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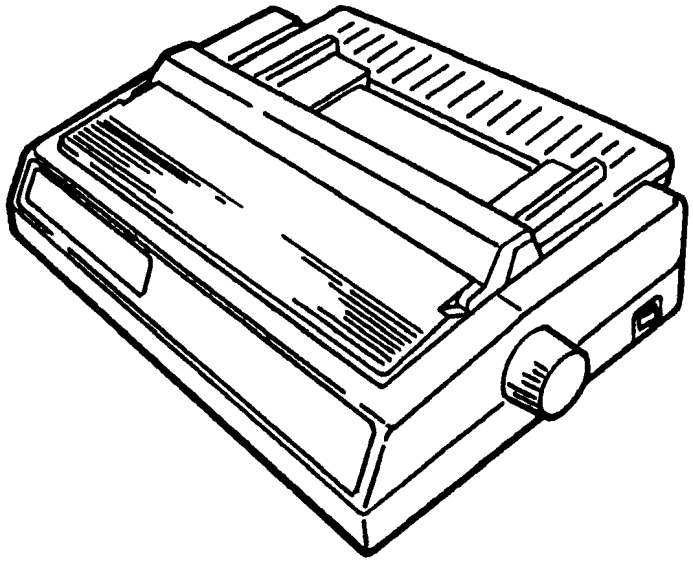
# Microline 520/521

# Service Handbook



OKI

P/N 59257803

# Microline 520/521

# Service Handbook

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# COURSE ADMINISTRATION

## OVERVIEW

Okidata developed this course in order to provide the information necessary to install and maintain the Microline 520 and Microline 521 printers. Upon successful completion of this training course, you will be able to do the following.

Install and operate the product

Locate the major assemblies of the product

Identify fault indications

Perform corrective and preventive maintenance

The Service Handbook is the primary reference manual for this course. You cannot, however, successfully complete this course by referring only to this manual. Take the time to familiarize yourself with all of the documentation in the training kit. This additional information will greatly simplify working with the product.

Okidata's Technical Training Program is designed to build a knowledgeable and efficient service and support group for Okidata products.

One step in becoming an Authorized Okidata Service Center is obtaining a training kit for the appropriate product. This acquisition allows the Dealership to have reference materials available during service jobs. Having, and using, these reference materials will minimize the time and money spent on repairs.

Technicians complete Certification Tests as part of Okidata's Authorization process. Testing familiarizes the technician with the product and reference materials.

This training course provides *assembly level* repair information to the field technician. No attempt is made to provide basic training in being a technician. This kit strives to train a technician to service the product. Okidata views service technicians as representatives of Okidata. Through this course, Okidata seeks to provide the means and the motivation that will make good service a reality.

**Remember**

*Component level servicing is provided only at Okidata Service Repair Depots!*

## RECOMMENDATIONS

### Prerequisites

Before beginning this course, you should know the following concepts.

Have an understanding of basic electronics

Be familiar with electrostatic principles

Be familiar with dot matrix technology and protocol

Be familiar with the proper procedures for handling circuit boards, Read Only Memory (ROM), and Random Access Memory (RAM)

Be able to use basic tools

Be able to use a digital multimeter (DMM)

### Equipment

The following equipment is recommended for the successful completion of this training course.

Microline 520 or Microline 521 (optional)

Tools (optional - refer to Module Three of the Service Handbook)

Personal Computer (for Okilink II connection)

Modem (for Okilink II connection)

Communications Software (for Okilink II connection)

Telephone (for Faxable Facts connection)

Facsimile Machine (for Faxable Facts connection)

Video Cassette Player (for viewing videotape)

Video Monitor (for viewing videotape)

### Documentation

You should have access to the following documentation while completing this course.

Okidata Service Center Reference Guide

Service Handbook

Printer Handbook

Service Videotape

## INFORMATION UPDATES

Every effort has been made to ensure the accuracy of the information contained in this training course. Okidata is not responsible for errors beyond its control.

Technical updates are made available to authorized Service Centers through the Technical Service Bulletins (TSBs / Okidata's Monthly Technical Mail). The TSBs are distributed via Okidata's Bulletin Board, Okilink II.

Additions and corrections to the training materials are available in the Training Section of Okilink II. Please sign on and check this section before beginning this course.

For information on using Okilink II, please refer to the Service Center Reference Guide.

## NOTICES

Pay attention to all notices that appear throughout this training course. They are for your safety! Here are the definitions of the notices.

*NOTE:*

*This notice refers to supplemental information.*

**CAUTION:**

*Deviation from the listed procedures may result in damage to the product.*

**WARNING:**

**Deviation from the listed procedures may result in personal injury.**

## WHERE TO SEND TESTING MATERIALS

Refer to the Okidata Service Center Reference Guide for where to send the test materials.

The Okidata Service Center Reference Guide is sent to your dealership along with the Okidata Service Contract materials. It is available from Okidata Dealer Service. It is also available through Okilink II.

## MISSING ITEMS OR MISSING PAGES

Missing Items

When you receive the training kit, you *MUST* verify that the kit contains the items listed on the Read Me First sheet.

If any items are missing, please contact Okidata Logistics at the appropriate number listed below.

Facsimile 1-609-424-7423

Voice 1-800-727-8654

You must provide the following information.

- Okidata Authorization Number (Dealer Number)
- Okidata Customer Number
- Order Acknowledgment Number (on the invoice)
- Part Number of kit

**Missing Pages**

If you find that *pages* are missing from any item in this kit, please contact Okidata Technical Training.

Please FAX your request or use Okilink II.

Fax Number: (609) 235-2600, ext. 7034

Okilink Login Name: Technical Training

You must provide the following information.

- Okidata Authorization Number (Dealer Number)
- Part Number of document with missing pages
- Name of document with missing pages
- Page numbers of missing pages

  If it is the Service Handbook, be sure to specify the section (i, 1, 2, 3, 4, a, or b).
- Your facsimile number (with area code)

## COURSE PATH

This Course Administration directs you through the training package. Each section covers a different part of the training. Tasks within each section direct you to the portions of the training materials that cover the subject you are studying.

When you have completed one section, move on to the next. You must achieve a score of 80% or greater on your Certification Test to successfully complete this course.

You must return your completed Certification Test Answer Sheet and Course Critique to Okidata within 30 days after the kit is received by your Dealership. If multiple technicians are training at your Dealership, only one technician must complete the testing during the 30 days.

DO NOT STAPLE THE ANSWER SHEET TO THE COURSE CRITIQUE!

Be sure to make a copy of the Answer Sheet for your records.

Your Answer Sheet will be corrected within two days after it is received by Okidata. If you achieve a score of 80% or higher, you will receive a Certificate of Training. The Dealership you work for will become an Authorized Service Center for the products covered in this training package.

Service Authorization is approved once Okidata processes the Answer Sheet. The Certificate of Training will be mailed to you after the Answer Sheet is corrected.

You and your Dealership are responsible for returning the Answer Sheet and Course Critique within 30 days after receiving the training kit. Okidata strongly urges you to keep track of the date you return your Answer Sheet and Course Critique. Certification and Authorization are processed within two days after Okidata receives the testing materials. A certificate for successful completion of the training program will be sent to you within 21 days. If authorization is not updated within two days or a certificate received within 21 days, contact Okidata Dealer Service.

Proceed through each section and perform the assigned tasks.

***Learn from the Course and Good Luck!***

## SERVICE TRAINING

**Requirements**

You will need the following items.

- Service Center Reference Guide
- Service Handbook
- User's Documentation
- Service Videotape
- Video Cassette Player and Monitor

Service Training is divided into the following six sections.

- General Description
- Installation
- Principles of Operation
- Failure Analysis
- Appendices
- Maintenance
    - Disassembly/Assembly
    - Adjustments and Service Checks
    - Cleaning
    - Lubrication
    - Shipping Instructions

**General Description**

This section describes the features and specifications of the printers.

*Assigned Tasks*

- ☐ Read Section 1 of the Service Handbook.
- ☐ Read Appendix A in the Printer Handbook.

**Installation**

In this section, you will install the unit. You will also perform various tests.

*Assigned Tasks*

- ☐ Review the Printer Handbook
- ☐ Read the Introduction; Chapters 1, 2, 3, 4, and 5; and Appendices B, C, D, E, and F in the Printer Handbook.
- ☐ If a product is available, perform the tests listed below. Refer to Section 4 of the Service Handbook.

  Rolling ASCII

  Font Test

**Principles of Operation**

This section describes the function of the major assemblies from an electrical and mechanical perspective.

*Assigned Tasks*

- ☐ Read Section 2 of the Service Handbook.

**Failure Analysis**

This section covers the methods used to identify and correct problems with the unit.

*Assigned Tasks*

- ☐ Read Section 4 of the Service Handbook.
- ☐ Read Chapter 6 of the Printer Handbook.
- ☐ Study the Board Diagrams in Appendix A of the Service Handbook.
- ☐ Check Okilink II for additional troubleshooting information. Refer to the Service Center Reference Guide for information on accessing Okilink II.

**Appendices A and B**

Appendices A and B contain charts, illustrations, and an illustrated parts list to support you in servicing the product.

Appendix A

Appendix A contains information about the printed circuit boards (PCBs). This appendix includes reference charts which present data regarding function, firmware, fuses, jumpers, sensors, switches, and test points. An illustration of each board is also included.

Appendix B

Appendix B is an illustrated parts listing of the product. This listing is cross-referenced to Section 3 of the Service Handbook.

*Assigned Tasks*

- ☐ Look through Appendix A and Appendix B in the Service Handbook.

**Maintenance**

**Disassembly / Assembly**

*Assigned Tasks*

- ☐ Read Section 3.2 of the Service Handbook.
- ☐ View the videotape.

**CAUTION:**

*Okidata does not recommend performing the disassembly / assembly procedures on a product which is operating normally. Therefore, you are not required to perform the disassembly / assembly procedures to complete this training.*

**Adjustments and Service Checks**

This section explains the adjustments performed after parts replacement. Hardware replacement may require adjustments to firmware settings. This section also explains viewing and resetting counters.

*Assigned Tasks*

- ☐ Read Section 3.3 of the Service Handbook.
- ☐ Perform the procedures listed in Section 3.3 of the Service Handbook.

**Cleaning**

*Assigned Tasks*

- ☐ Read Section 3.4 of the Service Handbook.

**Lubrication**

*Assigned Tasks*

- ☐ Read Section 3.5 of the Service Handbook.

**Shipping Instructions**

*Assigned Tasks*

- ☐ Read Section 3.6 of the Service Handbook.

## SERVICE AUTHORIZATION

### General Information

Read through the instructions for completing the testing process before you begin.

This section contains the Answer Sheet, Certification Test, and Course Critique for this service training package. These are the only copies of these items you will receive.

DO NOT WRITE ON THESE ITEMS!

PHOTOCOPY EACH ITEM!

Use the photocopies to complete the testing process. Photocopy the Certification Test, Answer Sheet, and Course Critique as required for each technician being trained.

The information provided on the Answer Sheet and Course Critique is used to update your Dealership's Okidata Service Warranty Profile and to process your Certificate of Training. The critique information is used to respond to your questions regarding this training package.

MAKE YOUR RESPONSES COMPLETE AND LEGIBLE!

Feel free to reference the training material as you answer the test questions.

Every attempt has been made to test your knowledge of the product and your ability to use the reference materials in this kit. No attempt has been made to write "trick questions".

If you have a question about a specific test question or answer, please bring it to the attention of Okidata Technical Training. Refer to the Service Center Reference Guide for information on contacting Okidata Technical Training.

In order to improve the quality of future training courses, Okidata welcomes your evaluation of this training program. Please complete the course critique for this training course.

Before returning your completed testing materials, photocopy your completed Answer Sheet for your records.

DO NOT ATTACH ANYTHING TO THE ANSWER SHEET!

**Certification Test**

**Requirements**

You must achieve a score of 80% or greater on your Certification Test to successfully complete this course.

You will need the following items.

Service Handbook

User's Documentation

#2 Lead Pencil

*Assigned Tasks*

- ☐ Read through all instructions *BEFORE* completing the testing process.
- ☐ Photocopy the Certification Test and Answer Sheet provided in this kit. Use the photocopies to complete the testing process.
- ☐ Complete the top section of the Answer Sheet. Make your responses legible.
- ☐ Answer the Certification Test Questions by filling in the appropriate block on the Answer Sheet. Use a Number 2 pencil and completely fill in the selected block.

  DO NOT ATTACH ANYTHING TO THE ANSWER SHEET!
- ☐ Make a copy of the completed Answer Sheet for your records.

**Course Critique**

**Requirements**

You will need the following items.

Your photocopy of the Course Critique

*Assigned Tasks*

- ☐ Complete the Course Critique.
- ☐ Return the Answer Sheet and Course Critique to Okidata Dealer Service.

  DO NOT ATTACH ANYTHING TO THE ANSWER SHEET!

**DATE ITEMS RETURNED TO OKIDATA: _____**

**Answer Sheet: Microline 520/521**

Section 1

Dealer Code: _____ Today's Date: _____

Technician's Name: _____

Company: _____

Company's Address: _____

_____

City: _____

State/Province: _____

Zip/Postal Code: _____

Country: _____

Phone #: _____ Fax #: _____

If your Dealership uses Okilink II, please provide your Dealership's Login Name.

First: _____ Last: _____

Section 2

| | A | B | C | D | | A | B | C | D |
|---|---|---|---|---|---|---|---|---|---|
| 1. | ☐ | ☐ | ☐ | ☐ | 11. | ☐ | ☐ | ☐ | ☐ |
| 2. | ☐ | ☐ | ☐ | ☐ | 12. | ☐ | ☐ | ☐ | ☐ |
| 3. | ☐ | ☐ | ☐ | ☐ | 13. | ☐ | ☐ | ☐ | ☐ |
| 4. | ☐ | ☐ | ☐ | ☐ | 14. | ☐ | ☐ | ☐ | ☐ |
| 5. | ☐ | ☐ | ☐ | ☐ | 15. | ☐ | ☐ | ☐ | ☐ |
| 6. | ☐ | ☐ | ☐ | ☐ | 16. | ☐ | ☐ | ☐ | ☐ |
| 7. | ☐ | ☐ | ☐ | ☐ | 17. | ☐ | ☐ | ☐ | ☐ |
| 8. | ☐ | ☐ | ☐ | ☐ | 18. | ☐ | ☐ | ☐ | ☐ |
| 9. | ☐ | ☐ | ☐ | ☐ | 19. | ☐ | ☐ | ☐ | ☐ |
| 10. | ☐ | ☐ | ☐ | ☐ | 20. | ☐ | ☐ | ☐ | ☐ |

**Course Critique: Microline 520/521**

Dealer Code: _____ Today's Date: _____

Technician's Name: _____

Company: _____

Company's Address: _____

_____

City: _____

State/Province: _____

Zip/Postal Code: _____

Country: _____

Phone #: _____ Fax #: _____

1. Have you completed other Okidata Self-Study Service Training packages?

   Yes _____ No _____

2. Please rate this course.

   Excellent _____ Below Average _____
   Above Average _____ Poor _____
   Average _____

3. Does your Dealership use Okilink II?

   Yes _____ No _____

   If yes, please provide your Dealership's Login Name.

   First Name: _____

   Last Name: _____

4. Comments

**Certification Test: Microline 520/521**

1. After installing the space motor, Okidata recommends that you check the printhead gap.

   A. True

   B. False

2. Refer to RAP 01. You have pressed the AC power switch to ON, but the unit does not power ON. The next step is to

   A. replace the fuse.

   B. check if the AC cable is connected properly.

   C. replace the space motor assembly.

   D. remove the printhead.

3. The + 40 vdc needed for the printhead and space motor drive can be verified at _____ on the main control (FJIM) board.

   A. CN1 Pins 8 and 9

   B. CN3 Pins 1 and 2

   C. CN7 Pins 29 and 31

   D. CN6 Pins 1 and 2

4. According to Appendix A of the Service Handbook, one function of the main control board is to regulate the AC voltages from the power supply (transformer).

   A. True

   B. False

5. You are using RAP 11 to troubleshoot a printer. The unit cannot receive serial communication from the host. You have verified that the cable has the proper configuration of pins. No ALARM LEDs are blinking. Your next step should be to

   A. replace the transformer.

   B. replace the RS 232-C serial board.

   C. check your serial interface parameters.

   D. replace the main control board (FJIM).

6. The printer is processing a head overheat alarm. When the printhead temperature exceeds 110 degrees Celsius, the printer switches to unidirectional print. When the printhead temperature exceeds 118 degrees Celsius, the printer will

   A. need a new space motor.

   B. continue unidirectional print.

   C. alternate between unidirectional print and bidirectional print.

   D. stop printing.

7. Before you begin troubleshooting an ALARM / LED display, you should always

   A. replace the power supply.

   B. check that all of the connectors of the printer are making good contact.

   C. replace the main control board.

   D. replace the operator panel.

8. According to the Printer Handbook or Section Three of this Service Handbook, which of the following settings is *NOT* a default menu setting of the serial interface configuration?

   A. Parity - Even

   B. Serial Data - 8 bits

   C. Protocol - Ready/Busy

   D. Baud Rate - 9600 bps

9. The ALARM lamp is flashing. The PROP and 10 cpi lamps are lit. Which alarm is the printer experiencing?

   A. Printhead Data Transfer Alarm

   B. Printhead Type Alarm

   C. Paper End Alarm

   D. Space Motor Alarm

10. You install a new control board in the printer. What are the indications of an incorrectly positioned cut sheet / continuous sensor lever?

    A. The unit will not power-ON.

    B. All lamps on the operator panel light.

    C. The ALARM lamp lights and F1 on the control board blows.

    D. The ALARM lamp lights and the unit will NOT automatically load paper.

11. What is the recommended ambient temperature and relative humidity (RH) for the printer while operating?

    A. 41°F to 104°F, 20% to 80% (RH)

    B. 41°F to 104°F, 10% to 70% (RH)

    C. 41°F to 104°F, 20% to 50% (RH)

    D. 41°F to 104°F, 20% to 90% (RH)

12. The Microline 520 and Microline 521 printers allow you to print up to eight different bar codes.

    A. True

    B. False

13. The Microline 520 and Microline 521 printers come with _____ Kbyte of resident RAM.

A. 32

B. 64

C. 128

D. 256

14. Refer to RAP 02. The carriage is jammed. The ribbon is not jammed. What do you do next?

A. Install a new space motor.

B. Power OFF the printer, then power ON.

C. Remove the space motor assembly and inspect the teeth on the space rack and space motor gear.

D. Replace fuse F1 on the main controller board.

15. You must replace the line feed motor. The disassembly procedure also tells you to remove the line feed idle gear.

A. True

B. False

16. Three items factor into printhead gap information.

1. Printhead Gap Adjustment (performed by a service technician)
2. Printhead Gap Adjust (set in the printer menu, under the Set-up Group)
3. Gap Control (set in the printer menu, under each [Paper Feed] Group)

A. True

B. False

17. Which of the following areas of the printer should *NOT* be lubricated?

1. Tractor pins
2. Pressure roller (Rubber Face)
3. Platen assembly (Rubber Face)
4. Teeth of gears in the gear case assembly

A. 1

B. 1 and 2

C. 1, 2, and 3

D. 1, 2, 3, and 4

18. You are performing the printhead gap adjustment. The printhead gap is changed by turning the adjusting screw, located on the space motor assembly. Turning the adjusting screw counter-clockwise will increase the gap. Turning it clockwise will decrease the gap.

A. True

B. False

19. The ALARM lamp is flashing. The 15 cpi LED is lit. Which of the following should be replaced *first*?

A. Printhead

B. Line feed motor

C. Space motor

D. Main control board and / or ROM

20. Before resetting a printer menu to factory settings, Okidata recommends that you

A. run a self test.

B. perform the hex dump test.

C. power OFF the printer, then press and hold the LINE FEED while powering ON the printer.

D. print the menu.

# SECTION ONE
# SPECIFICATIONS

## 1.1 OVERVIEW

### 1.1.01 General Information

The Microline 520 and Microline 521 are letter quality, nine-pin, dot-matrix printers which utilize *OKISMART* paper handling. Patented Okidata technology does away with the manual head gap adjustment. The printer actually "reads and learns" the print medium being used, then automatically adjusts the head gap to the optimum distance. This autogapping process leads to longer printhead life.

Options include the Bottom Feed Push Tractor, Cut-Sheet Feeder, Pull Tractor and Serial Interface Board.

The Microline 520 is an 80 column printer.

The Microline 521 is a 132 column printer.

Okidata's one year limited warranty covers the parts, labor and printhead on both printers.

The following items are available for the printer.

*OKISMART Typer* - software which provides the flexibility for the Microline 590/521 to function like a typewriter on checks, labels and envelopes.

*OKISMART Panel* - a utility program that lets you control selected printer functions from your personal computer.

Scalable Fonts - 14 scalable fonts, available on diskette.

*NOTE:*

*The OkiSmart software includes three programs.*

1. *OkiSmart Control*
2. *OkiSmart Panel Emulator*
3. *OkiSmart Setup*

*Refer to the Printer Handbook for more information.*

## 1.2 PHYSICAL SPECIFICATIONS

### 1.2.01 Dimensions

*NOTE:*

*Dimensions INCLUDE the platen knob, acoustic cover, and paper separator.*

Microline 520

Width: 16.9 inches (43 centimeters)

Depth: 14.9 inches (37.8 centimeters)

Height: 6.5 inches (16.5 centimeters)

Microline 521

Width: 23 inches (58.4 centimeters)

Depth: 14.9 inches (37.8 centimeters)

Height: 6.5 inches (16.5 centimeters)

### 1.2.02 Printer Weight

Microline 520

17.6 pounds (8.0 kilograms)

Microline 521

23.1 pounds (10.5 kilograms)

## 1.3 POWER REQUIREMENTS

### 1.3.01 Input Power

120 VAC: +5.5 / -15%

230/240 VAC: +10 / -14%

### 1.3.02 Power Consumption

Operating: 110 VA

Idle: 40 VA

Local Test: 70 VA

### 1.3.03 Power Frequency

120 VAC: 60 Hz +/- 2%

230/240 VAC: 50/60 Hz +/- 2%

## 1.4 ENVIRONMENTAL CONDITIONS

### 1.4.01 Acoustic Rating

Near Letter Quality Mode

Microline 520 54.9 dBA

Microline 521 54.4 dBA

Utility Mode

Microline 520 57.2 dBA

Microline 521 56.9 dBA

Quiet Mode

Microline 520 52.5 dBA

Microline 521 52.3 dBA

### 1.4.01 Altitude

10,000 feet (3,050 meters)

### 1.4.03 Ambient Temperature and Relative Humidity (RH)

While operating: 41 to 104 degrees Fahrenheit (5 to 40 degrees Celsius)

Operating humidity: 20% to 80% RH

While in storage: 14 to 122 degrees Fahrenheit ( - 10 to 50 degrees Celsius)

Storage humidity: 5% to 95% RH

## 1.5 AGENCY APPROVALS

### 1.5.01 Listings

| | |
|---|---|
| UL No: | UL Standard No. 1950 D3 |
| CSA No: | CSA Standard 22.2-950 D3 |
| FCC: | FCC Certified per Part 15, Subject J, Class B |
| IEC: | IEC 950 |
| VDE: | VDE 0805 VDE 0875 Class B |
| BS: | BS 7002 |

## 1.6 OPERATIONAL SPECIFICATIONS

### 1.6.01 Character Matrix Sizes

**Table of Print Speed and Character Matrix**

| Mode | Near Letter Quality | Utility | High Speed Draft |
|---|---|---|---|
| **Speed** | 80 (12 cpi) | 320 (12 cpi) | 427 (12 cpi) |
| **Matrix (H x V)** | 17 x 13 | 9 x 7 | 7 x 7 |

### 1.6.02 Characters Per Line

**Microline 520**

| Characters Per Line | Characters Per Inch |
|---|---|
| 80 | 10 |
| 96 | 12 |
| 120 | 15 |
| 137 | 17.1 |
| 160 | 20 |

**Microline 521**

| Characters Per Line | Characters Per Inch |
|---|---|
| 136 | 10 |
| 163 | 12 |
| 204 | 15 |
| 233 | 17.1 |
| 272 | 20 |

### 1.6.03 Character Pitches

5, 6, 8.5, 10, 12, 15, 17.1, 20

### 1.6.04 Character Sets

Standard ASCII

EPSON Character Set I & II

IBM Character Set I, II & All Characters

Foreign Character Substitution

International Character Sets

Code Page 850, 860, 863, 865 and 437

Line Graphics

Bar Code

- Code 39
- UPC A
- UPC E
- EAN 8
- EAN 13
- Interleaved 2 of 5
- Code 128 (A, B, C)
- Postnet

### 1.6.05 Emulations

*NOTE:*

*The emulations are co-resident*

Epson FX

IBM Proprinter

Microline Standard

### 1.6.06 Fonts

**Near Letter Quality**

Courier

**Utility**

Gothic

**High Speed Draft**

Gothic

**Bar Code**

Code 39
UPC A
UPC E
EAN 8
EAN 13
Interleaved 2 of 5
Code 128 (A, B, C)
Postnet

### 1.6.07 Front Panel Switches

| | |
|---|---|
| SELECT / Menu | Micro Feed Up / Down |
| Shift | Paper Park |
| Line Feed | Pitch Selection |
| FORM FEED / Load | Print Quality Selection |
| Top of Form | Tear |
| Quiet | Reset |

### 1.6.08 Graphics Resolution

Graphics Resolution: 288 (horizontal) x 144 (vertical) dots per inch (DPI) maximum

### 1.6.09 Interface

**Standard**

Centronics Parallel

**Optional**

RS232C Serial

### 1.6.10 Line Feed Increments

**Fixed**

6 lines per inch (lpi) [0.167 inch (4.23 millimeters)]

8 lines per inch (lpi) [0.125 inch (3.175 millimeters)]

**Variable**

n/60 inch

n/72 inch

n/144 inch

n/216 inch

### 1.6.11 Line Feed Time

65 milliseconds 6 lines per inch (lpi)

6 milliseconds 8 lines per inch (lpi)

1 second 5.0 inches (Continuous paper feed rate)

### 1.6.12 Menu Mode

| Switch | Action |
|---|---|
| Paper Park | Prints the entire menu. |
| Line Feed / Reverse | Selects Group Function |
| FORM FEED / Load | Selects Item |
| Tear | Selects Item Value |
| SEL / Menu | Exits Menu Mode, Enters Select |

### 1.6.13 Paper Feed Methods

**Standard**

Friction Feed (Top)

Rear Push Tractor (Rear)

**Optional**

Pull Tractor (Bottom)

Bottom Push Tractor Feed (Bottom)

Single-Bin Cut Sheet Feeder (Top)

CSF 5000 - Narrow

CSF 5001 - Wide

### 1.6.14 Paper Feed Paths

Top Feed (Standard)

Rear Feed (Standard)

Bottom Feed (by using an Optional feed mechanism)

Special Features

Paper Park

Automatic Paper Loading

Forms Tear Off

### 1.6.15 Paper Loading

Auto Loading (Top Feed)

Press FORM FEED / Load switch to feed paper to default position

### 1.6.16 Paper Out Detection

Distance from end of paper

| | |
|---|---|
| Rear Feed: | 0.5 inches (12.7 mm) |
| Bottom Feed: | 0.5 inches (12.7 mm) |
| Top Feed: | 0.5 inches (12.7 mm) |

### 1.6.17 Paper Tear Capabilities

Forms Tear-0ff (sharp edge on access cover)

Metal Tear Bar (with optional bottom feed tractor unit)

### 1.6.18 Print Method

#### Printhead Type

#### General Information

Impact: Dot Matrix

9 pin printhead

.0134 inch (0.34 millimeter) diameter pins

#### Overheat Protection

When printhead temperature exceeds 110 degrees Celsius, the printer stops bi-directional printing. Uni-directional printing begins.

If the temperature exceeds 118 degrees Celsius, printing stops.

Printing will resume when the printhead temperature drops below 118 degrees Celsius.

*NOTE:*

*Refer to Section Two for more information on printhead operation.*

### Printhead Gap Information

Three items factor into printhead gap information.

1. Printhead Gap Adjustment

   This is a SERVICE ADJUSTMENT made by a technician.

   It is covered in Section 3.3 of this Service Handbook.

   The Adjustment measures 0.014, +/- 0.001 inches (0.35, +/- 0.03 mm).

2. Printhead Gap Adjust

   This is a MENU ITEM in the SET-UP Group.

   It fine tunes the automatic setting of the printhead gap.

   The settings are 0, 1, and -1.

   0 is the factory default.

   Use 1 to *darken* print (if output is *consistently light*).

   Use - 1 to *lighten* print (if output is *consistently dark*).

3. Gap Control

   This is a MENU ITEM in *each* [Paper Feed] Group.

   The Groups are REAR FEED, BOTTOM FEED, and TOP FEED.

   Gap Control determines how the printhead gap is set.

   The settings are listed below.

   Auto Gap, Semi Auto Gap, 1, 2, 3, 4, 5, 6, 7, 8, 9

   An explanation of each setting follows.

Auto Gap

This is the factory default.

Automatically determines paper thickness of the first page.

During single-sheet feed, each page's thickness is checked *while* a job is printing.

Semi Auto Gap

Similar to Auto Gap.

Automatically determines paper thickness of the first page.

During single-sheet feed, each page's thickness IS NOT checked "while" a job is printing.

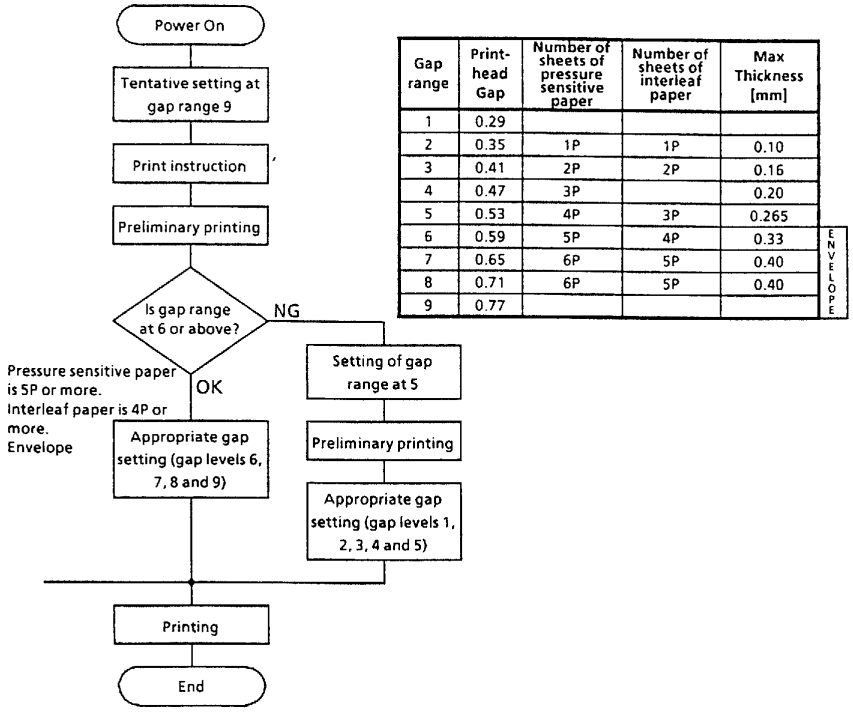
1, 2, 3, 4, 5, 6, 7, 8, 9

Used when the same paper is used ALL of the time.

Bypasses the automatic head gap adjustment.

1 is the narrowest gap setting.

9 is the widest gap setting.




| Gap range | Print-head Gap | Number of sheets of pressure sensitive paper | Number of sheets of interleaf paper | Max Thickness [mm] | |
|---|---|---|---|---|---|
| 1 | 0.29 | | | | |
| 2 | 0.35 | 1P | 1P | 0.10 | |
| 3 | 0.41 | 2P | 2P | 0.16 | |
| 4 | 0.47 | 3P | | 0.20 | |
| 5 | 0.53 | 4P | 3P | 0.265 | |
| 6 | 0.59 | 5P | 4P | 0.33 | ENVELOPE |
| 7 | 0.65 | 6P | 5P | 0.40 | |
| 8 | 0.71 | 6P | 5P | 0.40 | |
| 9 | 0.77 | | | | |

1-7-01.tif

### 1.6.19 Print Modes

Near Letter Quality

Utility

High Speed Draft

### 1.6.20 Print Speed

**Table of Print Speed and Character Matrix**

| Mode | Near Letter Quality | Utility | High Speed Draft |
|---|---|---|---|
| **Speed** | 80 (12 cpi) | 320 (12 cpi) | 427 (12 cpi) |
| **Matrix (H x V)** | 17 x 13 | 9 x 7 | 7 x 7 |

## 1.7 PAPER SPECIFICATIONS

**CAUTION:**

*Use Bottom Feed and/or optional Pull Tractor for card stock and labels.*

### 1.7.01 Types

#### Card Stock

| | | |
|---|---|---|
| Weight: | 120 lbs. (450 g/m$^2$) | Maximum |
| Width: | Microline 520 | 5 to 8 inches (12.7 to 20.3 centimeters) |
| | Microline 521 | 5 to 14 inches (12.7 to 35.6 centimeters) |
| Length: | 3 to 17 inches (7.62 to 43.18 centimeters) | |
| Thickness: | .017 inches (0.44 millimeters) | |
| Paper Feed Path: | Bottom | |
| Printhead Gap Information: | Refer to the Printhead Gap Information, Section 1.6 | |

#### Continuous Form

| | | |
|---|---|---|
| Weight: | | |
| Single Part | 12 - 24 lb. (45 to 90 g/m$^2$) | |
| Multi-Part, Carbonless | 9 - 11 lb. (35 to 40 g/m$^2$) | |
| Multi-Part, Interleaf | | |
| Paper | 10 - 12 lb. (38 to 45 g/m$^2$) | |
| Carbon | 9 lb. (35 g/m$^2$) | |
| Width: | Microline 520 | 3.5 to 10.5 inches (8.8 to 26.6 centimeters) |
| | Microline 521 | 3.5 to 16.5 inches (8.8 to 41.9 centimeters) |
| Length: | 3 to 17 inches (7.62 to 43.18 centimeters) | |
| Thickness: | 0.014 inches (0.36 millimeters) | Rear Feed |
| | 0.017 inches (0.44 millimeters) | Bottom Feed |
| Paper Feed Path: | Rear or Bottom | |
| Printhead Gap Information: | Refer to the Printhead Gap Information, Section 1.6 | |

**Cut Sheet**

| | | |
|---|---|---|
| Weight: | 12 to 24 lbs. (45 to 90 $g/m^2$) | |
| Width: | 7.2 to 14.3 inches (18.3 to 36.3 centimeters) | |
| Width: | Microline 520 | 7.2 to 8.5 inches (18.2 to 21.5 centimeters) |
| | Microline 521 | 7.2 to 14.3 inches (18.2 to 36.3 centimeters) |
| Length: | 3 to 17 inches (7.62 to 43.18 centimeters) | |
| Thickness: | 0.014 inches (0.325 millimeters) | Maximum |
| Paper Feed Path: | Top | |
| Printhead Gap Information: | Refer to the Printhead Gap Information, Section 1.6. | |

**Envelopes**

| | | |
|---|---|---|
| Weight: | 24 lbs. (90 $g/m^2$) | Maximum |
| Size: | | |
| Single Feed | | |
| Minimum: | 6.5 x 3.6 inches (16.5 x 9.1 centimeters) | |
| Maximum: | 9.5 x 4.1 inches (24.1 x 10.4 centimeters) | |
| Continuous | | |
| Non-overlap type | | |
| Thickness: | .014 inches (.325 millimeters) | Maximum |
| Paper Feed Path: | Bottom | |
| Printhead Gap Information: | Refer to the Printhead Gap Information, Section 1.6. | |

### Labels

| | | |
|---|---|---|
| Weight: | N/A | |
| Width: | Microline 520 | 3.5 to 10.5 inches (8.8 to 26.6 centimeters) |
| | Microline 521 | 3.5 to 16.5 inches (8.8 to 41.9 centimeters) |
| Length: | 3 to 17 inches (7.62 to 43.18 centimeters) | |
| Thickness: | .011 inches (0.28 mm) | Maximum (including backing) |
| Paper Feed Path: | Bottom | |
| Printhead Gap Information: | Refer to the Printhead Gap Information, Section 1.6. | |

**CAUTION:**

*Use Bottom Feed and/or optional Pull Tractor for card stock and labels.*

### Transparency

*NOTE:*

*Roller marks may mar the transparency under high temperature / high humidity conditions.*

| | | |
|---|---|---|
| Weight: | 12 to 24 lbs. (45 to 90 $g/m^2$) | |
| Width: | Microline 520 | 7.2 to 8.5 inches (18.2 to 21.5 centimeters) |
| | Microline 521 | 7.2 to 14.3 inches (18.2 to 36.3 centimeters) |
| Length: | 3 to 17 inches (7.62 to 43.18 centimeters) | |
| Thickness: | 0.14 inches (0.36 millimeters) | |
| Paper Feed Path: | Top | |
| Printhead Gap Information: | Refer to the Printhead Gap Information, Section 1.6. | |

### 1.7.02 Length

*NOTE:*

*The recommended length is specific to paper type.*

Rear Feed

| | |
|---|---|
| Minimum | 3 inches (7.62 centimeters) |
| Maximum | 17 inches (43.18 centimeters) |

Bottom Feed

| | |
|---|---|
| Minimum | 3 inches (7.62 centimeters) |
| Maximum | 17 inches (43.18 centimeters) |

Top Feed

| | |
|---|---|
| Minimum | 3 inches (7.62 centimeters) |
| Maximum | 17 inches (43.18 centimeters) |

### 1.7.03 Number of Copies

Original + 4 Interleaf

Original + 4 Carbonless

Original Cut Sheet

### 1.7.04 Thickness

0.014 inches / 0.36 mm Maximum Thickness, Rear Feed

0.017 inches / 0.44 mm Maximum Thickness, Bottom Feed

### 1.7.05 Weight

*NOTE:*

*The recommended weight is specific to paper type.*

Minimum: 9 lb. (35 $g/m^2$)

Maximum: 120 lb. (90 $g/m^2$)

### 1.7.06 Width

*NOTE:*

*The recommended width is specific to paper type.*

**Paper**

Microline 520

Minimum: 3.5 inches ( 8.8 centimeters)

Maximum: 10.5 inches (26.6 centimeters)

Microline 521

Minimum: 3.5 inches ( 8.8 centimeters)

Maximum: 16.5 inches (41.9 centimeters)

**Printing Area**

| | | |
|---|---|---|
| Microline 520 | 8 inches | Maximum |
| Microline 521 | 13.6 inches | Maximum |

## 1.8 MEMORY SPECIFICATIONS

### 1.8.01 EEPROM

1 Kbit serial EEPROM (used to store Menu data)

### 1.8.02 EPROM

1 MBit EPROM (Printer Control Program - Fonts)

### 1.8.03 RAM

128 Kbyte Total Resident RAM

Used as

Receive Buffer

Receive Buffer Size is selected through the Menu.

Settings are: 64 K, 32 K, 1 line

Print Buffer

DLL Buffer

Scratch Pad

## 1.9 CONSUMABLES

### 1.9.01 Ribbon

**CAUTION:**

*Using a non-Okidata ribbon may damage the printhead and void any warranties.*

Material

Nylon fabric, cartridge type, re-inking

Type

Black Ribbon

Life (On average, at 10 characters per inch, Utility Mode)

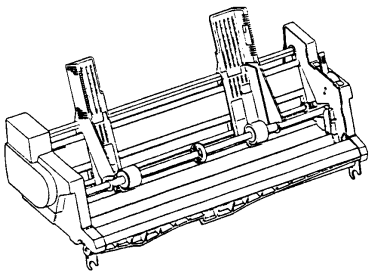
4 million characters

## 1.10 OPTIONS

### 1.10.01 Cut Sheet Feeders

#### Single Bin

The CSF-5000 is a narrow feeder for the Microline 520.



1-1-01.pcx

Single Bin with envelope capability

Paper Width: 7.2" to 8.5" (18.3 cm to 36.3 cm)

Paper Length: 10.1" to 14" (25.6 cm to 35.6 cm)

Capacity: 170 sheets (16 lb.), 100 sheets (20 lb.)

The CSF-5001 is a wide feeder for the Microline 521.

Single Bin with envelope capability

Paper Width: 7.2" to 14.3" (18.3 cm to 36.3 cm)

Paper Length: 10.1" to 14" (25.6 cm to 35.6 cm)

Capacity: 170 sheets (16 lb.), 100 sheets (20 lb.)

#### Dual Bin

P/N 70022601 is a narrow feeder for the Microline 520.

Dual Bin with envelope capability

Paper Width: 7.2" to 8.5" (18.3 cm to 36.3 cm)

Paper Length: 10.1" to 14" (25.6 cm to 35.6 cm)

Capacity: 170 sheets (16 lb.), 100 sheets (20 lb.)

P/N 70022801 is a wide feeder for the Microline 521.

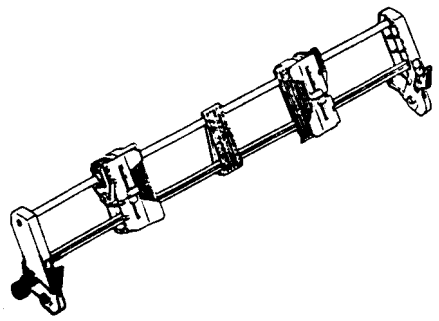
Dual Bin with envelope capability

Paper Width: 7.2" to 14.3" (18.3 cm to 36.3 cm)

Paper Length: 10.1" to 14" (25.6 cm to 35.6 cm)

Capacity: 170 sheets (16 lb.), 100 sheets (20 lb.)

### 1.10.02 Pull Tractor Kit



1-1-02.pcx

*NOTE:*

*The Pull Tractor Kit (P/N 70023001) is a narrow feeder for the Microline 520.*

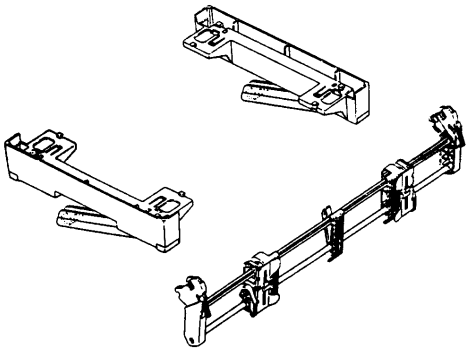
*The Pull Tractor Kit (P/N 70023201) is a wide feeder for the Microline 521.*

Bottom Feed

Rear Feed (For Push/Pull Operation)

Paper Types: Continuous Feed and Labels

### 1.10.04 Bottom Push Tractor Kit



1-1-03.pcx

*NOTE:*

*The Bottom Push Tractor Kit (P/N 70022901) is a narrow feeder for the Microline 520.*

*The Bottom Push Tractor Kit (P/N 70023101) is a wide feeder for the Microline 521.*

Bottom Feed

Paper Type: Continuous Feed

Includes: Stand and Metal Tear Bar

### 1.10.05 Serial Interface

Super-Speed 19.2K RS-232C

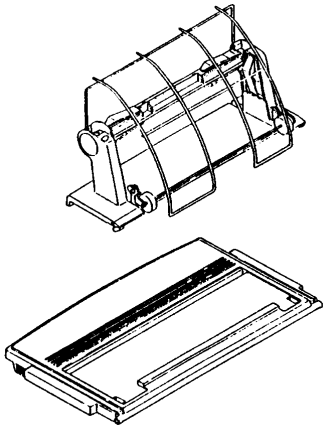
Ready/Busy/X-On/X-Off Protocols

Can be configured through the Menu or OKISmart Utility Program

### 1.10.06 Roll Paper Stand

Adapts printer for use with roll-type paper (Model 520 only)

Includes: Stand, Support, Cord and DIN plug for connection to printer



1-1-05.pcx

### 1.10.08 OKISmart Typer Utility

Obtained via BRC (Business Reply Card) packaged with printer

Includes: Typewriter Mode, Form Creation Utility and Barcode Utility

### 1.10.09 OKISmart Panel Utility

Obtained via BRC (Business Reply Card) packaged with printer

Includes: Front Panel Control Utility and Drivers for Windows 3.0 & 3.1

*NOTE:*

*The OKISmart software includes three programs.*

1. *OKISmart Control*
2. *OKISmart Panel Emulator*
3. *OKISmart Setup*

*Refer to the Printer Handbook for more information.*

## 1.11 RELIABILITY

### 1.11.01 Mean Time Before Failure (MTBF)

Approximately 6,000 hours: 25% duty cycle / 35% page density

### 1.11.02 Mean Time To Repair (MTTR)

Approximately 15 minutes to major sub-assembly level

### 1.11.03 Printer Life

Approximately 16,000 hours of power-on time: 25% duty cycle / 35% page density

### 1.11.04 Printhead Life

Average 200 million characters in 10 cpi utility mode @ normal 25% duty, 35% page density

### 1.11.05 Ribbon Life

Approximately 4 million characters

### 1.11.06 Warranty (Limited)

One year, parts and labor

### 1.11.07 Service

Authorized OKIdata Service Centers

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# SECTION TWO
# PRINCIPLES OF OPERATION

## 2.1 ELECTRICAL OPERATION

The printer is comprised of the electrical components listed below.

- Main Control Board
- Power Supply Assembly
  - Transformer
  - Filter Board
- Operator Panel
- Space Motor / Line Feed Motor
- Printhead

### 2.1.01 Main Control Board

The main control board is made up of the microprocessor, peripheral circuits, drive circuits, sensors and interface connectors.

The power to the main control board is supplied by the transformer assembly through a wire harness. The power to other electrical parts (line feed motor, space motor and printhead) is provided by the power supply circuitry through connectors on the main control board.

Microprocessor (MPU) (Location 04C: 67X640)

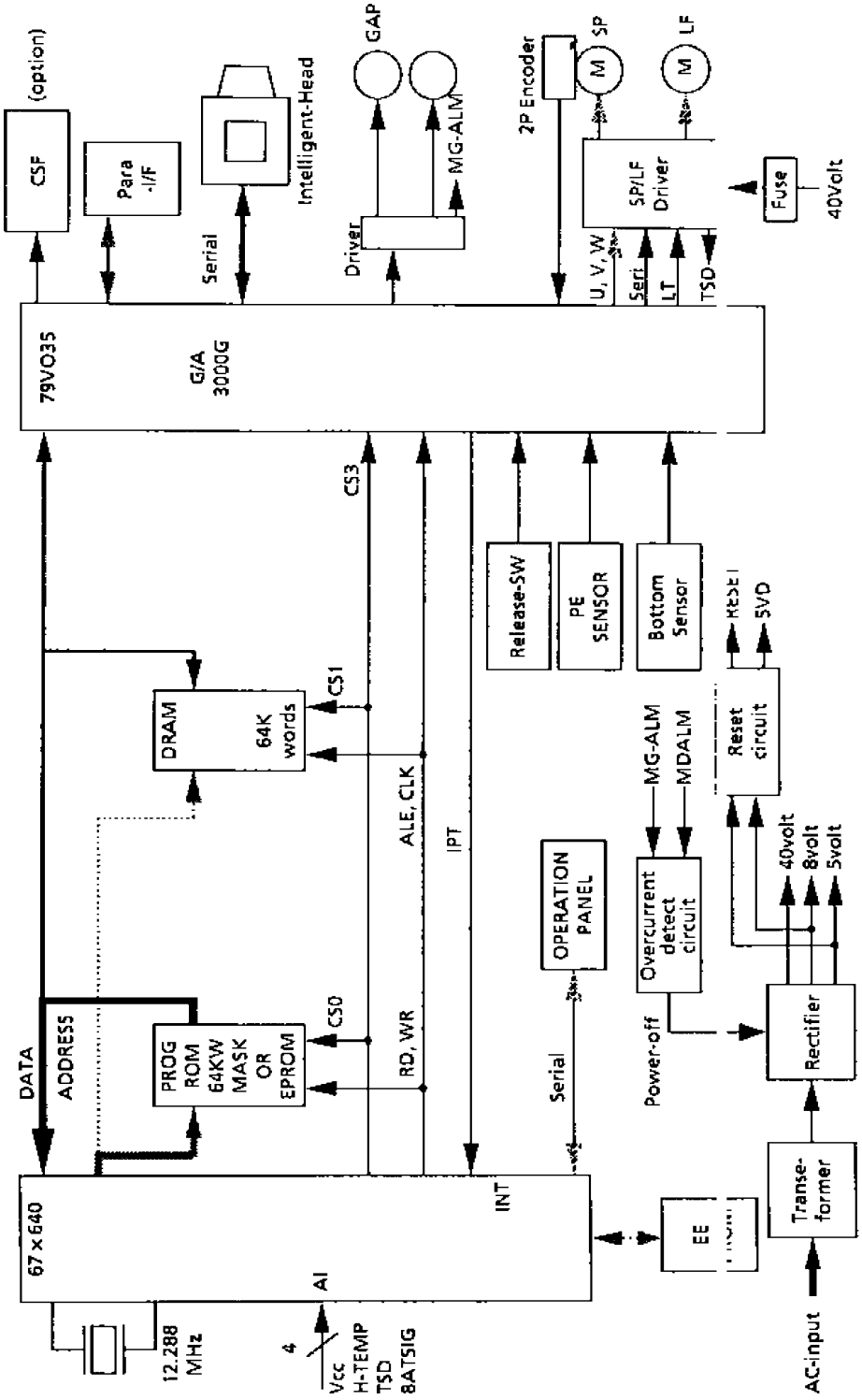
16 bit MPU, using CMOS technology.

The MPU contains a 20 bit address bus, a 16 bit data bus.

The MPU can access 1 Mbyte of program memory and 1 Mbyte of data memory space.

The microprocessor controls the entire printer by executing the control program through the LSIs and the driver circuits.

**Block Diagram**



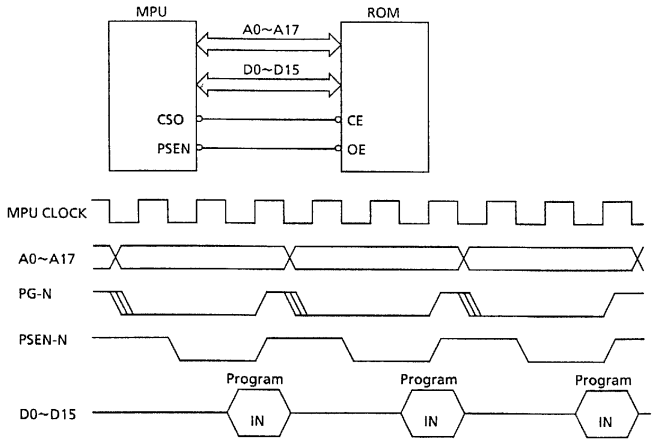

2-1-01a.tif

### Program ROM

Location 05CA: 27C1024

This 64k x 16 bit (1Mbit) EPROM contains the control program for the printer. The MPU executes the instructions contained in this program.

The Program ROM is assigned to the program memory area of the MPU and instructions are fetched by the PSEN signal of the MPU.

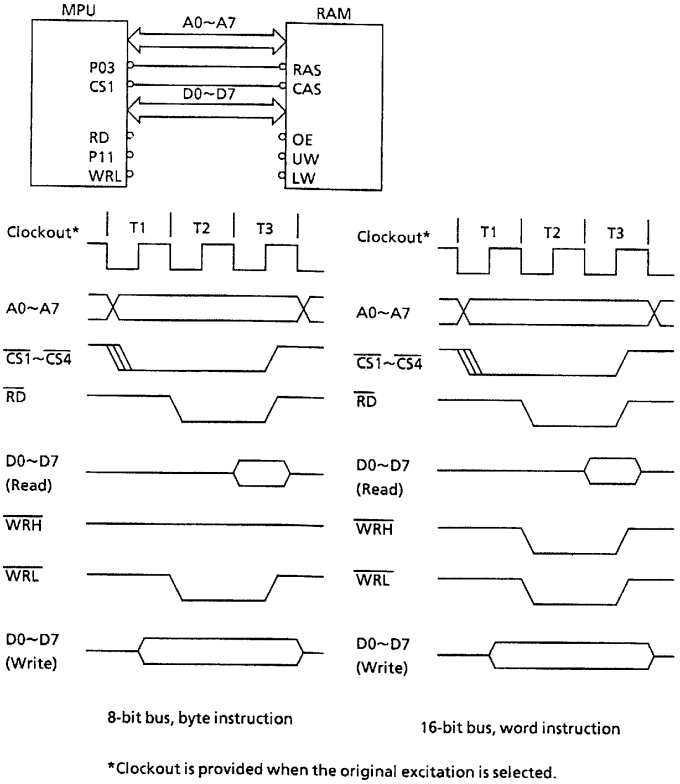



2-1-01b.tif

### RAM

Location 05CB: 511664Z

The RAM is CMOS dynamic RAM with 65,536 words x 16-bit configuration. It is used as a receive buffer, print buffer and work buffer.




2-1-01c.tif

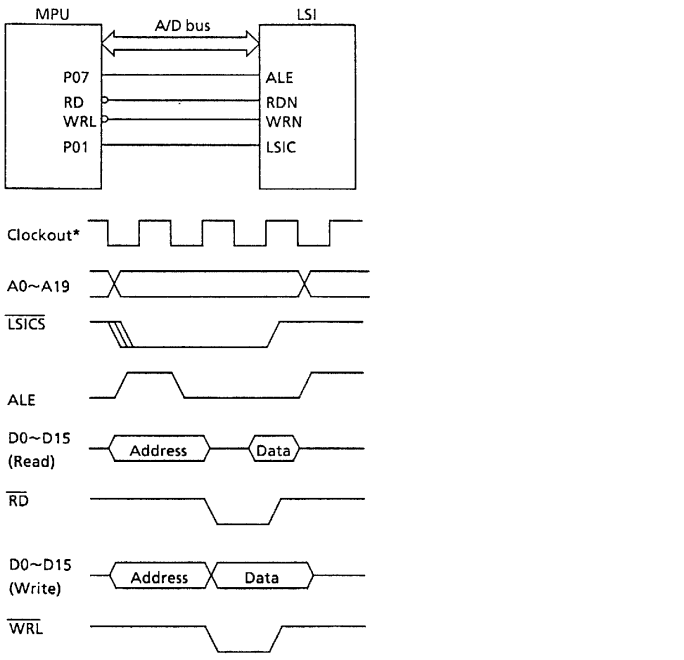
## LSI

Location 04B: MSM79VO35

Detects the output of the two-phase sensor on the DC space motor to control the motor drive phase.

Transmits and receives serial data to and from the printhead based on the dot timing (which is derived from the space motor speed).

Controls the external interface. The LSI is connected to the MPU.




* Clockout is provided when the original excitation is selected.

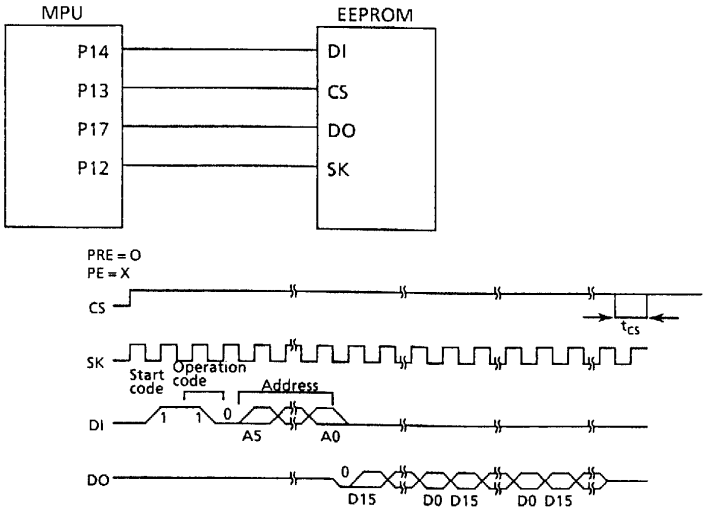
2-1-01e.tif

## Electrically Erasable Programmable Read Only Memory (EEPROM)

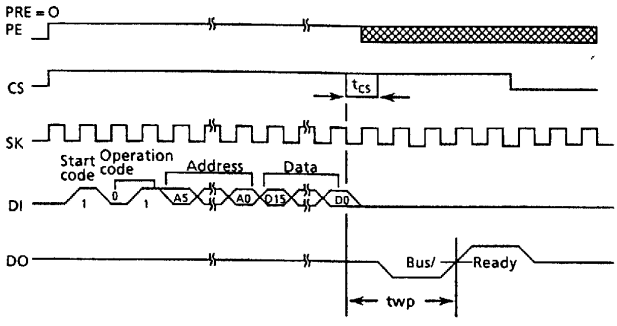
(Location 03C: 93CS46)

The EEPROM is a CMOS serial I/O type memory (EEPROM). It is capable of electrically erasing and writing 1,024 bits.

The EEPROM contains the menu data and the head drive time correction data.




Read cycle timing (READ)




Write cycle timing (WRITE)

2-1-01d.tif

### 2.1.02 Initialization

This printer is initialized when the printer is powered on or when the I-PRIME-N signal is input from the host via the parallel interface.

The steps in Printer Initialization are listed below.

The RST-N signal is output from the reset circuit to reset the MPU and LSIs.

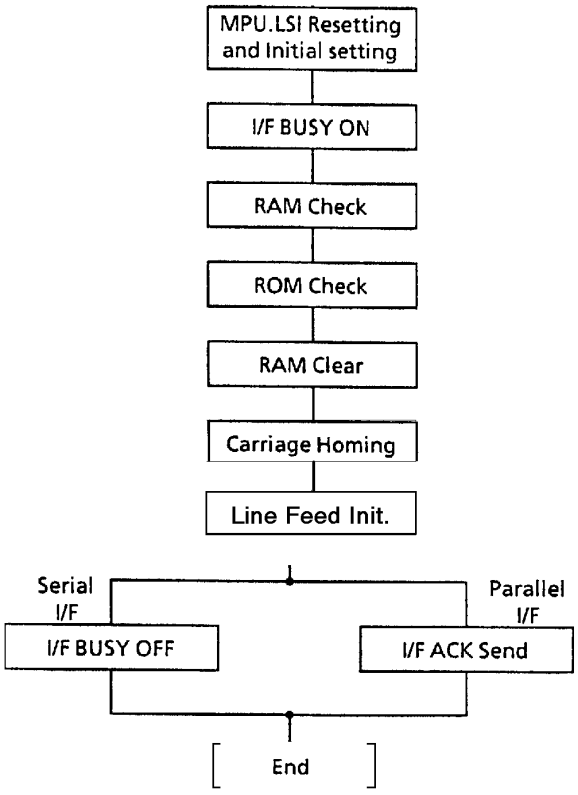
The program is executed and the LSIs are reset by the MPU via IORST-N.

*NOTE:*

*A reset operation initiated by I-PRIME does not reset the MPU.*

The program sets the LSI (02D) mode, checks the memory (ROM/RAM), then executes carriage homing and determines the phase of the line feed motor.

Finally, the program establishes the interface signals (P-I/F: ACK-P signal sending, and S-I/F: BUSY-N signal off) and lights the SELECT lamp to indicate that the printer is in the ON-LINE state.



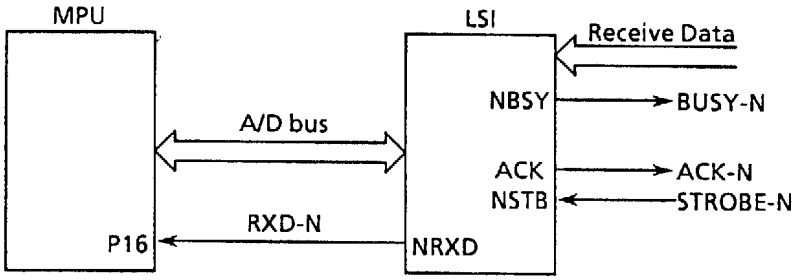

2-1-02.tif

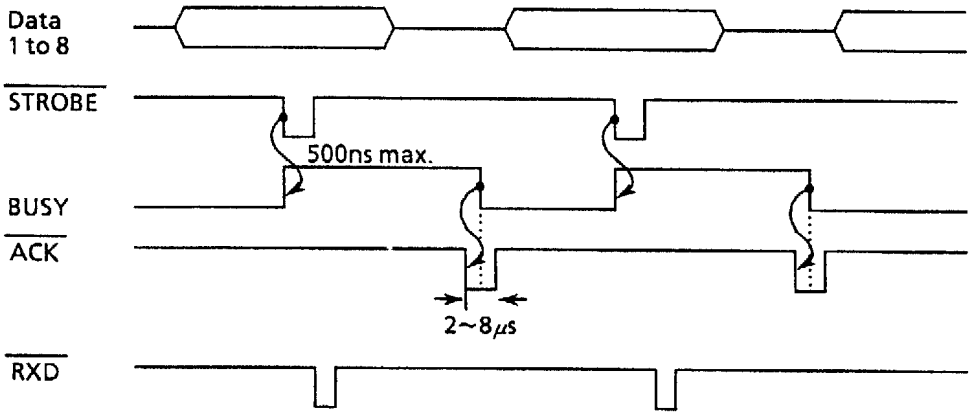
### 2.1.03 Parallel Interface Control

The parallel data input from the host to the interface LSI is latched to the internal register at the falling edge of the STROBE-N signal.

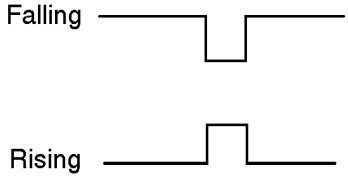
The LSI sets the BUSY-N signal to inform the host that the data is being processed. The LSI also outputs the RXD-N signal to inform the MPU of data reception. The data is read upon receiving the RD-N signal from the MPU.

When the data processing is complete, the BUSY-N signal is disabled and the ACK-N signal is sent to request the next data. When the buffer is full and reception is not desired, the BUSY signal is sent to request data transmission be stopped.




NOTE:




2-1-03b.pcx

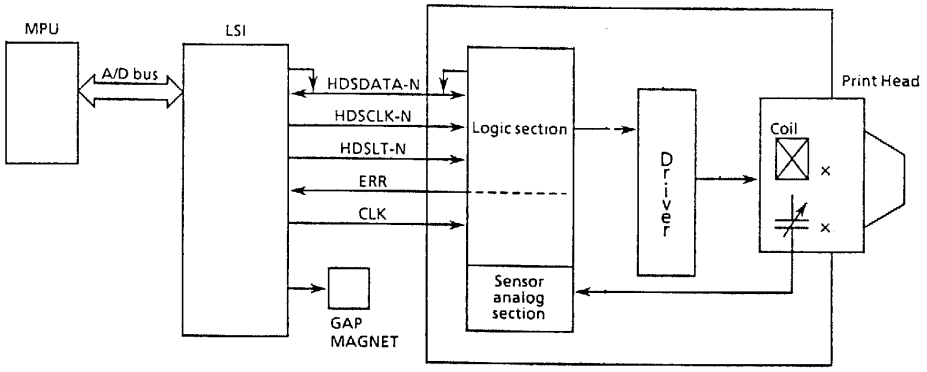
2-1-03a.tif

### 2.1.04 Print Control

The print data is transmitted as serial data from the LSI to the control circuit and the driver contained in the printhead.

After the data is printed, the sensor analog circuit controlling each pin returns the pin stroke data to the MPU. The MPU will make an automatic head gap adjustment. This feedback system sets the optimum drive time for each pin in order to maintain high print quality.

In the case of envelopes, where the medium thickness varies as the printhead moves along the platen, the strike force of the pins changes to compensate for the differences in thickness.

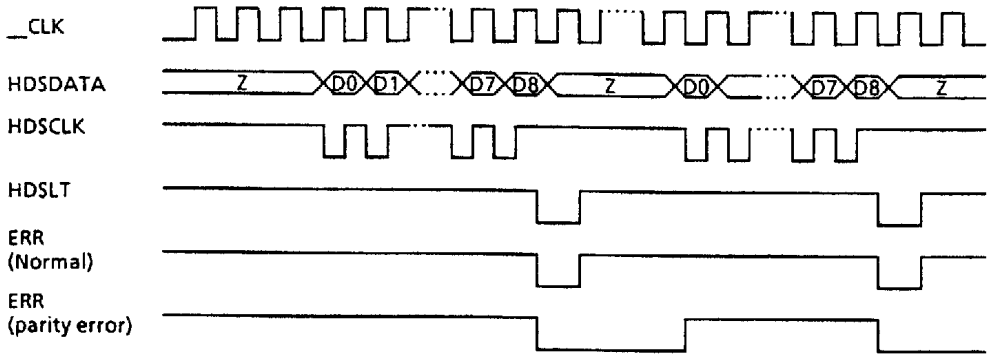



2-1-04a.tif

#### LSI/Printhead Interface

The connection between the LSI and the printhead is made with the bi-directional serial data bus. The LSI transmits the print data as serial data to the logic circuit of the printhead. The printhead returns serial data from the printhead sensor analog circuit to the LSI. This information is used to determine the optimum drive time for the next print request.

The logic circuit of the printhead signals the LSI if a parity error is detected in the print data.




2-1-04b.tif

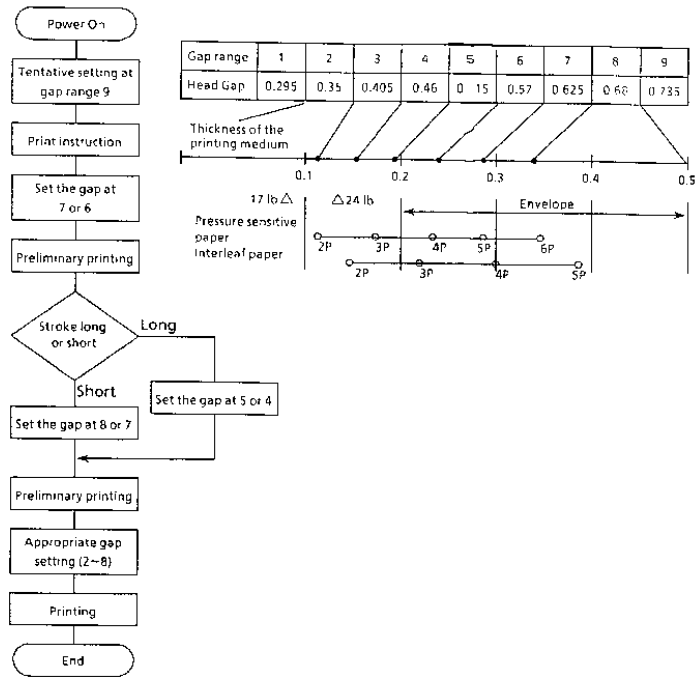
### Gap Adjust Control

The Gap Adjust LSI receives stroke length information for all of the printhead pins from the sensor analog circuit. The Gap Adjust LSI then sets the optimum printhead gap for the printing medium.

*NOTE:*

*Refer to Section 2.2.03 for a decription of the mechanical process.*

*All values in the below chart are in millimeters*




b. Auto Gap and Fixed Gap Adjust Control

| Gap range | 1~3 | 4~6 | 7~9 |
|---|---|---|---|
| Print Speed | High (100%) | Mid (85%) | Low (50%) |

As shown in the table left, three print speeds are available according to the thickness of the printing medium

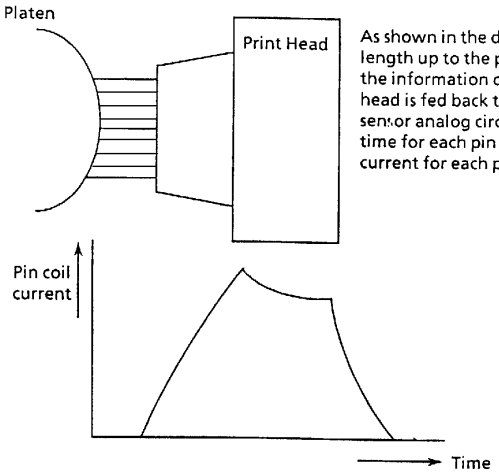
2-1-04c.tif

### Print Compensation Control

The printhead compensates for the shape of the platen as shown below.

*NOTE:*

*Also refer to Section 2.1.07 - Head Drive Time*

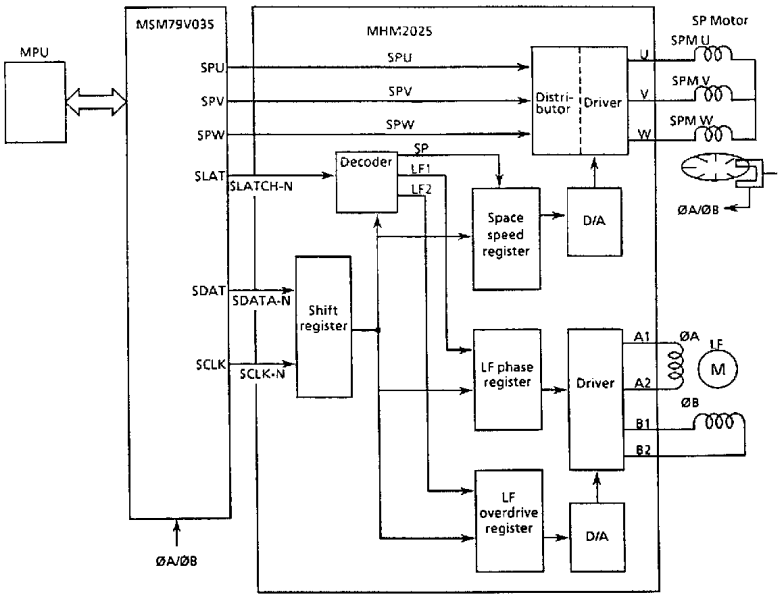


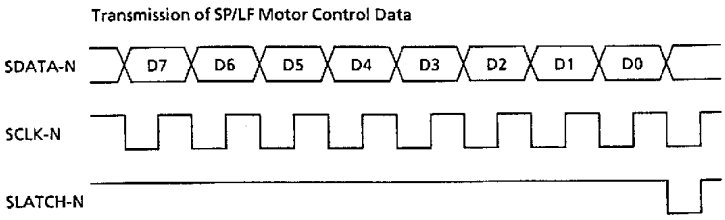

As shown in the drawing left, since the stroke length up to the platen is different for each pin, the information of each pin within the print head is fed back to the logic circuit from the sensor analog circuit to set the optimum drive time for each pin by controlling the pin coil current for each pin.

2-1-04d.tif

## 2.1.05 Space and Line Feed (SP/LF) Motor Control

The LSI (Location 04B: MSM79V035) generates the space motor and the line feed motor control signals according to commands received from the MPU. These signals are sent to the SP/LF motor driver.



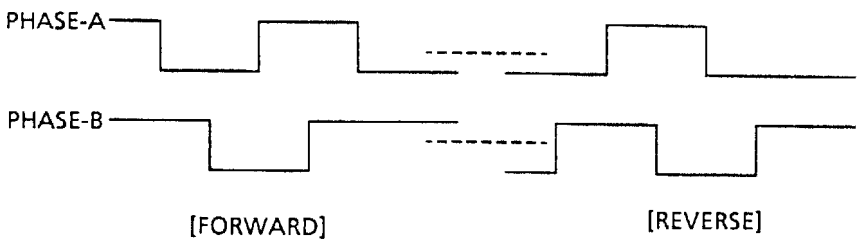




2-1-05a.tif

### Line Feed Motor Control

The SP/LF motor driver (Location 5A: MHM2025) drives the line feed motor in two-phase bipolar, based on the phase changeover data output from the LSI.

The serial data from the LSI (04B: MSM79V035) is processed by a register contained in the SP/LF motor driver to measure the overdrive time and to change the phase.

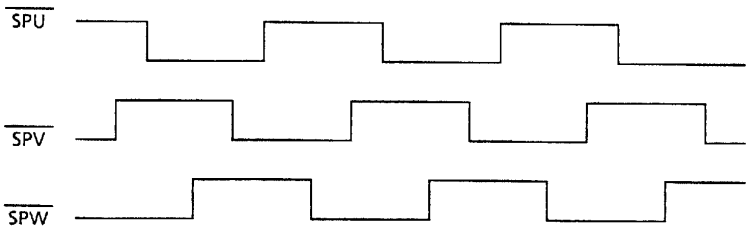



2-1-05d.tif

### Space Motor Control

The SP/LF motor driver (Location 5A: MHM2025) drives the three-phase brushless motor. Motor movement is based on the phase signal (SPU,SPV and SPW) and the speed instruction data from the LSI. The MPU can identify the current speed of the space motor by measuring the pulse width of the output (Phase A, Phase B) of the encoder disk sensor.

After comparing the target speed for each print mode with the actual speed, the motor is accelerated or decelerated to maintain the desired speed for each print mode.



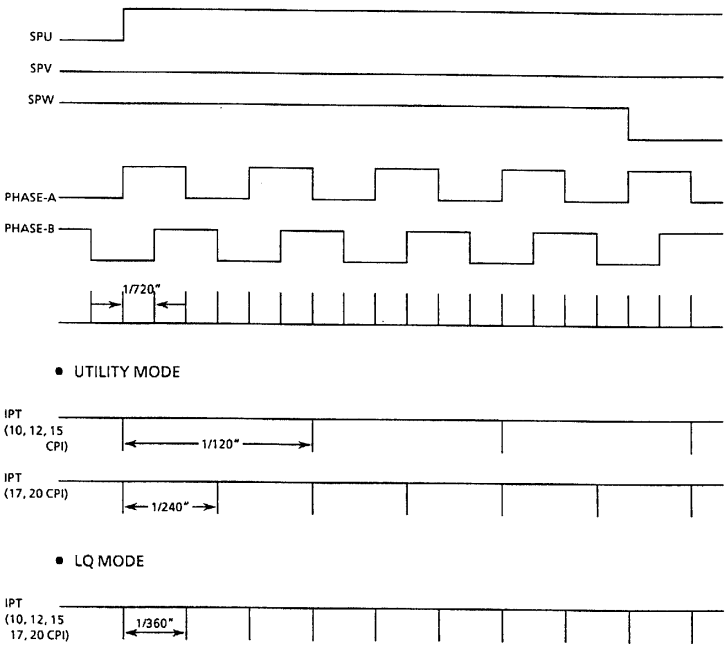

SP truth table

| HALL AMP INPUT | | | OUTPUT | | |
|---|---|---|---|---|---|
| $\overline{SPU}$ | $\overline{SPV}$ | $\overline{SPW}$ | U | V | W |
| H | H | L | OPEN | L | H |
| H | L | L | L | OPEN | H |
| H | L | H | L | H | OPEN |
| L | L | H | OPEN | H | L |
| L | H | H | H | OPEN | L |
| L | H | L | H | L | OPEN |

2-1-05b.tif

### Encoder Disk

As the space motor operates, the encoder disk spins. When the encoder disk interrupts the photo sensors, the signals Phase A and Phase B are generated. The LSI (Location 04B: MSM79V035) divides these edge pulse signals (the frequency division is based on the selected print pitch) to generate the signal IPT. The IPT signal provides dot-on timing and carriage position detection timing.

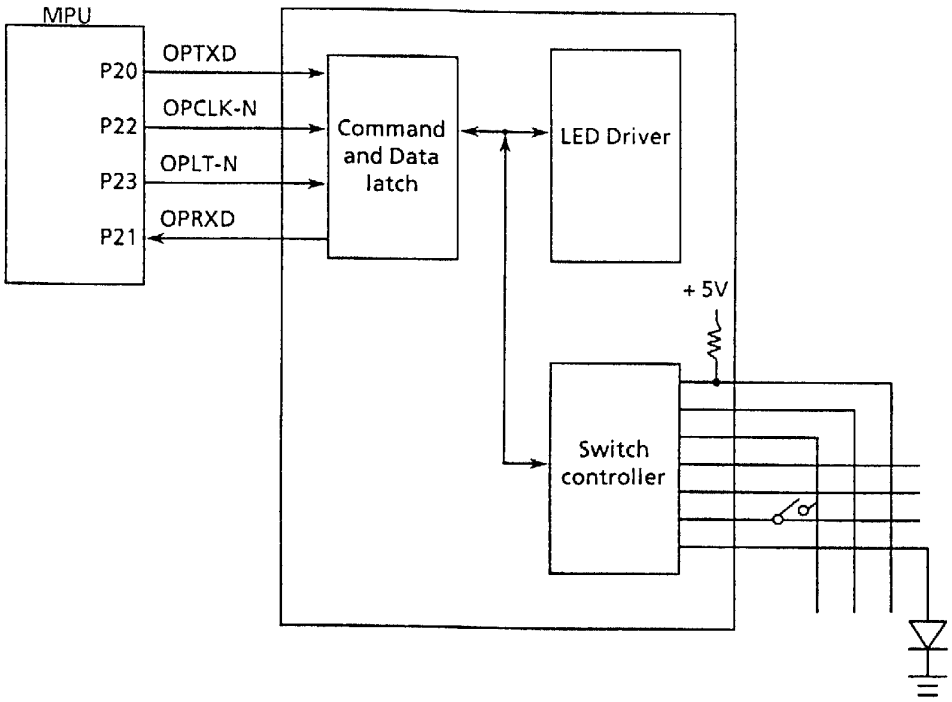



2-1-05c.tif

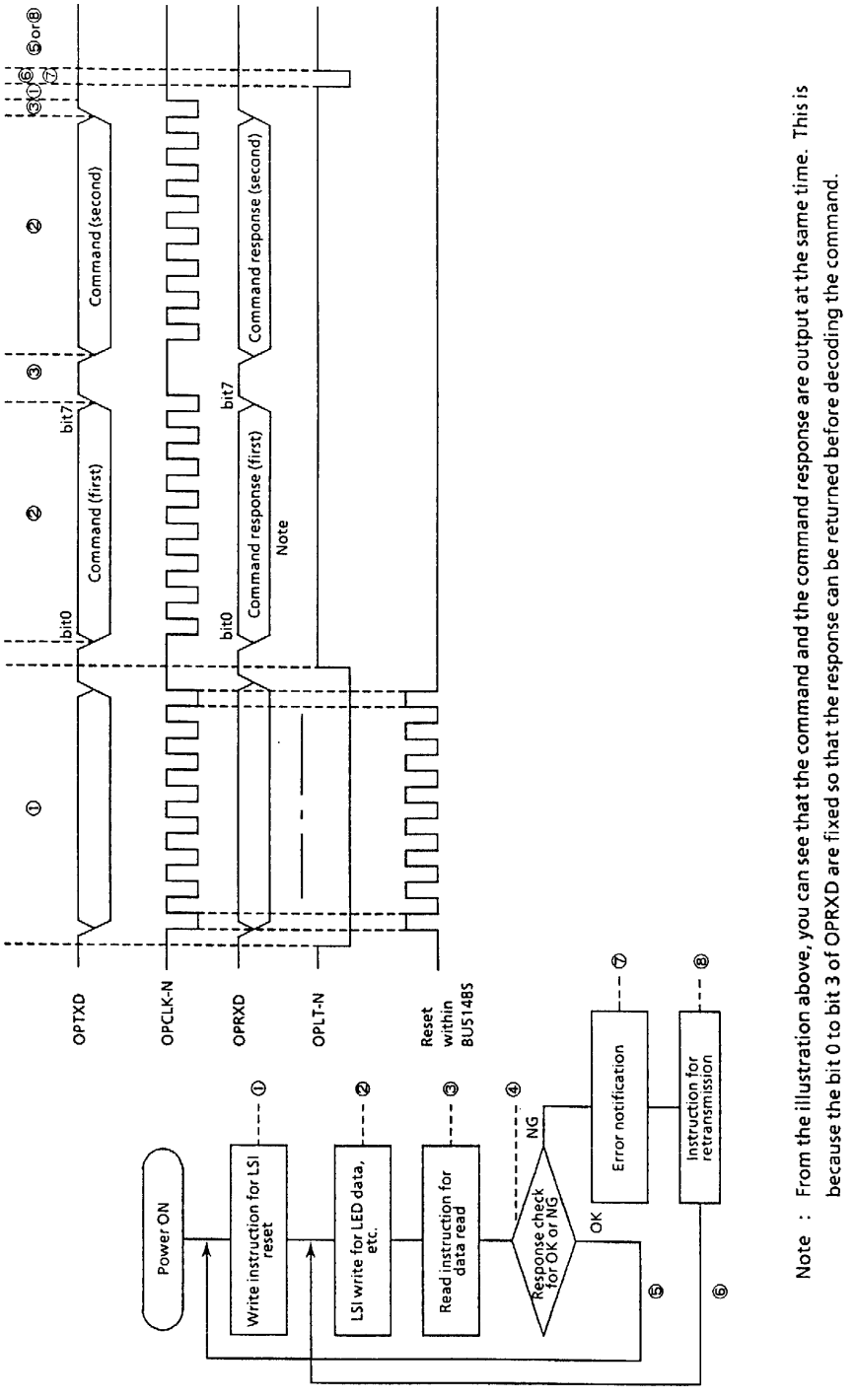
### 2.1.06 Operation Panel

The Serial I/O Port (Ports 20 - 23) of the MPU reads the operation panel switch data from the operation panel control LSI (Location IC1: BUS148S).

A two byte (15 bits +1 parity bit (even parity)) command (OPTXD) is transmitted from the MPU to the operation panel LSI in synchronization with the OPCLK signal. Once the LSI decodes the command, the command must pass a command code check and have no parity errors. Then, the specified I/O control will return the two byte command response to the MPU.




2-1-06a.tif



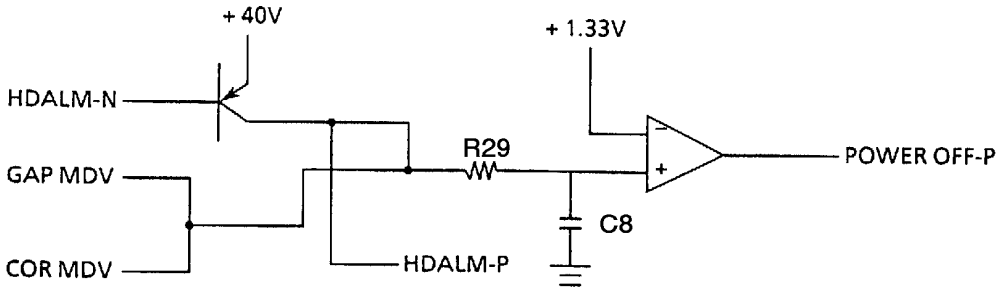

Note : From the illustration above, you can see that the command and the command response are output at the same time. This is because the bit 0 to bit 3 of OPRXD are fixed so that the response can be returned before decoding the command.

2-1-06b.tif

## 2.1.07 Alarm Circuit

### Driver Circuit Alarm Processing

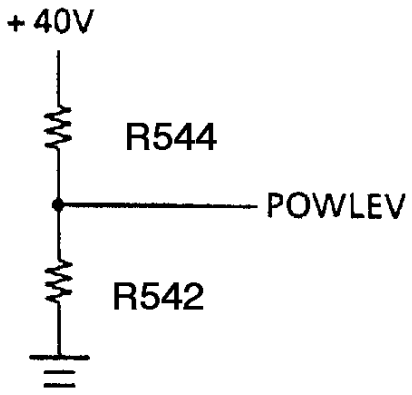
The printhead driver output and the head gap magnet output drive signals are monitored at R29 and C8. The POWER OFF-P signal is output by the comparator (Location 02C: IC2901) when driven for more than the specified time. This signal becomes the ALM signal. The ALM signal is sent to the power supply board and causes the DC voltages to be turned off.




2-1-07a.tif

### Low Motor Drive Voltage Alarm

+40V is converted into the POWLEV signal (0 vdc to +5 vdc) by the voltage divider network of R542 and R544, then input to the A/D port of the MPU. The value of this voltage is used to control the drive time and the print speed (pass number) of the head.




2-1-07b.tif

### Head Drive Time

The head drive time is modified to compensate for the amount of the voltage drop of the POWLEV signal. By monitoring the voltage drop every 500 microseconds, the MPU is able to control and maintain the impact necessary for each printhead pin.

### Print Speed

| Actual Voltage (+40 vdc) | Passes Required | Relative Print Speed |
|---|---|---|
| +34 vdc or greater | 1 | 100% |
| +32 vdc to +34 vdc | 1 | Approximately 85% |
| +30 vdc to +32 vdc | 1 | Approximately 50% |
| +30 vdc or less | 2 | Less than 50% |

### Head Overheat Alarm Processing

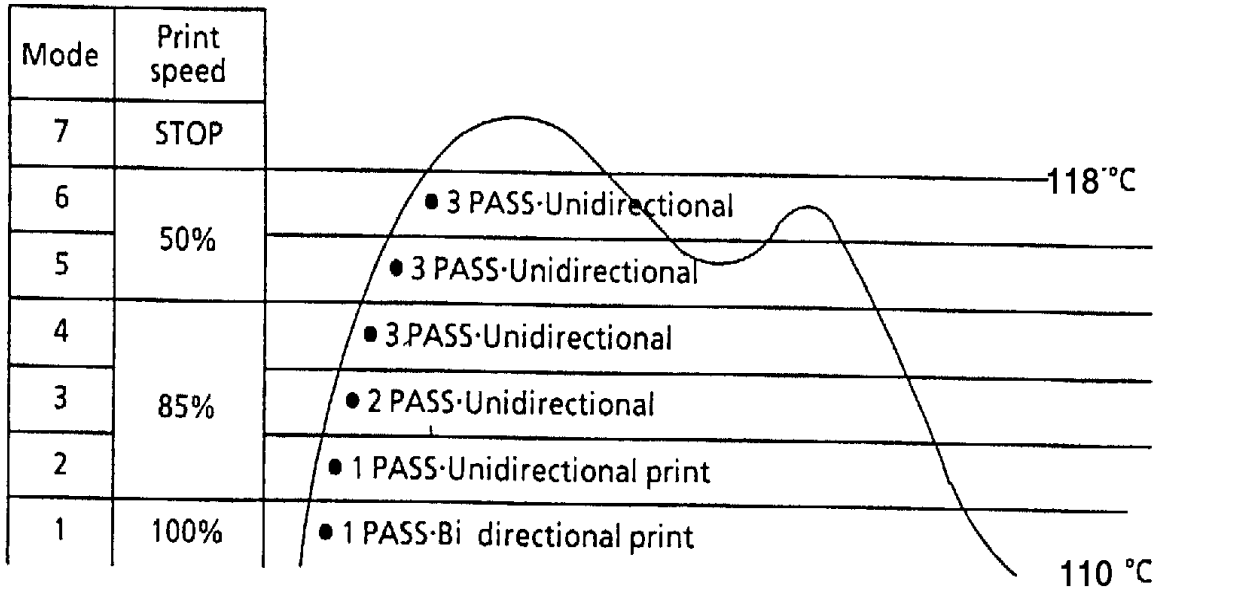
If the printhead temperature exceeds 110 degrees Celsius, the printer will switch to uni-directional print. If the temperature exceeds 118 degrees Celsius, printing will stop. Once the printhead cools, printing will resume.

Two thermistors are used to monitor the printhead temperature. One is contained in the printhead. The other is in the printhead driver.

A thermistor in the printhead prevents over-heating of the coil during periods of continuous bi-directional printing. If the temperature of the coil exceeds the pre-determined limits, the control circuit detects the thermistor signal (TSD).

Another thermistor monitors the temperature of the printhead driver. If the temperature of the driver exceeds the pre-determined limits, the control circuit detects the thermistor signal (TSD).

The voltage of the TSD signal is monitored at the MPU A/D port to control the pass number and print method (uni-directional / bi-directional) at each of seven levels.



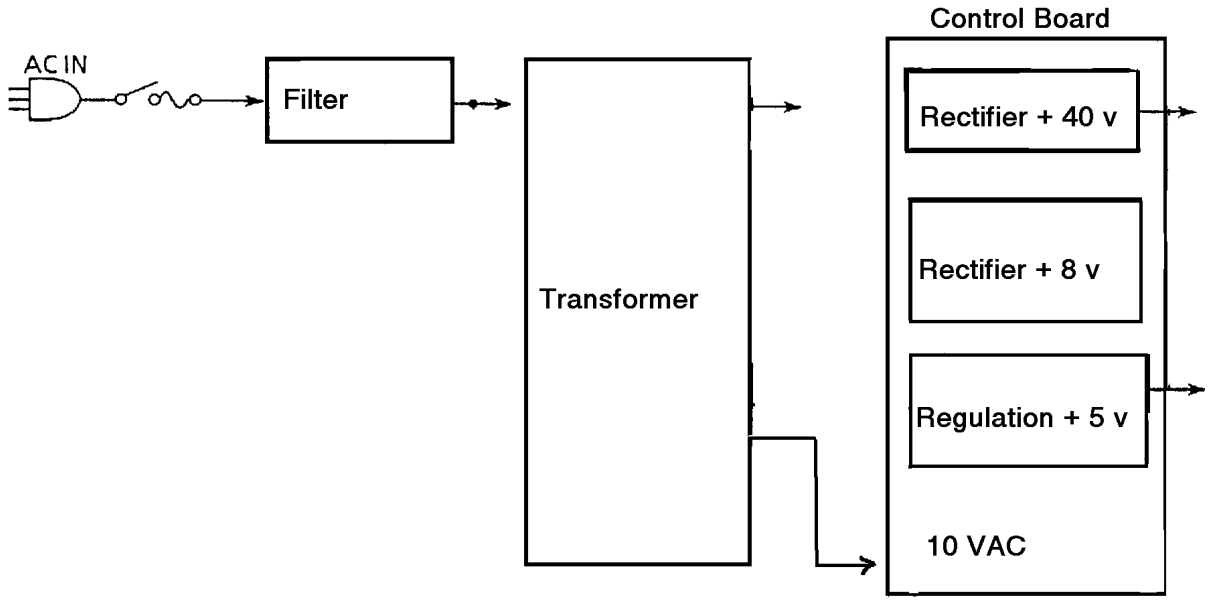

2-1-07c.tif

### 2.1.08 Power Supply Circuit

The switching type power supply circuit supplies the +5 vdc, +/-8 vdc, 10 VAC and +40 vdc.

#### Table of Output Voltages

| Voltage / Signal | Purpose |
|---|---|
| +5 vdc | IC logic levels, LED drive voltages |
| +8 vdc | Serial interface line voltage, comparator IC |
| +10 VAC | Serial interface line voltage and the printhead analog circuit |
| +40 vdc | Printhead, space motor and line feed motor drive voltage |




2-1-08.tif

## 2.2 MECHANICAL OPERATION

### 2.2.01 Printhead Mechanism

The printhead is a spring-charged, 9-pin printhead. It is attached to the carriage, which moves parallel to the platen. Electrically, the printhead is controlled by the main control board via the carriage cable and the space motor.

The printhead is composed of the following parts.

Wire Guide

Spring Assembly

Wire, Armature, Spring, Yoke, Spacer

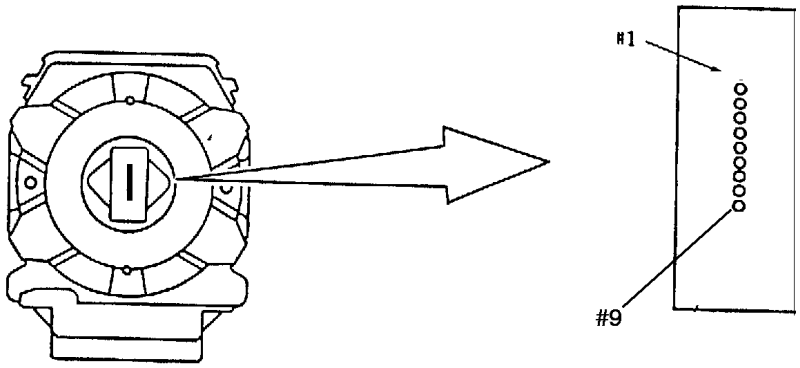
Magnet Assembly

Magnet, Core, Coil, Yoke

Printed Circuit Board

Logic Control, Print Driver, Analog Sensor Control and Thermistor

Cooling Fin




Arrangement of the head pins
View from the tip of the printhead

2-2-01a.tif

### Printhead Gap Information

Three items factor into printhead gap information.

1. Printhead Gap Adjustment

   This is a SERVICE ADJUSTMENT made by a technician.

   It is covered in Section 3.3 of this Service Handbook.

   The Adjustment measures 0.014, +/- 0.001 inches (0.35, +/- 0.03 mm).

2. Printhead Gap Adjust

   This is a MENU ITEM in the SET-UP Group.

   It fine tunes the automatic setting of the printhead gap.

   The settings are 0, 1, and -1.

   0 is the factory default.

   Use 1 to *darken* print (if output is *consistently light*).

   Use - 1 to *lighten* print (if output is *consistently dark*).

3. Gap Control

   This is a MENU ITEM in *each* [Paper Feed] Group.

   The Groups are REAR FEED, BOTTOM FEED, and TOP FEED.

   Gap Control determines how the printhead gap is set.

   The settings are listed below.

   Auto Gap, Semi Auto Gap, 1, 2, 3, 4, 5, 6, 7, 8, 9

   An explanation of each setting follows.

Auto Gap

This is the factory default.

Automatically determines paper thickness of the first page.

During single-sheet feed, each page's thickness is checked *while* a job is printing.

Semi Auto Gap

Similar to Auto Gap.

Automatically determines paper thickness of the first page.

During single-sheet feed, each page's thickness IS NOT checked "while" a job is printing.

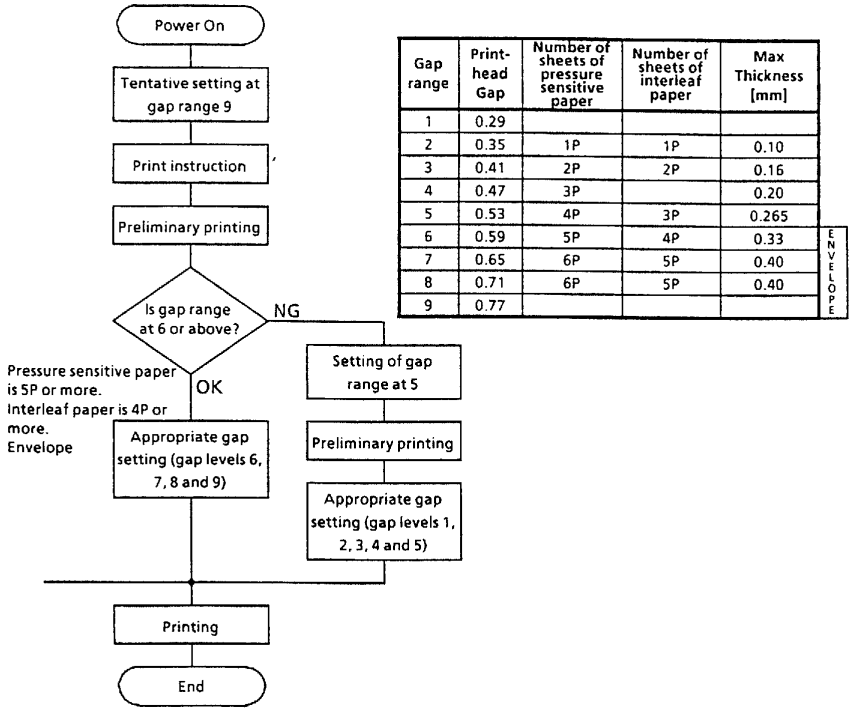
1, 2, 3, 4, 5, 6, 7, 8, 9

Used when the same paper is used ALL of the time.

Bypasses the automatic head gap adjustment.

1 is the narrowest gap setting.

9 is the widest gap setting.




| Gap range | Print-head Gap | Number of sheets of pressure sensitive paper | Number of sheets of interleaf paper | Max Thickness [mm] | |
|---|---|---|---|---|---|
| 1 | 0.29 | | | | |
| 2 | 0.35 | 1P | 1P | 0.10 | |
| 3 | 0.41 | 2P | 2P | 0.16 | |
| 4 | 0.47 | 3P | | 0.20 | |
| 5 | 0.53 | 4P | 3P | 0.265 | |
| 6 | 0.59 | 5P | 4P | 0.33 | ENVELOPE |
| 7 | 0.65 | 6P | 5P | 0.40 | |
| 8 | 0.71 | 6P | 5P | 0.40 | |
| 9 | 0.77 | | | | |

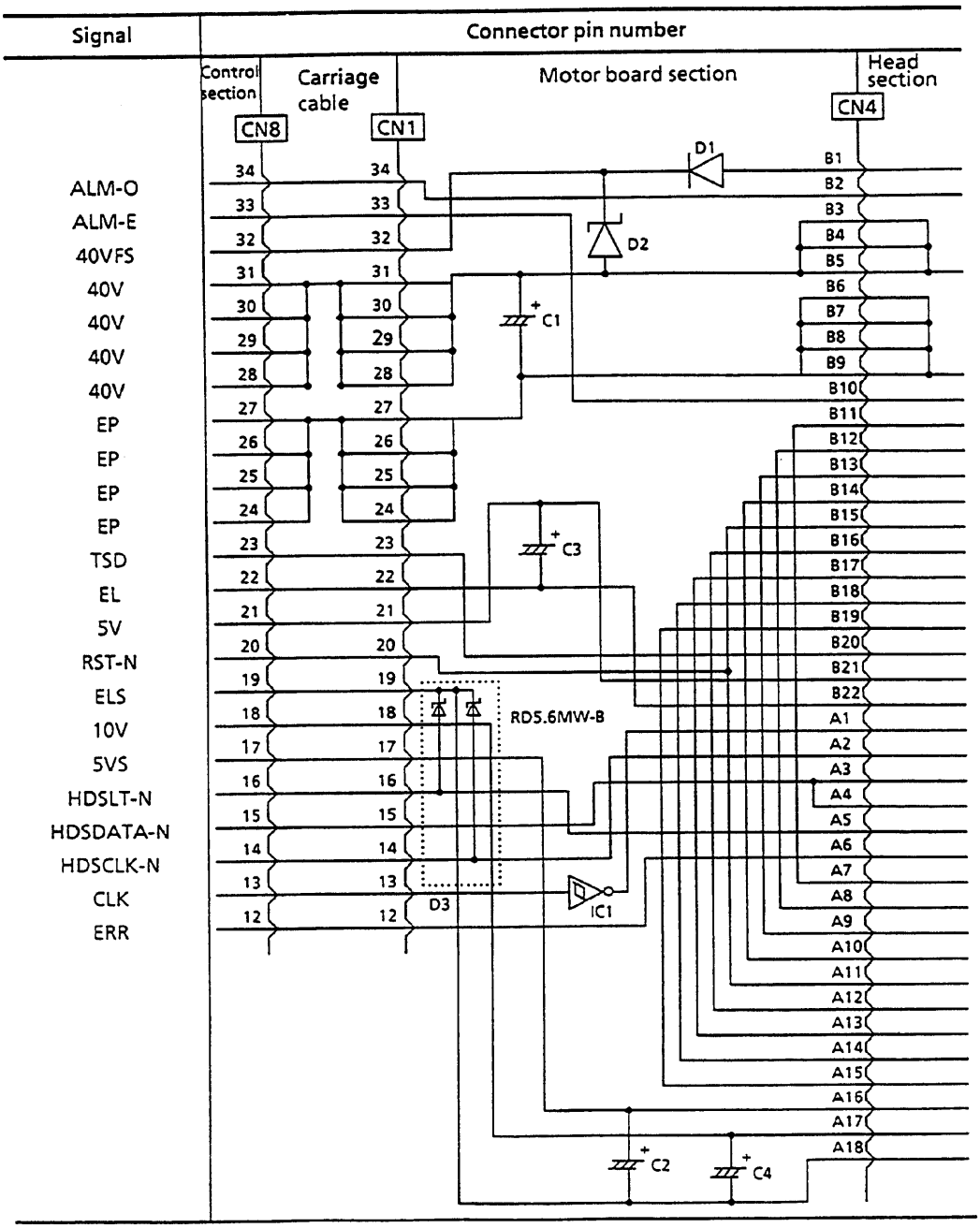
1-7-01.tif

**Interconnect Diagram: Control Board to Printhead**

*NOTE:*

*The printhead coil resistance values ARE NOT LISTED.*

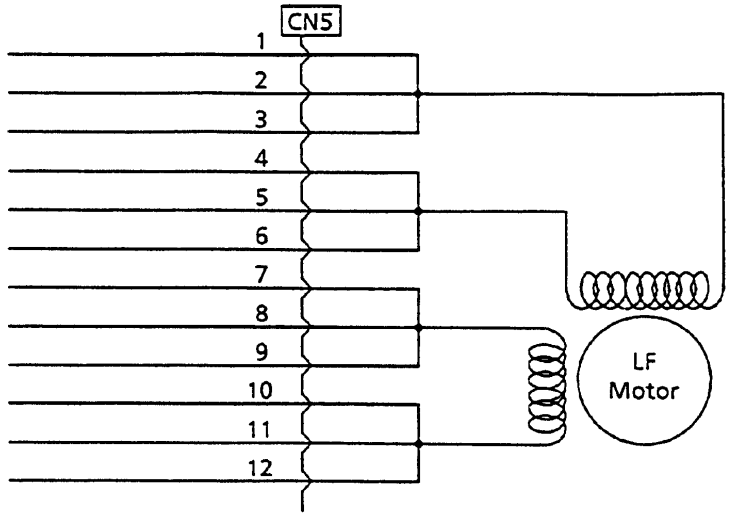
*The individual printwire control lines CANNOT be accessed on this printhead.*




2-2-01b.pcx

### Line Feed Motor Resistance

The resistance of each coil should be approximately 13 ohms.

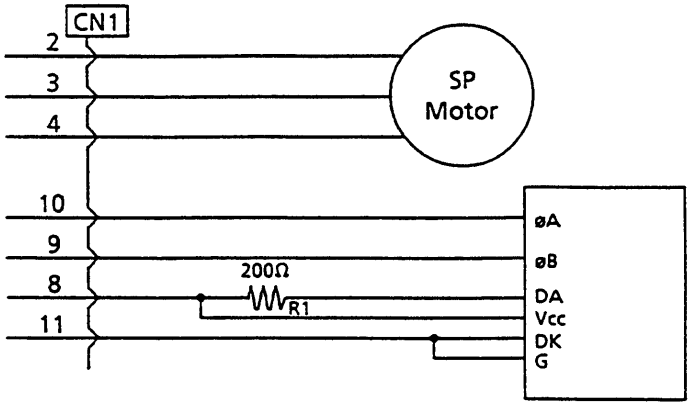
| Pin number of LF Motor | Signal | Connector pin number |
|---|---|---|
| 1 | LF1 |  |
| 2 | LF1 | |
| 3 | LF1 | |
| 4 | LF2 | |
| 5 | LF2 | |
| 6 | LF2 | |
| 7 | LF3 | |
| 8 | LF3 | |
| 9 | LF3 | |
| 10 | LF4 | |
| 11 | LF4 | |
| 12 | LF4 | |



2-2-01c.pcx

### Space Motor Resistance

The resistance of each coil should be approximately 5 ohms.

| Pin number of SP Motor | Signal | Connector pin number |
|---|---|---|
| 2 | SP-U |  |
| 3 | SP-V | |
| 4 | SP-W | |
| 10 | PHASE-A | |
| 9 | PHASE-B | |
| 8 | + 5V | |
| 11 | EL | |



2-2-01d.pcx

### Printhead Operation

When the printhead is idle, the armature is attracted to the permanent magnet. The print wires, which are attached to each armature, are then concealed inside the wire guide.

When a signal to print a character is received, current flows through a coil. The magnetic field generated by the coil opposes the magnetic field between the armature and the permanent magnet. The armature is then driven in the direction of the platen by the force of the armature spring. The print wire (which is attached to the armature) protrudes from the tip of the wire guide and strikes the paper through the ribbon. This prints a dot on the paper.

As the armature gets closer to the electrode of the analog sensor, the capacitance between them increases and a small amount of current flows. This current is amplified and sent to the logic control LSI to indicate armature activity. In order to attain optimum drive time, this information is transferred to the MPU. The MPU continually modifies the head gap to maintain the optimum drive time condition.

The analog sensor element monitors all of the pins. The difference in pin stroke due to the curvature of the platen is compensated for at the logic control section of the printhead and is not transferred to the MPU.

After the character has been printed, the permanent magnet attracts the armature and the print wires are retracted into the wire guide.

### Printhead Temperature

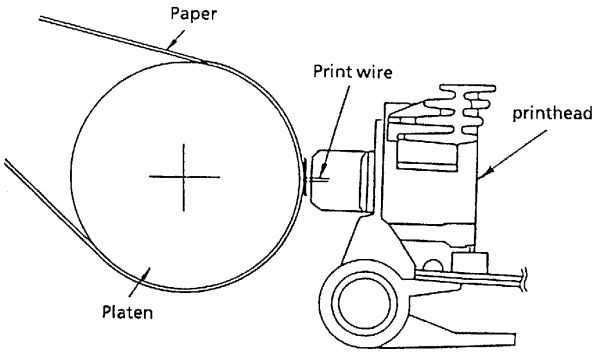
If the printhead temperature exceeds 110 degrees Celsius, the printer will switch to uni-directional print. If the temperature exceeds 118 degrees Celsius, printing will stop. Once the printhead cools, printing will resume.

Two thermistors are used to monitor the printhead temperature. One is contained in the printhead. The other is in the printhead driver.

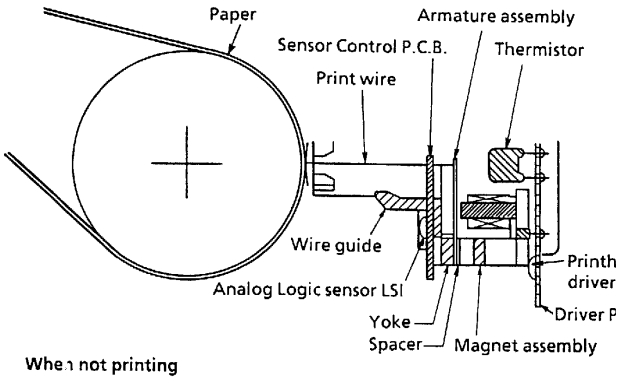
A thermistor in the printhead prevents over-heating of the coil during periods of continuous bi-directional printing. If the temperature of the coil exceeds the pre-determined limits, the control circuit detects the thermistor signal (TSD).

Another thermistor monitors the temperature of the printhead driver. If the temperature of the driver exceeds the pre-determined limits, the control circuit detects the thermistor signal (TSD).

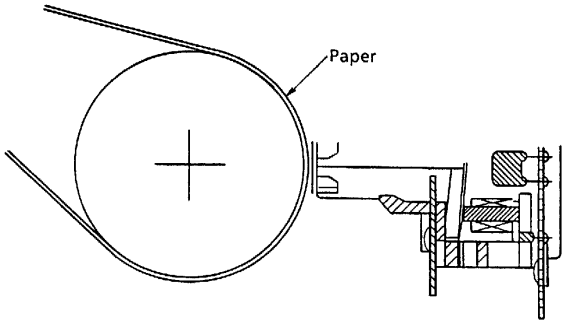
The voltage of the TSD signal is monitored at the MPU A/D port to control the pass number and print method (uni-directional / bi-directional) at each of seven levels.




(1) When printing




(2) When not printing




2-2-01e.pcx

### 2.2.02 Spacing Mechanism

The spacing mechanism consists of a carriage shaft (mounted parallel to the platen), and a carriage frame which moves along the shaft. The carriage frame is driven by a DC servo motor mounted on the carriage frame. Items included in the spacing mechanism are listed below.

Space Motor Assembly

- DC Servo Motor
- Motor Gear
- Sensor
- Encoder Disk

Carriage Frame

Carriage Shaft

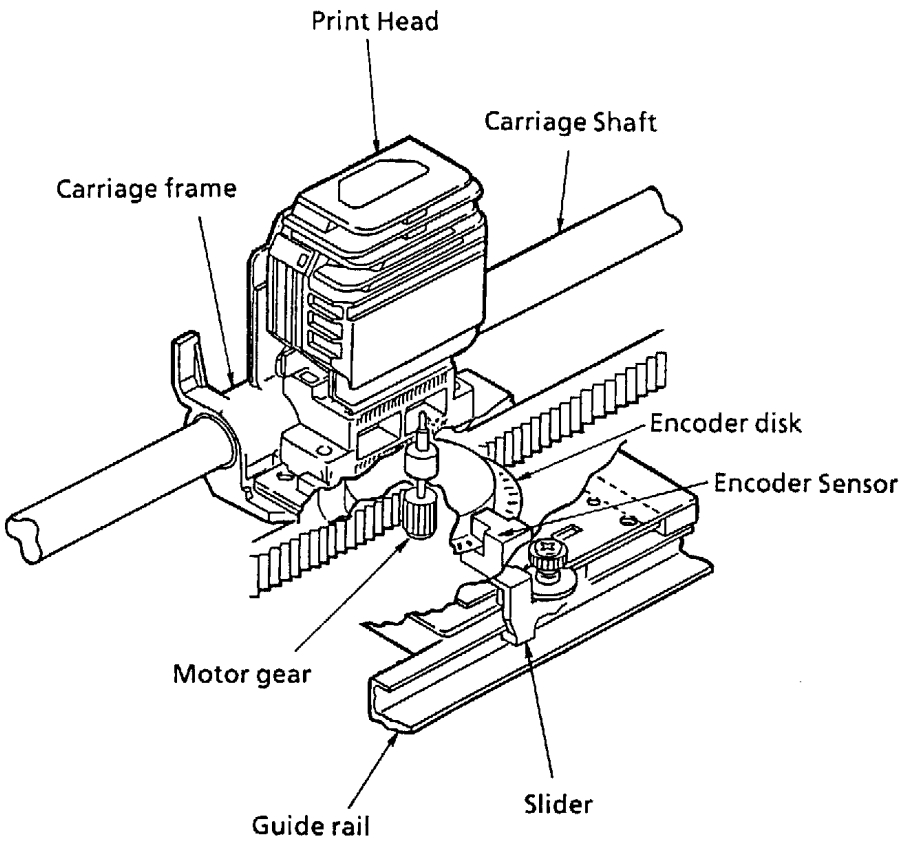
Space Rack

#### Spacing Operation

The carriage frame, which contains the printhead and space motor, moves along the carriage shaft parallel to the platen. When the space motor rotates, the driving force is transmitted to the motor gear. As the motor gear rotates, the carriage moves along the platen. For every revolution of the DC servo motor, the carriage frame moves 0.8 inch (20.32 mm).

As the DC servo motor rotates, a slotted disk (called the encoder disk), rotates with the servo motor and passes through the photosensor. The position of the carriage frame can be determined by counting the pulses generated by the photosensors.

In the same way, the rotation of the space motor can be recognized and controlled by measuring the phase relationship and the pulsewidth of the signals generated by the photosensors.


Print Head
Carriage Shaft
Carriage frame
Encoder disk
Encoder Sensor
Motor gear
Guide rail
Slider

2-2-02.tif

## 2.2.03 Head Gap Mechanism

The head gap is automatically set for the thickness of the medium loaded in the printer. In the case of envelopes, where the medium thickness varies as the printhead moves along the platen, the strike force of the pins changes to compensate for the differences in thickness.

### Head Gap Setting Operation

Once printing starts, the space motor rotates the ribbon gear, causing idle gear C to turn the change gear.

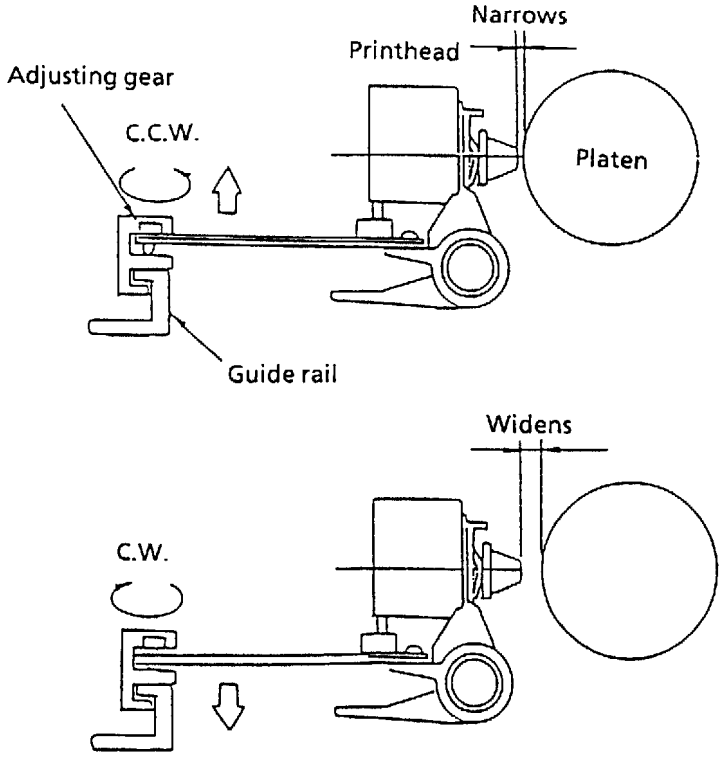
When the MPU requests a change in the head gap setting, the GAP-P signal causes the armature (which is holding the change gear) to be attracted to the pranger magnet. The gap reset spring can now push the change gear so it contacts the gap change gear.

The rotation of the gap change gear causes idle gear D to turn the adjust gear. The adjust gear turns the adjusting screw, resulting in a new head gap setting.

*NOTE:*

*As the adjusting screw turns counter-clockwise, the gap narrows.*

*As the adjusting screw turns clockwise, the gap widens.*

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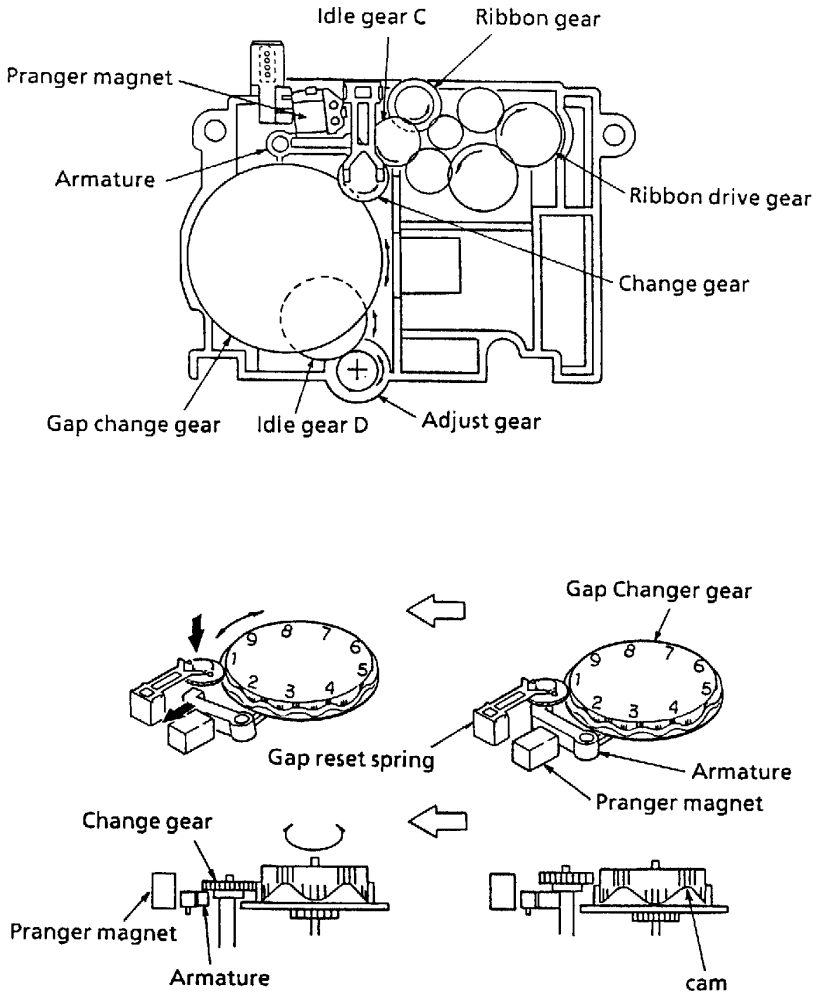
There is a cam at each setting of the gap change gear. When the change gear is at the top of the cam, the change gear disengages from the gap change gear. At this time, the armature resets, changing the head gap by one setting.

The head gap is modified in .06 mm units for each range setting.

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## 2.2.04 Ribbon Drive Mechanism

### Ribbon Drive Operation

The ribbon drive mechanism feeds the ribbon in synchronization with the spacing operation. The force required to drive the ribbon is obtained from the space motor.

The ribbon drive mechanism is composed of the items listed below.

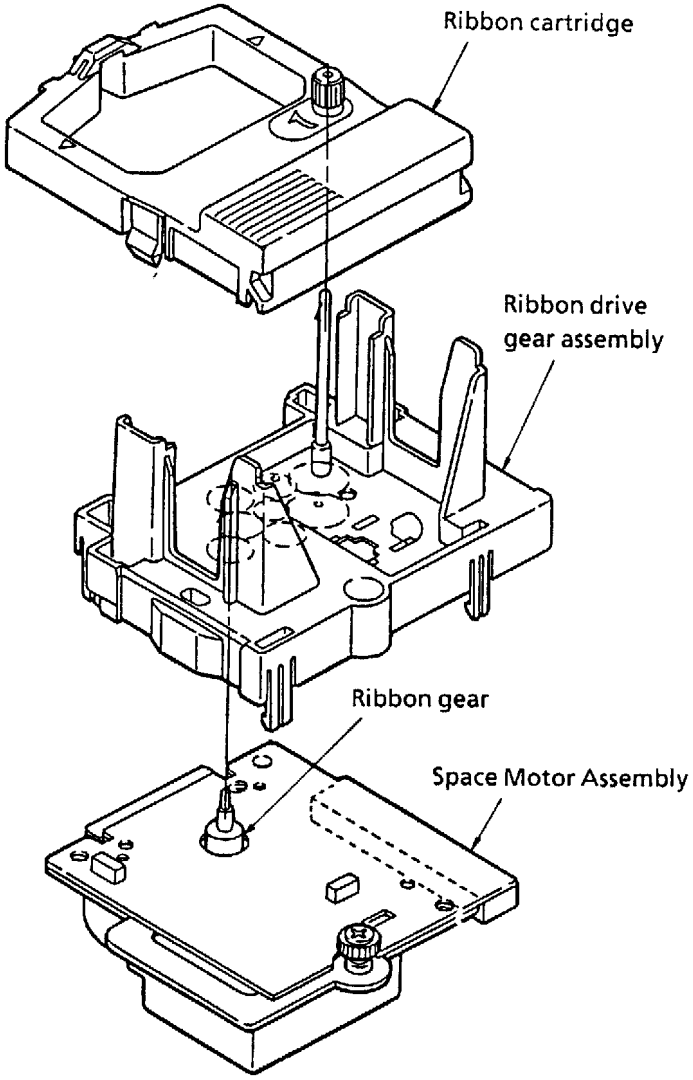
Ribbon Drive Gear Assembly

Ribbon Gear

This gear is located on the space motor assembly

Ribbon Cartridge

A continuous loop ribbon with uni-directional feed is used. Ink is supplied from an ink tank, which is built into the ribbon cartridge.




2-2-04a.tif

When the space motor turns, the ribbon gear on the spacing motor shaft rotates. The rotation is transmitted via a combination of gears, from the ribbon drive gear assembly to the drive gear in the ribbon cartridge.

Although the space motor moves in both the forward and reverse directions during bi-directional printing, the gears in the ribbon drive assembly maintain uni-directional ribbon feed by switching the rotation direction of the gears.

## 2.2.05 Line Feed Mechanism

The line feed operation is accomplished by activating the line feed motor which turns the platen. The rotation of the platen is used to feed paper from the selected paper path.

The components of the paper feed mechanism are listed below.

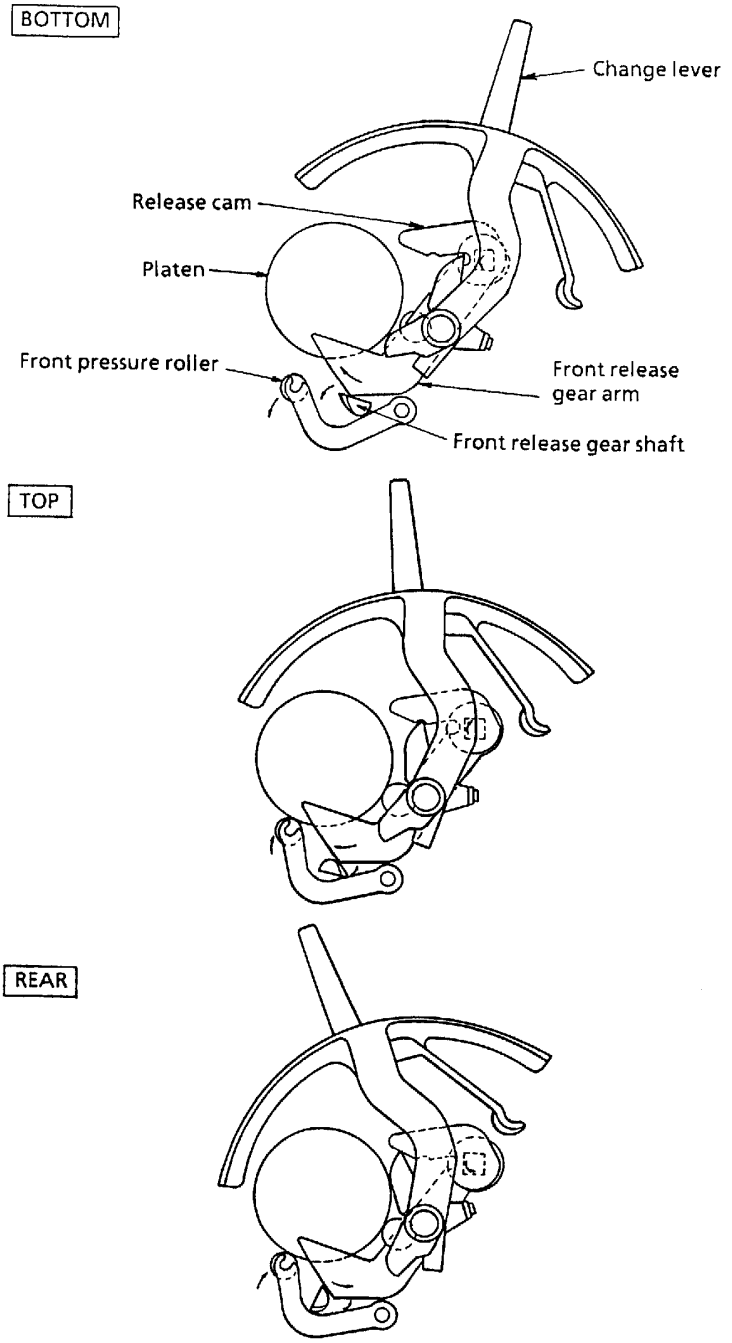
Line Feed Motor (pulse motor), with gears

Line Feed Idler Gear

Platen

Rear Tractor Feed Unit

Pressure Roller

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### Change Lever (Paper Path Selection Lever)

The change lever is used to select one of three different paper paths; top, rear or bottom.

### Paper Clamp Mechanism

Moving the change lever between the bottom, top and rear positions, changes the positions of the front release gear arm and the release cam.

The movement of the front release gear arm changes the position of the front release gear shaft. This causes the front pressure roller to open or close.

The movement of the release cam causes the rear pressure roller to open or close.

| Position of Change Lever | Status of Front Pressure Roller | Tension of Front Pressure Roller | Status of Rear Pressure Roller | Tension of Rear Pressure Roller |
|---|---|---|---|---|
| Bottom | OPEN | N/A | OPEN | N/A |
| Top | CLOSED | 250 g | CLOSED | 700 g |
| Rear | CLOSED | 90 g | OPEN | N/A |

### Cut Sheet/Continuous Sheet Switching Mechanism

#### Top Feed (for cut sheet paper)

When cut sheet paper is used during normal operation or by the Cut Sheet Feeder (CSF) option, place the change lever in the Top Feed position.

As the platen turns, the platen gear causes the idle gear to rotate.

At this time, the rear and front pressure rollers are pressed securely to the platen to feed the cut sheet.

The cut sheet detection lever enables the cut sheet detection switch (which is located on the main control board). This places the printer in the cut sheet mode.

When cut sheet paper is placed between the platen and the paper chute, the printer automatically feeds the sheet to the print start position.

#### Rear/Bottom Feed (for continuous feed paper)

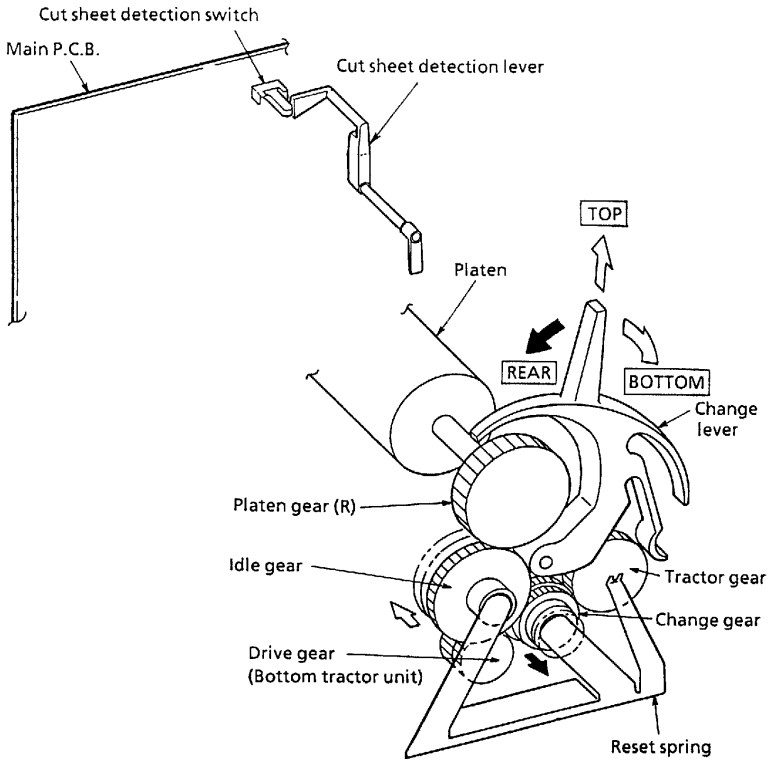
When the continuous feed paper is used, either with the rear tractor, optional bottom tractor or optional pull tractor, place the change lever in the Rear/Bottom Feed position.

When the change lever is placed in this position, the reset spring pushes the change gear. In this position, the idle gear is engaged with the bottom tractor unit drive gear and the tractor gear. As the platen turns, power is transferred from the platen gear, to the idle gear, to the change gear, and then to the push tractor shaft.

**CAUTION:**

*The cut sheet / continuous sensor lever must be positioned below the BASW sensor. The lever should contact the sensor only when the change lever is in the top feed (middle) setting.*

*If the lever is not correctly positioned, the ALARM lamp will light and the unit will not automatically load paper or receive data.*

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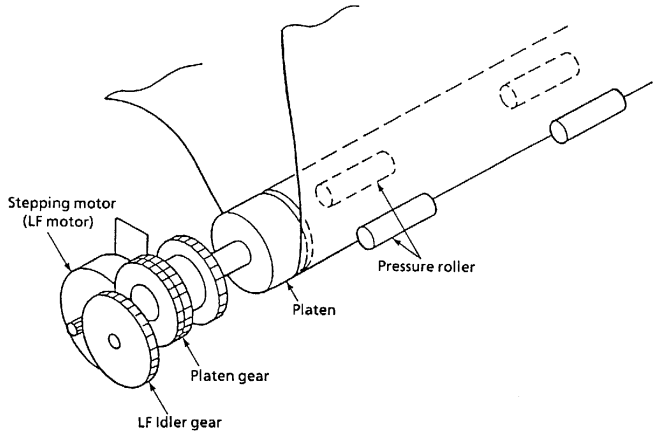
### Cut Sheet Paper Feed Operation

As the line feed motor rotates, power is transferred through the decelerating gears (line feed idler gear, platen gear) to the platen.

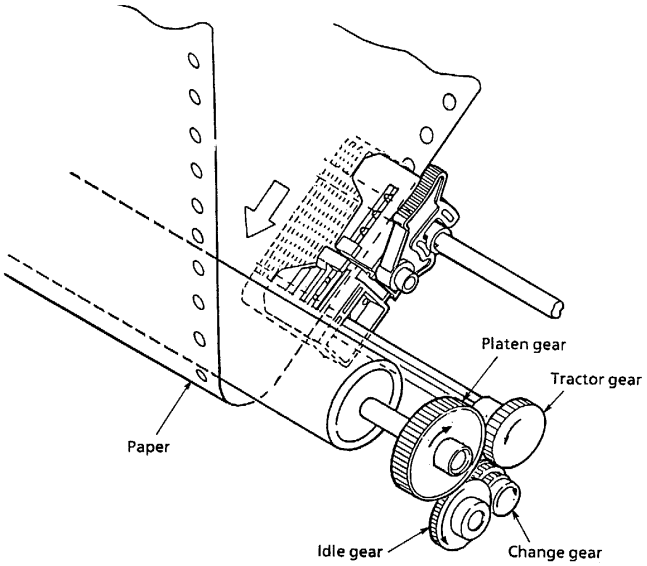
When using cut sheet paper, the change lever must be in the TOP position so the platen and pressure rollers can feed the paper. This also disengages the push tractor.




2-2-05c.tif

### Continuous Paper Feed (Rear Tractor Mechanism)

As the platen rotates, power is transferred to the tractor gear from the platen gear, the idler gear, and the change gear. The tractor gear drives the pin tractor belts, which feed the continuous paper.

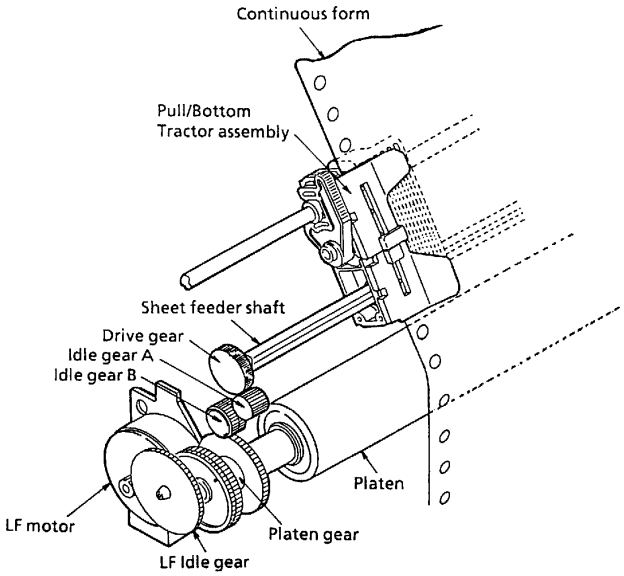



2-2-05d.tif

### Continuous Paper Feed (Pull Tractor Mechanism)

Bottom feed of continuous sheets is possible *only* when an optional pull tractor unit is installed.

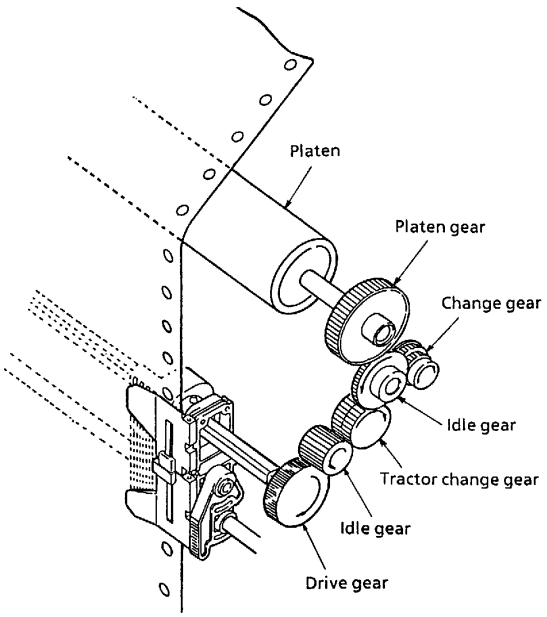
As the platen rotates, power is transferred to the drive gear from the line feed idler gear, the platen gear, idler gear B and idler gear A. The drive gear turns the pull tractor assembly, which feeds the continuous paper.




2-2-05e.tif

### Continuous Paper Feed (Bottom Tractor Feed Mechanism)

As the platen rotates, power is transferred to the drive gear from the platen gear, the idle gear and the tractor change gear. The drive gear turns the pin tractor belts on the bottom tractor feed unit, which feeds the continuous paper.

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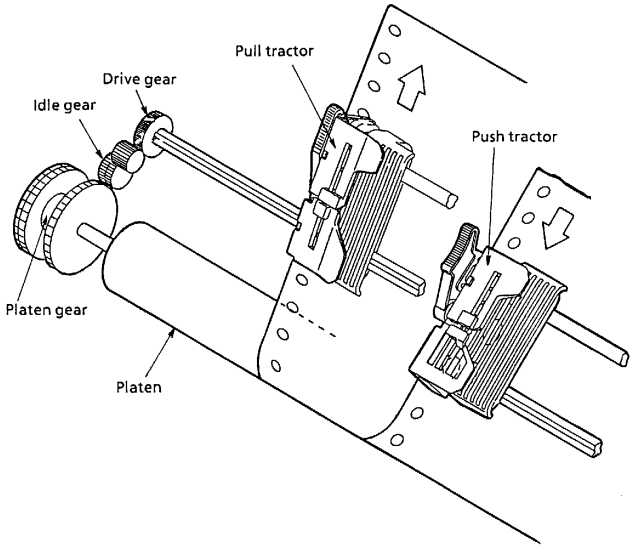
### Continuous Paper Feed (Push/Pull Tractor Mechanism)

This mechanism consists of an optional pull tractor and a standard push tractor mechanism.

Continuous paper is fed by these two tractors at the same time.




2-2-05G.tif

## 2.2.06 Paper Detection Mechanism

### Top Feed Paper Detection

When cut sheet paper is inserted into the printer, Point A of the Rear/Top Paper Feed Lever is pushed backward, causing the Sensor Lever to rotate.

As the Sensor Lever rotates, it contacts the Rear Sensor Lever. This makes the Rear Sensor Lever rotate.

The Rear Sensor Lever rotates, unblocking the Rear / Top Paper End Sensor (SNS1).

### Rear Feed Detection

When paper is fed from the Rear Push Tractor, Point B is pushed backward. This makes the Sensor Lever rotate.

As the Sensor Lever rotates, it contacts the Rear Sensor Lever. This makes the Rear Sensor Lever rotate.

The Rear Sensor Lever rotates, unblocking the Rear / Top Paper End Sensor (SNS1).

### Bottom Feed Detection

When the paper is fed from the bottom of the printer, Point C is pushed, rotating the Bottom Paper End Lever.

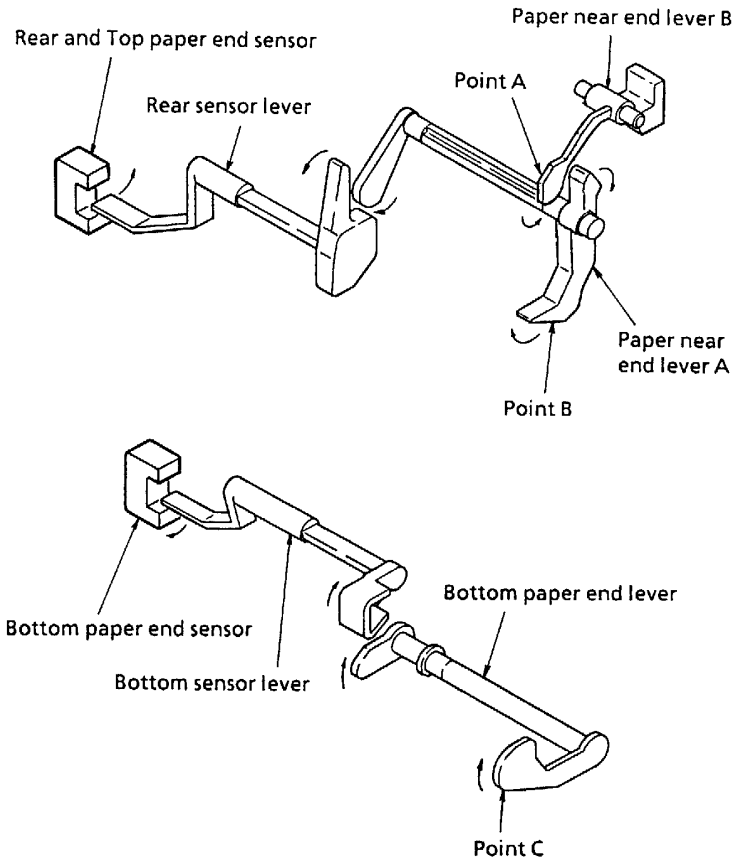
As the Bottom Paper End Lever rotates, it contacts the Bottom Sensor Lever. This makes the Bottom Sensor Lever rotate.

The Bottom Sensor Lever rotates, unblocking the Bottom Paper End Sensor (SNS2).

*NOTE:*

*The method for detecting a paper-end condition is the reverse of the above.*

*PAPER-END is detected when the Bottom Paper End Sensor (SNS2) is blocked.*




2-39.tif

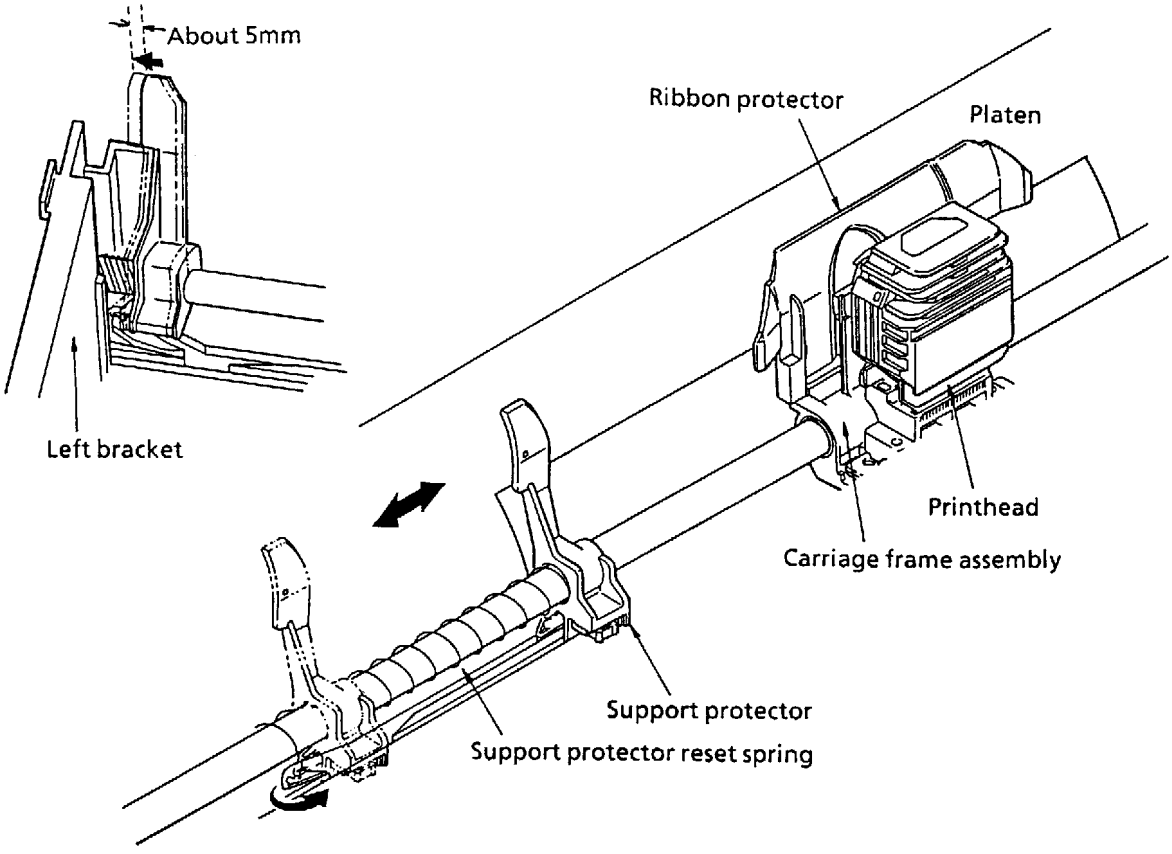
## 2.2.07 Support Protector Mechanism

During printer initialization, the support protector is latched in the stored position (approximately 5 mm from the left bracket of the main frame).

Just before paper is loaded, the printhead moves towards the left bracket and unlatches the support protector.

As the printhead moves to the right, the support protector reset spring pushes the support protector toward the center of the platen. With the support protector in this position, the ribbon protector and the support protector prevent the leading edge of the paper from curling or folding.

Once the paper is ejected, the printhead slowly moves towards the left bracket. The support protector is latched in the stored position when it is pushed to approximately 5 mm from the left bracket.




2-2-07.tif

## 2.2.08 Automatic Paper Load

The Microline 520/521 printers will automatically detect cut sheet paper and feed the paper to the Top of Form (TOF) position.

### Cut Sheet Paper

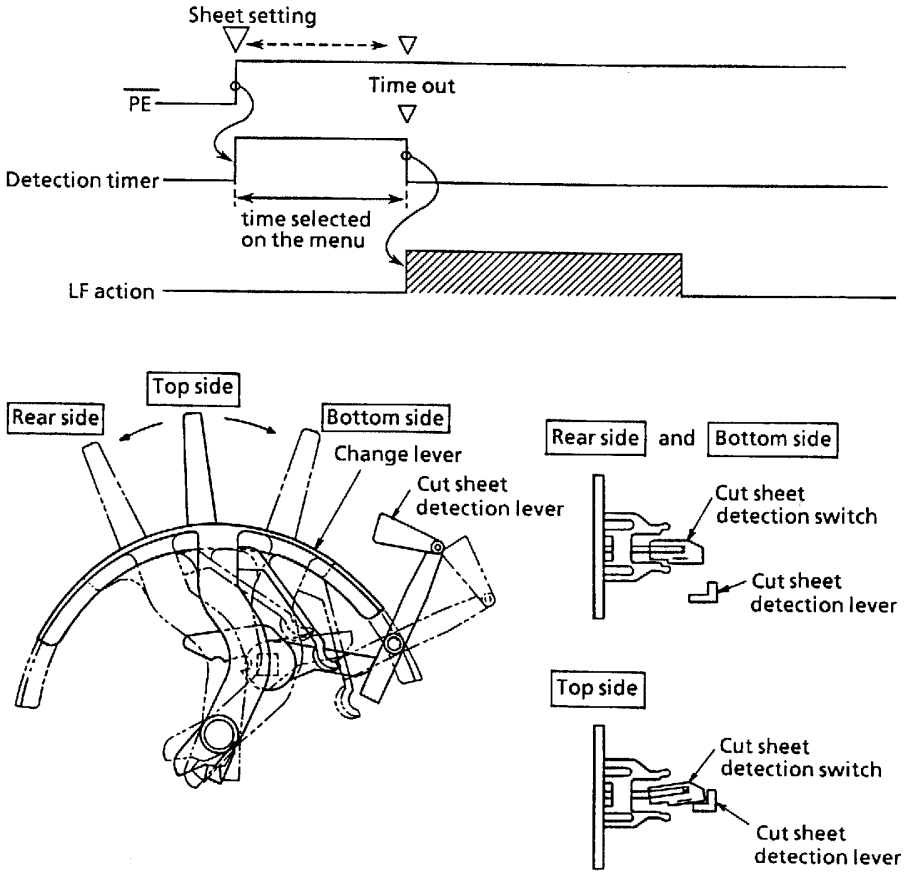
Set the change lever to the TOP FEED position.

*NOTE:*

*When the change lever is in the TOP FEED position, the cut sheet detection lever contacts the cut sheet detection switch (BASW), which is located on the main control board.*

Insert the sheet of paper between the platen and the paper chute.

Once paper is detected at the paper end sensor and the amount of time selected on the *Wait Time* setting of the menu has lapsed, the line feed motor will feed the paper until the leading edge of the paper reaches the top of form position.




2-2-08a.tif

**Continuous Feed Paper**

Set the change lever to either the REAR FEED or BOTTOM FEED position.

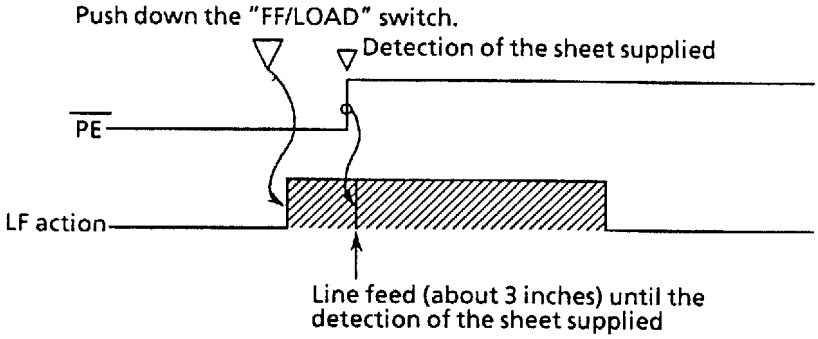
*NOTE:*

*When the change lever is in the REAR FEED or BOTTOM FEED position, the cut sheet detection lever does NOT contact the cut sheet detection switch (BASW), which is located on the main control board.*

Place continuous feed paper in the appropriate tractor.

Press the FF/LOAD switch.

The line feed motor will feed the paper until the leading edge of the paper reaches the top of form position.




2-2-08b.tif

### 2.2.09 Paper Park

If continuous feed paper is installed and printing on cut sheet paper is desired, it is not necessary to unload the continuous feed paper. The Paper Park feature provides a means of retracting the continuous feed paper from the paper path, while (at the same time) cut sheet paper is fed.

#### Paper Park Operation

Place the change lever in the REAR FEED or BOTTOM FEED position.

Press the PARK switch on the operation panel.

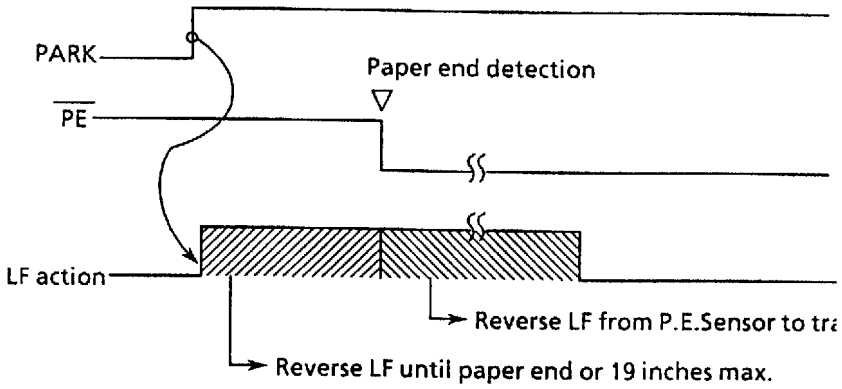
A reverse line feed operation retracts the paper until paper-end occurs or 19 inches of paper have been retracted.

*NOTE:*

*Retracting 19 inches of paper without detecting a paper-end condition causes the line feed operation to stop. The line feed operation stops because the printer assumes a jam has occurred.*

*The operator can press the SEL switch to reset the ALARM LED and press the PARK switch to continue the park operation.*

*This operation may be useful when length of the paper to be parked is greater than 19 inches.*




2-2-09.tif

# SECTION THREE

# MAINTENANCE

## 3.1 OVERVIEW

### 3.1.01 General Information

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

Disassembly should not be performed unless absolutely necessary. **NEVER** perform disassembly on a malfunctioning printer 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 consumable or parts are replaced. Failure to perform these procedures could result in unnecessary service calls.

Proper performance of maintenance and cleaning will help to achieve the best possible print quality from the printer.

### 3.1.02 Maintenance Tools

The following tools are required to service the printer.

- #2 Phillips Screwdriver (with magnetic tip)
- Straight-slot Screwdriver
- Needle Nose Pliers (4 Inch)
- Wire Cutters
- Digital Multimeter
- Feeler Gauge (capable of measuring .014 inches)
- Shop Vacuum
- Clean, soft, and lint-free Cloth
- All-Purpose Cleaner
- Contact Kleen (Okidata P/N 51802301)
- Platen Cleaner
- Machine Grease
- Machine Oil

### 3.1.03 Maintenance Precautions

1. Do not disassemble the unit if it is operating normally.
2. Before starting disassembly and assembly, always turn the AC power switch OFF and pull out the AC plug.
3. Detach the interface cable, if installed.
4. Do not remove parts unnecessarily. Try to keep disassembly to a minimum.
5. Use the recommended maintenance tools.
6. When disassembling, follow the listed sequence. Failure to follow the correct sequence may result in damaged parts.
7. Since screws, collars and other small parts are easily lost, they should be temporarily attached to the original positions.
8. When handling circuit boards use extreme care. Integrated circuits (microprocessors, ROM, and RAM) can be destroyed by static electricity.
9. Do not place printed circuit boards directly on conductive surfaces.
10. Follow the recommended procedures when replacing assemblies and units.
11. Perform the printhead gap adjustment procedure (Refer to Section 3.3 of this Service Handbook) when the any of the following occur.

    Print Quality is darker on one side of the document.

    Parts are replaced

    Printhead (3.2.02)

    Space Motor Assembly (3.2.11)

    Space Rack (3.2.13)

    Guide Rail (3.2.15)

    Platen Assembly (3.2.19)

    Carriage Shaft (3.2.25)

## 3.2 DISASSEMBLY/ASSEMBLY PROCEDURES

### General Information

This section contains the printer disassembly procedures. Only the removal procedures are explained here. 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, comment (RSPL, Option, Consumable) and cross-reference to Appendix B is provided for each part. Items included in the Recommended Spare Parts List are indicated by the acronym RSPL. N/A will appear where a part number is not available.

520 indicates that the item is specific to the Microline 520.

521 indicates that the item is specific to the Microline 521.

Both indicates that the item is common to both printers.

| ☐ Part Number | Item Description | Comment | Appendix B Reference |
|---|---|---|---|

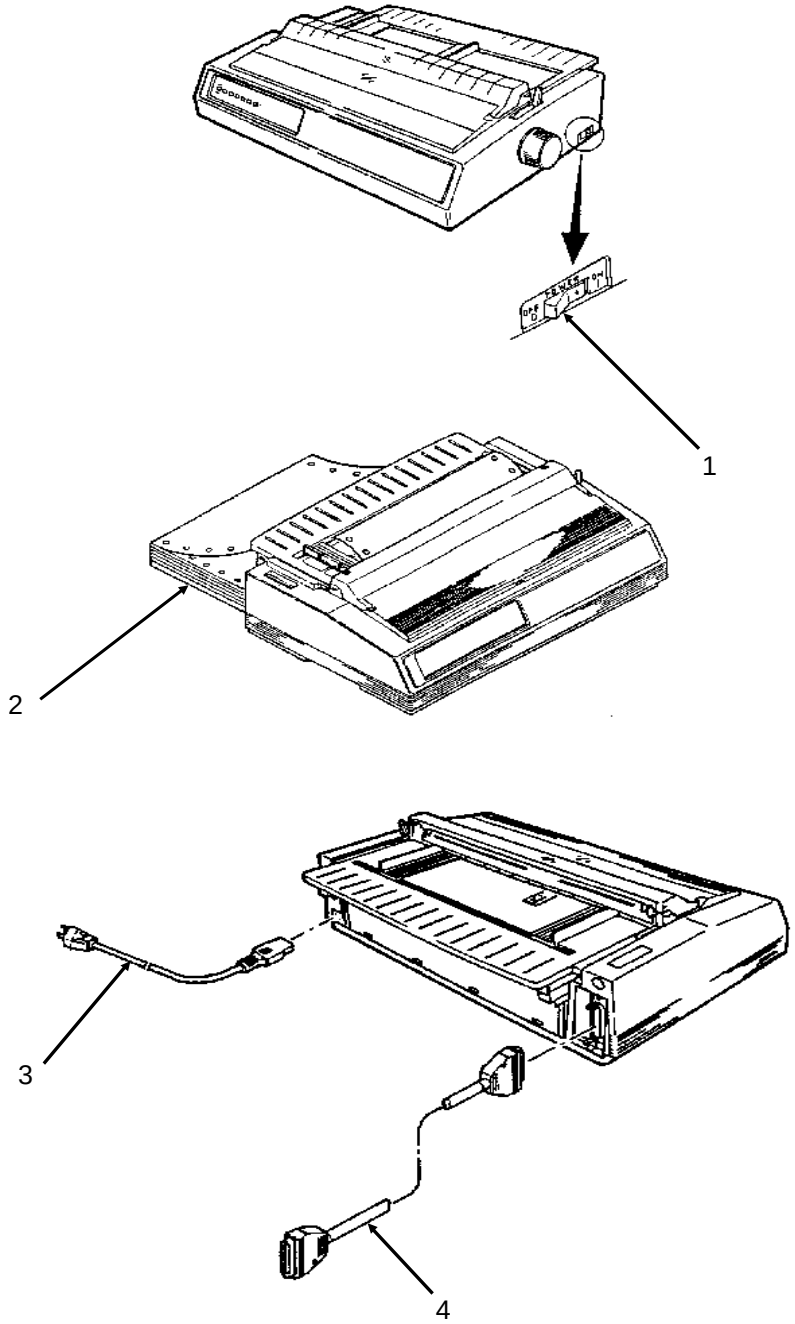
This Service Handbook lists the disassembly procedures for major components of the unit. Okidata DOES NOT recommend disassembling a unit which is operating normally. If you decide to perform disassembly during this training, Okidata recommends that you perform *only* the disassembly procedures for RSPL 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 unit.

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

### 3.2.01 Preliminary Items

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

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 56609701 | Cord: AC | RSPL | Both | B.2.03 |
| ☐ | P/N 56624101 | Cord: AC 220V (ML Series) Right Angle | Option RSPL | Both | B.2.03 |
| ☐ | P/N 56624401 | Cord: AC 240V | Option RSPL | Both | B.2.08 |
| ☐ | P/N 70000803 | Kit: Parallel Interface Plug'n'Play Accessory | Option | Both | B.2.08 |
| ☐ | P/N 70012801 | Kit: RS232-C Serial Interface | Option | Both | B.2.08 |




3-2-01.pcx

### 3.2.02 Printhead Assembly

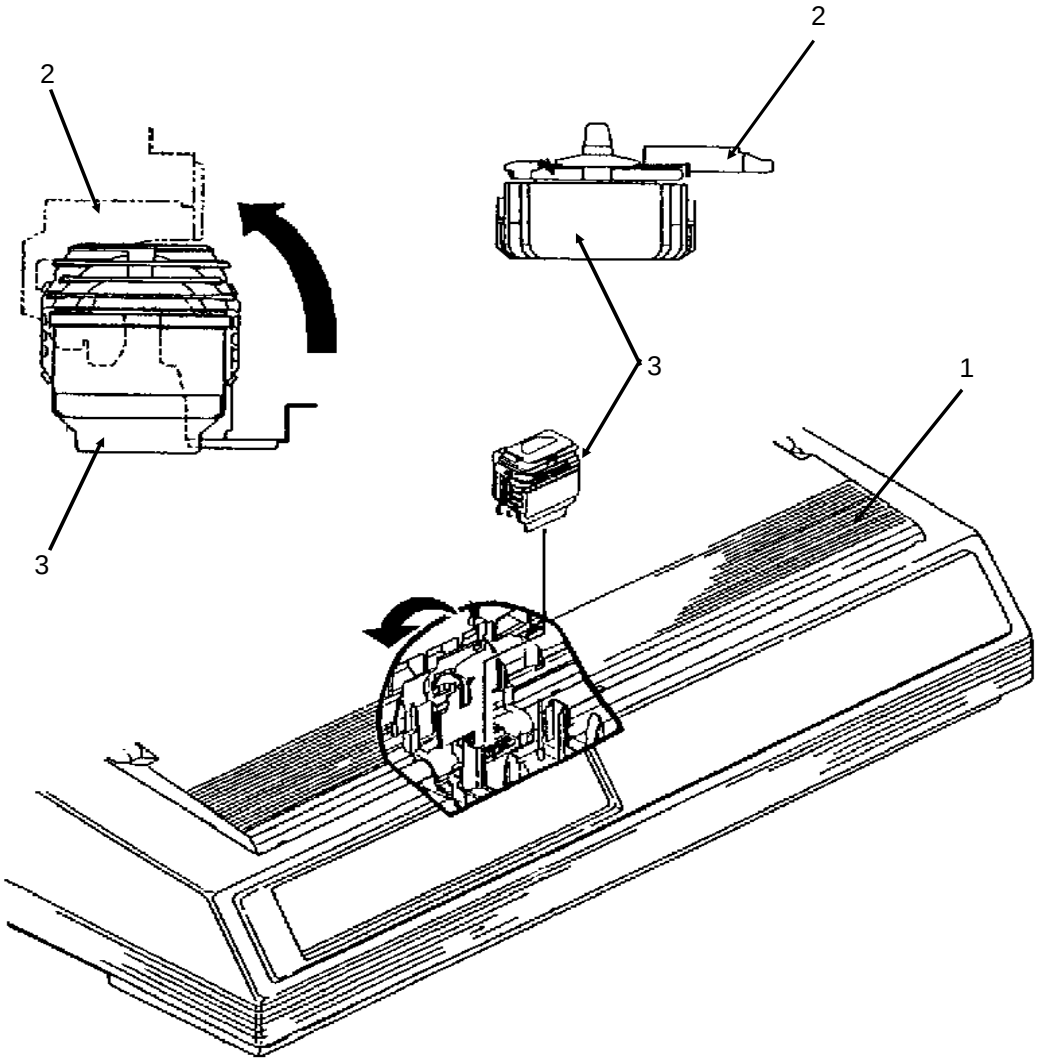
1. Perform this procedure: 3.2.01.
2. Open the access cover (1).
3. Lift and remove the ribbon. (*Not shown*)
4. Pull the head clamp (2) towards the right and then rotate it up to release the printhead (3).
5. Pull the printhead straight up to remove it.

*NOTE:*

*Installation*

*After installing the printhead, check the printhead gap adjustment. Refer to Section 3.3 of this Service Handbook.*

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 52107001 | Ribbon: Black | Consumable | Both | B.2.10 |
| ☐ | P/N 50707401 | Clamp: Head | RSPL | Both | B.2.07 |
| ☐ | P/N 50099501 | Assembly: Printhead | RSPL | Both | B.2.03 |




3-2-02.pcx

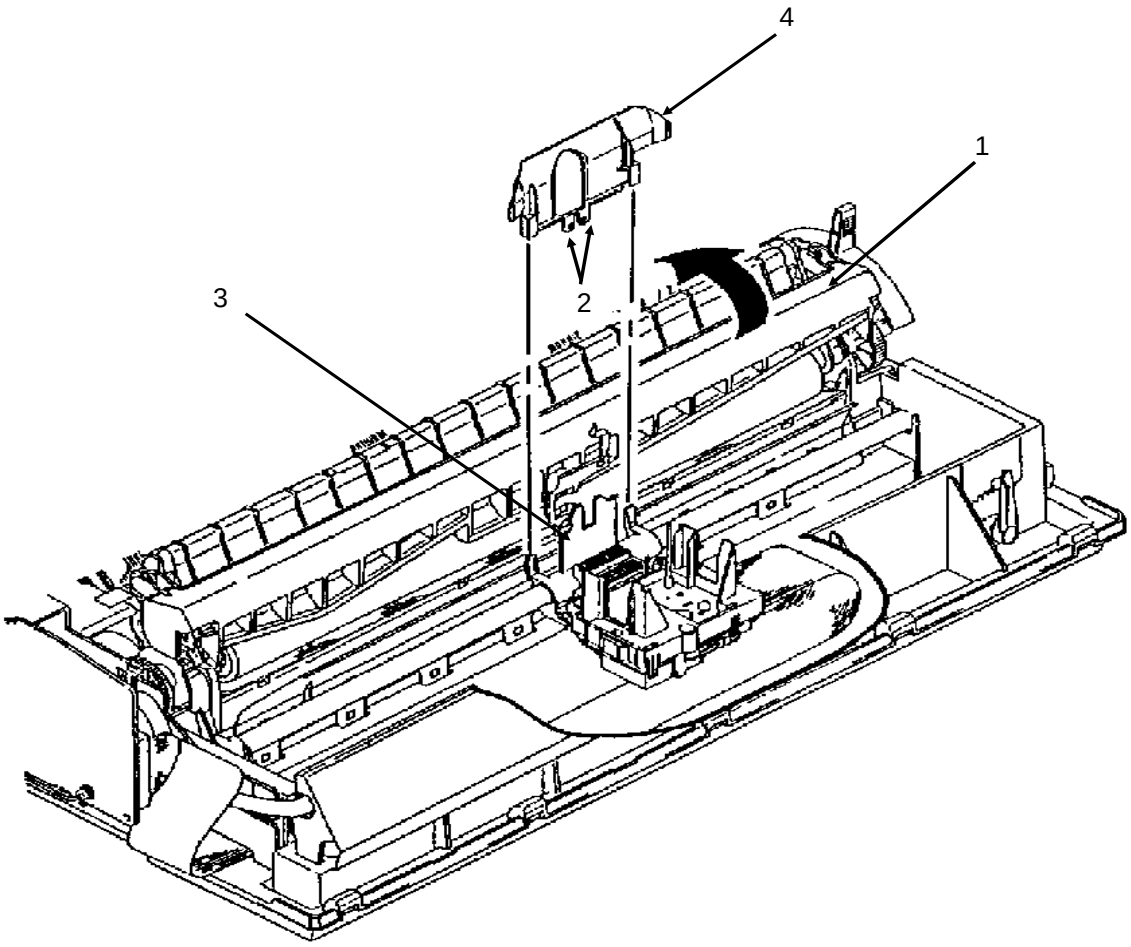
### 3.2.03 Ribbon Protector

**CAUTION**

*You MUST use a straight slot screwdriver to release the ribbon protector. If you attempt to lift the protector without releasing the tabs, the protector will break.*

1. Perform these procedures: 3.2.01, and 3.2.02.
2. Open the pull-up roller cover (1).
3. Use a straight-slot screwdriver to release the extensions (2) from the carriage frame set (3).
4. Lift the ribbon protector (4) straight up and remove it.

☐ P/N 53562801 Protector: Ribbon RSPL Both B.2.07




3-2-03.pcx

### 3.2.04 Gear Case Assembly

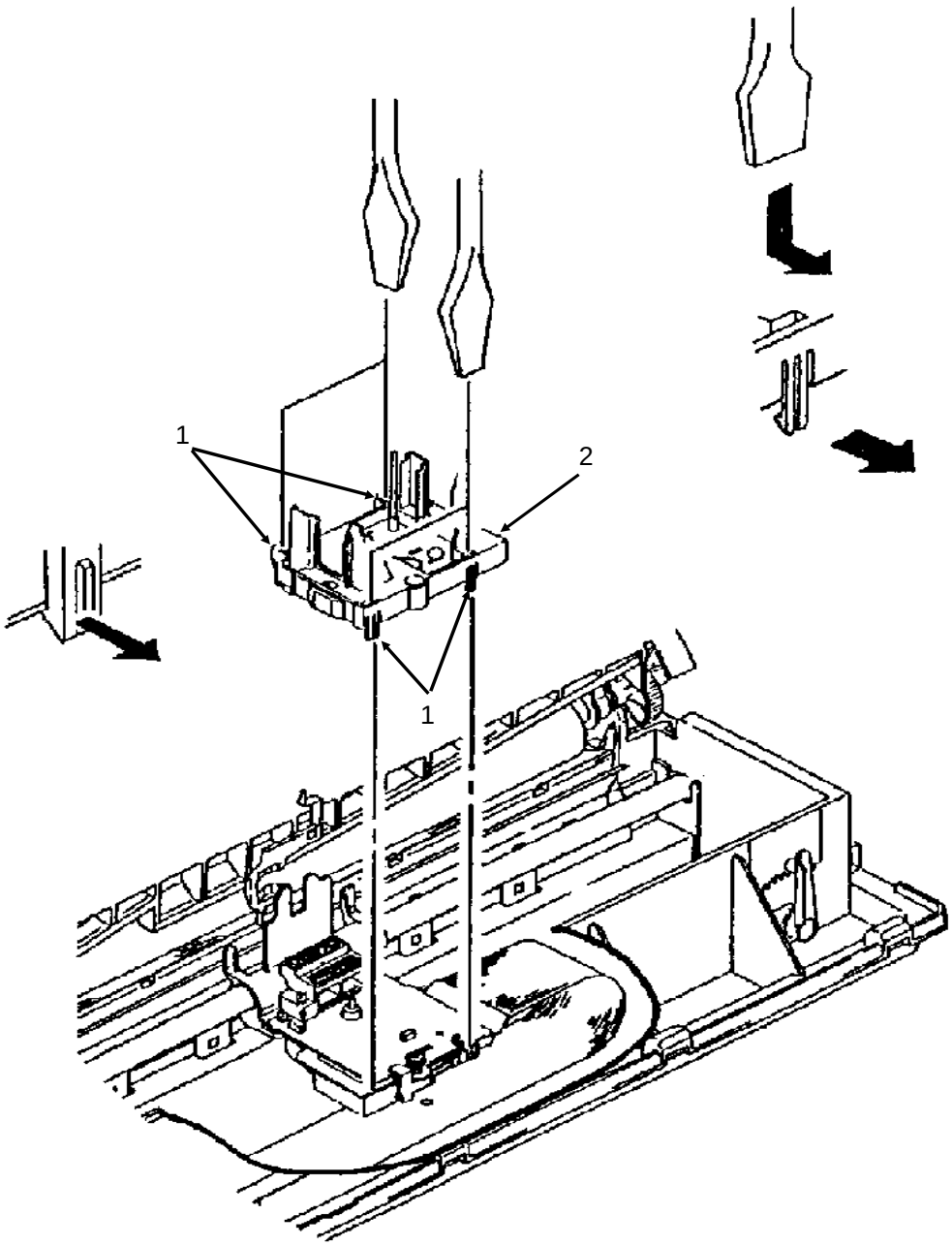
1. Perform these procedures: 3.2.01, and 3.2.02.
2. Use a straight-slot screwdriver to release the four claws (1) of the gear case assembly (2).
3. Lift and remove the gear case assembly.

*NOTE:*

*Lubrication*

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

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 51228501 | Gear: Case (Assembly) | RSPL | Both | B.2.07 |




3-2-04.pcx

### 3.2.05 Pull-up Roller Assembly

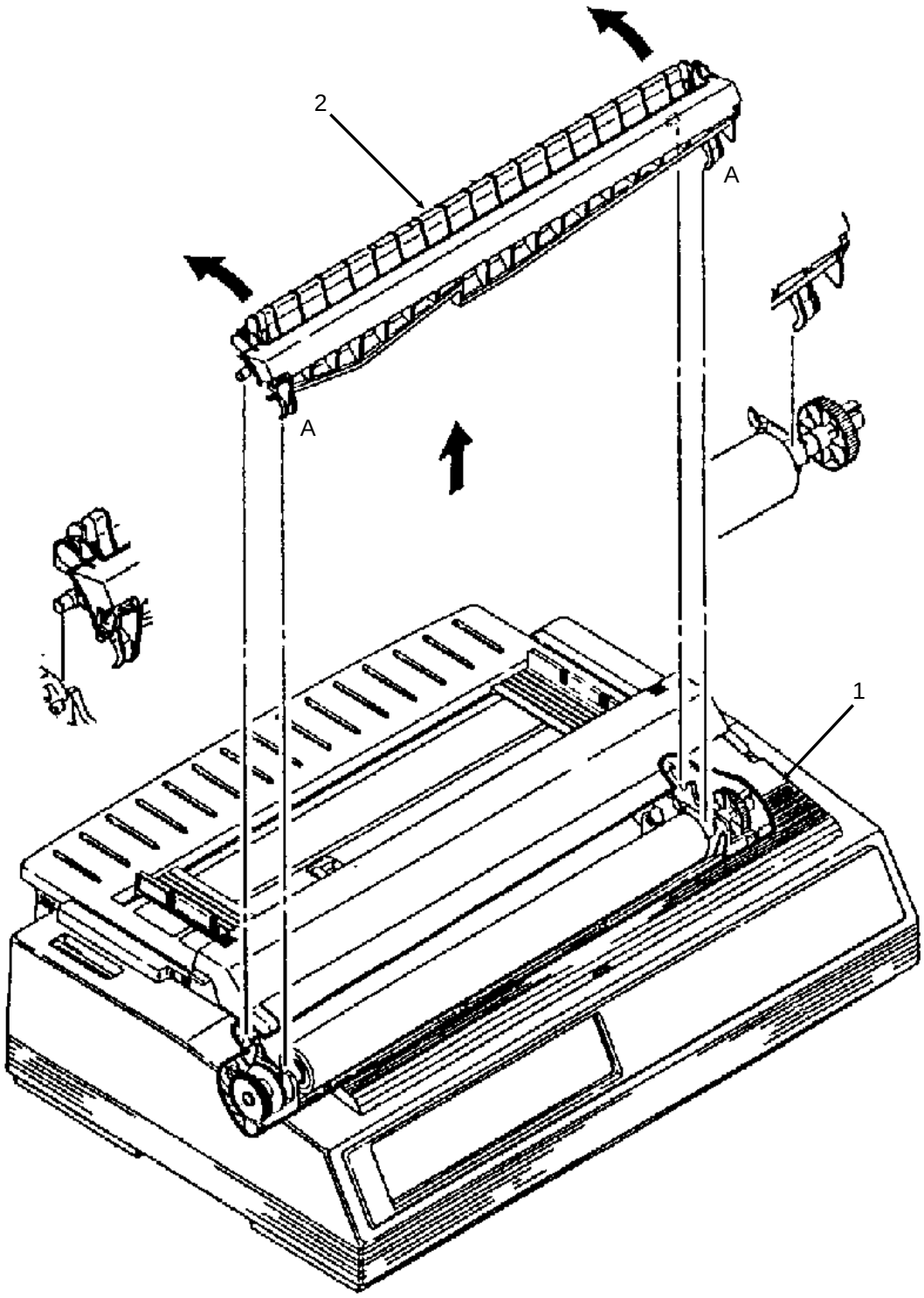
1. Perform this procedure: 3.2.01.
2. Open the access cover (1).
3. Open the cover of the pull-up roller assembly (2).
4. Press at A while rotating the assembly towards the back of the printer.
5. Remove the assembly.

*NOTE:*

*Lubrication*

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

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 53341501 (Narrow) | Roller: Pull Up Assembly | RSPL | 520 | B.2.05 |
| ☐ | P/N 53341601 | Roller: Pull Up Assembly (Wide) | RSPL | 521 | B.2.05 |




3-2-05.pcx

### 3.2.06 Upper Cover, Access Cover, and Sheet Guide Assemblies

1. Perform this procedure: 3.2.01.
2. Pull the platen knob (1) straight out and remove it.
3. Set the change lever (2) to the bottom feed position (toward the rear of the printer).
4. Insert a flat-blade screwdriver into the grooves (3) of the frame and pry the upper cover (4) away from the frame.
5. Raise the front side of the upper cover assembly.
6. Tilt the upper cover assembly toward the rear to disengage the claws (not shown) at the rear of the frame.
7. Lift the upper cover assembly and remove it.

**CAUTION:**

*Do not rotate the access cover past the vertical when removing it or you will break the tab extensions.*

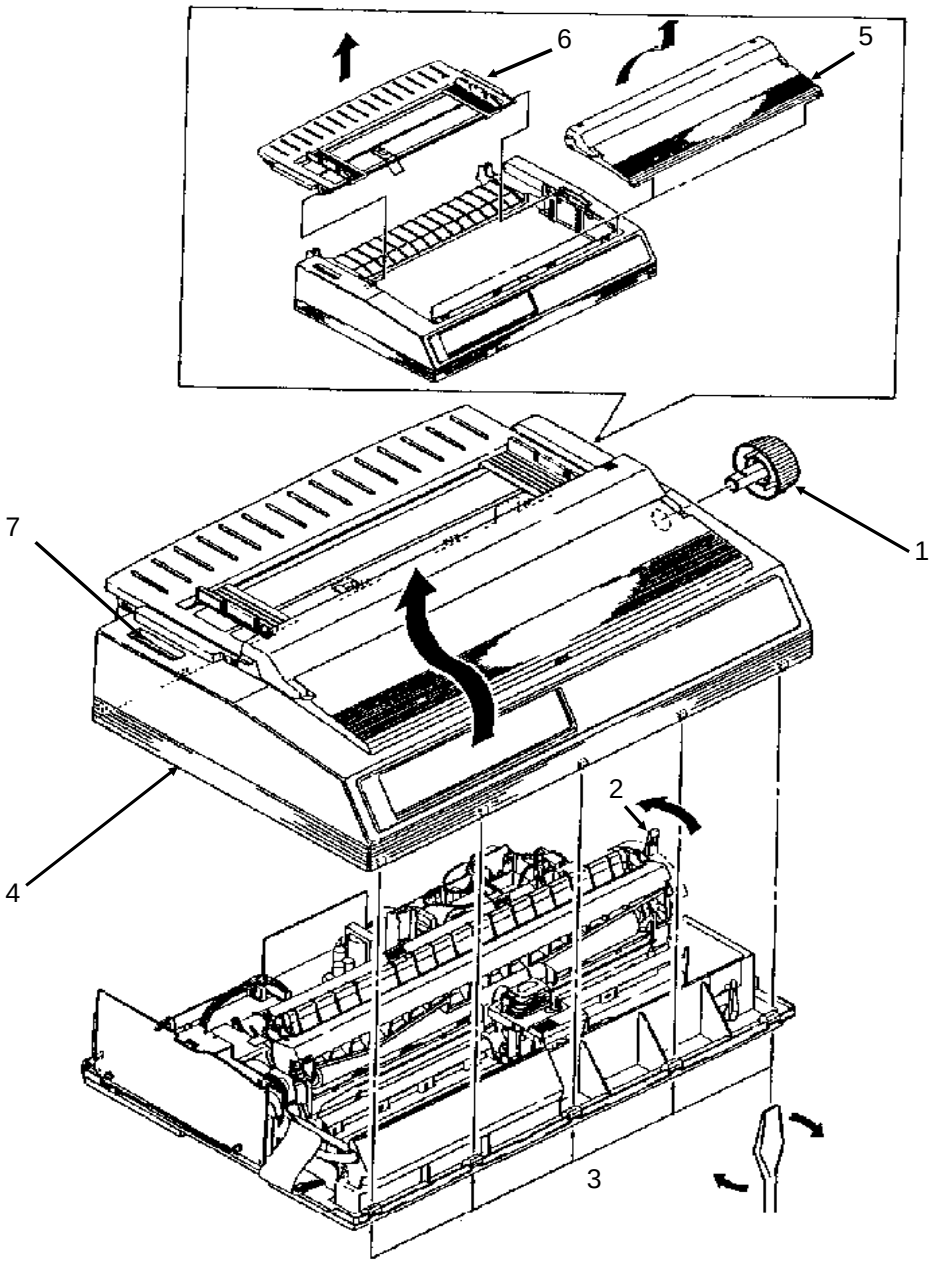
8. Raise the access cover assembly (5) until it is vertical, then lift it straight up to remove it.
9. Remove the sheet guide assembly (6).
10. Note the position of the cover (B) [for card slot] (7). This is part of the upper cover and should not be removed. No font cards are currently available.

**CAUTION:**

*When installing the upper cover, make sure that the sensors correctly contact the control board (3.2.07). The cut sheet/continuous sensor lever must be positioned below the BASW sensor. The lever should contact the sensor only when the change lever is in the top feed (middle) setting. If the lever is not correctly positioned, the ALARM lamp will light and the unit will not automatically load paper or receive data.*

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

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 51009401 | Guide: Sheet (Narrow) | RSPL | 520 | B.2.02 |
| ☐ | P/N 51009501 | Guide: Sheet (Wide) | RSPL | 521 | B.2.02 |
| ☐ | P/N 53066902 | Cover: Upper (Narrow) | RSPL | 520 | B.2.02 |
| ☐ | P/N 53067002 | Cover: Upper (Wide) | RSPL | 521 | B.2.02 |
| ☐ | P/N 53067101 | Cover: Access (Narrow) | RSPL | 520 | B.2.02 |
| ☐ | P/N 53067201 | Cover: Access (Wide) | RSPL | 521 | B.2.02 |
| ☐ | P/N 53067301 | Cover: (B) for card slot | RSPL | Both | B.2.03 |
| ☐ | P/N 53562601 | Knob: Platen (ML500 Series) | RSPL | Both | B.2.03 |




3-2-06.pcx

### 3.2.07 Control Board (FJIM)

1. Perform these procedures: 3.2.01, and 3.2.06.
2. Remove the two screws (1).
3. Release the control board (2) from the bracket (3).
4. Tilt the board to access the connectors.
5. Detach connectors CN6 - operator panel (4), CN7- carriage cable (5), CN3 - power supply (6), and CN5 - line feed motor (7).
6. Remove the board.

*NOTE:*

*Installation*

*The bottom sensor lever must be positioned in the SNS3 sensor (8).*

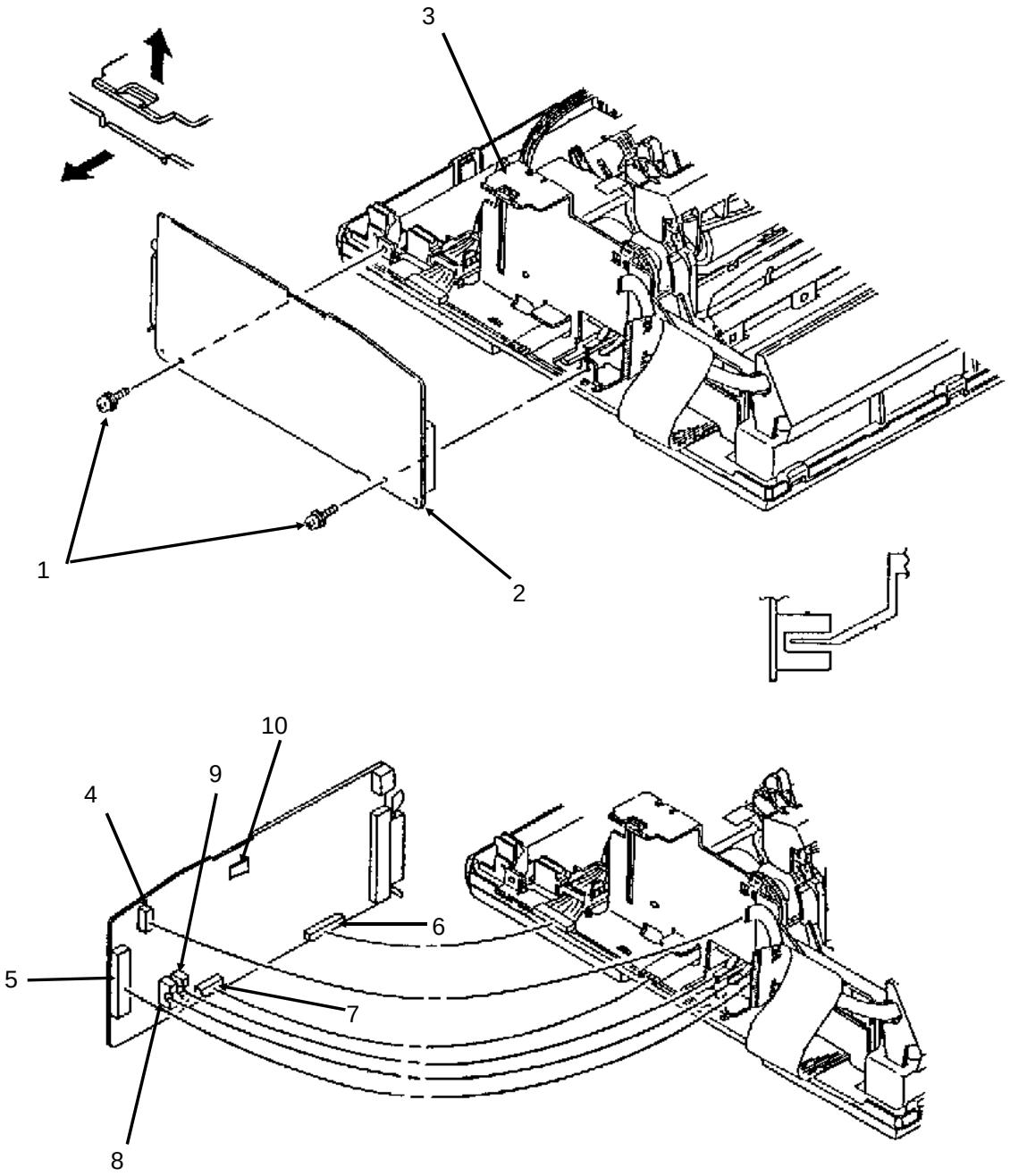
*The rear sensor lever must be positioned in the SNS1 sensor (9).*

*The cut sheet/continuous sensor lever must be positioned below the BASW sensor (10). The lever should contact the sensor only when the change lever is in the top feed (middle) setting.*

*If the lever is not correctly positioned, the ALARM lamp will light and the unit will not automatically load paper or receive data.*

*The IC: EEPROM is soldered in on the board.*

| | | | | |
|---|---|---|---|---|
| ☐ P/N 55072401 | PCB: FJIM (w/o ROM) | RSPL | Both | B.2.03 |
| ☐ P/N 55938301 | IC: EEPROM BR93CC46A | RSPL | Both | B.2.03 |




3-2-07.pcx

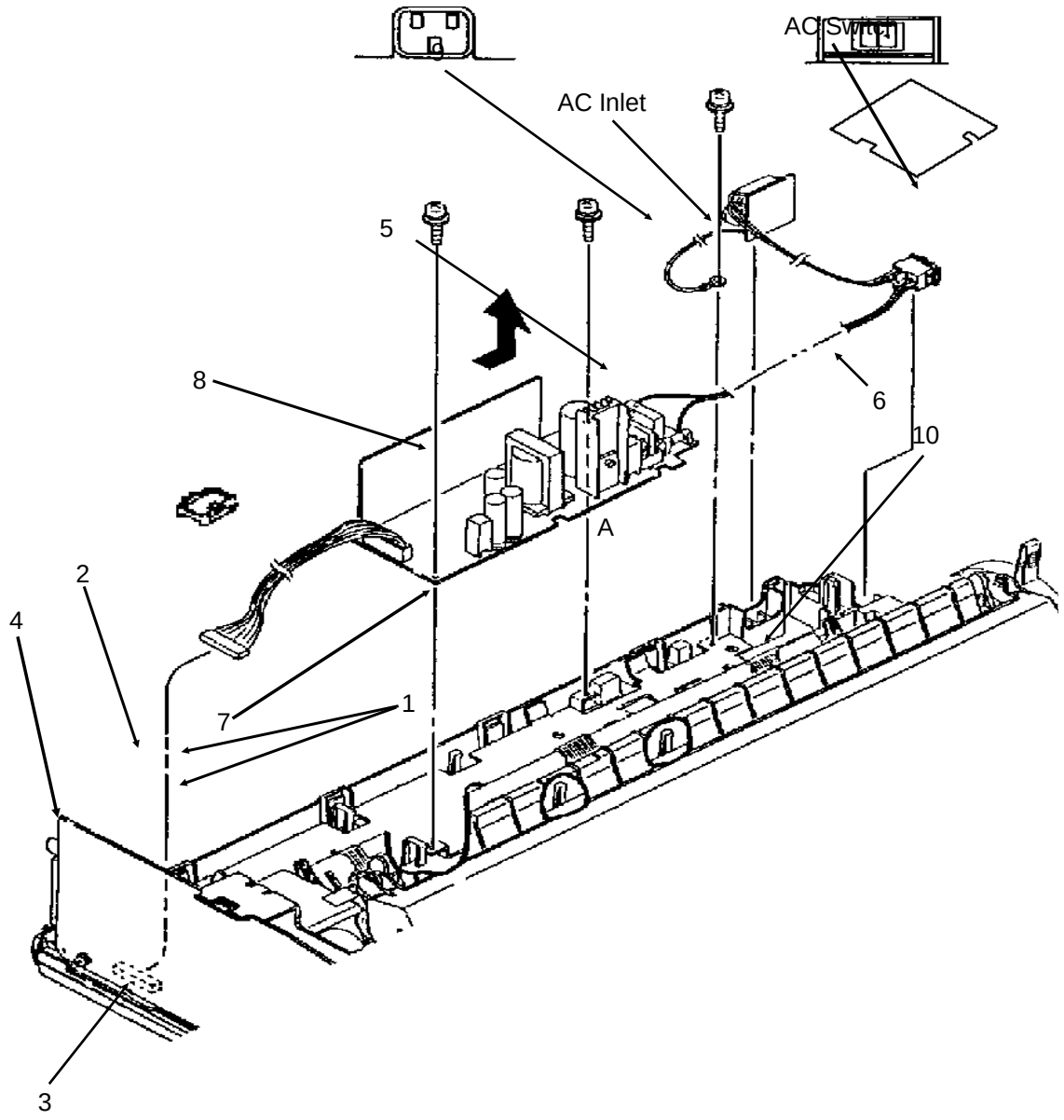
### 3.2.08 Power Supply Assembly

1. Perform these procedures: 3.2.01 and 3.2.06.
2. Use a straight slot screwdriver to detach the claws from both sides of the cable clamp (1).
3. Remove the cable clamp (2).
4. Detach the transformer cable from connector CN3 (3) of the control board (4).
5. Detach the cable from the connector (5) of the filter board (6).
6. Use a straight slot screwdriver to free the transformer from the holding clamp (A), position the screwdriver in the direction of the arrow (7) twist the screwdriver while pushing the transformer (8) towards the control board .
7. Lift and remove the transformer assembly.
8. Remove the screw (9) from the ground wire of the filter board.
9. Use a straight slot screwdriver to detach the claw (10), tilt the filter baord upward, then work the AC inlet and the AC switch free.
10. Lift and remove the filter board assembly.

*NOTE:*

*When installing, verify that the AC inlet and AC switch are oriented correctly.*

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 56412401 | Transformer: 120 V ML520 | RSPL | 520 | B.2.03 |
| ☐ | P/N 56412402 | Transformer: 120 V ML521 | RSPL | 521 | B.2.03 |
| ☐ | P/N 55073201 | PCB: Filter 120 V | RSPL | Both | B.2.03 |
| ☐ | P/N 50707501 | Clamp: Cord | RSPL | Both | B.2.03 |
| ☐ | P/N 56306201 | Fuse: 1A 250V (Filter Brd 220V) | Option RSPL | Both | B.2.03 |
| ☐ | P/N 56306101 | Fuse: 2.5A 125V (Filter Board) | RSPL | Both | B.2.03 |

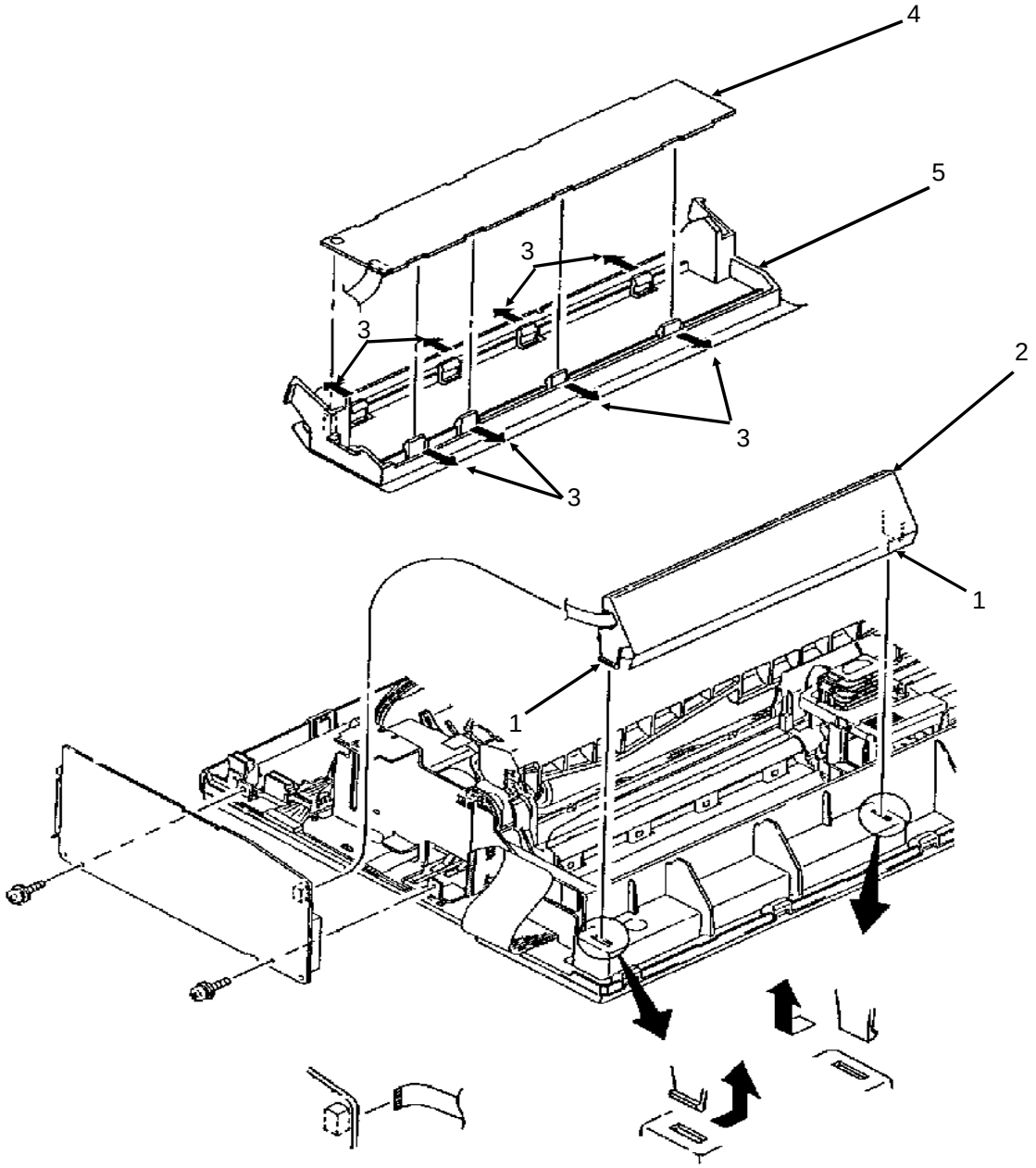



3-2-08.pcx

### 3.2.09 Operator Panel PCB (LEOP)

1. Perform these procedures: 3.2.01, 3.2.06. and 3.2.07.
2. Cut the nylon tie and release the cable. *(Not shown)*
3. Disengage the claws (1) on both sides of the frame.
4. Lift the operator panel assembly (2) straight up and remove it.
5. Open eight claws (3) and remove the operator panel board (4) from the operator panel (5).

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 53562703 | Panel: Operator | RSPL | Both | B.2.03 |
| ☐ | P/N 55937502 | PCB: LEOP (Operator Panel) | RSPL | Both | B.2.03 |




3-2-09.pcx

### 3.2.10 PC Connector

1. Perform these procedures: 3.2.01, 3.2.02, and 3.2.04.
2. Remove the two screws (1) and the connector holders. The holders are not shown.
3. Remove the PC connector (2).

*NOTE:*

*Installation*

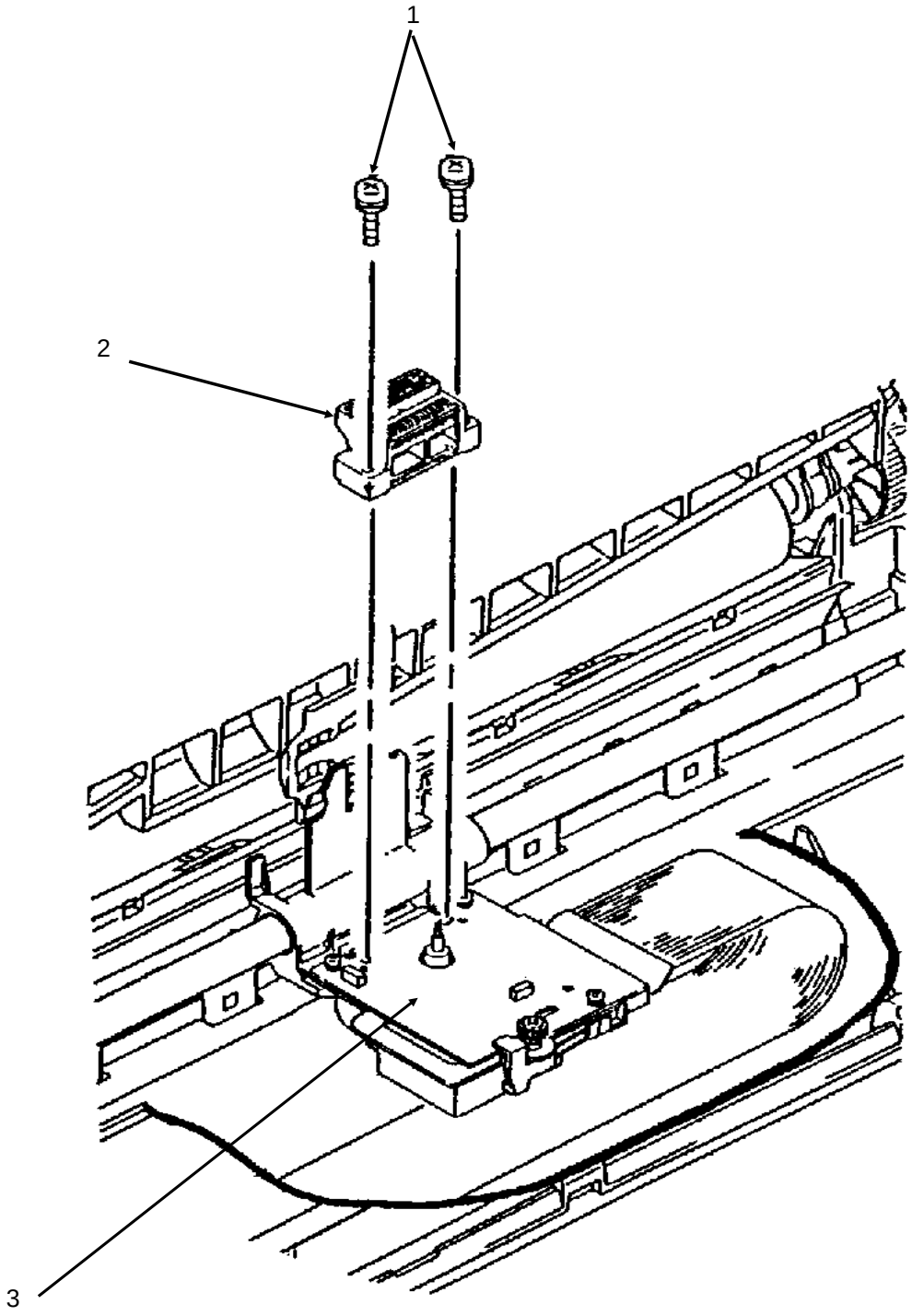
*Do not touch the contacts of the PC connector.*

*Do not touch the contacts of the space motor (3).*

*Cleaning*

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

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 56729601 | Connector: PC HD40 | RSPL | Both | B.2.07 |




3-2-10.pcx

### 3.2.11 Space Motor and Roller Guide Assemblies

1. Perform these procedures: 3.2.01, 3.2.02, 3.2.04, and 3.2.10.
2. Remove the three screws (1).
3. Lift the space motor assembly (2).
4. Remove the left (3) and right connector holders (4).
5. Remove the roller guide assembly (5) and guide roller spring (6).
6. Use firm pressure to pull the carriage cable (7) out to detach the cable from the space motor assembly.
7. Remove the space motor assembly.

*NOTE:*

*The guide roller assembly includes the guide roller (8), the guide roller holder (9), and the pin (10).*

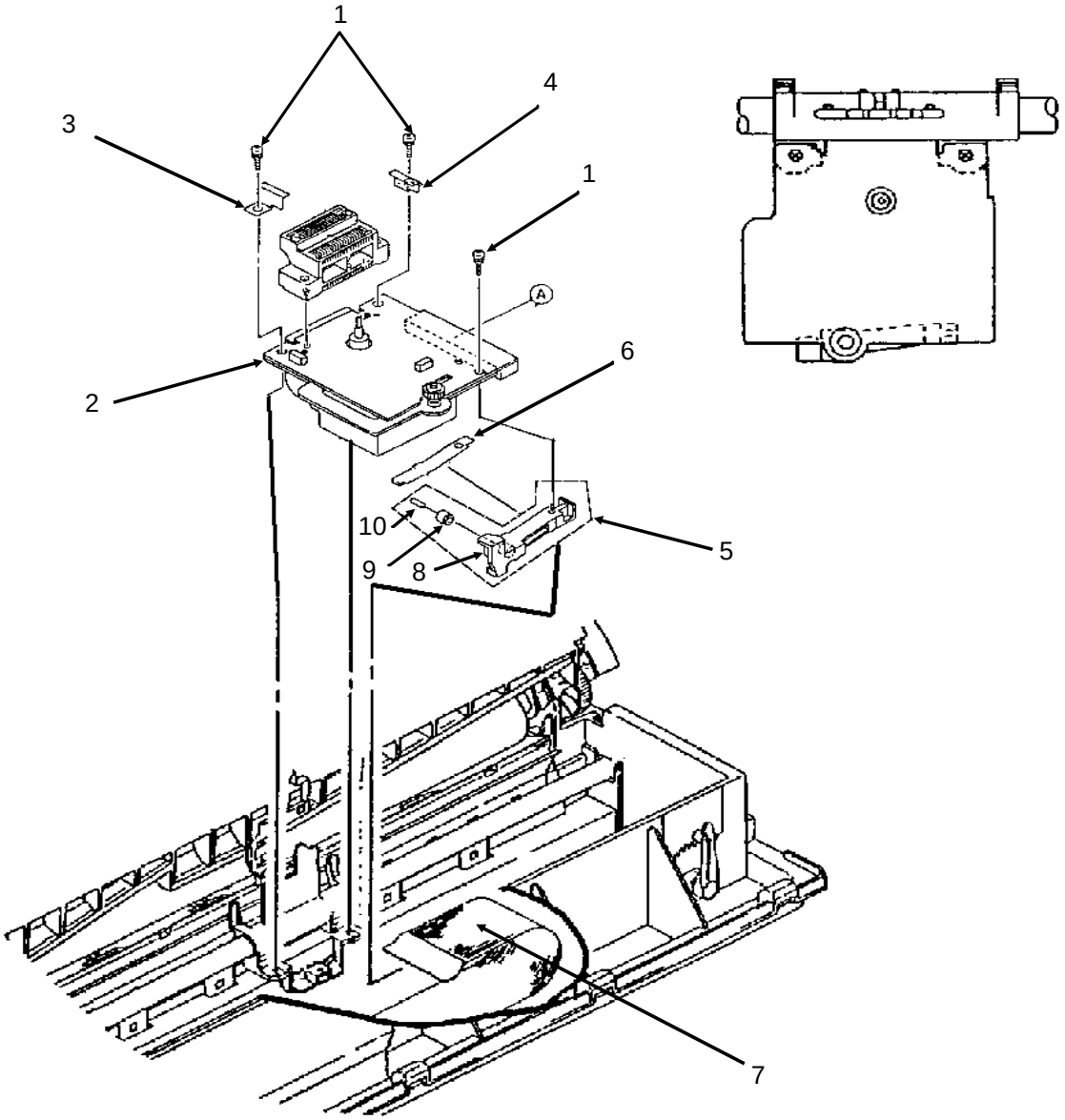
*Installation: Position the guide roller assembly first.*

*The contact side of the 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.*

*After installing the space motor assembly, check the printhead gap adjustment. Refer to Section 3.3 of this Service Handbook.*

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

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 53343001 | Holder: Connector (L) | RSPL | Both | B.2.07 |
| ☐ | P/N 53343101 | Holder: Connector (R) | RSPL | Both | B.2.07 |
| ☐ | P/N 56510401 | Motor: Space Assembly | RSPL | Both | B.2.07 |
| ☐ | P/N 53343301 | Guide: Roller Assembly | | Both | B.2.07 |
| ☐ | P/N 53341901 | Roller: Guide | RSPL | Both | B.2.07 |
| ☐ | P/N 53342001 | Holder: Guide Roller | RSPL | Both | B.2.07 |
| ☐ | P/N N/A | Pin | | Both | B.2.07 |
| ☐ | P/N N/A | Guide Roller Spring | | Both | B.2.07 |




3-2-11.pcx

### 3.2.12 Carriage Cable

1. Perform these procedures: 3.2.01, 3.2.06, 3.2.07, and 3.2.11.
2. Slightly bow the carriage cable (1) to release it from the claws (2) and the projection on the main frame (3).
3. Remove the carriage cable guide (4).
4. Remove the carriage cable.

*NOTE:*

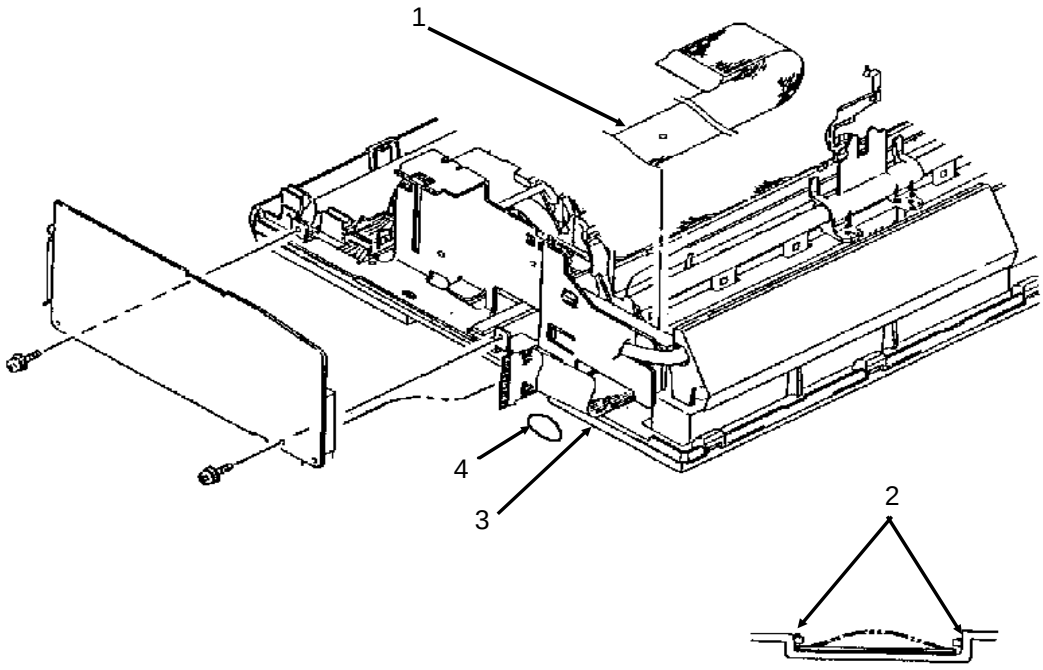
*Installation*

*The contacts on the cable face up when the cable is positioned on the main frame.*

*The cable end with the 45° angled contacts connects to the gear case assembly.*

*Do NOT sharply bend the carriage cable. You will slightly bow the cable to position it under the claws and over the projection.*

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 56627301 | Cable: Carriage (Narrow) | RSPL | 520 | B.2.07 |
| ☐ | P/N 56627302 | Cable: Carriage (Wide) | RSPL | 521 | B.2.07 |




3-2-12.pcx

### 3.2.13 Space Rack

1. Perform these procedures: 3.2.01, 3.2.02, 3.2.04, 3.2.10, and 3.2.11.
2. Remove the spring (1).
3. Disengage the claws (2) on the both ends of the space rack (3).
4. Pull the space rack straight up and remove it.

*NOTE:*

*Installation*

*After installing the space rack, check the printhead gap adjustment. Refer to Section 3.3 of this Service Handbook.*

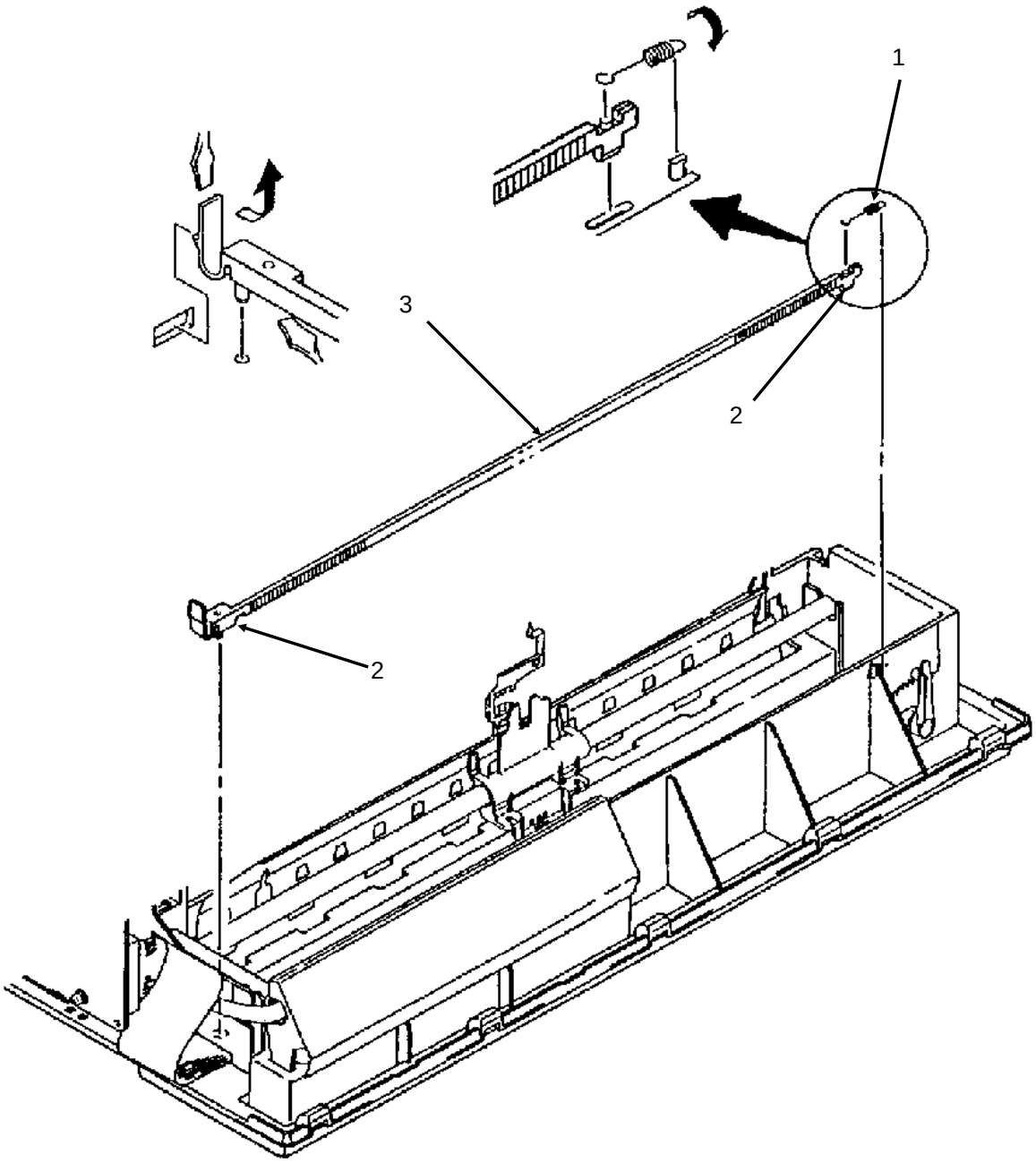
*Cleaning*

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

**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.*

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 50923501 | Spring: Tension (Space Rack) | RSPL | Both | B.2.04 |
| ☐ | P/N 53563301 | Rack: Space (Narrow) | RSPL | 520 | B.2.04 |
| ☐ | P/N 53563401 | Rack: Space (Wide) | RSPL | 521 | B.2.04 |




3-2-13.pcx

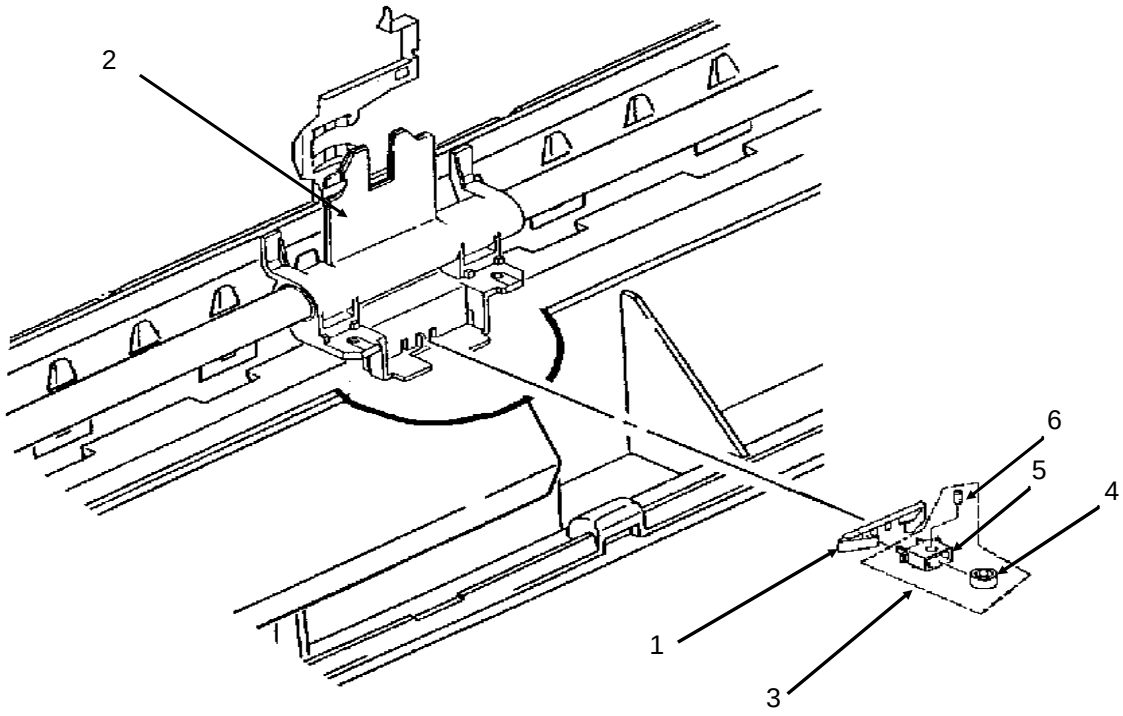
### 3.2.14 Roller/Holder Backup Assembly

1. Perform these procedures: 3.2.01, 3.2.02, 3.2.04, 3.2.10, and 3.2.11.
2. Use a small straight slot screwdriver to disengage the claws of the backup roller holder spring (1) from the carriage frame (2).
3. Remove the roller/holder backup assembly (3).

*NOTE:*

*The roller/holder backup assembly includes the backup roller (4), the backup roller holder (5), and the pin (6).*

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 53343201 | Assembly: Roller/Holder Backup | | Both | B.2.07 |
| ☐ | P/N 53341701 | Roller: Back Up | RSPL | Both | B.2.07 |
| ☐ | P/N 53341801 | Holder: Back Up Roller | RSPL | Both | B.2.07 |
| ☐ | P/N N/A | Pin | | Both | B.2.07 |
| ☐ | P/N 50925001 | Backup Roller Holder Spring | | Both | B.2.07 |




3-2-14.pcx

### 3.2.15 Guide Rail and Adjust Cam

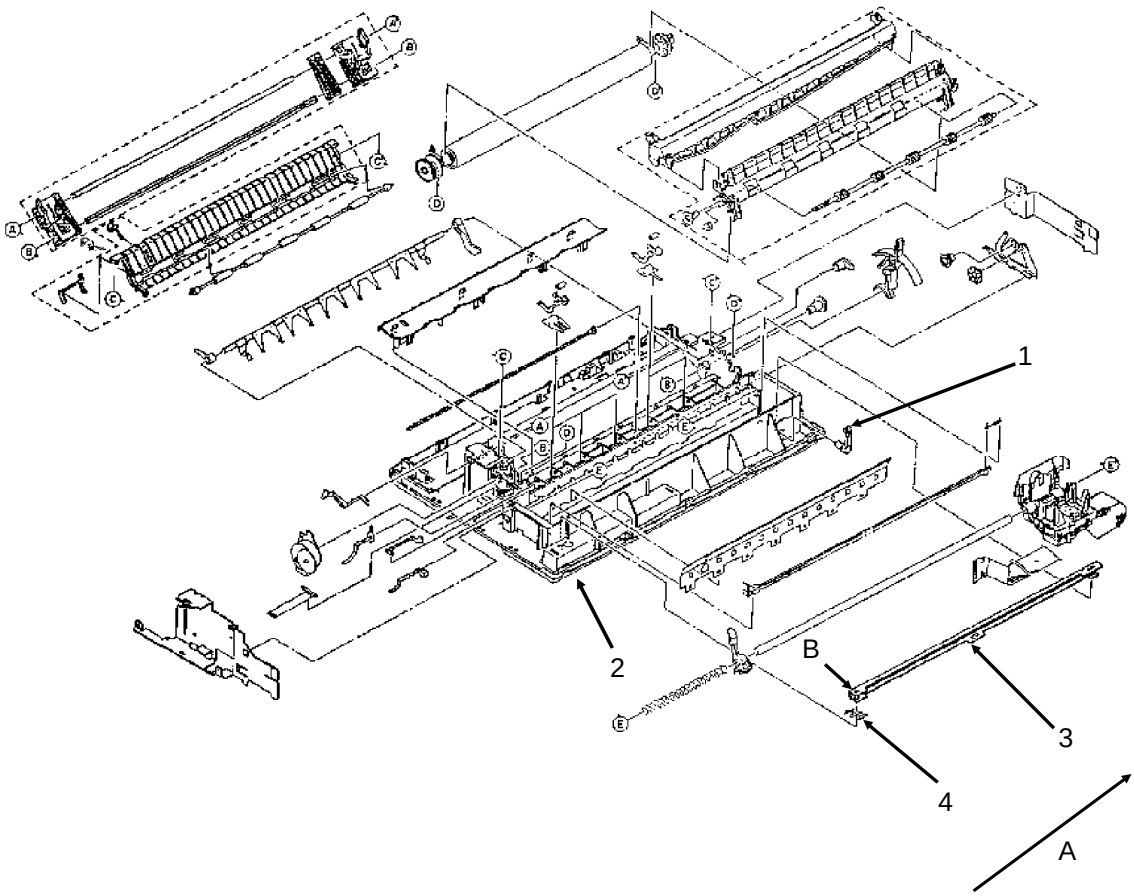
1. Perform these procedures: 3.2.01, 3.2.02, 3.2.04, 3.2.10, 3.2.11, and 3.2.14.
2. Rotate the adjust cam (1) in the direction of arrow A as far as possible.
3. Pull the cam out and remove it.
4. Carefully press the claw (2 *location only*) in the base frame down to release the guide rail (3). Do not press too hard or the claw will break.
5. Use a straight slot screwdriver to slide the guide rail in direction of arrow A.
6. Lift the guide at position B and work the other end of the guide free to remove the guide rail.
7. Remove the ground clip (4)

*NOTE:*

*Installation*

*After installing the guide rail, check the printhead gap adjustment. Refer to Section 3.3 of this Service Handbook.*

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 51009701 | Guide: Rail Ground Clip | RSPL | Both | B.2.04 |
| ☐ | P/N 51009801 | Guide: Rail (Narrow) | RSPL | 520 | B.2.04 |
| ☐ | P/N 51009901 | Guide: Rail (Wide) | RSPL | 521 | B.2.04 |
| ☐ | P/N 53067701 | Cam: Adjust | RSPL | Both | B.2.04 |

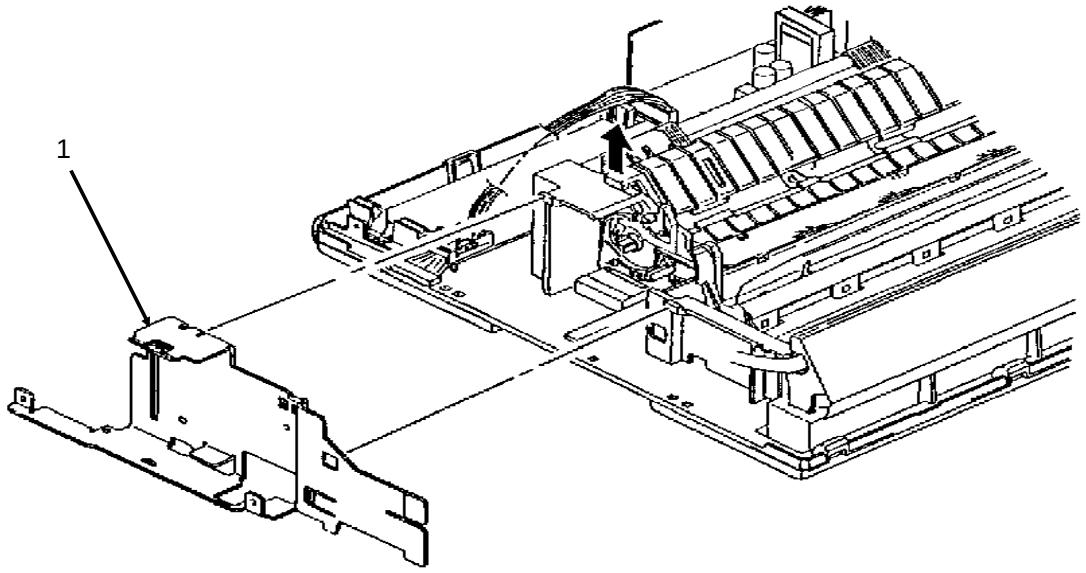



3-2-15.pcx

### 3.2.16 Left Ground Plate

1. Perform these procedures: 3.2.01, 3.2.06, and 3.2.07.
2. Cut the nylon tie and release the cable. (Not shown).
3. Work the left ground plate (1) up, and then out, to remove it.

| | | | | |
|---|---|---|---|---|
| ☐ P/N 51010301 | Plate: Left Ground | RSPL | Both | B.2.04 |




3-2-16.pcx

### 3.2.17 Right Ground Plate

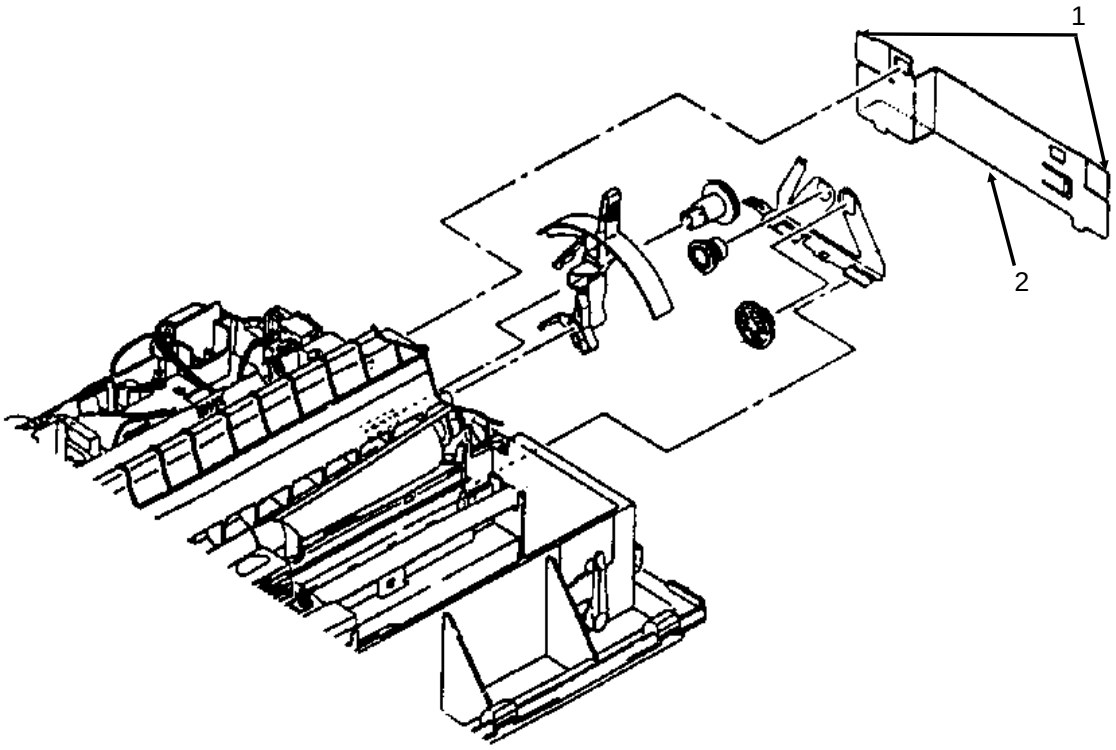
1. Perform these procedures: 3.2.01, and 3.2.06.
2. Pull the top tabs (1) of the right ground plate (2) out to free the plate from the claws of the base frame. You may have to use a screwdriver to work the plate tabs free.
3. Lift the plate and remove it.

*NOTE:*

*Installation*

*The plate must be securely seated under the claws.*

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 51010201 | Plate: Right Ground | RSPL | Both | B.2.05 |

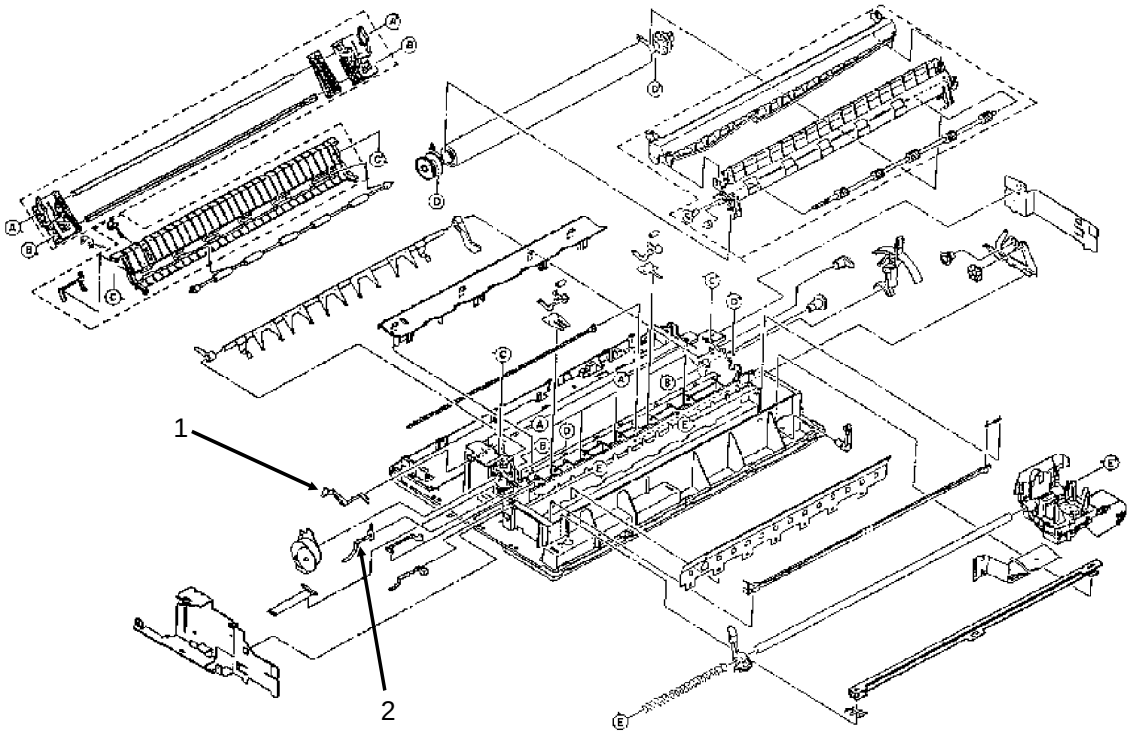



3-2-17.pcx

### 3.2.18 Rear and Cut Sheet Paper Feed Sensor Levers

1. Perform these procedures: 3.2.01, 3.2.06, 3.2.07, 3.2.16, and 3.2.20.
2. Turn the cut sheet/continuous feed paper sensor lever (1) until the flag is at the top, then work the lever free.
3. Remove the lever.
4. Turn the rear feed paper sensor lever (2) until the flag is at the top, then work the lever free.
5. Remove the lever.

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 50804902 | Lever: Sensor Cut Sheet/Continuous | RSPL | Both | B.2.04 |
| ☐ | P/N 50804801 | Lever: Rear Sensor | RSPL | Both | B.2.04 |




3-2-15.pcx

### 3.2.19 Platen Assembly

1. Perform these procedures: 3.2.01, and 3.2.06.
2. Move the change lever (1) to the bottom feed position (to the rear of the printer).
3. Push the lock levers (2) in, then rotate them towards the front to unlock them from the frame.
4. The levers should be vertical.
5. Lift the platen assembly (3) straight up and remove it.

*NOTE:*

*Installation*

*After installing the platen assembly, check the printhead gap adjustment. Refer to Section 3.3 of this Service Handbook.*

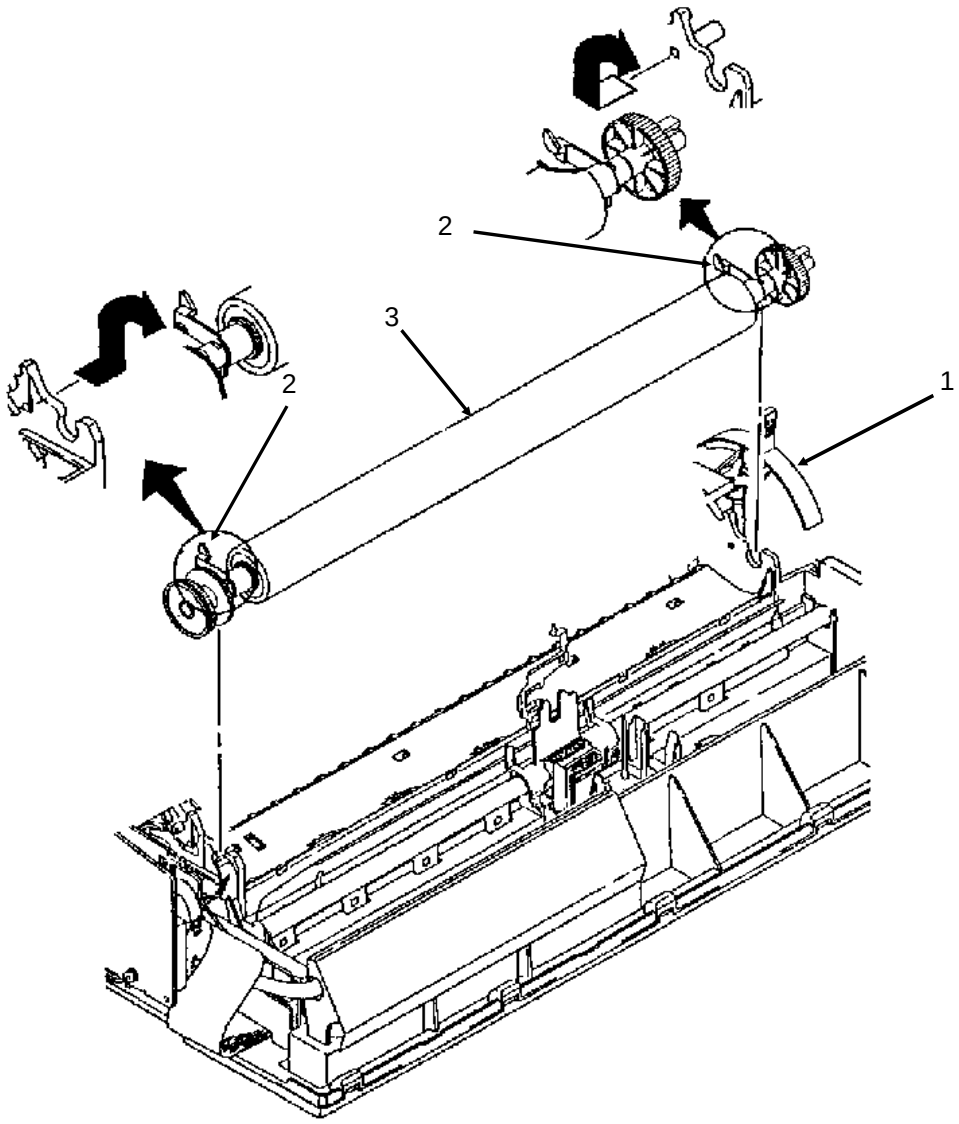
*Cleaning*

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

*Lubrication*

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

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 50098301 | Platen Assembly (Narrow) | RSPL | 520 | B.2.05 |
| ☐ | P/N 50098302 | Platen Assembly (Wide) | RSPL | 521 | B.2.05 |




3-2-19.pcx

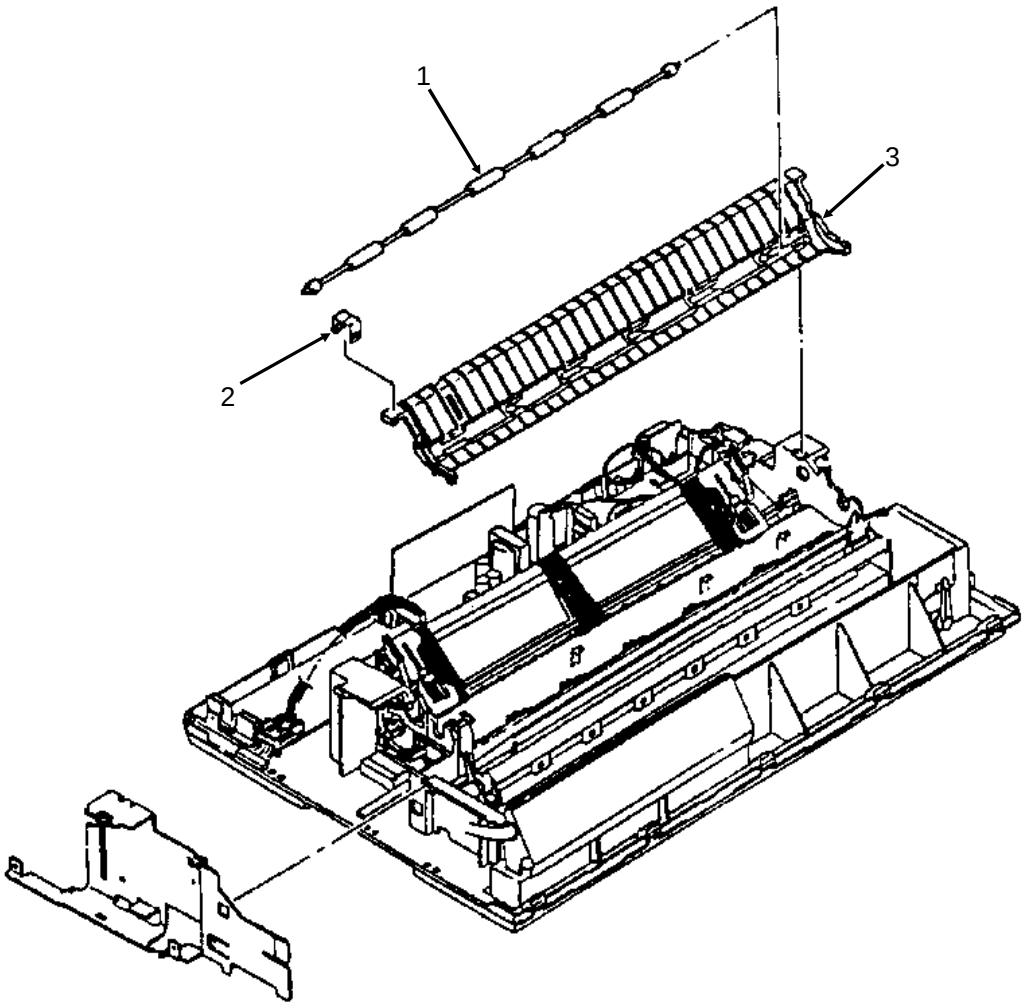
### 3.2.20 Paper Chute Assembly

1. Perform these procedures: 3.2.01, 3.2.06, and 3.2.19.
2. Remove the rear pressure roller (1).
3. Use a straight slot screwdriver to release the claws of the lock spring (2) and remove the spring.
4. Remove the paper chute assembly (3).

*NOTE:*

*The paper chute assembly includes the levers for the rear and top paper feed paths.*

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 53341301 | Roller: Pressure Rear (Narrow) | RSPL | 520 | B.2.06 |
| ☐ | P/N 53341401 | Roller: Pressure Rear (Wide) | RSPL | 521 | B.2.06 |
| ☐ | P/N 50924701 | Spring: Lock | RSPL | Both | B.2.06 |
| ☐ | P/N 50097701 | Paper Chute Assembly N | RSPL | 520 | B.2.06 |
| ☐ | P/N 50097801 | Paper Chute Assembly W | RSPL | 521 | B.2.06 |




3-2-15.pcx

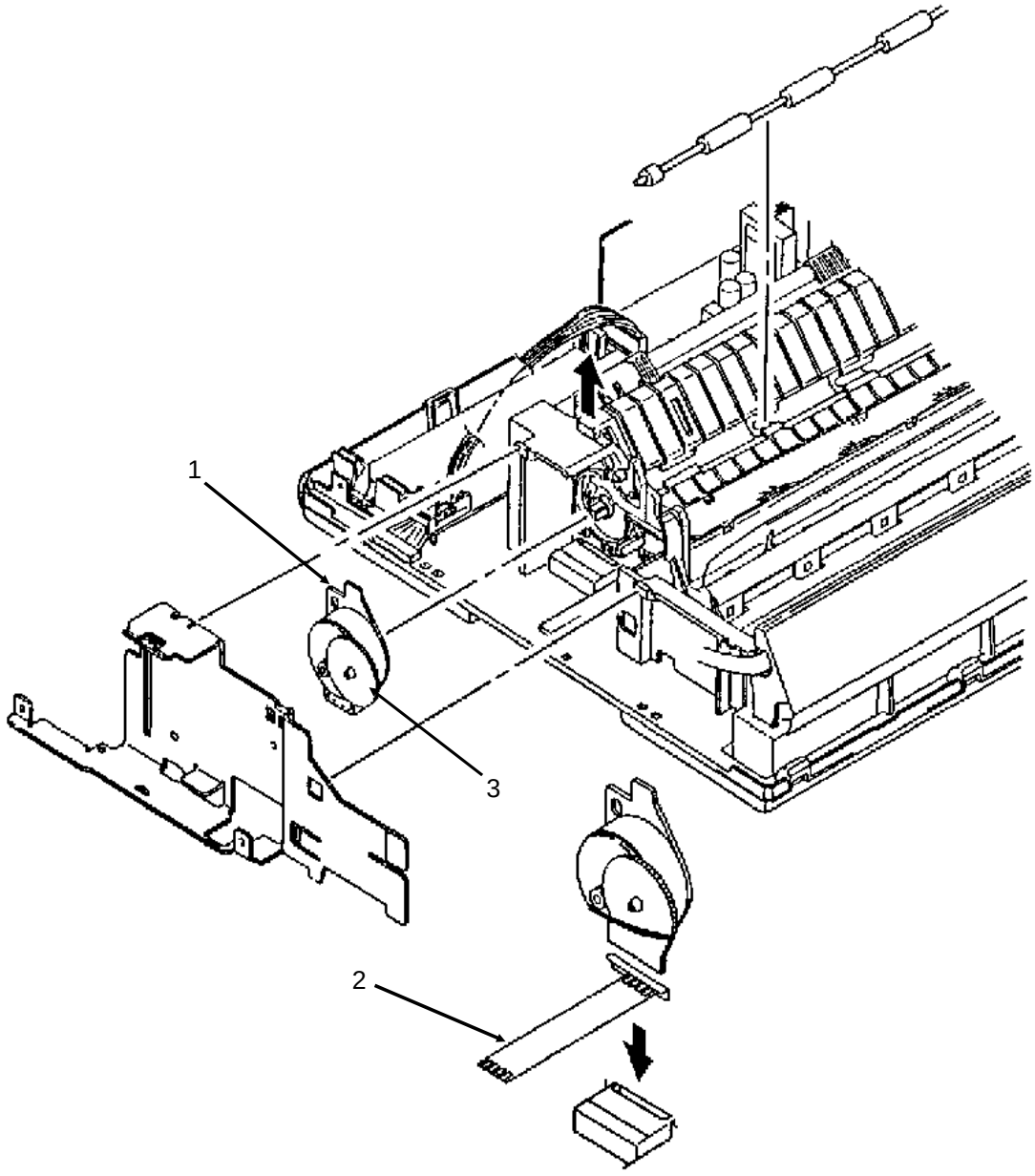
### 3.2.21 Line Feed Motor Assembly

1. Perform these procedures: 3.2.01, 3.2.06, 3.2.07, 3.2.16, 3.2.19, 3.2.20, and 3.2.21.
2. Firmly press down on the line feed motor assembly (1) while tilting the assembly out.
3. Remove the line feed motor assembly.
4. Remove the line feed connection cord (2).

**CAUTION:**

*The line feed idle gear (3) should be removed only if it must be replaced. The claws will break when the gear is removed. A new gear must be installed.*

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 51228401 | Gear: Line Feed Idle | RSPL | Both | B.2.04 |
| ☐ | P/N 56510301 | Motor: Line Feed (Assembly) | RSPL | Both | B.2.04 |
| ☐ | P/N 56627201 | Cord: Connection Line Feed | RSPL | Both | B.2.04 |




3-2-21.pcx

### 3.2.22 Reset Spring

**CAUTION:**

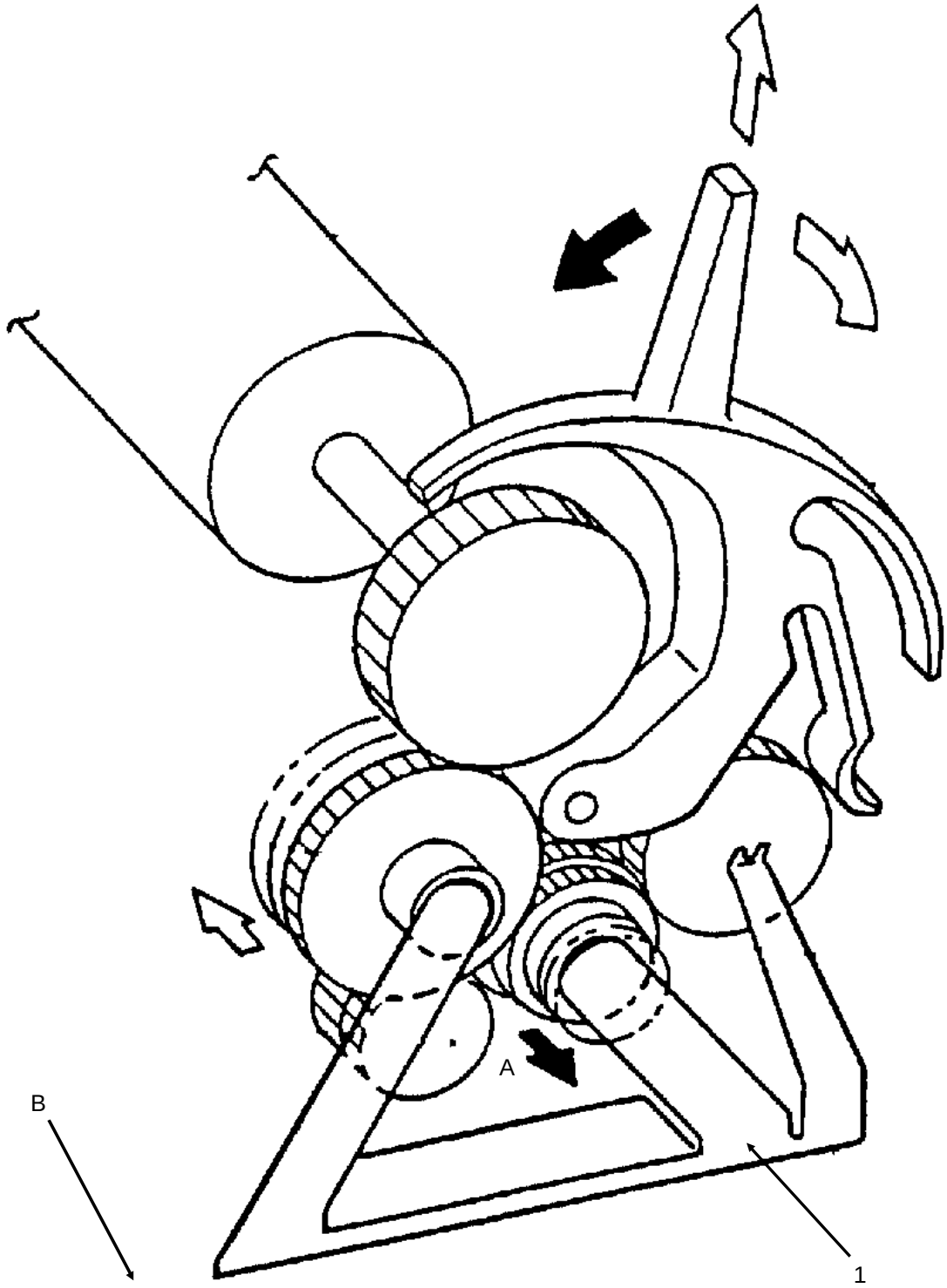
*Please read through this entire procedure before performing it.*

*Do not press against the vertical extensions of the reset spring at any time during this procedure.*

*Firm pressure will release the spring, not brute force.*

1. Perform these procedures: 3.2.01, 3.2.06, and 3.2.17.
2. Place the right side of the unit over the edge of your work surface. You must be able to access the bottom of the unit. You will be working underneath and above the reset spring (1) at the same time.
3. Reach from underneath the unit and press up at the extension (A) to free the spring from the claw.
4. While pressing up, slide the spring out (in the direction of Arrow B) and remove it.

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 50923201 | Spring: Reset | RSPL | Both | B.2.05 |




3-2-22.pcx

### 3.2.23 Idle Gear and Change Lever

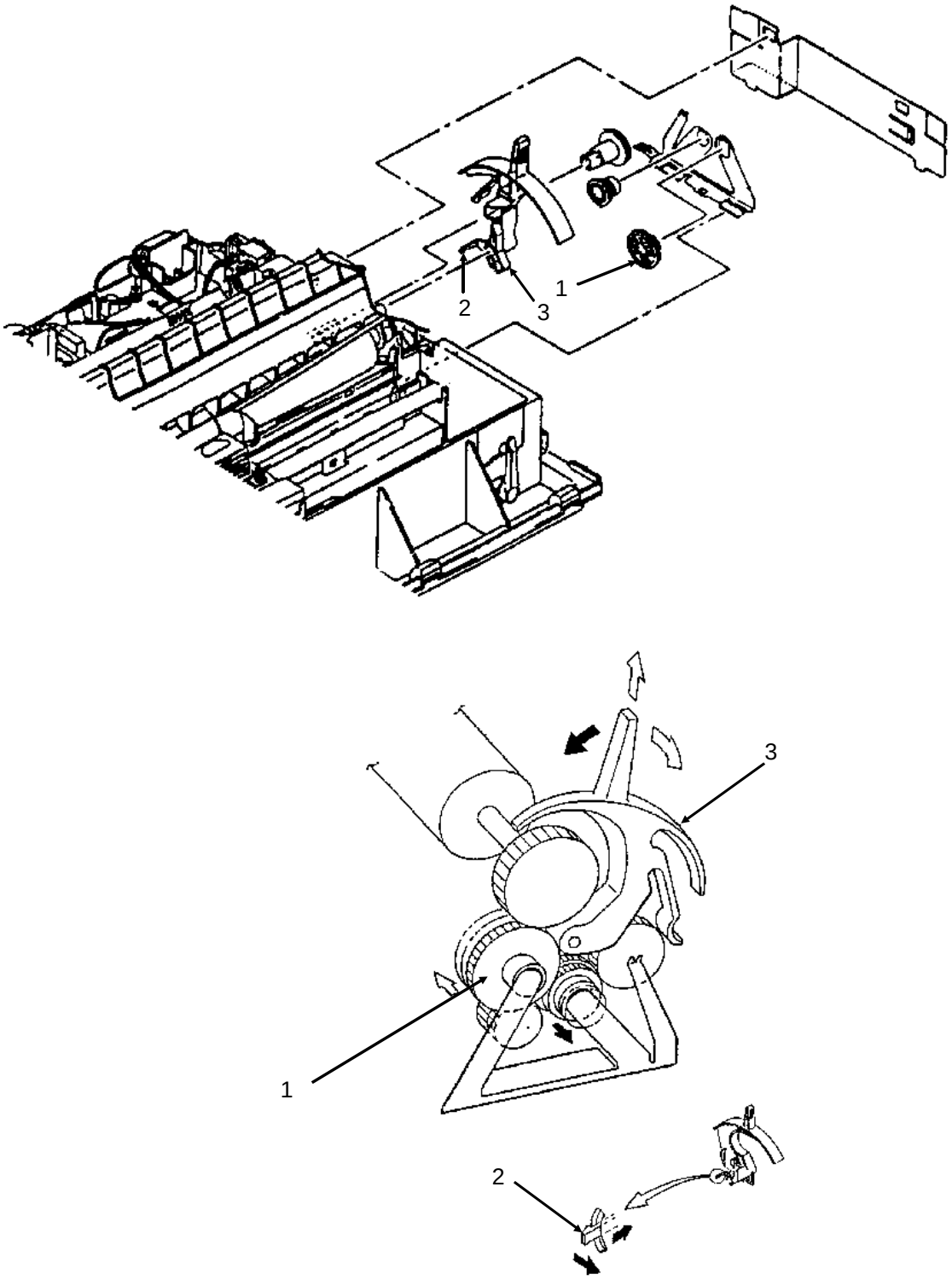
1. Perform these procedures: 3.2.01, 3.2.06, 3.2.07, 3.2.16, 3.2.17, 3.2.19, 3.2.20, and 3.2.22.
2. Remove the idle gear (1). The idle gear is a large narrow gear.
3. Release the claw (2) of the change lever (3). The claw is accessed from inside the unit.
4. Remove the change lever.

*NOTE:*

*Lubrication*

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

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 50805101 | Lever: Change | RSPL | Both | B.2.05 |
| ☐ | P/N 51228201 | Gear: Idle | RSPL | Both | B.2.05 |




3-2-23.pcx

### 3.2.24 Pressure Spring

1. Perform these procedures: 3.2.01, 3.2.06, 3.2.07, 3.2.16, 3.2.17, 3.2.19, 3.2.20, 3.2.22, and 3.2.23.
2. Turn the front release gear arm (1) until it is disengaged.
3. Remove the release cam (2). This is the medium size, thick cam.
4. Work the end of the pressure spring (3) free and remove the spring.
5. Remove the front release gear arm. This arm is long, with a serrated edge.
6. Remove the switch lever (4). This is the small lever.

*NOTE:*

*Installation*

*Install the release cam first.*

*Then, install one end of the pressure spring into the release cam.*

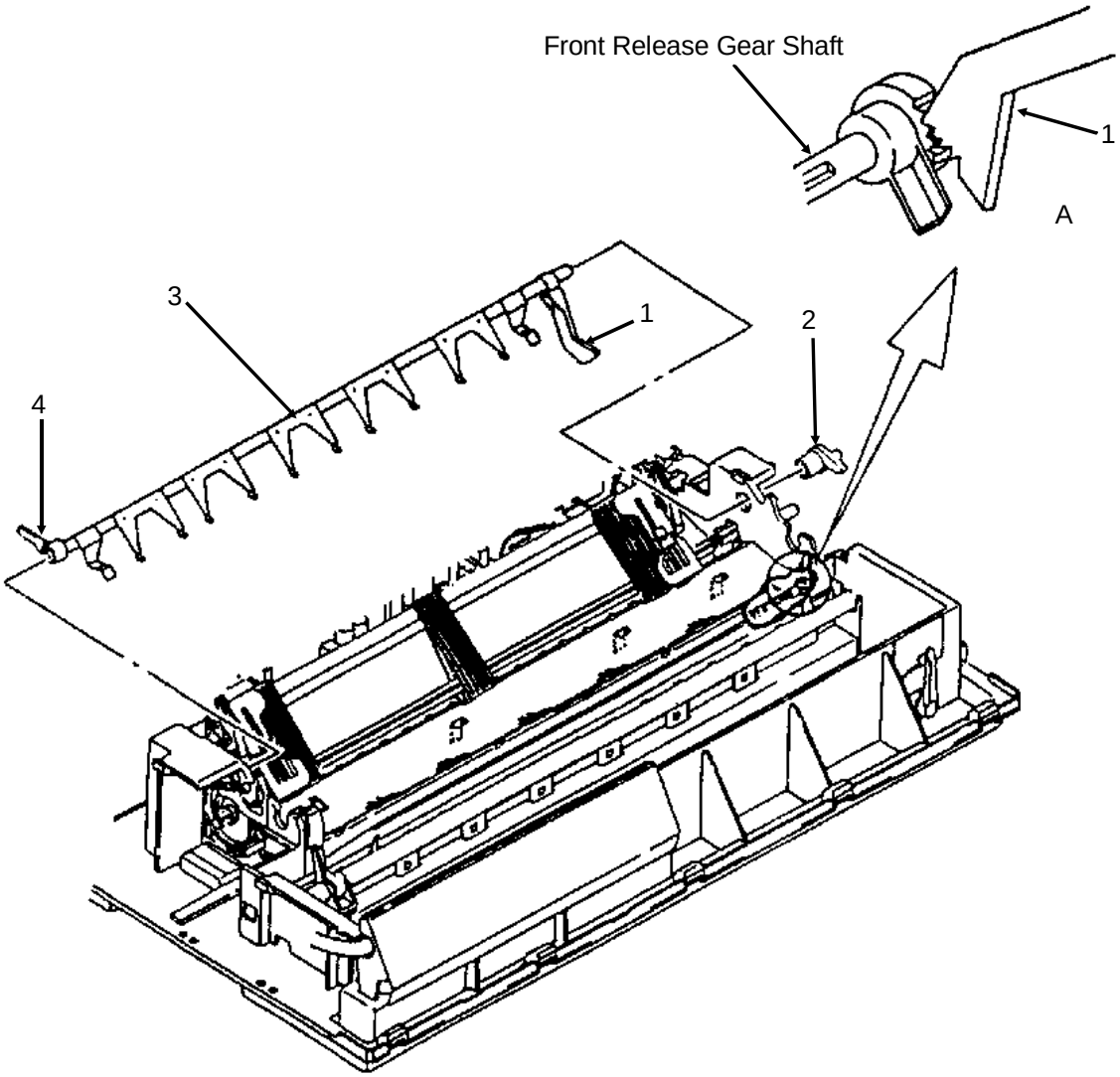
*Slide the cam and spring away from the base frame until the opposite end of the spring can be installed into the frame.*

*Make sure that the front release gear arm is engaged as shown (A).*

*Lubrication*

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

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 50805201 | Lever: Switch | RSPL | Both | B.2.06 |
| ☐ | P/N 50805301 | Cam: Release | RSPL | Both | B.2.05 |
| ☐ | P/N 50923301 | Spring: Pressure (Narrow) | RSPL | 520 | B.2.06 |
| ☐ | P/N 50923401 | Spring: Pressure (Wide) | RSPL | 521 | B.2.06 |
| ☐ | P/N 51228301 | Arm: Front Release Gear | RSPL | Both | B.2.06 |




3-2-24.pcx

### 3.2.25 Carriage Shaft

**CAUTION**

*The space motor assembly, etc. may be left in place when removing the carriage shaft. However, use extra care when doing so.*

*The carriage cable should be detached from the space motor before removing the carriage shaft.*

1. Perform these procedures: 3.2.01, 3.2.06, 3.2.07, and 3.2.16.
2. Push the end (A) of the carriage shaft (1) until it clears the base frame.
3. Pull the carriage shaft free of the base frame.
4. Remove the support protect reset spring (2).
5. Remove the support protector assembly (3).
6. Remove the frame set carriage (4).

*NOTE:*

*Installation*

*After installing the carriage shaft, check the printhead gap adjustment. Refer to Section 3.3 of this Service Handbook.*

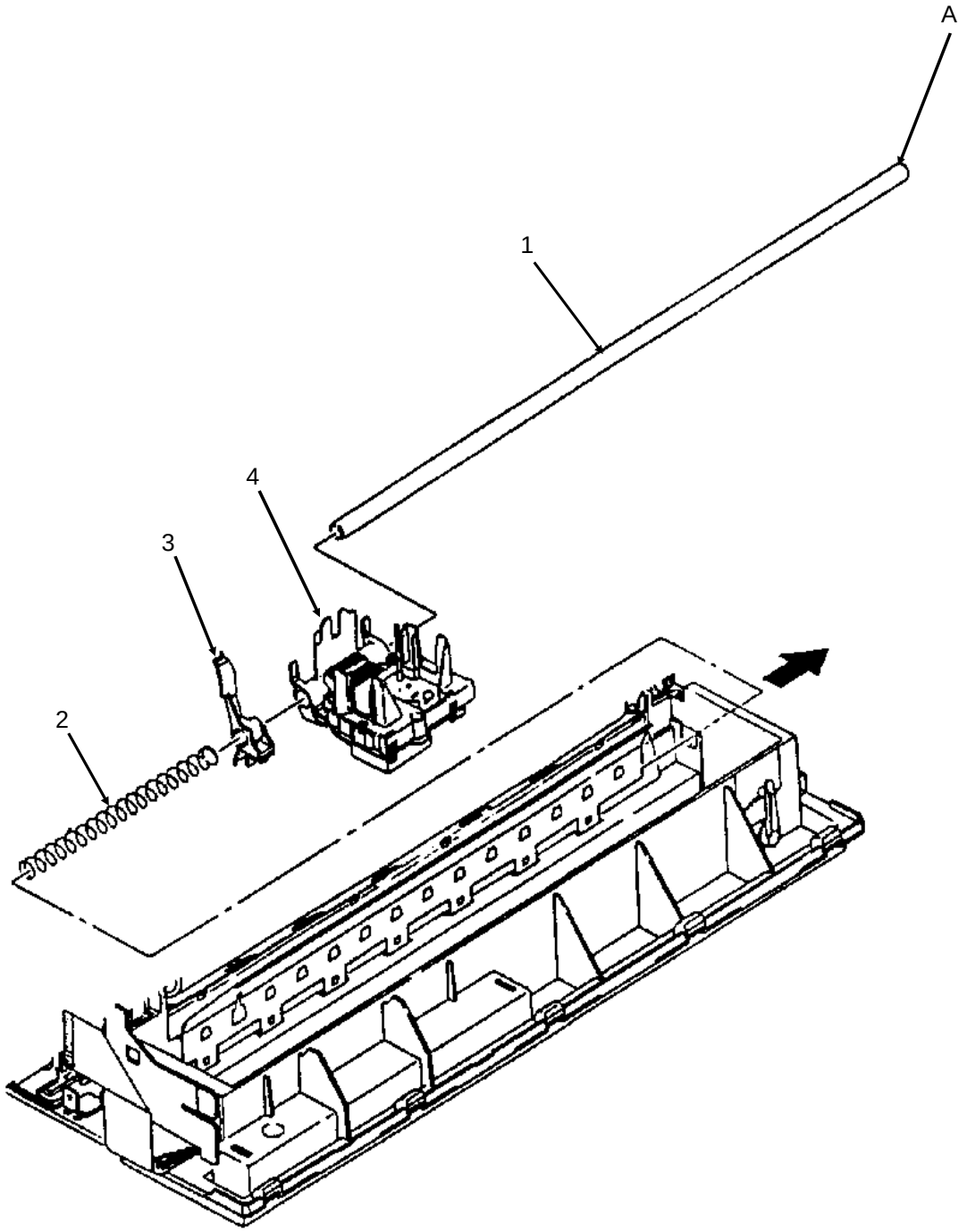
*Cleaning*

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

*Lubrication*

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

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 50098901 | Carriage: Frame Set | RSPL | Both | B.2.07 |
| ☐ | P/N 50923601 | Spring: Support Protect Reset | RSPL | Both | B.2.04 |
| ☐ | P/N 53067601 | Protector: Support (Assembly) | RSPL | Both | B.2.04 |
| ☐ | P/N 53563501 | Shaft: Carriage (Narrow) | RSPL | 520 | B.2.04 |
| ☐ | P/N 53563502 | Shaft: Carriage (Wide) | RSPL | 521 | B.2.04 |

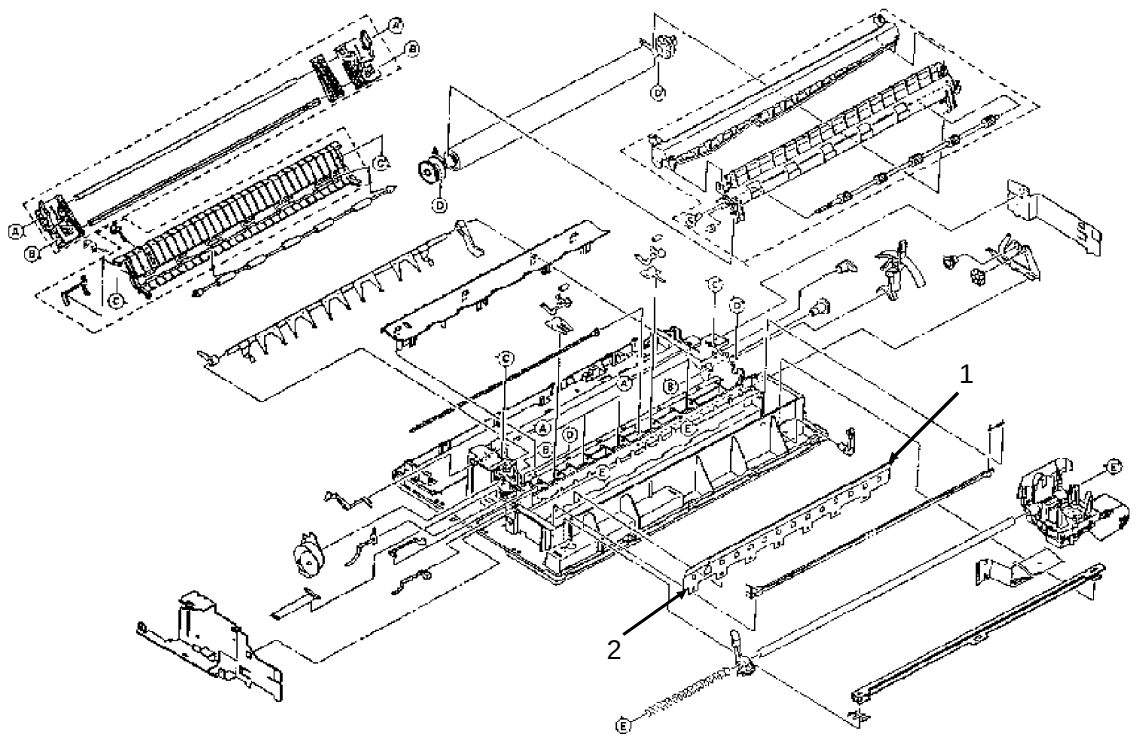



3-2-15.pcx

### 3.2.26 Leaf Spring

1. Perform these procedures: 3.2.01, 3.2.06, 3.2.07, 3.2.16, and 3.2.25.
2. Position the unit so you can access the top and bottom of the leaf spring (1).
3. Start at one end of the spring.
4. Use a straight slot screwdriver to release the bottom extension (2) from the claw of the base frame.
5. Pull the spring up to release the top of the spring from the upper claw.
6. Repeat the above two steps, working towards the opposite end of the spring.
7. Remove the spring.

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 50923001 | Spring: Leaf (Narrow) | RSPL | 520 | B.2.04 |
| ☐ | P/N 50923101 | Spring: Leaf (Wide) | RSPL | 521 | B.2.04 |

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### 3.2.27 Bottom Paper Sensor Levers

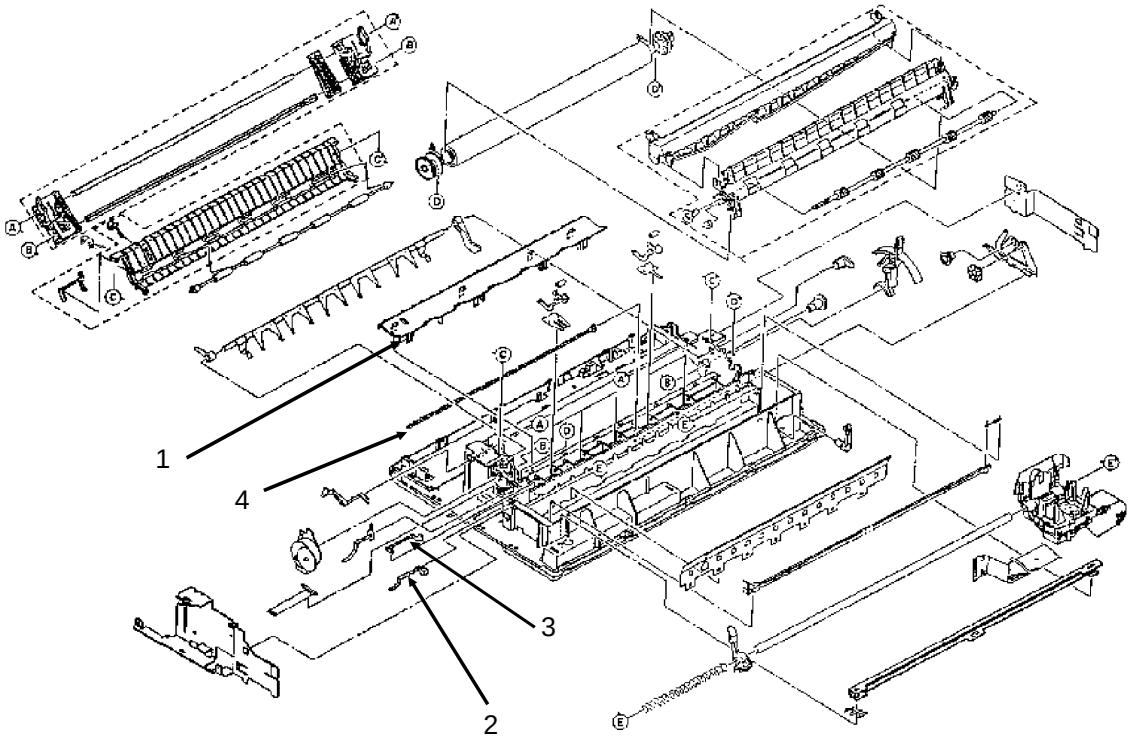
1. Perform these procedures: 3.2.01, 3.2.06, 3.2.07, 3.2.16, 3.2.17, 3.2.19, 3.2.20, 3.2.22, 3.2.23, and 3.2.24.
2. Working from the underside of the unit, release the claws of the paper pan (1). When you release a claw, push on the claw to move the paper pan away from the main frame.
3. Remove the pan.
4. Rotate the bottom sensor lever (2) until the flag is at the top. Then, lift the lever and work it free of the frame to remove it. This lever has a box end.
5. Remove the bottom paper end lever (3).
6. Work the front release gear shaft (4) free of the tabs and remove it.

*NOTE:*

*Lubrication*

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

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 50097301 | Pan: Paper (Narrow) | RSPL | 520 | B.2.06 |
| ☐ | P/N 50097401 | Pan: Paper (Wide) | RSPL | 521 | B.2.06 |
| ☐ | P/N 50804601 | Lever: Bottom Paper End | RSPL | Both | B.2.04 |
| ☐ | P/N 50804701 | Lever: Bottom Sensor | RSPL | Both | B.2.04 |
| ☐ | P/N 51227801 | Shaft: Front Release Gear (Narrow) | RSPL | 520 | B.2.06 |
| ☐ | P/N 51227901 | Shaft: Front Release Gear (Wide) | RSPL | 521 | B.2.06 |




3-2-15.pcx

### 3.2.28 Front Pressure Roller Assembly

1. Perform these procedures: 3.2.01, 3.2.06, 3.2.07, 3.2.16, 3.2.17, 3.2.19, 3.2.20, 3.2.22, 3.2.23, and 3.2.24, 3.2.27.
2. Separate the arms of the front roller holders (1) and remove the front pressure roller (2).
3. Squeeze the extensions of the front roller holders together and remove the holders.
4. Lift and remove the front pressure springs (3A and 3B).

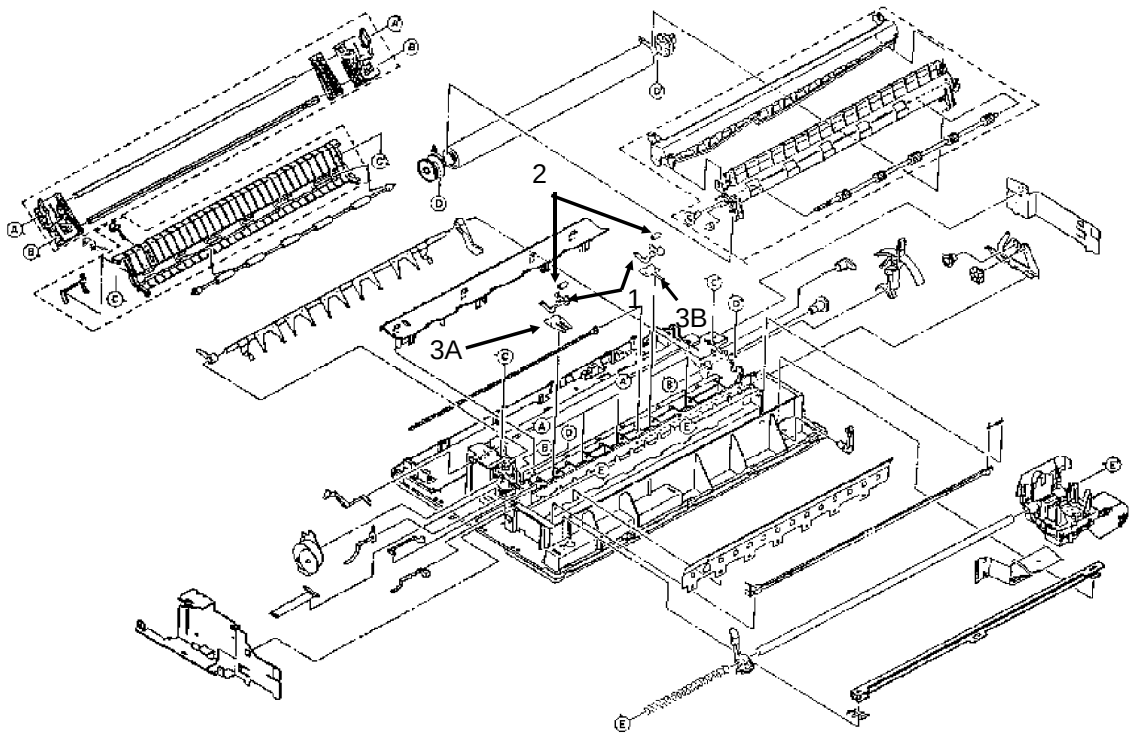
*NOTE:*

*The front pressure springs for the Microline 520 (3A) have three extensions. The front pressure springs for the Microline 521 (3B) have one extension. The Microline 521 uses both springs.*

*Lubrication*

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

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 50922901 | Spring: Front Pressure (Narrow) | RSPL | 520 | B.2.06 |
| ☐ | P/N 50922801 | Spring: Front Pressure (Wide) | RSPL | 521 | B.2.06 |
| ☐ | P/N 53341101 | Holder: Front Roller | RSPL | Both | B.2.06 |
| ☐ | P/N 53341202 | Roller: Front Pressure | RSPL | Both | B.2.06 |




3-2-15.pcx

### 3.2.29 Tractor Assembly

1. Perform these procedures: 3.2.01, 3.2.06, 3.2.07, 3.2.16, 3.2.17, 3.2.19, 3.2.20, 3.2.22, 3.2.23, and 3.2.24.
2. Use a needle nose pliers to release the claw of the tractor gear (1) and remove the gear.
3. Remove the change gear (2).
4. Raise the lock levers (3) on the left (4) and right (5) tractor assemblies.
5. Slide the lower tractor feed shaft (6) in the direction of arrow A and remove the shaft. This shaft is square.
6. Slide the upper tractor feed shaft (7) in the direction of arrow A and remove the shaft. This shaft is round.
7. Remove the left tractor assembly, the guide (8), and the right tractor assembly.

*NOTE:*

*Installation*

*The tractors must be synchronized. Align the synchronization marks (9) in the same direction.*

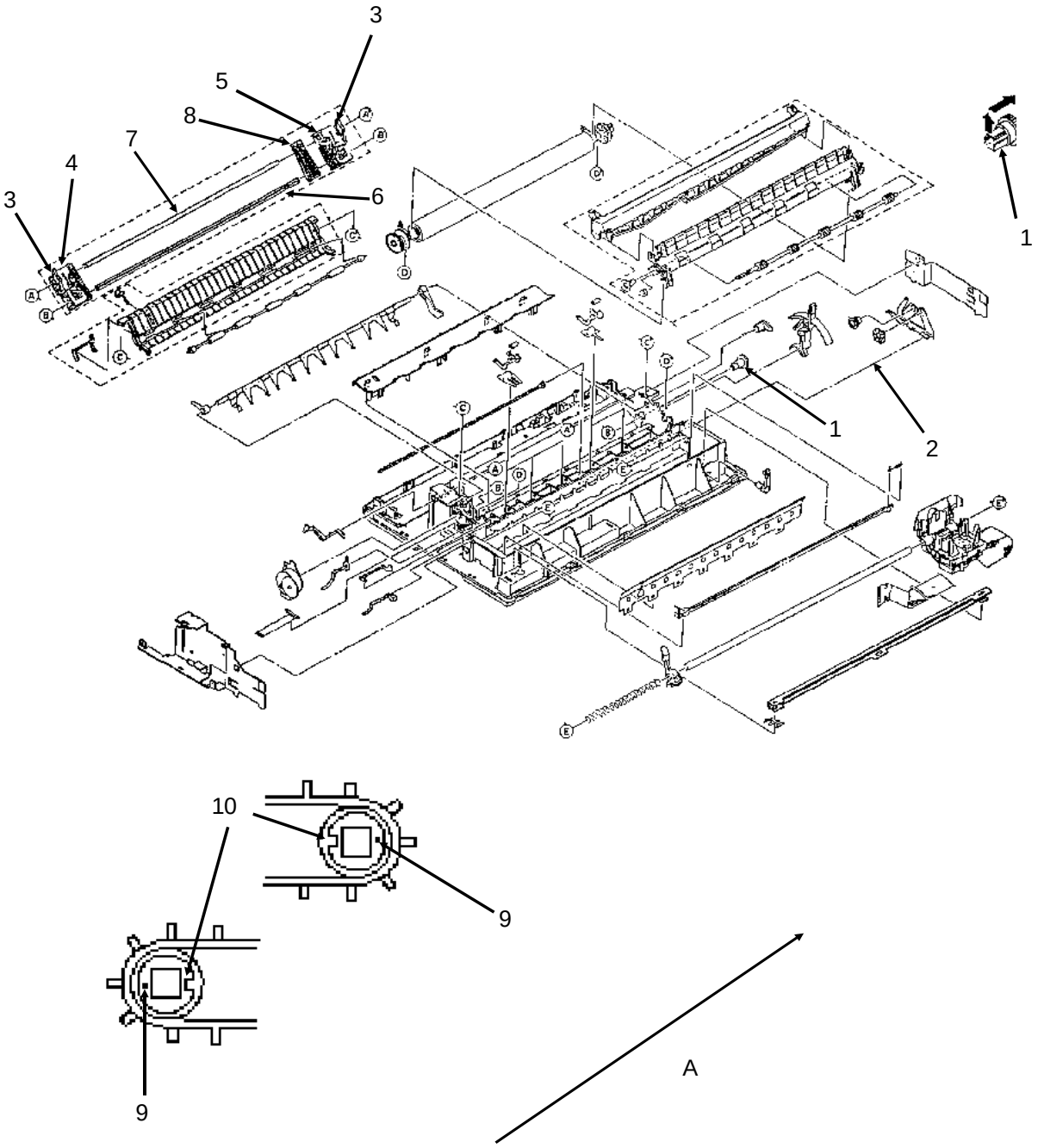
*Verify that the guide holes (10) in the tractor drive gears are facing the same direction.*

*The left tractor assembly must be positioned to the left (line feed motor side) of the plastic tab and ground plate.*

*Lubrication*

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

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 50097501 | Tractor: Assembly (Narrow) | RSPL | 520 | B.2.06 |
| ☐ | P/N 50097502 | Tractor: Assembly (Wide) | RSPL | 521 | B.2.06 |
| ☐ | P/N 51228001 | Gear: Change | RSPL | Both | B.2.05 |
| ☐ | P/N 51228101 | Gear: Tractor | RSPL | Both | B.2.05 |

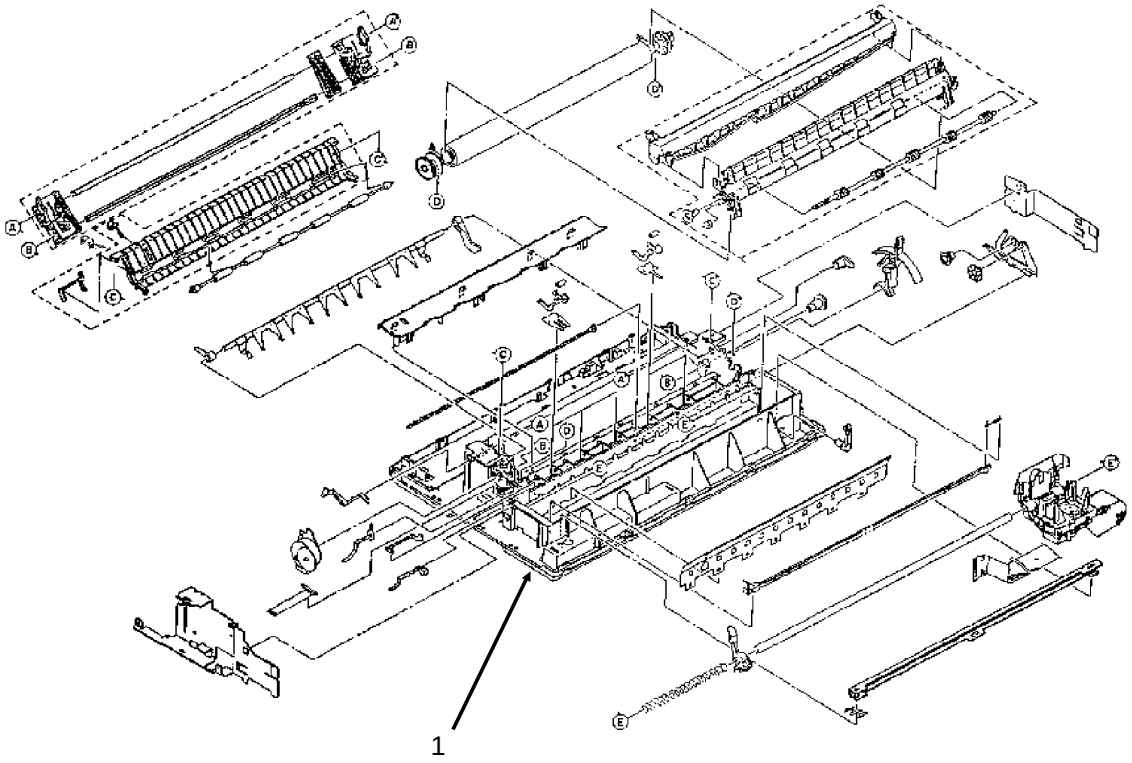



3-2-29.pcx

### 3.2.30 Main Frame

1. All disassembly procedures must be carried out to reach the base frame (1).

| | | | | | |
|---|---|---|---|---|---|
| ☐ | P/N 53563101 | Frame: Main (Narrow) | RSPL | 520 | B.2.04/5/6 |
| ☐ | P/N 53563201 | Frame: Main (Wide) | RSPL | 521 | B.2.04/5/6 |

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## 3.3 PRINTER ADJUSTMENTS

### 3.3.01 General Information

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

### 3.3.02 Printhead Gap Adjustment

#### General Information

Before performing this adjustment, always verify that the printhead is properly installed. This adjustment should be performed when the following parts are replaced.

1. Printhead (3.2.02)
2. Space Motor Assembly (3.2.11)
3. Space Rack (3.2.13)
4. Guide Rail (3.2.15)
5. Platen Assembly (3.2.19)
6. Carriage Shaft (3.2.25)

*NOTE:*

*Place a new ribbon cartridge in the printer before testing for parallelism.*

*If the density of the top portion of the characters differ from that of the bottom portion, follow steps 10 - 12.*

This adjustment is comprised of four phases.

1. Setup Phase

   Steps 1-5

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

2. Printhead Gap Modification Phase

   Steps 6 - 10

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

3. Parallel Adjustment Phase

   Steps 11 - 12

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

4. Verification Phase

   Steps 13 -14

   Verifies that the parallel adjustment phase did not affect the printhead gap modification phase.

### Procedure

#### Setup Phase

1. Remove the upper cover and pull roller assembly.
2. Move the change lever to the rear paper feed position.
3. Rotate the platen.
4. Set the gap change gear (Figure 1 A) to Range 2 by turning the adjust screw using a small phillips screwdriver. Turn this screw slowly while moving the carriage (1) to the left (if turning the screw counter clockwise) or (2) to the right (if turning the screw clockwise). This will allow easier rotation of the gears and prevent the gears from being stripped.

   *DO NOT DISENGAGE THE ADJUST GEAR!*
5. Remove the ribbon protector.

#### Printhead Gap Modification Phase

6. Slide the carriage assembly to the left side of the platen.
7. Check the printhead gap. Use a 0.014 inch or 0.35 mm feeler gauge. The printhead gap must measure 0.014 +/- 0.001 inch (0.35 +/- 0.03 mm).
8. Use a large, straightened paper clip (Figure 1 B) to push down on the adjust gear. This will disengage the adjust gear from idle gear D.
9. Use a small phillips screwdriver to turn the adjust screw. (Figure 1 C)

   Turning the screw CLOCKWISE will increase the printhead gap.

   Turning the screw COUNTERCLOCKWISE will decrease the gap.
10. Slide the carriage assembly to the right side of the platen.

#### Parallel Adjustment Phase

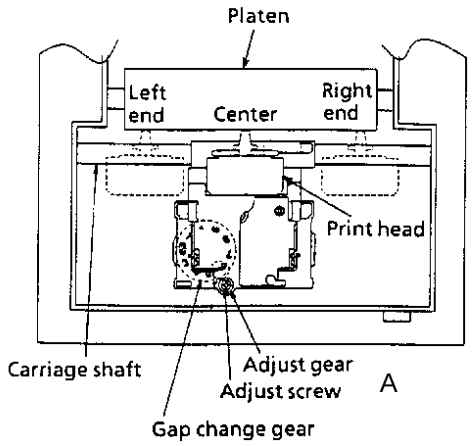
11. Check the printhead gap at the right side of the platen.
12. If the gap measurements are different between the left and right positions, turn the adjust cam as follows. (Figure 2 B)

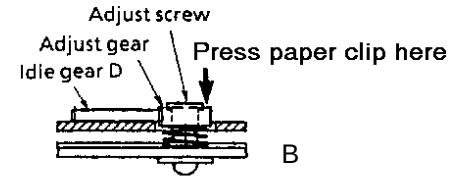
    Turning the cam CLOCKWISE will increase the printhead gap.

    Turning the cam COUNTERCLOCKWISE will decrease the printhead gap.

#### Verification Phase

13. Check the printhead gap adjustment at the left, right, and center of the platen.
14. If the printhead gap is not the same at all three positions, return to step 6.



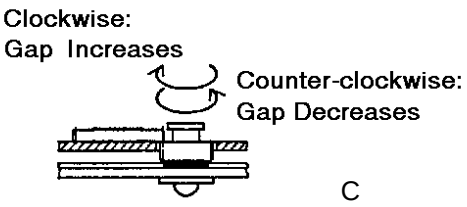
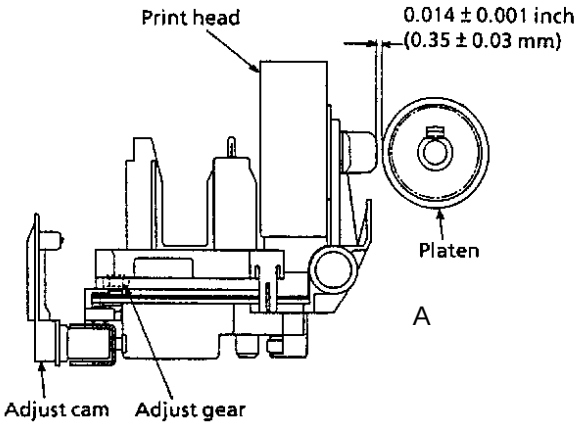




Figure 1



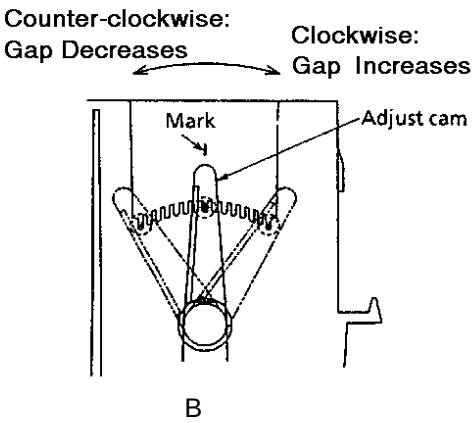




Figure 2

3-3-01a.tif

### 3.3.03 Key Combinations

| Key Combinations | Description |
|---|---|
| SEL + LF<br>(Hold during Power-ON) | Reset Menu to Factory Defaults. |
| SEL<br>(Hold during Power-ON) | Access Menu (if Menu set to LIMITED OPERATION) |
| QUIET + FF/LOAD<br>(Hold during Power-ON) | Reset Top of Form to Factory Default (1 inch) |
| QUIET<br>(Hold during Power-ON) | Activate Rolling ASCII Test |
| LF<br>(Hold during Power-ON) | Activate Font Test |
| SEL + FF/LOAD<br>(Hold during Power-ON) | Activate Hexadecimal Dump Test |

### 3.3.04 Menu Operation

#### General Information

The menu is used to customize the printer's settings and features.

The Menu is made up of a number of Groups.

Each Group has a list of Items.

Each Item has several Settings.

#### Menu Mode

To place the printer in the Menu Mode, follow this procedure.

1. Verify that continuous feed paper is installed.
2. Verify that the ribbon is correctly installed.
3. Verify that the width of the installed paper matches the paper width menu setting.

**CAUTION:**

*If the Menu is set for wide paper, and narrow paper is used, the printhead will print on the platen. This could damage / destroy the printhead, platen, and ribbon.*

4. Press and hold the SHIFT switch while pressing the SEL switch.
5. The MENU lamp will light. If the printer was selected, the SELECT lamp will light.

   When in Menu Mode, the functions printed below the operator panel switches are active.
6. Press GROUP until the desired Group prints.
7. Press ITEM until the desired Item prints.
8. Press SET until the desired Setting prints.
9. Press EXIT to save the change and exit Menu Mode.

### Printing the Menu

Printing the Menu provides a reference of current menu settings.

This will help you move through the menu.

Okidata STRONGLY RECOMMENDS printing the Menu *before* resetting the Menu to factory defaults.

Once the Menu is reset, all customized settings are LOST.

To print the Menu, follow this procedure.

1. Verify that continuous feed paper is installed.
2. Verify that the ribbon is correctly installed.
3. Verify that the width of the installed paper matches the paper width menu setting.

**CAUTION:**

*If the Menu is set for wide paper, and narrow paper is used, the printhead will print on the platen. This could damage / destroy the printhead, platen, and ribbon.*

4. Press and hold the SHIFT switch while pressing the SEL switch.
5. The MENU lamp will light. If the printer was selected, the SELECT lamp will light.

   When in Menu Mode, the functions printed below the operator panel switches are active.
6. Press the PRINT switch.
7. The Menu will print.
8. Press EXIT to exit Menu Mode.

For more information regarding the menu, please refer to the Printer Handbook.

**Sample Menu**

| | | |
|---|---|---|
| Printer Control | Emulation Mode | IBM PPR |
| Font | Print Mode | Utility |
| Font | Pitch | 10 CPI |
| Font | Proportional Spacing | No |
| Font | Style | Normal |
| Font | Size | Single |
| Symbol Sets | Character Set | Set 1 |
| Symbol Sets | Language Set | American |
| Symbol Sets | Zero Character | Slashed |
| Symbol Sets | Code Page | USA |
| Rear Feed | Line Spacing | 6 LPI |
| Rear Feed | Form Tear-Off | Off |
| Rear Feed | Skip Over Perforation | No |
| Rear Feed | Page Length | 11 " |
| Rear Feed | Gap Control | Auto Gap |
| Bottom Feed | Line Spacing | 6 LPI |
| Bottom Feed | Form Tear-Off | Off |
| Bottom Feed | Skip Over Perforation | No |
| Bottom Feed | Page Length | 11 " |
| Bottom Feed | Gap Control | Auto Gap |
| Top Feed | Line Spacing | 6 LPI |
| Top Feed | Bottom Margin | Valid |
| Top Feed | Page Length | 11 " |
| Top Feed | Gap Control | Auto Gap |
| Top Feed | Wait Time | 1 sec |
| Set-Up | Graphics | Uni-directional |
| Set-Up | Receive Buffer Size | 64K |
| Set-Up | Paper Out Override | No |
| Set-Up | Print Registration | 0 |
| Set-Up | Operator Panel Function | Full Operation |
| Set-Up | Reset Inhibit | No |
| Set-Up | Print Suppress Effective | Yes |
| Set-Up | Auto LF | No |
| Set-Up | Auto CR | No |
| Set-Up | SI Select Pitch (10CPI) | 17.1 CPI |
| Set-Up | SI Select Pitch (12CPI) | 20 CPI |
| Set-Up | Time Out Print | Valid |
| Set-Up | Auto Select | No |
| Set-Up | Printhead Gap Adjust | 0 |
| Parallel I/F | I-Prime | Buffer Print |
| Parallel I/F | Pin 16 | +5v |
| Printer Control | Emulation Mode | IBM PPR |

3-3-06.tif

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### Reset Menu to Factory Defaults

**CAUTION:**

*Once the menu has been reset, all customized menu settings will be lost.*

*Always print the menu before resetting the printer to factory defaults.*

To reset the menu to factory default settings:

1. Before resetting the Menu, Okidata STRONGLY RECOMMENDS printing the Menu.

   Printing the Menu provides a reference of customized settings.

   When the Menu is reset, all customized settings are LOST.
2. Power off the printer.
3. Press and hold SEL and LF while powering ON the printer.

## Limited Operation

### General Information

One of the menu selections that may be set by the end user is the operator panel function. This is found in the Set-up Group of the menu. Operator Panel Function is an item in the Set-up Group. This item may be set to either Full Operation or Limited Operation.

If the Operator Panel Function is set to Limited Operation the menu cannot be accessed and the operator panel switches listed below are not active.

1. Print Quality
2. Character Pitch

The Operator Panel Function item is frequently set to Limited Operation on networks or other areas where many users share a printer. Limited Operation prevents the printer settings from being changed.

This item cannot be changed through the OKISMART software. However, the print quality and character pitch may be set through your software application packages.

### Procedure

To return the printer to Full Operation, you must modify the menu.

**CAUTION:**

*Determine the preference of the end user regarding this feature. If the printer is on a network, do not reset this item without discussing the change with the network supervisor.*

To access the menu when the printer is set to Limited Operation, follow this procedure.

1. Verify that continuous feed paper is installed.
2. Verify that the ribbon is correctly installed.
3. Verify that the width of the installed paper matches the paper width menu setting.

**CAUTION:**

*If the Menu is set for wide paper, and narrow paper is used, the printhead will print on the platen. This could damage / destroy the printhead, platen, and ribbon.*

4. Power off the printer.
5. Press and hold the SEL switch while powering on the printer.
6. The MENU lamp will light. If the printer was selected, the SELECT lamp will light.

   When in Menu Mode, the functions printed below the operator panel switches are active.
7. Press GROUP until Set-Up prints.
8. Press ITEM until Operator Panel Function prints.
9. Press SET until FULL OPERATION prints.
10. Press EXIT to save the change and exit Menu Mode.

### Menu Settings

Factory default settings are printed in ***Bold Italic***.

The tables show *all* possible menu settings available with the Microline 520/521.

What you will actually see depends on the active emulation and the options installed.

### Menu Settings

Factory default settings are printed in ***Bold Italic***.

The tables show *all* possible menu settings available with the Microline 520/521.

What you will actually see depends on the active emulation and the options installed.

| Group | Item | Setting |
|---|---|---|
| Printer Control | Emulation Mode | ***IBM PPR***, Epson FX, ML |
| Font | Print Mode | ***Utility***, NLQ Courier, NLQ Gothic, HSD |
| | Pitch | ***10***, 12, 15, 17.1, 20 cpi |
| | Proportional Spacing | ***No***, Yes |
| | Style | ***Normal***, Italic |
| | Size | ***Single***, Double |
| Symbol Sets | Character Set | ***Set I***, Set II |
| | Language Set | ***American***, French, German, British, Danish I, Swedish, Italian, Spanish I, Japanese, Norwegian, Danish II, Spanish II, Latin American, French Canadian, Dutch, Publisher |
| | Zero Character | ***Slashed***, Unslashed |
| | Code Page | ***USA***, Canada French, Multilingual, Portugal, Norway |

| | |
|---|---|
| * | Model 521 only |
| * * | Appears only when Microline emulation is selected |
| * * * | Appears only when optional Cut Sheet Feeder is installed |
| * * * * | Appears only when IBM Proprinter emulation is selected |
| * * * * * | Appears only when Epson LQ emulation is selected |
| * * * * * * | Appears only when optional Serial Interface is installed |
| * * * * * * * | Appears only when optional Roll Paper Stand is installed |

Factory default settings are printed in ***Bold Italic***.

The tables show *all* possible menu settings available with the Microline 520/521.

What you will actually see depends on the active emulation and the options installed.

| Group | Item | Setting |
|---|---|---|
| Rear Feed | Line Spacing | ***6***, 8 LPI |
| | Form Tear-Off | ***Off***, 500 ms, 1 sec, 2 sec |
| | Skip Over Perforation | ***No***, Yes |
| | Page Width * | ***13.6"***, 8" |
| | Page Length | ***11***, 11 2/3, 12, 14, 17, 3, 3.5, 4, 5.5, 6, 7, 8, 8.5 " |
| | Gap Control | ***Auto Gap***, Semi Auto Gap, 1, 2, 3, 4, 5, 6, 7, 8, 9 |
| Bottom Feed | Line Spacing | ***6***, 8 LPI |
| | Form Tear-Off | ***Off***, 500 ms, 1 sec, 2 sec |
| | Skip Over Perforation | ***No***, Yes |
| | Page Width * | ***13.6"***, 8" |
| | Page Length | ***11***, 11 2/3, 12, 14, 17, 3, 3.5, 4, 5.5, 6, 7, 8, 8.5 " |
| | Gap Control | ***Auto Gap***, Semi Auto Gap, 1, 2, 3, 4, 5, 6, 7, 8, 9 |
| Top Feed | Line Spacing | ***6***, 8 LPI |
| | Form Tear-Off * * * * * * * | ***Off***, 500 ms, 1 sec, 2 sec |
| | Bottom Margin | ***Valid***, Invalid |
| | Page Width * | ***13.6"***, 8" |
| | Page Length | ***11***, 11 2/3, 12, 14, 17, 3, 3.5, 4, 5.5, 6, 7, 8, 8.5 " |
| | Gap Control | ***Auto Gap***, Semi Auto Gap, 1, 2, 3, 4, 5, 6, 7, 8, 9 |
| | Wait Time | ***1 sec***, 2 sec, 500 ms |

| | |
|---|---|
| * | Model 521 only |
| * * | Appears only when Microline emulation is selected |
| * * * | Appears only when optional Cut Sheet Feeder is installed |
| * * * * | Appears only when IBM Proprinter emulation is selected |
| * * * * * | Appears only when Epson LQ emulation is selected |
| * * * * * * | Appears only when optional Serial Interface is installed |
| * * * * * * * | Appears only when optional Roll Paper Stand is installed |

Factory default settings are printed in ***Bold Italic***.

The tables show *all* possible menu settings available with the Microline 520/521.

What you will actually see depends on the active emulation and the options installed.

| Group | Item | Setting |
|---|---|---|
| Set-Up | Graphics | ***Uni-directional***, bi-directional |
| | 7 or 8 Bit Graphics * * | ***8***, 7 |
| | Receive Buffer Size | ***64K,*** 1 line, 32 K |
| | Paper Out Override | ***No***, Yes |
| | Print Registration | ***O***<br>0.05 mm Left<br>0.10 mm Left<br>0.15 mm Left<br>0.20 mm Left<br>0.25 mm Left<br>0.25 mm Right<br>0.20 mm Right<br>0.15 mm Right<br>0.10 mm Right<br>0.05 mm Right |
| | Operator Panel Function | ***Full Operation***, Limited Operation |
| | Reset Inhibit | ***No***, Yes |
| | Print Suppress Effective | ***Yes***, No |
| | Auto LF | ***No***, Yes |
| | Auto CR * * * * | ***No***, Yes |
| | CSF Bin Select * * * | ***Bin 1***, Bin 2 |
| | Print DEL Code * * | ***No***, Yes |
| | SI Select Pitch (10 CPI) * * * * | ***17.1***, 15 cpi |
| | SI Select Pitch (12 CPI) * * * * | ***20***, 12 cpi |
| | Time Out Print | ***Valid***, Invalid |
| | Auto Select | ***No***, Yes |
| | Printhead Gap Adjust | ***0***, - 1, + 1 |

* Model 521 only

* * Appears only when Microline emulation is selected

* * * Appears only when optional Cut Sheet Feeder is installed

* * * * Appears only when IBM Proprinter emulation is selected

* * * * * Appears only when Epson LQ emulation is selected

* * * * * * Appears only when optional Serial Interface is installed

* * * * * * * Appears only when optional Roll Paper Stand is installed

Factory default settings are printed in ***Bold Italic***.

The tables show *all* possible menu settings available with the Microline 520/521.

What you will actually see depends on the active emulation and the options installed.

| Group | Item | Setting |
|---|---|---|
| Parallel I/F | I-Prime | ***Buffer Print***, Buffer Clear, Invalid |
| | Pin 18 | ***+5v***, Open |
| | Auto Feed XT * * * * * | ***Invalid***, Valid |
| Serial I/F * * * * * * | Parity | ***None***, Odd, Even |
| | Serial Data 7/8 Bits | ***8 Bits***, 7 Bits |
| | Protocol | ***Ready / Busy,*** X-ON / X-OFF |
| | Diagnostic Test | ***No***, Yes |
| | Busy Line | ***SSD-***, SSD+, DTR, RTS |
| | Baud Rate | 19200, ***9600***, 4800, 2400, 1200, 600, 300 bps |
| | DSR Signal | ***Valid***, Invalid |
| | DTR Signal | ***Ready on Power Up***, Ready on Select |
| | Busy Time | ***200 ms***, 1 sec. |
| CSF Bin 1* * * | Line Spacing | ***6 LPI***, 8 LPI |
| | Bottom Margin | ***Valid***, Invalid |
| | Page Width * | ***13.6"***, 8" |
| | Page Length | ***11***, 11 2/3, 12, 14, 17, 3, 3.5, 4, 5.5, 6, 7, 8, 8.5 " |
| | Gap Control | ***Auto Gap***, Semi Auto Gap, 1, 2, 3, 4, 5, 6, 7, 8, 9 |
| CSF Bin 2 * * * | Line Spacing | ***6 LPI***, 8 LPI |
| | Bottom Margin | ***Valid***, Invalid |
| | Page Width * | ***13.6"***, 8" |
| | Page Length | ***11***, 11 2/3, 12, 14, 17, 3, 3.5, 4, 5.5, 6, 7, 8, 8.5 " |
| | Gap Control | ***Auto Gap***, Semi Auto Gap, 1, 2, 3, 4, 5, 6, 7, 8, 9 |

* Model 521 only

* * Appears only when Microline emulation is selected

* * * Appears only when optional Cut Sheet Feeder is installed

* * * * Appears only when IBM Proprinter emulation is selected

* * * * * Appears only when Epson LQ emulation is selected

* * * * * * Appears only when optional Serial Interface is installed

* * * * * * * Appears only when optional Roll Paper Stand is installed

### 3.3.05 Top of Form

#### General Information

Top of Form is the distance from the top edge of the paper to the first print position on the page. The red line on the ribbon protector indicates the baseline of the Top of Form.

#### Setting Top of Form

1. Deselect the printer. The SEL lamp must not be lit.
2. To set the TOF further down the page, press and hold the SHIFT switch while pressing the FF/LOAD switch. This will advance the paper in micro increments.
3. To set the TOF higher on the page, press and hold the SHIFT switch while pressing the LF switch. This will retract the paper in micro increments.
4. This setting will be kept in memory until you power off the printer or until you change the setting.
5. To maintain this setting in the printer's memory (even when the printer is powered off), press and hold the SHIFT switch while pressing the QUIET/TOF switch.
6. Press the SEL switch.

#### Reset the Top of Form to Factory Default

1. Power off the printer.
2. Press and hold the QUIET and FF/LOAD switches while you power on the printer.

*NOTE:*

*The factory default Top of Form Setting is 1 inch.*

### 3.3.06 Paper Park

#### General Information

Paper Park allows the user to print using single (cut) sheet pages without removing continuous forms from the printer.

#### Procedure: Continuous Feed to Single Sheet

1. Remove any printed pages from the printer.
2. Press PARK to retract the continuous forms paper from the paper path.
3. Lift the paper separator to the upright position.
4. Move the paper lever to the TOP (Single Sheet) position.
5. Load the single sheet paper.

#### Procedure: Single Sheet to Continuous Feed

1. Remove any single sheet pages from the printer.
2. Lower the paper separator to the Continuous Forms position (rear feed).
3. Move the paper lever to the REAR or BOT position, as appropriate.
4. Lower the paper support.
5. Press FORM FEED to load the continuous forms paper into the printer.

*NOTE:*

*When the printer is set to a different paper path, the printhead will travel back and forth. The pins are "gently" fired to sense paper thickness and set the printhead gap.*

### 3.3.07 Tear Feature

*NOTE:*

*Tear is activated by pressing TEAR. It is a manual procedure.*

*FORMS TEAR OFF is activated by changing a setting in the Menu. It is an automatic procedure.*

#### General Information

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

Tear Feature 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.

To activate the Tear Feature, press TEAR.

### 3.3.08 Forms Tear Off

*NOTE:*

*Tear is activated by pressing TEAR. It is a manual procedure.*

*FORMS TEAR OFF is activated by changing a setting in the Menu. It is an automatic procedure.*

#### General Information

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

Forms Tear Off automatically 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.*

*Remember to activate the Form Tear Off for the paper path you are using (rear feed or bottom feed).*

### Vertical Line Spacing Problems

*NOTE:*

*This information is also covered in Technical Service Bulletin 1704.*

Customers may experience problems with vertical line spacing when printing on continuous forms and using Forms Tear Off. The first page may not line up correctly. Following pages will not align. The customers may have worked with other Okidata printers and DID NOT experience the problem with the other printer(s). The difference is that the Microline 520 and Microline 521 printers DO NOT have a bail arm. The paper does not feed as "high" as it would in a printer with a bail arm.

If you are experiencing problems with vertical line spacing when printing on continuous forms and using Forms Tear Off, perform the following steps to set the Top of Form position.

1. Enter Menu Mode.
2. Disable Form Tear Off.
3. Exit Menu Mode.
4. Deselect the printer.
5. Use the Micro Feed buttons to set the Top of Form.

   Press Micro Feed Up to advance the paper.

   Press Micro Feed Down to retract the paper.
6. Enter Menu Mode.
7. Enable Form Tear Off.
8. Exit Menu Mode.

### Setting

1. Verify that continuous feed paper is installed.
2. Verify that the ribbon is correctly installed.
3. Verify that the width of the installed paper matches the paper width menu setting.
4. Power ON the printer.
5. Press and hold the SHIFT switch while pressing the SEL switch to place the printer in Menu Mode.

   When in Menu Mode, the functions printed *below* the operator panels switches are active.
6. Press GROUP until the desired Group prints (Rear Feed or Bottom Feed).
7. Press ITEM until the desired Item prints (Form Tear Off)
8. Press SET until the desired setting prints (Off, 500 mS, 1 sec, 2 sec).
9. Press EXIT to save the change and exit Menu Mode.

### Using

1. Load paper.
2. Press FORM FEED
3. The paper will advance past the start print position (Top of Form) to the tear bar position.
4. The paper stays in this position until the printer receives data. Then, the paper will be retracted to the appropriate Top of Form position.
5. A few seconds after printing stops, the paper advances to the tear bar position.

### Checking Top of Form with Form Tear Off Activated

1. Load paper.
2. Press and *hold* TEAR. When you release TEAR, the paper will return to the tear off position.
3. The paper will retract to the Top of Form position.
4. Release TEAR.
5. The paper advances to the tear bar position.

### 3.3.09 Resets

#### Reset Menu to Factory Defaults

**CAUTION:**

*Once the menu has been reset, all customized menu settings will be lost.*

*Always print the menu before resetting the printer to factory defaults.*

To reset the menu to factory default settings, follow this procedure.

1. Before resetting the Menu, Okidata STRONGLY RECOMMENDS printing the Menu.

   Printing the Menu provides a reference of customized settings.

   When the Menu is reset, all customized settings are LOST.
2. Power off the printer.
3. Press and hold SEL and LF while powering ON the printer.

*NOTE:*

*Refer to the Printer Handbook for a list of the factory default settings.*

#### Reset the Top of Form to Factory Default

1. Power off the printer.
2. Press and hold the QUIET and FF/LOAD switches while you power on the printer.

*NOTE:*

*The factory default Top of Form Setting is 1 inch.*

## 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 the 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:

1. every six months

   or

2. every 300 hours of operating time.

### 3.4.03 Cleaning Tools

1. Clean, soft, lint-free cloth
2. All-purpose cleaner
3. Vacuum cleaner
4. Platen cleaner

### 3.4.04 Areas to be Cleaned

| Area | Procedure | Cleaning Tool(s) |
|---|---|---|
| Carriage Shaft | 3.2.25 | Cloth and All-purpose cleaner |
| Area around carriage shaft | 3.2.25 | Vacuum, Cloth, and All-purpose cleaner |
| Space Rack | 3.2.13 | Vacuum |
| Paper Paths | N/A | Vacuum, Cloth, and All-purpose cleaner |
| Platen | 3.2.19 | Cloth and Platen cleaner |
| Covers | 3.2.06 | Cloth and All-purpose cleaner |

## 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 lubricating should be performed:

1. once a year

   or

2. every 600 hours of operating time.

### 3.5.03 Lubrication Types

1. Machine Oil or equivalent
2. Moly-lube Grease or equivalent

### 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 Table will direct you to use the following amounts of lubricant.

1. Medium

   Oil: three to four drops

   Grease: thin coating (approximately .015 inch)

2. Small

   Oil: one drop

   Grease: extremely thin coating (approximately .008 inch)

### 3.5.05 Lubrication Table

| Area to be Lubricated | Disassembly Procedure | Lubricant | Amount |
|---|---|---|---|
| Visible Bearings of Gears in Gear Case Assembly | 3.2.04 | Oil | Small |
| Bearing of Pull-up Roller Shaft | 3.2.05 | Grease | Medium |
| Contact between Idle Gear Bearing and Pull-up Roller Shaft | 3.2.05 | Grease | Medium |
| Contact of Space Motor Assembly Gear and Space Rack | 3.2.11 | Oil | Small |
| Contact between Platen Shaft and Platen Ground Spring | 3.2.19 | Grease | Small |
| Contact between Bias Gear and Platen Gear | 3.2.19 | Oil | Small |
| Bearing of Change Lever | 3.2.23 | Grease | Medium |
| Bearing and Pivot Point of Change Lever | 3.2.23 | Grease | Medium |
| Pivot Point of Release Cam | 3.2.24 | Grease | Medium |
| Holders on Pressure Spring | 3.2.24 | Grease | Medium |
| Bearing of Front Release Gear Arm | 3.2.24 | Grease | Medium |
| Carriage Shaft<br>**NOTE:**<br>Place a small amount on the surface, then wipe clean. | 3.2.25 | Oil | See **NOTE** |
| Front Release Gear Shaft | 3.2.27 | Grease | Medium |
| Contact between Front Roller Holder and Front Pressure Roller | 3.2.28 | Oil | Small |
| Bearing of Tractor Gear | 3.2.29 | Grease | Medium |
| Contact between Lower Tractor Feed Shaft and Main Frame | 3.2.29 | Grease | Medium |

### 3.5.06 Areas Not Lubricated

Lubricant should never contact the parts listed below.

1. Ribbon
2. Platen Assembly (Rubber Face)
3. Pressure Roller (Rubber Face)
4. Tractor Pins
5. Head Cable
6. Space Motor Printed Circuit Board
7. Electrical Contacts and Connections
8. Space Rack

   ***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.*

9. Teeth of the gears in the Gear Case Assembly

## 3.6 SHIPPING INSTRUCTIONS

### 3.6.01 Return for Service

**CAUTION:**

*When shipping the printer, use the original packaging to prevent damage.*

*Be sure to secure the printhead so it will not move during shipment.*

1. Locate the original packaging or order replacement packaging from Okidata. (Refer to Appendix B)
2. Make sure the printhead is secured so it will not move during shipment.
3. Remove the platen knob. Be sure to place it in the shipping container.
4. Pack the unit, using the materials from Step 1.

### 3.6.02 All Other Returns

**CAUTION:**

*The product MUST be returned in the original packaging.*

*The product MUST be returned with ALL originally supplied factory items.*

*Be sure to secure the printhead so it will not move during shipment.*

1. Locate the original packaging or order replacement packaging from Okidata. (Refer to Appendix B)
2. Locate the originally supplied factory items.
   (Refer to Setting Up in the Printer Handbook)
3. Make sure the printhead is secured so it will not move during shipment.
4. Pack the unit, using the materials from Step 1.

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# SECTION FOUR
# FAILURE ANALYSIS

## 4.1 OVERVIEW

### 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, follow these steps.

1. Refer to Section 4.3, which explains where to check for updates to the troubleshooting information.
2. Section 4.4 contains tips on preventing problems, as well as a list of common problems.
3. Section 4.5 shows samples of abnormal outputs.
4. Section 4.6 provides tables of error messages.
5. Section 4.7 contains the Repair Analysis Procedures (RAPs). Each RAP 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.
6. Section 4.8 provides the procedures for various printer tests.
7. Section 4.9 lists the resistance check points.
8. Section 4.2 lists methods for reporting problems. If you encounter a situation that is NOT addressed by the documentation in this kit, please report the problem to Okidata, using one of the methods listed.

   Refer to the Service Center Reference Guide for information on contacting Okidata.

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### 4.1.02 Printer Serial Number Identification

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: 401A0154693

| | |
|---|---|
| Date Code | 401 (4 = year. 01 = month) |
| Revision | A |
| Serial Number | 0154693 |

### 4.1.03 Firmware Revision Identification

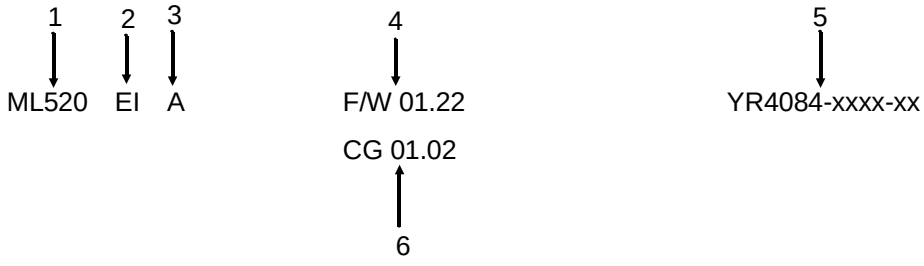
To identify the revision level and part number of the firmware, print the Rolling ASCII Test or the Font Test.

Refer to Section 4.8 of this Service Handbook for information on printing the tests.

**Header**

At the top of the test is a header.

This header provides the following information: printer model (1), emulation (2), country (3), firmware revision level (4), firmware part number (5) and character generator revision number (6). This information is often required while performing service or when contacting Okidata. Have this information available during your service call.



## 4.2 REPORTING PROBLEMS

### 4.2.01 General Information

Okidata strives to provide accurate and detailed service information through its training materials. The Technical Training Group realizes that service technicians have valuable experience, knowledge, and opinions. Okidata strongly encourages you to report any problems you may encounter when using the materials of this training kit. Please be as specific and detailed as possible. Your comments, suggestions, and criticisms are used to update and revise training kits.

You should reference the training materials when servicing Okidata products. Most problems can be solved by using the information provided in the training materials. If you encounter a situation that cannot be solved, please let Okidata know.

Refer to the Service Center Reference Guide for information on contacting Okidata.

### 4.2.02 Problem Lists

Technicians frequently request a list of common problems specific to a product. Technical Training Kits are written before a product is shipped to customers. Therefore, such information is NOT available when a product is first released.

However, Okidata wants to respond to these requests. Okilink II provides round-table discussions on technical problems. Errors and corrections in the training materials are listed in the Training Section of Okilink II. The Technical Service Bulletins (also known as Okidata's Monthly Mail) are available via Okilink II. Situations that are NOT addressed in the reference documentation, technical service bulletins, or round-tables may be reported to the Dealer Service and Support Engineers (Contact Technical Support) or the Technical Training Group. You will receive a response to your message within one business day.

The information on Okilink II is the most accurate and up-to-date technical information available from Okidata. This is only possible with your assistance. By reporting your suggestions, concerns, and problems, Okidata can provide the best possible information.

Your cooperation is greatly appreciated. Thank you for your help!

### 4.2.03 Reporting Methods

#### Okilink II

You may use Okilink II to report your findings. Refer to the Service Center Reference Guide for information on using Okilink II.

#### Course Critique

Use the Course Critique to report any problems you find as you are completing the self-paced training.

#### Fax Number

If you wish to fax your response, please use the numbers listed in the Service Center Reference Guide.

#### Mailing Address

If you respond by mail, please use the appropriate address listed in the Service Center Reference Guide.

#### Information Provided

Please provide the following information when reporting problems.

Okidata Dealer Number

Technician's Name

Company Name

Company's Address (Street, City, State/Province, ZIP / Postal Code, Country)

Telephone and Fax Numbers (with area / country access codes)

Product Name

Unit's Serial Number

Firmware Revision Level

Description of Problem

Document Name (with page number or procedure) with error or problem.

## 4.3 TROUBLESHOOTING UPDATES

### 4.3.01 General Information

Okidata distributes updated troubleshooting information in three ways.

Okilink II

Faxable Facts

Technical Service Bulletins

### 4.3.02 Okilink II

Okilink II is Okidata's Bulletin Board Service. This service is available to all Okidata Certified Service Technicians. Okilink II provides troubleshooting and service information. Technicians can download files, ask questions of Okidata's technical support personnel, and participate in round table discussions about Okidata products and services. Technical Service Bulletins, Recommended Spare Parts Lists, Printer Drivers, Product Specifications, and Service Training Information are also available.

Refer to the Service Center Reference Guide for information on accessing Okilink II.

### 4.3.03 Faxable Facts

Okidata's Faxable Facts is an automated fax document retrieval system. It is maintained by Okidata's Customer Information Center. Answers to common questions about Okidata products are available through Faxable Facts.

Refer to the Service Center Reference Guide for information on accessing Faxable Facts.

### 4.3.04 Technical Service Bulletins

Okidata's Technical Service Bulletins (TSBs) contain technical information developed after product release. Firmware updates, part number changes, and procedural changes are some of the subjects covered by these bulletins. The TSBs are distributed through Okilink II.

Refer to the Service Center Reference Guide for information on accessing Okilink II.

## 4.4 TROUBLESHOOTING TIPS

### 4.4.01 Preliminary Checks

1. Is the product being operated under the proper ambient conditions?
2. Does the paper being used meet the specifications for this product?
3. Has the ribbon been replaced as recommended?
4. Has the ribbon been installed properly?
5. Is an Okidata ribbon being used?
6. Is the printhead gap correctly set?
7. Is the firmware the latest (current) revision?
8. Are the printer drivers being used correct for the printer?
9. Is the printer driver being used the latest (current) release?

### 4.4.02 Problem Categories

There are three categories of problems that you might encounter when servicing the printer.

#### ALARM Lamp Blinks (Fatal Errors)

The following can cause the ALARM lamp to blink.

Open Bail Arm

Jammed Paper

Printhead Cannot Move

Other Fatal Error

When the ALARM Lamp is blinking, check the items listed below.

1. Close the bail arm.
2. Check for a paper jam.
3. Verify that the printhead moves freely.
4. Record the status of the ALARM, PRINT QUALITY, and CHARACTER PITCH Lamps.
5. Refer to the Alarm Lamp Codes Table. (Section 4.6)
6. Locate the error.
7. Perform the designated corrective action.

#### Operational Errors

An Operational Error is usually not accompanied by an ALARM Lamp.

Refer to the Start Here Flowchart (Section 4.4.03) and perform the corrective action.

#### ALARM Lamp Lights (Paper End/Jam Conditions)

A solid ALARM Lamp usually indicates a cover open, paper jam or paper-end (out of paper) condition.

### 4.4.03 START HERE Flowchart

START

Power ON the unit.

Does the printer initialize?

No Is the ALARM Lamp Blinking?

- No Refer to RAP 01.
- Yes Refer to Section 4.6 of the Service Handbook.

Yes Load the printer with paper.

- Does the paper load without jamming?
  - No Refer to RAP 04.
  - Yes Perform the Rolling ASCII test. Refer to Section 3 of the Service Handbook.
    - Is the output satisfactory?
      - No Refer to RAP 06.
      - Yes Are all operator panel switches operating properly?
        - No Refer to RAP 09.
        - Yes Has the problem been resolved?
          - Yes End of procedure.
          - No Does the parallel or serial interface port receive data from the host PC properly?
            - Yes End of procedure.
            - No Which port is not receiving data?
              - Parallel Refer to RAP 10.
              - Serial Refer to RAP 11.

### 4.4.04 Tips for Preventing Image Problems

1. Make sure that the ribbon is not "dried out". If the printer output is faded, install a new ribbon, then print another sample.
2. Make sure that the paper you are using is within specifications. Paper specifications can be found in Section 1 of this Service Handbook.

### 4.4.05 Common Problems

1. Nothing happens when the unit is powered on.

   The unit may not be plugged in. Check the power cord connection to the outlet and to the printer. If a power strip is being used, make sure that it is powered ON. Check to be sure that an external fuse hasn't blown or that a circuit breaker hasn't tripped.

2. The printer does not print when the computer sends data.

   The printer may be deselected. If the SEL light is out, press the SEL button to select the printer.

   The printer cable may not be securely connected. Check the cable to be sure that it is properly connected to both the PC and the printer.

   If you have installed the serial interface board, check to be sure that the board is firmly seated in the printer.

3. A brand new ribbon has been installed and the printing is smeared and streaked.

   The plastic shield on the ribbon is either loose or missing. The shield must be left on the ribbon when you are installing the cartridge. To correct this situation, move the printhead to the center of the platen (careful - the printhead may be HOT!) and lift off the ribbon cartridge. Check the ribbon shield. If it is loose, secure it in place properly. If it is missing, locate it and install.

4. 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 you have this problem 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.

5. The Print Quality and Character Pitch buttons on the front panel won't work.

   The Operator Panel Function Item on the printer MENU can be used to disable these buttons. If the printer is part of a customized system or if it is used by a number of people, the system manager may have used this option to make sure the printer is always set properly.

*NOTE:*

*This feature also prevents access to the Menu. To access the Menu, power OFF the printer, then hold down the SEL key while powering ON.*

6. Strange symbols and incorrect fonts appear on the output when a document is printed.

   The printer driver that is engaged does not agree with the emulation selected for the printer.

   To check the emulation selected, first make sure that paper is loaded. Then, press the SEL and SHIFT buttons simultaneously to enter the Menu Mode. Next, press the GROUP button. This will print the emulation selected.

   If the emulation is not the one you want to use, press the SET button to change it to the one you want before exiting the Menu Mode. To exit, press the SEL and SHIFT buttons.

   If the emulation is correct, check your software documentation on how to select a printer driver. Then, check to be sure that you have selected one of the drivers listed for that emulation. Refer to the Printer Handbook for emulation/driver selections. The closer the driver is to the top of the list in the Printer Handbook, the more compatible it will be with your printer. If your software does not have any of the indicated drivers available, check with the software manufacturer to see if they have added any additional drivers since you purchased your software.

   If you have embedded any printer commands in your software, check to be sure that you have entered them correctly.

7. Printing on the right side of the page is lighter or darker than the rest of the print on the page.

   Although the printer automatically sets the head gap, it sometimes may need a minor adjustment. To make this adjustment, enter the Menu Mode. Press SEL and SHIFT buttons simultaneously. To change the setting for the Printhead Gap Adjust under the Setup Group, use the following procedure.

   Press GROUP until Setup Group prints.

   Press ITEM until Printhead Gap prints.

   Press SEL to change the setting. The default setting is 0. If the printing is sometimes lighter, change the setting to - 1. If it is sometimes darker, change it to + 1.

   Press SEL and SHIFT buttons simultaneously to exit Menu Mode.

8. There are vertical spacing problems when using continuous forms and Forms Tear Off.

   The printer does not have a bail arm, so pages do not feed as high as printers with bail arms. The first page does not line up correctly. Enter Menu Mode and disable Form Tear Off. Exit Menu Mode. Deselect the printer and set the paper position, using the Micro Feed buttons (hold SHIFT while pressing MICRO FEED UP or DOWN). Enter Menu Mode and enable Form Tear Off. Exit Menu Mode.

9. The ALARM light is not on, but paper needs to be loaded.

   If the ALARM light is off, the printer "thinks" that paper is loaded. To correct this problem, press and release the SEL button. Then, hold the SHIFT button and press the RESET (Character Pitch) button. The ALARM light will come on and you will be able to load paper.

10. The ALARM light is on and the Character Pitch 15 light is blinking.

    This indicates a paper loading error. To stop the blinking light, press the SEL button. Before trying to load paper, check to be sure that you have the paper lever in the correct position (BOT, TOP, REAR) for the path that you are using.

**CAUTION:**

*Always power OFF the printer before you turn the platen knob.*

If the paper lever is in the correct position and you are using rear feed, lift up the paper separator and check to be sure that the paper is properly on the tractors and has not jammed.

If the paper lever is in the correct position and you are using the optional bottom-feed push tractor, check the bottom tractor unit to be sure that the paper is properly installed on the tractors and that the paper has not jammed.

Once the paper is correctly loaded, press and release the SEL button, then hold the SHIFT button and press the RESET (Character Pitch) button.

11. Word processor files do not print the way the MENU and front panel are set.

    Before sending a file to the printer, many word processors send either an initialization string or an I-Prime signal to the printer.

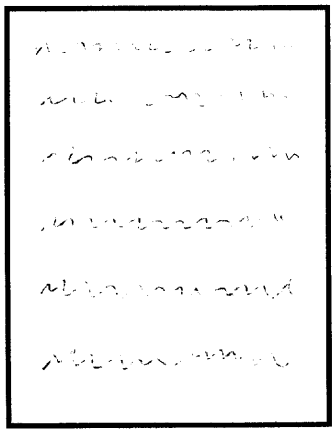
    The initialization string contains codes that reset the printer to a default set of features. Otherwise, the printer might accidentally print using features set for a previous job. These codes will override the panel or MENU settings. To set your printer to ignore the reset codes, enter the printer MENU (hold down the SHIFT button while pressing SEL/MENU button) and change the Reset Inhibit item (in the Setup Group) to Yes. Please note that while this will stop the reset code from resetting your printer, but other codes in the initialization string may still override the printer MENU and / or front panel settings.

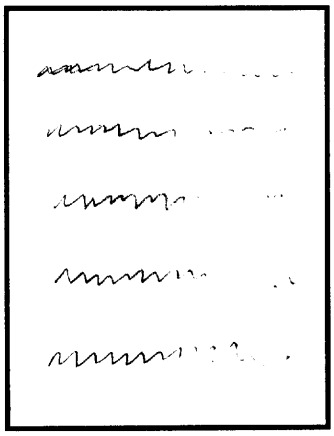
    The I-Prime signal is sent over the parallel interface (pin 31) and will automatically override any settings you have made using the front panel buttons. To eliminate this problem, enter the Menu Mode (hold down the SHIFT button while pressing SEL/MENU button) and change the I-Prime item (in the Parallel I/F Group) to Invalid.

## 4.5 ABNORMAL OUTPUT

### 4.5.01 Output Samples

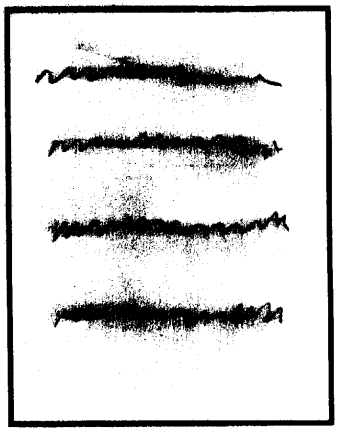
Light Print on the Entire Page

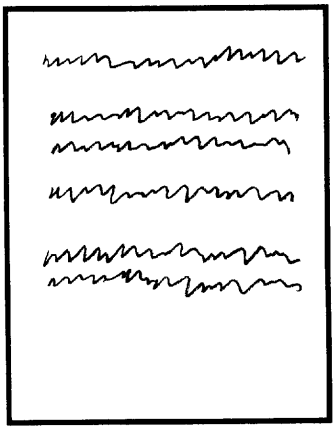




Uneven Print Density

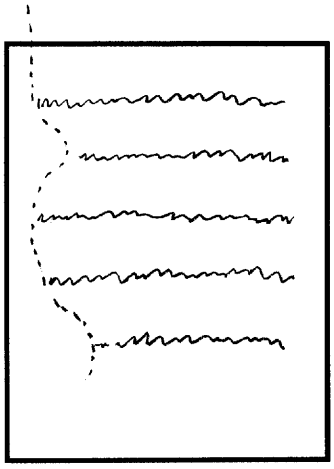
Smeared Print





Inconsistent Line Feed

Drifting Margin



4-5-01.pcx

### Light Print on the Entire Page

Possible Causes:

1. Ribbon is "dried out". Replace the ribbon.
2. Verify that the headgap menu setting is appropriate for the type of paper being used.
3. Check / perform the printhead gap adjustment.
4. Paper is not within specification. Refer to Section One for paper specification.

### Uneven Print Density

Possible Causes:

1. Printhead gap not within specification. Perform the printhead gap adjustment.
2. Defective platen. Replace the platen.

### Smeared Print

Possible Causes:

1. Ribbon protector is missing or broken. Replace the ribbon protector.
2. Verify that the headgap menu setting is appropriate for the type of paper being used.
3. Check / perform the printhead gap adjustment.
4. Paper is not within specification. Refer to Section One for paper specification.

### Inconsistent Line Feed

Possible Causes:

1. Power OFF the printer. Turn the platen knob. The platen should rotate smoothly. If it does not, remove the cause of the binding.
2. Defective line feed motor. Replace the line feed motor.

### Drifting Margin

Possible Causes:

1. Power OFF the printer. Move the carriage assembly. The carriage should move smoothly. If it does not, remove the cause of the binding.
2. Refer to the next section and / or Technical Service Bulletin 3309.

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**Left Margin Drifting Problem**

*NOTE:*

*This information is also provided in Technical Service Bulletin 1707.*

To correct a problem with the left margin drifting during print operations, follow this procedure.

1. Manually slide the carriage assembly back and forth along the full length of the carriage shaft.

   Check for "drag" caused by the ribbon, a dirty space rack, or other obstructions.

   If you suspect that the ribbon is causing movement problems, check the movement of the carriage assembly with the ribbon removed *OR* with a new ribbon installed.

2. Check the contact between the carriage frame and the space motor board assembly.

   Contact is made at the front edge of the board.

   Any gap will keep the space motor gear from fully engaging with the space rack. This will result in slippage problems, which will affect spacing operations.

3. Check the printhead cable connections between the main control board and the space motor. Solid contact *MUST BE* made at all connections or print problems will occur.

4. Check the condition of the printhead cable. If it is broken, torn, or sharply bent, replace the cable.

5. If the problem continues, check the parts listed below (in the order given). Replace the suspected part. Be sure to test the printer after replacing each part.

   1. Carriage: Frame Set
   2. Motor: Space
   3. Rack: Space
   4. Cable: Printhead
   5. Board: Main Control

6. If the problem continues, check all assemblies and connections. Then, contact Okidata Technical Information for further assistance.

## 4.6 FAULT ALARMS

### 4.6.01 General Information

Follow these guidelines when using the Troubleshooting Tables.

**CAUTION:**

*Always check that all connectors on the printer are making good contact.*

1. Record the status (OFF, solidly ON, Blinking) of the Operator Panel LEDs.
2. Go to to the Troubleshooting Table Index (Section 4.6.02).
3. Look for the LED Indications you have observed.
4. The Reference Number in the column at the right side of the Troubleshooting Table Index directs you to the appropriate item in the Troubleshooting Tables (Section 4.6.03).
5. The Troubleshooting Tables will provide a Failure Description, Probable Cause and Recommended Action.
6. The Recommended Action will direct you to the actions listed below.

   Follow a specific RAP

   Replace items in a listed order.

### 4.6.02 ALARM/LED Display Troubleshooting Table Index

**CAUTION:**

*Always check that all connectors on the printer are making good contact.*

| ALARM | UTILITY | PROP | NLQ | HSD | 10 | 12 | 15 | 17 | 20 | SEL | MENU | Reference Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Blinking | | On | | On | | | | | | | | 1 |
| Blinking | On | On | | | | | | | | | | 2 |
| Blinking | | | | | On | | | | On | | | 3 |
| Blinking | | | | On | On | | | | On | | | 4 |
| Blinking | On | | | | On | | | | On | | | 5 |
| Blinking | | On | | | On | | | | | | | 6 |
| Blinking | | On | | | On | | | | | | | 7 |
| Blinking | | | On | | On | | | | On | | | 8 |
| Blinking | | On | | | On | | | | On | | | 9 |
| Blinking | | | | | On | | | | | | | 10 |
| Blinking | | | | | | | On | | | | | 11 |
| Blinking | | | | | | | | | On | | | 12 |
| Blinking | On | | | | | | On | | | | | 13 |
| Blinking | | | On | | | | On | | | | | 14 |
| Blinking | | | | | | | | On | | | | 15 |
| Blinking | | | | On | | | | On | | | | 16 |
| Blinking | On | | | | | | | On | | | | 17 |
| Blinking | | | | On | On | | | | | | | 18 |
| Blinking | | | | On | | | On | | | | | 19 |
| Blinking | | | | On | | | | | On | | | 20 |
| Blinking | | | | On | | On | | | | | | 21 |
| On | | | | | On | | On | | | On | On | 22 |
| On | | | | | Blinking | | | | | | On | 23 |
| On | | | | | | | Blinking | | | | On | 24 |
| | | | | | On | | On | | | On | Blinking | 25 |
| | | | | | On | | On | | | On | Blinking | 26 |

*NOTE:*

*Reference Numbers 25 and 26 use identical Operator Panel displays*

### 4.6.03 ALARM/LED Display Troubleshooting Tables

**CAUTION:**

*Always check that all connectors on the printer are making good contact.*

| Reference Number | Failure Description | Cause | Recommended Action |
|---|---|---|---|
| 1 | Space Motor Alarm | Space motor IPT does not occur in specified time. | Refer to RAP 02. |
| 2 | Printhead Detection Alarm | Printhead does not home. | Refer to RAP 03. |
| 3 | Printhead A/D Alarm | Thermistor is open or +5 vdc shorted. | Check the printhead connection. Then, replace the main control board, the carriage cable, and the printhead. |
| 4 | Printhead Gap Alarm | Self adjustment was not successful. | Check the printhead connection. Then, replace the main control board, the carriage cable, and the printhead. |
| 5 | Printhead Data Transfer Alarm | Printhead parity error was not recovered or print head was not seated properly. | Replace the main control board, the carriage cable, and the printhead. |
| 6 | Printhead Type Alarm | 24 pin printhead is connected in a 9 pin printer. | Replace the printhead with a 9 pin printhead. |
| 7 | Printhead Connection Alarm (1) | Overdrive signal is active but no current is detected. | Check the printhead connection. Then, replace the main control board, the carriage cable, and the printhead. |
| 8 | Printhead Connection Alarm (2) | Self adjust was not successful. Head gap is too small or too narrow. | Check the printhead connection. Then, replace the main control board, the carriage cable, and the printhead. |
| 9 | Line Feed / Space Motor Driver Alarm | High driver temperature. The TSD signal has not changed. | Replace the following: main control board, line feed motor, and space motor. |
| 10 | MPU Internal RAM Alarm | Read/write error | Replace the main control board. |
| 11 | Program ROM Alarm | Check sum error | Replace the main control board, and/or ROM. |
| 12 | RAM on Main Control Board | Read/write error | Replace the main control board. |
| 13 | CG ROM Alarm | Check sum error | Replace the main control board. |

**CAUTION:**

*Always check that all connectors on the printer are making good contact.*

| Reference Number | Failure Description | Cause | Recommended Action |
|---|---|---|---|
| 14 | EEPROM Alarm | No reaction when the MPU reads data. | Replace the main control board |
| 15 | Watchdog Timeout Alarm | MPU hung up | Power OFF, then ON. |
| 16 | NMI Signal Alarm | NMI port of MPU kept low | Replace the main control board |
| 17 | BRK Instruction Alarm | FFFF data detected due to MPU hang up | Replace the ROM on the main control board |
| 18 | MPU Internal RAM Alarm | Read/write error | Replace the interface board. |
| 19 | ROM Alarm | Check sum error | Replace the interface board |
| 20 | RAM on I/F Board Alarm | Read/write error | Replace the interface board. Then, replace the main control board |
| 21 | Interface not Connected | Serial interface board not detected. | Replace the interface board. Then, replace the main control board |
| 22 | Paper End Alarm | From the cut sheet feed or bottom feed paper end | Check paper supply. Refer to RAP 04 |
| 23 | Paper Change Lever Alarm | Change lever is set for top feed while paper is inserted from rear or bottom. | Set the lever to the specified position. Check the rear sensor lever. Replace the main control board |
| 24 | Cut Sheet Jam | Cut sheet could not be fed properly. | Remove the paper. Check the feed mechanism. Press SEL. |
| 25 | Printhead Thermal Alarm | Printhead temperature exceeds 118 degrees | Wait until the printhead cools. The printer should resume printing. If the problem persists, replace the printhead. If that does not solve the problem, replace the main control board |
| 26 | Space Motor Thermal Alarm | Temperature of space motor exceeds specified value | Wait until the space motor cools. The printer should resume printing. If the problem persists, replace the space motor. If that does not solve the problem, replace the main control board |

## 4.7 REPAIR ANALYSIS PROCEDURES (RAPs)

### 4.7.01 Using the RAPs

When using the Repair Analysis Procedures, follow these steps.

1. Go to the RAP Index.
2. Find the RAP which is associated with the printer's problem.
3. Go to the appropriate RAP.
4. All RAPs begin with a START statement, followed by questions or another type of statement.

## 4.7.02 RAP Index

| RAP Number | Description |
|---|---|
| 1 | No Power Supplied to Printer |
| 2 | No Spacing Operation |
| 3 | Printhead Homing Error |
| 4 | Paper Jam During Paper Loading |
| 5 | Printhead Not Firing Pins |
| 6 | Poor Print Quality |
| 7 | Ribbon Feed Problem |
| 8 | Line Feed Problem |
| 9 | Operator Panel Malfunction |
| 10 | Parallel Interface Problem |
| 11 | Serial Interface Problem |

**RAP 01 No Power Supplied to Printer**

START

The printer does not power On when the AC switch is turned ON.

Check the AC cable.

Is it correctly connected?

Yes Check the fuse on the power supply board and F1 of the main control board. Are they open?

No Go to A.

Yes Replace the fuse(s) with fuse(s) of the same rating.

Is the problem resolved?

Yes End of procedure.

No Go to A.

B

No Remove the cable from CN3 on the main control board.

Refer to Appendix A of this Service Handbook for voltage check points on CN3 of the main control board. Check the output voltages of the secondary of the transformer.

Replace the following in the order listed below. Check operation before replacing next item in list.

1. Operation Panel.
2. Power Transformer.

Has the problem been resolved?

Yes End of procedure.

No Contact Technical Support.

A

Remove the cable from CN7 of the main control board. Then, power ON the unit.

Do the operation panel LEDs light?

No Go to B.

Yes Power OFF the unit. Remove the printhead. Power ON the unit.

Has the problem been resolved?

Yes Replace the printhead.

Has the problem been resolved?

Yes End of procedure.

No Go to B.

No Replace the following in the order listed below. Check operation before replacing next item in list.

1. Ribbon Feed Mechanism.
2. Carriage Cable.
3. Main Control Board
4. PROM 05CA

Has the problem been resolved?

Yes End of procedure.

No Contact Technical Support.

### RAP 02 No Spacing Operation

START

The alarm LED blinks.

Is the carriage assembly binding or jammed?

No Make sure the carriage cable is properly connected to the space motor assembly and CN7 on the main control board.

Go to A.

Yes 1. Remove the ribbon to verify that the ribbon is not jammed.

2. Remove the space motor assembly

3. Inspect the teeth on the space rack and the space motor gear.

4. Go to A.

A

Has the problem been resolved?

Yes End of procedure.

No Is the fuse F2 on the main control board open?

No Go to B.

Yes Replace the main control board.

Has the problem been resolved?

Yes End of procedure.

No Go to B.

B

Verify that +40 volts is present on CN7 main control board (Refer to Appendix A of the Service Handbook).

Has the problem been resolved?

Yes End of procedure.

No Replace the carriage cable.

Has the problem been resolved?

Yes End of procedure.

No Replace the ribbon feed mechanism

Has the problem been resolved?

Yes End of procedure.

No Replace the PROM (O5CA)

Has the problem been resolved?

Yes End of procedure.

No Contact Technical Support.

### RAP 03 Printhead Homing Error

START

Printhead does not return to the home position.

Make sure the carriage cable is properly connected to the space motor assembly and CN8 on the main control board.

Make sure the power connector cable is properly connected to CN3 on the main control board.

Does the space motor assembly move manually?

No Remove the space motor assembly and inspect the space motor and space rack for dirt and worn teeth.

Go to A

Yes Are there any breaks in the carriage cable?

Yes Replace the carriage cable assembly.

Go to A

No Verify that ribbon feed mechanism is properly fastened to the space motor assembly.

Go to A

A

Does the carriage move slightly to the left after turning the power on?

No Replace the space motor assembly.

Has the problem been resolved?

Yes End of procedure.

No Contact Technical Support.

Yes Replace the ribbon feed assembly.

Has the problem been resolved?

Yes End of procedure.

No Replace the main control board.

Has the problem been resolved?

Yes End of procedure.

No Replace the space motor assembly.

Has the problem been resolved?

Yes End of procedure.

No Contact Technical Support.

### RAP 04 Paper Jam During Paper Loading

START

Check paper path release lever for proper position. Make sure the paper path is clear.

Which of the following paper jams have occurred?

1. Paper bent at top left corner.

   Check the support protector to see if it covers the left side of the paper properly.

   Go to A.

2. Paper has torn ends.

   Check the ribbon protector.

   Check the pull up roller cover to see that it is closed properly.

   Go to A.

3. Paper squeezed from either end.

   Check around the pressure roller mechanism.

   Check the front pressure springs to see that they are mounted properly. There are three springs in the Microline 520 and five springs in the Microline 521.

   Check the tension of all the front pressure rollers to see if they are the same. Top springs: 250 g. Rear Springs: 90 g.

   Make sure that the front release gear arm and the gear of the front release gear shaft are in the proper position.

   Go to A.

A

Has the problem been resolved?

Yes End of procedure.

No Check that the head gap is set properly.

Has the problem been resolved?

Yes End of procedure.

No Contact Technical Support.

**RAP 05 Printhead Pins Not Firing**

START

Missing dots on output.

Verify that the printhead gap is set correctly.

Ensure the carriage cable is making firm contact with CN7 on the main control board and the space motor assembly. Inspect both ends of the carriage cable for worn edges.

Has the problem been resolved?

Yes End of procedure.

No Replace the printhead.

Has the problem been resolved?

Yes End of procedure.

No Replace the main control board

Has the problem been resolved?

Yes End of procedure.

No Replace the carriage cable.

Has the problem been resolved?

Yes End of procedure.

No Replace the space motor assembly.

Has the problem been resolved?

Yes End of procedure.

No Contact Technical Support.

**RAP 06 Poor Print Quality**

START

Is the print head gap properly set?

Yes Go to A

No Go to B

A Replace the printhead

Has the problem been resolved?

Yes End of procedure.

No Go to C.

C Replace the main control board.

Has the problem been resolved?

Yes End of procedure.

No Check that the carriage cable is making good contact with the main control board and the carriage assembly. Replace the cable if it is worn or bent.

Has the problem been resolved?

Yes End of procedure.

No Contact Technical Support.

B Adjust the print head gap (Refer to Section 3 of this Service Handbook).

Has the problem been resolved?

Yes End of procedure.

No Power ON the unit and view the head gap indicator.

Does the head gap indicator display a range of 9?

Yes Go to A

No Replace the ribbon feed mechanism.

Has the problem been resolved?

Yes End of procedure.

No Go to C

**RAP 07 Ribbon Feed Problem**

START

The ribbon feed does not function properly.

Verify that both ends of the carriage cable are connected correctly.

Make sure the ribbon shield is fastened properly.

Remove the ribbon cartridge.

Grasp the carriage. Manually move the carriage left and right.

Does the ribbon drive shaft rotate?

Yes Change the ribbon cartridge.

End of procedure.

No Remove the ribbon feed mechanism.

Manually move the carriage left and right.

Does the space motor shaft rotate freely?

Yes Replace the ribbon feed mechanism.

End of procedure.

No Replace the space motor assembly.

Has the problem been resolved?

Yes End of procedure.

No Replace the main control board.

Has the problem been resolved?

Yes End of procedure.

No Contact Technical Support.

**RAP 08 Line Feed Problem**

START

No line feed operation.

Make sure that the line feed cable is properly connected to the line feed motor and CN5 of the main control board.

Power OFF the printer. Manually rotate the platen.

Does the platen rotate smoothly?

Yes Go to A

No Is the left platen gear broken?

Yes Replace the platen assembly.

End of procedure.

No Is the line feed idle gear broken?

Yes Replace the line feed motor assembly or the line feed idle gear.

End of procedure.

No Are the right platen gear, idle gear and/or change gear broken?

Yes Replace the respective assembly.

End of procedure.

No Set the change lever to the rear position.

Does the platen rotate smoothly?

Yes Replace the tractor feed assembly.

End of procedure.

No Check the gears on the tractor feed assembly and platen assembly for broken or missing teeth. Replace the defective assembly.

Go to A

A

Replace the line feed motor assembly.

Has the problem been resolved?

Yes End of procedure.

No Replace the main control board.

Has the problem been resolved?

Yes End of procedure.

No Contact Technical Support.

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**RAP 09 Operation Panel Malfunction**

START

The operation panel does not function properly.

Do the operation panel LEDs light when power is applied?

Yes Make sure the cable from CN1 of the operation panel is properly connected to CN7 on the main control board.

Go to A

No Check the F1 fuse on the main control board and the fuse on the power supply board. Are they open?

Yes Replace the open fuse with one that has the proper rating.

Go to A

No Replace the power supply unit.

Go to A

A

Has the problem been resolved?

Yes End of procedure.

No Replace the operation panel board.

Has the problem been resolved?

Yes End of procedure.

No Replace the main control board.

Has the problem been resolved?

Yes End of procedure.

No Contact Technical Support.

### RAP 10 Parallel Interface Problem

START

No parallel port communication.

Is the SEL LED blinking?

Yes The printer is in the Print Suppress mode.

Disable the menu item Print Suppress if the function is not required.

End of procedure.

No Does the SEL LED light ?

Yes Go to A

No Press SEL key.

Has the problem been resolved?

No Disconnect the cable.

Does the SEL LED light ?

Yes Change the menu item I-prime to invalid.

No Go to A

Yes Is data being received properly?

Yes End of procedure.

No Check that the cable is properly connected to the Host PC and the correct LPT port is selected.

Does the SEL LED light?

No Go to A

Yes Change the menu item I-prime to invalid.

End of procedure.

A

Replace the interface cable.

Has the problem been resolved?

Yes End of procedure.

No Replace the main control board.

Has the problem been resolved?

Yes End of procedure.

No Contact Technical Support.

**RAP 11 Serial Interface Problem**

START.

Are you using a cable with the proper number of pins?

No Change the interface cable.

Has the problem been resolved?

Yes End of procedure

No Go to A

Yes Is the ALARM LED blinking?

Yes Refer to Section 4.6 of the Service Handbook.

Has the problem been resolved?

Yes End of procedure

No Go to A

No Go to A

A

Check the serial interface parameters for the RS232C (in the Printer Menu): baud rate, word length, parity, protocol, busy signal and parity.

Has the problem been resolved?

Yes End of procedure

No Go to B

B

Check the voltages on the main control board.

Is 10 VAC being supplied to the main control board?

Yes Replace the RS232C board.

Has the problem been resolved?

Yes End of procedure.

No Replace the main control board.

Has the problem been resolved?

Yes End of procedure.

No Contact Technical Support.

No Replace the power supply unit.

Has the problem been resolved?

Yes End of procedure.

No Replace the RS232C board.

Are + 8 vdc / - 8 vdc present on the main control board? (Refer to Appendix A of this Service Handbook).

Yes Replace the RS232C board.

Has the problem been resolved?

Yes End of procedure.

No Contact Technical Support.

No Replace the main control board.

Has the problem been resolved?

Yes End of procedure.

No Contact Technical Support.

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## 4.8 PRINTER TESTS

### 4.8.01 General Information

This section covers the tests listed below.

- Rolling ASCII Test
- Font Test
- Serial Interface Loopback Test
- Hexadecimal Dump Mode

The Rolling ASCII and Font Tests check print operations.

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

The Hexadecimal Dump Mode checks the data transfer between the computer and printer.

### 4.8.02 Rolling ASCII Test

#### General Information

The rolling ASCII test is a continuous printout of all 96 ASCII characters.

Use this test to check the following items.

1. Print Quality

   Across the entire length of a line

   Down the entire page

2. Line Spacing
3. Left Margin Alignment

At the top of the test is the printer type (1), emulation (2), country (3), and firmware revision level (4). This information is often required while performing service or when contacting Okidata. Have this test available during your service call.

**CAUTION**

*Before running this test, make sure that continuous feed paper is loaded.*

*If you are running this test on a Microline 521, use wide paper or have the page width set for 8.5" x 11" in the printer menu.*

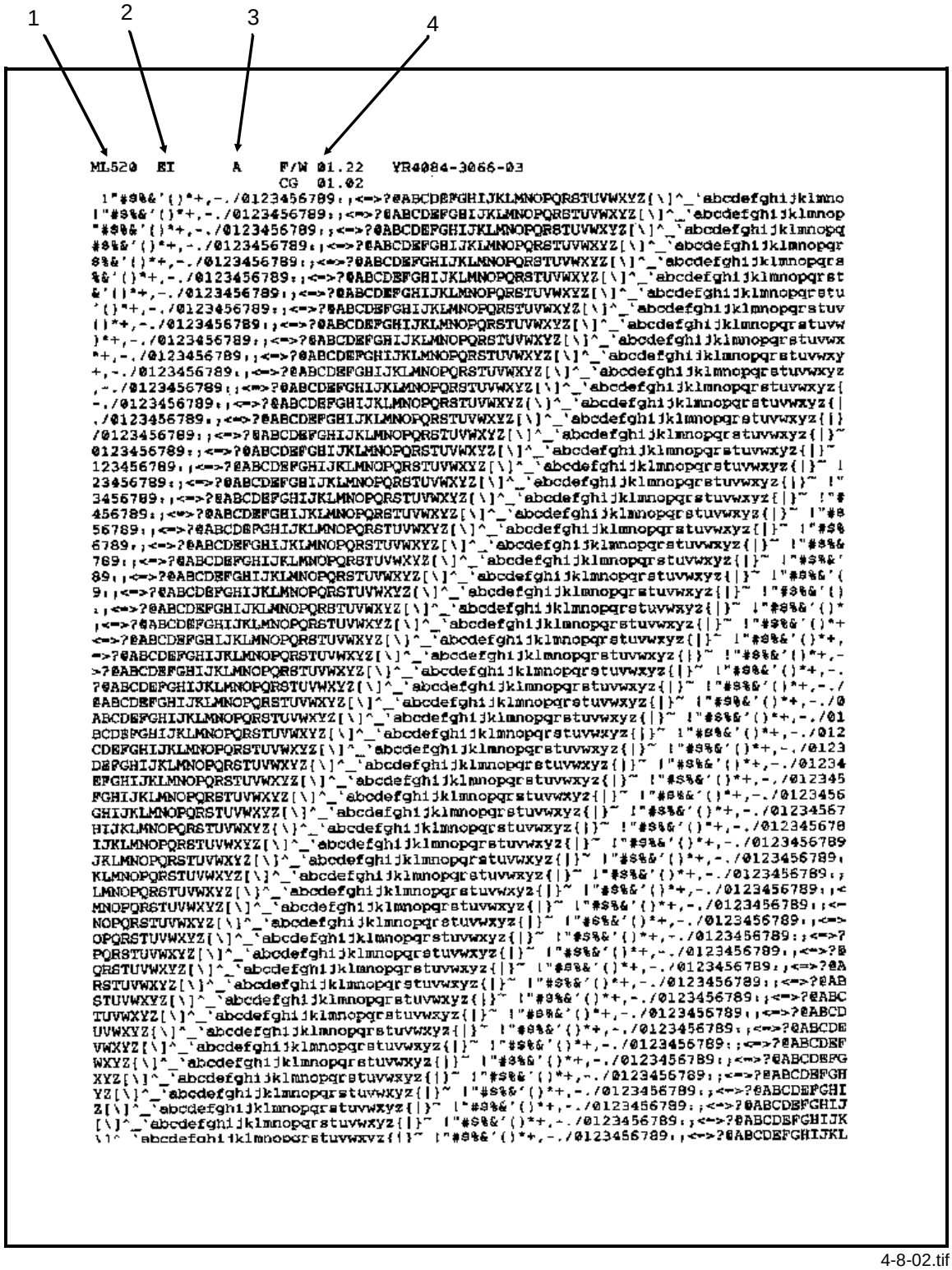
*Running the test without paper loaded or having the wrong width paper loaded will allow the printhead to print on the platen. This will dirty the platen, cause excessive wear on the ribbon, and may damage the platen, ribbon, and printhead.*

#### Procedure

Follow these steps to print the Rolling ASCII Test.

1. Load the correct size continuous feed paper.
2. Power off the printer.
3. Press and hold the QUIET switch while powering on the printer. You must hold the QUIET switch until the test starts to print.
4. The test will continue to print until you press the SEL switch or run out of paper.

**Sample**




4-8-02.tif

### 4.8.03 Font Test

#### General Information

The font test is a one page sample printout of each available typeface.

HSD 10 cpi

HSD 12 cpi

HSD 17.1 cpi

Utility 10 cpi

Utility 12 cpi

Utility 17.1 cpi

NLQ 10 cpi

NLQ 12 cpi

NLQ 10 cpi Double Height / Double Width

At the top of the test is the printer type (1), emulation (2), country (3), and firmware revision level (4). This information is often required while performing service or when contacting Okidata. Have this test available during your service call.

**CAUTION**

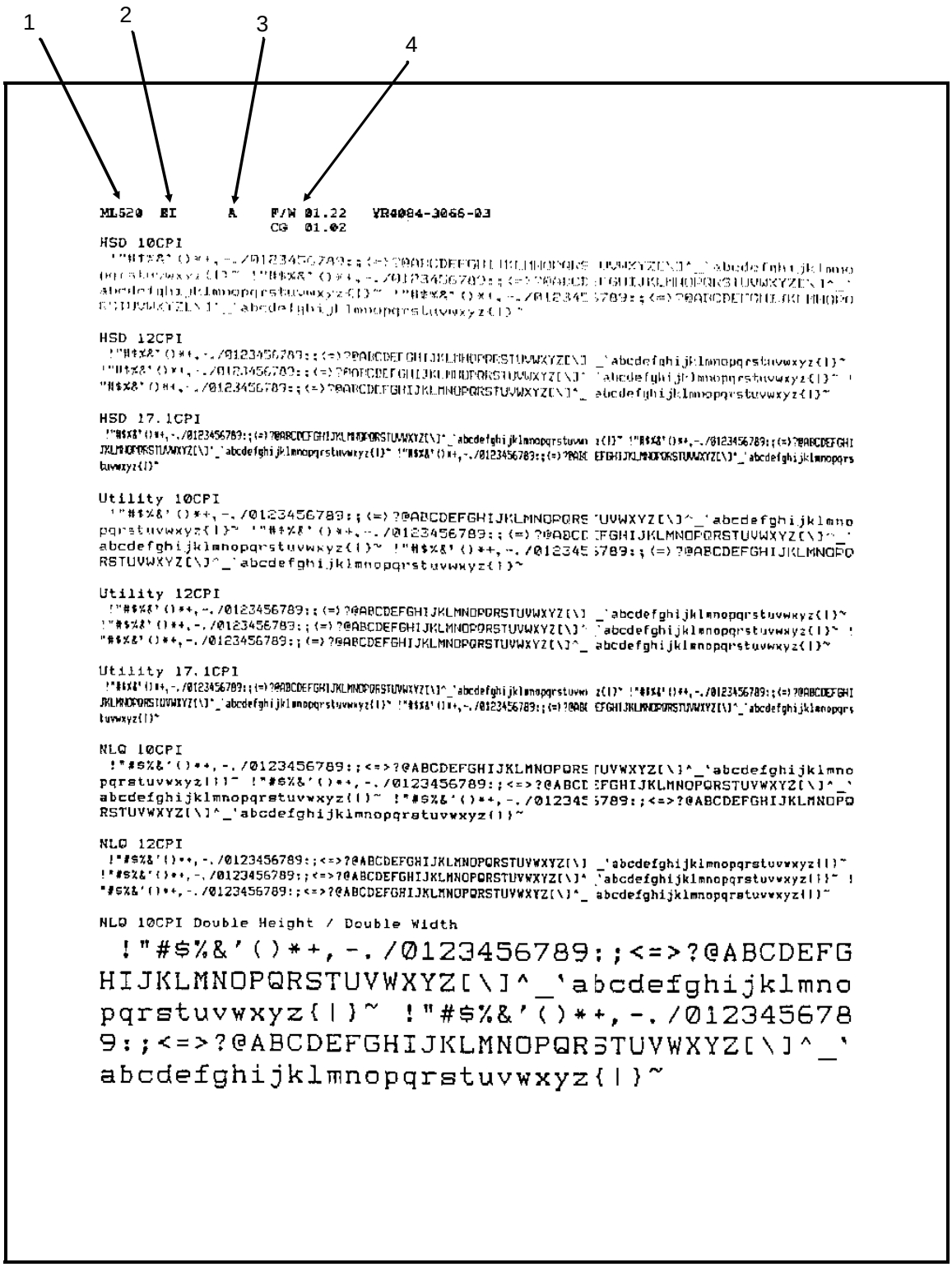
*Running the test without paper loaded will allow the printhead to print on the platen. This will dirty the platen, cause excessive wear of the ribbon, and may damage the platen, ribbon, and printhead.*

#### Procedure

Follow these steps to print the font test.

1. Load the paper.
2. Power off the printer.
3. Press and hold the LF switch while powering on the printer. You must hold the LF switch until the test starts to print.
4. The one page test will print, then stop.

**Sample**




4-8-03.tif

### 4.8.04 Serial Interface Loopback Test

*NOTE:*

*In order to run this test, the serial interface board must be installed with a serial loopback test connector attached to it.*

To perform the serial interface loopback test, follow these steps.

1. Place the printer in the Serial Diagnostic mode.

   Set the Diagnostic Test menu item to YES.

2. Power off the printer.
3. Attach the loopback connector to the serial port.
4. Install continuous feed paper.
5. Power on the printer.
6. The message LOOP TEST prints.
7. The size of the Message Buffer prints.
8. One of the following three messages prints next.

   If the message **OK** prints, the message buffer has been tested and no problems were found.

   If the message **BAD** prints, there is a problem with the message buffer.

   If the message **IF BAD** prints, the signal logic was tested and a problem was found.

9. Hexadecimal characters 20 through 7F are transmitted through the transmit data line.
10. The receive data line receives the characters.
11. The message buffer stores the characters.
12. The data prints.
13. The test runs until the printer is powered off or the SELECT switch is pressed.

### Loopback Connector Configuration

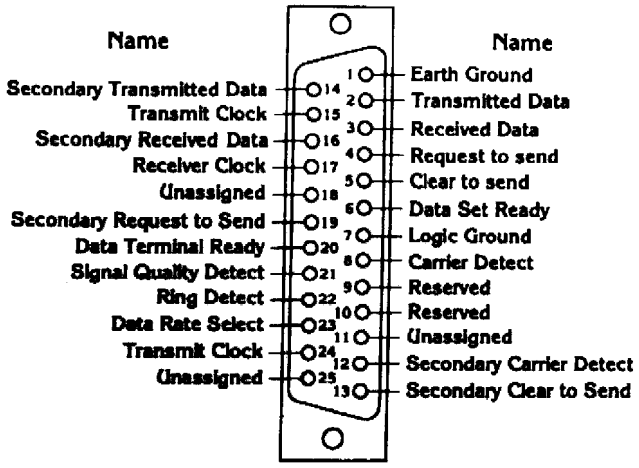
1. Jumper the following pins together.

   Pin 2 to Pin 3

   Pin 4 to Pin 5

   Pin 8 to Pin 11

   Pin 6 to Pin 20




RS232-C Serial Loopback Test Connector

(DB25P Plug) 4-8-04.tif

### Serial Cable Information

The information in this section will help you make a serial cable to connect between the printer and computer.

Refer to the computer documentation to determine the cable requirements on the computers end.

The printer has the following cable requirements.

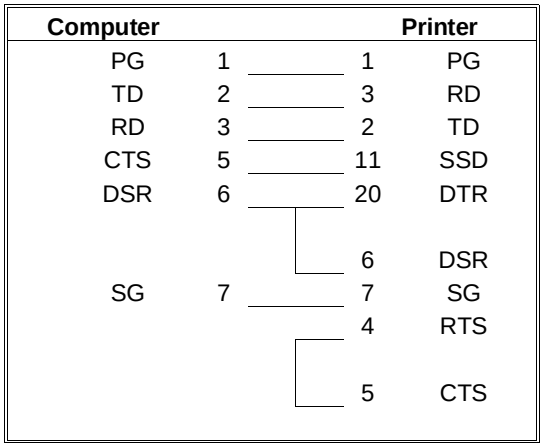
- Shielded, RS-232C cable
- UL and CSA approved
- No more than 50 feet long
- Cannon DB-25P plug (or equivalent) with 25 pins
- Cannon DB-C2-J9 (or equivalent) connector shell

### Serial Interface Signal Requirements

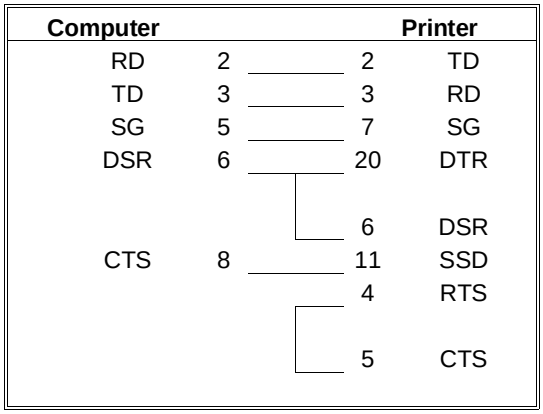
| Pin | Signal | Symbol | Direction | Description |
|---|---|---|---|---|
| 1 | Protective Ground | PG | Ground | Connected to the printer frame |
| 2 | Transmit Data | TD | From Printer | Serial data transmitted to the system |
| 3 | Receive Data | RD | To Printer | Serial data received by the printer |
| 4 | Request to Send | RTS | From Printer | Always set to low (mark) |
| 5 | Not Used | | | |
| 6 | Data Set Ready | DSR | To Printer | Indicates that data can be sent |
| 7 | Signal Ground | SG | Ground | Ground |
| 8 to 10 | Not Used | | | |
| 11 | Supervisory Send Data | SSD | From Printer | Indicates that the printer is not ready to receive data |
| 12 to 19 | Not Used | | | |
| 20 | Data Terminal Ready | DTR | From Printer | Indicates that the printer is not ready to receive data |
| 21 to 25 | Not Used | | | |

## Commonly Used Serial Cable Configurations

### IBM 25-Pin Cable Configuration




### IBM 9-Pin Cable Configuration



### 4.8.05 Hexadecimal Dump Mode

#### General Information

The hexadecimal dump mode allows you to view the data sent from a computer to the printer. When the printer is in hex dump mode, all data received (both printable characters and control codes) will be printed in both hexadecimal and ASCII format.

*NOTE:*

*In the ASCII format, all non-printable characters will be represented by a period.*

#### Example

Below is a line of BASIC code.

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

Below is the same line as it would appear in Hexadecimal Dump Mode.

```
1B 30 1E 54 68 69 73 20 69 73 20 61 6E 20 65 78 .0.  This is an ex
61 6D 70 6C 65 20 66 20 61 20 68 65 78 61  64    ample of a hexad
65 63 69 6D 61 6C 20 64 75 6D 70 2E 0D 0A       ecimal dump
```

#### Procedure

Follow these steps to engage the Hexadecimal Dump Mode.

1. Make sure the printer is connected to a computer.
2. Verify that paper is loaded.
3. Verify that the ribbon and printhead are correctly installed.
4. Power OFF the printer.
5. Press and hold the SEL and FF/LOAD switches while powering on the printer.
6. Hold the switches until the printer prints the line:

   **Hex Data Dump**

7. The printer is ready to receive data in the Hexadecimal Dump Mode.
8. Send data to the printer from the computer.
9. To exit Hexadecimal Dump Mode, power OFF the printer.

**Sample**

```
 Hex Data Dump
1B 7B 42 1B 74 01 1B 49 01 1B 36 1B 52 00 1B 78        .{B.t..I..6.R..x
01 1B 15 30 1B 43 00 0B 0D 1B 4A A8 1B 24 3C 00        ...0.C....J(.$<.
1B 72 00 1B 55 01 1B 2A 27 49 03 00 00 30 00 00        .r..U..*'I...0..
30 00 00 30 00 00 30 B0 00 30 00 00 30 00 00 3F        0..0..0..0..0..?
00 00 3F 00 00 30 00 00 30 00 00 30 00 00 30 00        ..?..0..0..0..0.
00 30 00 00 30 00 00 00 00 00 00 00 00 3F 00 00        .0..0........?..
3F 00 00 00 00 00 00 00 00 01 00 00 01 00 00 01        ?...............
00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00        ................
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00        ................
01 00 00 01 00 00 01 00 00 01 00 00 01 00 00 00        ................
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00        ................
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00        ................
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00        ................
00 00 00 00 00 00 3F 00 00 3F 00 00 38 00 00 1F        ......?..?..8...
00 00 07 00 00 00 00 00 00 00 00 00 00 00 00 00        ................
00 00 00 00 00 00 00 00 00 07 00 00 1F 00 00 00        ................
38 00 00 3F 00 00 3F 00 00 00 00 00 00 00 00 00        8..?..?.........

00 00 00 00 00 31 00 00 31 00 00 00 00 00 00 00        .....1..1.......
00 00 00 00 00 00 00 00 00 00 00 00 00 01 00 00        ................
01 00 00 01 00 00 01 00 00 01 00 00 01 00 00 00        ................
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00        ................
00 01 00 00 00 00 00 01 00 00 01 00 00 01 00 00        ................
00 00 00 00 00 00 00 00 00 00 00 00 01 00 00 01        ................
00 00 01 00 00 01 00 00 01 00 00 01 00 00 00 00        ................
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00        ................
3F 00 00 3F 00 00 00 00 00 00 00 00 00 00 00 00        ?..?............
00 00 31 00 00 31 00 00 00 00 00 00 00 00 00 00        ..1..1..........
00 00 00 00 01 00 00 01 00 00 00 00 00 00 00 00        ................
01 00 00 01 00 00 01 00 00 01 00 00 00 00 00 00        ................
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00        ................
00 00 00 00 00 01 00 00 01 00 00 01 00 00 00 00        ................
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00        ................

20 00 00 00 00 00 00 00 00 00 00 00 0F 00 00 00        ................
3F 00 00 30 00 00 30 00 00 30 00 00 30 00 00 30        ?..0..0..0..0..0
00 00 30 00 00 30 00 00 30 00 00 00 00 00 00 00        ..0..0..0.......
00 00 00 00 07 00 00 0F 00 00 1C 00 00 38 00 00        .............8..
30 00 00 30 00 00 30 00 00 30 00 00 1C 00 00 0F        0..0..0..0......
00 00 0F 00 00 03 00 00 00 00 00 00 00 00 03 00        ................
00 0F 00 00 1C 00 00 38 00 00 30 00 00 30 00 00        .......8..0..0..
30 00 00 30 00 00 38 00 00 1C 00 00 0F 00 00 03        0..0..8.........
00 00 00 00 00 00 00 00 00 00 00 00 00 00 01 00        ................
00 0F 00 00 3F 00 00 30 00 00 00 00 00 00 00 00        ....?..0........
0F 30 00 3F 00 00 30 00 00 30 00 00 30 00 00 30        .0.?..0..0..0..0
00 00 30 00 00 30 00 00 30 00 00 30 00 00 00 00        ..0..0..0..0....
00 00 00 00 00 00 00 07 00 00 0F 00 00 1C 00 00        ................
38 00 00 30 00 00 30 00 00 30 00 00 30 00 00 18        8..0..0..0..0...
00 00 1C 00 00 0F 00 00 03 00 00 00 00 00 00 00        ................
00 00 00 00 03 00 00 03 00 00 07 00 00 0E 00 00        ................

0C 00 00 3F 00 00 3F 00 00 00 30 00 00 00 00 00        ...?..?.....0...
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00        ................
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00        ................
```

4-8-05.tif

## 4.9 RESISTANCE CHECKS

### 4.9.01 General Description

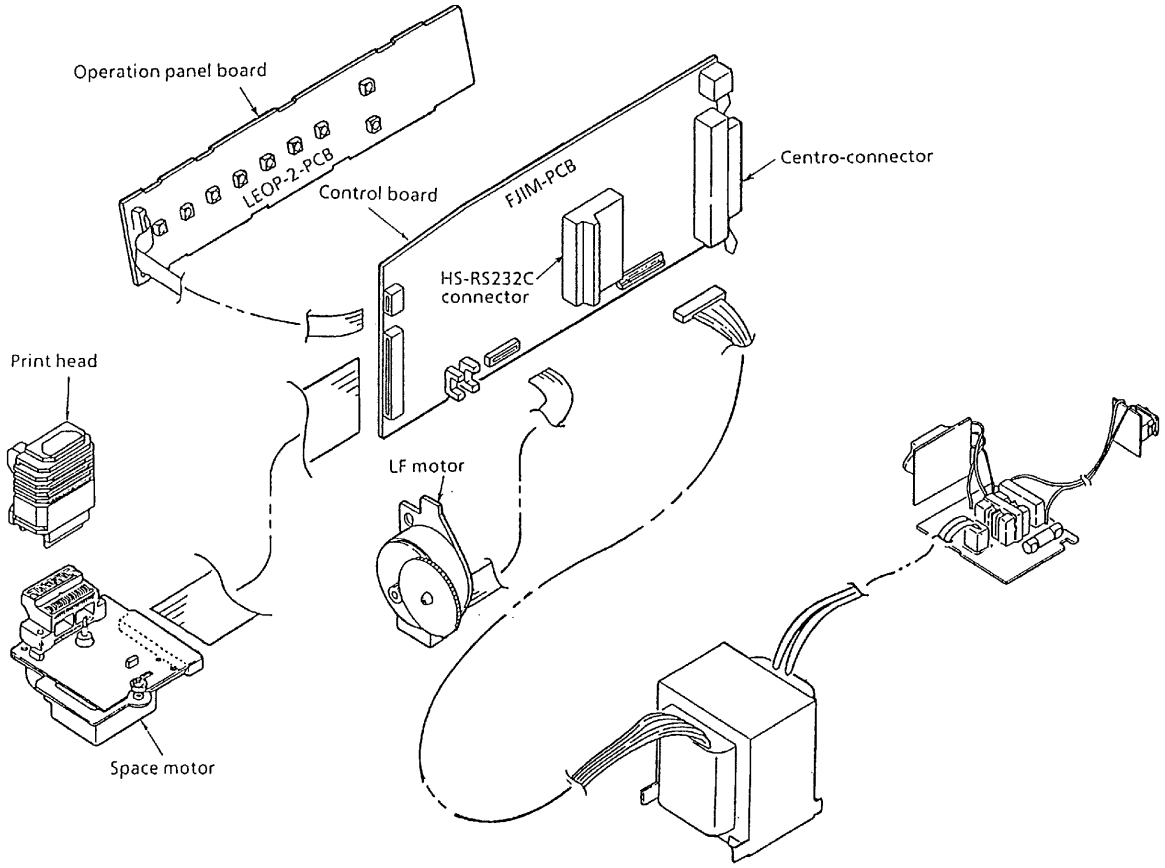
The charts on the following pages provide information needed to determine if the printhead and motors used in the printer are defective.

*NOTE:*

*The printhead coil resistance values ARE NOT LISTED.*

*The individual printwire control lines CANNOT be accessed on this printhead.*

**Layout Diagram**




4-6-01a.pcx

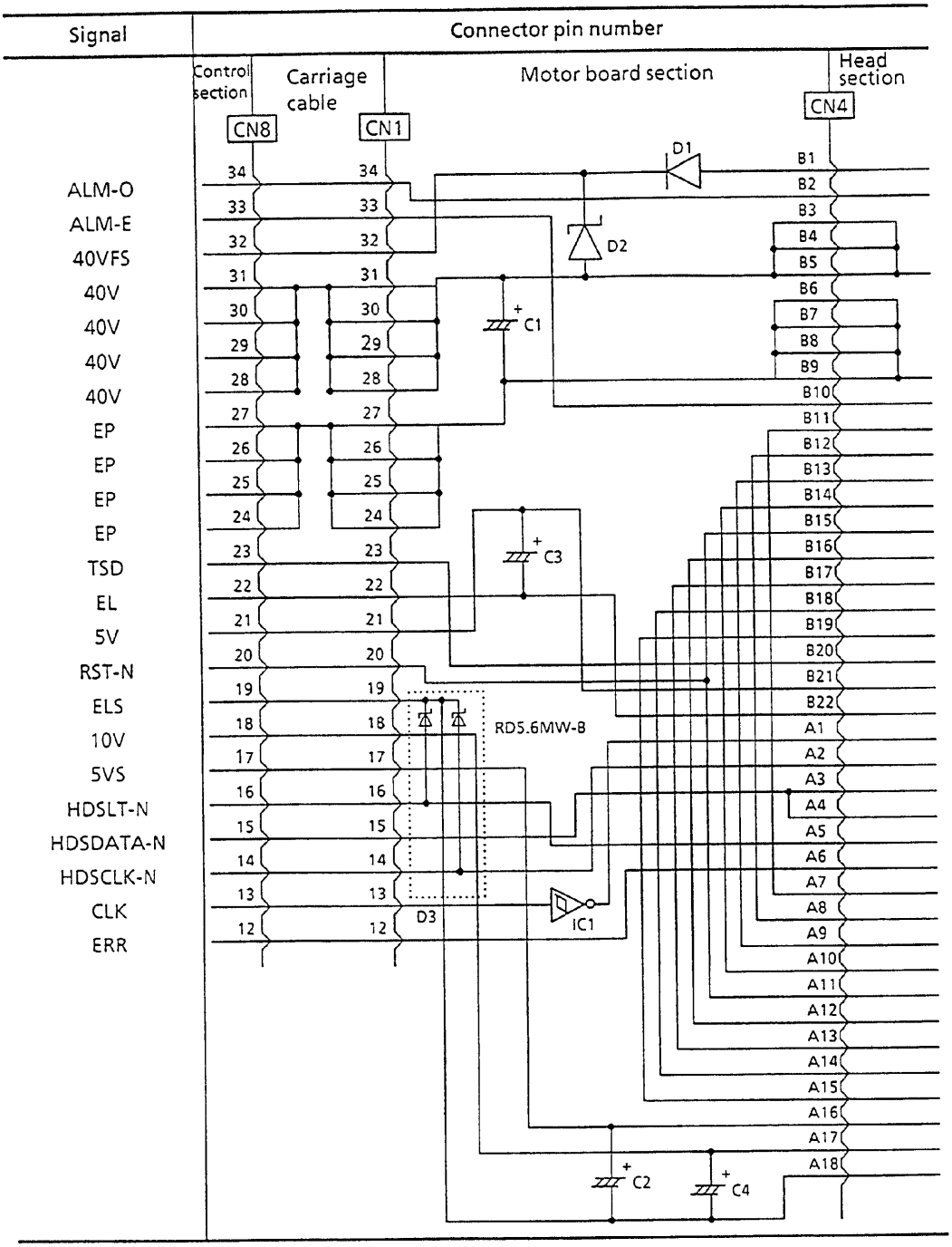
### 4.9.02 Printhead

**Interconnect Diagram: Control Board to Printhead**

*NOTE:*

*The printhead coil resistance values ARE NOT LISTED.*

*The individual printwire control lines CANNOT be accessed on this printhead.*

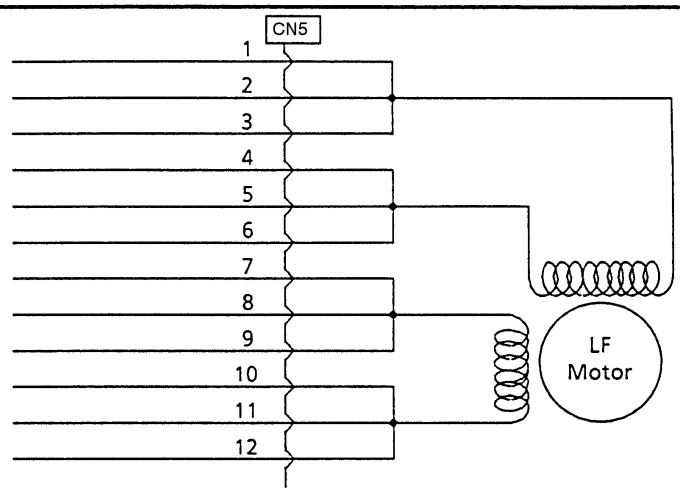



4-9-02.pcx

### 4.9.03 Line Feed Motor Resistance

The resistance of each coil should be approximately 13 ohms.

| Pin number of LF Motor | Signal | Connector pin number |
|---|---|---|
| 1 | LF1 | |
| 2 | LF1 | |
| 3 | LF1 | |
| 4 | LF2 | |
| 5 | LF2 | |
| 6 | LF2 | |
| 7 | LF3 | |
| 8 | LF3 | |
| 9 | LF3 | |
| 10 | LF4 | |
| 11 | LF4 | |
| 12 | LF4 | |

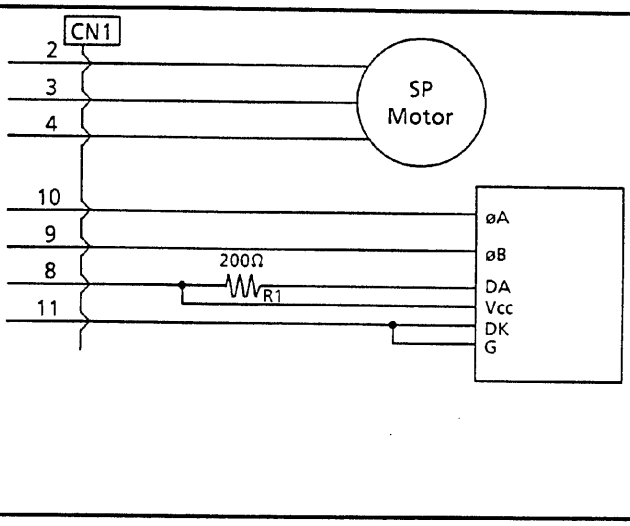



4-9-03.pcx

### 4.9.04 Space Motor Resistance

The resistance of each coil should be approximately 5 ohms.

| Pin number of SP Motor | Signal | Connector pin number |
|---|---|---|
| 2 | SP-U | |
| 3 | SP-V | |
| 4 | SP-W | |
| 10 | PHASE-A | |
| 9 | PHASE-B | |
| 8 | + 5V | |
| 11 | EL | |

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# APPENDIX A
# BOARD DIAGRAMS

## A.1 OVERVIEW

### A.1.01 General Information

This section describes the characteristics of the printed circuit boards used in the unit.

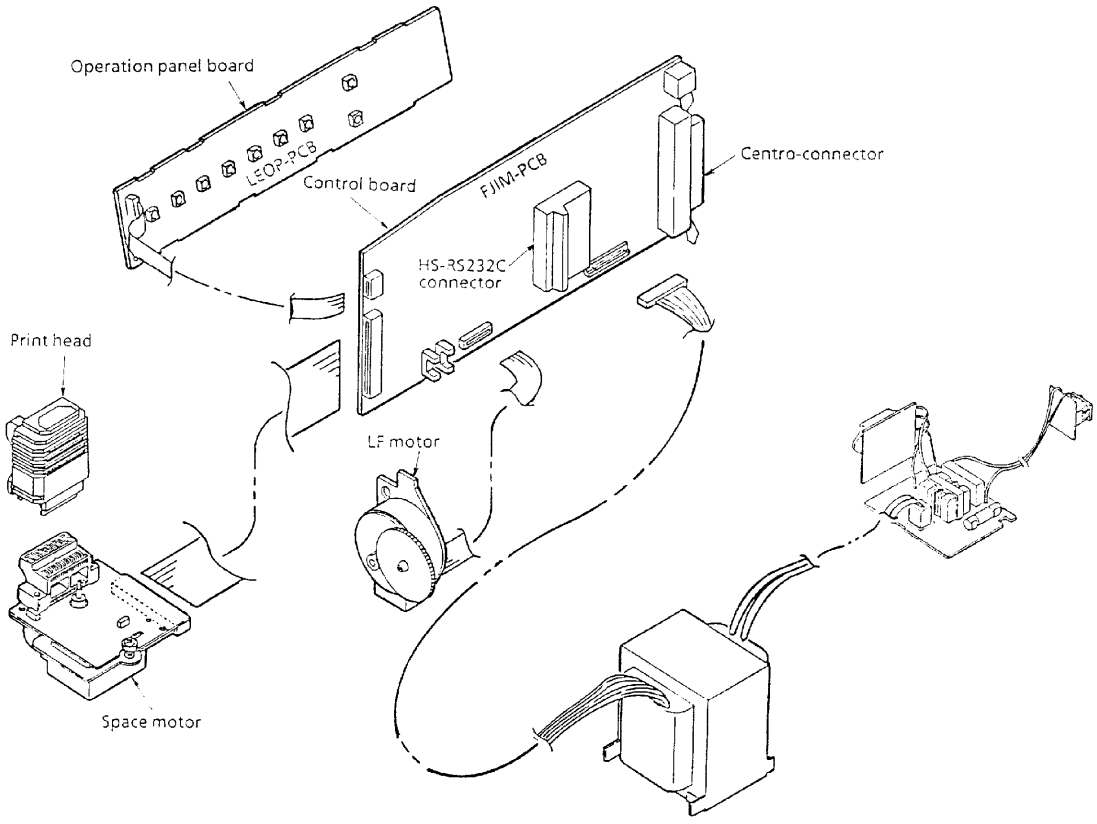
The following areas are covered.

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

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

## A.2 INDEX TO CHARTS

| Description | Board Designation | Section |
|---|---|---|
| Main Controller Board | FJIM | A.2.01 |
| Operator Panel Board | LEOP | A.2.02 |
| Power Supply Assembly | N/A | A.2.03 |
| Space Motor Board | N/A | A.2.04 |
| RS232-C Serial Interface Board | LXHI | A.2.05 |


Operation panel board
LEOP-PCB
Control board
FJIM-PCB
Centro-connector
HS-RS232C connector
Print head
LF motor
Space motor

A-2-00.pcx

### A.2.01 Main Controller Board (FJIM)

**Function**

The main controller board contains a microprocessor, EPROM, EEPROM, drive circuitry, 128 Kbyte DRAM, sensors and interface connector. The AC voltages from the power supply are rectified and regulated on the main controller board.

**Firmware**

05CB: CMOS Dynamic RAM (1 MBit)

05CA: EPROM (Program)

**Fuses**

F1: 125 Volt 2 amp. (AC line fuse)

F2: soldered - 2 amp. (protects the +40vdc motor drive circuit)

**Jumpers**

*NONE*

**Sensors**

SNS1: Rear / Top Feed Paper Out Sensor

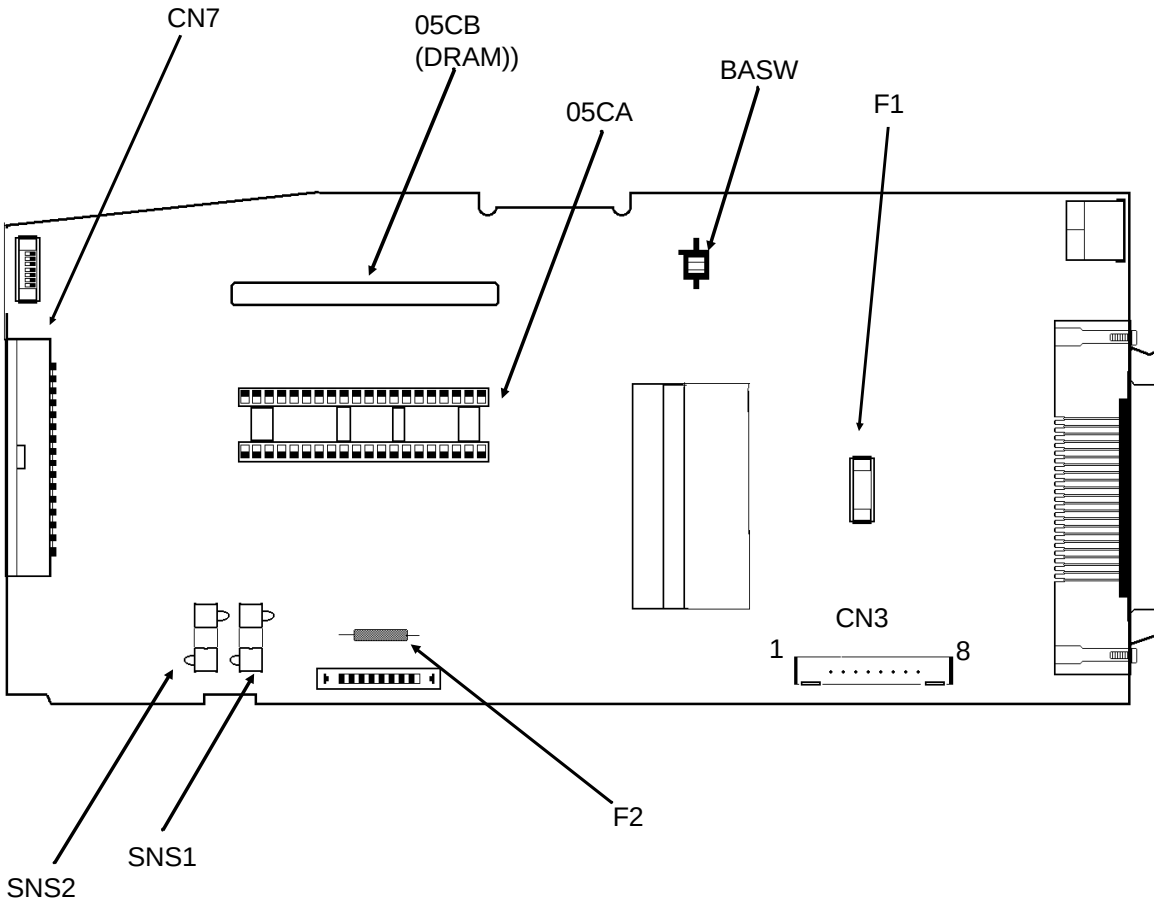
SNS2: Bottom Feed Paper Out Sensor

**Switches**

BASW: Paper Path Select Switch

**Test Points**

| | |
|---|---|
| Frame Ground | CN1 pins 37,38 |
| Logic Ground | CN1 pin 33 |
| +5 vdc : | CN7 - Pin 6 (logic circuitry voltage) |
| +40 vdc: | CN7 - Pins 29 and 31<br>(Printhead, Space Motor / Line Feed Motor Drive Voltage) |




A-2-01.pcx

### A.2.02 Operator Panel Board (LEOP)

**Function**

The operator panel control LSI send commands to the microprocessor's serial I/O port whenever the operator panel's switches are pressed. The operator panel LED display provides information on fault alarms and printer status.

**Firmware**

*NONE*

**Fuses**

*NONE*

**Jumpers**

*NONE*

**Sensors**

*NONE*

**Switches**

SEL (Select)

SHIFT

LF (Line Feed)

FF (Form Feed)

TEAR

PARK

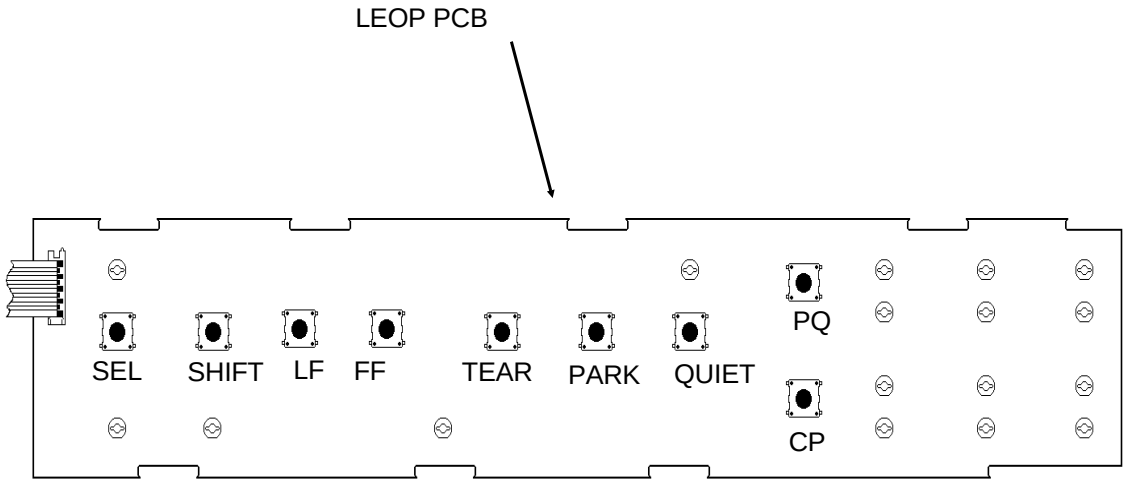
QUIET

PQ (Print Quality)

CP (Character Pitch)

**Test Points**

*NONE*




A-2-02.pcx

### A.2.03 Power Supply Assembly

**Function**

The power supply board is comprised of a noise filter board and transformer. The power supply board provides AC voltages to the main controller board via CN-3.

**Firmware**

*NONE*

**Fuses**

F1: 125/250V 2.5 amp. AC line fuse

**Jumpers**

*NONE*

**Sensors**

*NONE*

**Switches**

SW: Power Switch

**Test Points**

Transformer secondary voltages

CN 3 pin 1: 17.5 VAC

CN 3 pin 2: 0 VAC

CN 3 pin 3: 6.6 VAC

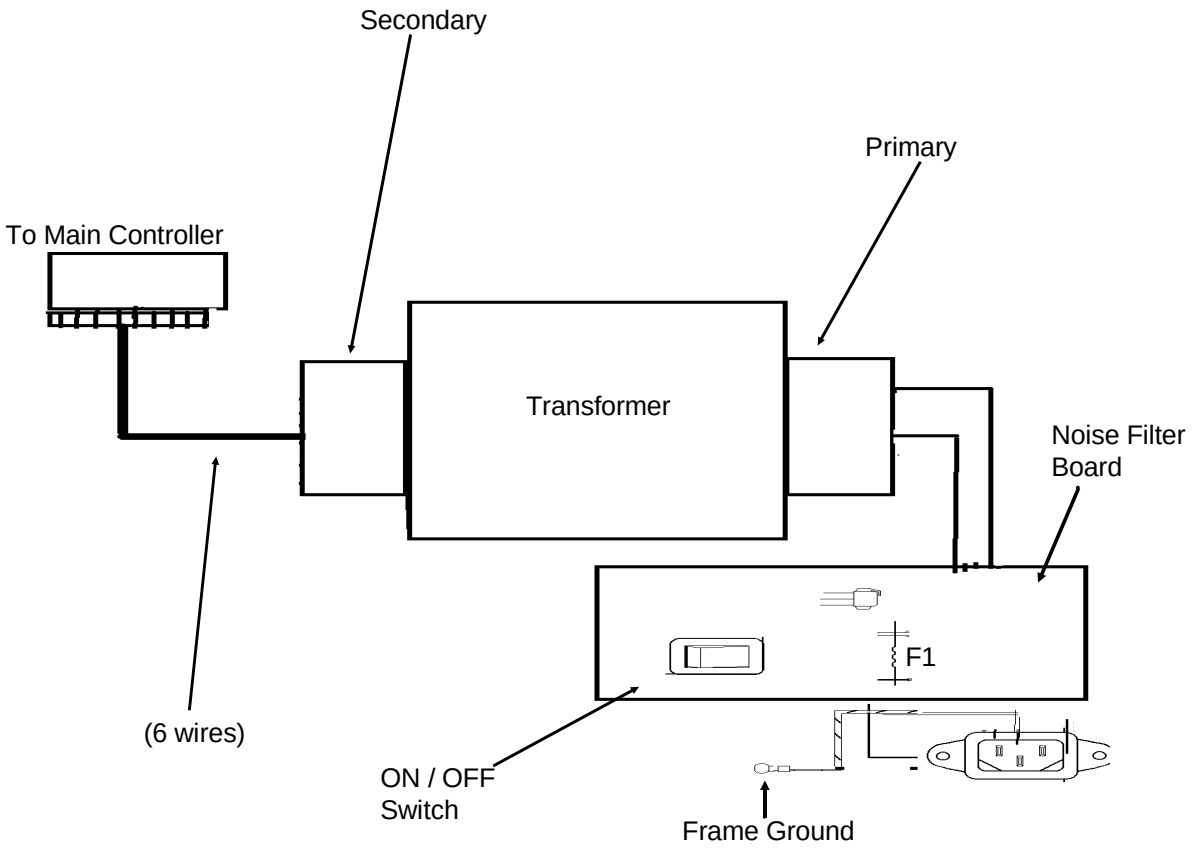
CN 3 pin 4: 0 VAC

CN 3 pin 5: 0 VAC

CN 3 pin 6: 6.6 VAC

CN 3 pin 7: 0 VAC

CN 3 pin 8 : 18.5 VAC


Secondary
Primary
To Main Controller
Transformer
Noise Filter
Board
F1
(6 wires)
ON / OFF
Switch
Frame Ground

A-2-03.pcx

### A.2.04 Space Motor Board

**Function**

The space motor board contains an encoder disk and photosensor. The encoder disk and the photosensor generate phase signals. These signals governs the speed and direction of the space motor via the LSI and microprocessor.

**Firmware**

*NONE*

**Fuses**

*NONE*

**Jumpers**

*NONE*

**Sensors**

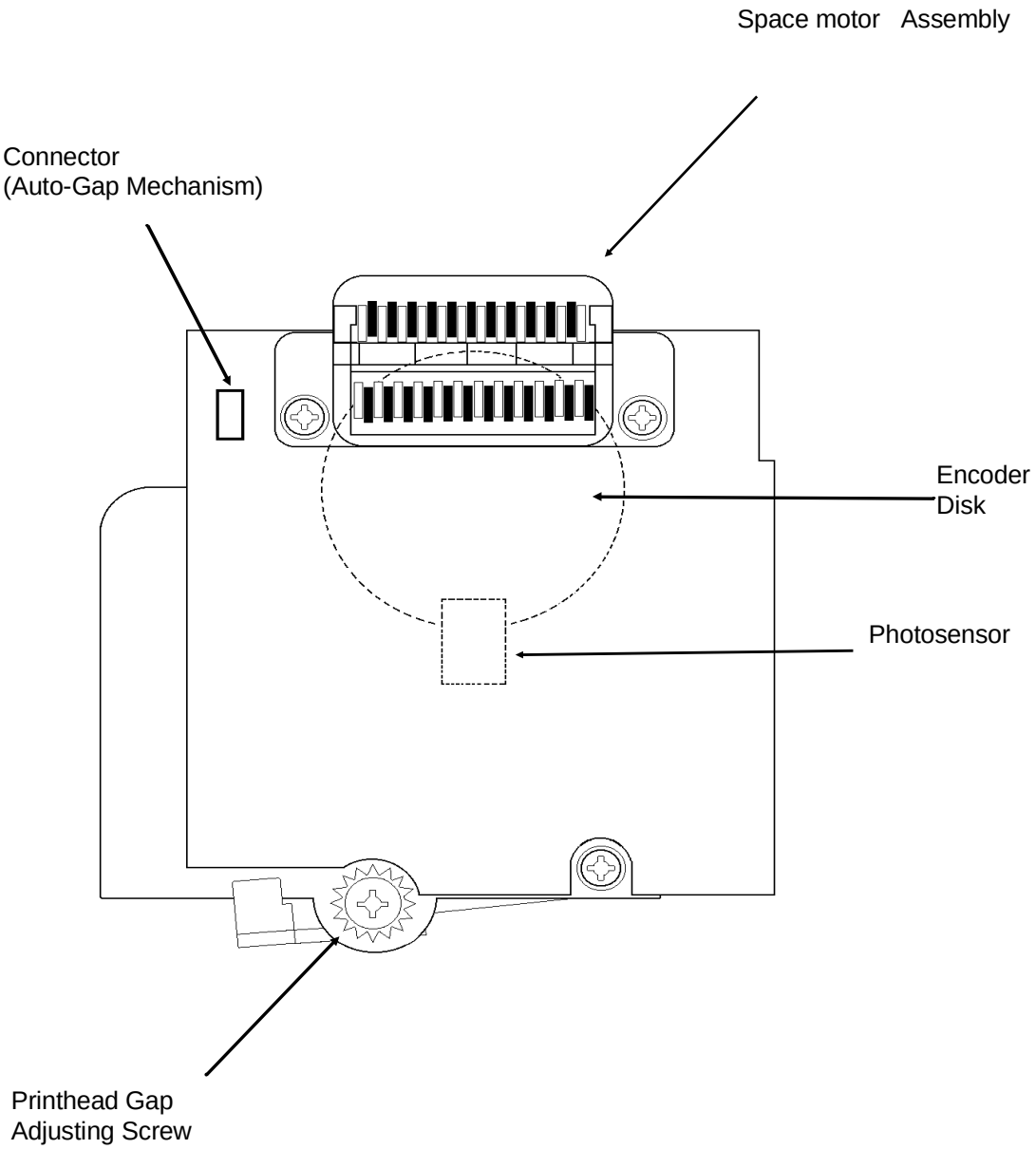
Photosensor: used to monitor space motor movement.

**Switches**

*NONE*

**Test Points**

*NONE*


Space motor Assembly
Connector
(Auto-Gap Mechanism)
Encoder
Disk
Photosensor
Printhead Gap
Adjusting Screw

A-2-04.pcx

### A.2.05 RS232-C Serial Interface Board - Option (LXHI)

**Function**

This board provides you serial interface capabilities. The serial interface parameters can be set through the printer menu.

**Firmware**

Masked to the MPU: Socket is empty

**Fuses**

*NONE*

**Jumpers**

SP1: EPROM Address Select Jumper (position as shown)
EPROM is masked to MPU

**Sensors**

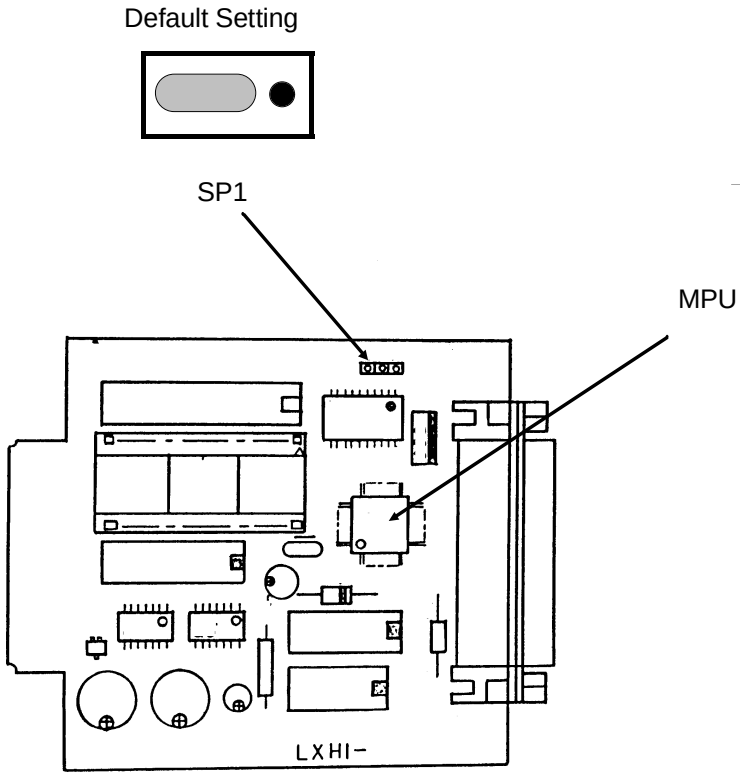
*NONE*

**Switches**

*NONE*

**Test Points**

*NONE*

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# APPENDIX B

# ILLUSTRATED PARTS LISTING

## B.1 OVERVIEW

### B.1.01 General Information

This appendix will assist you in identifying the assemblies and parts of the product.

Use Section Four (Failure Analysis) to determine the defective part(s).

Locate the part and its part number in this section.

Appendix B is cross-referenced to Section Three (Maintenance).

### Format

The format for this appendix is a series of tables with diagrams. The tables contain the item reference number, the Okidata and Oki-Japan (Oki-J) part numbers, the part description, a comments section, and the disassembly procedure.

| Item | Okidata P/N<br>Oki-J P/N | Description | Comments<br>Refer to B.1.02 | Disassembly<br>Procedure |
|---|---|---|---|---|

Items with the comments RSPL (Recommended Spare Parts List), Consumable, Document, or Option are available from Okidata. Items without these comments are usually not stocked.

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.

### Current Part Numbers

Okidata has made every effort to include current part numbers in this Service Handbook *at the time of publishing*.

However, technical information frequently changes. These changes often include new or modified parts, with new or modified part numbers.

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

- Okidata's Electronic 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.
- Okidata's Technical Information Group is a telephone support line reserved for Authorized Dealers. Part numbers and pricing are available through Technical Information. For instructions on accessing Technical Information, refer to the Service Center Reference Guide.

**REMEMBER**

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

## B.1.02 Definition of Terms

### Assemblies

Assemblies are parts grouped under a single description and/or part number. Generally, individual items in an assembly are not available from Okidata.

Assemblies are surrounded by broken line boxes in the diagrams.

Assemblies will say "Includes xx xx" under the *Comments* section of the tables.

Parts in assemblies will say "Part of xx" under the *Comments* section of the tables.

### 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.

### Consumable

A consumable is a supply item which has a specified life and must be periodically replaced. 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 is protected.

### Document

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

### Drivers

Printer drivers are updated frequently. Please refer to Okilink II for the latest printer driver information.

### Firmware

Firmware is revised frequently. Please refer to Okilink II for the latest firmware information.

### Option

An option is a part/assembly which is added to a product. The option expands the product'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.

### RSPL

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

### Technical Service Bulletins

Technical Service Bulletins (TSBs) are also referred to as Okidata's monthly mail.

The TSBs contain the latest information on firmware revisions, procedure changes, and technical information updates.

Okidata distributes the TSBs through Okilink II. The TSBs are issued monthly.

### 520

This part is specific to the Microline 520 printer.

### 521

This part is specific to the Microline 521 printer.

### Both

This part is used by both the Microline 520 and Microline 521 printers.

## B.1.03 Parts Ordering Information

### Service Center Reference Guide

When a technician has successfully completed a Service Training Course for a product and the Dealer has become Service Authorized, an information package is provided to the Dealer. The Okidata Service Center Reference Guide outlines the following items.

- Responsibilities of Okidata Service Centers
- Spare parts and consumables information
- Procedures for warranty repairs
- Product Training, Certification, and Authorization
- Product Support information
- Okidata Depot information and services
- Third Party Service information
- Information about Okidata's Customer Information Center
- Okidata Service and Support telephone numbers.

The Service Center Reference Guide contains the procedures to follow for ordering parts. Please *read*, *understand*, and *follow* these procedures. Service Authorization for a specific product *must* be obtained before a Dealer can submit warranty claims.

Direct questions regarding the Service Center Reference Guide to Okidata Dealer Service. Refer to the Service Center Reference Guide for information on contacting Okidata.

### Placing a Parts Order

All authorized Okidata resellers may order spare parts and consumables for Okidata products. Orders are placed through Okidata's Logistics Department.

Please refer to your Service Center Reference Guide for details on ordering parts.

You should have the following information available *before* you place your order.

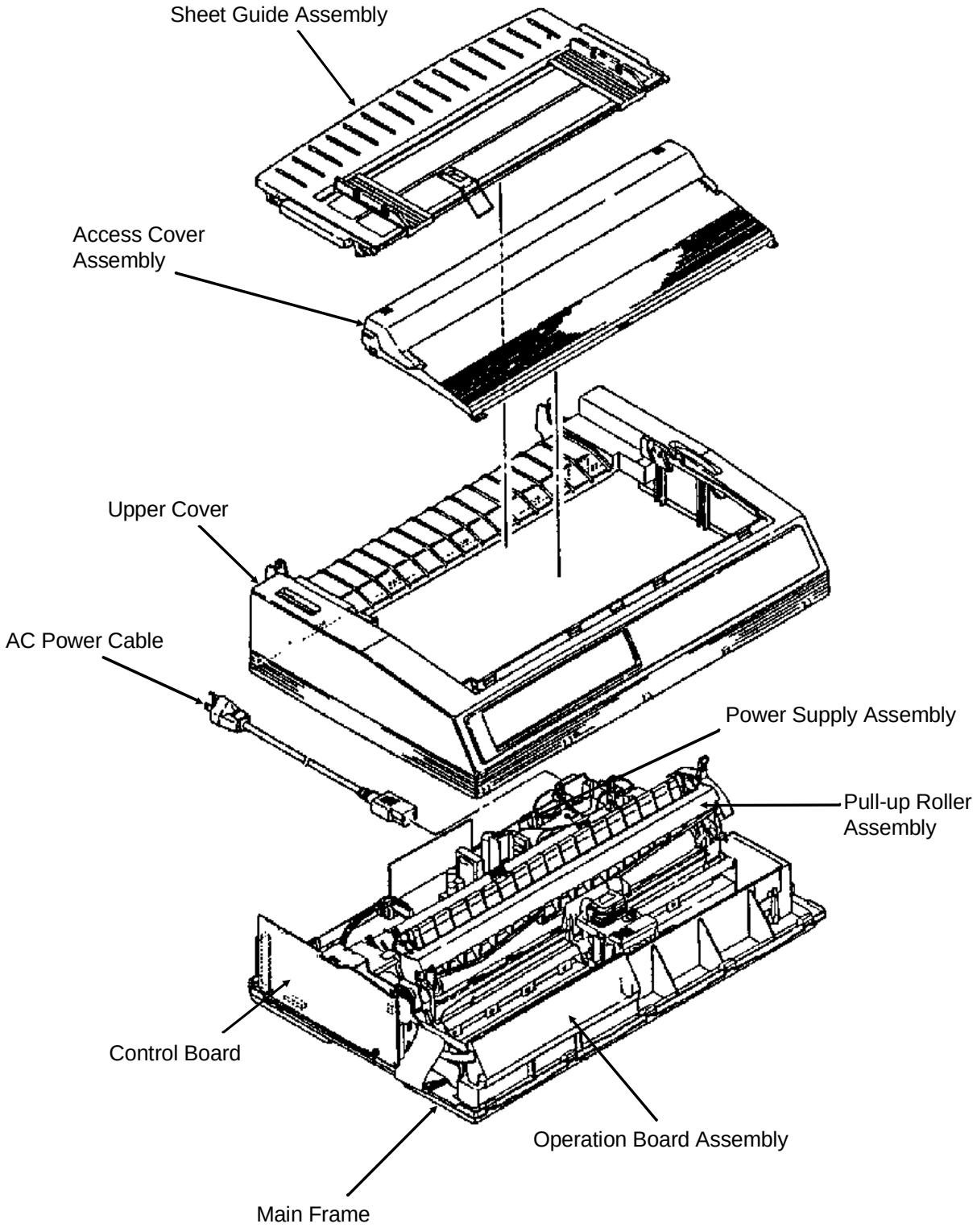
- Okidata Dealer Authorization Number
- Okidata Customer Number
- Your Purchase Order Number
- Okidata Part Number(s)

Use this Appendix, Okilink II, Faxable Facts, or contact Okidata Technical Support to find the correct part number. Refer to the Service Center Reference Guide for information on contacting Okidata.

## B.2 CHARTS

Below is an index to the illustrated parts breakdown charts.

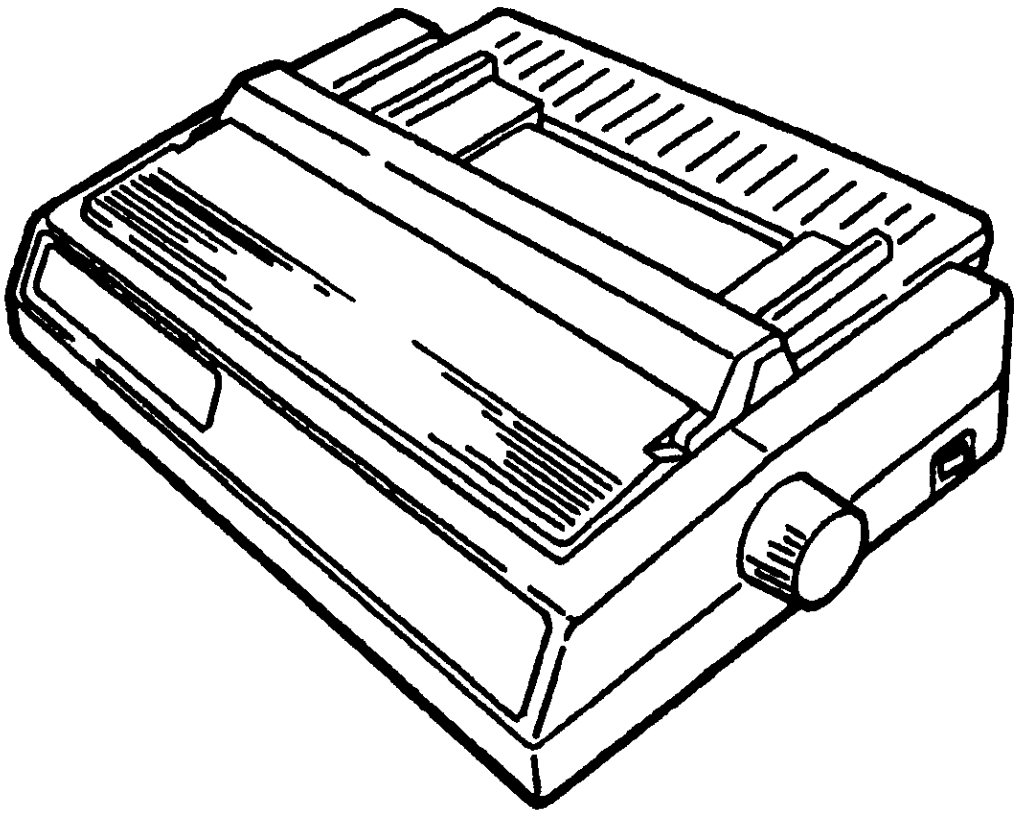
| Section | Description |
|---|---|
| B.2.01 | Printer |
| B.2.02 | Upper Cover Assembly |
| B.2.03 | Printer General Assembly |
| B.2.04 | Printer Unit (1 of 3) |
| B.2.05 | Printer Unit (2 of 3) |
| B.2.06 | Printer Unit (3 of 3) |
| B.2.07 | Carriage Assembly |
| B.2.08 | Options |
| B.2.09 | Option Parts |
| B.2.10 | Consumables |
| B.2.11 | Packing Materials |
| B.2.12 | Documentation |
| B.2.13 | Service Training Kit Revision List |


Sheet Guide Assembly
Access Cover Assembly
Upper Cover
AC Power Cable
Power Supply Assembly
Pull-up Roller Assembly
Control Board
Operation Board Assembly
Main Frame
B-2-00.pcx

## B.2.01 Printer

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.

| Item | Okidata P/N<br>Oki-J P/N | Description | Comments<br>Refer to B.1.02 | Disassembly Procedure |
|---|---|---|---|---|
| 1 | 62409001<br>N/A | Printer: ML520 Parallel<br>(Epson/IBM/ML Comp.) 120 V | | N/A |
| 2 | 62409002<br>N/A | Printer: ML520 Parallel<br>(Epson/IBM/ML Comp.) 220 V | | N/A |
| 3 | 62410001<br>N/A | Printer: ML521 Parallel<br>(Epson/IBM/ML Comp.) 120 V | | N/A |
| 4 | 62410002<br>N/A | Printer: ML521 Parallel<br>(Epson/IBM/ML Comp.) 220 V | | N/A |

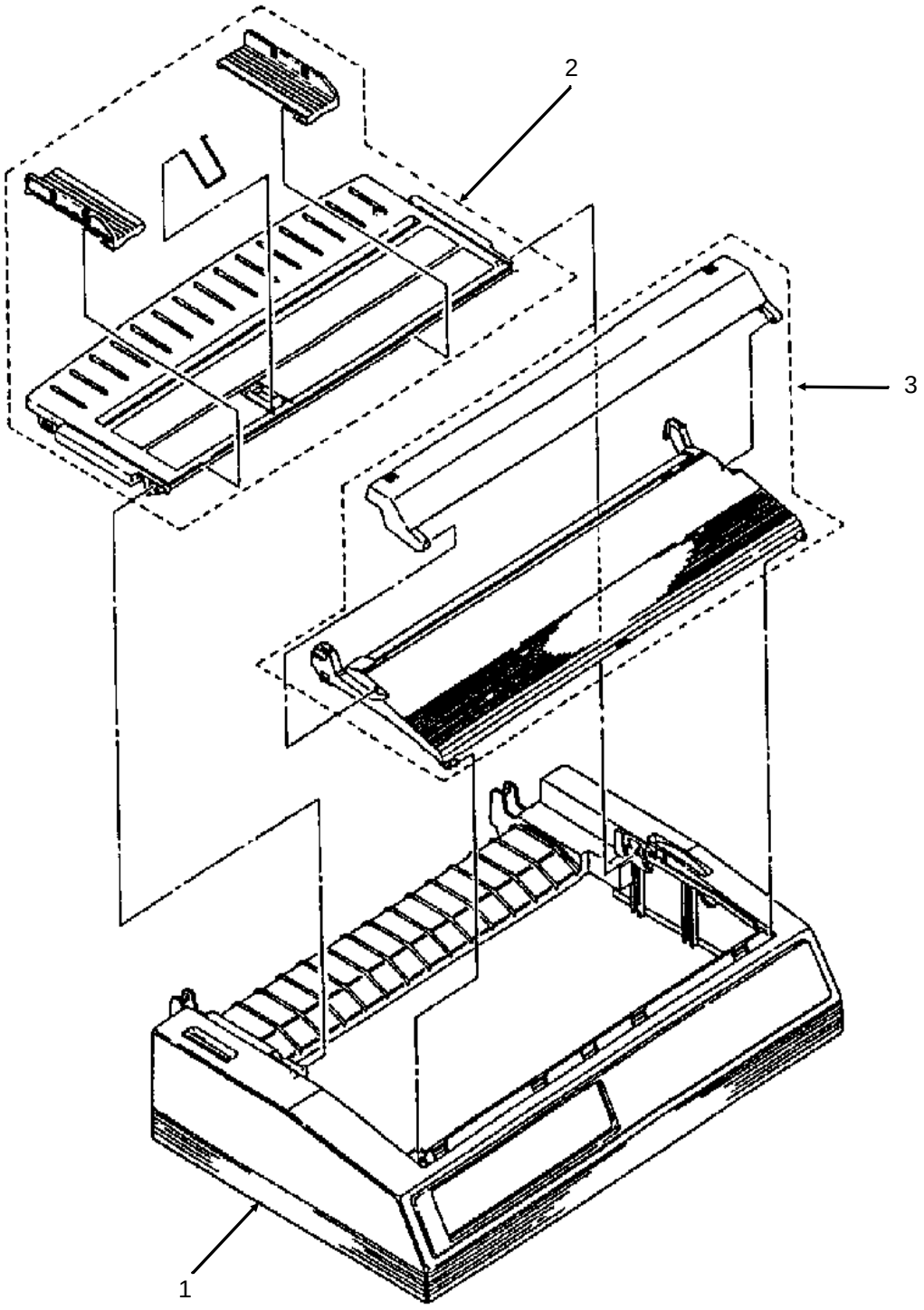


B-2-30.pcx

## B.2.02 Upper Cover Assembly

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.

| Item | Okidata P/N<br>Oki-J P/N | Description | Comments<br>Refer to B.1.02 | Disassembly Procedure |
|---|---|---|---|---|
| 1 | 53066902<br>1PP4094-6501P2 | Cover: Upper (Narrow) | RSPL<br>520 | 3.2.06 |
| 1 | 53067002<br>1PP4094-7201P2 | Cover: Upper (Wide) | RSPL<br>521 | 3.2.06 |
| 2 | 51009401<br>N/A | Guide: Sheet (Narrow) | RSPL<br>520 | 3.2.06 |
| 2 | 51009501<br>N/A | Guide: Sheet (Wide) | RSPL<br>521 | 3.2.06 |
| 3 | 53067101<br>2PA4094-7381G1 | Cover: Access (Narrow) | RSPL<br>520 | 3.2.06 |
| 3 | 53067201<br>2PA4094-7382G1 | Cover: Access (Wide) | RSPL<br>521 | 3.2.06 |

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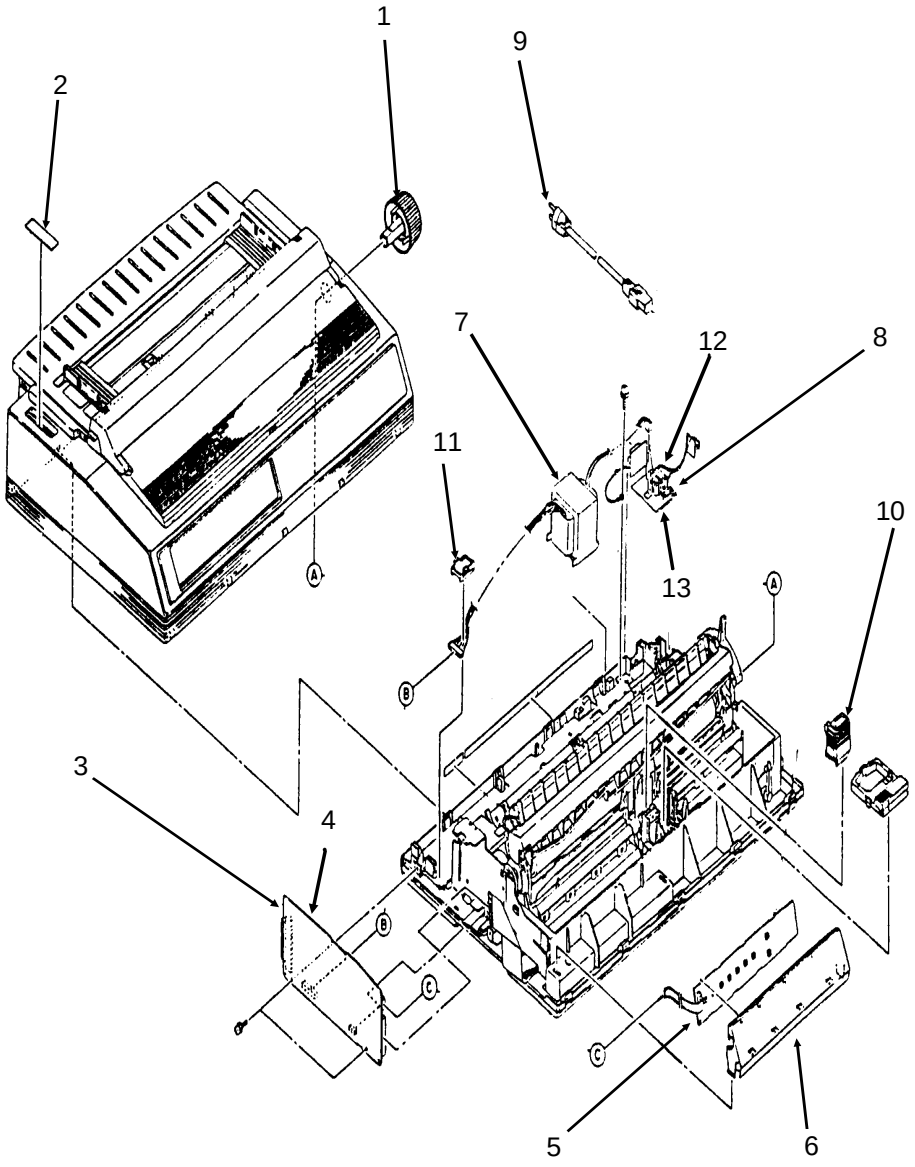
## B.2.03 Printer General Assembly

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.

| Item | Okidata P/N<br>Oki-J P/N | Description | Comments<br>Refer to B.1.02 | Disassembly Procedure |
|---|---|---|---|---|
| 1 | 53562601<br>2PP4094-6507P3 | Knob: Platen (ML500 Series) | RSPL<br>Both | 3.2.06 |
| 2 | 53067301<br>2PP4094-6506P1 | Cover: (B) for Card Slot | RSPL<br>Both | 3.2.06 |
| 3 | 55072401<br>4YA4042-1515G301 | PCB: FJIM (w/o ROM) | RSPL<br>Both | 3.2.07 |
| 4 | 56301702<br>540A2036M1202 | Fuse: 2A 125V (GG52) | RSPL<br>Both | N/A |
| 5 | 55937502<br>4YA4042-1516G2 | PCB: LEOP (Operator. Panel) | RSPL<br>Both | 3.2.09 |
| 6 | 53562703<br>3PP4025-3670G3 | Panel: Operator | RSPL<br>Both | 3.2.09 |
| 7 | 56412401<br>4YB4049-7030P1 | Transformer: 120 V ML520 | RSPL<br>520 | 3.2.08 |
| 7 | 56412402<br>4YB4049-7030P2 | Transformer: 120 V ML521 | RSPL<br>521 | 3.2.08 |
| 8 | 55073201<br>4YB4021-1143P1 | PCB: Filter 120 V | RSPL<br>Both | 3.2.08 |
| 9 | 56609701<br>3YS4011-1315P1 | Cord: AC 120V | RSPL<br>Both | 3.2.01 |
| 10 | 50099501<br>4YA4023-2801G1 | Printhead Assembly | RSPL<br>Both | 3.2.02 |
| 11 | 50707501<br>4PP4025-3621P1 | Clamp: Cord | RSPL<br>Both | 3.2.08 |
| 12 | 56306201<br>540A2062T2102 | Fuse: 1A 250V (Filter Brd 220V) | Option RSPL<br>Both | 3.2.08 |
| 13 | 56306101<br>540A2067T1252 | Fuse: 2.5A 125V (Filter Board) | RSPL<br>Both | 3.2.08 |

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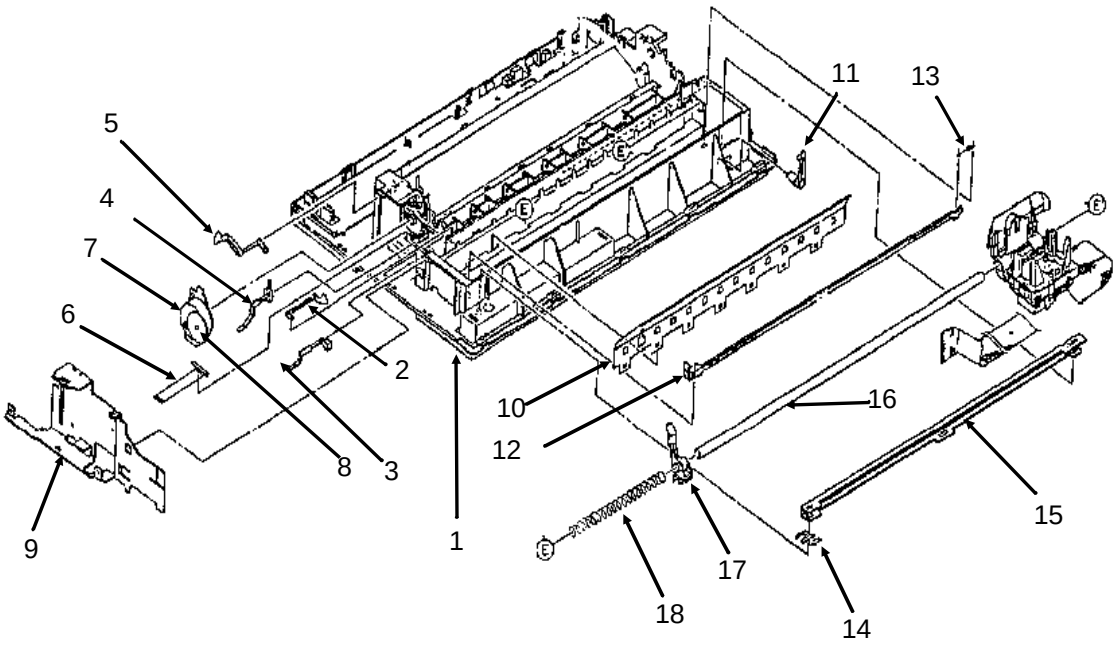
## B.2.04 Printer Unit

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.

| Item | Okidata P/N<br>Oki-J P/N | Description | Comments<br>Refer to B.1.02 | Disassembly Procedure |
|---|---|---|---|---|
| 1 | 53563101<br>3PA4025-3720G1 | Frame: Main (Narrow) | RSPL<br>520 | 3.2.30 |
| 1 | 53563201<br>3PA4025-3721G1 | Frame: Main (Wide) | RSPL<br>521 | 3.2.30 |
| 2 | 50804601<br>3PP4025-3315P1 | Lever: Bottom Paper End | RSPL<br>Both | 3.2.27 |
| 3 | 50804701<br>3PP4025-3322P1 | Lever: Bottom Sensor | RSPL<br>Both | 3.2.27 |
| 4 | 50804801<br>3PP4025-3321P1 | Lever: Rear Sensor | RSPL<br>Both | 3.2.18 |
| 5 | 50804902<br>4PP4025-3323P2 | Lever: Sensor (Cut Sheet/Continuous) | RSPL<br>Both | 3.2.18 |
| 6 | 56627201<br>3PB4025-3356P1 | Cord: Connection Line Feed | RSPL<br>Both | 3.2.21 |
| 7 | 56510302<br>3PB4025-3357P2 | Motor: Line Feed Assembly | RSPL<br>Both | 3.2.21 |
| 8 | 51228601<br>3PB4055-2893P1 | Gear: Line Feed Idle | RSPL<br>Both | 3.2.21 |
| 9 | 51010301<br>3PA4025-3387G1 | Plate: Left Ground | RSPL<br>Both | 3.2.16 |
| 10 | 50923001<br>3PP4025-3320P1 | Spring: Leaf (Narrow) | RSPL<br>520 | 3.2.26 |
| 10 | 50923101<br>3PP4025-3507P1 | Spring: Leaf (Wide) | RSPL<br>521 | 3.2.26 |
| 11 | 53067701<br>3PP4025-3380P1 | Cam: Adjust | RSPL<br>Both | 3.2.15 |
| 12 | 53563301<br>3PP4025-3376P1 | Rack: Space (Narrow) | RSPL<br>520 | 3.2.13 |
| 12 | 53563401<br>3PP4025-3522P1 | Rack: Space (Wide) | RSPL<br>521 | 3.2.13 |
| 13 | 50923501<br>4PB4025-3377P1 | Spring: Tension (Space Rack) | RSPL<br>Both | 3.2.13 |
| 14 | 51009701<br>4PP4025-3378P1 | Guide: Rail Ground Clip | RSPL<br>Both | 3.2.15 |
| 15 | 51009801<br>3PP4025-3379P1 | Guide: Rail (Narrow) | RSPL<br>520 | 3.2.15 |
| 15 | 51009901<br>3PP4025-3523P1 | Guide: Rail (Wide) | RSPL<br>521 | 3.2.15 |
| 16 | 53563501<br>4PP4025-3381P1 | Shaft: Carriage (Narrow) | RSPL<br>520 | 3.2.25 |
| 16 | 53563502<br>4PP4025-3381P2 | Shaft: Carriage (Wide) | RSPL<br>521 | 3.2.25 |
| 17 | 53067601<br>4PA4025-3382G1 | Protector: Support (Assembly) | RSPL<br>Both | 3.2.25 |
| 18 | 50923601<br>4PB4025-3385P1 | Spring: Support Protect Reset | RSPL<br>Both | 3.2.25 |

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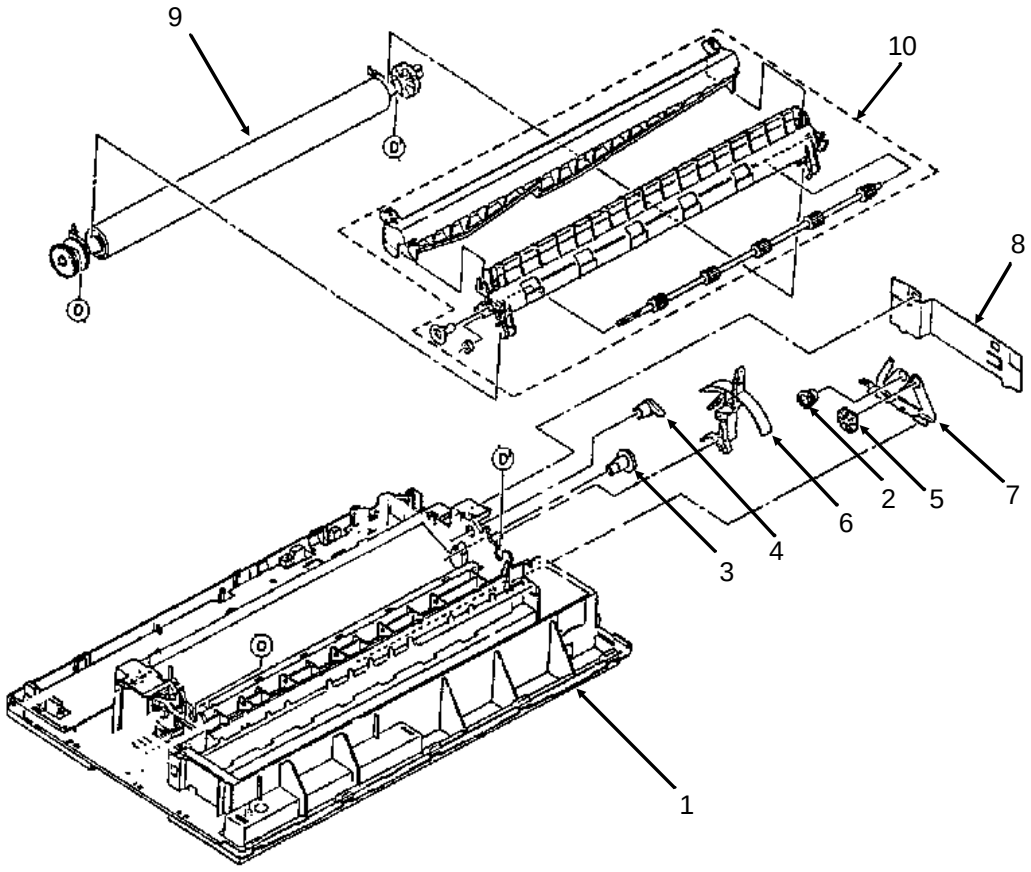
## B.2.05 Printer Unit

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.

| Item | Okidata P/N<br>Oki-J P/N | Description | Comments<br>Refer to B.1.02 | Disassembly Procedure |
|---|---|---|---|---|
| 1 | 53563101<br>3PA4025-3720G1 | Frame: Main (Narrow) | RSPL<br>520 | 3.2.30 |
| 1 | 53563201<br>3PA4025-3721G1 | Frame: Main (Wide) | RSPL<br>521 | 3.2.30 |
| 2 | 51228001<br>4PP4025-3340P1 | Gear: Change | RSPL<br>Both | 3.2.29 |
| 3 | 51228101<br>3PP4025-3341P1 | Gear: Tractor | RSPL<br>Both | 3.2.29 |
| 4 | 50805301<br>3PP4025-3352P1 | Cam: Release | RSPL<br>Both | 3.2.24 |
| 5 | 51228201<br>4PP4025-3353P1 | Gear: Idle | RSPL<br>Both | 3.2.23 |
| 6 | 50805101<br>2PP4025-3354P1 | Lever: Change | RSPL<br>Both | 3.2.23 |
| 7 | 50923201<br>3PP4025-3355P1 | Spring: Reset | RSPL<br>Both | 3.2.22 |
| 8 | 51010201<br>3PP4025-3386P1 | Plate: Right Ground | RSPL<br>Both | 3.2.17 |
| 9 | 50098301<br>3PA4025-3370G1 | Platen Assembly (Narrow) | RSPL<br>520 | 3.2.19 |
| 9 | 50098302<br>N/A | Platen Assembly (Wide) | RSPL<br>521 | 3.2.19 |
| 10 | 53341501<br>3PA4025-3440G2 | Roller: Pull Up Assembly (N) | RSPL<br>520 | 3.2.05 |
| 10 | 53341601<br>3PA4025-3530G2 | Roller: Pull Up Assembly (W) | RSPL<br>521 | 3.2.05 |

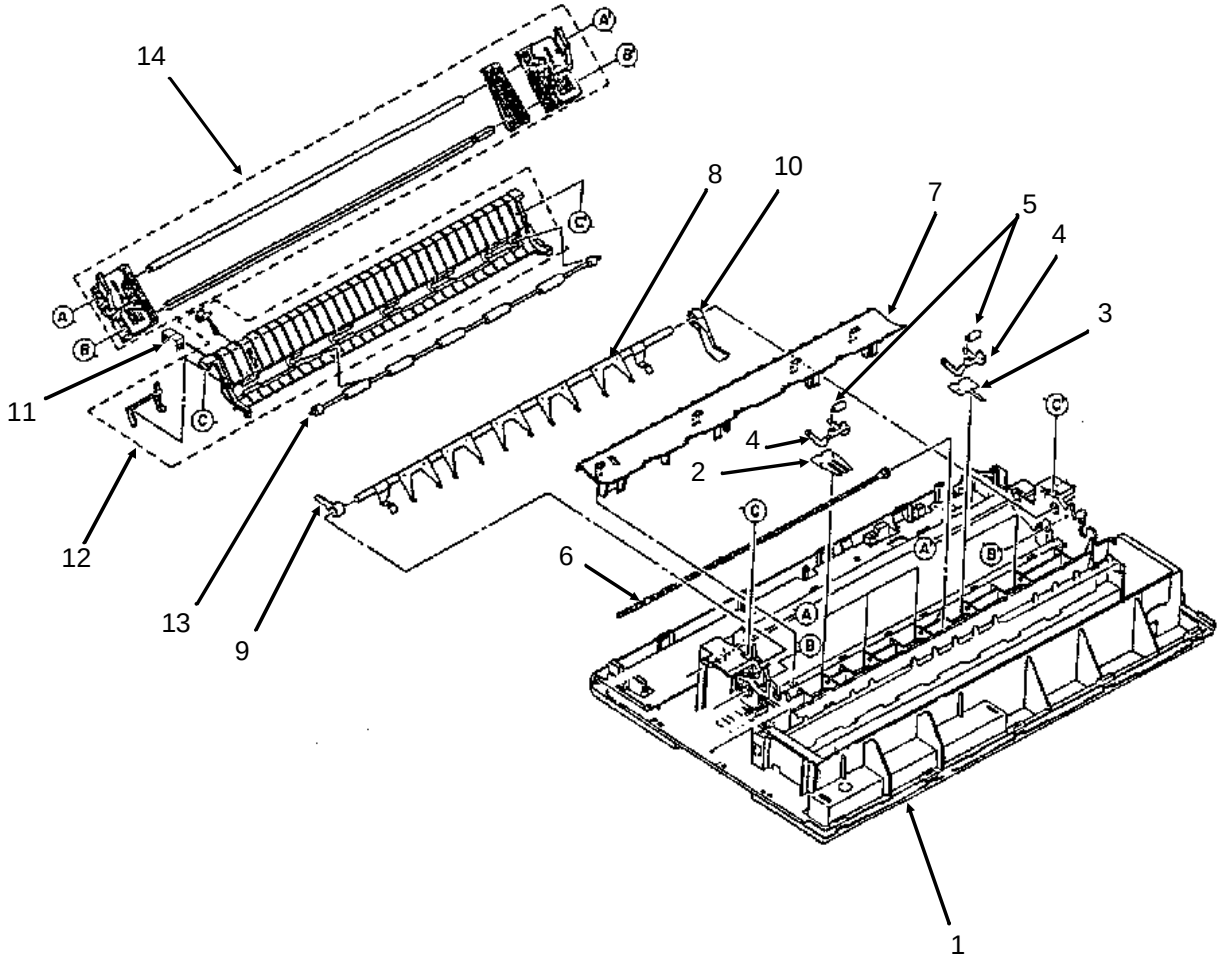



B-2-04.pcx

## B.2.06 Printer Unit

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.

| Item | Okidata P/N<br>Oki-J P/N | Description | Comments<br>Refer to B.1.02 | Disassembly Procedure |
|---|---|---|---|---|
| 1 | 53563101<br>3PA4025-3720G1 | Frame: Main (Narrow) | RSPL<br>520 | 3.2.30 |
| 1 | 53563201<br>3PA4025-3721G1 | Frame: Main (Wide) | RSPL<br>521 | 3.2.30 |
| 2 | 50922901<br>4PP4025-3316P1 | Spring: Front Pressure (Narrow) | RSPL<br>520 | 3.2.28 |
| 3 | 50922801<br>4PP4025-3324P1 | Spring: Front Pressure (Wide) | RSPL<br>521 | 3.2.28 |
| 4 | 53341101<br>4PP4025-3317P1 | Holder: Front Roller | RSPL<br>Both | 3.2.28 |
| 5 | 53341202<br>4PP4025-3327G1 | Roller: Front Pressure | RSPL<br>Both | 3.2.28 |
| 6 | 51227801<br>3PP4025-3318P1 | Shaft: Front Release Gear (Narrow) | RSPL<br>520 | 3.2.27 |
| 6 | 51227901<br>3PP4025-3505P1 | Shaft: Front Release Gear (Wide) | RSPL<br>521 | 3.2.27 |
| 7 | 50097301<br>N/A | Pan: Paper (Narrow) | RSPL<br>520 | 3.2.27 |
| 7 | 50097401<br>1PP4025-3506P2 | Pan: Paper (Wide) | RSPL<br>521 | 3.2.27 |
| 8 | 50923301<br>3PP4025-3346G1 | Spring: Pressure (Narrow) | RSPL<br>520 | 3.2.24 |
| 8 | 50923401<br>3PP4025-3511G1 | Spring: Pressure (Wide) | RSPL<br>521 | 3.2.24 |
| 9 | 50805201<br>4PP4025-3351P1 | Lever: Switch (Cut Sheet/Continuous) | RSPL<br>Both | 3.2.24 |
| 10 | 51228301<br>4PP4025-3350P1 | Arm: Front Release Gear | RSPL<br>Both | 3.2.24 |
| 11 | 50924701<br>4PP4025-3386P1 | Spring: Lock | RSPL<br>Both | 3.2.20 |
| 12 | 50097701<br>3PA4025-3360G2 | Paper Chute Assembly (Narrow) | RSPL<br>520 | 3.2.20 |
| 12 | 50097801<br>3PA4025-3515G2 | Paper Chute Assembly (Wide) | RSPL<br>521 | 3.2.20 |
| 13 | 53341301<br>3PB4025-3364P1 | Roller: Pressure Rear (Narrow) | RSPL<br>520 | 3.2.20 |
| 13 | 53341401<br>3PB4025-3517P1 | Roller: Pressure Rear (Wide) | RSPL<br>521 | 3.2.20 |
| 14 | 50097501<br>3PA4025-3330G1 | Tractor: Assembly (Narrow) | RSPL<br>520 | 3.2.29 |
| 14 | 50097502<br>3PA4025-3330G2 | Tractor: Assembly (Wide) | RSPL<br>521 | 3.2.29 |

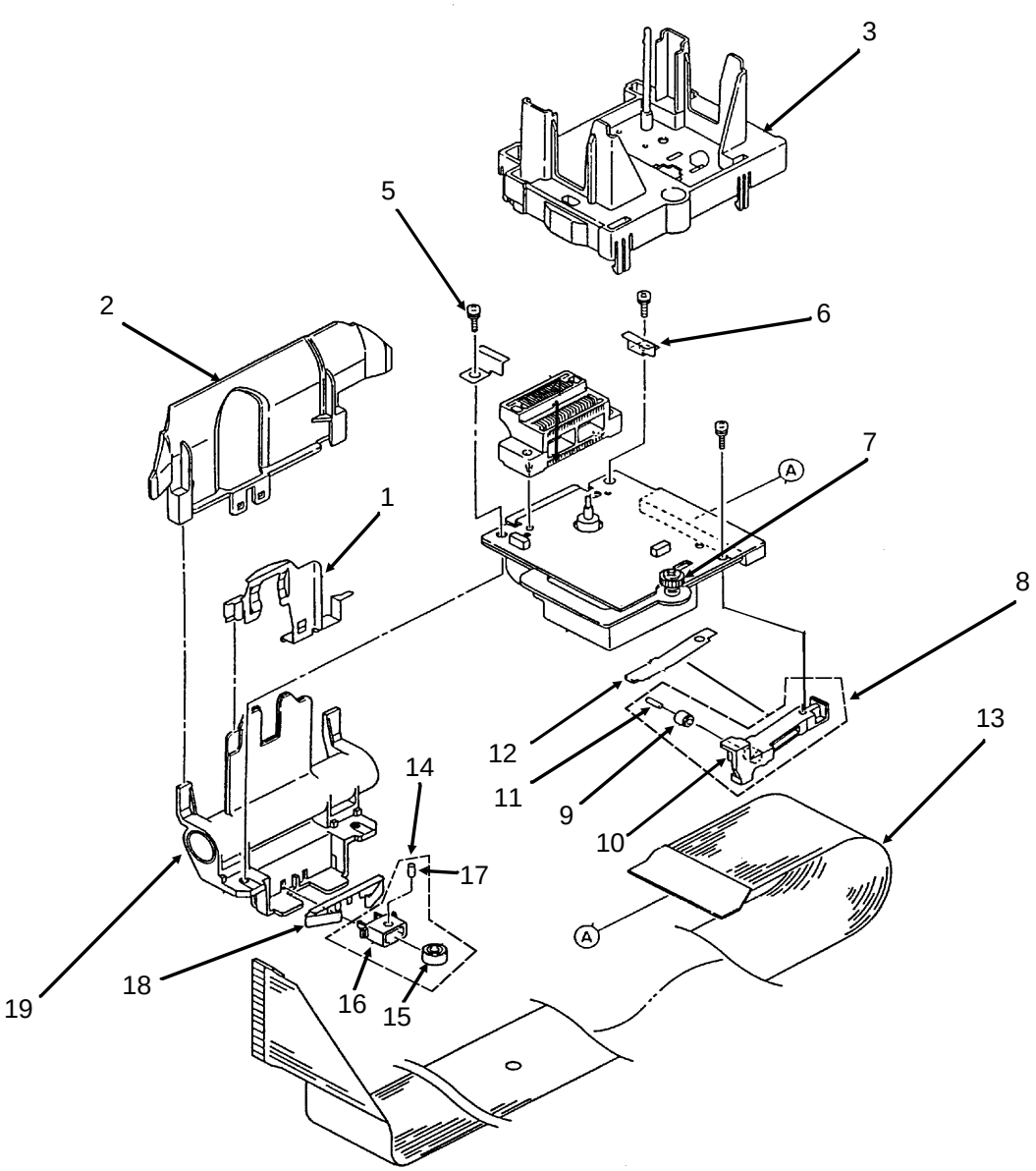



B-2-05.pcx

## B.2.07 Carriage Assembly

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.

| Item | Okidata P/N<br>Oki-J P/N | Description | Comments<br>Refer to B.1.02 | Disassembly Procedure |
|---|---|---|---|---|
| 1 | 50707401<br>3PP4025-3431P1 | Clamp: Head | RSPL<br>Both | 3.2.02 |
| 2 | 53562801<br>3PP4025-3430P1 | Protector: Ribbon | RSPL<br>Both | 3.2.03 |
| 3 | 51228501<br>3PA4025-3406G1 | Gear: Case (Assembly) | RSPL<br>Both | 3.2.04 |
| 4 | 56729601<br>224A1285P0400 | Connector: PC HD40 | RSPL<br>Both | 3.2.10 |
| 5 | 53343001<br>4PP4025-3433P1 | Holder: Connector (L) | RSPL<br>Both | 3.2.11 |
| 6 | 53343101<br>4PP4025-3434P1 | Holder Connector (R) | RSPL<br>Both | 3.2.11 |
| 7 | 56510401<br>4YA4025-3250G1 | Motor: Space (Assembly) | RSPL<br>Both | 3.2.11 |
| 8 | 53343301<br>4PA4025-3719G1 | Guide: Roller Assembly | Both<br>Inc. 9, 10,11 | 3.2.11 |
| 9 | 53341901<br>4PP4025-3398P1 | Roller: Guide | Both | 3.2.11 |
| 10 | 53342001<br>3PP4025-3399P1 | Holder: Guide Roller | Both | 3.2.11 |
| 11 | N/A<br>N/A | Pin | Both | 3.2.11 |
| 12 | N/A<br>4PP4025-3401P1 | Guide Roller Spring | Both | 3.2.11 |
| 13 | 56627301<br>2PU4007-1193P1 | Cable: Carriage (Narrow) | RSPL<br>520 | 3.2.12 |
| 13 | 56627302<br>N/A | Cable: Carriage (Wide) | RSPL<br>521 | 3.2.12 |
| 14 | 53343201<br>4PA4025-3718G1 | Assembly: Roller/Holder Backup | Both<br>Inc. 15, 16, 17 | 3.2.14 |
| 15 | 53341701<br>4PP4025-3392P1 | Roller: Back Up | Both | 3.2.14 |
| 16 | 53341801<br>3PP4025-3393P1 | Holder: Back Up Roller | Both | 3.2.14 |
| 17 | N/A<br>N/A | Pin | Both | 3.2.14 |
| 18 | 50925001<br>3PP4025-3397P1 | Holder: Backup Roller Spring | Both | 3.2.14 |
| 19 | 50098901<br>4PP4025-3394G1 | Carriage: Frame Set | RSPL<br>Both | 3.2.25 |




B-2-06.pcx

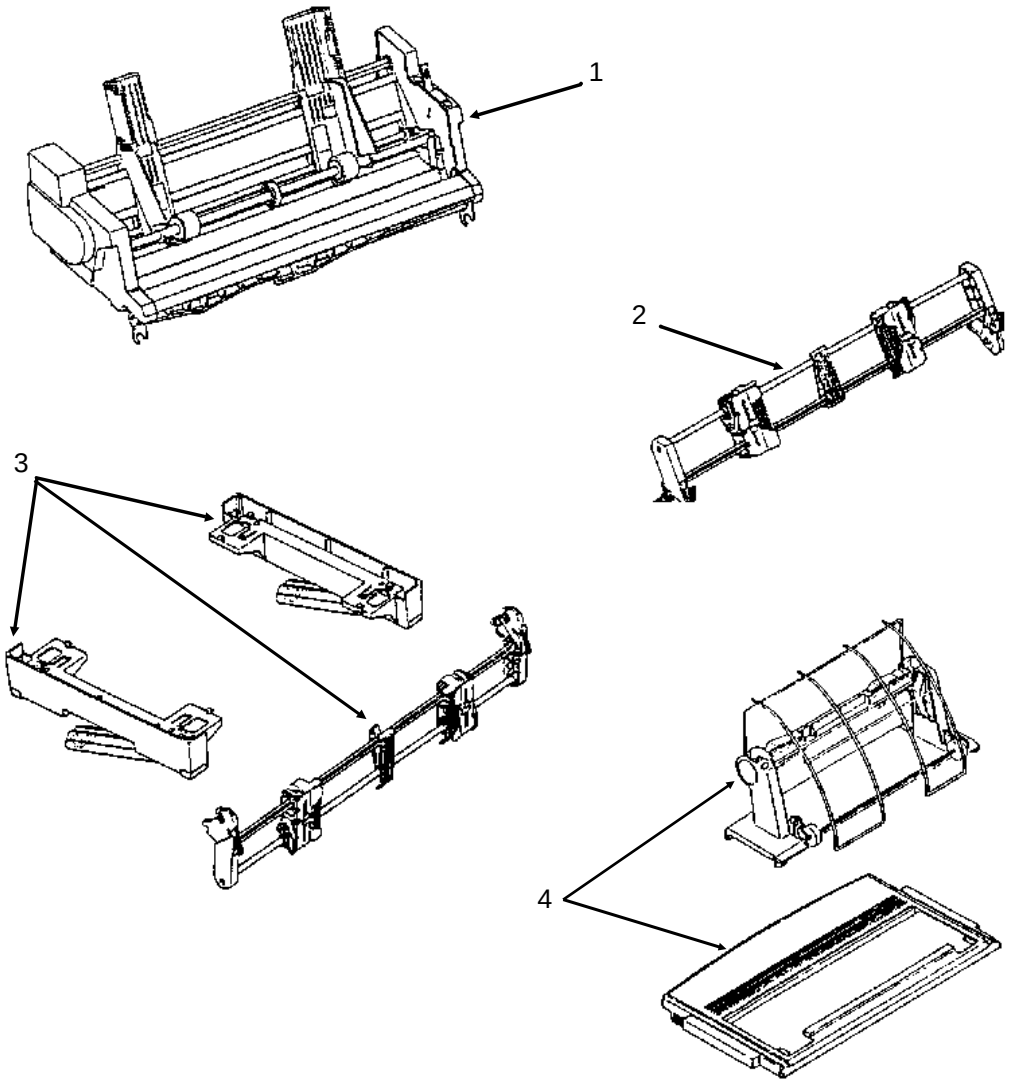
## B.2.08 Options

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.

| Item | Okidata P/N<br>Oki-J P/N | Description | Comments<br>Refer to B.1.02 | Disassembly Procedure |
|---|---|---|---|---|
| 1 | 70022501<br>N/A | Kit: Single Bin CSF 5000 Narrow | Option<br>520 | N/A |
| 1 | 70022701<br>N/A | Kit: Single Bin CSF 5001 Wide | Option<br>521 | N/A |
| 2 | 70023001<br>N/A | Kit: Pull Tractor Narrow | Option<br>520 | N/A |
| 2 | 70023201<br>N/A | Kit: Pull Tractor Wide | Option<br>521 | N/A |
| 3 | 70022901<br>N/A | Kit: Push Tractor (Bottom) Narrow | Option<br>520 | N/A |
| 3 | 70023101<br>N/A | Kit: Push Tractor (Bottom) Wide | Option<br>521 | N/A |
| 4 | 70023301<br>N/A | Kit: Roll Paper Stand | Option<br>520 | N/A |
| 5 | 70000803<br>N/A | Kit: Parallel Interface Plug'n'Play Accessory | Option<br>Both | N/A |
| 6 | 70012801<br>N/A | Kit: RS232-C Serial Interface | Option<br>Both | N/A |
| 7 | 56412501<br>4YB4049-7031P1 | Transformer 230-240V (ML520) | Option RSPL<br>520 | N/A |
| 7 | 56412502<br>4YB4049-7031P2 | Transformer 230-240V (ML521) | Option RSPL<br>521 | N/A |
| 8 | 56624101<br>3YS4011-1265P1 | Cord: AC (220V) ML Series Right Angle | Option RSPL<br>Both | N/A |
| 8 | 56624401<br>3YS4011-1268P1 | Cord: AC 240V | Option RSPL<br>Both | N/A |
| 9 | 55038901<br>4YA4021-1050G1 | PCB: LXHI (RS232-C) | Option RSPL<br>Both | N/A |
| 10 | 56306001<br>4YB4021-1146P1 | Fuse: 3.15A for 230/240V Power Supply | Option RSPL<br>Both | N/A |
| 11 | 55073301<br>4YB4021-1144P1 | PCB: Filter 230 V | Option RSPL<br>Both | N/A |
| 11 | 55073302<br>4YB4021-1144P2 | PCB: Filter 240 V | Option RSPL<br>Both | N/A |
| 12 | 56306201<br>540A2062T2102 | Fuse: 1A 250V (Filter Brd 220V) | Option RSPL<br>Both | N/A |

*NOTE:*

*The Microline 520/521 printers are not shipped with an interface cable. The end user must purchase an interface cable separate from the printer.*




B-2-07.pcx

## B.2.09 Option Parts

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.

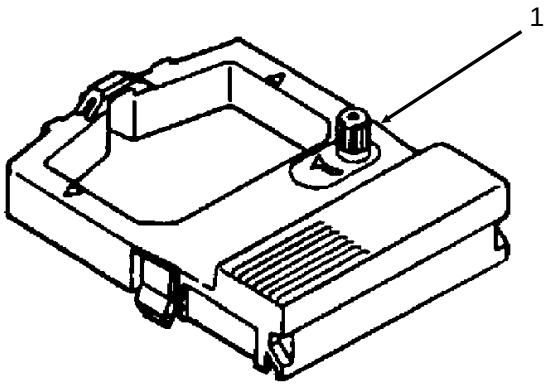
| Item | Okidata P/N<br>Oki-J P/N | Description | Comments<br>Refer to B.1.02 | Disassembly Procedure |
|---|---|---|---|---|
| 1 | 50097901<br>N/A | Tractor: Pull and Bottom Assembly (Right) | Option RSPL<br>Both | N/A |
| 2 | 50098001<br>4PA4025-3608G1 | Tractor: Pull and Bottom Assembly (Left) | Option RSPL<br>Both | N/A |
| 3 | 50098101<br>2PP4094-7383G1 | Tractor: Cover Assembly (N) Pull Tractor | Option RSPL<br>520 | N/A |
| 3 | 50098201<br>2PP4094-7384G1 | Tractor: Cover Assembly (W) Pull Tractor | Option RSPL<br>521 | N/A |
| 4 | 50098501<br>2PA4094-6510G1 | Stand: Bottom Push (Right) | Option RSPL<br>Both | N/A |
| 5 | 50098502<br>2PA4094-6510G4 | Stand: Bottom Push (Left) | Option RSPL<br>Both | N/A |
| 6 | 50098701<br>4PP4094-7385G1 | Knife: Paper (N) Bottom Push Tractor | Option RSPL<br>520 | N/A |
| 6 | 50098801<br>4PP4094-7386G1 | Knife: Paper (W) Bottom Push Tractor | Option RSPL<br>521 | N/A |
| 7 | 51010001<br>1PP4053-2570P1 | Guide: Front Sheet (N) Cut-Sheet Feeder | Option RSPL<br>520 | N/A |
| 7 | 51010101<br>1PP4053-2571P2 | Guide: Front Sheet (W) Cut-Sheet Feeder | Option RSPL<br>521 | N/A |
| 8 | 53067401<br>1PP4053-2574P1 | Cover: Side (Left) Cut-Sheet Feeder | Option RSPL<br>Both | N/A |
| 8 | 53067501<br>1PP4053-2575P1 | Cover: Side (Right) Cut-Sheet Feeder | Option RSPL<br>Both | N/A |
| 9 | 53480901<br>1PP4043-1891P4 | Supporter: Front Sheet (W) Cut-Sheet Feeder | Option RSPL<br>521 | N/A |
| 9 | 53562901<br>1PP4053-2576P1 | Supporter: Front Sheet (N) Cut-Sheet Feeder | Option RSPL<br>520 | N/A |
| 10 | 53563001<br>4PP4053-2547G1 | Shoe: Brake Cut-Sheet Feeder | Option RSPL<br>Both | N/A |
| 11 | 55937301<br>4YA4053-3025G1 | PCB: NCSF Cut-Sheet Feeder | Option RSPL<br>Both | N/A |
| 12 | 56510501<br>3PB4050-2560P1 | Motor: Pulse Cut-Sheet Feeder | Option RSPL<br>Both | N/A |
| 13 | 56627501<br>3YS4011-5120G1 | Cable: CSF Cut-Sheet Feeder | Option RSPL<br>Both | N/A |
| 14 | 50062801<br>4PB4053-1705G1 | Roller: Hopping (L.H.) CSF | Option<br>Both | N/A |
| 15 | 50062802<br>4PB4053-1705G2 | Roller: Hopping (R.H.) CSF | Option<br>Both | N/A |
| 16 | 53321501<br>3PB4025-1941P1 | Support: Rear Sheet CSF | Option<br>Both | N/A |
| 17 | 53448501<br>4PB4025-1914P1 | Sheet: Friction CSF | Option<br>Both | N/A |

**No pictures were available at press time.**

## B.2.10 Consumables

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.

| Item | Okidata P/N<br>Oki-J P/N | Description | Comments<br>Refer to B.1.02 | Disassembly Procedure |
|---|---|---|---|---|
| 1 | 52107001<br>N/A | Ribbon: Black | Consumable<br>Both | 3.2.02 |

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## B.2.11 Packing Materials

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.

| Item | Okidata P/N<br>Oki-J P/N | Description | Comments<br>Refer to B.1.02 | Disassembly Procedure |
|---|---|---|---|---|
| 1 | 53565101<br>N/A | Box: Graphic (ML520) | RSPL<br>520 | N/A |
| 1 | 53565201<br>N/A | Box: Graphic (ML521) | RSPL<br>521 | N/A |
| 2 | 53565401<br>N/A | Foam: Molded (Left) | RSPL<br>Both | N/A |
| 3 | 53565402<br>N/A | Foam: Molded (Right) | RSPL<br>Both | N/A |

**No pictures were available at press time.**

## B.2.12 Documentation

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.

| Item | Okidata P/N<br>Oki-J P/N | Description | Comments<br>Refer to B.1.02 | Disassembly Procedure |
|---|---|---|---|---|
| 1# | 58229401<br>N/A | Kit: ML520/521 Service Training | Document<br>Both | N/A |
| 1# | 58229402<br>N/A | Kit: ML520/521 Service Training | Document<br>Both | N/A |
| 1# | 58229403<br>N/A | Kit: ML520/521 Service Training | Document<br>Both | N/A |
| 2 A | 58232501<br>N/A | Package: User's Documentation | Document<br>Inc. 3 4 5 6 7 | N/A |
| 3 A | 52033001<br>N/A | Card: QA Reply | Document<br>Part of 2 A | N/A |
| 4 A | 53436029<br>N/A | Bag: Poly 9" x 12" | Document<br>Part of 2 A | N/A |
| 5 A | 52050809<br>N/A | Card: Request | Document<br>Part of 2 A | N/A |
| 6 A | 58059501<br>N/A | Card: Registration | Document<br>Part of 2 A | N/A |
| 7 A | 59256801<br>N/A | Handbook: Printer | Document<br>Part of 2 A | N/A |
| 2 B | 58232502<br>N/A | Package: User's Documentation | Document<br>Inc. 3 4 5 6 7 8 | N/A |
| 3 B | 52033001<br>N/A | Card: QA Reply | Document<br>Part of 2 B | N/A |
| 4 B | 53436029<br>N/A | Bag: Poly 9" x 12" | Document<br>Part of 2 B | N/A |
| 5 B | 52050809<br>N/A | Card: Request | Document<br>Part of 2 B | N/A |
| 6 B | 58059501<br>N/A | Card: Registration | Document<br>Part of 2 B | N/A |
| 7 B | 58306101<br>N/A | Sheet: Printer Handbook Errata | Document<br>Part of 2 B | N/A |
| 8 B | 59256802<br>N/A | Handbook: Printer | Document<br>Part of 2 B | N/A |
| 9 | 59258401<br>N/A | Manual: Maintenance | Document<br>Both | N/A |
| 10 | 59261000<br>N/A | Manual: Troubleshooting | Document<br>Both | N/A |
| 11 | 59254001<br>N/A | Product Specifications | Document<br>Both | N/A |

* To order Marketing Literature, complete an Okidata Marketing Literature Order Form. Fax the completed form to Okidata Marketing Communications.

* * Obtain this form by faxing a request to Okidata Marketing Communications. Refer to the Service Center Reference Guide for information on contacting Okidata.

# See the following pages

| Item | Okidata P/N<br>Oki-J P/N | Description | Comments<br>Refer to B.1.02 | Disassembly Procedure |
|---|---|---|---|---|
| 12 | N/A<br>N/A | Okidata Service Center Reference Guide | Document | N/A |
| 13 | 53547501<br>N/A | Okidata Support 3-Ring Binder | Document | N/A |
| 14 | 58067201<br>N/A | ABCD Warranty Claim Forms (Pkg of 20) | Document | N/A |
| 15 | 58052401<br>N/A | Warranty Summary Forms (Pkg of 20) | Document | N/A |
| 16 | N/A<br>N/A | Printer Drivers | Refer to Okilink | N/A |
| 17 | N/A<br>N/A | Product Updates | Document<br>Refer to Okilink | N/A |
| 18 | N/A<br>N/A | Recommended Spare Parts List | Document<br>Refer to Okilink | N/A |
| 19 | N/A<br>N/A | Software | Refer to Okilink | N/A |
| 20 | N/A<br>N/A | Technical Service Bulletins | Document<br>Refer to Okilink | N/A |
| 21 * | N/A<br>N/A | Marketing Literature | Document | N/A |
| 22 * * | N/A<br>N/A | Okidata Marketing Literature Order Form | Document | N/A |

* To order Marketing Literature, complete an Okidata Marketing Literature Order Form. Fax the completed form to Okidata Marketing Communications.

* * Obtain this form by faxing a request to Okidata Marketing Communications. Refer to the Service Center Reference Guide for information on contacting Okidata.

\# See the following pages

## B.2.13 Service Training Kit Revision List

P/N 58229401 Microline 520/521 Service Training Kit

*This kit was replaced by P/N 58229402.*

*Items in the training kit (except for the Printer Handbook) are NOT available separately.*

| Item | Okidata P/N<br>Oki-J P/N | Description | Comments<br>Refer to B.1.02 | Disassembly Procedure |
|---|---|---|---|---|
| 1 A | 58229401<br>N/A | Kit: ML520/521 Service Training | Document<br>Both | N/A |
| 2 A | 52063201<br>N/A | Label: Box | Document | N/A |
| 3 A | 58229501<br>N/A | Administration Package | Document | N/A |
| 4 A | 58090301<br>N/A | Envelope: Administration Package | Document | N/A |
| 5 A | 58090401<br>N/A | Cover Letter | Document | N/A |
| 6 A | 59257701<br>N/A | Training Guide | Document | N/A |
| 7 A | 58090501<br>N/A | Printhead Gap Adjustment Material | Document | N/A |
| 8 A | 58090601<br>N/A | Certification Test | Document | N/A |
| 9 A | 58090701<br>N/A | Certification Test Answer Sheet | Document | N/A |
| 10 A | 58090801<br>N/A | Course Critique | Document | N/A |
| 11 A | 58090901<br>N/A | Envelope: Pre-Printed Return | Document | N/A |
| 12 A | 59257801<br>N/A | Service Handbook | Document | N/A |
| 13 A | 59257901<br>N/A | User's Documentation | Document<br>Inc 14 A | N/A |
| 14 A | 59256801<br>N/A | Handbook: Printer | Document<br>Both | N/A |
| 15 A | 57519801<br>N/A | Service Videotape | Document | N/A |
| 16 A | 52063202<br>N/A | Label: Service Videotape Case | Document | N/A |
| 17 A | 52063203<br>N/A | Label: Service Videotape Front | Document | N/A |
| 18 A | 52063204<br>N/A | Label: Service Videotape Spine | Document | N/A |
| 19 A | 57517101<br>N/A | Red Vinyl Case (VHS Videotape) | Document | N/A |
| 20 A | 53533001<br>N/A | Storage Box | Document | N/A |

P/N 58229402 Microline 520/521 Service Training Kit

*This kit was replaced by P/N 58229403.*

*Items in the training kit (except for the Printer Handbook) are NOT available separately.*

| Item | Okidata P/N<br>Oki-J P/N | Description | Comments<br>Refer to B.1.02 | Disassembly Procedure |
|---|---|---|---|---|
| 1 B | 58229402<br>N/A | Kit: ML520/521 Service Training | Document<br>Both | N/A |
| 2 B | 52063205<br>N/A | Label: Kit | Document<br>Both | N/A |
| 3 B | 58090402<br>N/A | Read Me First | Document<br>Both | N/A |
| 4 B | 59257802<br>N/A | Service Handbook | Document<br>Both | N/A |
| 5 B | 59257901<br>N/A | User's Documentation | Document<br>Inc 6 B | N/A |
| 6 B | 59256801<br>N/A | Printer Handbook | Document<br>Both | N/A |
| 7 B | 57519801<br>N/A | Service Videotape | Document<br>Both | N/A |
| 8 B | 52063204<br>N/A | Label: Service Videotape Spine | Document<br>Both | N/A |
| 9 B | 53570401<br>N/A | Sleeve: Videotape (Cardboard) | Document<br>Both | N/A |

P/N 58229403 Microline 520/521 Service Training Kit

*This kit replaces P/N 58229402.*

*Items in the training kit (except for the Printer Handbook) are NOT available separately.*

| Item | Okidata P/N<br>Oki-J P/N | Description | Comments<br>Refer to B.1.02 | Disassembly Procedure |
|---|---|---|---|---|
| 1 C | 58229403<br>N/A | Kit: ML520/521 Service Training | Document<br>Both | N/A |
| 2 C | 52063206<br>N/A | Label: Kit | Document<br>Both | N/A |
| 3 C | 58090403<br>N/A | Read Me First | Document<br>Both | N/A |
| 4 C | 59257803<br>N/A | Service Handbook | Document<br>Both | N/A |
| 5 C | 59256802<br>N/A | Printer Handbook | Document<br>Both | N/A |
| 6 C | 58306101<br>N/A | Sheet: Printer Handbook Errata | Document<br>Both | |
| 7 C | 57519802<br>N/A | Service Videotape | Document<br>Both | N/A |
| 8 C | 52063204 Rev B<br>N/A | Label: Service Videotape Spine | Document<br>Both | N/A |
| 9 C | 53570401<br>N/A | Sleeve: Videotape (Cardboard) | Document<br>Both | N/A |

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OKIDATA
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Microline 520/521 Service Handbook

P/N 59257803