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**OKIDATA<sup>®</sup>**  
**Service Manual**

**ML320/ML321**  
**Dot Matrix Printers**

Adobe Acrobat printable reference  
copy of the OKIDATA Service Training Manual.  
09/17/97

**Note: This Adobe Acrobat version of the Okidata Service Training Manual was built with the pictures rendered at 300 dpi, which is ideal for printing, but does not view on most displays well.**

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## Service Guide ML320/ML321

### Chapter 0 About This Manual

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**Chapter 0 About This Manual**

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**Manual Part Number and Revision**

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## Service Guide ML320/ML321

### Chapter 1 Product Specifications

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#### 1.1 GENERAL DESCRIPTION

The Microline 320 and Microline 321 are nine pin, dot matrix printers. Two versions of the printers are available. The first provides Microline emulation. The second version provides Epson and IBM Proprinter emulations, which are selected through the Printer Menu.

The major difference between the Microline 320 and Microline 321 is the width of each printer. The Microline 320 can handle 80 print columns (at 10 CPI). The Microline 321 can print up to 136 columns (at 10 CPI).

The standard interface is a Centronics parallel and an optional RS232-C serial interface can be installed. The optional serial interface can transfer data at speeds up to 19.2K baud.

Both printers feature an enhanced operator panel which provides access to the following capabilities.

- Menu Selection
- Quiet Mode
- Printer Tests
- Paper Park
- Print Characteristics
- Standard Printer Controls

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### 1.1.02 Serial Number Identification & (A-D) Revision Levels

#### A

Rev A units are original production units. An interconnect module connects the power supply board to the main control board.

#### B

Rev B units are retrofitted to include a modified interconnect module, which prevents corrosion.

#### C

Rev C units have a cable harness connection between the power supply board and the main control board. The cable harness replaces the interconnect module.

#### D

Rev D units have no power supply board. The circuitry for the power supply board has been incorporated on the main control board.


#### Please Note the following:

The Rev C main control board (LXMC) and power supply board (SU11) are downward compatible with Rev A and B units.

The Rev A and Rev B main control board (LXMC) and power supply board (PA11) cannot be used in Rev C units.

Rev D units do **NOT** use Rev A, Rev B, or Rev C main control boards, transformers, operator panels, upper covers, and lower covers. Rev D units have a unique main control board (LXMR), no power supply board, a 50 volt transformer, and a unique operator panel (LXON).

#### NOTE:

Please refer to the parts lists (Appendix B

#### Printer Serial Number Identification

There are four serial number revision levels for the Microline 320 and 321 printers. Hardware differences exist between levels. To identify the revision level of a printer, record the serial number from the back of the printer. **Refer to the following to decode the serial number.**

**Example Printer Serial Number: 401D0154693**

**Date Code**      401 (4 = year. 01 = month)  
**Revision**        D  
**Serial Number** 0154693

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
LXMC Board	55041411	Main Control Board	Yes	Yes	No	No
LXMC-3 Board	55041412	Main Control Board	Yes	Yes	Yes	No
LXMR	55075111	Main Control Board (with SSD)	No	No	No	Yes

### Power Supply Board

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
PAII-2 Board	55039902	Power Supply Board	Yes	Yes	No	No
SUII-2 Board	55047402	Power Supply Board	Yes	Yes	Yes	No
N/A	N/A	Power supply function included on the Main Control Board	No	No	No	Yes

### Operator Panel Assembly

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
LXSP-2	55038602	Operator Panel Board	Yes	Yes	Yes	No
LXON	55075011	Operator Panel Board (with SSD)	No	No	No	Yes
N/A	50069603	Operator Panel Bezel	Yes	Yes	Yes	No
N/A	50107426	Operator Panel Bezel (with SSD)	No	No	No	Yes

### Transformer

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
120 Volt XFRMR	56407503	Transformer - Microline 320	Yes	Yes	Yes	No

120 Volt XFRMR	56407502	Transformer - Microline 321	Yes	Yes	Yes	No
120 Volt XFRMR	56413201	Transformer - Microline 320 (with SSD)	No	No	No	Yes
120 Volt XFRMR	56413202	Transformer - Microline 321 (with SSD)	No	No	No	Yes

#### Interconnect Module

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Interconnect Module	55328301	Connects power supply board to main board	Yes	Yes	No	No

#### Cable

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cable	56616802	Connects power supply board to main board	No	No	Yes	No

#### Cable Guide

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cable Guide	51003801	Holds cable in place	No	No	Yes	Yes

#### Covers

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cover	53488302	Middle Cover - Microline 320	Yes	Yes	Yes	No
Cover	53488402	Middle Cover - Microline 321	Yes	Yes	Yes	No

Cover	53070701	Middle Cover - Microline 320 (with SSD)	No	No	No	Yes
Cover	53070801	Middle Cover - Microline 321 (with SSD)	No	No	No	Yes

**Chassis**

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Chassis	50061101	Middle Cover - Microline 320	Yes	Yes	Yes	No
Chassis	50061201	Middle Cover - Microline 321	Yes	Yes	Yes	No
Chassis	50104501	Middle Cover - Microline 320 (with SSD)	No	No	No	Yes
Chassis	50104601	Middle Cover - Microline 321 (with SSD)	No	No	No	Yes

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## Service Guide ML320/ML321

### Chapter 1 Product Specifications

#### Compatibility Chart

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
LXMC Board	55041411	Main Control Board	Yes	Yes	No	No
LXMC-3 Board	55041412	Main Control Board	Yes	Yes	Yes	No
LXMR	55075111	Main Control Board (with SSD)	No	No	No	Yes

#### Power Supply Board

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
PAII-2 Board	55039902	Power Supply Board	Yes	Yes	No	No
SUII-2 Board	55047402	Power Supply Board	Yes	Yes	Yes	No
N/A	N/A	Power supply function included on the Main Control Board	No	No	No	Yes

#### Operator Panel Assembly

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
LXSP-2	55038602	Operator Panel Board	Yes	Yes	Yes	No
LXON	55075011	Operator Panel Board (with SSD)	No	No	No	Yes
N/A	50069603	Operator Panel Bezel	Yes	Yes	Yes	No
N/A	50107426	Operator Panel Bezel (with SSD)	No	No	No	Yes

### Transformer

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
120 Volt XFRMR	56407503	Transformer - Microline 320	Yes	Yes	Yes	No
120 Volt XFRMR	56407502	Transformer - Microline 321	Yes	Yes	Yes	No
120 Volt XFRMR	56413201	Transformer - Microline 320 (with SSD)	No	No	No	Yes
120 Volt XFRMR	56413202	Transformer - Microline 321 (with SSD)	No	No	No	Yes

### Interconnect Module

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Interconnect Module	55328301	Connects power supply board to main board	Yes	Yes	No	No

### Cable

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cable	56616802	Connects power supply board to main board	No	No	Yes	No

### Cable Guide

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cable Guide	51003801	Holds cable in place	No	No	Yes	Yes

### Covers

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cover	53488302	Middle Cover - Microline 320	Yes	Yes	Yes	No
Cover	53488402	Middle Cover - Microline 321	Yes	Yes	Yes	No
Cover	53070701	Middle Cover - Microline 320 (with SSD)	No	No	No	Yes
Cover	53070801	Middle Cover - Microline 321 (with SSD)	No	No	No	Yes

### Chassis

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Chassis	50061101	Middle Cover - Microline 320	Yes	Yes	Yes	No
Chassis	50061201	Middle Cover - Microline 321	Yes	Yes	Yes	No
Chassis	50104501	Middle Cover - Microline 320 (with SSD)	No	No	No	Yes
Chassis	50104601	Middle Cover - Microline 321 (with SSD)	No	No	No	Yes

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## 1.2 PRODUCT SPECIFICATIONS

### 1.2.01 Print Method

Impact Dot Matrix  
Number of Print Wires: 9  
Print Wire Diameter: .013 inch (.34 mm)

### 1.2.02 Print Modes

Revs A, B, and C  
High Speed Draft (HSD)  
Utility  
Near Letter Quality (NLQ)

Rev D  
Super Speed Draft (SSD)  
High Speed Draft (HSD)  
Utility  
Near Letter Quality (NLQ)

### 1.2.03 Character Pitches

10 CPI  
12 CPI  
17.1 CPI  
20 CPI  
Proportional (not available in High Speed Draft mode)

### 1.2.04 Character Sets

Standard (Microline) Version  
Standard ASCII  
IBM Line Graphics  
Down-Line Loadable (DLL)  
Block Graphics

Epson/IBM Version  
Character Set I  
Character Set II  
DLL (not available through Menu)

NOTES:            Characters Per Inch = cpi  
                     Characters Per Second = cps  
                     Dots Per Inch = dpi  
                     Character Sets are selected through the Menu

### 1.2.05 Print Speed

NOTE: Super Speed Draft (SSD) is available ONLY with Rev D units.

Character Pitch

<u>Print Mode</u>	<u>10 cpi</u>	<u>12 cpi</u>	<u>17.1cpi</u>	<u>20 cpi</u>
SSD	N/A	360 cps	N/A	N/A
HSD	300 cps	300 cps	300 cps	300 cps
Utility	250 cps	250 cps	250 cps	250 cps
NLQ	62.5 cps	62.5 cps	62.5 cps	62.5 cps

Print Speed at Different CPI for the ML 320/321

<b>Mode</b>	<b>CPI</b>	<b>CPS</b>	<b>Horiz. DPI</b>	<b>Vert DPI</b>	<b>LPS</b>
SSD	12	360	192		30.0
HSD	10	300	100		30.0
	12	300	120		25.0
	17.1	300	171		17.5
	20	300	200		15.0
Utility	10	250	120		25.0
	12	250	144		20.8
	17.1	250	206		14.6
	20	250	240		12.5
LQ (2 Pass Print)	10	62.5	240		6.25
	12	62.5	288		5.20
	17.1	62.5	412		3.64
	20	62.5	480		3.12

**1.2.06 Print Resolution**

NOTE: Super Speed Draft (SSD) is available ONLY with Rev D units.

<u>Print Mode</u>	<u>Character Pitch</u>			
	<u>10 cpi</u>	<u>12 cpi</u>	<u>17.1cpi</u>	<u>20 cpi</u>
HSD	100 dpi	120 dpi	171.4 dpi	200 dpi
Utility	120 dpi	144 dpi	205.7 dpi	240 dpi
NLQ	240 dpi	288 dpi	411.4 dpi	480 dpi

**1.2.07 Character Matrix Sizes**

NOTE: SSD is available ONLY with Rev. D units.

<b>PRINT MODE</b>	<b>MATRIX SIZE</b>
SSD	7 x 7
HSD	7 X 7
Utility	9 X 7
NLQ	17 X 13

### 1.2.08 Paper Feed Specification

Available Paper Paths

Rear

Top

Bottom Feed

NOTE: Bottom Feed requires the use of the optional pull tractor

### Line Feed Increments

1/6", 1/8", n/72", n/144", n/288" and n/216".

### Line Feed Timing

70 ms @ 6 lines per inch

60 ms @ 8 lines per inch

Slew Rate: 4.5 inches per second (Continuous Feed Paper)

### 1.2.09 Interface Specifications

Centronics Parallel (Standard)

RS232C Serial (Optional)

**NOTE:** Interface cables are sold separately.

A shielded cable is required. Twisted-pair wires are recommended for noise protection.

Parallel interface cables should be no more than 16.4 feet (5 m) in length.

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### 1.3 PAPER SPECIFICATIONS

#### 1.3.01 Width

##### Microline 320

Minimum: 3 inches (76.2 mm)

Maximum: 10 inches (254 mm)

##### Microline 321

Minimum: 3 inches (76.2 mm)

Maximum: 16 inches (406.4 mm)

#### 1.3.02 Single Part Forms

##### Weight

Minimum: 12 pound (45 g/m<sup>2</sup>)

Maximum: 24 pound (90 g/m<sup>2</sup>)

##### Thickness

Maximum: 0.014 inches (0.356 mm)

#### 1.3.03 Multipart Forms - Carbon Lined or Pressure Sensitive

##### Weight

Minimum: 9 pound (35 g/m<sup>2</sup>)

Maximum: 11 pound (40 g/m<sup>2</sup>)

##### Thickness

Maximum: 0.014 inches (0.356 mm)

##### Number of Copies

Original plus four copies

#### 1.3.04 Multipart - Interleaf

##### Weight

##### Paper

Minimum: 10 pound (38 g/m<sup>2</sup>)

Maximum: 12 pound (45 g/m<sup>2</sup>)

##### Carbon

Maximum: 9 pound (35 g/m<sup>2</sup>)

##### Thickness

Maximum: 0.014 inches (0.356 mm)

##### Number of Copies

Original plus four copies

#### 1.3.05 Cut Sheets (Single Part ONLY)

##### Friction Feed

##### Weight

Minimum: 12 pound (45 g/m<sup>2</sup>)

Maximum: 24 pound (90 g/m<sup>2</sup>)

##### Thickness

Maximum: 0.014 inches (0.356 mm)

Cut Sheet Feeder 3000

##### Weight

Minimum: 12 pound (45 g/m<sup>2</sup>)

Maximum: 24 pound (90 g/m<sup>2</sup>)  
Thickness  
Maximum: 0.014 inches (0.356 mm)

### 1.3.06 Envelopes (Individual)

Weight  
Maximum: 24 pound maximum (90 g/m<sup>2</sup>)  
Thickness  
Maximum: 0.016 inches (0.41 mm)  
Dimensions  
6.5 inches x 3 5/8 inches  
8 7/8 inches x 3 7/8 inches  
9.5 inches x 4 1/8 inches

### 1.3.07 Envelopes (Continuous)

NOTES: Continuous Feed Envelopes should be used ONLY with bottom feed.

Weight  
Maximum: 24 pound (90 g/m<sup>2</sup>)  
Thickness  
Maximum: 0.014 inches (0.36 mm)  
Width  
Minimum: 3 inches (76.2 mm)  
Maximum: 10 inches (354 mm)

### 1.3.08 Card Stock

NOTES: Card Stock should be used ONLY with bottom feed.  
Set the head gap at Position 2 for 100 pound card stock.

Weight  
Maximum: 100 pound (150 g/m<sup>2</sup>)  
Thickness  
Maximum: 0.008 inches (0.20 mm)  
Dimensions  
Maximum: 5 inches x 8 inches

### 1.3.09 Labels

NOTES: Labels should be used ONLY with bottom feed.  
Do NOT use fabric labels.  
Do NOT print on the edge or perforation of the label.

Carrier Width  
Maximum: 8.5 inches (216 mm) Microline 320  
Maximum: 15 inches (381 mm) Microline 321  
Thickness  
Maximum: 0.011 inches (0.28 mm)

### 1.3.10 Transparencies

Thickness  
Maximum: 0.004 inches (0.10 mm)  
Dimensions  
Maximum: 8.5 inches wide x 11 inches long (216 mm x 260 mm)

---

## 1.4 PHYSICAL SPECIFICATIONS

### 1.4.01 Printer Dimensions

The printer dimensions do not include the platen knob, acoustic cover, or paper separator

<u>Product</u>	<u>Height</u>	<u>Width</u>	<u>Depth</u>
320	4.6"	15.7"	13.6"
321	4.6"	21.7"	13.6"

### 1.4.02 Weight

#### Microline 320

Revs A, B, and C:	16 pounds
Rev D:	17.2 pounds (7.8 kg)

#### Microline 321

Revs A, B, and C:	20 pounds
Rev D:	22.2 pounds (10.1 kg)

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**1.5 POWER REQUIREMENTS****1.5.01 Input Power Requirements**

Single Phase AC  
Voltage

120 VAC +5.5%, -15%  
or  
220/240 VAC +10%, -15%

Frequency

50/60 Hz +/- 2%

**1.5.02 Power Consumption**

Revs A, B, and C

Operating: 315 VA

Idle: 80 VA

Rev D

Operating: 70 VA

Idle: 25 VA

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**1.6 ENVIRONMENTAL REQUIREMENTS****1.6.01 Temperature**

Operating

41 through 104 degrees Fahrenheit (5 to 40 degrees Celsius)

Non-Operating

14 through 109.4 degrees Fahrenheit (-10 to 43 degrees Celsius)

Storage

-40 through 158 degrees Fahrenheit (-40 to 70 degrees Celsius)

**1.6.02 Relative Humidity**

Operating

20% to 90%

Non-Operating

5% to 95%

Storage

5% to 95%

**1.6.03 Acoustic Specifications**

Standard Operation

57 dba

Quiet Mode

52 dba



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**1.7 AGENCY APPROVALS**

**1.7.01 Listings**

Revs A, B, C, and D

UL Standard No. 478

CSA Standard C22.2 No. 220

FCC Part 15, Subject J, Class B

Revs A, B, and C

VDE 0806, VDC 0875 Class B

BS5850

Rev D

VDE 0806, VFG 0243 Class B

BS7002

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**1.8 OPTIONS**

Pull Tractor with Acoustic Cover  
Cut Sheet Feeder with Access Cover (CSF-3000A)  
Super-Speed RS232-C Serial Interface Board

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**1.9 CONSUMABLES**

**1.9.01 Cartridge Ribbon**

Black

3 million character ribbon life

Re-inking cartridge

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**1.10 MEMORY SPECIFICATIONS**

- 1.10.01 DRAM  
60 Kbytes
- 1.10.02 Working RAM  
15.3 Kbytes
- 1.10.03 Print Buffer  
3.5 Kbytes
- 1.10.04 Image Buffer  
13.2 Kbytes
- 1.10.05 Receive Buffer  
Epson Mode: 28 Kbytes  
IBM Mode: 16 Kbytes

---

**1.11 RELIABILITY SPECIFICATIONS**

**1.11.01 Mean Time Between Failures (MTBF)**

5000 hrs @ 25% duty cycle, 35% page density

**1.11.02 Mean Time To Repair (MTTR)**

15 minutes @ major sub-assembly level

**1.11.03 Printer Life**

12,000 hrs @ 25% duty cycle, 35% page density

**1.11.04 Ribbon Life**

3 million characters

**1.11.05 Printhead Life**

200 million characters in 10 cpi utility print quality. 35% page density and 25% duty cycle

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## 2.1 PRINTER OVERVIEW

### 2.1.01 General Information

This section describes the operation of the printer. It is divided into three parts.

#### 1) Circuit Board Description

The major components of the main controller board are described and functional descriptions of the operator panel board and power supply are provided. Some signal names are listed with a (-N) after them. This means that the signal is "active" or ON when it is a logic "0". This is also indicated by a line over the signal name (I-PRIME).

#### 2) Electrical Operation

This section views the printer functions from an electrical perspective.

#### 3) Mechanical Operation

This section views the printer functions from a mechanical perspective.

### Serial Number Identification & (A-D) Revision Levels

#### A

Rev A units are original production units. An interconnect module connects the power supply board to the main control board.

#### B

Rev B units are retrofitted to include a modified interconnect module, which prevents corrosion.

#### C

Rev C units have a cable harness connection between the power supply board and the main control board. The cable harness replaces the interconnect module.

#### D

Rev D units have no power supply board. The circuitry for the power supply board has been incorporated on the main control board.

#### **Please Note the following:**

The Rev C main control board (LXMC) and power supply board (SU11) are downward compatible with Rev A and B units.

The Rev A and Rev B main control board (LXMC) and power supply board (PA11) cannot be used in Rev C units.

Rev D units do **NOT** use Rev A, Rev B, or Rev C main control boards, transformers, operator panels, upper covers, and lower covers. Rev D units have a unique main control board (LXMR), no power supply board, a 50 volt transformer, and a unique operator panel (LXON).

**NOTE:**

Please refer to the parts lists ([Appendix B](#)) for parts differentiation. Please be sure of the parts you need before ordering to avoid confusion and incorrect parts orders.

**Printer Serial Number Identification**

There are four serial number revision levels for the Microline 320 and 321 printers. Hardware differences exist between levels. To identify the revision level of a printer, record the serial number from the back of the printer. Refer to the following to decode the serial number.

Example Printer Serial Number: 401D0154693

Date Code	401 (4 = year. 01 = month)
Revision	D
Serial Number	0154693





**For more information see the compatibility chart ([📄](#)).**

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**2.2 CIRCUIT BOARD DESCRIPTION**


Operator Panel Board	
Power Supply	
Control Board	
Large Scale Intergrated Circuitry	

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**2.2.01 Operator Panel Board****Rev A, B, C, and D**

The operator panel board contains switches and LED's which allow the end user to control and monitor the printer's operation. For specific information on the capabilities and use of the operator panel, please refer to Chapter 4 (  ) in the Printer Handbook.

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## 2.2.02 Power Supply

### Rev A, B, and C

The power supply consists of a power transformer, filter board and a DC power supply board. The AC input voltage is stepped down to 8.6 VAC, 46 VAC and 10 VAC by the power transformer. These AC voltages are converted into + 8 vdc, + 40 vdc, and + 5 vdc by the power supply board for use throughout the printer.

#### **Power Transformer**

If the transformer temperature rises above a pre-determined level, the built-in temperature fuse opens to prevent damage to components in the printer. Once this fuse opens, the transformer **MUST** be replaced.

#### **Filter Board**

The power switch, line fuse, and line filter are mounted on the filter board.

#### **Power Supply Board**

This board transforms AC voltages into + 5 vdc, + 8 vdc and + 40 vdc for use throughout the printer.

### Rev D

The power supply consists of the power transformer, a filter board, and power supply circuitry (located on the main controller board).

The input AC voltage is stepped down to 8.6 VAC, 46 VAC, and 10 VAC by the power transformer. These AC voltages are rectified into + 8 vdc, + 5 vdc, and + 50 vdc levels by the DC power supply circuitry on the main controller board.

---

### 2.2.03 Control Board

#### **Microprocessor**

The microprocessor is the nucleus of the control circuitry. All peripheral circuits operate under the control of the microprocessor.

For the Rev A, B, and C printers, the microprocessor is Q7 - 80C154.

For the Rev D printers, the microprocessor is Q1 - 80C154.

#### **Program Read Only Memory (ROM)**

The printer's control program and resident character fonts are stored in the Program ROM. The microprocessor operates under the control of this program.

For the Rev A, B, and C printers, the Program ROM is Q13 - 128 kilobytes.

For the Rev D printers, the Program ROM is Q4 - 64 kilobytes.

#### **Random Access Memory (RAM )**

The RAM stores the following information.

Data to be printed (Receive Buffer)

All character fonts

Q12 has a battery backup. Data is retained even after power is removed.

---

## Large Scale Integrated Circuitry (LSI)

**For the Rev A, B, and C printers, the LSI is Q11 - MSM6990**

**For the Rev D printers, the LSI is Q3 - 7U042-026.**

This is an external interface and motor control LSI. It performs the following functions.

### External Interface Controller

#### Parallel Interface Control

This circuit supplies signals used by the Centronics parallel interface.

#### Serial Interface Control

This circuit supplies signals used by the RS 232-C serial interface.

#### I/O Ports

Control signals are sent in response to commands input from the microprocessor. The input port is used to read information on the printer's condition.

#### Address Latch

It latches the low order eight bits of the address bus (A0 to A7). These bits are used as addresses for read/write operations with peripheral devices.

### Motor Controller

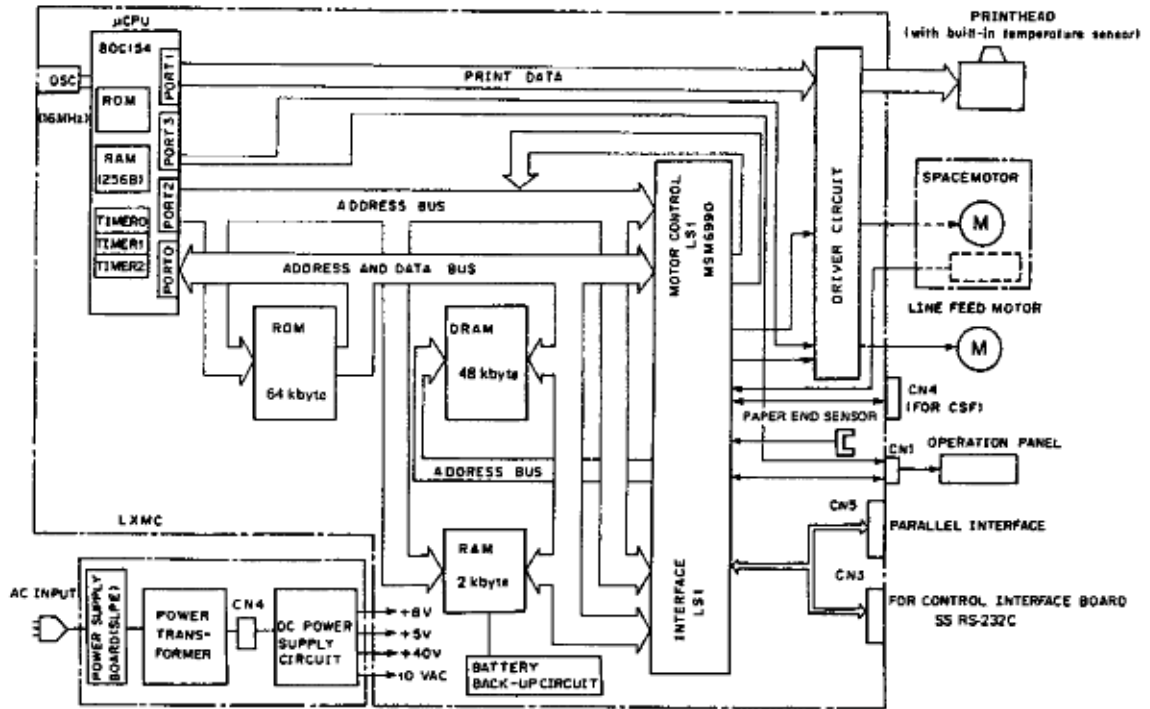
#### Spacing Motor Control

This function accelerates and decelerates the spacing motor in accordance with commands from the microprocessor and controls the spacing motor speed in various printing modes. Motor speed and direction are determined by monitoring the signals PHASE A and PHASE B, which are provided by the encoder on the spacing motor.

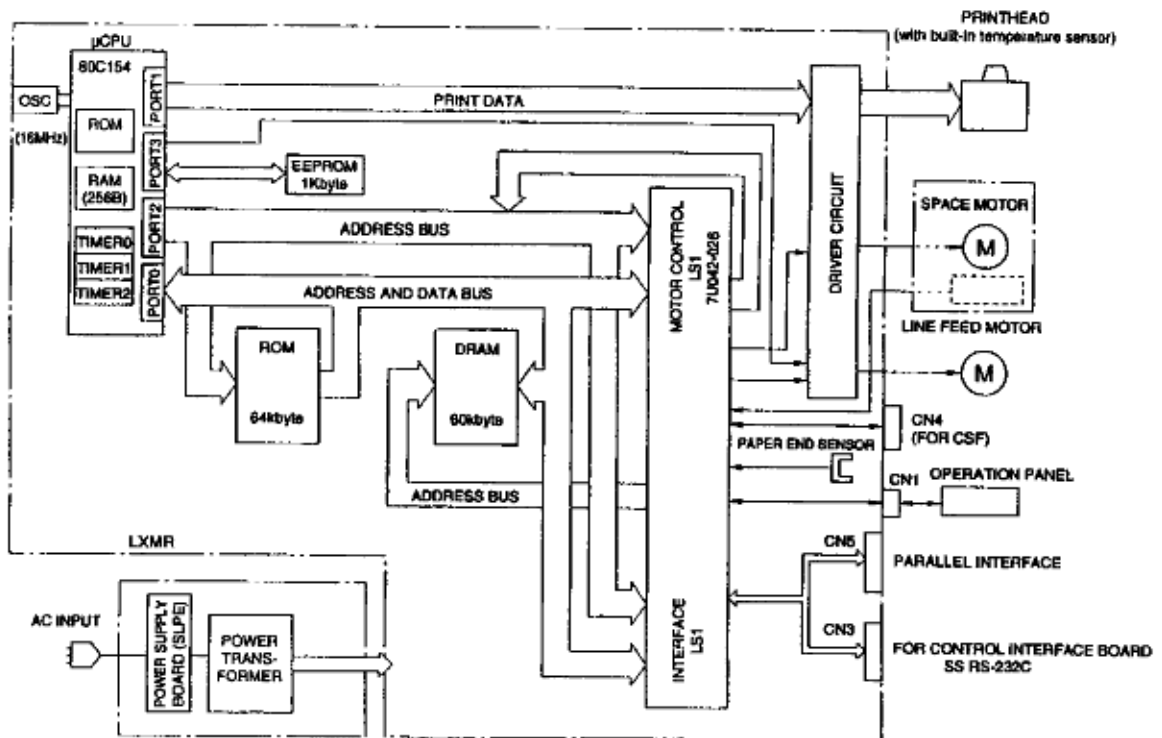
#### DOT Timing Generation

This function generates the DOT-ON signal (IPT), which synchronizes the print wire firing in accordance with the signals PHASE A and PHASE B. This timing information is also sent to the microprocessor.

Block Diagram (Rev A, B, and C)



Block Diagram (Rev D)



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**2.3 ELECTRICAL OPERATION**

- 2.3.01 Initialization** 
  - 2.3.02 Interface Control** 
  - 2.3.03 Print Head Drive Circuit** 
  - 2.3.04 Spacing Operation** 
  - 2.3.05 Line Feed** 
  - 2.3.06 Alarm Circuit** 
- 

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### 2.3.01 Initialization

In Rev A, B, and C printers, initialization occurs whenever the printer is powered ON or when the signal I-PRIME is received at the parallel interface.

In Rev D printers, initialization occurs whenever the printer is powered ON, or when the RSTOUT signal is sent from the reset circuit (Q11) Pin 2 to Q1 and Q3.

The initialization sequence is as follows.

In Rev A, B, and C printers, Q7 and Q11 are reset. In Rev D printers, Q1 and Q3 are reset.

In Rev A, B, and C printers, the operating modes of Q7 and Q11 are set. In Rev D printers, the operating modes of Q1 and Q3 are set.

Memory (ROM and RAM) is checked.

RAM is initialized.

Carriage homing is performed. The carriage will move to the left until it contacts the left frame.

The program then establishes the interface signals (ACK, BUSY) and the SEL lamp lights.

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### **2.3.02 Interface Control**

#### **Parallel Interface**

In Rev A, B, and C printers, the data from the host is input through connector CN5 to the interface LSI Q11.

In Rev D printers, the data from the host is input through connector CN6 to the interface LSI Q3.

The interface LSI latches this input data in synchronization with the STB-N signal. The BUSY signal is active while this data is being processed. When processing is complete, the BUSY signal is turned OFF, and an ACK-N is sent to the host (to request more data).

The BUSY signal is also sent to the host whenever the printer is incapable of receiving data.

### 2.3.03 Print Head Drive Circuit

This circuit drives the printhead coils (1 through 9) using the HD ON signal, along with the nine HD DATA signals. The pulsewidth of HD ON determines the pin drive time. The pin drive time increases as the number of pins to be driven increases. The pins are driven in synchronization with the signal IPT, which is derived from the timing encoder (PHASE A and PHASE B) on the space motor.

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#### **2.3.04 Spacing Operation**

##### **Spacing Motor Control**

The motor control LSI produces the spacing motor phase signals SP-U, SP-V, SP-W and the overdrive signal SPD-A in accordance with spacing commands from the microprocessor.

The SPD-A signal is a fixed period pulse signal whose pulsewidth is controlled by the program. This signal is used to control motor drive time.

The signal SP ON/OFF is used at acceleration/deceleration, when a large amount torque is required.

##### **Spacing Motor Encoder Disk / Photosensor**

As the spacing motor is driven, the signals PHASE-A and PHASE-B are generated by the photosensor / encoder disk (which is mounted to the spacing motor).

The motor control LSI divides the frequency of these signals in accordance with the selected print pitch. The LSI generates the IPT-N signal, which provides dot-on timing and carriage position detection.

**2.3.05 Line Feed**

During a line feed operation, the line feed motor is driven by the phase signals LF03 and LF04, in synchronization with the signal LFOVD.

When it is not being driven, the line feed motor is held in place by the LF HOLD signal.

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### 2.3.06 Alarm Circuit

#### **Drive Circuit Fault Alarm Circuit**

This is a protective circuit which causes the AC line fuse to open when a fault occurs in the printhead drive circuit, the spacing motor drive circuit, or the line feed drive circuit. The fault alarm circuit monitors the drive time of each of these circuits and produces the ALM signal if any drive time exceeds its specified value. The ALM signal activates SCR ON, which causes the secondary coil (Rev A, B, and C: 40 volts. Rev D: 50 volts) of the transformer to short-circuit. This creates an over-current condition, which causes the AC line fuse to open.

#### **Head Overheat Alarm Circuit**

In order to protect the printhead coils, this circuit uses the printhead's built-in thermistor to monitor printhead temperature.

Printhead temperature rises when the unit is printing. When printhead temperature reaches 110 degrees Celsius, the HEAD OVERHEAT alarm is generated. Printing stops when this alarm is detected. This allows the printhead temperature to fall. When the printhead temperature falls below the alarm detection level, printing is resumed.

Here is a description of the alarm detection.

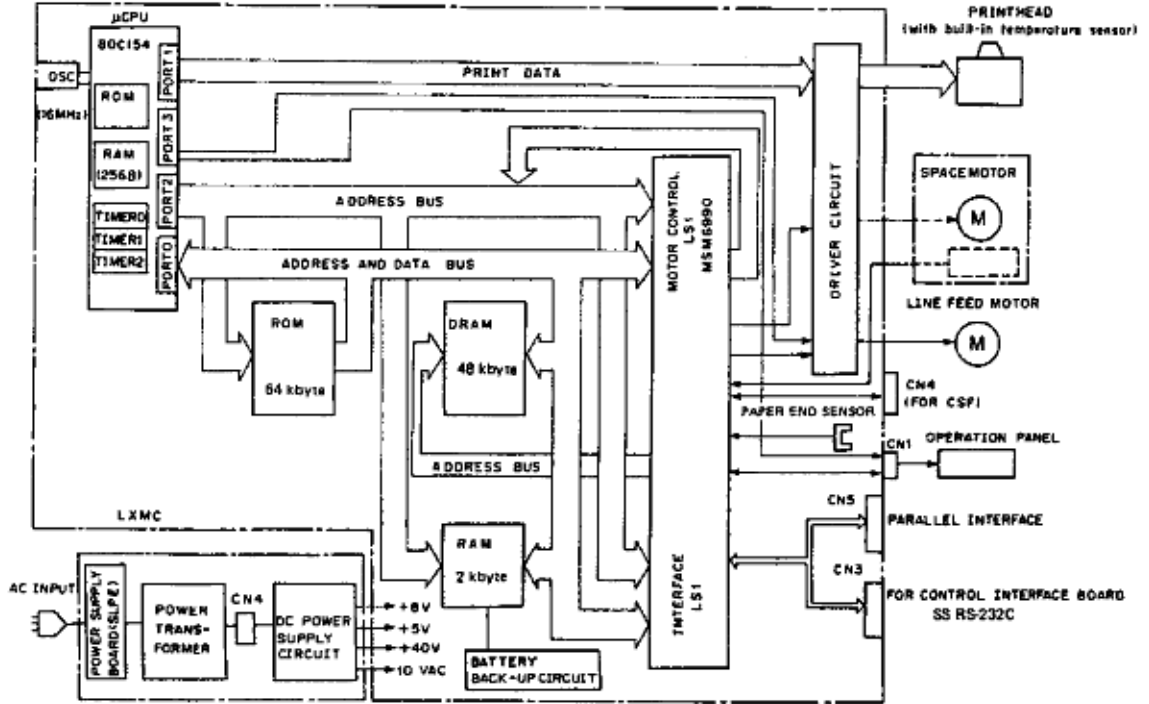
When the temperature of the printhead rises, the resistance of the thermistor decreases and the potential falls at the negative input of comparator Q6. Q6 is located on the main controller board. This inverts the comparator output, causing the HEAD TEMP signal to be sent to the motor control LSI.

#### **Paper End Detection Circuit**

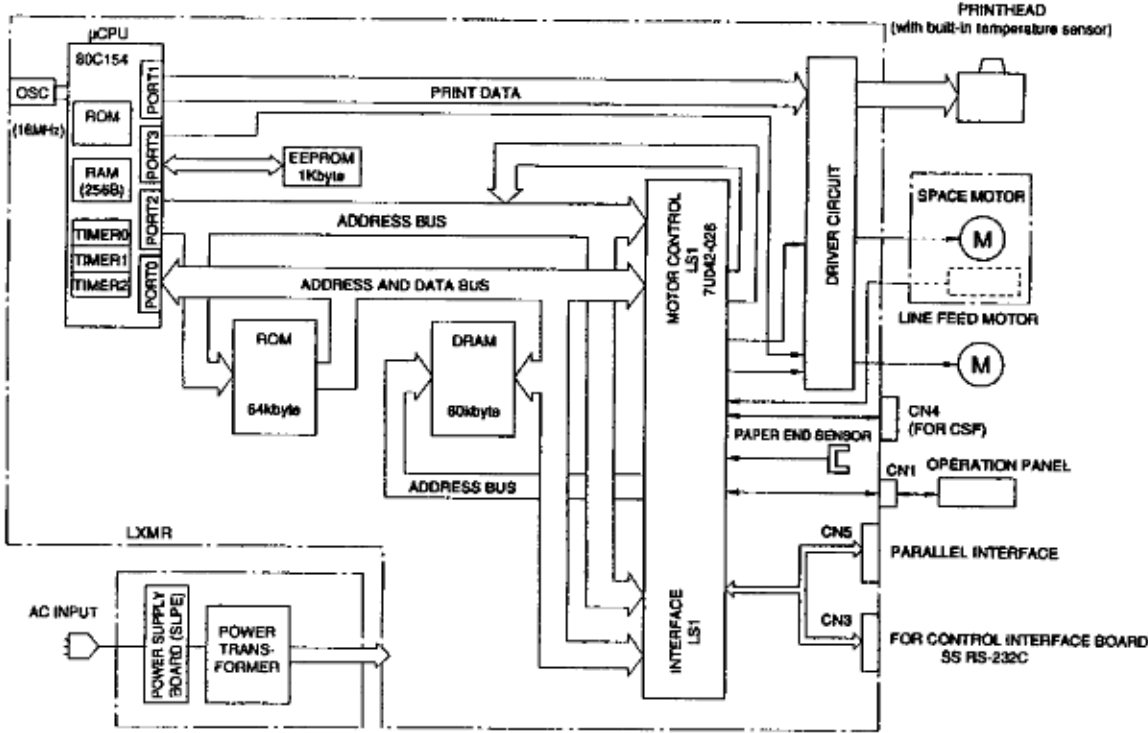
When the printer runs out of paper, the photosensor on the main control board is deactivated. This causes the signal PAPER END to become low. This signal is fed to a pin of the motor control LSI. Printing stops and the ALARM lamp lights.

### 2.4 MECHANICAL PRINCIPLES OF OPERATION

Block Diagram (Rev A, B, and C)



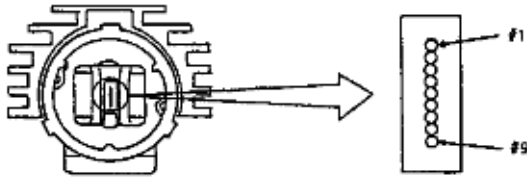
**Block Diagram (Rev D)**



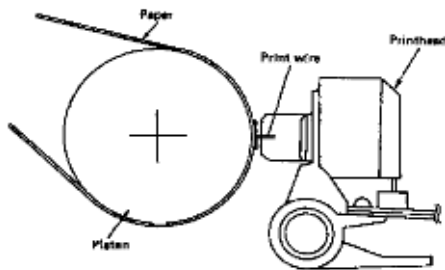
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#### 2.4.01 Printhead

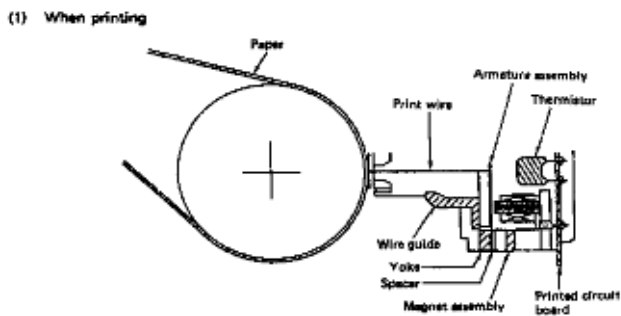
The printhead used by the printer is a highly efficient, stored-energy type. Power is not consumed until the pins are activated. Printhead life is approximately 200 million characters.



The printhead is designed with nine pins, vertically aligned. Each pin is welded to an armature ring. Behind the armature ring is a spacer ring.

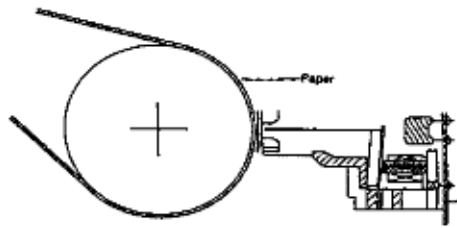


Each armature has a permanent magnet behind it. The magnet attracts the armature, keeping the pin inside the printhead. Because of the spacer ring behind the armature ring, the armature is attracted toward the permanent magnet at an angle. A coil is wrapped around each permanent magnet.





(2) When not printing



When a dot is printed, current passes through the coil, creating a magnetic field which counters the magnetic field of the permanent magnet. The armature and pin spring forward. A dot is printed on the paper.

When current is removed from the coil, the magnetic field of the permanent magnet attracts the armature. The pin is retracted into the printhead.

The printhead contains a built-in thermistor (rated at 110 degrees Celsius). The thermistor monitors the printhead temperature. If the temperature exceeds the 110 degrees Celsius, the thermistor causes a signal to be generated on the main controller board. The printer stops printing. A BUSY signal is sent to the host computer. Data remains in the print buffer as long as power is supplied to the printer. When the printhead temperature drops below the 110 degree Celsius threshold, the BUSY signal to the host computer becomes inactive. Printing is resumed.

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### 2.4.02 Space Mechanism / Operation

The spacing operation is performed by applying power to the DC spacing motor. This drives the carriage frame along the carriage shaft, space rack, and guide rail. The carriage shaft, space rack, and guide rail are parallel to the platen.

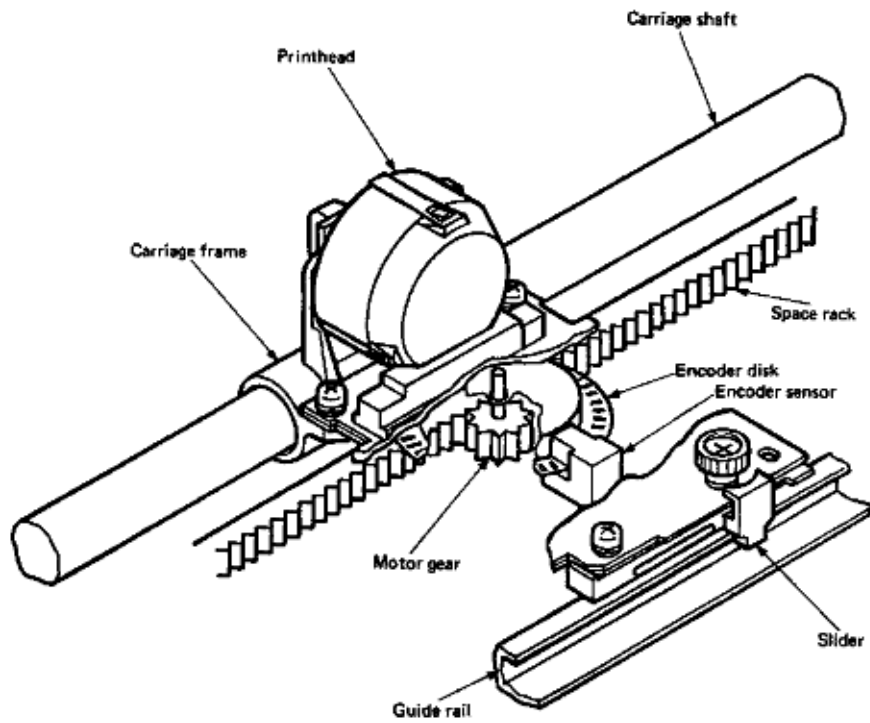
The spacing motor assembly consists of the following items.

- DC Motor / Gear
- Carriage Frame
- Carriage Shaft
- Space Rack
- Encoder Disk Sensor
- Encoder Disk
- Guide Rail

#### Spacing Operation

The printhead and spacing motor are mounted on the carriage frame. The carriage frame moves along the carriage shaft, space rack, and guide rail. The carriage shaft, space rack, and guide rail are parallel to the platen. As the spacing motor rotates counterclockwise, the carriage frame is driven to the right.

When the spacing motor rotates one turn, the carriage frame moves 0.8 inch (20.32 mm).



Motor rotation turns the encoder disk. The timing windows on the disk then pass through the encoder disk sensor. The position of the carriage frame is obtained by counting the pulses generated by the encoder disk sensor as the disk turns.

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### Head Gap Adjusting Mechanism

The head gap adjusting mechanism adjusts the gap between the platen and printhead by changing the tilt angle of the carriage frame. This is accomplished by using the adjusting lever.

Moving the adjusting lever rotates the adjusting screw. The adjusting screw is interlocked with the lever via a gear. Rotating the adjusting screw changes the angle of tilt for the carriage frame. The printhead is mounted vertically on the carriage frame. Changing the angle of tilt for the carriage frame moves the printhead closer to, or farther away from, the platen.

The adjusting cam is used to compensate for differences in the printhead gap when measured at the left and right sides of the platen. Rotating the adjusting cam changes the height of the guide rail. The height of the guide rail helps determine the distance between the printhead and platen, when measured at the right end of the platen.

Turning the adjusting cam to the RIGHT will lower the right side of the guide rail. This causes the printhead gap (on the right side of the platen) to increase.

Turning the adjusting cam to the LEFT will raise the right side of the guide rail. This causes the printhead gap (on the right side of the platen) to decrease.

The adjusting lever determines the head gap setting.

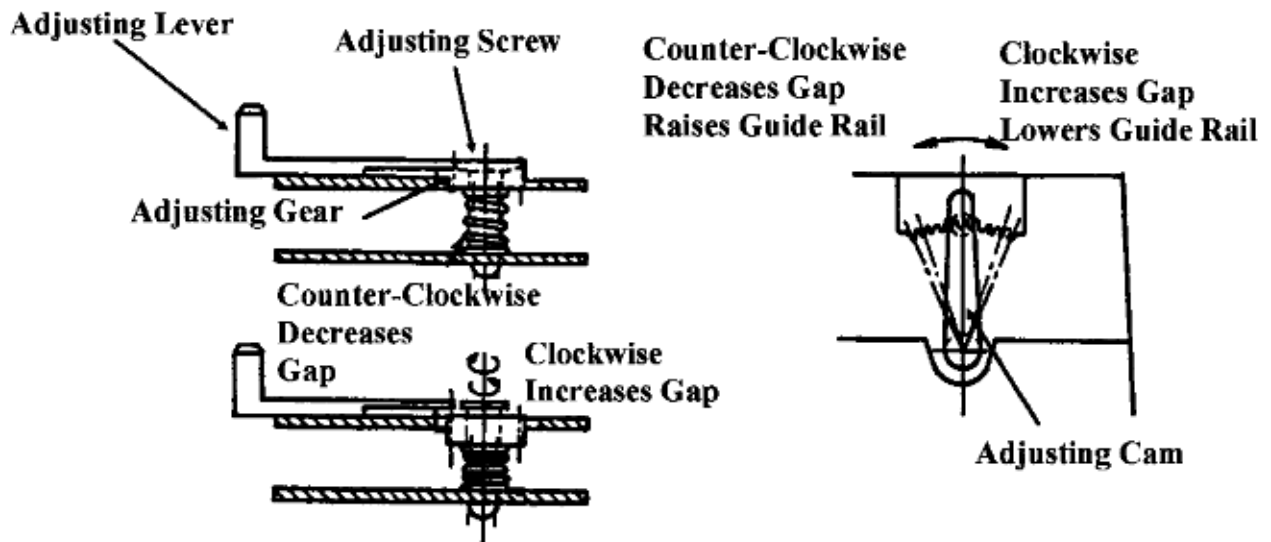
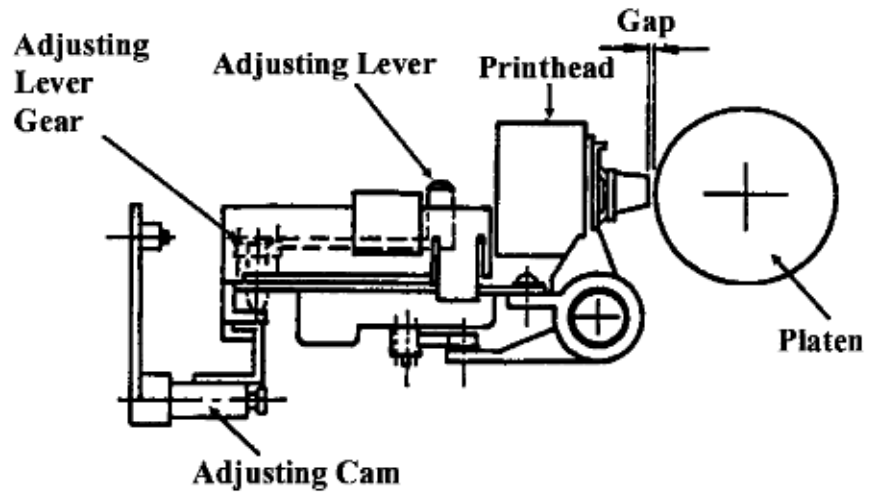
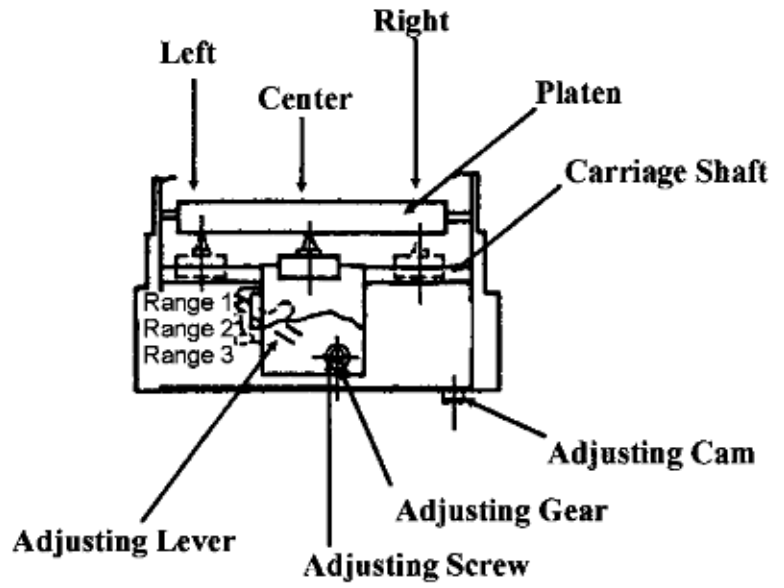
Setting 1 is for one or two part forms.

Setting 2 is for three or four part forms.

Setting 3 is for envelopes and extra-thick paper.

When the adjusting lever is set to position 3, the distance between the printhead and platen increases. The electrical contact (attached to the carriage cover) touches a contact pad on the spacing motor circuit board. This reduces printing speed. Slower speeds ensure adequate printing pressure.

Refer to Section 3.3  for further details on the Printhead Gap Adjustment.



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### 2.4.03 Ribbon Drive Mechanism / Operation

**NOTE:** The ribbon drive gear assembly is secured to the top of the spacing motor assembly by the four claw tabs.

The ribbon drive mechanism drives the ribbon in sync with the spacing operation. The mechanism is driven by the spacing motor.

The ribbon drive mechanism consists of the following items.

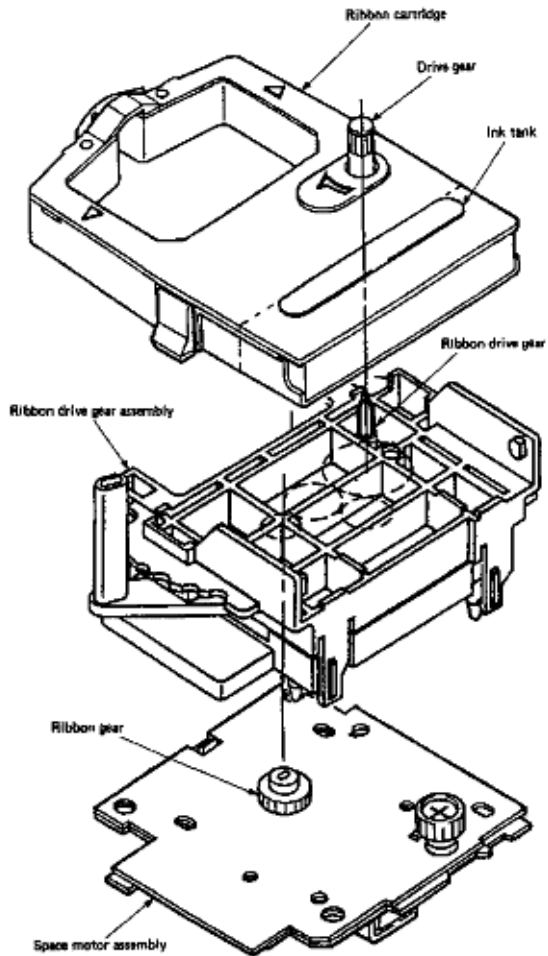
- Ribbon Drive Gear Assembly

- Ribbon Gear (The gear is attached to the spacing motor).

- Ribbon Cartridge

#### **Ribbon Cartridge**

A uni-directional feed, continuous ribbon is used. The ribbon is replenished by a built-in ink tank in the ribbon cartridge.



### **Ribbon Feed Operation**

As the spacing motor rotates, the ribbon gear (on the spacing motor shaft) turns the drive gear in the ribbon cartridge via the ribbon drive gear assembly. As a result, the ribbon is moved.

In bi-directional printing, the ribbon gear rotational direction reverses each time the direction of the carriage movement reverses. In this case, the gears in the ribbon drive gear assembly move the position of an intermediate idler gear, causing the ribbon to feed in one direction.

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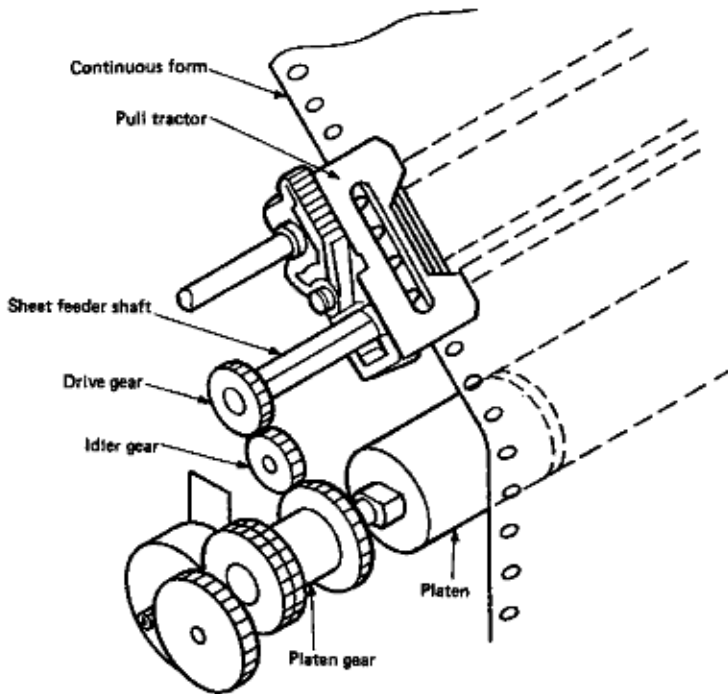
#### 2.4.04 Paper Feed Mechanism

The paper feed mechanism consists of the following items.

- Stepper Motor (with drive gear)
- Reduction Gear
- Platen
- Push Tractor Unit
- Pressure Rollers (friction feed rollers)
- Pull Tractor Unit (optional)

#### Paper Feed Operation

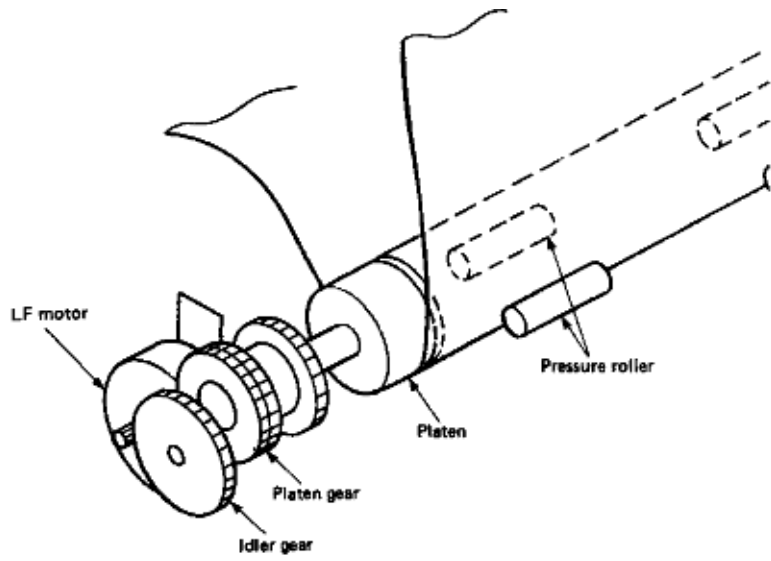
The line feed motor is mounted on the left side frame of the printer. It drives the platen via the reduction gear. If the optional tractor unit is installed, platen rotation is transmitted through the idle gear to the tractor unit.



The paper feed mechanism is designed so when the stepper motor rotates 48 steps (360 degrees), paper is fed 0.17 inch (4.23 mm).

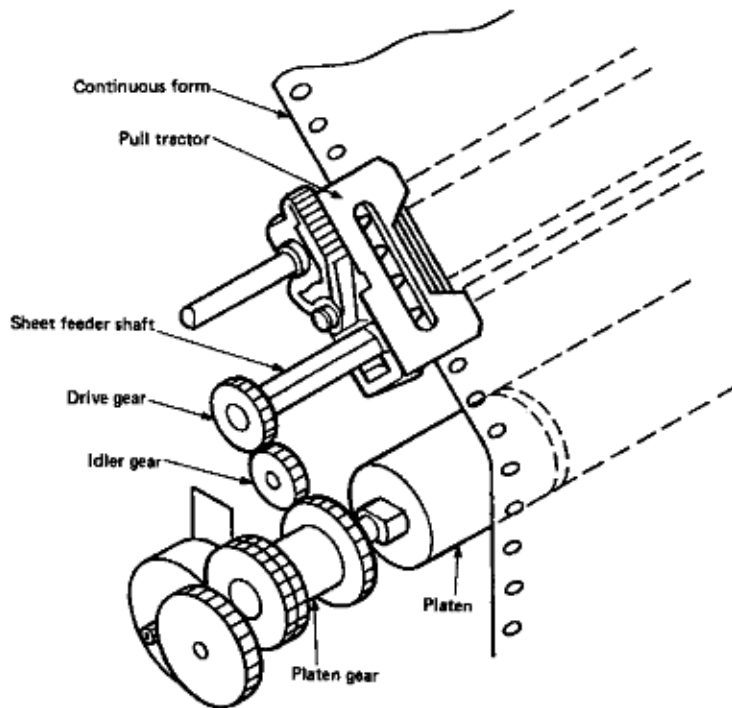
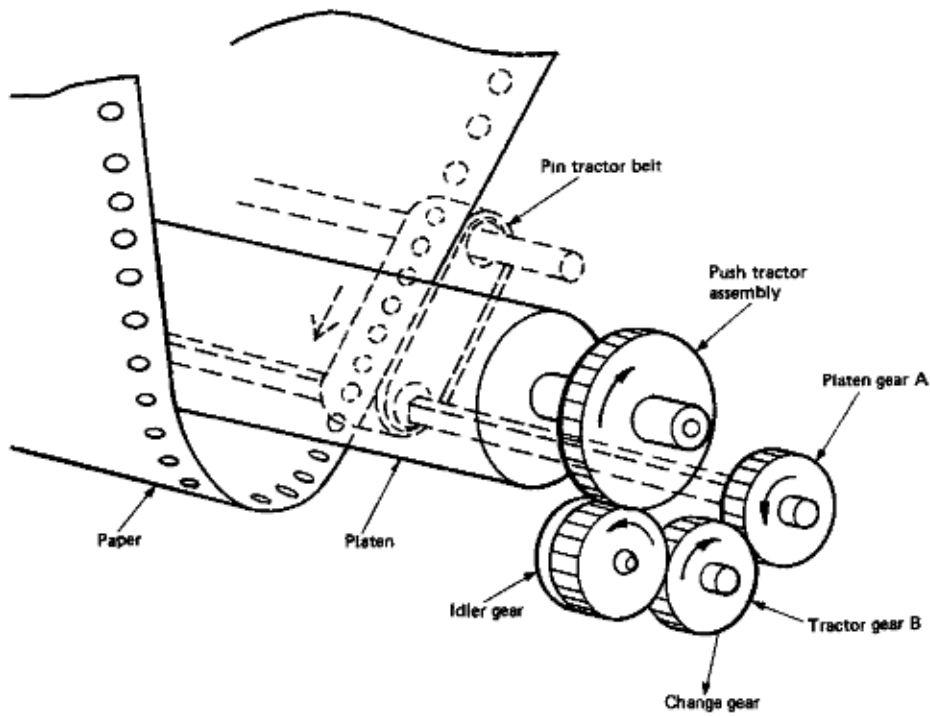
#### Friction Feed

When the release lever is set to the friction feed position, the release lever disengages the change gear from the tractor gear. At the same time, the release lever applies pressure to push the pressure rollers against the platen, allowing paper to be fed.



### Tractor Feed

When the release lever is set to the tractor feed position, the release lever allows the reset spring to push the change gear toward the tractor gear. At the same time, the release lever pushes the pressure rollers away from the platen, which allows paper to be fed by the push tractor.



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#### 2.4.05 Paper-End Detection Mechanism

##### Rear Paper Feed

When paper is installed in the printer, it prevents the paper-end lever (Tip A) from falling into the groove of the paper chute and platen. This activates the paper-end sensor.

When the printer runs out of paper, the paper-end lever falls into the groove of the paper chute. The rear part of the paper-end lever deactivates the paper-end sensor. An out-of-paper condition is detected.

Paper-end is detected when the end of the remaining paper is about 1 inch (25.4 mm) from the printhead position.

##### Bottom Paper Feed

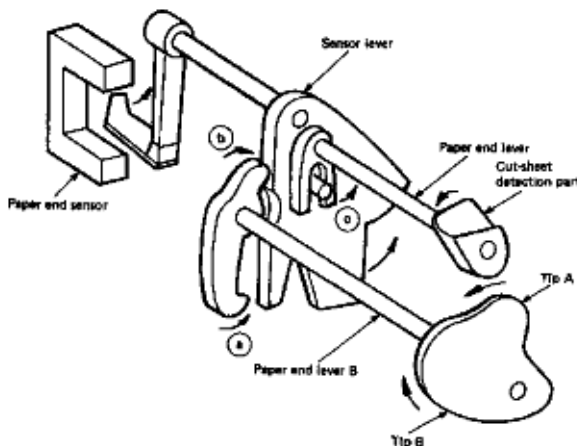
Paper installed in the printer contacts the paper-end lever (Tip B). The paper prevents the bottom paper-end lever from falling into the slot in the bottom paper guide. This causes the rear part of the paper-end lever to activate the paper-end sensor.

When the printer runs out of paper, the tip of the bottom paper-end lever falls into the hole in the bottom paper guide. The rear part of the paper-end lever activates the paper-end sensor. An out-of-paper condition is detected.

Paper-end is detected when the end of the remaining paper is about 1 inch (25.4 mm) from the printhead position.

##### Cut-Sheet Paper Feed

Paper installed in the printer prevents the paper-end lever (Tip C) from falling into the groove of the paper chute. The paper-end sensor is activated.



When paper is removed, the paper-end lever falls into the groove of the paper chute. The rear part of the paper-end lever deactivates the paper-end sensor. An out-of-paper condition is detected.

Paper-end is detected when the end of the remaining paper is about 1 inch (25.4 mm) from the

printhead position.

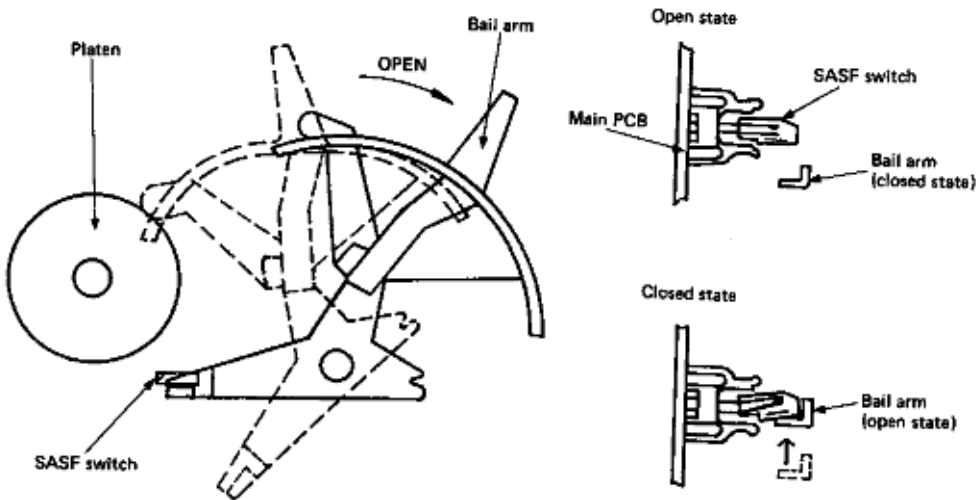
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### 2.4.06 Semi-Automatic Sheet Feeder (SASF) Operation

When the paper release lever is set for friction feed paper, opening the bail arm causes the SASF switch to close. The line feed motor feeds two inches of paper. SASF motion stops after two inches of paper feed motion and paper-end is detected.

SASF should be used for loading tractor feed paper. Okidata recommends using SASF instead of pressing FORM FEED. Since the paper bail is opened for SASF, there is less chance of jamming.




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**Maintenance & Disassembly**

This chapter consists of the following sections:

[Disassembly / Assembly Procedures](#) 

[Adjustments](#) 

[Cleaning](#) 

[Lubrication](#) 

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### 3.1.01 General Information

This section lists the parts replacement, adjustment, cleaning, and lubrication procedures.

Disassembly should not be performed unless absolutely necessary. NEVER perform disassembly on a malfunctioning unit until you have followed the [failure analysis procedures \(🔧\) in Section Four of this Service Handbook.](#)

Follow the procedures listed in Adjustments and Service Settings. Adjustments may be required when either consumables or parts are replaced. Failure to perform these procedures could result in unnecessary service calls.

Cleaning procedures must be performed correctly if high print quality is to be achieved.

### 3.1.02 Maintenance Tools

The following tools are required to service the unit.

- #2 Phillips Screwdriver (with magnetic tip)
- Straight-slot Screwdriver
- Needle Nose Pliers (4 Inch)
- Rubber Band (used during removal of upper cover)
- Cutters
- Feeler Gauge (capable of measuring .002, .016, and .018 inches)
- Large, straightened Paper Clip (used during printhead gap adjustment)
- Digital Multimeter
- Shop Vacuum
- Cloth (soft and lint-free)
- Cotton Swabs
- All-purpose Cleaner
- Platen Cleaner
- Contact Kleen (P/N 51802301)
- Grease (Dow Corning BR2 or equivalent)
- Machine Oil

### 3.1.03 Maintenance Precautions

- Do NOT disassemble the unit if it is operating normally.
- Before starting disassembly and assembly, always power OFF the unit and detach the power cord.
- Detach the interface cable, if installed.
- Do not remove parts unnecessarily. Try to keep disassembly to a minimum.
- Use the recommended maintenance tools.



- When disassembling, follow the listed sequence. Failure to follow the correct sequence may result in damaged parts.
- Since screws, collars and other small parts are easily lost, they should be temporarily attached to the original positions.
- When handling circuit boards use extreme care. Integrated circuits (microprocessors, ROM, and RAM) can be destroyed by static electricity.
- Do not place printed circuit boards directly on conductive surfaces.
- Follow the recommended procedures when replacing assemblies and units.
- Perform the Printhead Gap Adjustment ([Refer to Section 3.3](#)) when the following occur.
- Print quality is darker on either side of the document.
- The following parts are replaced.
- Space Motor Assembly ([Refer to Section 3.2.15](#))
- Carriage Shaft ([Refer to Section 3.2.16](#))
- Guide Rail ([Refer to Section 3.2.18](#))
- Platen Assembly ([Refer to Section 3.2.19](#))

### Serial Number Identification & (A-D) Revision Levels

#### A

Rev A units are original production units. An interconnect module connects the power supply board to the main control board.

#### B

Rev B units are retrofitted to include a modified interconnect module, which prevents corrosion.

#### C

Rev C units have a cable harness connection between the power supply board and the main control board. The cable harness replaces the interconnect module.

#### D

Rev D units have no power supply board. The circuitry for the power supply board has been incorporated on the main control board.

#### Please Note the following:

The Rev C main control board (LXMC) and power supply board (SUII) are downward compatible with Rev A and B units.

The Rev A and Rev B main control board (LXMC) and power supply board (PAII) cannot be used in Rev C units.

Rev D units do **NOT** use Rev A, Rev B, or Rev C main control boards, transformers, operator panels, upper covers, and lower covers. Rev D units have a unique main control board (LXMR), no power supply board, a 50 volt transformer, and a unique operator panel (LXON).

**NOTE:**

Please refer to the parts lists (Appendix B) for parts differentiation. Please be sure of the parts you need before ordering to avoid confusion and incorrect parts orders.

**Printer Serial Number Identification**

There are four serial number revision levels for the Microline 320 and 321 printers. Hardware differences exist between levels. To identify the revision level of a printer, record the serial number from the back of the printer. Refer to the following to decode the serial number.

Example Printer Serial Number: 401D0154693

Date Code      401 (4 = year. 01 = month)  
Revision        D  
Serial Number  0154693

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
LXMC Board	55041411	Main Control Board	Yes	Yes	No	No
LXMC-3 Board	55041412	Main Control Board	Yes	Yes	Yes	No
LXMR	55075111	Main Control Board (with SSD)	No	No	No	Yes

**Power Supply Board**

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
PAII-2 Board	55039902	Power Supply Board	Yes	Yes	No	No
SUII-2 Board	55047402	Power Supply Board	Yes	Yes	Yes	No
N/A	N/A	Power supply function included on the Main Control Board	No	No	No	Yes

**Operator Panel Assembly**

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
LXSP-2	55038602	Operator Panel Board	Yes	Yes	Yes	No

LXON	55075011	Operator Panel Board (with SSD)	No	No	No	Yes
N/A	50069603	Operator Panel Bezel	Yes	Yes	Yes	No
N/A	50107426	Operator Panel Bezel (with SSD)	No	No	No	Yes

### Transformer

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
120 Volt XFRMR	56407503	Transformer - Microline 320	Yes	Yes	Yes	No
120 Volt XFRMR	56407502	Transformer - Microline 321	Yes	Yes	Yes	No
120 Volt XFRMR	56413201	Transformer - Microline 320 (with SSD)	No	No	No	Yes
120 Volt XFRMR	56413202	Transformer - Microline 321 (with SSD)	No	No	No	Yes

### Interconnect Module

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Interconnect Module	55328301	Connects power supply board to main board	Yes	Yes	No	No

### Cable

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cable	56616802	Connects power supply board to main board	No	No	Yes	No

### Cable Guide

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cable Guide	51003801	Holds cable in place	No	No	Yes	Yes

### Covers

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cover	53488302	Middle Cover - Microline 320	Yes	Yes	Yes	No
Cover	53488402	Middle Cover - Microline 321	Yes	Yes	Yes	No
Cover	53070701	Middle Cover - Microline 320 (with SSD)	No	No	No	Yes
Cover	53070801	Middle Cover - Microline 321 (with SSD)	No	No	No	Yes

### Chassis

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Chassis	50061101	Middle Cover - Microline 320	Yes	Yes	Yes	No
Chassis	50061201	Middle Cover - Microline 321	Yes	Yes	Yes	No
Chassis	50104501	Middle Cover - Microline 320 (with SSD)	No	No	No	Yes
Chassis	50104601	Middle Cover - Microline 321 (with SSD)	No	No	No	Yes

---

## 3.2 DISASSEMBLY/ASSEMBLY PROCEDURES

### General Information

This section contains the printer disassembly procedures. Only the removal procedures are explained. Reverse the procedure for the installation.

At the bottom of each procedure is a listing of the parts covered in that procedure. The Okidata part number, item description, applicable product, comment (RSPL, Option, Consumable), serial number revision level, and the cross-reference(s) to Appendix B are provided for each part. Items included in the Recommended Spare Parts List are indicated by the acronym RSPL. N/A appears where a part number is not available.

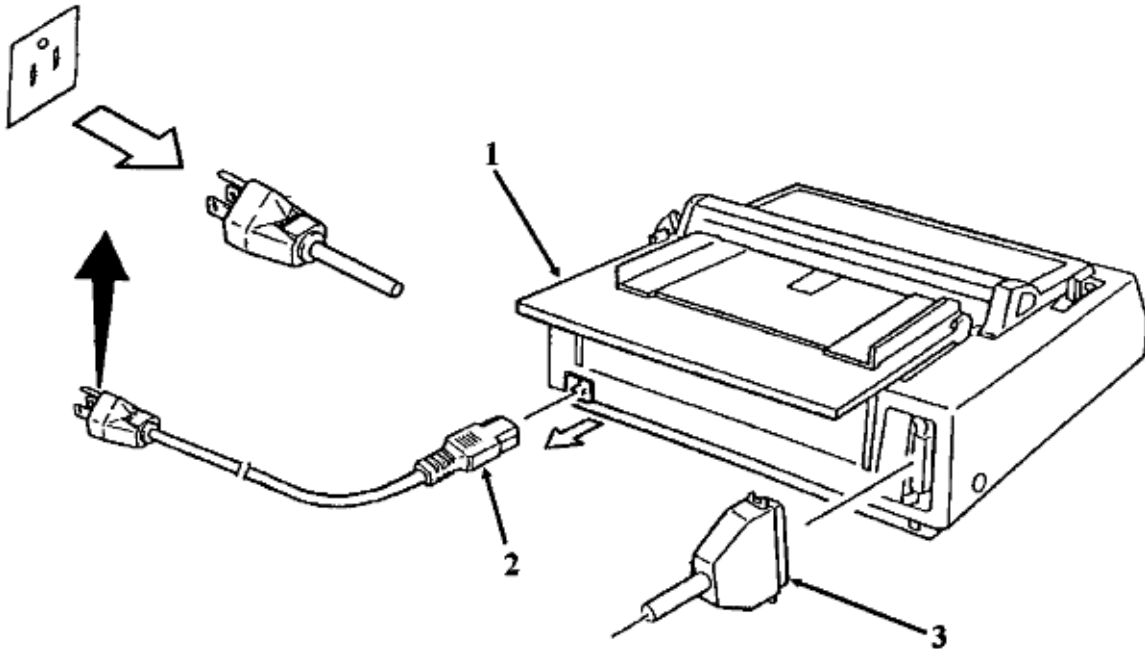
<b>Part Number</b>	<b>Item Description</b>	<b>Product</b>	<b>Comment</b>	<b>Revision</b>	<b>App. B Reference</b>
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This Service Handbook lists the disassembly procedures for major components of the unit. Okidata does NOT recommend disassembling a unit which is operating normally. If you decide to perform disassembly during this training, Okidata recommends that you perform only the disassembly procedures for RSPL items. All other procedures are provided to assist you in identifying parts. It is not likely that you will perform these procedures while servicing the product.

Be sure to read all notes, cautions, and warnings, as they contain important information regarding assembly/disassembly.

#### 3.2.01 Preliminary Items

- 1) Press the AC switch (1 shows location) and power OFF the printer.
- 2) Remove the paper, if installed.
- 3) Detach the AC power cord (2).
- 4) Detach the interface cable (3), if installed.



Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 56609701	Cord: AC 120 V	Both	RSPL	A B C D	B.2.03 04 05
P/N 56624101	Cord: AC (220 V) (Right Angle for ML Series)	Both	Option RSPL	A B C D	B.2.03 04 05
P/N 56616501	Cord: AC 240V	Both	Option	A B C D	B.2.03 04

P/N 56624401	Cord: AC 240V	Both	Option	A B C D	B.2.05
P/N 70000803	Kit: Parallel Interface Plug'n'Play Accessory	Both	Option	A B C D	N/A

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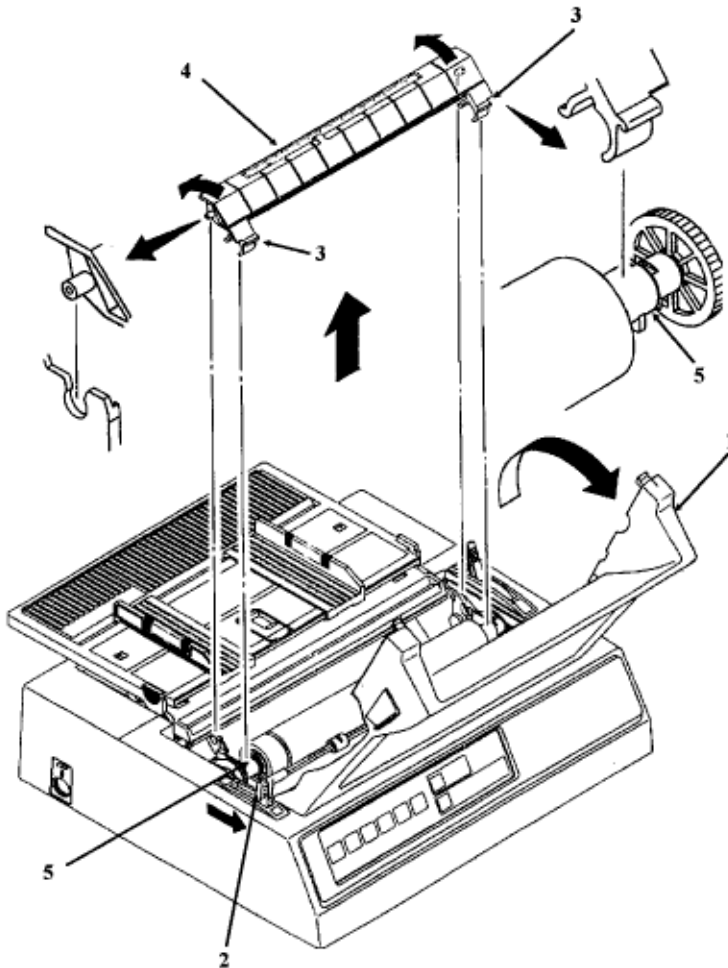
### 3.2.02 Separator Assembly

**CAUTION:** To avoid damaging the ribbon protector, slide the printhead towards the center of the printer before removing the separator assembly.

Perform these procedures first:

- 3.2.01 

- Open the access cover (1).
- Move the paper bail lever (2) toward the front of the printer.
- While pressing the release latches (3), tilt the separator assembly (4) toward the rear of the printer to release it from the platen shaft (5).
- Remove the separator assembly.





<b>Part Number</b>	<b>Item Description</b>	<b>Product</b>	<b>Comment</b>	<b>Revision</b>	<b>App. B Reference</b>
P/N 50069801	Separator: Assembly (Narrow)	320	RSPL	A B C D	B.2.06 08 10
P/N 50069901	Separator: Assembly (Wide)	321	RSPL	A B C D	B.2.06 08 10

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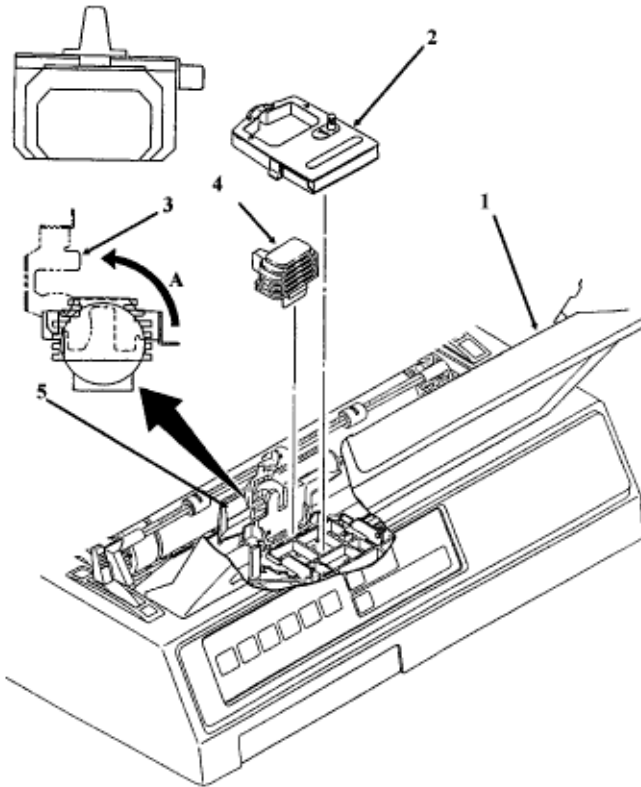
### 3.2.03 Printhead Assembly

**WARNING:** The printhead will be hot immediately after printing.  
Allow the printhead to cool before handling.

**Perform these procedures first:**

**- 3.2.01 (🔧)**

- Open the access cover (1).
- Remove the ribbon cartridge (2).
- Move the printhead mounting clamp (3) in the direction of arrow A to unlock the printhead (4).
- Lift and remove the printhead from the carriage frame (5).



**NOTE:** When installing the printhead, push the printhead towards the platen.

<b>Part Number</b>	<b>Item Description</b>	<b>Product</b>	<b>Comment</b>	<b>Revision</b>	<b>App. B Reference</b>
P/N 50063802	Printhead: (Assembly)	Both	RSPL	A B C D	B.2.03 04 05
P/N 52102001	Ribbon	Both	Consumable	A B C D	B.2.16

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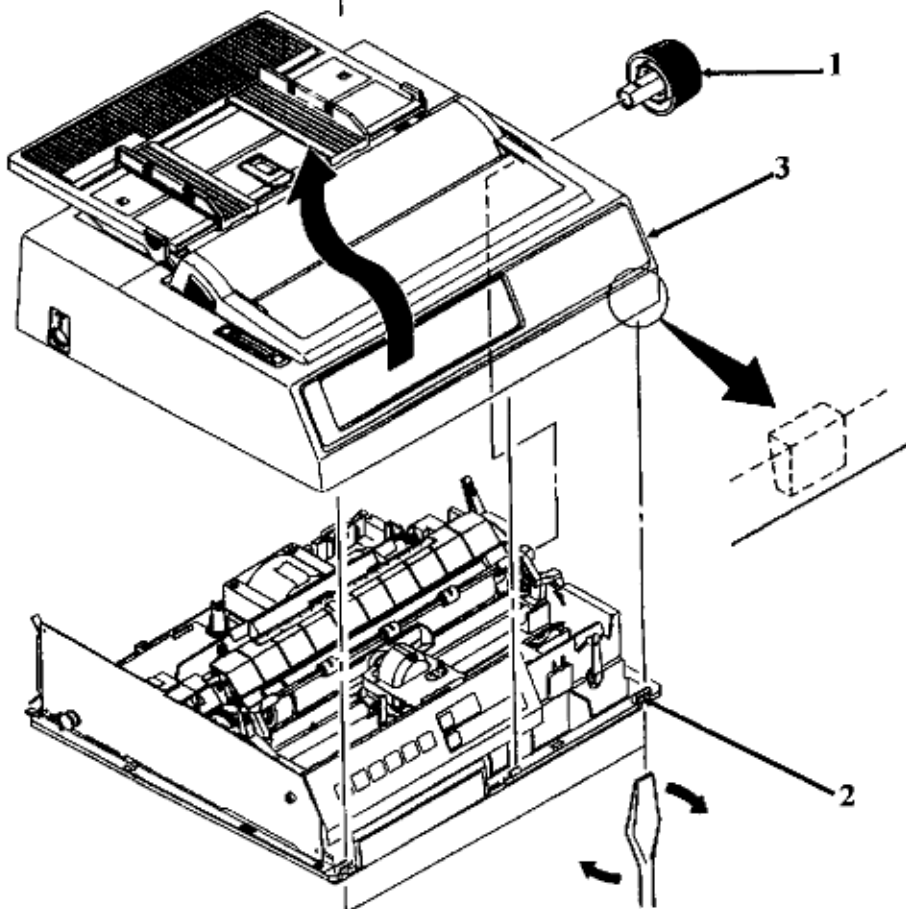
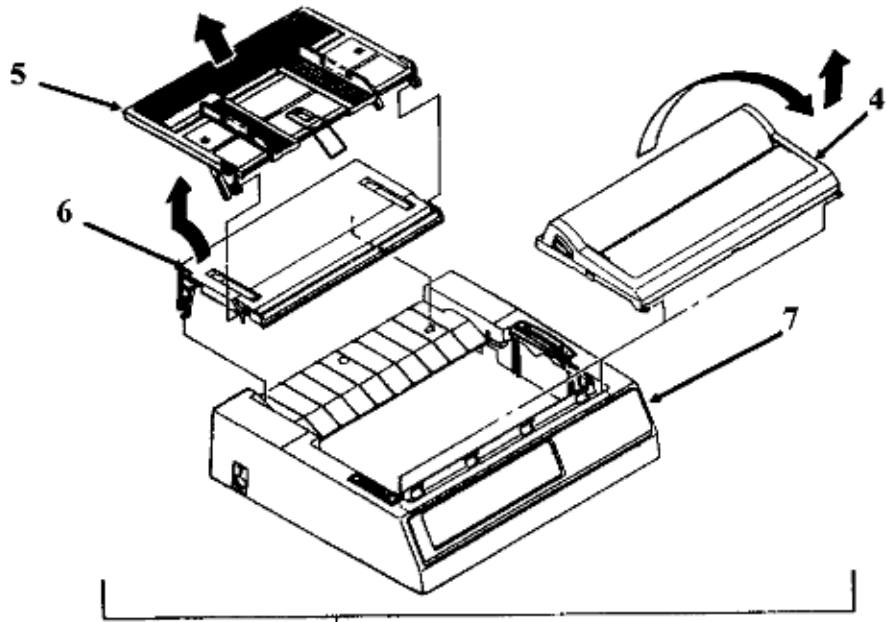
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### 3.2.04 Upper Cover Assembly

#### Perform these procedures first:

##### - 3.2.01

- Wrap a rubber band around the wire extensions of the interface connector.  
This pulls the extensions in and avoids damage when the cover is removed. (Notshown).
- Detach the platen knob (1).
- Insert a flat-blade screwdriver through the slots (2) and disengage the claws of the cover.  
The Microline 320 has three slots. The Microline 321 has five slots.
- Lift the front of the upper cover assembly (3) and remove the assembly.
- The upper cover assembly contains the access cover assembly (4), the sheet separator assembly (5), the rear cover (6), and the middle cover (7)



**CAUTION:** Do NOT rotate the access cover past the vertical when removing it. The tab extensions can break.

The Rev D middle cover is NOT compatible with the Rev A, B, and C middle cover.

Before installing the cover, move the bail arm lever towards the back of the printer and move the release lever towards the front of the printer.

After installation, verify that the cover is correctly seated in the front slots. The cover will warp if it is incorrectly installed. Check that the paper bail moves properly.

**When cleaning, refer to Section 3.4 of this Service Handbook.**

<b>Part Number</b>	<b>Item Description</b>	<b>Product</b>	<b>Comment</b>	<b>Revision</b>	<b>App. B Reference</b>
P/N 51901101	Knob: Platen	Both	RSPL	A B C D	B.2.03 04 05
P/N 50060701	Cover: Access (Assembly)	320	RSPL	A B C D	B.2.01 02
P/N 50060801	Cover: Access (Assembly)	321	RSPL	A B C D	B.2.01 02
P/N 50060901	Separator: Sheet (Assembly)	320	RSPL	A B C D	B.2.01 02
P/N 50061001	Separator: Sheet (Assembly)	321	RSPL	A B C D	B.2.01 02
P/N 53488501	Frame: Rear Cover	320	RSPL	A B C D	B.2.01 02
P/N 53488601	Frame: Rear Cover	321	RSPL	A B C D	B.2.01 02
P/N 53488302	Cover: Middle	320	RSPL	A B C	B.2.01
P/N 53488402	Cover: Middle	321	RSPL	A B C	B.2.01
P/N 53070801	Cover: Middle (SSD)	321	RSPL	D	B.2.02
P/N 53070701	Cover: Middle (SSD)	320	RSPL	D	B.2.02

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### 3.2.05 Operator Panel Assembly

**NOTE:** The operator panel assembly and board for the Rev D units are NOT compatible with the Rev A, B, and C operator panel assembly and board.

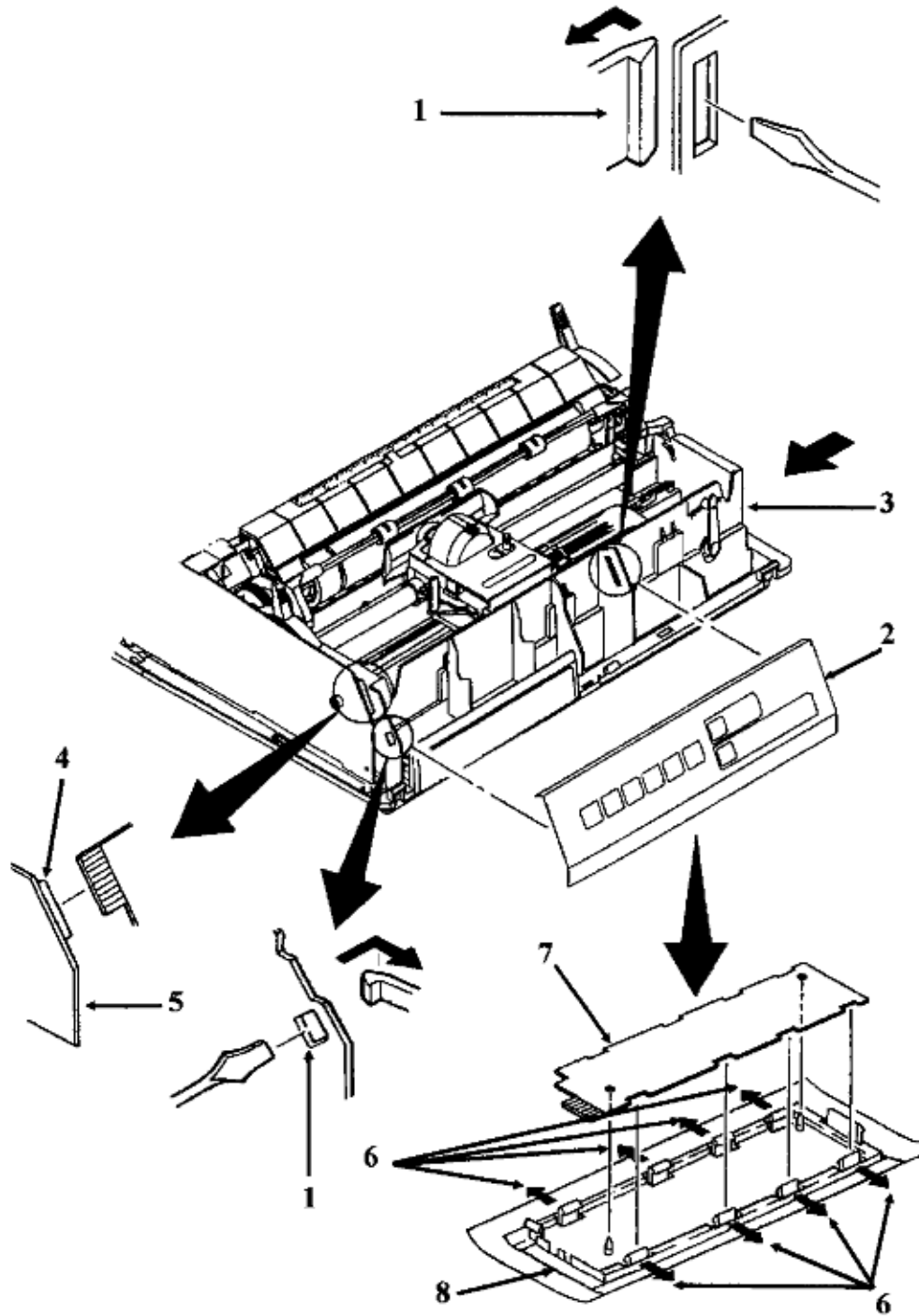
**Perform these procedures first:**

- **3.2.01** 

- **3.2.04** 

- Release the claws (1) and remove the operator panel assembly (2) from the chassis (3). As the operator panel assembly is removed, it must be detached from the connector (4) on the control board (5).
  
- Release the eight claws (6) and remove the operator board (7) from the bezel (8).





Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 50069603	Panel: Operation w/Frame	Both	RSPL	A B C	B.2.12 (Assembly)

P/N 53490101	Operation Panel	Both		A B C	B.2.12
P/N 55038602	PCB: LXSP-2	Both	RSPL	A B C	B.2.12 (Operator PCB)
P/N 55075011	PCB: LXON (Assembly)	Both	RSPL	D	B.2.12 SSD Op Panel PCB

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### 3.2.06 Control Board



#### Rev A and B

**CAUTION:** Check the contacts between the power interconnect module, the control board, and the power supply board (Rev A and B units ONLY). Clean the contacts if dirty. If contacts are bent or broken, replace the module. Proper inspection and cleaning of the power interconnect module contacts can eliminate a false diagnosis of a failed control board or power supply board.

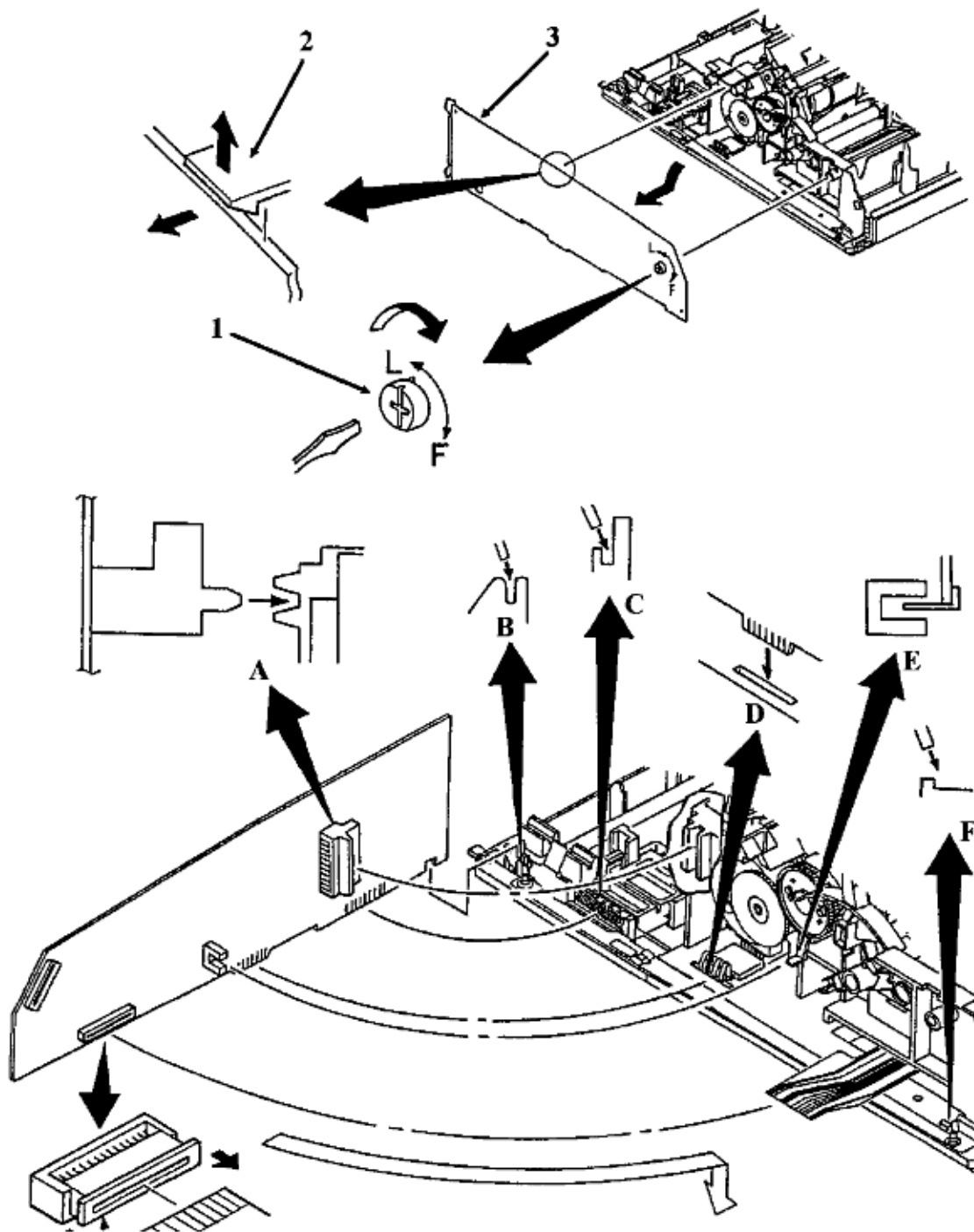
Check the contacts and connections of the control board. If good contact is not made at all connections and ground points, false diagnosis will occur.

Refer to Appendix A () for detailed information regarding the differences between the Rev A, B, C, and D control boards.

Perform these procedures first:

- 3.2.01 ()
- 3.2.04 ()
- 3.2.05 ()

- Turn the locking post (1) 90 degrees clockwise to unlock it.
- Lift the locking claw (2) and pull the control board (3) away from the chassis.
- Tilt the control board 45 degrees and remove it.



**NOTE:** When installing, verify that correct contacts are made at these points.

- Guides (A and B)
- Power Interconnect Module (C)
- Linefeed Motor Interconnect Module (D)
- Sensor Lever (E)
- Printhead Cable Connector (F)

The sensor lever must be positioned in the paper end sensor. If the lever is not correctly

positioned, the ALARM lamp will light and the unit will not automatically load paper or receive data.

<b>Part Number</b>	<b>Item Description</b>	<b>Product</b>	<b>Comment</b>	<b>Revision</b>	<b>App. B Reference</b>
P/N 50704301	Clamp: PCB	Both	RSPL	A B C D	B.2.03 04 05
P/N 55041412	PCB: LXMC-3 w/o ROM	Both	RSPL	A B C	B.2.03 04 (Control Board)
P/N 50605501	Lock: Board Screw (LXMC)	Both	RSPL	A B C D	B.2.03 04 05




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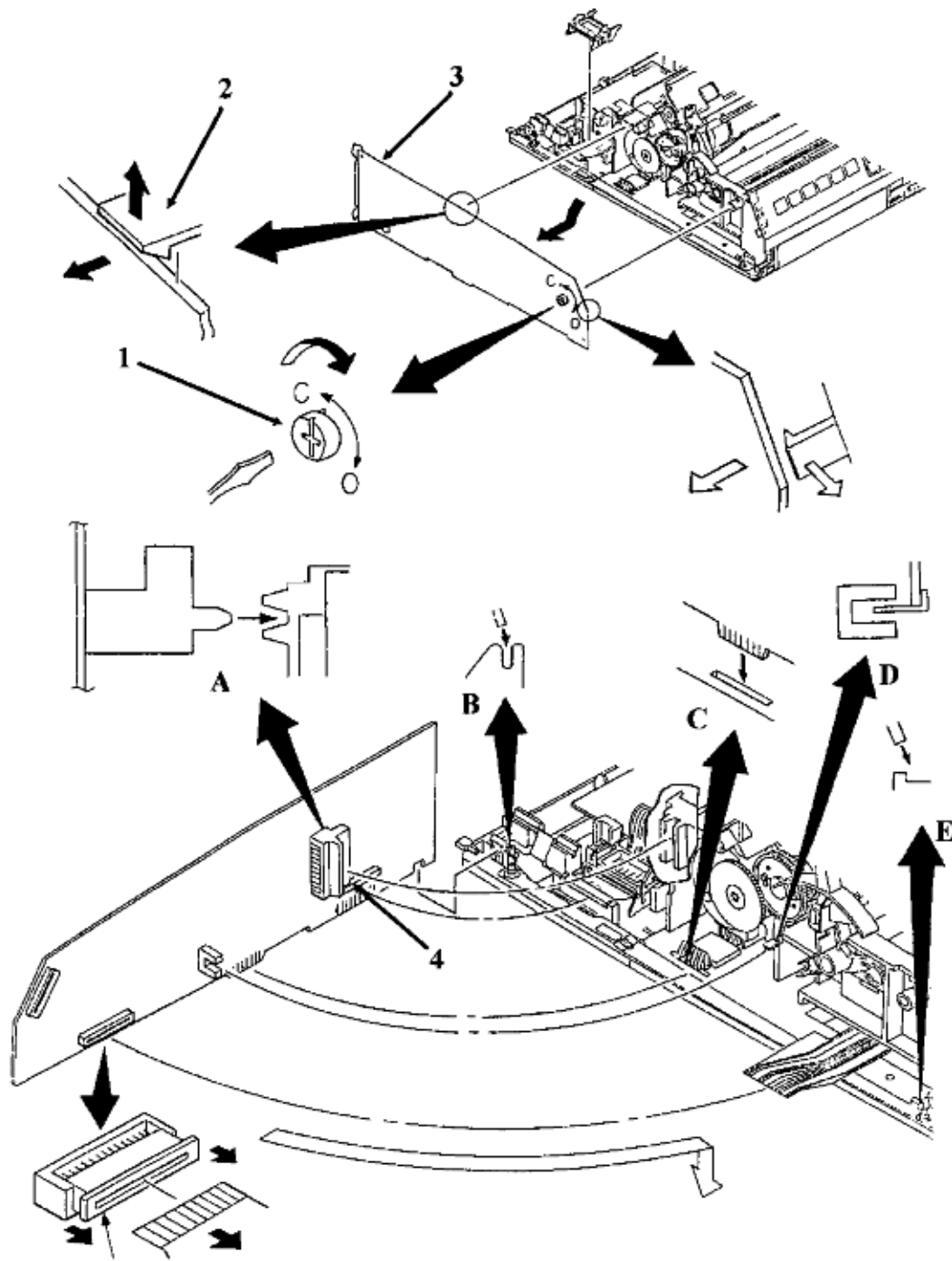
**Control Board Rev C**

**CAUTION:** Check the contacts and connections of the control board. If good contact is not made at all connections and ground points, false diagnosis will occur.

**Perform these procedures first:**

- 3.2.01 
- 3.2.04 
- 3.2.05 

- Turn the locking post (1) 90 degrees clockwise to unlock it.
- Lift the locking claw (2) and pull the control board (3) away from the chassis.
- Detach the cable from the connector (4).
- Tilt the control board 45 degrees and remove it.



**NOTE:** When installing, verify that correct contacts are made at these points.

- Guides (A and B)
- Linefeed Motor Interconnect Module (C)
- Sensor Lever (D)

- Printhead Cable Connector (E)

The sensor lever must be positioned in the paper end sensor. If the lever is not correctly positioned, the ALARM lamp will light and the unit will not automatically load paper or receive data.

<b>Part Number</b>	<b>Item Description</b>	<b>Product</b>	<b>Comment</b>	<b>Revision</b>	<b>App. B Reference</b>
P/N 50704301	Clamp: PCB	Both	RSPL	A B C D	B (Control Board) 2.03 04 05
P/N 55041412	PCB: LXMC-3 w/o ROM	Both	RSPL	A B C	B.2.03 04
P/N 50605501	Lock: Board Screw (LXMC)	Both	RSPL	A B C D	B.2.03 04 05

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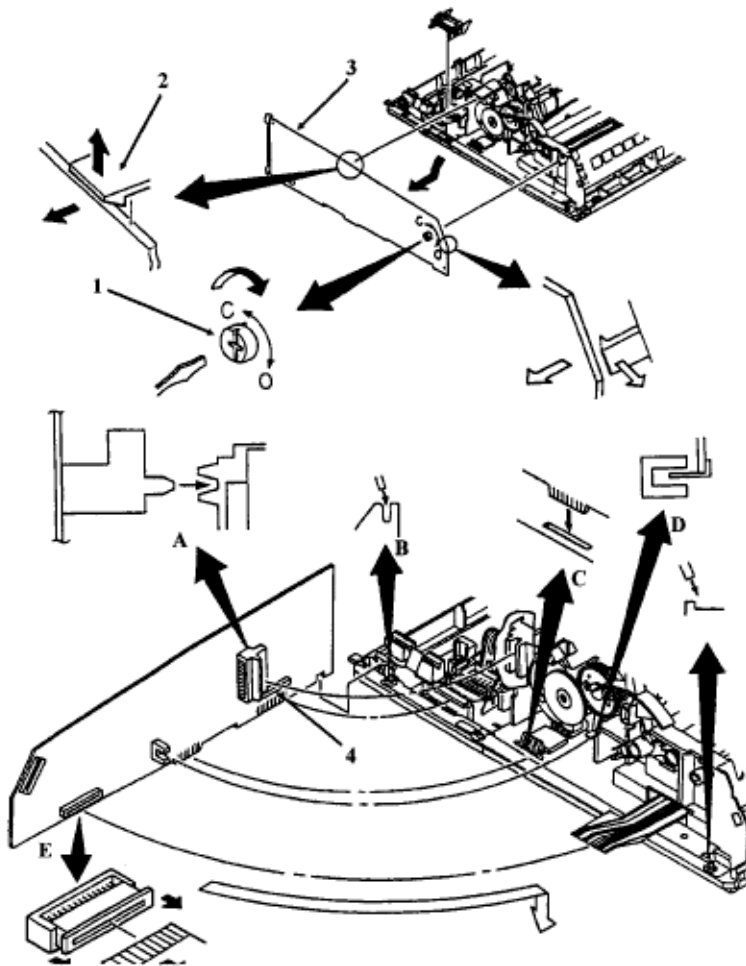
**Control Board (Rev D)**

**CAUTION:** Check the contacts and connections of the control board. If good contact is not made at all connections and ground points, false diagnosis will occur.

**Perform these procedures first:**

- 3.2.01 
- 3.2.04 
- 3.2.05 

- Turn the locking post (1) 90 degrees clockwise to unlock it.
- Lift the locking claw (2) and pull the control board (3) away from the chassis.
- Detach the cable from the connector (4).
- Tilt the control board 45 degrees and remove it.



NOTE: When installing, verify that correct contacts are made at these points.

- Guides (A and B)
- Linefeed Motor Interconnect Module (C)
- Sensor Lever (D)
- Printhead Cable Connector (E)

The sensor lever must be positioned in the paper end sensor. If the lever is not correctly positioned, the ALARM lamp will light and the unit will not automatically load paper or receive data.

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 50704301	Clamp: PCB	Both	RSPL	A B C D	B.2.03 04 05
P/N 50605501	Lock: Board Screw (LXMC)	Both	RSPL	A B C	B.2.03 04 05

P/N 55075111	PCB: LXMR (Assembly) SSD w/o ROMs (Control Board)	Both	RSPL	D	B.2.05'
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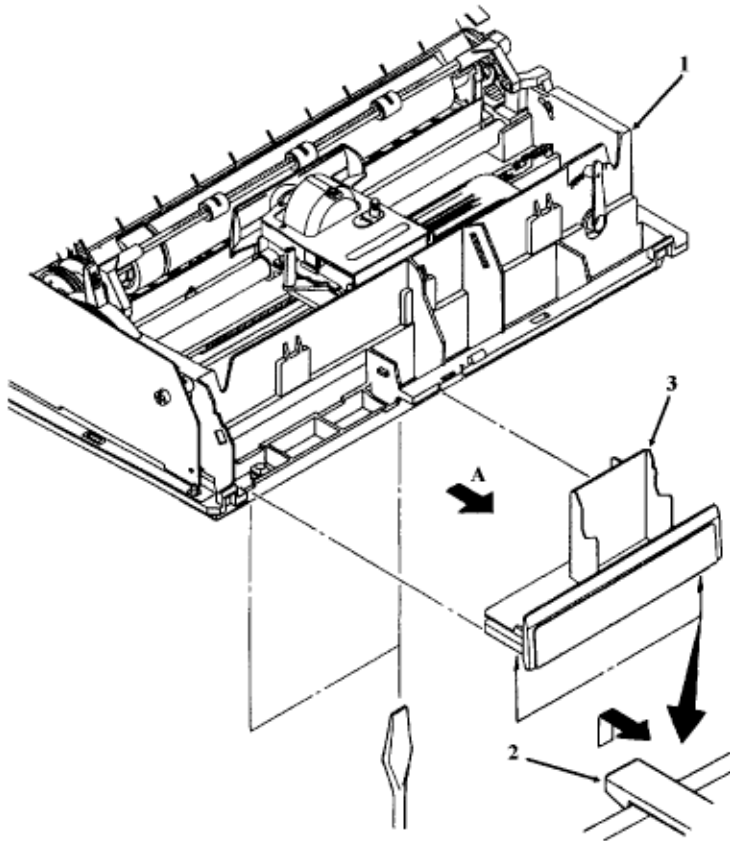
**3.2.07 IC Card (A) Panel**

**NOTE:** The Rev D printers do not have this part.

**Perform these procedures first:**

- 3.2.01 
- 3.2.04 

- Insert a flat-blade screwdriver at the bottom of the chassis (1) and push up on the two claws (2) of the IC card (A) panel (3) to release the panel.
- Pull the panel in the direction of arrow A and remove the panel.



Part Number	Item Description	Product	Comment	Revision	App. B Reference

P/N 53494901	Panel: IC Card (A)	Both	RSPL	A B C	B.2.06 08
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### 3.2.08 Transformer



#### Revs A and B

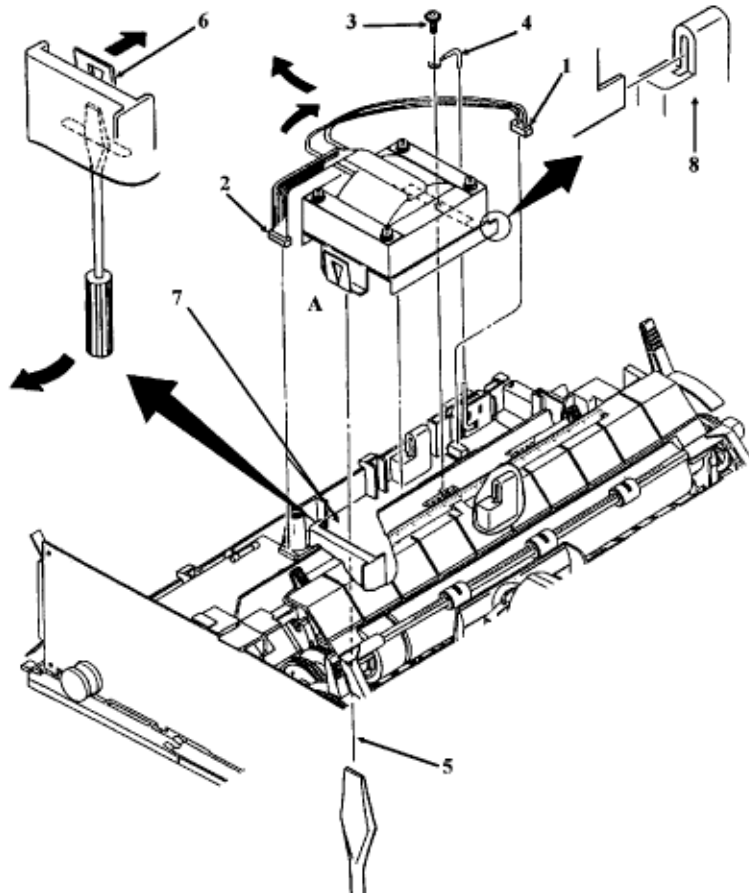
**NOTE:** The transformer contains a built-in temperature fuse. Once the fuse opens, the transformer **MUST** be replaced.

The Rev A, B, and C transformers are **NOT** compatible with the Rev D transformer.

The transformer shown in the diagram is the Rev A and B transformer. This unit has been replaced by the Rev C unit, shown on the following pages.

#### Perform these procedures first:

- 3.2.01 
- 3.2.04 
- Disconnect the cable (1) from the filter assembly.
- Disconnect the cable (2) from the power supply board.
- Remove the screw (3) and detach the grounding wire (4).
- Insert a straight-slot screwdriver into the chassis from the bottom.  
(5 shows location)
- Push the lock spring (6) on the transformer and detach the lock spring from transformer clamp A (7).
- Lift the A side of the transformer and detach it from the transformer clamp B (8).



Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 56407503	Transformer: 120 V	320	RSPL	A B C	B.2.03 04
P/N 56407502	Transformer: 120 V	321	RSPL	A B C	B.2.03 04
P/N 56407901	Transformer: 220/240 V	320	Option RSPL	A B C	B.2.03 04
P/N 56407902	Transformer: 220/240 V	321	Option RSPL	A B C	B.2.03 04



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**Transformer Rev C**

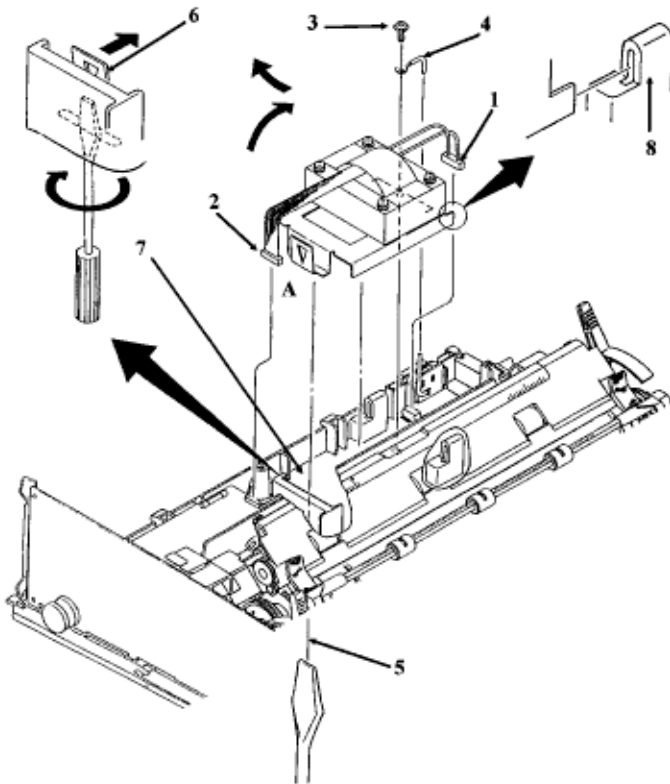
**NOTE:** The transformer contains a built-in temperature fuse. Once the fuse opens, the transformer **MUST** be replaced.

The Revs A, B, and C transformers are **NOT** compatible with the Rev D transformer.

**Perform these procedures first:**

- 3.2.01 
- 3.2.04 
  
- Disconnect the cable (1) from the filter assembly.
  
- Disconnect the cable (2) from the power supply board.
  
- Remove the screw (3) and detach the grounding wire (4).
  
- Insert a straight-slot screwdriver into the chassis from the bottom.  
(5 shows location)
  
- Push the lock spring (6) on the transformer and detach the lock spring from transformer clamp A (7).
  
- Lift the A side of the transformer and detach it from the transformer clamp B (8).





Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 56407503	Transformer: 120 V	320	RSPL	A B C	B.2.03 04
P/N 56407502	Transformer: 120 V	321	RSPL	A B C	B.2.03 04
P/N 56407901	Transformer: 220/240 V	320	Option RSPL	A B C	B.2.03 04
P/N 56407902	Transformer: 220/240 V	321	Option RSPL	A B C	B.2.03 04

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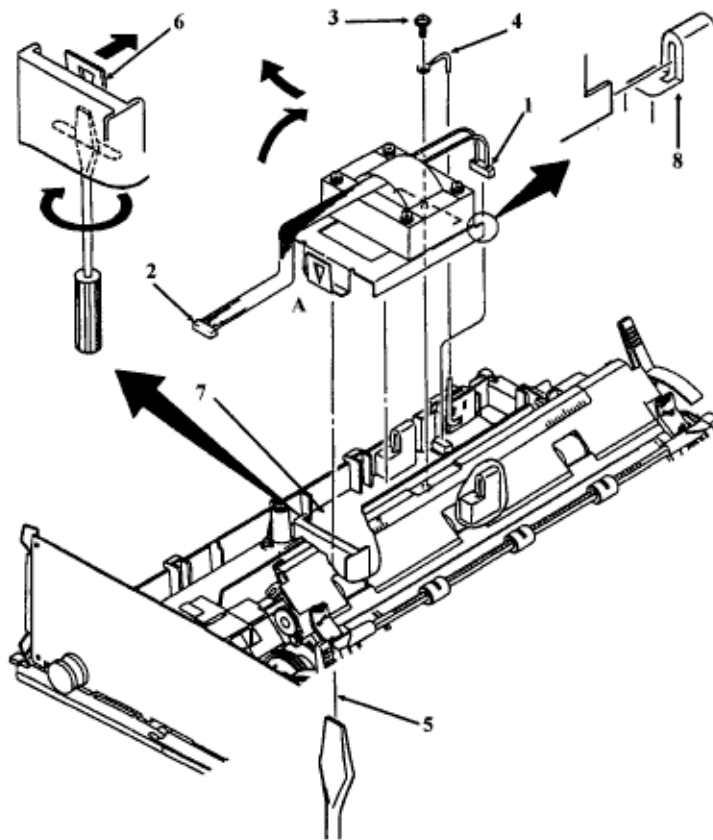
**Transformer Rev D**

**NOTE:** The transformer contains a built-in temperature fuse. Once the fuse opens, the transformer **MUST** be replaced.

The Revs A, B, and C transformers are **NOT** compatible with the Rev D transformer.

**Perform these procedures first:**

- 3.2.01 
- 3.2.04 
  
- Disconnect the cable (1) from the filter assembly.
  
- Disconnect the cable (2) from the power supply board.
  
- Remove the screw (3) and detach the grounding wire (4).
  
- Insert a straight-slot screwdriver into the chassis from the bottom.  
(5 shows location)
  
- Push the lock spring (6) on the transformer and detach the lock spring from transformer clamp A (7).
  
- Lift the A side of the transformer and detach it from the transformer clamp B (8).



Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 53413201	Transformer: 120 V	SSD 320	RSPL	D	B.2.05
P/N 56413202	Transformer: 120 V	SSD 321	RSPL	D	B.2.05
P/N 56413301	Transformer: 230/240V	SSD 320	Option RSPL	D	B.2.05
P/N 56413302	Transformer: 230/240V	SSD 321	Option RSPL	D	B.2.05

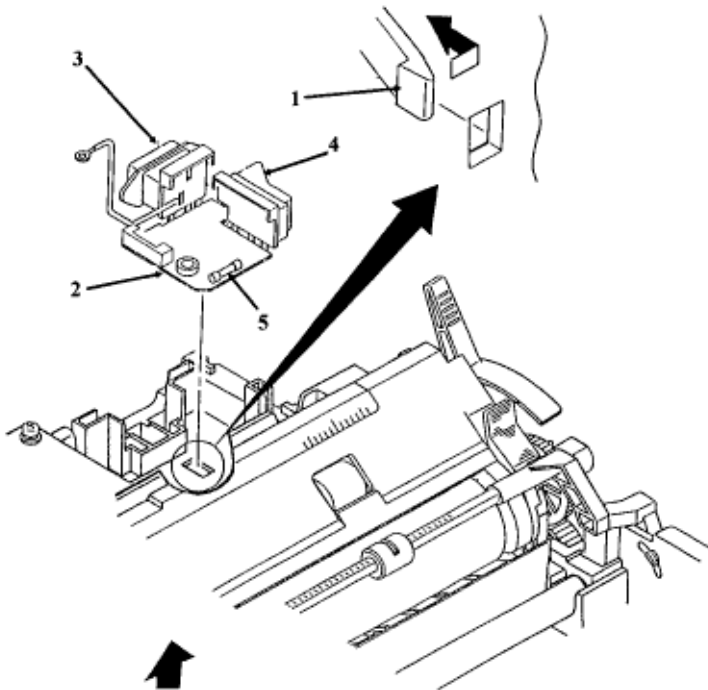
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### 3.2.09 Filter Assembly

**Perform these procedures first:**

- 3.2.01
- 3.2.04
- Working from the bottom of the chassis, push on and release the claw (1) of the filter assembly (2).
- Lift the AC connector (3) and the AC power switch (4) from the two guides on the main frame.
- Remove the filter assembly.
- The filter assembly contains a 1.5 amp fuse (5).



Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 55503103	Filter: (Assembly)	Both	RSPL	A B C D	B.2.03 04 05 AC 120 V

P/N 55503104	Filter: (Assembly)	Both	Option	A B C D	B.2.03 04 05 AC 220/240V
P/N 56303402	Fuse: 1.5 amp 250 V	Both	Option	A B C D	B.2.03 04 05 (Filter Board)

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**3.2.10 Power Supply Board**

Revs A and B

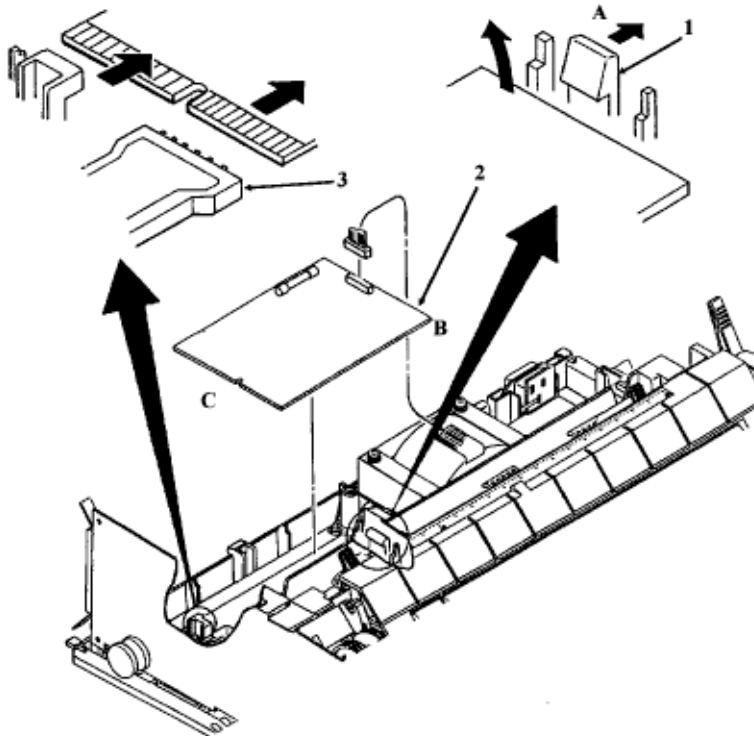
**NOTES:** The Rev D printers do NOT have a power supply board. The control board contains circuitry to provide the power supply function.

Refer to Appendix A for more information on this board.

Perform these procedures first:

- [3.2.01](#) (🔧)
- [3.2.04](#) (🔧)

- Push the board clamp claw (1) in the direction of arrow A.
- Lift the B side of the power supply board (2).
- Detach the C side of the power supply board from the power interconnect module (3).



Part Number	Item Description	Product	Comment	Revision	App. B Reference

P/N 55047402	PCB: SU11-2	Both	RSPL	A B C	B.2.03 04
P/N 55047406	PCB: SU11-6 (220/24V)	Both	Option	A B C	B.2.03 04
P/N 56302101	Fuse: Glass 2 amp 250V	Both	Option	A B C	B.2.03 04 (PA11 or SU11 Board)
P/N 56302502	Fuse: 250V 1A	Both	Option	A B C	B.2.03 04
P/N 56616802	Cable: Power Supply	Both	RSPL	C	B.2.04 Nylon Conn

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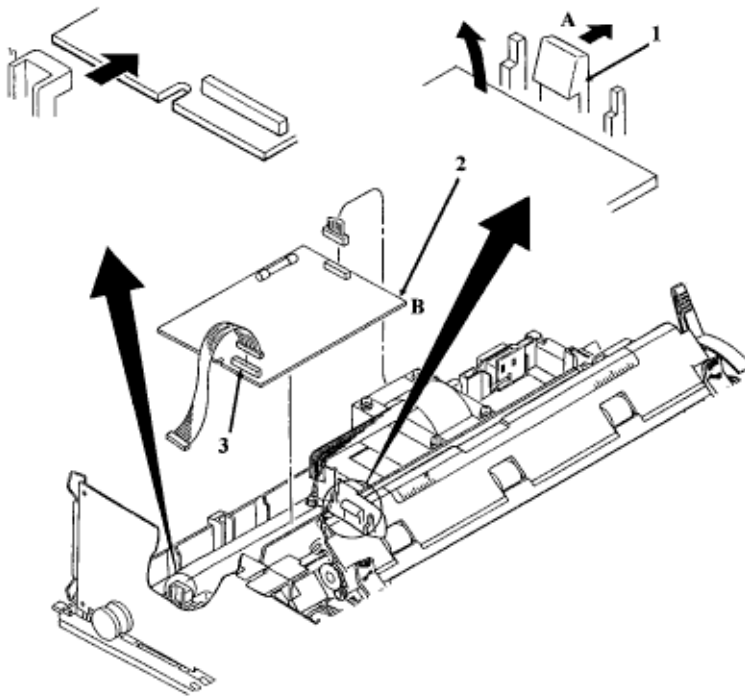
**Power Supply Boards Rev C**

**NOTES:** The Rev D printers do NOT have a power supply board. The control board contains circuitry to provide the power supply function.

Refer to Appendix A for more information on this board.

**Perform these procedures first:**

- 3.2.01 
- 3.2.04 
- Push the board clamp claw (1) in the direction of arrow A.
- Lift the B side of the power supply board (2).
- Detach the cable from the connector (3).



Part Number	Item Description	Product	Comment	Revision	App. B Reference



P/N 55047402	PCB: SUII-2	Both	RSPL	A B C	B.2.03 04
P/N 55047406	PCB: SUII-6 (220/24V)	Both	Option	A B C	B.2.03 04
P/N 56302101	Fuse: Glass 2 amp 250V (PAII or SUII Board)	Both	Option	A B C	B.2.03 04
P/N 56302502	Fuse: 250V 1A	Both	Option	A B C	B.2.03 04
P/N 56616802	Cable: Power Supply Nylon Conn	Both	RSPL	C	B.2.04

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### 3.2.11 Power Interconnect Module / Cable Guide

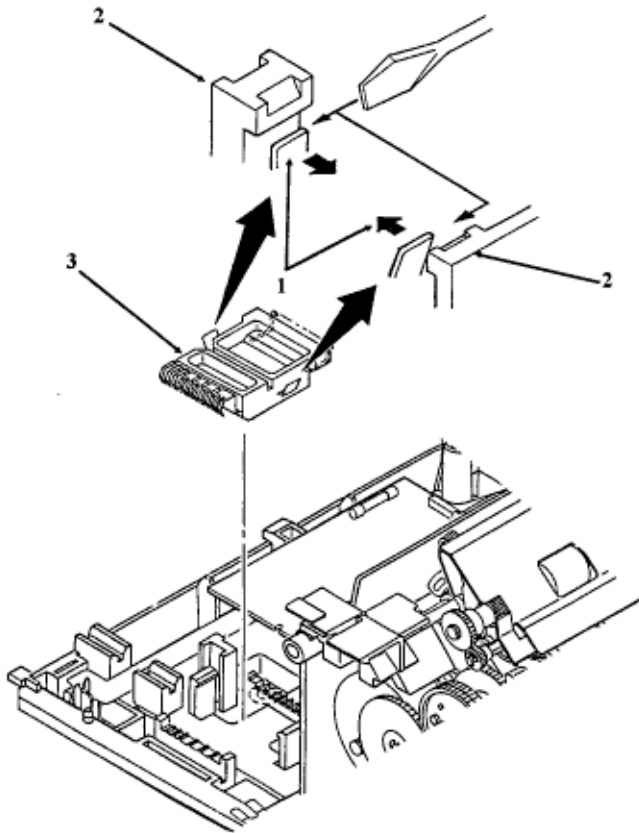
#### Revs A and B

**NOTES:** The Rev A and B printers do NOT have a cable guide.  
The Rev C and Rev D printers do NOT have a power interconnect module.  
Rev C and Rev D printers have a cable guide.

Perform these procedures first:

- 3.2.01 
- 3.2.04 

- Use a straight-slot screwdriver to release the claws (1) from the chassis clamps (2).
- Remove the power interconnect module (3).



<b>Part Number</b>	<b>Item Description</b>	<b>Product</b>	<b>Comment</b>	<b>Revision</b>	<b>App. B Reference</b>
P/N 53328301	Module: Power Interconnect	Module: Power Interconnect	Both	A B	B.2.06

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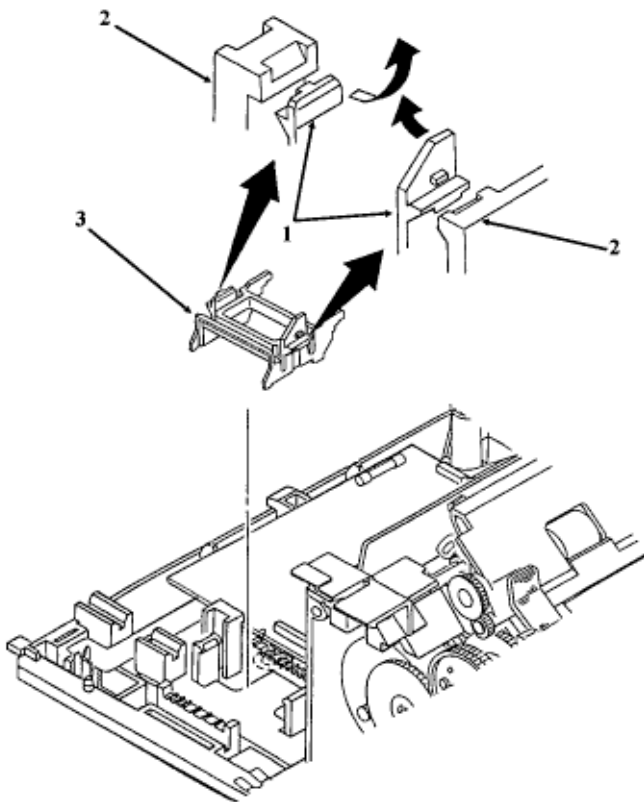
**Power Interconnect Module / Cable Guide Rev C**

**NOTES:** The Rev A and B printers do NOT have a cable guide.  
 The Rev C and Rev D printers do NOT have a power interconnect module.  
 Rev C and Rev D printers have a cable guide.

**Perform these procedures first:**

- 3.2.01
- 3.2.04

- Use a straight-slot screwdriver to release the claws (1) from the chassis clamps (2).
- Remove the cable guide (3).



Part Number	Item Description	Product	Comment	Revision	App. B Reference

P/N 51003801	Guide: Cable	320	RSPL	C D	B.2.08 10
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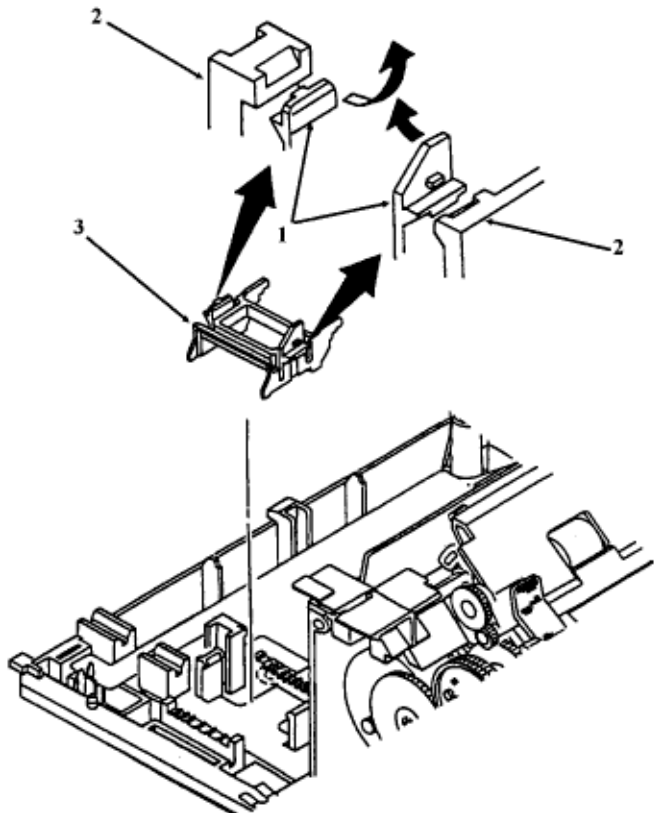
#### Power Interconnect Module / Cable Guide (Rev D)

**NOTES:** The Rev A and B printers do NOT have a cable guide.  
 The Rev C and Rev D printers do NOT have a power interconnect module.  
 Rev C and Rev D printers have a cable guide.

**Perform these procedures first:**

- 3.2.01 
- 3.2.04 

- Use a straight-slot screwdriver to release the claws (1) from the chassis clamps (2).
- Remove the cable guide (3).



Part Number	Item Description	Product	Comment	Revision	App. B Reference

P/N 51003801	Guide: Cable	320	RSPL	C D	B.2.08 10
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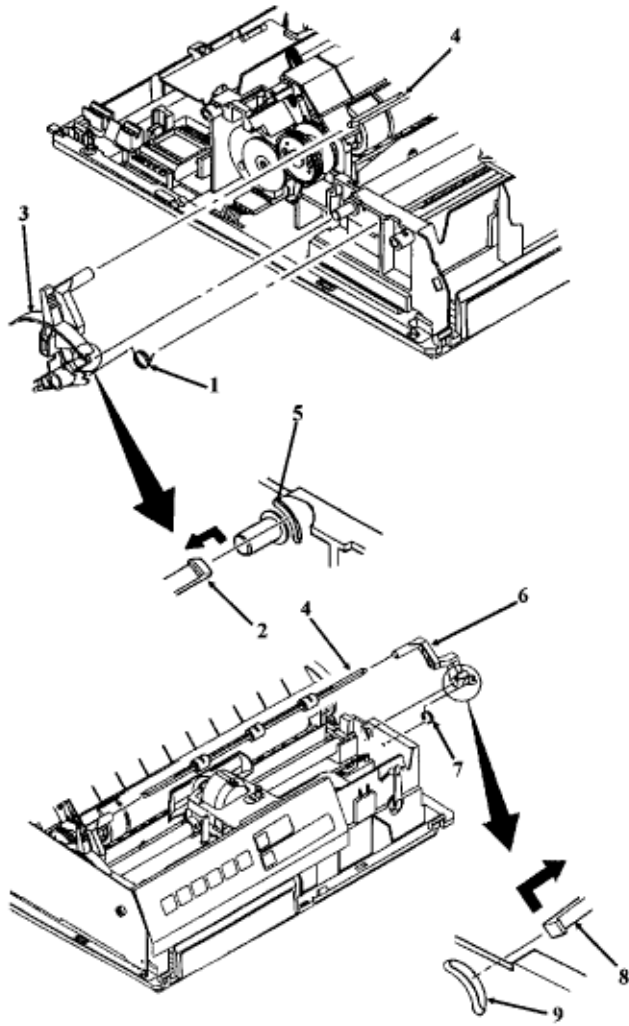
### 3.2.12 Indicator Assembly (Bail Bar Assembly)

#### Perform these procedures first:

- 3.2.01 
- 3.2.04 
- 3.2.05 
- 3.2.06 

- Use needle-nose pliers to remove the left bail arm spring (1).
- Release the claw (2) and detach the left bail arm (3) from the bail bar (4).
- Pull the left bail arm through the guide hole (5) in the chassis and remove the arm.
- Detach the bail bar from the right bail arm (6).
- Use needle-nose pliers to remove the right bail arm spring (7).
- Release the claw (8) and detach the right bail arm from the bail bar.
- Pull the right bail arm through the guide hole (9) in the chassis and remove the arm.





Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 50911801	Spring: Bail Arm (L)	Both	RSPL	A B C D	B.2.06 08 10
P/N 53489301	Bail Arm (L)	Both	RSPL	A B C D	B.2.06 08 10
P/N 50911701	Spring: Bail Arm (R)	Both	RSPL	A B C D	B.2.06 08 10
P/N 53489201	Bail Arm (R)	Both	RSPL	A B C D	B.2.06 08 10
P/N 50061501	Indicator (Assembly)	320	RSPL	A B C D	B.2.06 08 10

P/N 50061502	Indicator (Assembly)	321	RSPL	A B C D	B.2.06 08 10
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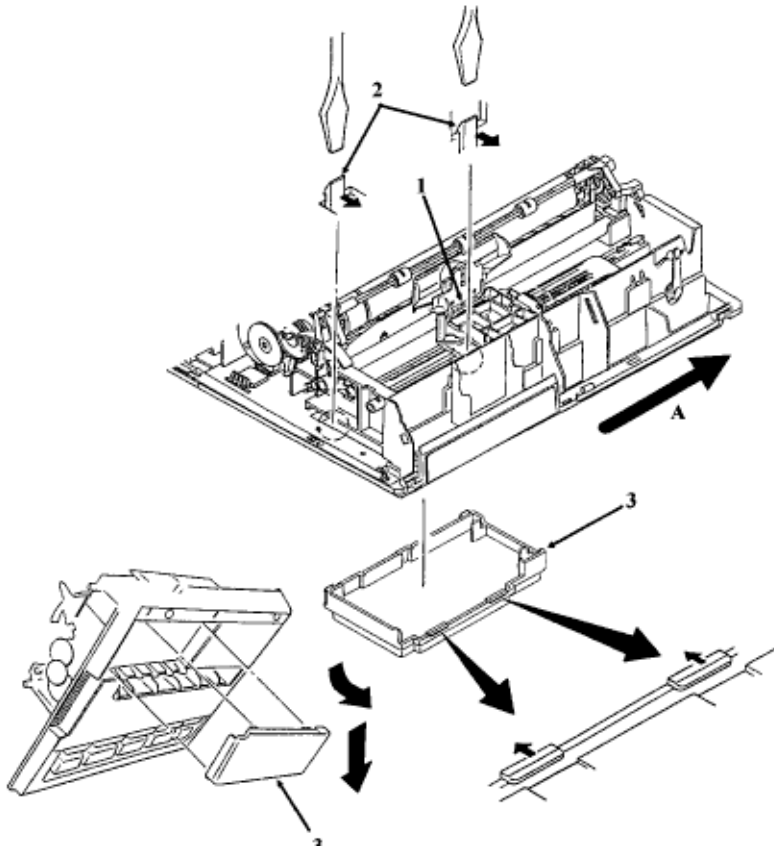
**3.2.13 Head Cable Access Cover**

**NOTE:** Remove this cover to provide access when connecting the head cable to the control board.

Perform these procedures first:

- 3.2.01 
- 3.2.04 
- 3.2.06 

- Slide the carriage frame (1) in the direction of arrow A.
- Release the two claws (2) and remove the head cable access cover (3).



Part Number	Item Description	Product	Comment	Revision	App. B Reference

P/N 50062301	Cover: Head Cable Access	Both	RSPL	A B C	B.2.06 08
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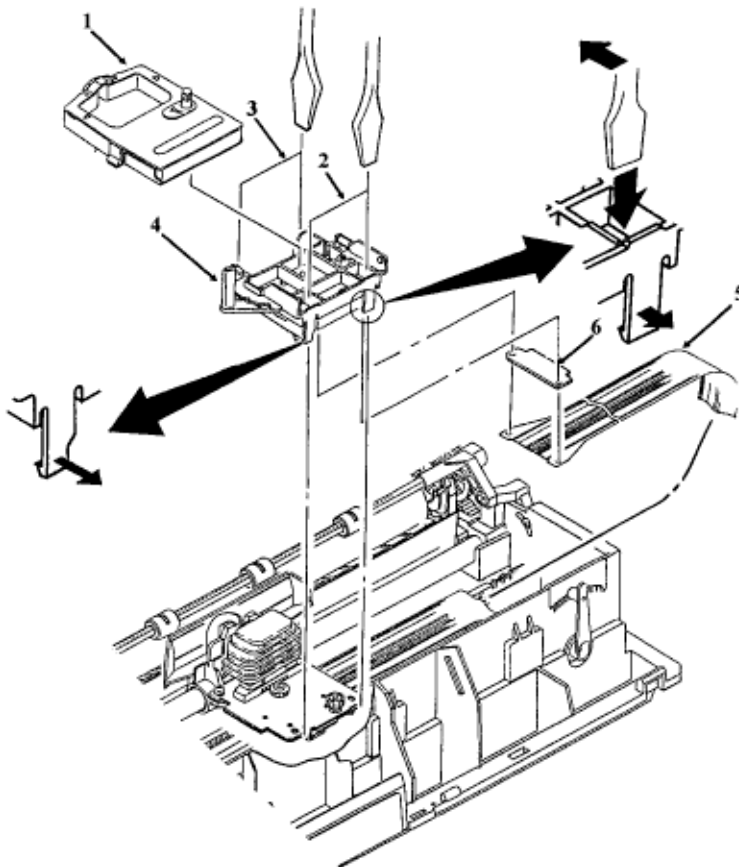
### 3.2.14 Ribbon Drive Assembly

**CAUTION:** When handling the head cable, do NOT bend the cable at sharp angles or you may damage it.

**Perform these procedures first:**

- 3.2.01
- 3.2.04

- Remove the ribbon (1).
- Insert a straight-slot screwdriver through the access slots and release the two front claws (2) and the two rear claws (3) of the ribbon drive assembly (4).
- Lift and remove the assembly.
- Detach the head cable (5), the cable clamp (not shown) and the contact pressure rubber (6) from the drive assembly.



**When lubricating, refer to Section 3.5  of this Service Handbook.**

<b>Part Number</b>	<b>Item Description</b>	<b>Product</b>	<b>Comment</b>	<b>Revision</b>	<b>App. B Reference</b>
P/N 50063701	Drive: Ribbon Assembly	Both	RSPL	A B C D	B.2.13
P/N 56616301	Cable: Head (Flexible)	320	RSPL	A B C D	B.2.13
P/N 56616302	Cable: Head (Flexible)	321	RSPL	A B C D	B.2.13
P/N 51706501	Rubber: Contact Pressure	Both	RSPL	A B C D	B.2.13

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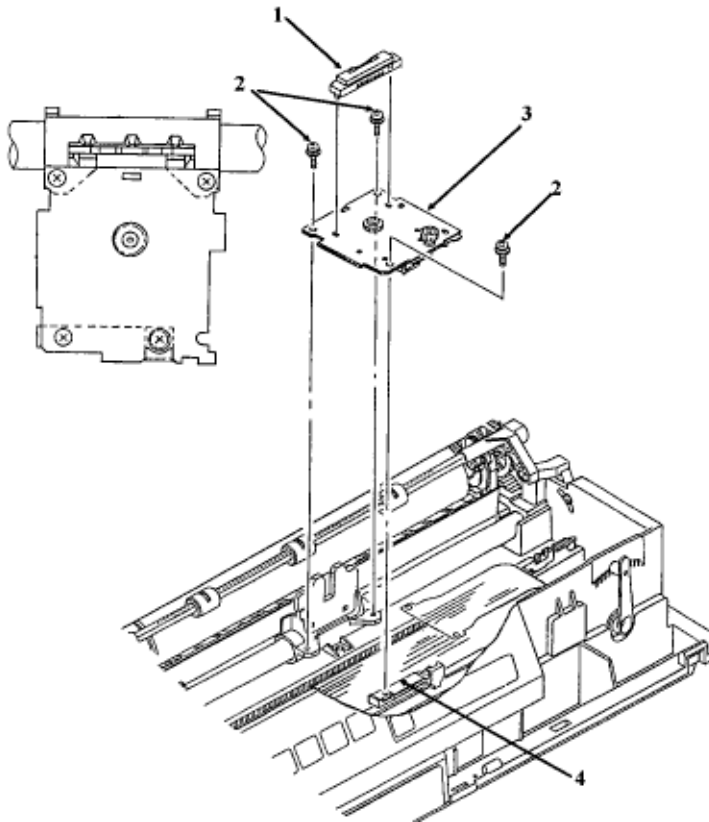
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### 3.2.15 Space Motor Assembly

#### Perform these procedures first:

- 3.2.01 
- 3.2.03 
- 3.2.04 
- 3.2.14 

- Note the position of the connector (1). During assembly, the connector's orientation is critical for correct printhead operation.
- Detach the connector.
- Remove the three mounting screws (2).
- Remove the space motor assembly (3). Be careful not to lose the slider (4).



#### NOTES:

Installation

- Do not touch the contacts of the assembly.
- Position the slider first.
- The contact side of the head cable faces down when the carriage cable is inserted into the connector on the space motor assembly.
- Work the cable from side to side until it is fully seated in the connector. No contacts should be visible.
- Perform the printhead gap adjustment after installing this assembly.

**Refer to Section 3.3  of this Service Handbook.**

Cleaning

**When cleaning, refer to Section 3.4 () of this Service Handbook.**

Lubrication

**When lubricating, refer to Section 3.5 () of this Service Handbook.**


<b>Part Number</b>	<b>Item Description</b>	<b>Product</b>	<b>Comment</b>	<b>Revision</b>	<b>App. B Reference</b>
P/N 51001801	Guide: Space Motor (Slider)	Both	RSPL	A B C D	B.2.13
P/N 56718601	Connector: Head	Both	RSPL	A B C D	B.2.13
P/N 56507202	Motor: Space (Assembly)	Both	RSPL	A B C D	B.2.13



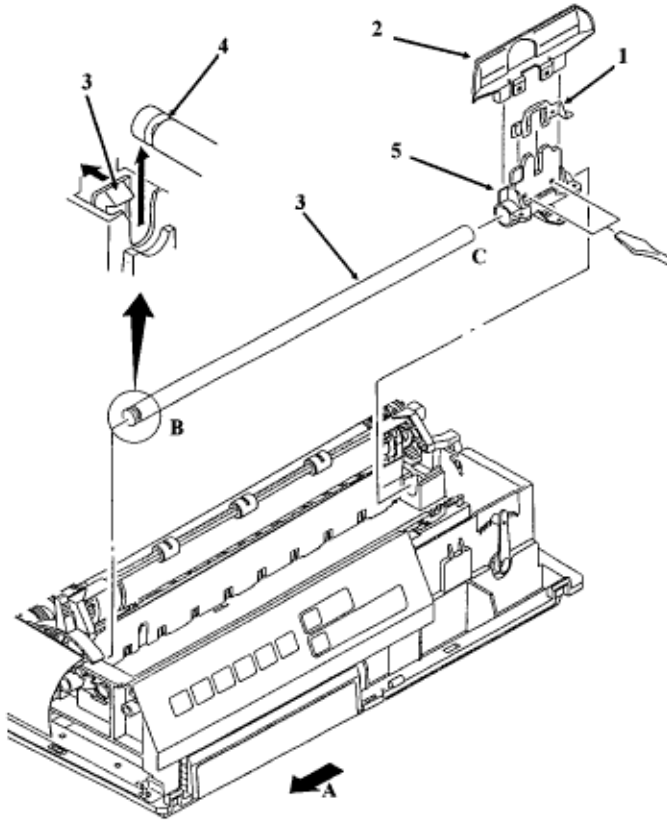
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### 3.2.16 Carriage Frame Assembly

#### Perform these procedures first:

- 3.2.01 
- 3.2.03 
- 3.2.04 
- 3.2.14 
- 3.2.15 

- Detach the head clamp (1).
- Use a flat-blade screwdriver to release the tabs of the ribbon protector (2).
- Remove the ribbon protector.
- Push the carriage shaft clamp (3) in the direction of arrow A.
- Lift the carriage shaft (4) at position B.
- Remove the carriage shaft from the guide hole by pulling at position C.
- Remove the carriage shaft, with the carriage frame (5).
- Slide the carriage frame off the carriage shaft.



**NOTES:**

Installation

- After installing the carriage shaft, check the printhead gap adjustment.

[Refer to Section 3.3 of this Service Handbook.](#)

Cleaning

[When cleaning, refer to Section 3.4 of this Service Handbook.](#)

Lubrication

[When lubricating, refer to Section 3.5 \(🔧\) of this Service Handbook.](#)

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 51109401	Shaft: Carriage	320	RSPL	A B C D	B.2.06 08 10

P/N 51109402	Shaft: Carriage	321	RSPL	A B C D	B.2.06 08 10
P/N 50702901	Clamp: Head	Both	RSPL	A B C D	B.2.13
P/N 53490401	Frame: Carriage (Assembly)	Both	RSPL	A B C D	B.2.13
P/N 53056201	Protector: Ribbon	Both	RSPL	A B C D	B.2.13





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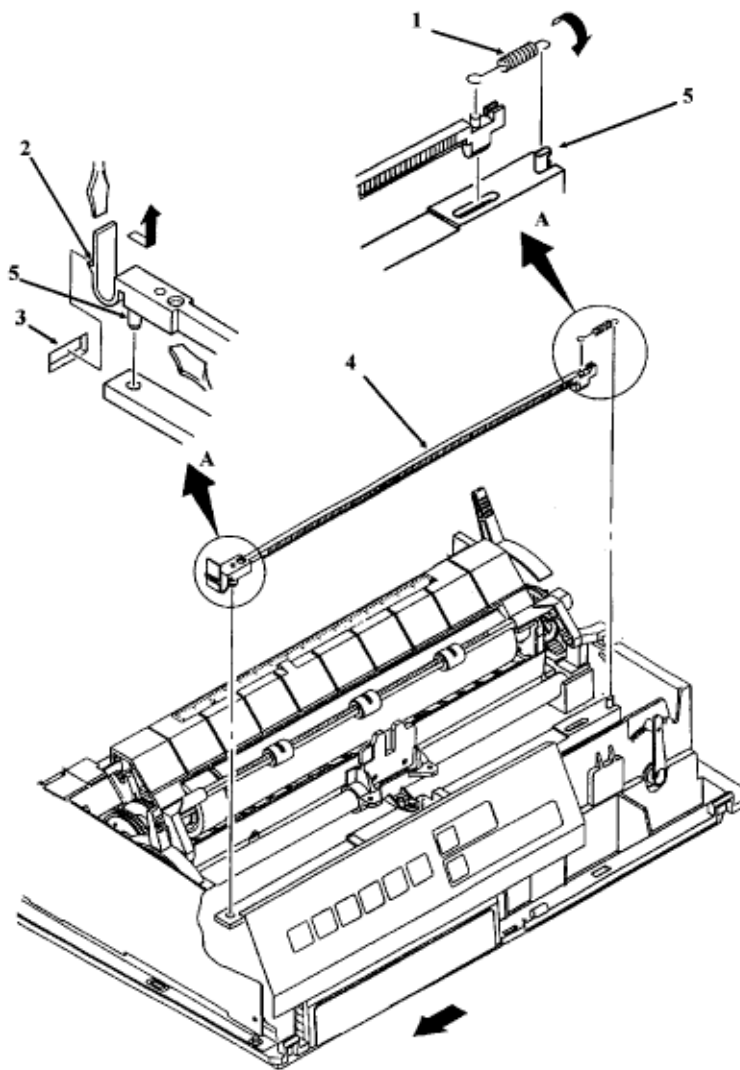
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### 3.2.17 Space Rack

#### Perform these procedures first:

- 3.2.01 
  - 3.2.04 
  - 3.2.14 
  - 3.2.15 .
- 
- Remove the tension spring (1).
  - Release the claw (2) from the hole (3) in the chassis.
  - Pull the space rack (4) in the direction of arrow A.
  - Remove the space rack.



**NOTES:**

Installation

- Fully seat the two guide pins (5).

Cleaning

**- When cleaning, refer to Section 3.4  of this Service Handbook.**

**CAUTION:** Do NOT lubricate the space rack. Lubricating the space rack will attract dust. If enough dust accumulates on the space rack, printing problems will occur.

<b>Part Number</b>	<b>Item Description</b>	<b>Product</b>	<b>Comment</b>	<b>Revision</b>	<b>App. B Reference</b>
P/N 53489401	Rack: Space	320	RSPL	A B C D	B.2.06 08 10
P/N 53489402	Rack: Space	321	RSPL	A B C D	B.2.06 08 10
P/N 50911901	Spring: Tension	Both	RSPL	A B C D	B.2.06 08 10

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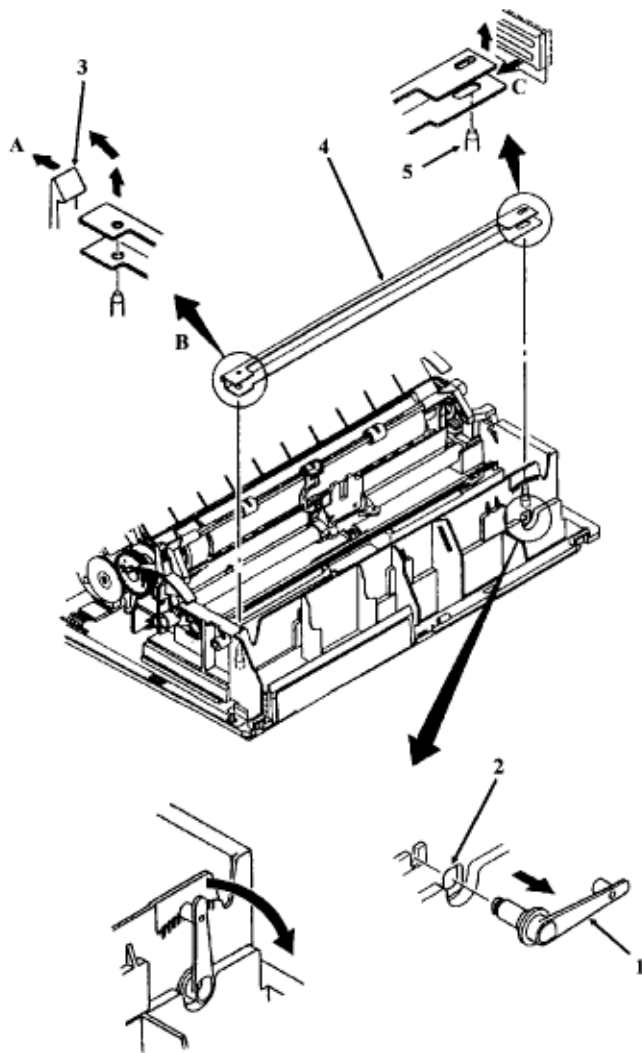
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### 3.2.18 Guide Rail

#### Perform these procedures first:

- 3.2.01 
- 3.2.04 
- 3.2.14 
- 3.2.15 

- Pull the adjusting cam (1) out and rotate it to the horizontal position.
- Release the adjusting cam from the guide (2) in the chassis and remove the cam.
- Push the claw (3) in the direction of arrow A to disengage the guide rail (4) at position B.
- Pull the guide rail in the direction of arrow C to release it from the guide (5) in the chassis.
- Lift and remove the guide rail.



**NOTE:** After installing the guide rail, check the printhead gap adjustment.  
Refer to [Section 3.3](#) of this Service Handbook.

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 51002101	Rail: Guide	320	RSPL	A B C D	B.2.06 08 10
P/N 51002102	Rail: Guide	321	RSPL	A B C D	B.2.06 08 10
P/N 51216201	Cam: Adjust	Both	RSPL	A B C D	B.2.06 08 10



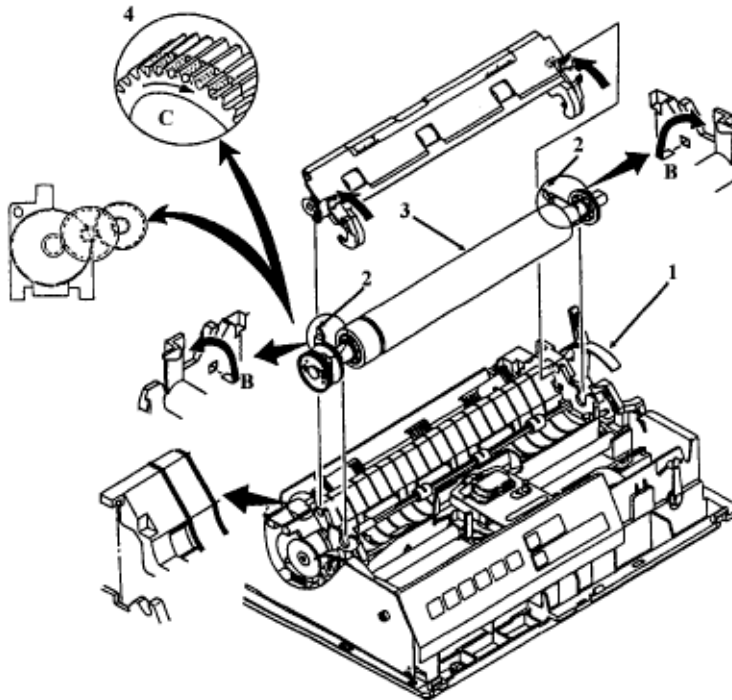
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### 3.2.19 Platen Assembly

Perform these procedures first:

- 3.2.01
- 3.2.02
- 3.2.04


- Push the release lever (1) to the rear of the printer.
- Pull the platen lock levers (2) in the direction of arrow A.
- Rotate the lock levers in the direction of arrow B. This releases the platen assembly (3) from the chassis.
- Lift and remove the platen assembly.



#### NOTES:

##### Installation

- Before installation, turn the bias gear (4) towards the front of the printer as far as it will go.

- Set the platen assembly into place.
- Verify that the bias gear securely engages the line feed motor gear.
- Secure the two lock levers.
- Set the release lever to OPEN (front) and check that the groove of the paper chute firmly engages with the groove of the main chassis.
- **Check the printhead gap adjustment. Refer to Section 3.3  of this Service Handbook.**

Cleaning

**When cleaning, refer to Section 3.4  of this Service Handbook.**

Lubrication

**When lubricating, refer to Section 3.5  of this Service Handbook.**

**Do NOT lubricate the line feed motor gear. Lubricant will cause the gear to disintegrate.**

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 50061305	Platen: (Assembly)	320	RSPL	A B C D	B.2.06 08 10
P/N 50061306	Platen: (Assembly)	321	RSPL	A B C D	B.2.06 08 10

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### 3.2.20 Line Feed Motor and Gear

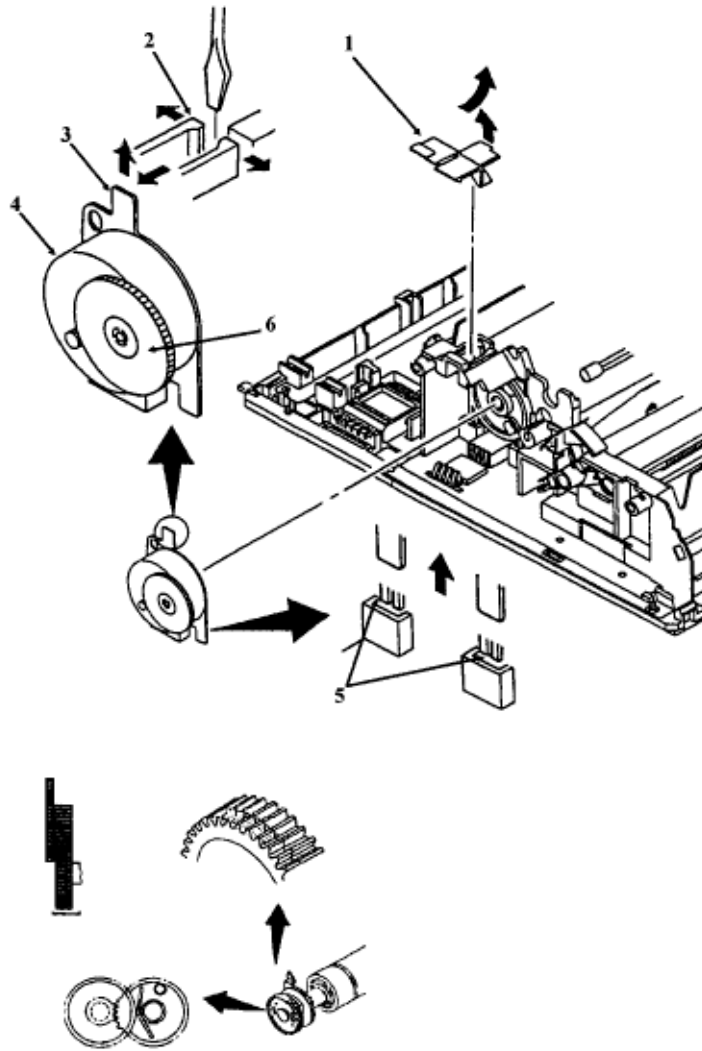
#### Line Feed Motor

**NOTES:** Use care when performing this procedure. The plastic claws will break if too much pressure is applied.

If the line feed motor gear breaks or becomes worn, it is not necessary to replace the entire line feed motor assembly. The gear (6) can be replaced without removing the line feed motor assembly. However, the platen assembly **MUST** be removed. The line feed idle gear should be removed **ONLY** if it must be replaced. The claws will break when the gear is removed. A new gear must be installed.

#### Perform these procedures first:

- 3.2.01 
  - 3.2.02 
  - 3.2.04 
  - 3.2.05 
  - 3.2.06 
  - 3.2.19. 
- 
- Remove the left bail arm.
  - Use a straight slot screwdriver to remove the clip (1).
  - Use a straight slot screwdriver to open the lock levers (2) and push the bracket (3) of the line feed motor (4) in the direction of arrow A.
  - Remove the line feed motor from the guides (5).



**CAUTION:**

Installation

If the line feed motor assembly is not correctly installed, excessive wear of the platen gears will occur.

Verify that the tabs are not bent. If the tabs are bent, straighten them. The assembly will not seat if the tabs are bent. If the assembly is not seated correctly, the gears will not correctly align.

Rotate the bias gear towards the front of the printer as far as the gear will turn. This aligns the bias gear with the platen gear.

Set the platen assembly in place, securely engaging the idler gear with the platen gears.

Lock the line feed motor assembly into position. Verify that the tabs are not bent.

<b>Part Number</b>	<b>Item Description</b>	<b>Product</b>	<b>Comment</b>	<b>Revision</b>	<b>App. B Reference</b>
P/N 56507003	Motor: Line Feed	Both	RSPL	A B C D	B.2.07 09 11

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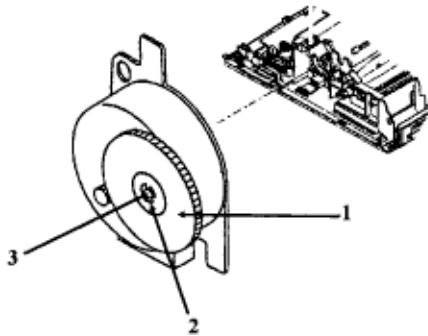
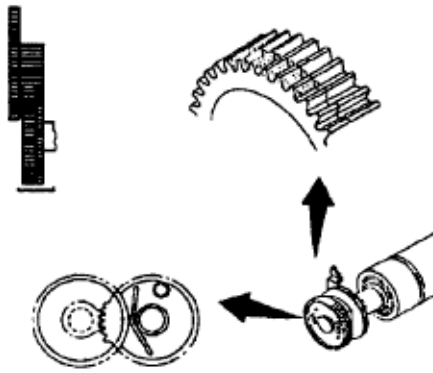
### Line Feed Motor Gear

**NOTES:** If the line feed motor gear breaks or becomes worn, it is not necessary to replace the entire line feed motor assembly. The gear can be replaced without removing the line feed motor assembly. However, the platen assembly **MUST** be removed. The line feed idle gear should be removed **ONLY** if it must be replaced. The claws will break when the gear is removed. A new gear must be installed.

#### Perform these procedures first:

- 3.2.01 
- 3.2.02 
- 3.2.04 
- 3.2.05 
- 3.2.06 
- 3.2.19. 

- Remove the left bail arm.
- Use a small cutting pliers to cut the three claws (1) that secure the line feed motor gear (2) to the support shaft (3).
- Remove the gear and cut claws.
- Apply one drop of machine oil to the support shaft.
- Slide the new gear onto the support shaft.
- Lock the three claws of the gear into the groove of the shaft.
- Rotate the bias gear towards the front of the printer as far as the gear will turn. This aligns the bias gear with the platen gear.
- Set the platen assembly in place, securely engaging the line feed motor gear with the platen gears.



**CAUTION:**

If the claws do not lock into the groove of the support shaft, the gear will "walk" off the shaft during use. Verify that the line feed motor gear and line feed motor assembly are correctly installed. Verify that the line feed motor gear and the platen gears are correctly aligned. Incorrect installation and alignment will cause line feed motor gear breakage and wearing.

**Do NOT apply lubricant to the teeth of the line feed motor gear. Grease causes the plastic to break down, resulting in premature wear of the gear teeth.**

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 51219001	Gear: Line Feed Motor	Both	RSPL	A B C D	B.2.07 09 11
P/N 58217901	<b>*Field Change Order 7677A Kit</b>	Both		A B	

\* Contains a strengthened line feed motor gear and installation instructions.



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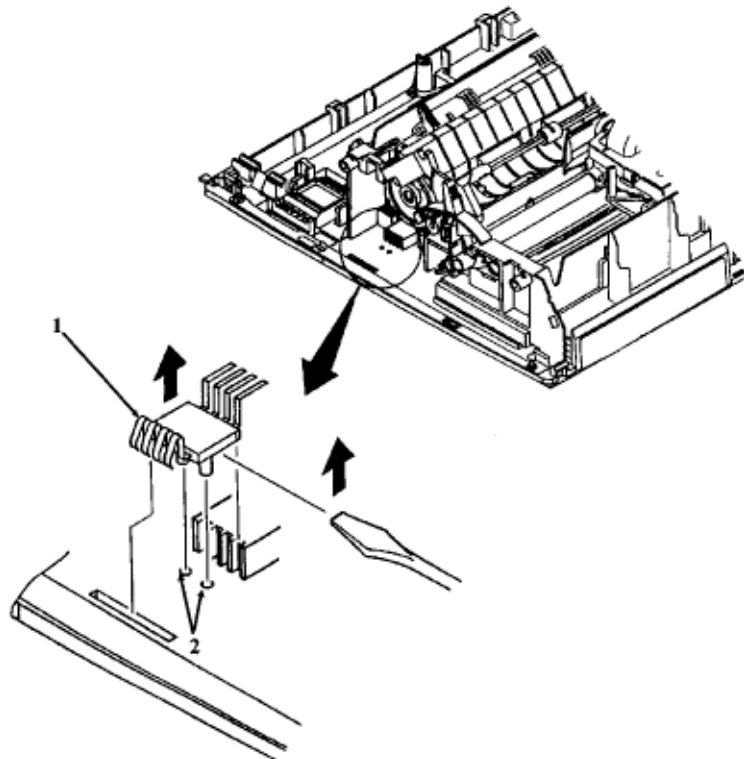
**3.2.21 Line Feed Motor Interconnect Module**

**NOTE:** Use care when performing this procedure. The plastic extension will break if too much pressure is applied.

Perform these procedures first:

- 3.2.01 
- 3.2.02 
- 3.2.04 
- 3.2.05 
- 3.2.06 
- 3.2.20 

- Insert a straight-slot screwdriver between the line feed motor interconnect module (1) and the chassis. Then, carefully pry the module from the two guide holes (2).



Part Number	Item Description	Product	Comment	Revision	App. B Reference

P/N 53328401	Module: LF Motor Interconnect	Both	RSPL	A B C D	B.2.07 09 11
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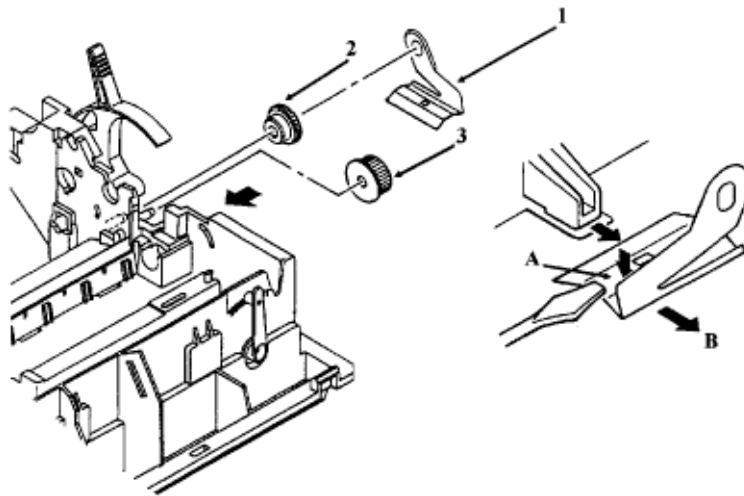
### 3.2.22 Reset Spring, Change Gear, and Idler Gear

- CAUTION:**
- Please read through this entire procedure before performing it.
  - Do NOT press against the vertical extension of the reset spring at any time during this procedure.
  - Firm pressure will release the reset spring, NOT brute force.

**Perform these procedures first:**

- 3.2.01
- 3.2.02
- 3.2.04

- Use a flat-blade screwdriver to press down at position A of the reset spring (1).
- Slide the spring out in the direction of arrow B.
- Detach the change gear (2).
- Detach the idler gear (3).



**NOTE:**

**Lubrication**

When lubricating, refer to Section 3.5 of this Service Handbook.

**Parts Replacement**

The Kit: Idler/Change Gear (ML300) includes the change and idler gears. Order

this kit when replacing these parts.

<b>Part Number</b>	<b>Item Description</b>	<b>Product</b>	<b>Comment</b>	<b>Revision</b>	<b>App. B Reference</b>
P/N 50912001	Spring: Reset	Both	RSPL	A B C D	B.2.07 09 11
P/N 58227501	Kit: Idler/Change Gear (ML300) Includes the Change Gear and the Idler Gear	Both	RSPL	A B C D	B.2.07 09 11
P/N 51215901	Change Gear Included in the Idler/Change Gear Kit	Both		A B C D	B.2.07 09 11
P/N 51216001	Idler Gear Included in the Idler/Change Gear Kit	Both		A B C D	B.2.07 09 11

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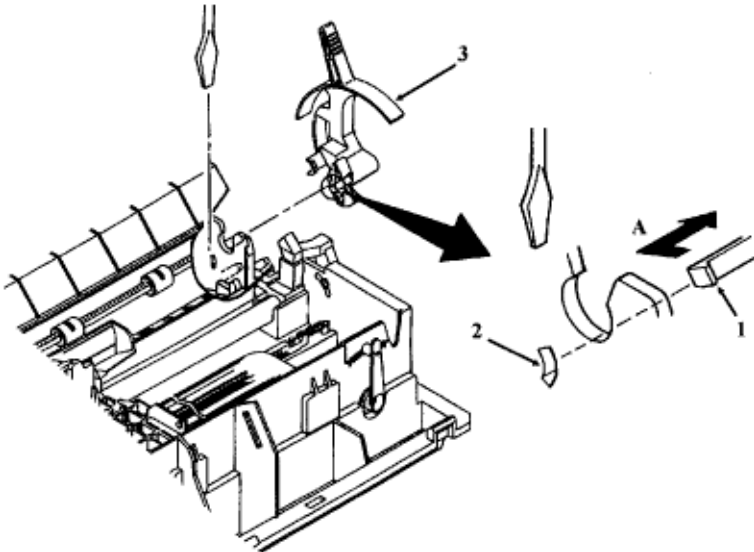
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### 3.2.23 Release Lever

**Perform these procedures first:**

- 3.2.01
- 3.2.02
- 3.2.04
- 3.2.22

- Release the claw (1) from the guide (2) in the chassis.
- Pull the release lever (3) in the direction of arrow A and remove the lever.





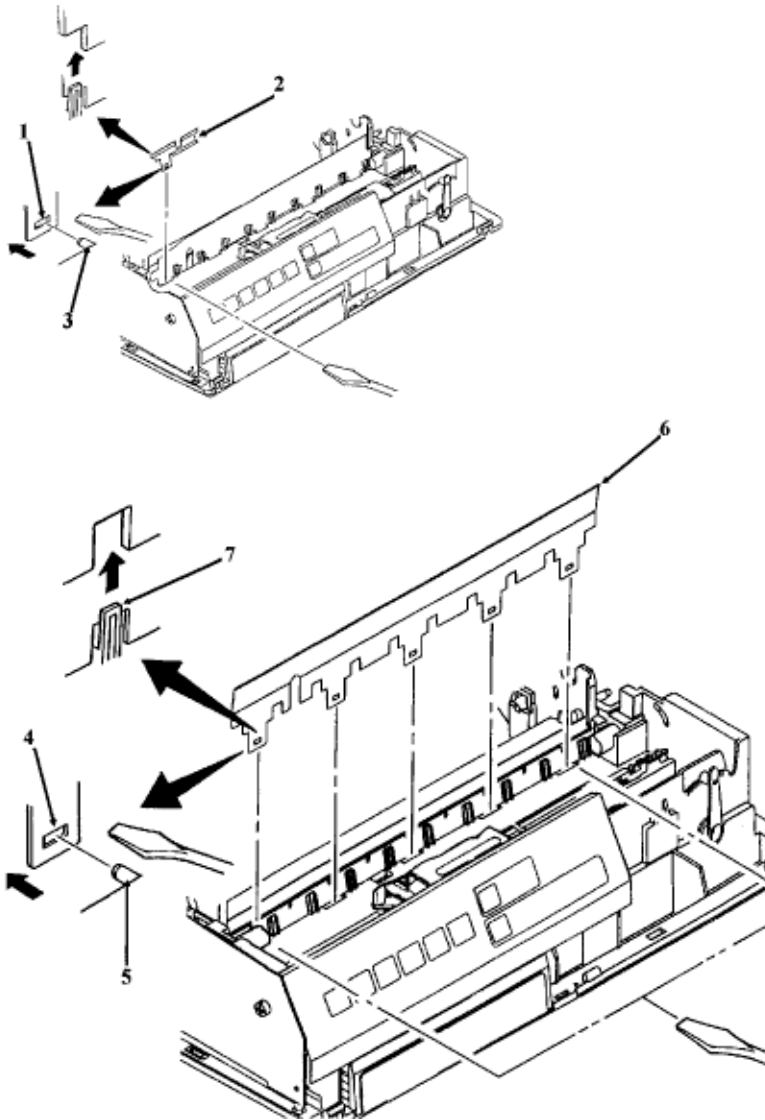
Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 53489501	Lever: Release	Both	RSPL	A B C D	B.2.07 09 11

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### 3.2.24 Paper Pressure Guide

#### Perform these procedures first:

- 3.2.01 
- 3.2.02 
  
- Use a straight-slot screwdriver to detach the coupling holes (1) of the support spring (2) from the projections (3) on the main chassis. (Microline 321 ONLY)
  
- Work from left to right and use a straight-slot screwdriver to detach the coupling holes (4) from the projections (5) on the chassis.
  
- Remove the paper pressure guide (6).



**NOTE:**

When installing the paper pressure guide, be sure to fit it into the projections (5) and guide plates (7) at the same time.

The Microline 320 has five coupling holes and ten guide plates.

The Microline 321 has seven coupling holes and thirteen guide plates.

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 50911501	Guide: Paper Pressure	320	RSPL	A B C D	B.2.07 09 11



P/N 50911602	Guide: Paper Pressure	321	RSPL	A B C D	B.2.07 09 11
P/N 50913901	Spring: Support	321	RSPL	A B C D	B.2.07 09 11

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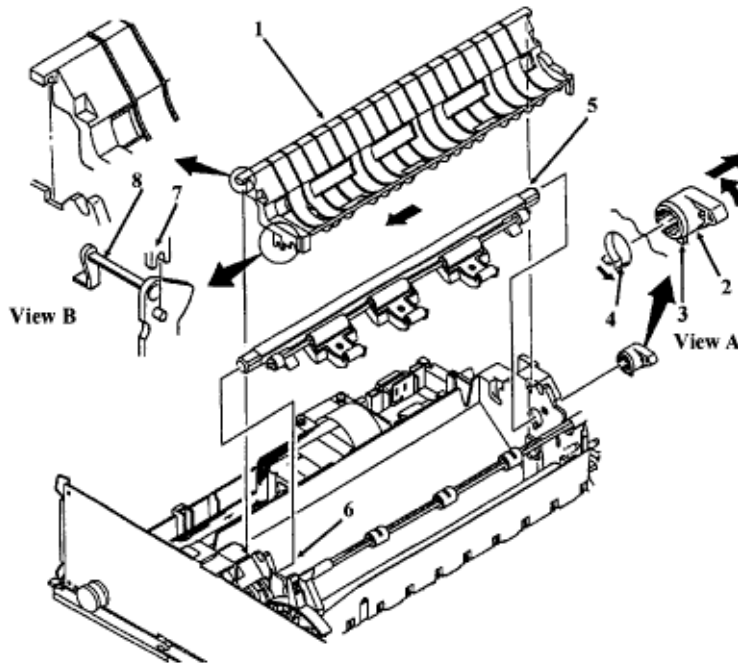
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### 3.2.25 Pressure Roller Assembly

**Perform these procedures first:**

- 3.2.01 
- 3.2.02 
- 3.2.04 
- 3.2.22 
- 3.2.23 

- Remove the paper chute (1).
- Turn the release link (2) as shown in View A so the spine (3) is aligned with the slot (4) in the guide hole.
- Slide the release link off the pressure roller assembly (5).
- Remove the pressure roller assembly by sliding it through the guide hole (6).



**NOTES:**

**Installation**

Attach the paper end lever (7) to the shaft of the sensor lever (8). Refer to View B for the correct position. If the paper end lever is incorrectly positioned, paper jams / no paper-end indications will occur.

Position the tab of the paper chute firmly with the groove of the main frame.

Engage the cut-sheet paper end lever (attached to the bottom of the paper chute) to the bottom paper end lever (under the main frame). Then, install the paper chute.

<b>Part Number</b>	<b>Item Description</b>	<b>Product</b>	<b>Comment</b>	<b>Revision</b>	<b>App. B Reference</b>
P/N 50061801	Chute: Paper (Assembly)	320	RSPL	A B C D	B.2.07 09 11
P/N 50061901	Chute: Paper (Assembly)	321	RSPL	A B C D	B.2.07 09 11
P/N 50061601	Roller: Pressure (Assembly)	320	RSPL	A B C D	B.2.07 09 11
P/N 50061701	Roller: Pressure (Assembly)	321	RSPL	A B C D	B.2.07 09 11
P/N 53489601	Link: Release	Both	RSPL	A B C D	B.2.07 09 11

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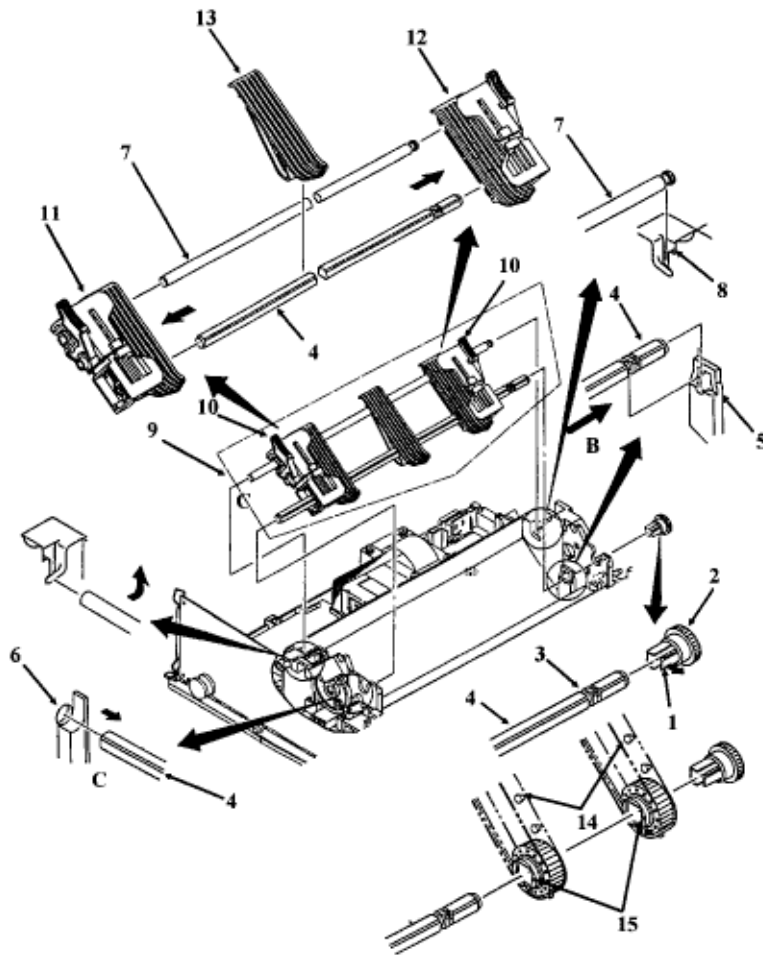
### 3.2.26 Tractor Assembly

**NOTE:** Horizontal movement of the left tractor is restricted by a stopper on the lower cover.

Perform these procedures first:

- 3.2.01 
- 3.2.02 
- 3.2.04 
- 3.2.22 
- 3.2.25 

- Use a needle nose pliers to release the claw (1) of the tractor gear (2) from the groove (3) in the lower tractor feed shaft (4). The lower tractor feed shaft is square.
- Remove the tractor gear.
- Lift the lower tractor feed shaft above the guide (5).
- Slide the lower tractor feed shaft in the direction of arrow B until the C side is free of the guide hole (6).
- Lift the upper tractor feed shaft (7) above the guide (8). The upper tractor feed shaft is round.
- Remove the tractor assembly (9).
- Raise the lock levers (10) on the left (11) and right (12) tractor assemblies.
- Remove the left tractor assembly, the sheet guide (13), and the right tractor assembly.



**NOTES:**

Installation

The tractors must be synchronized. The pins (14) on the left and right tractors must be aligned when installed. Also, verify that the guide holes (15) in the tractor drive gears are facing the same direction.

The left tractor assembly must be positioned to the left (line feed motor side) of the plastic tab and ground plate. This limits movement and correctly positions the paper against the paper end sensor.

**When lubricating, refer to Section 3.5 of this Service Handbook.**

Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 51216101	Gear: Tractor	Both	RSPL	A B C D	B.2.07 09 11

P/N 50062101	Frame: Tractor (L) Assembly	Both	RSPL	A B C D	B.2.14
P/N 50062001	Frame: Tractor (R) Assembly	Both	RSPL	A B C D	B.2.14
P/N 51109501	Shaft: Drive	320	RSPL	A B C D	B.2.14
P/N 51109502	Shaft: Drive	321	RSPL	A B C D	B.2.14
P/N 51111201	Shaft: Lock	320	RSPL	A B C D	B.2.14
P/N 51109602	Shaft: Lock	321	RSPL	A B C D	B.2.14
P/N 51004901	Sheet Guide	Both	RSPL	A B C D	B.2.14

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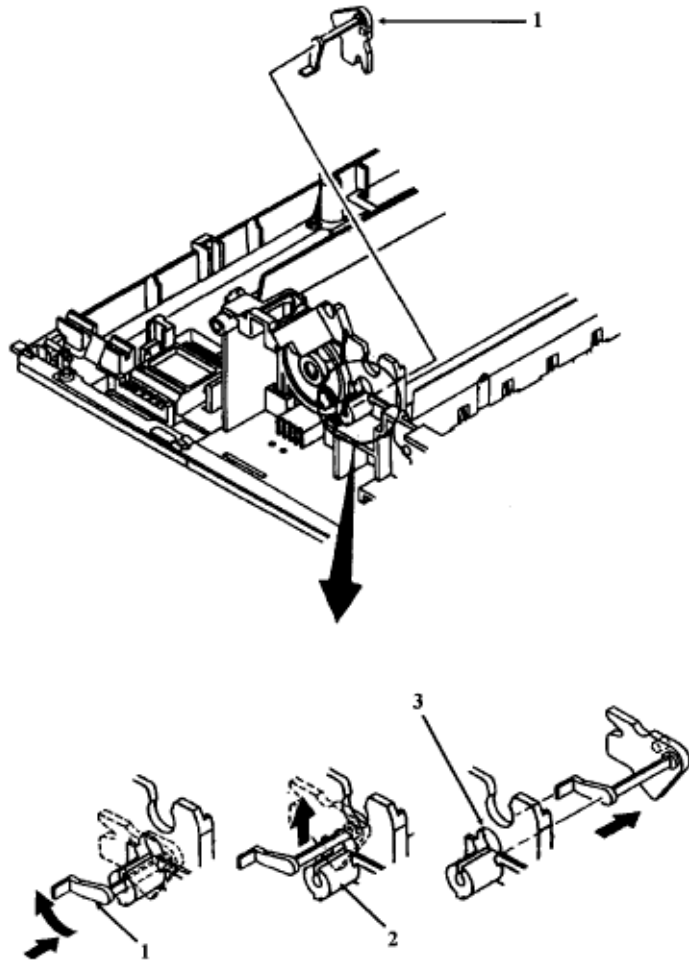
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### 3.2.27 Sensor Lever

#### Perform these procedures first:

- 3.2.01 
- 3.2.02 
- 3.2.04 
- 3.2.05 
- 3.2.06 
- 3.2.20 
- 3.2.22 
- 3.2.25 
- 3.2.26 

- Turn the sensor lever (1) clockwise until it is horizontal.
- Lift the sensor lever from the shaft bearing (2).
- Work the sensor lever from the guide hole (3) in the chassis and remove the lever.



Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 53489001	Lever: Sensor	Both	RSPL	A B C D	B.2.07 09 11

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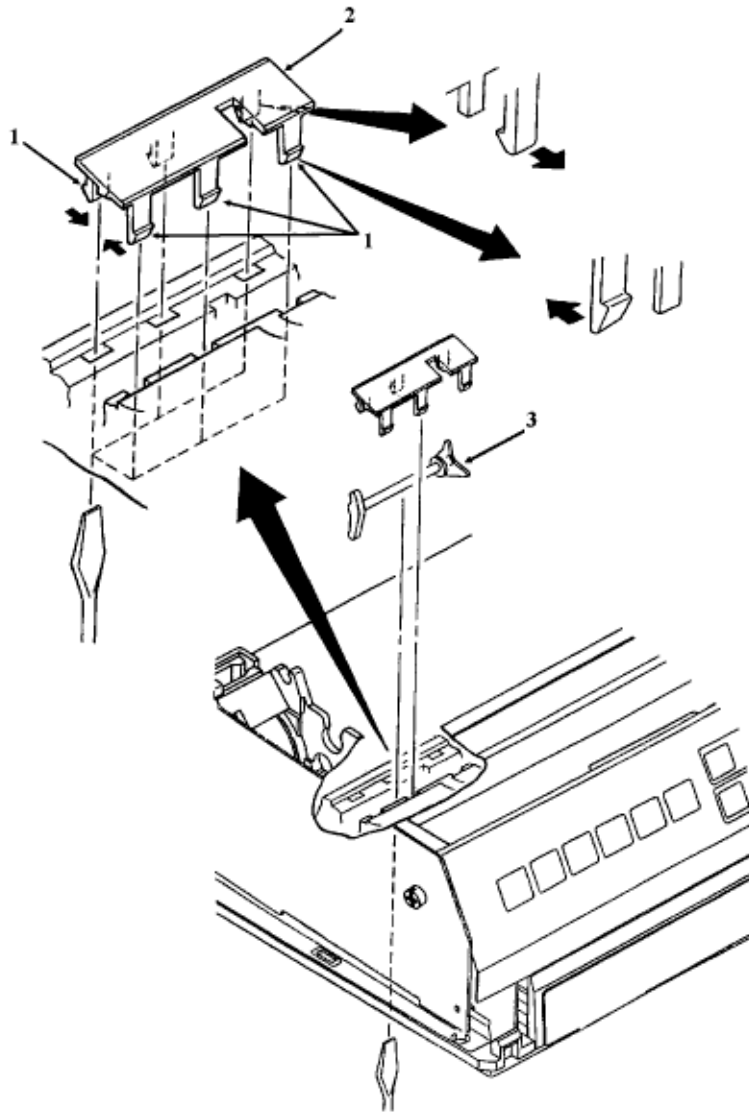
### 3.2.28 Paper End (B) Lever

**NOTE:** The paper end lever guide is accessed from the bottom of the printer.

**Perform these procedures first:**

- 3.2.01 
- 3.2.02 
- 3.2.04 
- 3.2.05 
- 3.2.06 
- 3.2.20 
- 3.2.22 
- 3.2.25 
- 3.2.26 
- 3.2.27 

- While pushing on the six claws (1), detach the sensor cover (2). Four of the six claws are visible in the illustration.
- Lift the paper end (B) lever (3) from the chassis.

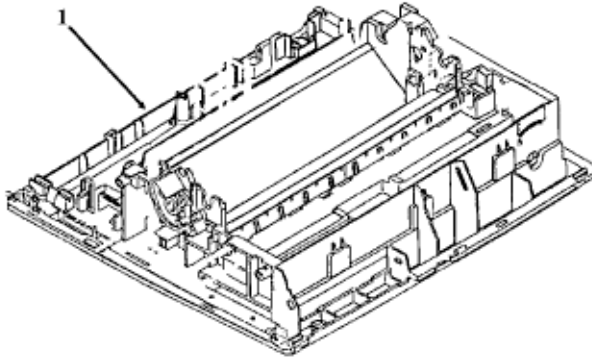


Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 53488901	Lever: Paper End (B)	320	RSPL	A B C D	B.2.07 09 11
P/N 53488902	Lever: Paper End (B)	321	RSPL	A B C D	B.2.07 09 11
P/N 53489101	Cover: Sensor	Both	RSPL	A B C D	B.2.07 09 11

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**3.2.29 Main Chassis Assembly**

All disassembly procedures must be carried out to reach the main chassis assembly (1).



Part Number	Item Description	Product	Comment	Revision	App. B Reference
P/N 50061101	Chassis: Main (Assembly)	320	RSPL	A B C	B.2.07 09
P/N 50061201	Chassis: Main (Assembly)	321	RSPL	A B C	B.2.07 09
P/N 50104501	Chassis: Main (Assembly) SSD	320	RSPL	D	B.2.11
P/N 50104601	Chassis: Main (Assembly) SSD	321	RSPL	D	B.2.11

### 3.3 ADJUSTMENTS

#### General Information

This section contains the procedure for performing the adjustment on the Microline 320 and 321 printers. This procedure may be required when replacing either consumables or parts. The disassembly / assembly procedures list the required adjustment and refer you to this section. Failure to perform these procedures may result in unnecessary service calls.

#### **3.3.01 Printhead Gap Adjustment**

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### 3.3.01 Printhead Gap Adjustment

Before performing this adjustment, always verify that the printhead is properly installed.

**The printhead gap should measure:**

Rev A, B, and C:	0.016 inch, + / - 0.002 inch
Rev D:	0.018 inch, + / - 0.002 inch

The printhead gap adjustment procedure should be performed when the following occur.

- Print quality is darker on either side of the document.
- Parts /Assemblies are replaced.
- Space Motor Assembly (3.2.15 )
- Carriage Shaft ..... (3.2.16 )
- Guide Rail ..... (3.2.18 )
- Platen Assembly ..... (3.2.19 )

**This adjustment has four phases.**

**Phase 1: Setup Phase (Steps 1-6)**

The cover is removed and the printhead is placed at a known reference point.

**Phase 2: Printhead Gap Modification Phase (Steps 7-9)**

The distance between the printhead and the platen at the left (line feed motor) side of the platen is modified by turning the adjust screw. Turning the adjust screw varies the vertical position of the space motor.

**Phase 3: Parallel Adjustment Phase (Steps 10 - 12)**

The adjust cam lever is moved to ensure that the printhead moves parallel to the platen.

**Phase 4: Check Phase (Steps 13 - 14)**

This phase verifies that the Parallel Adjustment Phase did not affect the Printhead Gap Modification Phase.

To adjust the printhead gap, follow this procedure.

- 1) Remove the upper cover.
- 2) Move the change lever to the rear paper feed position.

- 3) Place the paper bail bar in the OPEN position.
- 4) Set the adjusting lever to Position 1.
- 5) Place the adjust cam in the vertical position.
- 6) Slide the carriage assembly to the left (line feed motor) side of the platen.
- 7) Use a feeler gauge to check the printhead gap. The printhead gap must measure:

Rev A, B, and C:	0.016 inch, + / - 0.002 inch
Rev D:	0.018 inch, + / - 0.002 inch
- 8) Use a straightened paper clip to press down on the adjusting gear. This separates the gear from the adjusting lever. Keep pressing down on the adjusting gear while performing Step 9.
- 9) Use a small phillips screwdriver to turn the adjusting screw.

Turn the adjusting screw CLOCKWISE to increase the gap.

Turn the adjusting screw COUNTER-CLOCKWISE to decrease the gap.

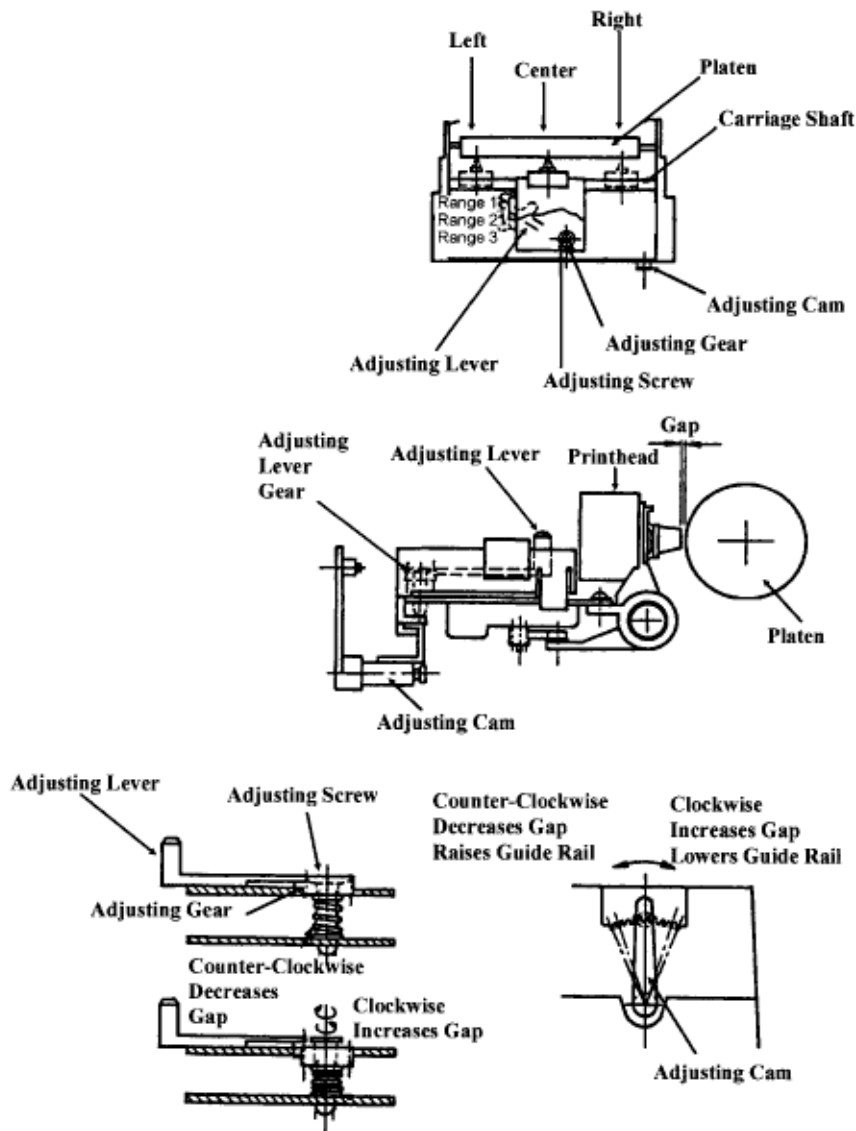
The printhead gap must measure:

Rev A, B, and C:	0.016 inch, + / - 0.002 inch
Rev D:	0.018 inch, + / - 0.002 inch
- 10) Slide the carriage assembly to the right (platen knob) side of the platen.
- 11) Use a feeler gauge to check the printhead gap. The printhead gap must measure:

Rev A, B, and C:	0.016 inch, + / - 0.002 inch
Rev D:	0.018 inch, + / - 0.002 inch
- 12) If the gap measurements are different between the left and right positions, turn the adjust cam. Turning the adjust cam adjusts the height of the ruler guide.

Turn CLOCKWISE to increase the printhead gap. The guide rail is lowered.

Turn COUNTER-CLOCKWISE to decrease the gap. The guide rail is raised.
- 13) Check the printhead gap at the left, right, and center of the platen.
- 14) If the printhead gap is not the same in all three positions, return to Step 6.



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## Service Guide ML320/ML321

### Chapter 3 Maintenance & Disassembly

## 3.4 CLEANING

### 3.4.01 General Information

An accumulation of paper dust is the most frequent cause of print quality problems in a dot matrix printer. Small pieces of paper can cause paper jams. A dirty platen will smudge paper. It is important to clean the printer regularly, paying particular attention to the printhead area and paper paths.

If the lubrication procedures are not performed properly, the printer will require more frequent cleaning. Excessive lubricant attracts dust and accumulations build up quickly.

Keeping the covers in place and performing the cleaning procedures correctly will help ensure the highest quality printer output.

### 3.4.02 Cleaning Schedule

Routine inspection and cleaning should be performed as listed below.


Every six months  
or  
300 hours of operation




### 3.4.03 Cleaning Tools

Soft, Lint-free Cloth  
Cotton Swab  
All-purpose Cleaner  
Platen Cleaner  
Vacuum Cleaner  
Contact Kleen (P/N 51802301)

**WARNING:** Power OFF the printer before cleaning it.

### 3.4.04 Areas to be Cleaned

Areas To Be Cleaned	Disassembly Procedure	Tools	Description Of Cleaning
Paper Feed Paths and Pins	N/A	Vacuum Cloth All-purpose cleaner	Remove any paper particles. Wipe or vacuum all dirt, dust, etc.
Ribbon Protector	3.2.03 	Cotton swab All-purpose cleaner	Remove ink residue

Covers	3.2.04 	Cloth All-purpose cleaner	Clean all covers with the all-purpose cleaner and cloth.
Carriage Shaft	3.2.16 	Cloth All-purpose cleaner	Remove any paper particles. Wipe or vacuum all dirt, dust, etc.
Area Around Carriage Shaft	3.2.16 	Vacuum Cloth All-purpose cleaner	Remove any paper particles. Wipe or vacuum all dirt, dust, etc.
Space Rack	3.2.17 	Vacuum Cloth	Remove any paper particles. Wipe or vacuum all dirt, dust, etc.
Paper-End Sensor	3.2.28 	Vacuum Cloth	Wipe or vacuum any accumulated dust from the sensor.
Platen	3.2.29 	Cloth Platen Cleaner	Wipe the surface of the platen with platen cleaner.

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## Service Guide ML320/ML321

### Chapter 3 Maintenance & Disassembly

## 3.5 LUBRICATION

### 3.5.01 General Information

If the lubrication procedures are not performed properly, the printer will require more frequent cleaning. Excessive lubricant attracts dust and accumulations build up quickly. An accumulation of paper dust is the most frequent cause of print quality problems in a dot matrix printer.

### 3.5.02 Lubrication Schedule

Routine inspection and lubrication should be performed as listed below.

Every six months  
or  
300 hours of operation  
or  
When a part on the lubrication schedule is replaced

### 3.5.03 Lubrication Types

Grease (Dow Corning BR2 or equivalent)  
Machine Oil (10 - 30 weight)

### 3.5.04 Lubrication Amounts


Do NOT over-lubricate the printer. Operational problems are caused by excess lubricant. The excess lubricant causes dust to accumulate. These accumulations can jam gears or cause print problems.









The Lubrication Chart will direct you to use the following amounts of lubricant.

Medium  
Oil: three to four drops  
Grease: thin coating (approximately 0.15 inch)

Small  
Oil: one drop  
Grease: extremely thin coating (approximately 0.008 inch)

### 3.5.05 Lubrication Table

Lubrication Point	Disassembly Procedure	Lubricant	Amount	Notes
Ribbon Drive Assembly (Visible bearings of gears)	3.2.14 	Machine Oil	Small	Do NOT lubricate the teeth of the gears. Do NOT disassemble the case.

<b>Space Motor Assembly.</b> Contact between the space motor assembly gear and the space rack.	3.2.15 	Machine Oil	Small	Turn the assembly over to access the point. Do not over-lubricate. Do NOT place lubricant directly on the space rack.
<b>Carriage Shaft</b>	3.2.16 	Machine Oil	Small	Place a small amount on the surface of the carriage shaft. Wipe with a soft, lint-free cloth.
<b>Platen Assembly</b> Contact point between the bias gear and the platen gear.	3.2.19 	Machine Oil	Small	
<b>Idle Gear Bearing</b>	3.2.22 	Grease	Medium	
<b>Change Lever</b> Bearing and pivot point	3.2.22 	Grease	Medium	
<b>Pressure Spring</b> Pivot point of the release cam. Holders on the pressure spring. Bearing of the front release arm.	3.2.22 	Grease	Medium	
<b>Tractor Gear Bearing</b>	3.2.26 	Grease	Medium	
<b>Lower Tractor Feed Shaft</b> Contact points with main chassis	3.2.26 	Grease	Medium	

### 3.5.06 Areas Not Lubricated

**WARNING :** Do NOT allow lubricant to contact the following areas. Poor print quality will result.

Ribbon Cartridge  
Printhead  
Platen Surface (Rubber Face)  
Pressure Roller (Rubber Face)  
Tractor Pins  
Space Motor Board  
Electrical Contacts and Connections  
Space Rack  
Carriage Drive Belt  
Head Cable  
Microswitches  
Pressure Rollers (on Bail Bar)

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#### 4.1.01 Introduction

This section is used to isolate problems to the assembly level. Application problems and detection of faulty components on the printed circuit boards are not addressed.

When troubleshooting a defective unit, refer first to Section 4.4 of this Service Handbook. This section contains tips on preventing problems as well as a list of common problems.

Next, refer to Section 4.6. Repair Analysis Procedures (RAPs) will ask you questions or require you to make observations. The answers to these questions and the results of your observations determine your next course of action. Use the RAP Index to identify which RAP should be used to resolve the problem with the machine.

If you encounter a situation that is not addressed by the documentation in this kit, please report the problem to Okidata. Send your report to the Okidata Technical Training Group. Refer to the Service Center Reference Guide for information on contacting Okidata.

#### **The following information is provided to detect and analyze failures.**

- Okilink II, Faxable Facts, Technical Service Bulletins
- Troubleshooting Tips / Common Problems
- Fault Alarms
- Repair Analysis Procedures
- Hexadecimal Dump
- Resistance / Service Checks
- Tests
- Menu Operation
- Top of Form
- Paper Park

#### **Serial Number Identification & (A-D) Revision Levels**

##### **A**

Rev A units are original production units. An interconnect module connects the power supply board to the main control board.

##### **B**

Rev B units are retrofitted to include a modified interconnect module, which prevents corrosion.

##### **C**

Rev C units have a cable harness connection between the power supply board and the main control board. The cable harness replaces the interconnect module.

##### **D**

Rev D units have no power supply board. The circuitry for the power supply board has been incorporated on the main control board.

**Please Note the following:**

The Rev C main control board (LXMC) and power supply board (SUII) are downward compatible with Rev A and B units.

The Rev A and Rev B main control board (LXMC) and power supply board (PAII) cannot be used in Rev C units.

Rev D units do **NOT** use Rev A, Rev B, or Rev C main control boards, transformers, operator panels, upper covers, and lower covers. Rev D units have a unique main control board (LXMR), no power supply board, a 50 volt transformer, and a unique operator panel (LXON).

**NOTE:**

Please refer to the parts lists (Appendix B) for parts differentiation. Please be sure of the parts you need before ordering to avoid confusion and incorrect parts orders.

**Printer Serial Number Identification**

There are four serial number revision levels for the Microline 320 and 321 printers. Hardware differences exist between levels. To identify the revision level of a printer, record the serial number from the back of the printer. Refer to the following to decode the serial number.

Example Printer Serial Number: 401D0154693

Date Code      401 (4 = year. 01 = month)  
Revision        D  
Serial Number 0154693

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
LXMC Board	55041411	Main Control Board	Yes	Yes	No	No
LXMC-3 Board	55041412	Main Control Board	Yes	Yes	Yes	No
LXMR	55075111	Main Control Board (with SSD)	No	No	No	Yes

**Power Supply Board**

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
PAII-2 Board	55039902	Power Supply Board	Yes	Yes	No	No
SUII-2 Board	55047402	Power Supply Board	Yes	Yes	Yes	No

N/A	N/A	Power supply function included on the Main Control Board	No	No	No	Yes
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### Operator Panel Assembly

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
LXSP-2	55038602	Operator Panel Board	Yes	Yes	Yes	No
LXON	55075011	Operator Panel Board (with SSD)	No	No	No	Yes
N/A	50069603	Operator Panel Bezel	Yes	Yes	Yes	No
N/A	50107426	Operator Panel Bezel (with SSD)	No	No	No	Yes

### Transformer

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
120 Volt XFRMR	56407503	Transformer - Microline 320	Yes	Yes	Yes	No
120 Volt XFRMR	56407502	Transformer - Microline 321	Yes	Yes	Yes	No
120 Volt XFRMR	56413201	Transformer - Microline 320 (with SSD)	No	No	No	Yes
120 Volt XFRMR	56413202	Transformer - Microline 321 (with SSD)	No	No	No	Yes

### Interconnect Module

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Interconnect Module	55328301	Connects power supply board to main board	Yes	Yes	No	No



### Cable

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cable	56616802	Connects power supply board to main board	No	No	Yes	No

### Cable Guide

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cable Guide	51003801	Holds cable in place	No	No	Yes	Yes

### Covers

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Cover	53488302	Middle Cover - Microline 320	Yes	Yes	Yes	No
Cover	53488402	Middle Cover - Microline 321	Yes	Yes	Yes	No
Cover	53070701	Middle Cover - Microline 320 (with SSD)	No	No	No	Yes
Cover	53070801	Middle Cover - Microline 321 (with SSD)	No	No	No	Yes

### Chassis

Item	Okidata P/N	Purpose / Function of Item	A	B	C	D
Chassis	50061101	Middle Cover - Microline 320	Yes	Yes	Yes	No
Chassis	50061201	Middle Cover - Microline 321	Yes	Yes	Yes	No
Chassis	50104501	Middle Cover - Microline 320 (with SSD)	No	No	No	Yes
Chassis	50104601	Middle Cover - Microline 321 (with SSD)	No	No	No	Yes

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#### 4.4 TROUBLESHOOTING TIPS

##### 4.4.01 Preliminary Checks

Is the product being operated under the proper ambient conditions?

Does the paper being used meet the specifications for this product?

Has the ribbon been replaced as recommended?

Has the ribbon been installed properly?

Is an Okidata ribbon being used?

Is the printhead gap correctly set?

Check the contacts between the power interconnect module, the control board, and the power supply board (Rev A and B units ONLY). Clean the contacts if dirty. If contacts are bent or broken, replace the module. Proper inspection and cleaning of the power interconnect module contacts can eliminate a false diagnosis of a failed control board or power supply board.

Check the contacts and connections of the control board. If good contact is not made at all connections and ground points, false diagnosis will occur.

---

#### 4.4.02 Common Problems

**Nothing happens when the printer is powered ON.**

Make sure the printer is plugged in.

Check the power cord connection to the printer and the outlet.

If a power strip is being used, make sure the strip is powered ON.

**The ALARM lamp is lit.**

The printer may be out of paper or the paper may have jammed. The SEL lamp will not light. After loading paper, press the SEL switch.

If the ALARM lamp does not go out after paper is loaded, refer to Section 4.4 (📖) of this Service Handbook.

**The printer does not print when the computer sends it data.**

The printer may be deselected. Make sure that the SEL lamp is lit. If it is not, press the SEL switch.

**The paper keeps jamming.**

Verify that the top of form is set so that the paper is held in place by the bail bar. If the top edge of the page is below the bail, it will catch on the bail as it advances. Do not use the FORM FEED switch to load paper into the printer.

If the paper does jam, power OFF the printer. Carefully back the paper out of the paper path by using the platen knob. Remove any shreds of paper from the paper path.

**The printer suddenly changes to unidirectional printing. It then stops printing completely.****The MENU light is flashing.**

This indicates a Printhead Overheat Condition. When the printer prints for a long period of time, heat will build up in the printhead. When the printhead temperature reaches 100 degrees Celsius, the printer will print unidirectionally. If the temperature reaches 110 degrees Celsius, printing will stop until the printhead cools. Printing will resume after the printhead cools.

**Output is missing dots.**

Check the headgap setting. Move the head gap lever to a lower setting.

- Setting 1 is for one or two part forms.
- Setting 2 is for three or four part forms.
- Setting 3 is for envelopes and extra-thick paper.

Perform the Printhead Gap Adjustment. Refer to Section 3.3 (📖) of this Service Handbook for details.

Refer to RAP 03 (📖).

**Files do not print the way the printer menu and front panel are set.**

Before sending a file to a printer, many word processors send an initialization string. This string

contains codes that reset the printer to a default set of features. Otherwise, the printer might print using features set for a previous job. The codes will override panel or menu settings. Check the word processor's manual to see if the initialization string can be modified. If so, remove any codes that interfere with the printer's settings.

**The PRINT QUALITY, CHARACTER PITCH, and MODE switches do not work.**

The Operator Panel Functions Item in the Printer Menu can be set to enable (FULL OPERATION) or disable (LIMITED OPERATION) these features. If the printer is part of a customized system or if it is used by different operators, a system manager may be using this feature to maintain proper print settings.

To activate these switches, power OFF the printer. Press and hold the MODE switch while powering ON the printer. Follow the normal menu procedures to set the Operator Panel Functions Item to FULL OPERATION.

**Static electricity causes the paper to stick.**

In cold, dry weather, static charges can build up on continuous-form paper. This can make the paper cling to the paper separator. If this problem occurs during high-volume printing jobs, try moving the single sheet paper guides on the separator together so that the paper rests on the guides rather than on the separator itself.

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## Service Guide ML320/ML321


### Chapter 4 Failure & Repair Analysis

#### 4.5 FAULT ALARMS

##### 4.5.01 General Information

The operator panel is used to display printer modes and error conditions. The table below shows the operator panel display and the mode or condition it matches.

##### Printer Modes - Rev A, B, and C


Alarm Lamp Status	SELECT Lamp Status	MENU Lamp Status	Printer Mode	Status	Description
OFF	ON	N/A	Normal Operation	On-Line	The printer is ready to receive data and to print.
OFF	ON	N/A	Normal Operation	Hex Dump	The printer is in Hex Dump Mode. Refer to Section 4.7 
OFF	OFF	N/A	Normal Operation	Off-Line	The printer will NOT receive data or print.
	OFF	ON	Normal Operation	Menu Mode	The operator may view or change the menu settings.
ON	OFF	N/A	Operator Alarm	Paper End	Printer is out of paper.
ON	OFF	N/A	Operator Alarm	Paper Jam	SASF paper jam
ON	OFF	N/A	Operator Alarm	CSF Paper Jam	Paper jam or paper end with CSF installed.
OFF	BLINK	N/A	Operator Alarm	Print Suppress	The printer has received a PRINT SUPPRESS code from the computer.
Blink	Off	N/A	Fault Alarm		

### Printer Modes - Rev D


<b>ALAR M Lamp Status</b>	<b>SELECT Lamp Status</b>	<b>MENU Lamp Status</b>	<b>Printer Mode</b>	<b>Status</b>	<b>Description</b>
OFF	ON	N/A	Normal Operation	On-Line	The printer is ready to receive data and to print.
OFF	ON	N/A	Normal Operation	Hex Dump	The printer is in Hex Dump Mode. Refer to Section 4.7 (📖)
OFF	OFF	N/A	Normal Operation	Off-Line	The printer will NOT receive data or print.
	OFF	ON	Normal Operation	Menu Mode	The operator may view or change the menu settings.
ON	OFF	N/A	Operator Alarm	Paper End	Printer is out of paper.
ON	OFF	N/A	Operator Alarm	Paper Jam	SASF paper jam
ON	OFF	N/A	Operator Alarm	CSF Paper Jam	Paper jam or paper end with CSF installed.
OFF	BLINK	N/A	Operator Alarm	Print Suppress	The printer has received a PRINT SUPPRESS code from the computer.
BLINK	OFF	N/A	Fault Alarm	Refer to the Fault Alarm Conditions Table - Rev D	+

### Fault Alarm Conditions - Rev A, B, and C

<b>ALARM Lamp Status</b>	<b>Select Lamp Statu s</b>	<b>10</b>	<b>12</b>	<b>17</b>	<b>20</b>	<b>PRO P</b>	<b>Error Condition</b>	<b>Action</b>
Blinking		ON					Internal RAM Error	Replace the control board
Blinking			ON				Program ROM Error	Replace the control board

Blinking				ON			External RAM Error	Replace the control board
Blinking					ON		Spacing Error	Go to RAP 02 
Blinking						ON	Serial Interface Error	Replace the Serial Interface Board

**Fault Alarm Conditions - Rev D**

MENU Lamp Status	ALARM Lamp Status	SELECT Lamp Status	10	12	17	20	PRO	UTL	Error Condition	Action
Current Mode	ON		Current CPI	" "	" "	" "	" "	" "	Paper Out	Add paper
Blinking		ON	Current CPI	" "	" "	" "	" "	" "	Printhead Temp	Normal
	Blinking		ON						Internal RAM Error	Replace the control board
	Blinking			ON					Program ROM Error	Replace the ROM. Replace the control board
	Blinking				ON				External RAM Error	Replace the control board
	Blinking					ON			Spacing Error	Go to RAP 02 
	Blinking						ON		Serial Interface Error	Replace the Serial Interface Board
	Blinking							ON	EEPROM error	Replace the EEPROM

**CAUTION:** Check the contacts between the power interconnect module, the control board, and the power supply board (Rev A and B units ONLY). Clean the contacts with if dirty. If contacts are bent or broken, replace the module. Proper inspection and cleaning of the power interconnect module contacts can eliminate a false diagnosis of a failed control



board or power supply board.

Check the contacts and connections of the control board. If good contact is not made at all connections and ground points, false diagnosis will occur.

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**4.6 REPAIR ANALYSIS PROCEDURES****4.6.01 Using the RAPs**

When using the Repair Analysis Procedures, follow these steps.

Use the RAP INDEX to find the RAP associated with the printer's problem.

Go to the appropriate RAP.











All of the RAPs will begin with a START Statement, followed by questions or another type of statement.

If the RAPs do not lead you to the cause of a problem, please report this to Okidata.

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**4.6.02 RAP Index**

<u>RAP #</u>	<u>Description</u>
--	Troubleshooting Cautions..... 
01A	Operator Panel Lamps Do Not Light (Rev A, B, and C)..... 
01B	Operator Panel Lamps Do Not Light (Rev D)..... 
02 A	Abnormal Spacing - Rev A, B, and C..... 
02 B	Abnormal Spacing - Rev D ..... 
03	Wrong or Missing Characters / Dots on Output..... 
04	Line Feed Problems..... 
05	Malfunction of Operator Panel Switch(es)..... 
06	Parallel Interface Does Not Receive Data..... 
07	Serial Interface Does Not Receive Data..... 

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#### **4.6.03 Troubleshooting Cautions**

##### **Power Interconnect Module**

Check the contacts between the power interconnect module, the control board, and the power supply board (Rev A and B units ONLY). Clean the contacts if dirty. If contacts are bent or broken, replace the module. Proper inspection and cleaning of the power interconnect module contacts can eliminate a false diagnosis of a failed control board or power supply board.

##### **Control Board**

Check the contacts and connections of the control board. If good contact is not made at all connections and ground points, false diagnosis will occur.

---

**RAP 01A: Operator Panel Lamps Do Not Light - Rev A, B, and C****START**

Are the AC cables connected correctly?

NO Connect the AC cables correctly.

Is the problem resolved?

YES End of procedure.

NO Go to A

YES Go to A

**A**

Check the AC fuse on the primary side of the filter assembly. Is it open?

YES Replace the fuse

Is the problem resolved?

YES End of procedure.

NO Go to B

NO Go to B

**B**

Verify that the fuse holder is making proper contact with the fuse. Remove the fuse from the holder. Gently squeeze both sides of the holder slightly towards each other. Reinsert the fuse. Is the problem resolved?

YES End of procedure.

NO Are + 5 vdc and + 40 vdc supplied to the control board?

+ 5 vdc

Take the voltage reading between Pin 5 and Pin 9 of CN2 on the power supply board.

+ 38 vdc

Take the voltage reading between Pin 1 and Pin 5 of CN2 on the power supply board. Meter should read + 40 vdc.

YES Replace the control board.

YES End of procedure.

NO Go to C

NO Go to C

### **C**

Check the fuse on the power supply board. Is it open?

YES Replace the fuse.

Is the problem resolved?

YES End of procedure.

NO Go to D

NO Go to D

### **D**

Are the control board contacts and the power supply board contacts properly made?

NO Properly make the contacts.

Is the problem resolved?

YES End of procedure.

NO Go to E

YES Go to E

### **E**

Replace the connector between the power supply board and the control board.

Is the problem resolved?

YES End of procedure.

NO Replace the power supply board.

Is the problem resolved?

YES End of procedure.

NO Contact Technical Support.

---

**RAP 01B:Operator Panel Lamps Do Not Light - Rev D****START**

Are the AC cables connected correctly?

NO     Connect the AC cables correctly.

Is the problem resolved?

YES     End of procedure.

NO     Go to A

YES     Go to A

**A**

Check the AC fuse on the primary side of the filter assembly. Is it open?

YES     Replace the fuse

Is the problem resolved?

YES     End of procedure.

NO     Go to B

NO     Go to B

**B**

Verify that the fuse holder is making proper contact with the fuse. Remove the fuse from the holder. Gently squeeze both sides of the holder slightly towards each other. Reinsert the fuse. Is the problem resolved?

YES     End of procedure.

NO     Are + 5 vdc and + 50 vdc supplied to the control board?

+ 5 vdc

Take the voltage reading between Pin 16 and Pin 34 of the IC4 (ROM) on the control board.

+ 50 vdc

Take the voltage reading between both leads of C33 on the control board. Meter should read + 50 vdc.

YES    Replace the control board.  
Is the problem resolved?  
          YES    End of procedure.  
          NO    Go to C  
NO    Go to C

**C**

Check Fuse F2 on the control board. Is it open?

YES    Replace the fuse.  
Is the problem resolved?  
          YES    End of procedure.  
          NO    Go to D  
NO    Go to D

**D**

Is the power cable correctly connected to CN4 of the control board?

NO    Correctly connect the cable.  
Is the problem resolved?  
          YES    End of procedure.  
          NO    Go to the next step listed below.  
YES    Replace the transformer.  
Is the problem resolved?  
          YES    End of procedure.  
          NO    Contact Technical Support.



---

**RAP 02A:Abnormal Spacing - Rev A, B, and C****START**

Check the movement (Steps A and B) of the carriage assembly.

**A**

Does the assembly vibrate back and forth in the same location or does it move sharply to the left or right end of the carriage shaft?

YES    Replace the control board.

Is the problem resolved?

YES    End of procedure.

NO     Go to the next step listed below.

NO     Clean the contacts between the carriage cable and the space motor contacts.

Is the problem resolved?

YES    End of procedure.

NO     Go to B.

**B**

Is the carriage assembly jammed?

YES    Clean the teeth of the space motor and the space rack.

Is the problem resolved?

YES    End of procedure.

NO     Go to C

NO     Go to C

**C**

Are + 5 vdc and + 40 vdc being supplied to the control board?

+ 5 vdc

Take the voltage reading between Pin 5 and Pin 9 of CN2 on the power supply board.

+ 40 vdc

Take the voltage reading between Pin 1 and Pin 5 of CN2 on the power supply board.

YES Replace the control board.

YES End of procedure.

NO Go to D

NO Go to D

## D

Are the power supply board and the control board connected properly?

YES Replace the power supply board.

Is the problem resolved?

YES End of procedure.

NO Go to the next step listed below.

NO Reseat the power supply board, the control board, and the connection between the two boards.

Is the problem resolved?

YES End of procedure.

NO Go to E.

## E

Is the carriage cable properly inserted into CN2 of the control board?

NO Properly insert the cable.

Is the problem resolved?

YES End of procedure.

NO Go to the next step listed below.

YES Replace the control board.

Is the problem resolved?

YES End of procedure.

NO Replace the space motor.

Is the problem resolved?

YES End of procedure.

NO Contact Technical Support.

---

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**RAP 02B:Abnormal Spacing - Rev D****START**

Check the movement (Steps A and B) of the carriage assembly.

**A**

Does the assembly vibrate back and forth in the same location or does it move sharply to the left or right end of the carriage shaft?

YES Replace the control board.

Is the problem resolved?

YES End of procedure.

NO Go to the next step listed below.

NO Clean the contacts between the carriage cable and the space motor contacts.

Is the problem resolved?

YES End of procedure.

NO Go to B.

**B**

Is the carriage assembly jammed?

YES Clean the teeth of the space motor and the space rack. Make sure that the space rack is correctly installed.

Is the problem resolved?

YES End of procedure.

NO Go to C

NO Go to C

**C**

Are + 5 vdc and + 50 vdc supplied to the control board?

+ 5 vdc

Take the voltage reading between Pin 16 and Pin 34 of the IC4 (ROM) on the control board.

+ 50 vdc

Take the voltage reading between both leads of C33 on the control board. Meter should read + 50 vdc.

YES Go to D

NO Is the power cable correctly connected to CN4 of the control board?

YES Replace the transformer.

Is the problem resolved?

YES End of procedure.

NO Go to D.

NO Correctly connect the cable.

Is the problem resolved?

YES End of procedure.

NO Go to D.

## **D**

Is the carriage cable properly inserted into CN2 of the control board?

NO Properly insert the cable.

Is the problem resolved?

YES End of procedure.

NO Go to the next step listed below.

YES Replace the control board.

Is the problem resolved?

YES End of procedure.

NO Replace the space motor.

Is the problem resolved?

YES End of procedure.

NO Contact Technical Support.

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**RAP 03:Wrong or Missing Characters / Dots on Output****START**

Is the head cable correctly inserted into CN2 of the control board?

NO Correctly insert the cable.

Is the problem resolved?

YES End of procedure.

NO Go to the next step listed below.

YES Replace the printhead.

Is the problem resolved?

YES End of procedure.

NO Replace the control board.

Is the problem resolved?

YES End of procedure.

NO Go to A.

**A**

Are the contacts between the space motor and the carriage cable properly made?

YES Replace the space motor.

Is the problem resolved?

YES End of procedure.

NO Go to the next step listed below.

NO Reseat the carriage cable and the space motor assembly.

Is the problem resolved?

YES End of procedure.

NO Contact Technical Support.

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**RAP 04:Line Feed Problems****NOTE:**

Before performing this RAP, check the following.

1. Is the head gap correctly set for the type of paper being used?
2. Remove the printhead. Examine the pins. Do they appear damaged? If so, replace the printhead.

**START**

Manually rotate the platen knob. Does it rotate smoothly?

YES Go to A.

NO Set the release lever to OPEN. Manually rotate the platen knob. Does it rotate smoothly?

NO Go to A.

YES Check the following in the order given below. Check the operation of the platen knob before moving between steps.

1. Check the paper feed path setting.
2. Clean the platen gear, idle gear, and drive gear.
3. Verify that the platen gear, idle gear, and drive gear are correctly meshing.
4. Verify that the left and right push tractor assemblies are correctly installed.
5. Verify that the left and right push tractor assemblies are correctly operating.  
Replace if necessary.

Is the problem resolved?

YES End of procedure.

NO Go to A.

**A**

Are the connection plate and the line feed motor making correct contact?

YES Is the connection plate making correct contact with the control board?

YES    Replace the control board.

Is the problem resolved?

YES    End of procedure.

NO     Replace the line feed motor.

Is the problem resolved?

YES    End of procedure.

NO     Contact Technical Support.

NO     Replace the line feed motor.

Is the problem resolved?

YES    End of procedure.

NO     Contact Technical Support.

NO     Correct the contact.

Is the problem resolved?

YES    End of procedure.

NO     Contact Technical Support.

---

**RAP 05:Malfunction of Operator Panel Switch(es)****START**

Is the operator panel board correctly connected to CN1 of the control board?

YES    Replace the operator panel assembly.

Is the problem resolved?

YES    End of procedure.

NO     Replace the control board.

Is the problem resolved?

YES    End of procedure.

NO     Contact Technical Support.

NO     Correctly make the connection.

Is the problem resolved?

YES    End of procedure.

NO     Replace the control board.

Is the problem resolved?

YES    End of procedure.

NO     Contact Technical Support.

---

**RAP 06:Parallel Interface Does Not Receive Data**

**START**

Is the SELECT lamp lit?

NO Press the SELECT button to place the printer in Select Mode. The SELECT lamp will be lit when the printer is in Select Mode.

Is the problem resolved?

YES End of procedure.

NO Go to the next step listed below.

YES Check the interface cable. Is it correctly connected?

YES Replace the cable with a cable known to work.

Is the problem resolved?

YES End of procedure.

NO Replace the control board.

Is the problem resolved?

YES End of procedure.

NO Call Technical Support.

NO Correctly connect the cable.

Is the problem resolved?

YES End of procedure.

NO Replace the control board.

Is the problem resolved?

YES End of procedure.

NO Call Technical Support.

---

---

**RAP 07:Serial Interface Does Not Receive Data****NOTE:**

Before performing the procedures of this RAP, make sure that the correct protocols are selected. Print the Menu to check protocol settings. For information on printing the Menu, refer to [Section 4.10](#) of this Service Handbook.

**START**

Is the serial interface cable correctly connected to both the serial interface board and the host computer?

NO Correctly connect the cable.

Is the problem resolved?

YES End of procedure.

NO Go to the next step listed below.

YES Replace the serial interface cable with a cable proven to work. Is the problem resolved?

YES Replace the cable.

NO Perform the Serial Loopback Test.  
[Refer to Section 4.9](#) of this Service Handbook.

Do the memory buffer and interface tests pass?

NO Replace the serial interface board.

Is the problem resolved?

YES End of procedure.

NO Go to the next step listed below.

YES Check the connection between the serial interface board and the control board. Is the serial interface board properly inserted into CN3 of the control board?

YES End of procedure.

NO Replace the control board.

Is the problem resolved?

YES End of procedure.

NO Contact Technical Support.

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## 4.7 HEXADECIMAL DUMP

### 4.7.01 General Information

Hexadecimal dump mode allows you to check the data sent from the computer to the printer. All data sent to the printer, including test and printer commands, will print in both hexadecimal and ASCII format. In the ASCII format, all non-printable codes will be represented by a period.

### 4.7.02 Procedure

To place the printer in hexadecimal dump mode, follow this procedure.

- 1) Power OFF the printer.
- 2) Press and hold SEL and FORM FEED while powering ON the printer.
- 3) The printer will remain in hexadecimal dump mode until it is powered OFF.

### 4.7.03 Sample

Here is a line of BASIC code.

```
LPRINT CHR$(27) ;"0";CHR$(30) ;"This is an example of a hexadecimal dump."
```

In hexadecimal dump mode, the BASIC code line would print as follows.

```
1B 30 1E 54 68 69 73 20 69 73 20 61 6E 20 65 78 .0.  
61 6D 70 6C 65 20 6F 66 20 61 20 68 65 78 61 64  
65 63 69 6D 61 6C 20 64 75 6D 70 2E 0D 0A
```




This is an example of a hexadecimal dump...

---


**4.8 RESISTANCE / SERVICE CHECKS****4.8.01 Index to Charts**

The following resistance charts are included in this section.


**Interconnect Diagram**

- Rev A and B ..... 
- Rev C ..... 
- Rev D ..... 


**Printhead**

- Rev A, B, C, and D ..... 

**Space Motor**

- Rev A, B, C, and D ..... 

**Line Feed Motor**

- Rev A, B, C, and D ..... 

**Operator Panel Board**

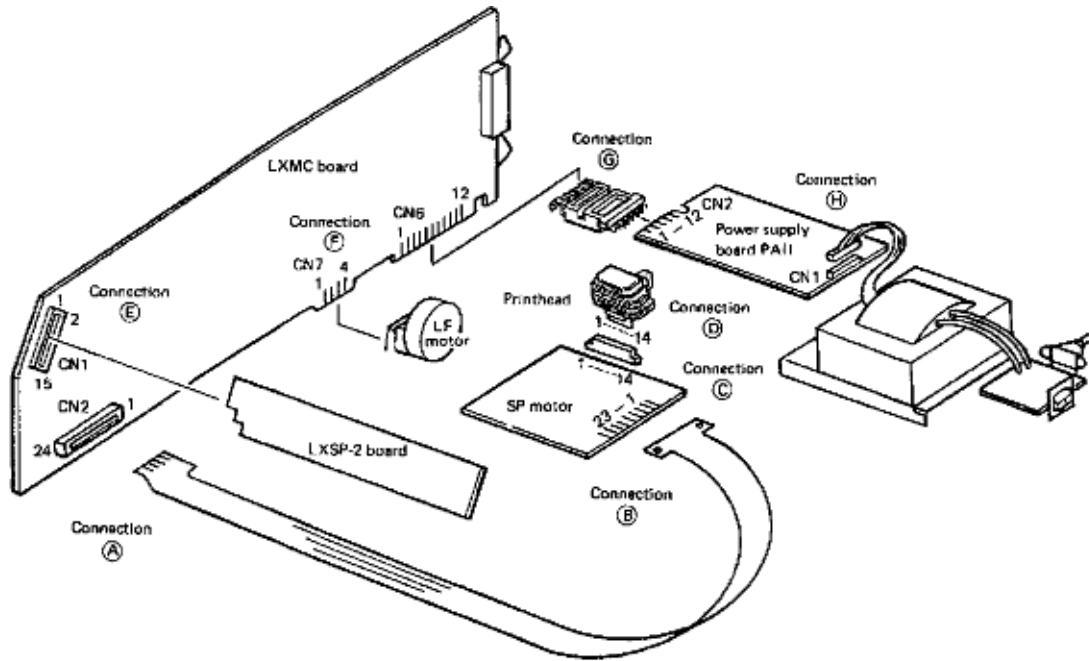
- Rev A, B and C ..... 
- Rev D ..... 

**Control Board**

- Rev A, B, C, D ..... 



4.8.02 Interconnect Diagrams (Rev A & B)

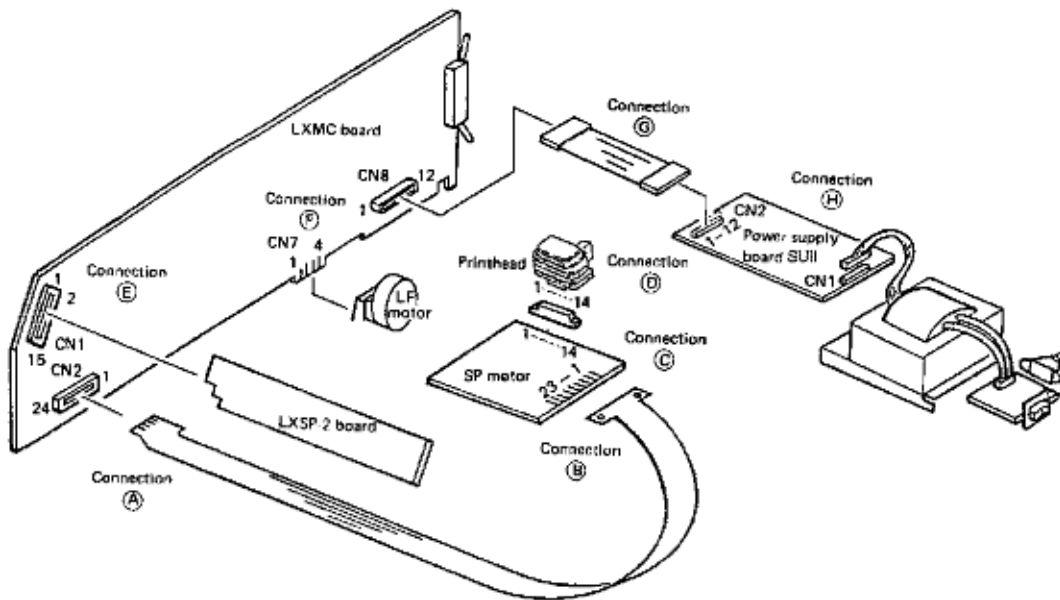




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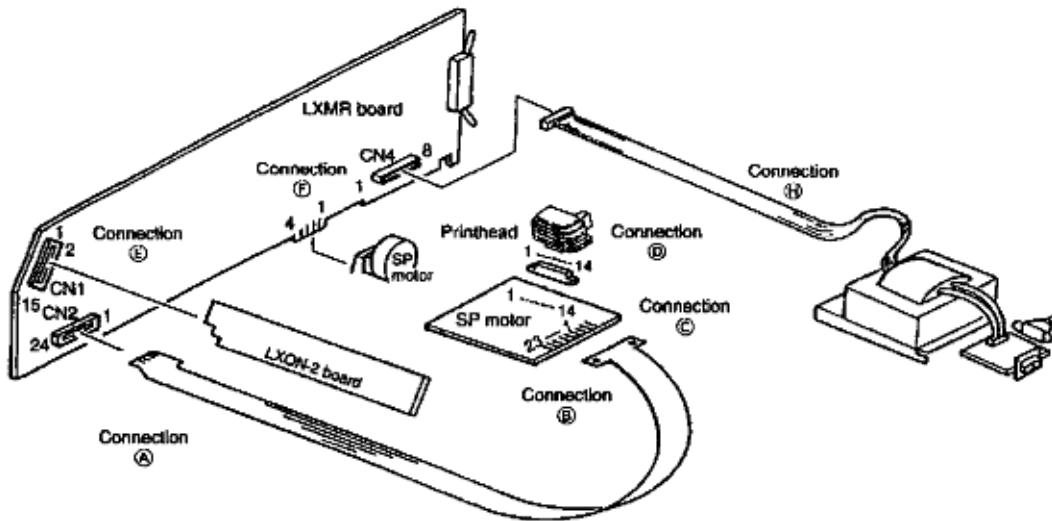
## Chapter 4 Failure & Repair Analysis

### Interconnect Diagrams (Rev C)



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Interconnect Diagrams (Rev D)



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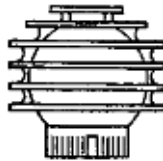


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### Chapter 4 Failure & Repair Analysis

#### 4.8.03 Printhead

Name	Signal Name	Connection								Coil Resistance	Figure	
		A	B	C	D	E	F	G	H			
P R I N T H E A D	Headgap	3	3									Pins on printhead
	TSD	10	10	7	7							
	+ 38 V	8.9	8.9	8 - 10	8 - 10							
	+ 5 V	20	20									
	SG	11.21	11.21	6	6							
	1	16	16	1	1						Back of printhead	
	2	15	15	2	2							
	3	4	4	14	14							
	4	14	14	3	3							
	5	5	5	13	13							
	6	13	13	4	4							
	7	6	6	12	12							
	8	12	12	5	5							
	9	7	7	11	11							



1 - 15

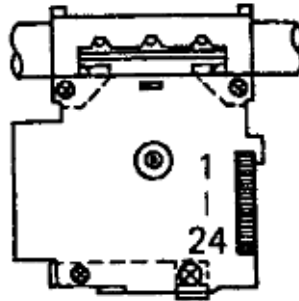


## Service Guide ML320/ML321

### Chapter 4 Failure & Repair Analysis

#### 4.8.04 Space Motor

Name	Signal Name	Connection								Coil Resistance
		A	B	C	D	E	F	G	H	
Space Motor	U	18								Approx. 21 $\Omega$
	V	17								
	W	19								
	$\phi$ A	23								
	$\phi$ B	22								



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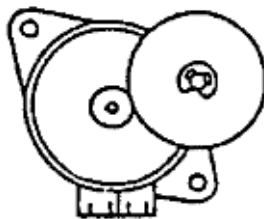


## Service Guide ML320/ML321

### Chapter 4 Failure & Repair Analysis

#### 4.8.05 Line Feed Motor

Name	Signal Name	Connection								Coil Resistance
		A	B	C	D	E	F	G	H	
	φ1						2			Approx. 6.8 Ω
							1			
	φ2						3			
							4			



4 - 1

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**4.8.06 Operator Panel Board (Rev A, B, & C)**

Name	Signal Name	Connection							
		A	B	C	D	E	F	G	H
Op Panel	SEL					3			
	MODE					4			
	LF					5			
	FF					6			
	PARK					7			
	TOF					13			
	PRINT					10			
	CHAR					12			
	LED					2			
	LED CLK					14			
	+ 5 V					1.15			
0 V					8.9				

**Operator Panel Board (Rev D)**

Name	Signal Name	Connection							
		A	B	C	D	E	F	G	H
Op Panel	SEL					3			
	MODE					4			
	LF					5			
	FF					6			
	PARK					7			
	TOF					13			
	PRINT					10			
	CHAR					12			
	LED					2			
	LED CLK					14			
	+5 V					1.15			
0 V					8.9				



---

**4.8.07 Control Board (Rev A - D)**

Name	Signal Name	Connection							
		A	B	C	D	E	F	G	H
	+ 38 V							1 - 3	
	EP							4, 5	
	+ 5 V							6, 7	
	0 V							8, 9	
	+ 8 V							10	
	AC 10 V							11	
	ALM							12	

---

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## 4.9 PRINTER TESTS

### 4.9.01 General Information

There are three tests which can be run for the unit.

- Rolling ASCII Print Test 
- Font Sample Test 
- Serial Interface Loopback Test 

The Rolling ASCII Print and Font Sample Tests are used to determine if the printer is operating properly. The Serial Interface Loopback Test is used to test proper operation of the Serial Interface Board.

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#### 4.9.02 Rolling ASCII Print Test

##### General Information

The Rolling ASCII Print Test produces a continuous printout of all 96 ASCII characters in a rolling pattern. The type style set in the printer menu will be utilized.

Use the Rolling ASCII Test to check the following.

- Print Quality
- Across the entire length of a line
- Down the entire page
- Line Spacing
- Character Formation

At the top of the printout, you will see the Printer Model, Emulation, Country Code, and Firmware Revision Level.

**CAUTION:** If 13.6 inch Paper Width is selected in the menu, and you run this test with 8.5 inch wide paper loaded, the test will print on the platen. This may damage the platen, ribbon, and printhead. Set the paper width to 8.5 inches before running this test.

##### Procedure

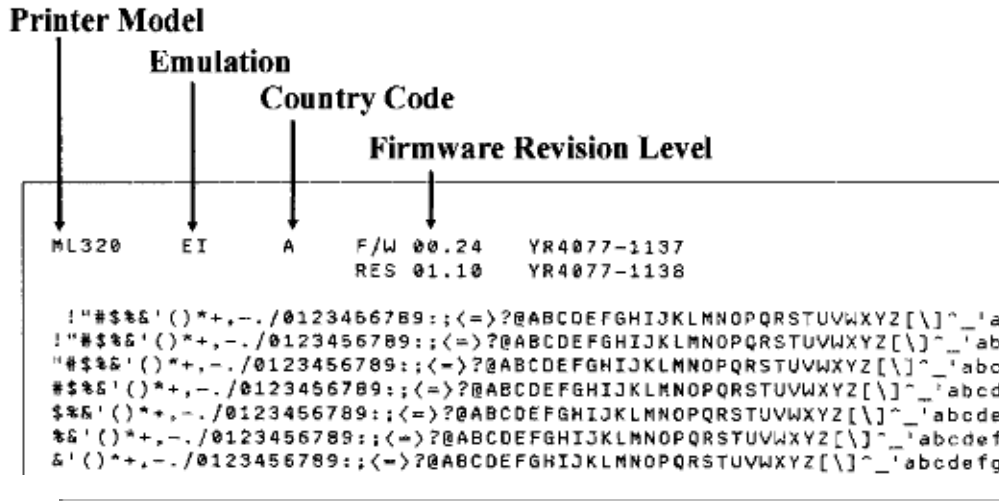
Verify that the printer is loaded with paper and that the paper is the correct width.

Power OFF the printer.

Press and hold the TOF/QUIET switch while powering ON the printer. If the printer is powered on and the Rolling ASCII Test does not start, you may have released the PARK/QUIET switch too soon.

To stop the Rolling ASCII Test, press the SELECT switch or power OFF the printer.

## Sample



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### 4.9.03 Font Sample Test

#### General Information

This test will print samples of these fonts.

- LQ - ROMAN 10 cpi
- LQ - SWISS 10 cpi
- LQ - COURIER 10 cpi, 12 cpi, 15 cpi, 17.1 cpi, 20 cpi
- LQ - ORATOR 10 cpi
- LQ - 12 cpi
- UTILITY - 10 cpi, 12 cpi, 15 cpi
- HSD - 15 cpi
- LQ - SWISS Double Width / Height
- LQ - SWISS Proportional
- LQ - ROMAN Proportional
- LQ - ORATOR 10 cpi, 12 cpi
- LQ - COURIER Proportional

At the top of the printout, you will see the Printer Model, Emulation, Country Code, Interface, and Firmware Revision Level.

**CAUTION:** If 13.6 inch Paper Width is selected in the menu, and you run this test with 8.5 inch wide paper loaded, the test will print on the platen. This may damage the platen, ribbon, and printhead. Set the paper width to 8.5 inches before running this test.

#### Procedure

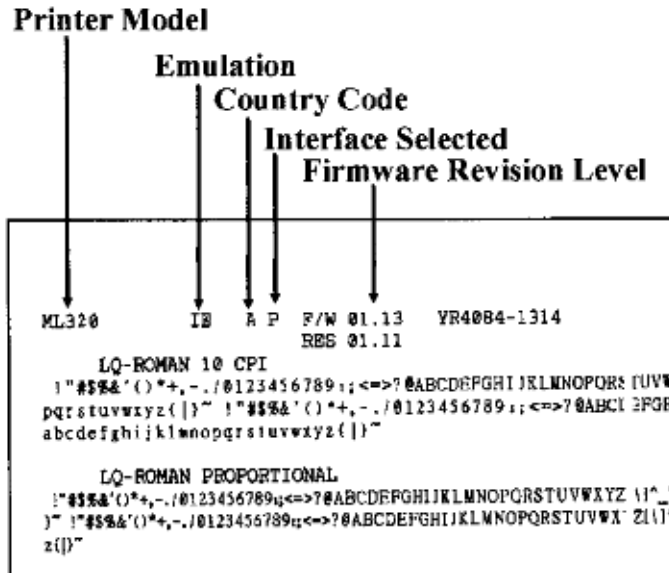
Verify that the printer is loaded with paper.

Power OFF the printer.

Press and hold the LINE FEED switch while powering ON the printer. If the font sample test does not print after you power ON the printer, you may have released the LINE FEED switch too soon.

This is a one page test. The printer will stop after printing the page. If you want to stop the test before the page is complete, press the SELECT switch or power OFF the printer.

## Sample



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#### 4.9.04 Serial Interface Loopback Test

**NOTE:** Attach a serial loopback test connector to the printer's serial port to run this test.

##### General Information

The Serial Interface Loopback Test checks the operation of the serial interface board.

##### Procedure

Verify that the ribbon and paper are installed.

Power ON the printer.

Press MODE. The SEL light will go out and the MENU lamp will light.

When the MENU lamp is lit, the functions printed BELOW the operator panel switches are activated.

Press GROUP until you access the desired group (Serial Interface). Each time you press GROUP, the printer will print the current group.

Press ITEM until you access the desired item (Diagnostic Test).

Press SET until you access the desired setting (YES).

Press MODE to record the changes and return to Print Mode. The MENU lamp will go out and the SEL lamp will light.

Power OFF the printer.

Attach the loopback test connector to the printer's serial port.

Verify that continuous feed paper is installed.

Power ON the printer.

The message LOOP TEST will print.

The test checks the memory function of the memory buffer.

GOOD will print if the memory check passes.

BAD will print if the memory check fails.

One of the following messages will print next.

I/F Good

If the message I/F Good prints, no problems were found.

## I/F BAD

If the message I/F BAD prints, a problem was found.

Hexadecimal characters 20 through 7F are transmitted through the transmit data (TD) line.

The receive data (RD) line receives the characters.

The message buffer stores the characters.

The data prints.

The test runs until the SELECT switch is pressed or the printer is powered OFF.

To restore the printer to normal operation, power OFF the printer.

Press and hold the MODE switch while powering ON the printer. The printer will be in Menu Mode.

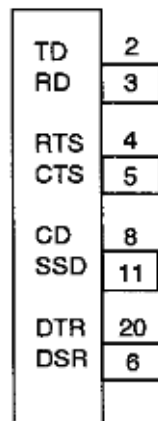
Press GROUP until you access the desired group (Serial Interface). Each time you press GROUP, the printer will print the current group.

Press ITEM until you access the desired item (Diagnostic Test).

Press SET until you access the desired setting (NO).

Press MODE to record the changes and return to Print Mode. The MENU lamp will go out and the SEL lamp will light.

### Serial Loopback Plug Diagram



**RS232-C (DB 25P Plug)**



---

## 4.10 MENU OPERATION

### 4.10.01 General Information

The end user can customize printer features by changing menu settings. These settings are automatically activated when the printer is powered ON.

Selections made in Menu Mode are stored in the printer's permanent memory. They will stay in effect, even when the printer is powered OFF. However, they can be changed through software commands, the front panel, and by resetting the menu. Changes made by software commands or the front panel are canceled when the printer is powered OFF.

Refer to Chapter 4 of the Printer Handbook information regarding the menu.

### 4.10.02 Limited Operation

In the Printer Menu, the sixth item in the General Control Group is Operator Panel functions. The settings for this item are Full Operation and Limited Operation. A system manager may use this feature to maintain proper print settings if the printer is part of a customized system or if it is used by different operators.

When the Printer Menu is set to Limited Operation, the PRINT QUALITY, CHARACTER PITCH, and MODE switches of the operator panel do not work.

To change from LIMITED OPERATION to FULL OPERATION, follow this procedure.

Verify that the ribbon and paper are installed.

Power OFF the printer.

Press and hold MODE while powering ON the printer.

Follow the normal menu procedures to set the Operator Panel Functions Item to FULL OPERATION.

### 4.10.03 Printing the Menu

Verify that the ribbon and paper are installed.

Power ON the printer.

Press MODE. The SEL light will go out and the MENU lamp will light.

Press PRINT. The menu will print.

### 4.10.04 Modifying the Menu

Verify that the ribbon and paper are installed.

Power ON the printer.

Press MODE. The SEL light will go out and the MENU lamp will light.

When the MENU lamp is lit, the functions printed BELOW the operator panel switches are activated.

Press GROUP. The first line of the menu will print.

FONT	Print Mode	Utility
(GROUP)	(ITEM)	(Current SETting)

Press GROUP until you reach the desired group.

Press ITEM until you access the desired item of a group.

Press SET until you access the desired setting for an item.

Press MODE to record the changes and return to Print Mode. The MENU lamp will go out and the SEL lamp will light.

#### **4.10.05 Resetting to Factory Defaults**

**CAUTION:** Always print the menu before resetting to factory defaults. All customized information will be lost once the menu has been reset.

#### **Menu**

Power OFF the printer.

Press and hold the MODE and SELECT switches while powering ON the printer.

#### **Menu and Top of Form**

Power OFF the printer.

Press and hold the PARK and TOF/QUIET switches while powering ON the printer.

---

## 4.11 TOP OF FORM

### 4.11.01 General Information

Top of Form sets the print start position for the printer. It is adjustable in increments of 1/144 of an inch. The amount of adjustment is limited to avoid paper jams.

### 4.11.02 Procedure

Permanent (Continuous Feed / Single Sheet)

Verify that the ribbon and paper are installed.

Power ON the printer.

Press SEL until the SEL lamp goes out. The printer is deselected.

Press and hold TOF/Quiet. While doing this, press either of the switches listed below.

FORM FEED increases the Top of Form. The paper is advanced.

LINE FEED decreases the Top of Form. The paper is retracted.

The lower red line on the ribbon protector shows the baseline of the current printing position. Use this when positioning the Top of Form.

The Top of Form is automatically saved in the printer's static memory. Powering OFF the unit will NOT change the Top of Form. You must reset the Top of Form to change it.

**NOTE:** The bail must hold the paper in place. If the top of the page is set below the bail, the paper will catch on the bail and a paper jam will occur.

### Temporary (Continuous Feed)

Verify that the ribbon and paper are installed.

Power ON the printer.

Press SEL until the SEL lamp goes out. The printer is deselected.

Press either of the switches listed below. Do NOT press TOF/Quiet.

FORM FEED increases the Top of Form. The paper is advanced.

LINE FEED decreases the Top of Form. The paper is retracted.

The lower red line on the ribbon protector shows the baseline of the current printing position. Use this when positioning the Top of Form.

Press TOF/Quiet to "save" the Top of Form as the temporary setting. It is saved in the printer's dynamic memory. Powering OFF the unit will erase the temporary Top of Form.

**NOTE:** The bail must hold the paper in place. If the top of the page is set below the bail, the paper will catch on the bail and a paper jam will occur.

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## 4.12 PAPER PARK

### 4.12.01 General Information

Paper Park allows single sheet paper to be printed without removing continuous feed paper from the printer.

### 4.12.02 Procedure

Remove any printed pages.

Press PARK. The continuous feed paper will retract from the paper path. The ALARM lamp will light and the SEL lamp will go out.

Move the paper lever to the Single Sheet Setting. This is towards the back of the printer.

Open the access cover.

Push the guide wire back into its locked position on the paper separator.

Raise the separator to its upright position.

Set a sheet of paper on the separator and adjust the guides. The guides should barely touch the edges of the paper. Be sure to position the left edge of the paper even with the reference mark on the separator.

Pull the bail lever forward. The paper will advance.

Push the bail lever back.

*Adjust the Top of Form (if necessary). Refer to Section 4.11.*

Print.

To return to continuous feed paper printing, perform the following.

Remove any printed pages.

Set the paper lever to continuous feed. This is towards the front of the printer.

Pull the bail lever forward. The paper will advance.

Push the bail lever back.

*Adjust the Top of Form (if necessary). Refer to Section 4.11.*

The unit is ready to print.

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## 4.13 FORMS TEAR OFF

### 4.13.01 General Information

This feature allows a printed page (rear feed, continuous form) to be torn off without wasting paper or adjusting the printer.

Forms Tear Off advances the paper from the initial printing position to the tear off position. The top of the page (perforation) will be even with the tear bar. The tear bar is located under the clear top of the access cover.

Paper will remain in the tear off position until the printer receives data. Then, the paper is retracted to the initial print position.

When printing stops, the paper will advance to the tear off position.

**NOTE:** If the software package being used "pauses" while sending data to the printer, Forms Tear Off may be activated (if it is enabled through the Menu). The pause must be for two or more seconds. No data is lost. Uneven print registration will occur due to the paper movement. If the problem occurs, deactivate Forms Tear Off through the Menu.

**Do NOT use Forms Tear Off with labels or multi-part forms.**

### 4.13.02 Procedure

Verify that the ribbon and paper are installed.

Power ON the printer.

Press MODE. The SEL light will go out and the MENU lamp will light.

When the MENU lamp is lit, the functions printed BELOW the operator panel switches are activated.

Press GROUP. The first line of the menu will print.

<b>FONT</b>	<b>Print Mode</b>	<b>Utility</b>
<b>(GROUP)</b>	<b>(ITEM)</b>	<b>(Current SETting)</b>

Press GROUP until you access VERTICAL CONTROL.

Press ITEM until you access FORMS TEAR OFF.

Press SET until you access 500 ms.

Press MODE to record the changes and return to Print Mode. The MENU lamp will go out and the SEL lamp will light.

Press SEL until the SEL lamp goes out. The printer is deselected.

Press and hold TOF/Quiet. While doing this, press either of the switches listed below.

FORM FEED increases the Top of Form. The paper is advanced.

LINE FEED decreases the Top of Form. The paper is retracted.

The lower red line on the ribbon protector shows the baseline of the current printing position. Use this when positioning the Top of Form.

The Top of Form is automatically saved in the printer's static memory. Powering OFF the unit will NOT change the Top of Form. You must reset the Top of Form to change it.

Release TOF/Quiet. The paper advances from the initial print position to the tear off position.

**To check the initial print position, perform the following procedure.**

Press SEL until the SEL lamp goes out. The printer is deselected.

Press and hold TOF/Quiet. The paper will retract to the initial print position.

Release TOF/Quiet. The paper will advance to the forms tear off position.

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## A.1 BOARD DIAGRAMS

### A.1.01 General Information

This section describes the characteristics of the printed circuit boards used in the Microline 320 and Microline 321 printers. The following areas are covered in each section.

- Function
- Firmware
- Fuses
- Jumpers
- Switches
- Sensors
- Test Points

Where an item is not applicable, the word NONE will be listed.

### Serial Number Identification & (A-D) Revision Levels

#### A

Rev A units are original production units. An interconnect module connects the power supply board to the main control board.

#### B

Rev B units are retrofitted to include a modified interconnect module, which prevents corrosion.

#### C

Rev C units have a cable harness connection between the power supply board and the main control board. The cable harness replaces the interconnect module.

#### D

Rev D units have no power supply board. The circuitry for the power supply board has been incorporated on the main control board.

#### Please Note the following:

The Rev C main control board (LXMC) and power supply board (SU11) are downward compatible with Rev A and B units.

The Rev A and Rev B main control board (LXMC) and power supply board (PA11) cannot be used in Rev C units.

Rev D units do **NOT** use Rev A, Rev B, or Rev C main control boards, transformers, operator panels, upper covers, and lower covers. Rev D units have a unique main control board (LXMR), no power supply board, a 50 volt transformer, and a unique operator panel (LXON).

#### NOTE:

Please refer to the parts lists (Appendix B) for parts differentiation. Please be sure of the parts you need before ordering to avoid confusion and incorrect parts orders.

### **Printer Serial Number Identification**

There are four serial number revision levels for the Microline 320 and 321 printers. Hardware differences exist between levels. To identify the revision level of a printer, record the serial number from the back of the printer. Refer to the following to decode the serial number.

Example Printer Serial Number: 401D0154693

Date Code	401 (4 = year. 01 = month)
Revision	D
Serial Number	0154693

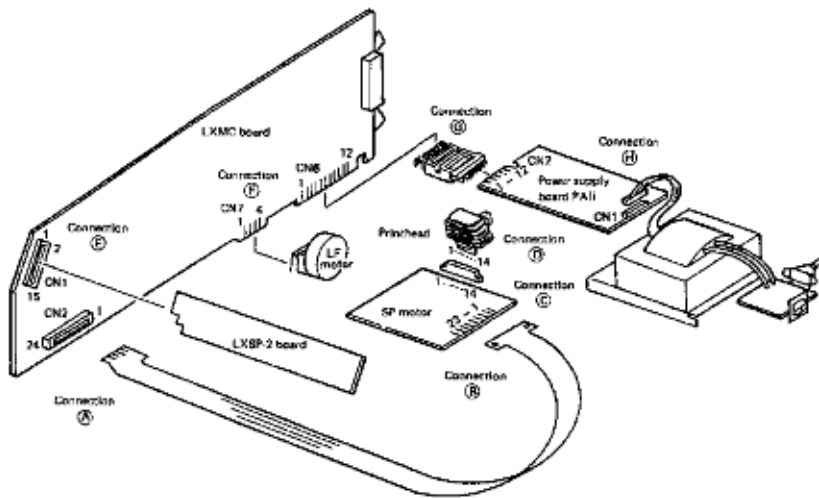
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**A.2 INDEX TO CHARTS**


**Rev A and B**

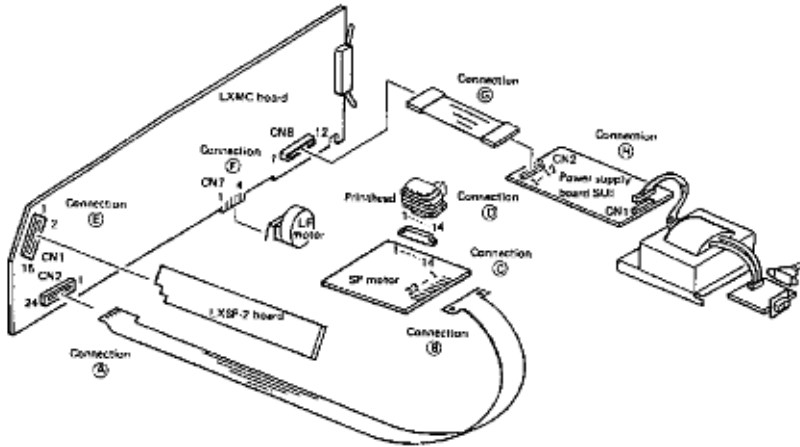
Description	Board Designation	- Rev	Section
Control Board	LXMC	A and B	<a href="#">A.2.01</a>
Power Supply	PAII-2	A and B	<a href="#">A.2.04</a>
Filter Assembly		A, B, C, and D	<a href="#">A.2.06</a>
Operator Panel	LXSP	A, B, and C	<a href="#">A.2.07</a>
RS232-C Serial Interface	LXHI	A, B, C, and D	<a href="#">A.2.09</a>







**Rev C**

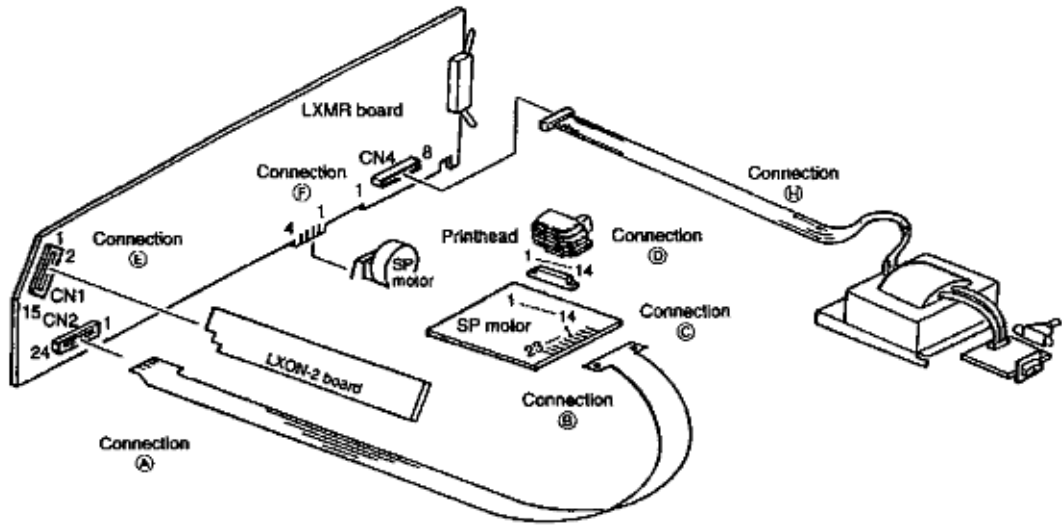
Description	Board Designation	- Rev	Section
Control Board	LXMC-3	C	<a href="#">A.2.02</a>
Power Supply	PAII-2	C	<a href="#">A.2.05</a>
Filter Assembly		A, B, C, and D	<a href="#">A.2.06</a>
Operator Panel	LXSP	A, B, and C	<a href="#">A.2.07</a>

RS232-C Serial Interface	LXHI	A, B, C, and D	<a href="#">A.2.09</a> 
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**Rev D**

Description	Board Designation	- Rev	Section
Control Board	LXMR	D	<a href="#">A.2.03</a> 
Filter Assembly		A, B, C, and D	<a href="#">A.2.06</a> 
Operator Panel	LXSP	D	<a href="#">A.2.08</a> 
RS232-C Serial Interface	LXHI	A, B, C, and D	<a href="#">A.2.09</a> 



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**A.2.01 Control Board (LXMC) - Rev A and B****Function**

The control board contains the microprocessor and its peripheral circuits. The drive circuits, paper end sensor, and the interface connector are on this board. A 3.25 V lithium battery is on this board.

**Firmware**

Q13	Program ROM
Q8 and Q9	Dynamic RAM (require a constant refresh signal)
Q12	Static RAM (backed up by a 3.25 V lithium battery)

**Fuses**

Rev 1 and 2

F1: Thermal Fuse (The fuse is located on Q10.)

Rev 3 and up

F1: Inline Thermal Fuse

**Jumpers**

SP1	Side A	Enable I-Prime
	Side B	Disable I-Prime
SP2	Side A	Auto Line Feed always enabled
	Side B	Auto Line Feed status determined through Menu setting
SP3	Side A	+ 5 vdc is applied to Pin 18 of the parallel interface

**Sensors**

Paper End

Switches

SASF

**Test Points**

CN6

+ 5 vdc, + 8 vdc, + 38 vdc, 10 vac

ALM-P If this line goes high (+ 5 vdc), the fuse on the filter assembly will open.

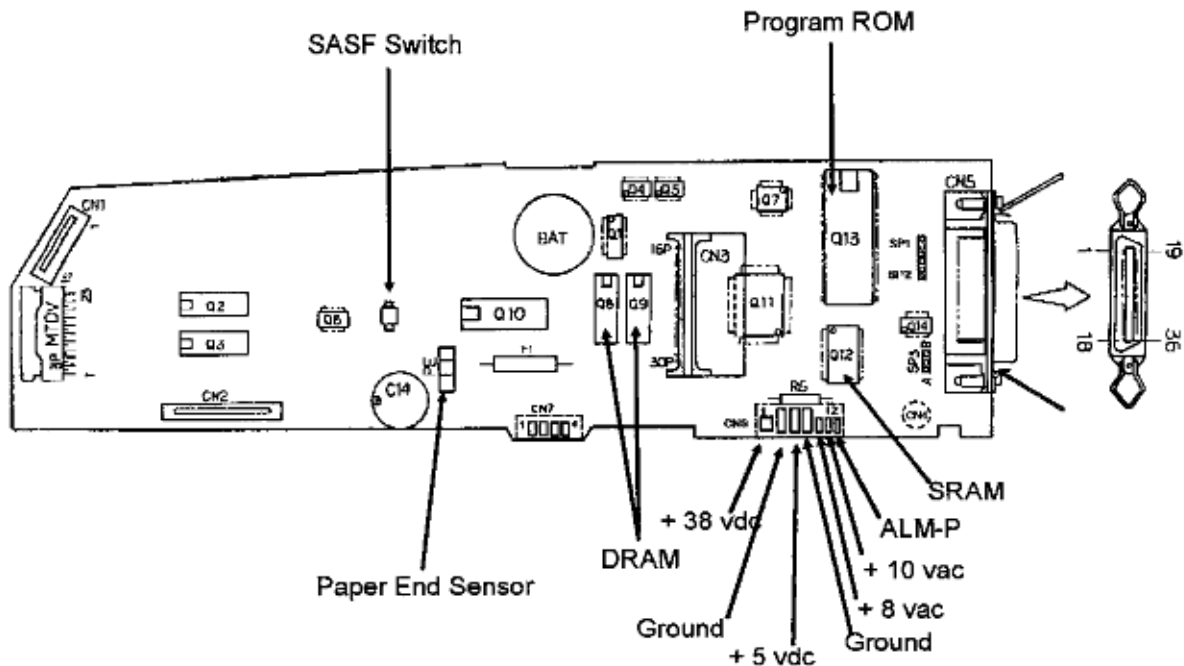
Refer to Section Two of this Service Handbook for more details.

MTDV	Pin 3	+8 vdc
R12 and S1		+ 5 vdc
F1		+40 vdc
R88		+ 5 vdc
C12		+ 40 vdc

### Notes

- CN1to operator panel
- CN2to head cable
- CN3to serial interface
- CN4 to optional cut sheet feeder
- CN5to parallel interface
- CN6to power supply
- CN7to line feed motor

Diagram - PCB Version Numbers 2 - 7



**A.2.02 Control Board (LXMC-3) - Rev C**

**Function**

The control board contains the microprocessor and its peripheral circuits. The drive circuits, paper end sensor, and the interface connector are on this board. A 3.25 V lithium battery is on this board.

**Firmware**

Q13	Program ROM
Q8 and Q9	Dynamic RAM (require a constant refresh signal)
Q12	Static RAM (backed by a 3.25 V lithium battery)

**Fuses**

F1: Inline Fuse

**Jumpers**

SP1	Side A	Enable I-Prime	Side B	Disable I-Prime
SP2	Side A	Auto Line Feed always enabled		
	Side B	Auto Line Feed status determined through Menu setting		
SP3	Side B	+ 5 vdc is applied to Pin 18 of the parallel interface		

**Sensors**

Paper End

**Switches**

SASF

**Test Points**

CN6

+ 5 vdc, + 8 vdc, + 38 vdc, 10 vac

ALM-P If this line goes high (+ 5 vdc), the fuse on the filter assembly will open.

Refer to Section Two (📖) of this Service Handbook for more details.



R5+ 38 vdc

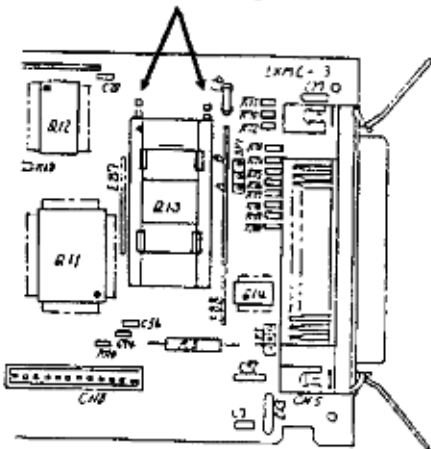
SP3 B Side+ 5 vdc

MTDV Pin 3 + 8 vdc

### Notes

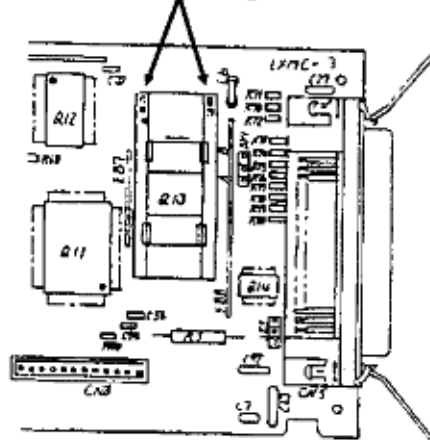
The LXMC-3 Board has gone through a modification. The older version of the board accepted a 28 pin EPROM at the Q13 socket location. The newer version of the board accepts a 32 pin masked ROM. It will also accept the 28 pin EPROM. No jumper changes are necessary. If a 28 pin EPROM is installed on the 32 pin Q13 socket, the four unused pins will be located at the top.

#### Four additional pins (Not used)



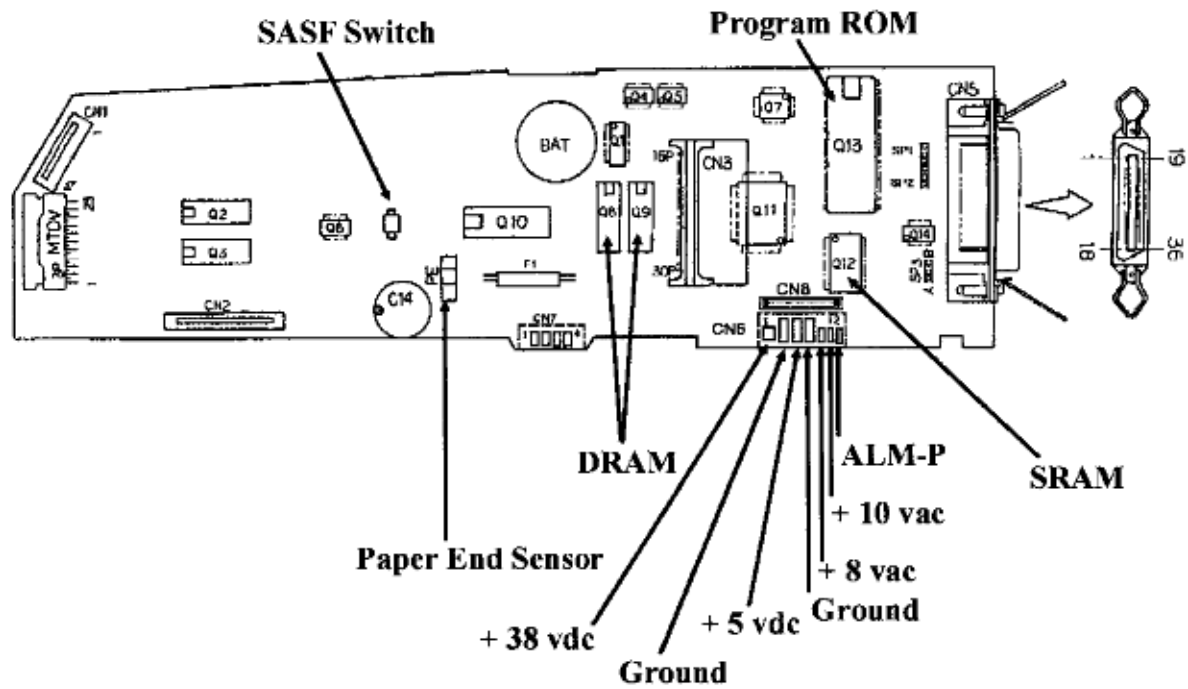
**28 pin  
EPROM  
installed**

#### Four additional pins (Used)



**32 pin  
Masked ROM  
installed**

Diagram - PCB Version Number 8



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**A.2.03 Control Board (LXMR) - Rev D****Function**

The control board contains the microprocessor and its peripheral circuits. The drive circuits, paper end sensor, and the interface connector are on this board. It also contains the components needed for regulating DC voltage and those needed to convert AC voltage to DC voltage.

**Firmware**

NONE

**Fuses**

F1 1 amp in-line fuse (protects 40 V line feed)

F2: 1 amp AC line fuse (protects transformer)

**Jumpers**

NONE

**Sensors**

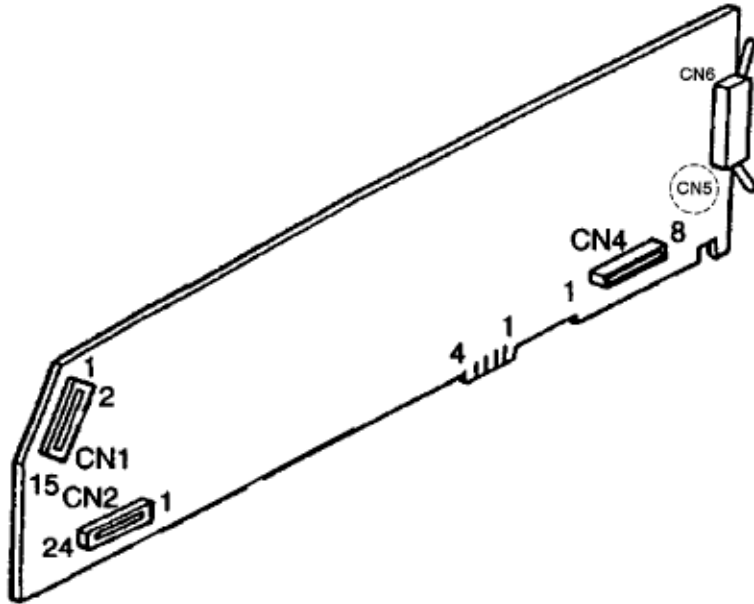
Paper End

**Switches**

NONE

**Test Points**

NONE



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## Service Guide ML320/ML321

### Chapter A Reference Charts

#### A.2.04 Power Supply (PAII-2) - Rev A and B

##### Function

This board converts and regulates the AC voltage input to DC voltage and supplies the DC voltage to the control board.

##### Firmware

NONE

##### Fuses

F1 2.0 amp / 250 VAC

##### Jumpers

NONE

##### Sensors

NONE

##### Switches

NONE

##### Test Points

CN2: Pin 1 + 40 vdc

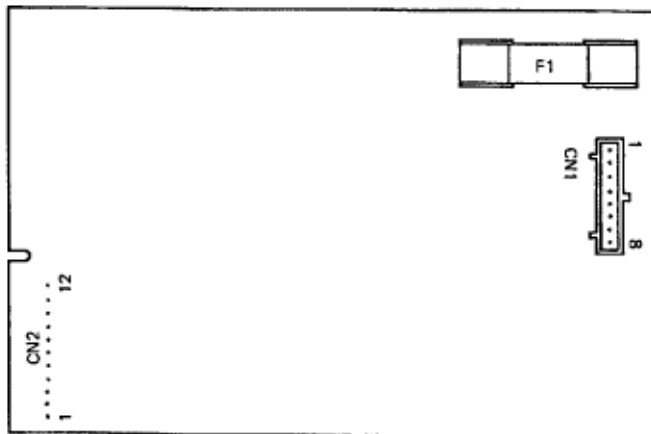
CN2: Pin 6 + 5 vdc

CN2: Pin 10 + 8 vdc

##### Notes

CN1 connection from Transformer

CN2 connection to Power Interconnect Module



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**A.2.05 Power Supply (SUII-2) - Rev C****Function**

This board converts and regulates the AC voltage input to DC voltage and supplies the DC voltage to the control board.

**Firmware**

NONE

**Fuses**

F1 2.0 amp / 250 VAC

**Jumpers**

NONE

**Sensors**

NONE

**Switches**

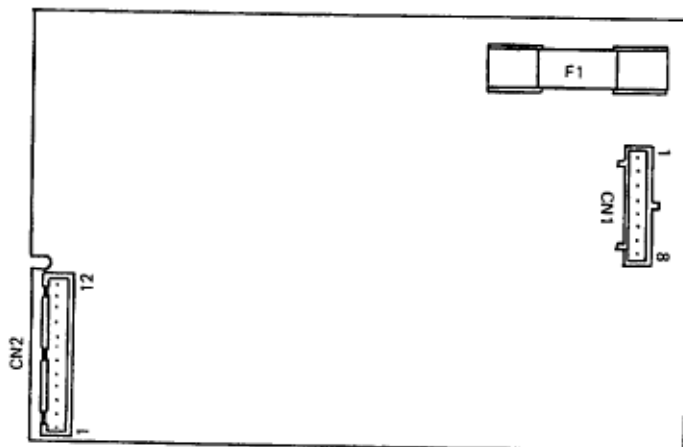
NONE

**Test Points**

CN2: Pin 1 + 40 vdc  
CN2: Pin 6 + 5 vdc  
CN2: Pin 8 + 8 vdc

**Notes**

CN1 connection from Transformer  
CN2 connection to Power Interconnect Module



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**A.2.06 Filter Assembly - Rev A, B, C, and D****Function**

This assembly is a protective feature. It also filters out unwanted line noise. Its fuse will open when a fault occurs in the printhead drive circuit, the space motor drive circuit, or any of their peripheral circuits. This prevents component failure.

**Firmware**

NONE

**Fuses**F2 (also known as the AC fuse)  
1.5 amp (120 V)

or

1.0 amp (220 / 240 V)

**Jumpers**

NONE

**Sensors**

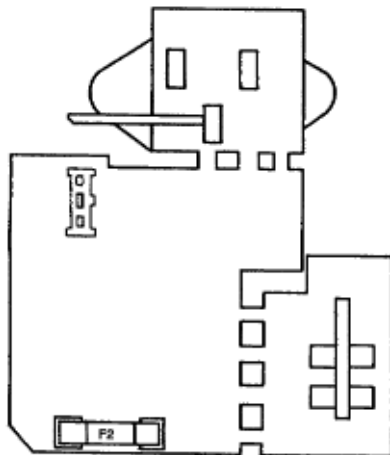
NONE

**Switches**

NONE

**Test Points**

NONE



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## Service Guide ML320/ML321

### Chapter A Reference Charts

#### A.2.07 Operator Panel (LXSP) - Rev A, B, and C

##### Function

The operator panel is the interface between the operator and the printer.

##### Firmware

NONE

##### Fuses

NONE

##### Jumpers

NONE

##### Sensors

NONE

##### Switches

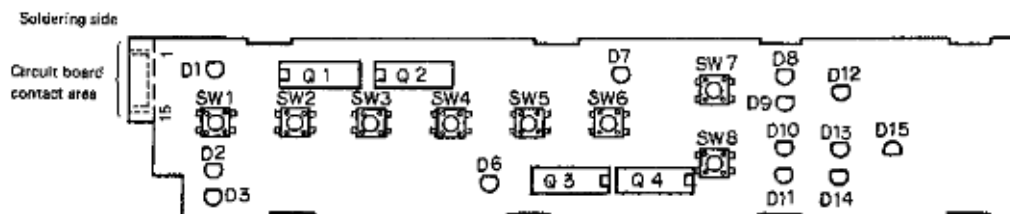
SW1	SEL	SW5	PARK / Set
SW2	MODE	SW6	TOF/QUIET / Print
SW3	LF / Group	SW7	PRINT QUALITY
SW4	FF / Item	SW8	CHARACTER PITCH

##### Displays

D1	SELECT	D9	NLQ
D2	ALARM	D10	10 cpi
D3	POWER	D11	20 cpi
D4	Not used	D12	UTL
D5	Not used	D13	12 cpi
D6	MENU	D14	PROP
D7	TOF / QUIET	D15	17 cpi
D8	HSD		

##### Test Points

NONE



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## Service Guide ML320/ML321

### Chapter A Reference Charts

#### A.2.08 Operator Panel (LXON) - Rev D

##### Function

The operator panel is the interface between the operator and the printer.

##### Firmware

NONE

##### Fuses

NONE

##### Jumpers

NONE

##### Sensors

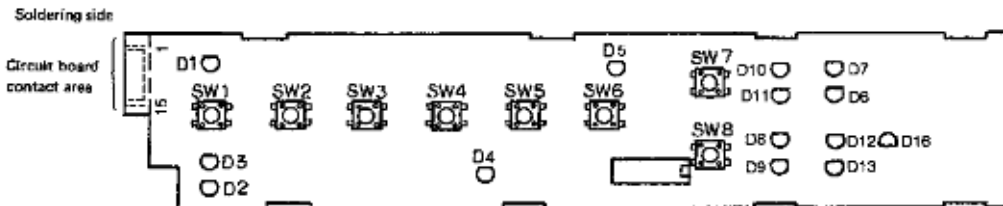
NONE

##### Switches

SW1	SEL	SW5	PARK / Set
SW2	MODE	SW6	TOF/QUIET / Print
SW3	LF / Group	SW7	PRINT QUALITY
SW4	FF / Item	SW8	CHARACTER PITCH
D1	SELECT	D9	20 cpi
D2	POWER	D10	HSD
D3	ALARM	D11	NLQ
D4	MENU	D12	12 cpi
D5	Not used	D13	PROP
D6	SSD	D14	Not used
D7	UTL	D15	Not used
D8	10 cpi	D16	17 cpi

##### Test Points

NONE



---

**A.2.09 RS232-C Serial Interface (LXHI) - Rev A, B, C, and D****Function**

This board permits the serial transport of data to and from the printer.

**Firmware****ROM**

Version 1Q8: 1 megabyte ROM. Contains the serial interface control program.

Version 2: None

**RAM**

Versions 1 and 28 kilobytes, Static. Is the Message Buffer

**Processor**

Version 1Q3M80C31F

Version 2Q3M80C51F

**Fuses**

NONE

**Jumpers**

Version 1SP1 Side AQ8 has ROM installed

Version 2SP1 Side BCP1 Masked ROM is utilized

**Sensors**

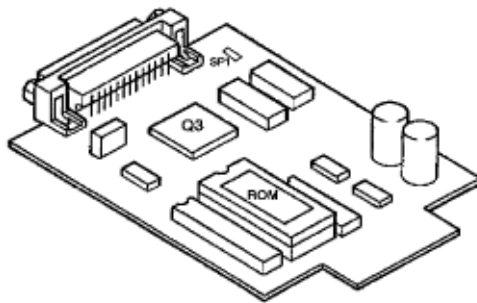
NONE

**Switches**

NONE

**Test Points**

NONE



---

## **B.1 ILLUSTRATED PARTS LISTING**

### **B.1.01 General Information**

This appendix will assist you in identifying the assemblies and parts of the printers. Once you have used Section Four (Failure Analysis) to find a defective part, you can locate the part number in this section. This appendix is cross-referenced to Section Three (Maintenance) to assist you in servicing the printers.

The format for this appendix is a series of tables with diagrams. The table contains the item reference number, the Okidata and Oki-Japan (Oki-J) part numbers, the part description, a comments section, and the disassembly procedure. Items with the comment RSPL (Recommended Spare Parts List), Consumable, or Option are available from Okidata. Items without these comments are usually not stocked. Also note that some items are only available as assemblies. Every effort has been made to clearly indicate which items are in assemblies and which are not.

N/A will appear where a part number is not available.

Please read the Definition of Terms in the following section carefully. It is important that you understand the different types of classifications and their availability.

Please refer to either of the following resources for current part numbers and pricing.

Okidata's Bulletin Board (Okilink II) contains current part numbers, prices, and recommended stocking levels for each item listed as a recommended spare part. For instructions on accessing Okilink II, refer to the Service Center Reference Guide.

Okidata's Faxable Facts is an automated fax document retrieval system. Part numbers and pricing are available through Faxable Facts. For instructions on accessing Faxable Facts, refer to the Service Center Reference Guide.

#### **REMEMBER**

Current part numbers, recommended stocking levels, and pricing information are available through Okilink II and Faxable Facts. Refer to the Service Center Reference Guide for information on accessing these resources.

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## **B.1.02 Definitions of Terms**

### **RSPL**

Okidata recommends that this part/assembly be on hand for servicing.

### **Consumable**

A consumable is a supply item which has a specified life and needs to be replaced periodically. It is purchased and installed by the end user. Okidata machines are designed to work exclusively with Okidata consumables. By using genuine Okidata consumable products, the investment made in the equipment will be protected.

### **Option**

An option is a part/assembly which is added to a printer. The option expands the printer's functionality. An option may or may not be installed by the end-user. Instructions for installation accompany each option.

### **Option RSPL**

Okidata recommends that this part/assembly be on hand for servicing installed options.

### **Document**

A document is a printed item which supports the service and marketing of a product. Various documents are available from Okidata.

### **Blank**

Okidata does not recommend stocking this item. This item should be purchased on an As Required Basis only. The availability of this item is not guaranteed by Okidata.

### **320**

This part is found ONLY in the Microline 320 printer.

### **321**

This part is found ONLY in the Microline 321 printer.



















### **Both**

This part is found in both the Microline 320 and 321 printers.



**B.2 Index to Illustrated Parts Breakdown Charts**

Below is an index to the illustrated parts breakdown charts.

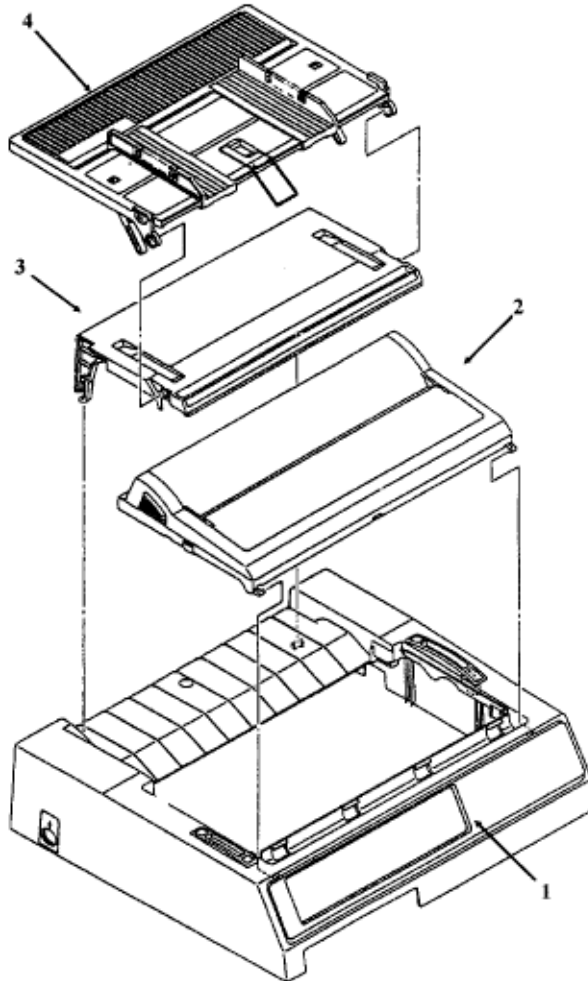
Description	Section
Covers - Rev A, B, and C	B.2.01 ..... 
Covers - Rev D	B.2.02 ..... 
Electrical Components - Rev A and B	B.2.03 ..... 
Electrical Components - Rev C	B.2.04 ..... 
Electrical Components - Rev D	B.2.05 ..... 
Printer Mechanism - Rev A and B (1 of 2)	B.2.06 ..... 
Printer Mechanism - Rev A and B (2 of 2)	B.2.07 ..... 
Printer Mechanism - Rev C (1 of 2)	B.2.08 ..... 
Printer Mechanism - Rev C (2 of 2)	B.2.09 ..... 
Printer Mechanism - Rev D (1 of 2)	B.2.10 ..... 
Printer Mechanism - Rev D (2 of 2)	B.2.11 ..... 
Operator Panel Assembly - Rev A, B, C, and D	B.2.12 ..... 
Carriage Assembly - Rev A, B, C, and D	B.2.13 ..... 
Tractor Assembly - Rev A, B, C, and D	B.2.14 ..... 
Options - Rev A, B, C, and D	B.2.15 ..... 
Consumables - Rev A, B, C, and D	B.2.16 ..... 
Packaging - Rev A, B, C, and D	B.2.17 ..... 
Documentation - Rev A, B, C, and D	B.2.18 ..... 


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**B.2.01 Covers - Rev A, B, and C**

Part numbers are subject to change.



#	Okidata PN / OKI-J PN	Description	Model	Comments	Disassembly Section	Serial #. Rev Level
1	53488302 1PP4016-6557 P2	Cover: Middle (ML320)	320	RSPL	3.2.04 	A B C

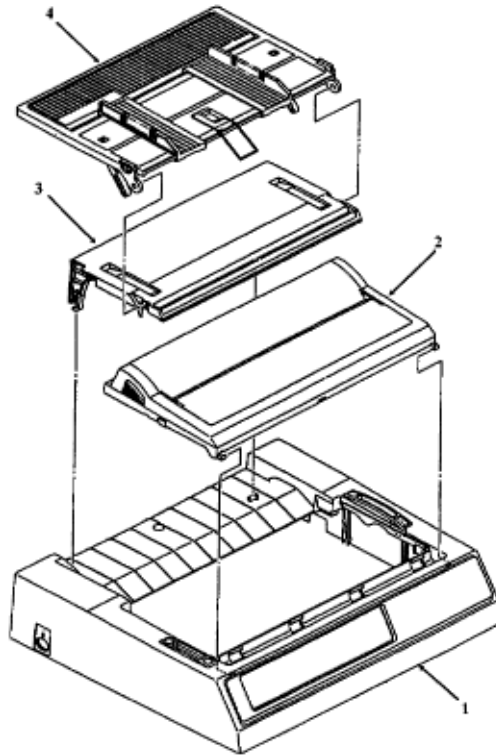
1	53488402 1PP4016-6558 P2	Cover: Middle (ML321)	321	RSPL	3.2.04 	A B C
2	50060701 2PA4016-6559 G1	Cover: Access (Assembly)	320	RSPL	3.2.04 	A B C D
2	50060801 2PA4016-6560 G1	Cover: Access (Assembly)	321	RSPL	3.2.04 	A B C D
3	53488501 1PP4016-6567 P1	Frame: Rear Cover	320	RSPL	3.2.04 	A B C D
3	53488601 1PP4016-6568 P1	Frame: Rear Cover	321	RSPL	3.2.04 	A B C D
4	50060901 1PA4016-6569 G1	Separator: Sheet (Assembly)	320	RSPL	3.2.04 	A B C D
4	50061001 1PA4016-6570 G1	Separator: Sheet (Assembly)	321	RSPL	3.2.04 	A B C D

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**B.2.02 Covers - Rev D**

Part numbers are subject to change.



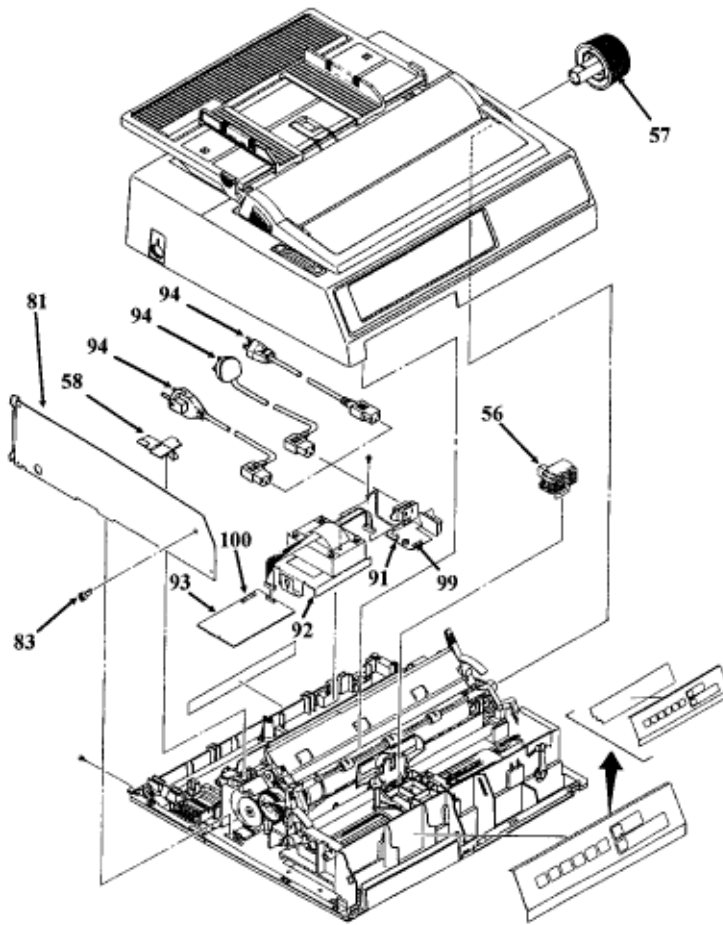
#	Okidata PN / OKI-J PN	Description	Model	Comments	Disassembly Section	Serial #. Rev Level
1	53070701 1PP4128-1005 P1	Cover: Middle (SSD)	320	RSPL	3.2.04	D
1	53070801 1PP4128-1007 P1	Cover: Middle (SSD) ML321	321	RSPL	3.2.04	D
2	50060701 2PA4016-6559 G1	Cover: Access (Assembly)	320	RSPL	3.2.04	A B C D

2	50060801 2PA4016-6560 G1	Cover: Access (Assembly)	321	RSPL	3.2.04 	A B C D
3	53488501 1PP4016-6567 P1	Frame: Rear Cover	320	RSPL	3.2.04 	A B C D
3	53488601 1PP4016-6568 P1	Frame: Rear Cover	321	RSPL	3.2.04 	A B C D
4	50060901 1PA4016-6569 G1	Separator: Sheet (Assembly)	320	RSPL	3.2.04 	A B C D
4	50061001 1PA4016-6570 G1	Separator: Sheet (Assembly)	321	RSPL	3.2.04 	A B C D

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**B.2.03 Electrical Components - Rev A and B**



#	Okidata PN / OKI-J PN	Description	Model	Comments	Disassembly Section	Serial #. Rev Level
94	56609701 3YS4011-1315 P1	Cord: AC 120 V	Both	RSPL	3.2.01	A B C D
94	56624101 3YS4011-1265 P1	Cord: AC (220 V) (ML Series)	Both	Option RSPL	3.2.01	A B C D

94	56616501 3YS4011-1192 P1	Cord: AC 240V	320/3 21	Option	3.2.01 	A B C D
56	50063802 4YA4025-1401 G2	Printhead: (Assembly)	Both	RSPL	3.2.03 	A B C D
57	51901101 3PP4025-2871 P1	Knob: Platen	Both	RSPL	3.2.04 	A B C D
58	50704301 3PA4025-2896 P1	Clamp: PCB	Both	RSPL	3.2.06 	A B C D
81	55041412 4YA4021-1051 G106	PCB: LXMC-3 w/o ROM (Control Board)	Both	RSPL	3.2.06 	A B C
83	50605501 4PP4025-2870 P1	Lock: Board Screw (LXMC)	Both	RSPL	3.2.06 	A B C D
92	56407503 4YB4056-8293 P3	Transformer: 120 V	320	RSPL	3.2.08 	A B C
92	56407502 4YB4056-8293 P4	Transformer: 120 V	321	RSPL	3.2.08 	A B C
92	56407901 4YB4056-8349 P1	Transformer: 220/240 V	320	Option RSPL	3.2.08 	A B C
92	56407902 4YB4056-8349 P2	Transformer: 220/240 V	321	Option RSPL	3.2.08 	A B C
91	55503103 4YX4056-3477 G3	Filter: (Assembly) AC 120V	Both	RSPL	3.2.09 	A B C D
91	55503104 4YX4056-3477 G4	Filter: 220/240 V (Assembly)	Both	Option	3.2.09 	A B C D



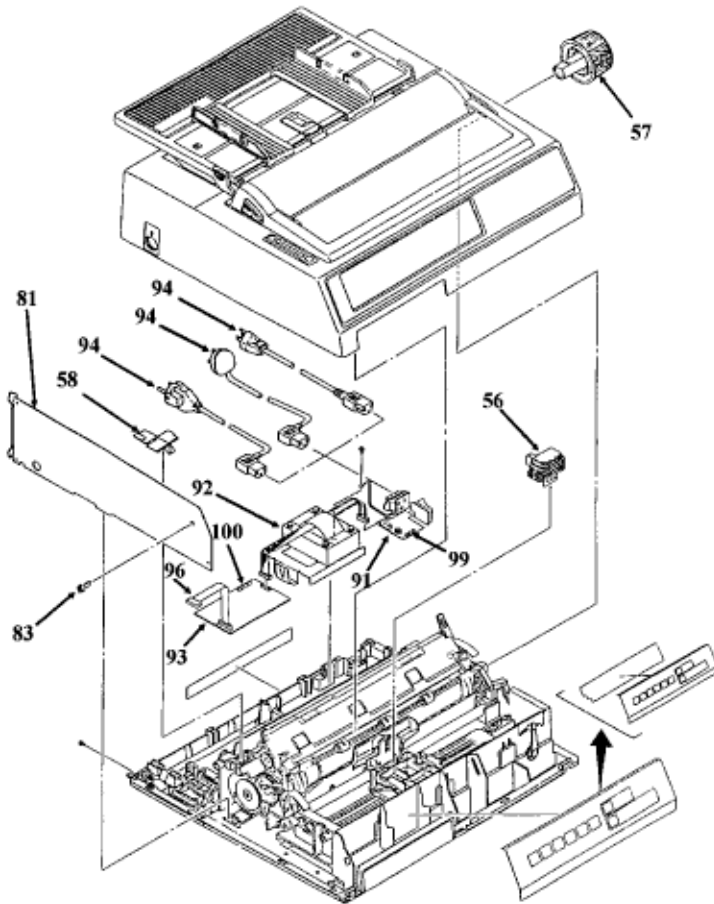
99	56303402 FP-21107-1	Fuse: 1.5 amp 250 V (Filter Board)	Both	Option	3.2.09 	A B C D
93	55047402 3YU5057-3311 G2	PCB: SUII-2	Both	RSPL	3.2.10 	A B C
93	55047406 3YU5057-3311 G6	PCB: SUII-6 (220/24V)	Both	Option	3.2.10 	A B C
10 0	56302101 540A2065N220 2	Fuse: Glass 2 amp 250V (PAII or SUII Board)	Both	Option	3.2.10 	A B C
10 0	56302502 FP-21093-1	Fuse: 250V 1A	Both	Option	3.2.10 	A B C

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**B.2.04 Electrical Components - Rev C**

Part numbers are subject to change.



#	Okidata PN / OKI-J PN	Description	Model	Comments	Disassembly Section	Serial #. Rev Level
94	56609701 3YS4011-1315 P1	Cord: AC 120 V	Both	RSPL	3.2.01	A B C D

94	56624101 3YS4011-1265 P1	Cord: AC (220 V) (ML Series)	Both	Option RSPL	3.2.01 	A B C D
94	56616501 3YS4011-1192 P1	Cord: AC 240V	320/3 21	Option	3.2.01 	A B C D
56	50063802 4YA4025-1401 G2	Printhead: (Assembly)	Both	RSPL	3.2.03 	A B C D
57	51901101 3PP4025-2871 P1	Knob: Platen	Both	RSPL	3.2.04 	A B C D
58	50704301 3PA4025-2896 P1	Clamp: PCB	Both	RSPL	3.2.06 	A B C D
81	55041412 4YA4021-1051 G106	PCB: LXMC-3 w/o ROM (Control Board)	Both	RSPL	3.2.06 	A B C
83	50605501 4PP4025-2870 P1	Lock: Board Screw (LXMC)	Both	RSPL	3.2.06 	A B C D
92	56407503 4YB4056-8293 P3	Transformer: 120 V	320	RSPL	3.2.08 	A B C
92	56407502 4YB4056-8293 P4	Transformer: 120 V	321	RSPL	3.2.08 	A B C
92	56407901 4YB4056-8349 P1	Transformer: 220/240 V	320	Option RSPL	3.2.08 	A B C
92	56407902 4YB4056-8349 P2	Transformer: 220/240 V	321	Option RSPL	3.2.08 	A B C
91	55503103 4YX4056-3477 G3	Filter: (Assembly) AC 120V	Both	RSPL	3.2.09 	A B C D

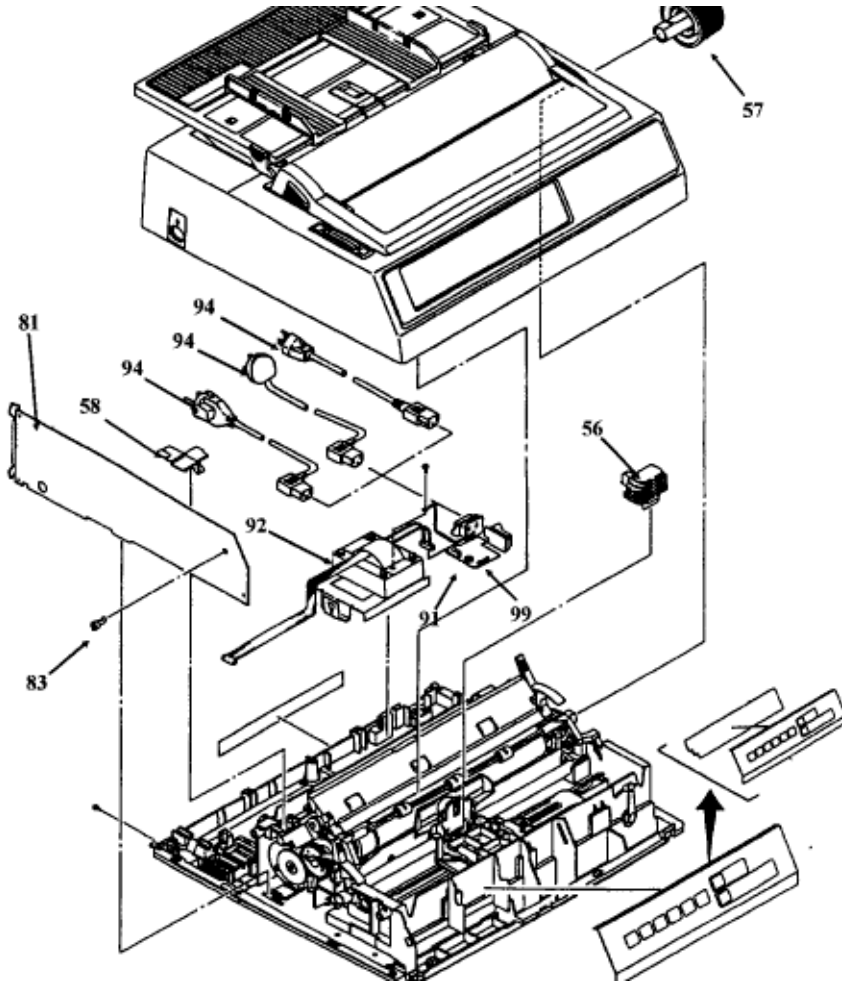
91	55503104 4YX4056-3477 G4	Filter: 220/240 V (Assembly)	Both	Option	3.2.09 	A B C D
99	56303402 FP-21107-1	Fuse: 1.5 amp 250 V (Filter Board)	Both	Option	3.2.09 	A B C D
93	55047402 3YU5057-3311 G2	PCB: SU11-2	Both	RSPL	3.2.10 	A B C
93	55047406 3YU5057-3311 G6	PCB: SU11-6 (220/24V)	Both	Option	3.2.10 	A B C
96	56616802 4YS4011-4311 P2	Cable: Power Supply - Nylon Conn	Both	RSPL	3.2.10 	C
10 0	56302101 540A2065N220 2	Fuse: Glass 2 amp 250V (PA11 or SU11 Board)	Both	Option	3.2.10 	A B C
10 0	56302502 FP-21093-1	Fuse: 250V 1A	Both	Option	3.2.10 	A B C

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B.2.05 Electrical Components - Rev D

Part numbers are subject to change.



#	Okidata PN / OKI-J PN	Description	Model	Comments	Disassembly Section	Serial #. Rev Level
94	56609701 3YS4011-1315 P1	Cord: AC 120 V	Both	RSPL	3.2.01	A B C D

94	56624101 3YS4011-1265 P1	Cord: AC (220 V) (Right Angle for ML Series)	Both	Option RSPL	3.2.01 	A B C D
94	56624401 3YS4011-1268 P1	Cord: AC 240V	320/3 21	Option	3.2.01 	A B C D
56	50063802 4YA4025-1401 G2	Printhead: (Assembly)	Both	RSPL	3.2.03 	A B C D
57	51901101 3PP4025-2871 P1	Knob: Platen	Both	RSPL	3.2.04 	A B C D
58	50704301 3PA4025-2896 P1	Clamp: PCB	Both	RSPL	3.2.06 	A B C D
81	55075111 4YA4042-1530 G11	PCB: LXMR (Assembly) SSD w/o ROMs	Both	RSPL	3.2.06 	D
83	50605501 4PP4025-2870 P1	Lock: Board Screw (LXMC)	Both	RSPL	3.2.06 	A B C D
92	53413201 4YB4049-7061 P1	Transformer: 120 V SSD (ML320)	320	RSPL	3.2.08 	D
92	56413202 4YB4049-7061 P2	Transformer: 120 V SSD (ML321)	321	RSPL	3.2.08 	D
92	56413301 4YB4049-7062 P1	Transformer: 230/240V SSD (ML320)	320	Option RSPL	3.2.08 	D
92	56413302 4YB4049-7062 P2	Transformer: 230/240V SSD (ML321)	321	Option RSPL	3.2.08 	D
91	55503103 4YX4056-3477 G3	Filter: (Assembly) AC 120V	Both	RSPL	3.2.09 	A B C D

91	55503104 4YX4056-3477 G4	Filter: 220/240 V (Assembly)	Both	Option	3.2.09 	A B C D
99	56303402 FP-21107-1	Fuse: 1.5 amp 250 V (Filter Board)	Both	Option	3.2.09 	A B C D

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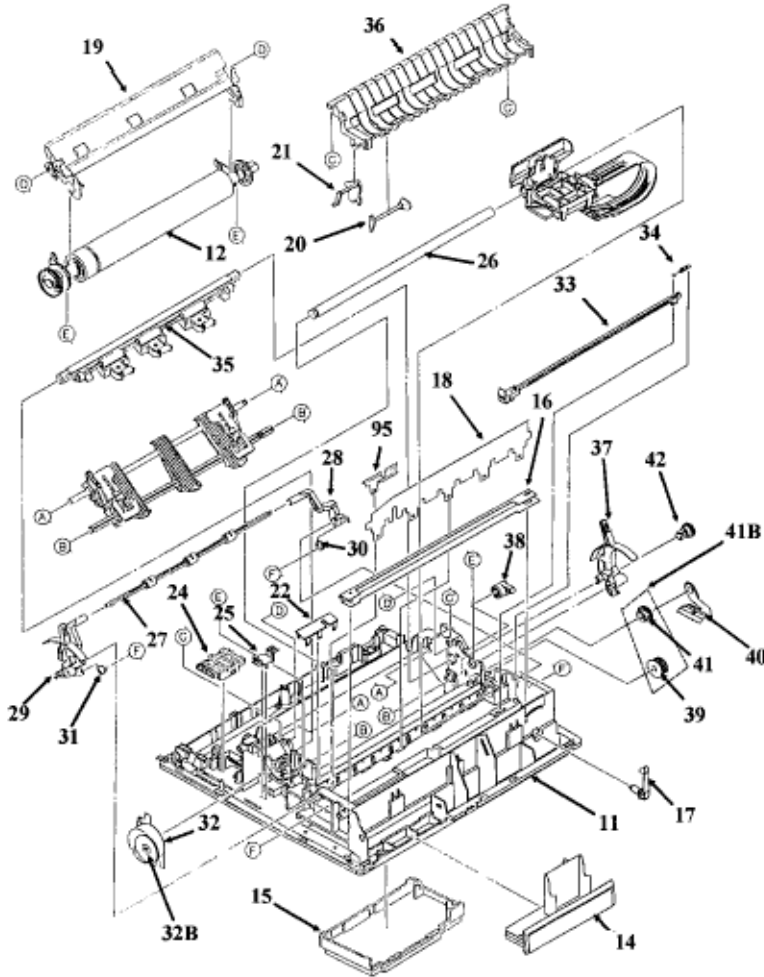
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**Service Guide ML320/ML321**  
Chapter B Illustrated Parts Listing

**B.2.06 Printer Mechanism - Rev A and B (1 of 2)**

Part numbers are subject to change.



#	Okidata PN / OKI-J PN	Description	Model	Comments	Disassembly Section	Serial #. Rev Level
19	50069801 3PA4025-2963 G1	Separator: Assembly (Narrow)	320	RSPL	3.2.02	A B C D



1 9	50069901 3PA4025-2978 G1	Separator: Assembly (Wide)	321	RSPL	3.2.02 	A B C D
1 4	53494901 2PP4025-2952 P1	Panel: IC Card (A)	Both	RSPL	3.2.07 	A B C
2 4	53328301 3PB4025-2911 P1	Module: Power Interconnect	Both		3.2.11 	A B
2 7	50061501 4PA4025-2838 G1	Indicator (Assembly)	320	RSPL	3.2.12 	A B C D
2 7	50061502 4PA4025-2838 G2	Indicator (Assembly)	321	RSPL	3.2.12 	A B C D
2 8	53489201 3PP4025-2840 P1	Bail Arm (R)	Both	RSPL	3.2.12 	A B C D
2 9	53489301 3PP4025-2841 P1	Bail Arm (L)	Both	RSPL	3.2.12 	A B C D
3 0	50911701 4PB4025-2842 P1	Spring: Bail Arm (R)	Both	RSPL	3.2.12 	A B C D
3 1	50911801 4PB4025-2843 P1	Spring: Bail Arm (L)	Both	RSPL	3.2.12 	A B C D
1 5	50062301 3PA4025-2806 G1	Cover: Head Cable Access	Both	RSPL	3.2.13 	A B C
2 6	51109401 4PP4025-2837 P1	Shaft: Carriage	320	RSPL	3.2.16 	A B C D
2 6	51109402 4PP4025-2837 P2	Shaft: Carriage	321	RSPL	3.2.16 	A B C D

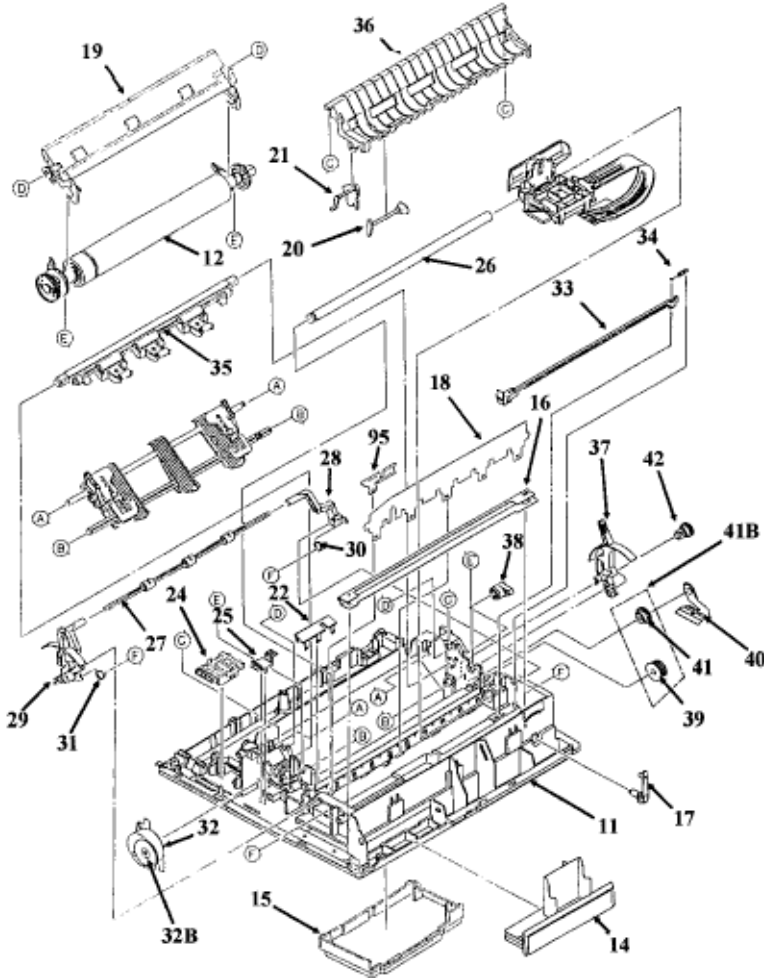
3 3	53489401 3PP4025-2845 P1	Rack: Space	320	RSPL	3.2.17 	A B C D
3 3	53489402 3PP4025-2845 P2	Rack: Space	321	RSPL	3.2.17 	A B C D
3 4	50911901 4PB4025-2873 P1	Spring: Tension	Both	RSPL	3.2.17 	A B C D
1 6	51002101 3PP4025-2809 P1	Rail: Guide	320	RSPL	3.2.18 	A B C D
1 6	51002102 3PP4025-2809 P2	Rail: Guide	321	RSPL	3.2.18 	A B C D
1 7	51216201 4PP4025-2810 P1	Cam: Adjust	Both	RSPL	3.2.18 	A B C D
1 2	50061305 3PA4025-2811 G5	Platen: (Assembly)	320	RSPL	3.2.19 	A B C D
1 2	50061306 3PA4025-2811 G6	Platen: (Assembly)	321	RSPL	3.2.19 	A B C D


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**B.2.07 Printer Mechanism - Rev A and B (2 of 2)**

Part numbers are subject to change.



#	Okidata PN / OKI-J PN	Description	Model	Comments	Disassembly Section	Serial #. Rev Level
32 B	51219001 3PB4055-2440 P1	Gear: Line Feed Motor	Both	RSPL	3.2.20  )	A B C D

32	56507003 3PB4025-2844 P3	Motor: Line Feed	Both	RSPL	3.2.20 	A B C D
25	53328401 3PP4025-2874 P1	Module: LF Motor Interconnect	Both	RSPL	3.2.21 	A B C D
41 B	58227501 N/A	Kit: Idler/Change Gear (ML300)	Both	RSPL<R> to 39 and 41	3.2.22 	A B C D
39	51216001 4PP4025-2868 P1	Idler Gear	Both		3.2.22 	A B C D
41	51215901 4PP4025-2866 P1	Change Gear	Both		3.2.22 	A B C D
40	50912001 4PP4025-2867 P1	Spring: Reset	Both	RSPL	3.2.22 	A B C D
37	53489501 3PP4025-2852 P1	Lever: Release	Both	RSPL	3.2.23 	A B C D
18	50911501 3PP4025-2819 P1	Guide: Paper Pressure	320	RSPL	3.2.24 	A B C D
18	50911602 3PP4025-2905 P1	Guide: Paper Pressure	321	RSPL	3.2.24 	A B C D
95	50913901 3PP4025-3161 P1	Spring: Support	321		3.2.24 	A B C D
36	50061801 3PA4025-2853 G1	Chute (Assembly) Paper	320	RSPL	3.2.25 	A B C D
36	50061901 3PA4025-2915 G1	Chute (Assembly) Paper	321	RSPL	3.2.25 	A B C D

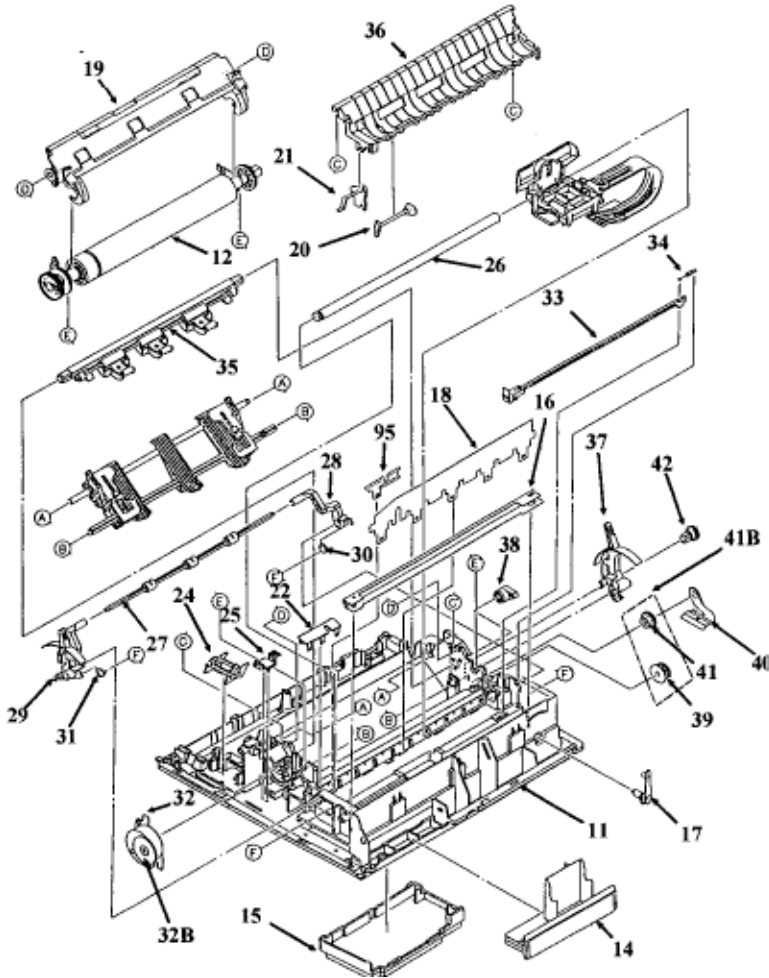
38	53489601 4PP4025-2881 P1	Link: Release	Both	RSPL	3.2.25 (  )	A B C D
35	50061601 3PA4025-2846 G1	Roller: Pressure (Assembly)	320	RSPL	3.2.25 (  )	A B C D
35	50061701 3PA4025-2908 G1	Roller: Pressure (Assembly)	321	RSPL	3.2.25 (  )	A B C D
42	51216101 4PP4025-2869 P1	Gear: Tractor	Both	RSPL	3.2.26 (  )	A B C D
21	53489001 3PP4025-2826 P1	Lever: Sensor	Both	RSPL	3.2.27 (  )	A B C D
20	53488901 3PP4025-2825 P1	Lever: Paper End (B)	320	RSPL	3.2.28 (  )	A B C D
20	53488902 3PP4025-2825 P2	Lever: Paper End (B)	321	RSPL	3.2.28 (  )	A B C D
22	53489101 3PP4025-2827 P1	Cover: Sensor	Both	RSPL	3.2.28 (  )	A B C D
11	50061101 3PA4025-2802 G1	Chassis: Main (Assembly)	320	RSPL	3.2.29 (  )	A B C
11	50061201 3PA4025-2902 G1	Chassis: Main (Assembly)	321	RSPL	3.2.29 (  )	A B C




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**B.2.08 Printer Mechanism - Rev C (1 of 2)**

Part numbers are subject to change.



#	Okidata PN / OKI-J PN	Description	Model	Comments	Disassembly Section	Serial #. Rev Level
19	50069801 3PA4025-2963 G1	Separator: Assembly (Narrow)	320	RSPL	3.2.02(  )	A B C D

1 9	50069901 3PA4025-2978 G1	Separator: Assembly (Wide)	321	RSPL	3.2.02(  )	A B C D
1 4	53494901 2PP4025-2952 P1	Panel: IC Card (A)	Both	RSPL	3.2.07(  )	A B C
2 4	51003801 4PB4025-3180 P1	Guide: Cable	320	RSPL	3.2.11(  )	C D PCB Ver #8 and after
2 7	50061501 4PA4025-2838 G1	Indicator (Assembly)	320	RSPL	3.2.12(  )	A B C D
2 7	50061502 4PA4025-2838 G2	Indicator (Assembly)	321	RSPL	3.2.12(  )	A B C D
2 8	53489201 3PP4025-2840 P1	Bail Arm (R)	Both	RSPL	3.2.12(  )	A B C D
2 9	53489301 3PP4025-2841 P1	Bail Arm (L)	Both	RSPL	3.2.12(  )	A B C D
3 0	50911701 4PB4025-2842 P1	Spring: Bail Arm (R)	Both	RSPL	3.2.12(  )	A B C D
3 1	50911801 4PB4025-2843 P1	Spring: Bail Arm (L)	Both	RSPL	3.2.12(  )	A B C D
1 5	50062301 3PA4025-2806 G1	Cover: Head Cable Access	Both	RSPL	3.2.13(  )	A B C
2 6	51109401 4PP4025-2837 P1	Shaft: Carriage	320	RSPL	3.2.16(  )	A B C D
2 6	51109402 4PP4025-2837 P2	Shaft: Carriage	321	RSPL	3.2.16(  )	A B C D

3 3	53489401 3PP4025-2845 P1	Rack: Space	320	RSPL	3.2.17(  )	A B C D
3 3	53489402 3PP4025-2845 P2	Rack: Space	321	RSPL	3.2.17 ( (  )	A B C D
3 4	50911901 4PB4025-2873 P1	Spring: Tension	Both	RSPL	3.2.17(  )	A B C D
1 6	51002101 3PP4025-2809 P1	Rail: Guide	320	RSPL	3.2.18(  )	A B C D
1 6	51002102 3PP4025-2809 P2	Rail: Guide	321	RSPL	3.2.18(  )	A B C D
1 7	51216201 4PP4025-2810 P1	Cam: Adjust	Both	RSPL	3.2.18(  )	A B C D
1 2	50061305 3PA4025-2811 G5	Platen: (Assembly)	320	RSPL	3.2.19(  )	A B C D
1 2	50061306 3PA4025-2811 G6	Platen: (Assembly)	321	RSPL	3.2.19(  )	A B C D

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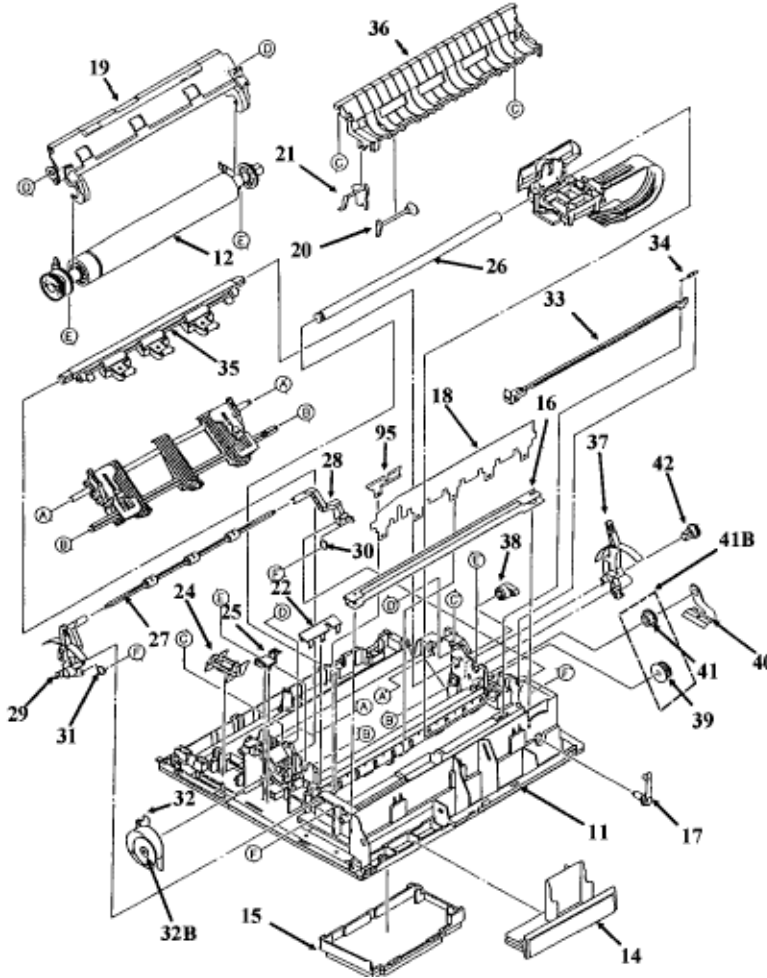













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**B.2.09 Printer Mechanism - Rev C (2 of 2)**

Part numbers are subject to change.



#	Okidata PN / OKI-J PN	Description	Model	Comments	Disassembly Section	Serial #. Rev Level
3 2 B	51219001 3PB4055-2440 P1	Gear: Line Feed Motor	Both	RSPL	3.2.20 (  )	A B C D

3 2	56507003 3PB4025-2844 P3	Motor: Line Feed	Both	RSPL	3.2.20 (  )	A B C D
2 5	53328401 3PP4025-2874 P1	Module: LF Motor Interconnect	Both	RSPL	3.2.21 (  )	A B C D
4 1 B	58227501 N/A	Kit: Idler/Change Gear (ML300)	Both	RSPL<R>I nc. 39 and 41	3.2.22 (  )	A B C D
3 9	51216001 4PP4025-2868 P1	Idler Gear	Both		3.2.22 (  )	A B C D
4 1	51215901 4PP4025-2866 P1	Change Gear	Both		3.2.22 (  )	A B C D
4 0	50912001 4PP4025-2867 P1	Spring: Reset	Both	RSPL	3.2.22 (  )	A B C D
3 7	53489501 3PP4025-2852 P1	Lever: Release	Both	RSPL	3.2.23 (  )	A B C D
1 8	50911501 3PP4025-2819 P1	Guide: Paper Pressure	320	RSPL	3.2.24 (  )	A B C D
1 8	50911602 3PP4025-2905 P1	Guide: Paper Pressure	321	RSPL	3.2.24 (  )	A B C D
9 5	50913901 3PP4025-3161 P1	Spring: Support	321		3.2.24 (  )	A B C D
3 6	50061801 3PA4025-2853 G1	Chute: Paper (Assembly)	320	RSPL	3.2.25 (  )	A B C D
3 6	50061901 3PA4025-2915 G1	Chute: Paper (Assembly)	321	RSPL	3.2.25 (  )	A B C D

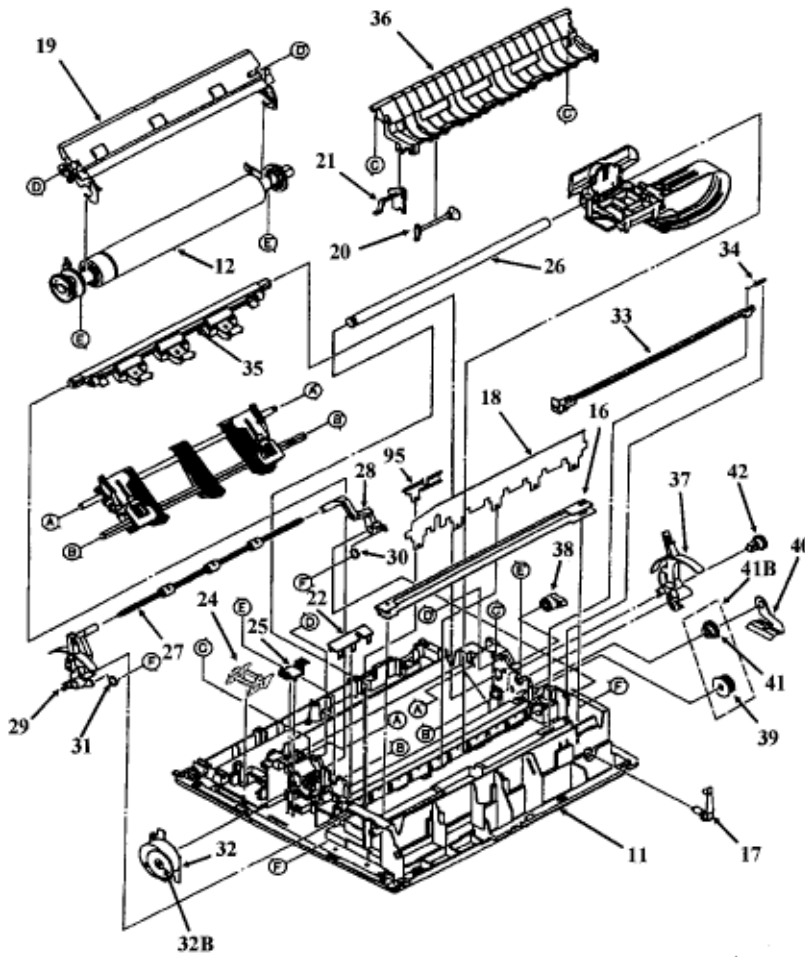
3 5	50061601 3PA4025-2846 G1	Roller: Pressure (Assembly)	320	RSPL	3.2.25 (  )	A B C D
3 5	50061701 3PA4025-2908 G1	Roller: Pressure (Assembly)	321	RSPL	3.2.25 (  )	A B C D
3 8	53489601 4PP4025-2881 P1	Link: Release	Both	RSPL	3.2.25 (  )	A B C D
4 2	51216101 4PP4025-2869 P1	Gear: Tractor	Both	RSPL	3.2.26 (  )	A B C D
2 1	53489001 3PP4025-2826 P1	Lever: Sensor	Both	RSPL	3.2.27 (  )	A B C D
2 0	53488901 3PP4025-2825 P1	Lever: Paper End (B)	320	RSPL	3.2.28 (  )	A B C D
2 0	53488902 3PP4025-2825 P2	Lever: Paper End (B)	321	RSPL	3.2.28 (  )	A B C D
2 2	53489101 3PP4025-2827 P1	Cover: Sensor	Both	RSPL	3.2.28 (  )	A B C D
1 1	50061101 3PA4025-2802 G1	Chassis Main (Assembly)	320	RSPL	3.2.29 (  )	A B C
1 1	50061201 3PA4025-2902 G1	Chassis Main (Assembly)	321	RSPL	3.2.29 (  )	A B C
















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**B.2.10 Printer Mechanism - Rev D (1 of 2)**

Part numbers are subject to change.



#	Okidata PN / OKI-J PN	Description	Model	Comments	Disassembly Section	Serial #. Rev Level
19	50069801 3PA4025-2963 G1	Separator: Assembly (Narrow)	320	RSPL	3.2.02 (  )	A B C D

1 9	50069901 3PA4025-2978 G1	Separator: Assembly (Wide)	321	RSPL	3.2.02 (  )	A B C D
2 4	51003801 4PB4025-3180 P1	Guide: Cable	320	RSPL	3.2.11 (  )	C D PCB Ver #8 and after
2 7	50061501 4PA4025-2838 G1	Indicator (Assembly)	320	RSPL	3.2.12 (  )	A B C D
2 7	50061502 4PA4025-2838 G2	Indicator (Assembly)	321	RSPL	3.2.12 (  )	A B C D
2 8	53489201 3PP4025-2840 P1	Bail Arm (R)	Both	RSPL	3.2.12 (  )	A B C D
2 9	53489301 3PP4025-2841 P1	Bail Arm (L)	Both	RSPL	3.2.12 (  )	A B C D
3 0	50911701 4PB4025-2842 P1	Spring: Bail Arm (R)	Both	RSPL	3.2.12 (  )	A B C D
3 1	50911801 4PB4025-2843 P1	Spring: Bail Arm (L)	Both	RSPL	3.2.12 (  )	A B C D
2 6	51109401 4PP4025-2837 P1	Shaft: Carriage	320	RSPL	3.2.16 (  )	A B C D
2 6	51109402 4PP4025-2837 P2	Shaft: Carriage	321	RSPL	3.2.16 (  )	A B C D
3 3	53489401 3PP4025-2845 P1	Rack: Space	320	RSPL	3.2.17 (  )	A B C D
3 3	53489402 3PP4025-2845 P2	Rack: Space	321	RSPL	3.2.17 (  )	A B C D

3 4	50911901 4PB4025-2873 P1	Spring: Tension	Both	RSPL	3.2.17 (  )	A B C D
1 6	51002101 3PP4025-2809 P1	Rail: Guide	320	RSPL	3.2.18 (  )	A B C D
1 6	51002102 3PP4025-2809 P2	Rail: Guide	321	RSPL	3.2.18 (  )	A B C D
1 7	51216201 4PP4025-2810 P1	Cam: Adjust	Both	RSPL	3.2.18 (  )	A B C D
1 2	50061305 3PA4025-2811 G5	Platen: (Assembly)	320	RSPL	3.2.19 (  )	A B C D
1 2	50061306 3PA4025-2811 G6	Platen: (Assembly)	321	RSPL	3.2.19 (  )	A B C D

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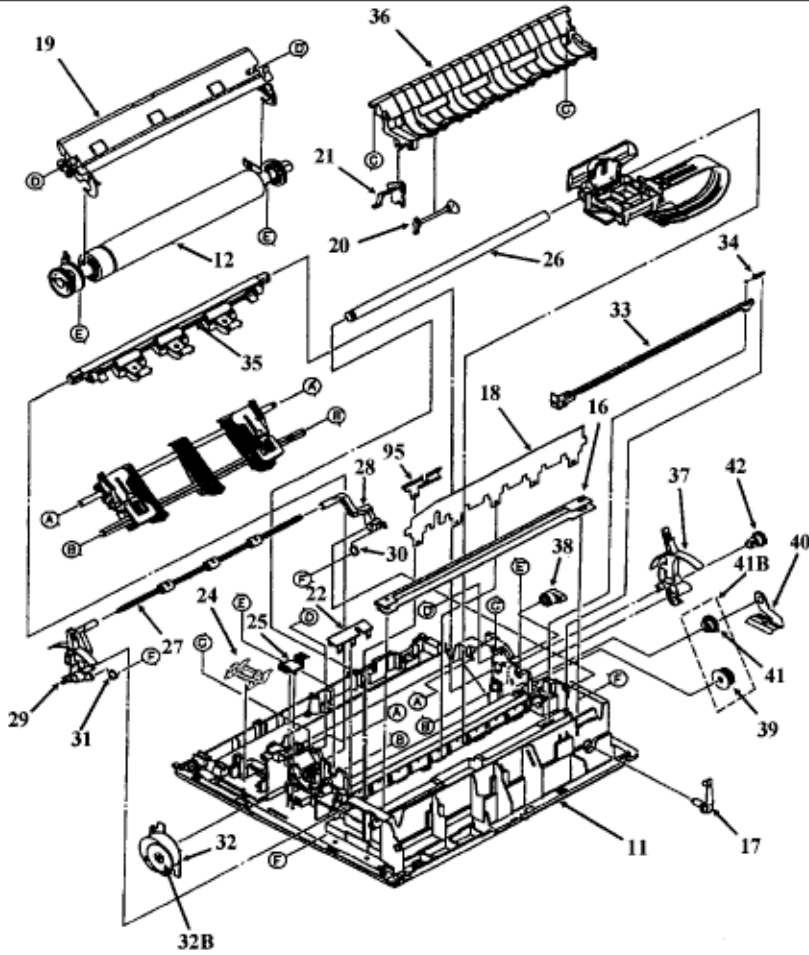
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**B.2.11 Printer Mechanism - Rev D (2 of 2)**


Part numbers are subject to change.



#	Okidata PN / OKI-J PN	Description	Model	Comments	Disassembly Section	Serial #. Rev Level
32 B	51219001 3PB4055-2440 P1	Gear: Line Feed Motor	Both	RSPL	3.2.20 (  )	A B C D

32	56507003 3PB4025-2844 P3	Motor: Line Feed	Both	RSPL	3.2.20 (  )	A B C D
25	53328401 3PP4025-2874 P1	Module: LF Motor Interconnect	Both	RSPL	3.2.21 (  )	A B C D
41 B	58227501 N/A	Kit: Idler/Change Gear (ML300)	Both	RSPL<R> to 39 and 41	3.2.22 (  )	A B C D
39	51216001 4PP4025-2868 P1	Idler Gear	Both		3.2.22 (  )	A B C D
41	51215901 4PP4025-2866 P1	Change Gear	Both		3.2.22 (  )	A B C D
40	50912001 4PP4025-2867 P1	Spring: Reset	Both	RSPL	3.2.22 (  )	A B C D
37	53489501 3PP4025-2852 P1	Lever: Release	Both	RSPL	3.2.23 (  )	A B C D
18	50911501 3PP4025-2819 P1	Guide: Paper Pressure	320	RSPL	3.2.24 (  )	A B C D
18	50911602 3PP4025-2905 P1	Guide: Paper Pressure	321	RSPL	3.2.24 (  )	A B C D
95	50913901 3PP4025-3161 P1	Spring: Support	321		3.2.24 (  )	A B C D
36	50061801 3PA4025-2853 G1	Chute Paper (Assembly)	320	RSPL	3.2.25 (  )	A B C D
36	50061901 3PA4025-2915 G1	Chute Paper (Assembly)	321	RSPL	3.2.25 (  )	A B C D



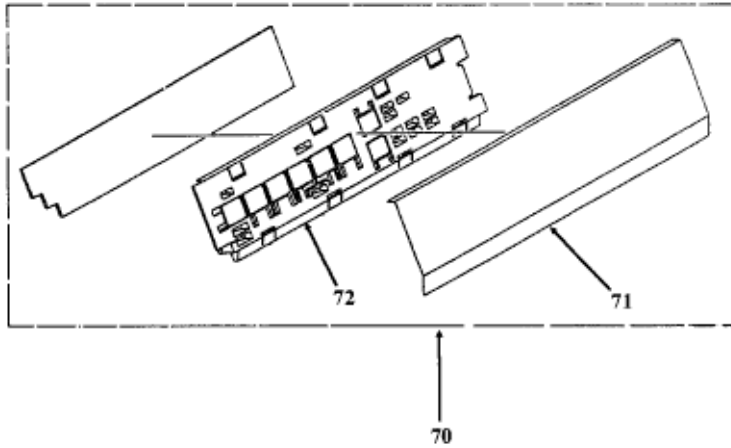
35	50061601 3PA4025-2846 G1	Roller: Pressure (Assembly)	320	RSPL	3.2.25 (  )	A B C D
35	50061701 3PA4025-2908 G1	Roller: Pressure (Assembly)	321	RSPL	3.2.25 (  )	A B C D
38	53489601 4PP4025-2881 P1	Link: Release	Both	RSPL	3.2.25 (  )	A B C D
42	51216101 4PP4025-2869 P1	Gear: Tractor	Both	RSPL	3.2.26 (  )	A B C D
21	53489001 3PP4025-2826 P1	Lever: Sensor	Both	RSPL	3.2.27 (  )	A B C D
20	53488901 3PP4025-2825 P1	Lever: Paper End (B)	320	RSPL	3.2.28 (  )	A B C D
20	53488902 3PP4025-2825 P2	Lever: Paper End (B)	321	RSPL	3.2.28 (  )	A B C D
22	53489101 3PP4025-2827 P1	Cover: Sensor	Both	RSPL	3.2.28 (  )	A B C D
11	50104501 3PA4025-3822 G1	Chassis: Main (Assembly) SSD ML320	320	RSPL	3.2.29 (  )	D
11	50104601 3PA4025-3832 G1	Chassis: Main (Assembly) SSD ML321	321	RSPL	3.2.29 (  )	D








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**B.2.12 Operator Panel - Rev A, B, C, and D**

Part numbers are subject to change.



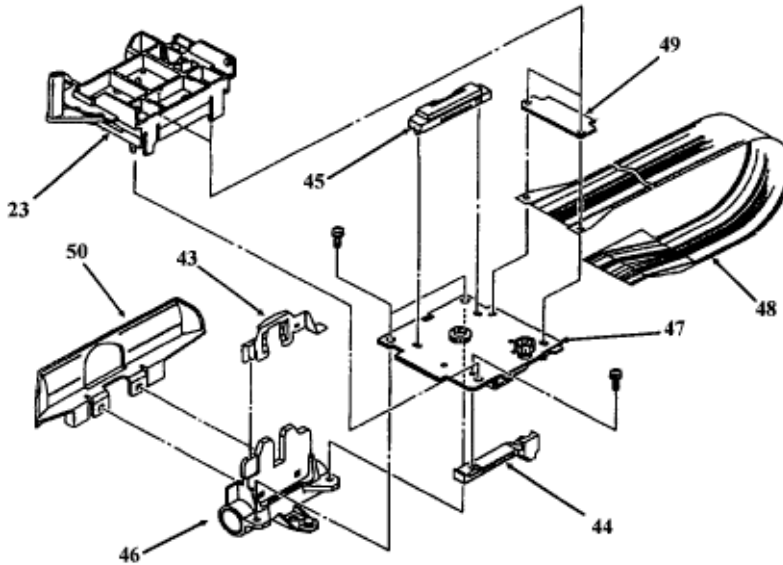
#	Okidata PN / OKI-J PN	Description	Model	Comments	Disassembly Section	Serial #. Rev Level
70	50069603 3PP4025-3114 G3	Panel: Operation w/Frame (Assembly)	Both	RSPL	3.2.05(  )	A B C
71	53490101 3PP4025-3114 G3	Operation Panel	Both		3.2.05(  )	A B C
71	50107426 3PA4025-2821 G26	Operation Panel (Assembly) SSD	Both	RSPL	3.2.05(  )	D
72	55038602 4YA4021-1048 G2	PCB: LXSP-2 (Operator PCB)	Both	RSPL	3.2.05(  )	A B C
72	55075011 4YA4042-1531 G11	PCB: LXON (Assembly) SSD Op Panel PCB	Both	RSPL	3.2.05(  )	D

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#### B.2.13 Carriage Assembly - Rev A, B, C, and D

Part numbers are subject to change.



#	Okidata PN / OKI-J PN	Description	Model	Comments	Disassembly Section	Serial #. Rev Level
2 3	50063701 4PA4025-2955 G1	Drive: Ribbon Assembly	Both	RSPL	3.2.14	A B C D
4 8	56616301 2PU4007-1096 P1	Cable: Head (Flexible)	320	RSPL	3.2.14	A B C D
4 8	56616302 2PU4007-1096 P2	Cable: Head (Flexible)	321	RSPL	3.2.14	A B C D
4 9	51706501 4PP4025-2690 P1	Rubber: Contact Pressure	Both	RSPL	3.2.14	A B C D

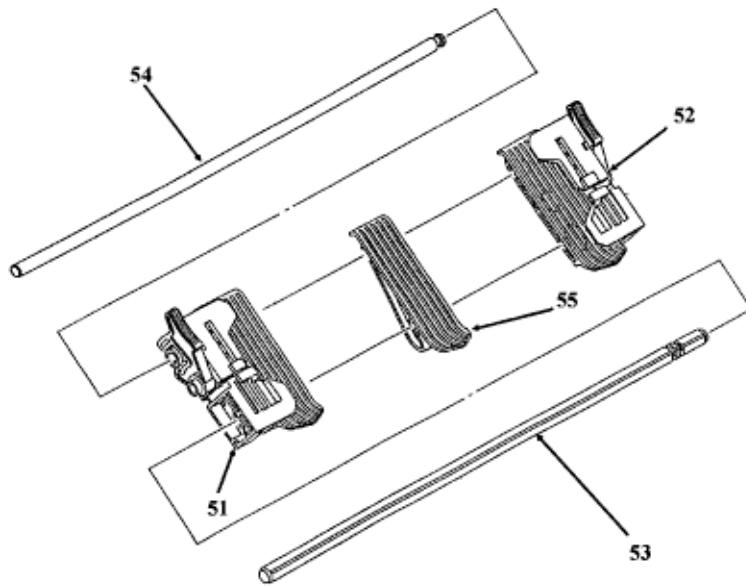
4 4	51001801 4PB4025-1088 P1	Guide: Space Motor (Slider)	Both	RSPL	3.2.15 	A B C D
4 5	56718601 3PB4025-1116 P1	Connector: Head	Both	RSPL	3.2.15 	A B C D
4 7	56507202 4YX4025-1800 G2	Motor: Space (Assembly)	Both	RSPL	3.2.15 	A B C D
4 6	53490401 4PB4025-2829 G1	Frame: Carriage (Assembly)	Both	RSPL	3.2.16 	A B C D
4 3	50702901 4PP4025-1048 P1	Clamp: Head	Both	RSPL	3.2.16 	A B C D
5 0	53056201 3PP4025-2836 P1	Protector: Ribbon	Both	RSPL	3.2.16 	A B C D

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**B.2.14 Tractor Assembly - Rev A, B, C, and D**

Part numbers are subject to change.



#	Okidata PN / OKI-J PN	Description	Model	Comments	Disassembly Section	Serial #. Rev Level
51	50062101 4PA4025-2861 G1	Frame: Tractor (L) Assembly	Both	RSPL	3.2.26	A B C D
52	50062001 4PA4025-2855 G1	Frame: Tractor (R) Assembly	Both	RSPL	3.2.26	A B C D
53	51109501 4PP4025-2864 P1	Shaft: Drive	320	RSPL	3.2.26	A B C D

5 3	51109502 4PP4025-2864 P2	Shaft: Drive	321	RSPL	3.2.26 	A B C D
5 4	51111201 4PP4025-2831 P1	Shaft: Lock	320	RSPL	3.2.26 	A B C D
5 4	51109602 4PP4025-2865 P2	Shaft: Lock	321	RSPL	3.2.26 	A B C D
5 5	51004901 3PP4025-2927 P1	Sheet Guide	Both	RSPL	3.2.26 	A B C D

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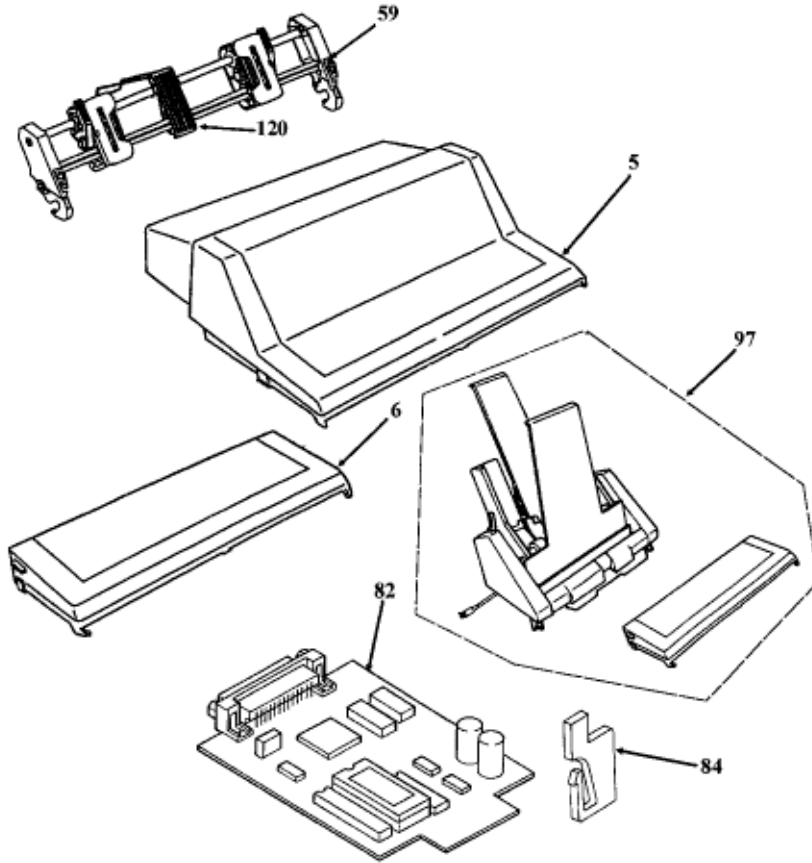
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**B.2.15 Options - Rev A, B, C, and D**

Part numbers are subject to change.



#	Okidata PN / OKI-J PN	Description	Model	Comments	Disassembly Section	Serial #. Rev Level
5	53493201 2PP4016-6865 G1	Cover: Acoustic (Tractor Option)	320	Option RSPL	N/A	A B C D
5	53494201 2PP4016-6866 G1	Cover: Acoustic (Tractor Option)	321	Option RSPL	N/A	A B C D



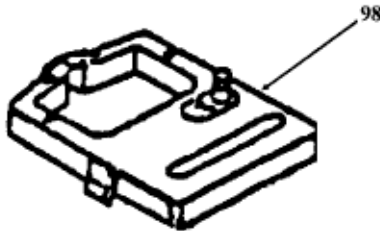
6	53494301 2PP4016-6867 G1	Cover: Acoustic (CSF Option)	320	Option RSPL	N/A	A B C D
6	53494401 2PP4016-6868 G1	Cover:ustic (CSF Option)	321	Option RSPL	N/A	A B C D
59	70012501 N/A	Pull Tractor Assembly Kit	320	Option	N/A	A B C D
59	70012601 N/A	Pull Tractor Assembly Kit	321	Option	N/A	A B C D
97	70012701 N/A	CSF-3000A (Cut Sheet Feeder)	Both	Option	N/A	A B C D
82	55038901 4YA4021-1050 G1	PCB: LXHI (RS232-C)	Both	Option RSPL	N/A	A B C D
84	50803801 4PP4025-2887 P1	Clip: Interface Lock	Both	Option RSPL	N/A	A B C D
120	N/A 4PP4025-2653 P1	Sheet Guide	Both	Option	N/A	A B C D

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**B.2.16 Consumables - Rev A, B, C, and D**

Part numbers are subject to change.



#	Okidata PN / OKI-J PN	Description	Model	Comments	Disassembly Section	Serial #. Rev Level
9 8	52102001 N/A	Ribbon	Both	Consumable	3.2.03	A B C D

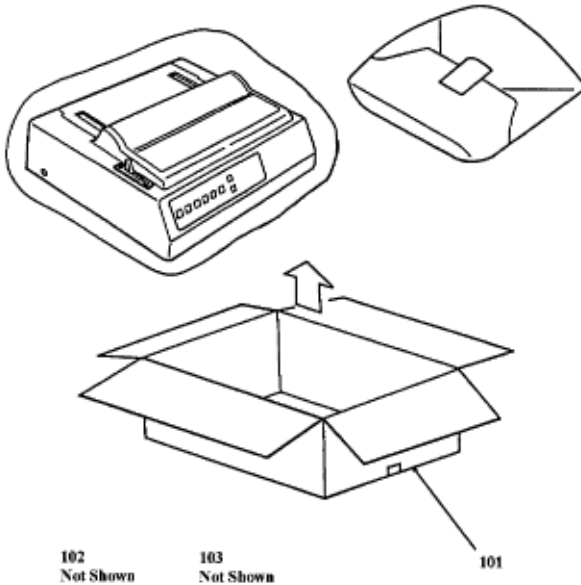


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#### B.2.17 Packaging - Rev A, B, C, and D

Part numbers are subject to change.



#	Okidata PN / OKI-J PN	Description	Model	Comments	Disassembly Section	Serial #. Rev Level
101	53496401 N/A	Box (ML320)	320	RSPL	N/A	D
101	53496501 N/A	Box (ML321)	321	RSPL	N/A	D
102	53495501 N/A	End Cap L	Both	RSPL	N/A	D
103	53495502 N/A	End Cap R	Both	RSPL	N/A	D

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#### B.2.18 Documentation - Rev A, B, C, and D

Part numbers are subject to change.

#	Okidata PN / OKI-J PN	Description	Model	Comments	Disassembly Section	Serial #. Rev Level
105	58302601 N/A	Product Update	Both	Document	N/A	A B C
106	59230804 N/A	Setup Guide	Both	Document	N/A	A B C
107	59231404 N/A	Standard Reference Guide	Both	Document	N/A	A B C
108	58061601 N/A	Epson/IBM Product Update	Both	Document	N/A	A B C
109	59230904 N/A	Epson/IBM Reference Guide	Both	Document	N/A	A B C
110 <R >	59264901	Printer Handbook<R>Includes Rev D<R>Supersedes 104 - 109	Book	Document	N/A	A B C D
104	58215503 N/A	Model 320/321 Service Training Kit	Both	Document	N/A	A B C D
111	59231102 N/A	Maintenance Manual<R>(Assembly Level)	Both	Document	N/A	A B C
111	59264801 N/A	Maintenance Manual<R>(Assembly Level)	Both	Document	N/A	D

112	59231301 N/A	CSF 3000 Cut Sheet Feeder Handbook	Both	Document	N/A	A B C D
113	59231001 N/A	CSF 3000 Cut Sheet Feeder Maintenance Manual	Both	Document	N/A	A B C D
114	N/A N/A	Marketing Literature	Both	Document	N/A	A B C D
115	N/A N/A	Marketing Literature Order Form	Both	Document	N/A	A B C D

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