M-8400RVe
Thermal Transfer Printer

Service Manual

PN 9001094
Rev. A

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The information supplied in this manual was current at time of publication. If you come across procedures that need clarification or find errors or have suggestions contact us at qc@satoamerica.com

Warning: This equipment complies with the requirements in Part 15 of FCC rules for a Class B 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.

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Section 1

Overview and Specifications

1.1 Overview

The SATO M-8400RVe Printer Service Manual provides information for installing and maintaining the M-8400RVe Thermal Transfer printer. Step-by-step maintenance instructions are included in this manual with typical problems and solutions. It is recommended that you become familiar with each section in this manual before installing and maintaining the printer.

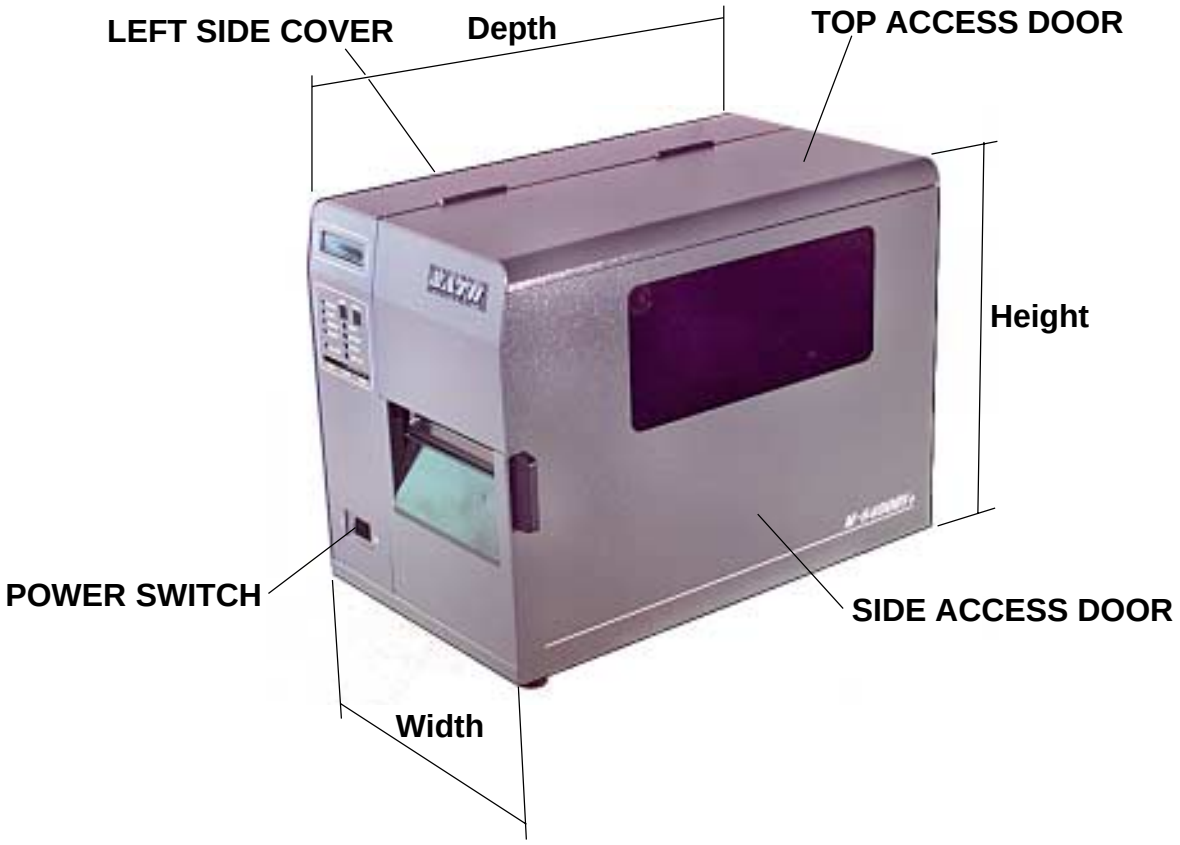
The M-8400RVe printer has a resolution of 203 dpi and can print labels up to 4.1 inches wide. It uses the standard SATO RISC printer command codes. The only differences between it and other RISC printers are the allowable values representing the print positions on the label. These values are specified in "dots" and will vary depending upon the resolution of the printer and the amount of memory available for imaging the label. The allowable range for the M-8400RVe is specified in a table for those command codes.

The M-8400RVe was designed to be compatible with the standard M-8400. The main difference is how it receives the command sequence and how it responds to certain commands. Refer to the "Operator and Technical Reference Manual" for other information.

The sections in this manual cover the following:

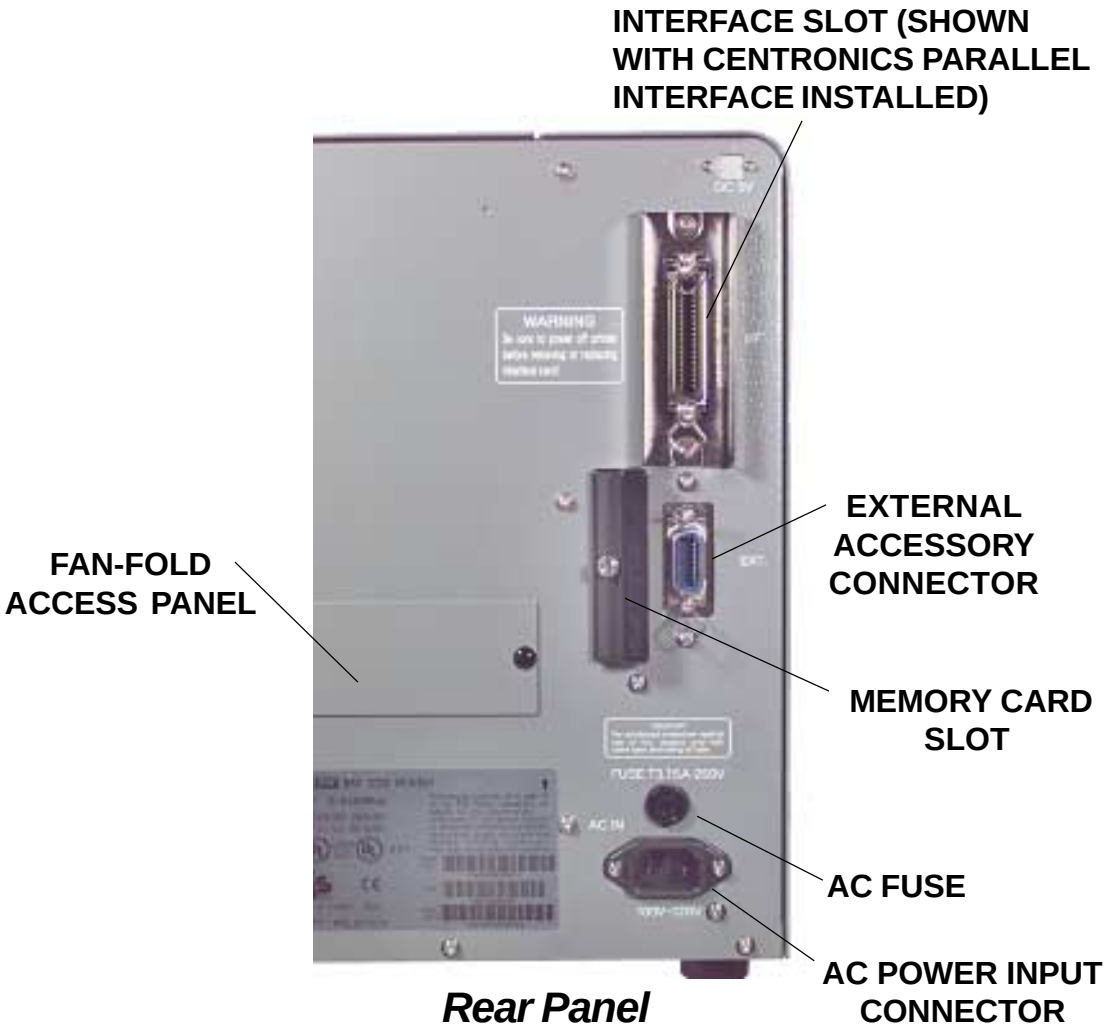
- *Section 1. Overview and Specifications*
- *Section 2. Configuration*
- *Section 3. Interface Specifications*
- *Section 4. Electrical Checks and Adjustments*
- *Section 5. Mechanical Adjustments*
- *Section 6. Replacement Procedures*
- *Section 7. Factory Resets*
- *Section 8. Troubleshooting*
- *Section 9. Optional Accessories*
- *Section 10. Parts list*

1.2 Physical Characteristics



Dimensions	M-8400RVe
Wide	10.4 in. (265 mm)
Deep	17.1 in. (435 mm)
High	13.4 in. (341 mm)
Weight	39.7 lbs. (18 kg)
Power Requirements	
Voltage	115 -220 V (+/- 10%) 50/60 Hz (+/- 1%)
Power Consumption	50W idle 130W Operating

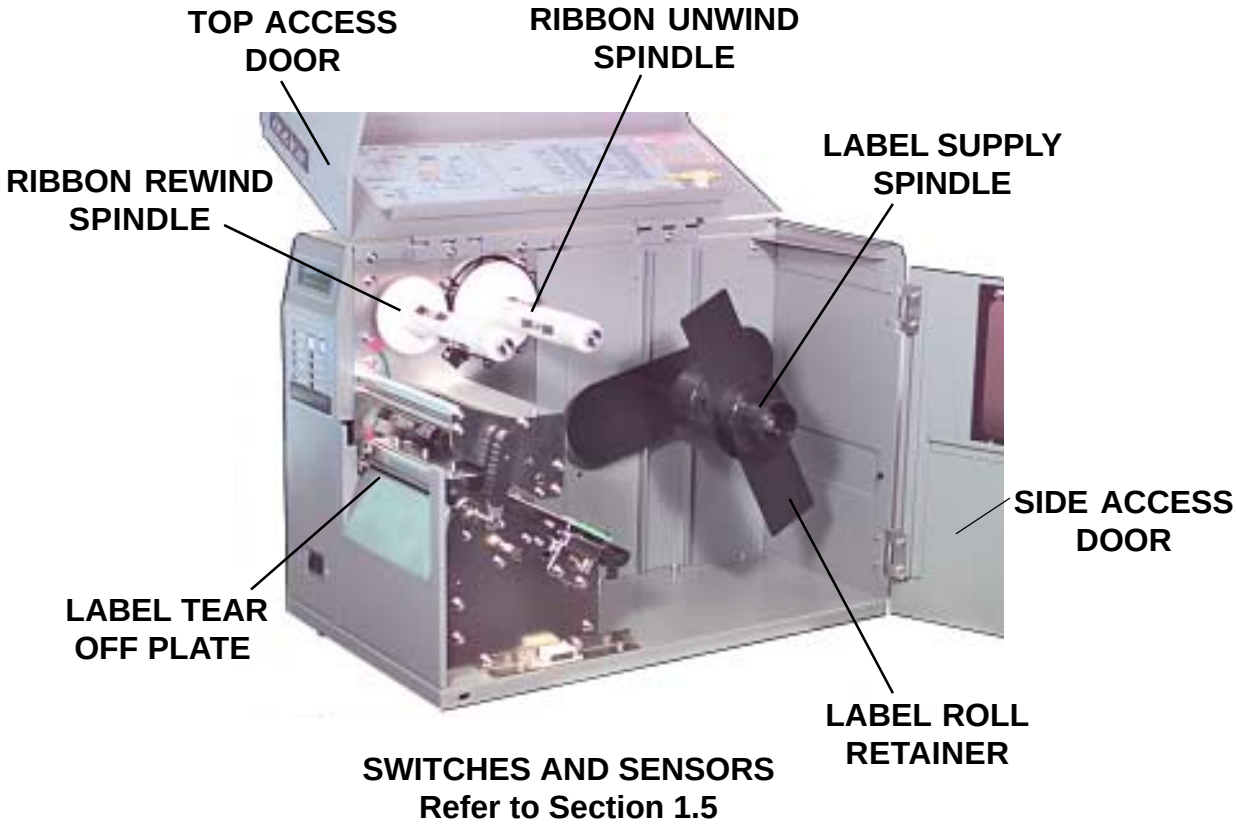
1.3 Printer Features

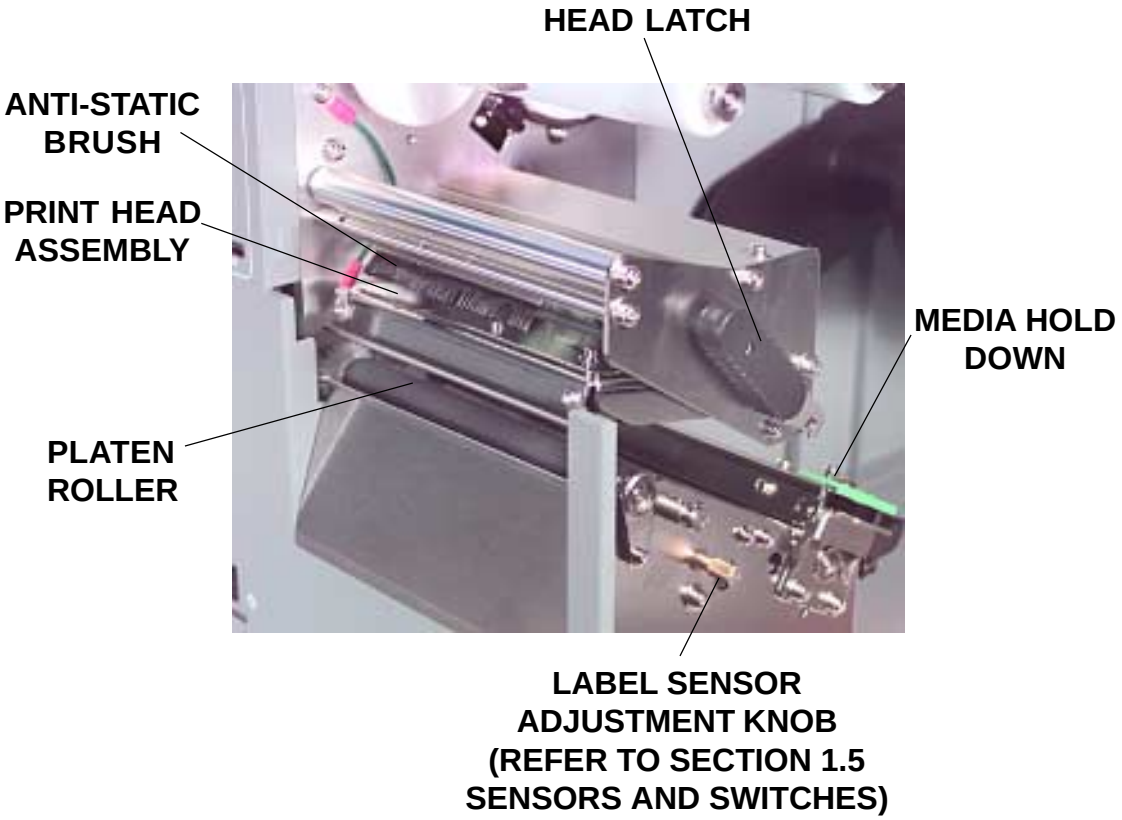


Rear Panel

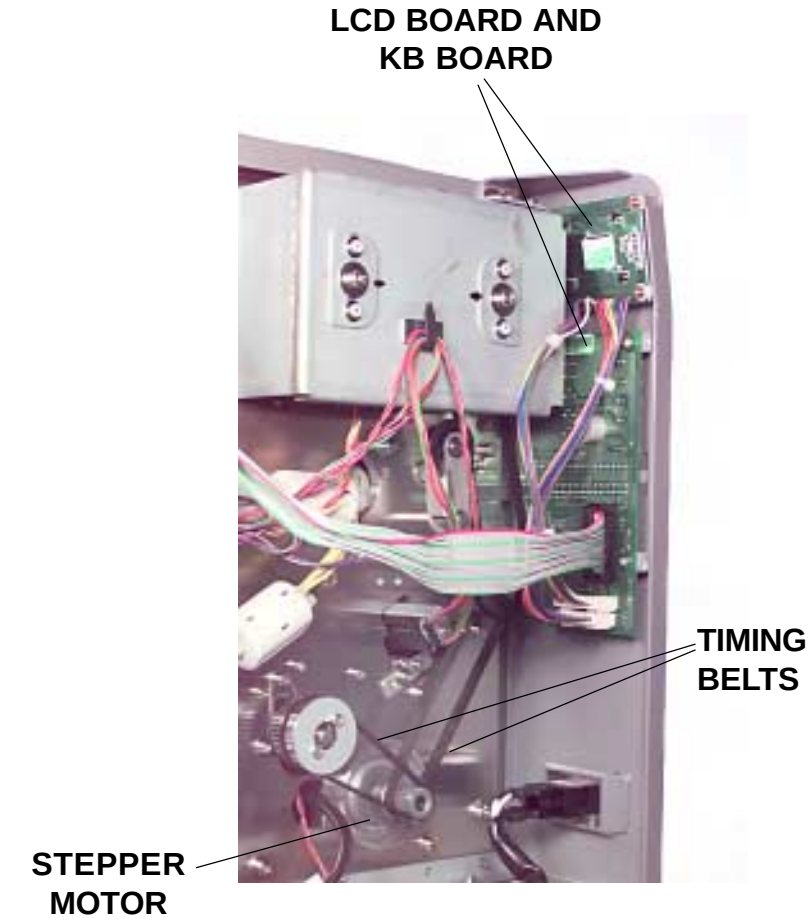
INTERFACE SLOT	Slot to plug in an interface adapter. An adapter must be connected before the printer is operational. The adapter types available are: RS232C Serial I/F Module, DB-25. IEEE1284 Parallel I/F Module, AMP 57-40360 Universal Serial Bus I/F Module Ethernet 10/100 BaseT I/F Module RS-422/485 I/F Module, DB-9
MEMORY CARD SLOT	One slot for optional PCMCIA Memory Cards.
EXT. ACCESSORY CONNECTOR	External signal connector for Accessories, AMP 57-60140
AC FUSE	Input power protection. Type 3A/250V.
AC POWER INPUT	Input 115V 50/60 Hz connector. Use the cable provided.

Printer Features

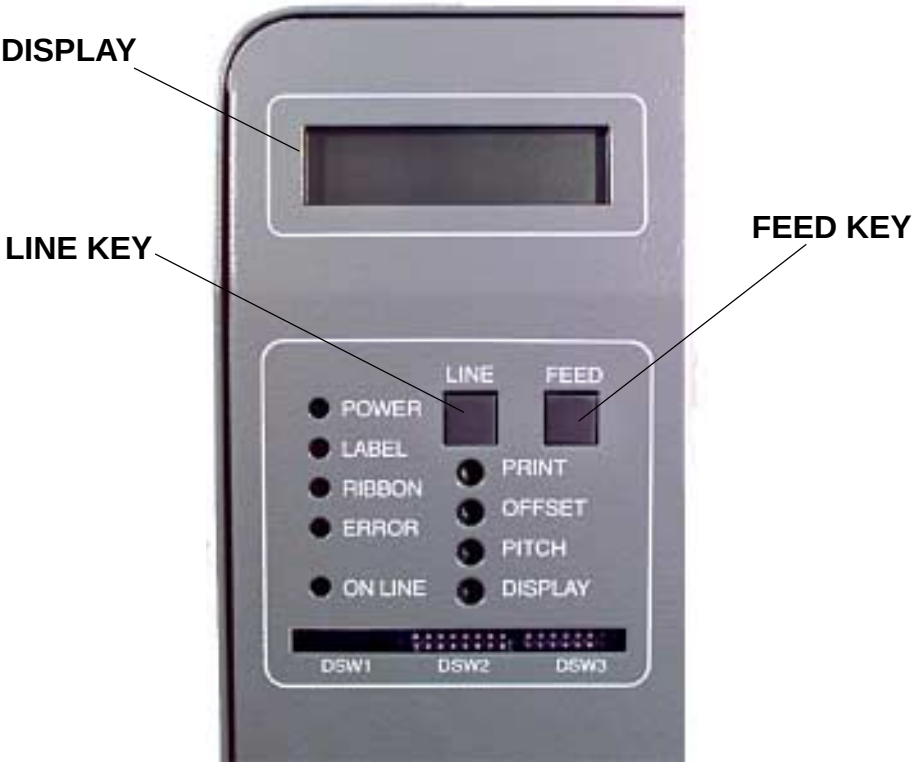




Printer Features



1.4 Operation Panel/Displays



LCD Display 2 LINE x 16 Character LCD display. Used for setting operational parameters of the printer and displaying error conditions.

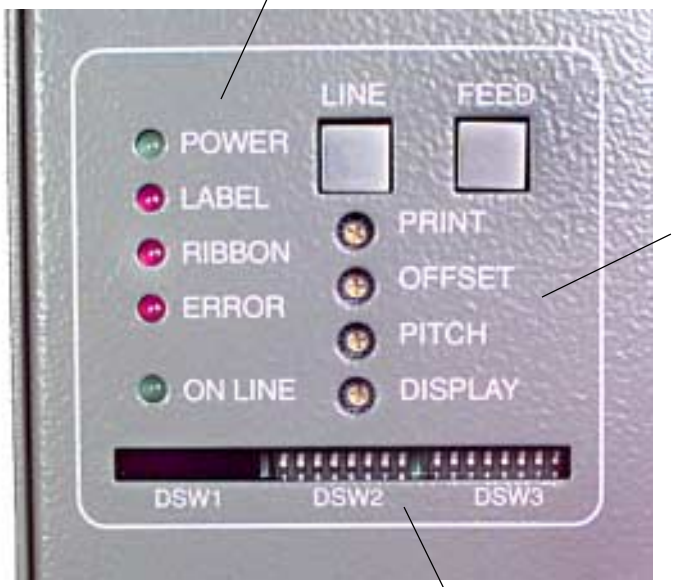
LINE KEY Momentary switch. Pressing this key toggles the printer between the on-line and off-line mode. When the printer is on-line, it is ready to receive data from the host. This key acts as a pause during a print job by taking the printer off-line. It can also be used as a Pause function key to stop the printer during the printing process.

FEED KEY Momentary switch. Pressing this key feeds one blank label through the printer when it is off-line. When the printer is on-line, another copy of the last label will be printed.

Operation Panel/Displays

ADVISORY LED'S

POWER	Illuminated when power is on.
ONLINE	Illuminated when printer is ready to receive data. Turn ON/OFF by toggling the LINE key.
LABEL	Illuminated when label supply is out.
RIBBON	Illuminated when ribbon motion sensor does not detect any ribbon motion.
ERROR	Illuminated when there is a system fault such as an open print head.



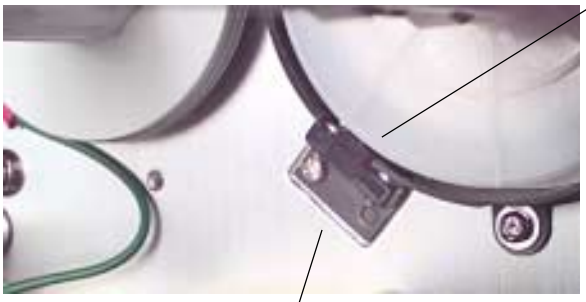
POTENTIOMETERS

PRINT	To adjust print darkness (fine adjustment).
OFFSET	To adjust amount of back/forward feed for dispenser/cutter/tear-off bar position (+/- 3.75).
PITCH	To adjust home print position of the label (+/- 3.75 mm). Affects stop position of label feed, print position and dispense position.
DISPLAY	To adjust the contrast of the LCD display.

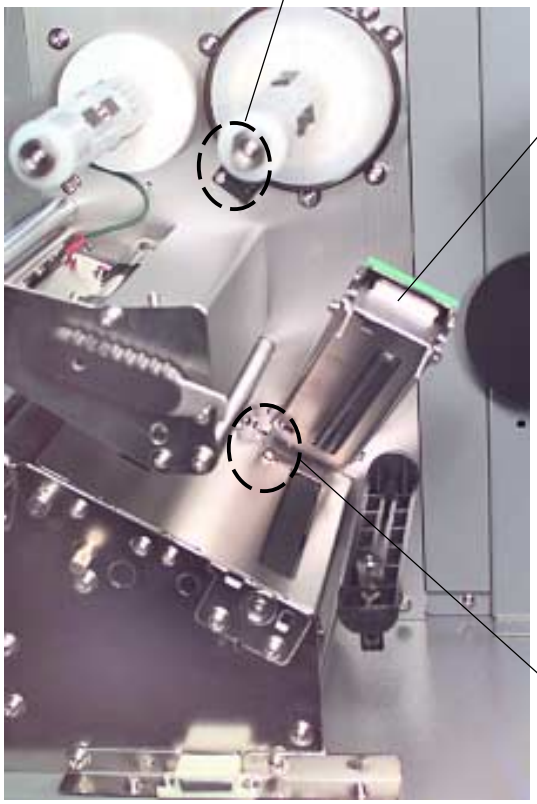
DIP SWITCHES

DSW2 & DSW3	Dip Switches used to set operational parameters of printer. Refer to Section 2 for settings.
DSW1	Optional RS232 Communication Card contains DSW1 switches which are configured when supplied with the printer. Refer to Section 2 for settings.

1.5 Sensors and Switches



RIBBON MOTION SENSOR: This sensor is a motion detector that signals the printer when the ribbon supply is turning. This sensor is used for both the ribbon end and ribbon near end sensing.

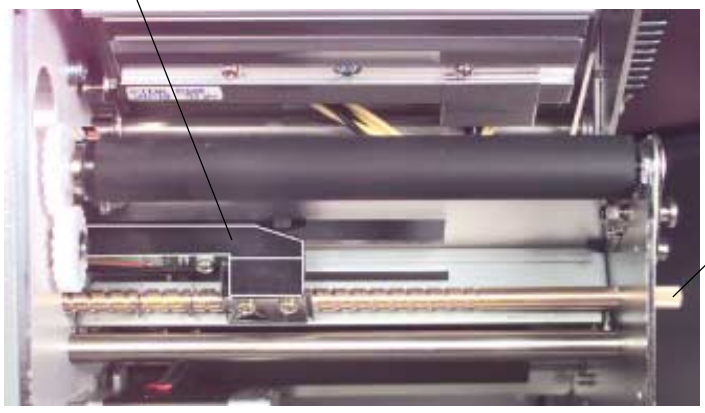


MEDIA HOLD DOWN: Open by lifting up on the release tab underneath the green tab marked "PUSH". The Media Hold Down is spring loaded and will remain in the up position. Close by pushing down on the same green tab.

HEAD OPEN SWITCH

LABEL OUT SENSOR: This micro switch is activated when media stock is out or when the Media Hold Down is in the up position. All printer operations stop, and an error message is displayed on the LCD.

LABEL SENSOR



LABEL SENSOR ADJUSTMENT KNOB

SEE SECTION 5.9

1.6 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.

1.7 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, 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.
- Warm temperatures which can cause electrical problems within the printer. (See Section 1.9 Environment.

1.8 Optional Accessories

ACCESSORY	M-8400RVe
Memory Expansion	One slot for PCMCIA Memory Cards (up to 16 MB Flash or 4 MB SRAM). Can be used for graphic file storage, print buffer expansion, format storage and downloaded True Type fonts.*
Calendar	An internally mounted Date/Time chip that can be used to date/time stamp labels at the time of printing.*
Label Cutter	An internally mounted attachment allowing labels to be cut at specified internals. Controlled through programming.*
Label Dispenser	Internal attachment allowing labels to peeled from backing for immediate (on demand) application. Backing is not rewound.
Label Rewinder	External option that rewinds labels onto a roll after they are printed.
Parallel Interface	IEEE1284 Bi-Directional Plug-In Interface Module
Serial Interface	High Speed Serial RS232 Interface Module
Universal Serial I/F	USB Interface Module
Ethernet Interface	10/100BaseT Interface Module
Coax/Twinax Interface	Coax/Triax Interface Module. Coax I/F emulates an IBM 3287-2 printer with a standard Type A BNC connector. Twinax I/F emulates IBM 5224, 5225, 5226 or 4214 printers with auto-terminate/cable-thru capabilities.

***** Check with your software vendor to make sure these functiions are supported.

1.9 Environment & Approvals

Environmental	**M-8400RVe**
Operating Temperature	41^0 to 104^0 F (5^0 to 40^0 C)
Storage Temperature	-0^0 to 104^0 F (-20^0 to 40^0 C)
Operating Humidity	15-85% RH, non-condensing
Storage Humidity	Max 90% RH, non-condensing
Electrostatic Discharge	8KV
Regulatory Approvals	
Safety	UL, CSA, TUV
RFI/EMI	FCC Class A

1.10 General Printer Specifications

Specification	**M-8400RVe**
Print	
Method	Direct or Thermal Transfer
Speed (User Selectable)	2 to 10 ips - 50 to 250 mm/s
Print Module (Dot Size)	.0049 in. - .125 mm
Resolution	203 dpi - 8 dpmm
Maximum Print Width	4.1 in. - 104 mm
Maximum Print Length	49.2 in. - 1249 mm

Specification	**M-8400RVe**
Media	
Minimum Width	.87 in. (22 mm)
Minimum Length	.63 in. (16 mm)
Maximum Width	5.0 in. (128 mm)
Type	Die Cut Labels, Fan-Fold, Tag Stock or Continuous
Caliper	.010 in. (.25 mm)
Roll OD (max)	8.6 in. (218 mm), Face-in Wind
Core ID (min)	1.5 in. (38 mm)
Core ID (Recommended)	3 in. (76 mm)

General Printer Specifications

Specification	**M-8400RVe**
Sensing	
See-Thru for labels or tags	Movable
Reflective Eye-Mark	Movable
Continuous Form	Sensor not used
Ribbon	
Maximum Width	4.4 in. (111 mm)
Length	1475 ft. (450 m)
Thickness	4.5 micron, Face in Wind
Controls and Signals	
On-Line	Green LED
Power	Green LED
Label	Red LED
Ribbon	Red LED
Error	Red LED
LCD Panel	2 Line x 16 Character
On/Off-Line Key	Front Panel
Label Feed Key	Front Panel
Power On/Off Switch	Front Panel
Potentiometer Adjustments	
Print Darkness	Front Panel
Pitch	Front Panel
Offset	Front Panel
Display	Front Panel

General Printer Specifications

Specification	**M-8400RVe**
Interface Modules	
Parallel	IEEE 1284
Serial Serial Protocol	RS232C (9600 to 57,600 bps) Hardware Flow Control (Ready/Busy) Software Flow Control (X-On/X-Off) Bi-directional Status
Universal Serial Bus	USB Version 1.1
Ethernet	10/100BaseT
Data Transmission	ASCII Format
Processing	
CPU	32 Bit RISC
Flash ROM	2 MB
SDRAM	16 MB
Receive Buffer	2.95 MB
Optional Flash ROM	4 MB
Optional PCMCIA Memory	Up to 16 MB Flash or 4 MB SRAM

1.11 Character Fonts

Specification	M-8400RVe
Matrix Fonts	
U Font	(5 dots W x 9 dots H)
S Font	(8 dots W x 15 dots H)
M Font	(13 dots W X 20 dots H)
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
OB Font	(20 dots W x 24 dots H) OCR-B
Auto Smoothing Fonts	
WB	WB Font (18 dots W x 30 dots H)
WL	WL Font (28 dots W x 52 dots H)
XB	XB Font (48 dots W x 48 dots H) Univers Condensed Bold
XL	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 Helvetica, 10 Font Variations
AGFA Raster Fonts	
A Font	CG Times, 8 to 72 pt
B Font	CG Triumvirate, 8 to 72 pt
Downloadable Fonts	
	Bit Mapped TrueType Fonts with Utility Program
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

1.12 Bar Codes

Specification	M-8400RVe
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, .BMP or .PCX formats
Form Overrlay	Form overlay for high-speed editing of complex formats

Section

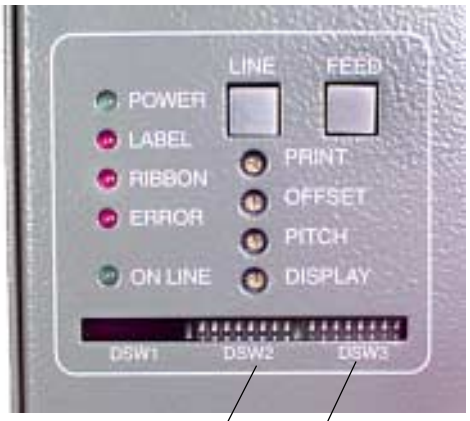
2

Configuration

2.1 Dip Switch Settings

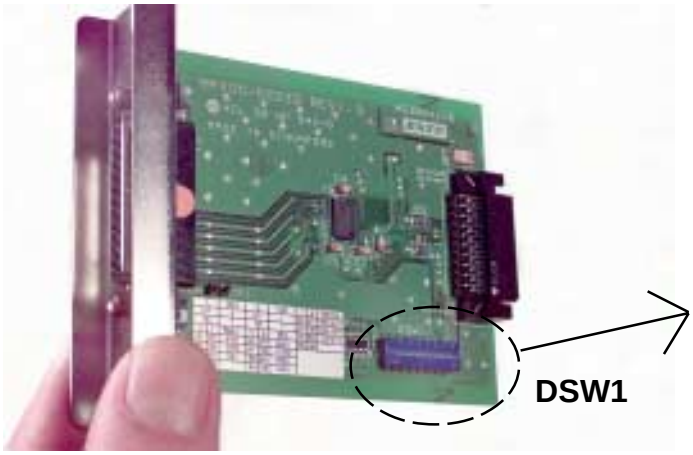
Two DIP switches (DSW2 & DSW3) are located on the front panel. These switches can be used to set:

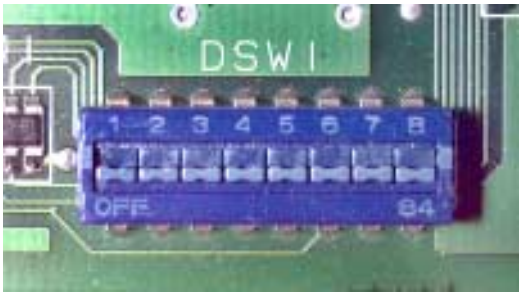
- *Thermal transfer or direct thermal mode*
- *Head Check Mode*
- *Hex Dump Mode*
- *Label sensor enable/disable*
- *Single Job or Multi-Job Receive Buffer*
- *Operation Mode*



DIP SWITCHES

In addition, a third DIP switch (DSW1) is located on the optional RS232 Serial Adapter card and is used to set the RS232C transmit/receive parameters.





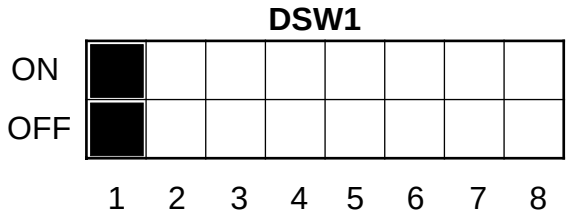
Each switch is an eight section toggle switch. The On position is always to the top. To set the switches, first power the unit Off, then position the DIP switches. Finally after placing the switches in the desired positions, power the printer back on. The switch settings are read by the printer electronics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

Dip Switch Settings

RS232 Transmit/Receive Setting (located on RS232 I/F Module)

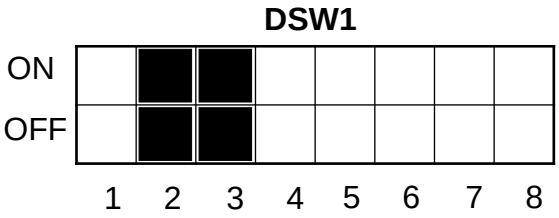
Data Bit Selection (DSW1-1): This switch sets the printer to receive either 7 or 8 data bits for each byte transmitted.

DSW1-1	SETTING
Off	8 data bits
On	7 data bits



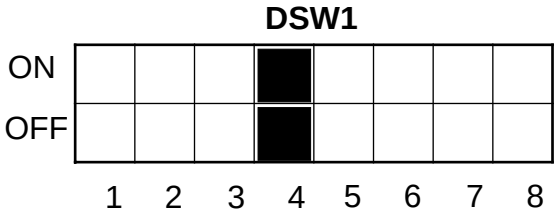
Parity Selection (DSW1-2, DSW1-3): These switches select the type of parity used for error detection.

DSW1-2	DSW1-3	SETTING
Off	Off	None
Off	On	Even
On	Off	Odd
On	On	Not Used



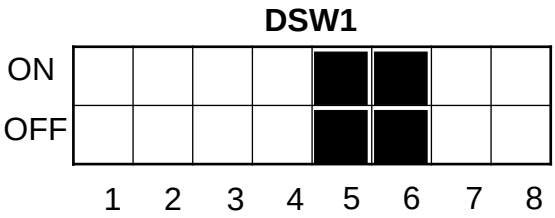
Stop Bit Selection (DSW1-4): Selects the number of stop bits to end each byte transmission.

DSW1-4	SETTING
Off	1 Stop Bit
On	2 Stop Bits



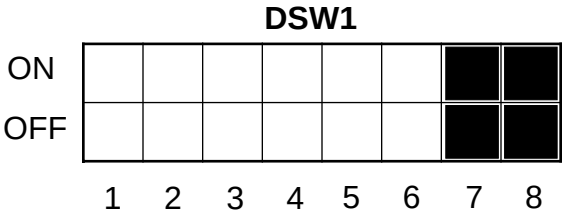
Baud Rate Selection (DSW1-5, DSW1-6): Selects the data rate (bps) for the RS232 port.

DSW1-5	DSW1-6	SETTING
Off	Off	9600
Off	On	19200
On	Off	38400
On	On	57600



Protocol Selection (DSW1-7, DSW1-8): Selects the flow control and status reporting protocols.
(* Will select protocol Bi-Com for M-8400 if DSW2-8 is ON)

DSW1-7	DSW1-8	SETTING
Off	Off	Rdy/Bsy
Off	On	Xon/Xoff
On	Off	Bi-Com 3
On	On	Bi-Com 4*

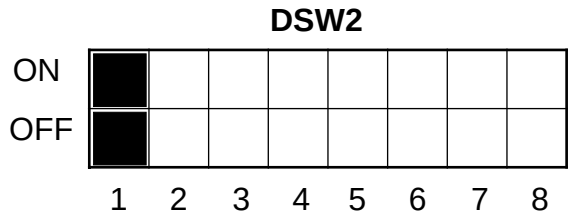


Dip Switch Settings

Printer Set up

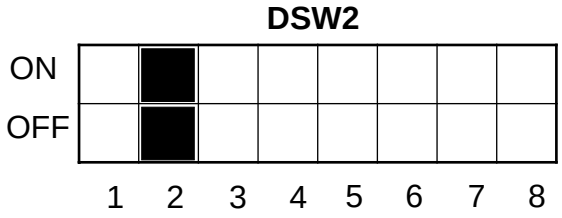
***Print Mode* Selection (DSW2-1):** Selects between direct thermal printing on thermally sensitive paper and thermal transfer printing using a ribbon.

DSW2-1	SETTING
Off	Transfer
On	Direct Therm



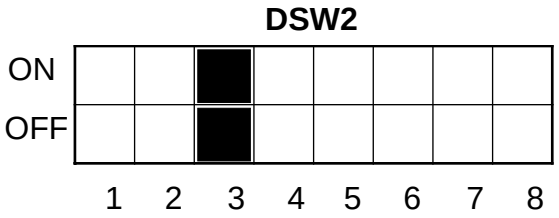
***Sensor Type* Selection (DSW2-2):** Selects between the use of a label gap or a reflective Eye-Mark.

DSW2-2	SETTING
Off	Gap
On	Eye-Mark



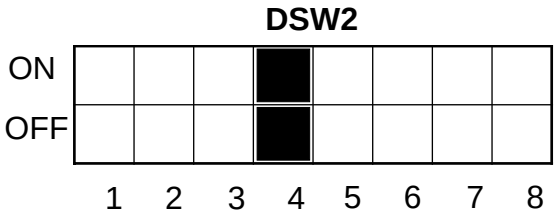
***Head Check* Selection (DSW2-3):** When selected, the printer will check for head elements that are electrically malfunctioning.

DSW2-3	SETTING
Off	Disable
On	Enable



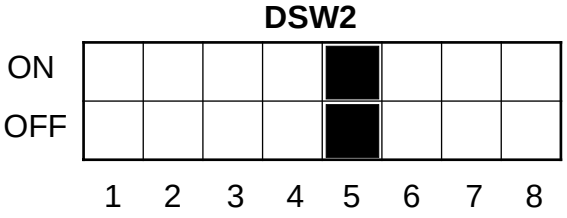
***Hex Dump* Selection (DSW2-4):** Selects Hex Dump mode.

DSW2-4	SETTING
Off	Disable
On	Enable



***Receive Buffer* Selection (DSW2-5):** Selects the operating mode of the receive buffer. See Section 3: Interface Specifications for more information.

DSW2-5	SETTING
Off	One Item
On	Multi-Job

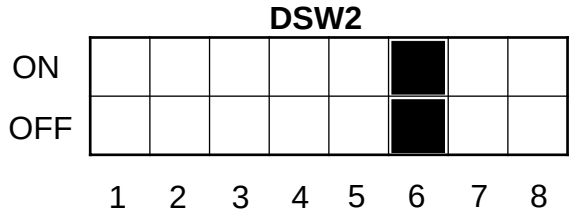


For more information about the cause of troubleshooting printer errors, see Section 8, Troubleshooting.

Dip Switch Settings

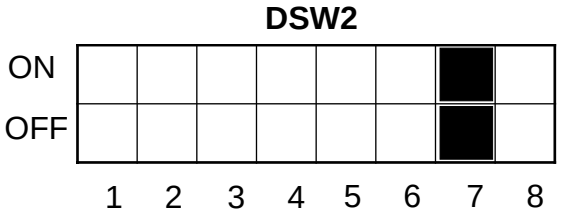
Firmware Download (DSW2-6): Places the printer in the Firmware Download mode for downloading new firmware into flash ROM.

DSW2-6	SETTING
Off	Disabled
On	Enabled



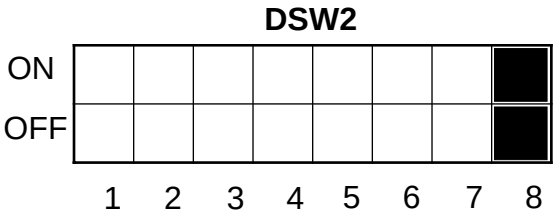
Protocol Code Selection (DSW2-7): Selects the command code set used.

DSW2-7	SETTING
Off	Standard
On	Non-Std.



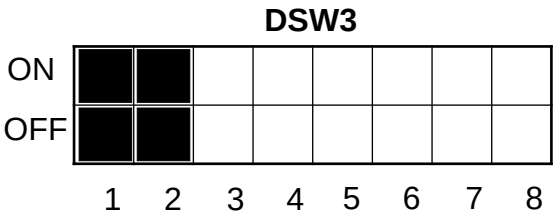
M8400 Emulation Mode (DSW2-8): For emulating earlier series software commands. Should be used only if problems are encountered when using existing software. This switch will also affect the setttings selected by DSW1-7 and DSW1-8.

DSW2-8	SETTING
Off	Disabled
On	Enabled



Backfeed Sequence Selection (DSW3-1 and DSW3-2): Selects the operating mode of the printer. Batch/Continuous disables the label taken (dispense option) sensor.

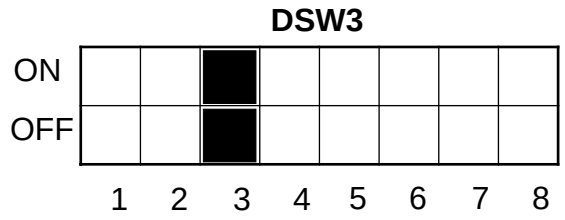
DSW3-1	DSW3-2	SETTING
Off	Off	Batch/Continuous
Off	On	Tear Off
On	Off	Cutter
On	On	Dispenser



Dip Switch Settings

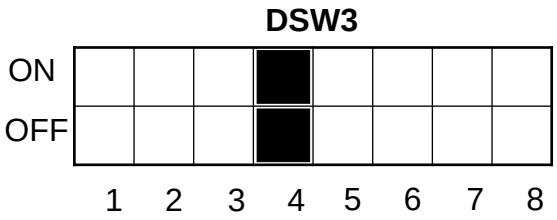
***Label Sensor* Selection (DSW3-3):** Enables or disables the Label Pitch sensor. If the sensor is enabled, it will detect the edge of the label and position it automatically. If it is disabled, the positioning must be under software control using Line Feed commands.

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 label for dispensing/cutting and retract it before printing the next label. The amount of backfeed is adjustable.

DSW3-4	SETTING
Off	Enabled
On	Disabled

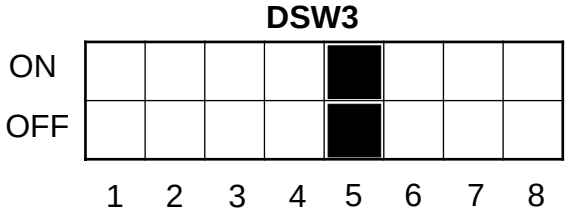


***External Signal* Interface**

The EXT connector on the printer rear panel is intended for use with the external printer accessories such as label rewinders or applicators. The 14-pin Centronics 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. See Section 3: Interface Specifications for a description of the signal level and requirements. When DSW3-5 is On, the unit is in the Continuous print mode, Backfeed is disabled an External Signals are ignored.

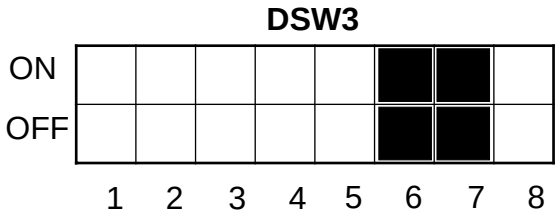
DSW3-5	SETTING
Off	Disabled
On	Enabled



Dip Switch Settings

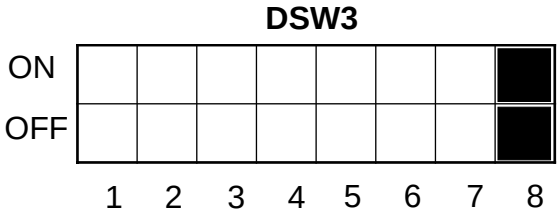
***External Signal Type* Selection (DSW3-6, DSW3-7):** Both the polarity and signal type (level or pulse) of the external print synchronizing signal can be selected. See Section 3 for a definition of signal types.

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 an applicator or other device to reprint the last label of the print job. See Section 3: Interface Specifications for a description of the signal requirements.

DSW3-8	SETTING
Off	Disabled
On	Enabled



2.2 Default Settings

Dip Switch Selections

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

Communications: (1)	8 data bits, no parity, 1 Stop bit, 9600 Baud (1)
Protocol: (1)	Ready/Busy
Sensor:	Gap Sensor
Receive Buffer:	Multi-Job
Mode:	Batch Continuous
Label Sensor:	Sensor Used
Backfeed:	Enabled
External Signals:	Disabled

(1) Applicable only if an RS232 Interface Card is installed in the printer.

Software Default Settings - The printer stores any software settings upon receipt from the host and uses them until they are again changed by receipt of a command containing a new setting. These settings are stored in non-volatile memory 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. You will be asked to confirm that you want the printer default settings by selecting either YES or NO by using the LINE key to step the underline cursor to the desired setting. If you select YES and press the FEED key, the following default configuration will be stored:

SETTING	M-8400RVe
Print Darkness	3
Print Speed	6 in. per sec.
Print Reference	Vertical = 0000, Horizontal = 0000
Zero	No Slash
Auto On-Line	Enabled

Once the default operation is completed, a **DEFAULT SETTING COMPLETED** message will be displayed on the LCD panel and a single "beep" 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.

2.3 LCD Panel Configuration

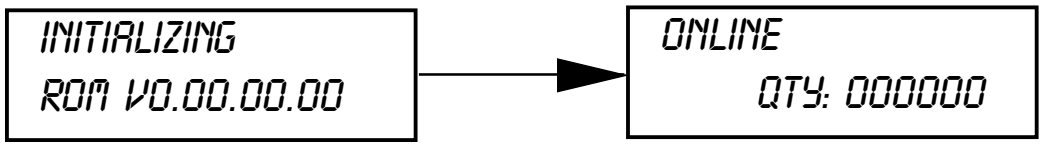
The LCD Panel is used in conjunction with the **LINE** and **FEED** switches to manually enter printer configuration settings. Many of the settings can also be controlled via software commands and in the case of conflict between software and control panel settings, the printer will always use the last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

There are 7 modes of operation you can access from the LCD panel. To enter the desired mode, the KEY SEQUENCE combination listed in the table below must be performed. The initial LCD display message is shown for each mode.

MODE	KEY SEQUENCE	INITIAL DISPLAY	PAGE
Normal Mode	Power	ONLINE QTY:000000	2-9
Advanced Mode	LINE + POWER	ADVANCED MODE	2-13
Test Print Mode	FEED + POWER	TEST PRINT MODE CONFIGURATION	2-33
Default Setting Mode (Std Protocol)	LINE + FEED + POWER	DEFAULT SETTING YES NO	2-34
Maintenance Mode	DSW2-4 ON + LINE + FEED + POWER	MAINTENANCE MODE DIPSW2-4 ON->OFF	2-35
Hex Dump Mode	DSW2-4 ON + POWER	ONLINE QTY:000000	2-38
Firmware Download Mode	DSW2-6 ON + POWER	FLASH DOWNLOAD READY	2-39

LCD Panel — Normal Mode

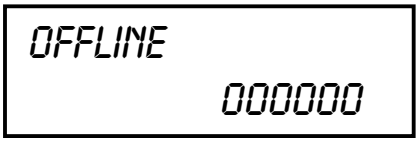
When the printer is first powered on it displays the current ROM version of the printer then immediately displays the ONLINE mode.



The LCD Panel will display the ONLINE status on the top line of the display. The bottom line will contain the label quantity (QTY) status. The message will be changed to OFFLINE 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. The user can access the User Settings using the following procedures:

User Settings

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



Print Darkness Setting

There are five **Darkness** (or heat range) settings on the printer. The higher numbers represent darker settings. The current setting is indicated by a line 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. 1 = Light 2 = Slightly Light 3 = Medium 4 = Slightly Dark 5 = Dark
2.	Once the correct setting is underlined, press the **FEED** key to accept the setting and advance to the next adjustment.

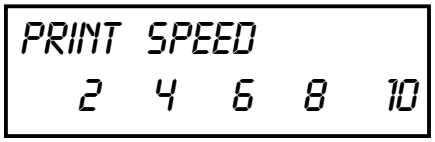
LCD Panel — Normal Mode

Print Speed Adjustment

The print speed selections are dependent upon the printer setting of DSW2-8. The current setting is indicated by the underline cursor. To change the setting:

CS Command	DSW2-8 OFF	DSW2-8 ON
1	2 ips (50mm/s)	2 ips (50mm/s)
2	4 ips (100mm/s)	3 ips (75mm/s)
3	6 ips (150mm/s)	4 ips (100mm/s)
4	8 ips (150mm/s)	5 ips (125mm/s)
5	10 ips (250mm/s)	N/A

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.



Pitch Offset Adjustment

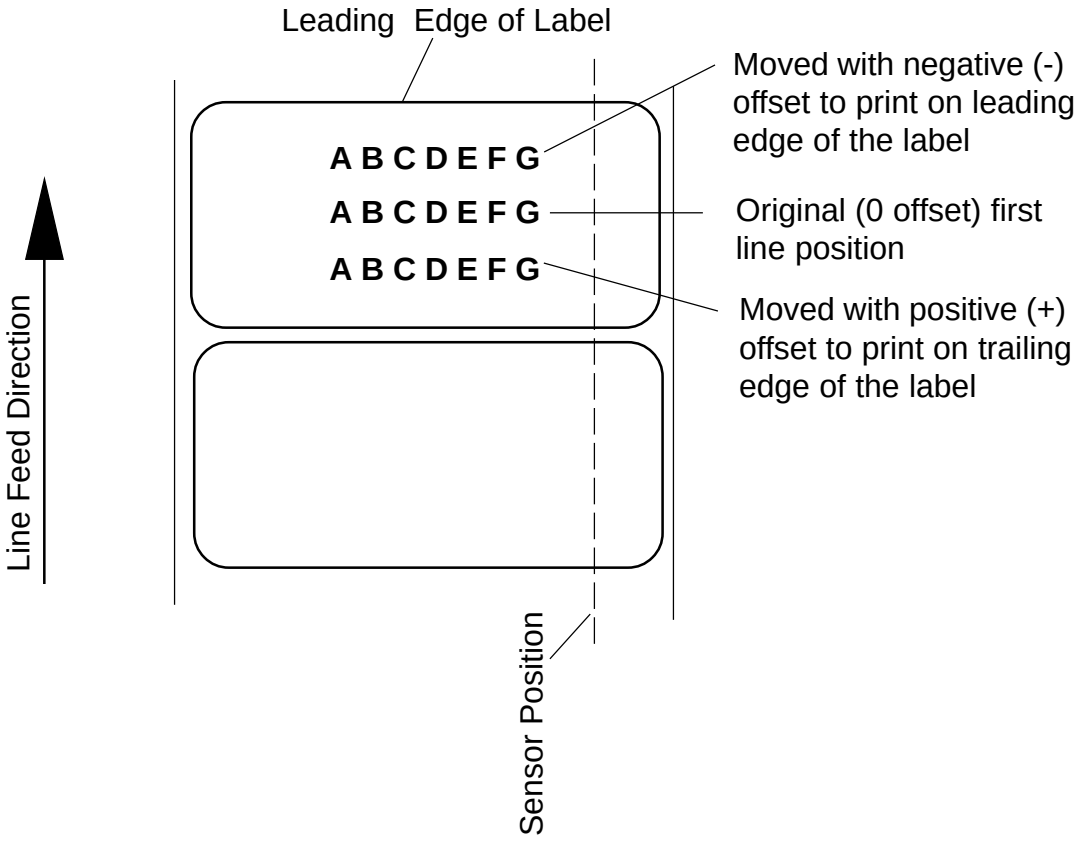
The label pitch is the distance from the leading edge (the edge that comes out of the printer first) of a label and the leading edge of the next label. The leading edge position of the label can be adjusted relative to the print head +/- 49mm in increments of 1mm. Once the position is set, it can be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

STEP	PROCEDURE
1.	The underline cursor will initially be positioned underneath the Pitch Direction setting. Use the **LINE** key to step the underline to either the positive (+) or negative (-) selection. A position selection moves the leading edge of the label forward (away from the print head) while a negative selection moves the leading edge of the label back into the mechansim.
2.	Once the correct setting is underlined, press the **FEED** key to accept the setting and advance to the Offset adjustment.
3.	Use the **LINE** Key to step the first digit of the counter to the desired setting. The display will increment one step each time the **LINE** key is pressed. The reading will advance to a setting of 4 after which it will automatically wrap and start at 0 again.

LCD Panel — Normal Mode

Pitch Offset Adjustment

STEP	PROCEDURE
4.	Press the **FEED** key to accept the setting and advance the cursor to the second digit. Again use the **LINE** key to step to the desired setting. Once it is correct, press the **FEED** key to advance to the next adjustment. Print a test label after completing the adjustments to ensure it is correct.

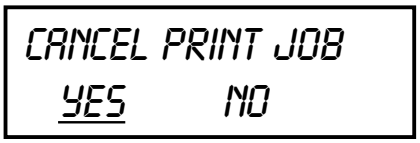


LCD Panel — Normal Mode

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.	Press the **LINE** key to step the underlined cursor to either **No** or **Yes.**
2.	Once the correct setting is underlined, press the **FEED** key to accept the setting.
3.	After the print job(s) have been cleared from memory, the printer will display a COMPLETED message for 3 seconds and then return to the initial ONLINE Normal Mode.

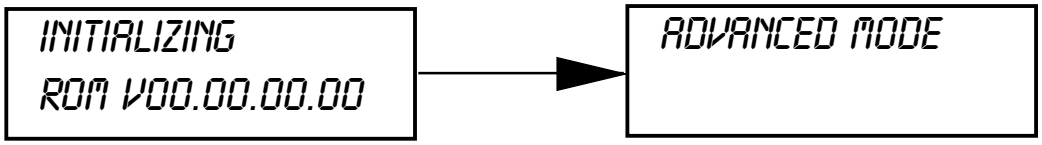
If you wish to change any of the settings, you must enter the User mode again by taking the printer OFFLINE and simultaneously pressing **FEED** and **LINE** keys.

LCD Panel — Advanced Mode

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:

STEP	PROCEDURE
1.	Press the **LINE** key while simultaneously turning the power **ON**. When the printer emits one long beep, release the **LINE** key to display the first screen.
2.	Press the **FEED** key to display the Zero Slash display.

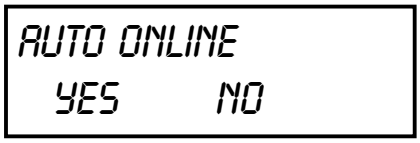


Zero Slash

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 printer internal fonts will have a slash through the center of the zero character.

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 to the Auto Online display.

AutoOnline



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

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

LCD Panel — Advanced Mode

Print Offset

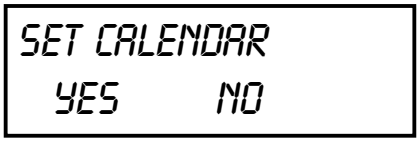
Since the printer moves the label in discrete steps equal to the size of the print dot, the units of measure for Vertical and Horizontal Offset distance is dots.

Vertical Offset is the distance down from the leading edge in dots (the edge of the label that comes out of the printer first) to the first vertical print position. A positive setting moves the first print position down the length of the label while making it negative moves it up the length of the label. The maximum value that can be set is 823 dots.

Horizontal Offset is the distance that the label image is shifted either to the right or left on the label. For a positive setting the image is shifted to the left (towards the inside edge of the label). For a negative setting the image the image is shifted to the right (towards the outside edge of the label). This setting changes the base reference point for all subsequent label jobs. The effect is identical to the <ESC>A3 Base Reference point command. The maximum values that can be set for each is +/-1424 dots.

STEP	PROCEDURE
1.	Use the **LINE** key to step the first digit of the counter to the desired setting. The display will increment one step each time the **LINE** key is pressed.
2.	Press the **FEED** key to accept the setting and advance the cursor to the second digit. Again use the **LINE** key to step to the desired setting. Once it is correct, press the **FEED** key to advance to the next adjustment.
3.	Once the setting is correct, press the **FEED** key to accept the setting and advance to the next display. Print a test label after completing the adjustments to ensure it is correct. *Note: This setting can be overridden by the Base Reference Point Command in your software.*

Set Calendar



This message will only be displayed if the Calendar Option is installed in the printer.

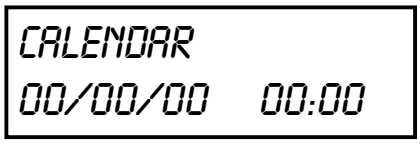
The Calendar is an optional feature in M-8400RVe printers allowing the date and time to be set manually using the LCD Display or via the <ESC>WT Calendar Set command. The last setting, set either manually via software command, received by the printer will be the value used. The format of the display 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 YES. If the Calendar feature is to be disabled, press the **LINE** key until the cursor is underneath the NO. When the desired setting is selected, Press the **FEED** key.

LCD Panel — Advanced Mode

Set Calendar (Continued)

Calendar
00/00/00 00:00



STEP	PROCEDURE
1.	**Year** - The first display shown will have the two digit year selection underlined. You can scroll through the dates by pressing the **LINE** key. 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, pressing the **FEED** key will advance the underline cursor to the two digit Month position. You can scroll through the numbers corresponding to the month by pressing the **LINE** key. 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, pressing the **FEED** key will advance the underline cursor to the two digit Day position. You can scroll through the numbers corresponding to the month date by pressing the **LINE** key. 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, pressing the **FEED** key will advance the underline cursor to the two digit Hour position. You can scroll through the numbers corresponding to the hour (using a 24 hour clock) by pressing the **LINE** key. 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, pressing the **FEED** key will advance the underline cursor to the two digit Minute position. You can scroll through the numbers corresponding to the hour by pressing the **LINE** key. 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 minutes, pressing the **FEED** key will accept the setting and advance to the Ignore CR/LF selection.

LCD Panel — Advanced Mode

Ignore CR/LF

This setting tells the printer to strip out all carriage return/line feed pairs (CRLF) from the data stream, including graphics and 2D bar codes. It is used primarily to maintain compatibility with earlier models of SATO printers.

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

Character Pitch

This setting allows you to set the default character pitch to either fixed character spacing or proportional character spacing.

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to the desired setting.
2.	Once the desired setting is underlined, press the **FEED** key to accept the setting and return to the Advance Mode screen.

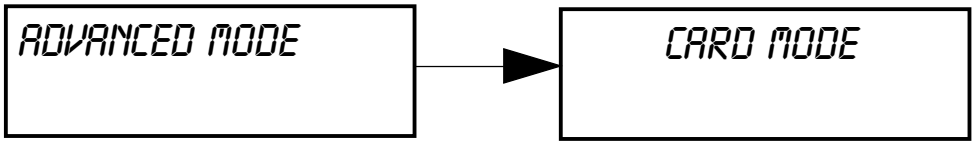
Note: This command can be overriden by the <ESC>PR or <ESC>PS Character Pitch Commands.

Exit Advanced Mode

To exit the Advanced mode, power off the printer then back on.

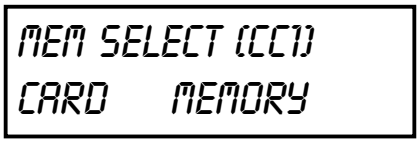
LCD Panel — Card Mode

The Card Mode allows the operator to manage the Expanded Memory (PCMCIA Card or Internal Expanded Flash ROM). The Card Mode is entered from the Advanced Mode display by pressing the **LINE** key once.



The Card Mode display indicates that the printer is in the Card Mode. To advance to the Mem Select (CC1), press the **FEED** key.

Mem Select (CC1)

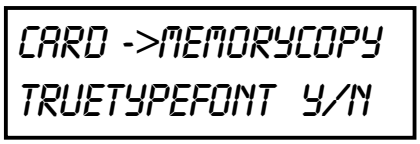


This selection determines which type of optional expanded memory will be addressed as "CC1" in the command streams. The CARD selection specifies the optional PCMCIA card as CC1 and the optional Expanded Flash ROM as CC2.

STEP	PROCEDURE
1.	Use the **LINE** key to step the cursor to the desired setting (Card or Memory).
2.	Once the desired setting is underlined, press the **FEED** key to accept the setting and advance the display.

LCD Panel — Card Mode

Card ->MemoryCopy TrueTypeFont Y/N

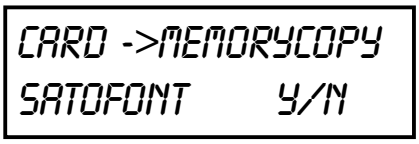


This selection allows you to copy TrueType fonts from the PCMCIA Memory card installed in the Memory Card slot (on the rear of the printer) to the optional Flash ROM.

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to the desired setting. IF Yes is selected, the printer will enter the Card Copy mode. If No is selected, the display will advance to *Card to Memory Copy SATO Font* mode. Press the **FEED** key to accept the selection and advance the display.
2.	Confirm your selection by stepping the underline cursor to the Yes selection. If you select No, the display will return to the previous selection. 
3.	Press the **FEED** key to accept the selection. If Yes was selected, the copy process will start. 
4.	Once the copy process is completed, press the **FEED** key to advance the display. 
5.	If an error is encountered in the copy process, one of the following messages will be displayed on the second line.  R/W Error Indicates a Read/Write error occurred No Card Error Indicates no card was recognized Mem Full Error Indicates that there is insufficient memory available

LCD Panel — Card Mode

Card ->MemoryCopy SatoFont Y/N

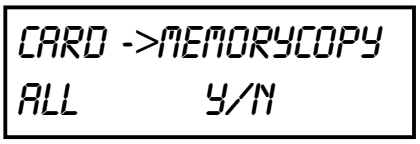


This selection allows you to copy SATO fonts from the PCMCIA Memory card installed in the Memory Card slot (on the rear of the printer) to the optional Flash ROM.

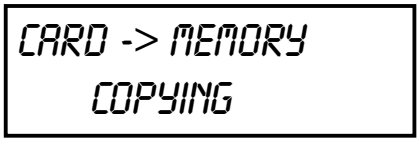
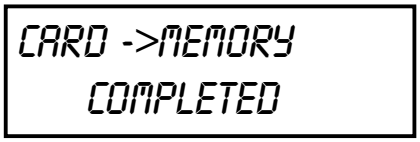
STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to the desired setting. IF Yes is selected, the printer will enter the Card Copy mode. If No is selected, the display will advance to Card->MemoryCopy All mode. Press the **FEED** key to accept the selection and advance the display.
2.	Confirm your selection by stepping the underline cursor to the Yes selection. If you select No, the display will return to the previous selection. 
3.	Press the **FEED** key to accept the selection. If Yes was selected, the copy process will start. 
4.	Once the copy process is completed, press the **FEED** key to advance the display. 
5.	If an error is encountered in the copy process, one of the following messages will be displayed on the second line.  R/W Error Indicates a Read/Write error occurred No Card Error Indicates no card was recognized Mem Full Error Indicates that there is insufficient memory available.

LCD Panel — Card Mode

Card ->MemoryCopy All Y/N



This selection allows you to copy the entire contents from PCMCIA Memory card installed in the Memory Card slot on the rear of the printer to the optional internal Expanded Memory.

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to the desired setting. IF Yes is selected, the printer will enter the Card Copy mode. If No is selected, the display will advance to Card->MemoryCopy All mode.
2.	Confirm your selection by stepping the underline cursor to the Yes selection. If you select No, the display will return to the previous selection. 
3.	Press the **FEED** key to accept the selection. If Yes was selected, the copy process will start. 
4.	Once the copy process is completed, press the **FEED** key to advance the display. 
5.	If an error is encountered in the copy process, one of the following messages will be displayed on the second line.  R/W Error Indicates a Read/Write error occurred No Card Error Indicates no card was recognized Mem Full Error Indicates that there is insufficient memory available

LCD Panel — Card Mode

Memory->Card Copy All <XMB> Y/N

```
MEMORY ->CARDCOPY
ALL      <XMB> Y/N
```

This selection allows you to copy the entire contents of the optional Expanded Memory to the PCMCIA Memory card installed in the Memory Card slot on the rear of the printer.

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to the desired setting. IF Yes is selected, the printer will enter the Card Copy mode. If No is selected, the display will advance to Card->MemoryCopy All mode.

2.	Confirm your selection by stepping the underline cursor to the Yes selection. If you select No, the display will return to the previous selection.
	`COPY START`
	`YES  NO`

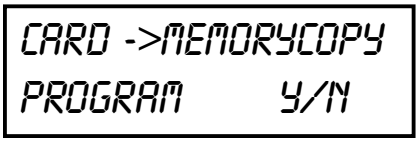
3.	Press the **FEED** key to accept the selection. If Yes was selected, the copy process will start.
	`MEMORY-> CARD COPY`
	`COPYING`

4.	Once the copy process is completed, press the **FEED** key to advance the display.
	`MEMORY-> CARD COPY`
	`COMPLETED`

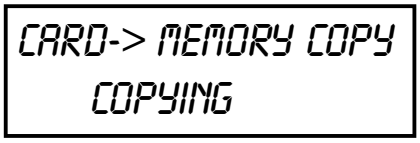
5.	If an error is encountered in the copy process, one of the following messages will be displayed on the second line.
	`CARD COPY/FORMAT`
	`XXXXXXX ERROR`
	R/W Error Indicates a Read/Write error occurred
	No Card Error Indicates no card was recognized
	Mem Full Error Indicates that there is insufficient memory available

LCD Panel — Card Mode

Card->Memory Copy Program Y/N



This selection allows you to copy printer firmware from the PCMCIA Memory card to the printer.

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to the desired setting. IF Yes is selected, the printer will enter the Card Copy mode. If No is selected, the display will advance to the mode display.
2.	Confirm your selection by stepping the underline cursor to the Yes selection. If you select No, the display will return to the previous selection. 
3.	Press the **FEED** key to accept the selection. If Yes was selected, the copy process will start. 
4.	Once the copy process is completed, press the **FEED** key to advance the display. 
5.	If an error is encountered in the copy process, one of the following messages will be displayed on the second line.  R/W Error Indicates a Read/Write error occurred No Card Error Indicates no card was recognized Mem Full Error Indicates that there is insufficient memory available.

LCD Panel — Card Mode

Memory->Card Copy Program Y/N

```
MEMORY->CARDCOPY
PROGRAM     Y/N
```

This selection allows the user to copy the current firmware installed in the printer to a PCMCIA Memory Card.

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to the desired setting. IF Yes is selected, the printer will enter the Card Copy mode. If No is selected, the display will advance to the mode display.

2.	Confirm your selection by stepping the underline cursor to the Yes selection. If you select No, the display will return to the previous selection.
	`COPY START`
	`YES  NO`

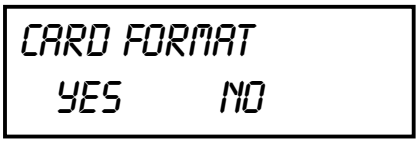
3.	Press the **FEED** key to accept the selection. If Yes was selected, the copy process will start.
	`MEMORY-> CARD COPY`
	`COPYING`

4.	Once the copy process is completed, press the **FEED** key to advance the display.
	`MEMORY-> CARD COPY`
	`COMPLETED`

5.	If an error is encountered in the copy process, one of the following messages will be displayed on the second line.
	`CARD COPY/FORMAT`
	`XXXXXXX ERROR`
	R/W Error Indicates a Read/Write error occurred
	No Card Error Indicates no card was recognized
	Mem Full Error Indicates that there is insufficient memory available

LCD Panel — Card Mode

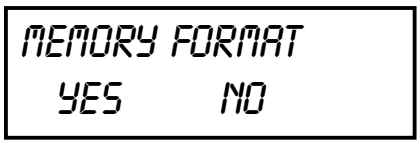
Card Format
Yes No



Before a PCMCIA card can be used, it must be formatted.
Note: Formatting a card destroys all data currently stored on the Card.

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to the desired setting. IF Yes is selected, the printer will enter the Card Format mode. If No is selected, the display will advance to the mode display.

Memory Format
Yes No



Before the internal Expanded Memory can be used, it must be formatted.
Note: Formatting the memory will destroy any stored data.

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to the desired setting. IF Yes is selected, the printer will enter the Memory Format mode. If No is selected, the display will advance to the mode display.

To exit the Card Mode, power off the printer, then back on.

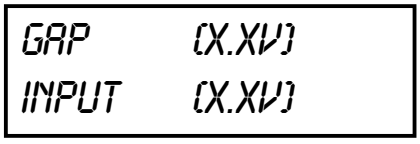
LCD Panel — Service Mode

The Service Mode allows the operator to set up the basic operation parameters of the printer and is entered from the Advanced Mode.

***To Enter Advanced Mode*:**

STEP	PROCEDURE
1.	Press the **LINE** key while simultaneously turning the power on. When the printer emits one long beep, release the LINE key to display the first screen. 
2.	Press the **LINE** key twice to enter the Service Mode.  The Service Mode display indicates that the printer is in the Service Mode. To advance to the first selection, press the **FEED** key.

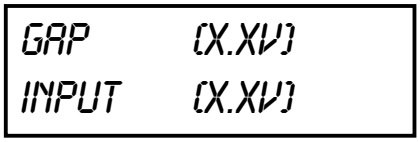
Gap [X.XV]
Input [X.XV}



The M-8400RVe printer determines the location of the leading edge of the label by measuring the difference between light levels when it sees either a label gap 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" 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.

LCD Panel — Service Mode

Gap [X.XV]
Input [X.XV}



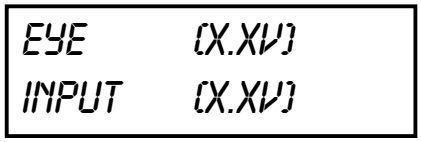
GAP - When setting the "GAP" threshold, the voltage shown on the top line of the display must be measured with nothing but the backing in the sensor and then again with a label still attached to the backing. The formula to be used for setting the threshold is:

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

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 range. Backing without label = 0.5V or less Backing with label = 1.0V above the low value 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 3.3 (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, pressing the **FEED** key will accept the setting and advance to the Online Feed display.

LCD Panel — Service Mode

Eye [X.XV]
Input [X.XV}



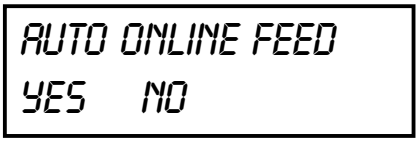
EYE - When setting the "EYE" threshold, the voltage must be measured with nothing but the label under the sensor and then again with the printed "eye" mark under the sensor. The formula to be used for this is:

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

STEP	PROCEDURE
1.	Insert a label into the sensor and close the Label Hold-Down. Make sure the printed "eye" mark in 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 = 0.3 - 0.5V Eye-mark = Equal to or greater than 1.2V above the low value. 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 3.3 (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, pressing the **FEED** key will accept the setting and advance to the Auto Online Feed display.

LCD Panel — Service Mode

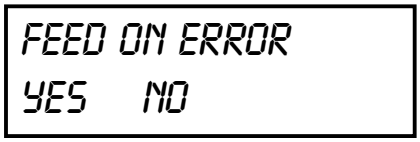
Auto Online Feed
Yes No



This selection specifies whether or not the printer will automatically feed a blank label when it is placed in the Online mode.

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to the desired setting. IF Yes is selected, the printer will feed a blank label anytime it enters the Online mode. If No is selected, the display will advance to the mode display.

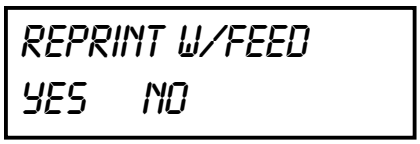
Feed on Error
Yes No



This selection specifies whether or not the printer will feed a blank label automatically when an error condition is cleared.

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to the desired setting. IF Yes is selected, the printer will feed a blank label anytime an error condition is cleared. If No is selected, the display will advance to the mode display.

Reprint W/Feed
Yes No



This selection specifies whether or not the printer will print the last printed label stored in memory when the FEED key is pressed in the Normal Online mode.

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to the desired setting. IF Yes is selected, the printer will reprint the last label when the FEED key is pressed when the printer is Online. If the printer is Offline, pressing the **FEED** key will feed a blank label. If No is selected, the display will advance to the mode display.

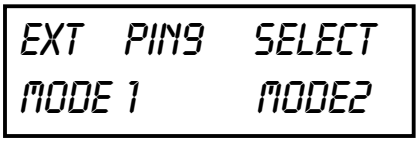
LCD Panel — Service Mode

Forward/Backfeed Distance Default

This display will only appear when Backfeed is enabled (DSW3-4 = OFF). The maximum backfeed distance is 255mm.

STEP	PROCEDURE
1.	Press the **FEED** key to use the default distance. This setting will be appropriate for use with standard labels with a 1/8" gap between labels and most tag stock applications.
2.	Press the **LINE** key to set your own backfeed distance up to 255mm. Each time you press the LINE key, the distance is advanced 1mm. CAUTION: A backfeed distance over 40mm may cause ribbon wrinkle and require ribbon tension adjustments. 
3.	Press the **FEED** key to accept the selected backfeed distance.

Ext Port Pin 9 Select



This selection allows user selection of when Pin #9 of the 14 pin EXT connector goes HIGH, to allow printer status to be determined without using Bi-Directional Communication Select Mode1 or Mod2, using the Line key. Press **FEED** key to save and exit.

MODE 1 = On-Line print job waiting.

MODE 2 = On-Line

LCD Panel — Service Mode

Euro Code D5

This selection allows the user to specify the hexadecimal code for the character which is replaced with the Euro Character. The default is D5 Hex.

STEP	PROCEDURE
1.	The underline cusor should be positioned underneath the first digit selection. Use the **LINE** key to step to the desired setting.
2.	Press the **FEED** key to advance the underline cursor to the second digit of the desired hexadecimal code.
3.	Press the **LINE** key to step to the desired setting.
4.	When the setting is correct, press the **FEED** key to accept the setting and advance to the next display.

Select LCD Display Language

This selection allows the user to select the language used in the LCD menu and error messages. The selections are English, French, German, Spanish, Italian and Portuguese.

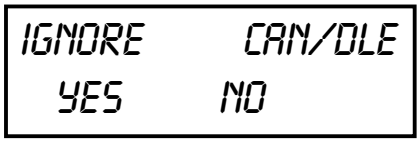
STEP	PROCEDURE
1.	Press the **LINE** key to advance to the desired language setting.
2.	When the setting is correct, press the **FEED** key to accept the setting and advance to the next display.

LCD Panel — Service Mode

Priority Setting LCD Command

This selection allows the user to assign a priority for Print Darkness, Print Speed and Print Offset.

STEP	PROCEDURE
1.	Use the **LINE** key to step to the desired priority. If LCD is selected, the setting established via the LCD display/menu system will be used for an incoming label job, regardless of any different command settings. If Command is selected, any commands in the label job will take precedence and be used for printing the job and the LCD Display will reflect the new setting.
2.	Once the desired setting is selected, press the **FEED** key to accept the setting and advance to the next display.



This function allows the user to disable:

<DLE> (Hex 10) the print stop command and

<CAN> (Hex 18) the cancel command.

Used for compatibility with some third party hardware and software. It is only displayed and functional when RS-232C HS serial interface is installed and configured for Status 4 Bi-direction operation.

This function is only displayed when a RS232 HS serial interface card is installed and configured for Status 3 Bi-direction operation. The disable function was added for compatibility with older non "e" version printers, where ribbon near end was not reported. Use the **LINE** key to select Enable or Disable and press **FEED** to save and exit.

Service Mode

To exit the Service Mode power the printer off, then back on.

LCD Panel — Counters Mode

The Counters Mode is provided to allow the user to access the internal printer counters and is entered from the Advanced Mode.

***To Enter Advanced Mode*:**

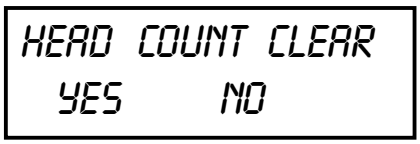
STEP	PROCEDURE
1.	Press the **LINE** key while simultaneously turning the power on. When the printer emits one long beep, release the LINE key to display the first screen.
2.	Press the **LINE** key 3X to advance to the Counters Mode.
3.	Press the **FEED** key to advance the display to the counters selections.

Counters
HD DSP CUT LIFE

The counters are identified in the display as:

HD: Head Counter (should be reset when print head is replaced)
DSP: Dispense Counter
CUT: Cutter Counter
LIFE: Life Counter (cannot be reset)

STEP	PROCEDURE
1.	Use the **LINE** key to step the underlined cursor to the desired counter, the Head (HD) counter or the LIFE counter. The default position is the Head Counter.
2.	Press the **FEED** key to display the current value (in meters) stored in the counter.
3.	Press the **FEED** key to advance to the next screen.



LCD Panel — Counters Mode

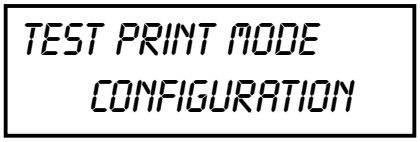
STEP	PROCEDURE
4.	Use the **FEED** key to select the desired setting. If you only want to read the counter value, select NO. If you want to read the counter and reset it to 0.0, place the underline cursor under YES. Once the desired setting is selected, press the **FEED** key to return to the Counter Mode display.

To exit the Counters Mode power the printer off, then back on.

Test Print Mode

The Test Print Mode offers four different printer status labels for troubleshooting. If DSW3-5 is ON, the Test Print cycle must be initiated with a Print Start signal.

Test Print Mode Configuration



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:

STEP	PROCEDURE
1.	Power on the printer while pressing the **FEED** key. Release the **FEED** key after the beep sound and the printer will display the Test Print Mode message on the LCD panel.
2.	Use the **LINE** key to step the underline cusror to the type of test label you wish to print. The choices are: Configuration Bar Code Head Check Memory Factory **See last pages in this section for test label sample print-outs**
3.	Once you have selected the type of test label to be printed, use the FEED key to accept the selection and advance to the Test Print Size display. This display allows you to select the label width.

LCD Panel — Test Print Mode

Test Print Size 10 CM

NOTE: This display does not appear when a Memory Test Print is chosen. Only a small Memory Test Print can be printed.

Once you have selected the type of test label to be printed, use the **FEED** key to accept the selection and the display advances to the Test Print Size display. This display allows you to select the label width.

STEP	PROCEDURE
1.	Use the **LINE** key to select the label width. Each time the **LINE** key is pressed, the label size advances 1 cm until it reaches a maximum width of 10 cm at which point it will wrap to the smallest size of 4 cm.
2.	Press the **LINE** key to accept the selection.
3.	Press the **FEED** key to start printing test labels continuously.
4.	Press the **FEED** key to stop the printer.

To exit the Test Print Mode, power the printer off, then back on.

Default Setting Mode

Occassionally it is desirable to reset all printer configuration settings to their original default conditions. This allows the operator to start the reconfiguration of the printer starting from a known set of conditions.

Default Setting Mode

To enter the Default Setting Mode press the **LINE** and **FEED** keys while simultaneously powering on the printer. When the printer emits one long beep release the **FEED** and **LINE** keys.

STEP	PROCEDURE
1.	Use the **LINE** key to select either YES or NO.
2.	Once the desired setting is selected, press the **FEED** key to accept the selection and the printer will reset to the original default conditions.
3.	When the printer has completed the reset process, the Default Setting Completed display will appear. The printer is now in the default configuration.

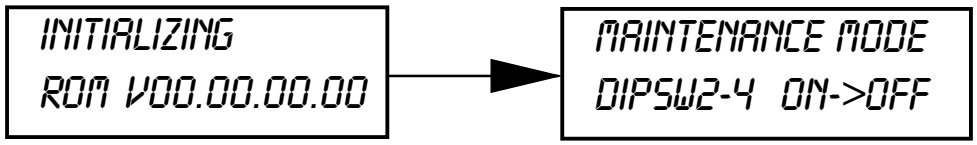
To exit the Default Setting Mode, power the printer off, then back on.

LCD Panel — Maintenance Mode — Factory Mode

This function is used to clear counters and reset the printer's firmware.

This procedure is used after upgrading the flash firmware or installing a new memory module.

STEP	PROCEDURE
1.	Record all current dip switch positions, then place all switches in the **OFF**position.
2.	Place the **DSW2-4** in the **ON** or up position.
3.	Press the **LINE and FEED** key while simultaneously turning **ON** the power switch. When the printer beeps, release the keys. The following screens will appear.



4.	Place the **DSW2-4** in the **OFF** position and the following screen will appear.

5.	Press the **FEED** key to display the next screen.

6.	Press the **LINE** key once to change the message to the proper selection. The counters are identified in the display as: HD: Head Counter (should be reset only when a print head is replaced). DSP: Dispense Counter - meters of label stock dispensed. CUT: Cutter Counter - number of cutter cycles. LIFE: Life Counter (cannot be reset) meters of label stock run through the printer. ALL: Clears all counters and resets firmware and returns printer to factory default setting. This setting is used when upgrading firmware.

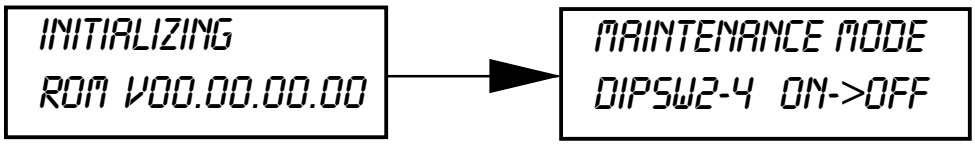
7.	Press the **FEED** key to clear the selected function. After a pause, the next screen will appear.

8.	Select the print label size by pressing the **LINE** key. The default is LARGE.
9.	Press the **FEED** key for a test print. Press the **FEED** key again to stop printing.

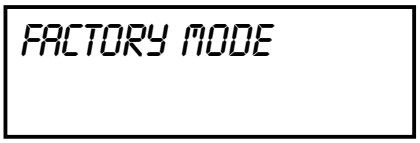
LCD Panel — Maintenance Mode
All Clear Mode

This function is used to clear counters and reset the firmware and doesn't produce a test label.

STEP	PROCEDURE
1.	Record all current dip switch positions, then place all switches in the **OFF** position.
2.	Place the **DSW2-4** in the **ON** or up position.
3.	Press the **LINE and FEED** key while simultaneously turning **ON** the power switch. When the printer beeps, release the keys. The following screens will appear.

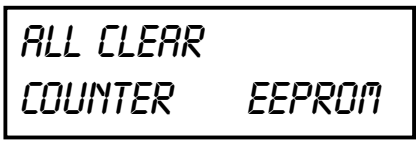


4.	Place the **DSW-4** in the OFF position and the following screen will appear.

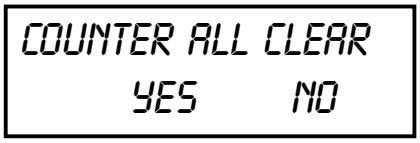


5.	Press the **LINE** key to display the next screen.

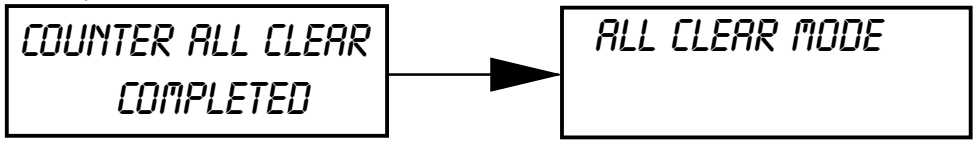
6.	Press the **FEED** key to display the next screen.



7.	Press the **LINE** key to select either COUNTER or EEPROM. Select Counter to clear all counters. Select EEPROM to clear/reset the firmware to factory default setting
8.	Press the **FEED** key to display the next screen.



9.	Press the **LINE** key to select **YES** or **NO**. If **YES** is selected press the **FEED** key to clear your selection.



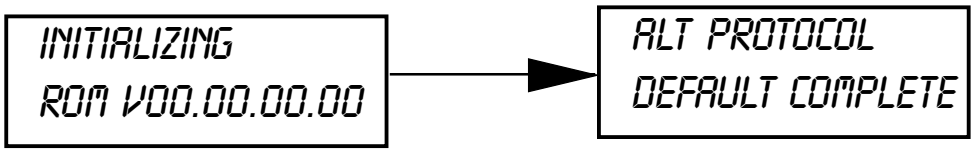
10.	The printer will beep three times signaling the competion of the process.
11.	Power off the printer to exit Maintenance Mode.

LCD Panel — Clear Non-Standard Protocol

The standard protocol codes used by the printer can be modified to accomodate the requirements of different host systems. However, if the printer is to be used with a system that does not use the custom protocol codes, they can be cleared and the default protocol codes reactivated.
The default values are:

STX = $7B_{H,}$ ETX = $7D_{H,}$ ESC = $5E_{H,}$ ENQ = $40_{H,}$ NULL = $7E_{H,}$
CAN = 21_{H} and OFFLINE = $5D_{H.}$

Alt. Protocol Default Complete



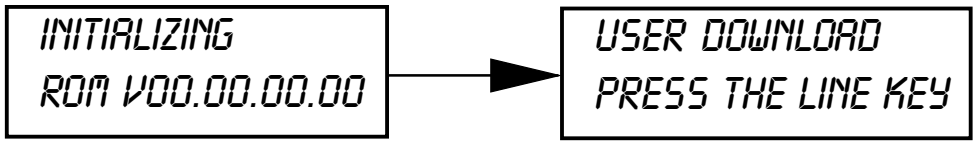
To Clear Non-Standard protocol codes, place **DSW2-7** in the **ON** position and power on the printer while simultaneously pressing the **LINE** and **FEED** keys.

STEP	PROCEDURE
1.	When the printer emits one long beep release the **LINE** and **FEED** keys.
2.	When the keys are released, the printer will replace the Alternate protocol codes with the default values.
3.	After the default setting is complete, the printer will emit three short beeps indicating that the process is complete.
	To exit the mode, power the printer off, then back on.

Download User Defined Protocol Codes

The user can define a set of custom protocol codes and download them to the printer using the <ESC>LD command.

User Download Press the Line Key



To enter the User Download mode, place DSW2-7 in the **ON** position and power on the printer while simultaneously pressing the **LINE** key. When the printer emits one long beep release the **LINE** key.

STEP	PROCEDURE
1.	Set **DSW2-7** to the **OFF** position to replace the Standard protocol codes or **ON** to replace the Alternate set of protocol codes.
2.	Press the **LINE** key. The printer is now waiting for the data to be sent.

LCD Panel — Download User Defined Protocol Codes

User Download
Press the Line Key (Continued)

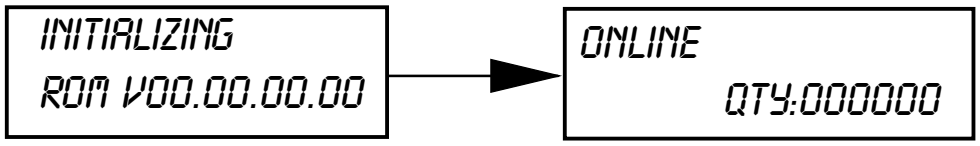
STEP	PROCEDURE
3.	Transmit the download data command stream to the printer.
4.	After the data has been received, the printer will beep and print a status label. If it does not beep and print a status label, the printer did not accept the data.
5.	If the printer did not beep and print a status label, turn the printer off and check you data stream for errors snd start the download process over.
6.	If the custom codes are correct, press the **FEED** key to accept them and terminate the download process. If they are incorrect, turn the printer off without pressing the **FEED** key and begin the process again.

Refer to the Operator and Technical Reference Manual for the data stream command structure required.

Hex Dump Mode

In addition to the User Test Print Labels, the printer can print the contents of the receive buffer in a hexadecimal format to allow the data stream to be examined for errors and troubleshooting.

Online

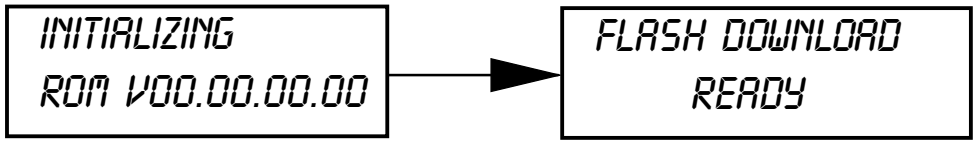


To enter the Hex Dump mode, place **DSW2-4** in the **ON** position and power on the printer.

STEP	PROCEDURE
1.	The printer is now ready to receive data.
2.	Send the data stream to the printer.
3.	The receive data will be printed in a hexadecimal format.
4.	To return the printer to normal position, place **DSW2-4** in the **OFF** position and power the printer **OFF** and then back ON.

LCD Panel —Firmware Download Mode

STEP	PROCEDURE
1.	Record all current dip switch positions, then place all switches in the **OFF** position.
2.	Place the **DSW2-6** in the **ON** or up position.
3.	Turn **ON** the power switch. The following screens will appear.



Refer to the specific instructions provided with the flash firmware files provided by SATO America Technical Support or downloaded from the SATO America Web Site.

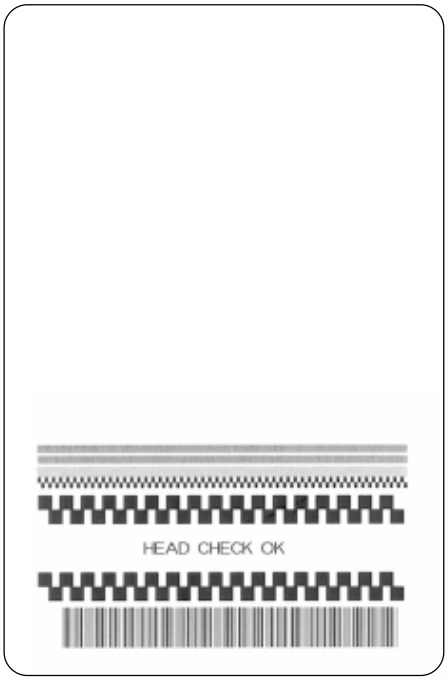
www.satoamerica.com

2.4 Sample Test Labels

CONFIGURATION

BAR CODE

MEMORY



HEAD CHECK

FACTORY

Section 3

Interface Specifications

3.1 Overview

This section presents the interface specifications for the M-8400RVe printer. These specifications include detailed information on how to properly interface your printer with your host system.
The printer utilizes a Plug-In Interface Module for maximum printer configuration flexibility.

The following information is presented in this section.

- Interface Types
- The Receive Buffer
- IEEE1284 Parallel Interface
- RS232C Serial Interface
- BI-Directional Communications using the RS232C Serial Interface
- Universal Serial BUS (USB)
- Local Area Network (LAN)
- Ext Connector

3.2 Interface Types

The parallel interface for the M-8400RVe printer is a high speed, bi-directional parallel interface that conforms to the IEEE 1284 specification. (ECP mode on some computers). The interface is also compatible with the older Centronics parallel interface standard. If it does not detect the correct IEEE 1284 signals in the interface connection, it will automatically operate in the standard Centronics mode which is much slower. To use the IEEE 1284 parallel interface to its fullest capability requires that the host also have an IEEE 1284 compatible interface and that the two be connected with a cable that meets the IEEE 1284 specification. If either of these two are not present, the data rate is severely compromised.

Interface Types

In order to provide flexibility in communicating with a variety of host computer systems, the M-8400RVe printer uses a Plug-In Interface Module. The IEEE1284 Interface module is shipped with the printer unless another interface type is specified at the time of the order. The other interfaces available are a high speed (to 57.6K bps) serial interface, an Ethernet interface or an optional Universal Serial Bus (USB) interface.

The 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. The USB interface allows the printer to be connected to a computer that supports peripherals attached to a USB bus.

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 warranty.

CENTRONICS PARALLEL INTERFACE | **RS232C SERIAL INTERFACE** | **USB INTERFACE** | **ETHERNET INTERFACE**

Available Interfaces

3.3 The Receive Buffer

The M-8400RVe printer has 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.

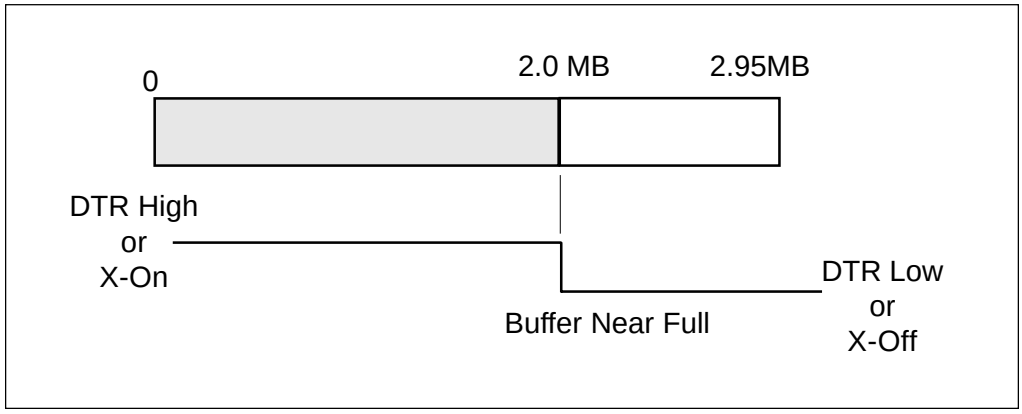
Single Job Buffer

The printer receives and prints one job at a time. Each job must not exceed 2.95MB.

Multi Job Buffer

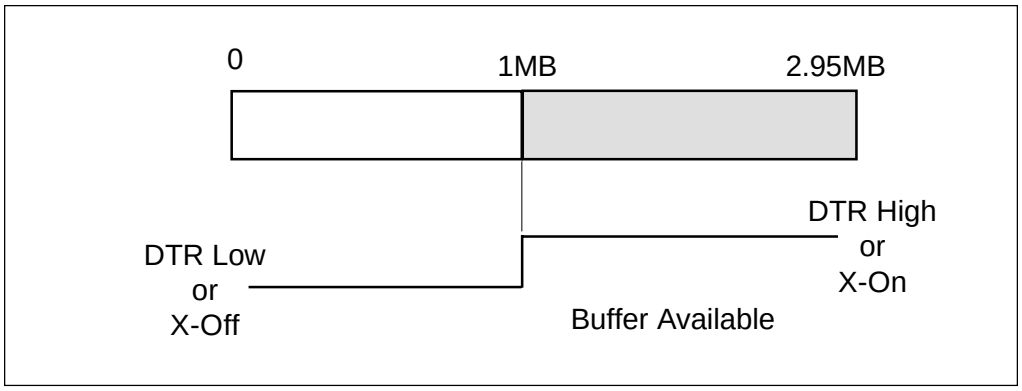
The printer is able to continuously receive print jobs, compiling and printing other jobs at the same time. It acts much like a "print buffer" ot maximize the performance of the host and the printer.

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 2.0MB of data (1MB 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."



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 1MB bytes of data are being held (2.0MB 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.

The Receive Buffer



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 online. The printer will also be busy if taken offline from the front panel.

3.4 IEEE 1284 Parallel Interface

The parallel interface for the M-8400RVe printer is a Plug-In Interface Module that can be installed by the user. It conforms to the IEEE 1284 specification. It will automatically detect the IEEE 1284 signals and operate in the high speed mode. If it does not detect the IEEE 1284 signals, it will operate in the standard Centronics mode, which is significantly slower. *For this reason, an interface cable and host interface conforming to the IEEE 1284 specification must be present to fully utilize the speed capabilities.* This interface also operates bi-directionally and can report the status of the printer back to the host.

Electrical Specifications:

Printer Connection	AMP 57-40360 (DDK) or equivalent
Cable Connection	AMP 57-30360 (DDK) or equivalent
Cable	IEEE1284 Parallel, 10 ft. (3 m) or less
Signal Level	High = +2.4V to +5.0V Low = 0V to -0.4V

Data Streams:

<ESC>A .. Job#1 .. <ESC>Z<ESC>A .. Job#n .. <ESC>Z

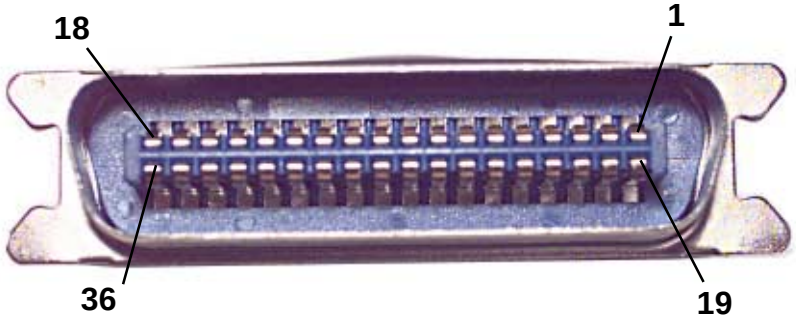
Please Note:
SATO does not recommend the use of mechanical data switches commonly called A/B switches, as they are known to damage both the computer and printer parallel ports.

IEEE 1284 Parallel Interface

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 Host	28	ACK Return	Reference
11	Busy	To Host	29	BUSY Return	Reference
12	Printer Error	To Host	30	PE Return	Reference
13	SELECT	To Host	31	$\overline{\text{INIT}}$	From Host
14	$\overline{\text{AUTOFD}}$(1)	To Host	32	$\overline{\text{FAULT}}$	To Host
15	Not Used		33	Not Used	
16	Logic Gnd		34	Not Used	
17	FG	Frame Ground	35	Not Used	
18	+5V(Z=24K ohm)	To Host	36	$\overline{\text{SELECTION}}$(1)	From Host

(1) Signals required for IEEE 1284 mode.

PIN ASSIGNMENTS - IEEE 1284 CABLE END



3.5 RS232C Serial Interface

The High Speed Serial Interface is a Plug-In Interface Module that can be installed in the printer by the user.

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

Data Transmission Rate 9600, 19200, 38400, 57600 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.

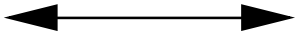
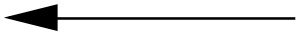
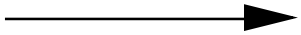
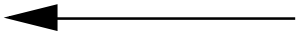
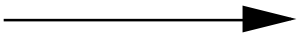
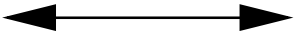
Signal Level

High = +5V to +12V
Low = -5V to -12V

PIN ASSIGNMENTS - RS232C PRINTER END

RS232C Serial Interface

Cable Requirements

DB9	DB25	HOST	INTERCONNECTION	DB25	PRINTER
1	1	FG		1	FG (Frame Ground)
2	3	RD		2	TD (Transmit Data)
3	2	TD		3	RD (Receive Data)
8	5	CTS		4	RTS (Request to send)
7	4	RTS		5	CTS (Clear to Send)
4	20	DTR		6	DSR (Data Set Ready)
6	6	DSR*		20	DTR (Data Terminal Ready)
5	7	SG		7	SG (Frame 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.

Please Note:
SATO does not recommend the use of mechanical data switches commonly called A/B switches, as they are known to damage both the computer and printer serial ports.

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. 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.

Ready/Busy Flow Control

Ready/Busy is the hardware flow control for the serial interface on the M-8400RVe 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.

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 viable 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 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 is resumes printing, no **X-On** is sent until the current job is completed and the printer is once again ready 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 as **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.

Data Streams

The data streams for **X-On/X-Off** and **Ready/Busy** flow control are constucted in the same way as they are for Ready/Busy flow control.

<ESC>A .. Job#1 .. <ESC>Z<ESC>A .. Job#n .. <ESC>Z

Example: <ESC>A .. Job#1 .. <ESC>Z

NOTE: All characters are in ASCII.

3.6 Universal Serial Bus (USB) Interface

The Universal Serial Bus (USB) interface is a Plug-In Interface Module that can be installed by the user. It requires a driver (shipped with each printer that has the interface installed) that must be loaded on your PC and the PC must be configured to support USB peripherals using Windows 98 or above. Details for loading the USB driver are contained in the USB Interface Manual that is shipped with each printer with a USB Optional interface installed. Up to 127 devices may be connected to a USB port.

Universal Serial Bus (USB) Interface (Cont)

General Specifications:

Connector:	USB Type B Plug
Cable:	10ft (3 m) max.
Host:	Windows 98 USB Port

Electrical Specifications:

Power Supply:	Bus Power through cable
Power Consumption::	+5V@80ma

3.7 Ethernet Interface

The Ethernet interface is a Plug-In Interface Module that can be installed by the user. It requires a driver (shipped with each printer) that has the interface installed. The driver must be loaded on your PC and the PC must be configured to run one of the supported network protocols using a 10/100BaseT LAN connection. Details for loading the Ethernet driver are contained in the Ethernet Interface Manual that is shipped with each printer with a Ethernet interface installed.

General Specifications:

Type:	10/100BaseT
Connector:	RJ-45 Receptical
Cable:	Category 5

Electrical Specifications:

Power Supply: Powered from printer

Refer to the manual & CD supplied with the interface card.

3.8 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 Bi-Com 4, Bi-Com 3 or Bi-Com 2 communications is selected on the serial interface card, there is no busy signal from the printer. The host must request the complete status from the printer, including ready/busy.

Refer to the Operator's and Technical Manual for complete information.

3.9 Accessory (EXT) Connector

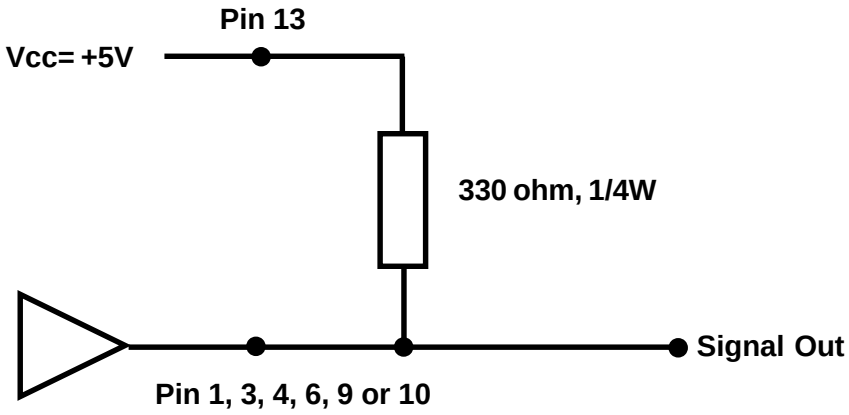
The EXT connector on the rear panel of the M-8400RVe printer is intended for use with the external printer accessories such as label rewinders or applicators. The 14 pin Centronics type connector provides a choice of four different output signals along with various error conditions. A DB-9 to 14 pin Centronics adapter cable is provided for legacy applications.

Old DB-9 14 Pin Centronics

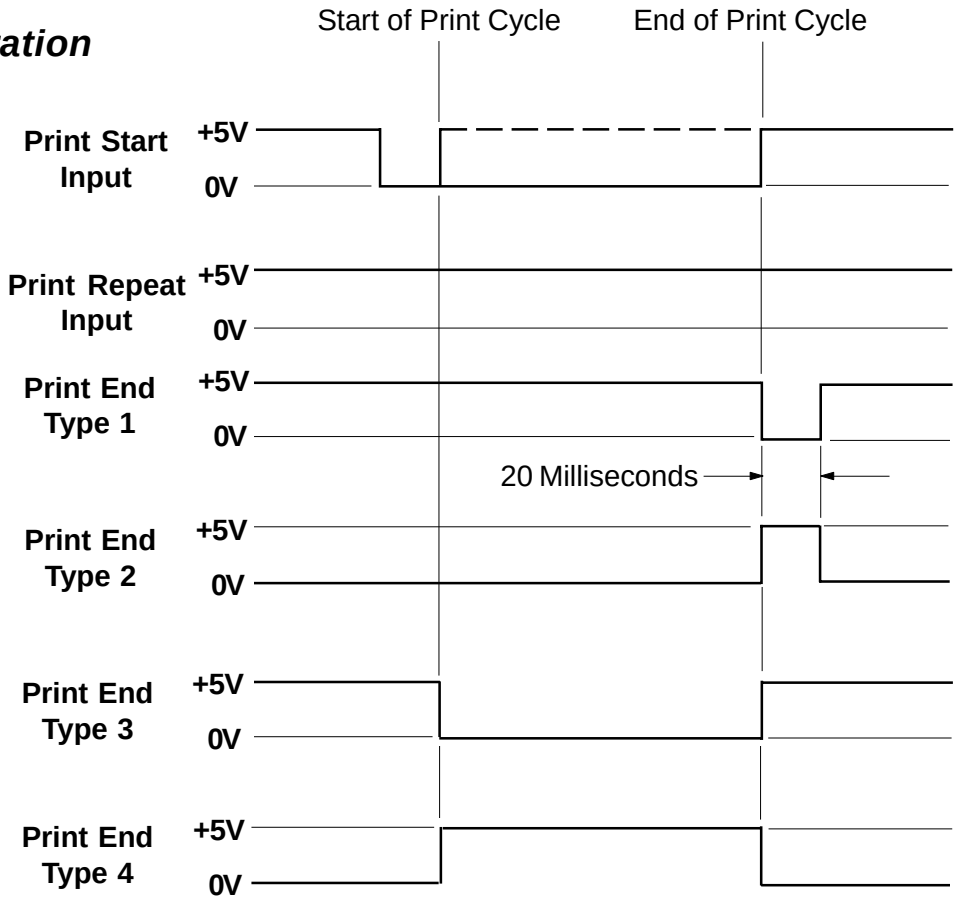
Pin Assignments

PIN	PIN	DIRECTION	SIGNAL DESCRIPTION
1	13	To Host	Vcc -/+5V
2	10	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	4	To Host	Error - This pin goes low when the printer detects an error condition such as head open or receiving buffer is full.
4	7	To Printer	Reprint - A duplicate of the last label in a print job will be reprinted when this signal is received.
5	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	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. See timing charts on next page.
7	1	To Host	Label Out - This pin goes low (0V) when a label error exists.
8	3	To Host	Ribbon Out - This pin goes low (0V) when ribbon is out.
9	2	Reference	Signal Ground
	8	To Printer	Isolated Power Source for signal input.
	9	To Host	When Mode 1 in LCD selected High Voltage = On-Line Print Job waiting. When Mode 2 in LCD selected High Voltage = On-Line. This goes low (0V) when printer Off-Line.
	11		Reserved
	12	To Host	+24V +/- 10% @2A - Power for external devices
	14		Frame Ground

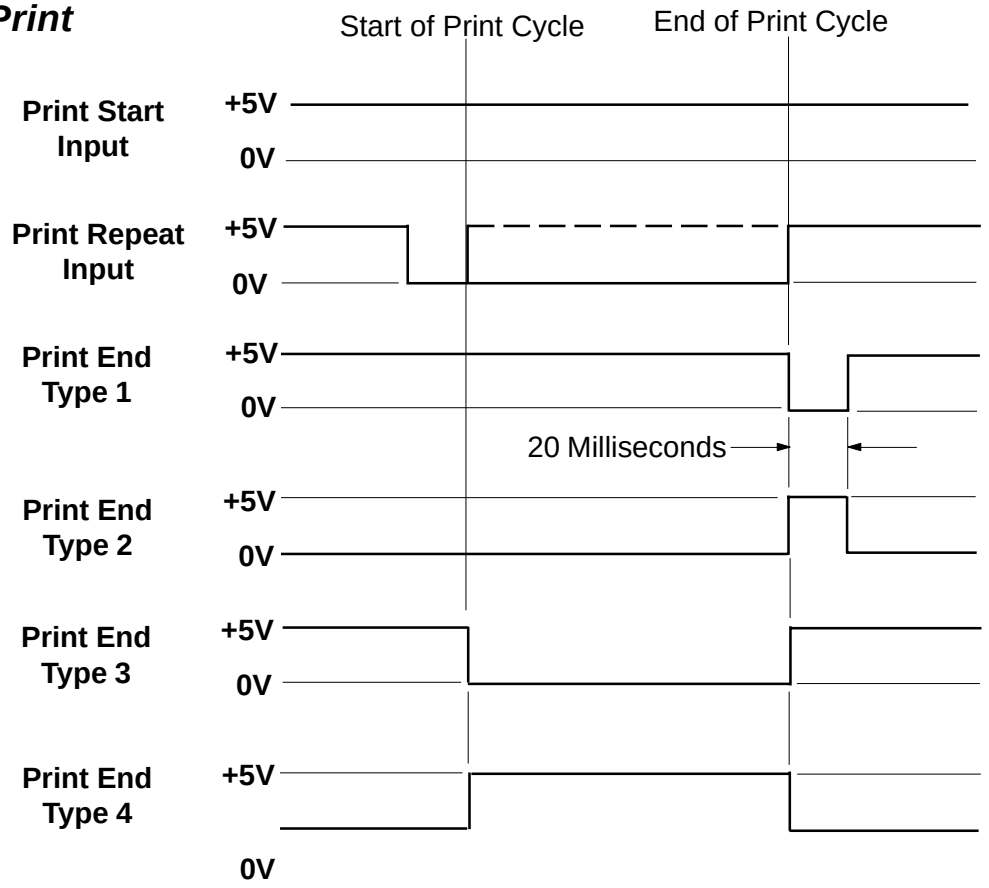
NOTE: The signals on pins 1, 3, 4, 6, 9 and 10 each have an open collector output. These pins normally measure +.07V maximum when a true condition exists. If a false condition occurs, the voltage will drop to 0V. To achieve a signal level of +5V, you must add a 330 ohm, ¼ W pull-up resistor between the open collector output pin and Vcc (pin 13) 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.



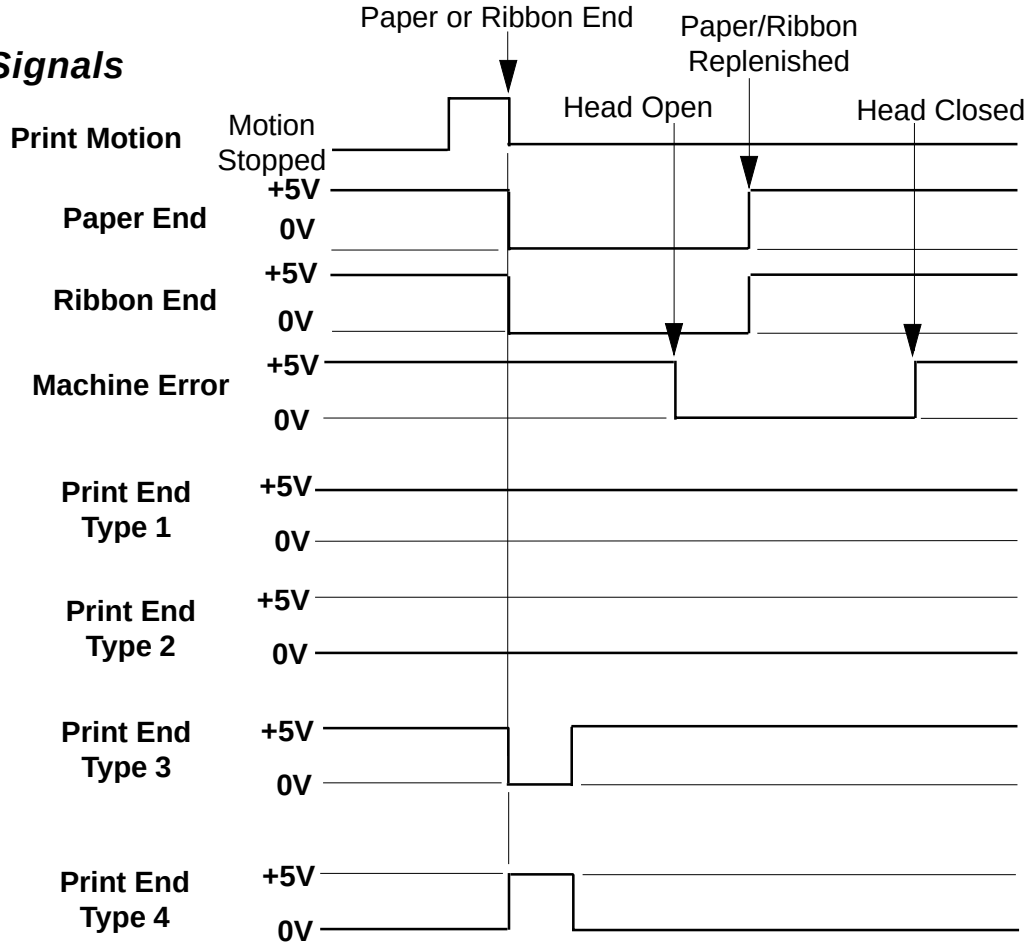
Standard Operation



Repeat Print



Error Signals



Section

4

Electrical Checks and Adjustments

4.1 Overview

This chapter describes how to check M-8400RVe Printer voltage levels and adjust threshold sensor voltages.

The power supply converts 125 VAC into regulated DC voltages. The printer uses: +5V and +24V. These DC voltages are not adjustable, however you can measure these DC voltages at test points located on the PCB. Section 4.3 contains procedures for measuring DC voltage levels.

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 Voltage*
- *Label Sensors*
- *Ribbon Sensor*
- *Pitch Offset*

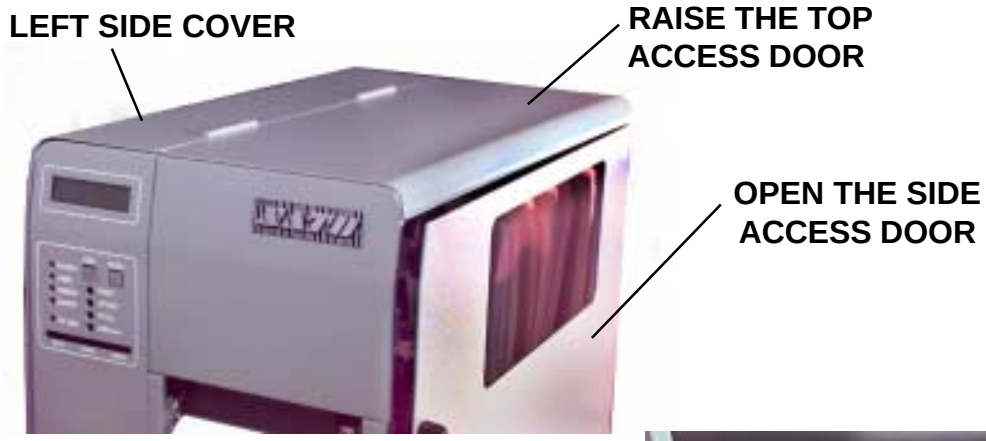
Checks and adjustments in this section require standard metric tools. Also required:

Digital Multimeter required for use with SATO TP Test Module (Voltage Checker) Part # RH1773100 and is required for most electrical adjustments.

4.2 Steps Prior to Some Procedures

Some adjustments in this section require access to potentiometers and the test point connector located on the main PCB. Remove the left side cover for access to the main PCB.

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cord.
2.	Open the side access door and raise the top access door.
3.	Loosen (2) inside screws holding the left side cover to the inside top of the printer. Remove (2) screws holding the left side cover to the printer base and remove the cover.
	Refer to the appropriate sub-section to begin adjustments.

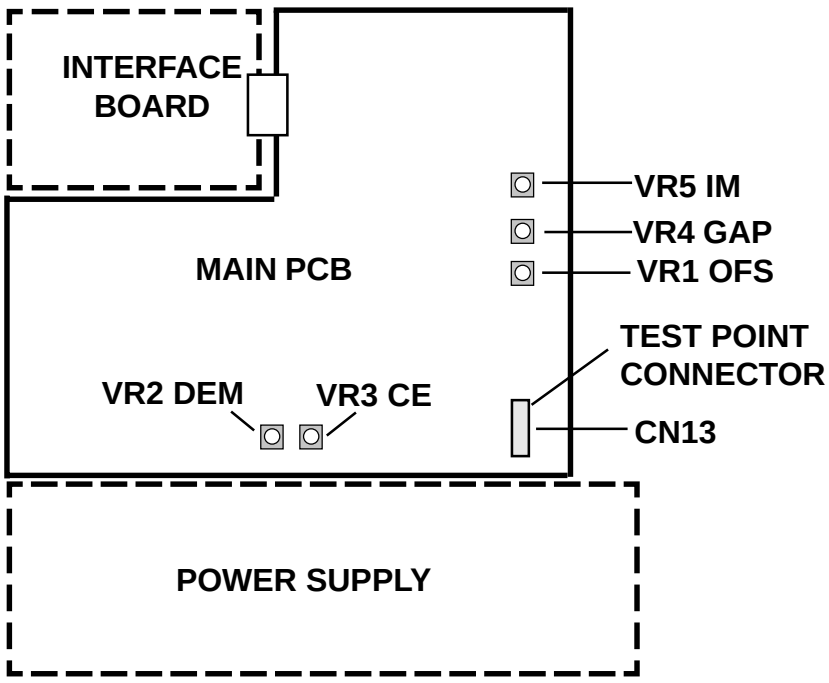


4.3 DC Power Voltage Checks

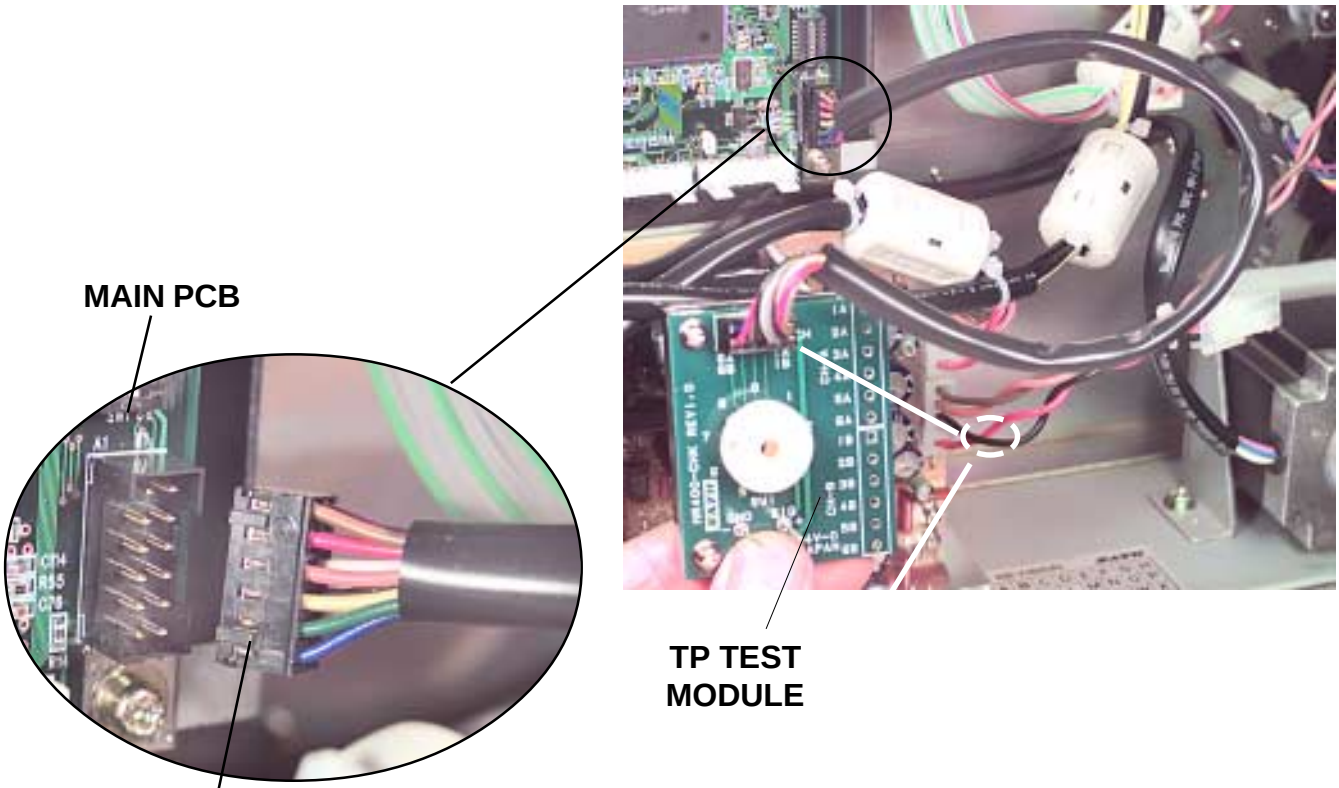
To check voltage levels, first check the fuses (Section 6.3) and replace if necessary. Then perform the following steps.

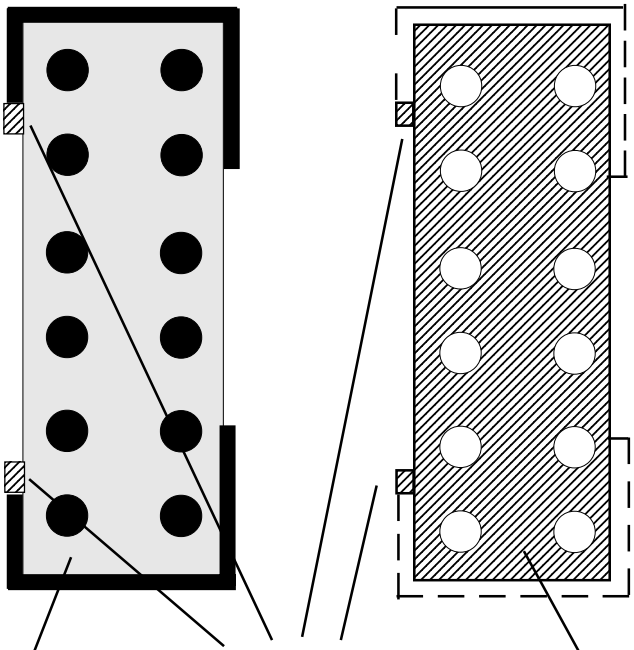
Addtional equipment required:	TP Test Module Digital Multimeter

STEP	PROCEDURE
	Refer to illustrations on pages 4-3 through 4-5.
1.	Attach the connector from the TP Test Module to the test port on the main PCB. Note correct positioning of connector. Nibs on the connector are placed down in the receptacle on the PCB in the forward position.
2.	Attach the ground probe of the multimeter to the TP Test Module Gnd pin.
3.	Attach the positive probe of the multimeter to the +SIG pin on the TP Test Module terminal.
4.	Turn printer on and rotate the dial to a dial POS on the TP Test Module. Record the values from the Multimeter LCD.
5.	Confirm voltages are correct. If not, then replace power supply. Refer to Section 6.4.
6.	After performing tests, replace the left side cover.

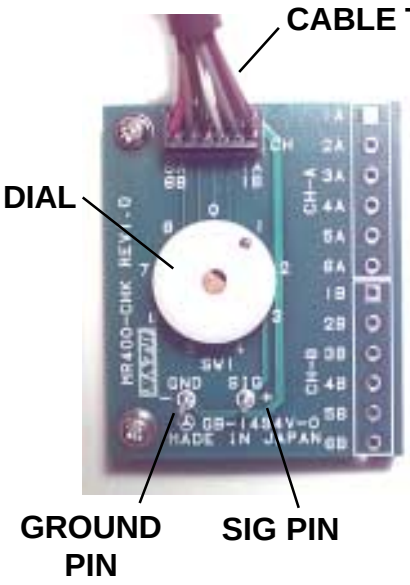


DC Power Voltage Checks

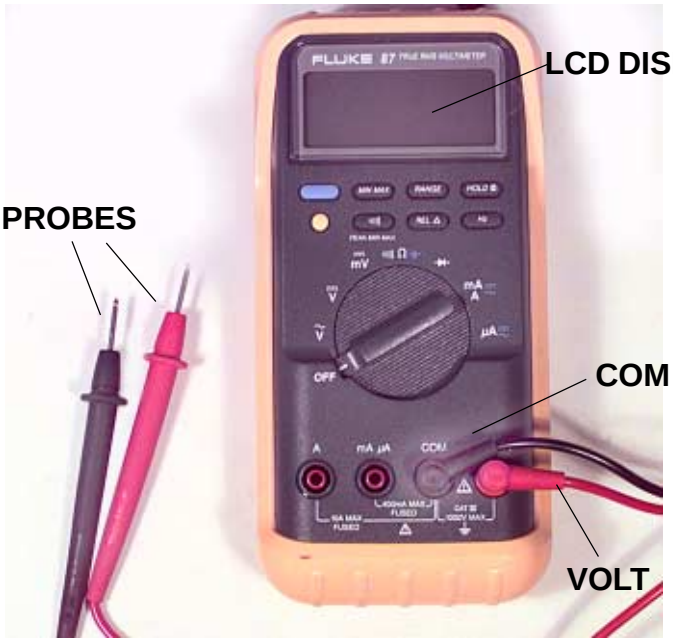




DC Power Voltage Checks



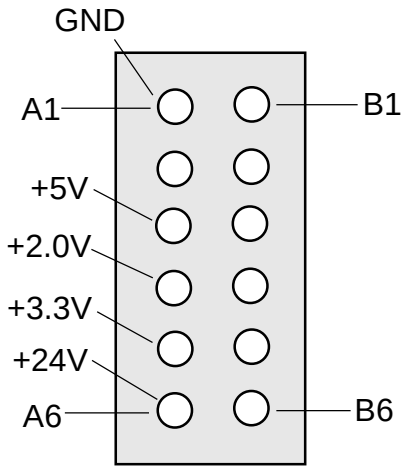
TP TEST MODULE



DIGITAL MULTIMETER

Dial POS	DISC	VOLTAGE RANGE	TP TEST MODULE
	SG		
	NC		
0	+5V	+4.8 to +5.2V	CHA3 (+5V) - CHA1 (GND)
1	+2.0V	+1.90 to +2.1V	CHA4 (+2.0V) - CHA1 (GND)
2	+3.3V	+3.1V to +3.5V	CHA5 (+3.3V) - CHA1 (GND)
3	+24V	+23.5V to +24.5V	CHA6 (+24V) - CHA1 (GND)

TEST POINT CHART



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

4.4 Potentiometer Assignments & Adjustments

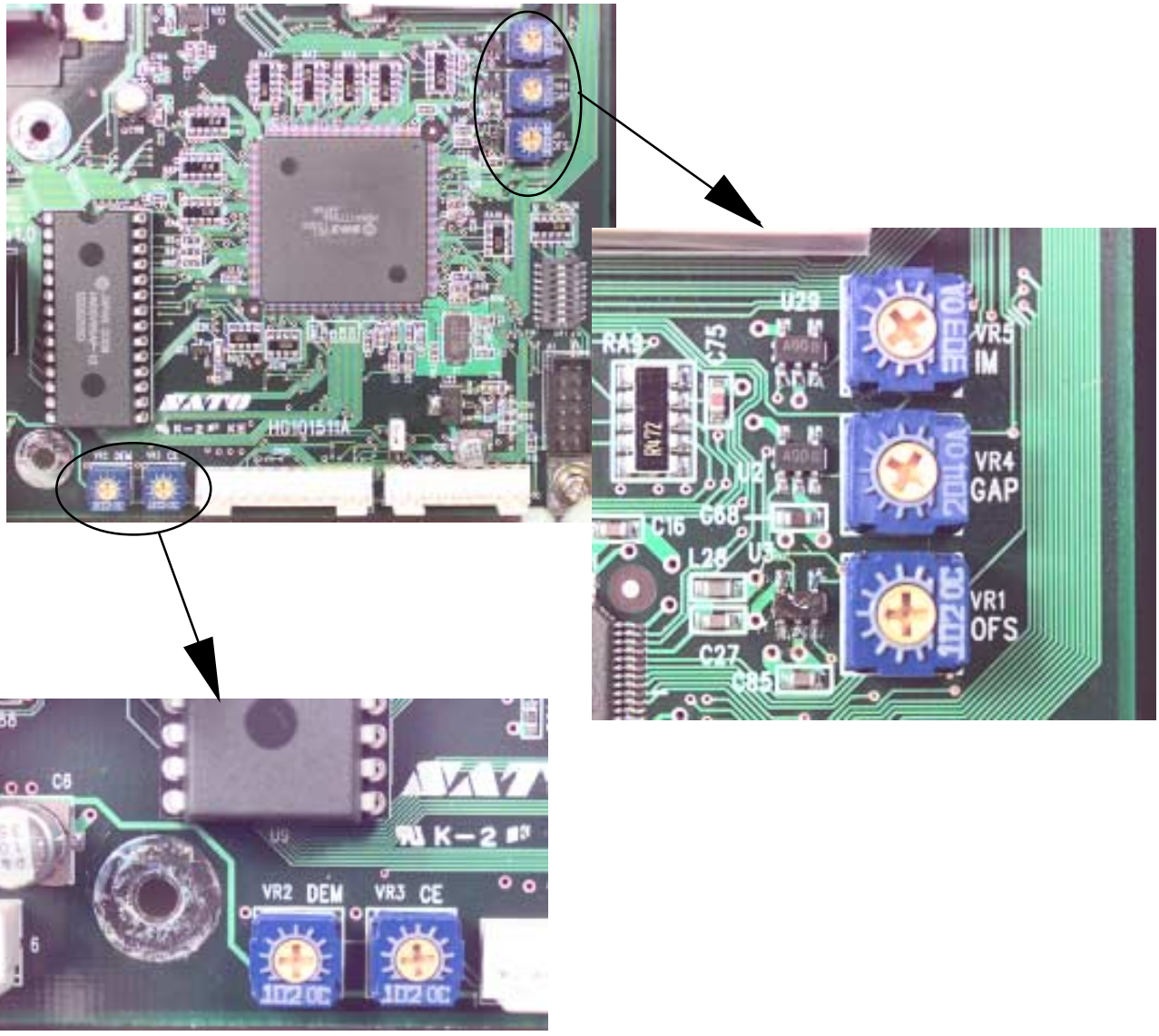
VR to Adjust	ITEM	POSITION DIAL
	5V	0
	2V	1
	3.3V	2
	24V	3
VR1	Pitch Offset	
VR4	GAP	5
VR5	Eye-Mark	4
VR2	DEM	Dispenser
VR3	CE	Ribbon Sensor

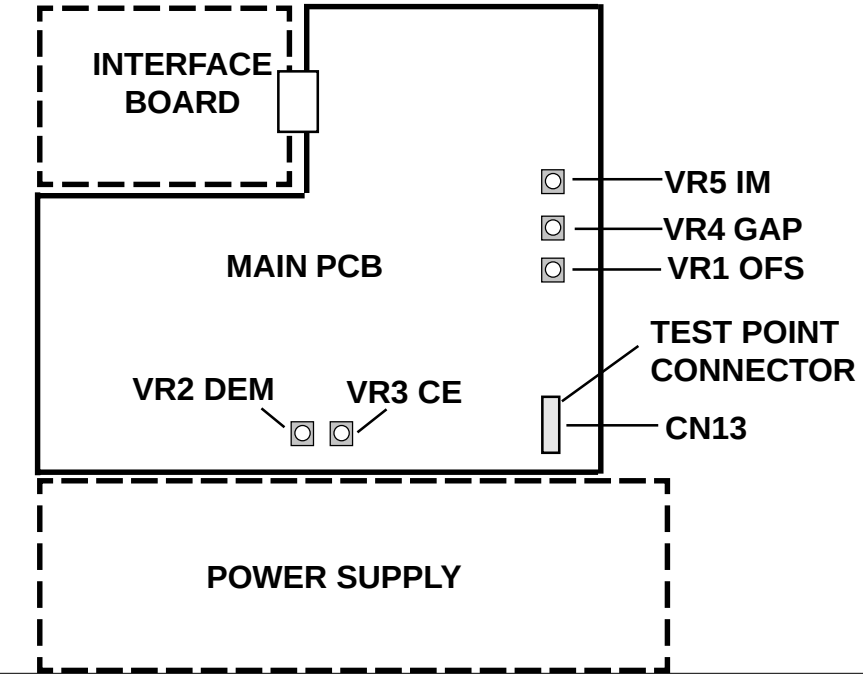
POTENTIOMETERS ARE LOCATED ON MAIN PCB

VR	TO ADJUST
PRINT	Darkness
OFFSET	Offset
PITCH	Pitch
DISPLAY	Display

POTENTIOMETERS ARE LOCATED ON THE FRONT PANEL

Potentiometer Assignments & Adjustments

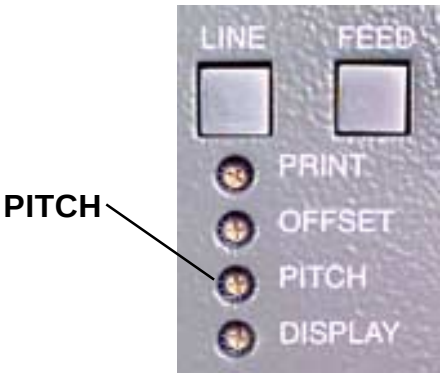




4.5a Print Position Adjustment

Print Position is adjusted with the PITCH potentiometer on the Front Panel and/or VR1 potentiometer on the main PCB board.

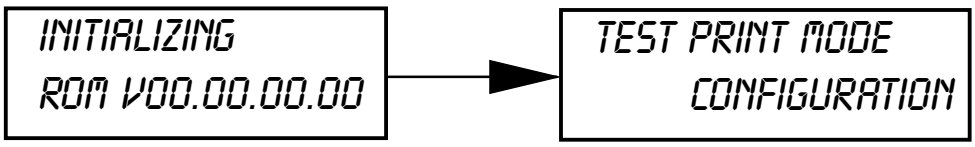
The following instructions are for adjusting the potentiometer on the Front Panel. Refer to Section 4.5b for making adjustments using the potentiometer on the PCB board.



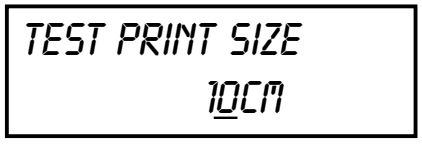
Note: PITCH potentiometer is for changing the print position but not for the print stop position. The stop position can be changed with the OFFSET potentiometer.

VR3 adjustment range is +/- 3.75mm.

STEP	PROCEDURE
1.	Turn the OFFSET potentiometer on the front panel to the center position.
2.	Press the **FEED** key while simultaneously turning **ON** the power switch.
3.	When the printer beeps, release the key. The following screens will appear.



4.	Press the **FEED** key to display the next screen.



5.	Use the **LINE** Key to step to the second digit of the counter to the desired setting. The display will increment one step each time the **LINE** key is pressed. After the reading will advances to a setting of 09, it will automatically wrap and start at 10 CM again.
6.	Press the **FEED** key for a test print. Press the **FEED** key again to stop printing.

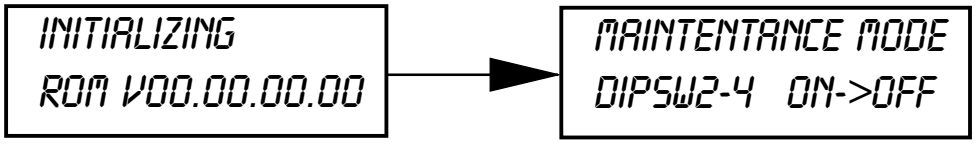
7.	Adjust the position using the potentiometer and feed another label. When the adjustment is correct, turn the printer off. If the print position can't be adjusted replace the Keyboard PCB. Refer to Section 6.

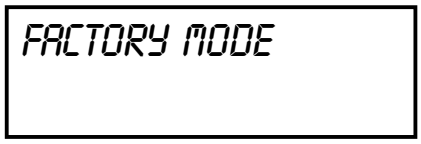
4.5b Print Position Adjustment

Using VR1 potentiometer on the main PCB board.

VR1 adjustment range is +/- 3.75mm.

STEP	PROCEDURE
1.	Refer to Section 4.2 and remove the left side cover.
2.	Record all current dip switch positions, then place all switches in the **OFF** position and the power switch **OFF**.
3.	Turn **VR1** on the main PC Board to the center position.
4.	Place DSW2-4 in the **ON** (up) position.
5.	Press the **LINE** and **FEED** key while simultaneously turning the power switch **ON**.
6.	When the printer beeps, release the keys. The following screens will appear.
7.	Place DSW2-4 in the **OFF** (down) position and the screen will display the next screen.
8.	Press the **FEED** key to display the next screen.
9.	Confirm "None" then press the **FEED** key to display the next screen. The default is Large.
10.	Press the **FEED** key for a test print. Press the **FEED** key again to stop printing.
11.	Adjust the position using the VR1 potentiometer and feed another label. When the adjustment is correct, turn the printer off. If the print position can't be adjusted with the VR1, replace the Main PCB. Refer to Section 6.
12.	Replace left side cover.





4.6 Label Gap Adjustment

Additional equipment required:	TP Test Module Digital Multimeter

STEP	PROCEDURE
1.	Refer to Section 4.2 and remove the left side cover.
2.	Turn **VR4 (GAP)** potentiometer on the main PCB all the way to the left.
3.	Refer to Section 4.3. Set the digital multimeter to DC voltage measurement mode. Attach the connector from the TP Test Module to the test port on the main PCB. Note correct positioning of connector. Nibs on the connector are placed down in the receptacle on the PCB in the forward position. Set the dial to 5.
4.	Connect (+) probe of the multimeter to Sig+ and (-) probe to pin GND.
5.	For Low level (Label Gap part with backing only) adjustment, put label gap part in the sensor. Then adjust the electrical level with **VR4** on the main PCB so that it will measure less than 0.5 V.
6.	For High level (paper part) adjustment, put paper part in the sensor and check the electrical level. If the level difference is +1.0 V more than the Low level, it is acceptable. If it is lower than 1.0V repeat STEPS 4 & 5 and readjust **VR4**.
7.	Standard values: Low level (gap): below 0.5 V High level (paper part): Low level +1.0 V or higher. If these values do not result, try the following: a) Repeat the process b) Clean the sensor c) Verify sensor is operational d) Replace labels with higher quality labels e) Perform factory reset
8.	Replace left side cover.

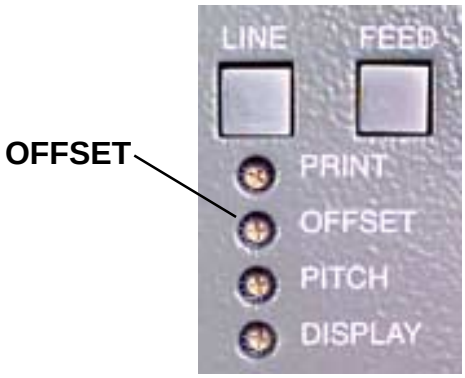
4.7 Eye-Mark Adjustment

Additional equipment required:	TP Test Module Digital Multimeter

STEP	PROCEDURE
1.	Refer to Section 4.2 and remove the left side cover.
2.	Turn **VR5 (IM)** potentiometer on the main PCB all the way to the left.
3.	Refer to Section 4.3. Set the digital multimeter to DC voltage measurement mode. Attach the connector from the TP Test Module to the test port on the main PCB. Note correct positioning of connector. Nibs on the connector are placed down in the receptacle on the PCB in the forward position. Set the dial to 4.
4.	Connect (+) probe of the multimeter to Sig+ and (-) probe to pin GND.
5.	For Low level (no "Eye-Mark" part) adjustment, put paper part in the sensor. Then adjust the electrical level with **VR5** on the main PCB so that it will measure less than 0.5 V.
6.	For High level ("Eye-Mark" part) adjustment, put paper part with the "Eye-Mark" part in the sensor and check the electrical level. If the level difference is +1.0 V more than the Low level, it is acceptable. If not, return to STEP 4 and readjust **VR5**.
7.	Standard values: Low level (no "Eye-Mark" part): +0.5 V or less. High level ("Eye-Mark"): Low level +1.0 V or higher. If these values do not result, try the following: a) Repeat the process b) Clean the sensor c) Verify sensor is operational d) Replace labels with higher quality labels e) Perform factory reset
8.	Replace left side cover.

4.8 Offset Label Stop Position Adjustment

Used for fine adjustment of label stop position for Tear-Off, Cutter and Dispense Modes. The Feed/Backfeed is adjusted with the Offset potentiometer on the Front Panel.



Note: The stop position only is changed with the Offset-VR. The print position is changed with the Pitch-VR.

The OFFSET-VR adjustment range is +/- 3.75mm.

STEP	PROCEDURE
1.	Turn the **OFFSET** potentiometer on the front panel to the center position.
2.	Press the **FEED** key while simultaneously turning **ON** the power switch.
3.	When the printer beeps, release the key. The following screens will appear.

```
INITIALIZING
ROM V00.00.00.00
```
→
```
TEST PRINT MODE
     CONFIGURATION
```

4.	Press the **FEED** key to display the next screen.

```
TEST PRINT SIZE
          10CM
```

5.	Use the **LINE** Key to step to the second digit of the counter to the desired setting. The display will increment one step each time the LINE key is pressed. After the reading will advances to a setting of 09, it will automatically wrap and start at 10 CM again.
6.	Press the **FEED** key for a test print. Press the **FEED** key again to stop printing.

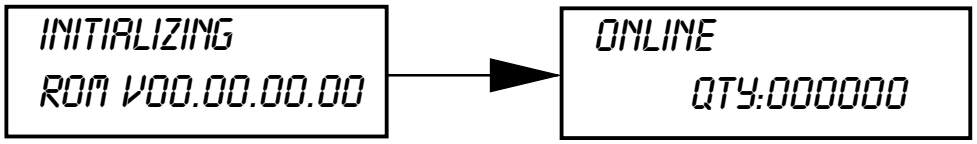
```
PRESS FEED KEY
TO STOP PRINTING
```

7.	Adjust the stop position using **OFFSET** potentiometer and feed another label. When the adjustment is correct, turn the printer off. If the print position can't be adjusted replace the Display Panel PCB. Refer to Section 6.

4.9a Ribbon Sensor Operation Verification

PLACE DSW2-1 IN THE OFF POSITION

STEP	PROCEDURE
1.	Access the dip switches on the front panel.
2.	Record all dip switch positions, then place DSW2-1 in the **OFF** position and the power switch **OFF**.
3.	Remove the ribbon from the printer and close the Head Open Lever.
4.	Turn the power switch **ON** to initialize the printer. The following screens will display.
5.	Press the **LINE** key to place the printer off-line.
6.	Press the **FEED** key. The printer will beep and the following screen will display to confirm that the ribbon is not in position and confirm the sensor is functioning.
7.	Turn off the printer and reinstall the ribbon.
8.	Turn **ON** the printer. The printer will initialize as in Step 4. Be sure to place the printer off line. Press the **FEED** key to generate a blank label and confirm ribbon has been installed and is in position.



4.9b Ribbon Sensor Voltage Checking

There is no adjustment POT for the ribbon sensor on the CL408e/412e. The CE POT on the main logic board has no effect on the voltage values. The voltage values only can be taken off the connector SEN4 on the display.

Refer to illustrations below.

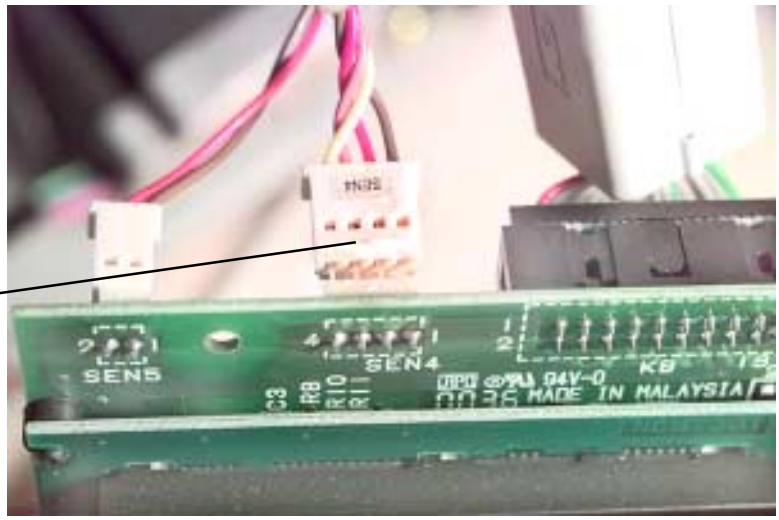
PIN 1 = Brown
PIN 2 = Red
PIN 3 = Orange
PIN 4 = Yellow

PIN 3 (Signal) and PIN 4 (Ground) are the test pins. Low value when the carbon assembly is rotated is around 0.16V. High value is around 4.8V.

If the voltages you monitor are at or close to these voltages, the ribbon out problem is being caused by improper ribbon tension adjustment.

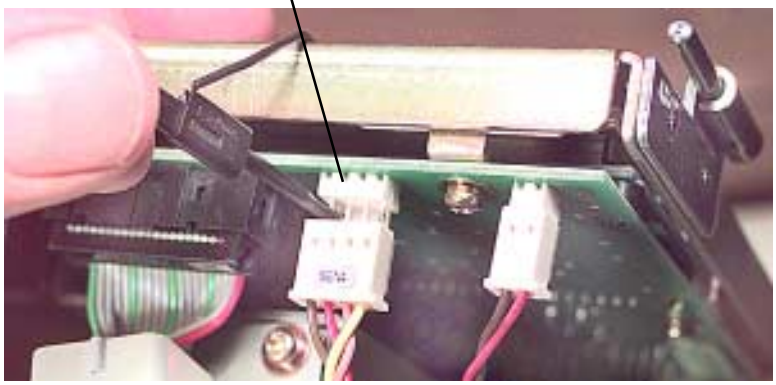
If the voltages are not at or close to these values, it indicates a component problem. The order suggested for component replacement trouble shooting is ribbon sensor first, display panel next, and finally the main logic board.

PULL SEN4 CONNECTOR SLIGHTLY AWAY FROM DISPLAY PANEL CONNECTIOR SO THAT VOLTAGE PROBES CAN BE ATTACHED TO THE EXPOSED PINS



Ribbon Sensor Voltage Checking

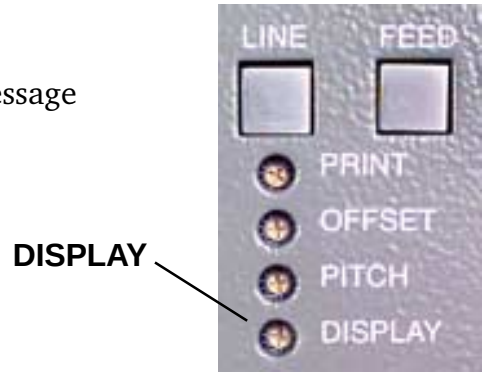
ATTACH THE GROUND (BLACK) PROBE FROM THE MULTIMETER TO PIN 4 (GROUND) AND THE SIGNAL (WHITE) PROBE TO PIN 3



TO CHECK VOLTAGE RANGE FOR RIBBON SENSOR, ROTATE CARBON UNWIND SPINDLE.
LOW VALUE ~/- 1.6V
HIGH VALUE ~/- 4.8V

4.10 LCD Display Adjustment

STEP	PROCEDURE
1.	Turn **ON** the power.
2.	Confirm the backlight on the LCD is lit and message is displayed.
3.	Adjust the display darkness with **DISPLAY** potentiometer (located on the front panel) as necessary.

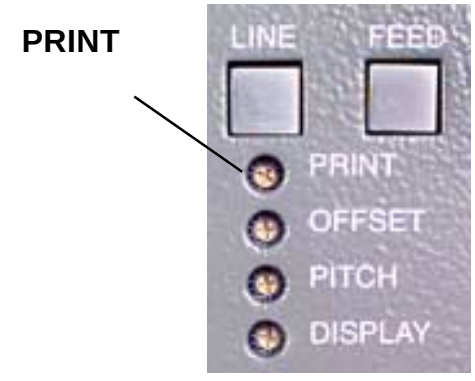


POTENTIOMETERS ARE LOCATED ON THE FRONT PANEL

4.11 Print Darkness Adjustment

STEP	PROCEDURE
1.	Turn **PRINT** potentiometer on the front panel to the center position.
2.	Turn **ON** the power. Press the **LINE** key to go off-line. Then press **LINE** and **FEED** keys simultaneously and the following message will display.
3.	Press **LINE** key and place the cursor under the print darkness desired, then press the **FEED** key to enter.
4.	Turn **OFF** the power.
5.	Check the print darkness and adjust to suit with **PRINT** potentiometer.

```
PRINT DARKNESS
1  2  3  4  5
```



POTENTIOMETERS ARE LOCATED ON THE FRONT PANEL

Section

5

Mechanical Adjustments

5-1 Overview

The SATO M-8400RVe printer contains adjustable 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.

In this section you will find procedures for:

- *Ribbon Clutch Adjustments*
- *Print Head Position Alignment*
- *Print Head Balance Alignment*
- *Ribbon Guide Plate Adjustment*
- *Feed Roller Adjustment (Label Tracking)*
- *Timing Belt Tension Adjustment*
- *Pitch Sensor Setup*

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 specifications or if adjustment of either clutch is necessary.

Required Equipment:	• 1 Kg Tension Gauge • Ribbon Core, empty • String • 12mm Wrench • #2 Pozidrv Screwdriver

5.2.1 Ribbon Unwind Clutch Adjustment

STEP	PROCEDURE
1.	Connect the power cable to the printer and AC outlet. Turn the printer **ON**.
2.	Open the access doors and remove the ribbon and label stock if installed. ***Fig. 5-1***
3.	Attach string to an empty ribbon core and place on the Ribbon Unwind Spindle. 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. ***Fig. 5-2 & 5-3***
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 550 to 650 grams of tension. Excessive or insufficient tension must be corrected by adjusting the Ribbon Unwind Clutch. ***Fig. 5-2 & 5-3***
5.	To adjust the clutch, loosen the locking screw and move the adjust nut CW for more tension and CCW for less tension. Tighten the locking screw and repeat Steps 3 and 4 until the correct tension is achieved.

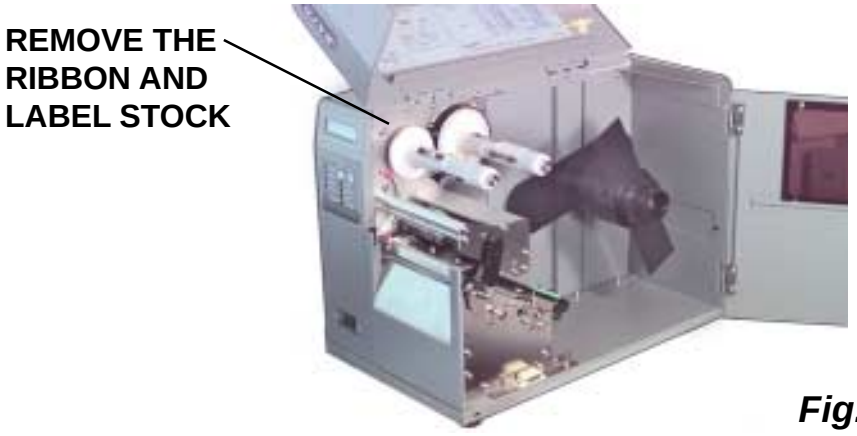


Fig. 5-1

Ribbon Clutch Adjustments

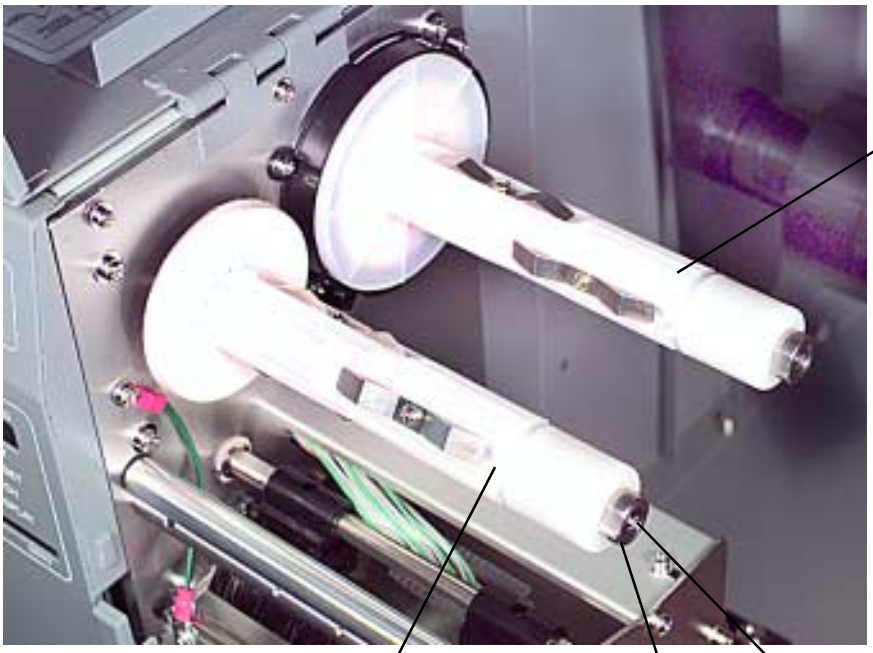


Fig. 5-2

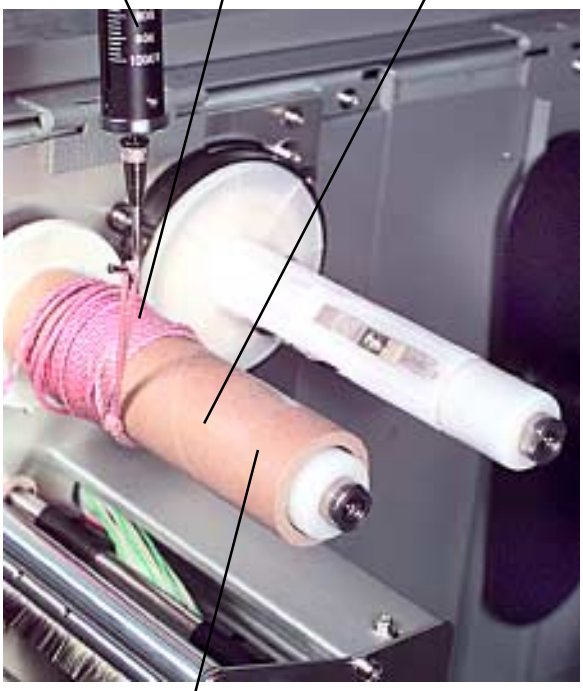


Fig. 5-4

REWIND CLUTCH

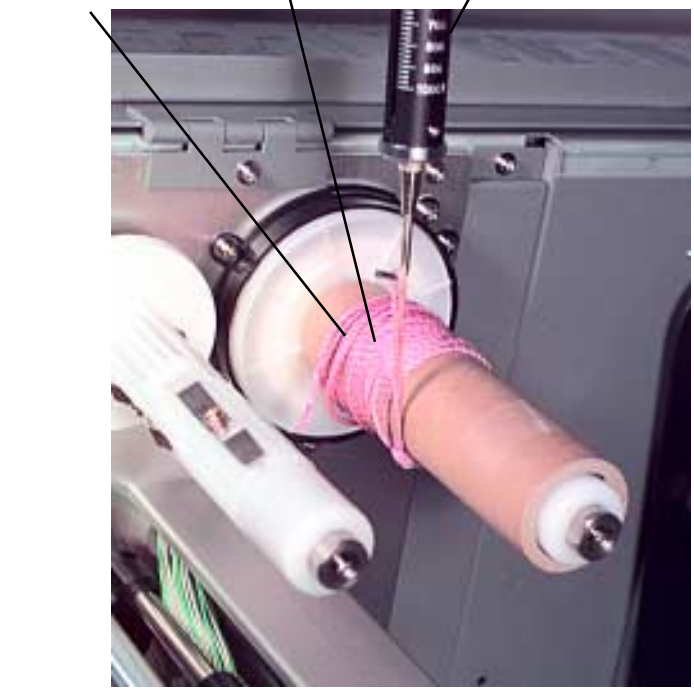


Fig. 5-3

UNWIND CLUTCH

Ribbon Clutch Adjustments

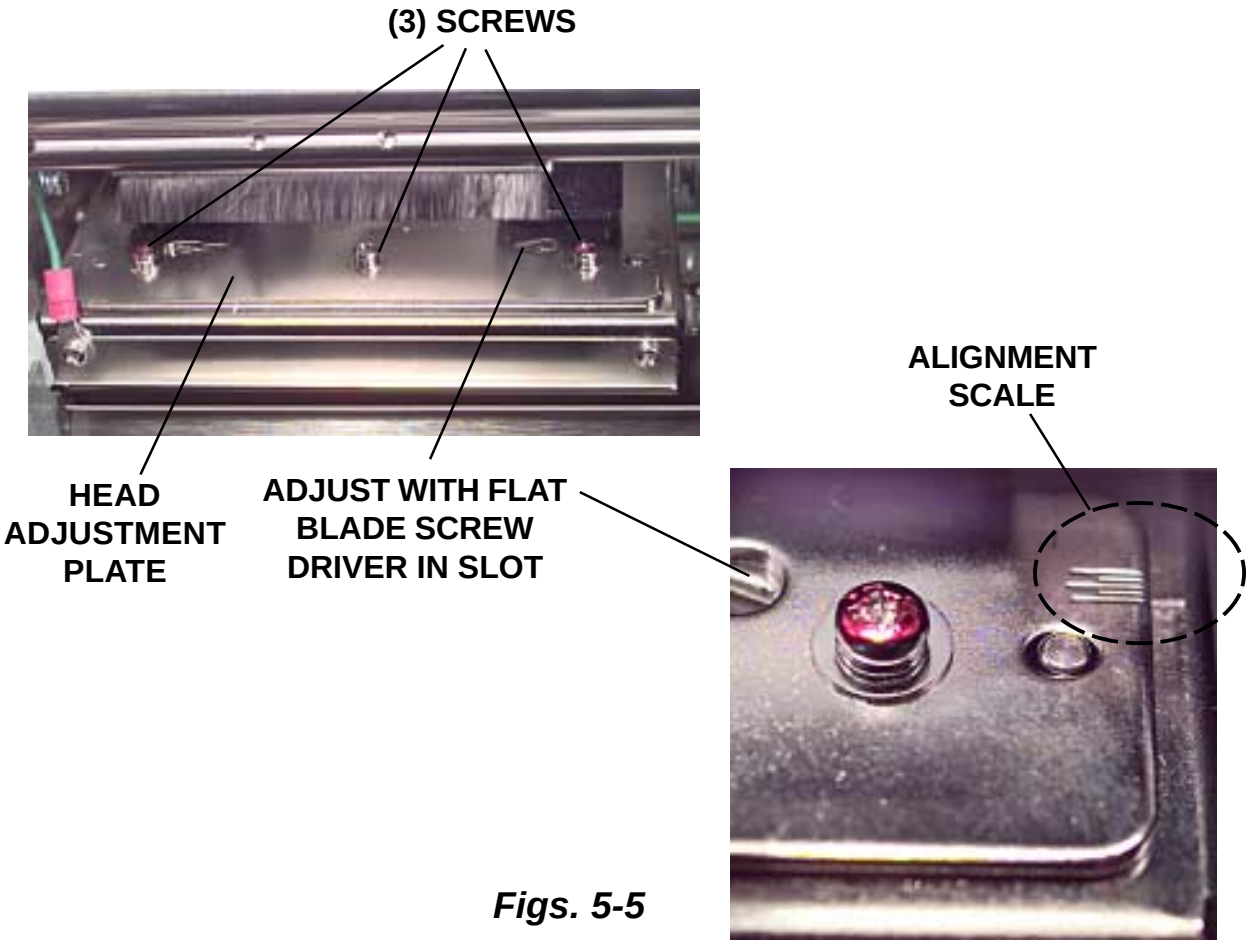
5.2.2 Ribbon Rewind Clutch Adjustment

STEP	PROCEDURE
1.	Connect the power cable to the printer and AC outlet. Turn the printer **ON**.
2.	Open the access doors and remove the ribbon and label stock if installed. ***Fig. 5-1***
3.	Attach string to an empty ribbon core and place on the Ribbon Rewind Spindle. 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. ***Fig. 5-2 & 5-4***
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 950 to 1050 grams of tension. Excessive or insufficient tension must be corrected by adjusting the ribbon unwind clutch. ***Fig. 5-2 & 5-4***
5.	To adjust the clutch, loosen the locking screw and move the adjust nut CW for more tension and CCW for less tension. Tighten the locking screw and repeat Steps 3 and 4 until the correct tension is achieved.

5.3 Print Head Position Alignment

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

STEP	PROCEDURE
1.	Connect the power cable to the printer and AC outlet. Turn the printer **ON**.
2.	Open the access doors and load ribbon and label stock.
3.	Loosen the (1) center and (2) side screws attaching the head adjustment plate to the head. ***Fig. 5-6 & 5-7***
4.	Adjust with flat blade screw driver in slot, aligning the center idex scale as a guide to adjust. Tighten the screws. NOTE: Use the printed head pattern as a guide to even print position. Refer to Section 8.9 for head pattern examples.



Figs. 5-5

5.4 Print Head Balance Alignment

To further optimize print quality especially when using thick label stock, additional adjustments are possible. Perform the following steps, using head pattern as a guide.

STEP	PROCEDURE
1.	Connect the power cable to the printer and AC outlet. Turn the printer **ON**.
2.	Open the access doors and load ribbon and label stock.
3.	Loosen the screw near the bottom of the plate. ***Fig. 5-6***
4.	Rotate adjusting screw to achieve optimum print quality along the length of the print head. NOTE: Rotating the screw CW places pressure on the inside end (left side) of the print head creating a darker impression on that surface. Rotating the screw CCW places pressure on the outside end (right side) of the print head creating a darker impression on that surface.

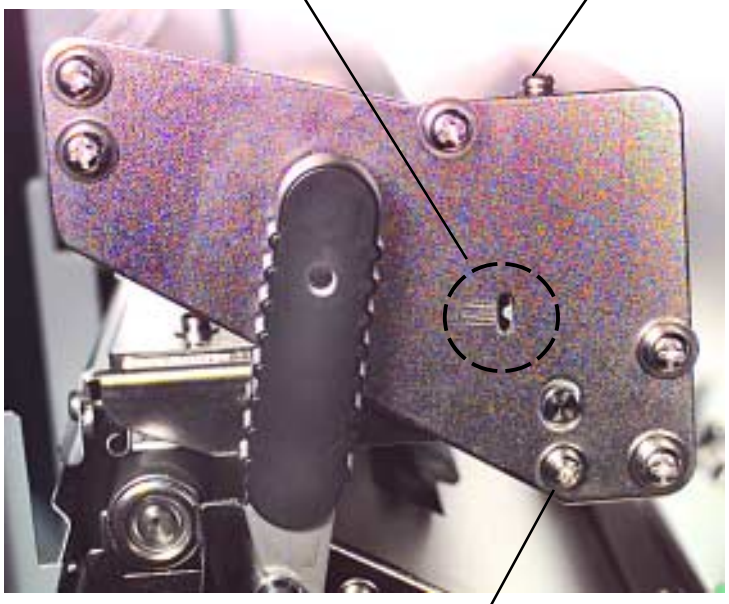
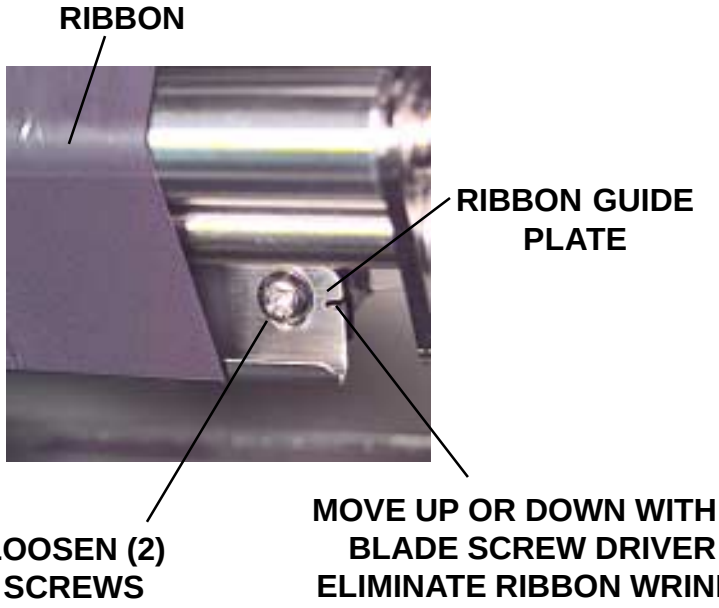


Fig. 5-6

5.5 Ribbon Guide Plate Adjustment

If the ribbon is not smooth across the guide plate (ribbon wrinkle) adjustment is required. To remedy the problem perform the Print Head Balance Adjustment (Section 5.4) before doing the Ribbon Guide Plate Alignment.

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, (wrinkles) proceed to step 2. ***Figs. 5-7***
2.	Reposition and adjust the ribbon guide plate loosening two screws and moving the plate with a flat blade screw driver.



Figs. 5-7

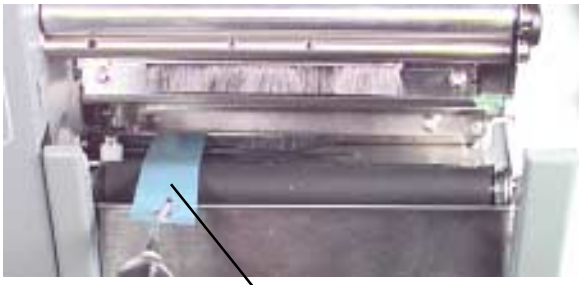
5.6 Feed Roller Adjustment (Label Tracking)

Required Equipment:	• #2 Pozidrv Screwdriver • 5.5mm wrench • 1 Kg Tension Gauge

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

STEP	PROCEDURE
1.	Switch the printer **OFF** and disconnect the power cable.
2.	Open the access doors and remove the label stock if installed. ***Fig. 5-1***
3.	Attach a strip of 20mm + wide liner backing paper to the end of the tension gauge. Under the media cover, place the strip between the pressure rollers at the left side with the print head assembly open. Gradually pull the tension gauge and measure the friction. Repeat at the right side of the rollers. ***Figs. 5-10***
4.	The difference between the left side and the right side should be 100g or less.
5.	To adjust the pressure between the rollers, loosen the two fixing nuts on the media lid with a 5.5mm wrench and adjust the screws. ***Figs. 5-11***
6.	To adjust the alignment of the roller, loosen the locking screws and move the adjust plate with a screwdriver until the required positions are found.
7.	Tighten the locking screws.

Feed Roller Adjustment (Label Tracking)



BACKING PAPER

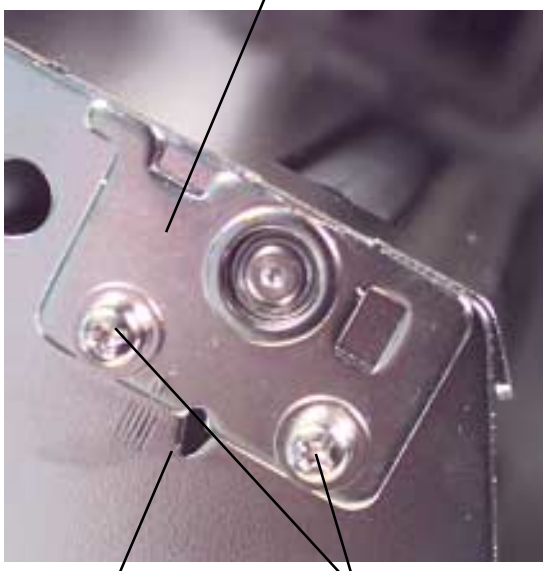
PULL

TENSION GAUGE

Figs. 5-10

PULL

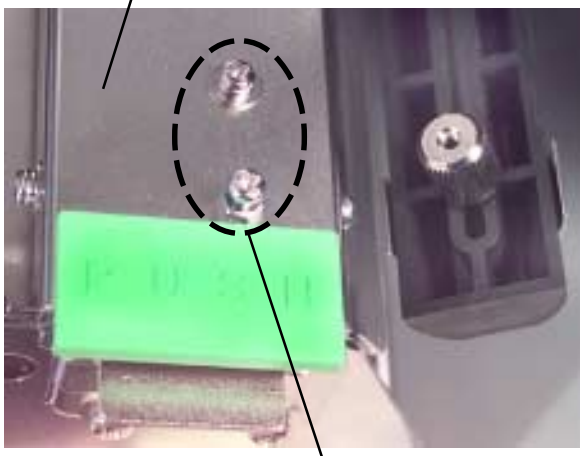
ADJUST PLATE



MOVE WITH FLAT BLADE SCREWDRIVER

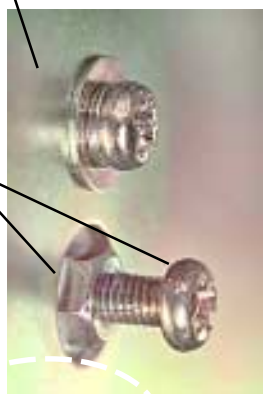
LOCKING SCREWS

MEDIA LID



Figs. 5-11

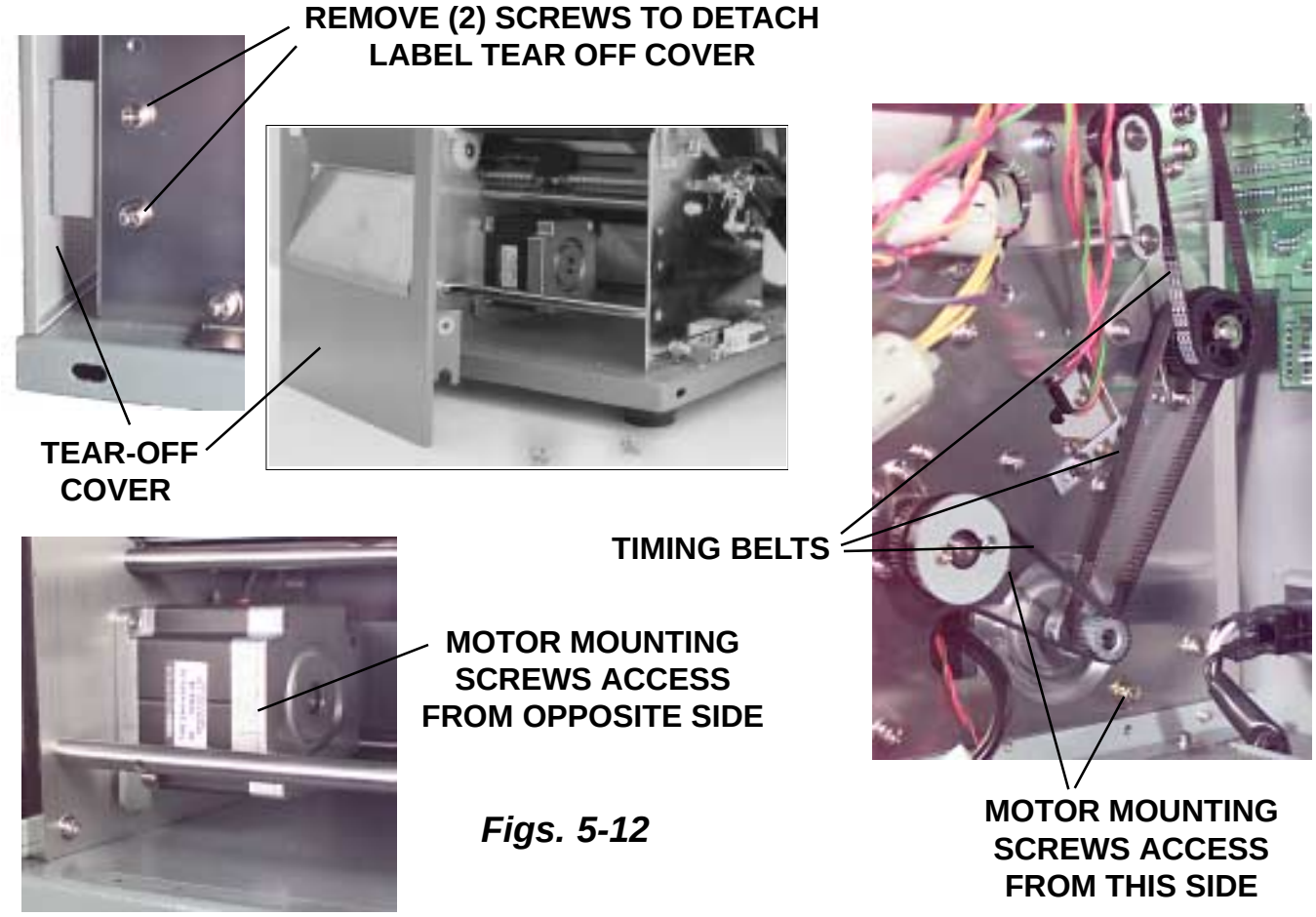
ADJUST SCREW & FIXING NUT ON BOTH ENDS OF MEDIA COVER



5.7 Timing Belt Tension Adjustment

Required Equipment:	• #2 Pozidrv Screwdriver • 1 Kg Tension Gauge

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the AC power cord.
2.	Refer to Section 4.2 and remove the left side cover.
3.	Unload the ribbon and label stock.
4.	Pull the center of each timing belt with the tension gauge and note the tension reading when the belt is moved 1 to 2mm. If the tension reading of each belt is not within range of 80 - 120g, the stepper motor mounting screws must be loosened to adjust the motor pulley.
5.	To gain access to the motor remove (2) screws holding the label tear-off cover to the printer. Rotate the cover down, then remove it by lifting up. ***Figs. 5-12***
6.	Loosen the (2) stepper motor mounting screws and move the motor to achieve the required range. Tighten but do not over tighten screws. Belts should have some movement. Replace label tear-off cover and the left side cover.

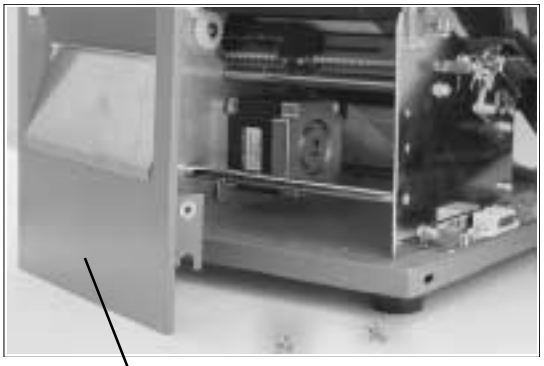


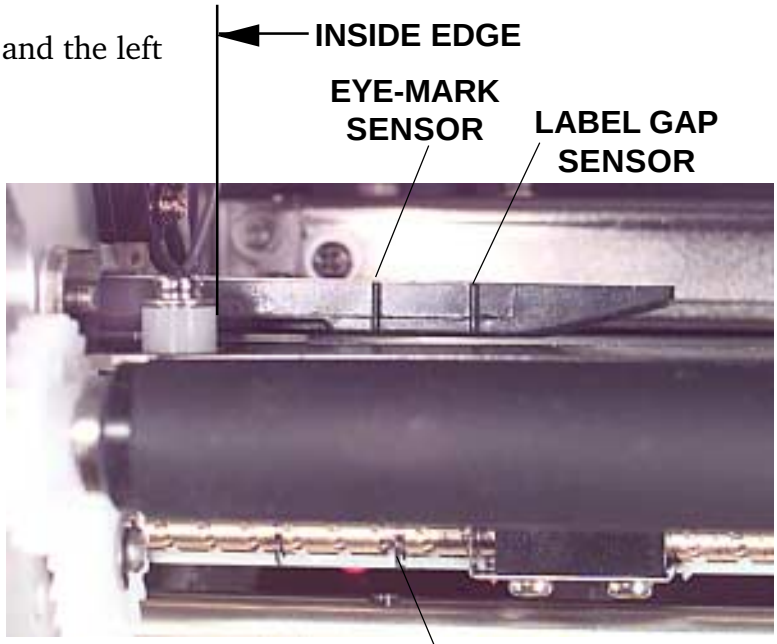
Figs. 5-12

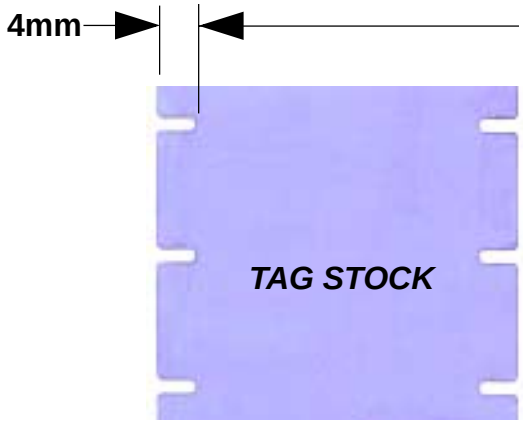
5.8 Pitch Sensor Setup for Sensing "R-Corner" Notch Tags

Required Equipment:	• #2 Pozidrv Screwdriver • Snap Ring Remover Tool

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the AC power cord.
2.	Refer to Section 4.2 and remove the left side cover.
3.	Unload the ribbon and label stock.
4.	Remove (2) screws holding the label tear-off cover to the printer. Rotate the cover down, then remove it by lifting up. ***Figs. 5-12***
5.	Remove the E-Ring from rod to allow sensor the full range of adjustment. ***Figs. 5-13 & 5-14***
6.	Replace label tear-off cover and the left side cover.



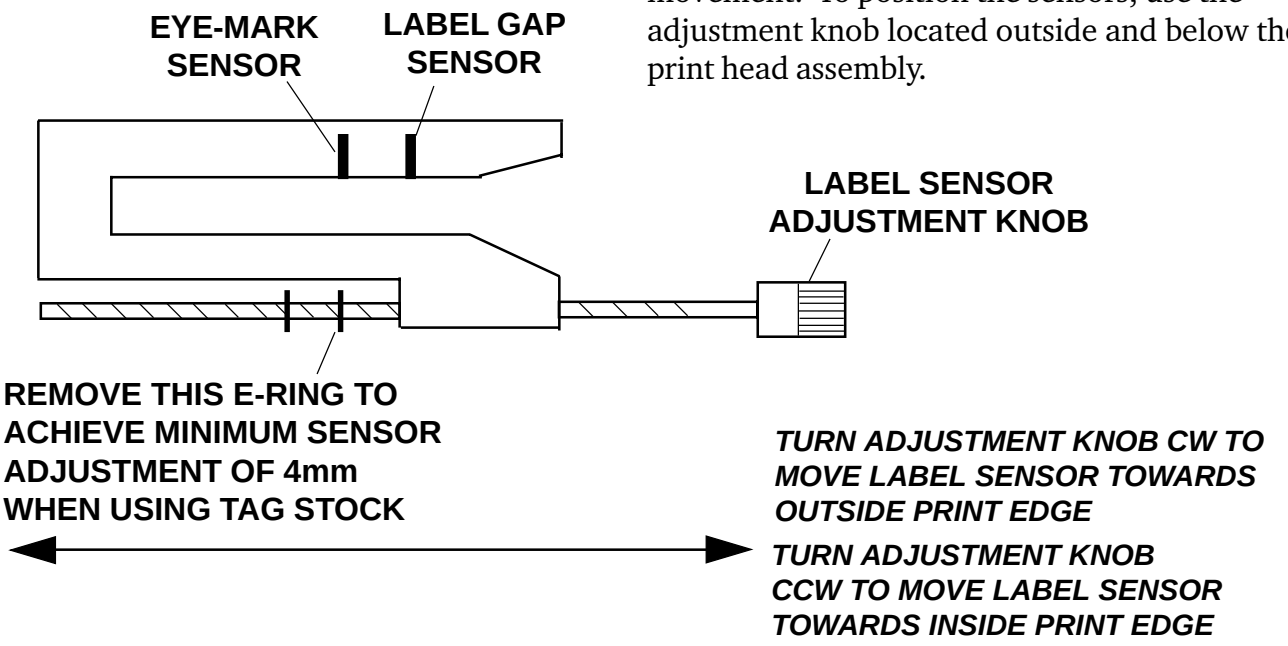


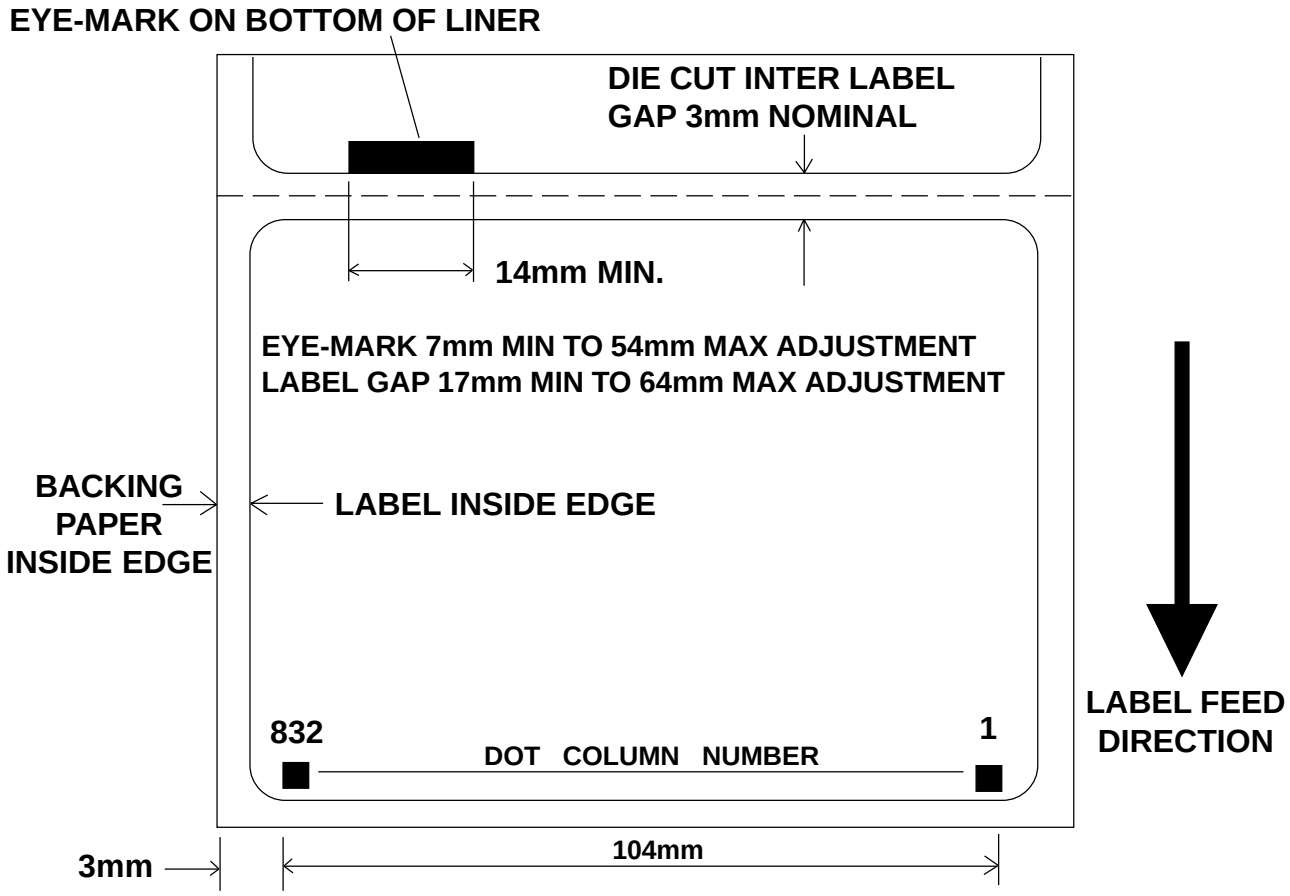


Figs. 5-13

Setting the Pitch Sensor

The Label Sensor Assembly can be positioned to match the location of the label registration hole/notch/gap/edge. The diagram below illustrates the relative position of each sensor along the Label Sensor Unit and its range of movement. To position the sensors, use the adjustment knob located outside and below the print head assembly.





TOP VIEW OF LABEL STOCK ***Figs. 5-14***

Section 6

Replacement Procedures

6.1 Overview

The SATO M-8400RVe Printer contains replaceable components and sub-assemblies. This section contains step-by-step instructions for removing and replacing the following components and sub-assemblies.

- *Main Circuit Board*
- *Fuse(s)*
- *Power Supply*
- *Stepper Motor*
- *Timing Belts*
- *Print Head*
- *Platen*
- *Ribbon Drive Clutch Washers*
- *Ribbon Motion Sensor*
- *Head Open Switch*
- *Label Out Sensor Assembly*
- *Label Sensor Assembly*
- *LC Display and Keyboard PCB Display*

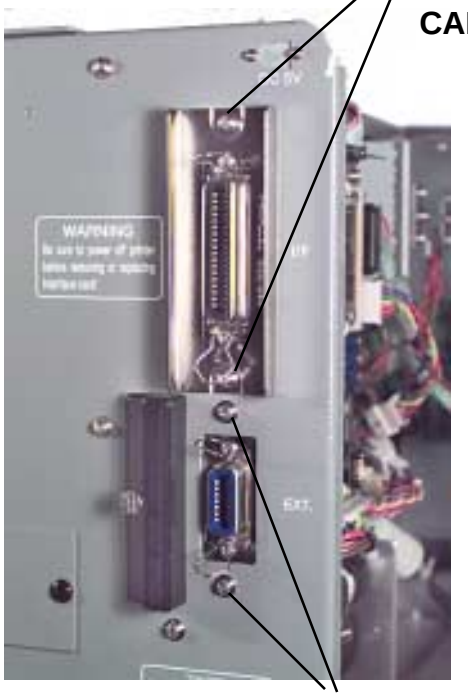
6.2 Replacing the Main Circuit Board

The Main Circuit Board contains the control electronics for the printers and is located behind L.H. cover of the printer. The I/O PCB interface and optional memory card unit if installed, which are attached to the main circuit board must first be removed.

NOTE: Many of the components on this board are 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 and use a wrist grounding strap.

STEP	PROCEDURE
1.	Switch the printer **OFF** and disconnect the power cord.
2.	Refer to Section 4.2 and remove left side cover.
3.	Remove (2) screws holding the I/O PCB Interface from the back side of the unit. Pull away to detach the connector on the interface from the main circuit board. ***Figs. 6-2***
4.	Remove (2) screws holding the main circuit board. ***Figs. 6-2***
5.	Note cable connection locations, then carefully disconnect the cables from the main circuit board. ***Figs. 6-3***
6.	Remove (3) screws holding the PC Board to the frame. Remove the board from the printer. ***Figs. 6-3***
7.	Locate the Flash Memory Module on the Main PC Board. Carefully press outward on the tabs on both ends of the Main PC Board Memory Frame to release the Memory Module PCB. The module should lift by itself when released. Remove the module from the frame. Note the indexing notches. ***Figs. 6-4*** Set the Memory Module PCB aside for installing on the replacement Main PC Board.
8.	Install the Memory Module on the replacement Main PC Board. Note the indexing notches. Insert the module into the Main PCB Memory Frame at approximately 45^0 away from the Main PCB Board. Gently push down to snap into position. ***Figs. 6-5***
9.	Reinstall the replacement PCB reversing Steps 3 through 5.
10.	Replace left side cover.
11.	Complete the Factory Reset Procedure.

Replacing the Main Circuit Board



Figs. 6-2

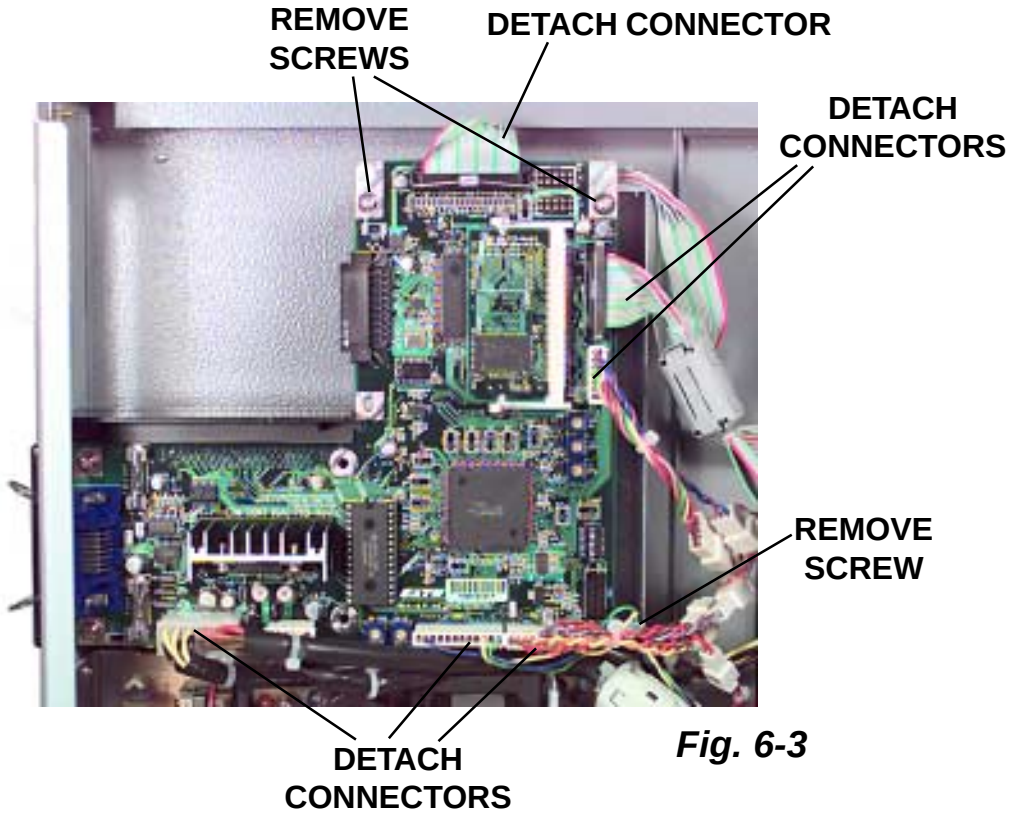
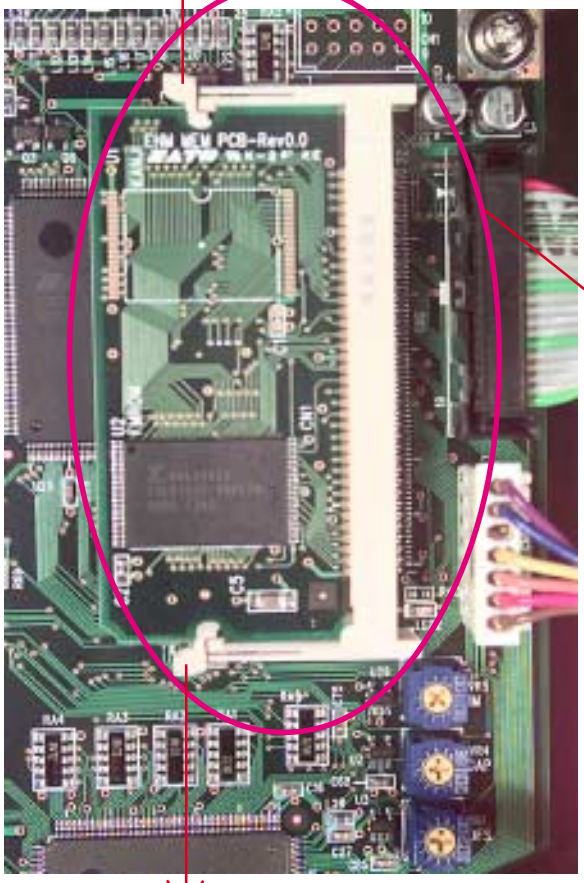
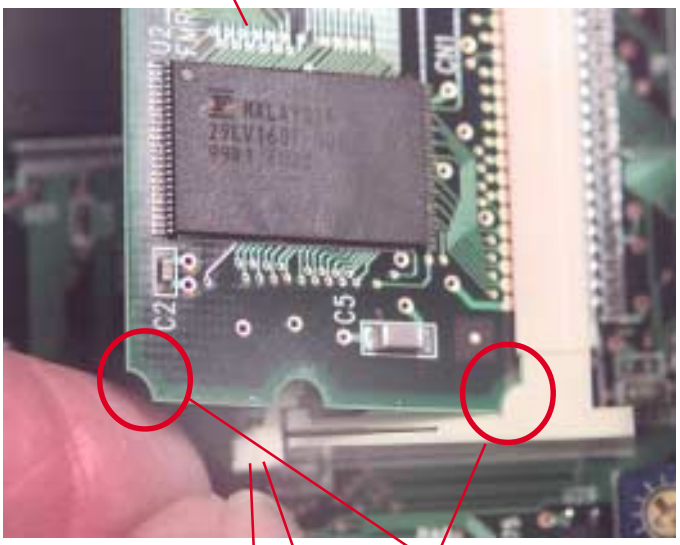


Fig. 6-3

Replacing the Main Circuit Board



MEMORY MODULE PCB IN THE MAIN PCB MEMORY FRAME

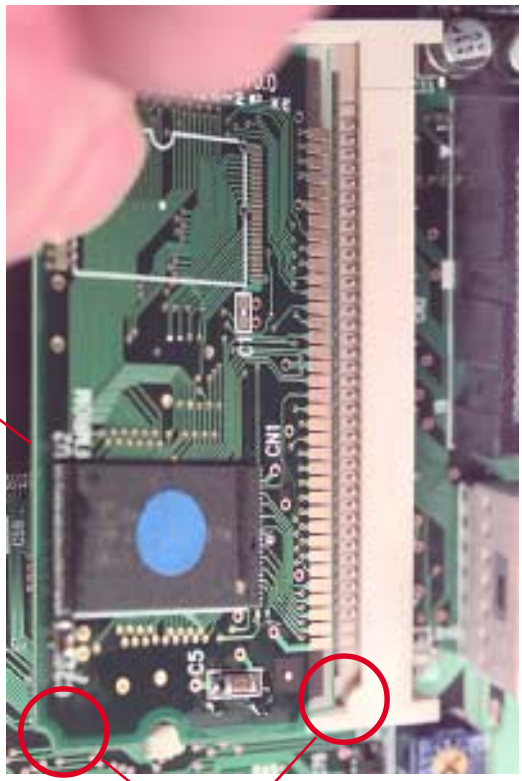


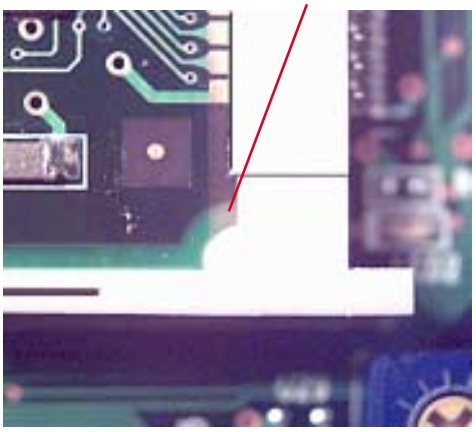
INDEXING NOTCHES

Figs. 6-4

*** CAREFULLY PRESS OUTWARD ON TABS ON BOTH ENDS OF THE FRAME TO RELEASE THE MEMORY PCB.**

Replacing the Main Circuit Board





INSERT THE FLASH MEMORY MODULE INTO THE MAIN PCB MEMORY FRAME AT APPROXIMATELY 45⁰. NOTE THE INDEXING NOTCH ON THE MODULE. GENTLY PUSH DOWN TO SNAP INTO POSITION

Figs. 6-5

6.3 Replacing the 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 Internal Fuse*

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

6.3.1 Removing and Replacing the Main Power Fuse

> Required: F3A, 250V Fuse Fuse

STEP	PROCEDURE
1.	Switch the printer **OFF** and disconnect the power cord.
2.	Locate the fuse cap on the back of the printer. Unscrew the cap and remove the defective fuse. ***Fig. 6-6***
3.	Replace the fuse with one of equal rating (3A, 250V). **Do not use a fuse with a higher rating.**
4.	Screw the fuse cap back on.

Fig. 6-6

Replacing the Fuses

Required:	T3.15A, 250V Fuse or T1 Amp 250V Fuse

To remove and replace these fuse(s) do the following:

STEP	PROCEDURE
1.	Switch the printer **OFF** and disconnect the power cord.
2.	Refer to Section 4.2 and remove left side cover.
3.	Refer to ***Fig. 6-7*** and locate the appropriate fuse on the PCB.
4.	Remove and replace the fuse(s) with one of equal rating. **Do not use a fuse with a higher rating.**
5.	Replace the left side cover.

Fig. 6-7

6.4 Replacing the Power Supply

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

STEP	PROCEDURE
1.	Refer to Section 6.2 and remove the main circuit board. Do not remove the flash memory module.
2.	Detach all cable connections to the power supply.
3.	Remove (2) screws to detach the power cable guard. ***Figs. 6-8***
4.	Remove (2) screws to which secures the power supply to the back side of the cabinet and (1) screw from inside the cabinet.
5.	Remove and replace the defective power supply.
6.	Reinstall the power cable guard.
7.	Refer to Section 6.2 and replace the main circuit board.
8.	Check the DC power voltages. Refer to Section 4.3.

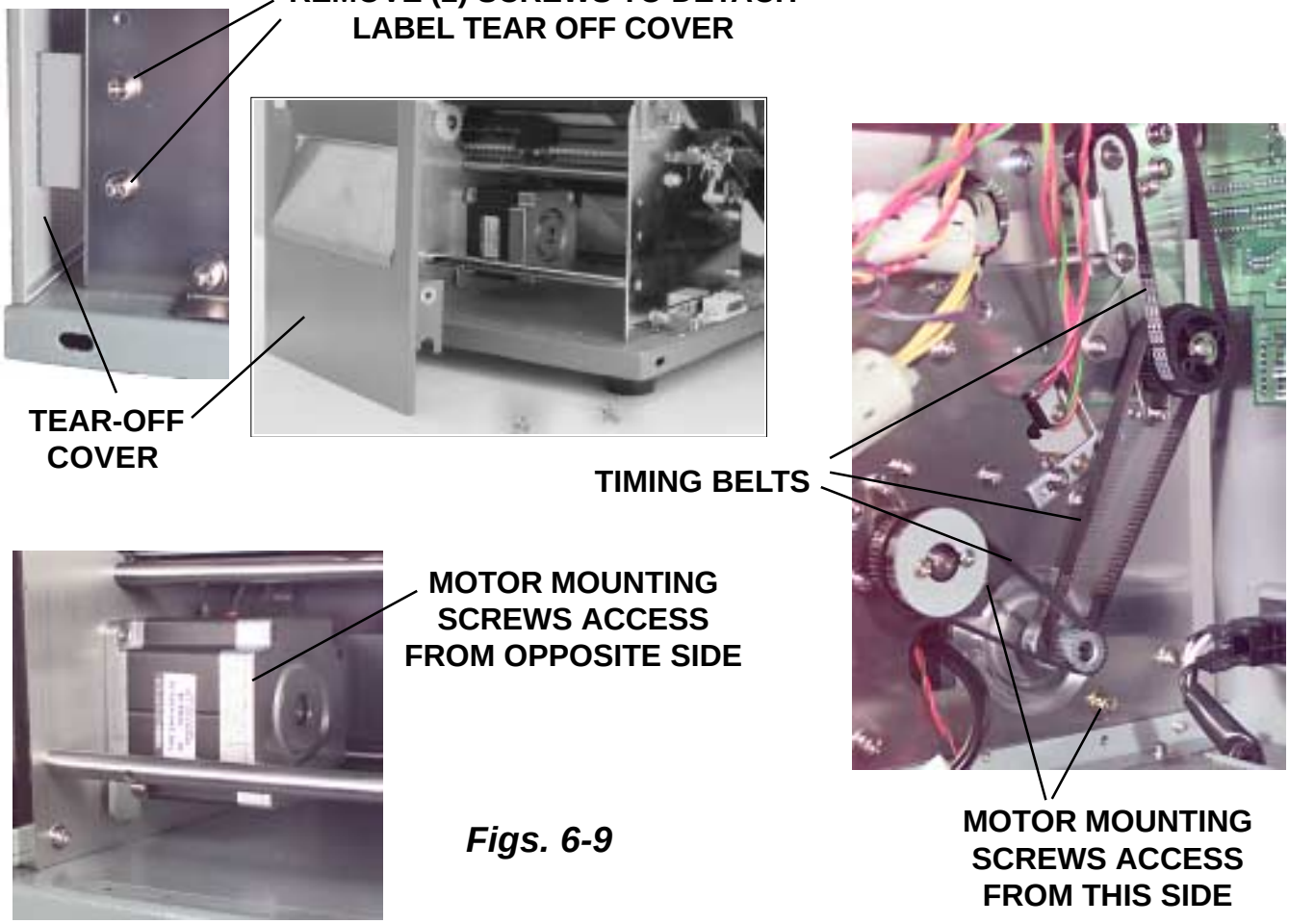
Figs. 6-8

6.5 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 timing belts and gears.

STEP	PROCEDURE
1.	Switch the printer **OFF** and disconnect the power cord.
2.	Refer to Section 4.2 and remove left side cover.
3.	Remove the ribbon and label stock if installed.
4.	Remove (2) screws holding the label tear-off cover. ***Figs. 6-9***
5.	Remove (2) mounting screws holding the stepper motor to the frame. Access the body of the motor from the opening previously covered by the label cover. Detach the motor from the belts.
6.	Unfasten and remove the pulley from the motor shaft.
7.	Detach (2) screws holding the label out sensor (Micro Switch). Access to the sensor screws is through the holes in the side frame. ***Fig. 6-10***
8.	Remove and replace the motor.
9.	Reattach the wires to the label out sensor. Remount the motor and sensor to the frame and secure the pulley to the motor shaft.
10.	Adjust belt tension as outlined in Section 5.8.
11.	Replace the label tear-off cover and the left side cover.

Replacing the Stepper Motor



Figs. 6-9

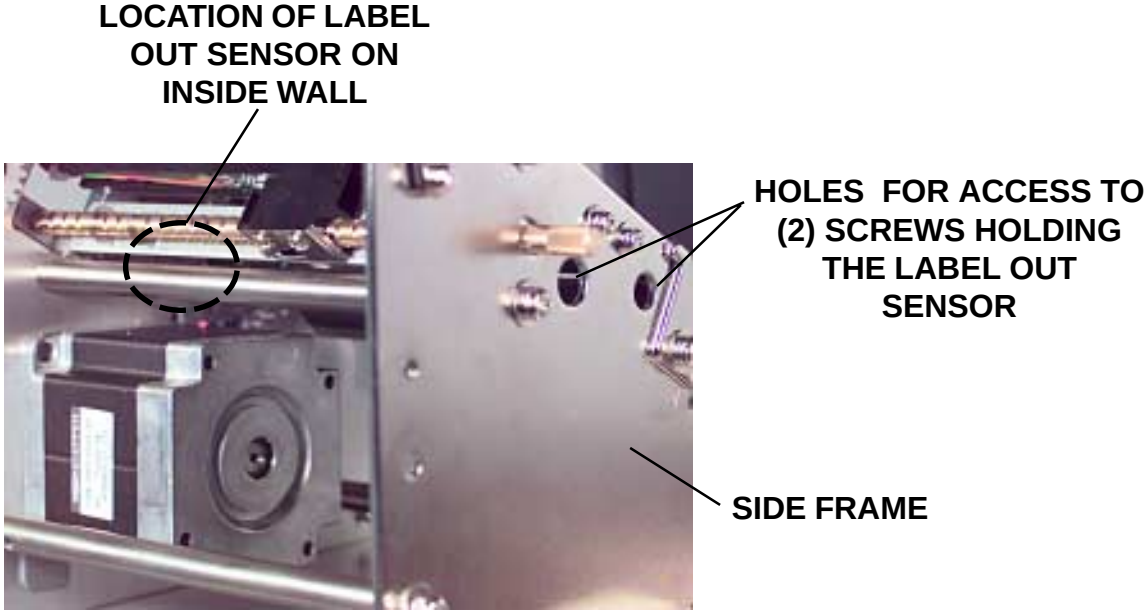


Fig. 6-10

6.6 Replacing the Timing Belts

There are three timing belts in the M-8400RVe printer.

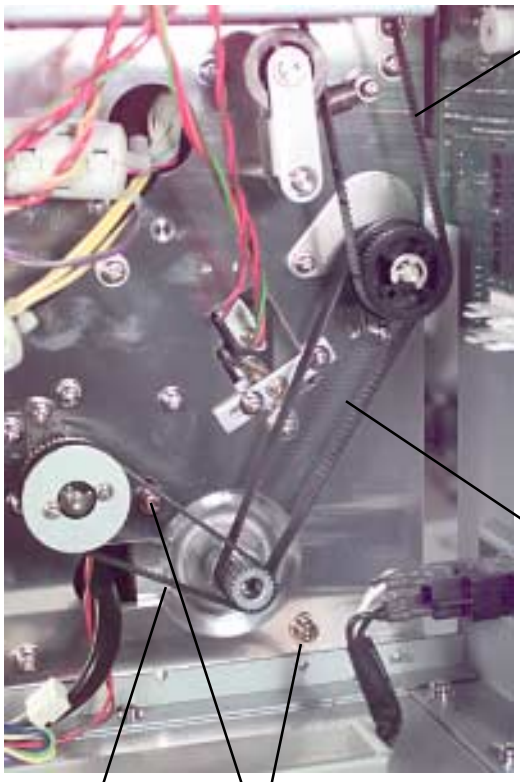
Belt "A"- Label Feed Roller Timing Belt is used to feed torque from the stepper motor to a set of toothed pulleys whidh is connected to the label feed mechanism.

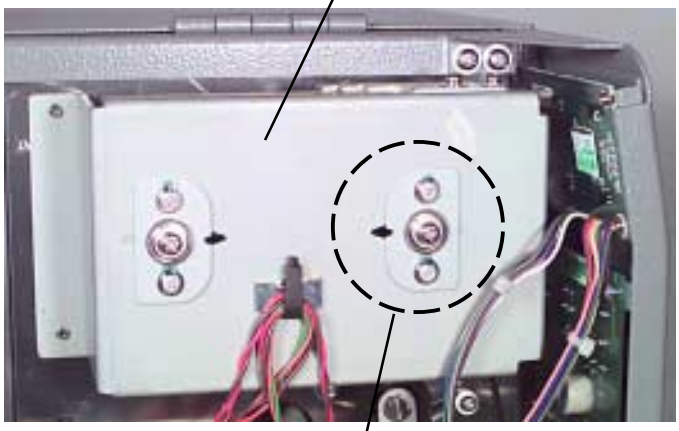
Belt "B"- Platten Pulley Timing Belt is used to transmit torque from the stepper motor to the platen pulley via a set of toothed pulleys.

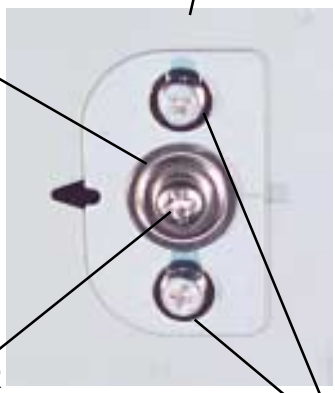
Belt "C"- Carbon Pulley Rewind Timing Pulley is used to transmit torque from the platen pulley to the ribbon roller via another set of toothed pulleys.

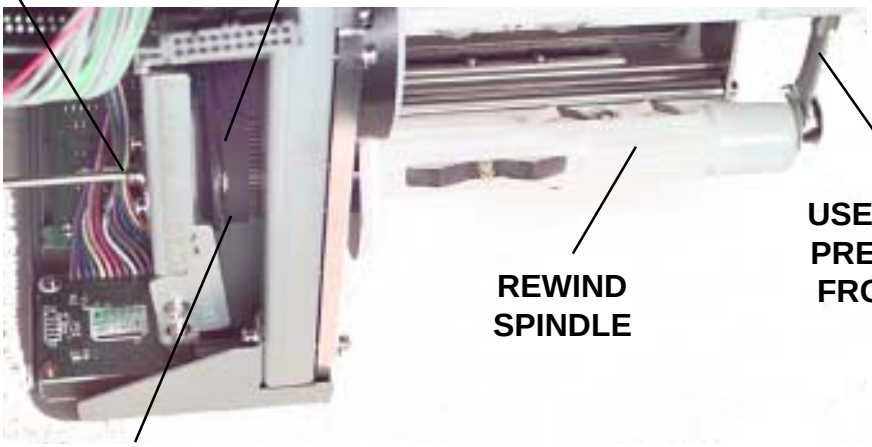
STEP	PROCEDURE
1.	Switch the printer **OFF** and disconnect the power cord.
2.	Refer to Section 4.2 and remove left side cover.
3.	Remove the ribbon and label stock if installed.
4.	Remove (2) screws to detach the label tear-off cover. ***Figs. 6-9***
5.	Detach the connector from the main PCB to the display panel PCB for easier access to the belts.
6.	Loosen (2) mounting screws attaching the stepper motor to the frame. Access the motor from the opening previously covered by the label cover. Move the motor in the motor mounting slots to release pressure from the belt "A" & "B". ***Figs. 6-11***
7.	Remove the center screw holding the rewind spindle to the shaft supporting bracket. Use a wrench on the opposite end of the shaft (in the mechanical section) to prevent the shaft from slipping. Pull the shaft back towards the mechanical section just enough so that belt "C" slides off the end of the shaft. Remove the belt.
8.	Replace the belts reversing steps 5-7.
9.	Adjust the belt tension as outlined in Section 5.8.
10.	Replace the label tear-off cover and the left side cover.

Replacing the Timing Belts









Figs. 6-11

6.7 Replacing the Print Head

If the print head becomes damaged, it can be easily removed and replaced. No critical adjustments are required. Before you replace the print head, check the head counter values by printing a test pattern.

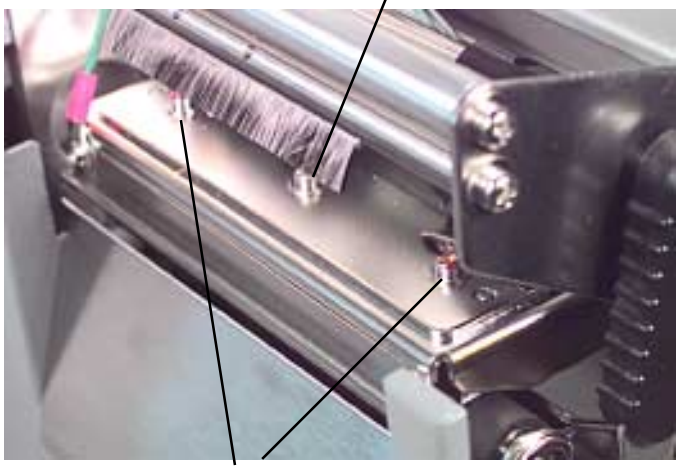
STEP	PROCEDURE
1.	Switch the printer **OFF** and disconnect the power cord.
2.	Open the side access door and raise the top access door.
3.	Unload the ribbon and label stock.
5.	Close the Head Latch Lever to facilitate removal of the print head. Remove the center screw. ***Figs. 6-12***
6.	Carefully open the head latch lever so that the print head will drop down.
7.	Carefully disconnect the cables and remove the print head.
8.	Install a new print head by connecting the cables to the print head. The print head must be positioned so that it aligns properly with the alignment pins.
9.	Close the head latch lever and reinstall the center screw.

Before you return the printer to normal service, you should perform the following procedures.

- Clear Counter Heads (Refer to Section 7.3).
- Confirm that head cables are connected and that they do not touch the head opening spring. Also confirm that you can open and close the head without restriction.
- Print test pattern.

Replacing the Print Head

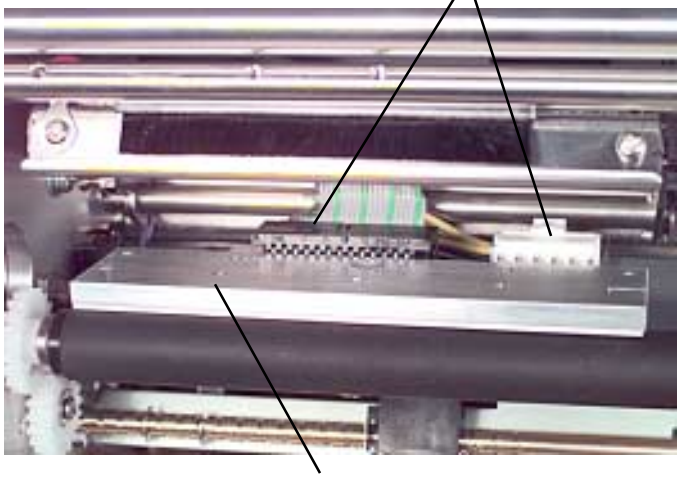
REMOVE CENTER SCREW



DO NOT DISTURB THESE TWO RED SCREWS

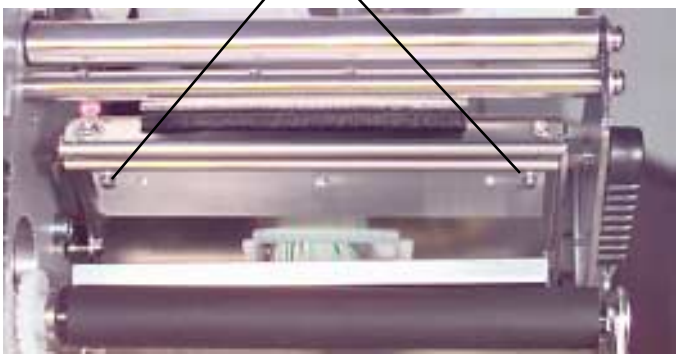
Figs. 6-12

DISCONNECT CABLES



PRINT HEAD

ALIGNMENT PINS



6.8 Replacing the Platen

Before replacing the platen, tension mist be released from the timing belts.

STEP	PROCEDURE
1.	Switch the printer **OFF** and disconnect the power cord.
2.	Refer to Section 4.2 and remove left side cover.
3.	Remove the ribbon and label stock if installed.
4.	Remove (2) screws to detach the label tear-off cover. ***Figs. 6-9***
5.	Loosen (2) mounting screws attaching the stepper motor to the frame. Access the motor from the opening previously covered by the label cover. Move the motor in the motor mounting slots to release pressure from the belts. ***Fig. 6-13***
6.	Loosen the screw holding the clamp which supports the platen to the side frame. ***Fig. 6-14***
7.	Remove the screw holding the clamp and platen components to the back plate. ***Fig. 6-15***
8.	Remove the E-Ring from the end of platen shaft and slide off the belts from the gears. ***Fig. 6-15***
9.	Loosen screw and slide cover aside hole in frame. ***Figs. 6-15 & 6-16***
10.	Displace platen by tilting up and away from the holding clamp in the mechanical section and pull forward through the hole in the frame and out the electronics compartment. ***Fig. 6-17***
11.	Remove old bushings and replace with bushings from new platen.
12.	Install new platen by reversing removal procedure above.
13.	Reinstall belts.
14.	Refer to Section 5.8 to adjust belts.
15.	Refer to Section 5.4 to perform Print Head Balance Alignment.
16.	Replace the label tear-off cover.
17.	Replace the left side cover.

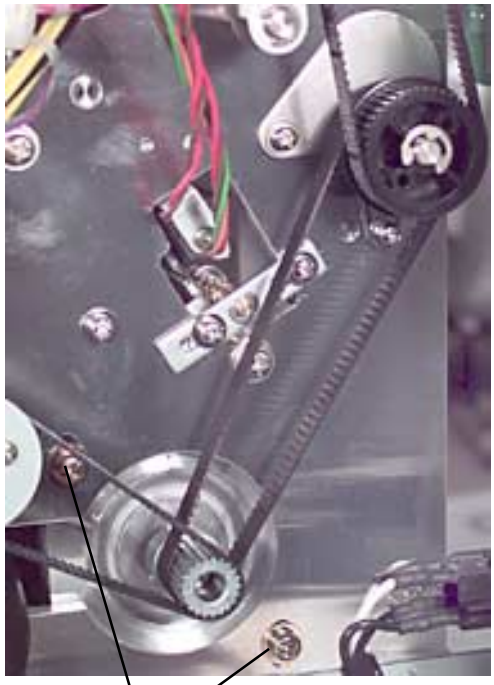
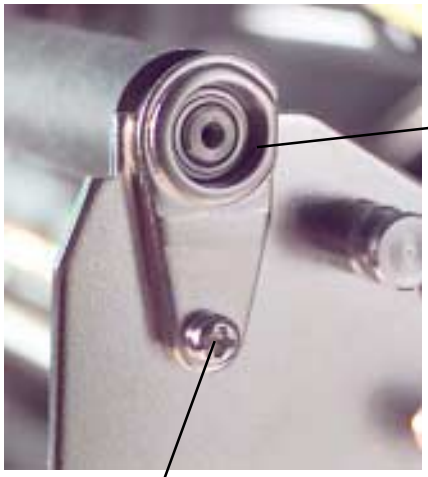


Fig. 6-13

LOOSEN (2) MOTOR MOUNTING SCREWS

Replacing the Platen



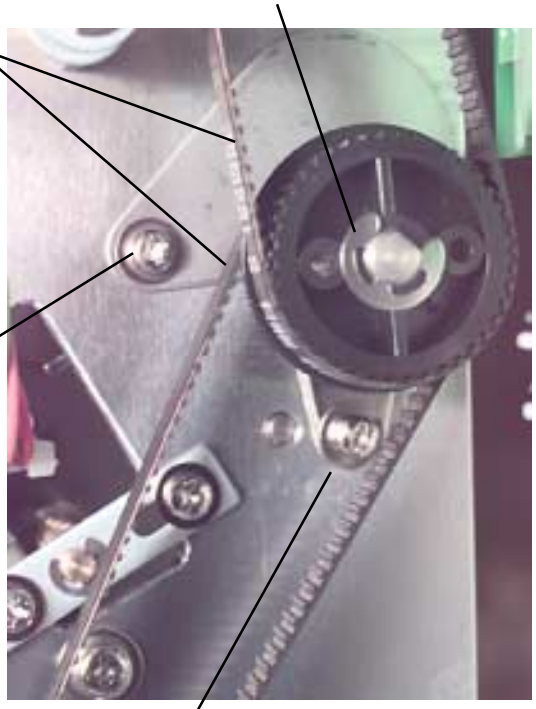
BALL BEARING SUPPORT LOCATED AT BOTH ENDS OF SHAFT

LOOSEN SCREW WHICH HOLDS THE CLAMP TO SIDE FRAME

Fig. 6-14

REMOVE "E" RING

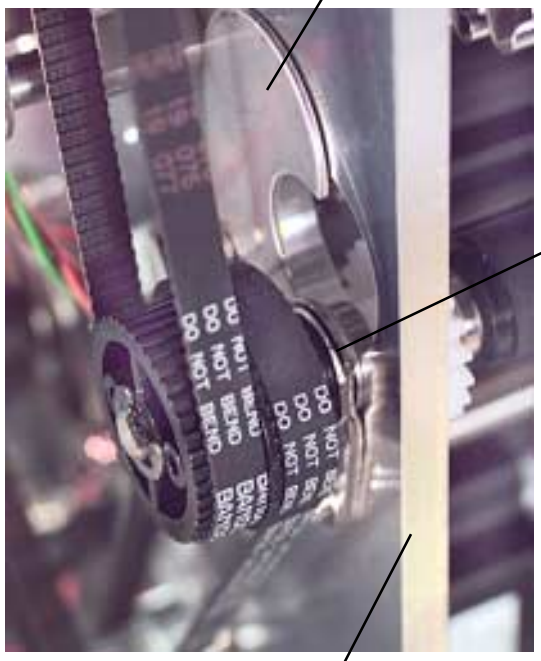
SLIDE OFF BELTS



LOOSEN SCREW AND SLIDE COVER ASIDE HOLE IN FRAME

REMOVE SCREW HOLDING CLAMP TO BACK PLATE

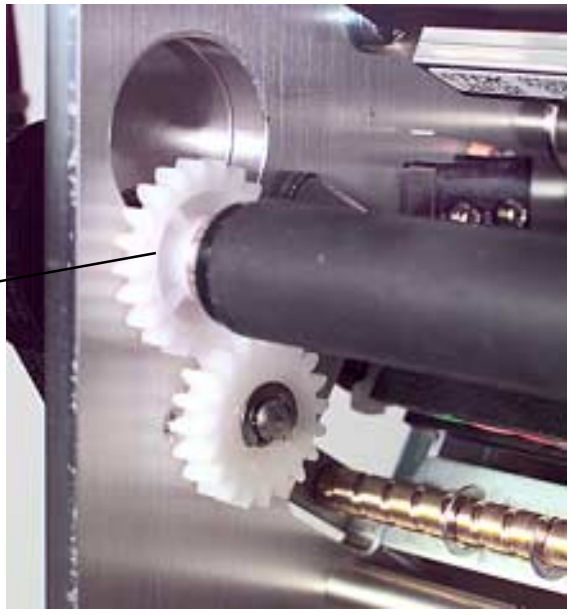
Fig. 6-15



BALL BEARING SUPPORT LOCATED AT BOTH ENDS OF SHAFT

Fig. 6-16

BACKPLATE



DISPLACE PLATEN BY PULLING UP AND AWAY FROM HOLDING CLAMP AND PULLING THROUGH HOLE IN FRAME AND OUT THE ELECTRONICS COMPARTMENT

Figs. 6-17

6.9 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 unwind and the rewind clutch assemblies.

DISASSEMBLE

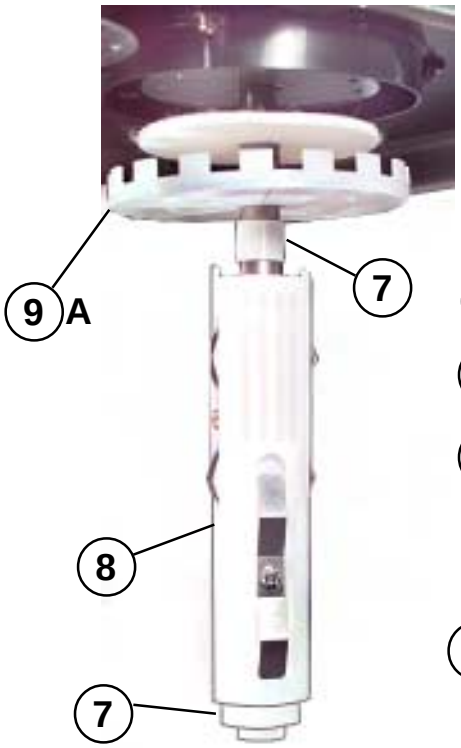
STEP	PROCEDURE
1.	Switch the printer **OFF** and disconnect the power cord.
2.	Refer to Section 4.2 and remove left side cover.
3.	Remove the ribbon and label stock if installed.
4.	Remove the following parts from the two spindle shafts (in order). ***List 6A and Figs. 6-18*** NOTE: Disassemble one spindle at a time so that the other can be used for reference.

ITEM NO.	DESCRIPTION	QTY. EACH ASSY
1	Locking 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	(3)
8	Ribbon Boss	(1)
9A & 9B	Disc Plate (each assy different)	(1)
10	Friction Washer	(1)
11	Hold Plate	(1)

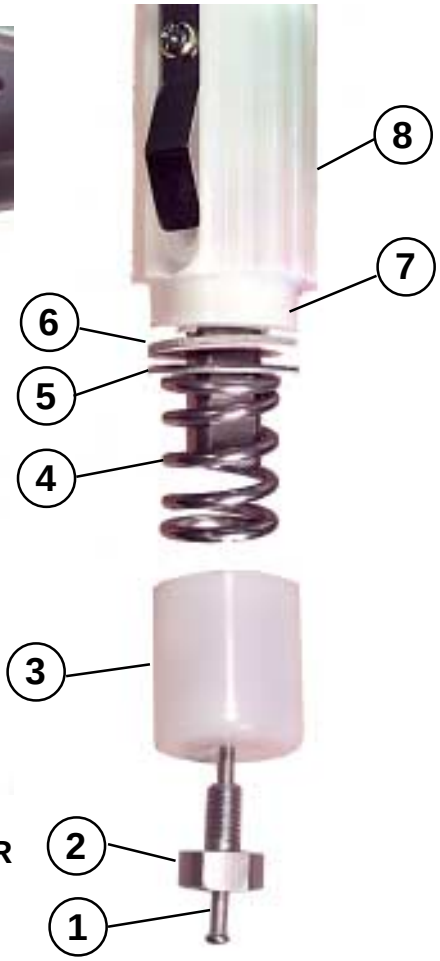
List 6-A

Replacing the Ribbon Drive Clutch Washers

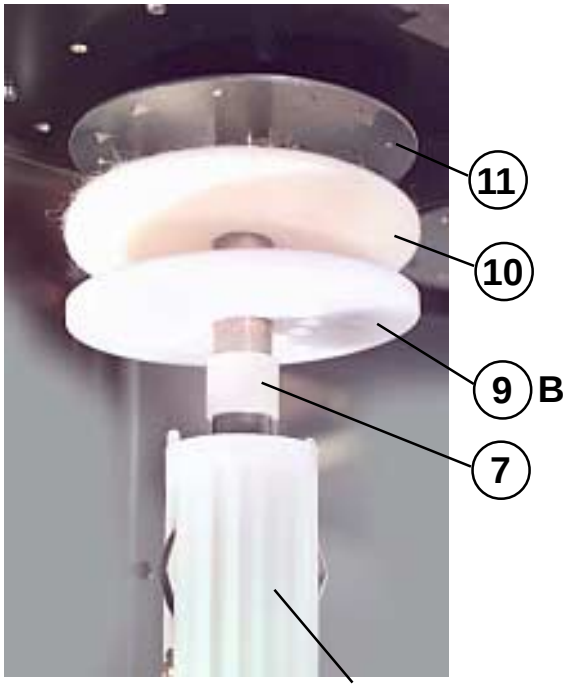
USE 12mm OPEN END WRENCH AND PHILLIPS SCREW DRIVER TO REMOVE LOCKING SCREW AND ADJUSTMENT NUT



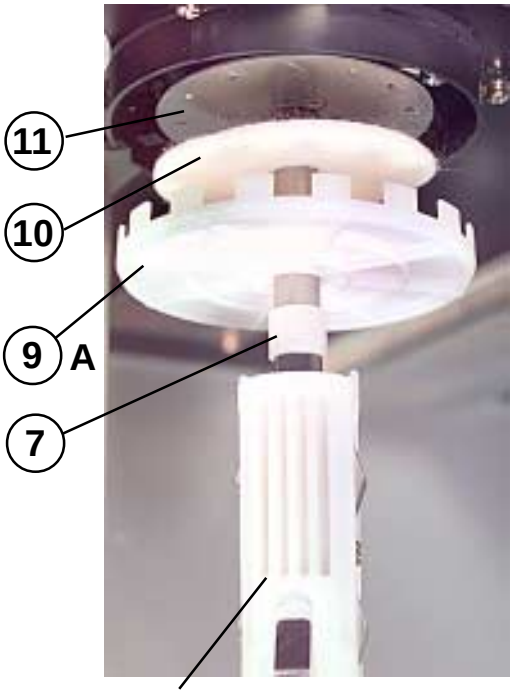
REMOVE & INSTALL PARTS IN THIS ORDER (SEE ITEM LIST 6A)



Figs. 6-18



REWIND SPINDLE



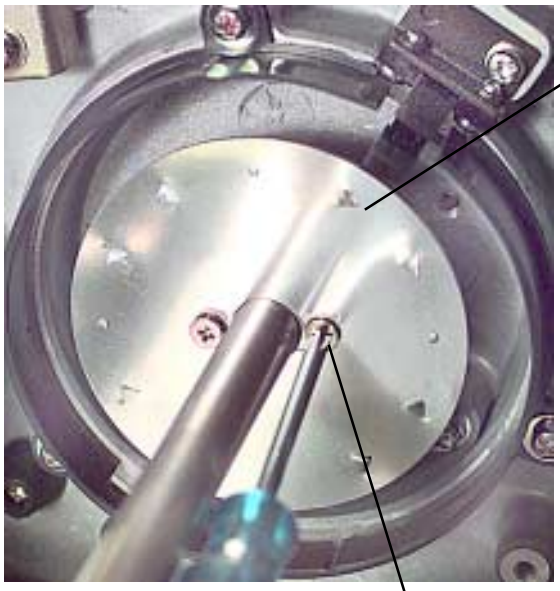
UNWIND SPINDLE

Replacing the Ribbon Drive Clutch Washers

ASSEMBLE

STEP	PROCEDURE
1.	For each spindle, position and fasten Item 11 Plate, with teeth facing outward with (2) screws. Except for Item 9, all items are the same for the ribbon unwind and ribbon rewind assemblies, ***List 6-A and Figs. 6-18***
2.	Install Item 10 Felt Friction Washer onto the Ribbon Shaft and slide it against Item 11 Plate. The jagged teeth on Item 11 Plate will "dig into" the felt washers. Slide (1) Item 9a or 9b Unwind or Rewind Disc Plates onto each Ribbon Shaft. The teeth/slots on the unwind disc plate must face towards felt washer. ***Fig. 6-19 & 6-20***
3.	Slide (2) Item 7 Collars onto the Ribbon Shaft and against Item 9a or 9b Unwind or Rewind Disc Plates. **NOTE:** The collars may still be inside the ribbon boss. ***List 6-A & Figs. 6-18***
4.	Slide Item 8 Ribbon Bosses onto the Ribbon Shaft. Align the pegs on Item 8 with the location holes on the Item 9a/9b disc plates. Slide the 2nd Item 7 Collar onto the shaft and into Item 8 Ribbon Boss. ***List 6-A, Figs. 6-18 & Fig. 6-21***
5.	Install Item 6 Oil-less Dry Metal Washer onto the ribbon shaft with the frictionless coated side facing outward away from Item 8. Align the hole on Item 6 Washer with the peg on Item 8 Ribbon Boss. ***List 6-A, Figs. 6-18 & Fig. 6-22***
6.	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 rough edges). ***List 6-A & Figs. 6-18***
7.	Place Item 4 Spring next on the shaft, then Item 3 Stopper Collar. ***List 6-A & Figs. 6-18***
8.	Screw Item 2 Adjustment Nut clockwise into the end of the ribbon shaft until it just touches the stopper collar. ***Figs. 6-18*** **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.
9.	Install Locking screw. Hold Adjust nut with 12mm wrench while tightening screw to avoid changing clutch adjustment.
10.	Replace the left side cover.

Replacing the Ribbon Drive Clutch Washers



FASTEN ITEM 11 WITH (2) SCREWS

Fig. 6-19

ITEM 11 TEETH FACING OUTWARD TO ENGAGE ITEM 10 FELT WASHER

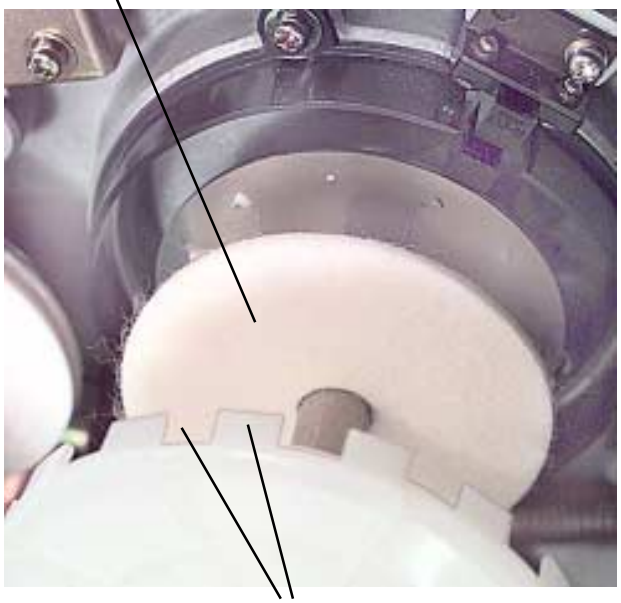


Fig. 6-20

TEETH/SLOTS ON ITEM 9a DISC PLATE FACING TOWARDS FELT WASHER

LOCATION HOLES

ITEM 9a/9b DISK PLATE

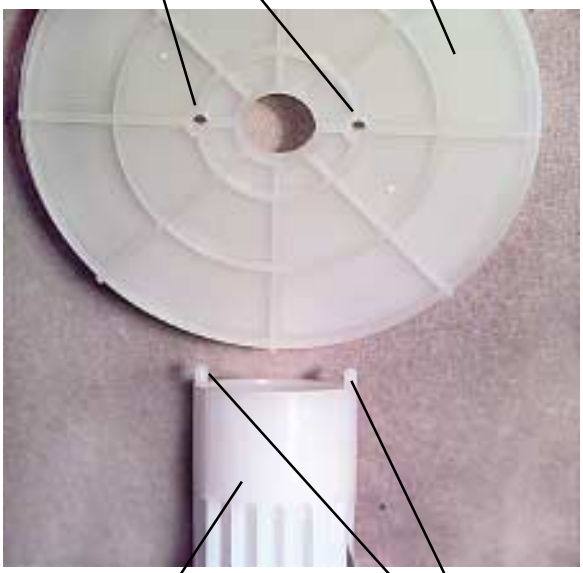
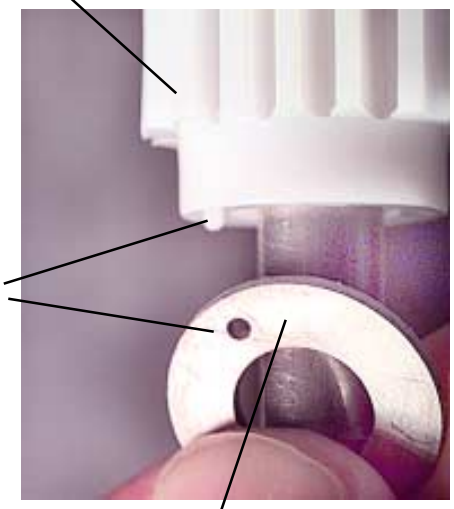


Fig. 6-21

ITEM 8 RIBBON BOSS

INSERT PEGS INTO LOCATION HOLES

ITEM 8 RIBBON BOSS



ALIGN HOLE WITH PEG

Fig. 6-22

ITEM 6 OIL-LESS WASHER

6.10 Replacing the Ribbon Motion Sensor

The Ribbon Motion Sensor is easily replaced for service.

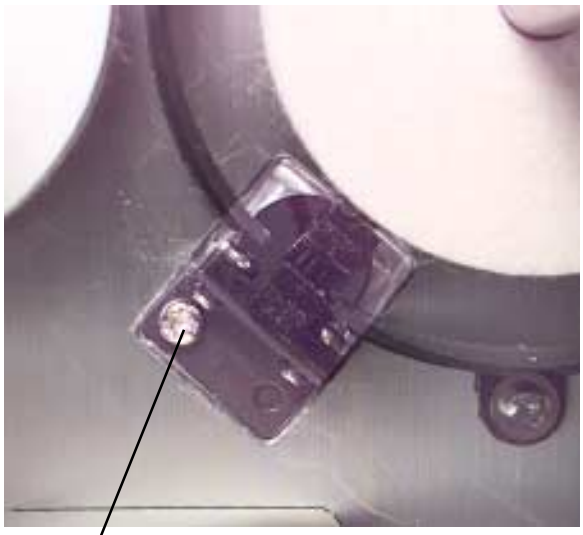
STEP	PROCEDURE
1.	Switch the printer **OFF** and disconnect the power cord.
2.	Refer to Section 4.2 and remove left side cover.
3.	Remove the ribbon and label stock if installed.
4.	Use 12mm wrench and phillips screw driver to remove locking screw and adjustment nut on the unwind spindle. Pull spindle unit away from frame for access to the ribbon motion sensor. ***Figs. 6-23***
5.	Remove the sensor mounting screw. ***Figs. 6-24***
6.	Unplug the SEN4 connector from the PCB harness and pull the sensor cable and connector through the frame hole.
7.	Remove (2) screws holding the sensor to the bracket. ***Fig. 6-25***
8.	Replace sensor and reattach to the mounting bracket. Feed new sensor connector back through the frame hole and reattach SEN4 to the SEN4 harnesss.
9.	Replace the left side cover.

Replacing the Ribbon Motion Sensor

USE 12mm OPEN END WRENCH AND PHILLIPS SCREW DRIVER TO REMOVE LOCKING SCREW AND ADJUSTMENT NUT

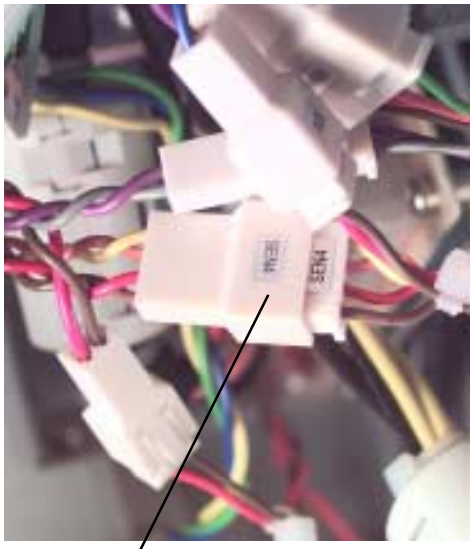
Figs. 6-23

PULL SPINDLE UNIT AWAY FROM FRAME FOR ACCESS TO SENSOR



REMOVE SCREW AND DETACH SENSOR FROM FRAME

Figs. 6-24



UNPLUG SEN4 FROM THE PCB HARNESS AND PULL THE SENSOR CONNECTOR THROUGH THE FRAME HOLE

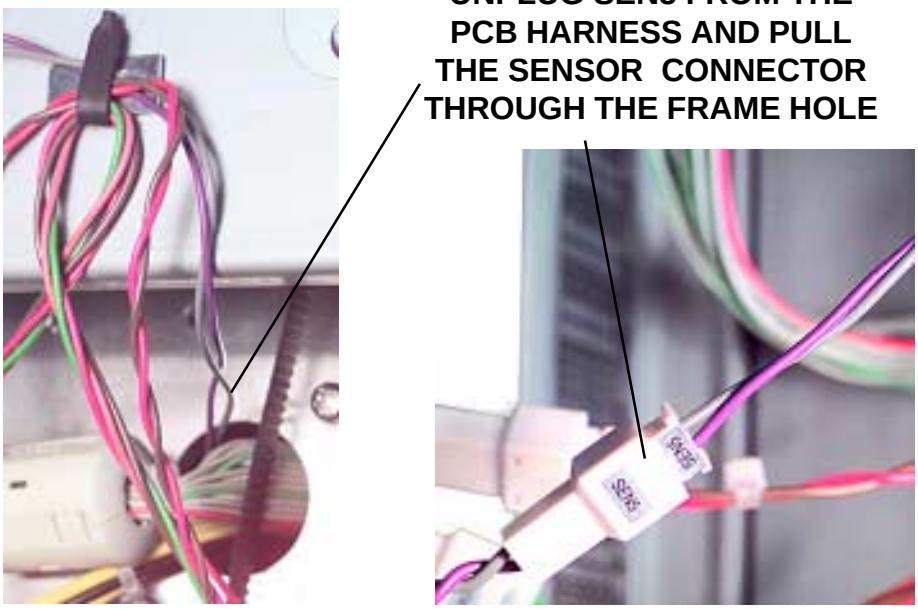
REMOVE (2) SCREWS AND DETACH RIBBON MOTION SENSOR FROM MOUNTING BRACKET

Fig. 6-25

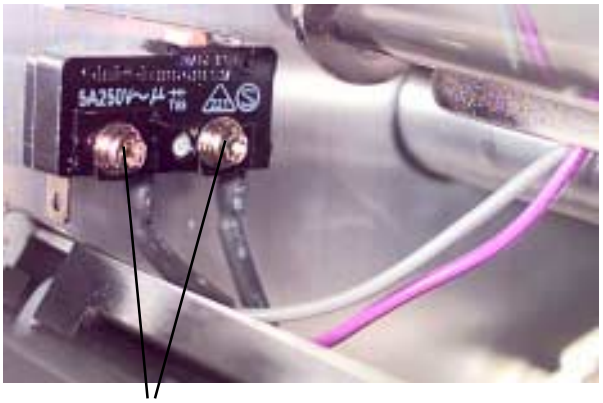
6.11 Replacing the Head Open Switch

STEP	PROCEDURE
1.	Switch the printer **OFF** and disconnect the power cord.
2.	Refer to Section 4.2 and remove left side cover.
3.	Remove the ribbon and label stock if installed.
4.	Unplug the SEN5 connector from the PCB harness and pull the sensor cable and connector through the frame hole. ***Figs. 6-26***
5.	Loosen (5) screws as shown in ***Fig. 6-27***
6.	Remove screw and move roller aside so that cable with connector end can slide through space. ***Fig. 6-27***
7.	Remove (2) screws holding the switch to the frame. ***Fig. 6-28***
8.	Replace switch and reattach to the frame. Feed new sensor connector back through the frame hole and reattach SEN5 to the SEN5 harnesss.
9.	Tighten (5) screws from step 5 and replace screw removed in step 6.
10.	Replace the left side cover.

Replacing the Head Open Switch



Figs. 6-26



REMOVE (2) SCREWS AND DETACH SWITCH FROM FRAME

Fig. 6-28

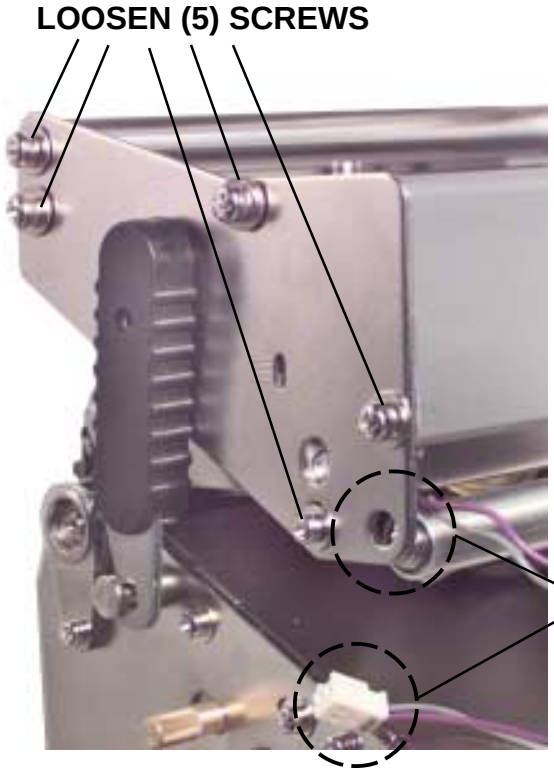


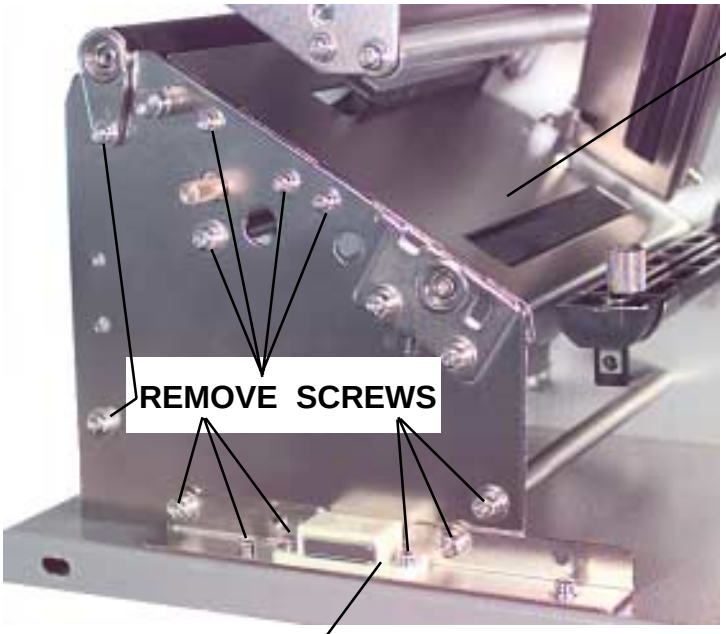
Fig. 6-27

6.12 Replacing the Label Out Sensor Assembly (Micro-Switch)

The Label Sensor Assembly can be removed from the printer to clear label fragments and for service. No critical alignment is required when replacing the sensor.

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cord.
2.	Open the side access door and raise the top access door.
3.	Unload the ribbon and label stock.
4.	Remove (2) screws to detach the label tear-off cover. Rotate the cover down, then remove it by lifting up. ***Figs. 6-9***
5.	Raise the label lid. Remove screws attaching the door latch and angle support to the frame. Remove all screws attaching the side plate to the ramp assembly. Detach the side plate from the rest of the unit and set aside. ***Figs. 6-29***
6.	Remove (2) screws to detach the label out sensor. Install a new sensor. ***Fig. 6-30***
7.	Carefully replace the side plate into position. Replace the door latch and angle support and all screws previously removed.
8.	Replace label tear-off cover.

Replacing the Label Out Sensor Assembly (Micro-Switch)



Figs. 6-29

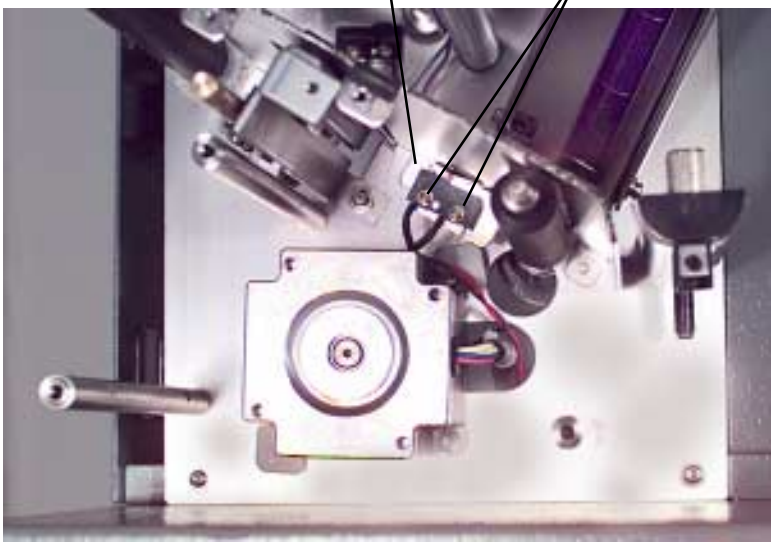
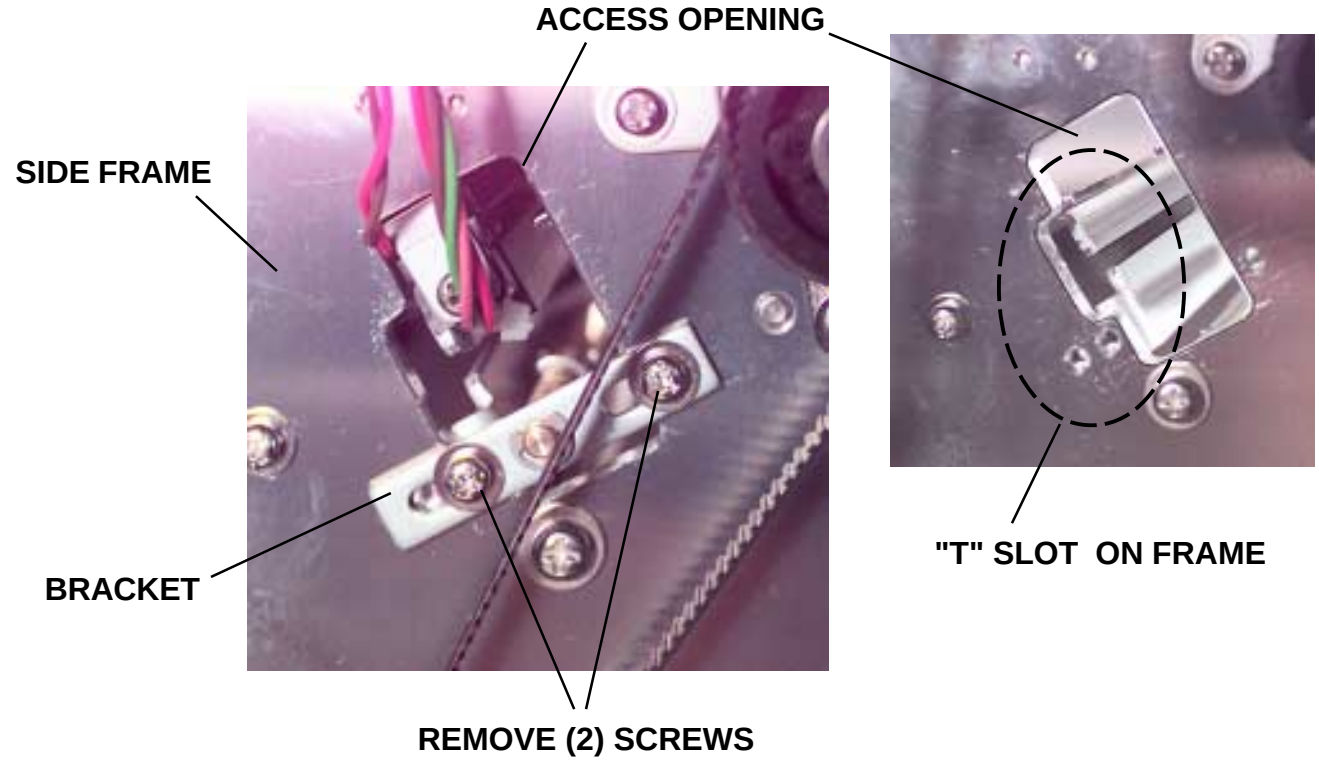


Fig. 6-30

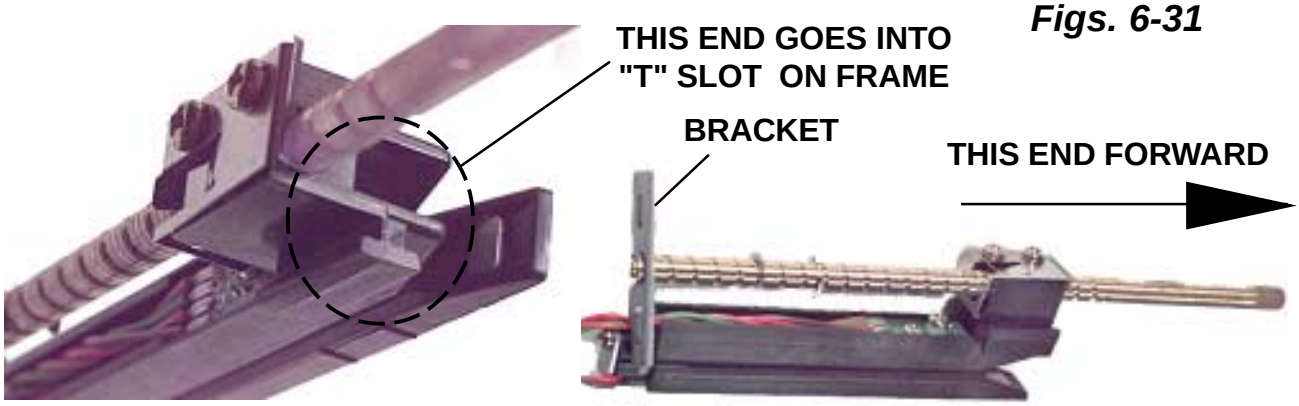
6.13 Replacing the Label Sensor Assembly

STEP	PROCEDURE
1.	Switch the printer **OFF** and disconnect the power cord.
2.	Refer to Section 4.2 and remove left side cover.
3.	Remove the ribbon and label stock if installed.
4.	Remove (2) screws to detach the label tear-off cover. Rotate the cover down, then remove it by lifting up. ***Figs. 6-9***
5.	Remove (2) screws from the bracket that holds the sensor to the side frame. ***Figs. 6-31***
6.	Carefully glide the sensor back out through the access openiing.
7.	Remove (2) screws holding the spring plate to the shaft and sensor. ***Fig. 6-32***
8.	Remove and replace the sensor module.
9.	Carefully slide the sensor unit back into the access hole of the back plate. The "T" extrusion of the sensor assembly must fit into the "T" slot of the side frame. Replace the bracket that holds the sensor to the side frame with (2) screws previously removed. ***Figs. 6-31***
10.	Replace the label tear-off cover and the left side cover.

Replacing the Label Sensor Assembly



Figs. 6-31



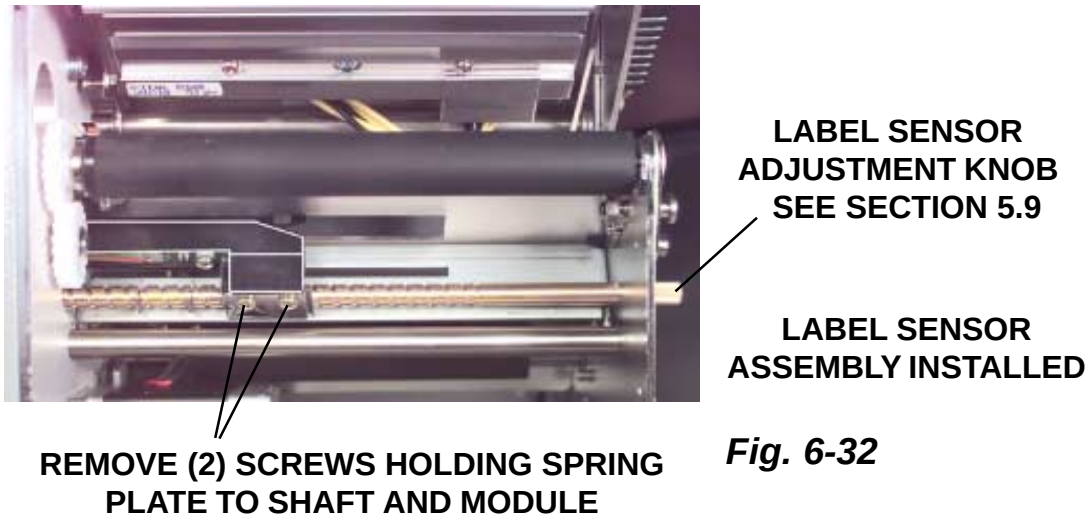


Fig. 6-32

6.14 Replacing the LC Display and Keyboard PCB Display

STEP	PROCEDURE
1.	Switch the printer **OFF** and disconnect the power cable.
2.	Refer to Section 4.2 and remove left side cover.
3.	Refer to ***Fig. 6-33***. Replace either panel as required. To remove LC Display, detach connector and remove (2) screws. To remove Keyboard PCB Display, detach connector and remove (2) screws.
4.	Replace the left side cover. After replacing either panel, perform the following procedures: a) Refer to Section 2.1 Dip Switch Settings to readjust. b) Refer to Section 4.5 Pitch Offset Adjustment to readjust. c) Refer to Sections 4.8, 4.9, 4.10 Feed/Backfeed Adjustment to readjust. d) Refer to Section 2.3 LCD Panel Printer Configuration to readjust print darkness.

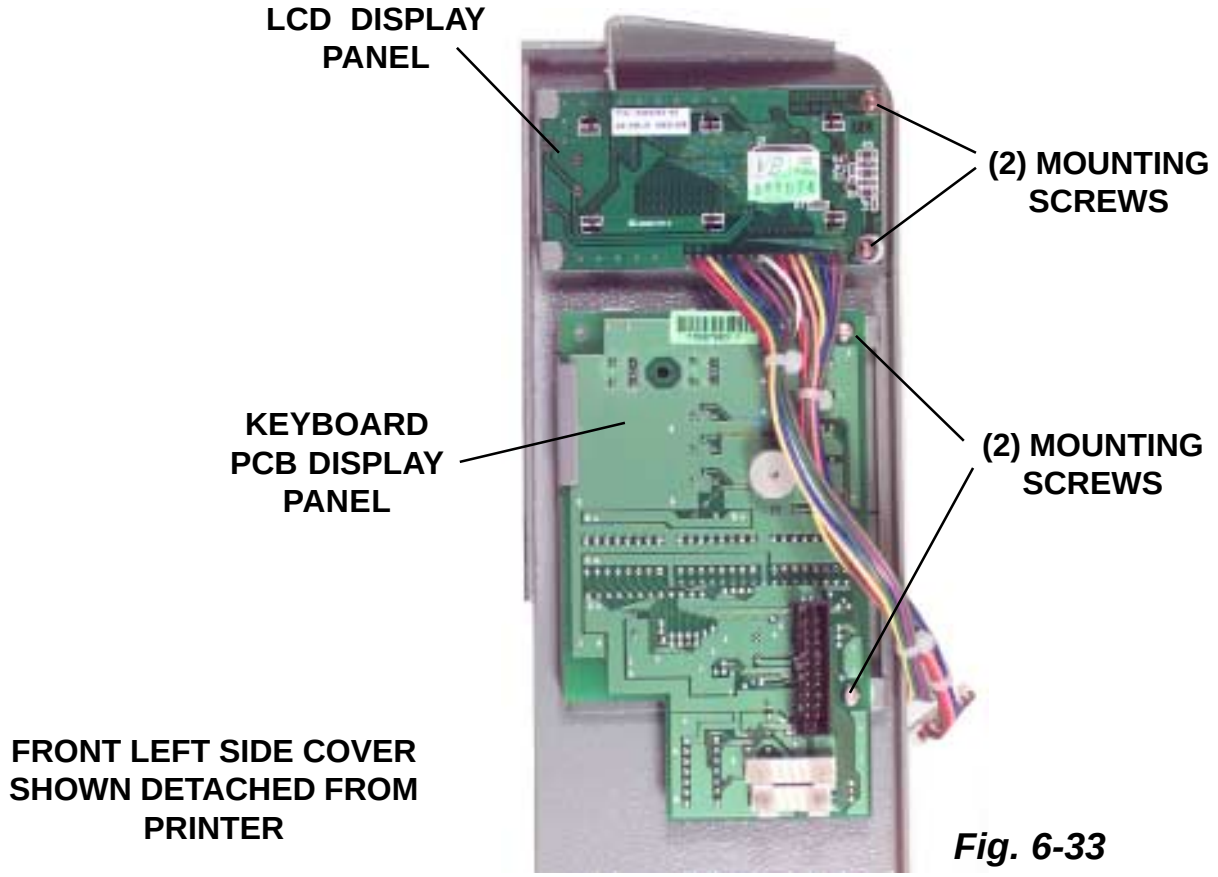


Fig. 6-33

Section 7

Factory Resets

7.1 Overview

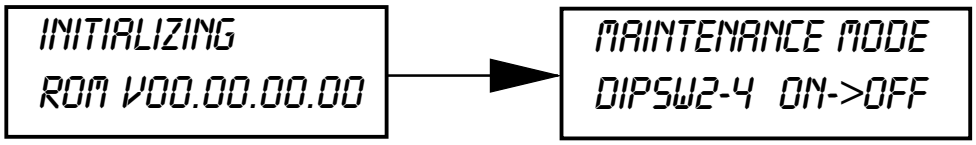
The Factory Reset Mode allows you to:

- *Factory Settings/Test Print*
- *Clear Head Counters*
- *Clear Dispenser Counter*
- *Clear Cutter Counter*
- *Clear EEPROM*

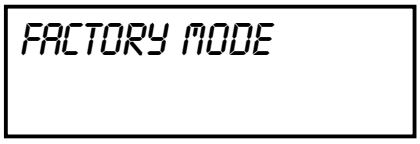
7.2 Factory Settings/Test Print

To reset the printer to the factory settings, perform the following steps.
Caution: Resetting the printer will clear all registers.

STEP	PROCEDURE
1.	Record all current dip switch positions, then place all switches in the **OFF** position.
2.	Place the **DSW2-4** in the **ON** or up postion.
3.	Press the **LINE and FEED** key while simultaneously turning **ON** the power switch. When the printer beeps, release the keys. The following screens will appear.



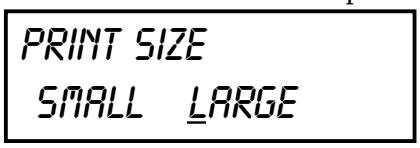
4.	Place the DSW-4 in the OFF postion and the following screen will appear.



5.	Press the **FEED** key to display the next screen.

6.	Press the **LINE** key once to change the message from **NONE** to **ALL**.

7.	Press the **FEED** key to clear the EEPROM. After a pause, the next screen will appear.



8.	Select the print label size by pressing the **LINE** key. The default is LARGE.
9.	Press the **FEED** key for a test print. Press the **FEED** key again to stop printing.

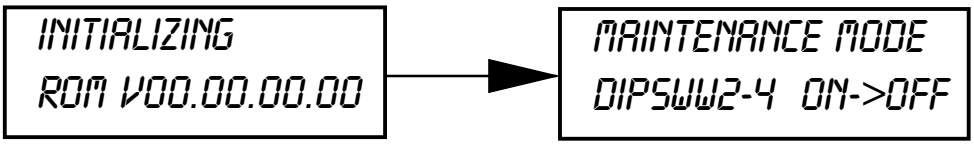
Warning: This test activates all the heating elements on the print head and therefore should be used for testing purposes only with full width labels to avoid damaging the print head.

10.	Verify that the counters on the test print have reset to 0.0 km.
11.	Power OFF the printer and confirm that all switches are in the OFF or down position.

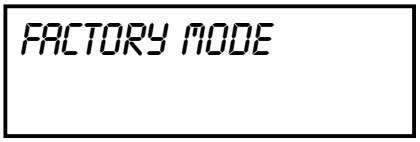
7.3 Clear Head Counters

To reset the printer to the factory settings, perform the following steps.
Caution: Resetting the printer will clear all registers.

STEP	PROCEDURE
1.	Record all current dip switch positions, then place all switches in the **OFF** position.
2.	Place the **DSW2-4** in the **ON** or up postion.
3.	Press the **LINE and FEED** key while simultaneously turning **ON** the power switch. When the printer beeps, release the keys. The following screens will appear.



4.	Place the DSW-4 in the OFF postion and the following screen will appear.

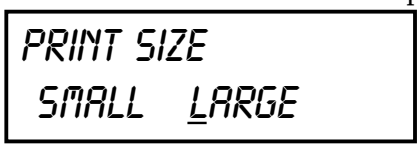


The Head Counter will be cleared by the following steps:

5.	Press the **FEED** key to display the next screen.

6.	Press the **LINE** key twice to change the message from **NONE** to **HEAD**.

7.	Press the **FEED** key to clear the Head Counter. After a pause, the next screen will appear.



8.	Select the print label size by pressing the **LINE** key. The default is LARGE.
9.	Press the **FEED** key for a test print. Press the **FEED** key again to stop printing.

Warning: This test activates all the heating elements on the print head and therefore should be used for testing purposes only with full width labels to avoid damaging the print head.

10.	Verify that the counters on the test print have reset to 0.0 km.
11.	Power OFF the printer and confirm that all switches are in the OFF or down position.

7.4 Clear Dispenser Counter

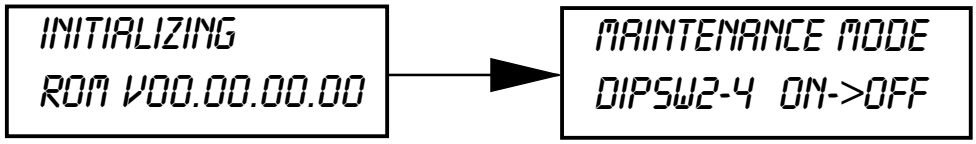
To reset the printer to the factory settings, perform the following steps.
Caution: Resetting the printer will clear all registers.

STEP	PROCEDURE
1.	Record all current dip switch positions, then place all switches in the **OFF** position.
2.	Place the **DSW2-4** in the **ON** or up postion.
3.	Press the **LINE and FEED** key while simultaneously turning **ON** the power switch. When the printer beeps, release the keys. The following screens will appear. `INITIALIZING` `ROM V00.00.00.00` → `MAINTENANCE MODE` `DIPSW2-4 ON->OFF`
4.	Place the DSW-4 in the OFF postion and the following screen will appear. `FACTORY MODE`
5.	Press the **FEED** key to display the next screen. `COUNTER CLEAR` `NONE`
6.	Press the **LINE** key trice to change the message from **NONE** to **DIS**. `COUNTER CLEAR` `DIS`
7.	Press the **FEED** key to clear the DISPENSER Counter. After a pause, the next screen will appear. `PRINT SIZE` `SMALL LARGE`
8.	Select the print label size by pressing the **LINE** key. The default is LARGE.
9.	Press the **FEED** key for a test print. Press the **FEED** key again to stop printing. `TEST PRINT` `PRESS FEED KEY` **Warning:** This test activates all the heating elements on the print head and therefore should be used for testing purposes only with full width labels to avoid damaging the print head.
10.	Verify that the counters on the test print have reset to 0.0 km.
11.	Power OFF the printer and confirm that all switches are in the OFF or down position.

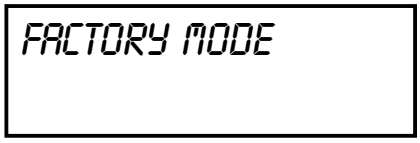
7.5 Clear Cutter Counter

To reset the printer to the factory settings, perform the following steps.
Caution: Resetting the printer will clear all registers.

STEP	PROCEDURE
1.	Record all current dip switch positions, then place all switches in the **OFF** position.
2.	Place the **DSW2-4** in the **ON** or up postion.
3.	Press the **LINE and FEED** key while simultaneously turning **ON** the power switch. When the printer beeps, release the keys. The following screens will appear.



4.	Place the DSW-4 in the OFF postion and the following screen will appear.



5.	Press the **FEED** key to display the next screen.

6.	Press the **LINE** key four times to change the message from **NONE** to **CUT**.

7.	Press the **FEED** key to clear the Cutter Counter. After a pause, the next screen will appear.

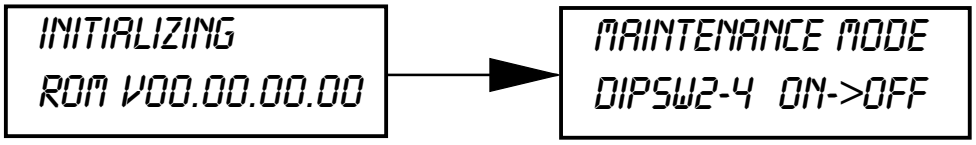
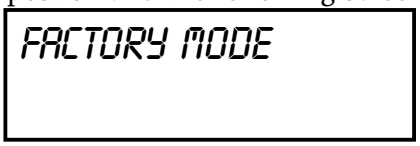
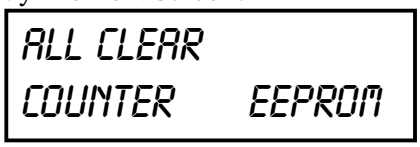
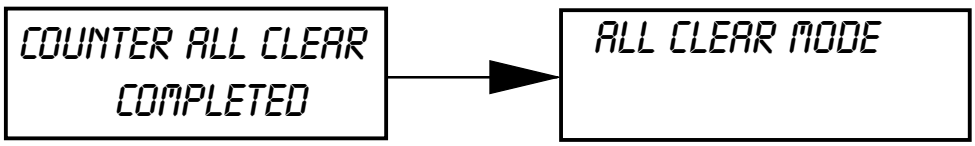
8.	Select the print label size by pressing the **LINE** key. The default is LARGE.
9.	Press the **FEED** key for a test print. Press the **FEED** key again to stop printing.

Warning: This test activates all the heating elements on the print head and therefore should be used for testing purposes only with full width labels to avoid damaging the print head.

10.	Verify that the counters on the test print have reset to 0.0 km.
11.	Power OFF the printer and confirm that all switches are in the OFF or down position.

7.6 Clear EEPROM

To clear the EEPROM, perform the following steps.
Caution: Resetting the printer will clear all registers.

STEP	PROCEDURE
1.	Record all current dip switch positions, then place all switches in the **OFF** position.
2.	Place the **DSW2-4** in the **ON** or up postion.
3.	Press the **LINE and FEED** key while simultaneously turning **ON** the power switch. When the printer beeps, release the keys. The following screens will appear. 
4.	Place the DSW-4 in the OFF postion and the following screen will appear. 
5.	Press the **LINE** key to display the next screen. 
6.	Press the **FEED** key to display the next screen. 
7.	Press the **FEED** key to display the next screen. 
8.	Press the **LINE** key to select **YES** or **NO**. If **YES** is selected press the **FEED** key to clear the EEPROM . 
9.	Power OFF the printer and confirm that all switches are in the OFF or down position.

7.7 Sample Test Prints

LARGE TEST PRINT

SMALL TEST PRINT

ILLUSTRATIONS SHOWN ARE EXAMPLES ONLY AND MAY NOT EXACTLY MATCH YOUR OUTPUT

Section

8

Troubleshooting

8.1 Overview

This section has been devised to help you if you are unable to produce output on the M-8400RVe printer. Use this section to make sure the basics have been checked before deciding you are unable to proceed further. The design of the SATO M-8400RVe printer 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. These tables 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.

To help you, this section has been divided into the following parts.

- *Initial Checklist*
- *IEEE1284 Parallel Interface*
- *RS232C Serial Interface*
- *Universal Serial Bus Interface*
- *LAN Ethernet Interface*
- *Error Signals*
- *Troubleshooting Tables*
- *Head Pattern Examples*

8.2 Initial Check List

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

1. Is the printer powered up and ON-LINE?
2. Is the ERROR light on the front panel OFF? If this light is ON, it may mean the Print Head Assembly or the Label Hold-Down is not closed and latched in position.
3. Are the Label and Ribbon lights on the front panel Off? If these lights are On, the labels or ribbons may be incorrectly loaded.

8.3 The IEEE1284 Parallel Interface

1. Is the IEEE1284 printer cable connected securely to your parallel port (DB25S 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. Does the Parallel Interface cable used meet IEEE1284 specifications? If it does not and you are connected to an IEEE1284 or ECP parallel port on the computer, the printer may not be able to communicate correctly.
3. 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.
4. Is the IEEE1284 Interface Module installed in the printer? The M-8400RVe requires the new IEEE1284 Parallel Interface (PN WCL40470) to take advantage of the faster data transmission speeds. The older Parallel Interface Modules will work, but at a reduced capability.
5. 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.

6. 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.

The IEEE1284 Parallel Interface (Cont)

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 data stream is consistent with these.

7. If you've checked all 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 Mode in Section 8-10.

   The Parallel 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.

   WARNING: A small label may produce a large amount of data when printed in Hex Dump.

8. While checking the Hex Dump printout, look for $0D_H$ $0A_H$ (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 $0D_H$ $0A_H$ 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 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. Is the RS232 Interface Module installed in the printer? The M-8400RVe requires the new Hi Speed Serial Interface (PN WCL40451) to take advantage of the faster data transmission speeds. The older Serial Interface Modules will work but at a reduced capability.

4. Check for obvious errors in the data stream. Is the data properly framed with the <ESC> A and <ESC>Z commands?

5. If after sending your job to the printer, it only "beeps" and displays an error message on the LCD display, 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 unsure as to what the printer's current RS232 settings are, print a Configuration Test Label. It will list all of the current printer configuration settings.

6. If you are still unable to get printer output, try the Hex Dump as described Step 7 under IEEE1284 Parallel Interface Troubleshooting. In this case, the printer monitors the RS232C interface for incoming data.

7. From the Hex Dump, if you are seeing extra $0D_H$ $0A_H$ (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 The Universal Serial BUS (USB)

If nothing prints when doing a test print you will need to verify that the device drivers have been successfully installed by doing the following:

1. Click on Start, then Settings and then Control Panel.

2. Within the new Window, you should have an Icon listed as System. Double click on this.

3. Click on the Device Manager tab.

4. Make sure that the View Device by type is checked. Scroll down until you get to SATO-USB device.

5. Verify that it does not have any errors next to it. If it shows an error, remove the device and then reinstall it.

6. Reboot the PC and the Printer.

7. Consult the Windows 98 Troubleshooting guide or contact technical support for further assistance.

8.6 Lan Ethernet Interface

Installation Problems (Printer Does Not Come Up Ready)

If you cannot print to the SATO enhanced ethernet adapter after you install it, check the following:

1. Make sure that the printer is powered on, all cables are securely plugged in, and that the printer is on-line.

2. Make sure there is a secure connection between the hub and the printer.

Installation Problems (Printer Comes up Ready but You Cannot Print)

If the printer starts up OK but you cannot print, the problem could one of the following:

- You've installed the wrong driver for your printer model type.

- There is a problem with the network connection or cabling.

- There is a queue setup problem, a print server setup problem, or other protocol-related problem.

Checking the Network Connection and Cabling

Check the network connection and cabling.

1. The LINK LED (Green LED) will come on solid if there is a valid 10baseT or 100baseTX connection. If the appropriate LEDs are not on, there is probably a bad 10baseT/ 100baseTX cable or the hub port is bad. If possible, try a different cable and hub port, or try connecting a different device (such as a PC) to the cable.

2. If you are using a repeater or hub, make sure that SQE (heartbeat) is turned off at the hub (this is the default setting for most hubs). Also, if you have a hub or multiport repeater, verify that the hub or repeater port is good by trying the print server on a different port.

3. If you have a bridge or router located between the SATO enhanced ethernet adapter and the host computer, make sure that the device is set up to allow the print server to send and receive data from the host. For example, a bridge can be set up to only allow certain types of Ethernet addresses to pass through (a process known as filtering); therefore, such a bridge must be configured to allow SATO enhanced ethernet adapter addresses. Likewise, a router can be set up to pass only certain protocols, so be sure that the desired protocol can be passed through to the SATO enhanced ethernet adapter. In the case of routers, also make sure that the protocol is routable (NetBEUI, and DLC/LLC are not routable).

4. If the job exits the queue but does not print, make sure that you have the correct driver installed. If you do, turn DSW2-4 on and cycle power. Try resending your print job. If something prints out at this point than we now that the connection is there but that the data is not correct.

5. Check the individual protocol troubleshooting sections in this chapter for additional causes of intermittent printer problems.

Intermittent Problems

If the print server and the printer start up OK, but you intermittently have problems printing, check the following:

1. Excessive NetWare polling can be a big cause of intermittent problems. Make sure that you have only enabled the NetWare file servers that you need for printing (do a SHOW NETWARE command from the print server console to see the enabled file servers). If you are not using NetWare, you can disable NetWare entirely with the command SET NETWARE DISABLED.

2. Check the individual protocol troubleshooting sections in this chapter for additional causes of intermittent printer problems.

TCP/IP Troubleshooting

If you are using TCP/IP and cannot print to the print server and you have checked the hardware and network as described in the previous steps, then check the following (*note that it is always a good idea to try creating a another print queue to eliminate the possibility of setup errors*):

l. The problem may be the result of mismatched or duplicate IP addresses. Verify that the IP address is correctly loaded into the SATO enhanced ethernet adapter and make sure that no other nodes on the network have this address (DUPLICATE IP ADDRESSES ARE THE BIGGEST CAUSE OF TCP/IP PRINTING PROBLEMS). If the address is not correct, then check whether the loading procedure was properly executed.

2. If you used NCP, XCONFIG, or ccr to enter the IP address, make sure that you exited the remote console properly with a CTRL-D or EXIT command.
3. If you used rarp, make sure that you started the rarp daemon using the rarpd, rarpd -a, in.rarpd -a, or equivalent command. Verify that the /etc/ethers file contains the correct Ethernet address and that the SATO enhanced ethernet adapter name matches the name in the /etc/hosts file.

4. If you used bootp, make sure that bootp is enabled (i.e., the "#" is removed from the bootp entry) in the
/etc/inetd.conf file. Verify that /etc/bootptab file is correctly configured.

5. Also verify that the host computer and the print server are either on the same subnet (for example, if the print server has a subnet mask of 255.255.255.0, the host must have the same subnet mask) or that the router is properly configured to pass data between the two devices.

6. If you are using a Berkeley-based UNIX, make sure that the daemon is started on Berkeley based systems with the command lpc start *printer*, where *printer* is the name of the local print queue.

7. If you are using an AT&T-based UNIX, make sure the printer is enabled (enable *printer*, where *printer* is the name of the local print queue).

8. Make sure that the lpr/lpd remote line printer service are running on the host computer (refer to your host computer documentation for information on how to do this).

9. If you cannot print from DEC TCP/IP Services for VMS (UCX), make sure that you have version 2.0B or later of this software, because earlier versions will not work with the SATO enhanced ethernet adapters.

10. If you are using the raw TCP port and are experiencing intermittent queue stalling problems, make sure that queueing is enabled on the service (do a SHOW SERVICE command from the remote console, and note if "Q" is listed in the OPT column for the desired service). If it is not, enable queueing with the command SET SERVICE *servicename* QUE ENA command.

11. If the wrong IP address is loaded, check your network for file servers that have DHCP, BOOTP, or rarp enabled, and make sure that these file servers are not set up to load IP addresses into the print server. Also, make sure that you do not use the command SET IP BOOT 0 to disable TCP/IP broadcasts; instead, you should use the command SET IP METHOD STATIC (unpredictable results will occur otherwise).

12. If you have problems with queues locking up when the active print job is deleted, try setting the IP timeout to one minute with the console command SET IP TIMEOUT 1.

NetWare Troubleshooting

If you cannot print from NetWare and you have checked the hardware and network as described in the previous steps, first verify that the print server is attached to the server queue by going to PCONSOLE, selecting PRINT QUEUE INFORMATION, and then CURRENTLY ATTACHED SERVERS. If the SATO enhanced ethernet adapter does not appear in the list of attached servers, then check the following (*note that it is always a good idea to try deleting and recreating the print server and creating a new print queue in order to eliminate the possibility of setup errors*):

1. If you cannot create a print queue, make sure that you have sufficient NetWare privileges. With NetWare 3.12 and earlier, you MUST be logged in as SUPERVISOR (not someone with Supervisor privileges). If you are having problems creating queues with NetWare 4.xx and later, try logging in as ADMIN. Also, make sure that you are not trying to run XAdmin32 with the Microsoft NetWare client (you must use the Novell 32-bit client).

2. If you changed the login password, you must change the password in *both* the SATO enhanced ethernet adapter (using the SET NETWARE PASSWORD command) and in the file server (using the PCONSOLE Print Server Information Change Password command).

3. Make sure that you have enabled at least one NetWare file server using the SET NETWARE SERVER *servername* ENABLED command.

4. Have you exceeded your NetWare user limit?

5. Make sure that the print server name you used in PCONSOLE *exactly* matches the name that is configured in the print server, and make sure it is defined as a Queue Server for the print queue.

6. If you are running both 802.3 and Ethernet II frames on different file servers on your network, there is a possibility that the print server may not make a connection to the desired file server. Try forcing the frame type to the desired one using the SET NETWARE FRAME command from the SATO enhanced ethernet adapter remote console.

7. If you are losing portions of your print job and you are using the DOS NetWare drivers, try setting the TIMEOUT parameter in your CAPTURE statement to a higher value (at least 50 seconds for Windows).

9. Because of a bug in the vendor's software driver, file servers equipped with certain models of SMC Ethernet controllers may crash when an SATO enhanced ethernet adapter is connected to the network. This problem, which primarily affects EISA-based controllers made in 1993 or earlier, is not specific to SATO enhanced ethernet adapters, and can be fixed by upgrading the file server with the latest SMC drivers. Contact SMC technical support at (516) 435-6250 for additional information and instructions on how to download the new drivers from the SMC bu*lletin board.*

Windows NT/LAN Server Troubleshooting

If you are having trouble printing with Windows NT or LAN Server, check the following:

1. Make sure that you can ping the SATO enhanced ethernet adapter using the DOS or OS/2 command PING *ipaddress*, where *ipaddress* is the IP address of the SATO enhanced ethernet adapter. If you cannot ping the print server, you will not be able to print.

Windows NT/LAN Server Troubleshooting

2. Make sure that TCP/IP and lpr printing are installed and running on the Windows NT system or the LAN Server file server.

3. If you are having problems printing to the SATO enhanced ethernet adapter from a client PC that is connected to a Windows NTAS or LAN Server file server, verify that you can print a job directly from the DOS or OS/2 prompt on the file server. If you can print from the file server but not from the client, then the problem is probably with the NetBEUI

   communications rather than with the TCP/IP link to the SATO enhanced ethernet adapter. Check your file server network setup (for example, make sure that you can print from the client to other printers on the network.

4. If you have problems with Windows NT queues locking up when the active print job is deleted, try setting the IP timeout to one minute with the console command SET IP TIMEOUT 1.

Windows 95/98 Peer-to-Peer Troubleshooting

If you are having trouble printing on a Windows 95 Peer-to-Peer network, check the following:

1. If the print server does not show up under HP JetAdmin on a Windows 95/98 Peer-to-Peer network, try removing all of the Windows 95 network software from the Network Control panel and then reinstalling them as follows:

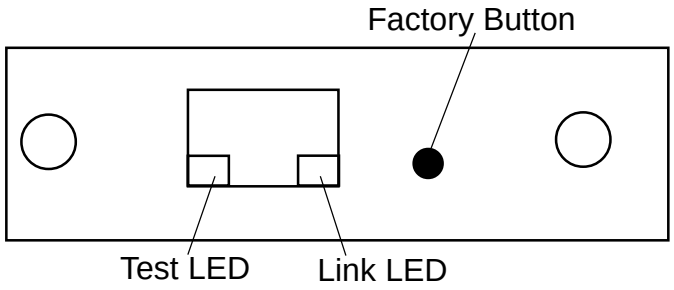
   - First install the **IPX/SPX-Compatible Protocol**, the **Client for Microsoft Networks**, and the network adapter card driver.

   - Restart the system, and then add the **HP JetAdmin** service.

   2. Because of the many changes that have been incorporated in Windows 95/98 Peer-to-Peer printing since its introduction, it is a good idea to upgrade to the latest version of JetAdmin (available on the HP web site at http://www.hp.com).

Resetting the Print Server

Press the Factory button for at least 5 seconds. Please wait approximately 1 minute before trying the factory test print.



8.7 Error Signals

The LCD display, Front Panel LED Indicators and Buzzer provide a visual/audio indication of the type of error encountered.

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	Print Head is damaged	Replace Print 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	Format Memory Card Cycle Power ON/OFF
Error Blinks	Card Low Battery	1 Long	Memory Card Battery Low	Replace MC Battery Cycle Power ON/OFF
Error Blinks	Head Open	3 Short	Head Open	Close Head Lever
Error On Line Blinks	Parity Error	3 Short	RS232 Parity Error	Correct parity to match system
Error On Line Blinks	Overrun Error	3 Short	RS232 Overrun Error	Verify RS232 Settings
Error On Line Blinks	Framing Error	3 Short	RS232 Framing Error	Verify RS232 Settings
Error On Line Blinks	Buffer Over	3 Short	Buffer Overflow	Verify RS232 Settings
Error On Line Blinks	Paper End	3 Short	Media End or Misselected Media Type	Replenish Media Select Correct Media Type Open/Close Head Lever Open/Close Media Hold Down
Error Blinks Ribbon On	Ribbon End	3 Short	Ribbon End Ribbon Broken	Replace Ribbon Open/Close Head Lever Open/Close Media 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

8.8 Troubleshooting Tables

The troubleshooting table below includes the following general symptoms 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
- ON LINE LED not on
- No Label Drive

Print Quality Problems

Symtom	Probable Cause	Suggested Corrective Action
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 electronics	Replace circuit board (Sec. 6.2)
	Damaged platen	Replace platen
Ribbon Wrinkle	Poor head alignment	Adjust head balance (Sec. 5.4) Adjust ribbon roller Adjust head alignment
	Poor ribbon tension	Adjust ribbon tension (Sec. 5.2 & 5.6)
	Worn platen	Replace platen (Sec. 6.8)
	Foreign material on head/platen	Clean head and platen
	Foreign material on labels	Use high quality label stock
	Damaged print head	Replace print head (Sec. 6.7)
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)

Print Quality Problems

Symtom	Probable Cause	Suggested Corrective Action
Light Images	Low print head pressure	Adjust head balance (Sec. 5.4)
	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 (Sec. 5.2)
	Foreign material on head	Clean head and platen
	Poor head alignment	Align print head (Sec. 5.3)
	Excessive print speed	Reduce print speed setting
Smearing	Poor quality labels	Use high quality label stock
	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 Carbon tension wrong	Adjust head balance (Sec. 5.4)
No Ribbon Movement	Incorrect ribbon core size	Use genuine SATO ribbons
	Loose drive clutch	Adjust drive clutch tension (Sec. 5.2)
	Loose platen drive belt	Adjust/replace belt (Sec. 6.6)
	No +24 volt output	Test power supply and replace if required (Sec. 6.4)
	Damaged electronics	Replace circuit board (Sec. 6.2)

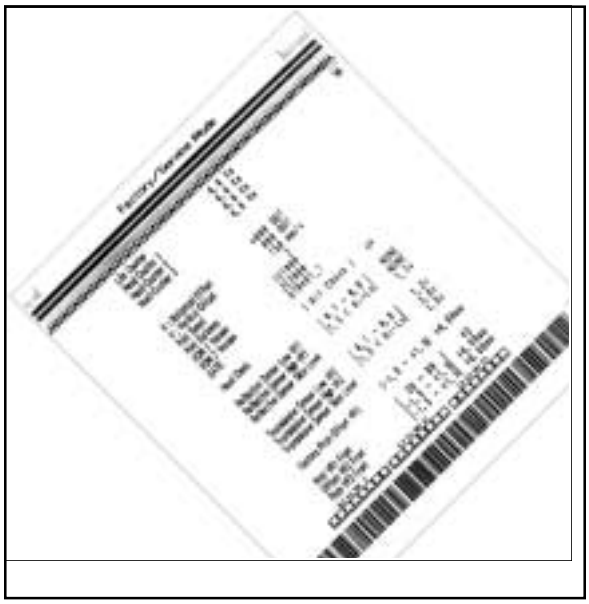
Print Quality Problems

Symtom	Probable Cause	Suggested Corrective Action
No Label Movement	Loose/broken platen drive belt	Adjust/replace belt Sec. 6.6)
	Incorrect label pitch sensor selected	Select correct label sensor type (DSW2-2)
	No +24 volt output	Replace fuse on main PCB (Sec. 6.3) Test power supply and replace if necessary (Sec. 6.4)
	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 (Sec. 6.7)
	Ribbon upside down	Use genuine SATO ribbons
	No + 24 volt output	Test power supply and replace if necessary (Sec. 6.4)
	Damaged print head	Replace print head (Sec. 6.7)
	Damaged electronics	Replace circuit board (Sec. 6.2)
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 (Sec. 6.3)
	Defective power supply	Test power supply and replace if defective (Sec. 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

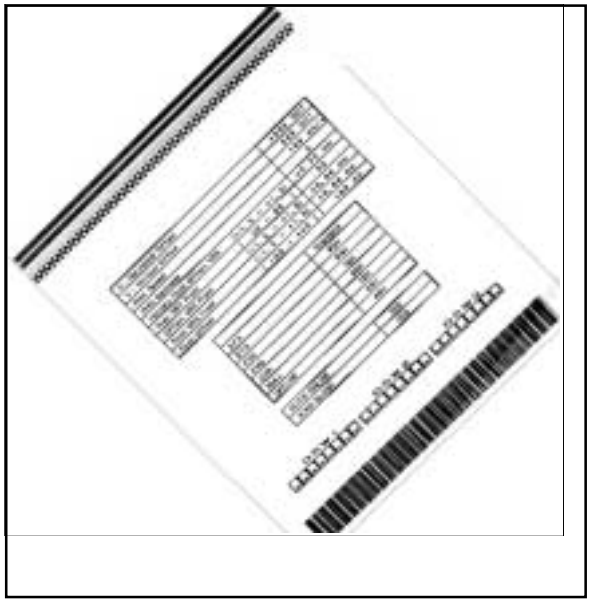
Print Quality Problems

Symtom	Probable Cause	Suggested Corrective Action
LABEL LED 0n	Label sensor blocked	Clean label sensor
	Incorrect label sensor threshold setting	Adjust label sensor threshold (Sec. 4.6 & 4.7)
	Platen drive malfunction	See Section 6.8
Ribbon LED on	Ribbon supply roll empty	Replenish ribbon supply
	Ribbon supply out of alignment	Realign ribbon sensor
	Ribbon sensor blocked	Clean ribbon sensor
	No cardboard core on ribbon rewind	Use cardboard core on ribbon rewind

8.9 Head Pattern Examples



FACTORY DEFAULT



GOOD ADJUSTMENT
CLEAR, DARK,
EVEN TEXT

FEED
DIRECTION

POOR HEAD
ALIGNMENT, BALANCE
OUT OF ADJUSTMENT

POOR HEAD
ALIGNMENT, BALANCE
OUT OF ADJUSTMENT

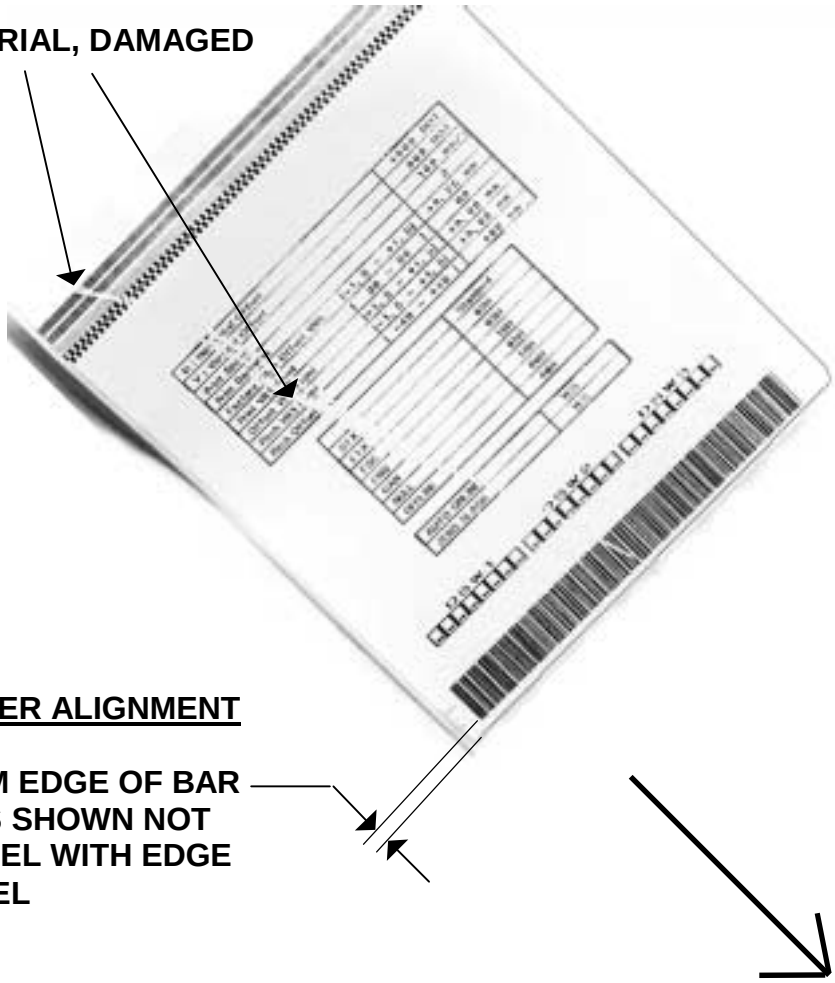
IRREGULAR UNEVEN
TEXT

ILLUSTRATIONS SHOWN ARE EXAMPLES ONLY AND WILL NOT EXACTLY MATCH YOUR OUTPUT

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

8.10 Hex Dump Diagnostic Labels

In addition to the User Test Print Labels, 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 a 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.

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 the printer off and then back on to place it back in the normal print mode.

Section

9

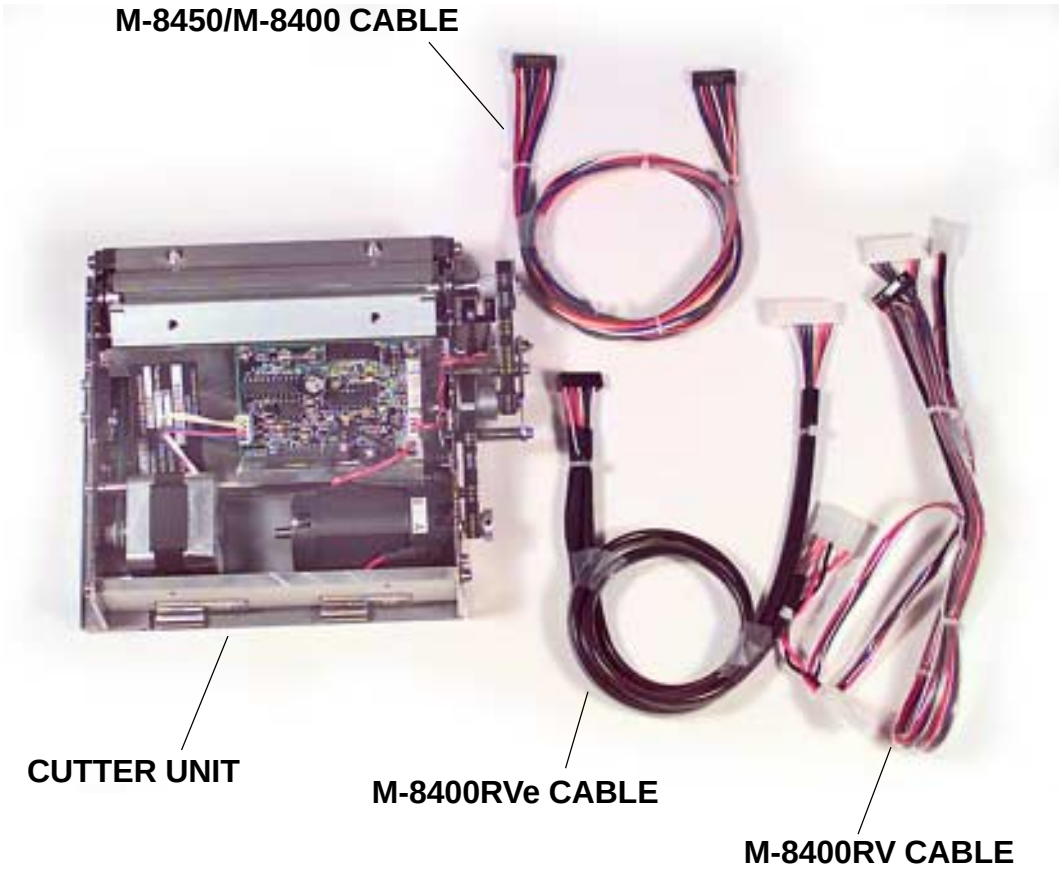
Optional Accessories

9.1 Overview

This section contains instructions for installing the following optional accessories:

- *Label Cutter Kit Installation*
- *Label Dispenser Kit Installation*
- *PCMCIA Memory Expansion*
- *Flash ROM Memory Expansion*
- *Real Time Clock*

9.2 Label Cutter Kit Installation



OTHER ITEMS IN KIT

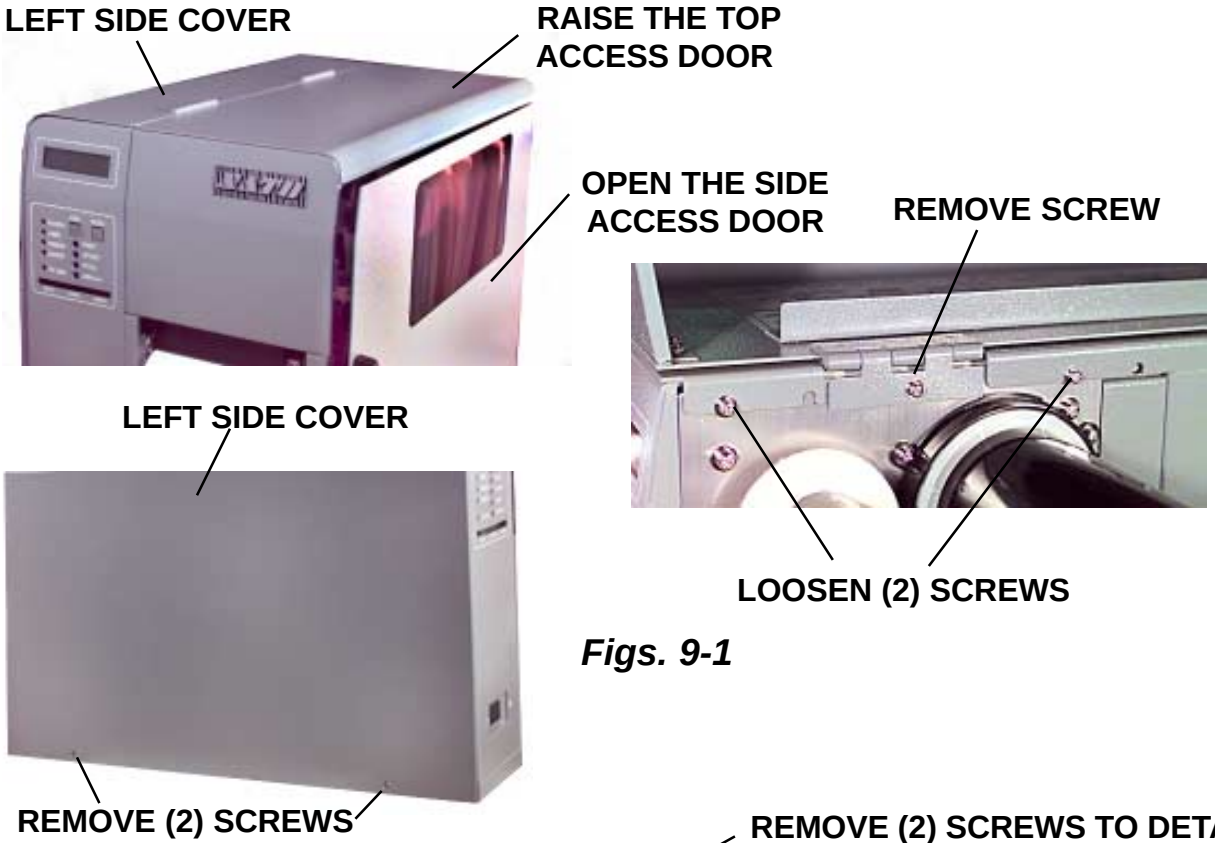
Label Cutter Kit Installation

The Cutter is a field installable option. No critical adjustments or special tools are required.

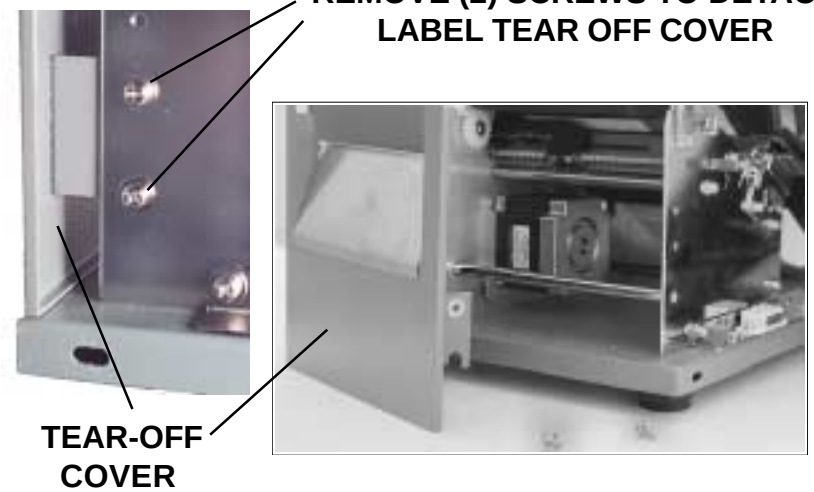
STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cord.
2.	Open the side access door and raise the top access door.
3.	Loosen (2) inside screws holding the left side cover to the inside top of the printer. Remove the screw from the front hinge of the top cover for Step 9 below. Remove (2) screws holding the left side cover to the printer base and remove the cover. ***Figs. 9-1***
4.	Remove the ribbon and label stock if installed.
5.	Remove (2) screws holding the label tear-off cover to the printer. Rotate the cover down, then remove it by lifting up. ***Figs. 9-2***
6.	Move the print head lock lever to the open position.
7.	Remove (2) screws to detach spacer panel. ***Fig. 9-3***
8.	Remove (4) screws holding the print mechanism to the back panel and (2) screws attached to the frame brackets of the print mechanism. ***Figs. 9-4, & 9-5***
9.	If your unit has a cable cover, remove (1) screw after Step 10. Replace the screw in the new location. ***Fig. 9-5***
10.	Slide the print mechanism as far towards the rear of the printer as it will go. It will cover the space left by the removal of the spacer panel, (Step 7). ***Fig. 9-3.*** After print mechanism is in place replace (2) screws removed in Step 8 at new location. ***Fig. 9-5***
11.	Replace (4) screws attaching print mechanism to the back panel removed in Step 8.
12.	Attach two hinge halves to the front base of the printer. Before tightening screws, pull both hinges towards front of the printer, then tighten. This will align hinge pins. ***Fig. 9-6***
13.	Install spacer panel with (1) screw in gap behind display panel. ***Fig. 9-7***
14.	Reattach hinge with screw removed in Step 3.
15.	Pass the cable with the single connector, (attaches to the cutter) through the access hole in the print mechanism wall from the electrical side. Insert the connector into the socket identified as CUT on the circuit board of the cutter. ***Fig. 9-8 Do not run cables through gears!*** ***Warning: Incorrect orientation of this connector will result in severe damage to the printer/cutter.***
16.	Route and attach the connectors from the split cable to the sockets on the PCB. ***Figs. 9-9, 9-10 and 9-11***
17.	Mate the hinges on the cutter to those installed in Step 12. Carefully slide the cutter to the inside of the printer. (The cutters drive pulleys and belts extend into the opening in the inside of the printer.)

Label Cutter Kit Installation

STEP	PROCEDURE
18.	Attach the bracket to the print mechanism using screw provided. ***Fig. 9-12***
19	Be sure all cables are routed. Close the door and lid and secure cover with screws previously removed.
20.	Verify printer is configured for cutter. DSW3-1 must be in the ON position and DSW3-2 must be in the OFF position. Refer to Section 4.9 Feed/Backfeed Adjustment.
21.	Connect the AC power cord to the printer and place the power switch in the On position.



Figs. 9-1



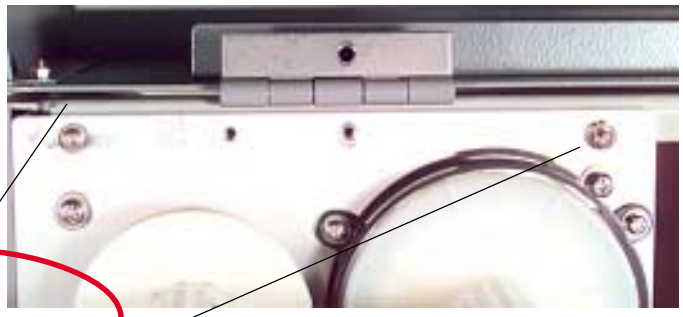
Figs. 9-2

Label Cutter Kit Installation

REMOVE (2) SCREWS

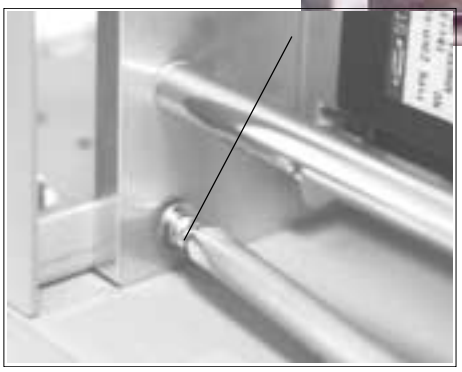
SPACER PANEL

Fig. 9-3



REMOVE (4) SCREWS HOLDING PRINT MECHANISM

Fig. 9-4



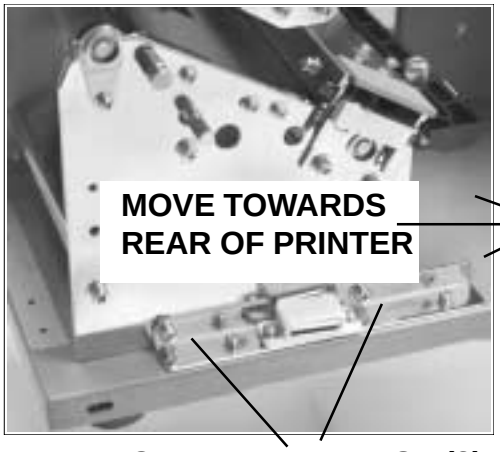
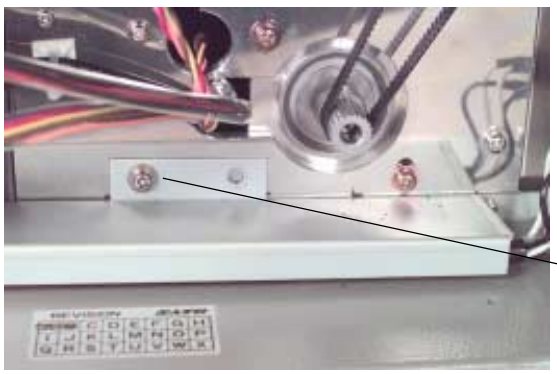


Fig. 9-5

REMOVE AND REPLACE (2) SCREWS TO FRAME BRACKETS AT NEW LOCATION



REMOVE SCREW. REPLACE SCREW TO CABLE COVER AT NEW LOCATION AFTER MOVING THE PRINT MECHANISM

Label Cutter Kit Installation

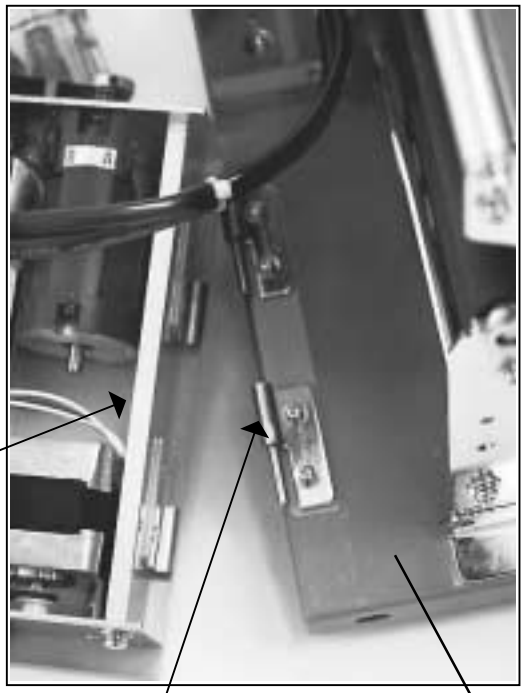


Fig. 9-6

FIT SPACER PANEL IN POSTION AND SECURE WITH (1) SCREW

SPACER PANEL

Fig. 9-7

PASS THE CABLE WITH THE SINGLE CONNECTOR THROUGH THE ACCESS HOLE IN THE PRINT MECHANISM WALL FROM THE ELECTRICAL SIDE

Fig. 9-8

Label Cutter Kit Installation

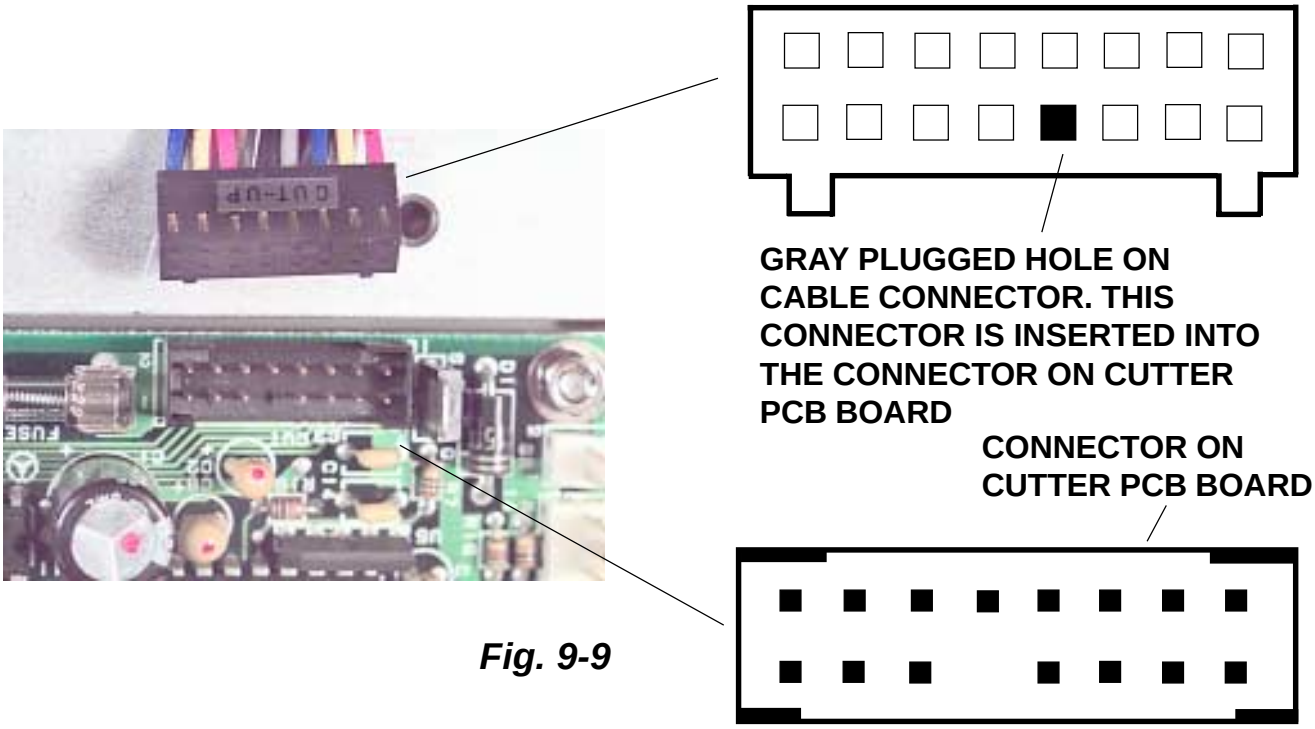


Fig. 9-9

Gray plugged hole and missing pin on Cutter PCB determine orientation. Plastic keys on cable connector housing do not prevent incorrect connection. However, the keys are also provided as an orientation device and must face down when connecting cable to Cutter PCB.

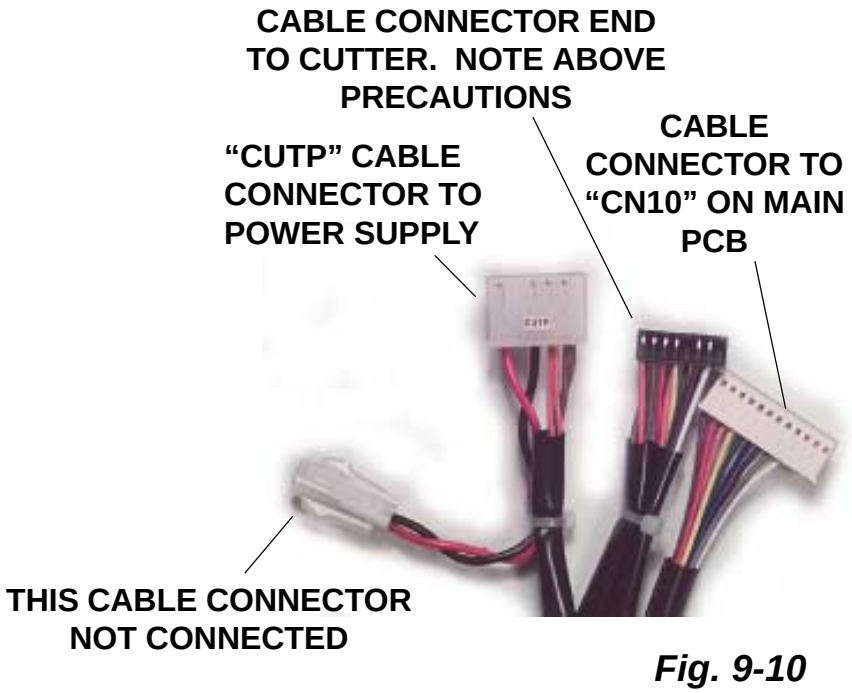
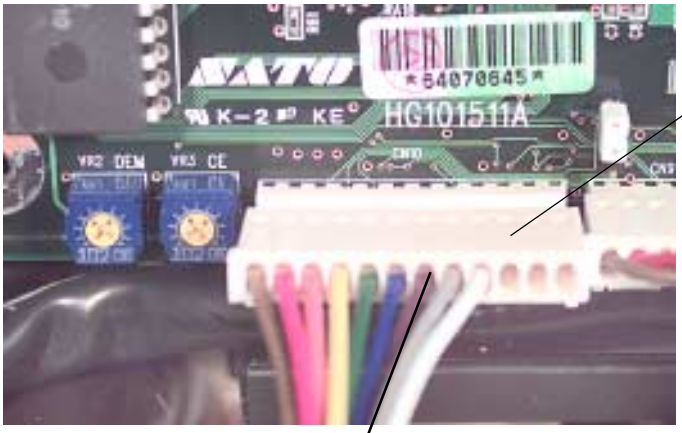


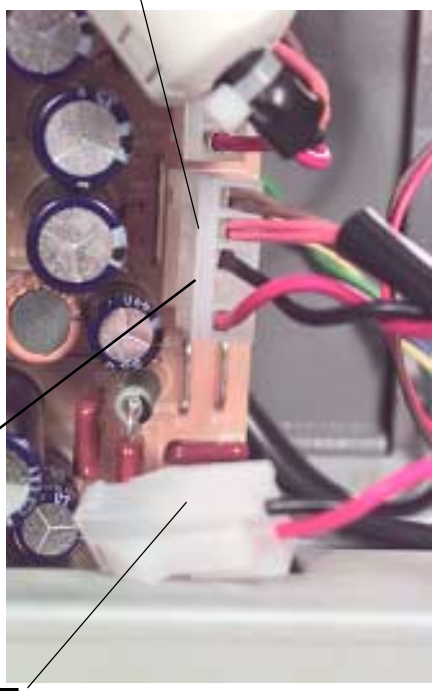
Fig. 9-10

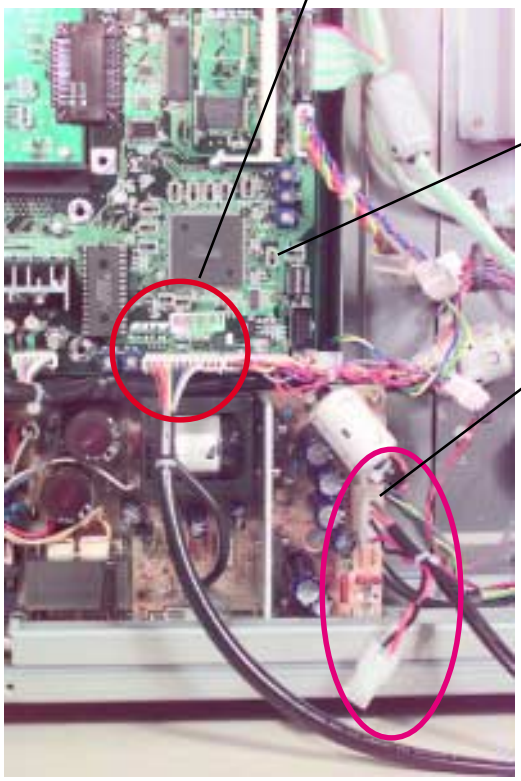
Label Cutter Kit Installation



CABLE CONNECTOR FROM CUTTER TO "CN10" ON MAIN PCB

"CUTP" CABLE CONNECTOR TO POWER SUPPLY





MAIN PCB

THIS CABLE CONNECTOR NOT CONNECTED

Figs. 9-11

ATTACH CUTTER TO PRINTER WITH SCREW.

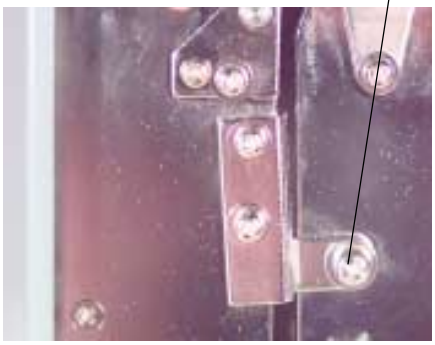


Fig. 9-12

9-3 Label Dispenser Installation

Installation of the optional Label dispenser into the printer adds the convenience of automatic label dispensing. Each label is printed, then peeled from the backing paper and presented at the front of the printer for removal by the operator. A photo electric sensor detects the presence of a completed label and signals the printer to await removal. Once the completed label is removed, this sensor signals the printer to automatically backfeed the label stock for correct alignment of the printing on the next label.

STEP	PROCEDURE
1.	Switch the printer OFF and disconnect the power cord.
2.	Open the side access door and raise the top access door.
3.	Loosen (2) inside screws holding the left side cover to the inside top of the printer. Remove (2) screws holding the left side cover to the printer base and remove the cover. ***Figs. 9-1***
4.	Remove the ribbon and label stock if installed.
5.	Remove (2) screws holding the label tear-off cover to the printer. Rotate the cover down, then remove it by lifting up. ***Figs. 9-2***
6.	Move the print head lock lever to the open position.
7.	Insert the dispense in place of the cover removed in step 5, carefully mating the dispenser's drive gears with those of the print mechanism while routing the cable through the slot in the printer side wall. Refer to ***Fig. 9-13 & 9-15***. NOTE: Remove and dispose ot the extra screw from the side of the dispenser side wall.
8.	Reinstall screw to secure dispenser. ***Fig. 9-14***
9.	Mate the cable from the dispenser to the socket on the free end of cable from the printer carefully observing the keying of the connectors. ***Fig. 9-15***
10.	Be sure all cables are routed. Close the door and lid and secure cover with screws previously removed.
11.	Verify printer is configured for the dispenser. DSW3-1 & 3-2 must be in the ON position. See page 9-11 for Setup.
12.	Replace the left side cover.

Label Dispenser Installation

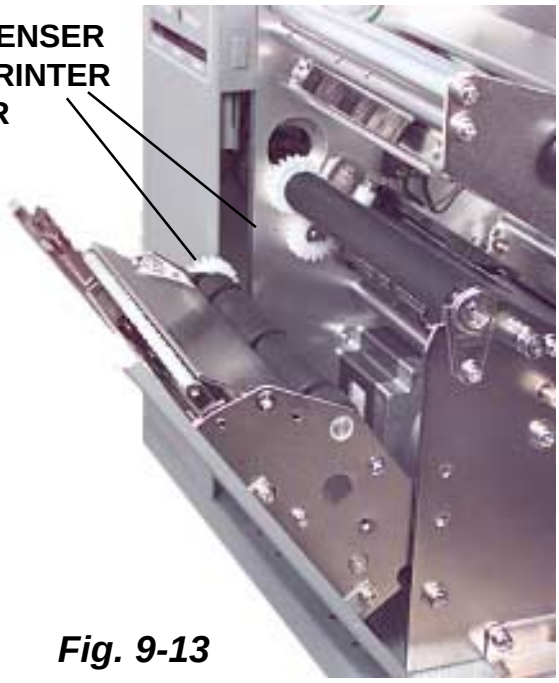


Fig. 9-13

Fig. 9-14

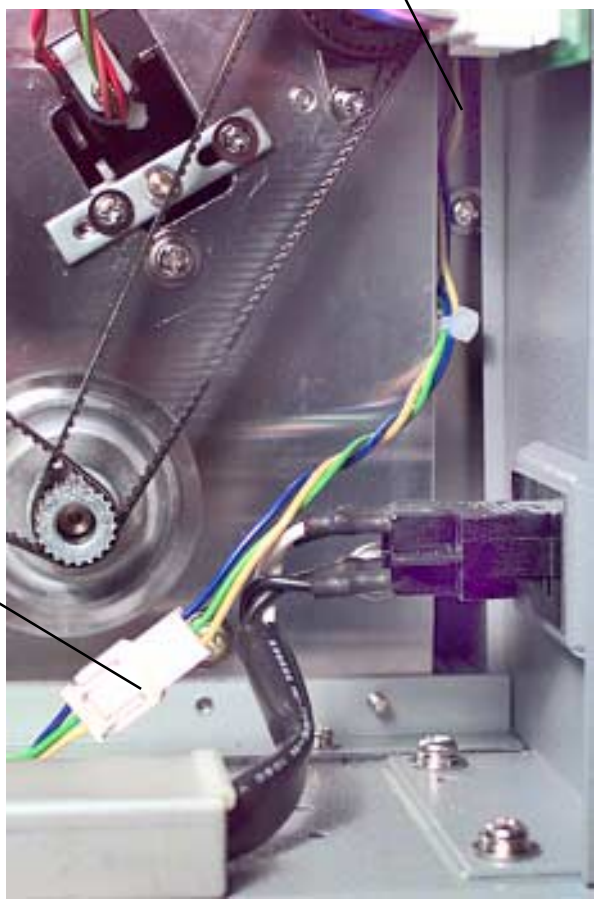


Fig. 9-15

Label Dispenser Installation

Setup:

STEP	PROCEDURE
1.	Install the label dispenser as directed.
2.	Power on the printer.
3.	The printer must be configured to use the label dispenser option.
4.	Remove one or two lead labels from the backing paper.
5.	Open the label dispenser by lifting up its front panel and swinging open the unit such that the knurled roller is easily seen.
6.	Open the print head assembly and feed the lead of the backing paper through the print area in the normal manner.
7.	At the label exit area, feed the backing paper down and behind the knurled roller, then out the lower exit of the label dispenser.
8.	Close the front panel of the label dispenser until it locks into place and again is flush with the front of the printer.
9.	Close the print head assembly and place the printer on-line.
10.	The label dispenser is ready for use.

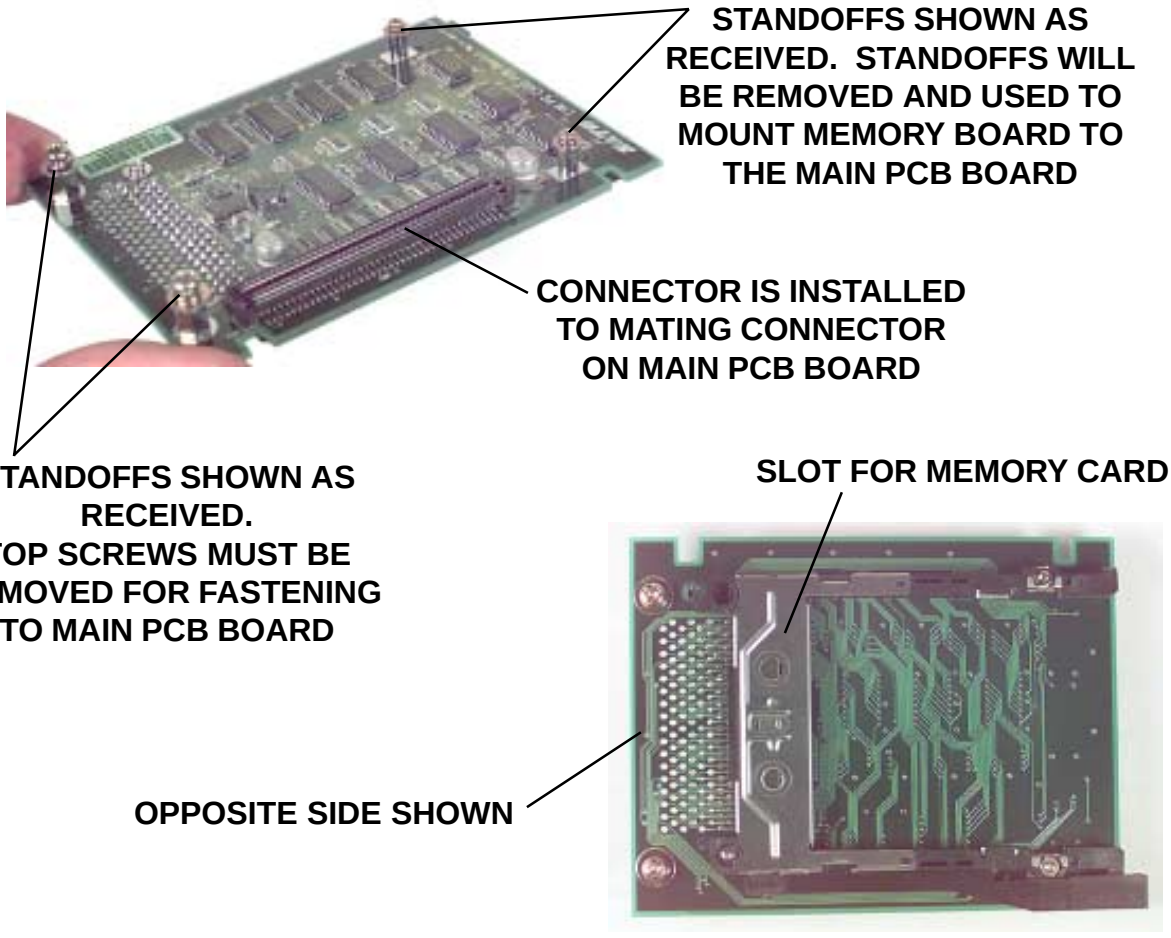
General Operation:

Send your data stream in the normal manner to the printer. Labels should print one at a time, even if your print quantity command requests more than one label. As labels are printed and presented for the operator to remove, the backing paper will continue to feed out the dispenser's lower exit path. If the dispenser's backfeed option has been set to TRIGGER in the printer configuration, the next label will print only after removing the current label from the label exit path. You may also control the printing of the next label with an external device attached to printer's EXT connector. Contact a SATO representative for more information on this method.

9.4 PCMCIA Memory Expansion Installation

The Memory PCB Board provides the interface board for (1) PCMCIA memory card slot.

Applicable Specifications	PCMCIA Version 2.1 (JEIDA Version 4.1)
Size	Up to 4MB SRAM Up to 16MB Flash
Connector Pins	68
Battery	Approximately two years (manufacturer dependent)
Write Protect	Yes
Low Battery Detect	Yes

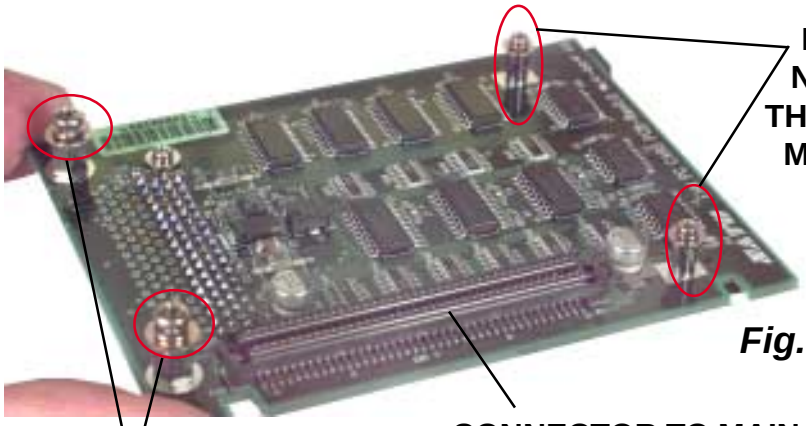


MEMORY PCB BOARD

PCMCIA Memory Expansion Installation

STEP	PROCEDURE
1.	Switch the printer OFF.
2.	Refer to Section 6.2 and remove the main circuit board.
3.	Remove (2) screws, nuts and standoffs from the Memory PCB Board for mounting to the Main PCB Board. ***Fig. 9-16***
4.	Remove (2) screws and washers as shown in ***Fig. 9-16*** for installing to the Main PCB Board. Do not remove standoffs themselves.
5.	Refer to ***Fig. 17*** for installation location on Main PCB Board. Insert the (2) screws through the Main PCB Board and into the standoffs as shown in ***Fig. 9-18***
6.	Place the Memory PCB Board down over the Main PCB Board so the the connectors mate and the standoffs are aligned with the mounting holes through the standoffs. ***Fig. 9-18***
7.	Secure one end of the Memory PCB Board with (2) screws previously removed and the opposite end from the underside of the Main PCB Board with (2) ea. screws and washers previously removed. ***Fig. 9-18***
8.	Reinstall the completed Main PCB assembly to the printer reversing the Steps prior to the Memory Board installation.
9.	Complete the Factory Reset Procedure.

PCMCIA Memory Expansion Installation

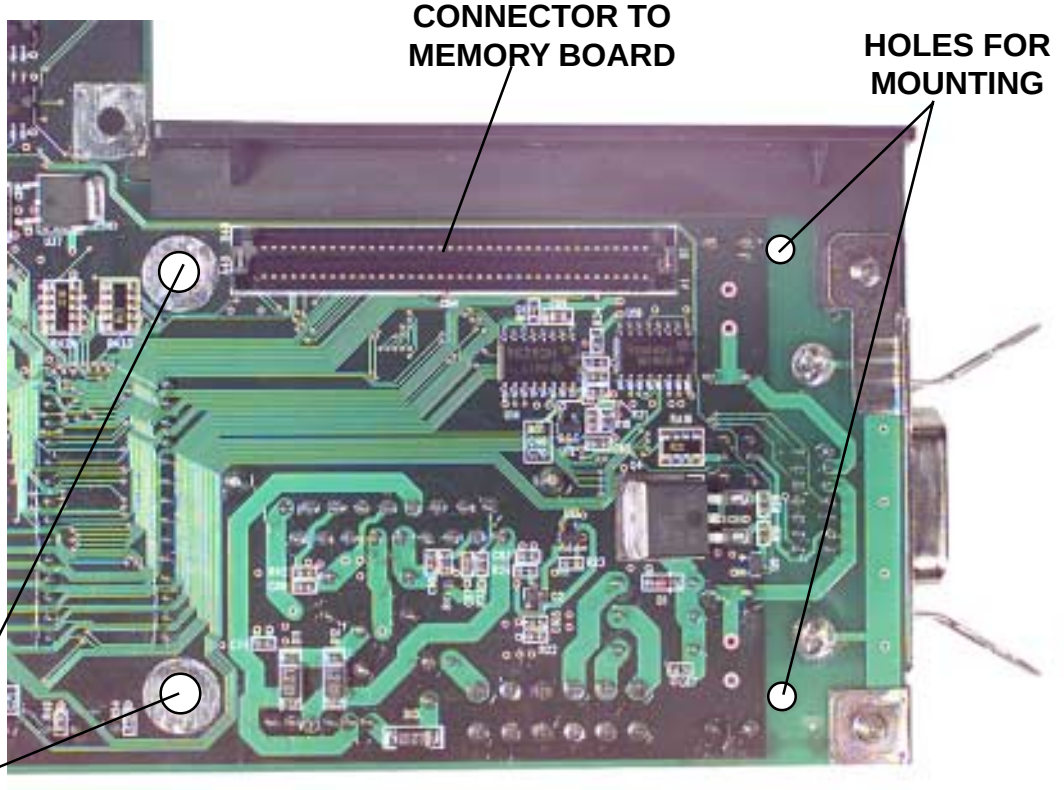


REMOVE (2) SCREWS, NUTS AND STANDOFFS. THIS HARDWARE WILL BE MOUNTED ON THE MAIN PCB BOARD (STEP 3)

CONNECTOR TO MAIN PCB BOARD

REMOVE (2) SCREWS AND WASHERS FROM THIS END OF STANDOFFS (STEP 4)

Fig. 9-16



CONNECTOR TO MEMORY BOARD

HOLES FOR MOUNTING

HOLES FOR MOUNTING

Fig. 9-17

MAIN PCB BOARD SHOWING WHERE THE MEMORY BOARD WILL BE INSTALLED

PCMCIA Memory Expansion Installation

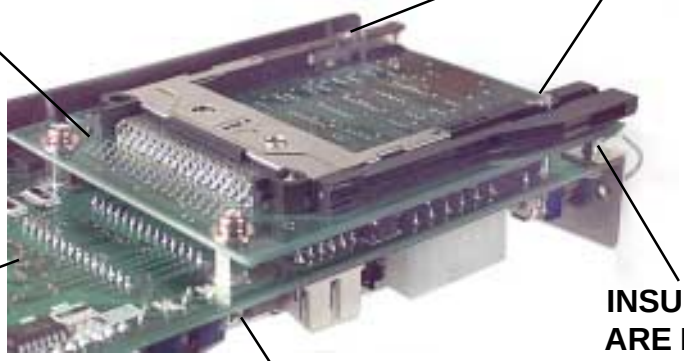
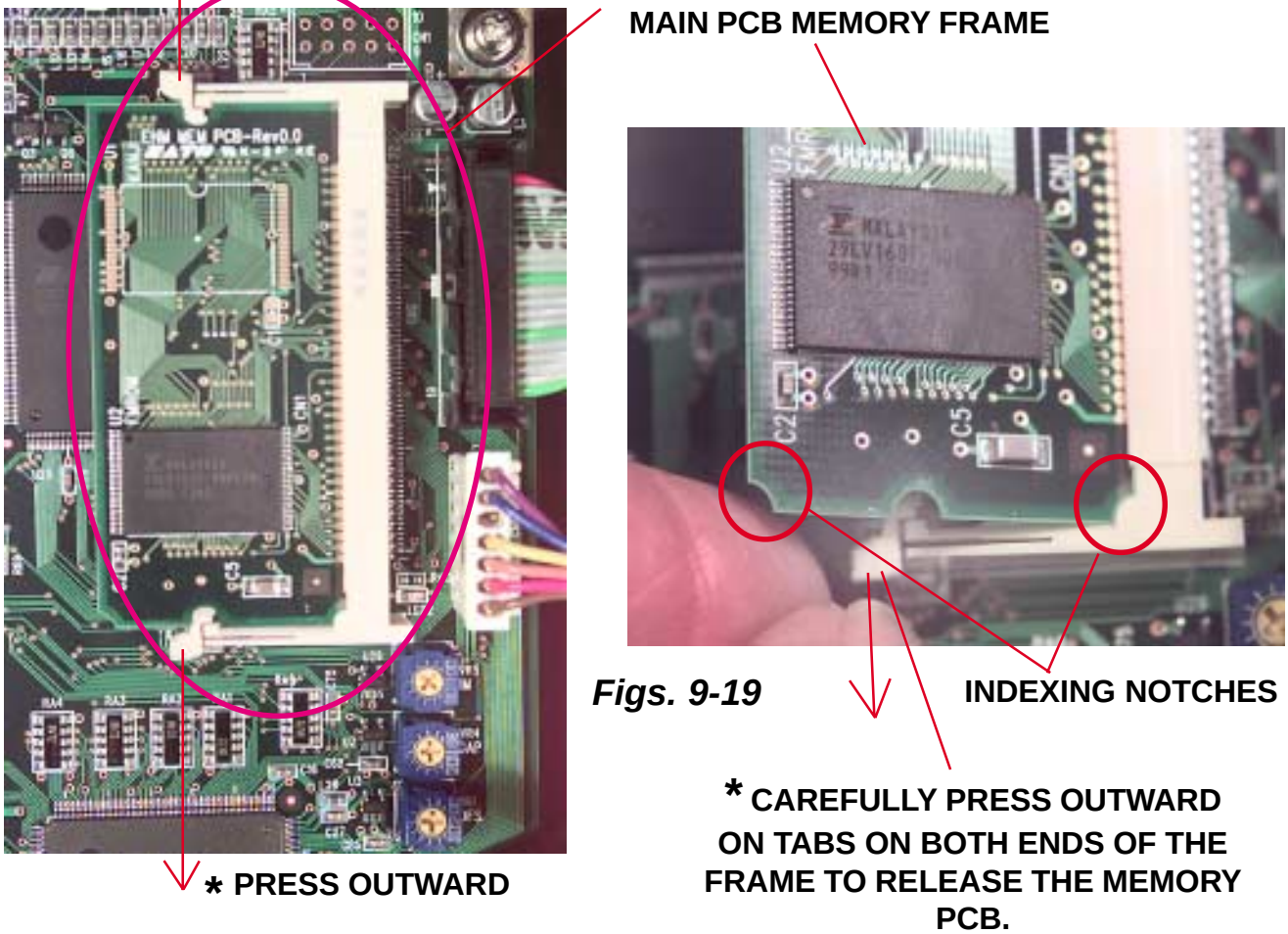


Fig. 9-18

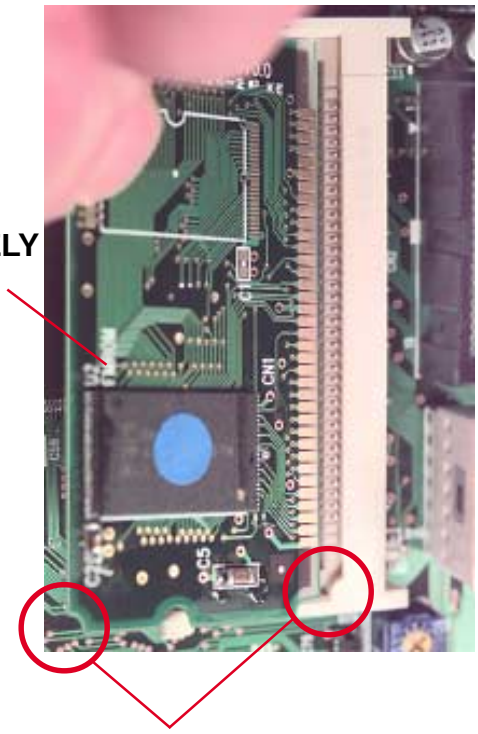
9.5 Flash Memory Expansion Installation

STEP	PROCEDURE
1.	Switch the printer **OFF** and disconnect the power cable.
2.	Open the side access door and raise the top access door.
3.	Loosen (2) inside screws holding the left side cover to the inside top of the printer. Remove (2) screws holding the left side cover to the printer base and remove the cover. ***Figs. 9-1***
3.	Carefully press outward on the tabs on both ends of the Main PCB Board Memory Frame to release the Standard Memory PCB. The Standard Memory PCB should lift by itself when released. Remove the Memory PCB from the frame. Note the indexing notches. ***Figs. 9-19***
4.	Remove the Flash Memory Module from the anti-static bag handling the module by the edges. Note the indexing notches. Insert the module into the Main PCB Memory Frame at approximately 45^0 away from the Main PCB Board. Gently push down to snap into position. ***Figs. 9-20***
5.	Replace the left side cover.
6.	Complete the Factory Reset Procedure.



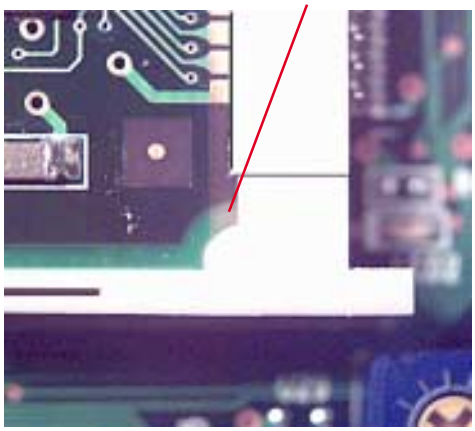
Figs. 9-19

Flash Memory Expansion Installation



Figs. 9-20

INSERT THE FLASH MEMORY MODULE INTO THE MAIN PCB MEMORY FRAME AT APPROXIMATELY 45⁰. NOTE THE INDEXING NOTCH ON THE MODULE. GENTLY PUSH DOWN TO SNAP INTO POSITION

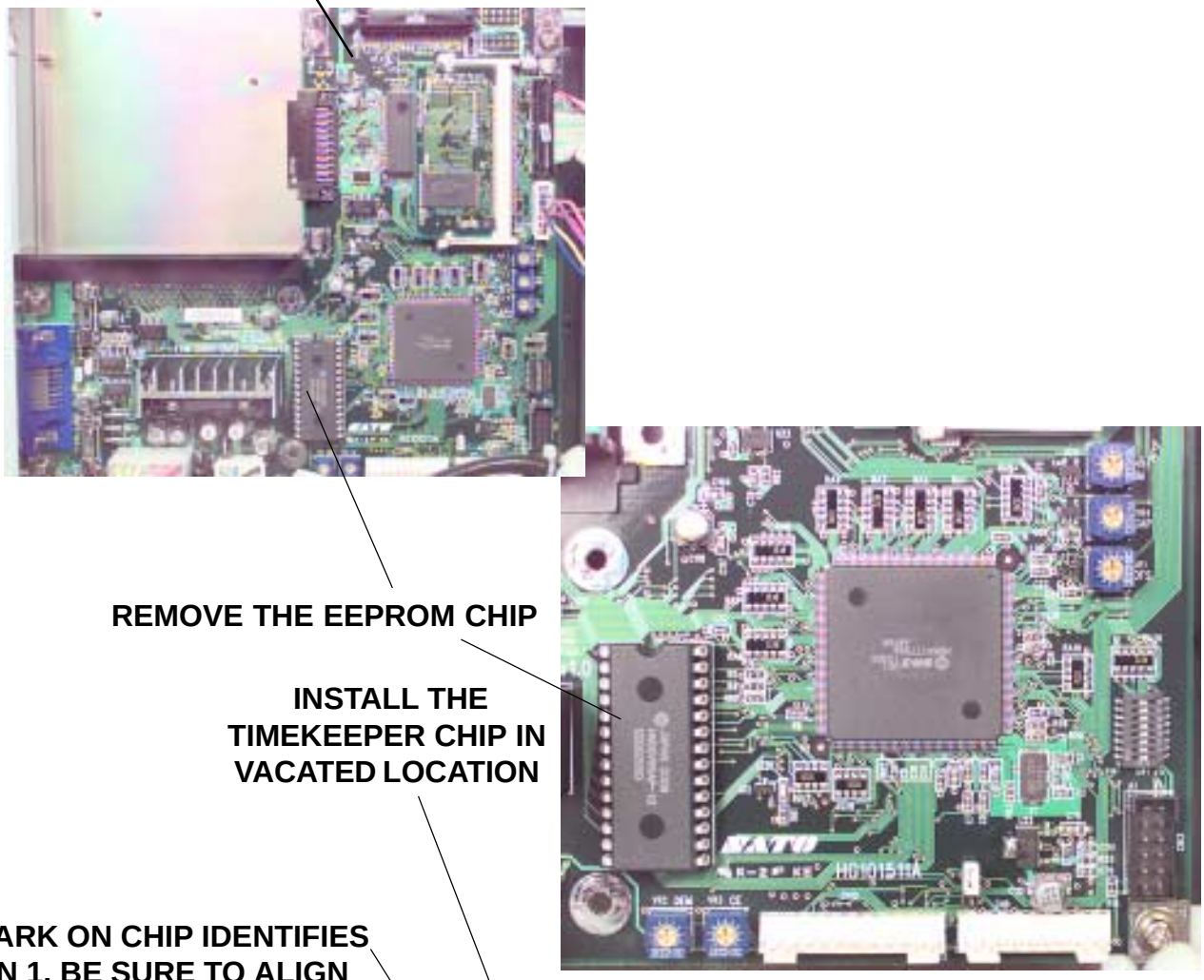


9.6 Real Time Clock Installation

The Real Time Clock Chip allows the date and time to be maintained in the local printer rather than using the system clock. It consists of a special clock chip that replaces the EEPROM chip on the main PCB.

STEP	PROCEDURE
1.	Switch the printer **OFF** and disconnect the power cable.
2.	Open the side access door and raise the top access door.
3.	Loosen (2) inside screws holding the left side cover to the inside top of the printer. Remove (2) screws holding the left side cover to the printer base and remove the cover. ***Figs. 9-1***
3.	Refer to ***Figs. 9-21.*** Remove the EEPROM chip. **CAUTION: Using a screwdriver to remove EEPROM may cause damage to the PCB. Be sure to have Prom remover under EEPROM and not under the socket itself.**
4.	Install the Real Time Clock Chip in location vacated by the EEPROM chip. Carefully align and insert the chip with the mark spot on the chip (identifying pin1) securely into the chip block socket using the “U” shaped notch as reference. Be very careful not to bend any chip legs.
5.	Replace the the left side cover.
6.	Complete the Factory Reset Procedure.

Real Time Clock Chip Installation

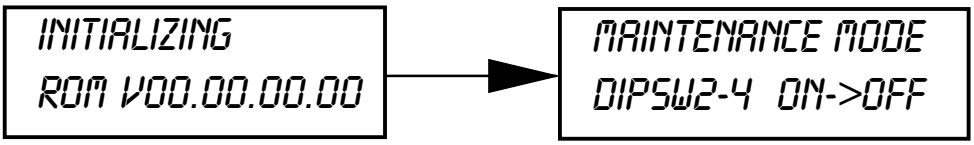


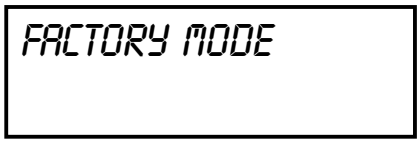
Figs. 9-21

Factory Reset Procedure

To reset the printer to the factory settings, perform the following steps.
Caution: Resetting the printer will clear all registers.

STEP	PROCEDURE
1.	Record all current dip switch positions, then place all switches in the **OFF** position.
2.	Place the **DSW2-4** in the **ON** or up postion.
3.	Press the **LINE and FEED** key while simultaneously turning **ON** the power switch. When the printer beeps, release the keys. The following screens will appear.
4.	Place the DSW-4 in the OFF postion and the following screen will appear.
5.	Press the **FEED** key to display the next screen.
6.	Press the **LINE** key once to change the message from **NONE** to **ALL**.
7.	Press the **FEED** key to clear the EEPROM. After a pause, the next screen will appear.
8.	Select the print label size by pressing the **LINE** key. The default is LARGE.
9.	Press the **FEED** key for a test print. Press the **FEED** key again to stop printing.
10.	Verify that the counters on the test print have reset to 0.0 km.
11.	Power **OFF** the printer and confirm that all switches are in the **OFF** or down position.





Warning: This test activates all the heating elements on the print head and therefore should be used for testing purposes only with full width labels to avoid damaging the print head.

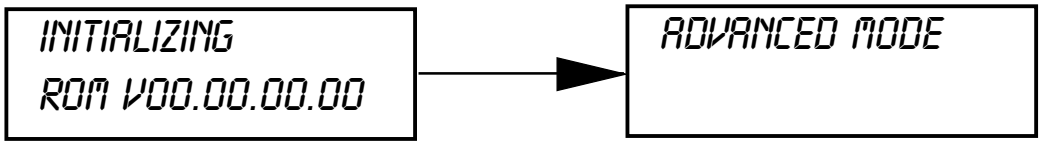
Set Calendar

After the Real Time Chip has been installed you must enter the Advance Mode to set the Calendar. Several steps are necessary in the Advanced Mode to get to the Calendar screen. For a full description of the steps in the Advanced mode leading to the Calendar screen refer to the Section 2 in the Service Manual.

The following steps will take you to the Calendar screen where you can input the settings:

***To Enter Advanced Mode*:**

STEP	PROCEDURE
1.	Press the **LINE** key while simultaneously turning the power on. When the printer emits one long beep, release the LINE key to display the first screen.
2.	Press the **FEED** key 11 times to display the "Set Calendar" display.



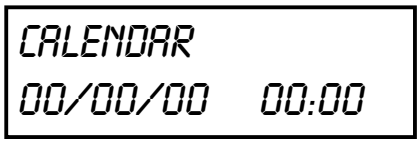
Set Calendar

This message will only be displayed if the Calendar Option is installed in the printer.

The Calendar is an optional feature in the M-8400RVe printer allowing the date and time to be set manually using the LCD Display or via the <ESC>WT Calendar Set command (SATO Programming Language). The last setting, set either manually 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 YES. If the Calendar feature is to be disabled, press the LINE key until the cursor is underneath the NO. When the desired setting is selected, Press the FEED key.

Calendar
00/00/00 00:00



Set Calendar (Cont)

STEP	PROCEDURE
1.	**Year** - The first display shown will have the two digit year selection underlined. You can scroll through the dates by pressing the LINE key. 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, pressing the FEED key will advance the underline cursor to the two digit Month position. You can scroll through the numbers corresponding to the month by pressing the LINE key. 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, pressing the FEED key will advance the underline cursor to the two digit Day position. You can scroll through the numbers corresponding to the month date by pressing the LINE dey. 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, pressing the FEED key will advance the underline cursor to the two digit Hour position. You can scroll through the numbers corresponding to the hour (using a 24 hour clock) by pressing the LINE key. 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, pressing the FEED key will advance the underline cursor to the two digit Minute position. You can scroll through the numbers corresponding to the hour by pressing the LINE key. 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 minutes, pressing the FEED key will accept the setting. Power Off the printer to exit.

Section

10

Spare Parts List

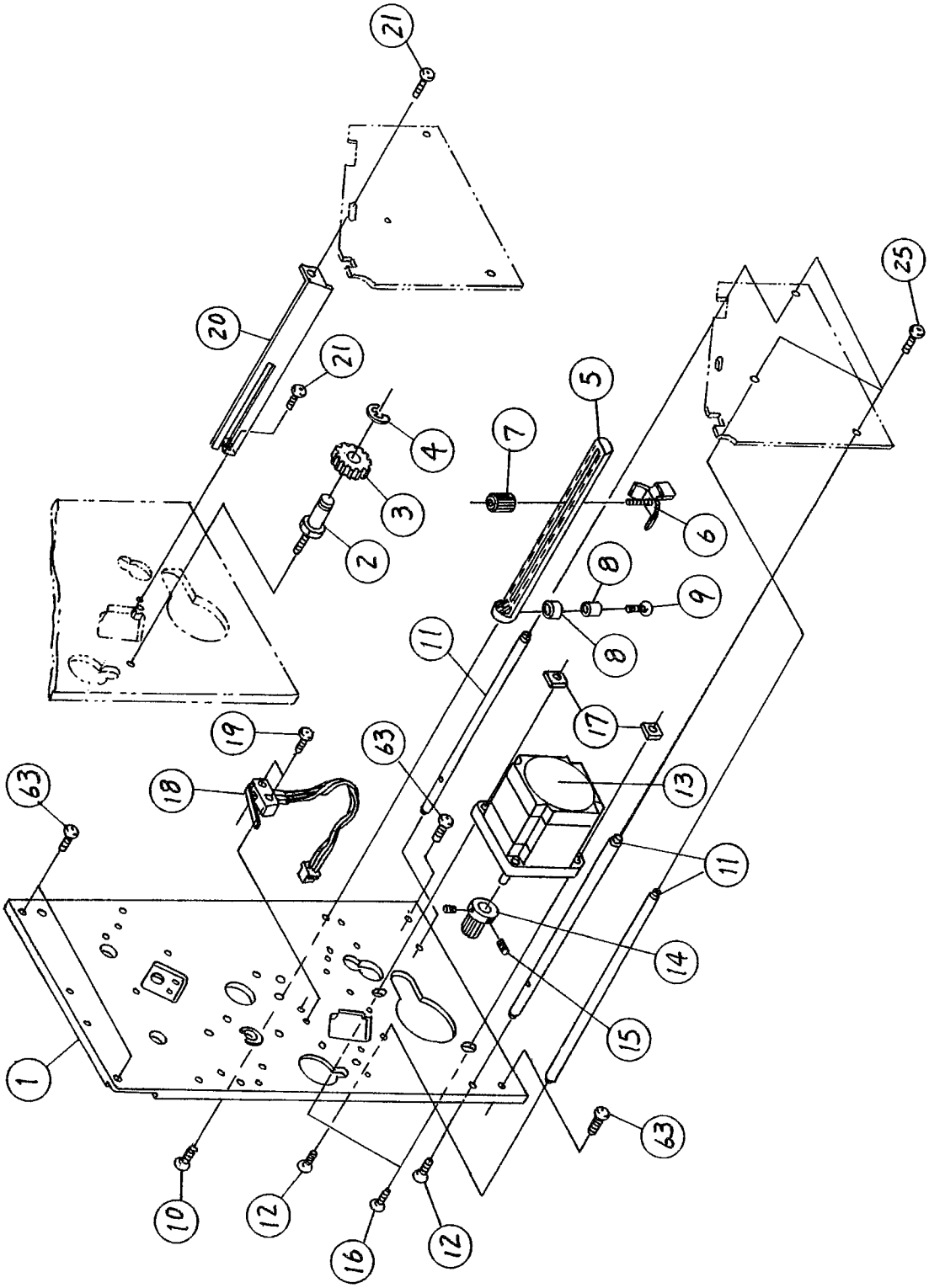
10.1 Overview

The following parts lists are included for the M-8400RVe Printer:

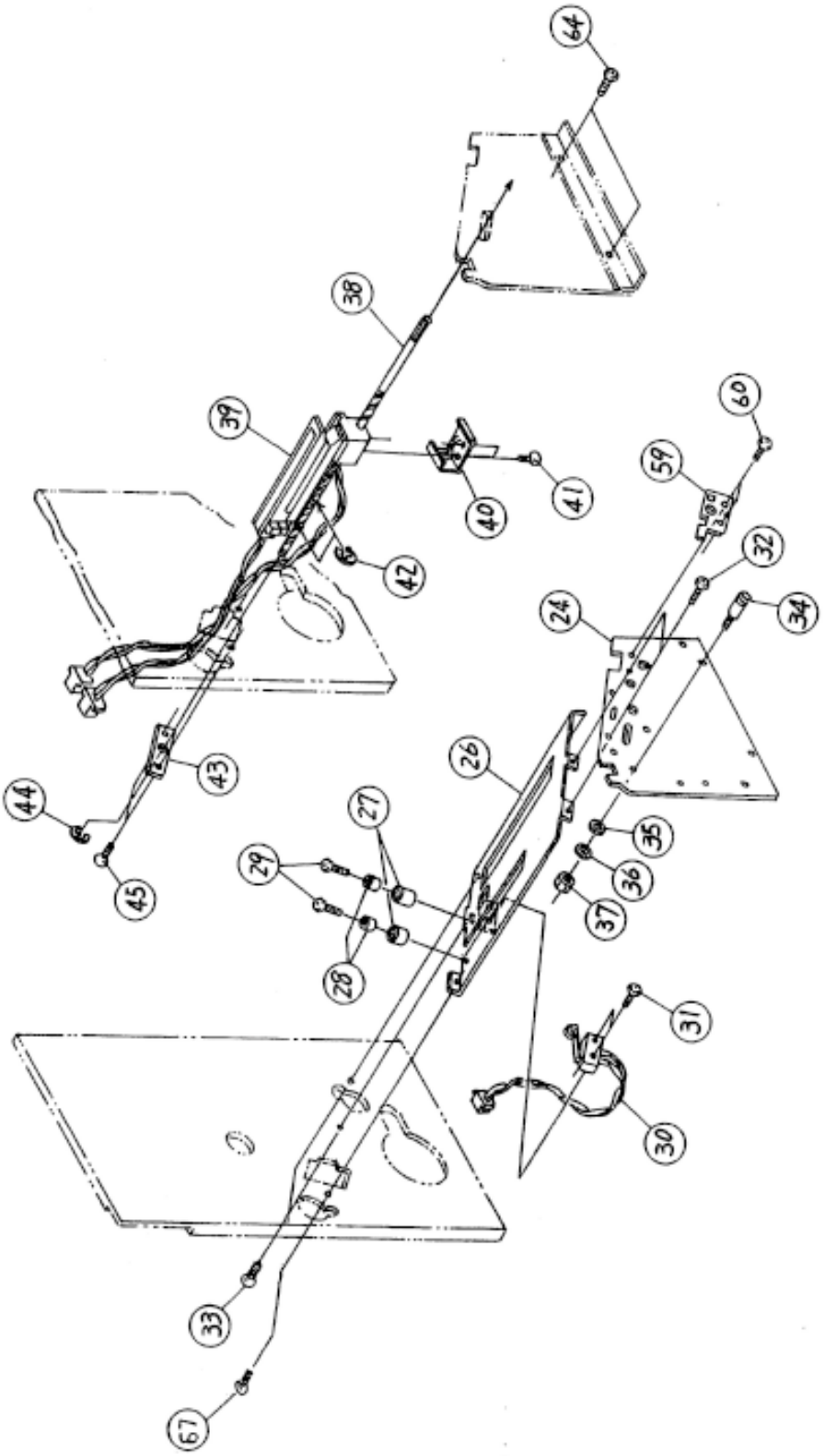
- *Frame Assembly*
- *Print Head Assembly*
- *Ribbon Assembly*
- *Feed Roller Assembly*
- *Base Cover Assembly*
- *Cutter Option*
- *Dispenser Assembly Option*

Note:
The spare parts information in this manual is accurate at the time of publication of this service manual and is subject to change without notice.

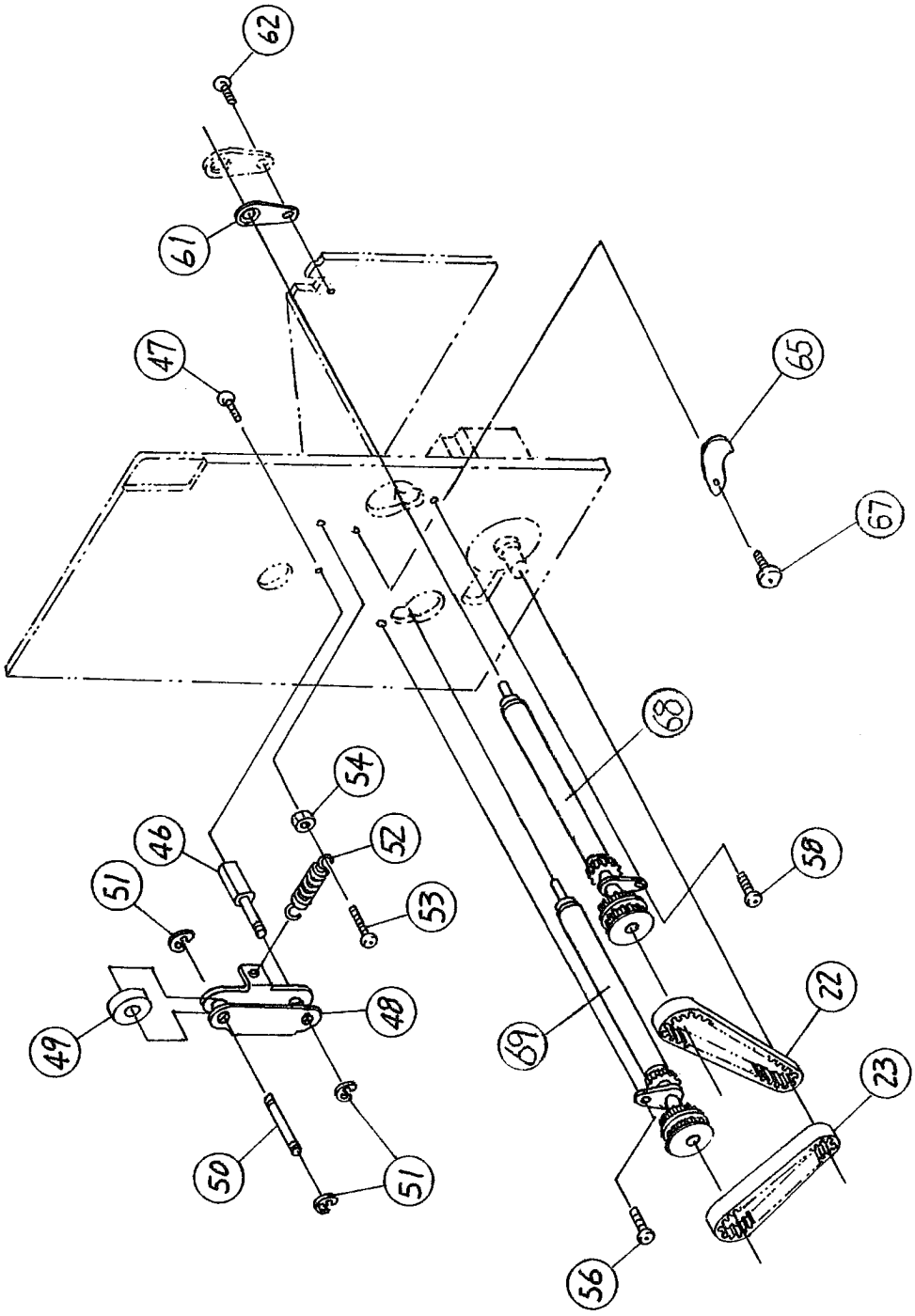
10.2 Frame Assembly



Frame Assembly



Frame Assembly



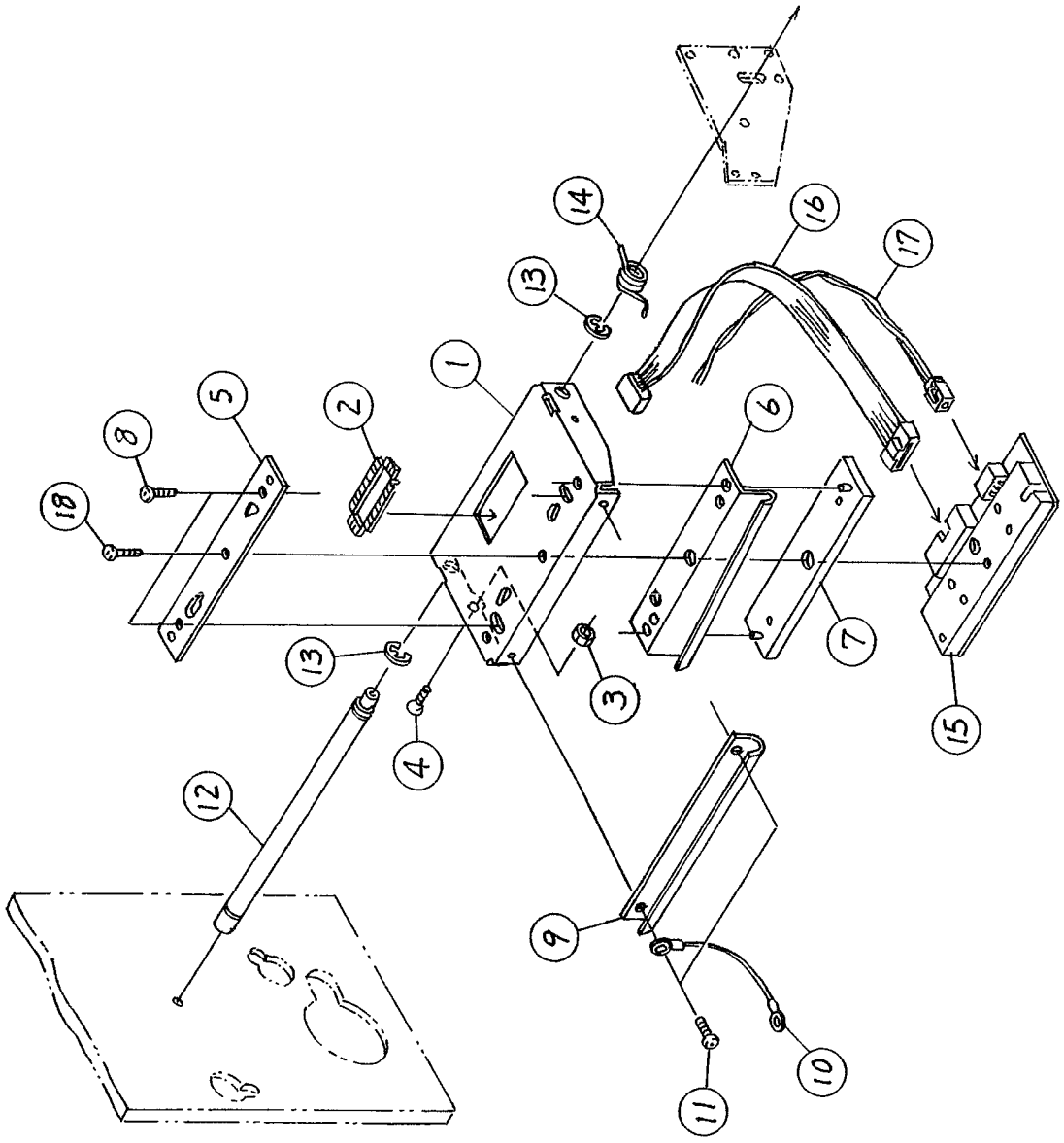
Frame Assembly

NO.	CODE	DESCRIPTION	QTY
1	PR1740104	ENGINE FRAME	1
2	PB0680000	IDLE GEAR POST	1
3	PR1680100	IDLE GEAR	1
4	ND0040030	E-SNAP RING	1
5	PE5680000	GUIDE SHAFT	1
6	PR3740501	SLIDE GUIDE (MELTED)	1
7	PB2680100	KNOB	1
8	PE1010400	GUIDE ROLLER (A)	2
9	MF0302022	PAN TAPPING SCREW W/+ HOLE	1
10	MH0301621	PAN HEAD SCREW	1
11	PB0680400	GUIDE SHAFT	3
12	MD4401022	PAN HEAD SCREW	3
13	RH1741400	STEPPER MOTOR ASSY	1
14	PL0680102	MOTOR PULLEY	1
15	MJ1300424	HEX HOLE W-POINT	2
16	MD4402021	PAN HEAD SCREW	2
17	PA1740100	NUT PLATE	2
18	RH1740500	HEAD OPEN SW CABLE SET(SEN5)	1
19	MD3201221	PAN SCREW	2
20	PA3740200	SENSOR GUIDE	1
21	MD4300822	PAN HEAD SCREW	2
22	PT8130064	MINI PITCH BELT	1
23	PT8090064	MINI PITCH BELT	1
24	PA1740200	SIDE FRAME	1
25	MD4401022	PAN HEAD SCREW	3
26	PR3740400	PAPER GUIDE	1
27	PE3720300	ROLLER	2
28	PB2740100	COLLAR	2
29	MD4301222	PAN HEAD SCREW	2
30	RH1741300	PAPER END SW CODE SET (SEN7)	1
31	MD3201221	PAN HEAD SCREW	2
32	MD4300622	PAN HEAD SCREW	2
33	MD4301022	PAN HEAD SCREW	2
34	PB0740101	POST (LATCH)	1
35	NA1040022	PLAIN WASHER	1
36	NB0040022	SPRING WASHER	1
37	MT1400722	HEX NUT	1
38	PB0740202	SENSOR SHAFT	1
39	PR7740200	PITCH SENSOR SUB	1

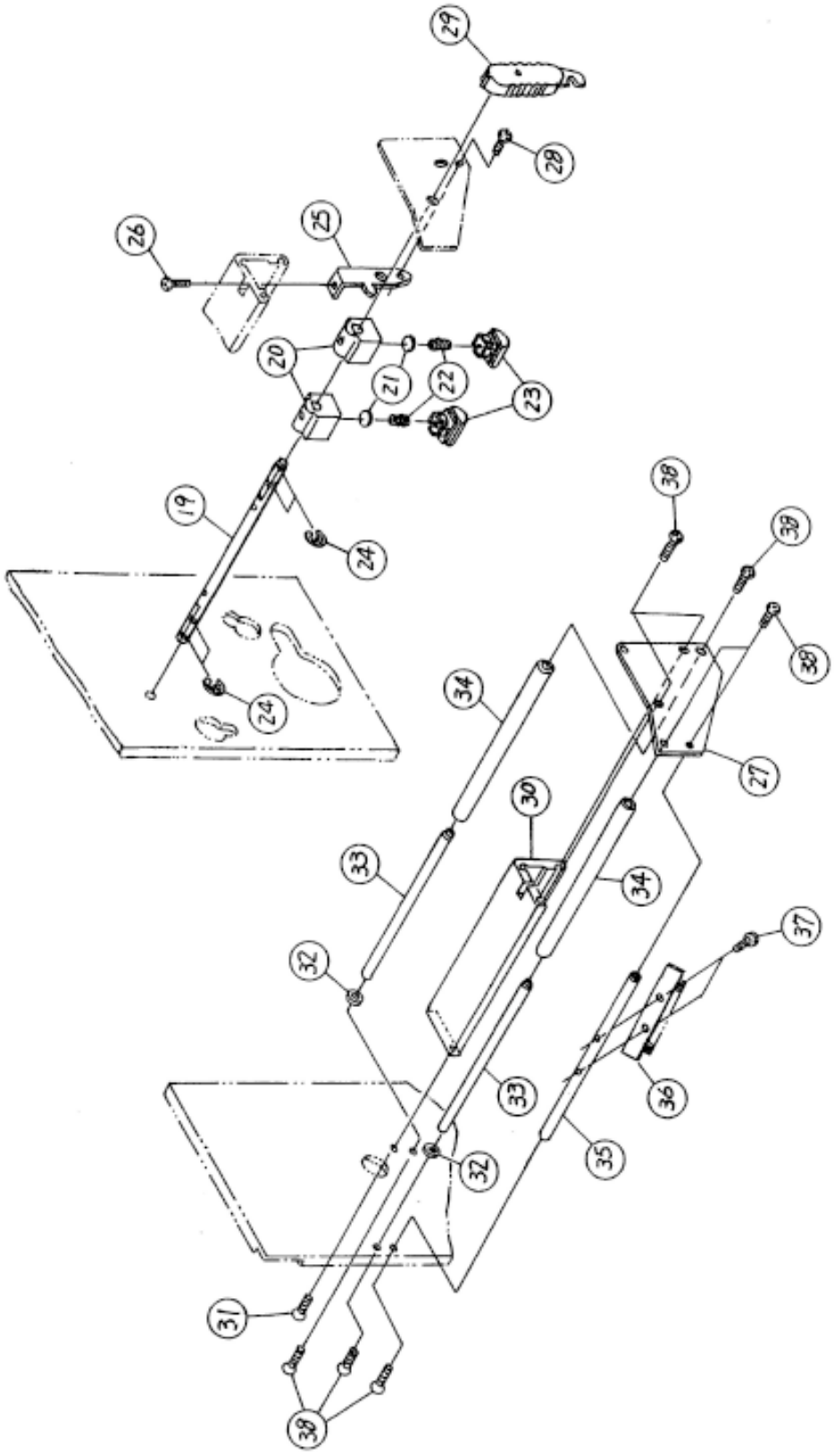
Frame Assembly

NO.	CODE	DESCRIPTION	QTY
40	PA4740300	PLATE SPRING	1
41	MH0300821	P-TIGHT SCREW	2
42	ND0040030	E-SNAP RING	2
43	PA1740300	SENSOR BRACKET	1
44	ND0030030	E-SNAP RING	1
45	MD4300822	PAN HEAD SCREW	2
46	PB0740800	POST	1
47	MD4401621	PAN HEAD SCREW	1
48	PA3741800	TENSION BRACKET	1
49	PE3720100	TENSION ROLLER	1
50	PB0740900	TENSION ROLLER SHAFT	1
51	ND0040030	E-SNAP RING	3
52	PC4740100	SPRING	1
53	MD4301422	PAN HEAD SCREW	1
54	MT1300522	HEX NUT	1
56	MD4300822	PAN HEAD SCREW	1
58	MD4300822	PAN HEAD SCREW	1
59	PA1741000	ADJUST PLATE	1
60	MD4401022	PAN HEAD SCREW	2
61	PA1681000	SPACER	1
62	MD0300622	PAN HEAD SCREW	1
63	MD4301422	PAN HEAD SCREW	4
64	MD4401022	PAN HEAD SCREW	2
65	PA1741400	COVER (PLATE)	1
67	MD4301222	PAN HEAD SCREW	1
68	PR7740102	PLATEN ROLLER SUB	1
69	PR7740300	FEED ROLLER SUB	1

10.3 Head Assembly



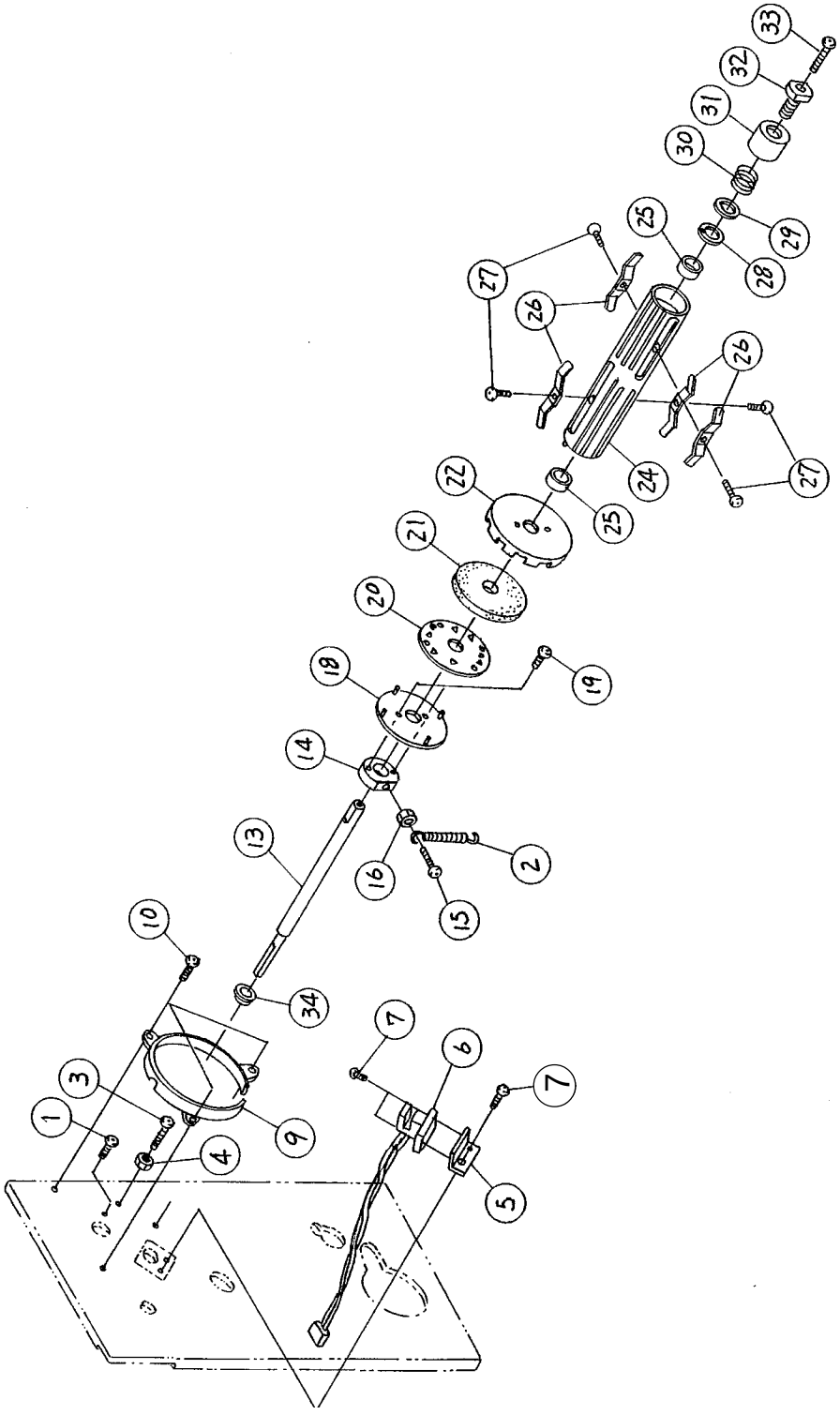
Head Assembly



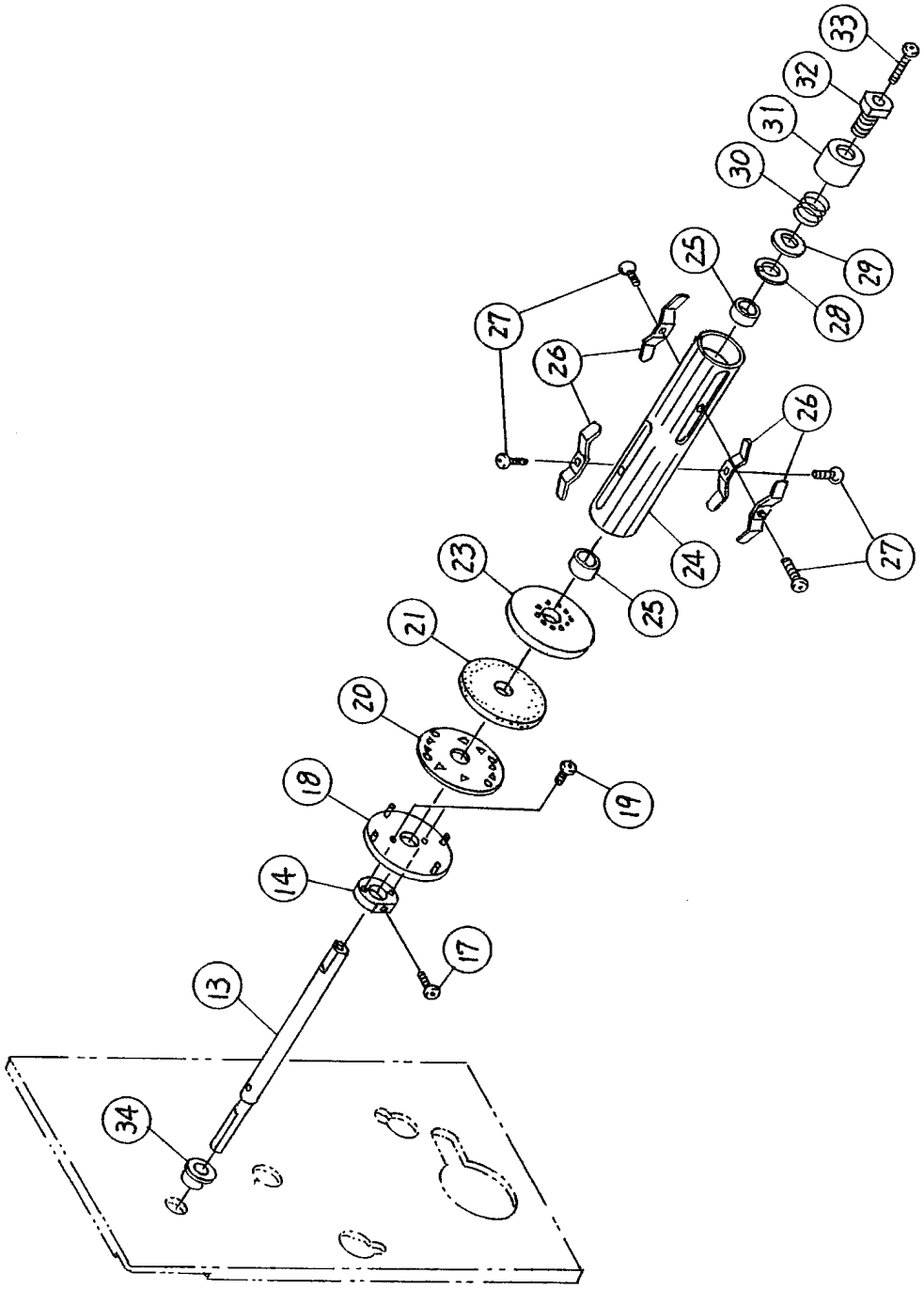
Head Assembly

NO.	CODE	DESCRIPTION	QTY
1	PA3740402	HEAD BRACKET	1
2	PV9740300	BUSHING	1
3	MT1300522	HEX NUT 1ST TYPE	1
4	MA0300821	PAN HEAD SCREW	1
5	PA1740401	ADJUST PLATE	1
6	PR4740402	PLATE (RIBBON)	1
7	PR1740300	HEAD SUB HOLD	1
8	MD4301022	PAN HEAD SCREW	2
9	PA3740504	PLATE (RIBBON ADJUST)	1
10	RH1741800	HEAD BRACKET FG CORD SET	1
11	MA0300622	PAN HEAD SCREW	2
12	PB0740300	SHAFT (HEAD)	1
13	ND0060030	E-SNAP RING	2
14	PC2740101	SPRING (OPEN)	1
15	GH000811A	PRINT HEAD	1
16	RH1775201	PRINT HEAD CABLE ASSY	1
17	RH1775100	HEAD CABLE ASSY	1
18	MD4301422	PAN SCREW	1
19	PB0740401	SHAFT (HEAD PRESSURE)	1
20	PE1740100	HEAD PRESSURE BRACKET	2
21	PA0740100	PRESSURE PLATE	2
22	PC1740200	SPRING (HEAD)	2
23	PE1740200	HEAD PRESSURE	2
24	ND0060030	E-SNAP RING	4
25	PA3740600	ADJUST PLATE	1
26	MD4301422	PAN SCREW	1
27	PA1740500	HEAD PLATE	1
28	MD4300622	PAN SCREW	1
29	PR2740100	LATCH HANDLE	1
30	PD1740100	STAY	1
31	MD4401621	PAN HEAD SCREW	2
32	PT9740300	POLY SLIDER	2
33	PB0680400	GUIDE SHAFT	2
34	PR1740400	ROLLER	2
35	PB0740500	SHAFT(BRASH)	1
36	PR1340500	ANTI-STATIC BRASH	1
37	MA0300622	PAN HEAD SCREW	2
38	MD4401022	PAN SCREW	8

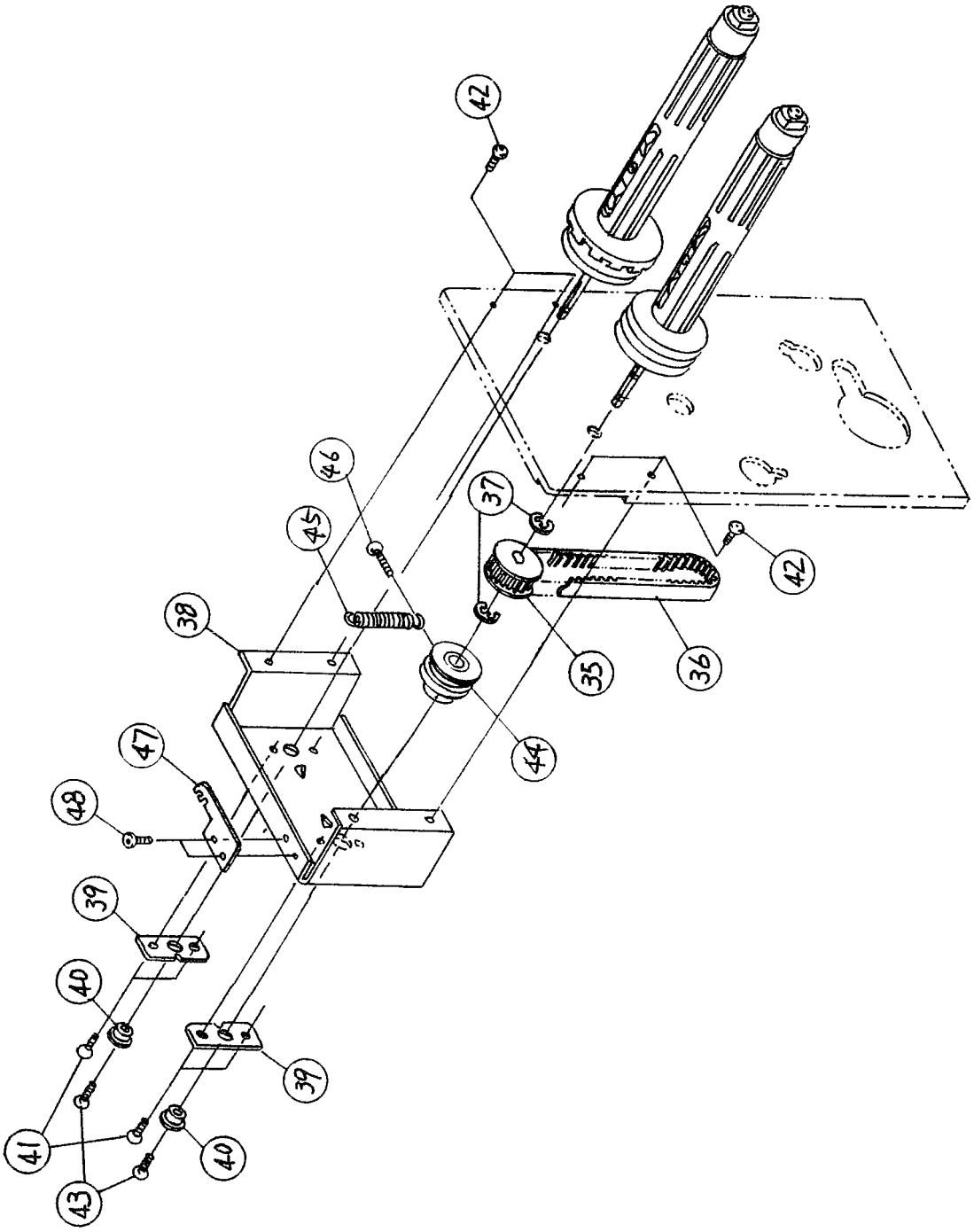
10.4 Ribbon Assembly



Ribbon Assembly



Ribbon Assembly



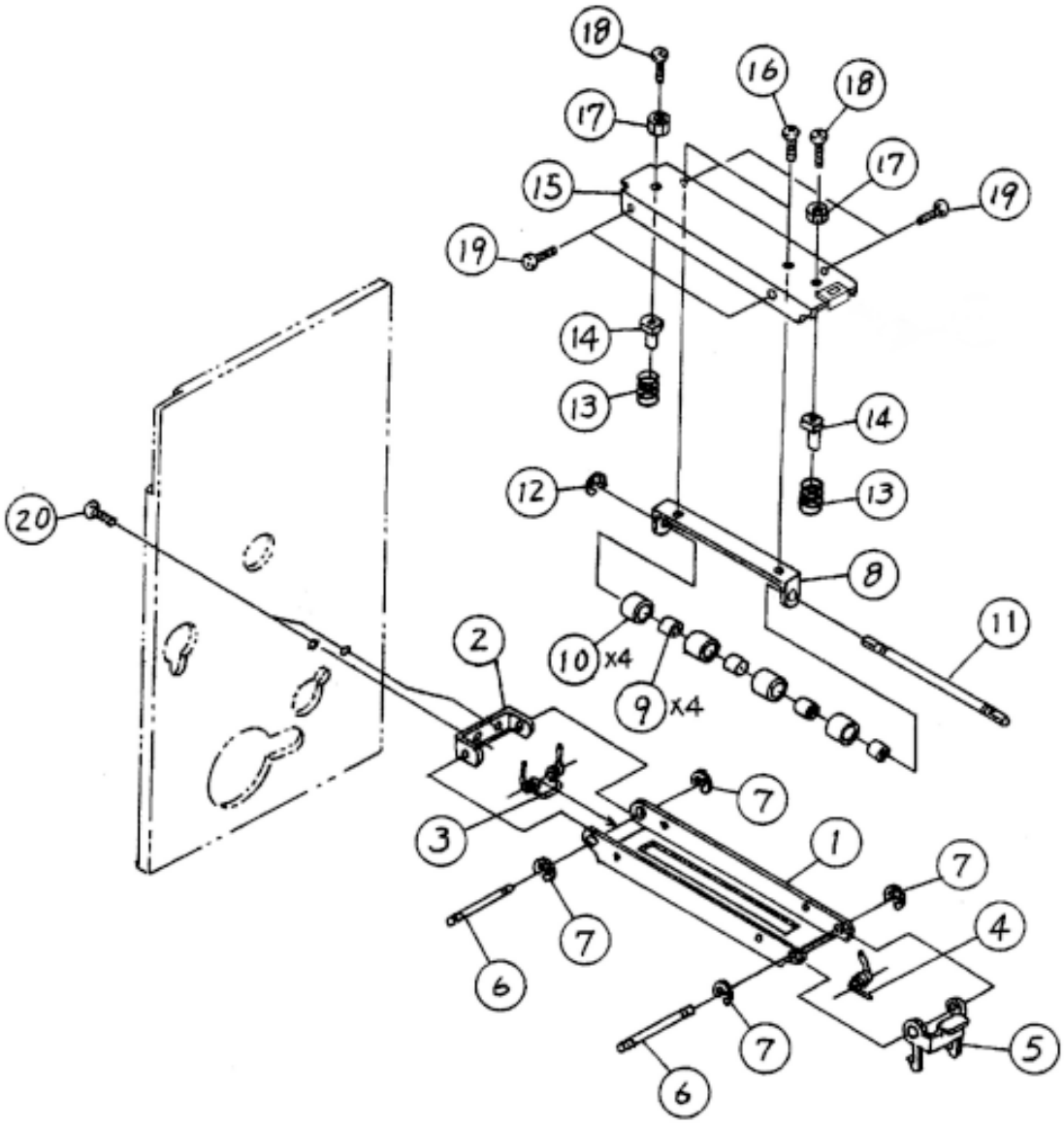
Ribbon Assembly

NO.	CODE	DESCRIPTION	QTY
1	MD 4300622	PAN HEAD SCREW	1
2	PC0740200	SPRING (BACK)	1
3	MA1300822	FLAT SCREW	1
4	MT1300522	HEX NUT 1ST TYPE	1
5	PA3730200	SENSOR BRACKET (RIBBON)	1
6	RH1740400	RIBBON SENSOR CABLE SET (SEN4)	1
7	MA0300622	PAN HEAD SCREW	3
9	PE6720100	DISPLAY	1
10	MD4300822	PAN HEAD SCREW	1
13	PB0740602	SHAFT (RIBBON)	2
14	PE4720200	PLATE HOLDER BOSS	2
15	MA0302522	PAN SCREW	1
16	MT1300522	HEX NUT	1
17	MA0301821	PAN HEAD SCREW	1
18	PA0730100	GUIDE PLATE	2
19	MH1250621	FLAT P-TIGHT SCREW	4
20	PA0730200	HOLD PLATE	2
21	PA0680300	LINING	2
22	PE7720100	DISC PLATE (A)	1
23	PE1681100	GUIDE PLATE(B)	1
24	PE4730100	RIBBON BOSS	2
25	PE2720100	COLLAR	4
26	PA4690900	SPRING	8
27	MH0300521	PAN P-TIGHT SCREW	8
28	PT2301020	OIL DRY METAL WASHER	2
29	PA0680400	DISC	2
30	PC1730100	SPRING (RIBBON)	2
31	PE2730100	STOPPER COLLAR	2
32	PB5730100	ADJUST SCREW	2
33	MA0303022	PAN HEAD SCREW	2
34	PT1112080	BEARING	2
35	PR1720400	PULLEY	1
36	PT8165064	TIMING BELT	1
37	ND0060030	E STOP RING	1
38	PA3740900	RIBBON FRAME	1
39	PA1731000	ADJUST PLATE	2
40	PT1112080	BEARING	2
41	MD4300622	PAN HEAD SCREW	4

Ribbon Assembly

NO.	CODE	DESCRIPTION	QTY
42	MD4401222	PAN HEAD SCREW	4
43	MD4401022	PAN HEAD SCREW	2
44	PR1770100	PULLEY	1
45	PC0740200	SPRING (BACK)	1
46	MH0300821	PAN HEAD P-TIGHT SCREW	1
47	PA2771300	SPRING BRACKET	1
48	MD4300622	PAN HEAD SCREW	2

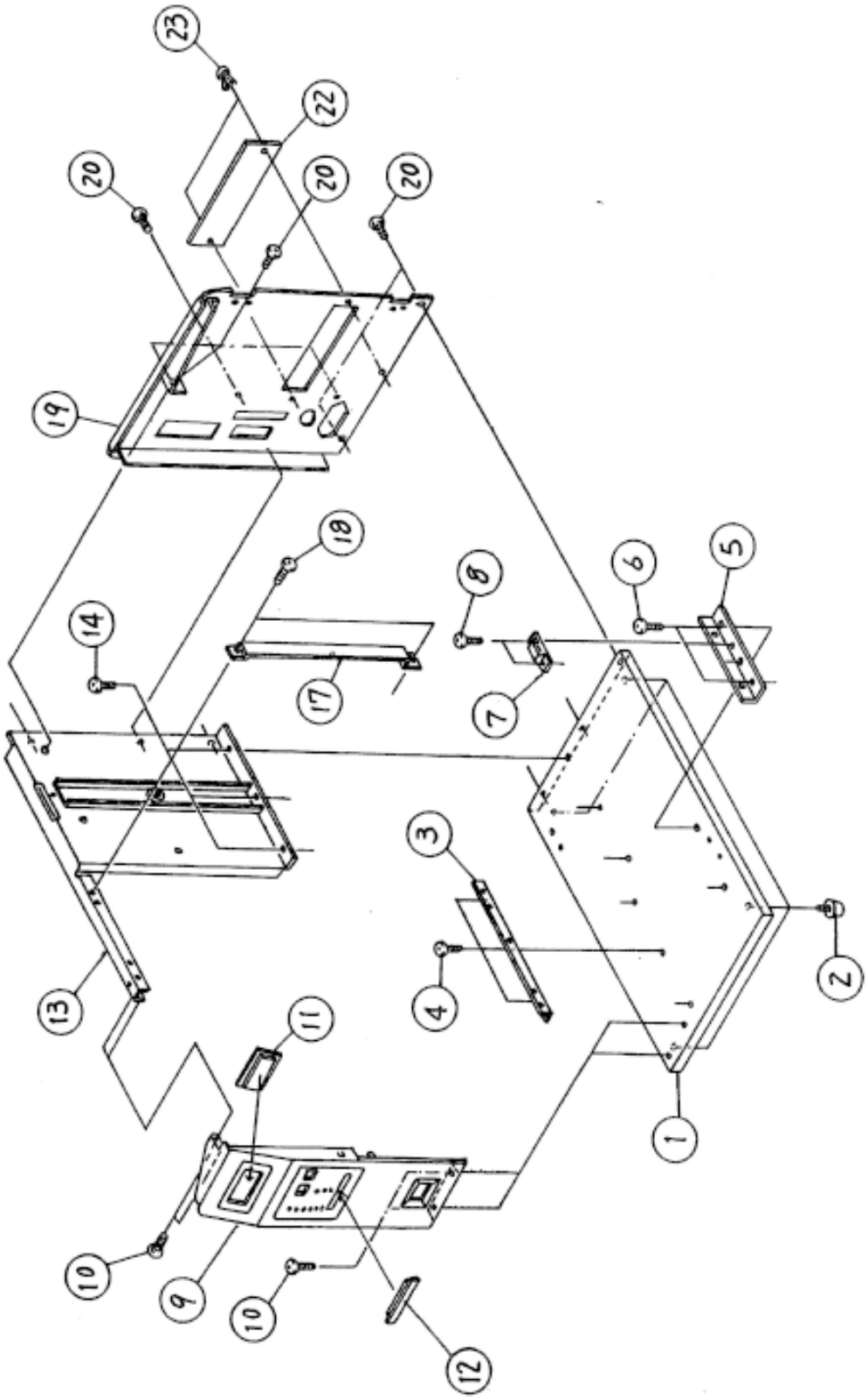
10.5 Feed Roller Assembly



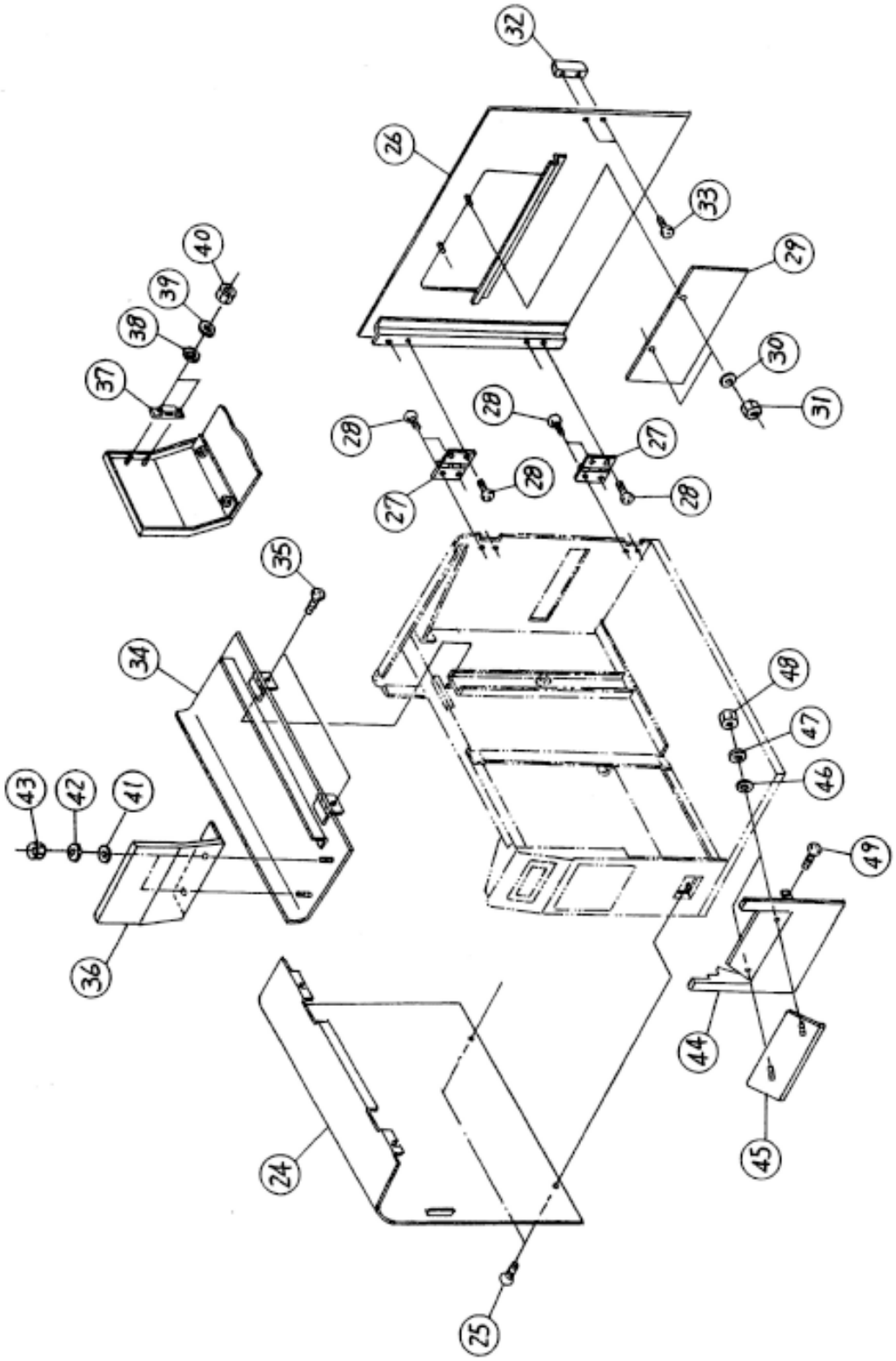
Feed Roller Assembly

NO.	CODE	DESCRIPTION	QTY
1	PA3742201	PAPER LID (BOTTOM)	1
2	PA3742001	LID	1
3	PC2740200	SPRING (OPEN)	1
4	PC2740300	SPRING (LATCH)	1
5	PA3742100	LATCH HANDLE	1
6	PB0741100	SHAFT (LID)	2
7	ND0020030	E-SNAP RING	4
8	PA3741900	ROLLER BRACKET	1
9	PE3720500	ROLLER	4
10	PE3720200	ROLLER	4
11	PB0741000	SHAFT (PRESSURE ROLLER)	1
12	ND0040030	E- SNAP RING	1
13	PC1740401	SPRING (PRESSURE)	2
14	PE2730300	STOPPER COLLAR	2
15	PR4740300	PAPER LID (TOP)	1
16	MD4300622	PAN HEAD SCREW	2
17	MT1300522	HEX NUT	2
18	MA0301022	PAN HEAD SCREW	2
19	MD4300622	PAN HEAD SCREW	4
20	MD4301022	PAN HEAD SCREW	2

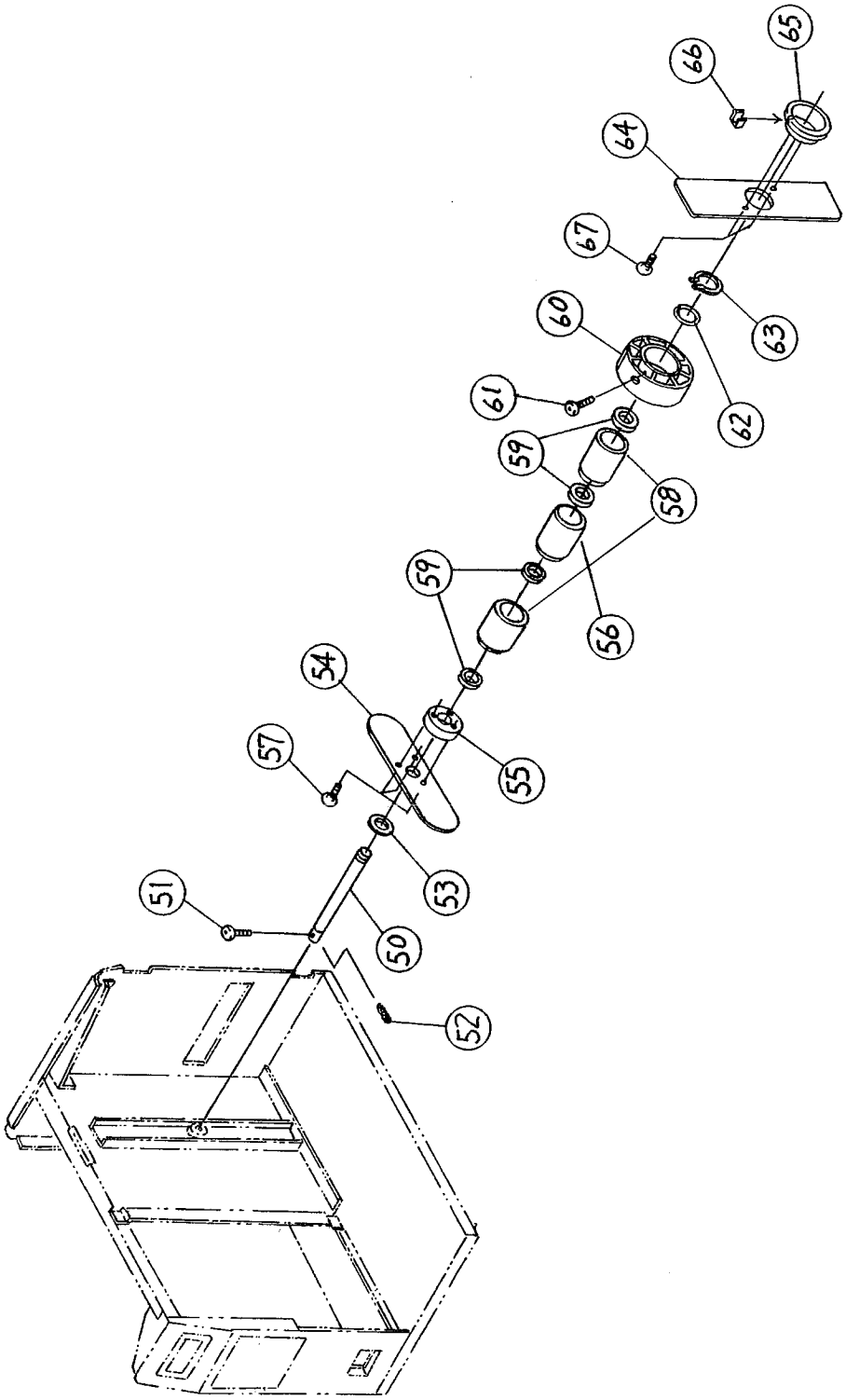
10.6 Base Cover Assembly



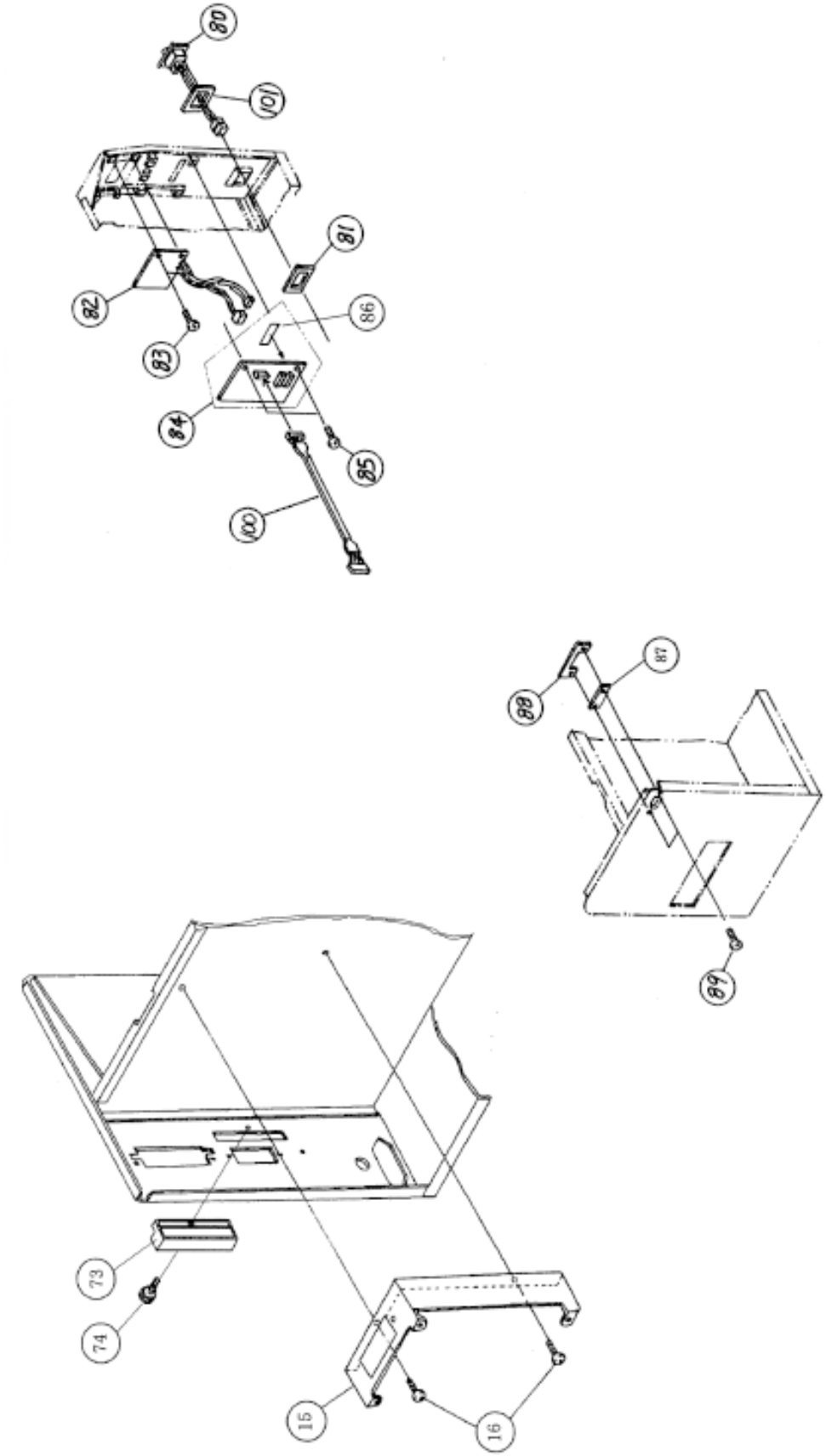
Base Cover Assembly



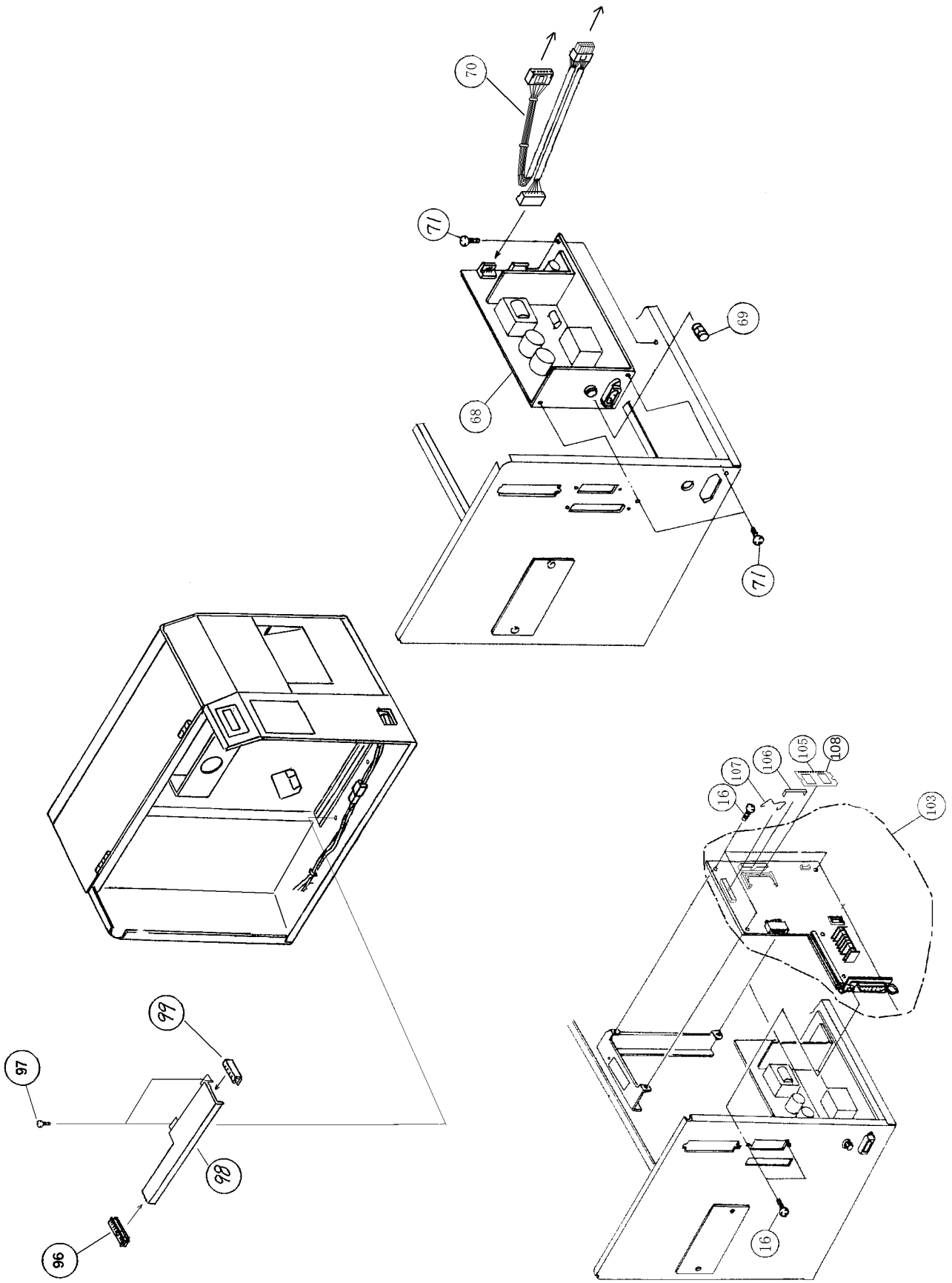
Base Cover Assembly



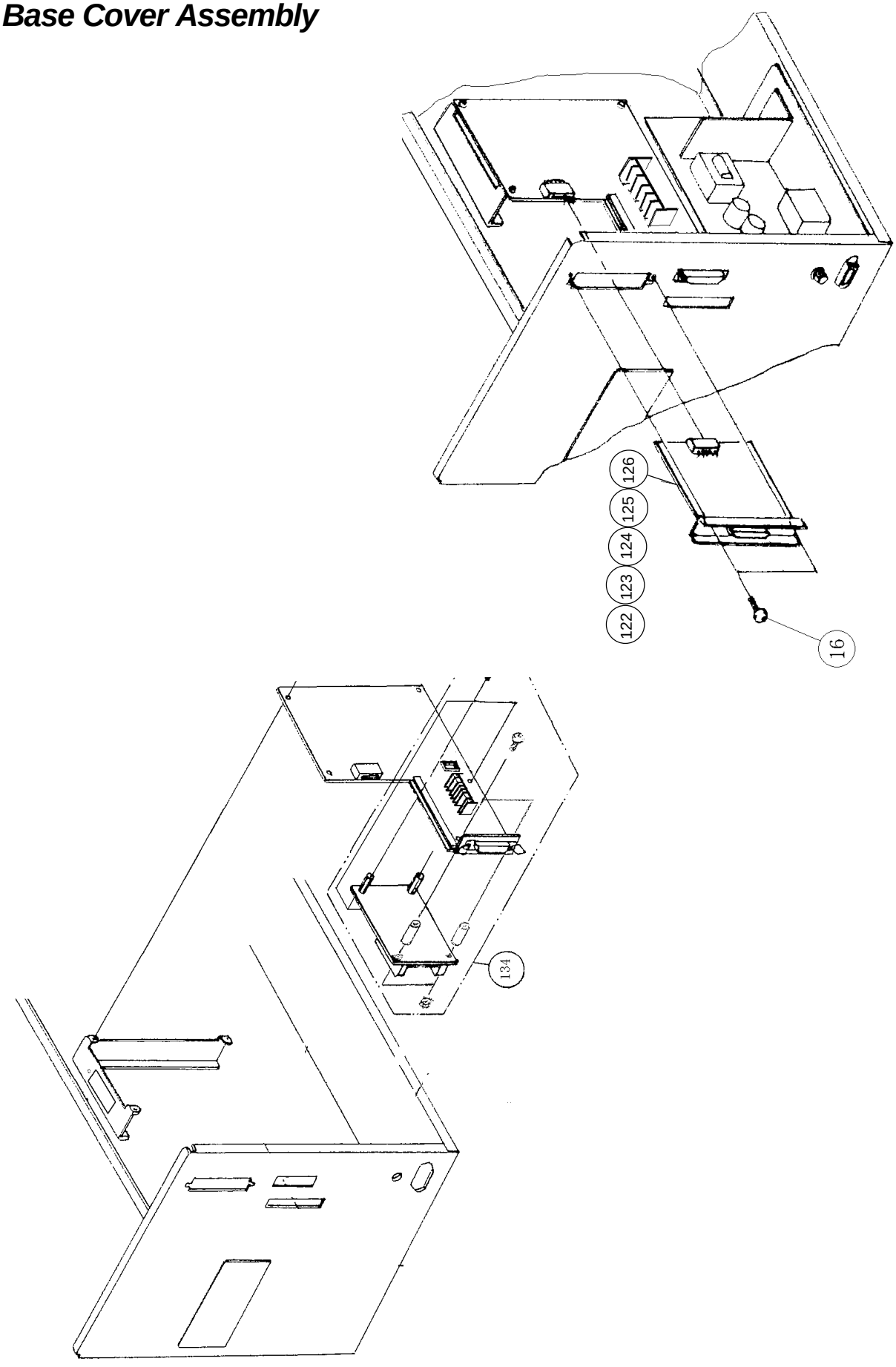
Base Cover Assembly



Base Cover Assembly



Base Cover Assembly



Base Cover Assembly

NO.	CODE	DESCRIPTION	QTY
1	PH1742700	BASE FRAME	1
2	PT6680100	RUBBER FOOT	4
3	PA3741000	FRAME BRACKET	1
4	MD4301022	PAN HEAD SCREW	3
5	PA3742500	FRAME BRACKET	1
6	MD4301022	PAN HEAD SCREW	2
7	PT9689000	MAGNET	1
8	MD4301022	PAN HEAD SCREW	2
9	PZ0740500	COVER (FRONT)	1
10	MD4401022	PAN HEAD SCREW	4
11	PE1680200	PROTECTOR	1
12	PE6740300	DIP SW COVER	1
13	PH1742900	CENTER FRAME	1
14	MD4401022	PAN HEAD SCREW	3
15	PA1775400	PCB BRACKET	2
16	MD4300622	PAN HEAD SCREW	7
17	PH1741800	CENTER FRAME SUB(A)	1
18	MD4300622	PAN HEAD SCREW	2
19	PZ0740800	COVER (REAR) SA	1
20	MD4300622	PAN HEAD SCREW	7
22	PH3683802	LID	1
23	PT9520100	NYLON RIVET	2
24	PH1741600	COVER (LH)	1
25	MD4300822	PAN HEAD SCREW	2
26	PZ0740901	COVER (RH) SET	1
27	PT3681200	HINGE	2
28	MD4300822	PAN HEAD SCREW	8
29	PH2680000	WINDOW	1
30	NA1030022	FLAT WASHER(POLISHED)	2
31	MT1300522	HEX NUT	2
32	PE1680300	HANDLE	1
33	MH0300821	PAN HEAD P-TIGHT SCREW	2
34	PH1741500	COVER (TOP)	1
35	MD4300822	PAN HEAD SCREW	2
36	PH1741700	COVER (TOP SUB)	1
37	PT9689000	MAGNET	1
38	NA1030022	FLAT (POLISHED)	2
39	NB0030022	SPRING WASHER	2
40	MT1300522	HEX NUT	2

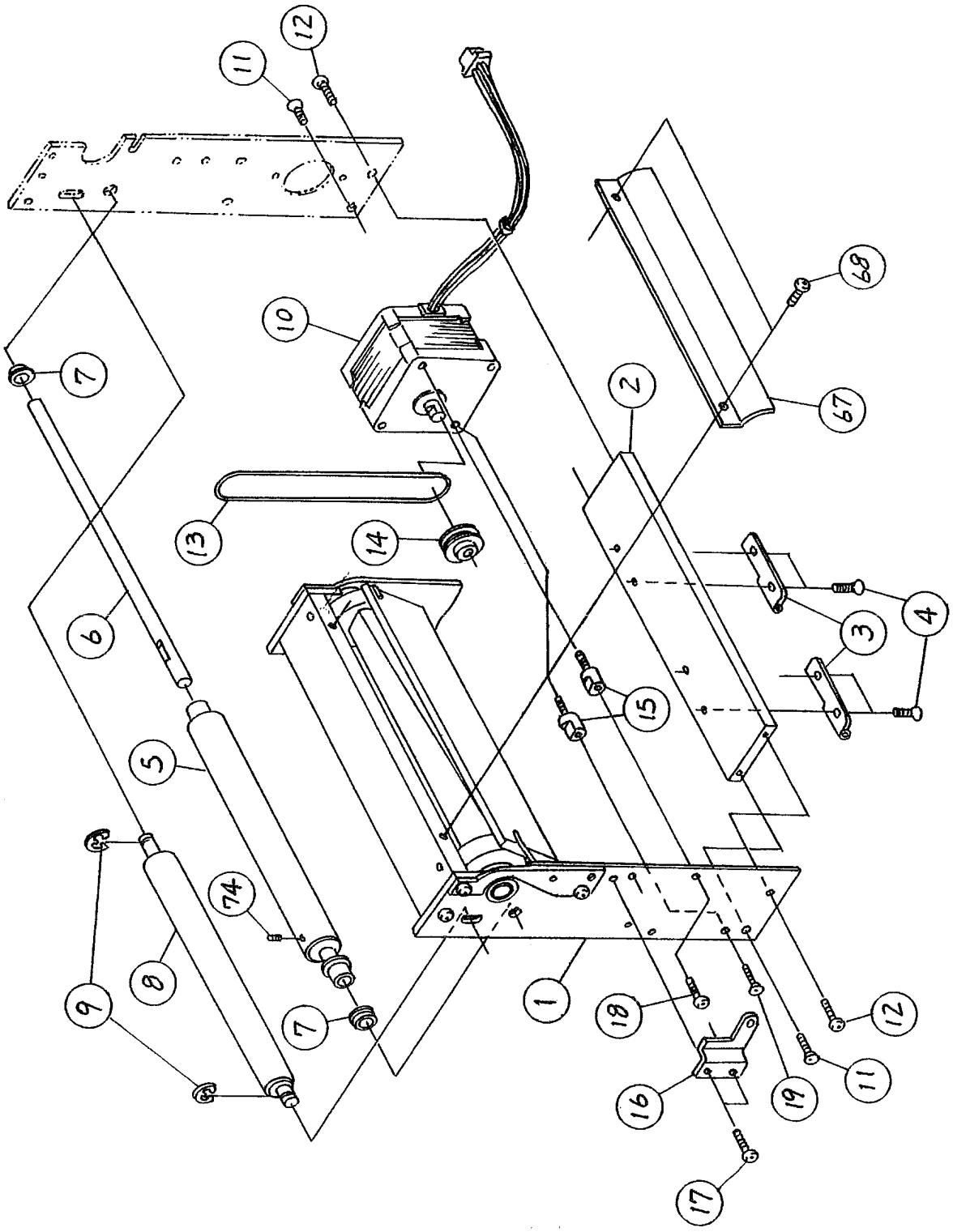
Base Cover Assembly

NO.	CODE	DESCRIPTION	QTY
41	NA1030022	FLAT (POLISHED)	2
42	NB0030022	SPRING WASHER	2
43	MT1300522	HEX NUT	2
44	PH3683002	COVER (FRONT)	1
45	PH1741000	COVER (FRONT) SUB	1
46	NA1030022	FLAT WASHER (POLISHED)	2
47	NB0030022	SPRING WASHER	2
48	MT1300522	HEX NUT	2
49	MD4401022	PAN HEAD SCREW	1
50	PB0740701	SHAFT (UNWIND)	1
51	MD4301422	PAN HEAD SCREW	1
52	MJ1400524	HEX HOLE SCREW W-POINT	1
53	PB2680700	SPACER	1
54	PA2680100	LABEL GUIDE PLATE	1
55	PE2680200	SPACER	1
56	PV3680000	PAPER GUIDE (ADDITIONAL PROCESSED)	1
57	MH0302021	PAN HEAD SCREW	3
58	PE4080100	PAPER GUIDE	2
59	PT2016010	DRY METAL	4
60	PE4210100	GUIDE CORE (3INCH)	1
61	MH0300821	PAN HEAD P-TIGHT SCREW	1
62	PT92100QY	O-RING	1
63	ND3160024	C-TYPE STOP RING	1
64	PB2080400	ROLL STOP	1
65	PE4080200	GUIDE STOPPER	1
66	PA1210400	PRESSING SPRING	1
67	MH1300821	FLAT P-TIGHT SCREW	2
68	KA500831A	POWER UNIT (115V)	1
69	HD100321A	FUSE(250V/3.15A)	1
70	RH1775100	HEAD CABLE ASSY	1
71	MD4300822	PAN HEAD SCREW	3
73	PE6771001	MEMORY CARD COVER	1
74	PB5A20001	HEAD SCREW	1
80	RH1686101	POWER SWITCH SUB	1
81	PH1688300	LOCK PLATE	1
82	RH1740700	LCD CABLE SET	1
83	MD4200621	PAN HEAD SCREW	2
84	RJ2741000	KB PC SA	1

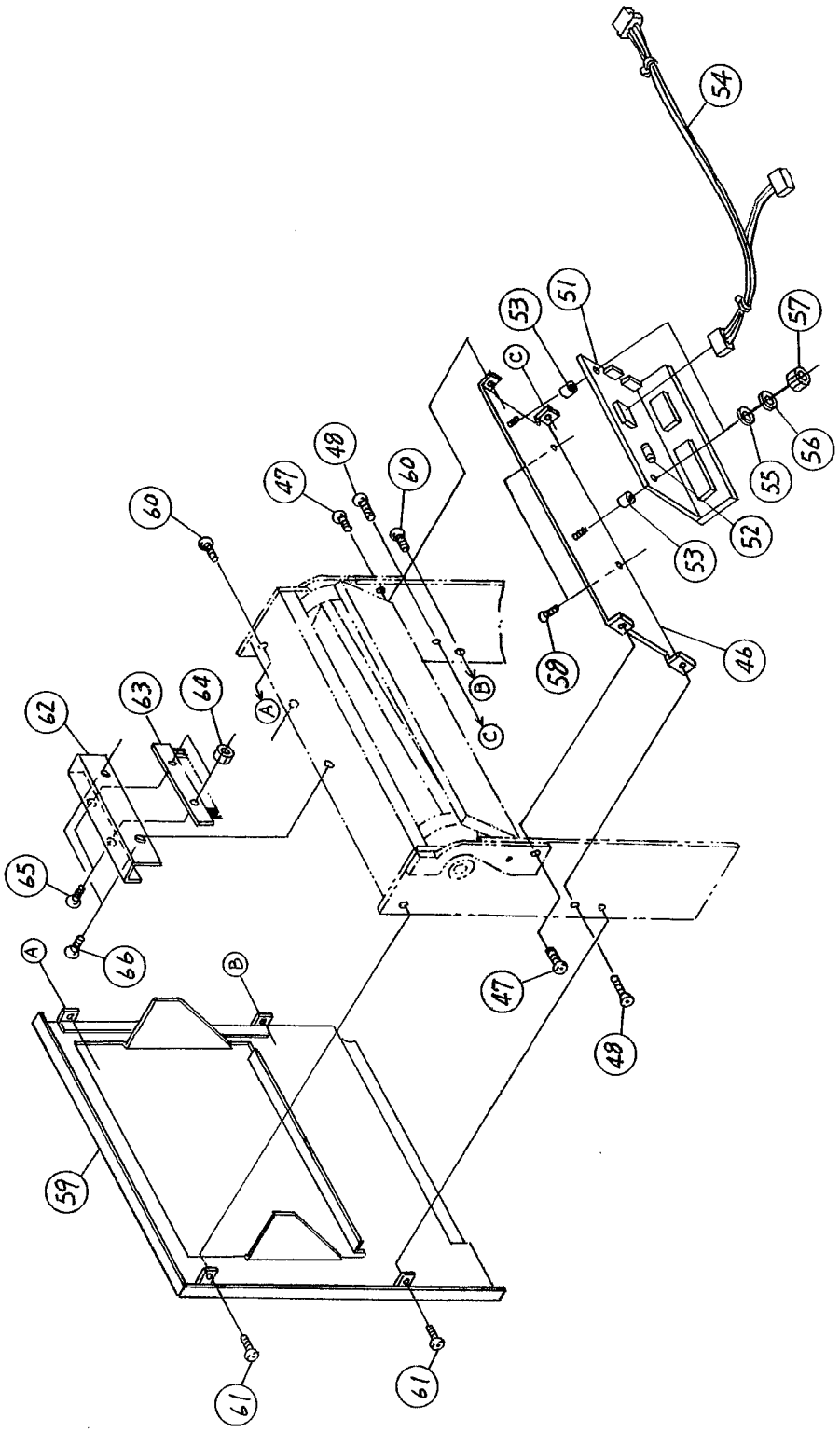
Base Cover Assembly

NO.	CODE	DESCRIPTION	QTY
85	MA0300621	PAN HEAD SCREW	2
86	PE6740400	DSW1 COVER	1
87	PA1774300	LID	1
88	PA6685400	NUT PLATE	1
89	MD3201221	PAN HEAD SCREW	2
96	PV9740400	BUSHING	1
97	MD4300622	PAN HEAD SCREW	2
98	PA6740200	SHEILD PLATE	1
99	PV9740500	BUSHING	1
100	RH1742000	KB CABLE SET (KB)	1
101	PH1742500	SWITCH PLATE	1
103	RJ1771200	CONT PCB ASSY-A	1
105	RJ7770200	MEMORY PCB ASSY-B	1
106	PA3739900	CONNECTOR LOCK	1
107	PC9730100	SPRING (LOCK)	1
108	RJ7770300	MEMORY PCB	
		(4 MB UPGRADE OPTION)	1
122	WCL404070	IEEE-1284 PARALLEL INTERFACE	1
123	WCL404051	SERIAL INTERFACE	1
124	WCL404060	USB INTERFACE	1
125	11S000158	ETHERNET INTERFACE	1
126	11S000136	CX/TX INTERFACE	1
134	RJ4770100	MEMORY KIT, (OPTION)	1

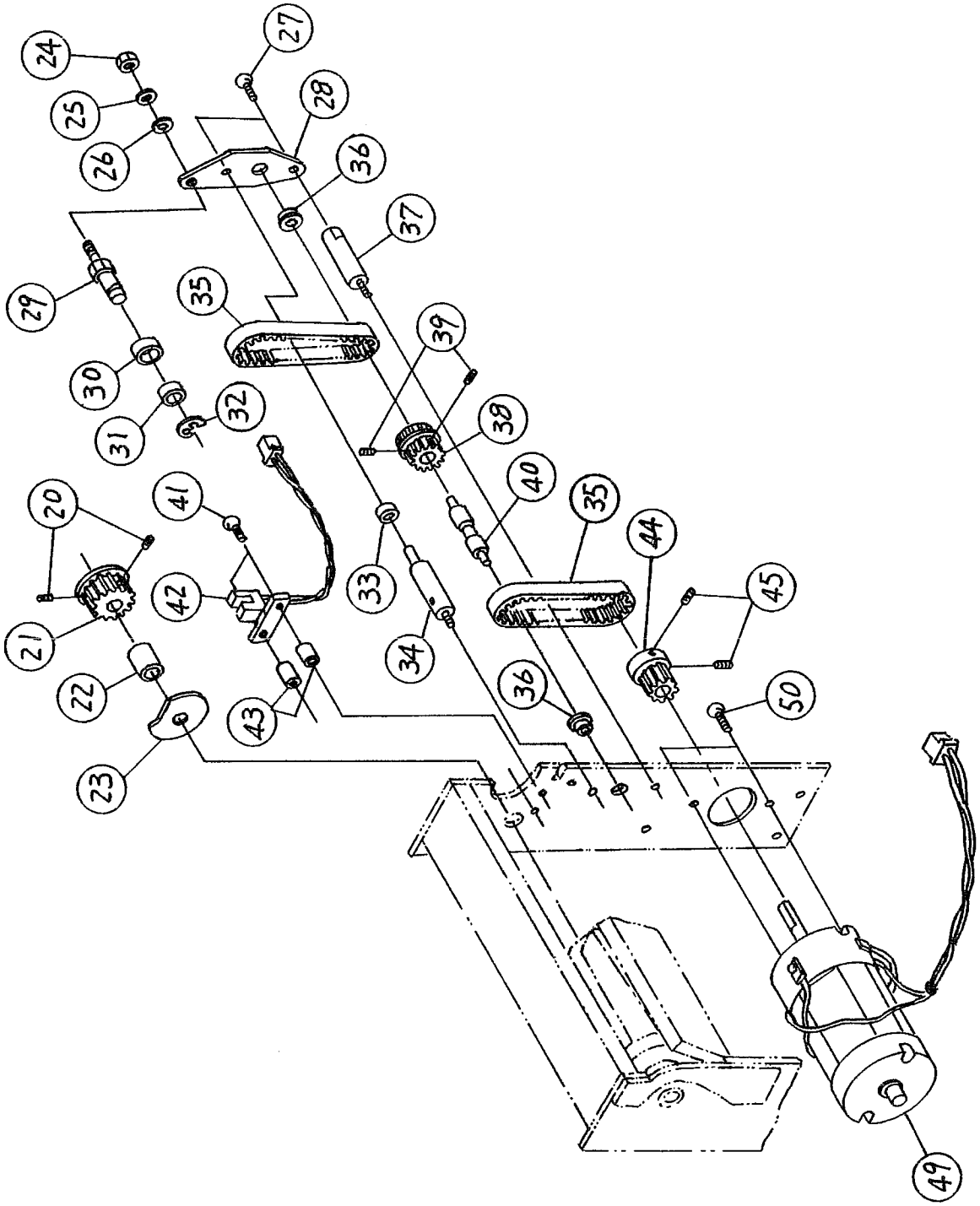
10.7 Cutter Unit Assembly



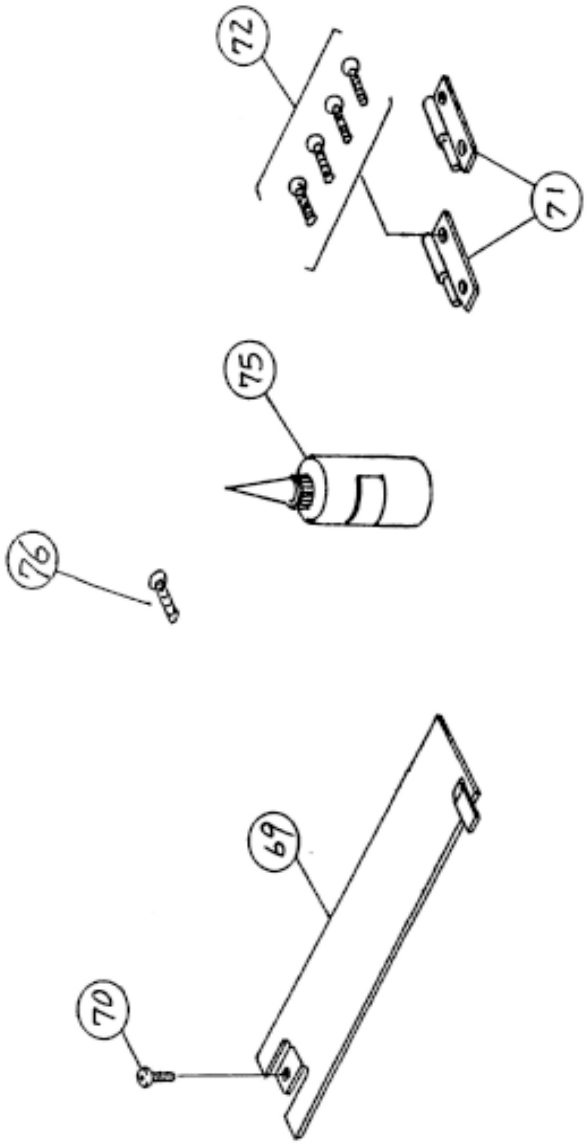
Cutter Unit Assembly



Cutter Unit Assembly



Cutter Unit Assembly



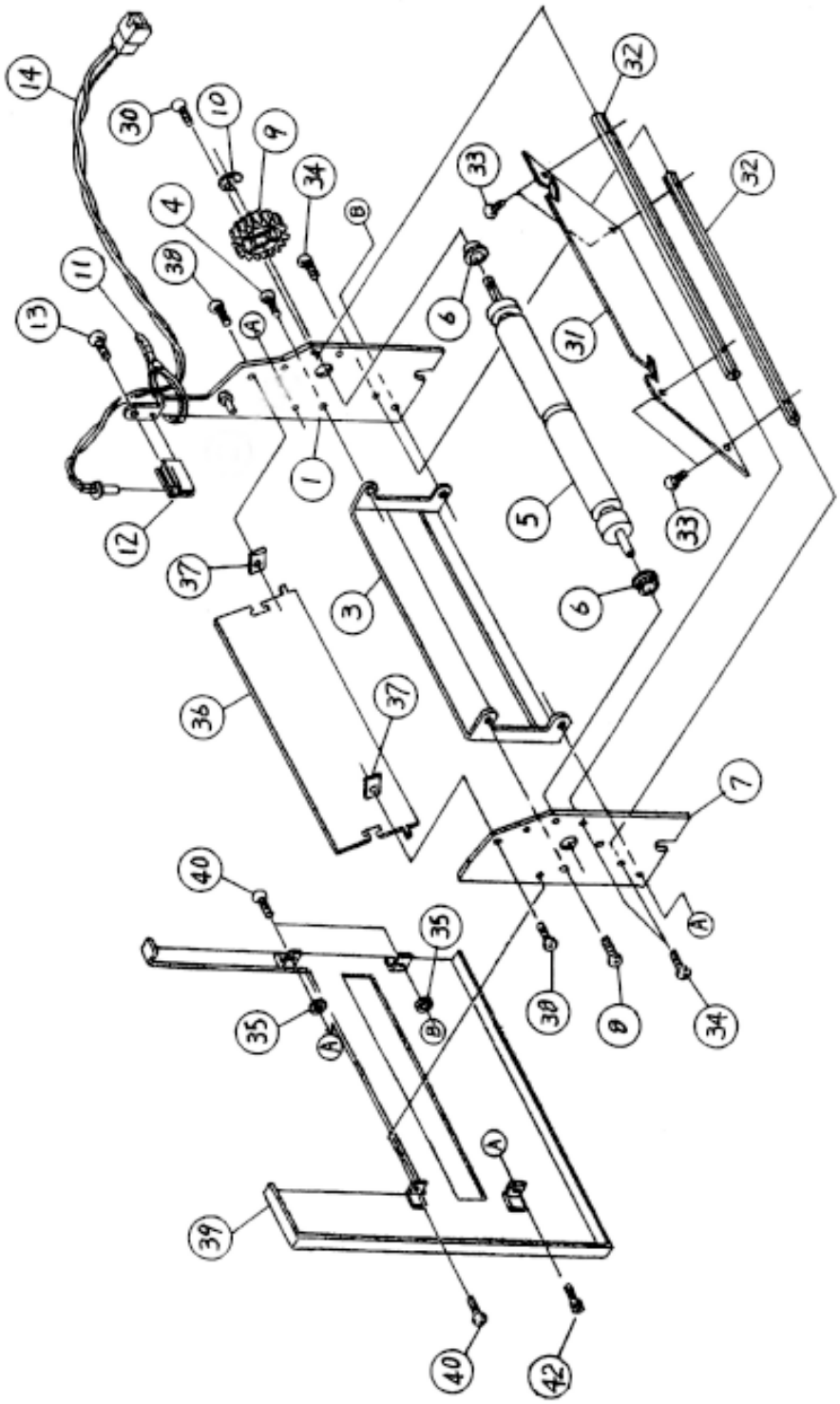
Cutter Unit Assembly

NO.	CODE	DESCRIPTION	QTY
1	PR4680600	Cutter Unit	1
2	PD1680301	Stay	1
3	PT3000100	Hinge	2
4	MA1300822	Flat Head Screw	4
5	PB3680700	Feed Roller	1
6	PB0682500	Feed Roller Shaft	1
7	PT1108050	Ball Supporter	2
8	PB3680200	Roller	1
9	ND0030030	E-snap Ring	2
10	RB0680300	Motor Sub	1
11	MA1400822	Flat Head Screw	2
12	MD4401022	Pan Head Screw	2
13	PT9680300	O-Ring Belt	1
14	PE8680400	Motor Pulley	1
15	PB0682600	Motor Post	2
16	PA3684600	Cutter Bracket(A)	1
17	MD4300622	Pan Head Screw	2
18	MD4300822	Pan Head Screw	1
19	MA1300822	Flat Head Screw	1
20	MJ1300424	W-point Screw	2
21	PR1691401	Cutter Pulley	1
22	PE3690701	Spacer	1
23	PA0680701	Sensor Slit	1
24	MT1300522	Hex nut	1
25	NB0030022	Spring Washer	1
26	NA1030022	Plain Washer	1
27	MD4300822	Pan Head Screw	2
28	PA1690000	Idle Gear Bracket	1
29	PB0690300	Roller Shaft	1
30	PE3690001	Tension Roller	1
31	PT2006008	Dry Metal	1
32	ND0050030	E-snap Ring	1
33	PT2005008	Dry Metal	1
34	PB0686500	Idle Bracket Shaft (B)	1
35	PT9690600	Timing Belt	2
36	PT1107030	Ball Supporter	2
37	PB0682400	Idle Bracket Shaft	1
38	PR1691502	Idle Pulley	1
39	MJ1300424	W-point Screw	2

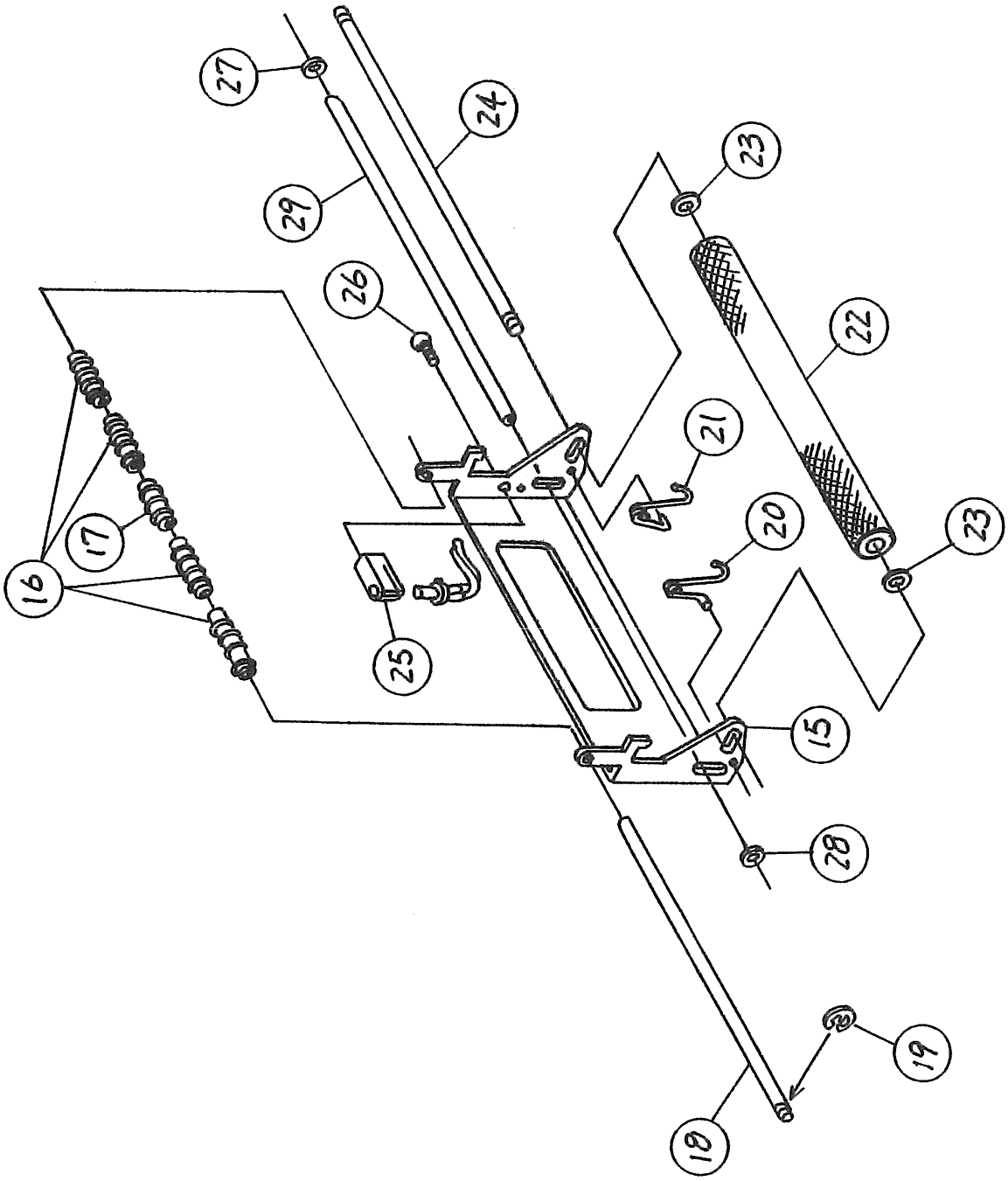
Cutter Unit Assembly

NO.	CODE	DESCRIPTION	QTY
40	PB0682300	Idle Pulley Shaft	1
41	MD3301222	Pan Head Screw	2
42	RF0680501	Sensor Sub	1
43	PE2680600	Spacer	2
44	PR1691601	Motor Pulley	1
45	MJ1300424	W-point Screw	2
46	PA3681400	Guide Plate	1
47	MD4300822	Pan Head Screw	2
48	MA1300822	Flat Head Screw	2
49	RB0680200	Motor Sub	1
50	MD4300822	Pan Head Screw	2
51	RJ1682300	Cutter PCB Assy	1
52	HD200031A	Fuse(3A)	1
53	PE2680900	PCB Spacer	2
54	RH1745101	Cutter Cord Set	1
55	NA1030022	Plain Washer	2
56	NB0030022	Spring Washer	2
57	MT1300522	Hex nut	2
58	MA1300822	Flat Head Screw	2
59	PH3684103	Cutter Cover	1
60	MA1300822	Flat Head Screw	2
61	MD4300622	Pan Head Screw	2
62	PA3684700	Brush Bracket	1
63	PR1340500	Brush	1
64	MT1250422	Hex Nut	2
65	MA1250621	Flat Head Screw	2
66	MD0300622	Pan Head Screw	2
67	PA3683600	Cutter Protect	1
68	MD4300822	Pan Head Screw	2
69	PH3684202	Center Frame Sub (B)	1
70	MD4300622	Pan Head Screw	1
71	PT3000100	Hinge	2
72	MD4300822	Pan Head Screw	4
74	MJ1300424	W-point Screw	1
75	QD9480100	Cutter Oil	1
76	MD4401022	Pan Head Screw	1

10.8 Dispenser Unit Assembly



Dispenser Unit Assembly



Dispenser Unit Assembly

NO.	CODE	DESCRIPTION	QTY
1	PR1680500	Frame (L)	1
3	PA3685100	Cutter Plate	1
4	MD0300622	Pan Head Screw	1
5	PR0681900	Feed Roller	1
6	PE2680400	Bush	2
7	PR1681800	Frame (R)	1
8	MD0300622	Pan Head Screw	1
9	PE6680300	Feed Roller Gear	1
10	ND0040030	E-snap Ring	1
11	JG100011A	Tie Wrap	1
12	PE1570300	Dispense Sensor Bracket	1
13	MH0250621	P-tight Screw	1
14	RH1681100	Dispense Sensor Cord Set	1
15	PA3685000	Dispense Roller Bracket	1
16	PE1010201	Dispense Roller	4
17	PV0681100	Dispense Roller	1
18	PB0685300	Dispense Roller Shaft	1
19	ND0020030	E-snap Ring	1
20	PC2680102	Spring	1
21	PC2680101	Spring	1
22	PB3680101	Pressure Roller	1
23	PT2005006	Dry Metal	2
24	PB0682201	Pressure Roller Shaft	1
25	PE1570300	Dispense Sensor Bracket	1
26	MH0250621	P-tight Screw	1
27	PB2681701	Spacer(B)	1
28	PA0680601	Spacer	1
29	PB0682000	Guide Shaft	1
30	MD0300622	Pan Head Screw	1
31	PA3684900	Paper Guide	1
32	PB1680100	Stay	2
33	MA1250621	Flat Head Screw	4
34	MA1300622	Flat Head Screw	3
35	PA0681300	Spacer	2
36	PA2681900	Dispense Plate	1
37	PA1680400	Nut Plate	2
38	MA1300622	Flat Head Screw	2
39	PH3684302	Dispense Cover	1
40	MD4300822	Pan Head Screw	3
42	MD4300622	Pan Head Screw	1

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