can help to suppress these extra 0D 0A characters by expanding the line length up to 255 characters.

   If you're not programming in BASIC, check to see if you have an equivalent statement in the language you're using to suppress extra carriage returns and line feeds from your data being sent out to the printer. We want the data stream to be one complete line going to the printer.

Part 1

8-4 Troubleshooting the RS232C (Serial) Interface

1. Is the RS232C Serial cable connected securely to your serial port on the PC (DB-25S Male) and to the RS232C connector on the printer?

Warning: Never connect or disconnect interface cables (or use a switch box) with power applied to either the printer or the host. This may cause damage to the interface circuitry and is not covered by warranty.

2. Is the cable defective? At the very least, you should be using a "Null Modem Cable," which crosses pins in a specific manner. This should enable your printer to print. We recommend that you use a cable built to specifications described in Section 3, Interface Specifications.

3. Check for obvious errors in the data stream. Remember that all print jobs for serial data must be framed by an STX and ETX.

4. If after sending your job to the printer, it only "beeps" (or displays a Framing Error message on the LCD panel), you may have a configuration problem. There may be some inconsistencies with the Baud Rate, Parity, Data Bits, or Stop Bits in relation to your host computer. If you are confused as to what the printer's current RS232 settings are, you may choose the SATO defaults (all DIP switches in the OFF position) to achieve 9600 baud, no parity, 8 data-bits, and 1 stop bit.

5. If you still are unable to get printer output, try the Hex Dump as described in Step 5 under the Centronics Interface troubleshooting. In this case, the printer monitors its RS232C interface for incoming data.

6. From the Hex Dump, if you are seeing extra 0D 0A (CR and LF) characters, and are using BASIC, refer to the beginning of the Command Code section in the Operator and Technical Reference Manual.

8-5 Error Signals

LED	LCD MESSAGE	AUDIBLE BEEP	ERROR CONDITION	TO CLEAR
Error On	Machine Error	1 Long	Machine Error	Cycle power ON/OFF
Error On	EEPROM Error	1 Long	EEPROM Read/Write	Cycle power ON/OFF
Error On	Head Error	1 Long	Head	Cycle power ON/OFF
Error On	Sensor Error	3 Short	Sensor	Cycle power ON/OFF
Error Blinks	Card R/W Error	1 Long	Memory Card Read/Write	Cycle power ON/OFF
Error Blinks	Card Low Battery	1 Long	Memory Card Battery Low	Cycle power ON/OFF
Error Blinks	Head Open	3 Short	Head Open	Close head lever
Error Blinks	Cutter Error	3 Short	Cutter	Cycle power ON/OFF
Error On Line Blinks	PARITY ERROR	3 Short	RS232 Parity Error	Cycle power ON/OFF
Error On Line Blinks	Overrun Error	3 Short	RS232 Overrun Error	Cycle power ON/OFF
Error On Line Blinks	Framing Error	3 Short	RS232 Framing Error	Cycle power ON/OFF
Error On Line Blinks	Buffer Over	3 Short	Buffer Overflow	Cycle power ON/OFF
Error Blinks Label On	Paper End	3 Short	Label End	Open/close Head Lever Open/close Label Hold down
Error Blinks Ribbon On	Ribbon End	3 Short	Ribbon End	Open/close Head Lever Open/close Label Hold down
Error Blinks Label Blinks	Media Error	3 Short	Media Error	Open/Close Head Lever
Ribbon Blinks		None	Ribbon Near End	Replace ribbon with full roll
Line Blinks		None	Buffer Near Full	Slow down transmission rate

Part 1

8-6 Troubleshooting Tables

The troubleshooting tables below include the following general symptom descriptions:

- Image Voids
- Ribbon Wrinkle
- Light Images
- Smearing
- No Ribbon Movement
- No Label Movement
- No printed Image
- Display Problem
- POWER LED not on
- ERROR LED on
- LABEL LED on
- RIBBON LED on
- ON LINE LED not on
- No Label Drive

Print Quality Problems

Symptom	Probable Cause	Suggested Corrective Action
ON LINE LED not on	LABEL, RIBBON, ERROR LED (s) on	Clear error condition
	Illegal printer memory state	Cycle POWER switch off and back on
No Label Drive	Timing Belt bad/loose	Replace/tighten timing belts (6-9)
Image Voids	Poor quality labels	Use thermal transfer compatible stock
	Poor quality ribbons	Use genuine SATO ribbons
	Ribbon not matched to label stock	Check with media suppliers
	Damaged print head	Replace print head
	Damaged platen	Replace platen

Print Quality Problems

Symptom	Probable Cause	Suggested Corrective Action
Ribbon Wrinkle	Poor Head Alignment	Adjust head balance (5-4) Adjust ribbon roller Adjust head alignment
	Poor Ribbon Tension	Adjust ribbon tension
	Worn Platen	Replace platen (6-17)
	Foreign material on head or platen	Clean head and platen
	Foreign materials on labels	Use high quality label stock
	Damaged print head	Replace print head (6-18)
Light Images	Poor quality labels	Use thermal transfer compatible stock
	Poor quality ribbons	Use genuine SATO ribbons
	Low print head energy/darkness	Adjust darkness control (See Operator Manual)
	Low print head pressure	Use correct head pressure position
	Ribbon not matched to label stock	Use Premier II ribbon with a “1C“ thermal transfer ribbon stock or equivalent for optimum results
	Low ribbon drive torque No ribbon movement	Adjust ribbon drive clutch (5-2)
	Foreign material on head	Clean head and platen
	Poor head alignment	Align Print Head (5-5)
	Excessive print speed	Reduce print speed setting

Symptom	Probable Cause	Suggested Corrective Action
Smearing	Poor quality labels	Use Premier II ribbon with a "1C" thermal transfer ribbon stock or equivalent for optimum results
	Poor quality ribbons	Use genuine SATO ribbons
	Foreign material on head/platen	Clean head and platen
	Foreign material on labels	Use high quality label stock
	Excessive print head energy	Adjust darkness control
	Excessive print speed	Adjust print speed
	Excessive head pressure	Use correct head pressure position
No Ribbon Movement	Incorrect ribbon core size	Use genuine SATO ribbons
	Loose drive clutch	Adjust clutch tension (5-2)
	Loose platen drive belt	Adjust/replace belt (6-9)
	No + 24 volt output	Test power supply and replace if required (4-2, 6-4)
	Loose service screws on rewind pulley	Tighten service screws
	Damaged electronics	Replace circuit board (6-5)
No Label Movement	Loose/broken platen drive belt	Adjust/replace belt (6-9)
	Incorrect label pitch sensor selected	Select correct label sensor type (DSW2-2)
	No +24 volt output	Replace fuse on main PCB (6-3) Test power supply and replace if required (4-2)
	Loose set screw on platen pulley/stepper motor	Tighten set screws
No Printed Image	Print head not connected	Verify print head connector fully seated at head and main PCB (6-18)
	Ribbon upside down	Use genuine SATO ribbons
	No + 24 volt output	Test power supply and replace if required (4-2)

Symptom	Probable Cause	Suggested Corrective Action
No Printed Image	Damaged print head	Replace print head (6-18)
	Damaged electronics	Replace circuit board (6-5)
Back light but no words on display or no display	The most likely cause is the ribbon cable has fallen out or not seated fully into connector.	Verify that the cable and connector are properly seated. Display POT not positioned properly.
POWER LED not on	AC power cable not connected	Verify that the cable is connected to the printer and the AC outlet
	Main Power Fuse defective	Replace fuse (6-3)
	Defective power supply	Test power supply and replace if defective (4-2, 6-4)
ERROR LED on	Head not locked	Close and latch head release
LABEL LED on	Label supply roll empty	Replenish label supply
	Label stock not routed through sensor	Reload labels
	Label sensor not positioned correctly	Adjust sensor position
	Label sensor blocked	Clean label sensor
	Incorrect label sense threshold setting	Adjust label sense threshold (4-3, 4-4)
	Platen drive malfunction	See Section 5, Mechanical Adjustments
RIBBON LED on	Ribbon supply roll empty	Replenish ribbon supply
	Ribbon sensor out of alignment	Realign ribbon sensor (4-5)
	Ribbon sensor blocked	Clean ribbon sensor
	No cardboard core on ribbon rewind	Use cardboard core on ribbon rewind

Part 1

8-7 Head Pattern Examples

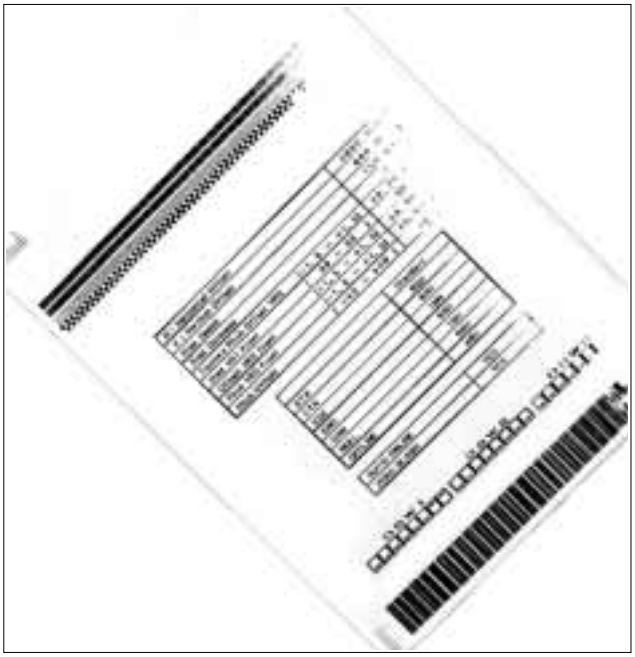
FACTORY DEFAULT

FEED DIRECTION

GOOD ADJUSTMENT
CLEAR, DARK, EVEN TEXT

Part 1

8-7 Head Pattern Examples



IRREGULAR UNEVEN TEXT

POOR HEAD ALIGNMENT, BALANCE OUT OF ADJUSTMENT

FEED DIRECTION

IRREGULAR UNEVEN TEXT

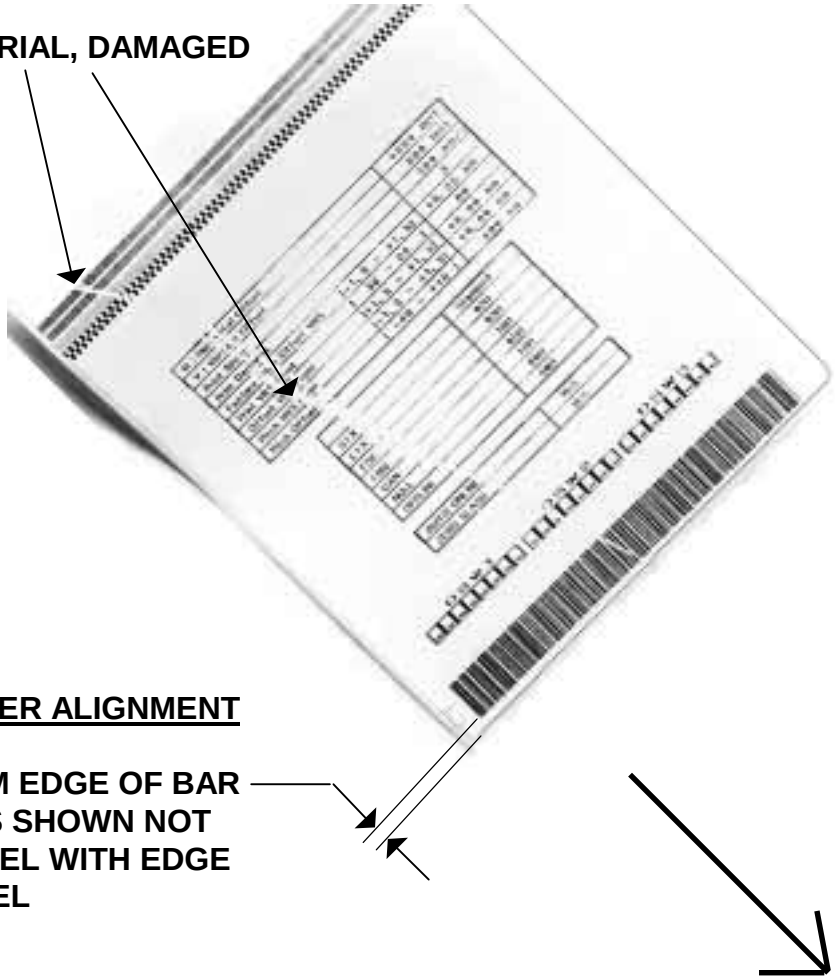
POOR HEAD ALIGNMENT, BALANCE OUT OF ADJUSTMENT

Part 1

8-7 Head Pattern Examples

DIAGONAL VOIDS (WHITE STREAKS) THAT "WALK" ACROSS LABEL

RIBBON WRINKLE
POOR HEAD ALIGNMENT, POOR RIBBON TENSION,
WORN PLATEN,
FOREIGN MATERIAL, DAMAGED PRINT HEAD



IMPROPER ALIGNMENT

BOTTOM EDGE OF BAR CODE IS SHOWN NOT PARALLEL WITH EDGE OF LABEL

FEED DIRECTION

8-8 Hex Dump Diagnostic Labels

In addition to the User Test Print Labels (Refer to Section 2-4), The printer contents of the receive and print buffers can be examined using the Hex Dump Test Labels.

Print Buffer Hex Dump

The contents of the Print Buffer can be examined using the Hex Dump mode. The label numbers each line of data received in the left-hand column, the data in hexadecimal format in the center columns followed by the same data in ASCII format in the right-hand column.

STEP	PROCEDURE
1.	Turn on the printer.
2.	Send and print label.
3.	Place the printer in the Off Line mode by pressing the **LINE** key. The **LINE** LED should go out.
4.	Place **DSW2-4** in the On position.
5.	Press the **LINE** key to place the printer back On Line.
6.	Press the **FEED** key.
7.	A label should be printed containing the contents of the print buffer in Hexadecimal format.
8.	Return **DSW2-4** to the off position.
9.	Turn the printer off and then back on to place it back in the normal print mode.

Part 1

8-8 Hex Dump Diagnostic Labels (Cont.)

Receive Buffer Hex Dump

The data that is being received by the printer (before it is placed in the Print Buffer) can be examined by using the Hex Dump Mode. The label numbers each line of data received in the left-hand column, the data in hexadecimal format in the center columns, followed by the same data in ASCII format in the right-hand column.

STEP	PROCEDURE
1.	Turn off the printer.
2.	Place **DSW2-4** in the On position.
3.	Turn on the printer.
4.	Transmit the data to the printer.
5.	The data received is printed on a label in hexadecimal format.
6.	Return **DSW2-4** to the off position.
7.	Turn off the printer and then back on to place it back in the normal print mode.

Section

9

Part 1

Options

9-1 Overview

The following options are available for the M-8480S/M-8490S printers.

- ***Memory Card***
- ***Calendar***
- ***Top Mounted Reflective Sensor***

Part 1

9-2 Memory Card

Description:

The Memory Card Option provides the connectors and interface board for two PCMCIA memory card slots. The two Memory Card slots, labeled Card 1 and Card 2, are on the memory option board mounted inside the printer. Access to these cards is by removing the PC board compartment cover. The printer memory can be expanded up to 4MB.

Type	RAM or Flash-ROM
Applicable Specifications	PCMCIA Version 2.1 (JEIDA Version 4.1)
Size	128KB, 256KB, 512KM, 1MB or 2MB
Connector Pins	68
Battery	Approximately two years (manufacturer dependent)
Write Protect	Yes
Low Battery Detect	Yes

Installation:

Instructions for installing the Memory Card Option are included with the installation kit.

Error Handling:

ERROR DESCRIPTION	INDICATION	REMEDY
Low Battery - Low battery condition is detected when printer is powered on.	ERROR LED: Blinking Audible Beep: 1 long Display: Card Low Battery Depress LINE key to print Card Status	Replace Memory Card battery. Note that all data will be lost when the battery is removed.
Card R/W Error 1. No card is inserted. 2. Card is write protected. 3. Invalid store/recall number. 4. Card has not been initialized.	ERROR LED: On Audible Beep: 1 long Display: Card R/W Error Printer must be powered off to reset.	1. Insert card into selected slot. 2. Remove write protect tab. 3. Correct program. 4. Initialize card with BJF command.
Warning 1. Duplicate number. 2. Data not in print area. 3. Data overflows card memory.	Audible Beep: 1short Display: None Printer will ignore invalid commands.	1. Correct program. 2. Correct program. 3. Use card with more capacity.

9-3 Calendar

Description:

The Calendar Option allows the date and time to be maintained in the local printer rather than using the system clock. It consists of a daughter PCBA containing a clock IC, a lithium battery and a EEPROM. This assembly replaces the EEPROM in the standard printer. A qualified technician should perform the upgrade as it requires modifications to the main PCB assembly. Please call SATO Technical Support if you need to add this option to an existing printer in the field.

9-4 Top Mounted Reflective Sensor

Description:

This option is used when special requirements make it necessary to use label stock that has the "Eye- Mark" located on the print side of the label.

THIS IS A FACTORY INSTALLED OPTION

Part 1

Section

1

Overview and Specifications

Part 2

1-1 Overview

The SATO "S" Series Thermal Transfer Printer Engines are designed to be integrated into high performance on-site labeling systems. All printer parameters are user programmable, using front panel controls and DIP switches. All popular bar codes and 13 human-readable fonts, including a vector font, are resident in memory providing literally thousands of type styles and sizes.

The major difference between the M-8485S and the M-8490S is the resolution of the head. The M-8485S with its 203 dpi head provides an economical labeling solution for most applications. It will print on labels from 1 inch wide x .25 inches long to 5.25 inches wide x 14 inches long using internal memory. Labels up to 5.25 inches wide x 49.2 inches long can be printed by installing a PCMCIA memory card option. The maximum print width is 5.0 inches.

The M-8490S provides a higher print resolution, 305 dpi, to give laser quality printing. It is useful when higher resolution is needed for detailed graphic images. It will print on labels from 1 inch wide x .25 inches long to 5.25 inches x 14 inches long using internal memory. Labels up to 5.25 inches wide X 32.8 inches long can be printed by installing a PCMCIA memory card option. The maximum print width is 4.4 inches.

The M-8459S Direct Thermal Print Engine is based on the M-8485S model and with a simplified direct thermal mechanism is significantly less expensive for print and apply applications where direct thermal is the technology of choice. In addition to the lower cost of the print engine, direct thermal is an economical solution to many labeling applications, saving users the costs of thermal transfer ribbons.

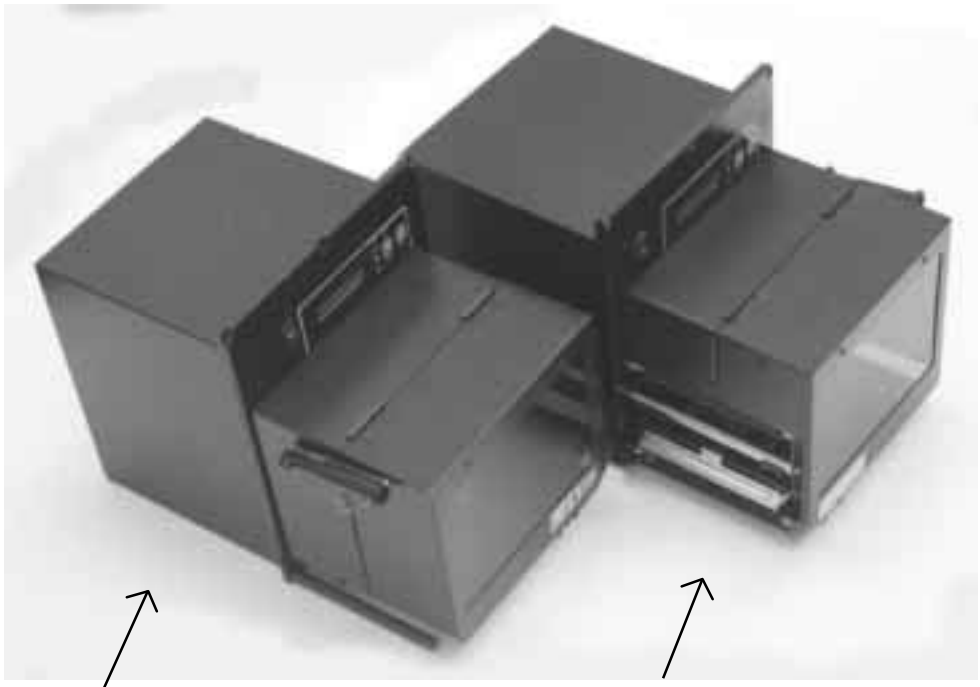
The M-8460S Wide Web Print Engine features a 6" wide print head and a 6.5" wide media path. This unit is ideal for pallet labeling as well as compliance labeling that require labels up to 6.5" wide.

There are many advantages in using a wide web print engine, among which are that users who print the typical 4" wide by 6" long shipping label size will now be able to print 6" wide by 4" long labels, allowing for more labels per roll as well as improving throughput significantly by shortening the feed length to 4".

Part 2

1.2 Visual Differences

Standard/Opposite Hand



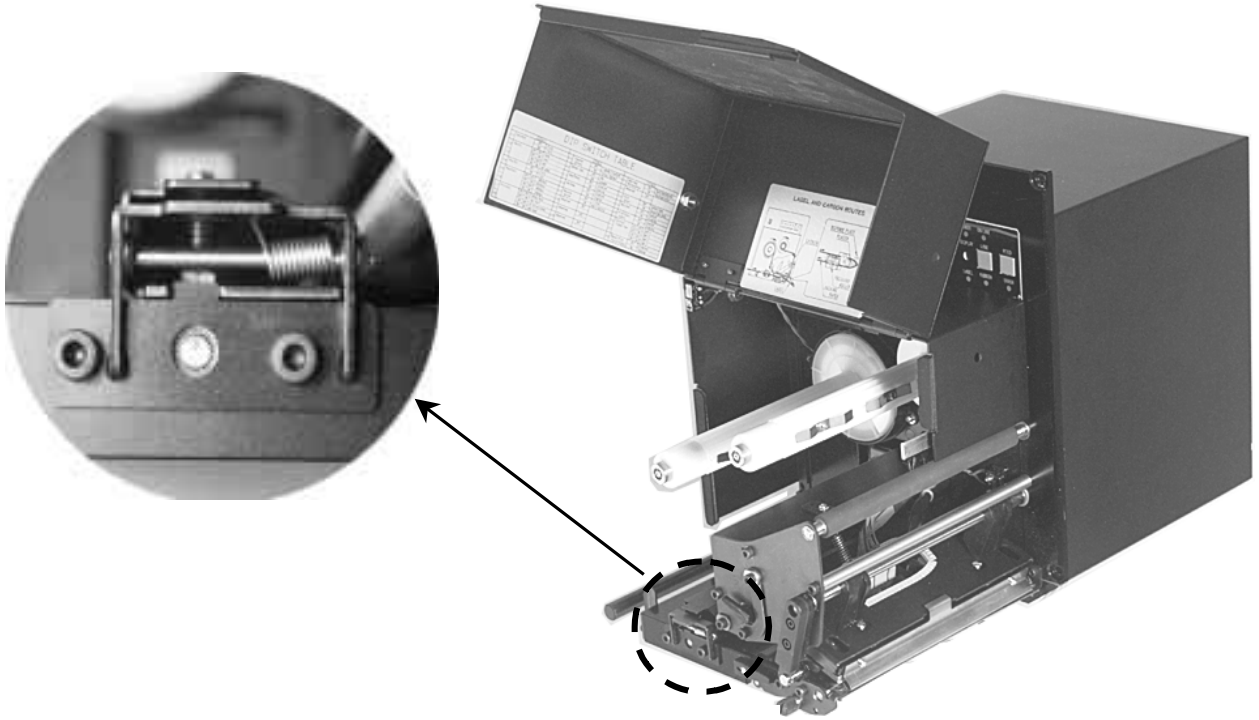
STANDARD UNIT

OPPOSITE HAND UNIT

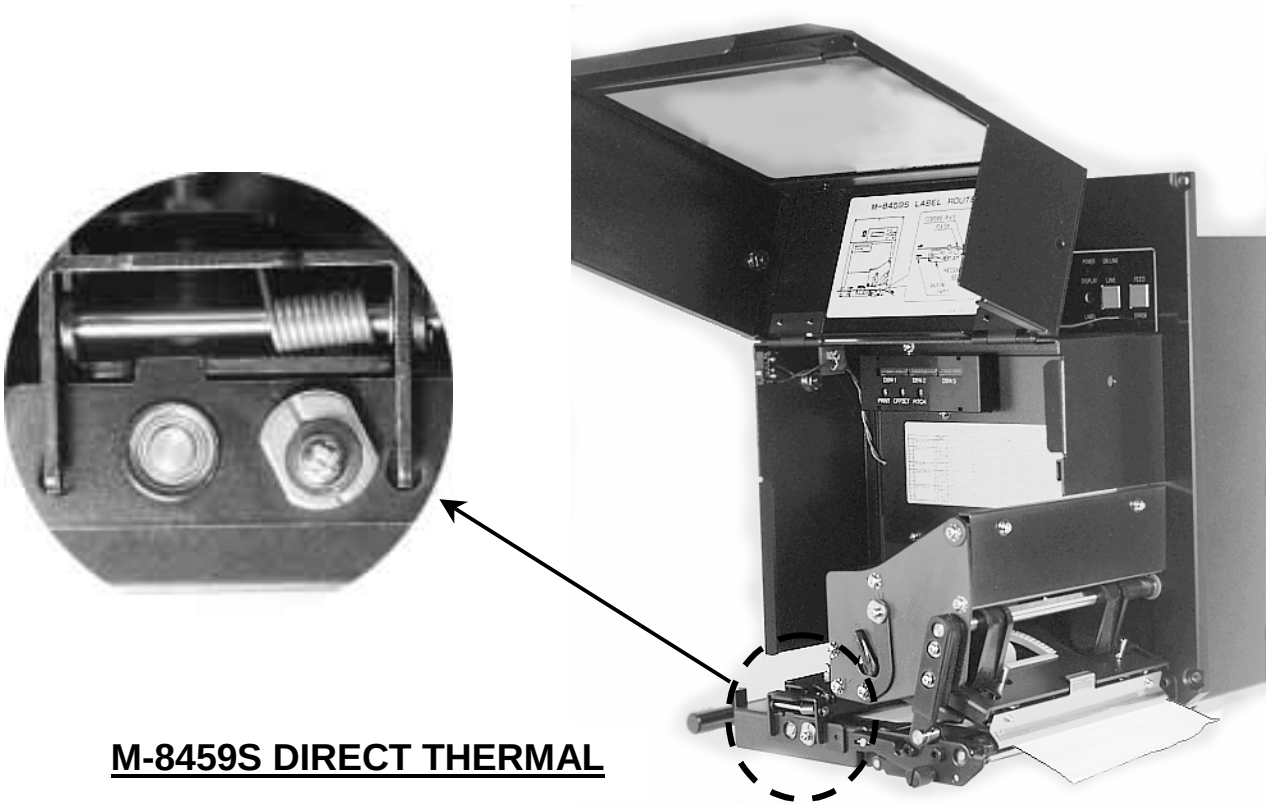
MEDIA IN THIS SIDE

MEDIA IN THIS SIDE

1.2 Visual Differences



M-8485S/M8490S THERMAL TRANSFER
M-8460S WIDE WEB THERMAL TRANSFER

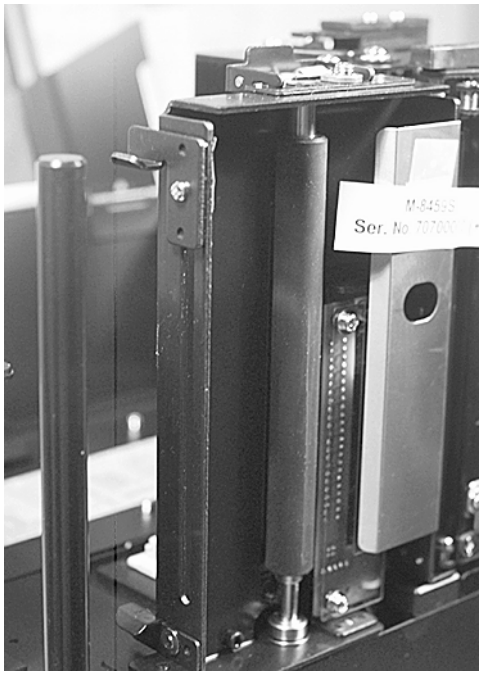


M-8459S DIRECT THERMAL

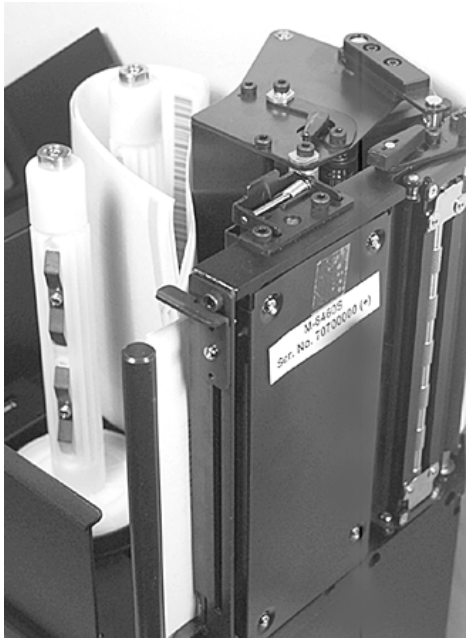
Part 2

Part 2

1.2 Visual Differences



M-8459S DIRECT THERMAL



M-8485S/M-8490S THERMAL TRANSFER
M-8460S WIDE WEB THERMAL TRANSFER

1.2 Visual Differences

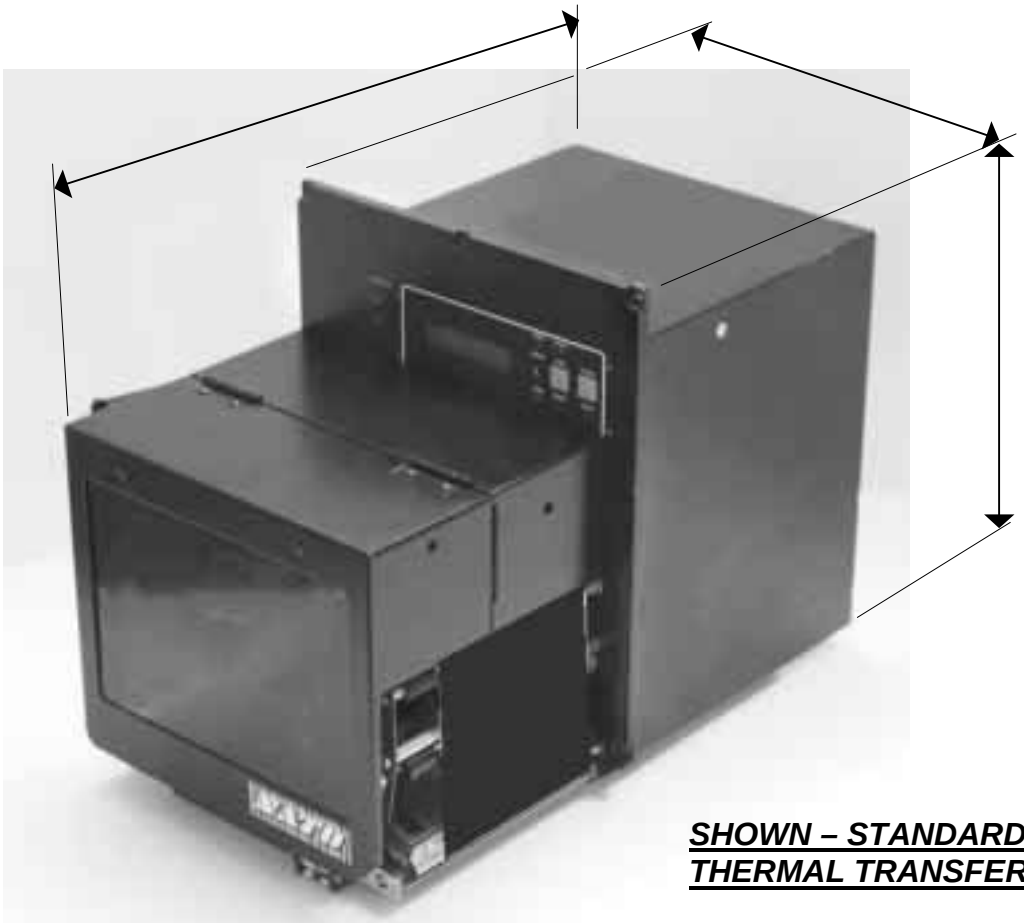
SERVICE BOARD (ALL UNITS)

Part 2

M-8485S/M-8490S THERMAL TRANSFER
M-8460S WIDE WEB THERMAL TRANSFER
M-8459S DIRECT THERMAL

Part 2

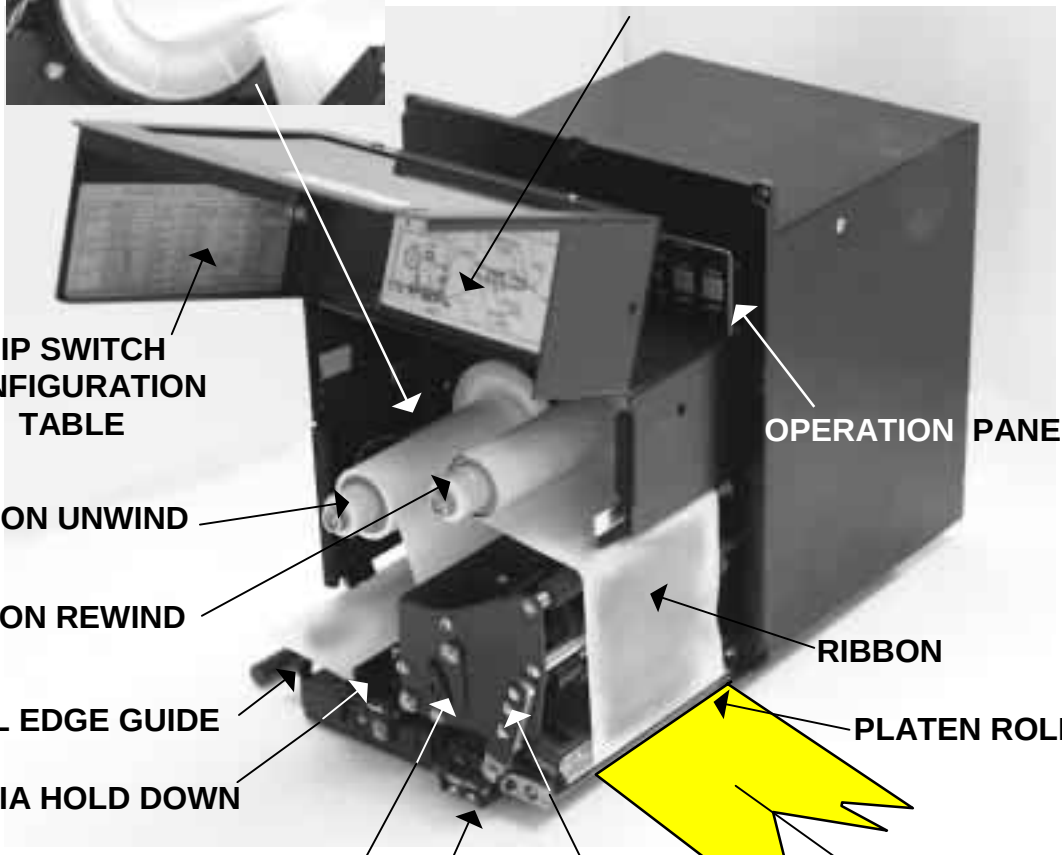
1-3 Overall Dimensions



SHOWN – STANDARD UNIT
THERMAL TRANSFER

SPECIFICATION	M-8485S/M-8490S/M-8459S	M-8460S
DIMENSIONS		
Width	9.65 in. (245 mm)	9.65 in. (245 mm)
Depth	16.1 in. (408 mm)	17.9 in (455 mm)
Height	11.8 in. (300 mm)	11.7 in (299 mm)
Weight	25.0 lbs (11.34 Kg)	27.5 lbs (12.5 Kg)
POWER REQUIREMENTS		
Voltage	100 - 115 V (+/- 10 %) 220 V (+/- 10 %) 50/60 Hz (+/- 1%)	
Power Consumption	50 Watts Idle 700 Watts Max	

1-4 Components

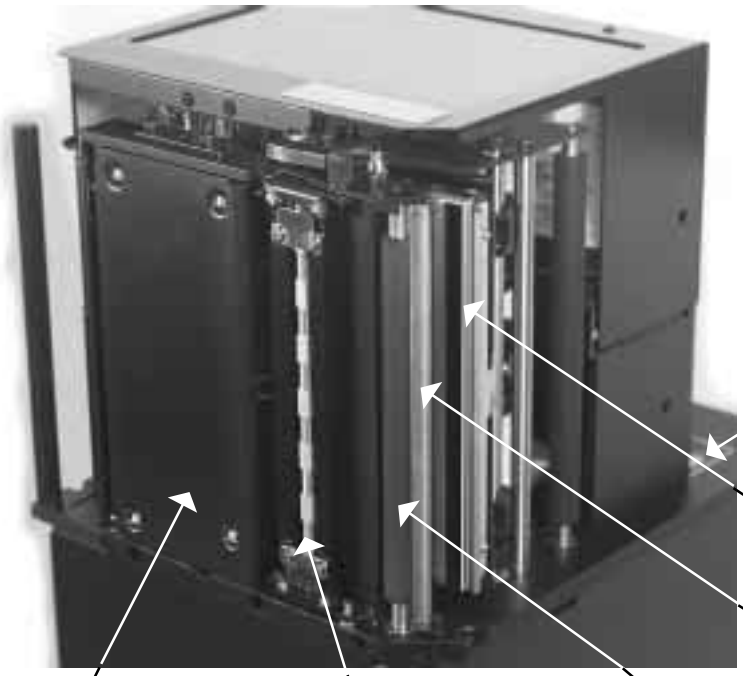


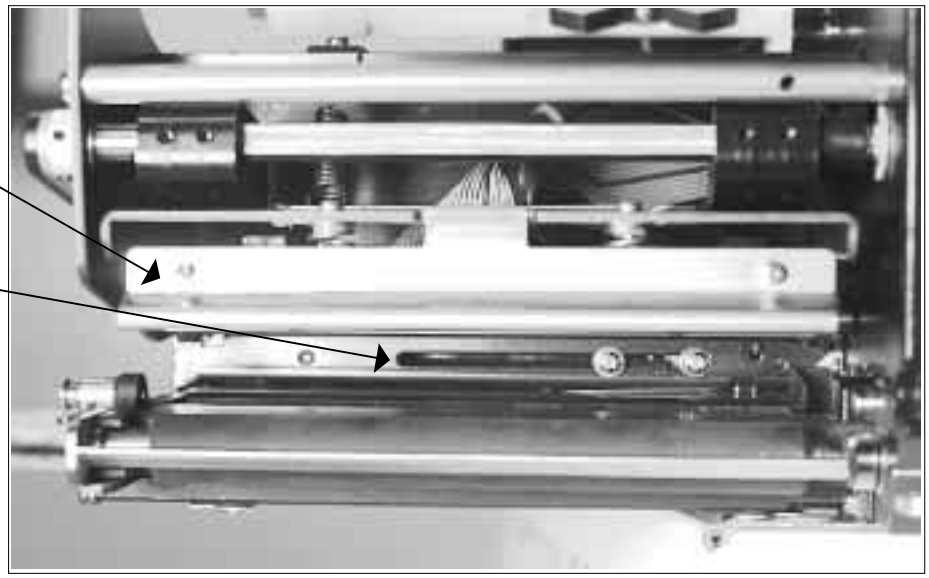
SHOWN – STANDARD UNIT THERMAL TRANSFER

Part 2

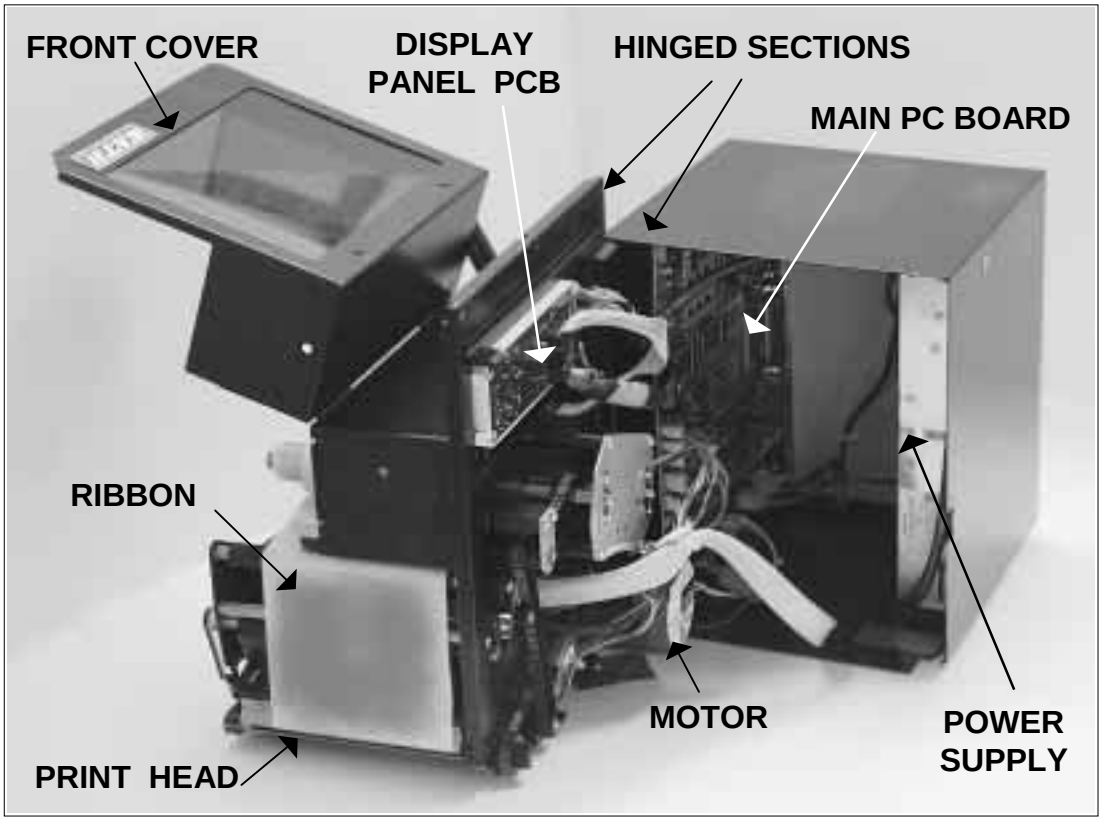
1-4 Components (Cont.)

Part 2

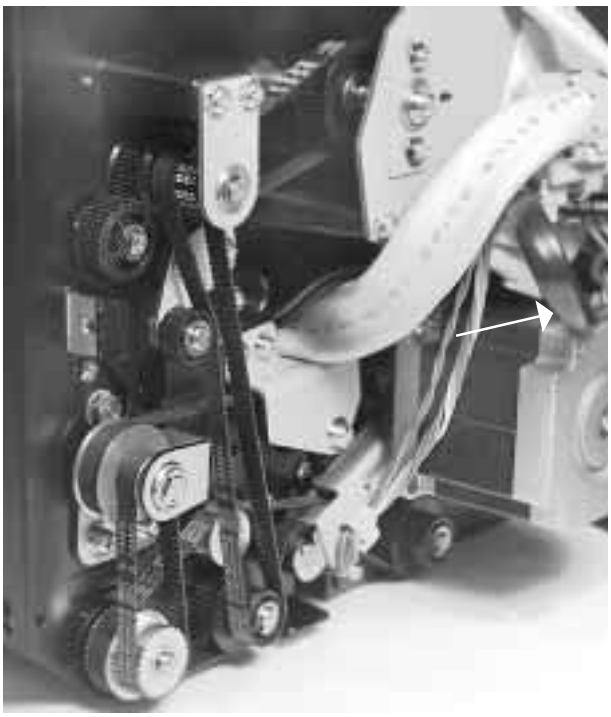




1-4 Components (Cont.)



Part 2



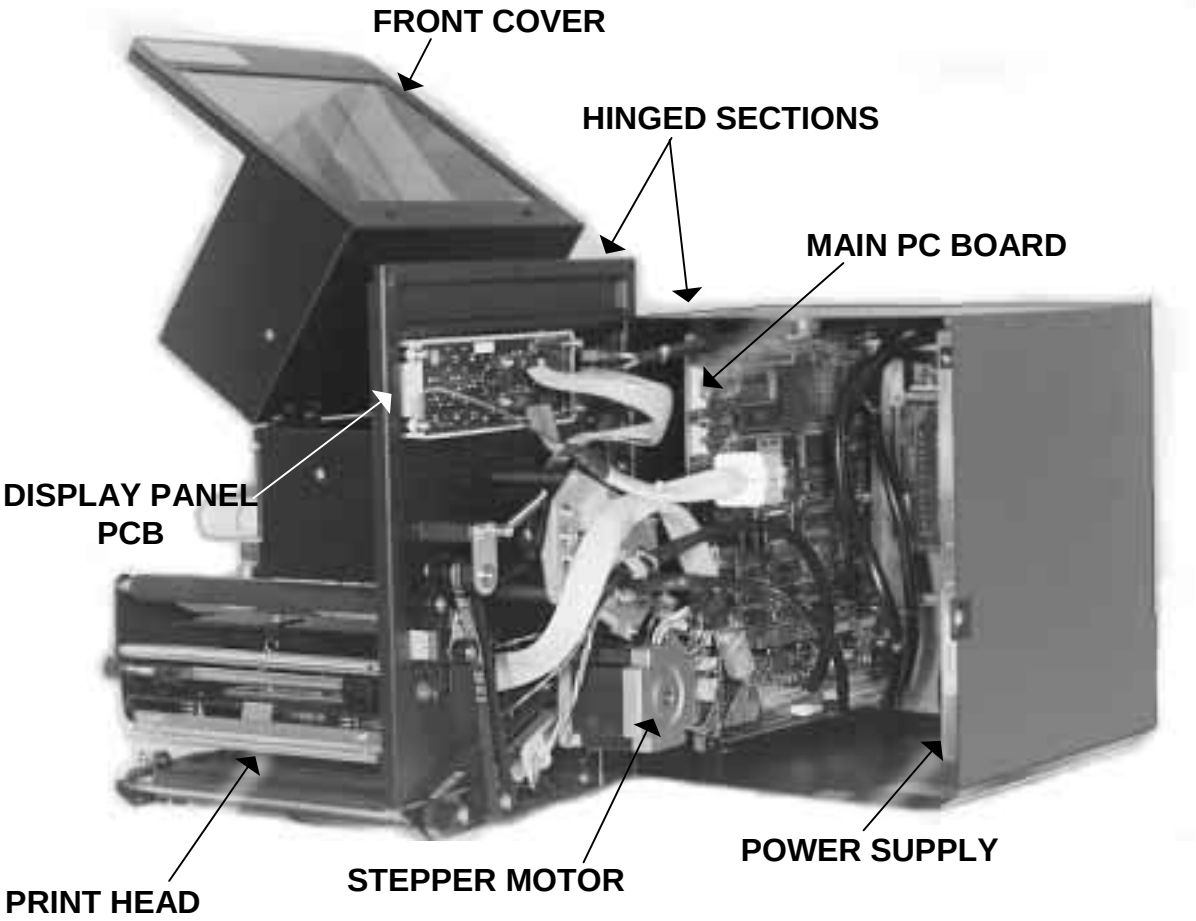
M-8490S

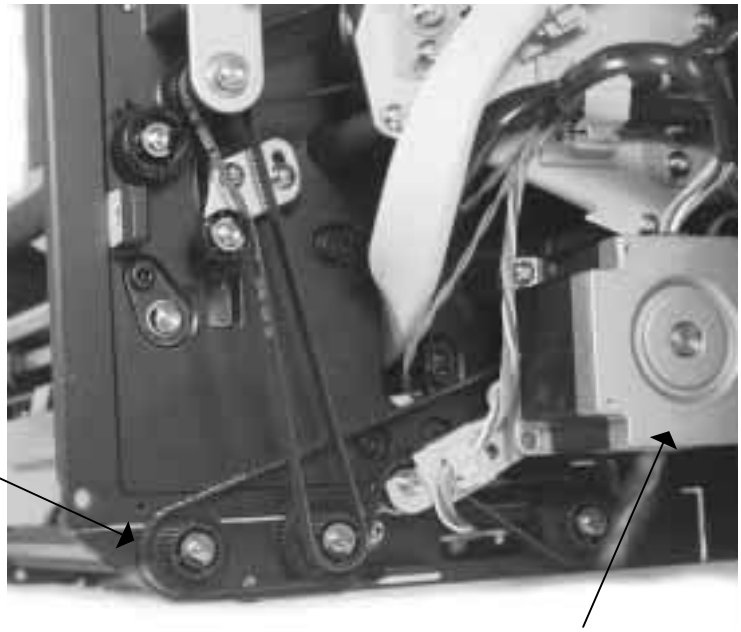
M-8485S

BELT & GEAR ARRANGEMENTS

1.4 Components (Cont)

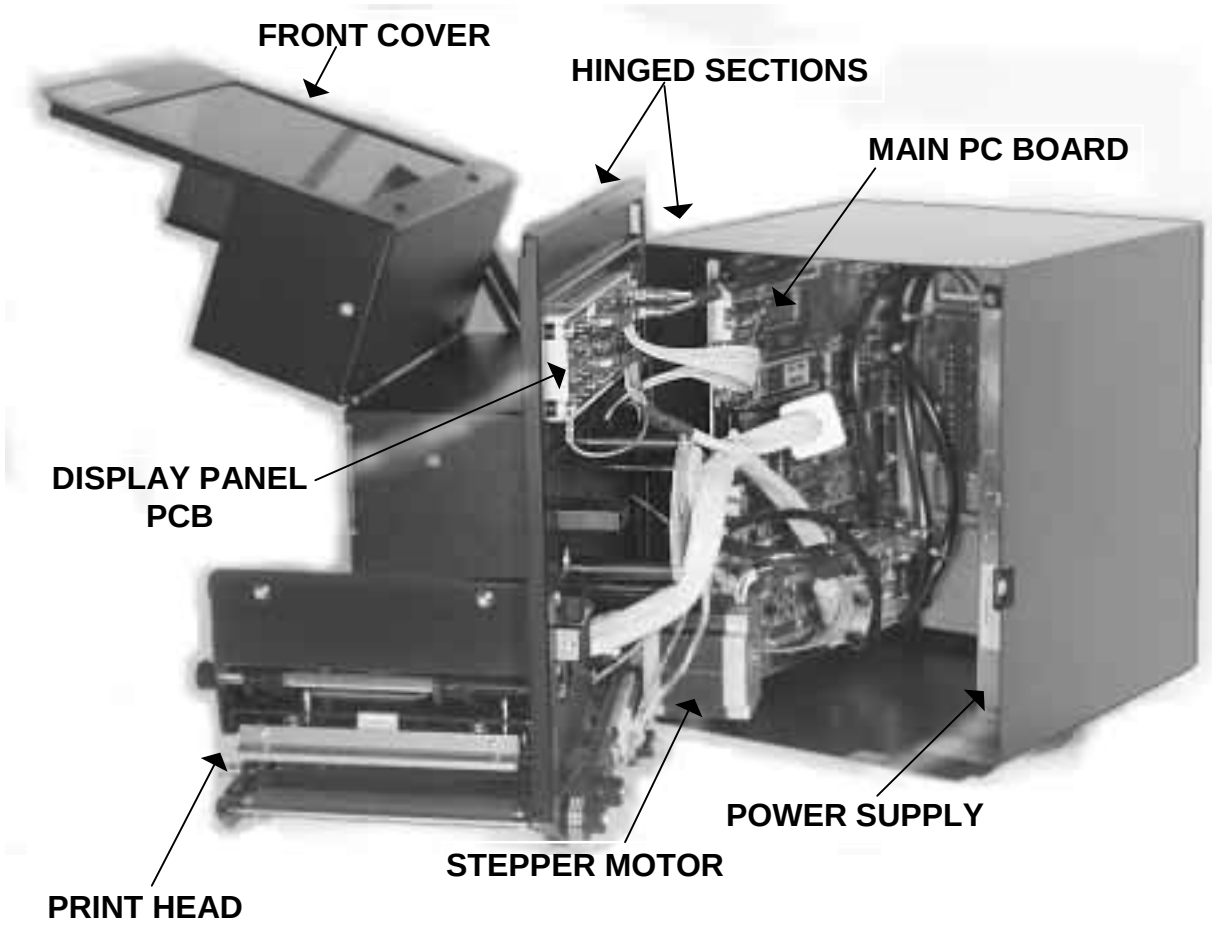
Part 2

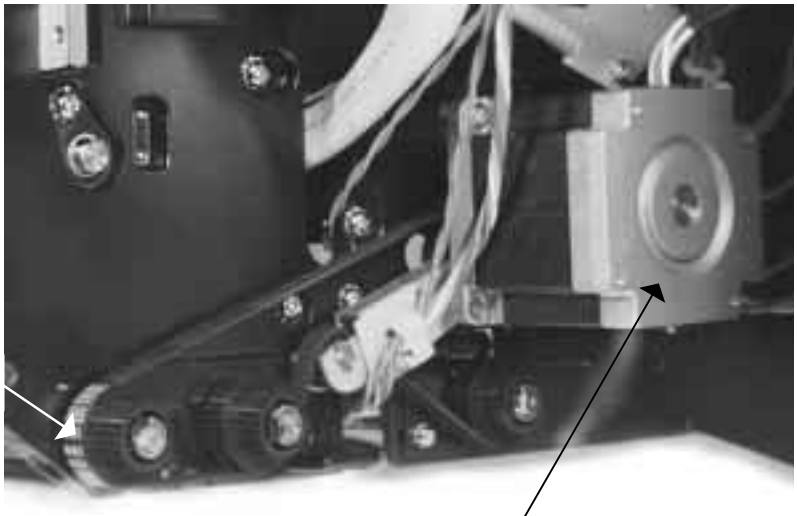




M-8460S

1.4 Components (Cont)

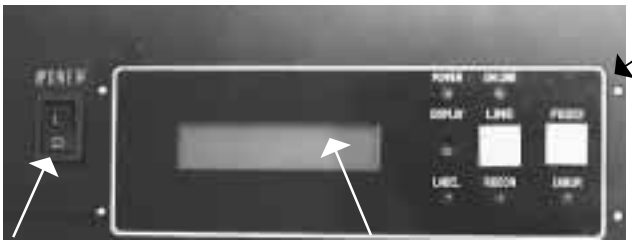




M-8459S DIRECT THERMAL

Part 2

1-5 Operation Panel



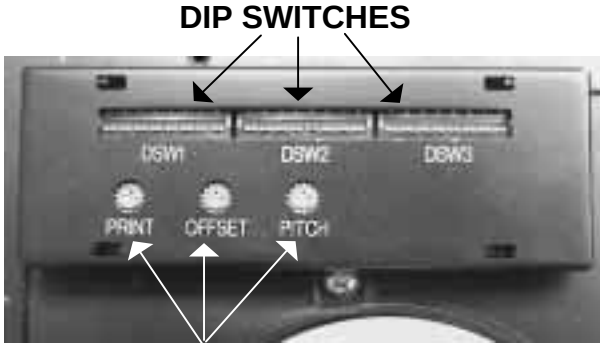
Part 2

OPERATION PANEL

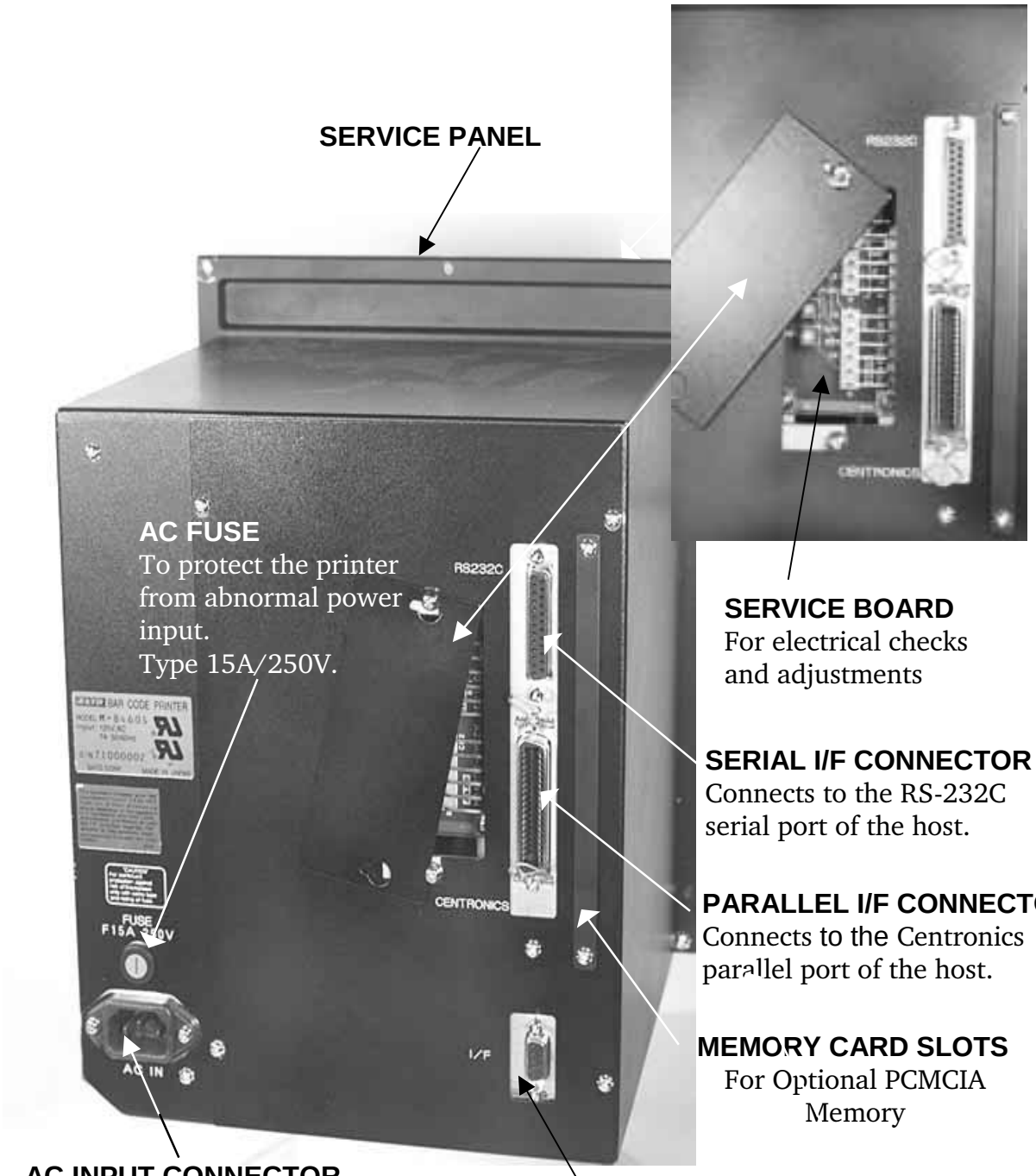
LCD Display	2 Line x 16 Character display
LABEL LED	Illuminated when label is out
RIBBON LED	Illuminated when ribbon is out
ERROR LED	Illuminated when errors have occurred
ON-LINE LED	Illuminated when printer is On-Line
LINE KEY	Switches the printer On-Line or Off-Line. Can also be used as a Pause function key to stop label during the printing process.
FEED KEY	To feed one blank label

1-6 Dip Switch Panel

The DIP Switch panel is located inside the printer in the mechanical section above the unwind/rewind spindles and contains three 8-position DIP switches and three adjustment potentiometers. Adjustment procedures for these are listed in Section 2, Configuration.



1-7 Input/Output Connections (Rear Panel)

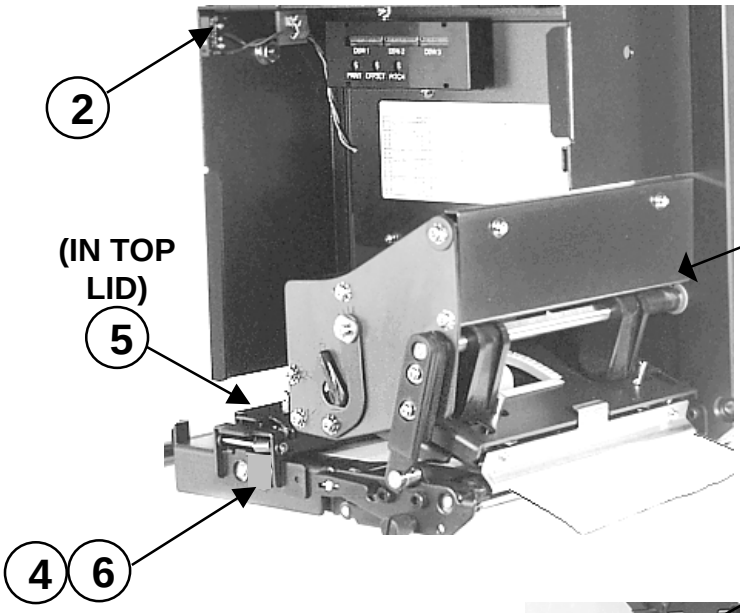


Part 2

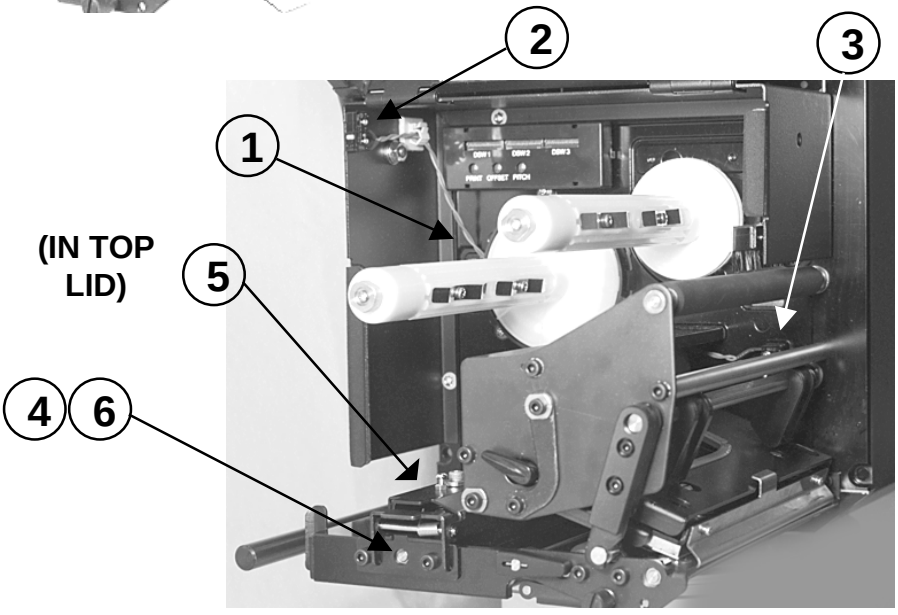
Part 2

1-8 Switches and Sensors

ITEM	DESCRIPTION	REFER SECTION
1	Ribbon Motion Sensor	Section 6-11
2	Cover Open Switch	Section 6-12
3	Head Open Switch	Section 6-13
4	Label Gap (Bot ½) & "Eye-Mark" Sensors	Section 6-14
5	Label Gap (Top ½)	Section 6-15
6	Label Out Sensor	Section 6-16

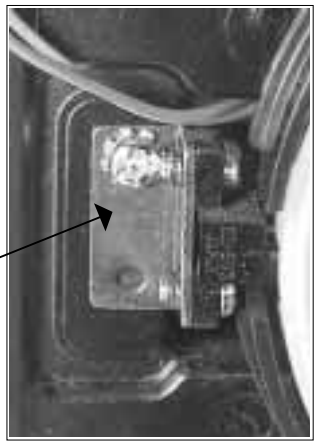


M-8459S DIRECT THERMAL

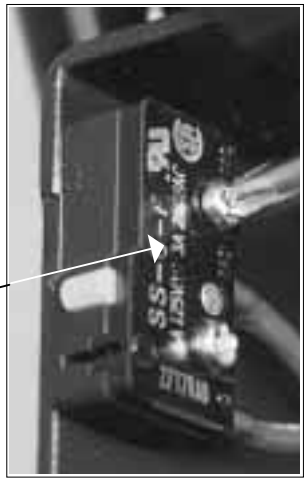


M-8485S/SM-8490S THERMAL TRANSFER
M-8460S WIDE WEB THERMAL TRANSFER

1-8 Switches and Sensors (Cont.)



1



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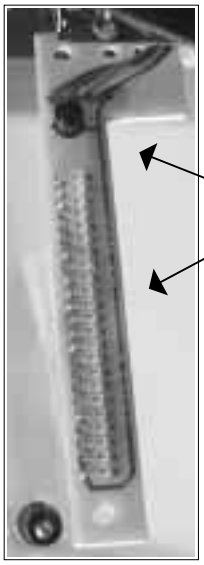
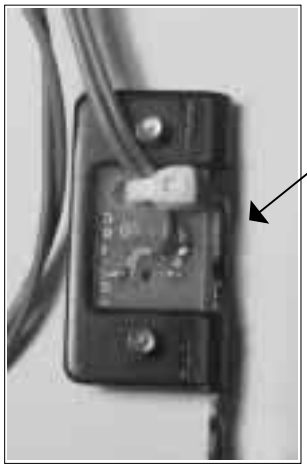
3



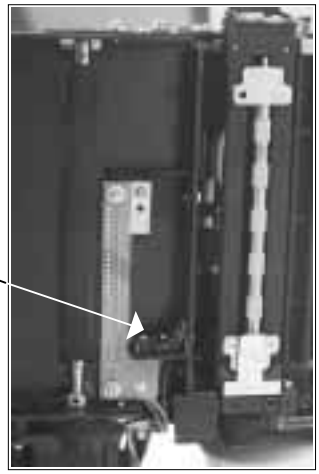
4

"Eye-MARK"
LABEL GAP
BOTTOM 1/2



5

LABEL GAP
TOP 1/2



6

Part 2

1-9 Ribbon

Use only SATO thermal transfer ribbons which were formulated expressly for use in all SATO printers. Use of other than approved ribbons may result in unsatisfactory print quality and/or damage to the print head and may void your warranty.

1-10 Installation Considerations

Printer operation can be affected by the printer environment. The location of the printer should be free from dust, humidity and sudden vibrations. To obtain optimum results from the printer module, avoid locations influenced by:

- Direct or bright sunlight since bright light will make the label sensor less responsive and may cause the label to be sensed incorrectly.

- Excessive warm or cold temperatures can cause electrical problems within the printer. (See Section 3 - Specifications).

POWER REQUIREMENTS	
Voltage	100-115V (+/- 10%) 220V (+/- 10%) 50/60 Hz (+/- 1%)
Power Consumption	50W Idle 700W Operating

1-11 Print

SPECIFICATION	M-8485S	M-8490S
PRINT		
Method	Direct or Thermal Transfer	
Speed (User Selectable)	4 to 10 ips 100 to 250 mm/s	4 to 8 ips 100 to 200 mm/s
Print Module (Dot Size)	.0049 in. .125 mm	.0033 in. .083 mm
Resolution	203 dpi 8 dpmm	305 dpi. 12 dpmm
Maximum Print Width	5.0 inches 128 mm	4.4 inches 112 mm
Maximum Print Length	14 inches 356 mm	14 inches 356 mm
Maximum Print Length with 2MB Memory Card	49.2 in. 1249 mm	32.8 in. 833 mm

1-11 Print (Cont)

SPECIFICATION	M-8459S	M-8460S
PRINT		
Method	Direct or Thermal Transfer	
Speed (User Selectable)	2 to 5 ips 50 to 125 mm/s	4 to 8 ips 100 to 200 mm/s
Print Module (Dot Size)	.0049 in. .125 mm	
Resolution	203 dpi 8 dpmm	
Maximum Print Width	4.4 inches 112 mm 1344 dots	6.0 inches 152 mm 1216 dots
Maximum Print Length	14 inches 356 mm	
Maximum Print Length with 2MB Memory Card	49.2 in. 1249 mm	

Part 2

1-12 Media , Sensing and Ribbons

SPECIFICATION	M-8485S/M8490S
MEDIA	
Minimum Width	1.0 in. (25 mm)
Minimum Length	.25 in. (6 mm) Labels
Maximum Width	5.25 in. (134 mm)
Type	Die Cut Labels
Caliper (thickness)	.010 in. (.25 mm)
Max. Unwind torque	8.8 lbs (4 Kg) with 5 in wide labels
SENSING	
See-Thru for labels	Adjustable
Reflective “Eye-Mark”	Fixed
RIBBON	
Maximum Width	5.25 in. (134 mm)
Length	1968 ft. (600 M)
Wind	Ink-In
Thickness	4.5 micron, Face in Wind

1-12 Media , Sensing and Ribbons (Cont)

SPECIFICATION	M-8459S	M-8460S
MEDIA		
Minimum Width	1.0 in. (25mm)	2.0 in. (53mm)
Minimum Length	.25 in. (6 mm)	
Print Module (Dot Size)	.0049 in. .125 mm	.0049 in. .125 mm
Maximum Width	5.25 inches 134 mm	6.5 inches 165 mm
Type	Die Cut Labels, Fan-Fold or Continuous	
Maximum Caliper	.010 in. (.25 mm)	
Maximum Unwind Torque	4.4 lbs. (1.0 kg) with 5 in. wide labels	
LABEL SENSING		
See-Thru for labels or tags	Adjustable	
Reflective “I-Mark”	Fixed	
Ribbon	**M-8459S**	**M-8460S**
Maximum Width	N/A	6.5 in. (165 mm)
Length	N/A	1968 ft. (600 M)
Thickness	N/A	4.5 micron, Face-in Wind

Part 2

1-13 Controls and Signals, Adjustments

SPECIFICATION	M-8485S/M-8490S/M-8459S/M-8460S
On-Line	LED
Power	LED
Label	LED
Ribbon	LED
Error	LED
LCD Panel	2 Line x 16 Character
Label Feed Switch	Front Panel
On/Off Switch	Front Panel
Power On/Off Switch	Front Panel
POTENTIOMETER ADJUSTMENTS	
Print Darkness	Inside Panel
Pitch	Inside Panel
Offset	Inside Panel
Display	Front Panel

1-14 Interface Connections

INTERFACE CONNECTIONS	
Parallel (AMP 36 pin)	Centronics Compatible
Serial (DB25S)	RS232C (2400 to 19.2K bps)
Serial Protocol	Hardware Flow Control (Ready/Busy) Software Flow Control (X-On/X-Off) Bi-directional (ENQ/Response)
Data Transmission	ASCII Format

1-15 Processing

SPECIFICATION	M-8485S/M-8490S/M-8459S/M-8460S
PROCESSING	
CPU	32 BIT RISC
ROM	1 MByte
DRAM	2 MByte

Part 2

1-16 Character Fonts

SPECIFICATION		
MATRIX FONTS		
U Font	(5 dots W x 9 dots H) Helvetica	
S Font	(8 dots W x 15 dots H) Univers Condensed Bold	
M Font	(13 dots W x 20 dots H) Univers Condensed Bold	
XU Font	(5 dots W x 9 dots H) Helvetica	
XS Font	(17 dots W x 17 dots H) Univers Condensed Bold	
XM Font	(24 dots W x 24 dots H) Univers Condensed Bold	
OA Font	(15 dots W x 22 dots H) OCR-A	(22 dots W x 33 dots H) OCR-A
OB Font	(20 dots W x 24 dots H) OCR-B	(30 dots W x 36 dots H) OCR-B
AUTO SMOOTHING FONTS		
WB Font	(18 dots W x 30 dots H)	
WL Font	(28 dots W x 52 dots H)	
XB Font	(48 dots W x 48 dots H) Univers Condensed Bold	
XL Font	(48 dots W x 48 dots H) Sans Serif	
VECTOR FONT		
	Proportional or Fixed Spacing Font Size 50 x 50 dots to 999 x 999 dots 10 Font Variations	

1-16 Character Fonts (Cont)

DOWNLOADABLE FONTS	
	True TypeFonts with Optional Memory Card
CHARACTER CONTROL	
	Expansion up to 12 x in either the X or Y coordinates Character Pitch control Line Space control Journal Print facility 0^0, 90^0 ,180^0 and 270^0 Rotation

1-17 Bar Codes and Other Features

SPECIFICATION		
SYMBOLOGIES		
	Bookland (UPC/EAN Supplemental) EAN-8, EAN-13 CODABAR Code 39 Code 93 Code 128 Interleaved 2 of 5	Industrial 2 of 5 Matrix 2 of 5 MSI POSTNET UCC/EAN-128 UPC-A and UPC-E Data Matrix Maxicode PDF417
Ratios	1:2, 1:3, 2:5 User definable bar widths	
Bar Height	4 to 600 dots, User programmable	
Rotation	0^0, 90^0, 180^0 and 270^0	
OTHER FEATURES		
Sequential Numbering	Sequential numbering of both numerics and bar codes	
Custom Characters	RAM storage for special characters	
Graphics	Full dot addressable graphics, SATO Hex/Binary or .PCX formats	
Form Overlay	Form overlay for high-speed editing of complex formats	

Part 2

Part 2

1-18 Optional Accessories

ACCESSORY	M-8485S/M-8490S/M-8459S/M-8460S
Memory Expansion	Two slots for PCMCIA Memory Cards (up to 2MB each). Can be used for Graphic File storage, print buffer expansion, format storage and downloaded TrueType fonts.
Calendar	An internally mounted Date/Time clock that can be used to date/time stamp labels at the time of printing.
Face-Out Label Sensor	Top-mounted sensor for reflective “Eye-Marks” printed on the face of the label. (N/A for M-8460S)

1-19 Environment & Approvals

ENVIRONMENTAL	
Operating Temperature	41^0 to 104^0F (5^0 to 40^0C)
Storage Temperature	-0^0 to 104^0F (-20^0 to 40^0C)
Operating Humidity	15-85 % RH, non-condensing
Storage Humidity	Max 90% RH, non-condensing
Electrostatic Discharge	8KV
REGULATORY APPROVALS	
Safety	UL, CSA
	CE (for M-8460S)
RFI/EMI	FCC Class A

Section

2

Configuration

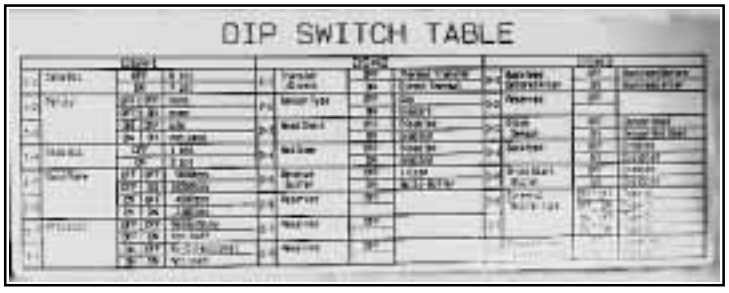
Part 2

2-1 Dip Switch Settings

Three DIP switches DSW1, DSW2, and DSW3 are located in the mechanical section of the printer and is accessed through the front door. These switches can be used to set:

- RS232C TRANSMIT/RECEIVE PARAMETERS
- THERMAL TRANSFER OR DIRECT THERMAL MODE
- LABEL SENSOR ENABLE/DISABLE
- HEAD CHECK MODE
- HEX DUMP MODE
- RECEIVE BUFFER SIZE
- OPERATION MODE

DIP Switch Panel



DIP SWITCH TABLE IS LOCATED ON BACK SIDE OF FRONT DOOR

2-1 Dip Switch Settings (Cont.)

Each switch is an eight position "toggle" switch. The ON position is always to the top. To set the switches, first power the unit Off, then position the DIP switches. After placing the switches in the desired positions, power the printer back on. The switch settings are read by the printer electronics during the power up sequence. They will not become effective until the power is cycled.

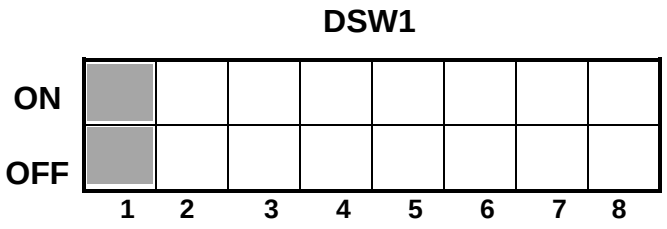
Part 2

RS232 Transmit/Receive Setting

Data Bit Selection (DSW1-1)

This switch sets the printer to receive either 7 or 8 bit data bits for each byte transmitted.

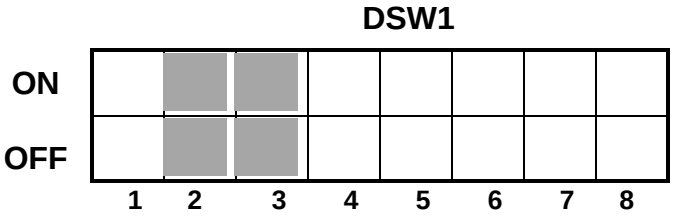
DSW1-1	SETTING
OFF	8 Data Bits
ON	7 Data Bits



Parity Selection (DSW1-2, DSW1-3)

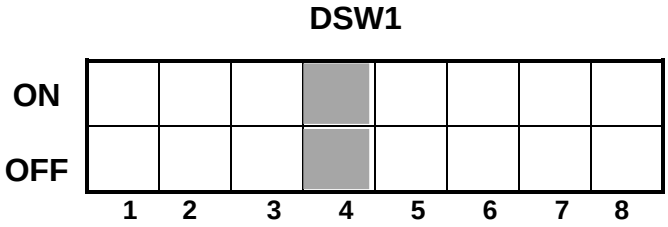
These switches select the type of parity used for error detection.

DSW1-2	DSW1-3	SETTING
OFF	OFF	No Parity
OFF	ON	Even
ON	OFF	Odd
ON	ON	Not Used



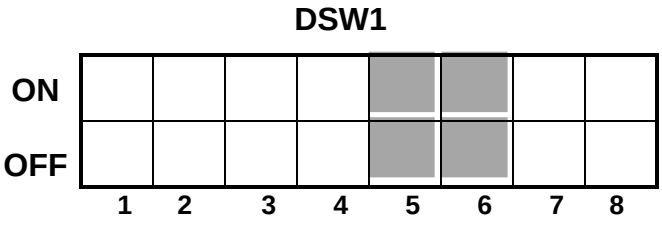
Stop Bit Selection (DSW1-4)
Selects the number of stop bits to end each byte transmission.

DSW1-4	SETTING
OFF	1 Stop Bit
ON	2 Stop Bits



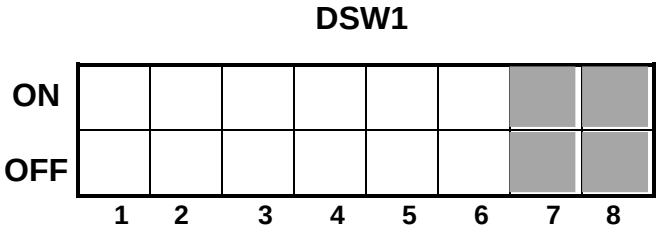
Baud Rate Selection (DSW1-5, DSW1-6)
Selects the data rate(bps) for the RS232 port.

DSW1-5	DSW1-6	SETTING
OFF	OFF	9600
OFF	ON	19200
ON	OFF	4800
ON	ON	2400



Protocol Selection (DSW1-7, DSW1-8)
Selects the flow control and status reporting protocols.

DSW1-7	DSW1-8	SETTING
OFF	OFF	Rdy/Bsy
OFF	ON	Xon/XOff
ON	OFF	Bi-Com
ON	ON	Not Used

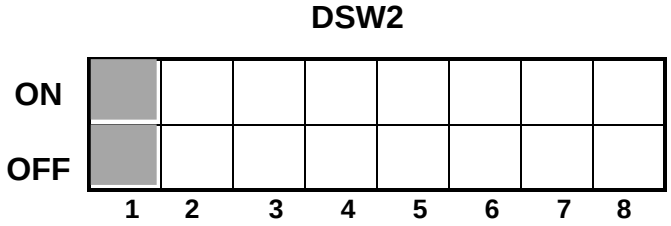


Printer Set Up

Print Mode Selection (DSW2-1)

Selects between direct thermal printing on thermally sensitive paper and thermal transfer printing using a ribbon.

DSW2-1	SETTING
OFF	Therm Xfr
ON	Direct Therm

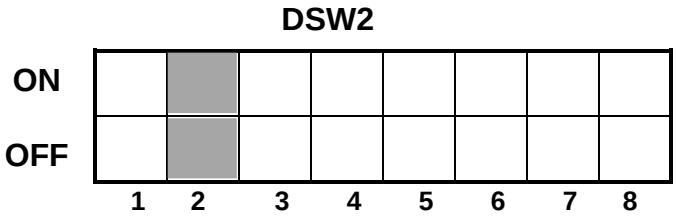


Part 2

Sensor Type Selection (DSW2-2)

Selects between the use of a label gap or a reflective "Eye-Mark" detector.

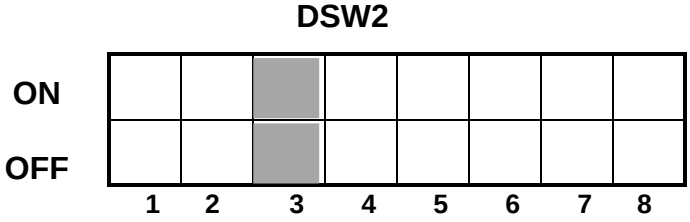
DSW2-2	SETTING
OFF	Gap
ON	"Eye-Mark"



Head Check Selection (DSW2-3)

When selected, the printer will check for head elements that are electrically malfunctioning.

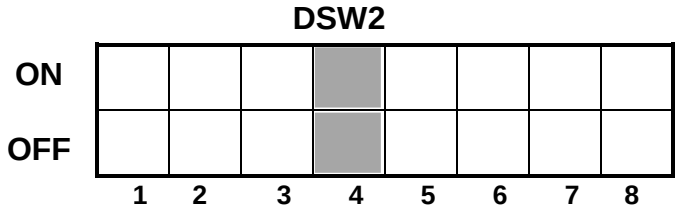
DSW2-3	SETTING
OFF	Disabled
ON	Enabled



Hex Dump Selection (DSW2-4)

Selects Hex Dump mode. Refer to Section 8-8.

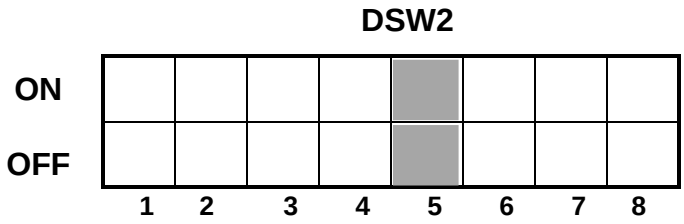
DSW2-4	SETTING
OFF	Disabled
ON	Enabled



Receive Buffer Selection (DSW2-5)

Selects the operating mode of the receive buffer.

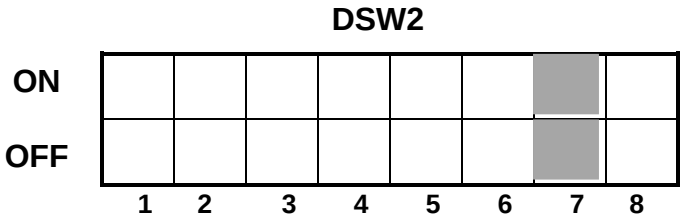
DSW2-5	SETTING
OFF	Single Job
ON	Multi Job



Protocol Control Code Selection (DSW2-7)

Selects the command codes used for protocol control.

DSW2-7	SETTING
OFF	Standard
ON	Non-Std.



Part 2

Reserved for Future Use (DSW2-6, DSW3-2)

NOTE: The Centronics (Parallel) communications port is always enabled regardless of the settings for the RS232 port. There are no settings for Centronics. Both the Centronics and the RS232 ports are active at all times. Care should be taken to ensure that data is not transmitted to both ports simultaneously as the received message will be corrupted.

Selecting Protocol Control Codes

Protocol control codes are the special control characters that prepare the printer to receive instructions. For example, the **<ESC>** character tells the printer that a command code will follow and the **<ENQ>** character asks for the printer status.

There are two pre-defined sets of Protocol Control codes to choose from. Each set is made up of six special characters. The ***Standard Protocol Control*** codes are non-printable characters, and the ***Non-Standard Protocol Control*** codes are printable characters. The Non-Standard set may be useful on host computers using protocol converters or in an application where non-printable ASCII characters cannot be sent from the host. This manual uses the Standard Protocol Control codes for all of the examples. Alternately, the user may define and download a set of custom Protocol Control Codes.

Note: If the data being sent to the printer is "Standard" and the printer is set to "Non-Standard the printer will do nothing.

The Protocol Control codes are selected by a DIP switch DSW2-7 on the front panel.

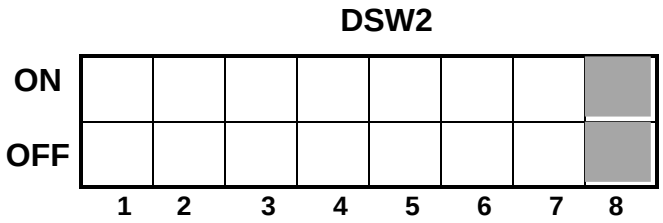
Selecting Protocol Control Codes (Cont.)

CONTROL CHARACTER	STANDARD DSW2-7 OFF	NON-STANDARD DSW2-7 ON	DESCRIPTION
STX	02 Hex	7B Hex = {	Start of Data
ETX	03 Hex	7D Hex = }	End of Data
ESC	1B Hex	5E Hex = ^	Command code to follow
Null	00 Hex	7E Hex = ~	Cutter command
ENQ	05 Hex	40 Hex = @	Get printer status, Bi-Com mode
Can	18 Hex	21 Hex = !	Cancel print job, Bi Com mode
Off-Line	40 Hex	5D Hex =]	Take printer Off-Line

M8400 Emulation Mode (DSW2-8)

For emulating M8400 software. Should be used only if problems are encountered when using existing M8400 software. Note: This setting is not valid for the M-8490S.

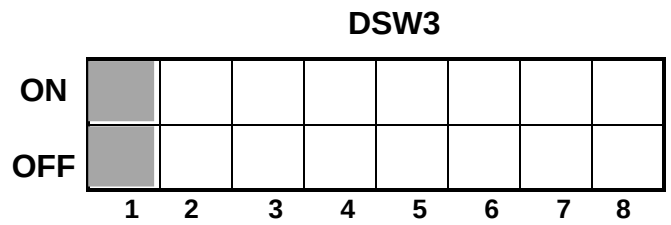
DSW2-8	SETTING
OFF	Disabled
ON	Enabled



Backfeed Selection (DSW3-1)

Backfeed is used to correctly position the label for application and then retract the next label to the proper print position. This operation can be performed immediately after a label is printed or immediately prior to the printing of the next label.

DSW3-1	SETTING
OFF	Backfeed before print
ON	Backfeed after print



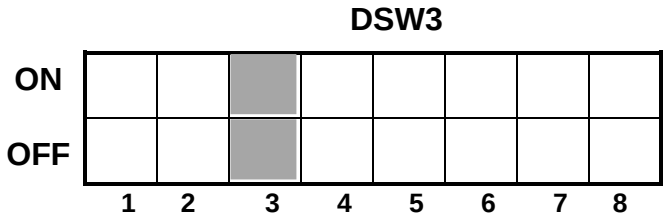
Reserved for Future Use (DSW2-6, DSW3-2)

NOTE: The Centronics (Parallel) communications port is always enabled regardless of the settings for the RS232 port. There are no settings for Centronics. Both the Centronics and the RS232 ports are active at all times. Care should be taken to ensure that data is not transmitted to both ports simultaneously as the received message will be corrupted.

Label Sensor Selection (DSW3-3)

Enables or disables the Label Sensor. If the Sensor is enabled, it will detect the edge of the label and position it automatically. If it is disabled, the positioning must be under software control using Line Feed commands.

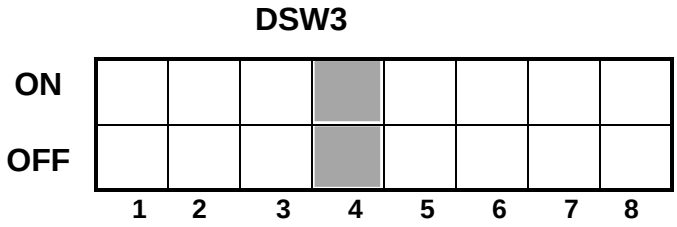
DSW3-3	SETTING
OFF	Sensor Used
ON	Sensor Not Used



Back Feed Selection (DSW3-4)

When Back-Feed is enabled, the printer will position the last printed label for dispensing and retract it to the correct print position before printing the next label. The amount of backfeed offset is adjustable.

DSW3-4	SETTING
OFF	Enabled
ON	Disabled



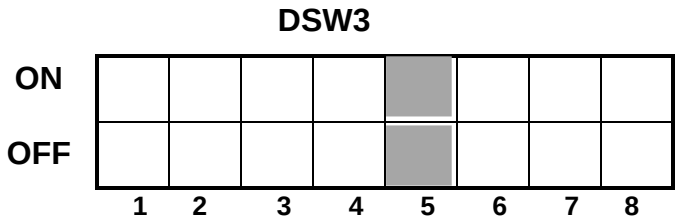
External Signal Interface

The EXT connector on the printer rear panel is intended for use with the external printer accessories such as label rewinders or applicators. The DB-9S type connector provides a choice of four different output signals along with various error conditions.

EXT Print Start Signal Selection (DSW3-5)

Allows an external device to initiate a label print for synchronization with the applicator.

DSW3-5	SETTING
OFF	Enabled
ON	Disabled

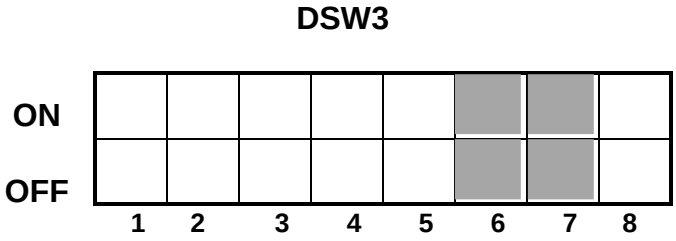


Part 2

External Signal Type Selection (DSW3-6, DSW3-7)

Both the polarity and signal type (level or pulse) of the external print synchronizing signal can be selected. See Section 3-6 for a description of signal types.

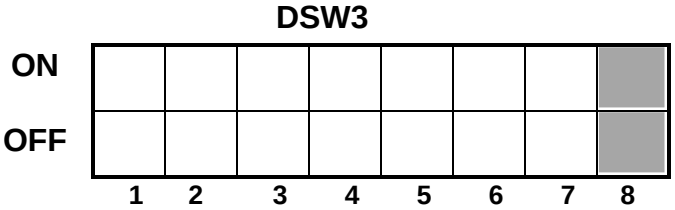
DSW3-6	DSW3-7	SETTING
Off	Off	Type 4
Off	On	Type 3
On	Off	Type 2
On	On	Type 1



Repeat Print via External Signal (DSW3-8)

Allows the applicator to reprint the current label in the print buffer.

DSW3-8	SETTING
OFF	Disabled
ON	Enabled



> ***Note:*** *The DIP Switch functions listed incorporate the latest firmware revisions at the time of printing.*

2-2 Default Settings

Switch Selections

All switches are placed in the ***Off*** position (default) for shipping. This will result in the following operating configuration:

Communications: 8 data bits, no parity, 1 Stop bit, 9600 Baud
Protocol: Ready/Busy
Sensor: Gap Sensor
Receive Buffer: Single Job
Mode: Batch/continuous
Label Sensor: Sensor Used
Back feed: Disabled
External Signals: Disabled

Software Default Settings

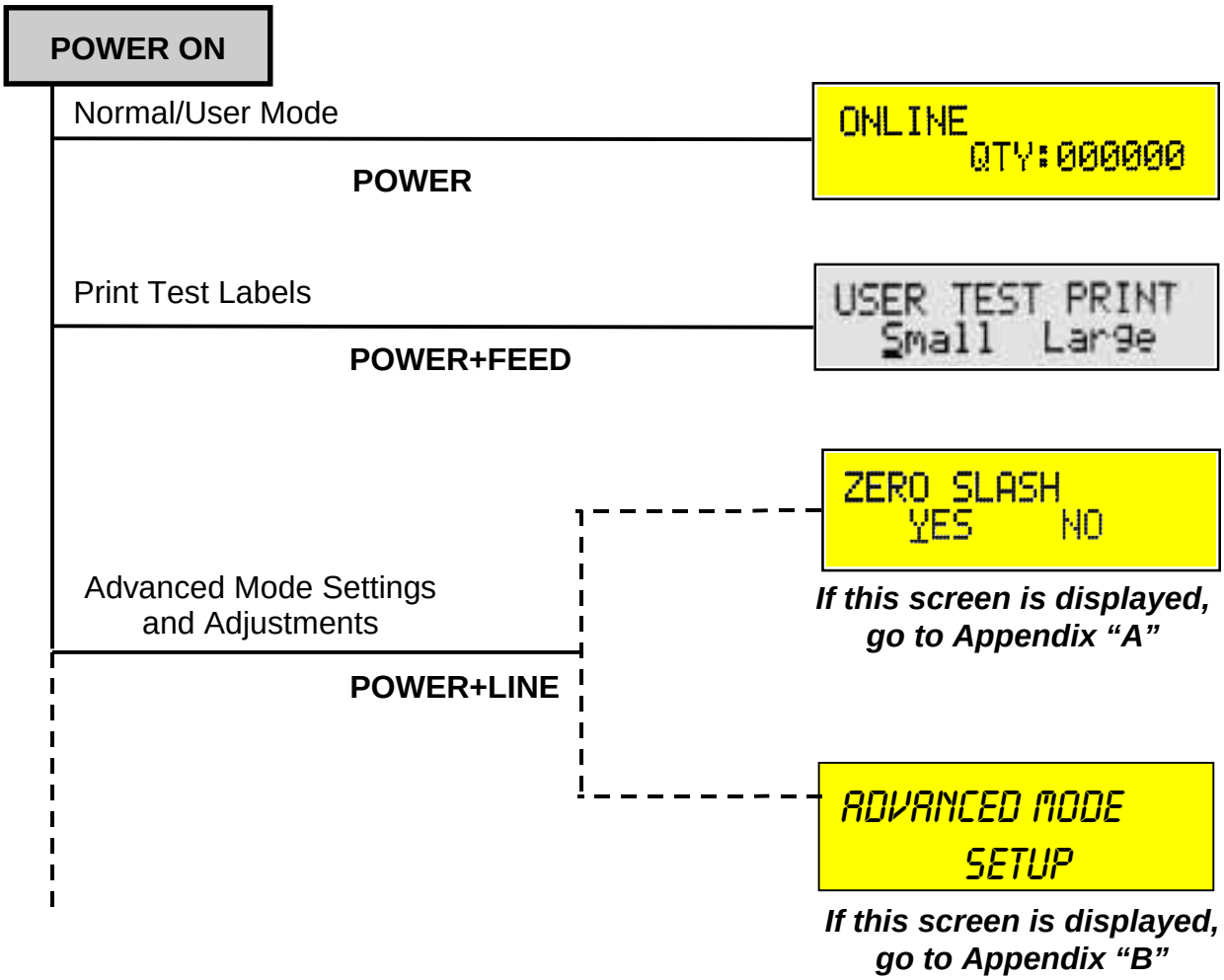
The printer stores the software settings upon receipt and uses them until they are again changed by receipt of a command containing a new setting. These settings are stored in non-volatile RAM and are not affected by powering the printer off. The printer may be reset to use the default software settings by depressing the **LINE** and **FEED** keys simultaneously while powering the printer on. This will result in the following default configuration:

	M-8459S	M-8460S	M-8485S	M-8490S
Print Darkness	3	2	2	2
Print Speed	4 in per sec	6 in per sec	6 in per sec	6 in per sec
Print Reference	Vertical = 0000, Horizontal = 0000			
Zero	Slash			
Auto On Line	Enabled			

Once the default operation is completed, a "SATO DEFAULT COMPLETED" message will be displayed on the LCD panel and a single audible signal will be heard. The printer should be powered off while this message is being displayed. This saves the default settings in the EEPROM where they will be automatically loaded the next time the printer is powered on.

Printer Adjustments (Refer to Appendix "A" or Appendix "B"

The LCD Panel is used in conjunction with the ***LINE*** and ***FEED*** switches by the operator to manually enter printer configuration settings. Many of the settings can also be controlled via software commands and in the case of conflict between software and control panel settings, the printer will always use the last valid setting.



Section

3

Interface Specifications

Part 2

3-1 Overview

This section explains the interface specifications for the M-8485S/M-8490S and M-8459S/M-8460S printers. These specifications include detailed information on how to properly interface your printer with your host system and includes data about the following:

- INTERFACE TYPES
- USING THE RECEIVE BUFFER
- RS232C SERIAL INTERFACE
- CENTRONICS PARALLEL INTERFACE
- I/F CONNECTOR

3-2 Interface Types

In order to provide flexibility in communicating with a variety of host computer systems, the printers can be configured for operation with either parallel or serial data transfers. Both a parallel Centronics and a serial RS232 interface are supplied with the standard printer.

The Centronics Parallel interface will probably be the most useful in communicating with IBM PCs and compatibles. The RS232C Serial interface allows connectivity to a number of other hosts. For instructions on how to properly configure the printer for either of these interface types, see the printer configuration instructions in Section 2 of this manual.

NOTE: Both the Centronics and RS232C interfaces are active at the same time, i.e. data can be received on either one, however no provision is made for port contention. If data is transmitted to both ports simultaneously, it will cause the data in the receive buffer to be corrupted.

WARNING: Never connect or disconnect interface cables or use a switch box with power applied to either the host or the printer. This may cause damage to the interface circuitry in the printer/host and is not covered by warranty.

3-3 The Receive Buffer

The printers have the ability to receive a data stream from the host in one of two ways. The receive buffer may be configured to accept one print job at a time or multiple print jobs. The single job print buffer is generally used by software programs that wish to maintain control of the job print queue so that it can move a high priority job in front of ones of lesser importance. The multiple job buffer, on the other hand prints all jobs in the order they are received by the printer, and the order of printing cannot be changed.

Part 2

Single Job Buffer

The printer receives and prints one job at a time. Each job must not exceed 64 K bytes. Dip switch 2-5 (Off)

Multi Job Buffer Dip switch 2-5 (On)

The printer is able to continuously receive print jobs, compiling and printing other jobs at the same time. It acts much like a "print buffer" to maximize the performance of the host and the printer. The Multi Job Buffer mode is selected with DSW2-5.

When using the RS232 Serial interface, the Multi Job Buffer uses either the **Ready/Busy** with **DTR** (pin 20) or **X-On/X-Off** flow control protocols. See these sections for more details. With an empty receiving buffer, the status of **DTR** is "high" (or an **X-On** status if using **X-On/X-Off**), meaning the printer is ready to receive data. When the receive buffer is holding 62K bytes of data (2K bytes from being full), **DTR** will go "low" (or an **X-Off** is sent) indicating the printer can no longer receive data. This condition is called "Buffer Near Full". See Figure 3-1.

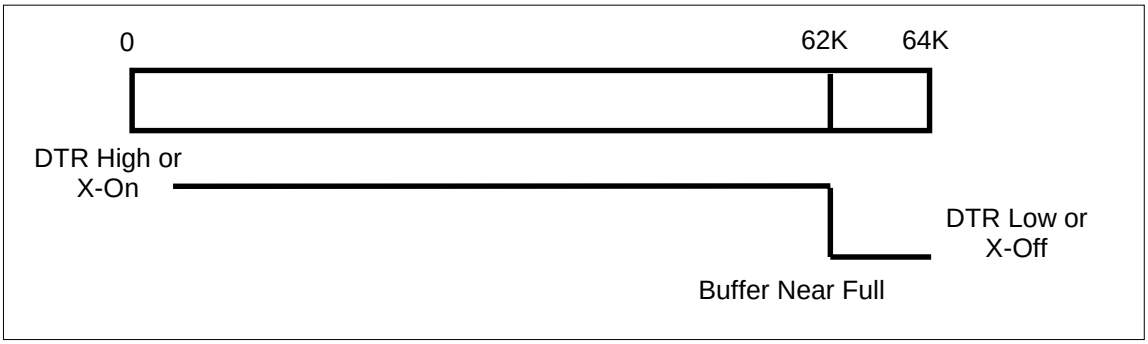


Fig. 3-1

Multi Job Buffer (Cont.)

The receiving buffer will not be able to receive more data again until a "Buffer Available" condition occurs. This takes place when the receiving buffer has emptied so that only 56K bytes of data are being held (8K bytes from being full). At this time, **DTR** will go "high" or an **X-On** is sent to tell the host that it can again receive data. See Figure 3-2.

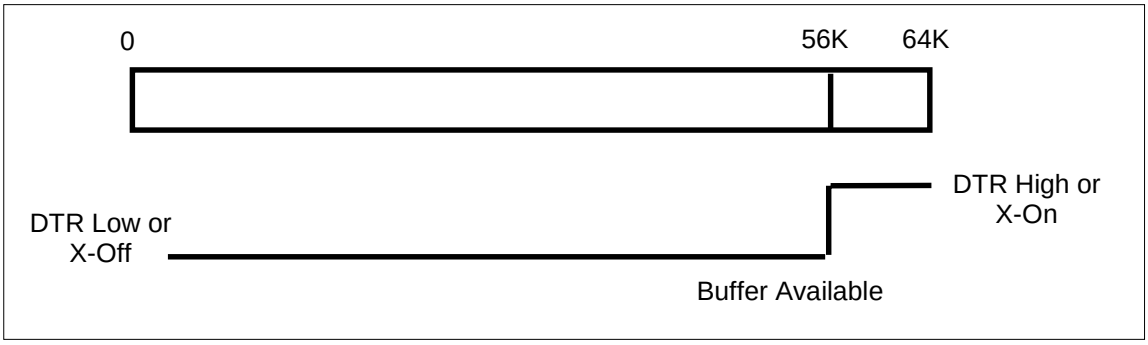


Fig. 3-2

All printer error conditions (i.e., label out, ribbon out) will cause the printer to go busy (**DTR** "low" or **X-Off**) until the problem is corrected and the printer is placed on-line. The printer will also be busy if taken off-line from the front panel.

Part 2

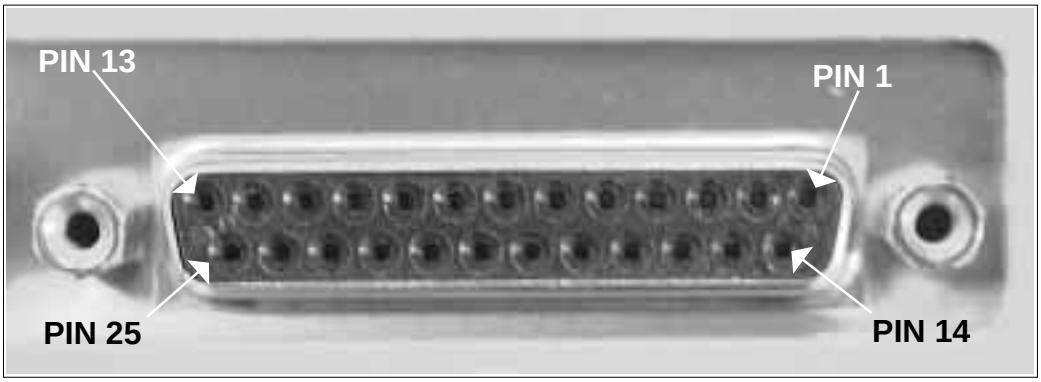
3-4 RS232C Serial Interface

General Specifications

Asynchronous ASCII	Half-duplex communication. Ready/Busy Hardware Flow Control Pin 20, DTR Control Pin 4, RTS Error Condition X-On/X-Off Software Flow Control. Bi-Directional communication (ENQ/Response)
Data Transmission Rate	2400, 4800, 9600 and 19200 bps
Character Format	1 Start Bit (fixed) 7 or 8 data bits (selectable) Odd, Even or No Parity (selectable) 1 or 2 Stop bits (selectable)

Electrical Specifications

Connector	DB-25S (Female)



Cable	DB-25P (Male), 50 ft. maximum length. For cable configuration, refer to cable requirements appropriate to the RS232C protocol chosen.
Signal Levels	High = +5V to +12V Low = -5V to -12V

3-4 RS232C Serial Interface (Cont.)

Pin Assignments

RS232C Interface Signals

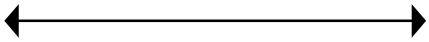
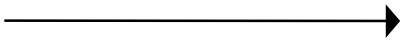
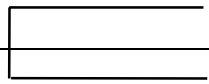
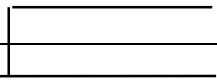
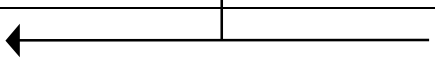
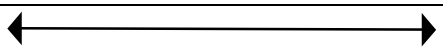
PIN	DIRECTION	SIGNAL DESCRIPTION
1	Reference	FG (Frame Ground)
2	To Host	TD (Transmit Data) - Data from the printer to the host computer. Sends X-On/X-Off characters or status data (Bi-Directional protocol).
3	To Printer	RD (Receive Data) - Data to the printer from the host computer.
4	To Host	RTS (Request to Send) Used with Ready/Busy flow control to indicate an error condition. RTS is high and remains high unless the print head is open, (in this case, RTS would return to the high state after the print head is closed and the printer is placed back on-line) or an error condition occurs during printing (e.g., ribbon out, label out).
5	To Printer	CTS (Clear to Send) - When this line is high, the printer assumes that data is ready to be transmitted. The printer will not receive data when this line is low. If this line is not being used, it should be tied high (to pin 4).
6	To Printer	DSR (Data Set Ready) - When this line is high, the printer will be ready to receive data. This line must be high before data is transmitted. If this line is not being used, it should be tied high (to pin 20).
7	Reference	SG (Signal Ground).
20	To Host	DTR (Data Terminal Ready) - This signal applies to Ready/Busy flow control. The printer is ready to receive data when this pin is high. It goes low when the printer is off-line, either manually or due to an error condition, and while printing in the Single Job Buffer mode. It will also go low when the data in the buffer reaches the Buffer Near Full level.

3-4 RS232C Serial Interface (Cont.)

Ready/Busy Flow Control

Ready/Busy is the hardware flow control for the serial interface on the printer. By raising/lowering the voltage level on Pin 20 of the RS232 port, the printer notifies the host when it is ready to receive data. Pin 4 (RTS) and Pin 20 (DTR) are the important signals on the printer for this method of flow control. The host must be capable of supporting this flow control method for it to function properly.

Cable Requirements

HOST	INTERCONNECTION	PRINTER
FG		1 FG (Frame Ground)
TD		3 RD (Receive Data)
		4 RTS (Request to Send)
		5 CTS (Clear to Send)
		6 DSR (Data Set Ready)
*		20 DTR (Data Terminal Ready)
SG		7 SG (Signal Ground)

* This connection at the host side of the interface would depend upon the pin that is being used as the Ready/Busy signal by the driving software. Typically on a PC, it would be either CTS (pin 5) or DSR (pin 6) on a DB-25 connector.

3-4 RS232C Serial Interface (Cont.)

X-On/X-Off Flow Control

X-On/X-Off flow control must be used whenever hardware (Ready/Busy) flow control is not available or desirable. Instead of a voltage going high/low at pin 20, control characters representing "Printer Ready" (X-On = 11 hexadecimal) or "Printer Busy" (X-Off = 13 hexadecimal) are transmitted by the printer on pin 2 (Transmit Data) to the host. In order for this method of flow control to function correctly, the host must be capable of supporting it. **X-On/X-Off** operates in a manner similar to the function of pin 20 (**DTR**) as previously explained. When the printer is first powered on and goes on-line, an **X-On** is sent out. In the Single Job Buffer mode, when the printer receives a print job, it transmits an **X-Off** and begins printing. When it is done printing, it transmits an **X-On**. In the Multi Job Buffer mode, the printer sends an **X-Off** when the "Buffer Near Full" level is reached and a **X-On** when the data level of the buffer drops below the "Buffer Available" mark. When the printer is taken off-line manually, it transmits an **X-Off** indicating it cannot accept data. When it is placed back on line manually, it sends an **X-On**, indicating it is again available for receipt of data. If an error occurs during printing (paper out, ribbon out), the printer sends nothing in the Single Job Buffer mode since the last character transmitted was an **X-Off**. When the error is cleared and the printer resumes printing, no **X-On** is sent until the current job is completed and the printer is once again read to receive the next job. If it is in the Multi Job Buffer mode, it sends an **X-Off** as soon as an error condition is detected. When the error is cleared and the printer is placed back on-line, it transmits an **X-On** indicating it is again ready to accept data.

Upon power up, if no error conditions are present, the printer will continually send **X-On** characters at five millisecond intervals until it receives a transmission from the host.

Cable Requirements

HOST	INTERCONNECTION	PRINTER
FG	◄——————►	1 FG (Frame Ground)
RD	◄——————	2 TD (Transmit Data)
TD	——————►	3 RD (Receive Data)
		4 RTS (Request to Send)
		5 CTS (Clear to Send)
		6 DSR (Data Set Ready)
		20 DTR (Data Terminal Ready)
SG	◄——————►	7 SG (Signal Ground)

Part 2

3-4 RS232C Serial Interface (Cont.)

Bi-Directional Communications

This is a two-way communications protocol between the host computer and the printer, thus enabling the host to check printer status. When this protocol is selected, there is no busy signal from the printer (pin 20, **DTR**, is always high). The host must request the complete status from the printer, including ready/busy. Whenever the host requests printer status, it transmits an **ENQ** to the printer and the printer will respond with its status within five milliseconds. If printing, it will respond upon finishing the current label, then resume printing. In order for this protocol to work properly, pin 6 (**DTR**) and pin 5 (**CTS**) must be held high by the host. One way to ensure these pins are always in the correct state is to tie pin 20 (**DTR)** to pin 6 (**DSR**) and pin 4 (**RTS**) to pin 5 (**CTS**) at the printer end of the cable.

Cable Requirements

HOST	INTERCONNECTION	PRINTER
FG	◄——————►	1 FG (Frame Ground)
RD	◄——————	2 TD (Transmit Data)
TD	——————►	3 RD (Receive Data)
		4 RTS (Request to Send)
		5 CTS (Clear to Send)
		6 DSR (Data Set Ready)
		20 DTR (Data Terminal Ready)
SG	◄——————►	7 SG (Signal Ground)

If a **CAN** (18 hexadecimal) is received by the printer, it will cancel the current print job and clear all data from the receive buffer.

3-5 Centronics Parallel Interface

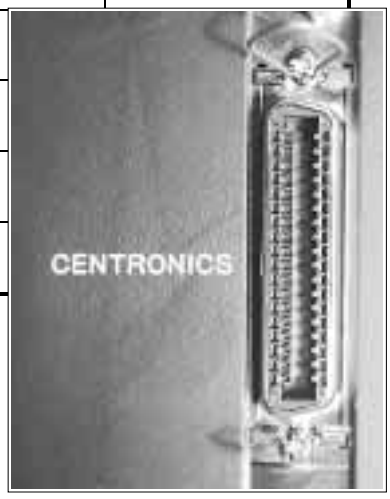
Electrical Specifications

Printer Connector	AMP 57-40360 (DDK) or equivalent
Cable Connector	AMP 57-30360 (DDK) or equivalent
Cable Length	10 ft. or less
Signal Level	High = +2.4V to +5.0V Low = 0V to -0.4V

3-5 Centronics Parallel Interface (Cont.)

Centronics Parallel Interface Pin Assignments

PIN	SIGNAL	DIRECTION	PIN	SIGNAL	DIRECTION
1	$\overline{\text{STROBE}}$	To Printer	19	STROBE Return	Reference
2	DATA 1	To Printer	20	DATA 1 Return	Reference
3	DATA 2	To Printer	21	DATA 2 Return	Reference
4	DATA 3	To Printer	22	DATA 3 Return	Reference
5	DATA 4	To Printer	23	DATA 4 Return	Reference
6	DATA 5	To Printer	24	DATA 5 Return	Reference
7	DATA 6	To Printer	25	DATA 6 Return	Reference
8	DATA 7	To Printer	26	DATA 7 Return	Reference
9	DATA 8	To Printer	27	DATA 8 Return	Reference
10	$\overline{\text{ACK}}$	To Printer	28	ACK Return	Reference
11	BUSY	To Host	29	BUSY Return	Reference
12	PTR ERROR	To Host	30	PE Return	Reference
13	SELECT	To Host	31		
14			32	$\overline{\text{FAULT}}$	To Host
15			33		
16			34		
17	FG	Frame Ground	35		
18	+5V (Z=24K ohm)		36		



Part 2

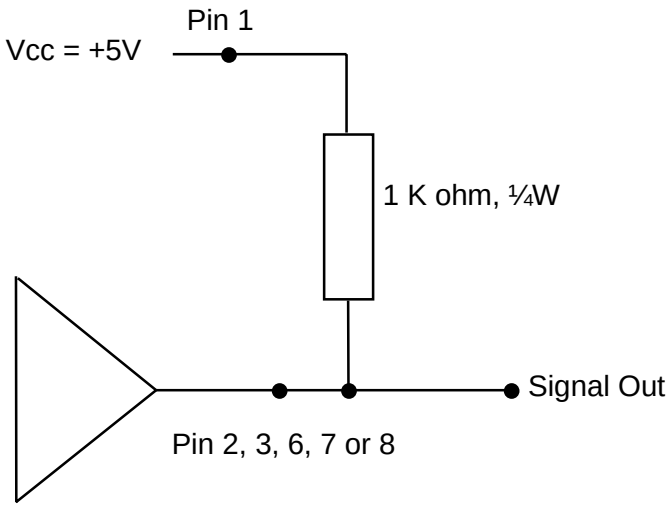
Part 2

3-6 I/F Connector

PIN Assignments

PIN	DIRECTION	SIGNAL DESCRIPTION
1	To Host	Vcc -+5V
2	To Host	Ribbon Near End - This pin goes high when the amount of ribbon on the unwind shaft is approximately 46 feet (14 m). The output will be low when the ribbon is completely out.
3	To Host	Error - This pin goes low when the printer detects an error condition such as head open or receiving buffer full.
4	To Printer	Reprint - The last label will be reprinted when this signal is received.
5	To Printer	Print Start - The printer will print one label when this pin is pulled to ground. This signal must be enabled by placing switch DSW3-5 on the Control Panel in the OFF position.
6	To Host	End Print - It is used to drive an applicator or other external device requiring synchronization with the print cycle. You may choose between four types of output signals using control panel DSW3-6 and DSW3-7 selections.
7	To Host	Label Out - This pin goes low (OV) when a label out error exists.
8	To Host	Ribbon Out - This pin goes low when the ribbon is out.
9	Reference	Signal Ground

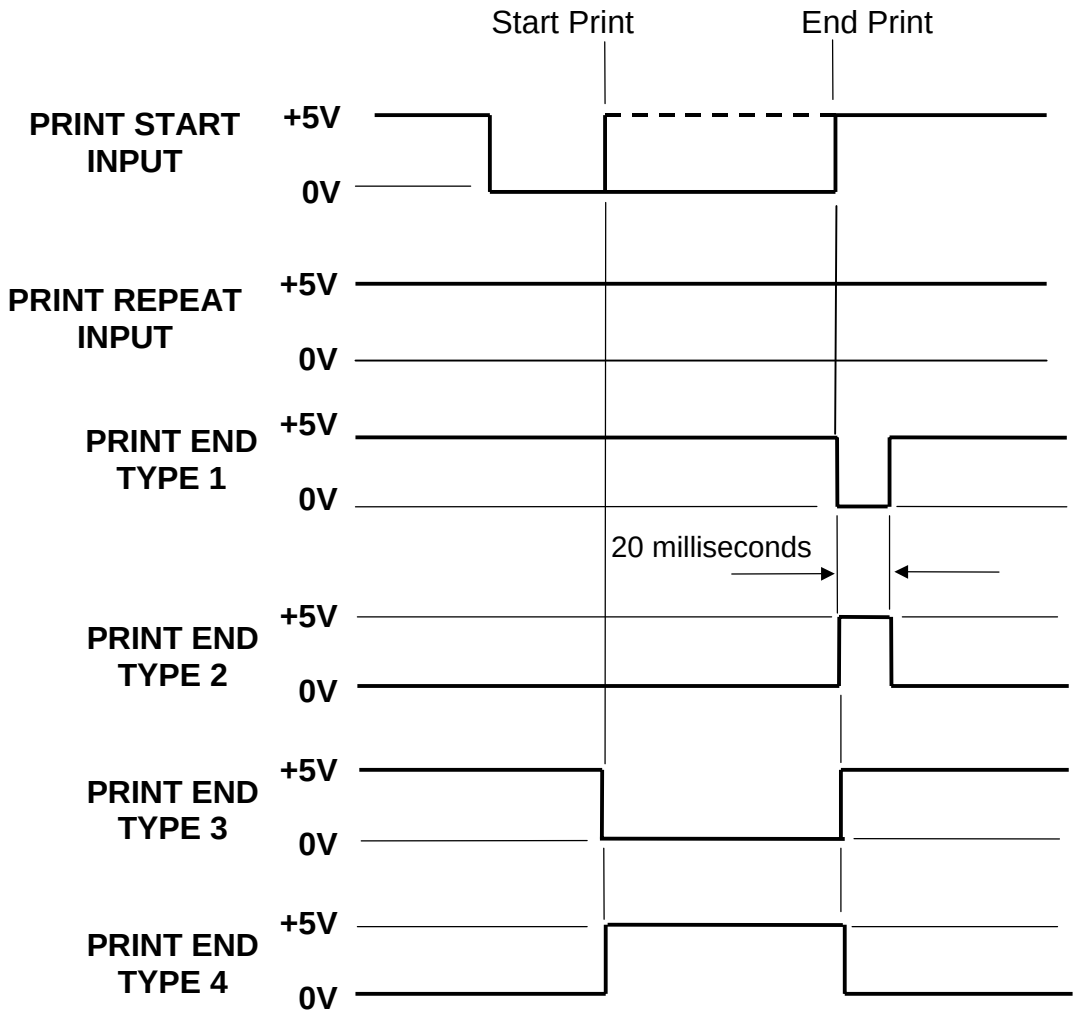
NOTE: The signals on pins 2, 3, 6, 7 and 8 each have an open collector output. These pins normally measure +.07V maximum when a true condition exists. If a false condition occurs, the voltage will drop to 0V. To achieve a signal level of +5V, you must add a 1K ohm, ¼ W pull-up resistor between the open collector output pin and Vcc (pin 1) as illustrated. This will provide a signal level of +5V for a true condition and 0V when a false condition exists. The maximum voltage that can be applied to these pins is +50V and the maximum current they can sink is 500 milliamps.



External Output Signal Types (Pin #6)

3-6 I/F Connector (Cont.)

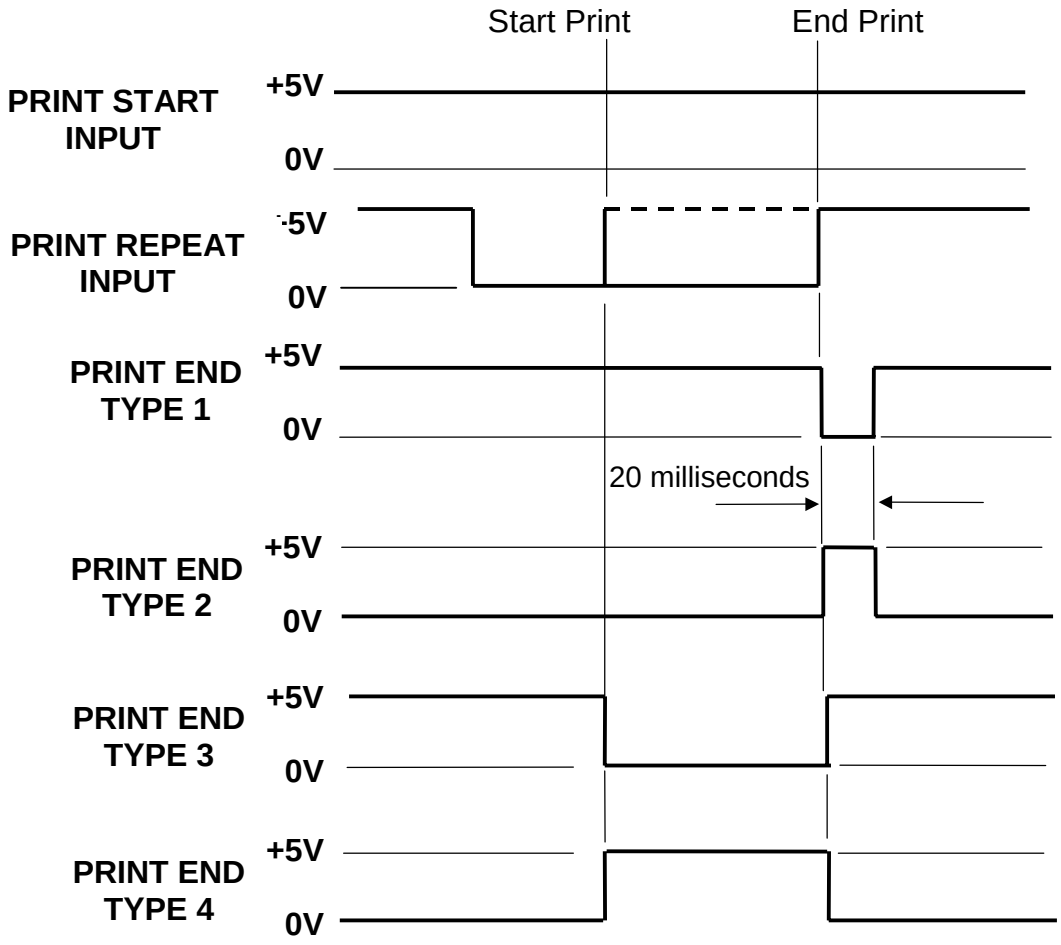
STANDARD OPERATION



Part 2

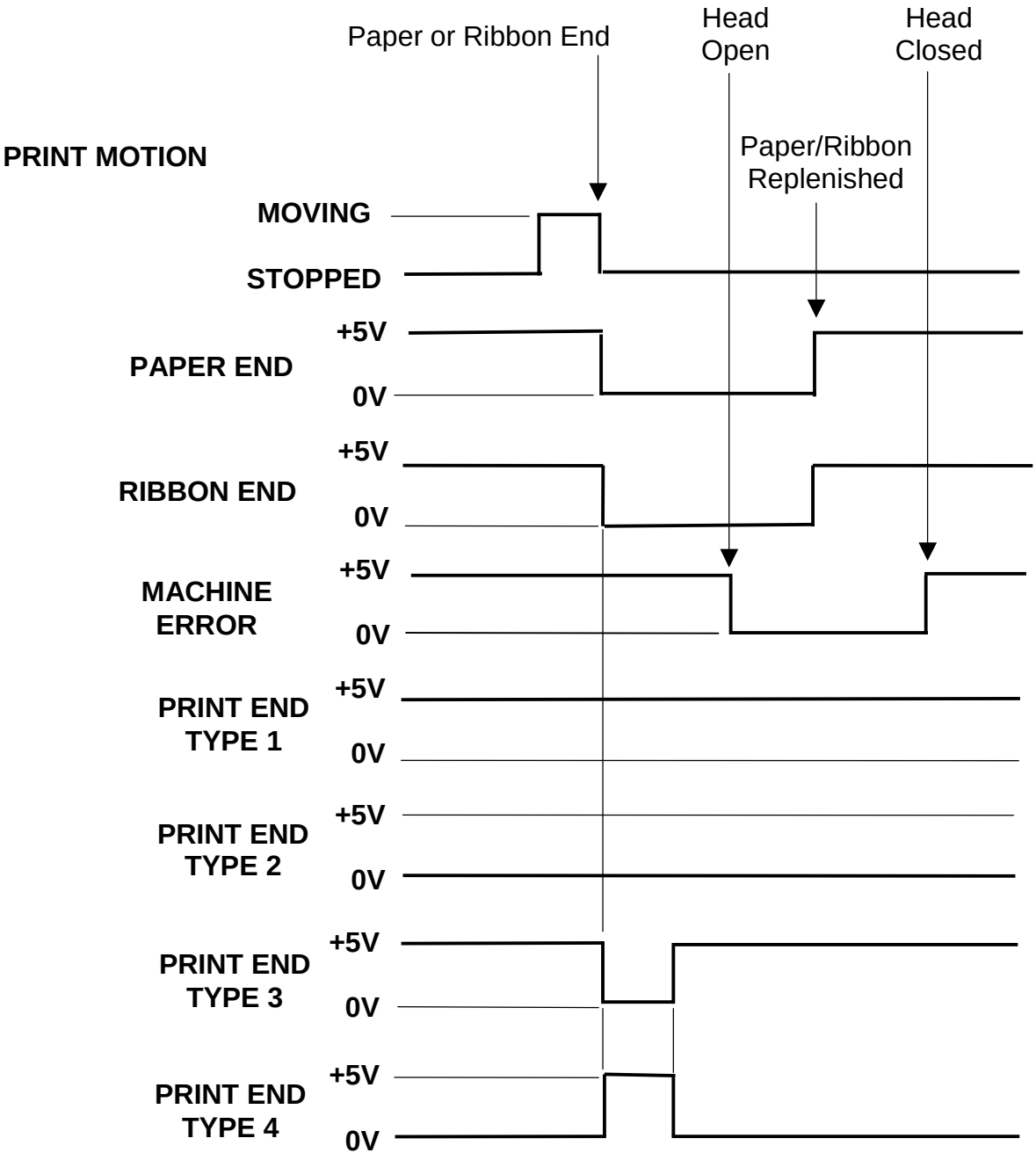
3-6 I/F Connector (Cont.)

REPEAT PRINT



3-6 I/F Connector (Cont.)

ERROR SIGNALS



Part 2

Part 2

Section

4

Electrical Checks and Adjustments

Part 2

4-1 Overview

This chapter describes how to check M-8485S/M-8490S/M-8459S/M-8460S voltage levels and adjust threshold sensor voltages.

The power supply converts 125 VAC into regulated DC voltages. The printer uses: +5V, +12V, -12V and +24V. These DC voltages are not adjustable, however you can measure these DC voltages at test points located on the PCB. If a voltage is out of specification, the power supply must be replaced. Section 4-2 contains procedures for measuring DC voltage levels. Power supply removal and replacement procedures are located in Section 6-4.

You can adjust threshold voltage levels for label sensors. These adjustments are made to allow for variations in the characteristics of the labels used with the printer. If you cannot calibrate the label sensor voltage level within the specified voltage range, you should reposition the label sensor by following the adjustment procedures included in this section. After completing the label sensor adjustment procedures, perform the label sensor voltage level adjustment procedure.

You can check or adjust:

- Power Supply
- Label Pitch Sensor
- Ribbon Sensor
- Pitch Offset Sensor

4-2 Power Supply Checks

Required Equipment:	• DC Voltmeter • #2 Phillips Screwdriver

To check voltage levels, first check the Main fuses (6-3) and replace if necessary, then perform the following steps:

Part 2

STEP	PROCEDURE
1.	Loosen (2) screws holding the service board access cover to the rear of the cabinet. Slide off the cover for access to the service board. ***Fig. 4-1***
2.	Connect the printer AC power cord to a grounded AC outlet. Place the power switch in the OFF position.
3.	Attach the DC voltmeter negative lead to the test point labeled **SG** (Ground) on the service board. Attach the DC voltmeter positive lead to the corresponding voltage test point and place the power switch in the ON position. Refer to table ***Fig. 4-2, and 4-3***.
4.	Confirm voltages are correct. If not then replace power supply. Refer to Section 6-4.
5.	After performing tests, replace the access cover.

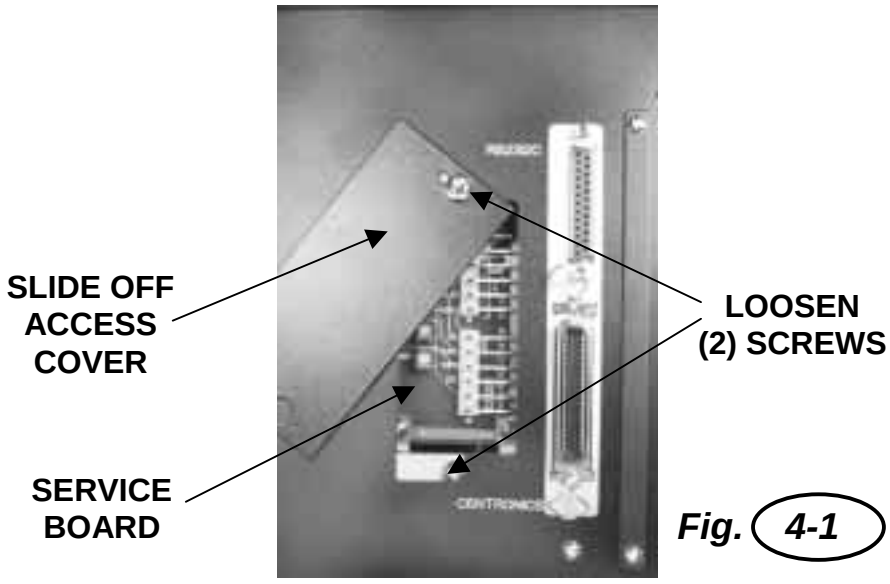


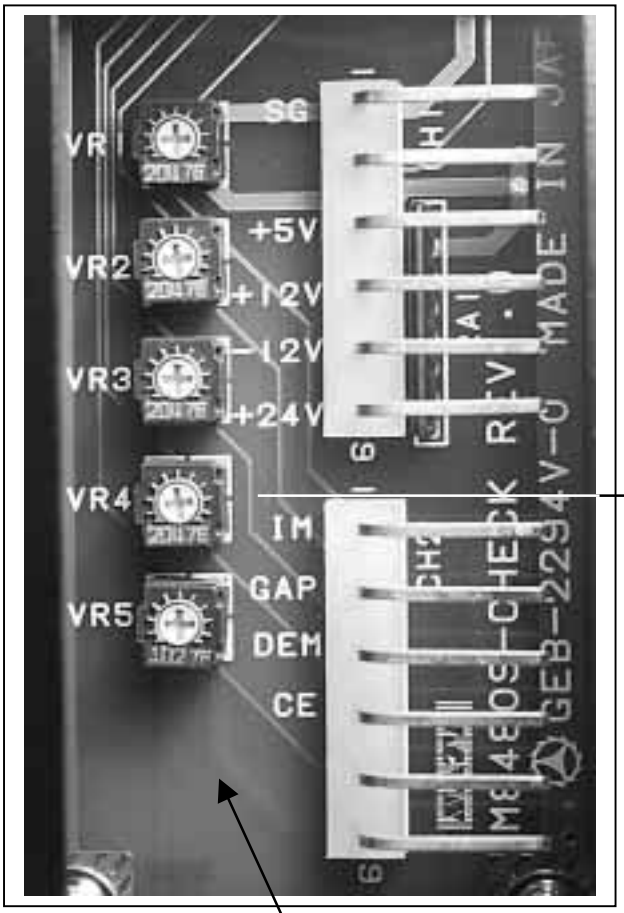
Fig. 4-1

4-2 Power Supply Checks

Test Points	Range	Nominal Voltage
SG +5V	+4.8 to +5.2V	+5V
SG +12V	+11.4 to +12.6	+12V
SG -12V	-11-4 to -12.6	-12V
SG +24V	+23.5 to +24.5	+24V

NOTE: The power supply voltages are not adjustable. All voltages must read within the nominal value for correct operation of the printer.

Fig. 4-2



Figs. 4-3

Part 2

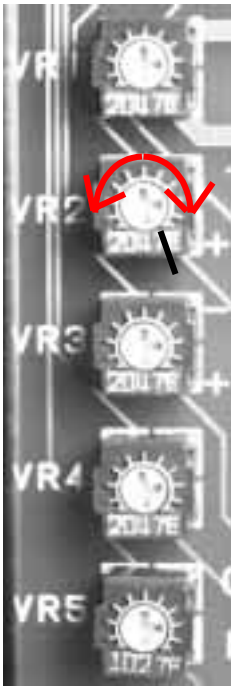
4-3 See Thru Label Pitch Sensor Adjustment

Required Equipment:	• DC Voltmeter • Small flathead screwdriver (for potentiometer adjustment)

IMPORTANT! Use pressure sensitive label stock that is rated for use with thermal transfer printers using see thru (transmissive) sensing.

To adjust the Reflective Label Pitch Sensor voltage, perform the following steps:

STEP	PROCEDURE
1.	Loosen (2) screws holding the service board access cover to the rear of the cabinet. Slide off the cover for access to the service board. ***Fig. 4-1***
2.	Connect the printer AC power cord to a grounded AC outlet. Place the power switch in the OFF position.
3.	On the service board attach the DC voltmeter negative lead to the test point labeled **SG** (Ground) on the service board. Attach the DC voltmeter positive lead to **GAP** on the service board and place the power switch in the ON position. Refer to ***Fig. 4-3***
4.	**LOW LEVEL ADJUSTMENT (GAP):** Position the label gap or a strip of backing sheet in the sensor's field of view. Adjust **VR2** to set the voltage under +0.5V. (*Ref. LOW LEVEL(GAP) = under +0.5V).* ***Fig. 4-4*** NOTE: Sensor is adjustable and can be moved for holes and notches.
5.	**HIGH LEVEL ADJUSTMENT**: Position a label in the sensor's field of view. Check that the difference between the high and low level is 2V or higher. If the voltage reading is not over +2.0 repeat Step 4. (*Ref. HIGH LEVEL (Label) - LOW LEVEL (GAP) >/= +2.0V)* *Level difference should be set as maximum.*



VR2 (PIN SG and GAP)

Rotate clockwise To lower the value and counter -clockwise To raise the value

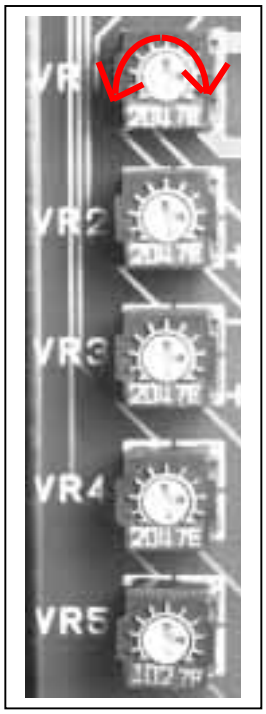
Fig. 4-4

4-4 Reflective Label Pitch Sensor Adjustment

Required Equipment:	• DC Voltmeter • Small flathead screwdriver (for potentiometer adjustment)

To adjust the Reflective Label Pitch Sensor voltage, perform the following steps:

STEP	PROCEDURE
1.	Loosen (2) screws holding the service board access cover to the rear of the cabinet. Slide off the cover for access to the service board. ***Fig. 4-1***
2.	Load a roll of label stock with "Eye-Marks" into the printer. Leave the head lock lever in the open position.
3.	Connect the printer AC power cord to a grounded AC outlet. Place the power switch in the OFF position.
4.	On the service board attach the DC voltmeter negative lead to the test point labeled **SG** (Ground) on the main circuit board. Attach the DC voltmeter positive lead to **IM** pin on the service board and place the power switch in the ON position. Refer to ***Fig. 4-3***
5.	**LOW LEVEL ADJUSTMENT:** Position a label in the sensor's field of view. Adjust **VR1** to set the voltage under +0.8V. (*Ref. LOW LEVEL except "Eye-Mark" = under +0.8V.)* ***Fig. 4-5*** NOTE: Sensor is fixed at center point.
6.	**HIGH LEVEL ADJUSTMENT**: Position the non-reflective "Eye-Mark" printed on the reverse side of the label backing in the sensor's field of view. Check that the difference between the high and low level is 2V or higher. If the voltage reading is not over +2.0 repeat Step 5. (*Ref. HIGH LEVEL with "Eye-Mark" - LOW LEVEL (except "Eye-Mark" >/= +2.0V.)*
7.	Repeat the above procedures to get the highest voltage difference between the high and low settings



VR1 (PIN SG and IM) Rotate clockwise or counter clockwise

Fig. 4-5

Part 2

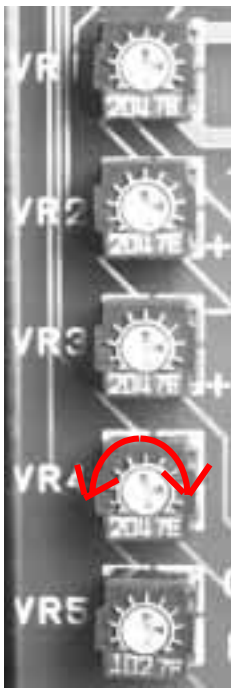
Part 2

4-5 Ribbon Sensor Adjustment

Required Equipment:	• DC Voltmeter • Small flathead screwdriver (for potentiometer adjustment)

STEP	PROCEDURE
1.	Loosen (2) screws holding the service board access cover to the rear of the cabinet. Slide off the cover for access to the service board. ***Fig. 4-1***
2	Connect the printer AC power cord to a grounded AC outlet. Place the power switch in the OFF position.
3.	On the service board attach the DC voltmeter negative lead to the test point labeled **SG** (Ground) on the service board. Attach the DC voltmeter positive lead to **CE** on the service board and place the power switch in the ON position. Refer to table ***Fig. 4-2 and Fig. 4-3.***
4.	On the service board, turn **VR4** clockwise to the stop position. Voltage is 0 V. ***Fig. 4-6***
5.	Turn the ribbon unwind boss spindle slowly until the lowest possible voltage reading is displayed on the voltmeter. If the voltage reading is not equal to or less than +0.5 VDC, adjust **VR4** to obtain that reading.

NOTE: Ribbon does not need to be loaded for this adjustment.



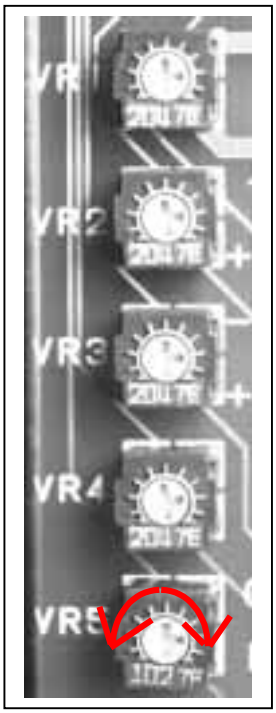
VR4 (PIN SG and CE) Rotate clockwise or counter clockwise

Fig. 4-6

4-6 Pitch Offset Sensor Adjustment

Pitch Offset is adjusted with the VR5 potentiometer and is a ***factory setting.*** The range is between +1.5 and -1.5V. ***Fig. 4-7***

STEP	PROCEDURE
1.	Place the pitch volume on the front panel to the center (12:00) position.
2	Place DSW1-7 & 1-8 to the OFF position and DSW2-5 to the ON position.
3.	Place the head to the OPEN position. Turn the power switch to the ON position while pressing the LINE and FEED keys.
4.	Release pressure from the keys when the buzzer sounds. "Head Open" will be displayed.
5.	Place the head in the CLOSE position and DSW2-5 to the OFF position. "Factory Mode" will be displayed.
6.	Press the FEED key twice (2X) and LINE key once (1X). A blank label will be fed and the test print will start. Press the FEED key to stop the printing. CAUTION: Excessive printing will cause degradation of the print head since all elements of the print head are heated at once. Be extra cautious if 5 inch wide labels are used.
7.	Adjust the **VR5** on the main circuit board. The range is +/- 3.75 mm.
8.	Press the FEED key to stop the test print. Place the power switch in the OFF position.



Rotate clockwise or counter clockwise

Fig. 4-7

Part 2

Part 2

Section

5

Mechanical Adjustments

Part 2

5-1 Overview

The "S" Series Printer Engines contain adjustable mechanical sub-assemblies. This means that during your regular maintenance, your service technicians are able to make adjustments to reset the printer to factory specifications thereby ensuring optimum performance of your printer.

The main mechanical sub-assemblies are:

- Ribbon Unwind/Rewind Assembly
- Ribbon Guide Roller Assembly
- Print Head Assembly
- Drive Belt Assembly

In this section you will find procedures for:

- Ribbon Clutch Adjustments
- Ribbon Guide Plate Adjustment
- Print Head Balance Adjustment
- Print Head Alignment
- Timing Belt Tension Adjustments
- Nip Roller Adjustment
- Feed Roller Adjustment
- Peel Bar Adjustment
- Ribbon Unwind/Rewind Shaft Adjustment

Part 2

5-2 Ribbon Clutch Adjustments (NA for M-8459)

Excessive ribbon unwind and rewind tension will result in variable ribbon motion and could be the cause of print quality problems.

Follow the procedures 5-2.1 and 5-2.2 to verify that the ribbon unwind and rewind tensions are within specification or if adjustment of either clutch is necessary.

Required Equipment: FOR 5-2.1 & 5-2.2	• 1 Kg Tension Gauge • Ribbon Core, empty • String • 12 mm Wrench • #2 Phillips Screw Driver

These instructions are for Standard Unit spindles: Opposite Hand Unit spindles are reversed.

5-2.1 Ribbon Unwind Clutch Adjustment

To adjust the Ribbon Unwind Clutch, perform the following steps:

STEP	PROCEDURE
1.	Remove the ribbon if installed.
2.	Place an empty ribbon core on the ribbon unwind spindle. Attach the free end of the string to the tension gauge. ***Fig. 5-1, 5-2***
3.	Wind the string tightly around the ribbon core in a single layer and in a clockwise direction. Attach the free end of the string to the tension gauge.
4.	Gradually lift the tension gauge, pulling the string to unwind it from core. Once the spindle begins to move, the gauge should indicate 600 to 800 grams of tension. Excessive or insufficient tension must be corrected by adjusting the ribbon unwind clutch. To adjust the clutch, loosen the set screw and move the adjust nut CW for more tension and CCW for less tension. Tighten the set screw and repeat Steps 3 and 4 until the correct tension is achieved.

5-2 Ribbon Clutch Adjustments

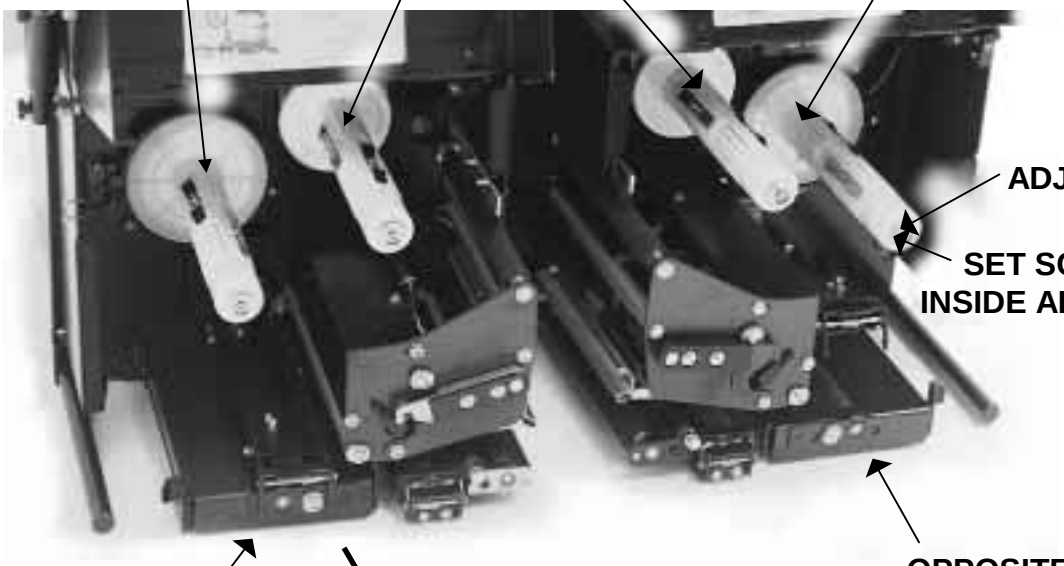


Fig. 5-1

STANDARD UNIT SHOWN, UNWIND & REWIND SPINDLES ARE OPPOSITE ON OPPOSITE HAND UNIT

Figs. 5-2

5-2.2 Ribbon Rewind Clutch Adjustment

These instructions are for Standard Unit spindles. Opposite Hand Unit spindles are reversed.

To adjust the Ribbon Rewind Clutch, perform the following steps:

STEP	PROCEDURE
1.	Connect the power cable to the printer and AC outlet. Place the printer's power switch to the ON position.
2.	Place an empty ribbon core on the ribbon wind spindle . Attach the free end of the string to the tension gauge. ***Fig. 5-1, 5-2***
3.	Wind the string tightly around the ribbon core in a single layer and in a CCW direction. Attach the free end of the string to the tension gauge.
4.	Gradually lift the tension gauge, pulling the string to unwind it from the core. Once the spindle begins to move, the gauge should indicate from 500 to 700 grams of tension. Excessive or insufficient tension must be corrected by adjusting the ribbon unwind clutch. To adjust the clutch, loosen the set screw and move the adjust nut to get the correct tension. Tighten the set screw and repeat Steps 3 and 4 until the correct tension is achieved.

5-3 Ribbon Guide Plate Adjustment

Required Equipment:	• #2 Phillips screwdriver • 10 mm Open End Wrench

If the ribbon is not smooth across the guide plate (ribbon wrinkle) and adjustment is required, perform the following steps:

STEP	PROCEDURE
1.	Check for even ribbon tension by watching the ribbon movement under the guide plate as it moves upward toward the ribbon rewind spindle. If it appears uneven, proceed to Step 2. ***Fig. 5-3 and 5-4***
2.	Loosen the (2) retaining screws and reposition the guide plate. Retighten the screws. ***Fig. 5-5***
3.	Recheck the ribbon alignment and print. If results are not satisfactory or if wrinkles appear behind the head, adjust the Ribbon Shaft Eccentric Nut ***(Fig. 5-6)*** with a 10 mm wrench and Phillips Screwdriver. For additional refinement, perform Print Clutch Adjustment (Section 5-2), Print Head Balance Adjustment (Section 5-4) and/or Print Head Alignment (Section 5-5).

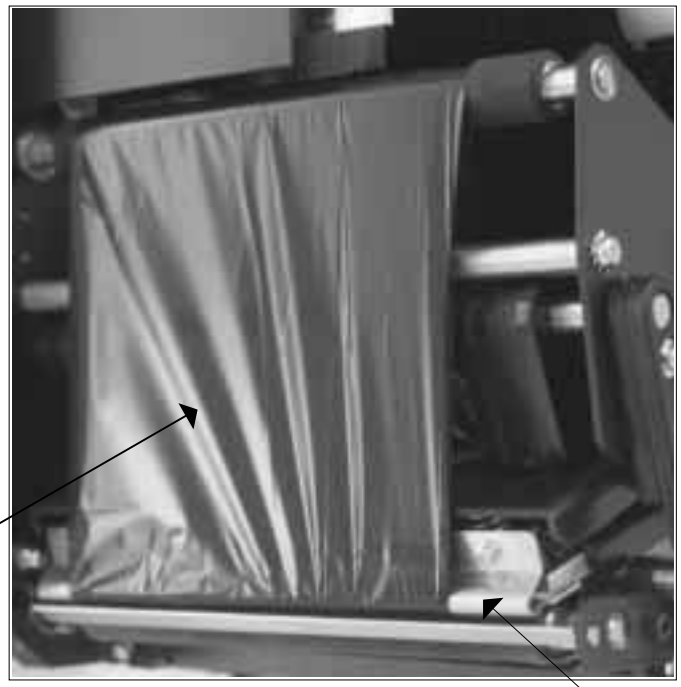
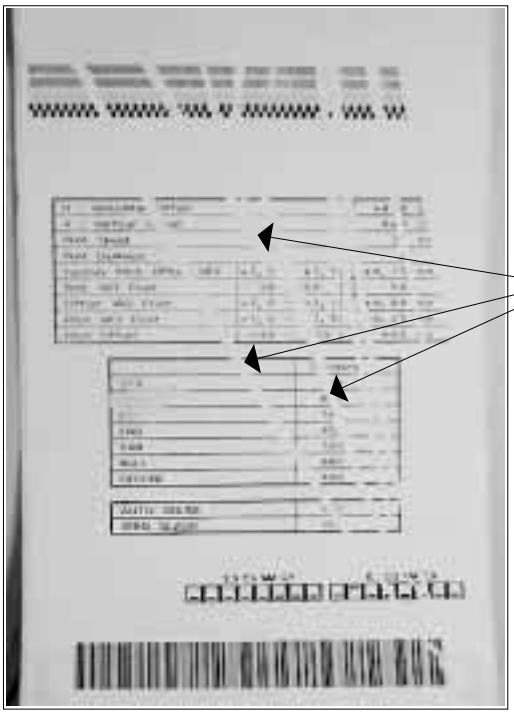


Fig. 5-3

Part 2

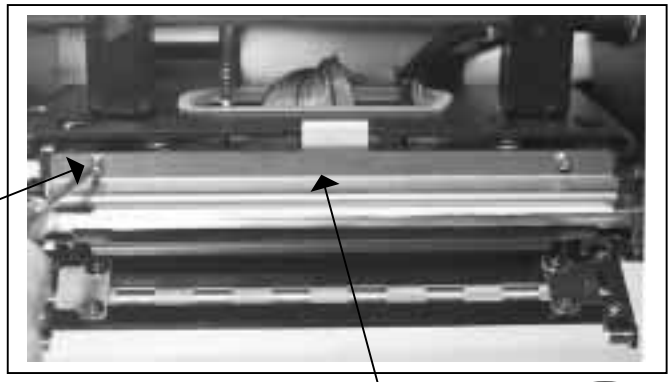
Part 2

5-3 Ribbon Guide Plate Adjustment



DIAGONAL VOIDS (WHITE STREAKS) THAT "WALK" ACROSS LABEL, CAUSED BY RIBBON WRINKLE

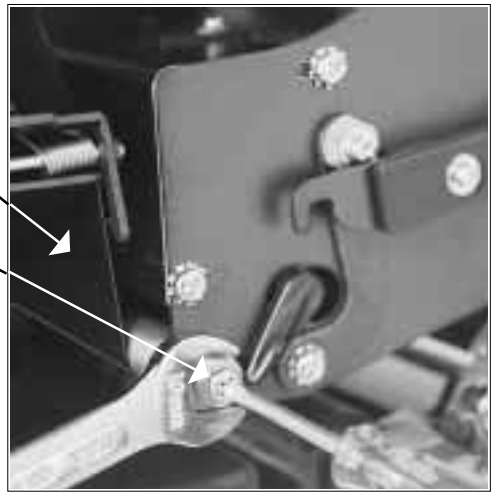
Fig. 5-4



RETAINING SCREWS

GUIDE PLATE

Fig. 5-5



RIBBON

IF WRINKLES APPEAR BEHIND THE PRINT HEAD, ADJUST RIBBON SHAFT ECCENTRIC NUT WITH WRENCH AND PHILLIPS SCREWDRIVER

Fig. 5-6

5-4 Print Head Balance Adjustment

Required Equipment:	• #2 Phillips Screwdriver • 10 mm Open End Wrench

To optimize print quality, perform the following steps to adjust the print head balance, using head pattern as a guide:

STEP	PROCEDURE
1.	Load the ribbon and label stock into the printer.
2.	Loosen screw holding spacer plate to side frame. Hold eccentric nut along flats with 10 mm wrench and loosen holding screw. Turn the eccentric nut clockwise to increase the density of the inner side of the image/label. Turn the eccentric nut counter-clockwise to increase the density of the print on the outside of the image/label. ***Fig. 5-7***
3.	Hold the eccentric nut in place with the 10 mm wrench and tighten the screw. Do not turn the eccentric nut beyond the adjustment marks. Refer to sample labels for adjustment conditions. ***Fig. 5-8***

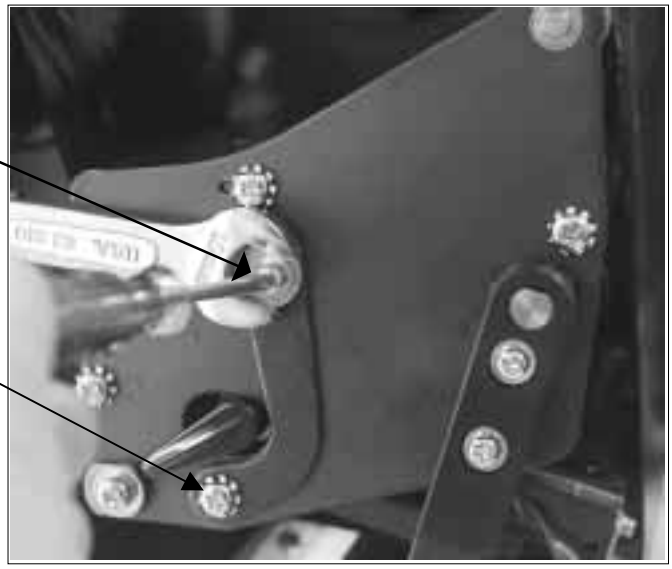
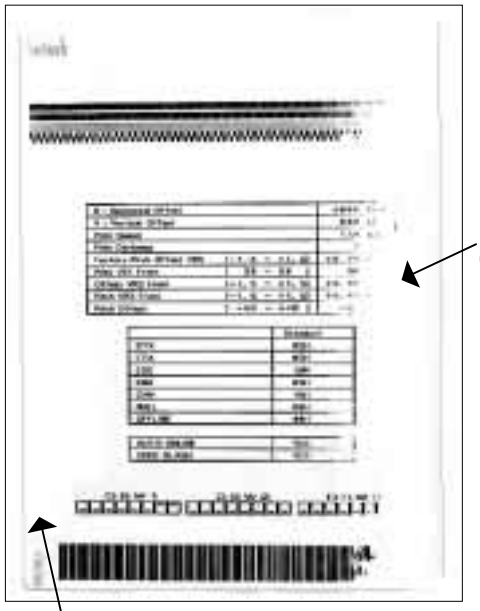


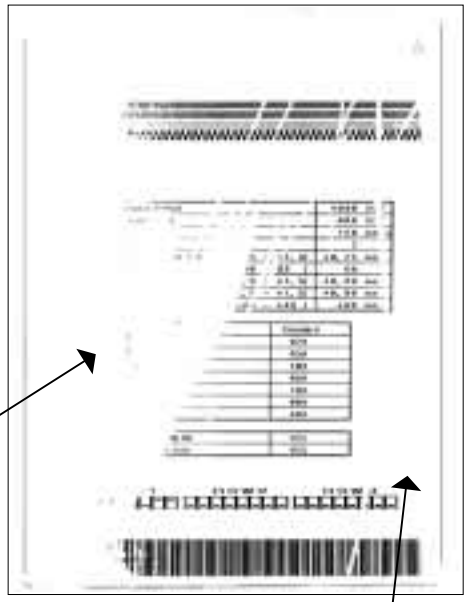
Fig. 5-7

Part 2

5-4 Print Head Balance Adjustment



LIGHT PATTERN
ON THE INSIDE



LIGHT PATTERN
ON THE OUTSIDE

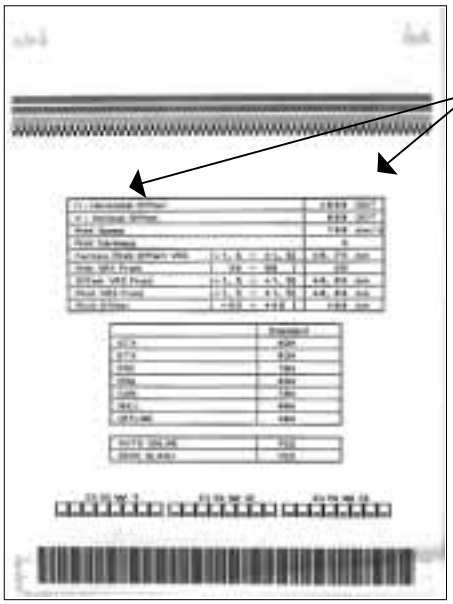
HEAVY PATTERN
ON THE OUTSIDE

FEED
DIRECTION

HEAVY PATTERN
ON THE INSIDE

EXCESSIVE PRESSURE ON THE OUTSIDE

EXCESSIVE PRESSURE ON THE INSIDE



PATTERN DENSITY
EVEN BOTH SIDES

CORRECT ADJUSTMENT

Figs. 5-8

5-5 Print Head Alignment

Required Equipment:	• #2 Phillips Screwdriver • Flat Head Screwdriver

To adjust the print head alignment and make print quality consistent across label, perform the following steps:

STEP	PROCEDURE
1.	Loosen the (2) guide plate screws on the print head, one on the right side and one on the left. Loosen (1-2) post screws. ***Fig. 5-9A & 5-9B & 5-9C***
2.	Move the position of the adjustment plate forward or backward by turning the flat head screwdriver in the adjustment slots. ***Fig. 5-10***
3.	Tighten all the screws. Refer to sample labels for adjustment conditions. ***Fig. 5-11***.

LOOSEN SCREWS ON PRINT HEAD TWO PLACES

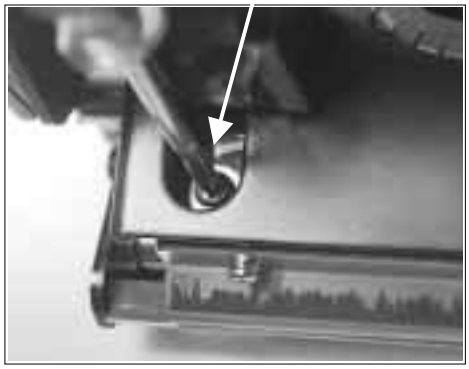


Fig. 5-9A

LOOSEN (2) POST SCREWS (M-8459S/M-8460S)

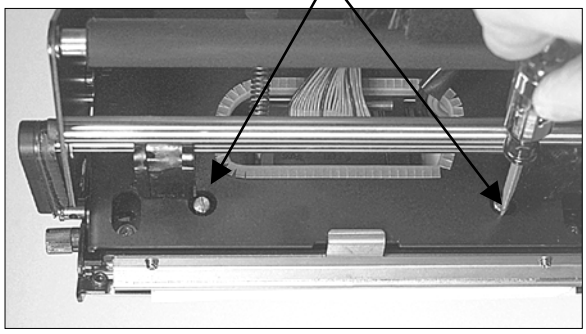
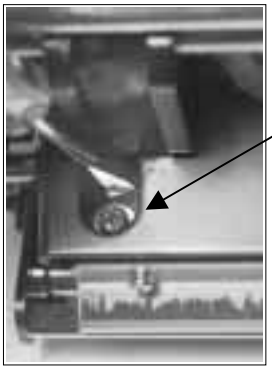


Fig. 5-9B



SCREWDRIVER IN SLOTS OF HEAD ADJUSTMENT PLATE

Fig. 5-10

LOOSEN (1) POST SCREW (M-8485S/M-8490S)

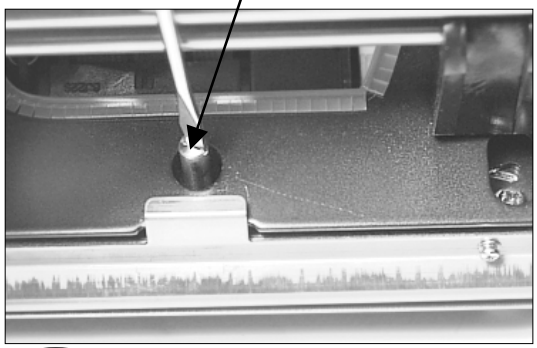


Fig. 5-9C

Part 2

5-5 Print Head Alignment

BOTTOM EDGE OF BAR CODE

EDGE OF LABEL

SHOWN WITH IMPROPER ALIGNMENT

BOTTOM EDGE OF BAR CODE IS SHOWN NOT PARALLEL WITH LABEL EDGE

BOTTOM EDGE OF BAR CODE AND LABEL EDGE ARE PARALLEL

SHOWN WITH PROPER ALIGNMENT

Figs. *5-11*

5-6A Timing Belt Tension Adjustment for the M-8485S

Required Equipment:	• 500g Tension Gauge • #2 Phillips Screwdriver

STEP	PROCEDURE
1.	Push the center of each timing belt with the tension gauge and note the tension reading when the each belt is moved 1 to 2mm. Refer to ***Fig. 5-12*** to identify Belts "A", "B" and "C" and Brackets #1, #2 and #3.
2.	If the tension reading from Belt "B" is not within range of 500g, reposition bracket #2. Tighten screws when belt tension is correct. ***Fig. 5-13***
3.	If the tension reading from Belt "C" is not within range of 500g, reposition bracket #3. Tighten screws when belt tension is correct. ***Fig. 5-14***
4.	If the tension reading from Belt "A" is not within range of 500g, reposition bracket #1. The screws are accessible from the media side of the printer. Tighten screws when belt tension is correct. ***Fig. 5-15 & 5-16***

Part 2

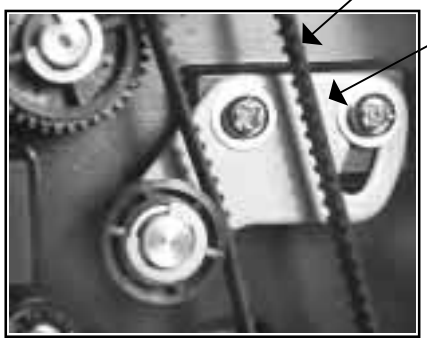


Fig. 5-13

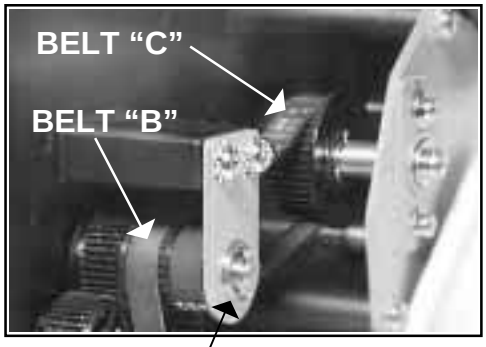


Fig. 5-14

Part 2

5-6A Timing Belt Tension Adjustment for the M-8485S

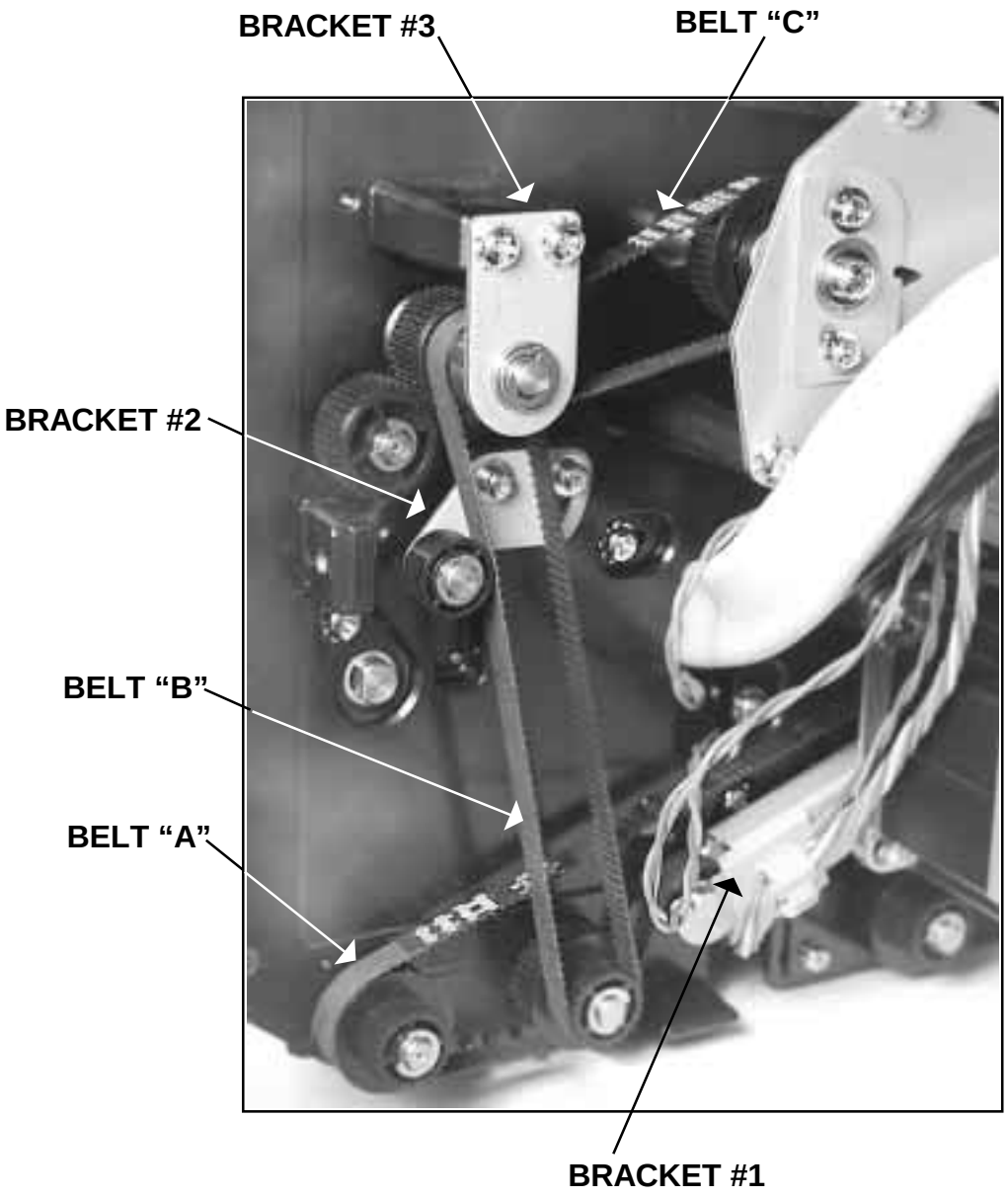
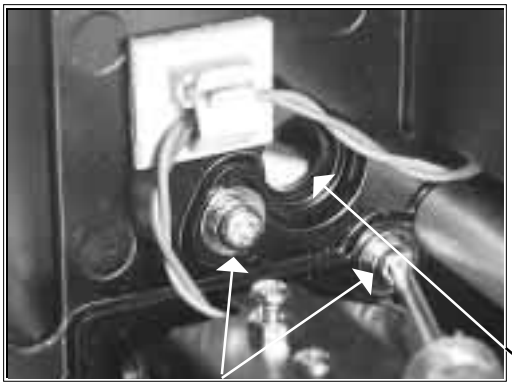
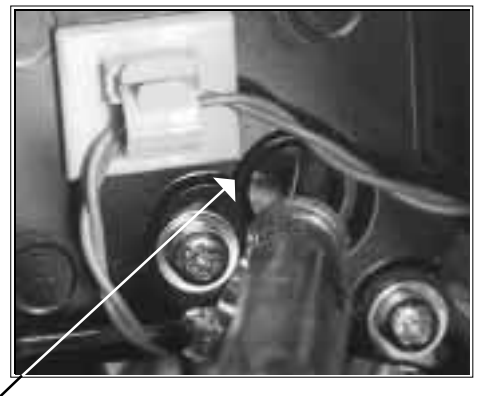


Fig. 5-12

5-6A Timing Belt Tension Adjustment for the M-8485S



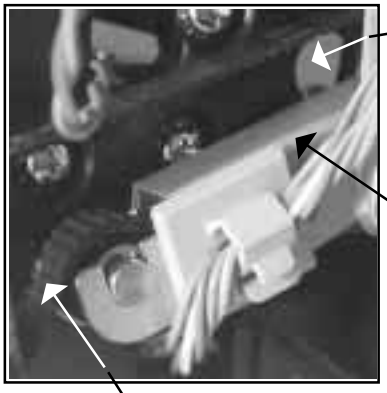
(2) ADJUSTMENT SCREWS FOR BRACKET #1



ACCESS HOLE TO ADJUST BRACKET #1 WITH SCREWDRIVER

Figs. 5-15

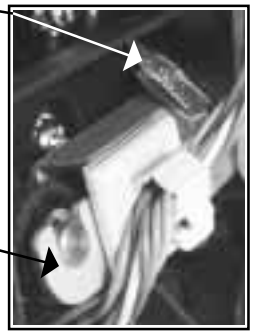
MEDIA SIDE



BELT "A"

ACCESS HOLE TO ADJUST BRACKET #1 WITH SCREWDRIVER (OPPOSITE SIDE)

BRACKET #1



Figs. 5-16

BELT SIDE

Part 2

5-6B Timing Belt Tension Adjustment for the M-8490S

Required Equipment:	• 500g Tension Gauge • #2 Phillips Screwdriver

STEP	PROCEDURE
1.	Refer to ***Fig. 5-17*** to identify belts and brackets. Push the center of each belt with the tension gauge and note the tension reading when the each belt is moved 1 to 2mm.
2.	If the tension reading of each belt is not within range of 500g, reposition the holding bracket. Tighten screws when belt tension is correct. ***Fig. 5-18, 5-19, 5-20, 5-21 and 5-22***

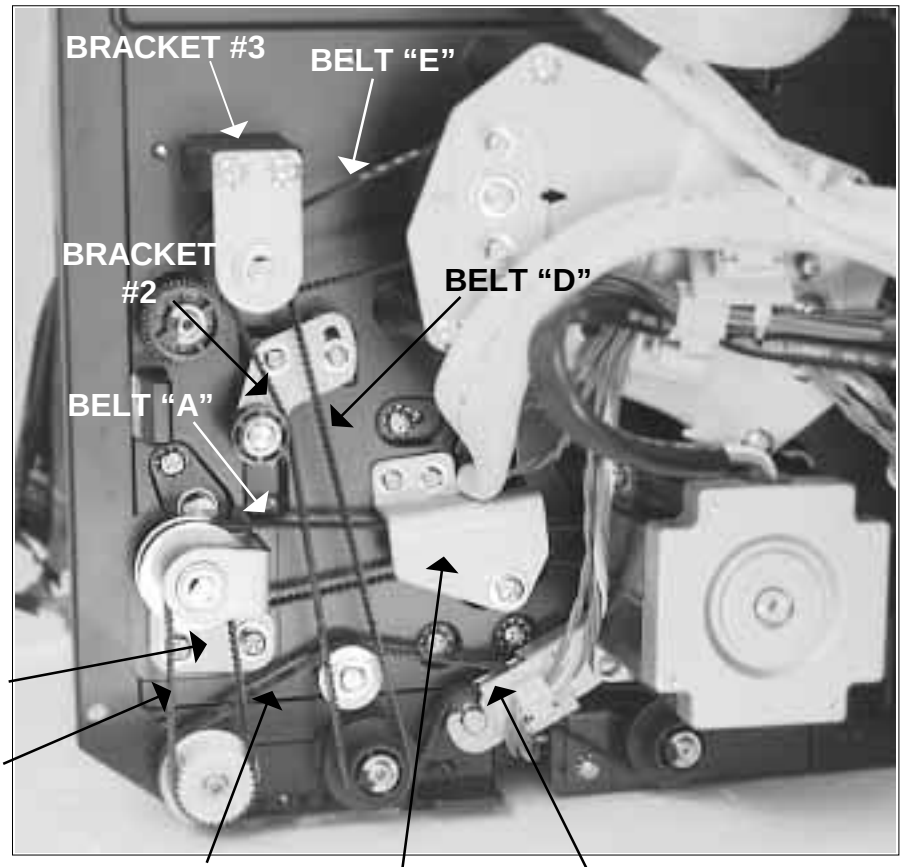


Fig. 5-17

5-6B Timing Belt Tension Adjustment for the M-8490S

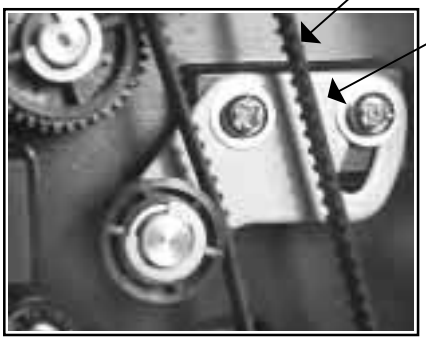


Fig. 5-18

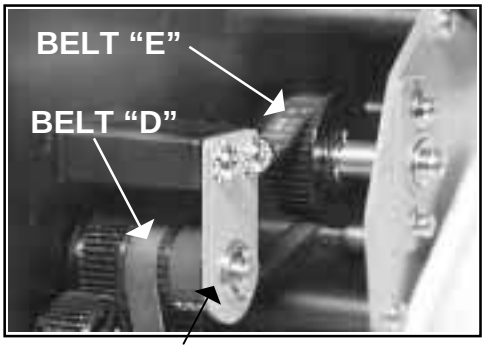
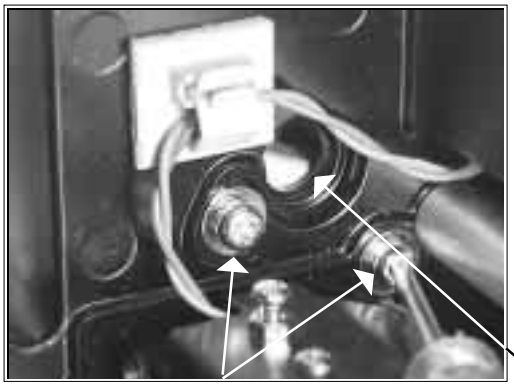
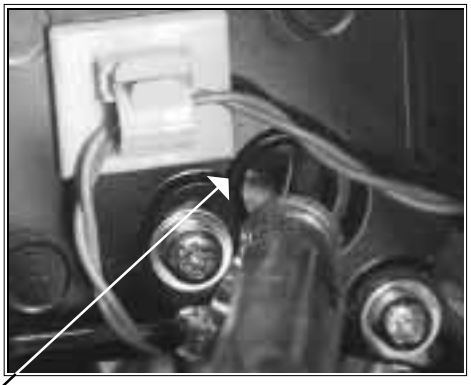


Fig. 5-19





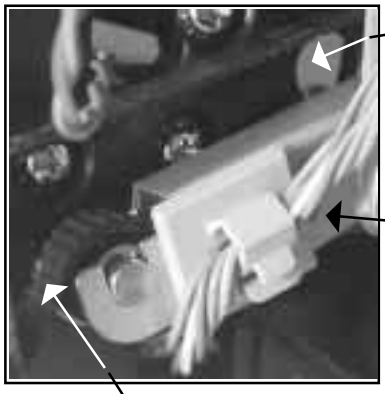
Figs. 5-20

MEDIA SIDE

Part 2

Part 2

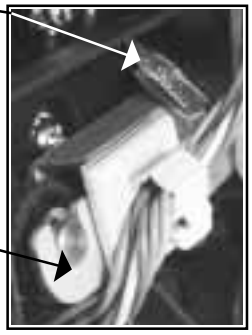
5-6B Timing Belt Tension Adjustment for the M-8490S



ACCESS HOLE TO ADJUST BRACKET #1 WITH SCREWDRIVER (OPPOSITE SIDE)

BRACKET #1

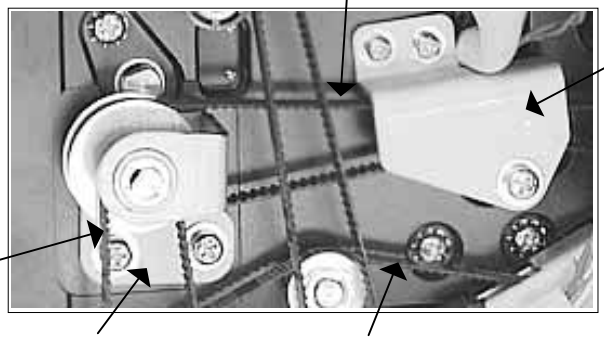
BELT "B"



BELT SIDE

Figs. 5-21

BELT "A"



BRACKET #5

BELT "C"

BRACKET #4

BELT "B"

Fig. 5-22

5-6C Timing Belt Tension Adjustment for the M-8459S

Required Equipment:	• 500g Tension Gauge • #2 Phillips Screwdriver

STEP	PROCEDURE
1.	Push the center of the timing belt with the tension gauge and note the tension reading when belt is moved 1 to 2mm. ***Fig. 5-23***
2.	If the tension reading from belt is not within range of 500g, reposition bracket. The screws are accessible from the media side of the printer. Tighten screws when belt tension is correct. ***Figs. 5-24 & 5-25***

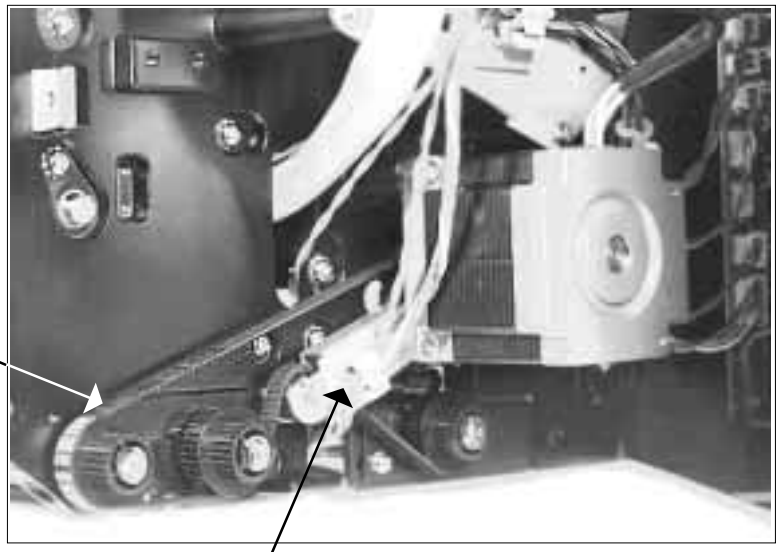
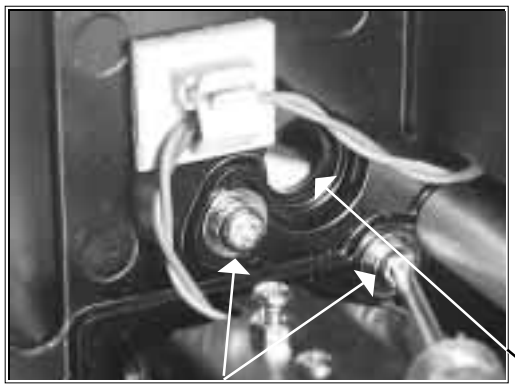


Fig. 5-23

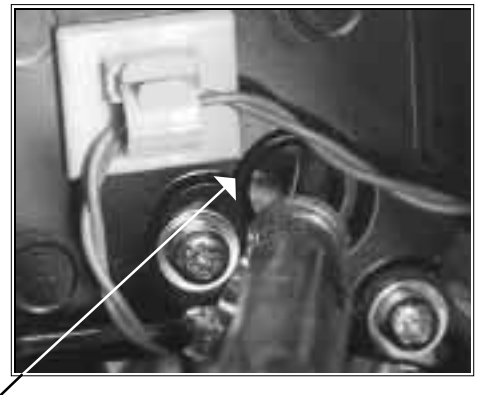
M-8459S

Part 2

5-6C Timing Belt Tension Adjustment for the M-8459S



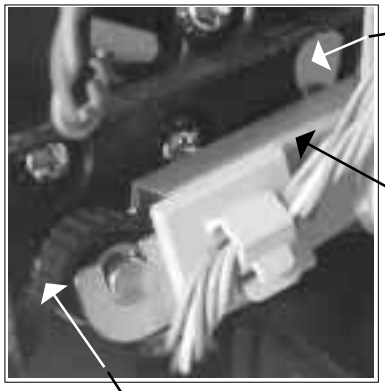
(2) ADJUSTMENT SCREWS FOR BRACKET



ACCESS HOLE TO ADJUST BRACKETWITH SCREWDRIVER

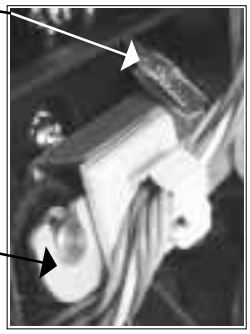
Figs. 5-24

MEDIA SIDE



ACCESS HOLE TO ADJUST BRACKET WITH SCREW DRIVER (OPPOSITE SIDE)

BRACKET



BELT

BELT SIDE

Figs. 5-25

M-8459S

5-6D Timing Belt Tension Adjustment for the M-8460S

Required Equipment:	• 500g Tension Gauge • #2 Phillips Screwdriver

STEP	PROCEDURE
1.	Refer to ***Fig. 5-26*** and identify belts and brackets. Push the center of belts "A", "B" and "C" with a tension gauge and note the tension reading when belt is moved 1 to 2mm.
2.	If the reading of each belt is not within range of 500g, reposition the bracket. The screws are accessible from the media side of the printer. Tighten screws when belt tension is correct. ***Figs. 5-27 & 5-28***

Part 2

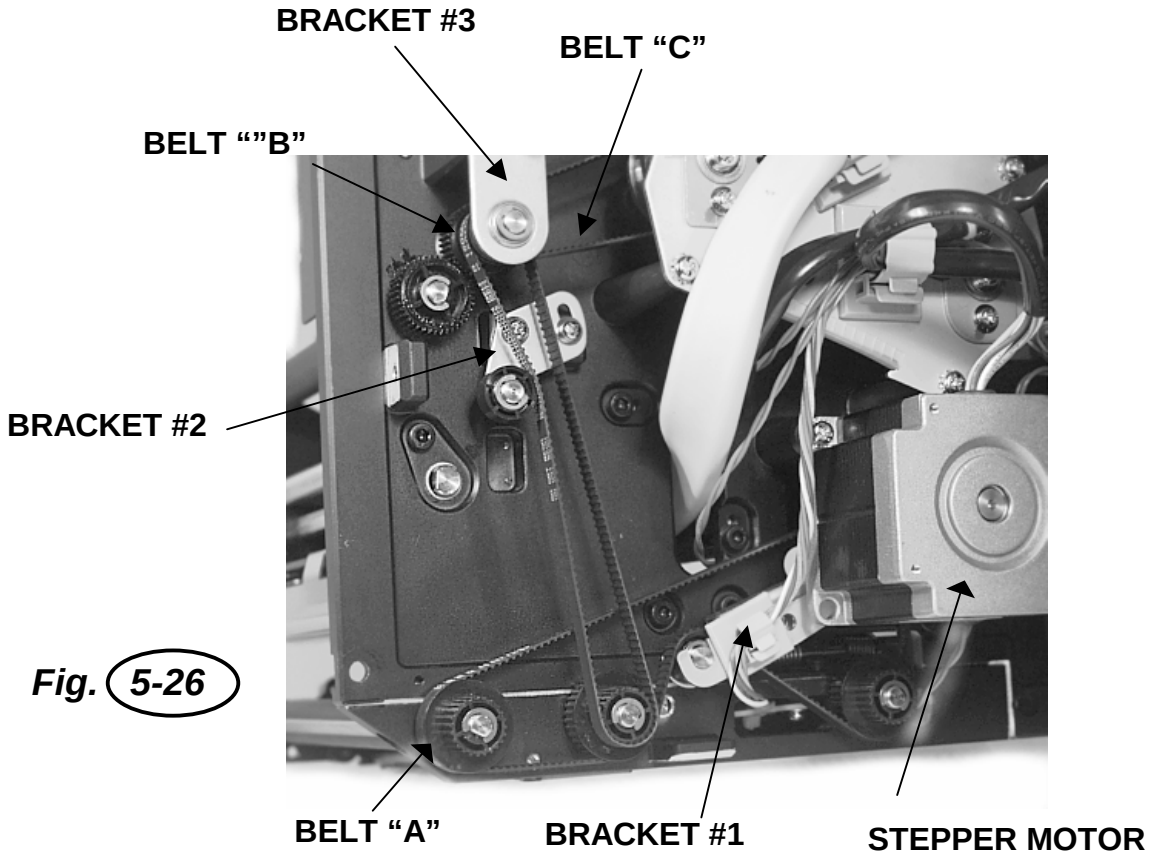


Fig. 5-26

M-8460S

Part 2

5-6D Timing Belt Tension Adjustment for the M-8460S

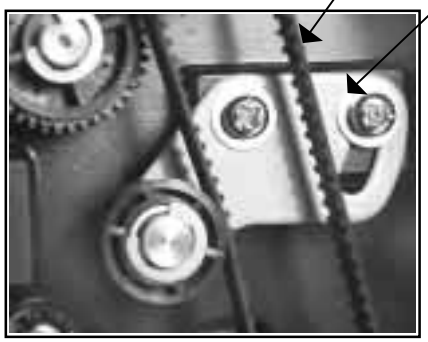


Fig. 5-27

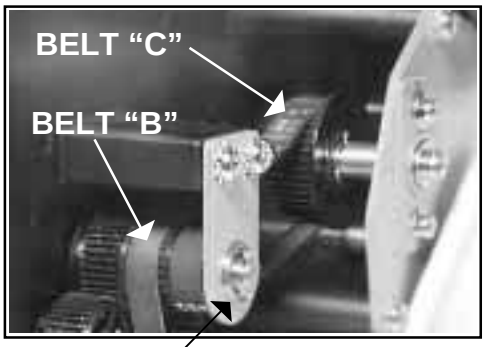
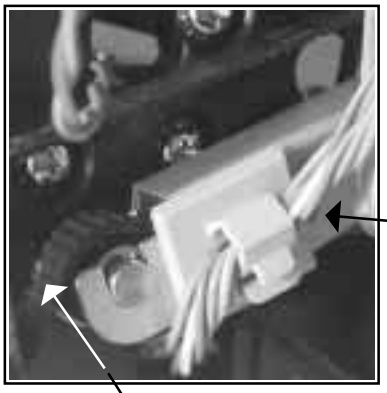


Fig. 5-28



M-8460S

5-7 Nip Roller Adjustment

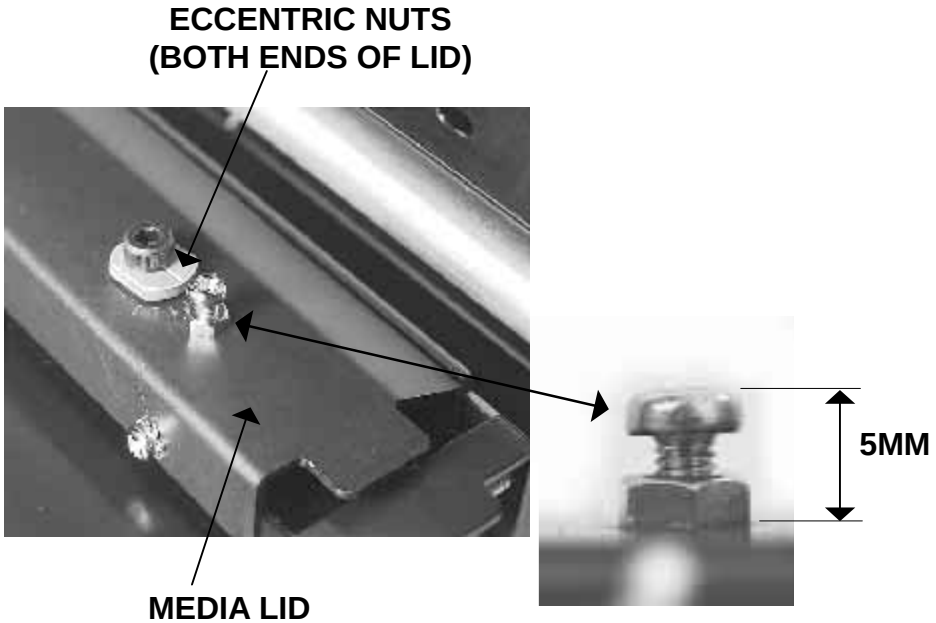
Not necessary for Serial Nos. 70700000 and above

5-8A Feed Roller Adjustment (Label Tracking) For M-8485S, M-8490S, M8460S

Required Equipment:	• 10 mm Open End Wrench • #2 Phillips Screwdriver

Used for fine tuning. Adjusts pressure between upper and lower rollers.

STEP	PROCEDURE
1.	To increase pressure between the upper and lower rollers, adjust the two screws on the media lid. Adjust the height of the screws to 5 mm. ***Figs. 5-29***
2.	Load the label stock into the printer.
3.	Loosen each screw securing the eccentric nut and rotate the nut CW or CCW. Rotating CW moves the Feed Roller Assembly forward and labels will track towards the inside. Rotating CCW moves the Feed Roller Assembly backward and labels will track towards the outside. Tighten the (2) screws after adjusting the eccentric nuts.



This style is on Models M-8485S, M-8490S and M8460S

Fig. ***5-29***

Part 2

5-8B Feed Roller Adjustment (Label Tracking) For M-8459S

Required Equipment:	• 10 mm Open End Wrench • #2 Phillips Screwdriver

Used for fine tuning. Adjusts pressure between upper and lower rollers.

STEP	PROCEDURE
1.	To increase pressure between the upper and lower rollers, adjust the two screws on the media lid. Adjust the height of the screws to 5 mm. ***Fig. 5-30***
2.	Load the ribbon and label stock into the printer.
3.	Loosen the set screw and turn the eccentric nut CW or CCW. ***Fig. 5-31*** Rotating CW moves the Feed Roller Assembly forward and labels will track towards the inside. Rotating CCW moves the Feed Roller Assembly backward and labels will track towards the outside. Tighten the (2) screws after adjusting.

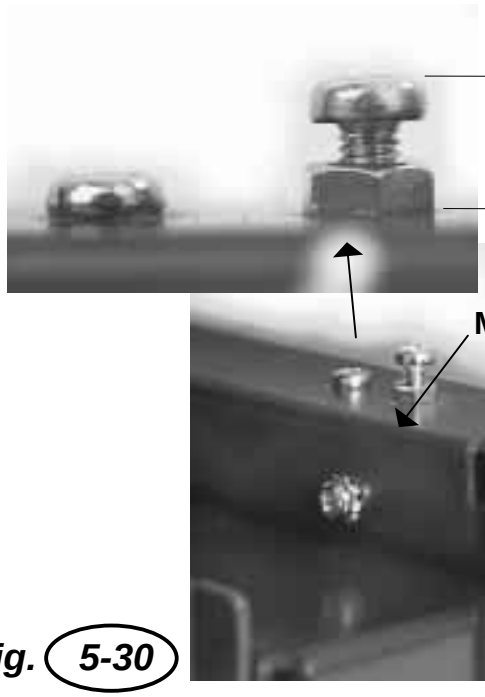


Fig. 5-30

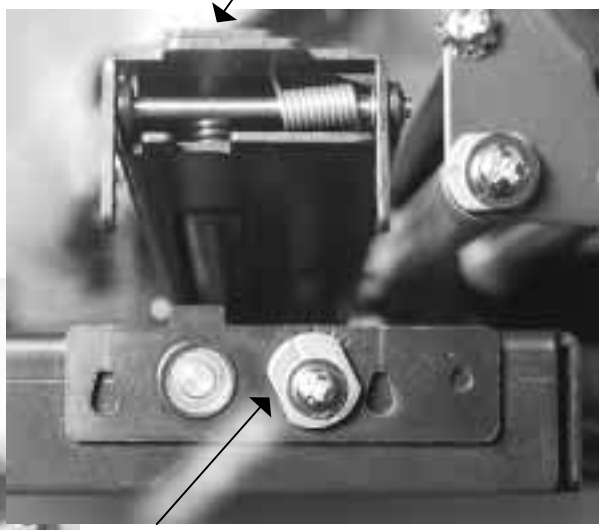


Fig. 5-31

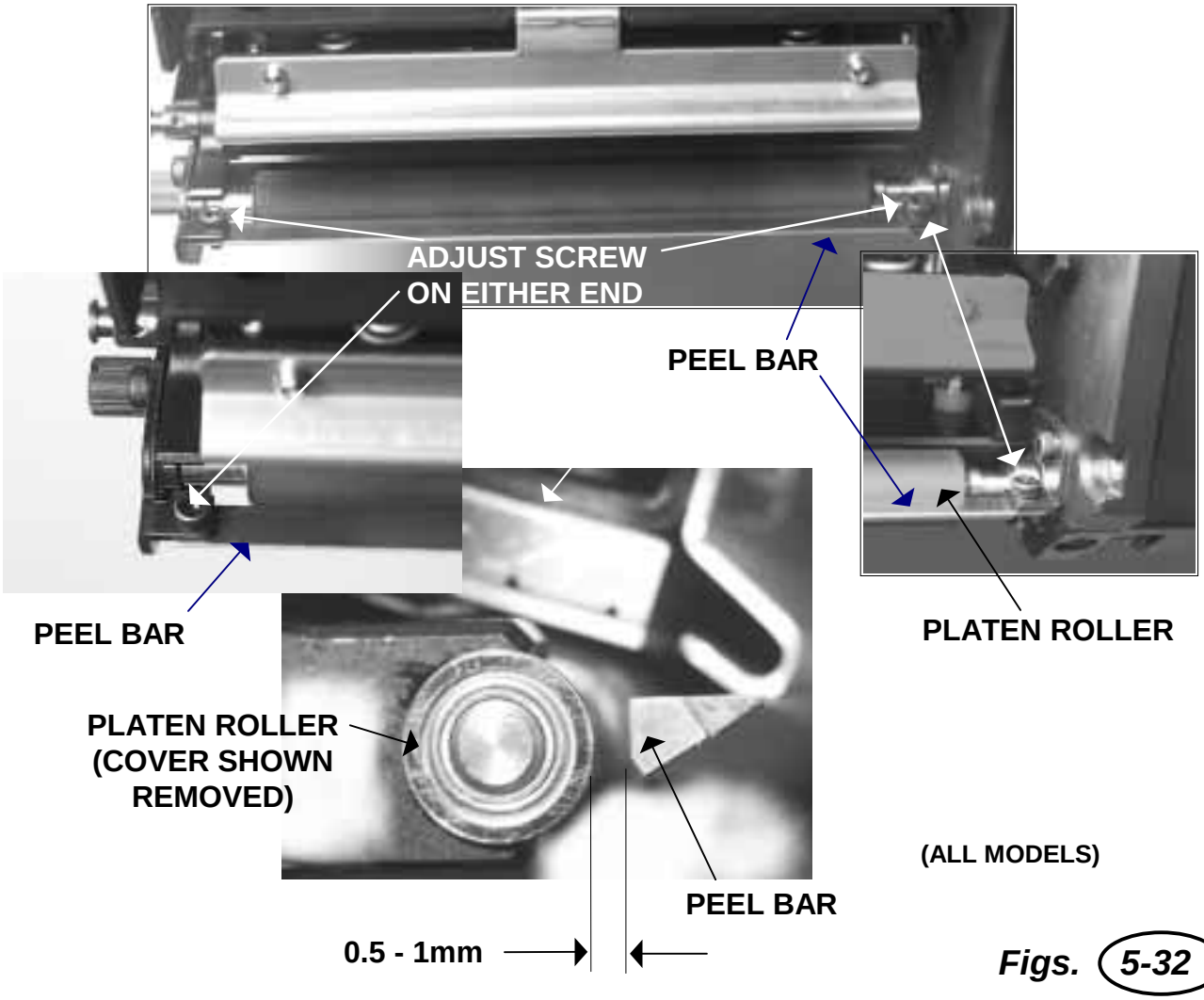
This style is on Model M-8459S

5-9 Peel Bar Adjustment

Required Equipment:	• 5.5 mm Open End Wrench • #2 Phillips Screwdriver

The distance between the dispense bar and the platen roller should be 0.5 - 1mm and equal on both the inside of the platen/peel bar and the outside of the platen peel bar. To adjust perform the following:

STEP	PROCEDURE
1.	Loosen the set screw on either end of the peel bar and adjust to obtain an equal distance between the platen roller and the peel bar. ***Figs. 5-32***



Figs. 5-32

Part 2

Part 2

5-10 Ribbon Unwind/Rewind Shaft Adjustment

To adjust the Ribbon Unwind/Rewind Shaft tension perform the following steps:

STEP	PROCEDURE
1.	Check for even/smooth ribbon tension at the ribbon unwind spool as the ribbon travels downward past the print head. If it appears to be uneven, proceed to Step 3.
2.	Check for even/smooth ribbon tension at the ribbon unwind spool as the ribbon travels upward from under the print head. If it appears to be uneven, proceed to Step 3. ***NOTE: Before attempting Step 3, be sure the Ribbon Guide Plate has first been adjusted (Section 5-3).***
3.	Loosen the set screws on the adjustment plate ***Fig. 5-33.*** Insert a flat blade screwdriver into the adjustment slot and adjust for even/smooth ribbon tension at the ribbon unwind/rewind spool/shaft. ***Note: The ribbon unwind/rewind shafts should be parallel to each other and perpendicular to the base frame of the printer.*** ***The ribbon unwind/rewind shaft adjustment may affect the timing belt adjustment (Section 5-6). Readjust if required.***

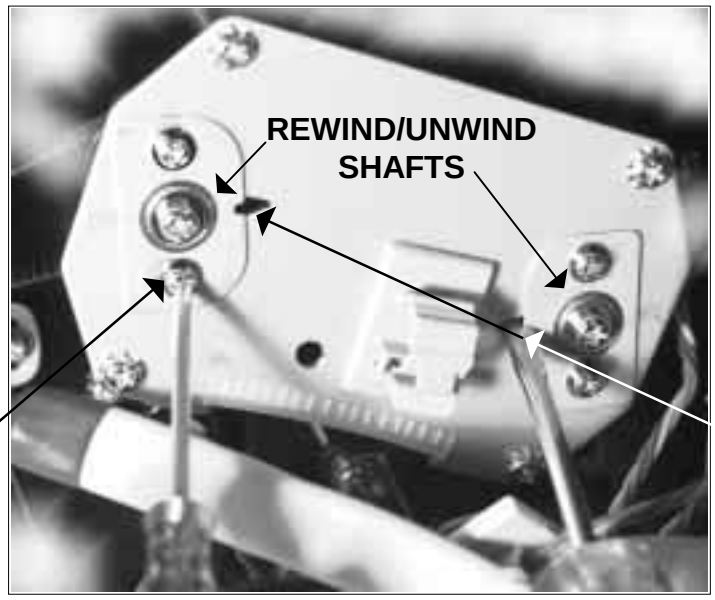


Fig. 5-33

Section

6

Replacement Procedures

Part 2

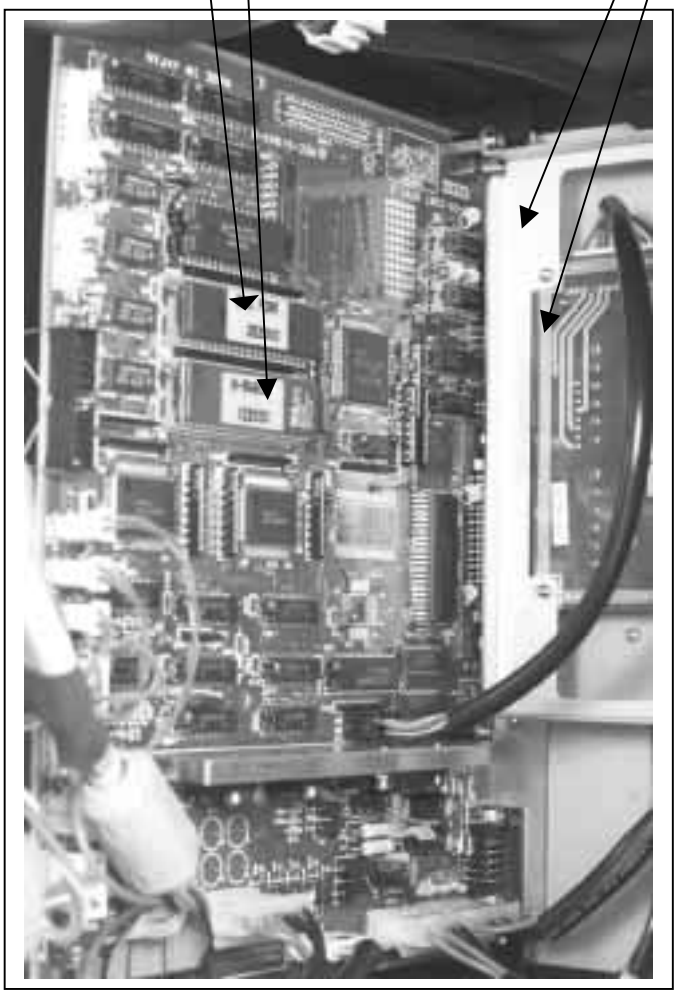
6-1 Overview

The printers contain replaceable components and sub-assemblies. This chapter contains step-by-step instructions for removing and replacing the following components and sub-assemblies.

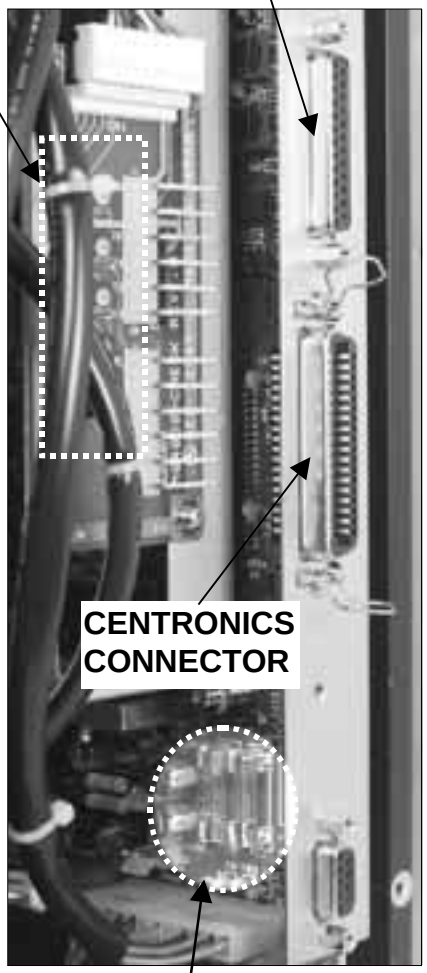
- Fuses
- Power Supply
- Main Circuit Board
- LCD Display Panel Label Sensor
- Dip Switch Panel
- Stepper Motor
- Timing Belts
- Ribbon Clutch Washers
- Ribbon Motion Sensor
- Cover Open Switch
- Head Open Switch
- Label Gap Sensors
- Label Out Sensor
- Platen
- Print Head

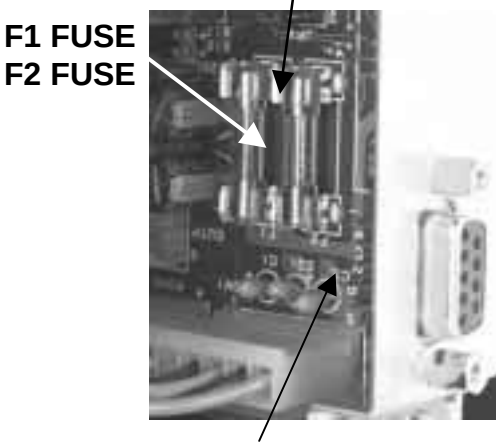
Part 2

6-2 Main Circuit Board Layout



MAIN CIRCUIT BOARD
(SHOWN INSTALLED)





I/F CONNECTOR
(VIEW FROM BACK OF PRINTER)

6-3 Replacing Fuses

Fuse replacement is described in the following section.

- 6-3.1 Removing and Replacing the Main Power Fuse
- 6-3.2 Removing and Replacing the +5V Fuse or+24VDC External Fuse

> NOTE: Before replacing a fuse, determine the cause of the overload condition.

6-3.1 Removing and Replacing the Main Power Fuse

Required Equipment:	F15 Amp, 250 V Fuse

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	On the back of the printer locate the fuse cap. Unscrew the fuse cap and remove the defective fuse. ***Fig.6-1***
3.	Replace the fuse with one of equal rating (F15 Amp, 250 V) and screw the fuse cap back. ***Do not use a fuse with a higher rating.***
4.	Reconnect the power cable.

Fig. 6-1

Part 2

6-3 Replacing Fuses

6-3.2 Removing and Replacing the +5V Or +24V FUSE(s)

Required Equipment:	• 1 Amp, 250 V Fuse (+5V) or • 3 Amp, 250 V Fuse (+24VDC)

To remove and replace the interior fuse(s) perform the following steps:

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove (5) screws securing the back panel to the cabinet. ***Fig. 6-2***
3.	Locate and replace defective fuse(s) with one of equal rating. ***Do not use a fuse with a higher rating. Fig. 6-3***
4.	Replace the back panel.
5.	Reconnect the power cable.

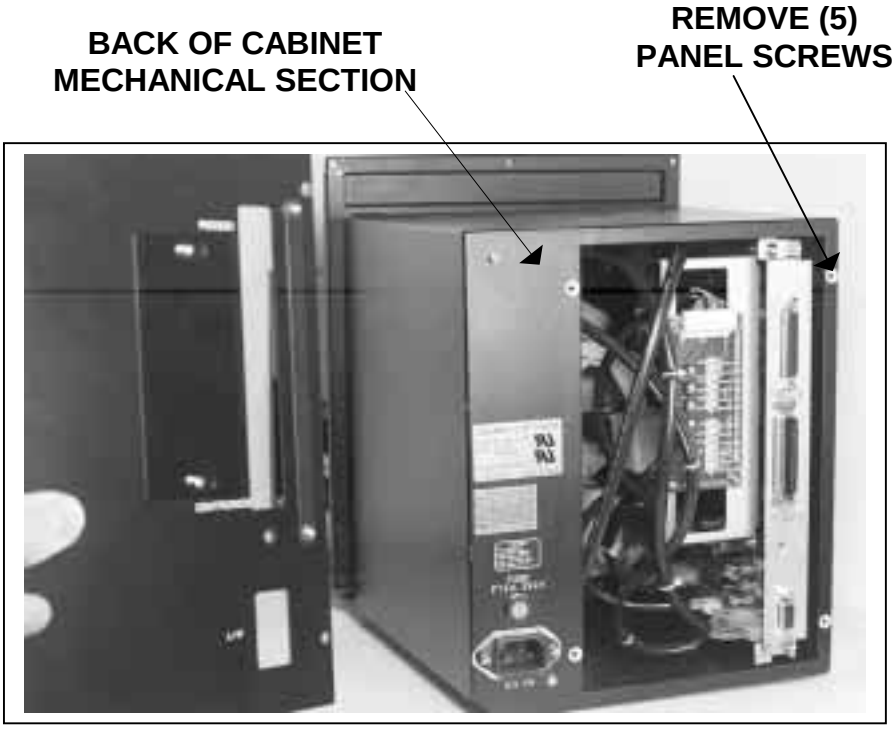


Fig. 6-2

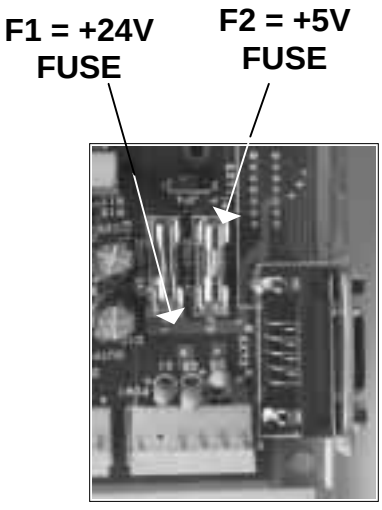


Fig. 6-3

6-4 Replacing the Power Supply

The Power Supply is a non-repairable component with no service parts and is replaced as a complete assembly.

To remove and replace the Power Supply, perform the following steps:

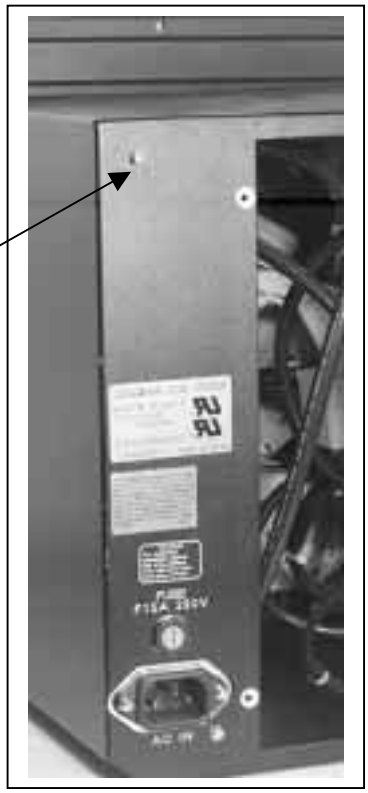
STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to mechanical and electrical sections. ***Fig. 6-4***
3.	Remove (2) screws holding the power supply to the back of the cabinet and (1) screw from inside of the cabinet. ***Fig. 6-5 and Fig. 6-6***
4.	Detach (5) connections from the Power Supply. ***Fig. 6-7 & 6-8***
5.	Remove and replace the defective power supply.
6.	Reattach connections and screws previously removed.
7.	Close the printer sections and replace locking screw.
8.	Reconnect the power cable.

Part 2

6-4 Replacing the Power Supply

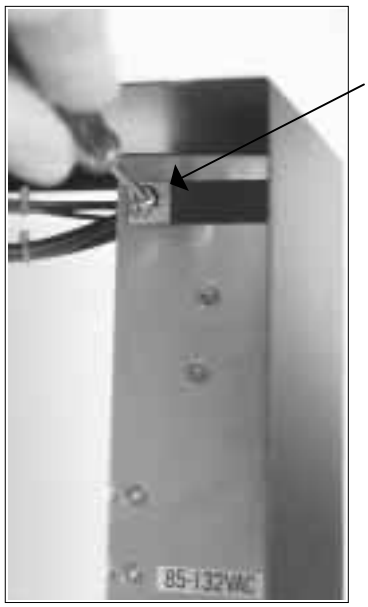
REMOVE LOCKING SCREW
AND SWING CABINET OPEN

Fig. 6-4



(2) SCREWS
(BACK OF
CABINET)

Fig. 6-5



(1) SCREW
(FRONT INSIDE
OF CABINET)

Fig. 6-6

6-4 Replacing the Power Supply

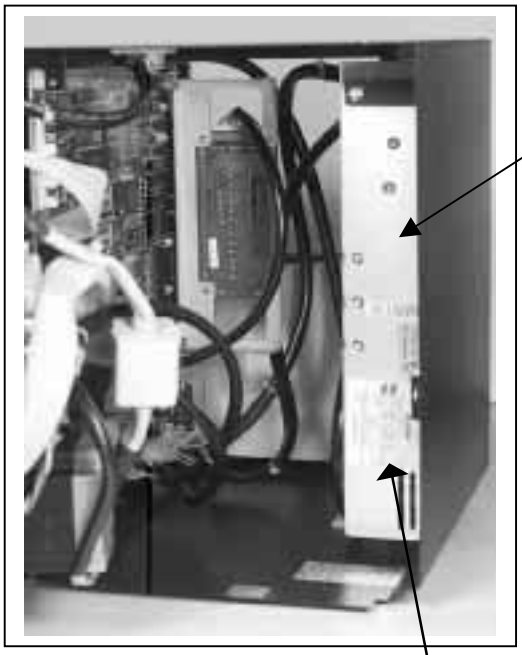


Fig. 6-7

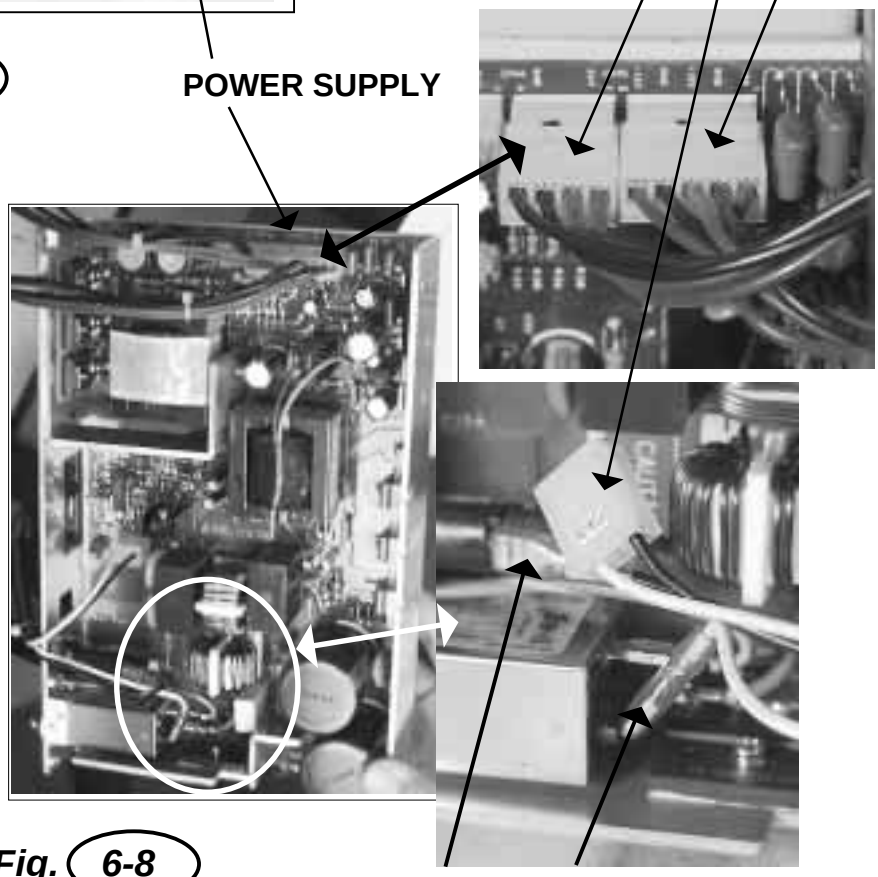


Fig. 6-8

Part 2

6-5 Replacing the Main Circuit Board and Service Board

NOTE: Many of the components on these boards are extremely susceptible to damage by static electricity. To avoid damage from static electricity, do not unpack new circuit boards from anti-static bags until instructed to do so.

The Main Circuit Board is attached to the inside of the cabinet and the Service Board is attached to a bracket that is attached to the Main Circuit Board.

6-5.1 Main Circuit Board

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove (5) screws securing the panel to the back of the cabinet. ***Fig. 6-9***
3.	Remove screw from the cabinet side to allow the printer halves to swing open for access to the electrical section of the unit. ***Fig. 6-10***
4.	Note cable connections locations, then disconnect all cables from the PCB board. ***Fig. 6-11***
5.	Remove (4) screws to detach the PCB from the printer, (2) are accessible from the backside of the printer and (2) from inside the printer through the open section. Note that one screw secures a ground wire. Note location for reassembly. Carefully dislodge and remove the board from the cabinet. The service board is attached with a bracket to the main PCB. ***Fig. 6-12***
6.	Remove (2) screws holding the service board bracket to the main PCB. Set aside for reassembly to the replacement PCB.
7.	Carefully remove and save the EPROM chips from the defective PCB. Install the chips in the same location(s) on the new PCB. ***Fig. 6-11*** Note: Make sure the marks on the EPROM(s) are aligned correctly with the socket.
8.	Reinstall the bracket holding the service board to the PCB. Reinstall the main PCB and reattach the cables.
9.	Replace the back panel.
10.	Close the printer and replace the locking screw.
11.	Reconnect the power cable.
12.	Reset printer to factory defaults. Refer to Section 7-1.

6-5.1 Replacing the Main Circuit Board

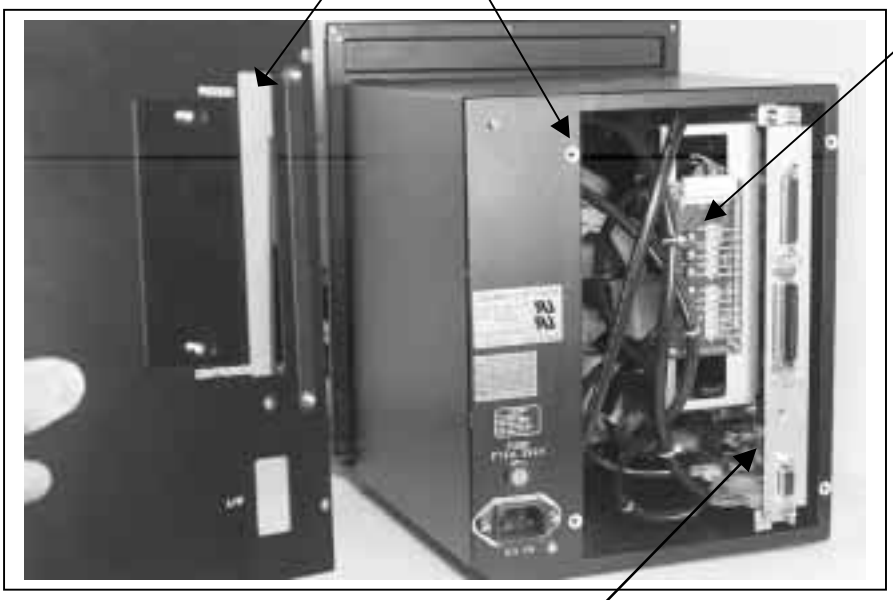


Fig. 6-9

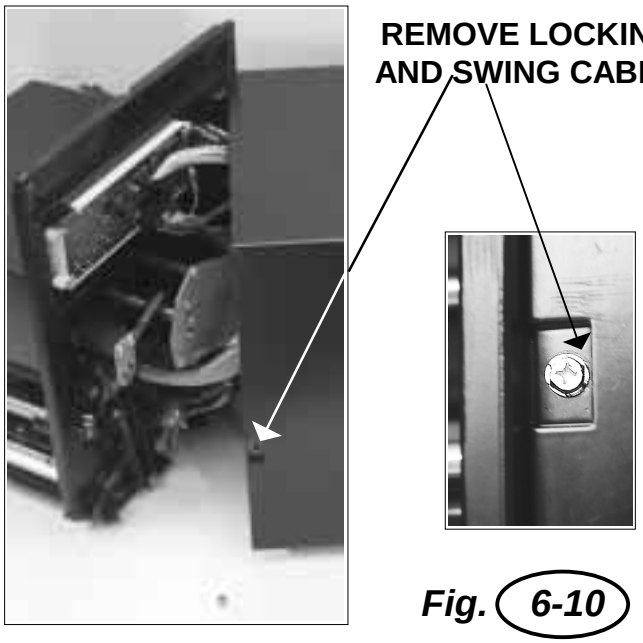
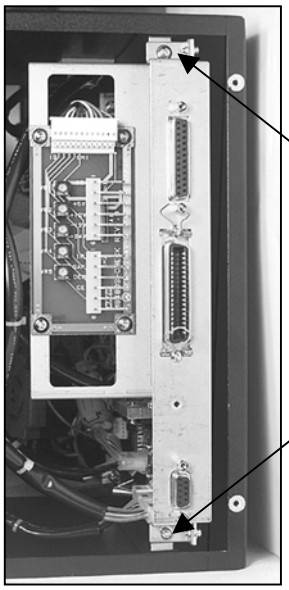


Fig. 6-10

Part 2

6-5.1 Replacing the Main Circuit Board

Part 2



REMOVE (2) SCREWS HOLDING BOARD TO PRINTER BRACKET

BACKSIDE OF SERVICE BOARD

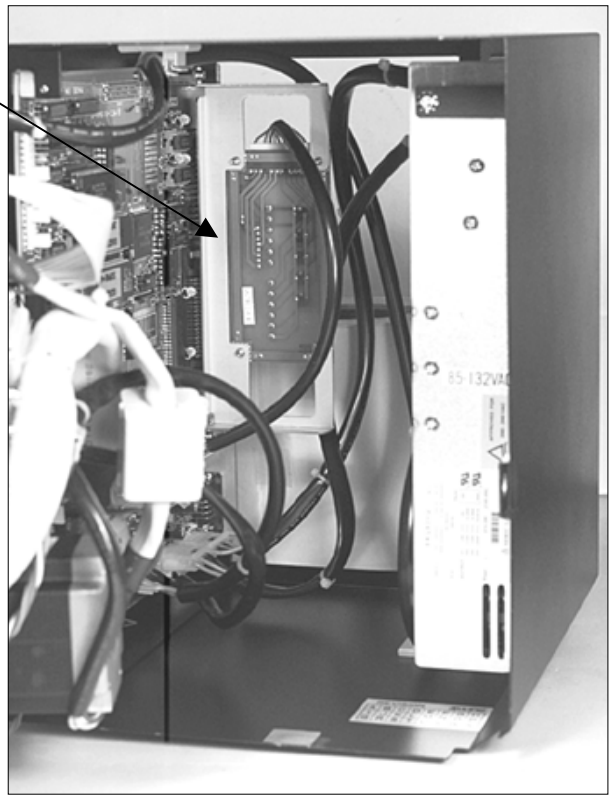
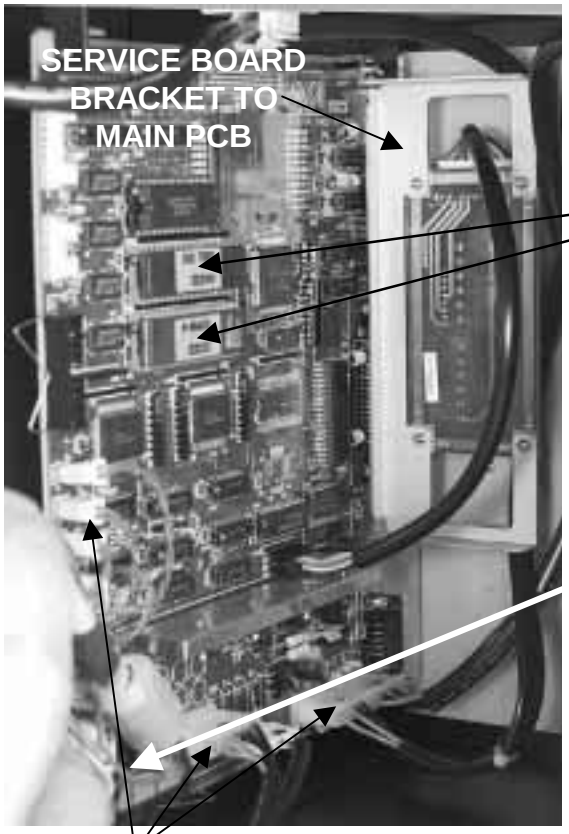


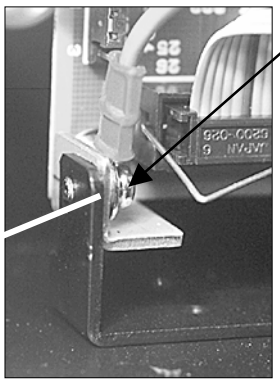
Fig. 6-12



SERVICE BOARD BRACKET TO MAIN PCB

REMOVE (2) EPROM CHIPS

DISCONNECT CABLES



REMOVE (2) SCREWS HOLDING BOARD TO PRINTER BRACKET- NOTE GROUNDING LUG (ACCESSED FROM INSIDE THE OPEN SECTION)

Fig. 6-11

6-5.2 Replacing the Service Board

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove (5) screws holding the back panel to the cabinet. ***Fig. 6-13***
3.	Detach the connector from the service board. ***Fig. 6-14***
4.	Remove (4) screws holding the service board to the bracket that is attached to the main PCB.
5.	Remove and replace the board and reattach connector.
6.	Replace the back panel removed in step 2.
7.	Reconnect the power cable.
8.	Reset printer to factory defaults. Refer to Section 7-1.

Fig. 6-13

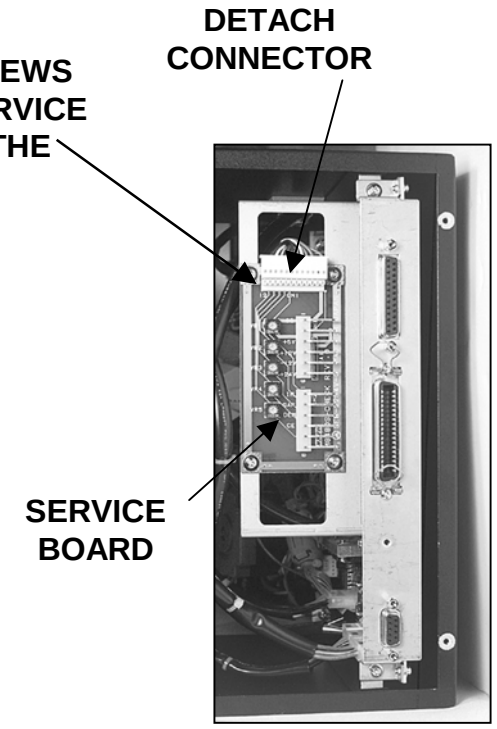


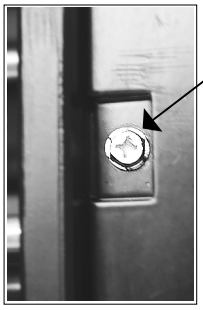
Fig. 6-14

6-6 Replacing the LCD Display Panel

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to the display panel. ***Fig. 6-15***
3.	Detach (2) connectors from display panel PCB.
4.	Remove (4) panel mounting screws. Note that one screw secures a ground wire. Note location for reassembly. ***Fig. 6-16***
5.	Remove and replace the LCD Display Panel. Reattach the connectors.
6.	Close the printer halves and replace the locking screw.
7.	Reconnect the power cable.

NOTE: This display panel can be rotated by 180° for ease of reading if necessary.

6-6 Replacing the LCD Display Panel

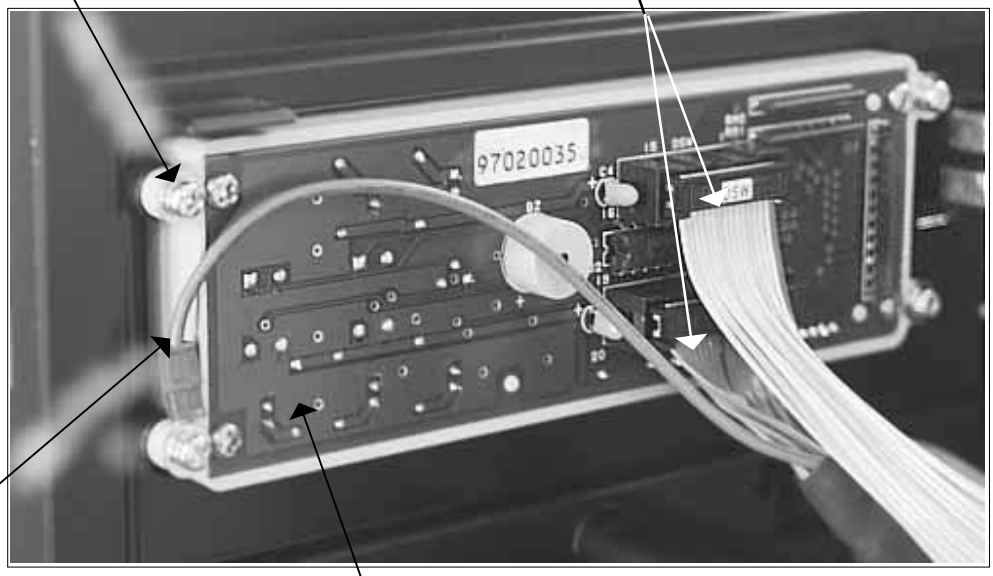


REMOVE LOCKING SCREW
AND SWING CABINET OPEN

Fig. 6-15

DETACH (2)
CONNECTORS

(4) MOUNTING
SCREWS



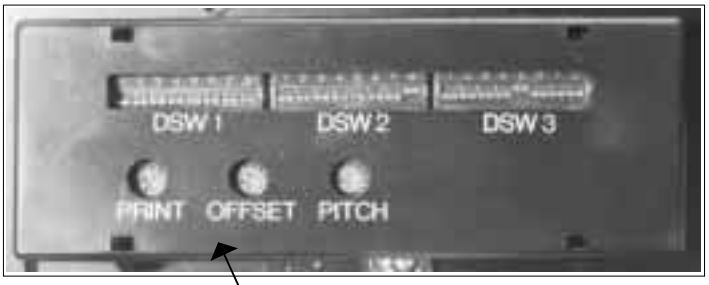
GROUND WIRE

LCD DISPLAY PANEL

Fig. 6-16

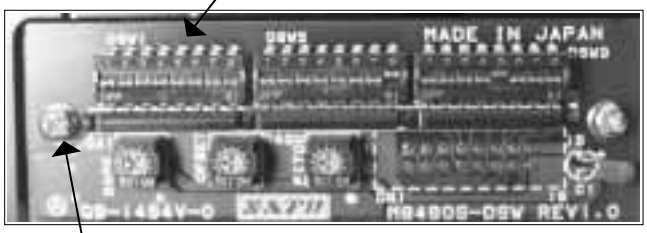
6-7 Replacing the Dip Switch Panel

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Raise the lid on the mechanical side of the printer.
3.	Snap off the cover from the Dip Switch Panel. ***Fig. 6-17***
4.	Remove (2) screws holding the panel to the cabinet. ***Fig. 6-18***
5.	Detach cable connection to the panel. ***Fig. 6-19***
6.	Remove and replace the Dip Switch Panel. Reattach the connection.
7.	Reconnect the power cable.



COVER

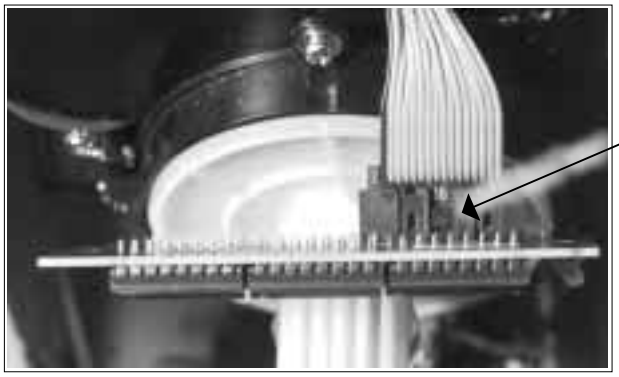
Fig. 6-17



DIP SWITCH PANEL

REMOVE (2) SCREWS

Fig. 6-18



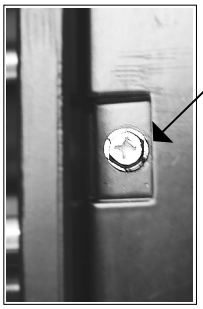
CABLE CONNECTION

Fig. 6-19

6-8 Replacing the Stepper Motor

The stepper motor is used to transmit motion to the print mechanism for precise print positioning. The stepper motor transmits torque to the label feed roller, the platen roller, the ribbon feed roller, and the ribbon rewind spindle via a series of toothed pulleys and timing belts.

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to the stepper motor. ***Fig. 6-20***
3.	Loosen belt idler pulley which is in contact with belt from motor. Refer to Section 5-6A for M-8485S, Section 5-6B for M-8490S, Section 5-6c for M-8459S and Section 5-6D for M-8460S.
4.	Remove (2) mounting screws attaching the stepper motor to the frame. Remove motor to dislodge pulley from belt. ***Fig. 6-21, 6-22***
5.	Detach the cable from the cable holder. Disconnect the "STP" cable connector from the main PCB and remove the motor. ***Fig. 6-23***
6.	Replace the motor and remount to the frame. Reconnect the "STP" cable connector to the PCB and reattach the cable to the cable holder.
7.	Adjust belt tension as outlined in Section 5-6.
8.	Close the printer halves and replace the locking screw.
9.	Reconnect the power cable.

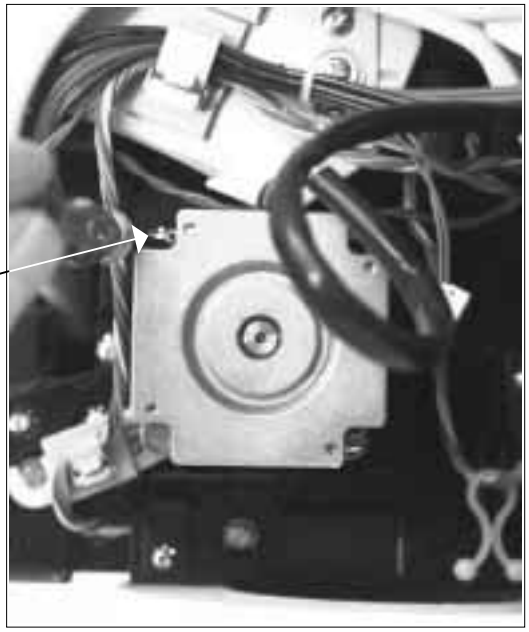


REMOVE LOCKING SCREW AND SWING CABINET OPEN

Fig. 6-20

Part 2

6-8 Replacing the Stepper Motor



(2) SCREWS MOTOR TO FRAME

***Fig.* 6-21**

***Fig.* 6-22**

MOTOR, SHAFT, AND PULLEY LOOSEN BELT IDLER SEE SECTION 5-6

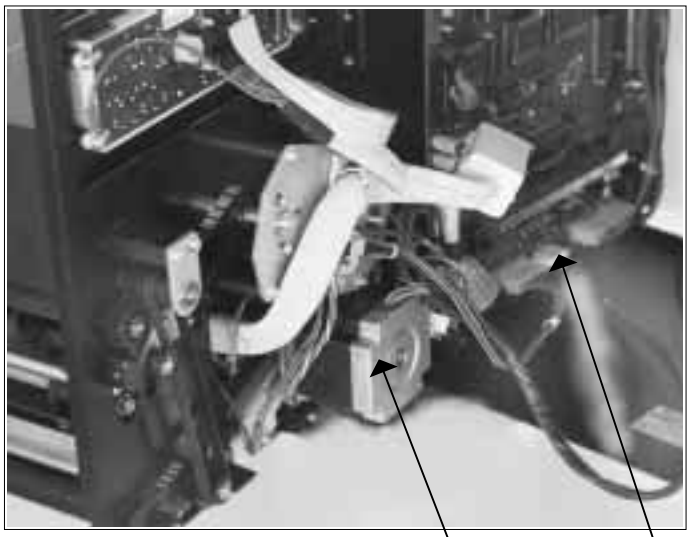


***Fig.* 6-23**

STEPPER MOTOR

DETACH CABLE FROM CABLE HOLDER AND DISCONNECT "STP" CONNECTOR FROM MAIN PCB

6-9A Replacing the Timing Belts for the M-8485S

Three timing belts used in this printer are arranged as follows:

Starting at the stepper motor:
Belt "A" - From the motor to front and rear platen rollers to idler pulley "A" to feed roller and back to motor. ***Fig. 6-24A & 24B***

Belt "B & C" - From rear platen roller to three level idler gear "B". The first level of idler gear "B" meshes with ribbon roller gear. The second level of idler gear "B" is connected to the rear platen. The third level of idler gear "B" is connected to the rewind spindle via Belt "C". ***Fig. 6-24C & 24D***

Idler pulley "C" is used for adjusting tension on belt "B".

FOR BELT "A"

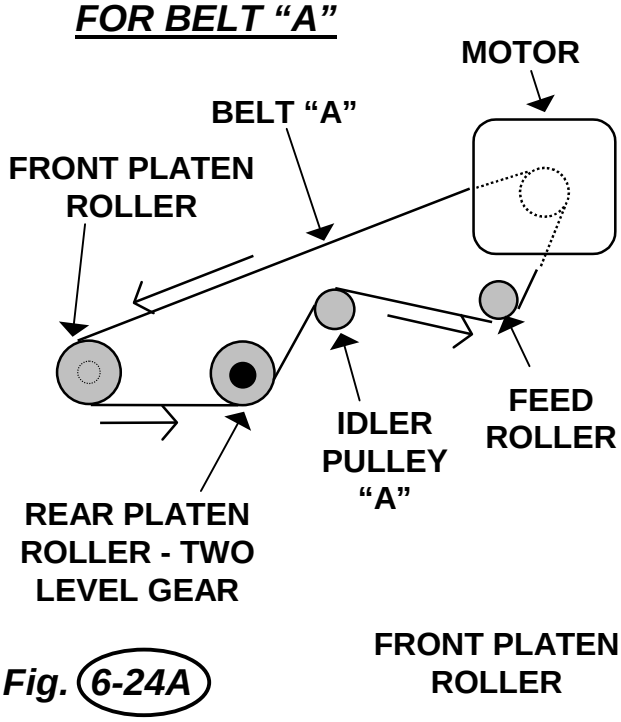


Fig. 6-24A

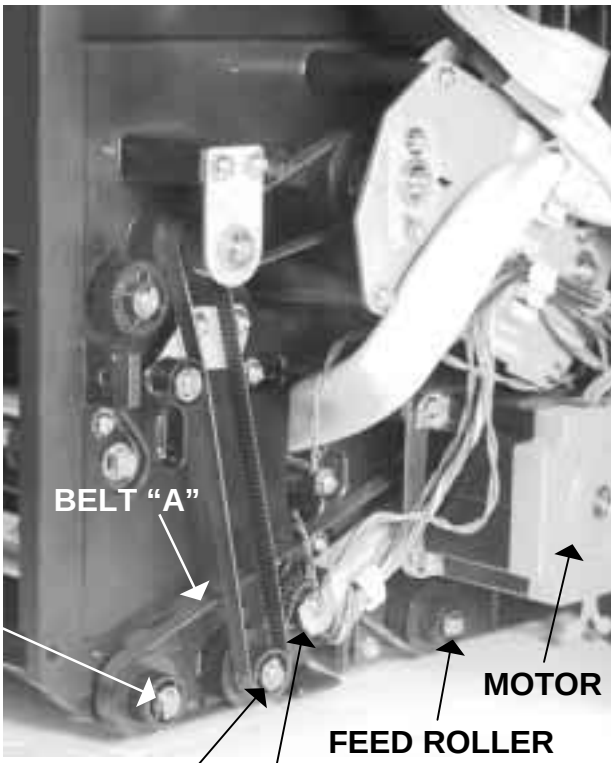


Fig. 6-24B

Part 2

6-9A Replacing the Timing Belts for the M-8485S

FOR BELTS "B & C"

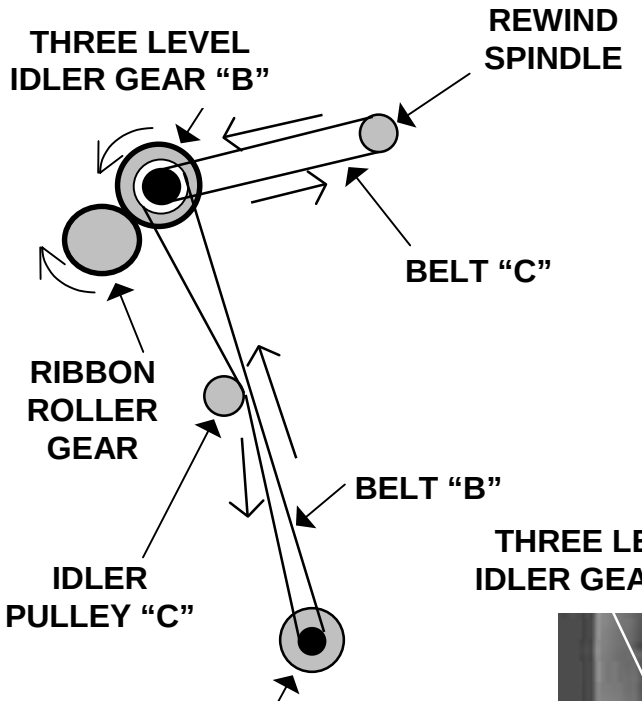


Fig. 6-24C

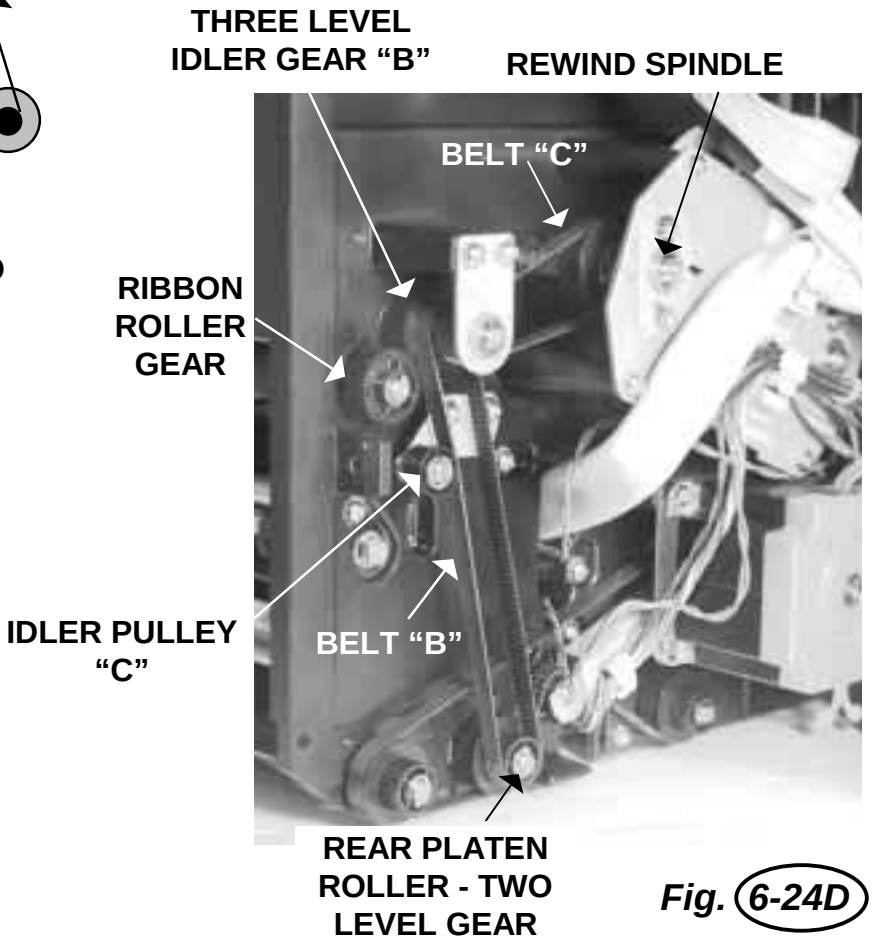


Fig. 6-24D

6-9A Replacing the Timing Belts for the M-8485S

FOR BELTS "A, B & C"

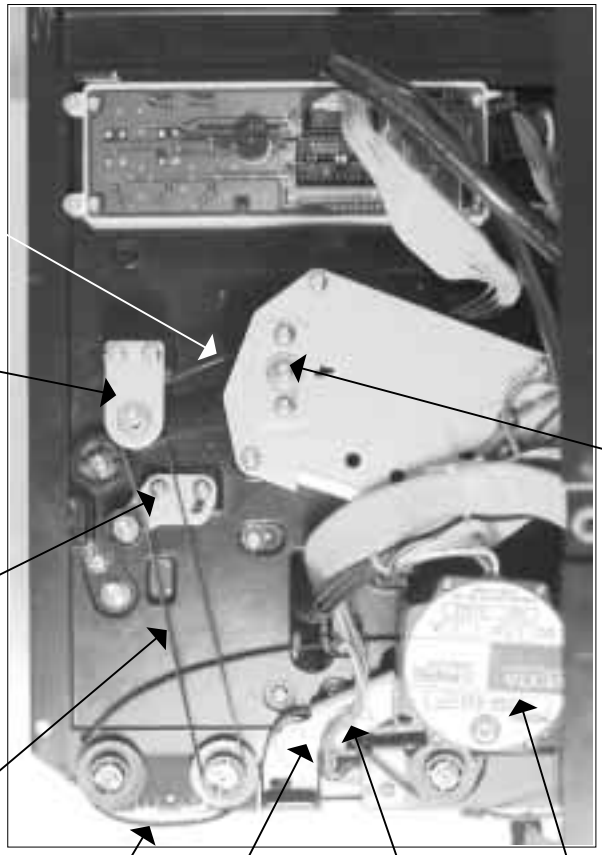
STEP	PROCEDURE
1.	Refer to Section 6-8 and perform Steps 1-3 to remove and dislodge the motor from the frame and from Belt "A". Do not detach wire connections from motor. Belts "C", "B" and "A" are removed in sequence.
2.	Remove (2) screws from idler gear "B" bracket and the center screw holding the ribbon rewind spindle. Use wrench on opposite end of shaft (in the mechanical section) to prevent the shaft from slipping. Pull shaft back towards the mechanical section, just enough so that Belt "C" slides off the end of the shaft. Remove Belt "C" from both pulleys. ***Figs. 6-24A to 6-24F***
3.	Loosen (2) screws from idler pulley "C". Remove Belt "B" from both pulleys.
4.	From the mechanical section, remove holding idler pulley "A" mounting bracket screw. Detach the bracket and maneuver Belt "A" from pulleys and the gears. Replace belts as required. Replace screws previously removed. Secure wire bundle in clamp.
5.	Refer to Section 6-8 and remount the motor and attaching hardware to the frame.
6.	Adjust the belt tension as outlined in Section 5-6.
7.	Close the printer halves and replace the locking screw.
8.	Reconnect the power cable.

Part 2

Part 2

6-9A Replacing the Timing Belts for the M-8485S

FOR BELTS "A, B & C"



BELT "C"

THREE LEVEL IDLER GEAR "B" REMOVE (2) SCREWS

RIBBON REWIND SPINDLE

IDLER PULLEY "C" LOOSEN (2) SCREWS TO REMOVE BELT "B"

BELT "B"

BELT "A"

WIRE BUNDLE CLAMP

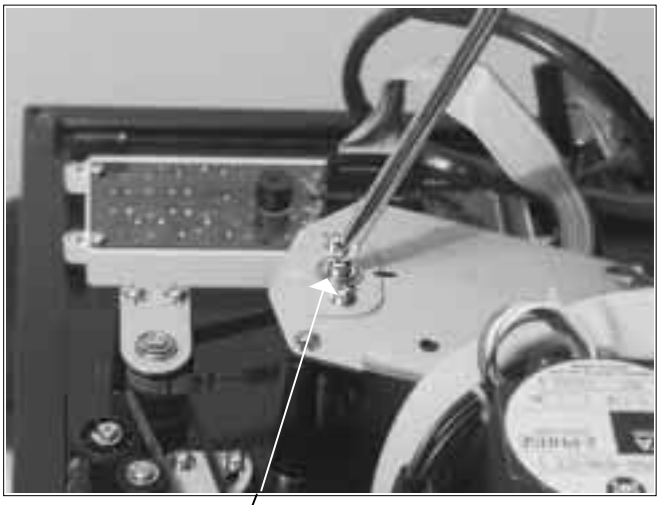
IDLER PULLEY "A" BRACKET REMOVE SCREW FROM OPPOSITE SIDE OF PRINTER

REMOVE MOTOR FROM FRAME REFER TO SECTION 6-8

Figs. 6-24E

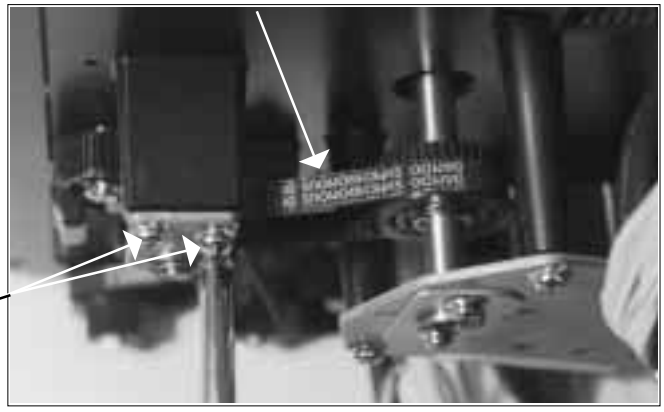
6-9A Replacing the Timing Belts for the M-8485S

FOR BELT "C"



REMOVE CENTER SCREW

SLIDE OFF BELT "C"



REMOVE (2) SCREWS FROM IDLER GEAR BRACKET "B"

USE WRENCH TO PREVENT SHAFT FROM SLIPPING WHEN REMOVING BELT "C"

Figs. 6-24F

Part 2

Part 2

6-9B Replacing the Timing Belts for the M-8490S

Five timing belts used in this printer are arranged as follows:

Starting at the stepper motor:
Belt "A" - From the motor to the first level of idler gear "C" to idler pulley "C" and back to motor. ***Fig. 6-25A & 25B***

Belt "B" - From feed roller to idler gear "D" to first level of front platen roller gear to first level of rear platen roller gear to idler pulley "A" back to feed roller. ***Fig. 6-25A & 25B***

Belt "C" - Joins the front platen roller gear to the two level gear "C" and is used as a "step- down" in transmitting torque to the front platen roller. ***Fig. 6-25C & 25D***

Belt "D & E" - From rear platen roller to three level idler gear "F". The first level of idler gear "F" meshes with ribbon roller gear. The second level of idler gear "F" is connected to the rear platen. The third level of idler gear "F" is connected to the rewind spindle via Belt "E". ***Fig. 6-25C & 25D***

Idler pulley "E" is used to adjust tension on belt "D".

FOR BELTS A & B

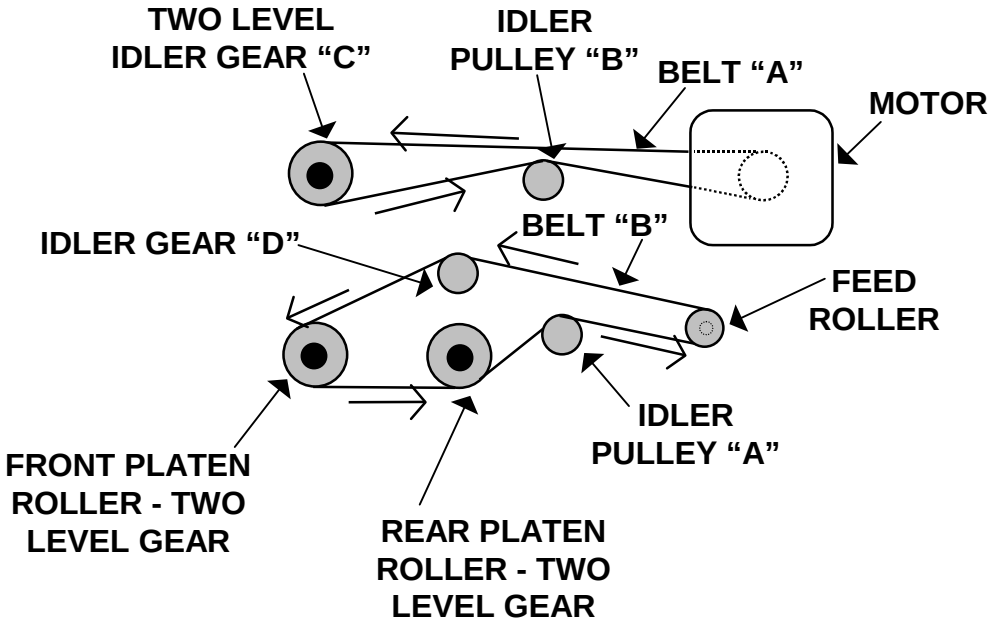


Fig. 6-25A

6-9B Replacing the Timing Belts for the M-8490S

FOR BELTS "A & B"

Part 2

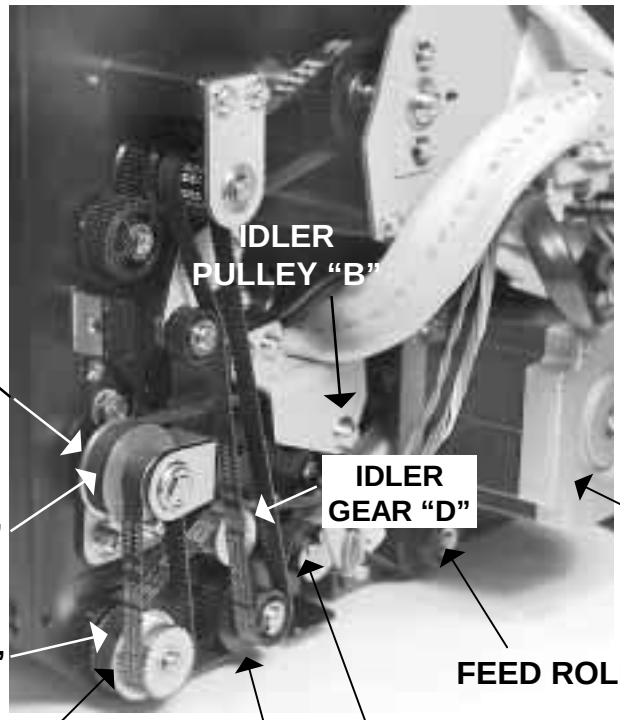


Fig. 6-25B

Part 2

6-9B Replacing the Timing Belts for the M-8490S

FOR BELTS "C, D & E"

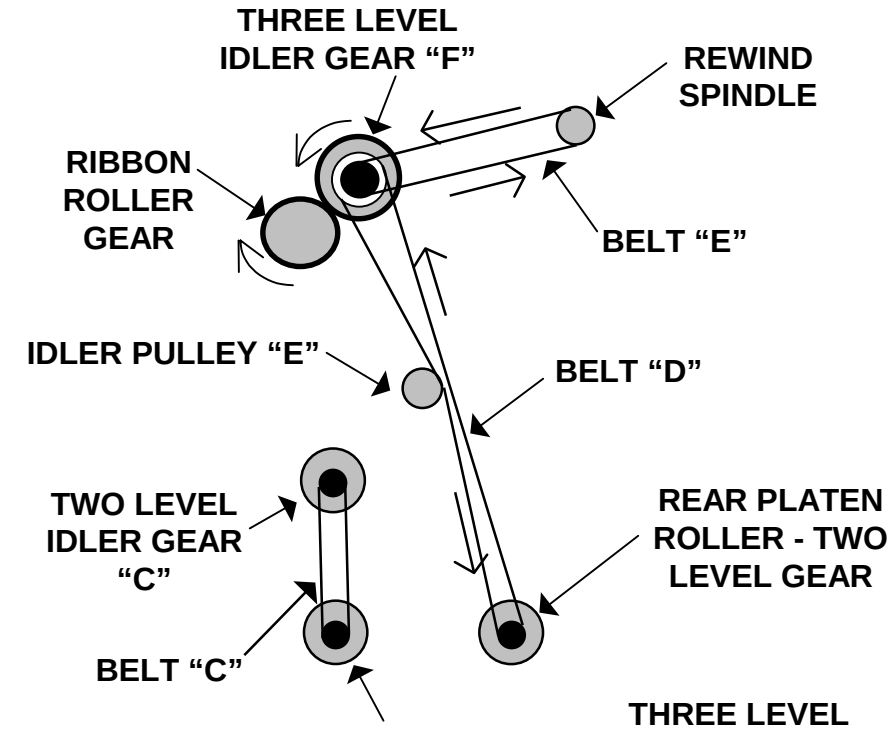


Fig. 6-25C

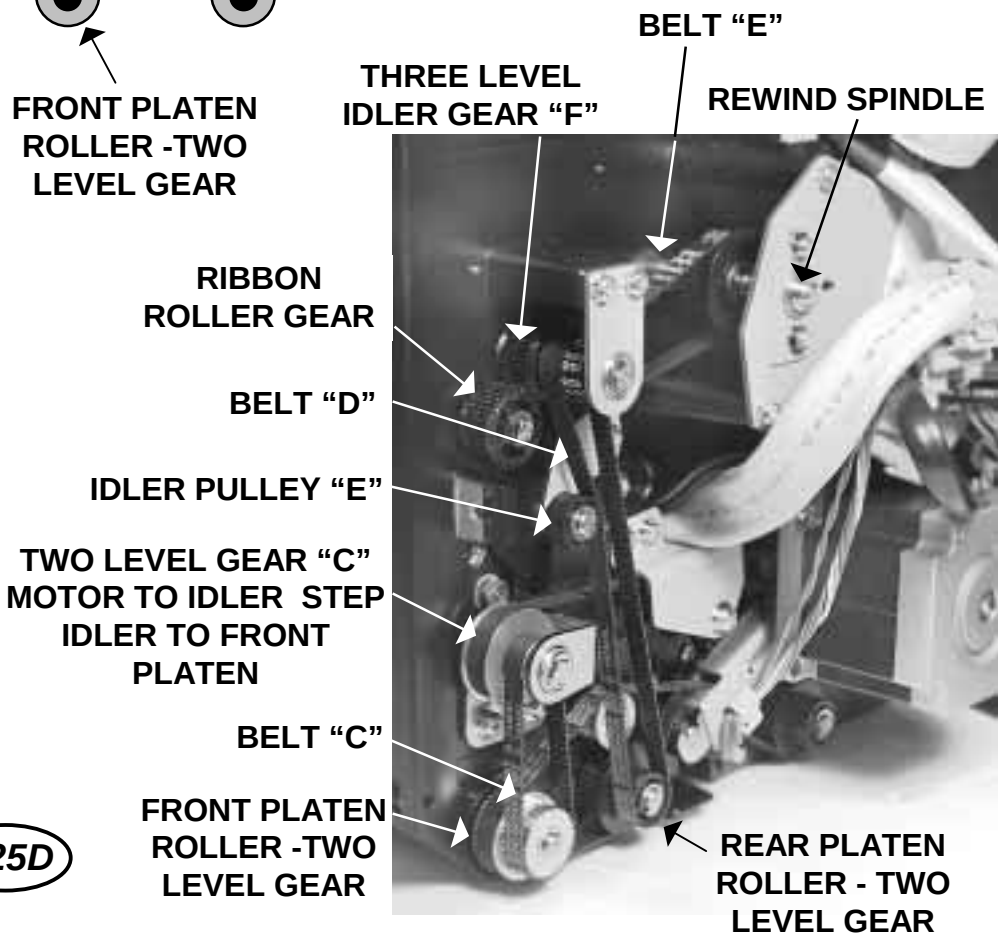


Fig. 6-25D

6-9B Replacing the Timing Belts for the M-8490S

FOR BELTS A, B, C, D & E

STEP	PROCEDURE
	TO REMOVE BELTS "A & C"
1.	Remove (2) motor mounting screws to dislodge motor from frame. Slide off belt "A" from motor gear and pull through idler pulley "B" mounting bracket. ***Fig. 6-25E, F, H, J, & K***
2.	Remove (2) screws to dislodge idler "C" bracket from frame. Belt "A" will slide free of printer. Slide off belt "C" from front platen roller gear. Belt "C" will still be enclosed in the "C" bracket To remove belt "C", remove snap ring from end of gear mounting shaft to disassemble and free belt "C". ***Fig. 6-24H, J, K & L***
	TO REMOVE BELTS "D & E"
	Remove (2) screws from idler gear bracket "F" to detach from frame. ***Fig. 6-25M***.
	Slide off belt "E" from gear "F". Belt "E" will still be attached to ribbon rewind spindle. Remove center screw holding the ribbon rewind spindle. ***Fig. 6-24N***.
	Use wrench on opposite end of shaft (in the mechanical section) to prevent the shaft from slipping ***Fig. 6-25P***.
	Pull shaft back towards the mechanical section, just enough so that belt "E" slides off the end of the shaft. Remove belt "E" from gears. Slide belt "D" from gear "F" and the rear platen gear. ***Fig. 6-25R***
	TO REMOVE BELT "B"
	From the mechanical section, remove the screw holding idler pulley "A" mounting bracket. Detach the bracket and maneuver Belt "B" from pulley and gears. ***Fig. 6-25E, F, G***
	AFTER BELT MAINTENACE HAS BEEN PERFORMED
1.	Replace belts as required. Remount motor, pulleys, gears and attaching hardware.
2.	Adjust belt tension as outlined in Section 5-6B.
3.	Close the printer halves and replace the locking screw.
4.	Reconnect the power cable.

Part 2

Part 2

6-9B Replacing the Timing Belts for the M-8490S

FOR BELTS A, B, C, D & E

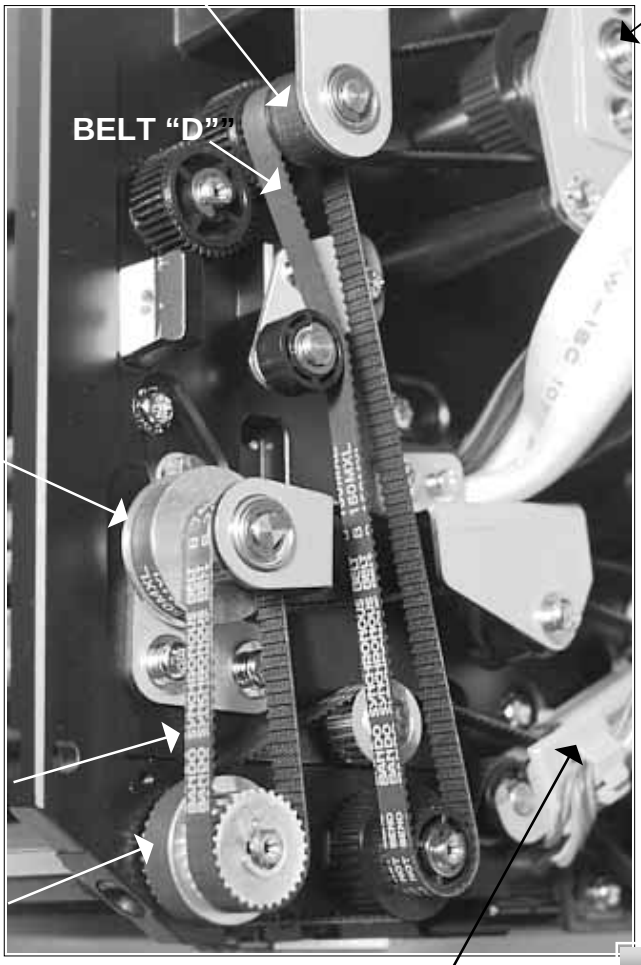


Fig. 6-25E

IDLER PULLEY "A"BRACKET REMOVE SCREW FROM OPPOSITE SIDE OF PRINTER FOR REMOVING BELT "B"

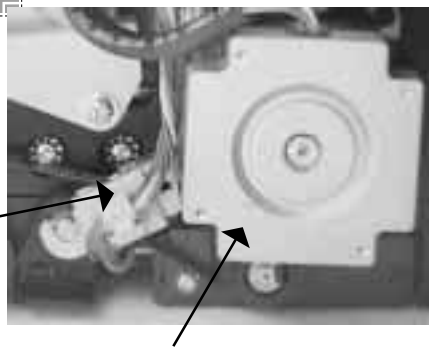


Fig. 6-25F

REMOVE (2) MOTOR MOUNTING SCREWS TO DISLODGE MOTOR FROM FRAME

Fig. 6-25G

6-9B Replacing the Timing Belts for the M-8490S

FOR BELTS A & C

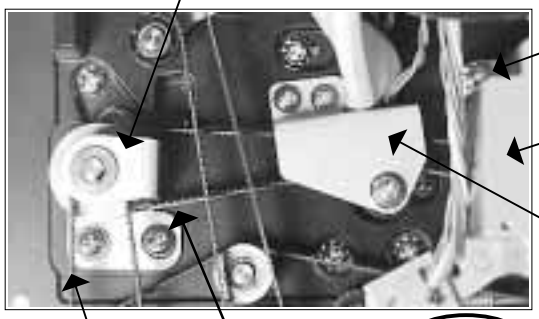


Fig. 6-25H

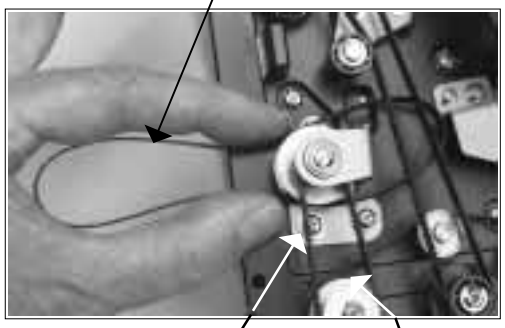


Fig. 6-25J

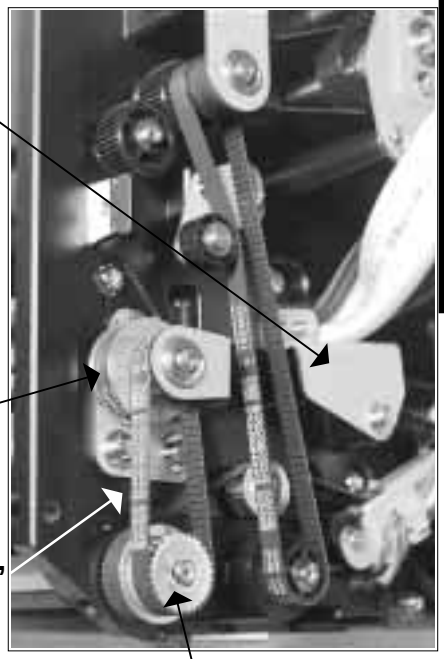


Fig. 6-25K

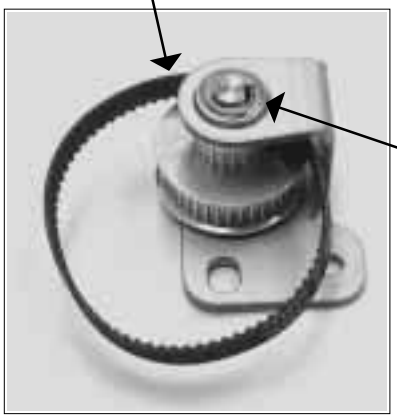


Fig. 6-25L

Part 2

Part 2

6-9B Replacing the Timing Belts for the M-8490S

FOR BELTS D & E

REMOVE CENTER SCREW

Fig. 6-25N

REMOVE (2) SCREWS FROM IDLER GEAR BRACKET "F"

SLIDE OFF BELT "E"

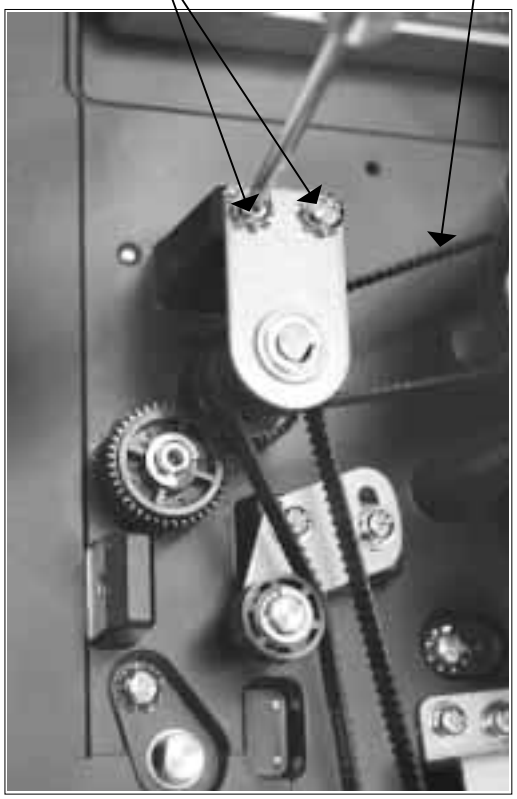
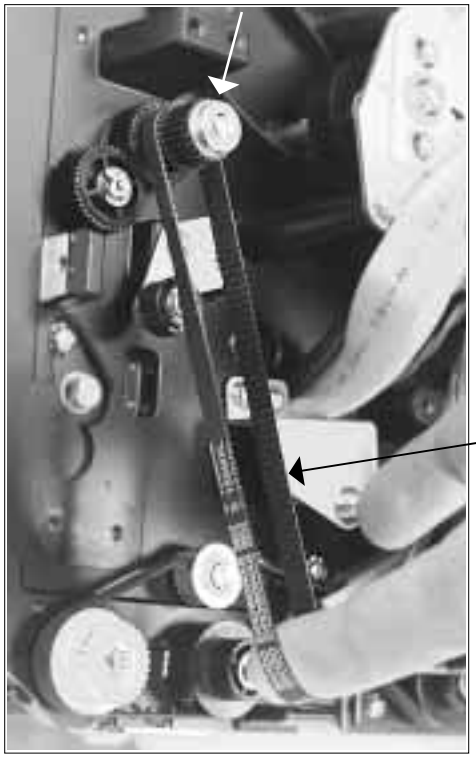


Fig. 6-25M

IDLER GEAR "F"



SLIDE OFF BELT "D"

Fig. 6-25R

USE WRENCH TO PREVENT SHAFT FROM SLIPPING WHEN REMOVING BELT "E"

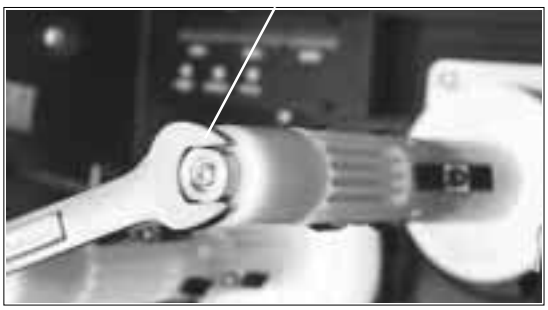


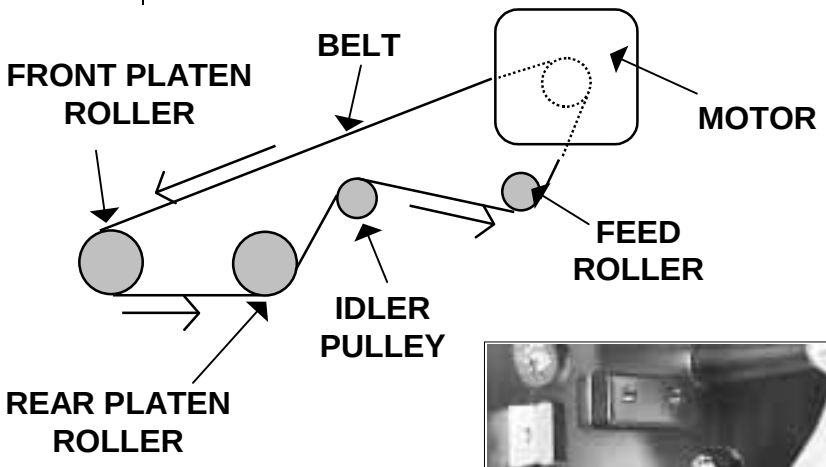
Fig. 6-25P

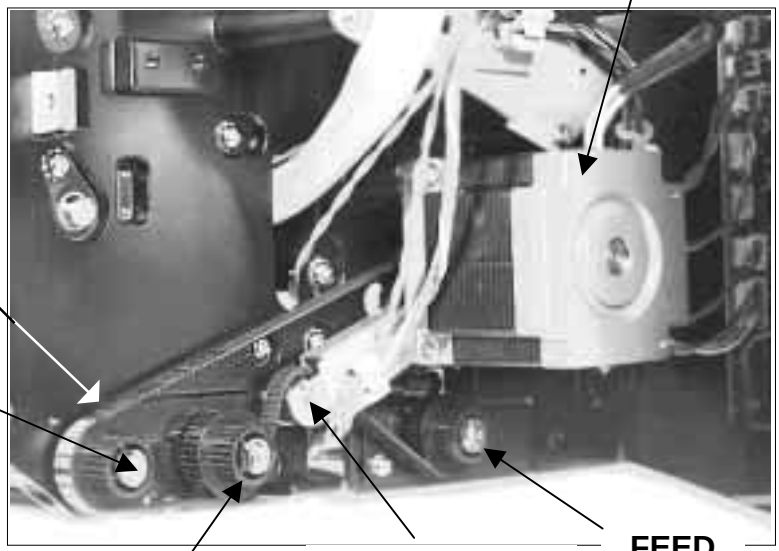
6-9C Replacing the Timing Belt for the M-8459S

A single timing belt is used in this printer and arranged as follows:

Starting at the stepper motor:
From the motor to the front and rear platen rollers to the idler pulley and to the feed roller and back to the motor.

STEP	PROCEDURE
1.	Refer to Section 6-8 and perform the steps necessary to remove and dislodge the motor from the frame and from the belt. Do not detach wire connections from motor.
2.	Remove the idler pulley mounting screw. Detach the bracket and maneuver the belt free. Replace the belt and parts previously removed. ***Fig. 6-26***
3.	Remount the motor and adjust the belt tension.
4.	Close the printer sections and replace the locking screw. Reconnect the power cable.





Figs. *6-26*

M-8459S

Part 2

6-9D Replacing the Timing Belts for the M-8460S

Three timing belts used in this printer are arranged as follows:

Starting at the stepper motor:
Belt "A" - From the motor to front and rear platen rollers to idler pulley "A" to feed roller and back to motor. ***Fig. 6-27A & 27B***

Belt "B & C" - From rear platen roller to three level idler gear "B". The first level of idler gear "B" meshes with ribbon roller gear. The second level of idler gear "B" is connected to the rear platen. The third level of idler gear "B" is connected to the rewind spindle via Belt "C". ***Fig. 6-27C & 27D***

Idler pulley "C" is used for adjusting tension on belt "B".

FOR BELT "A"

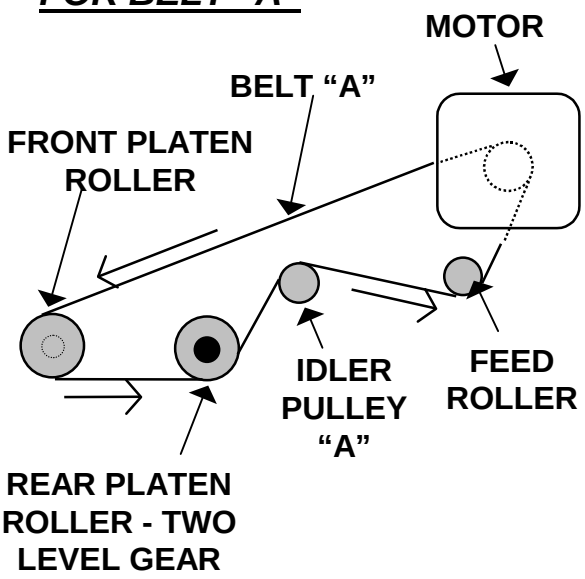
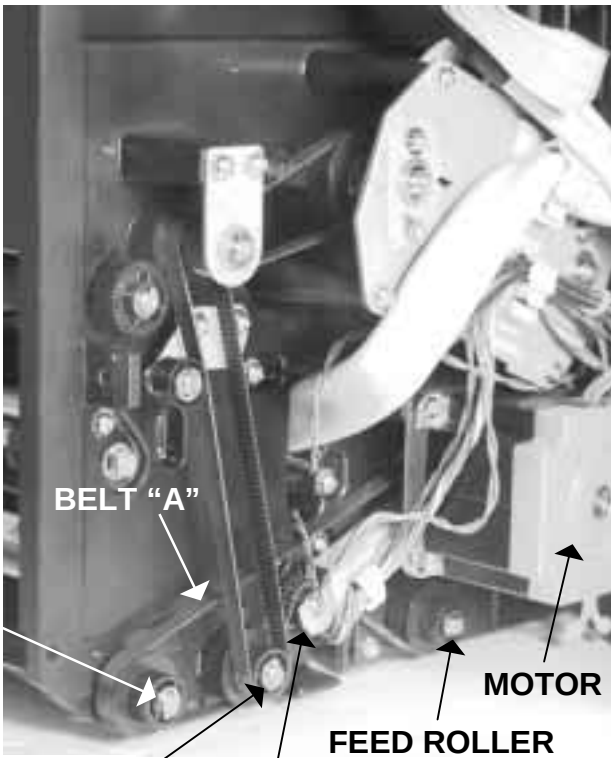


Fig. 6-27A



M-8460S

Fig. 6-27B

6-9D Replacing the Timing Belts for the M-8460S

FOR BELTS "B & C"

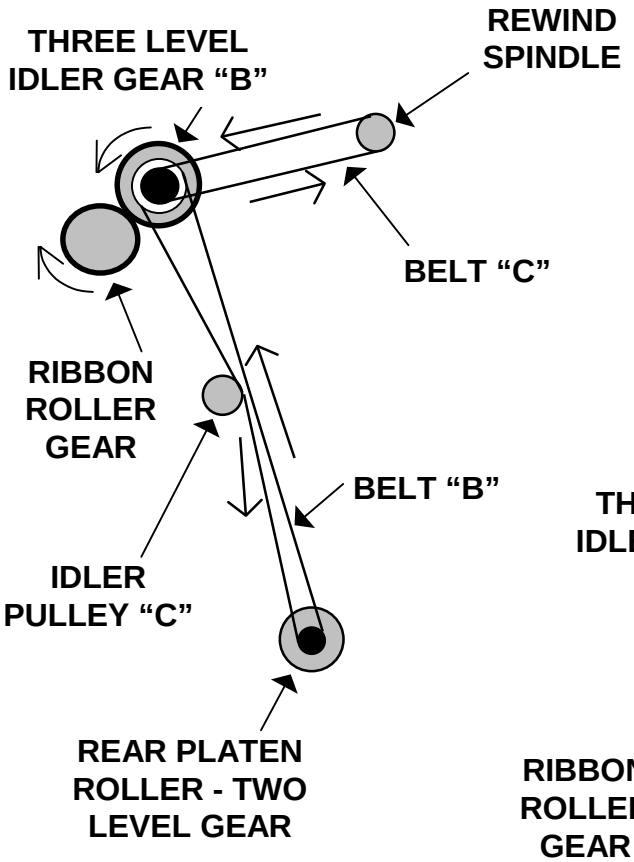


Fig. 6-27C

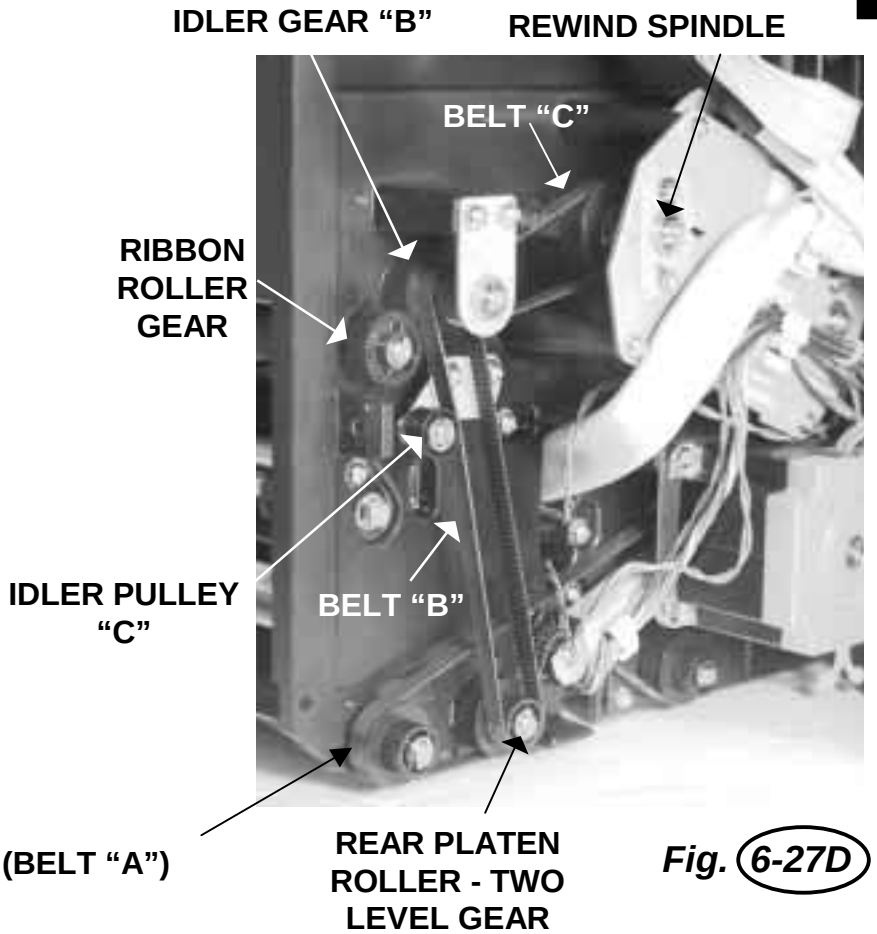


Fig. 6-27D

M-8460S

Part 2

6-9D Replacing the Timing Belts for the M-8460S

FOR BELTS "A, B & C"

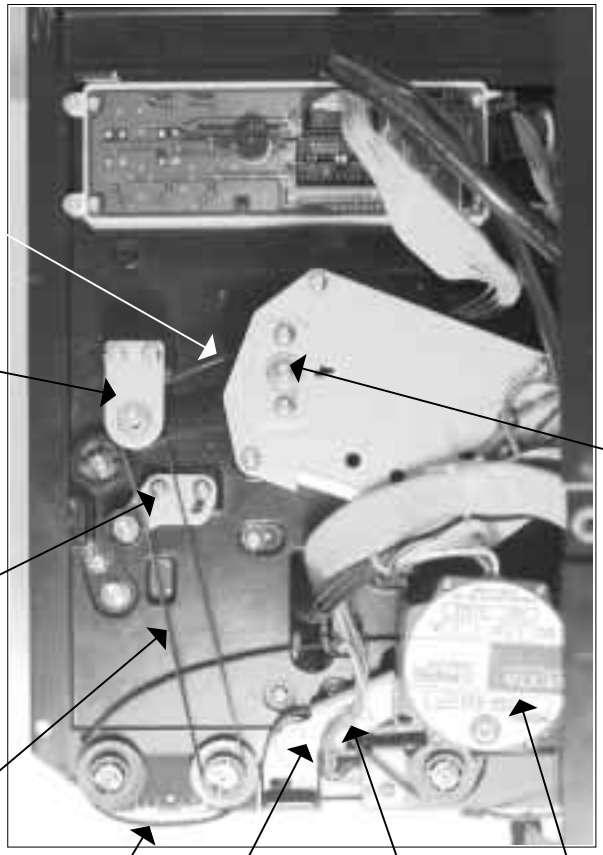
STEP	PROCEDURE
1.	Refer to Section 6-8 and perform Steps 1-3 to remove and dislodge the motor from the frame and from Belt "A". Do not detach wire connections from motor. Belts "C", "B" and "A" are removed in sequence.
2.	Remove (2) screws from idler gear "B" bracket and the center screw holding the ribbon rewind spindle. Use wrench on opposite end of shaft (in the mechanical section) to prevent the shaft from slipping. Pull shaft back towards the mechanical section, just enough so that Belt "C" slides off the end of the shaft. Remove Belt "C" from both pulleys. ***Figs. 6-27A to 6-27F***
3.	Loosen (2) screws from idler pulley "C". Remove Belt "B" from both pulleys.
4.	From the mechanical section, remove holding idler pulley "A" mounting bracket screw. Detach the bracket and maneuver Belt "A" from pulleys and the gears. Replace belts as required. Replace screws previously removed. Secure wire bundle in clamp.
5.	Refer to Section 6-8 and remount the motor and attaching hardware to the frame.
6.	Adjust the belt tension as outlined in Section 5-6.
7.	Close the printer halves and replace the locking screw.
8.	Reconnect the power cable.

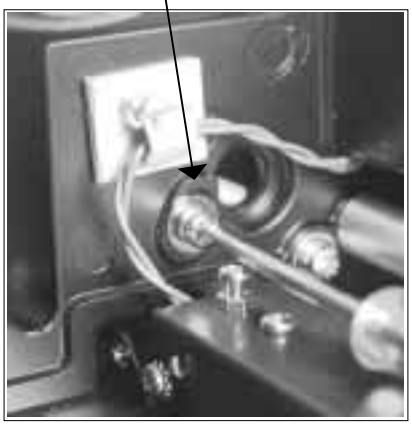
Part 2

M-8460S

6-9D Replacing the Timing Belts for the M-8460S

FOR BELTS "A, B & C"





M-8460S

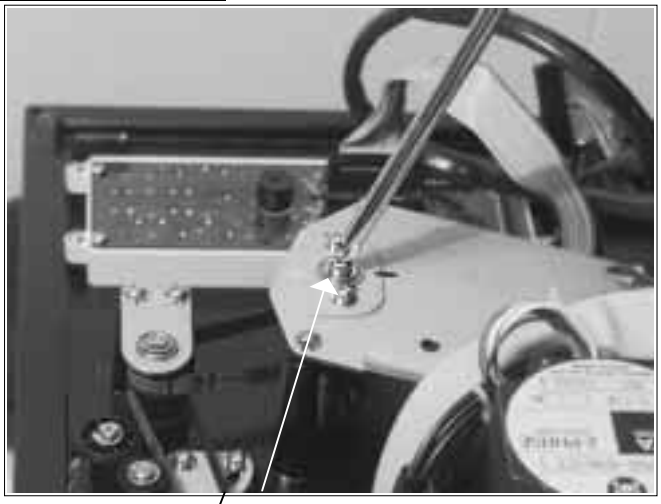
Figs. *6-27E*

Part 2

Part 2

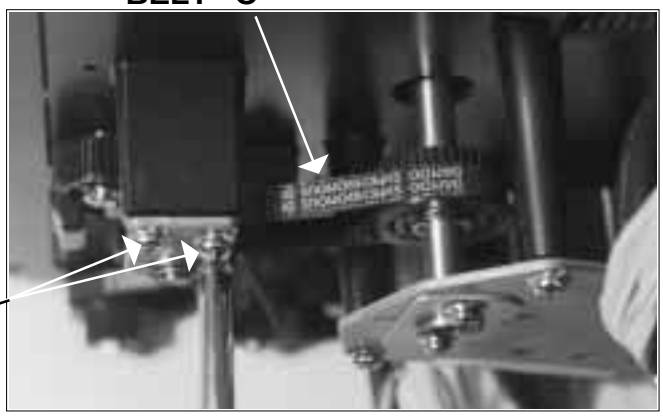
6-9D Replacing the Timing Belts for the M-8460S

FOR BELT "C"



REMOVE CENTER SCREW

SLIDE OFF BELT "C"



REMOVE (2) SCREWS FROM IDLER GEAR BRACKET "B"

M-8460S

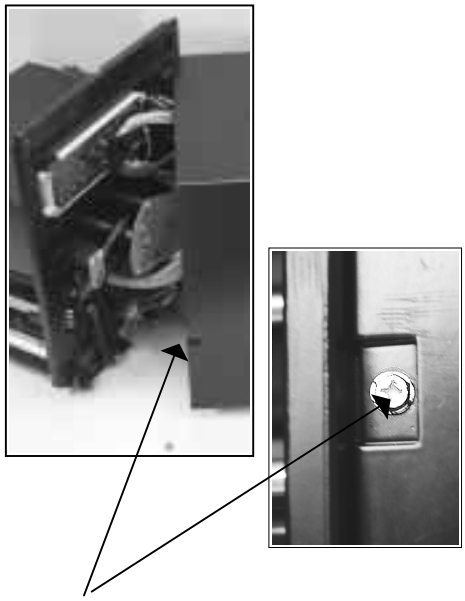
Figs. 6-27F

6-10 Replacing the Ribbon Drive Clutch Washers
This Procedure is NA for M-8459S

Both the ribbon unwind and the rewind drive spindles incorporate a friction clutch assembly to control tension. The friction washers within these clutch assemblies are replaceable. The procedure is identical for both the off-wind and the on-wind clutch assemblies.

To disassemble the spindles, perform the following steps:

STEP	PROCEDURE
1a.	Switch the printer OFF and disconnect the power cable.
2a.	Raise the lid on the mechanical side of the printer.
3a.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to mechanical and electrical sections. ***Fig. 6-28***
4a.	Remove the following parts from two spindle shafts(in order): ***Fig. 6-29***



REMOVE LOCKING SCREW AND SWING CABINET OPEN

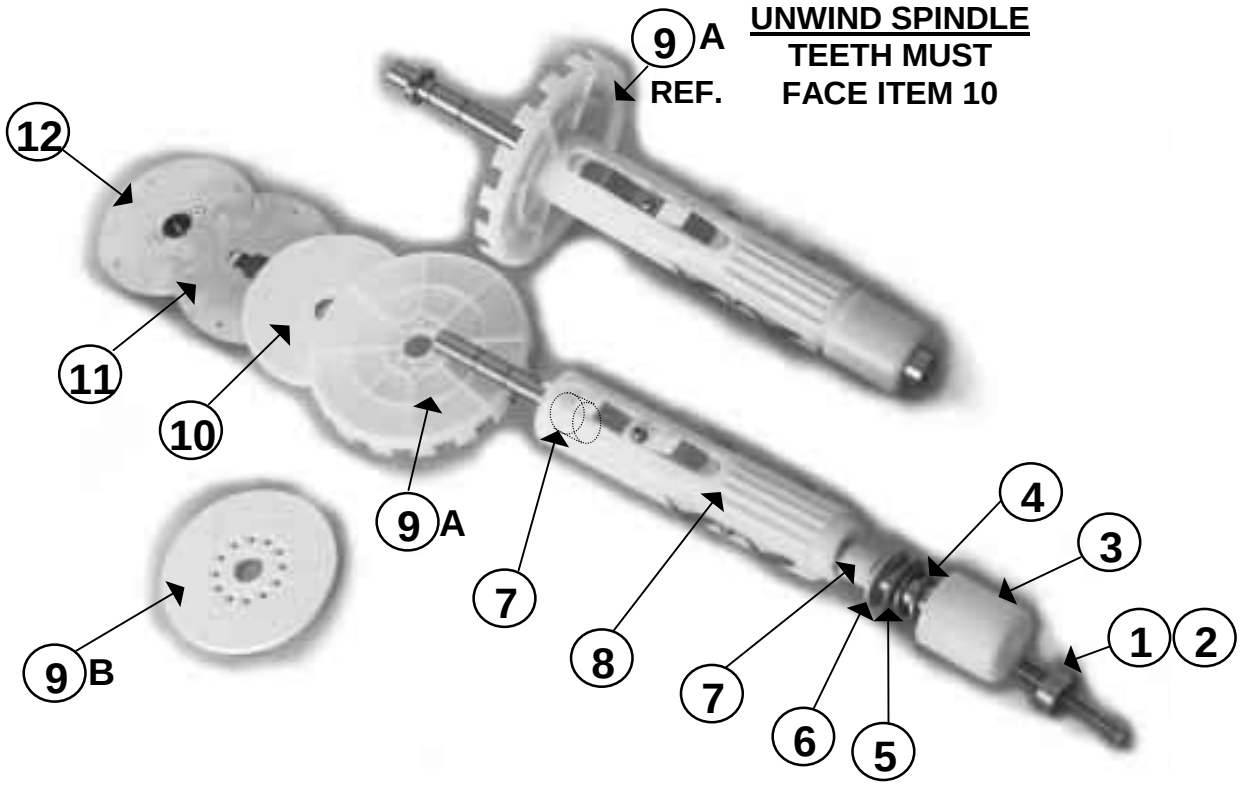
Fig. 6-28

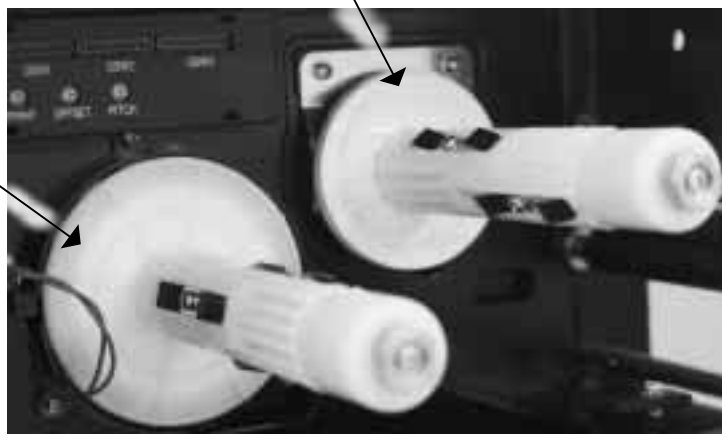
ITEM N0.	DESCRIPTION	QTY EA ASSY
1.	Screw	(1)
2.	Adjustment Nut	(1)
3.	Stopper Collar	(1)
4.	Spring	(1)
5.	Disc	(1)
6.	Oil- less Dry Metal Washer	(1)
7.	Collar	(2)
8.	Ribbon Boss	(1)
9A & 9B	Disc Plate (Different)	(1)
10.	Friction Washer	(1)
11. Hold Plate		(1)
12. Back Plate		(1)

NOTE: Disassemble one spindle at a time so that the other can be used for reference.

Part 2

6-10 Replacing the Ribbon Drive Clutch Washers (NA for M-8459S)





COMPONENTS SHOWN ASSEMBLED

Figs. 6-29

6-10 Replacing the Ribbon Drive Clutch Washers (NA for M-8459S)

To replace parts and reassemble the spindles, perform the following steps:
Refer to ***Fig. 6-29.***

STEP	PROCEDURE
1b.	To each spindle install Item 11 Plate with teeth facing outward and align the plate with the peg on the Ribbon Shaft Flange.
2b.	Install Item 10 Felt Friction Washer onto the Ribbon Shaft and slide it against Item 11 Plate.
3b.	Install (1) ea. Item 9A or 9B Rewind and Unwind Disc Plates onto Item 8 Ribbon Bosses. Align the hole in the Disc Plates over the pegs on Item 8. The teeth/slots on the unwind disc plate must be facing away from the Ribbon Boss. Install this assembly onto the Ribbon Shaft and slide it against the felt friction washer.
4b.	Install Item 6 Oil-less Dry Metal Washer onto the ribbon shaft with the copper side facing inward (the black carbon side will face outward). Align Item 6 Washer with the peg on #8 Ribbon Boss.
5b.	Install Item 5 Disc onto the ribbon shaft with the smooth side facing Item 6 Washer, (one side of the disc is smooth and the other side has sharp edges).
6b.	Install Item 4 Spring onto the ribbon shaft.
7b.	Install Item 3 Stopper Collar onto the ribbon shaft.
8b.	Screw the Item 2 Adjustment Nut clockwise into the end of the ribbon shaft.
9b.	Replace #1 Screw and tighten.
10b.	Close the printer halves and replace the locking screw. Lower the lid.
11b.	Reconnect the power cable.

NOTE: Do not over-tighten the adjustment nut since this screw is used to adjust the clutch tension. Adjust the clutch tension as outlined in Section 5-2.

Part 2

6-11 Replacing the Ribbon Motion Sensor

To remove and replace the Ribbon Motion Sensor, perform the following steps:

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to mechanical and electrical sections. ***Fig. 6-30***
3.	Raise the lid on the mechanical side of the printer.
4.	Remove the dip switch cover. ***Fig. 6-32***
5.	Remove (3) screws and the ring from around the unwind spindle. ***Fig. 6-32***
6.	Twist open the cable tie and unplug SEN4 connector from the PCB. ***Fig. 6-31 & 6-33***
7.	Remove sensor mounting screw and push the sensor through the access hole. ***Fig. 6-32 & 6-34***
8.	Remove (2) screws holding sensor to the mounting bracket. ***Fig. 6-35***
9.	Replace sensor and reattach to the mounting bracket. Feed sensor connector back through the access hole and reattach to SEN4 on the PCB. Attach the sensor bracket to the frame.
10.	Replace the ring and screws removed in Step 5. Replace the dip switch cover.
11.	Close the printer cabinet and replace the locking screw.
12.	Reconnect the power cable.

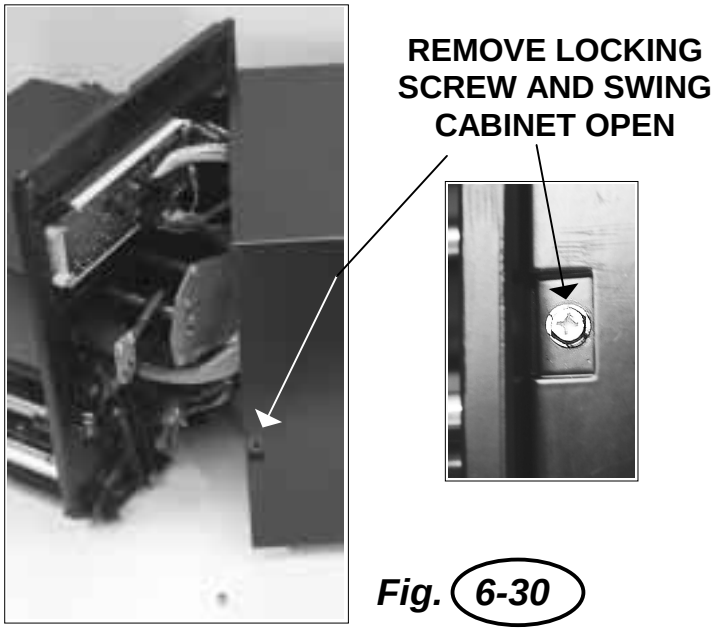
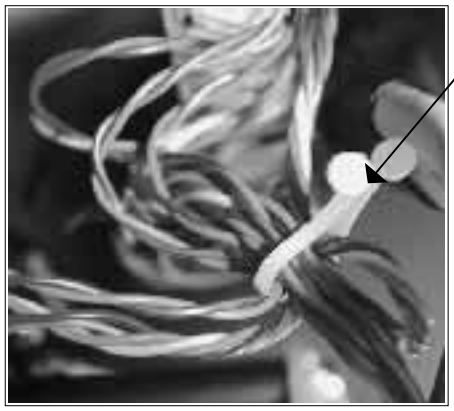


Fig. 6-30

Part 2

Part 2

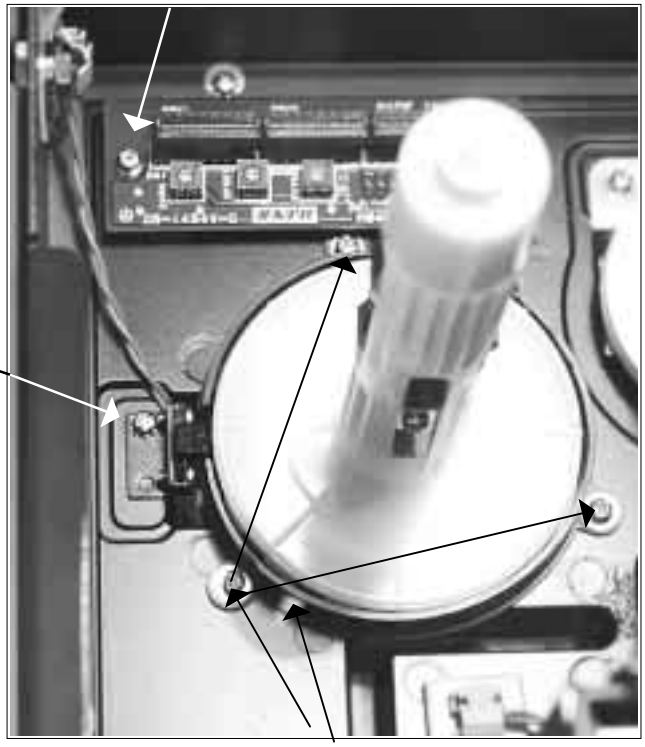
6-11 Replacing the Ribbon Motion Sensor



TWIST OPEN CABLE TIE

Fig. 6-31

REMOVE DIP SWITCH COVER (SHOWN REMOVED)



REMOVE MOUNTING SCREW

REMOVE (3) SCREWS AND RING

Fig. 6-32

UNPLUG SEN4 CONNECTOR FROM PCB

Fig. 6-33

PUSH CONNECTOR SEN4 THROUGH ACCESS HOLE

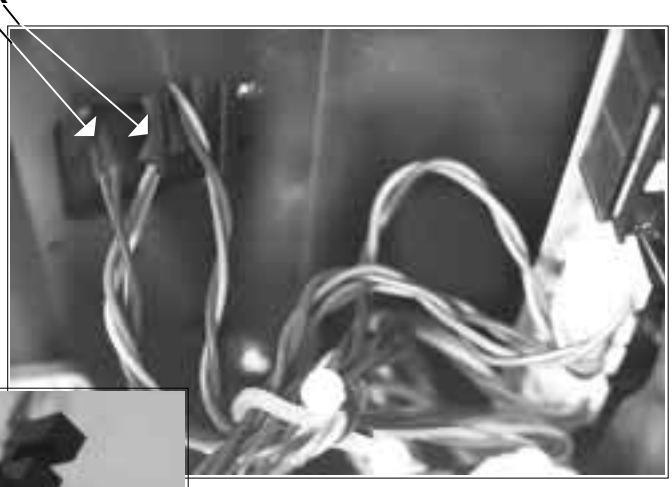
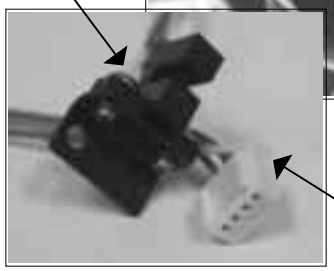


Fig. 6-34

(2) SCREWS ATTACHING SENSOR TO BRACKET



CONNECTOR TO PCB

Fig. 6-35

6-12A Replacing the Cover Open Switch For M-8485S/M8490S and M-8460S

To remove and replace the Cover Open Switch, perform the following steps:

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to mechanical and electrical sections. ***Fig. 6-35***
3.	Raise the lid on the mechanical side of the printer.
4.	Twist open cable tie. Unplug SEN 6 connector from the PCB. ***Fig. 6-36 & 6-37***
5.	Remove ferrite core filter (if attached) to SEN 5 & 6 and cut ties.
6.	Remove the screw securing the ribbon motion sensor and move the sensor just enough to allow the connector SEN 6 on the end of the sensor to slide through the access hole. ***Fig. 6-38 & 6-39***
7.	Remove (2) screws holding sensor to the cabinet side. ***Fig. 6-40***
8.	Replace sensor and reattach to the cabinet side. Feed sensor connector back through the access hole. Replace ties and reattach ferrite core filter if necessary to SEN 5 & 6.
9.	Reattach SEN 6 to PCB.
10.	Remount the ribbon motion sensor removed in Step 6.
11.	Close the printer cabinet and replace locking screw.
12.	Reconnect the power cable.

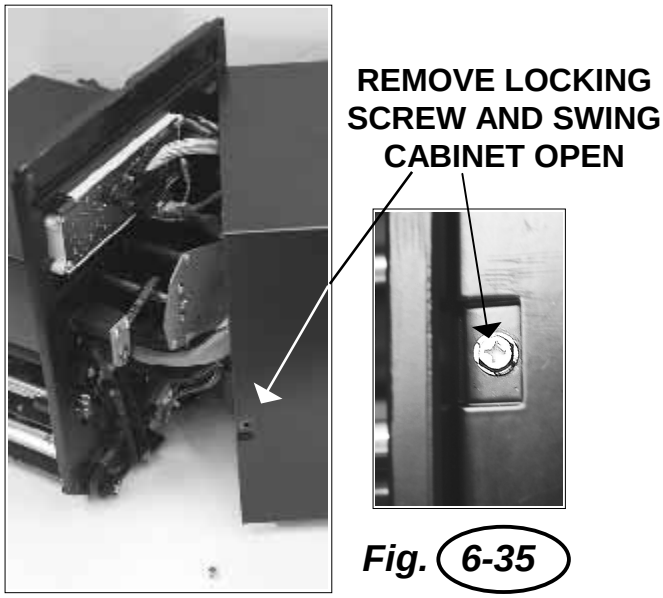


Fig. 6-35

Part 2

Part 2

6-12A Replacing the Cover Open Switch For M-8485S/M8490S and M-8460S

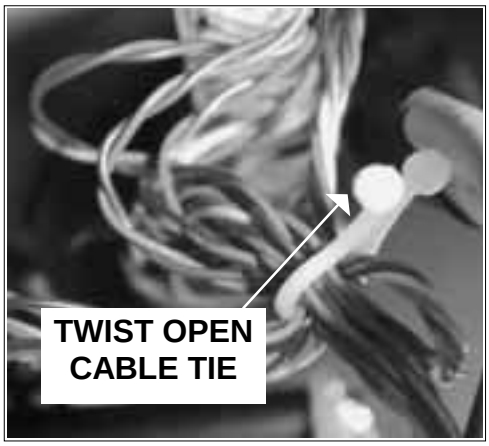
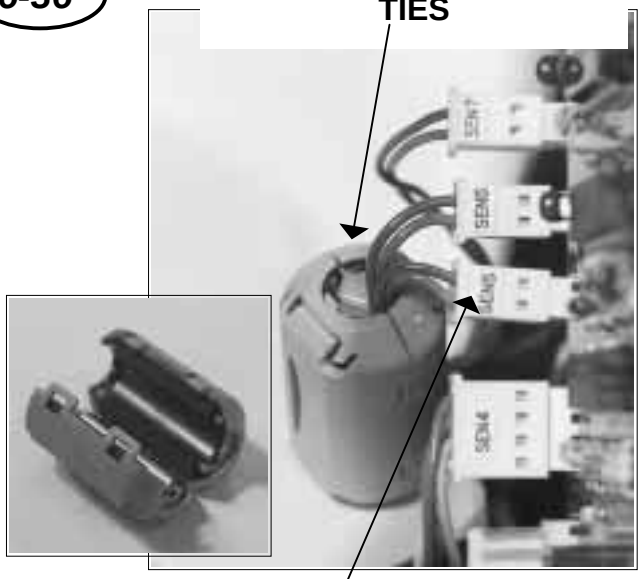


Fig. 6-36

REMOVE FERRITE CORE FILTER (IF ATTACHED) TO SEN 6 & 5 AND CUT CABLE TIES



UNPLUG SEN 6 CONNECTOR FROM PCB

Fig. 6-37

REMOVE MOUNTING SCREW FROM RIBBON MOTION SENSOR

Fig. 6-38

(2) SCREWS ATTACHING SENSOR TO CABINET

Fig. 6-40

PULL SEN 6 THROUGH ACCESS HOLE

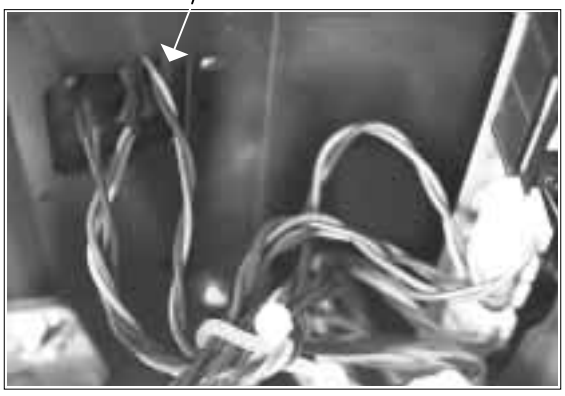


Fig. 6-39

6-12B Replacing the Cover Open Switch for M-8459S

To remove and replace the Cover Open Switch, perform the following steps:

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to mechanical and electrical sections. Position the printer so that the back side is resting on a flat surface and the access lid is facing up. ***Fig. 6-41***
3.	Raise the lid on the mechanical side of the printer.
4.	Snap off the cover from the Dip Switch Panel. ***Fig. 6-44***
5.	Remove (4) screws holding back plate to the chassis.
6.	In the electrical side, twist open cable tie. Unplug SEN 6 connector from the PCB. ***Fig. 6-42 & 6-43***
7.	Draw the connector through the access hole. ***Fig. 6-45***
8.	Remove (2) screws to detach sensor from cabinet side. ***Fig. 6-46***
9.	Replace sensor and reattach to the cabinet side. Feed sensor connector back through the access hole. Plug connector to SEN 6 on PCB.
10.	Replace the back plate to the chassis and replace dip switch cover.
11.	Close the printer cabinet and replace locking screw.
12.	Reconnect the power cable.

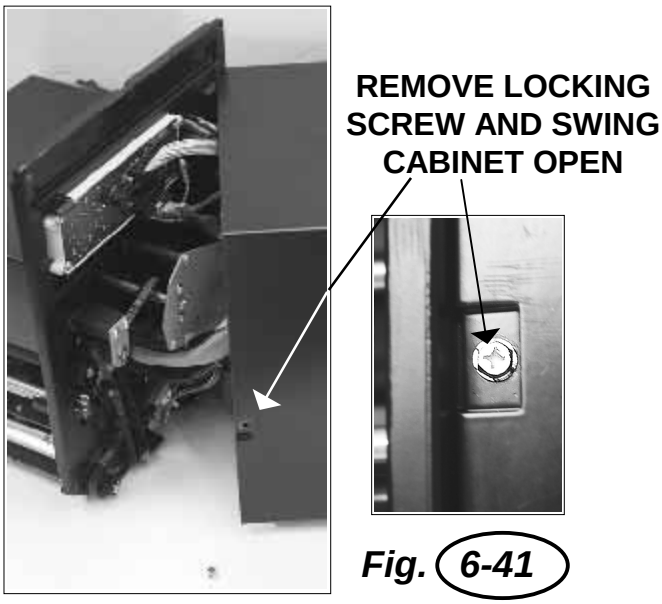


Fig. 6-41

Part 2

Part 2

6-12B Replacing the Cover Open Switch for M-8459S

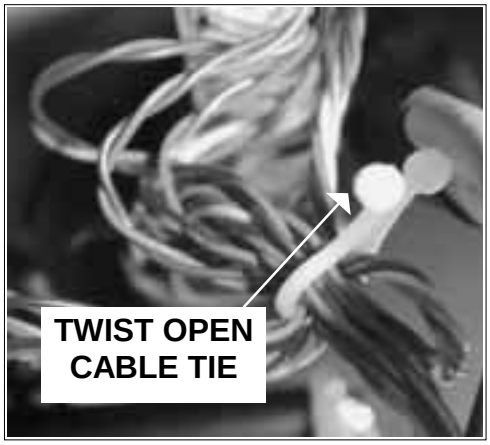


Fig. 6-42

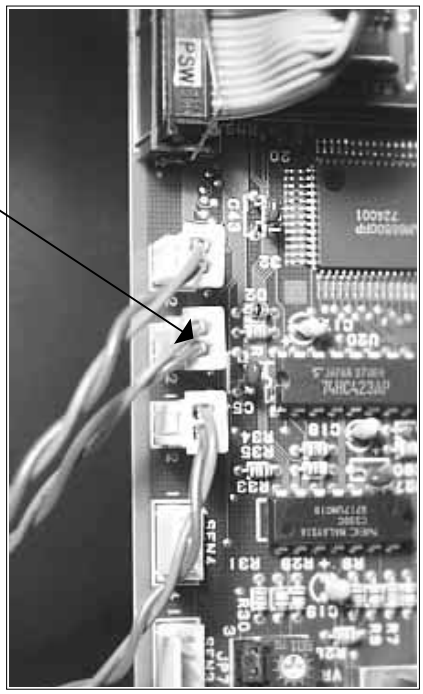


Fig. 6-43

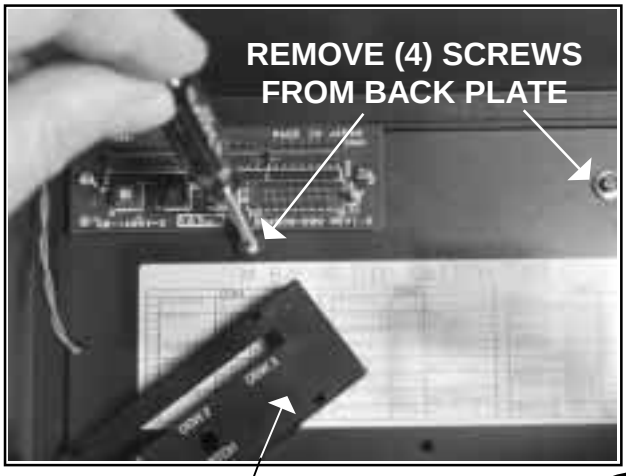


Fig. 6-44

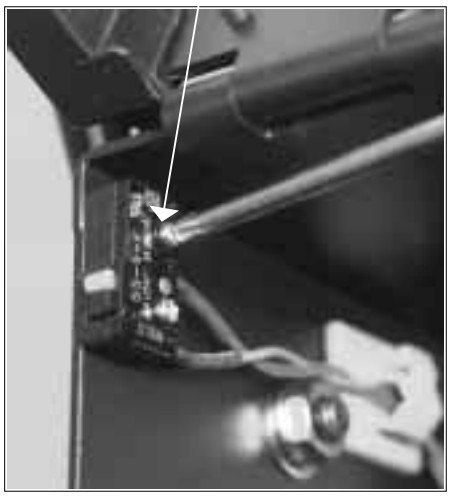


Fig. 6-46

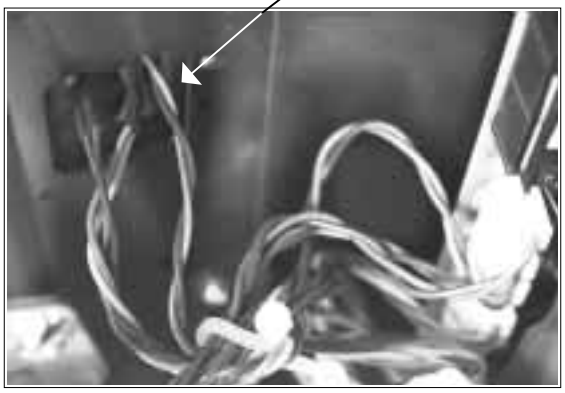
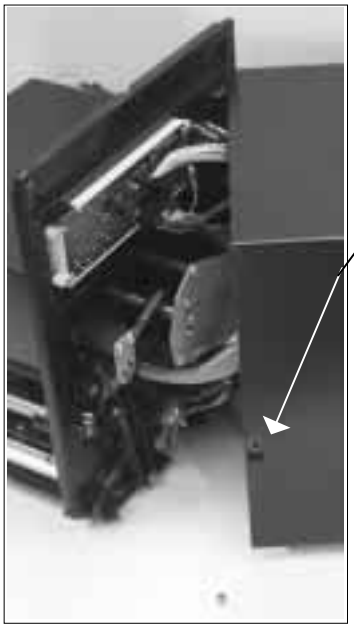


Fig. 6-45

6-13 Replacing the Head Open Switch

To remove and replace the Head Open Switch, perform the following steps:

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to mechanical and electrical sections. ***Fig. 6-47***
3.	Raise the lid on the mechanical side of the printer.
4.	Remove (2) screws holding sensor to the cabinet side. ***Fig. 6-48***
5.	Twist open cable holder and unsnap cable stay. Unplug SEN 5 connector from the PCB. ***Fig. 6-49 & 6-50***
6.	Detach ferrite core filter if one is attached to SEN 5 & 6 and cut ties.
7.	Pull the sensor back so that the connector SEN5 is drawn through the access opening. ***Fig. 6-43***
8.	Replace sensor and reattach to the cabinet side. Feed sensor connector back through the access hole. Replace ties and reattach ferrite core filter if necessary to SEN 5 & 6.
9.	Reattach SEN 5 to PCB.
10.	Close the printer cabinet and replace the locking screw.
11.	Reconnect the power cable.



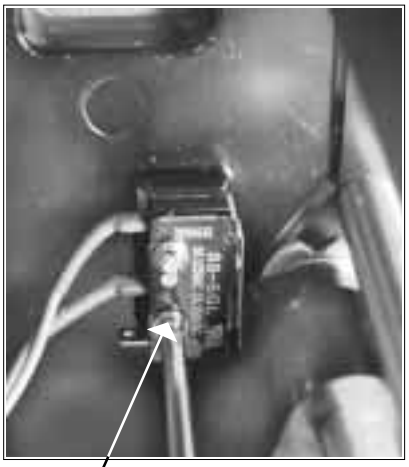
REMOVE LOCKING SCREW AND SWING CABINET OPEN

Fig. 6-47

Part 2

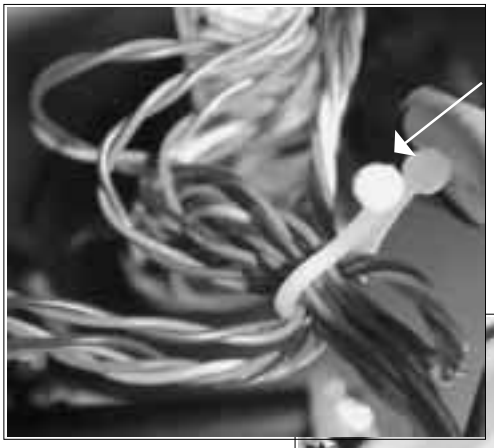
Part 2

6-13 Replacing the Head Open Switch

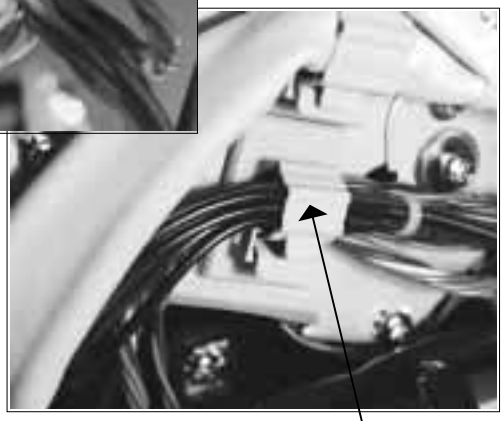


(2) SCREWS ATTACHING SENSOR TO CABINET

Fig. 6-48



TWIST OPEN CABLE TIE



UNSNAP CABLE HOLDER

Fig. 6-49

PULL SEN 5 CONNECTOR THROUGH ACCESS OPENING

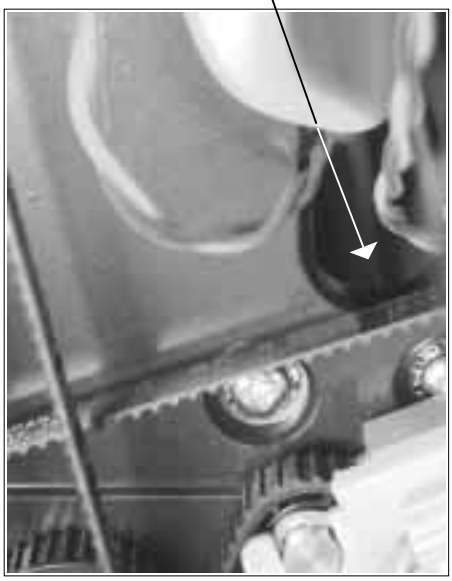
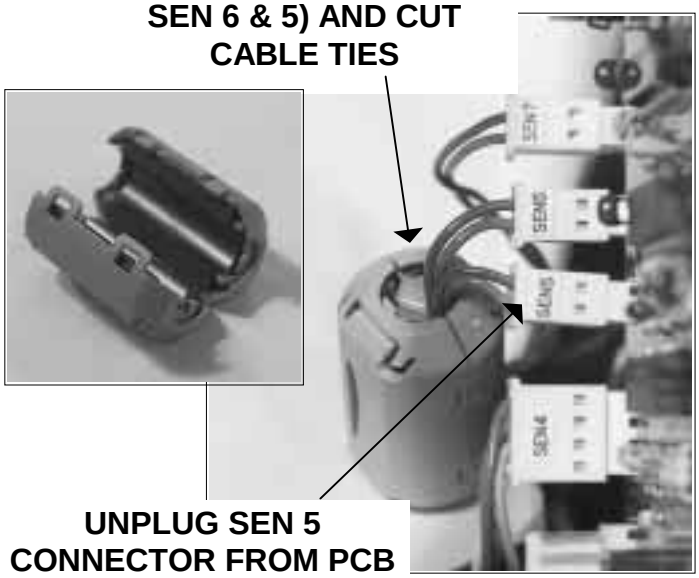


Fig. 6-51

REMOVE FERRITE CORE FILTER (IF ATTACHED) TO SEN 6 & 5) AND CUT CABLE TIES



UNPLUG SEN 5 CONNECTOR FROM PCB

Fig. 6-50

6-14A Replacing Label Gap Sensor Board (Bottom ½) and "Eye-Mark" Sensor (Reflective) Board for M-8460S

The bottom ½ of the Label Gap Sensor and the "Eye-Mark" Sensor is combined on one phenolic board. Access to replace is from the under side of the printer.

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to mechanical and electrical sections. Position the printer so that the back side is resting on a flat surface and the access lid is facing up. ***Fig. 6-52***
3.	Raise the lid.
4.	Remove (4) screws holding the bottom cover enclosing the sensors. ***Fig. 6-53***
5.	Remove (2) screws holding the Label Gap Sensor to the frame. ***Fig. 6-54***
6.	Unsnap cable holders (2) places and unplug SEN1 from the PCB. ***Fig. 6-55***
7.	Pull the sensor back so that the connector SEN1 is drawn through the frame opening.
8.	Remove and replace the sensor module. Reattach SEN1 to the PCB.
9.	Replace parts previously removed in Steps 4-6.
10.	Close the printer cabinet and replace the locking screw. Close the lid.
11.	Reconnect the power cable.

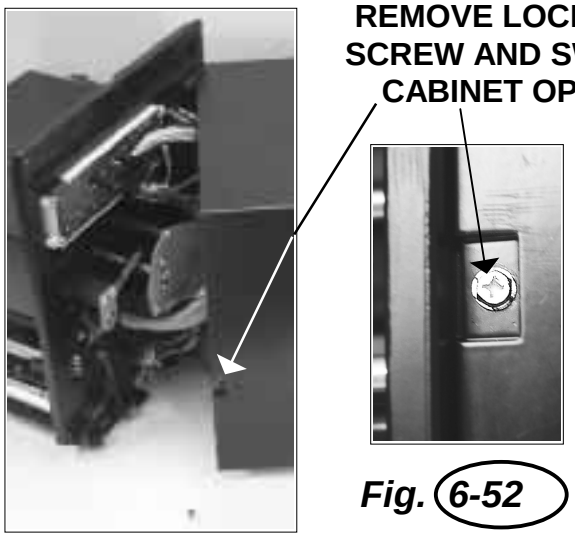


Fig. 6-52

Part 2

6-14A Replacing Label Gap Sensor Board (Bottom ½) and "Eye-Mark" Sensor (Reflective) Board for /M-8460S

Part 2

Fig. 6-53

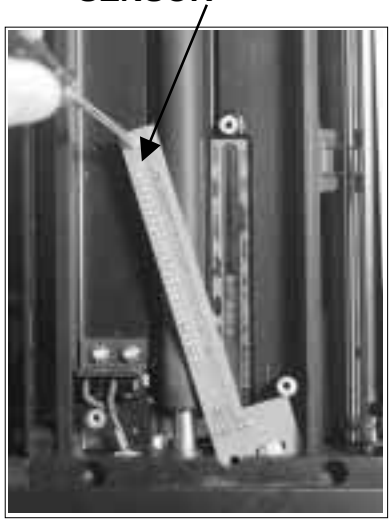


Fig. 6-54

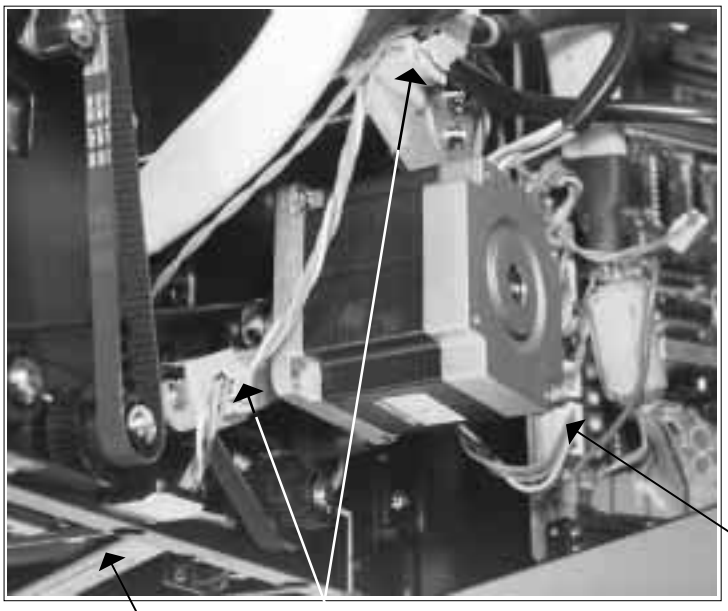


Fig. 6-55

6-14B Replacing Label Gap Sensor Board (Bottom ½) and "Eye-Mark" Sensor (Reflective) Board for M-8459S/M-8485S/M-8490S

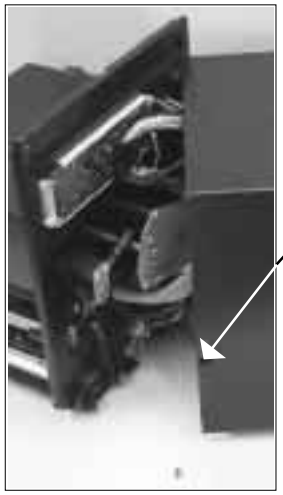
The bottom ½ of the Label Gap Sensor and the "Eye-Mark" Sensor is combined on one phenolic board. Access to replace is from the under side of the printer.

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to mechanical and electrical sections. Position the printer so that the back side is resting on a flat surface and the access lid is facing up. ***Fig. 6-56***
3.	Raise the lid on the mechanical side of the printer.
4.	Unfasten the thumbscrew and swing open the nip roller assembly. ***Fig. 6-57***
5.	Remove (2) E-Rings from the handle shaft. ***Fig. 6-58***
6.	Pull handle up and then slightly down to expose the pin holding the handle to the shaft. Remove pin and handle from the shaft. ***Fig. 6-59***
7.	Push down lever plate carefully (held in place under spring tension) so that the end of the top lever clears the end of the frame extender. Once the lever plate is disengaged, two screws holding the cover plate to the frame will be accessible. ***Fig. 6-60 & 6-61***
8.	Slide screwdriver under the nip roller assembly for access to screws. Loosen (2) screws to detach cover plate enclosing the board with the bottom ½ of the Label Gap Sensor and the "I-Mark" Sensor. ***Fig. 6-62***
9.	Remove (2) screws, (2) spacers and (1) plastic shield holding the Label Gap Sensor to the frame. ***Fig. 6-63***
10.	Untwist the cable tie and unsnap two cable holders. Unplug SEN1 from the PCB. ***Fig. 6-64 & 6-65***
11.	Pull the sensor back so that the connector SEN1 is drawn through the frame opening.
12.	Remove and replace the sensor module. Reattach SEN1 to the PCB.
13.	Replace parts previously removed in Steps 8-10.
14.	Rotate the lever plate back into position. Refer to Step 7.
15.	Replace the handle and pin removed in Step 6.
16.	Replace (2) E-Rings removed in Step 5.
17.	Close the printer cabinet and replace the locking screw. Close the lid.
18.	Reconnect the power cable.

Part 2

Part 2

6-14B Replacing Label Gap Sensor Board (Bottom ½) and "Eye-Mark" Sensor (Reflective) Board for M-8459S/M-8485S/M-8490S



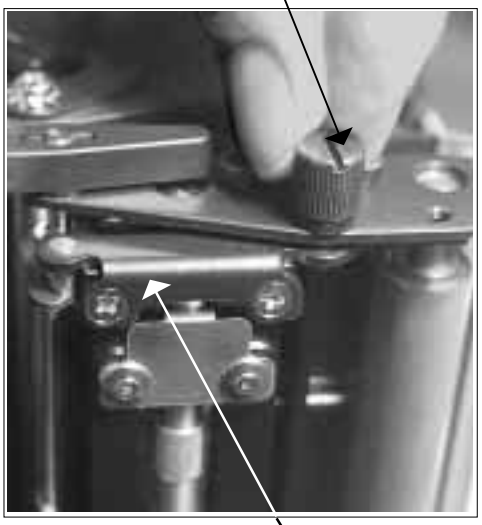
REMOVE LOCKING SCREW AND SWING CABINET OPEN

OPEN ACCESS LID

BACK SIDE OF CABINET PLACED DOWN ON FLAT SURFACE

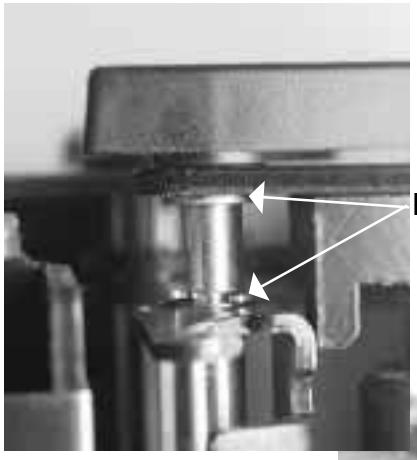
Fig. 6-56

UNFASTEN THUMB SCREW

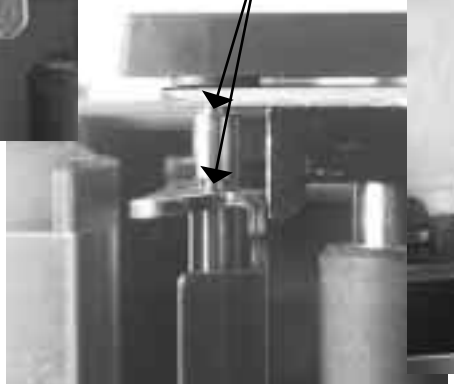


SWING OPEN NIP ROLLER ASSEMBLY

Fig. 6-57

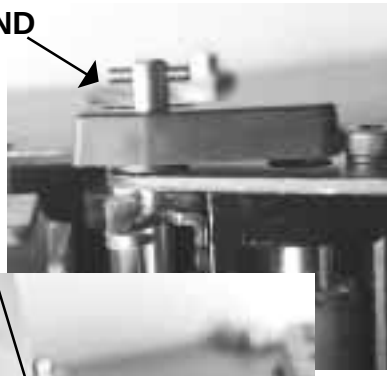


REMOVE (2) E-RINGS FROM SHAFT



Figs. 6-58

PULL HANDLE UP, THEN DOWN, TO EXPOSE AND REMOVE PIN



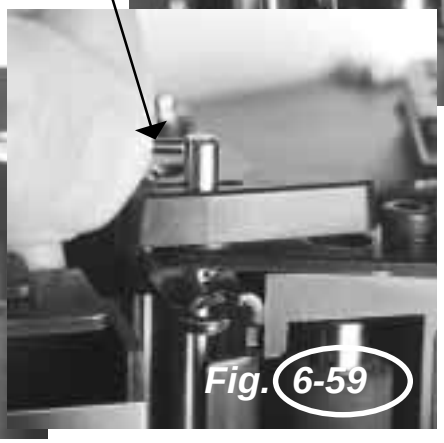
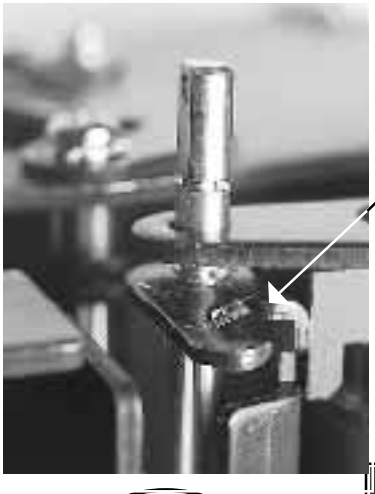
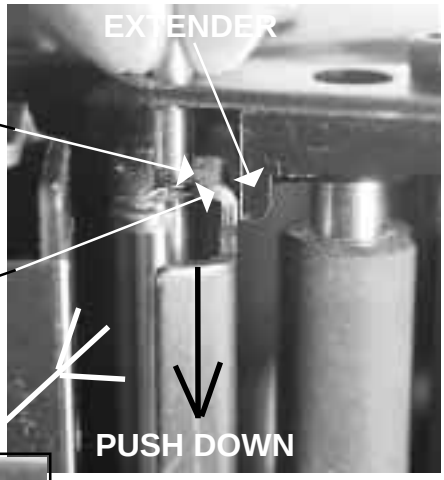


Fig. 6-59

6-14B Replacing Label Gap Sensor Board (Bottom ½) and "Eye-Mark" Sensor (Reflective) Board for M-8459S/M-8485S/M-8490S

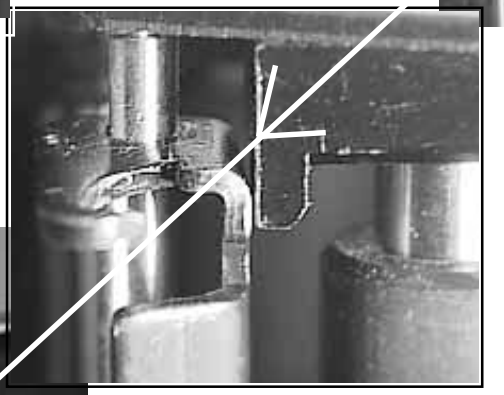


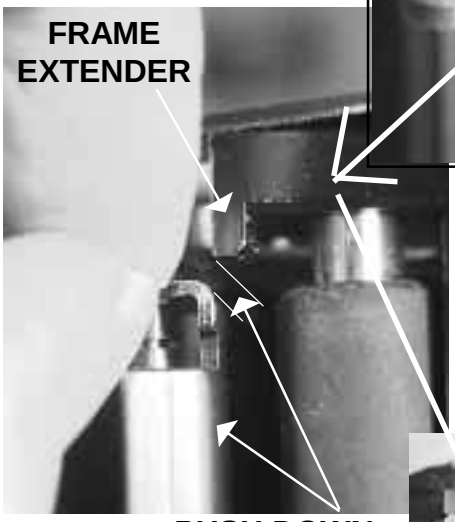


PUSH DOWN THE LEVER PLATE

END OF TOP LEVER (PART OF LEVER PLATE) TO CLEAR FRAME EXTENDER

Fig. *6-60*

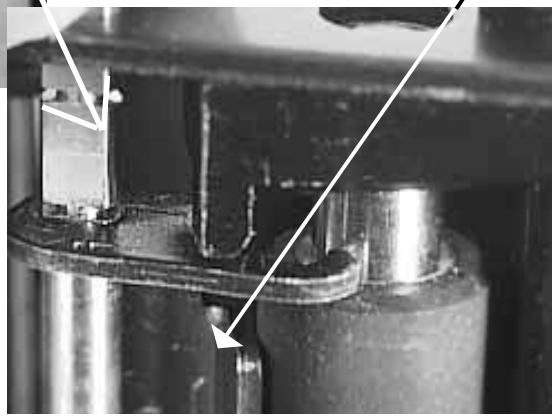




Figs *6-61*

TOP LEVER SHOWN IN FINAL ROTATED POSITION (NO LONGER UNDER SPRING TENSION) FOR ACCESS TO COVER PLATE SCREWS

PUSH DOWN TO CLEAR



Part 2

6-14B Replacing Label Gap Sensor Board (Bottom ½) and "Eye-Mark" Sensor (Reflective) Board for M-8459S/M-8485S/M-8490S

Part 2

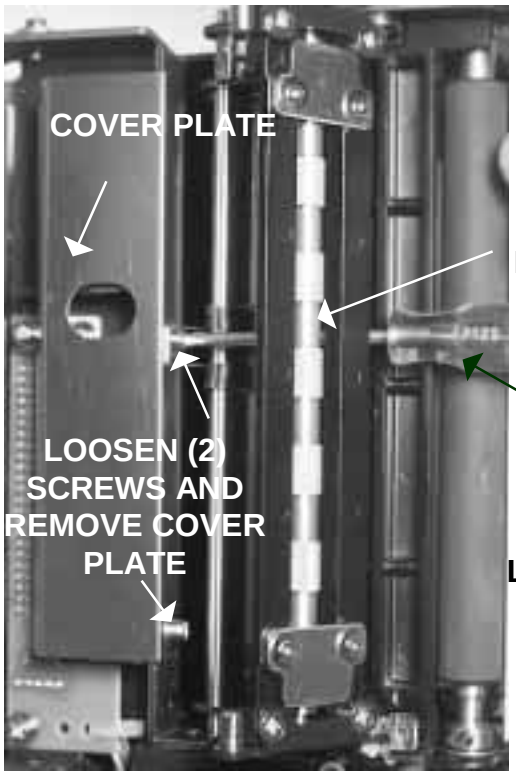


Fig. 6-62

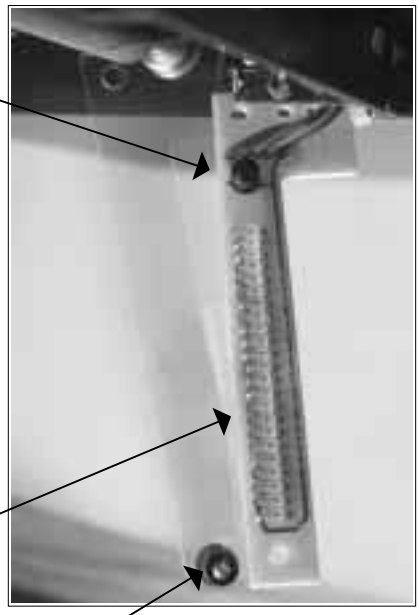


Fig. 6-63

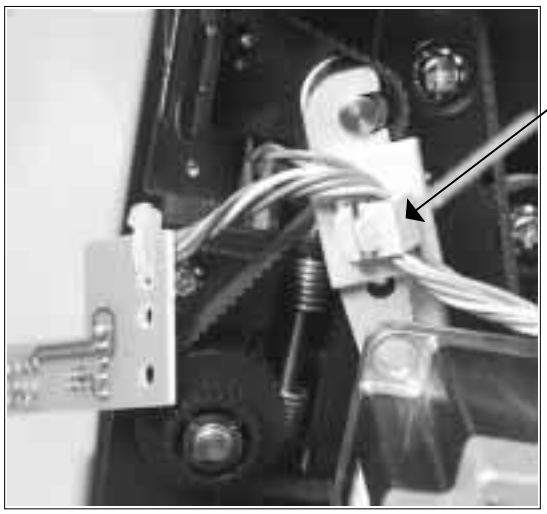


Fig. 6-64

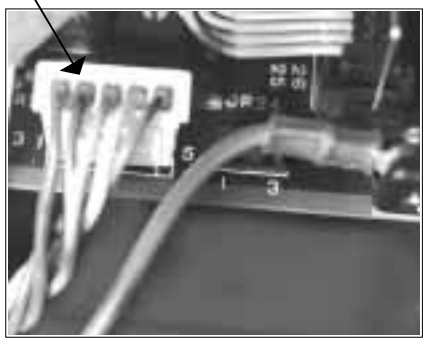


Fig. 6-65

6-15 Replacing the Label Gap Sensor (Top ½)

Access to top ½ of the Label Gap Sensor replace is through the front of the printer.

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to inside the printer. ***Fig. 6-65***
3.	Raise the lid on the mechanical side of the printer. ***Fig. 6-66***
4.	Remove (2-3) screws from side of media hold down. Carefully wiggle off cover to expose sensor module. ***Fig. 6-67 & 6-68***
5.	Insert screwdriver between head components and platen to remove (2) screws holding the sensor module to the bottom portion of the media hold down frame. ***Fig. 6-69, & 6-70***
6.	Remove (2) screws holding the sensor to the sensor bracket. ***Fig. 6-71 & 6-72***
7.	Unsnap the cable holder and unplug SEN2 from the PCB. ***Fig. 6-73 & 6-74.***
8.	Pull the sensor back so that the connector SEN2 is drawn through the access opening. ***Fig. 6-75***
9.	Remove and replace the sensor module. Feed sensor connector back through the access opening and reattach SEN2 to the PCB.
10.	Replace parts previously removed.
11.	Close the printer cabinet and replace the locking screw.
12.	Reconnect the power cable.

Part 2

Part 2

6-15 Replacing the Label Gap Sensor (Top ½)

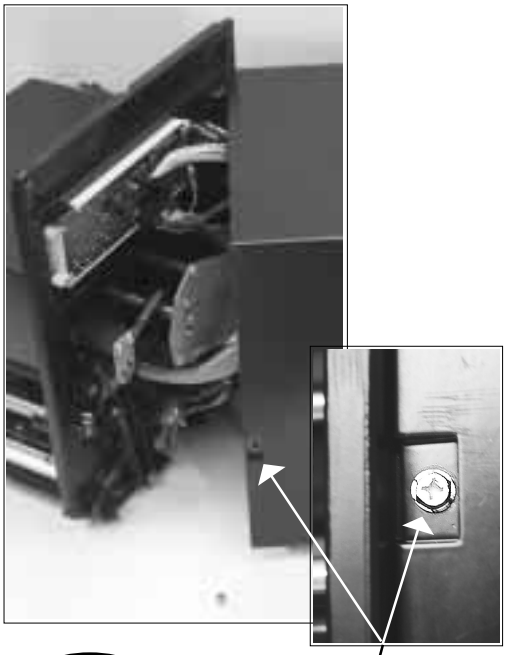


Fig. 6-65

REMOVE LOCKING SCREW AND SWING CABINET OPEN

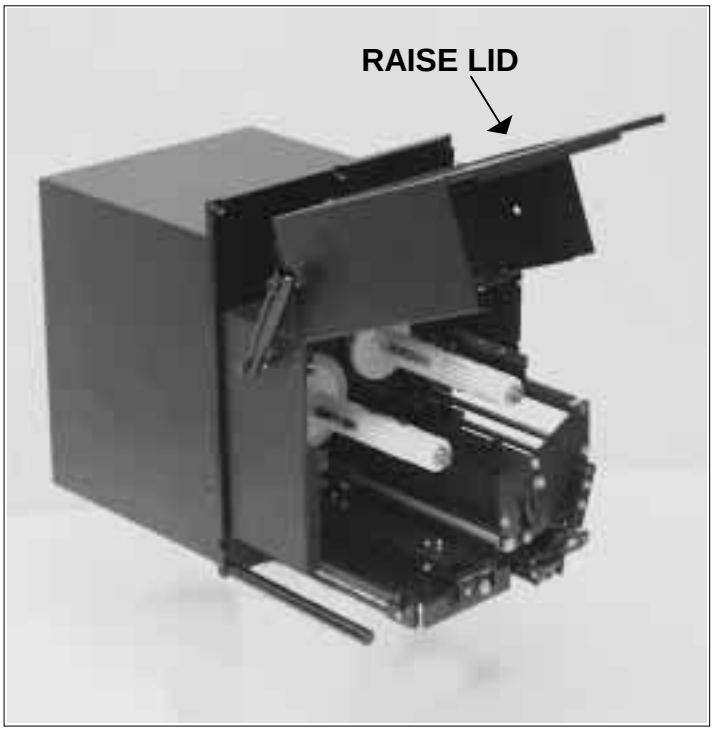


Fig. 6-66

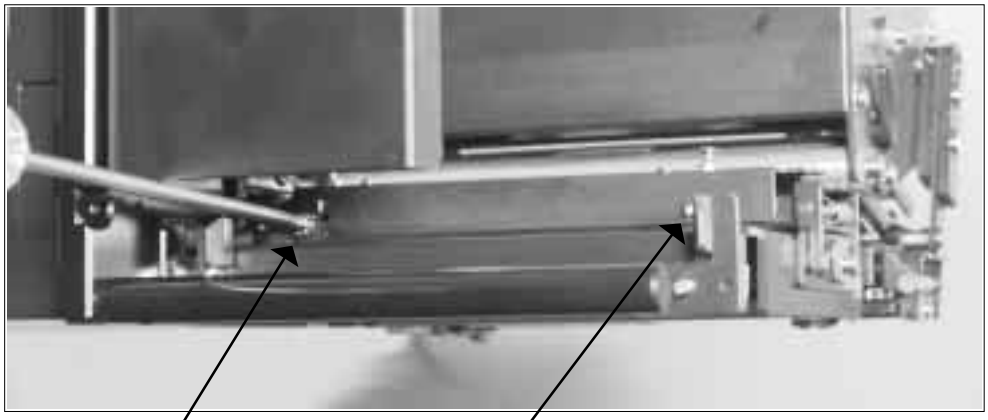


Fig. 6-67

REMOVE (2-3) SCREWS AND WIGGLE OFF MEDIA HOLD DOWN COVER

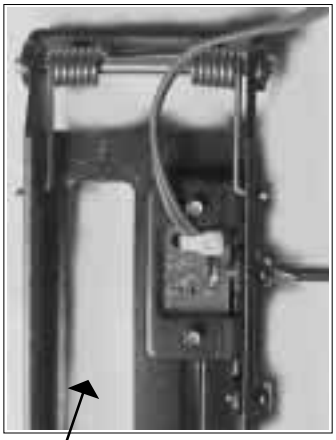


Fig. 6-68

MEDIA HOLD DOWN TOP COVER SHOWN REMOVED

6-15 Replacing the Label Gap Sensor (Top ½)

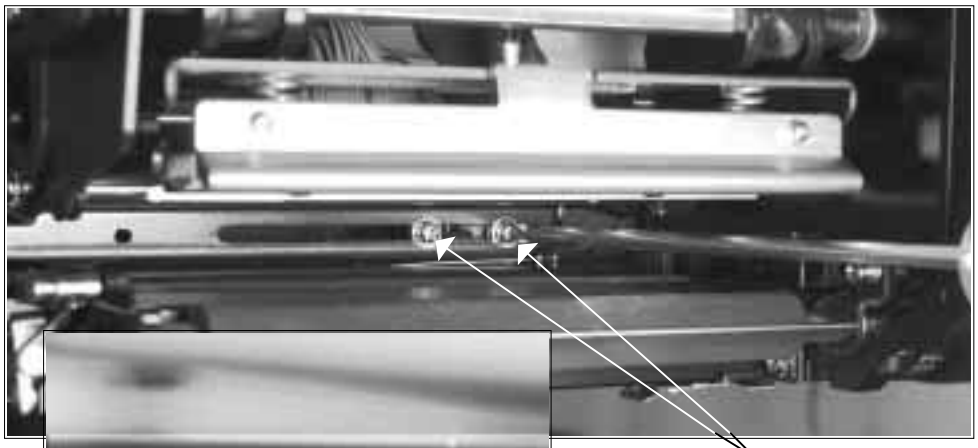


Fig. 6-69

CAREFULLY SLIDE SCREW DRIVER THROUGH SPACE AND REMOVE (2) SCREWS

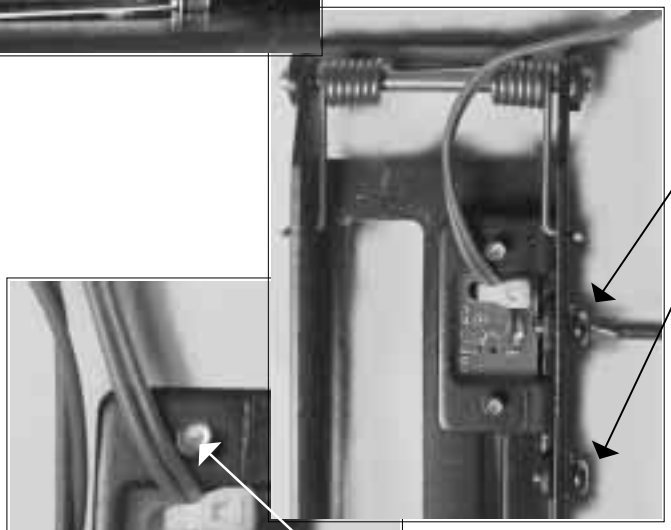


Fig. 6-70

SENSOR

REMOVE (2) SCREWS AND LIFT LABEL GAP SENSOR FROM BRACKET

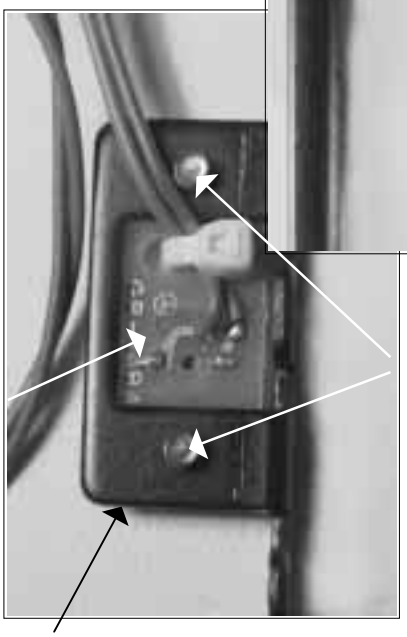


Fig. 6-71

SENSOR BRACKET

Part 2

Part 2

6-15 Replacing the Label Gap Sensor (Top ½)

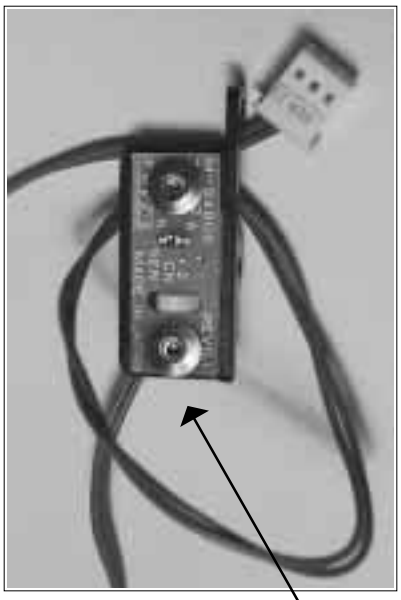


Fig. 6-72

LABEL GAP SENSOR (TOP ½) SHOWN REMOVED FROM THE SENSOR BRACKET

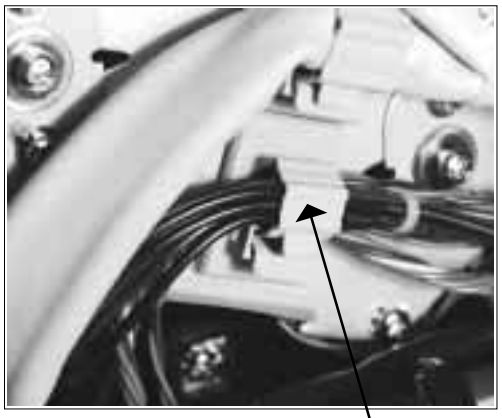
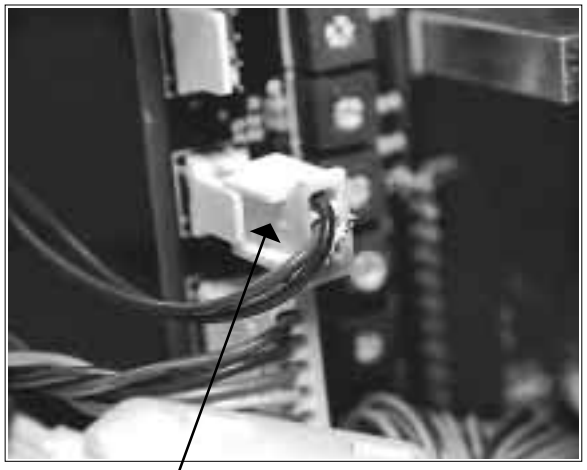


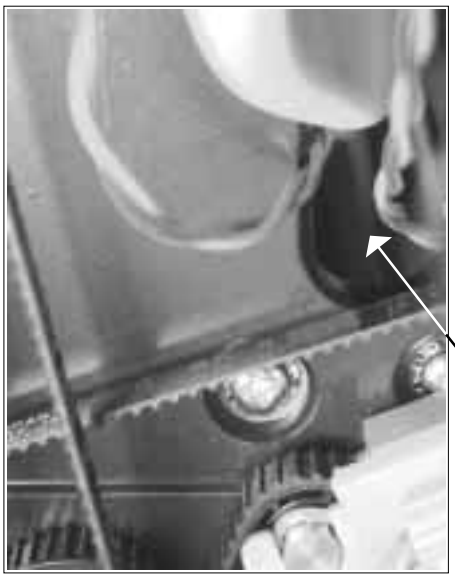
Fig. 6-73

UNSNAP CABLE HOLDER



UNPLUG SEN2 CONNECTOR FROM PCB

Fig. 6-74

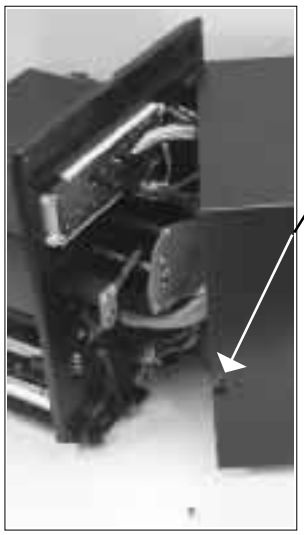


PULL SEN2 CONNECTOR THROUGH ACCESS OPENING

Fig. 6-75

6-16A Replacing the Label Out Sensor for M-8460S

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to the inside of the printer. Position the printer so that the back side is resting on a flat surface and the access lid is facing up. ***Fig. 6-76***
3.	Raise the lid.
4.	Remove (4) screws holding the bottom cover enclosing the sensors. ***Fig. 6-77***
5.	Remove (2) screws holding the Label Out Sensor to the frame. ***Fig. 6-78***
6.	Unsnap cable holder and unplug SEN7 from the PCB. ***Fig. 6-79 & 6-80***
7.	Pull the sensor back so that the connector SEN7 is drawn through the frame opening.
8.	Remove and replace the sensor module. Reattach SEN7 to the PCB.
9.	Replace parts previously removed.
10.	Close the printer cabinet and replace the locking screw. Close the lid.
11.	Reconnect the power cable.



REMOVE LOCKING SCREW AND SWING CABINET OPEN

Fig. 6-76

OPEN ACCESS LID

BACK SIDE OF CABINET PLACED DOWN ON FLAT SURFACE

6-16A Replacing the Label Out Sensor for M-8460S

REMOVE (4) SCREWS HOLDING BOTTOM COVER

Fig. 6-77

REMOVE (2) SCREWS HOLDING LABEL OUT SENSOR

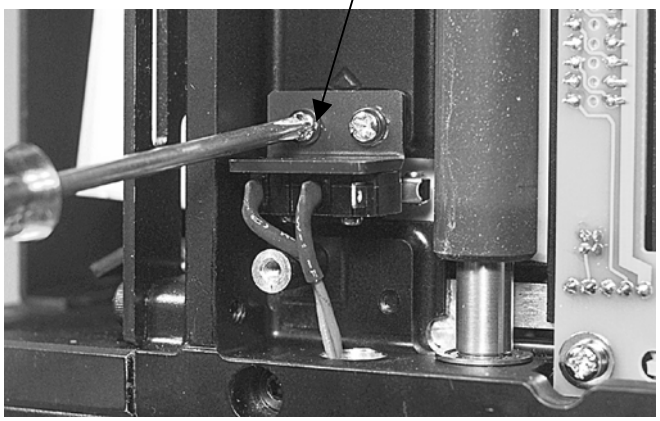


Fig. 6-78

UNSNAP CABLE HOLDER

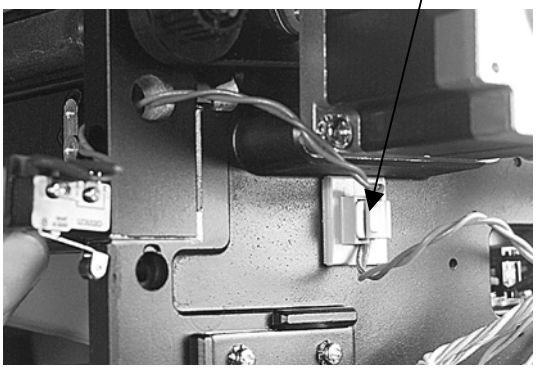


Fig. 6-79

UNPLUG SEN7 CONNECTOR FROM PCB

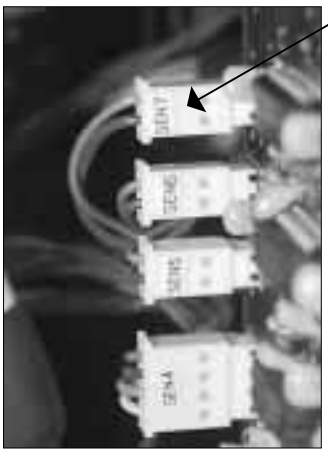
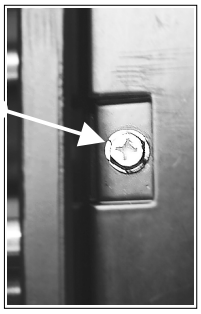


Fig. 6-80

6-16B Replacing the Label Out Sensor for M-8459S/M-8485S/ M-8490S

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to the inside of the printer ***Fig. 6-81***
3.	Raise the lid.
4.	Release and swing open the nip roller assembly. ***Fig. 6-82***
5.	Loosen (2) screws to detach cover plate.
6.	Remove (1) screw holding the Label Out Sensor to the frame. ***Fig. 6-83, & 6-84***
7.	Remove (2) screws holding the sensor module to the bracket. ***Fig. 6-85***
8.	Unsnap cable holder and unplug connector SEN7 from the PCB. ***Fig. 6-86***
9.	Draw the sensor cable (connector attached) through the clearance hole in the frame.
10.	Remove and replace the sensor module. Reattach connector SEN7 to the PCB.
11.	Replace parts previously removed.
12.	Reconnect the power cable.

Part 2



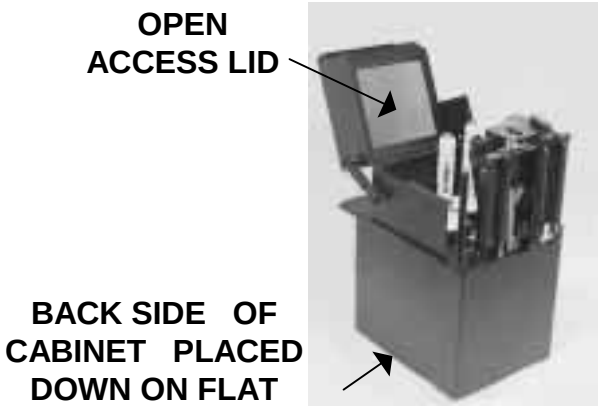


Fig. 6-81

Part 2

6-16B Replacing the Label Out Sensor for M-8459S M-8485S/ M-8490S

SWING OPEN THE NIP ROLLER ASSEMBLY

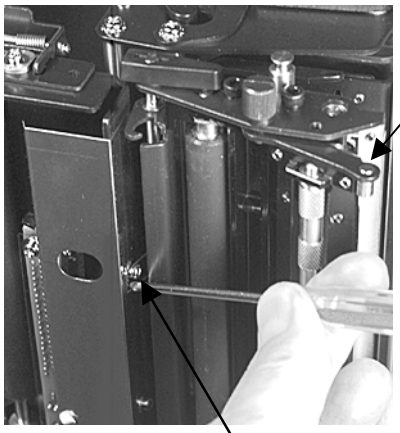


Fig. 6-82

LOOSEN (2) SCREWS AND REMOVE COVER PLATE

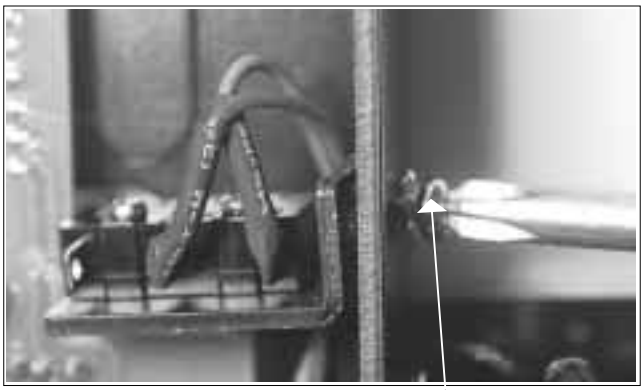


Fig. 6-83

REMOVE (1) SCREW TO DETACH LABEL OUT SENSOR FROM FRAME

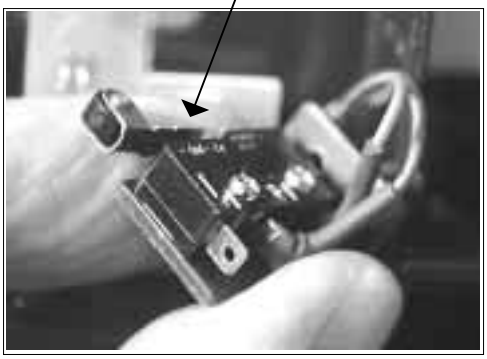
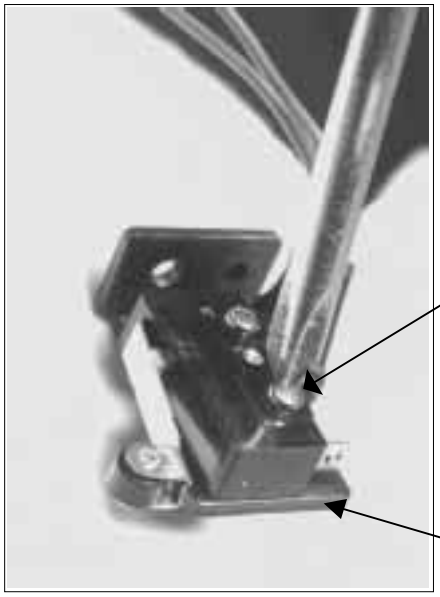


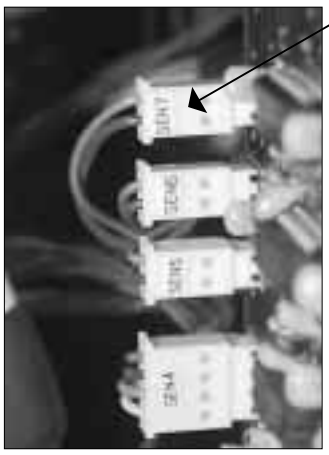
Fig. 6-84



REMOVE (2) SCREWS TO DETACH SENSOR MODULE FROM BRACKET

BRACKET

Fig. 6-85



UNPLUG SEN7 CONNECTOR FROM PCB

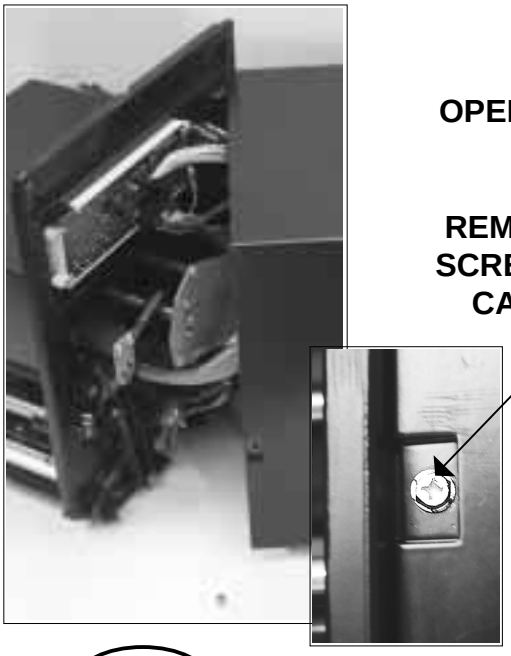
Fig. 6-86

6-17 Replacing the Platen

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Remove locking screw from the side of the cabinet to allow the printer to swing open for access to the inside of the printer. Place the printer so that the back side of the unit is resting on a flat surface and the access lid is facing up. Raise the lid. ***Fig. 6-87 & 6-88***
3.	Unlatch head lock lever if engaged. ***Fig. 6-89***
4.	Release the nip roller latch and swing open the nip roller assembly. ***Fig. 6-89***
5.	Unfasten the thumb screw and remove the nip roller assembly. ***Fig. 6-89 & 6-90***
6.	Remove (2) Allen screws attaching bracket to platen frame. ***Fig. 6-91***
7.	Remove (4) Allen screws attaching cradle frame to chassis. ***Fig. 6-92***
8.	Reposition printer for access to the motor. Loosen (2) motor mounting screws to free belts from platen and feed rollers. ***Fig. 6-93***
9.	Remove (1) Allen screw which holds one side of the peel bar to the small bracket and is attached to the chassis. ***Fig. 6-94***
10.	Carefully separate the cradle frame containing the platen and components from the chassis. The peel bar will still be attached on one end to the cradle frame. CAUTION! Be careful of the cable connections which are attached. ***Fig. 6-95***
11.	Remove “E” clip from the end of the shaft which holds a stepped gear to the end of the platen shaft. Push shaft slightly back into the gear so that the end of support bearing will clear the cradle. Repeat this step for the feed roller. ***Fig. 6-96***
12.	Remove Allen screw to dislodge the peel bar from the bracket which attaches to the cradle frame. ***Fig. 6-97***
13.	Push shaft slightly forward so that the end of the support bearing will clear cradle frame. Platen and components can now be easily separated. ***Fig. 6-98 & 6-99***
14.	Replace the platen roller and reattach the components as necessary.
15.	Reassemble parts previously removed.
16.	Remount the motor and adjust belt tension as outlined in Section 5-6.
17.	Close the printer and replace the locking screw.
18.	Reconnect the power cable.

Part 2

6-17 Replacing the Platen



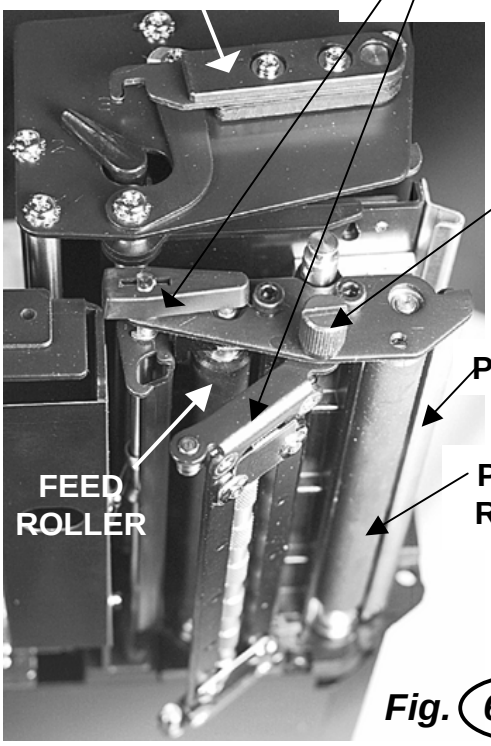
REMOVE LOCKING SCREW AND SWING CABINET OPEN

Fig. 6-87

OPEN ACCESS LID

BACK SIDE OF CABINET DOWN OF FLAT SURFACE

Fig. 6-88



UNLATCH HEAD LOCK LEVER

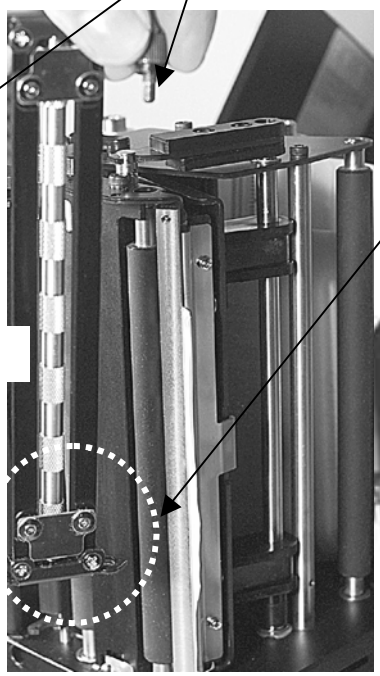
RELEASE THE NIP ROLLER LATCH AND SWING OPEN THE NIP ROLLER ASSEMBLY

PEEL BAR

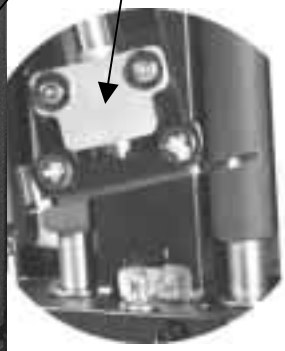
FEED ROLLER

PLATEN ROLLER

Fig. 6-89



UNFASTEN AND REMOVE THUMB



REMOVE NIP ROLLER ASSEMBLY

Fig. 6-90

6-17 Replacing the Platen

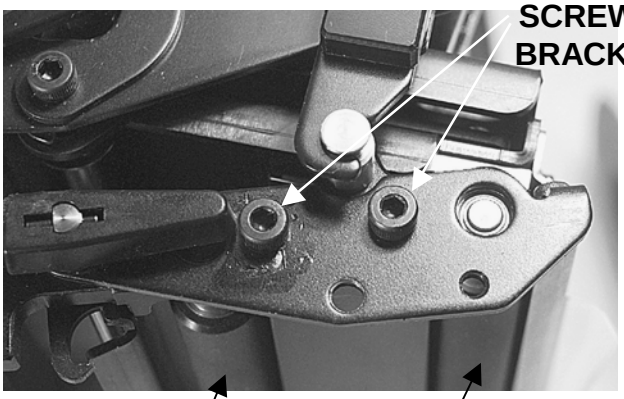


Fig. 6-91

Fig. 6-92

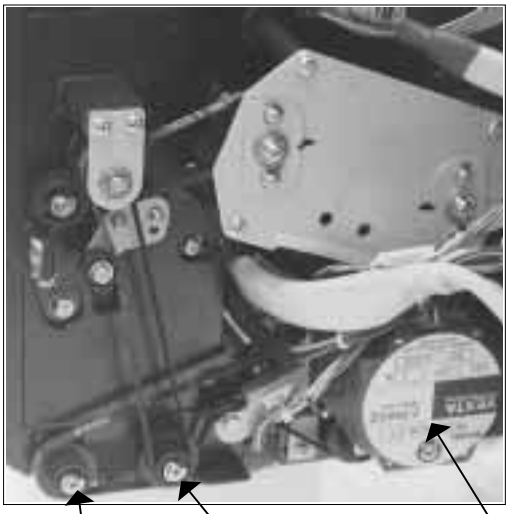


Fig. 6-93

Part 2

Part 2

6-17 Replacing the Platen

NOTE: PLATEN AND FEED ROLLERS ARE IDENTICAL)

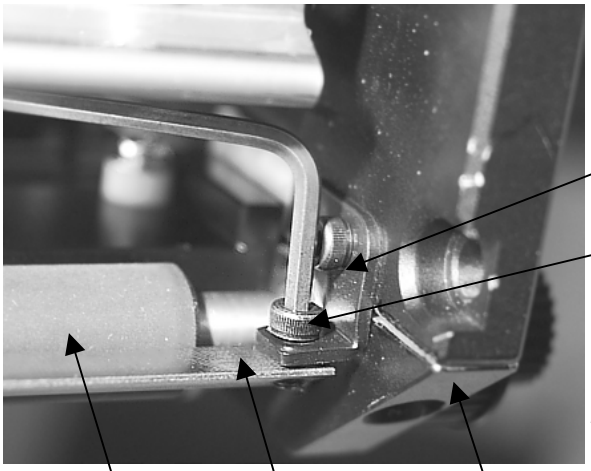


Fig. 6-94

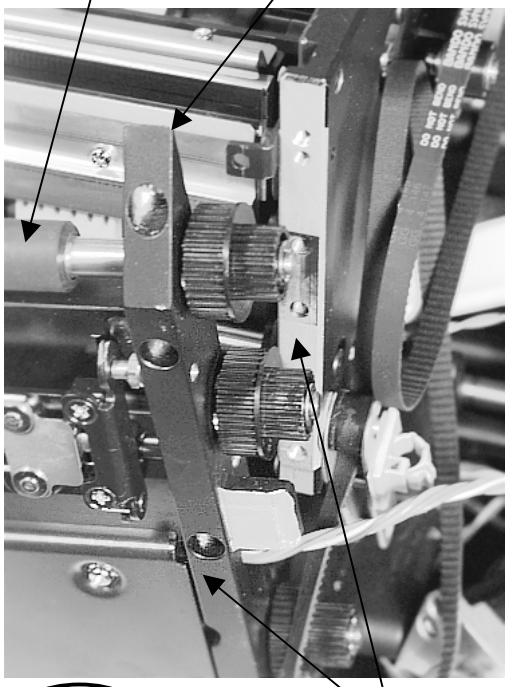


Fig. 6-95

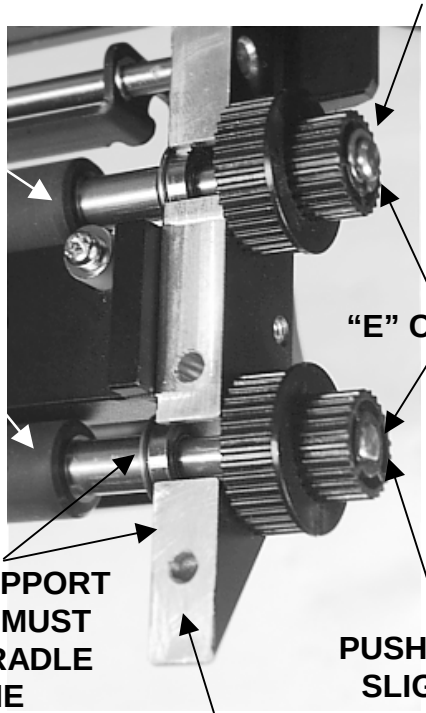


Fig. 6-96

6-17 Replacing the Platen

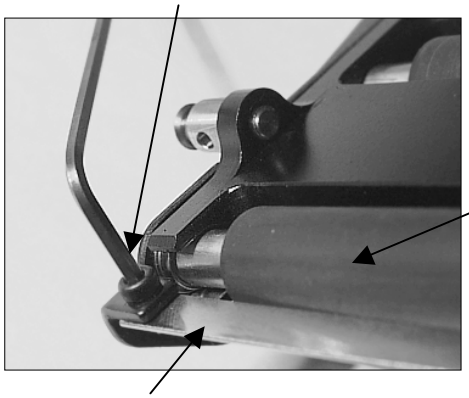


Fig. 6-97

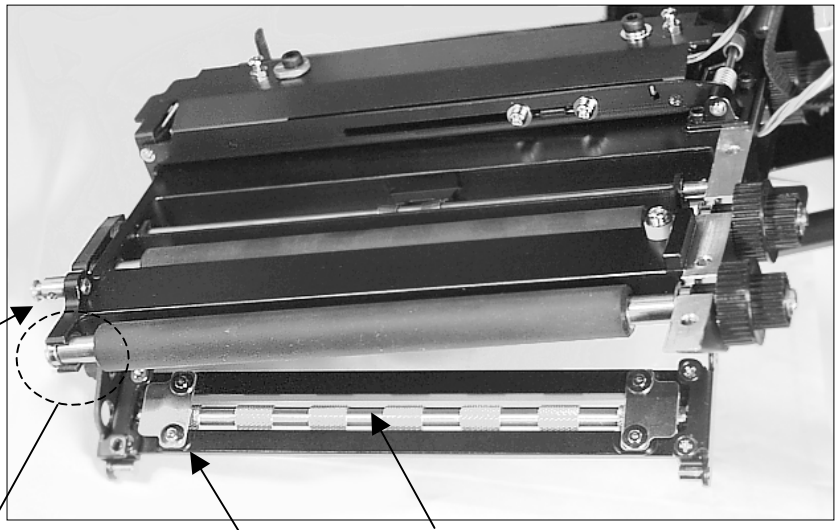


Fig. 6-98

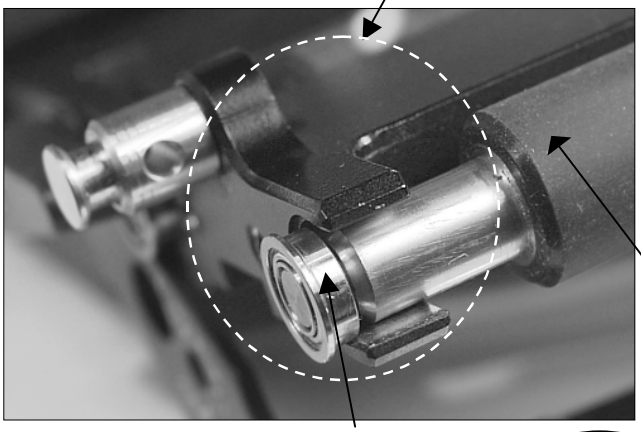


Fig. 6-99

Part 2

6-18A Replacing the Print Head for M-8460S

The print head can be easily replaced. No critical adjustments are required. Before replacing the print head, check the head counter values by printing a test pattern.

To remove and replace the print head perform the following steps:

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Open the access lid.
3.	Engage the head lock lever and remove (2) stud screws holding the head bracket to the print head. ***Fig. 6-100***
4.	Disengage the head lock lever and drop down the head. ***Fig. 6-101***
5.	Insert your forefinger (or flat blade screwdriver) through the access opening and dislodge the print head data cable and the print head power cable from the print head. ***Fig. 6-102***
6.	Install the new print head by reconnecting the print head data cable and the print head power cable to the print head. ***Fig. 6-105***
7.	Engage the head lock lever and position the print head so that the alignment pins seat into the head recesses. ***Fig. 6-103***
8.	Insert the (2) stud screws and tighten securely.
9.	Close the printer and replace the locking screw.
10.	Close the lid and reconnect the power cable.

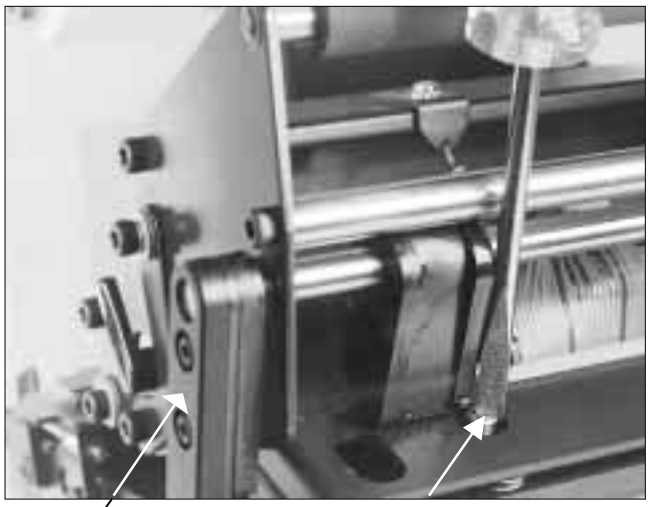
Before returning the printer to normal service, you should perform the following steps:

- Head Counter Clear
- Confirm that the head cables are connected and do not touch the head. Also confirm that you can open and close the head without restriction and that the ribbon guide plate adjustment is correct.
- Print test pattern.

CAUTION: Do not remove or loosen the two screws on either side of the center solder connection. Fig. 6-104

CAUTION: Head is very fragile and can be easily scratched so handle carefully.

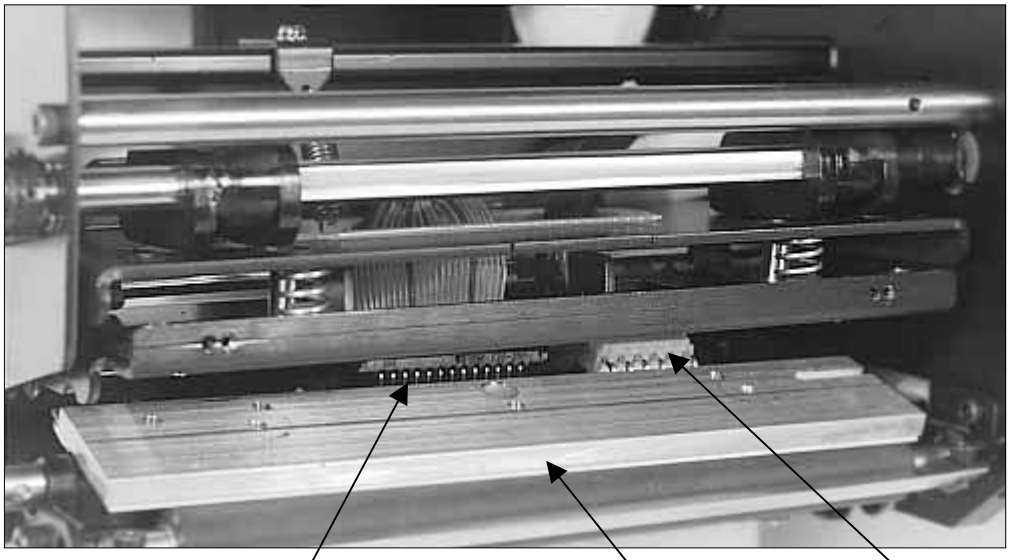
6-18A Replacing the Print Head for M-8460S



REMOVE (2) STUD SCREWS

HEAD LOCK LEVER ENGAGE / DISENGAGE

Fig. 6-100



DATA CABLE

PRINT HEAD (SHOWN IN DROPPED POSITION)

POWER CABLE

Fig. 6-101

Part 2

Part 2

6-18A Replacing the Print Head for M-8460S

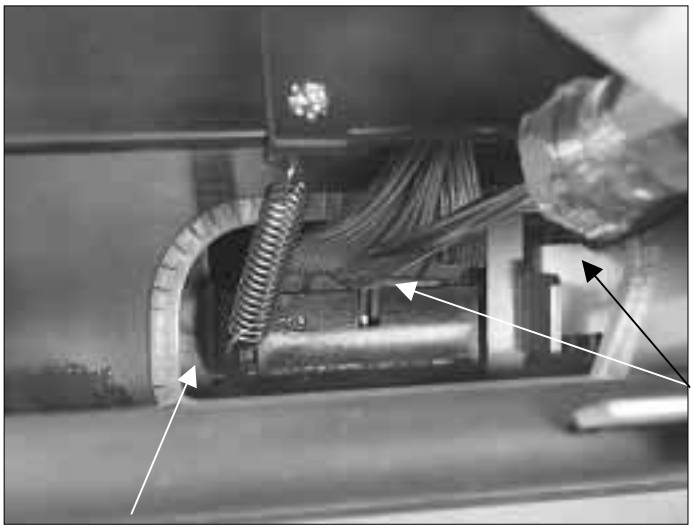


Fig. 6-102

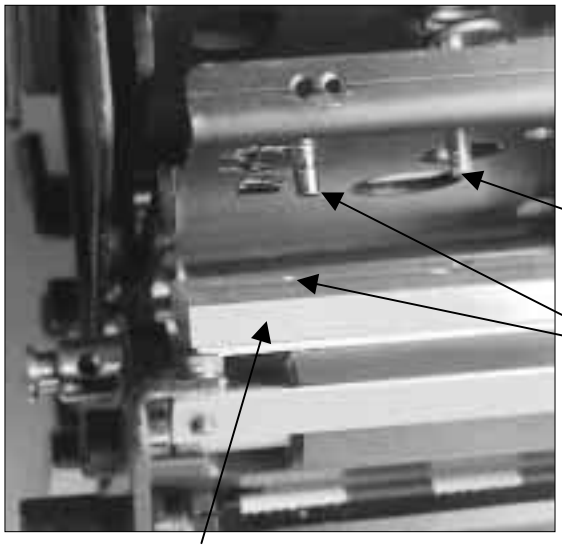


Fig. 6-103

6-18A Replacing the Print Head for M-8460S

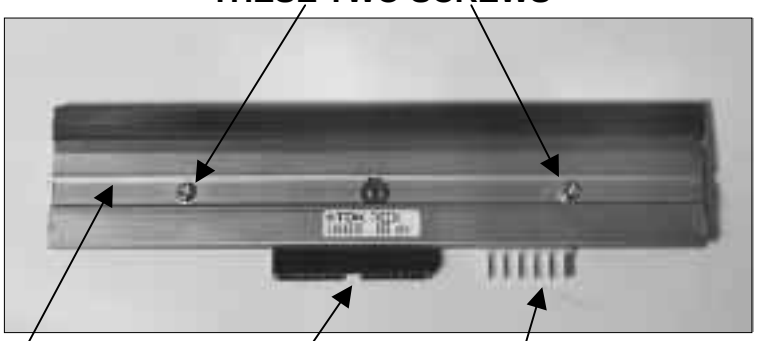


Fig. 6-105

6-18B Replacing the Print Head for M-8459S/M-8485S/M-8490S

The print head can be easily replaced. No critical adjustments are required. Before replacing the print head, check the head counter values by printing a test pattern.

To remove and replace the print head perform the following steps:

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cable.
2.	Open the access lid.
3.	Engage the head lock lever and remove the center stud holding the head bracket to the thermal head. ***Fig. 6-105***
4.	Disengage the head lock lever and drop down the head. ***Fig. 6-105***
5.	Carefully disconnect the print head data cable and the print head power cable and remove the print head. ***Fig. 6-106***
6.	Install the new print head by reconnecting the print head data cable and the print head power cable to the print head.
7.	Engage the media lever and position the print head so that the alignment pins seat into the head recesses. ***Fig. 6-107***
8.	Insert the center stud through the bracket and into the head. Tighten the stud securely.
9.	Close the printer and replace the locking screw. Close the lid.
10.	Reconnect the power cable.

Before returning the printer to normal service, you should perform the following steps:

- Head Counter Clear
- Confirm that the head cables are connected and do not touch the head. Also confirm that you can open and close the head without restriction and that the ribbon guide plate adjustment is correct.
- Print test pattern.

CAUTION: Do not remove or loosen the two screws on either side of the center screw. Fig. 6-108

CAUTION: Head is very fragile and can be easily scratched so handle carefully.

6-18B Replacing the Print Head for M-8459S//M-8485S/M-8490S

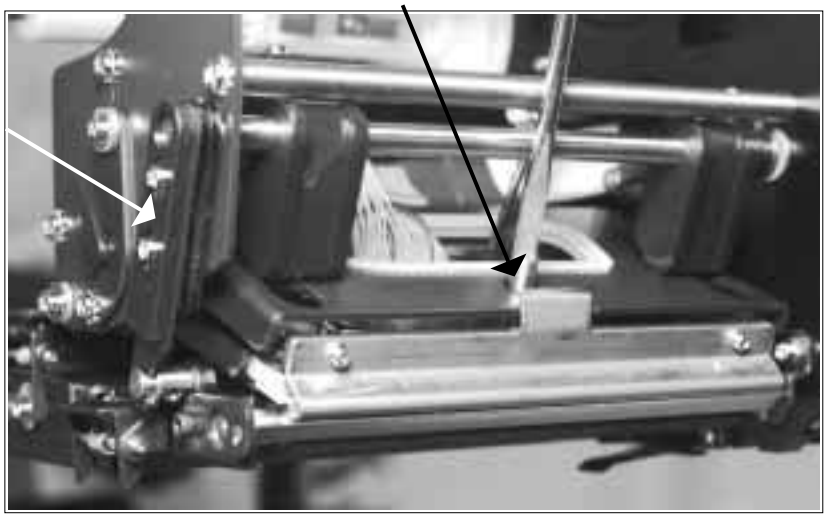


Fig. 6-105

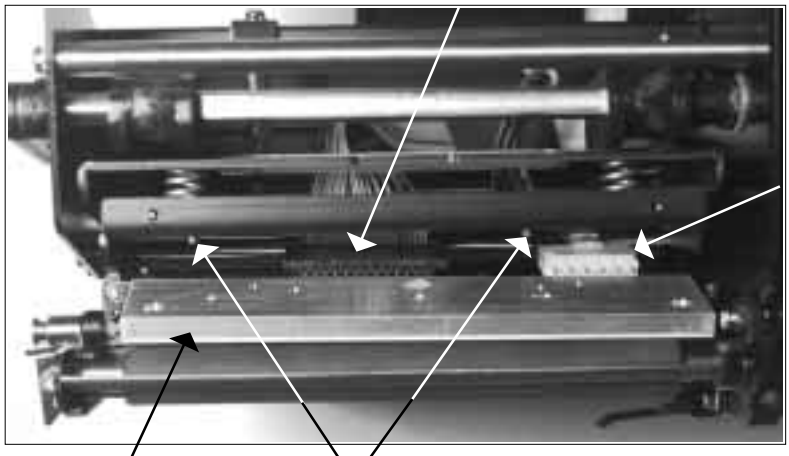


Fig. 6-106

Part 2

Part 2

6-18B Replacing the Print Head for M-8459S/M-8485S/M-8490S

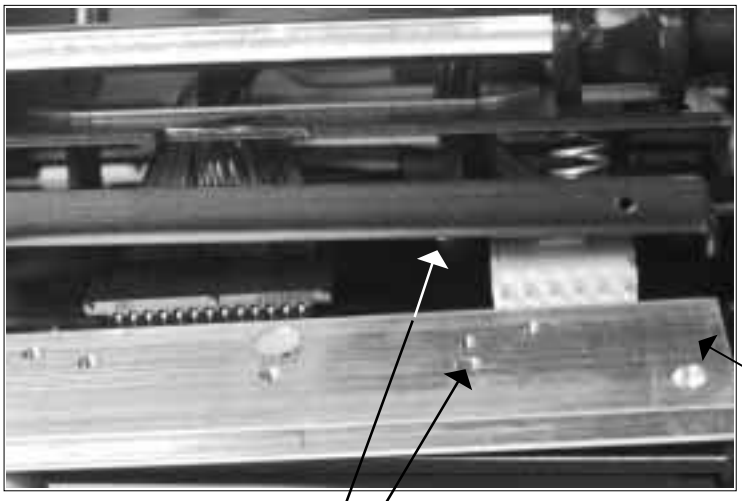


Fig. 6 107

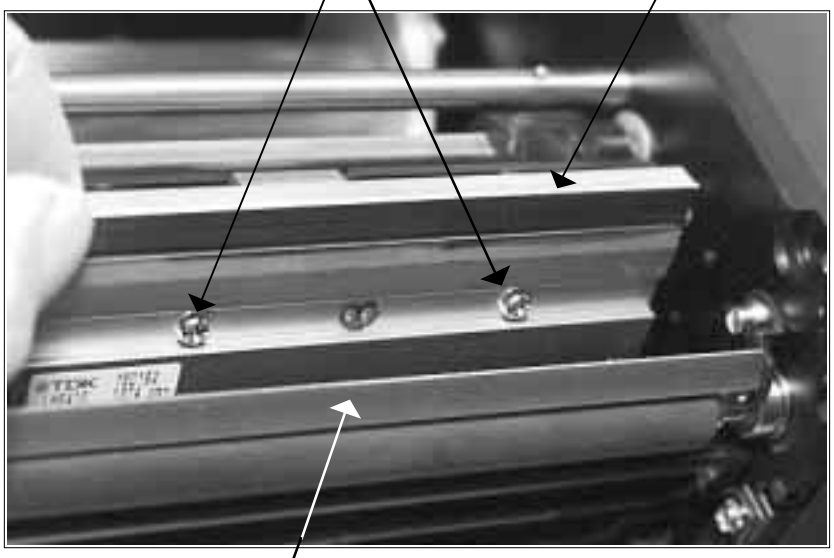


Fig. 6-108

Section

7

Part 2

Factory Resets

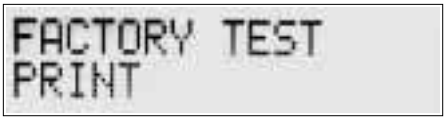
7.1 Resetting the Printers

M-8485S
TEST PRINT

M-8490S
TEST PRINT

Part 2

7-1 Resetting the Printers

STEP	PROCEDURE
1.	Record all current dip switch positions, then place all switches in the off position.
2.	Place DSW1-7, DSW1-8 and DSW2-5 switches in the ON (up) position.
3.	Place the print head in the OPEN position, keeping both the **LINE & FEED** keys depressed power on the printer.
4.	Upon hearing the audible tone, release the **LINE & FEED** keys. Place the print head back in the CLOSED position and DSW2-5 in the OFF position (down).
5.	Verify display: 
6.	Press the **LINE** key to initialize reset. After a slight pause, (1) blank will feed out followed by a factory test print. ***Warning:*** *This test activates all the heating elements on the print head and therefore should be used for testing purposes only, to avoid damaging the print head, especially when performed with labels less than the full width of the print head.*
7.	Press the **FEED** key to stop printing.
8.	Place the printers power switch to the Off position, and return all switches to their original positions.

Section

8

Troubleshooting

Part 2

8-1 Overview

The design of SATO "S" Series printers is based upon proven technology and reliable components. When a problem occurs, the solution can be easily traced using the troubleshooting tables in this section. This table list symptoms, probable causes, and suggested corrective actions. Many of the suggested corrective actions include references to a section or paragraph found elsewhere in this manual where more complete descriptions and procedures may be found.

Both print quality and general operational problems are listed in the troubleshooting table.

Make sure the basics have been checked before deciding you are unable to proceed any further. To help you this section has been divided into the following parts:

- Initial Checklist
- Centronics Parallel Interface
- RS232C Serial Interface
- Error Signals
- Troubleshooting Tables
- Head Pattern Examples
- Hex Dump Diagnostic Labels

8-2 Initial Checklist

If you are unable to produce output on your printer, check the following before deciding you are unable to proceed any further.

1. Is the printer powered up and ON-LINE?

2. Do any of the Front Panel LEDs indicate an error condition? If this light is ON, it may indicate the print head assembly is open.

3. Is the Print Head and the Label Hold Down in the down and latched position?

Other areas that may need looking at include:

8-3 Troubleshooting the Centronics (Parallel) Interface

1. Is the IBM parallel printer cable connected securely to your parallel port (DB-25S Female) on the PC and to the Centronics connector on the printer?

Warning: Never connect or disconnect interface cables (or use a switch box) with power applied to either the printer or the host. This may cause damage to the interface circuitry and is not covered by warranty.

2. Is there more than one parallel interface port on your PC (LPT1, LPT2, etc.)? If so, make sure you are sending data out the correct port.

3. When you send the print job to the printer, and it does not respond, do you get an error message on your PC that says “Device Fault” or something similar?

   This may mean that the computer doesn’t know the printer is there. Verify that:

   a. Both ends of the cable are securely inserted into their respective connectors.

   b. The printer is ON-LINE.

   c. The cable is not defective. There are other things that can cause this error message on your computer, but at this stage, a defective cable may be one of the reasons.

4. When you send the print job to the printer and it does not respond, and there is no error message on the PC:

   a. Check your data stream for some of the basics. Is your job framed as follows?

   <ESC>A—DATA---<ESC>Z

   b. Verify that you've included all required parameters in the data stream.

   c. Verify the following:

   - You have not typed a "0" (zero) for an "O" (letter) or vice-versa.
   - You have not missed any **<ESC>** characters where they're needed.
   - Make sure all printer command codes are capital letters.
   - Your protocol codes are set for Standard or Non-Standard and your data stream is consistent with these.

5. If you've checked all of the above and the printer still isn't printing, you may want to try a Receive Buffer Hex Dump to determine what (if anything) the printer is receiving from your computer. See Hex Dump Diagnostic Labels, Section 8-8.

   The Centronics port is now listening for incoming data. Send your print job. The printer will now print (only once) a Hexadecimal (Hex) Dump of everything it received from the host computer. Each 2-digit hexadecimal character represents a character the printer received. It may be tedious, but now you can analyze and troubleshoot the data stream.

6. While checking the Hex Dump printout, if you notice 0D 0A (Carriage Return and Line Feed) characters throughout. The command string should be continuous. CR or LF characters are not allowed between the Start Command (<ESC>A) and the Stop Command (<ESC>Z). If you are using BASIC, it may be adding these characters automatically as the line wraps. Adding a "width" statement to your program can help to suppress these extra 0D 0A characters by expanding the line length up to 255 characters.

   If you're not programming in BASIC, check to see if you have an equivalent statement in the language you're using to suppress extra carriage returns and line feeds from your data being sent out to the printer. We want the data stream to be one complete line going to the printer.

8-4 Troubleshooting the RS232C (Serial) Interface

1. Is the RS232C Serial cable connected securely to your serial port on the PC (DB-25S Male) and to the RS232C connector on the printer?

Warning: Never connect or disconnect interface cables (or use a switch box) with power applied to either the printer or the host. This may cause damage to the interface circuitry and is not covered by warranty.

Part 2

2. Is the cable defective? At the very least, you should be using a "Null Modem Cable," which crosses pins in a specific manner. This should enable your printer to print. We recommend that you use a cable built to specifications described in Section 3, Interface Specifications.

3. Check for obvious errors in the data stream. Remember that all print jobs for serial data must be framed by an STX and ETX.

4. If after sending your job to the printer, it only "beeps" (or displays a Framing Error message on the LCD panel), you may have a configuration problem. There may be some inconsistencies with the Baud Rate, Parity, Data Bits, or Stop Bits in relation to your host computer. If you are confused as to what the printer's current RS232 settings are, you may choose the SATO defaults (all DIP switches in the OFF position) to achieve 9600 baud, no parity, 8 databits, and 1 stop bit.

5. If you still are unable to get printer output, try the Hex Dump as described in Step 5 under the Centronics Interface troubleshooting. In this case, the printer monitors its RS232C interface for incoming data.

6. From the Hex Dump, if you are seeing extra 0D 0A (CR and LF) characters, and are using BASIC, refer to the beginning of the Command Code section in the Operator and Technical Reference Manual.

8-5 Error Signals

NOTE: Some of the following procedures are NA for M-8459S

LED	LCD MESSAGE	AUDIBLE BEEP	ERROR CONDITION	TO CLEAR
Error On	Machine Error	1 Long	Machine Error	Cycle power ON/OFF
Error On	EEPROM Error	1 Long	EEPROM Read/Write	Cycle power ON/OFF
Error On	Head Error	1 Long	Head	Cycle power ON/OFF
Error On	Sensor Error	3 Short	Sensor	Cycle power ON/OFF
Error Blinks	Card R/W Error	1 Long	Memory Card Read/Write	Cycle power ON/OFF
Error Blinks	Card Low Battery	1 Long	Memory Card Battery Low	Cycle power ON/OFF
Error Blinks	Head Open	3 Short	Head Open	Close head lever
Error Blinks	Cutter Error	3 Short	Cutter	Cycle power ON/OFF
Error On Line Blinks	PARITY ERROR	3 Short	RS232 Parity Error	Cycle power ON/OFF
Error On Line Blinks	Overrun Error	3 Short	RS232 Overrun Error	Cycle power ON/OFF
Error On Line Blinks	Framing Error	3 Short	RS232 Framing Error	Cycle power ON/OFF
Error On Line Blinks	Buffer Over	3 Short	Buffer Overflow	Cycle power ON/OFF
Error Blinks Label On	Paper End	3 Short	Label End	Open/close Head Lever Open/close Label Hold down
Error Blinks Ribbon On	Ribbon End	3 Short	Ribbon End	Open/close Head Lever Open/close Label Hold down
Error Blinks Label Blinks	Media Error	3 Short	Media Error	Open/Close Head Lever
Ribbon Blinks		None	Ribbon Near End	Replace ribbon with full roll
Line Blinks		None	Buffer Near Full	Slow down transmission rate

Part 2

8-6 Troubleshooting Tables

NOTE: Some of the following procedures are NA for M-8459S

The troubleshooting tables below include the following general symptom descriptions:

- Image Voids
- Ribbon Wrinkle
- Light Images
- Smearing
- No Ribbon Movement
- No Label Movement
- No printed Image
- Display Problem
- POWER LED not on
- ERROR LED on
- LABEL LED on
- RIBBON LED on
- ON LINE LED not on
- No Label Drive

Print Quality Problems

Symptom	Probable Cause	Suggested Corrective Action
ON LINE LED not on	LABEL, RIBBON, ERROR LED (s) on	Clear error condition
	Illegal printer memory state	Cycle POWER switch off and back on
No Label Drive	Timing Belt bad/loose	Replace/tighten timing belts (6-9)
Image Voids	Poor quality labels	Use thermal transfer compatible stock
	Poor quality ribbons	Use genuine SATO ribbons
	Ribbon not matched to label stock	Check with media suppliers
	Damaged print head	Replace print head
	Damaged platen	Replace platen

Print Quality Problems

NOTE: Some of the following procedures are NA for M-8459S

Symptom	Probable Cause	Suggested Corrective Action
Ribbon Wrinkle	Poor Head Alignment	Adjust head balance (5-4) Adjust ribbon roller Adjust head alignment
	Poor Ribbon Tension	Adjust ribbon tension
	Worn Platen	Replace platen (6-17)
	Foreign material on head or platen	Clean head and platen
	Foreign materials on labels	Use high quality label stock
	Damaged print head	Replace print head (6-18)
Light Images	Poor quality labels	Use thermal transfer compatible stock
	Poor quality ribbons	Use genuine SATO ribbons
	Low print head energy/darkness	Adjust darkness control (See Operator Manual)
	Low print head pressure	Use correct head pressure position
	Ribbon not matched to label stock	Use Premier II ribbon with a “1C“ thermal transfer ribbon stock or equivalent for optimum results
	Low ribbon drive torque No ribbon movement	Adjust ribbon drive clutch (5-2)
	Foreign material on head	Clean head and platen
	Poor head alignment	Align Print Head (5-5)
	Excessive print speed	Reduce print speed setting

Symptom	Probable Cause	Suggested Corrective Action
Smearing	Poor quality labels	Use Premier II ribbon with a "1C" thermal transfer ribbon stock or equivalent for optimum results
	Poor quality ribbons	Use genuine SATO ribbons
	Foreign material on head/platen	Clean head and platen
	Foreign material on labels	Use high quality label stock
	Excessive print head energy	Adjust darkness control
	Excessive print speed	Adjust print speed
	Excessive head pressure	Use correct head pressure position
No Ribbon Movement	Incorrect ribbon core size	Use genuine SATO ribbons
	Loose drive clutch	Adjust clutch tension (5-2)
	Loose platen drive belt	Adjust/replace belt (6-9)
	No + 24 volt output	Test power supply and replace if required (4-2, 6-4)
	Loose service screws on rewind pulley	Tighten service screws
	Damaged electronics	Replace circuit board (6-5)
No Label Movement	Loose/broken platen drive belt	Adjust/replace belt (6-9)
	Incorrect label pitch sensor selected	Select correct label sensor type (DSW2-2)
	No +24 volt output	Replace fuse on main PCB (6-3) Test power supply and replace if required (4-2)
	Loose set screw on platen pulley/stepper motor	Tighten set screws
No Printed Image	Print head not connected	Verify print head connector fully seated at head and main PCB (6-18)
	Ribbon upside down	Use genuine SATO ribbons
	No + 24 volt output	Test power supply and replace if required (4-2)

Symptom	Probable Cause	Suggested Corrective Action
No Printed Image	Damaged print head	Replace print head (6-18)
	Damaged electronics	Replace circuit board (6-5)
Back light but no words on display or no display	The most likely cause is the ribbon cable has fallen out or not seated fully into connector.	Verify that the cable and connector are properly seated. Display POT not positioned properly.
POWER LED not on	AC power cable not connected	Verify that the cable is connected to the printer and the AC outlet
	Main Power Fuse defective	Replace fuse (6-3)
	Defective power supply	Test power supply and replace if defective (4-2, 6-4)
ERROR LED on	Head not locked	Close and latch head release
LABEL LED on	Label supply roll empty	Replenish label supply
	Label stock not routed through sensor	Reload labels
	Label sensor not positioned correctly	Adjust sensor position
	Label sensor blocked	Clean label sensor
	Incorrect label sense threshold setting	Adjust label sense threshold (4-3, 4-4)
	Platen drive malfunction	See Section 5, Mechanical Adjustments
RIBBON LED on	Ribbon supply roll empty	Replenish ribbon supply
	Ribbon sensor out of alignment	Realign ribbon sensor (4-5)
	Ribbon sensor blocked	Clean ribbon sensor
	No cardboard core on ribbon rewind	Use cardboard core on ribbon rewind

Part 2

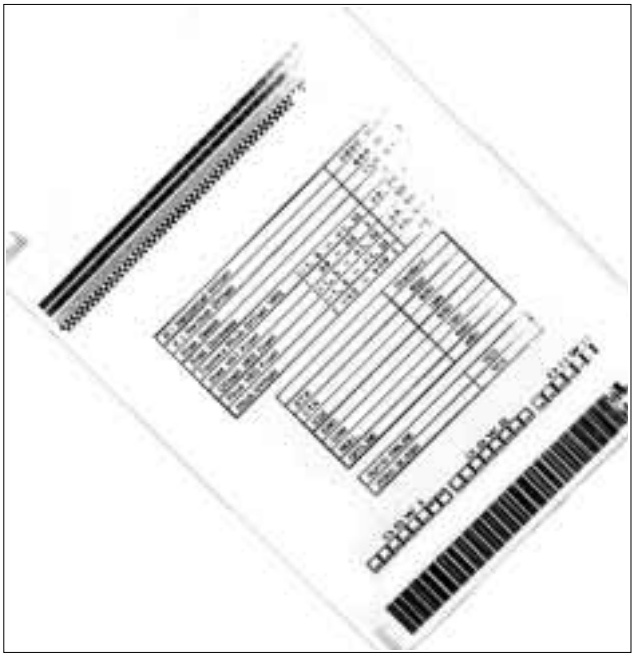
8-7 Head Pattern Examples

FACTORY DEFAULT

FEED DIRECTION

GOOD ADJUSTMENT
CLEAR, DARK, EVEN TEXT

8-7 Head Pattern Examples



IRREGULAR UNEVEN TEXT

POOR HEAD ALIGNMENT, BALANCE OUT OF ADJUSTMENT

FEED DIRECTION

IRREGULAR UNEVEN TEXT

POOR HEAD ALIGNMENT, BALANCE OUT OF ADJUSTMENT

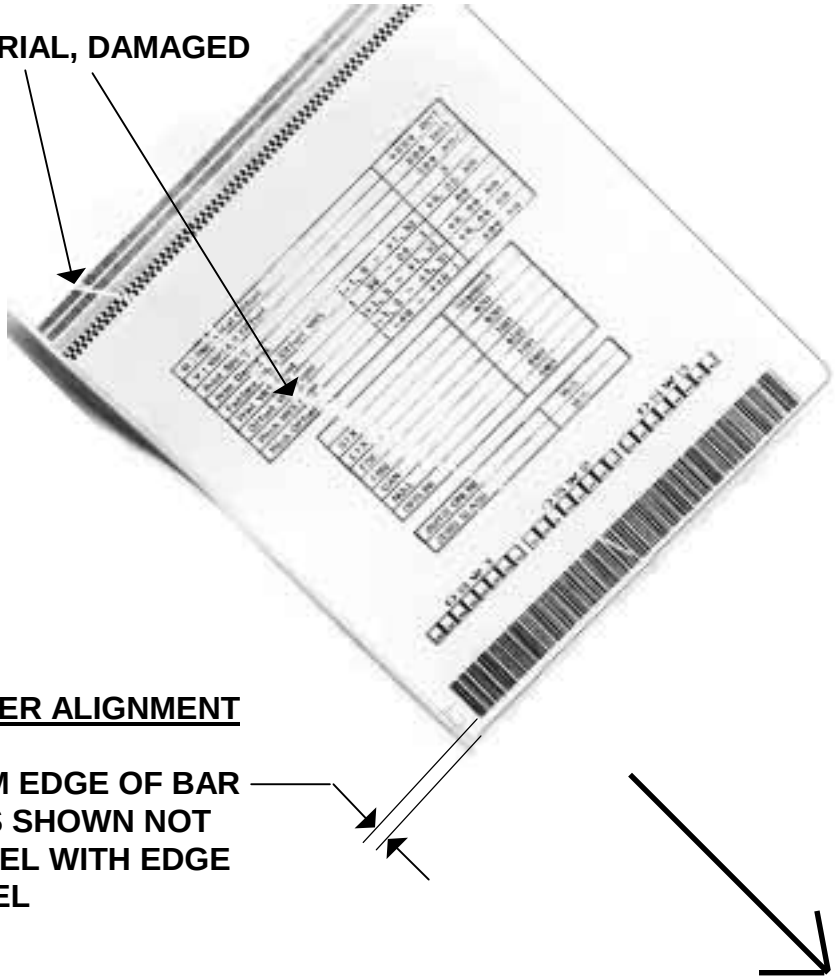
Part 2

Part 2

8-7 Head Pattern Examples

DIAGONAL VOIDS (WHITE STREAKS) THAT "WALK" ACROSS LABEL

RIBBON WRINKLE
POOR HEAD ALIGNMENT, POOR RIBBON TENSION,
WORN PLATEN,
FOREIGN MATERIAL, DAMAGED PRINT HEAD



IMPROPER ALIGNMENT

BOTTOM EDGE OF BAR CODE IS SHOWN NOT PARALLEL WITH EDGE OF LABEL

FEED DIRECTION

8-8 Hex Dump Diagnostic Labels

In addition to the User Test Print Labels (Refer to Section 2-4), The printer contents of the receive and print buffers can be examined using the Hex Dump Test Labels.

Print Buffer Hex Dump

The contents of the Print Buffer can be examined using the Hex Dump mode. The label numbers each line of data received in the left-hand column, the data in hexadecimal format in the center columns followed by the same data in ASCII format in the right-hand column.

STEP	PROCEDURE
1.	Turn on the printer
2.	Send and print label.
3.	Place the printer in the Off Line mode by pressing the **LINE** key. The **LINE** LED should go out.
4.	Place **DSW2-4** in the On position.
5.	Press the **LINE** key to place the printer back On Line.
6.	Press the **FEED** key.
7.	A label should be printed containing the contents of the print buffer in Hexadecimal format.
8.	Return **DSW2-4** to the off position.
9.	Turn the printer off and then back on to place it back in the normal print mode.

8-8 Hex Dump Diagnostic Labels (Cont.)

Receive Buffer Hex Dump

The data that is being received by the printer (before it is placed in the Print Buffer) can be examined by using the Hex Dump Mode. The label numbers each line of data received in the left-hand column, the data in hexadecimal format in the center columns, followed by the same data in ASCII format in the right-hand column.

STEP	PROCEDURE
1.	Turn off the printer
2.	Place **DSW2-4** in the On position.
3.	Turn on the printer.
4.	Transmit the data to the printer.
5.	The data received is printed on a label in hexadecimal format.
6.	Return **DSW2-4** to the off position.
7.	Turn off the printer and then back on to place it back in the normal print mode.

Section

9

Options

Part 2

9-1 Overview

The following options are available for the M-8480S/M-8490S printers.

- ***Memory Card***
- ***Calendar***
- ***Top Mounted Reflective Sensor***

NOTE: Top Mounted Reflective Sensor is NA for M-8459S

9-2 Memory Card

Description:

The Memory Card Option provides the connectors and interface board for two PCMCIA memory card slots. The two Memory Card slots, labeled Card 1 and Card 2, are on the memory option board mounted inside the printer. Access to these cards is by removing the PC board compartment cover. The printer memory can be expanded up to 4MB.

Type	RAM or Flash-ROM
Applicable Specifications	PCMCIA Version 2.1 (JEIDA Version 4.1)
Size	128KB, 256KB, 512KM, 1MB or 2MB
Connector Pins	68
Battery	Approximately two years (manufacturer dependent)
Write Protect	Yes
Low Battery Detect	Yes

Installation:

Instructions for installing the Memory Card Option are included with the installation kit.

Error Handling:

ERROR DESCRIPTION	INDICATION	REMEDY
Low Battery - Low battery condition is detected when printer is powered on.	ERROR LED: Blinking Audible Beep: 1 long Display: Card Low Battery Depress LINE key to print Card Status	Replace Memory Card battery. Note that all data will be lost when the battery is removed.
Card R/W Error 1. No card is inserted. 2. Card is write protected. 3. Invalid store/recall number. 4. Card has not been initialized.	ERROR LED: On Audible Beep: 1 long Display: Card R/W Error Printer must be powered off to reset.	1. Insert card into selected slot. 2. Remove write protect tab. 3. Correct program. 4. Initialize card with BJF command.
Warning 1. Duplicate number. 2. Data not in print area. 3. Data overflows card memory.	Audible Beep: 1short Display: None Printer will ignore invalid commands.	1. Correct program. 2. Correct program. 3. Use card with more capacity.

9-3 Calendar

Description:

The Calendar Option allows the date and time to be maintained in the local printer rather than using the system clock. It consists of a daughter PCBA containing a clock IC, a lithium battery and a EEPROM. This assembly replaces the EEPROM in the standard printer. A qualified technician should perform the upgrade as it requires modifications to the main PCB assembly. Please call SATO Technical Support if you need to add this option to an existing printer in the field.

9-4 Top Mounted Reflective Sensor

Description:

This option is used when special requirements make it necessary to use label stock that has the "Eye- Mark" located on the print side of the label.

THIS IS A FACTORY INSTALLED OPTION

Part 2

Printer Adjustments
Printing Test Labels

Style A

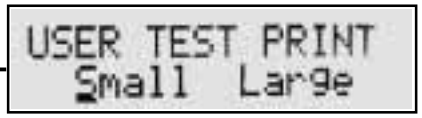
The LCD Panel is used in conjunction with the ***LINE*** and ***FEED*** switches by the operator to manually enter printer configuration settings. Many of the settings can also be controlled via software commands and in the case of conflict between software and control panel settings, the printer will always use the last valid setting. If you load a label job that includes software settings and then enter a new setting via the operation panel, the manually set values will be used by the printer. If you set the values manually and then download a job with software settings, the software settings will be used.

Printer Adjustments
Style A

POWER ON

Normal/User Mode
POWER

Print Test Labels
POWER+FEED



Advanced Mode Settings and Adjustments
POWER+LINE

Load SATO Default Settings
POWER+FEED + LINE

Download User Defined Protocol Codes
POWER+LINE + DSW2-7 =ON

Reset to SATO Default Protocol Codes
POWER +LINE + FEED +DSW2-7 =ON

Print Hex Dump Label
POWER, then DSW2-4 =ON

Print Buffer
Hex Dump Label

Print Hex Dump Label
POWER + DSW2-4 =ON

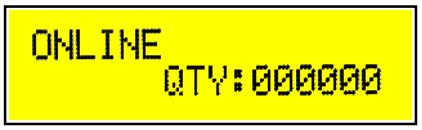
Receive Buffer
Hex Dump Label

Appendix A

Printer Adjustments - Style A

Normal Mode

When the printer is powered on, the readout will display the following message.



The LCD Panel will display the **ONLINE** status on the top line of the display and the bottom line will contain the label quantity (QTY) status. The **ONLINE** message will be changed to OFF Line whenever the printer is switched offline by depressing the **LINE** key. As soon as a print job is received, the QTY message will indicate the number of labels to be printed. As soon as the label job begins to print, the display will indicate the number of labels remaining in the print job that remain to be printed.

User Mode

To enter the USER mode, perform the following steps:

STEP	PROCEDURE
1.	The printer is first taken offline by pressing the **LINE** key once. The display will change to: 
2.	When the display changes to OFFLINE, press the **FEED** and **LINE** keys simultaneously for more than one second. The printer now displays the first USER mode adjustment (Print Darkness).

Print Darkness Setting

There are three **Darkness** (or heat range) settings. The higher numbers represent darker settings. The current setting is indicated by an underline under one of the range settings.

To change the setting perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to the desired setting. 
2.	Once the correct setting is underlined, press the **FEED** key to accept the setting and advance to the next adjustment.

Note: The setting can be overridden by software. Finer adjustments can also be made using the PRINT potentiometer setting on the adjustment panel.

Printer Adjustments - Type A

Print Speed Adjustment

There are three SPEED settings on the M8490S and four on the M-8485S. Each setting is listed on the bottom line of the display. The current setting is indicated by an underline under one of the speed settings.

		M-8485S	M-8490S
PRINT SPEED 4 6 8 10	Print Speed Setting	4 = 4 ips 6 = 6 ips 8 = 8 ips 10 = 10 ips	4 = 4 ips 6 = 6 ips 8 = 8 ips

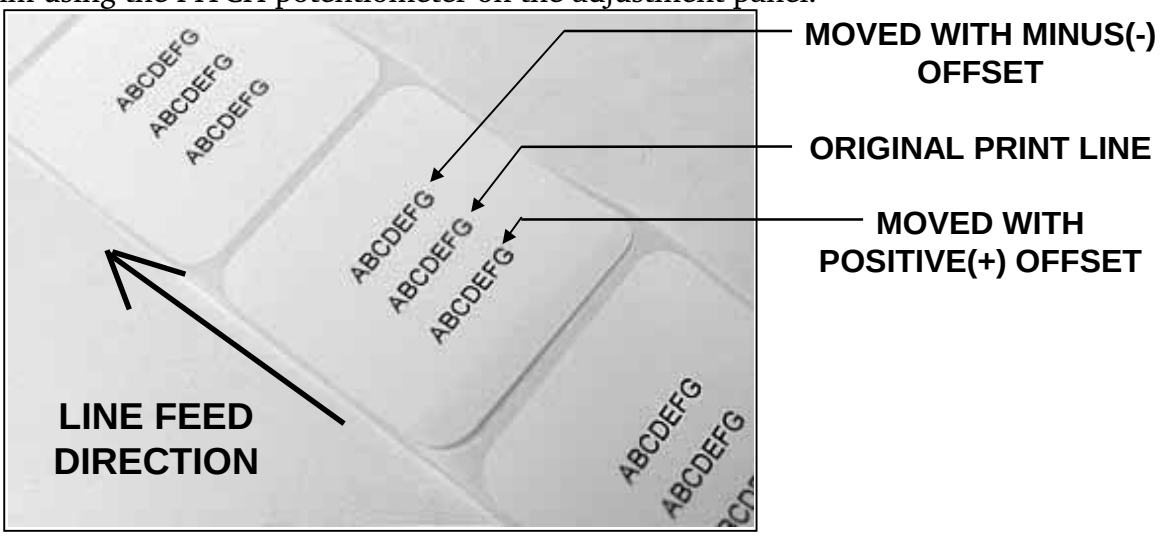
To change the setting perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to the desired setting.
2.	Once the correct setting is underlined, press the **FEED** key to accept the setting and advance to the next adjustment.

Note: This setting can be overridden by software.

Pitch Offset and Direction

The label pitch is the distance from the leading edge (the edge that comes out of the printer first) of a label and the leading edge of the next label. The leading edge position of the label can be adjusted relative to the print head +/- 49 mm in increments of 1 mm using the following procedure. Once the position is set, it can be adjusted +/- 3.75 mm using the PITCH potentiometer on the adjustment panel.



Appendix A

Printer Adjustments - Style A

Pitch Offset and Direction Cont.

To change the setting perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to either the positive (+) or the negative (-) selection. A positive selection moves the leading edge of the label forward (away from the print mechanism) while a negative selection moves the leading edge of the label back into the mechanism. 
2.	Once the correct setting is underlined, press the **FEED** key to accept the setting and advance to the Pitch Offset adjustment. 
3.	Use the **LINE** key to step the counter to the desired position. The display will increment one step for each time the **LINE** key is pressed. If the **LINE** key is held down for more then two seconds, it will automatically go into the fast scroll mode. The reading will advance to a setting of 49 mm after which it will automatically wrap and start of "00" again. The pitch direction set in the previous step will be displayed in front of the Offset setting.
4.	Once the setting is correct, press the **FEED** key to accept the setting and advance to the Cancel Print job display.
5.	You may wish to check your settings by printing a test label after you have completed the adjustments to ensure that they are correct.

Printer Adjustments – Style A

Cancel Print Job

If the printer has a print job(s) loaded in memory, selecting YES will cause the job(s) to be cleared. The default selection is NO. Make sure that you want to cancel the print job before selecting YES as the job cannot be recovered and will have to be retransmitted to the printer.

To cancel the print perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to either YES or NO. 
2.	Once the correct setting is underlined, press the **FEED** key to accept the setting and terminate the user mode of operation and return to the normal mode OFFLINE display. If you wish to change any of the settings, you must enter the user mode again by simultaneously pressing **FEED** and **LINE** keys for more than one second.

Advanced Mode Settings and Adjustments

Advanced mode is provided to make adjustments that require only occasional adjustments. Since they affect the basic operation of the printer, the procedure for entering this mode is designed to prevent someone from accidentally changing the settings.

To enter advanced mode, the printer is powered on while pressing the **LINE** key. The printer will emit a single audible signal and display the first configuration selection on the LCD panel.

From the advanced mode display, the advanced settings are accessed in sequence by pressing the **FEED** key.

Printer Adjustments - Style A

Zero Slash Setting

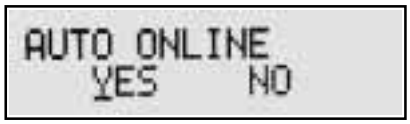
This setting determines if a zero is printed with a slash or without a slash. This setting can also be controlled via software commands. When YES is selected, the U, S, M, WB, WL, XU, XS, XM, XB, XL and vector fonts will have a slash through the center of the zero character.

To access this setting, perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to either YES or NO.
2.	Once the correct setting is underlined, press the **FEED** key to accept the setting and advance the display to the Auto Online display.

Auto Online Setting

This setting determines the mode in which the printer powers up. If the YES selection is made, the printer powers up in the ON LINE mode and is ready to print. If NO is selected, the printer powers up in the OFF LINE mode and must be manually placed in the ON LINE mode by pressing the **LINE** key before it is ready to print.



To access this setting perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to either YES or NO.
2.	Once the correct setting is underlined, press the **FEED** key to accept the setting and advance the display to the Vertical Offset display.

Printer Adjustments – Style A

Vertical Offset Setting

Vertical Offset is the distance down from the leading edge, (the edge of the label that comes out of the printer first) to the first vertical print position. It is always a positive setting since making it negative would move it up and off the printable label. This setting changes the base reference point for all subsequent label jobs. It's effect is identical to the **<ESC>** A3 Base Reference point command. Since the printer moves the label in discrete steps equal to the size of the print dot, the units of measure for Vertical Offset distance is dots. The maximum values that can be set for the different model printers are:

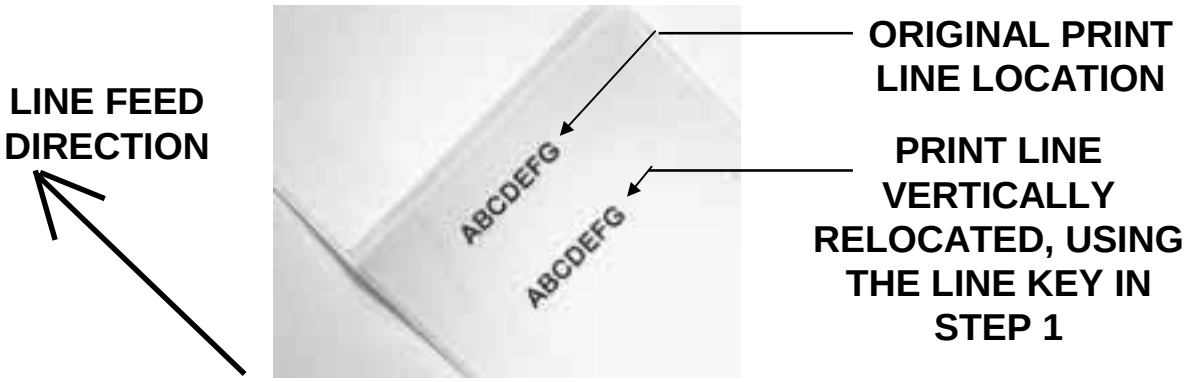
VERTICAL Offsett	M-8485S	M-8490S
Normal Length	0 to 1424	0 to 2136
Expanded Length	0 to 2848	0 to 4272

Note: This setting can be overridden by the Base Reference Point Command. Refer to the Operator Manual Section 5= Programming.

To access this setting perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step to the desired setting. The display will increment one step each time the **LINE** key is pressed. If the **LINE** key is held down for more than two seconds, it will automatically go into the fast scroll mode. The reading will advance to the maximum setting, (the maximum vertical offset) after which it will automatically wrap and start at "0000" again.
2.	Once the setting is correct, press the **FEED** key to accept the setting and advance the display to the Horizontal Direction display.

Note: The printers will not "wrap" images that extend beyond the print area. Any part of the image that extends beyond the print area will be truncated.

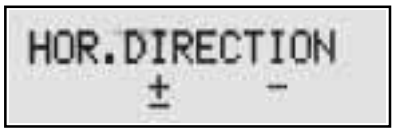


Appendix A

Printer Adjustments - Style A

Horizontal Offset and Direction

Horizontal Offset is the distance that the label image is shifted either to the right or left on the label. The image is shifted to the left (when facing the printer) for a positive setting and is shifted to the right for a negative setting. This setting changes the base reference point for all subsequent label jobs. It's effect is identical to the **<ESC>** A3 Base Reference point command. Since the printer can only print in discrete steps equal to the size of the print dot, the units of measure for the Horizontal Offset distance is dots.



Note: This setting can be overridden by the Base Reference Point Command. Refer to the Operator Manual Section 5 Programming.

To access this setting perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step the underline to either the positive (+) or negative (-) selection. NOTE: ***For Standard Unit*** A positive selection increases (moves) the horizontal reference point for the label to the right edge of the label, towards the outside, while a negative selection moves the horizontal reference point for the label to the left, towards the inside of the printer. ***For Opposite Hand Unit (M-8485S)*** A negative selection increases (moves) the horizontal reference point for the label to the right edge of the label, towards the outside, while a positive selection moves the horizontal reference point for the label to the left, towards the inside of the printer.
2.	Once the setting is underlined, press the **FEED** key to accept the setting and advance the display to the Horizontal Offset adjustment.
3.	Use the **LINE** key to step the counter to the desired setting. The display will increment one step each time the **LINE** key is pressed. If the **LINE** key is held down for more than two seconds, it will automatically go into the fast scroll mode. The reading will advance to the maximum setting, (the maximum horizontal offset) after which it will automatically wrap and start at "0000" again. The horizontal direction set in the previous step will be displayed in front of the Offset setting.

	M-8459S	M-8460S	M-8485S	M-8490S
Horizontal Offset	+/-896	+/-1216	+/-1024	+/-1344

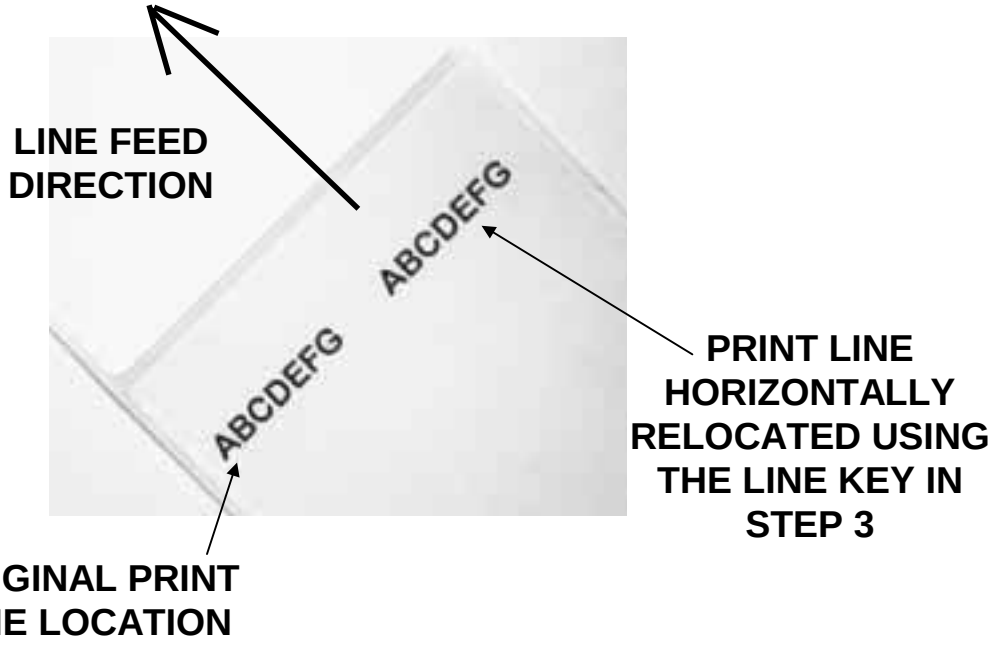
Note: The printers will not "Wrap" images that extend beyond the print area. Any part of the image that extends beyond the print area will be truncated.

Appendix A

Printer Adjustments - Style A

Horizontal Offset and Direction (Cont.)

4. Once the setting is correct, press the **FEED** key to accept the setting and advance to the Sensor Threshold display.



Sensor Threshold Level

The printer determines the location of the leading edge of the label by measuring the difference between light levels when it sees either a label edge or a black "Eye" mark. This adjustment allows you to manually set the threshold voltage level, between the maximum and minimum light levels. DIP switch DSW2-2 selects the sensor type. If **DSW2-2** is in the OFF position, the setting will be for a See-Thru (or Gap) sensor and the LCD will display "**GAP**" on the top line along with the current setting. If **DSW2-2** is in the **ON** position, the LCD will display "Eye-Mark" on the top line with its current setting. If the value entered for the bottom line setting is "0.0V", then the printer will automatically calculate the setting when the first label is fed after the printer is powered on or the head is closed. There are some instances where the automatically calculated value must be adjusted to ensure reliable label feeding, such as when the backing opacity or the reflectance of the "EYE-Mark" varies significantly within a roll of labels or between label rolls. In these instances the value should be set using the following procedures.

Appendix A

Printer Adjustments - Style A

Sensor Threshold Level (Cont.)

GAP: When setting the "Gap" threshold, the voltage shown on the top line of the display must be measured with nothing but the backing in the sensor and then again with a label still attached to the backing. The formula to be used for setting the threshold is:

(High Voltage Level + Low Voltage Level) x 0.5 = Start Value

To access this setting perform the following steps:

STEP	PROCEDURE
1.	Insert a label still attached to the backing into the sensor and close the Label Hold-Down. Record the voltage shown on the top line of the LCD panel. This line should have the message "GAP" on the top line (DIP switch DSW2-2 = OFF). Make sure the label is all the way under the sensor.
2.	Strip the label from the backing and insert the backing strip under the sensor and close the label lid. Record the voltage shown on the top line of the LCD panel. The voltage ranges measured should be within the following ranges:

Backing with Label	Label Backing Only
2.0V to 3.5V	Less than 1.0V

If the measured values are outside this range, you may have trouble finding a value that will work properly under all conditions. If this is the case, a higher quality label may be needed to get adequate performance.

3.	Calculate the starting point voltage using the formula above.
4.	Use the **LINE** key to step the counter to the desired setting. The display will increment one step for each time the **LINE** key is pressed. If the **LINE** key is held down for more than two seconds, it will automatically go into the fast scroll mode. The reading will advance to a setting of 4.9 (the maximum voltage) after which it will automatically wrap and start at "0.0" again. If a value of "0.0" is set, the printer will automatically set the level between the two measured voltages each time the printer is powered on with labels loaded.
5.	Once the setting is correct, press the **FEED** key to accept the setting and advance to the Calendar Set display.
6.	Repeat this procedure using values slightly higher or lower until the optimum performance is obtained. If you cannot find a setting between the high and low readings that gives adequate performance, then the label stock has too much variation in its opacity and a better quality stock should be used.

Printer Adjustments - Style A

Sensor Threshold Level (Cont.)

"Eye-Mark": When setting the "Eye-Mark" threshold, the voltage must be measured with nothing but the label under the sensor and then again with the printed "Eye-Mark" under the sensor. The formula for this is:

(High Voltage Level + Low Voltage Level) x 0.5 = Start Value

To access this setting perform the following steps:

STEP	PROCEDURE
1.	Insert a label into the sensor and close the Label Hold-Down. Make sure the printed "Eye-Mark" is not under the sensor. Record the voltage shown on the top line of the LCD panel. This line should have the message "Eye" on the top line (DIP switch DSW2-2 =ON).
2.	Now pull the label forward until the "Eye-Mark" is positioned under the sensor (the voltage reading should be at its highest point). Record the voltage shown on the top line of the LCD panel. The voltage ranges measured should be within the following ranges: **Label Only**: Less than 1.0V **"Eye-Mark"**: 2.5V to 3.5V If the measured values are outside this range, you may have trouble finding a value that will work properly under all conditions. If this is the case, a higher quality label may be needed to get adequate performance.
3.	Calculate the starting point voltage using the formula.
4.	Use the **LINE** key to step the counter to the desired setting. The display will increment one step for each time the **LINE** key is pressed. If the **LINE** key is held down for more than two seconds, it will automatically go into the fast scroll mode. The reading will advance to a setting of 4.9 (the maximum voltage) after which it will automatically wrap and start at "0.0" again. If a value of "0.0" is set, the printer will automatically set the level each time the printer is powered on with labels loaded or the head is closed.
5.	Once the setting is correct, press the **FEED** key to accept the setting and advance to the Calendar Set display.
6.	Repeat this procedure using values slightly higher or lower until the value that gives adequate performance is found. If you cannot find a that will give you adequate performance, then the label stock or printed "Eye-Mark" has too much variation in its reflectance and a better quality stock should be used.

Printer Adjustments - Style A

Calendar Set

If the Calendar Option is installed in the printer, the date and time can be set manually using the LCD display or via the **<ESC>WT** Calendar Set command. Refer to the Operator Manual, Section 5, Programming. The last setting, set either manually or via software command, received by the printer will be the value used. The format of the display is **YY/MM/DD hh:mm** (Year/Month/Day/hours: minutes). The date format is fixed and cannot be changed.

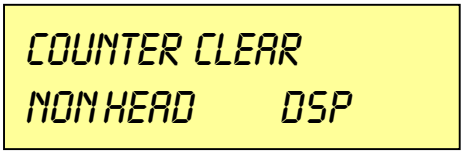
To access this setting perform the following steps:

STEP	PROCEDURE
1.	**Year:** The first display shown will have the two digit year selection underlined. Press the **LINE** key to scroll through the dates. The year number will increase by one each time the **LINE** key is pressed until it reaches its maximum legal value (i.e., "99" for the year digits) at which point it will wrap around to the "00" setting.
2.	**Month:** After you have set the correct year, press the **FEED** key to advance the underline cursor to the two digit Month position. Press the **LINE** key to scroll through the numbers corresponding to the month. The month number will increase by one each time the **LINE** key is pressed until it reaches a value of "12" at which point it will wrap around to the "01" setting.
3.	**Day:** After you have set the correct month, press the **FEED** key to advance the underline cursor to the two digit Day position. Press the **LINE** key to scroll through the numbers corresponding to the date. The date number will increase by one each time the **LINE** key is pressed until it reaches a value of "31" at which point it will wrap around to the "01" setting.
4.	**Hour:** After you have set the correct date, press the **FEED** key to advance the underline cursor to the two digit Hour position. Press the **LINE** key to scroll through the numbers corresponding to the hour (using a 24 hour clock). The hour number will increase by one each time the **LINE** key is pressed until it reaches a value of "24" at which point it will wrap around to the "01" setting.
5.	**Minute:** After you have set the correct hour, press the **FEED** key to advance the underline cursor to the two digit minute position. Press the **LINE** key to scroll through the numbers corresponding to the minute. The minute number will increase by one each time the **LINE** key is pressed until it reaches a value of "60" at which point it will wrap around to the "01" setting.
6.	After you have set the calendar, press the **FEED** key to accept the setting and advance to the Clear Head Counter display.

Printer Adjustments - Style A

Reset Counters

The Counter Clear display is used to reset the internal printer counters to zero. This allows the user to keep track of the number of centimeters of label material that has passed through the printer, how many labels have been dispensed or how many labels have been cut.



The counters are identified in the display as:

NON: None (default)
HEAD: Head Counter
DSP: Dispense Counter
CUT: Cutter Counter

To access this setting perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step the underline cursor to either the counter to be reset, the Head Counter (HEAD), Dispenser Counter (DSP),or the CUT Counter (CUT). The default position reset is None (NON). Use the LINE key to advance the underline cursor to the desired selection.
2.	Once the setting is underlined, press the **FEED** key to clear the selected counter and advance the display to the EXIT MODE display.

Exit Mode

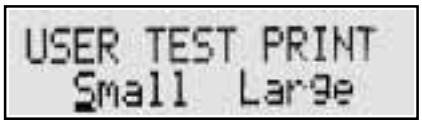
This allows you to exit the Advanced Mode or to recycle through the selections again.

To access this setting perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step the underline cursor to either the YES or NO selection. The default position is NO. 
2.	Once the correct setting is underlined, press the **FEED** key to advance the display to the OFF LINE mode if YES was underlined or back to the Zero Slash display if NO was selected.

Printing Test Labels - Style A

This option allows you to print a test label. It is recommended that you print a test label after you have changed any of the settings in the Advanced Mode. The test label allows you to verify that you indeed did make the desired changes. To enter the User Test Print Mode, power up the printer while pressing the **FEED** key and a single audible signal will be heard. Release the **FEED** key and the printer to display the following message on the LCD panel.

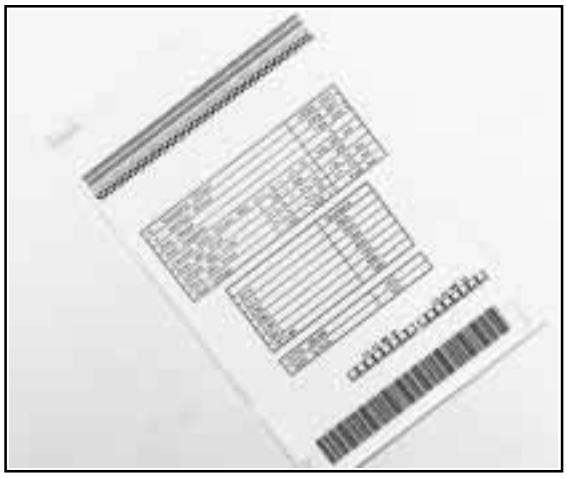


Print Size

To access this setting perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step the underline cursor to either the Large or Small selection. If Large is underlined, a label of maximum width will be printed showing a head check pattern and the current printer setting information.

The default position is Large.



Printing Test Labels - Style A

Print Size (Cont.)

STEP	PROCEDURE
2.	Once the desired label size setting is underlined, press the **FEED** key. If **LARGE** was underlined a label will be printed.. If **SMALL** is underlined, the display will advance to the Print Size display. You must enter the size of the label.

Small Label Size	M-8485S	M-8490S
Min.	04cm (1.6")	04cm (1.6")
Max.	12cm (4.7")	11cm (4.3")

Press the **LINE** key to increment the setting by 1 cm each time the key is pressed. Once the maximum size is reached, the display will wrap around and start incrementing at 04 cm again. Once the correct label width is selected, press the **FEED** key to initiate the print. The **SMALL** label only contains a head check pattern.

3. If you wish to pause the printer after it starts to print a test label, press the **LINE** key to place it Off-Line. Press the **FEED** key again to resume the test label printing. To stop the test label print, pause the printer and then turn power off.

Printer Adjustments
Printing Test Labels
Style B

The LCD Panel is used in conjunction with the ***LINE*** and ***FEED*** switches by the operator to manually enter printer configuration settings. Many of the settings can also be controlled via software commands and in the case of conflict between software and control panel settings, the printer will always use the last valid setting. If you load a label job that includes software settings and then enter a new setting via the operation panel, the manually set values will be used by the printer. If you set the values manually and then download a job with software settings, the software settings will be used.

Printer Adjustments
Style B

POWER ON

Normal/User Mode
POWER
→ ONLINE QTY:000000

Print Test Labels
POWER+FEED
→ USER TEST PRINT Small Large

Advanced Mode Settings and Adjustments
POWER+LINE
→ ADVANCED MODE SETUP

Load SATO Default Settings
POWER+FEED + LINE
→ SATO DEFAULT COMPLETED

Download User Defined Protocol Codes
POWER+LINE + DSW2-7 =ON
→ USER DOWNLOAD

Reset to SATO Default Protocol Codes
POWER +LINE + FEED +DSW2-7 =ON
→ ALT.PROTOCOL DEFAULT COMPLETE

Print Hex Dump Label
POWER, then DSW2-4 =ON
→ ***Print Buffer***
Hex Dump Label

Print Hex Dump Label
POWER + DSW2-4 =ON
→ ***Receive Buffer***
Hex Dump Label

Appendix B

Printer Adjustments - Style B

Normal Mode

When the printer is powered on, the readout will display the following message.

The LCD Panel will display the **ONLINE** status on the top line of the display and the bottom line will contain the label quantity (QTY) status. The **ONLINE** message will be changed to OFF LINE whenever the printer is switched offline by depressing the **LINE** key. As soon as a print job is received, the QTY message will indicate the number of labels to be printed. As soon as the label job begins to print, the display will indicate the number of labels remaining in the print job that remain to be printed.

User Mode

To enter the USER mode, perform the following steps:

STEP	PROCEDURE
1.	The printer is first taken offline by pressing the **LINE** key once. The display will change to: 
2.	When the display changes to OFFLINE, press the **FEED** and **LINE** keys simultaneously for more than one second. The printer now displays the first USER mode adjustment (Print Darkness).

Print Darkness Setting

There are three (five on the M-8459S) **Darkness** (or heat range) settings. The higher numbers represent darker settings. The current setting is indicated by an underline under one of the range settings.

To change the setting perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to the desired setting. 
2.	Once the correct setting is underlined, press the **FEED** key to accept the setting and advance to the next adjustment.

Note: The setting can be overridden by software. Finer adjustments can also be made using the PRINT potentiometer setting on the adjustment panel.

Printer Adjustments – Style B

Print Speed Adjustment

There are three SPEED settings on the M-8490S/M-8460S and four on the M-8485S/M-8459S. Each setting is listed on the bottom line of the display. The current setting is indicated by an underline under one of the speed settings.

	M-8459S	M-8485S	M-8460S/M-8490S
Print Speed Setting	2 = 2 ips 3 = 3 ips 4 = 4 ips 5 = 5 ips	4 = 4 ips 6 = 6 ips 8 = 8 ips 10 = 10 ips	4 = 4 ips 6 = 6 ips 8 = 8 ips

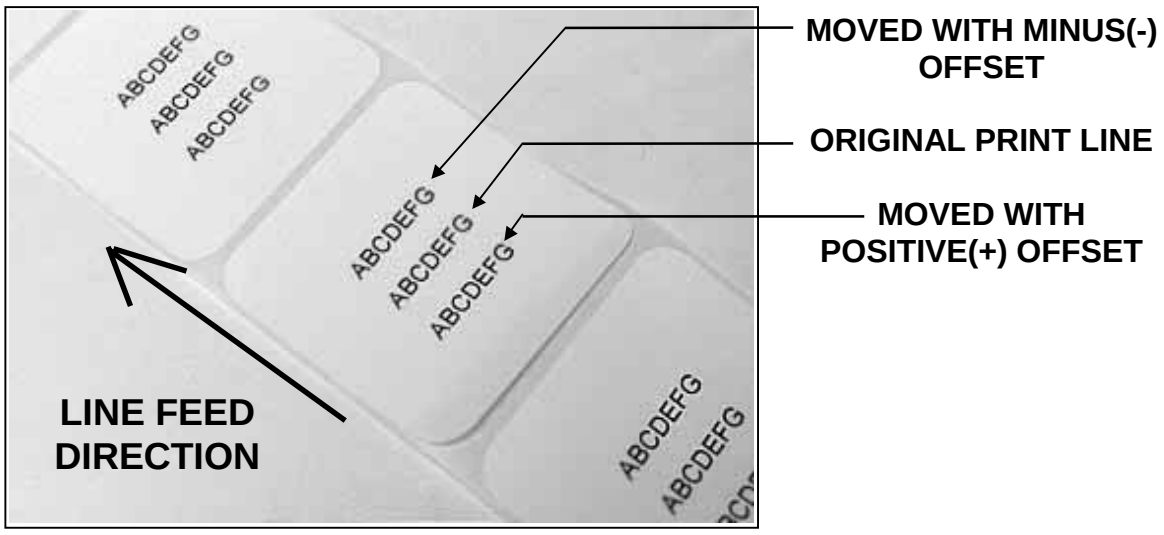
To change the setting perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to the desired speed setting.
2.	Once the correct setting is underlined, press the **FEED** key to accept the setting and advance to the next adjustment.

Note: This setting can be overridden by software.

Pitch Offset and Direction

The label pitch is the distance from the leading edge (the edge that comes out of the printer first) of a label and the leading edge of the next label. The leading edge position of the label can be adjusted relative to the print head +/- 49 mm in increments of 1 mm using the following procedure. Once the position is set, it can be adjusted +/- 3.75 mm using the PITCH potentiometer on the adjustment panel.

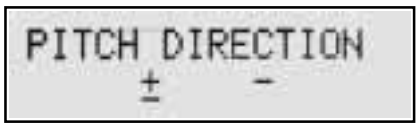


Appendix B

Printer Adjustments - Style B

Pitch Offset and Direction Cont.

To change the setting perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to either the positive (+) or the negative (-) selection. A positive selection moves the leading edge of the label forward (away from the print mechanism) while a negative selection moves the leading edge of the label back into the mechanism. 
2.	Once the correct setting is underlined, press the **FEED** key to accept the setting and advance to the Pitch Offset adjustment. 
3.	Use the **LINE** key to step the counter to the desired position. The display will increment one step for each time the **LINE** key is pressed. If the **LINE** key is held down for more then two seconds, it will automatically go into the fast scroll mode. The reading will advance to a setting of 49 mm after which it will automatically wrap and start of "00" again. The pitch direction set in the previous step will be displayed in front of the Offset setting.
4.	Once the setting is correct, press the **FEED** key to accept the setting and advance to the next Offset digit. Again use the LINE key to step to the desired setting (0 thru 9). Once the setting is correct, press the FEED key to accept the setting and advance to the Cancel Print job display.
5.	You may wish to check your settings by printing a test label after you have completed the adjustments to ensure that they are correct.

Printer Adjustments – Style B

Cancel Print Job

If the printer has a print job(s) loaded in memory, selecting YES will cause the job(s) to be cleared. The default selection is NO. Make sure that you want to cancel the print job before selecting YES as the job cannot be recovered and will have to be retransmitted to the printer.

To cancel the print perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to either YES or NO. 
2.	Once the correct setting is underlined, press the **FEED** key to accept the setting and terminate the user mode of operation and return to the normal mode OFFLINE display. If you wish to change any of the settings, you must enter the User Mode again by simultaneously pressing **FEED** and **LINE** keys for more than one second.

Advanced Mode Settings and Adjustments

Advanced mode is provided to make adjustments that require only occasional adjustments. Since they affect the basic operation of the printer, the procedure for entering this mode is designed to prevent someone from accidentally changing the settings.

To enter advanced mode, the printer is powered on while pressing the **LINE** key. The printer will emit a single audible signal and display the first configuration selection on the LCD panel.

Note: Pressing the LINE key at this time will take you to the Advanced Mode Counters display.

Press the **FEED** key to advance the display to the first setting selection.

Printer Adjustments - Style B

Zero Slash Setting

This setting determines if a zero is printed with a slash or without a slash. This setting can also be controlled via software commands. When YES is selected, the U, S, M, WB, WL, XU, XS, XM, XB, XL and vector fonts will have a slash through the center of the zero character.

To access this setting, perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to either YES or NO.
2.	Once the correct setting is underlined, press the **FEED** key to accept the setting and advance the display to the Auto Online display.

Auto Online Setting

This setting determines the mode in which the printer powers up. If the YES selection is made, the printer powers up in the ON LINE mode and is ready to print. If NO is selected, the printer powers up in the OFF LINE mode and must be manually placed in the ON LINE mode by pressing the **LINE** key before it is ready to print.

To access this setting perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to either YES or NO.
2.	Once the correct setting is underlined, press the **FEED** key to accept the setting and advance the display to the Vertical Offset display.

Printer Adjustments – Style B

Vertical Offset Setting

Vertical Offset is the distance down from the leading edge, (the edge of the label that comes out of the printer first) to the first vertical print position. It is always a positive setting since making it negative would move it up and off the printable label. This setting changes the base reference point for all subsequent label jobs. Its effect is identical to the **<ESC>** A3 Base Reference point command. Since the printer moves the label in discrete steps equal to the size of the print dot, the units of measure for Vertical Offset distance is dots. The maximum values that can be set for the different model printers are:

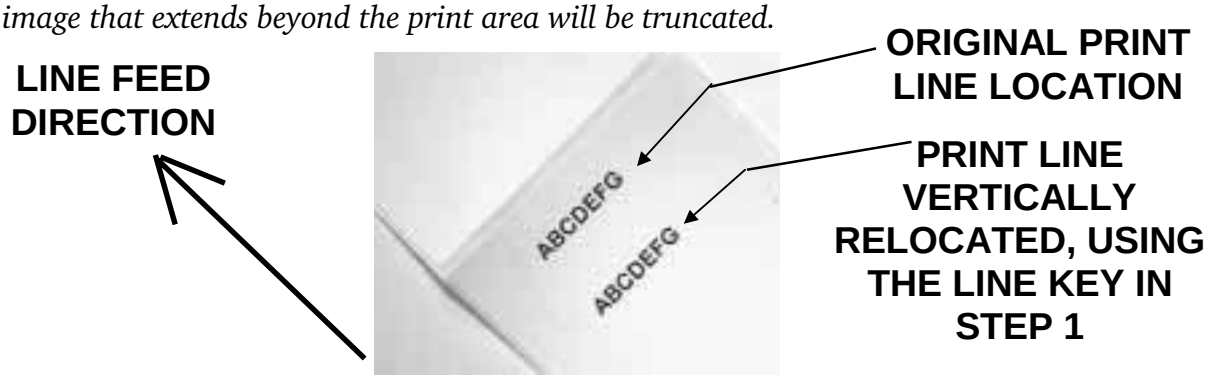
VERTICAL Offsett	M-8459S/M-8460S/M-8485S	M-8490S
Normal Length	0 to 1424	0 to 2136
Expanded Length	0 to 2848	0 to 4272

Note: This setting can be overridden by the Base Reference Point Command. Refer to the Operator Manual Section 5= Programming.

To access this setting perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step to the desired setting. The display will increment one step each time the **LINE** key is pressed. If the **LINE** key is held down for more than two seconds, it will automatically go into the fast scroll mode. The reading will advance to the maximum setting, (the maximum vertical offset) after which it will automatically wrap and start at "0000" again.
2.	Once the setting is correct, press the **FEED** key to accept the setting and advance to the next digit. The correct value for the second digit is set by pressing the **LINE** key. Once it is set to the correct value, press the **FEED** key to accept the setting and advance the cursor to the next digit. This process is repeated until all digits are correctly set. When the last digit is correctly set, press the **FEED** key to advance the display to the next selection.

Note: The printers will not "wrap" images that extend beyond the print area. Any part of the image that extends beyond the print area will be truncated.



Appendix B

Printer Adjustments - Style B

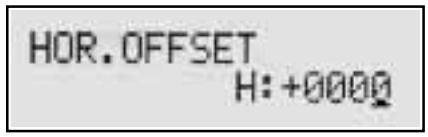
Horizontal Offset and Direction

Horizontal Offset is the distance that the label image is shifted either to the right or left on the label. The image is shifted to the left (when facing the printer) for a positive setting and is shifted to the right for a negative setting. This setting changes the base reference point for all subsequent label jobs. It's effect is identical to the **<ESC>** A3 Base Reference point command. Since the printer can only print in discrete steps equal to the size of the print dot, the units of measure for the Horizontal Offset distance is dots.

Note: This setting can be overridden by the Base Reference Point Command. Refer to the Operator Manual Section 5 Programming.

To access this setting perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step the underline to either the positive (+) or negative (-) selection. NOTE: ***For Standard Unit*** A positive selection increases (moves) the horizontal reference point for the label to the right edge of the label, towards the outside, while a negative selection moves the horizontal reference point for the label to the left, towards the inside of the printer. ***For Opposite Hand Unit (M-8485S)*** A negative selection increases (moves) the horizontal reference point for the label to the right edge of the label, towards the outside, while a positive selection moves the horizontal reference point for the label to the left, towards the inside of the printer.
2.	Once the setting is underlined, press the **FEED** key to accept the setting and advance the display to the first digit of the Horizontal Offset adjustment.
3.	Use the **LINE** key to step the counter to the desired setting. The display will increment one step each time the **LINE** key is pressed. Press the **FEED** key to accept the setting and advance the underline cursor to the digit. Use the **LINE** key to step it to the desired value and press the **FEED** key to accept the setting and advance to the next digit.



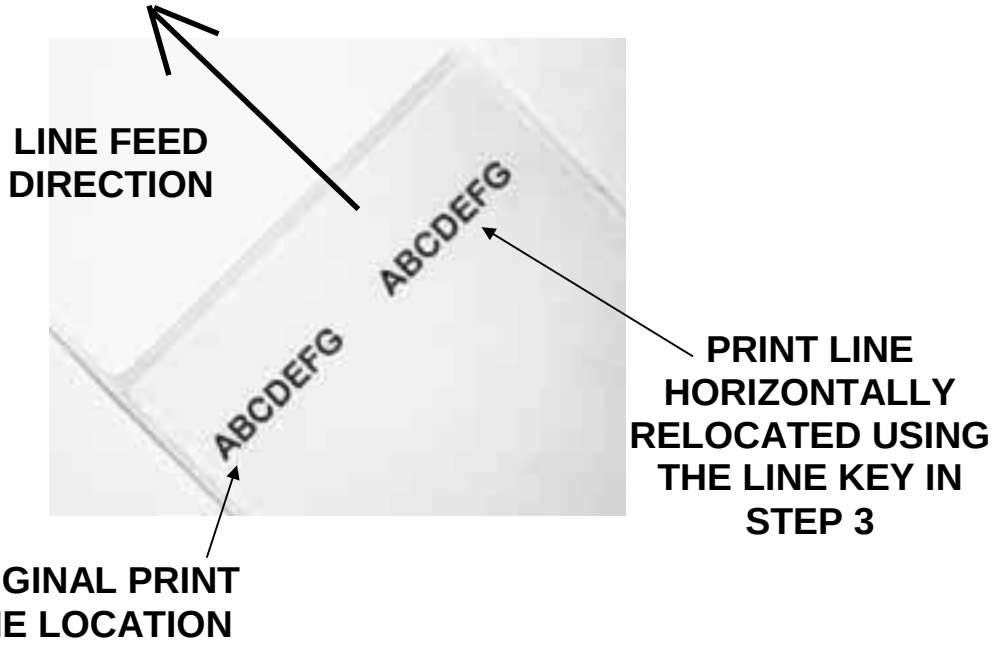
	M-8459S	M-8460S	M-8485S	M-8490S
Horizontal Offset	+/- 896	+/- 1216	+/- 1024	+/- 1344

Note: The printers will not "Wrap" images that extend beyond the print area. Any part of the image that extends beyond the print area will be truncated.

Printer Adjustments - Style B

Horizontal Offset and Direction (Cont.)

4. Once the setting is correct, press the **FEED** key to accept the setting and advance to the Sensor Threshold display.



Sensor Threshold Level

The printer determines the location of the leading edge of the label by measuring the difference between light levels when it sees either a label edge or a black "Eye" mark. This adjustment allows you to manually set the threshold voltage level, between the maximum and minimum light levels. DIP switch DSW2-2 selects the sensor type. If **DSW2-2** is in the OFF position, the setting will be for a See-Thru (or Gap) sensor and the LCD will display "**GAP**" on the top line along with the current setting. If **DSW2-2** is in the **ON** position, the LCD will display "Eye-Mark" on the top line with its current setting. If the value entered for the bottom line setting is "0.0V", then the printer will automatically calculate the setting when the first label is fed after the printer is powered on or the head is closed. There are some instances where the automatically calculated value must be adjusted to ensure reliable label feeding, such as when the backing opacity or the reflectance of the "EYE-Mark" varies significantly within a roll of labels or between label rolls. In these instances the value should be set using the following procedures.

Appendix B

Printer Adjustments - Style B

Sensor Threshold Level (Cont.)

GAP: When setting the "Gap" threshold, the voltage shown on the top line of the display must be measured with nothing but the backing in the sensor and then again with a label still attached to the backing. The formula to be used for setting the threshold is:

(High Voltage Level + Low Voltage Level) x 0.5 = Start Value

To access this setting perform the following steps:

STEP	PROCEDURE
1.	Insert a label still attached to the backing into the sensor and close the Label Hold-Down. Record the voltage shown on the top line of the LCD panel. This line should have the message "GAP" on the top line (DIP switch DSW2-2 = OFF). Make sure the label is all the way under the sensor.
2.	Strip the label from the backing and insert the backing strip under the sensor and close the label lid. Record the voltage shown on the top line of the LCD panel. The voltage ranges measured should be within the following ranges:

Backing with Label	Label Backing Only
2.0V to 3.5V	Less than 1.0V

If the measured values are outside this range, you may have trouble finding a value that will work properly under all conditions. If this is the case, a higher quality label may be needed to get adequate performance.

3.	Calculate the starting point voltage using the formula above.
4.	Use the **LINE** key to step the counter to the desired setting. The display will increment one step for each time the **LINE** key is pressed. If the **LINE** key is held down for more than two seconds, it will automatically go into the fast scroll mode. The reading will advance to a setting of 4.9 (the maximum voltage) after which it will automatically wrap and start at "0.0" again. If a value of "0.0" is set, the printer will automatically set the level between the two measured voltages each time the printer is powered on with labels loaded.
5.	Once the setting is correct, press the **FEED** key to accept the setting and advance to the Calendar Set display.
6.	Repeat this procedure using values slightly higher or lower until the optimum performance is obtained. If you cannot find a setting between the high and low readings that gives adequate performance, then the label stock has too much variation in its opacity.

Printer Adjustments - Style B

Sensor Threshold Level (Cont.)

"Eye-Mark": When setting the "Eye-Mark" threshold, the voltage must be measured with nothing but the label under the sensor and then again with the printed "Eye-Mark" under the sensor. The formula for this is:

(High Voltage Level + Low Voltage Level) x 0.5 = Start Value

To access this setting perform the following steps:

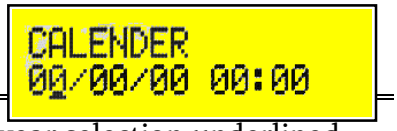
STEP	PROCEDURE
1.	Insert a label into the sensor and close the Label Hold-Down. Make sure the printed "Eye-Mark" is not under the sensor. Record the voltage shown on the top line of the LCD panel. This line should have the message "Eye" on the top line (DIP switch DSW2-2 =ON).
2.	Now pull the label forward until the "Eye-Mark" is positioned under the sensor (the voltage reading should be at its highest point). Record the voltage shown on the top line of the LCD panel. The voltage ranges measured should be within the following ranges: **Label Only**: Less than 1.0V **"Eye-Mark"**: 2.5V to 3.5V If the measured values are outside this range, you may have trouble finding a value that will work properly under all conditions. If this is the case, a higher quality label may be needed to get adequate performance.
3.	Calculate the starting point voltage using the formula.
4.	Use the **LINE** key to step the counter to the desired setting. The display will increment one step for each time the **LINE** key is pressed. If the **LINE** key is held down for more than two seconds, it will automatically go into the fast scroll mode. The reading will advance to a setting of 4.9 (the maximum voltage) after which it will automatically wrap and start at "0.0" again. If a value of "0.0" is set, the printer will automatically set the level each time the printer is powered on with labels loaded or the head is closed.
5.	Once the setting is correct, press the **FEED** key to accept the setting and advance to the Calendar Set display.
6.	Repeat this procedure using values slightly higher or lower until the value that gives adequate performance is found. If you cannot find a that will give you adequate performance, then the label stock or printed "Eye-Mark" has too much variation in its reflectance.

Printer Adjustments - Style B

Calendar Set

If the Calendar Option is installed in the printer, the date and time can be set manually using the LCD display or via the **<ESC>WT** Calendar Set command. Refer to the Operator Manual, Section 5, Programming. The last setting, set either manually or via software command, received by the printer will be the value used. The format of the display is **YY/MM/DD hh:mm** (Year/Month/Day/hours: minutes). The date format is fixed and cannot be changed.

To enable the Calendar feature (if installed), press the **LINE** key until the underline cursor is beneath the **Y**(es). If the Calendar feature is to be disabled, press the Line key until the cursor is under the **N**(o). When the desired setting is selected, press the FEED key to advance the display to the Calendar Set.



STEP	PROCEDURE
1.	**Year:** The first display shown will have the two digit year selection underlined. Press the **LINE** key to scroll through the dates. The year number will increase by one each time the **LINE** key is pressed until it reaches its maximum legal value (i.e., "99" for the year digits) at which point it will wrap around to the "00" setting.
2.	**Month:** After you have set the correct year, press the **FEED** key to advance the underline cursor to the two digit Month position. Press the **LINE** key to scroll through the numbers corresponding to the month. The month number will increase by one each time the **LINE** key is pressed until it reaches a value of "12" at which point it will wrap around to the "01" setting.
3.	**Day:** After you have set the correct month, press the **FEED** key to advance the underline cursor to the two digit Day position. Press the **LINE** key to scroll through the numbers corresponding to the date. The date number will increase by one each time the **LINE** key is pressed until it reaches a value of "31" at which point it will wrap around to the "01" setting.
4.	**Hour:** After you have set the correct date, press the **FEED** key to advance the underline cursor to the two digit Hour position. Press the **LINE** key to scroll through the numbers corresponding to the hour (using a 24 hour clock). The hour number will increase by one each time the **LINE** key is pressed until it reaches a value of "24" at which point it will wrap around to the "01" setting.
5.	**Minute:** After you have set the correct hour, press the **FEED** key to advance the underline cursor to the two digit minute position. Press the **LINE** key to scroll through the numbers corresponding to the minute. The minute number will increase by one each time the **LINE** key is pressed until it reaches a value of "60" at which point it will wrap around to the "01" setting.
6.	After you have set the calendar, press the **FEED** key to accept the setting and advance to the Ignore CR/LF display.

Printer Adjustments - Style B

Ignore CR/F

Under certain circumstances, it is desirable to filter out all CR/LF combinations from the data stream. Selecting YES for this for this setting will strip all CR/LF commands from the data stream, including graphics and 2D bar codes.

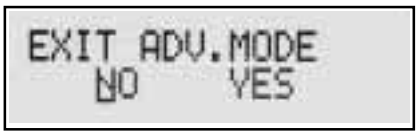
To access this setting perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step the underline cursor to the desired setting. 
2.	Once the setting is underlined, press the **FEED** key to accept the setting and advance to the next display.

Exit Mode

This allows you to exit the Advanced Mode or to recycle through the selections again.

To access this setting perform the following steps:

STEP	PROCEDURE
1.	Use the **LINE** key to step the underline cursor to either the YES or NO selection. The default position is NO. 
2.	Once the setting is underlined, press the **FEED** key to advance the display to the OFF LINE mode if YES was selected or back to the Advanced Setup Mode if NO was selected.

Appendix B

Advanced Mode Counters

An Advanced Counter Mode is provided for reading and clearing the internal counters. They allow the user to keep track of the number of centimeters of label material that has passed through the printer, how many labels have been dispensed or how many labels have been cut.

To access this setting perform the following steps:

STEP	PROCEDURE
1.	Power the printer on while pressing the **LINE** key. The printer will beep one time and display the Advanced Mode on the LCD panel. 
2.	Press the **LINE** key to advance the display to the Advanced Counter Mode. 
3.	Press the **FEED** key to advance the display to the counters selections. 

The counters are identified in the display as follows:

HD: Head Counter (should be reset when print head is replaced)

DSP: Dispense Counter (not used on "S" printers)

CUT: Cutter Counter (not used on "S" printers)

LIFE: Life Counter (cannot be reset)

STEP	PROCEDURE
1.	Press the **LINE** key to step the underline cursor to the desired counter, the Head (HD) Counter, Dispenser (DSP) counter, the CUT (CUTTER) counter or the LIFE counter. The default position is the Head Counter. Use the **LINE** key to advance the underline cursor to the desired selection.
2.	Once the correct setting is underlined, press the **FEED** key to display the current value (in kilometers) stored in the counter 

Advanced Mode Counters (Cont)

STEP	PROCEDURE
3.	Press the **FEED** key again to advance the counter to the Clear mode. All counters, with the exception of the LIFE counter may be cleared. HEAD CTR CLR YES NO
4.	Use the **LINE** key to select the desired setting. If you only want to read the counter value, select NO. If you want to read the counter and reset it to 0.0, place the underline cursor under YES. Once the desired setting is selected, press the **FEED** key to advance the display to the Exit Advanced Mode Display.

Printing Test Labels Style "B"

This option allows you to print a test label. It is recommended that you print a test label after you have changed any of the settings in the Advanced Mode. The test label allows you to verify that you indeed did make the desired changes. To enter the User Test Print Mode, power up the printer while pressing the **FEED** key and a single audible signal will be heard. Release the **FEED** key and the printer to display the following message on the LCD panel.

STEP	PROCEDURE
1.	Use the **LINE** key to step the underline cursor to either the Large or Small selection. If Large is underlined, a label of maximum width will be printed showing a head check pattern and the current printer setting information. USER TEST PRINT Small Large The default position is LARGE. 

Appendix B

Printing Test Labels - Style "B"

STEP	PROCEDURE
2.	Once the desired label size setting is underlined press the **FEED** key. If LARGE was underlined, a label will be printed. If SMALL was underlined, the display will advance to the Print Size display. You must enter the size of the label.

The minimum and maximum label that can be selected is:

Label Width	M-8459S	M-8460S	M-8485S	M-8490S
Minimum	4 cm 1.6 in.			
Maximum	11 cm 4.3 in.	15 cm 5.9 in.	12 cm 4.7 in.	11 cm 4.3 in

3. Once the desired label size setting is underlined press the **FEED** key. If LARGE was underlined, a label will be printed. If SMALL was underlined, the display will advance to the Print Size display. You must enter the size of the label.

4. Press the **LINE** key to increment the setting by 1 cm each time the key is pressed. Once the maximum size is reached, the display will wrap around and start incrementing at 04 cm again. Once the correct label width is selected, press the **FEED** key to initiate the print. The **SMALL** label only contains a head check pattern.

5. If you wish to pause the printer after it starts to print a test label, press the **FEED** key. Press the **FEED** key again to resume the test label printing. To stop the test label print, pause the printer and then turn power off.