
OKIDATA®
Service Manual

ML395 // ML395C
Dot Matrix Printers

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Table of Contents	Page
Service Guide ML395/395C	
0 About This Manual	
Front Cover	1
....Manual Copyright	2
1 Product Specifications	
1.1 Overview - General Information	3
1.2 Product Specifications	4
1.3 Paper Specifications	5
1.4 Physical Specifications	6
1.5 Power Requirements	7
1.6 Environmental Conditions	8
1.7 Agency Approvals	9
1.8 Options	10
1.9 Consumables	11
1.10 Memory Specifications	12
1.11 Printer Reliability	13
2 Principles of Operation	
2.1 Electrical Operation - General Information	14
....2.1.02 Microprocessors (MPUs) and Peripheral Circuits	15
....2.1.03 Initialization	16
....2.1.04 Interface Control	17
....2.1.05 Printhead Drive Circuit	18
....2.1.06 Spacing Drive Circuit	19
....2.1.07 Line Feed Circuit	20
....2.1.08 Alarm Circuits	21
....2.1.09 Paper End Detection Circuit	22
....2.1.10 Power Supply	23
2.2 Mechanical Operation	24
....2.2.02 Spacing	25
....2.2.03 Ribbon Drive	26
....2.2.04 Paper Feed	27
....2.2.05 Paper-End Detection	28
....2.2.06 Automatic Paper Loading	29
....2.2.07 Paper Park	30
3 Maintenance & Disassembly	
3.1 Maintenance - General Information	31
....3.1.02 Maintenance Items	32
....3.1.03 Maintenance Precautions	33
3.2 Disassembly/Assembly Procedures - General Information	34
....3.2.01 Preliminary Items Printhead	35
....3.2.02 Ribbon Guide	36
....3.2.03 Ribbon Protector	37
....3.2.04 Upper Cover Assembly	38

Table of Contents

Page

....3.2.05 Operator Panel Assembly	39
....3.2.06 Control Board (TFCB)	40
....3.2.07 Interface Connector Board (TFIF or LQPN)	41
....3.2.08 Printer Mechanism	42
....3.2.09 Platen Assembly	43
....3.2.10 Line Feed Motor	44
....3.2.11 Head Cable Assembly	45
....3.2.12 Sensor Board	46
....3.2.13 Ribbon Feed Assembly	47
....3.2.14 Space Motor Assembly	48
....3.2.15 Space Belt	49
....3.2.16 Cooling Fan	50
....3.2.17 Bail/Ribbon Motor Assembly	51
....3.2.18 Paper Bail Assembly	52
....3.2.19 Carriage and Carriage Shaft	53
....3.2.20 Paper Pressure Guide	54
....3.2.21 Printhead Gap / Release Lever Microswitches	55
....3.2.22 Push Tractor Assembly	56
....3.2.23 Power Supply Unit	57
....3.2.24 Ribbon Shift Arm Spring / Ribbon Shift Arm	58
....3.2.25 Roller Lever	59
....3.2.26 Ribbon Guide	60
....3.2.27 Bail Open Cam and Bail Open Gear	61
....3.2.28 Ribbon Shift Cam and Ribbon Shift Gear	62
....3.2.29 Ribbon Shift Cam Lever Assembly	63
....3.2.30 Printer Unit	64
....3.2.31 BTFD Printed Circuit Board	65
....3.2.32 Tension Spring	66
....3.2.33 Sheet Guide	67
....3.2.34 BTF Front Door Assembly	68
....3.2.35 Drive Pulley and Mini-pitch Belt	69
....3.2.36 Line Feed Motor	70
....3.2.37 Tractor Assembly	71
3.3 Printer Adjustments - Printhead Gap	72
....3.3.02 Line Feed Belt Tension	73
....3.3.03 Color Adjustment (Microline 395C Printer)	74
....3.3.04 Key Combinations	75
....3.3.05 Menu Operation - Menu Mode	76
.....Menu Print	77
.....Sample Menu	78
.....Menu Settings	79
.....Menu Reset	80
.....Limited Operation	81
....3.3.06 Top of Form	82

Table of Contents

Page

....3.3.07 Paper Park	83
....3.3.08 Forms Tear Off	84
3.4 Cleaning	85
3.5 Lubrication	86
.....Lubrication Points (Monochrome and Color)	87
.....Lubrication Points (Monochrome and Color) - Continued	88
.....Lubrication Points (Monochrome and Color) - Continued	89
.....Lubrication Points (Color)	90
.....Lubrication Points (Options)	91
3.6 Shipping Instructions - Return For Service	92
....3.6.02 All Other Returns	93
4 Failure & Repair Analysis	
4.1 Overview	94
....4.1.02 Printer Serial Number Identification	95
4.2 Reporting Problems - General Information	96
....4.2.02 Problem Lists	97
....4.2.03 Reporting Methods	98
4.3 Troubleshooting Updates - General Information	99
....4.3.02 Okilink II	100
....4.3.03 Faxable Facts	101
....4.3.04 Technical Service Bulletins	102
4.4 Troubleshooting Tips - Preliminary Checks	103
....4.4.02 Problem Categories	104
....4.4.03 START HERE Flowchart	105
....4.4.04 Tips for Preventing Image Problems	106
....4.4.05 Common Problems	107
4.5 Abnormal Output	108
4.6 Fault Alarms - General Information	109
4.7 Repair Analysis Procedures (RAPS) - Using The RAPS	110
....4.7.02 RAP Index	111
.....RAP 01: Power Lamp Does Not Light	112
.....RAP 02: Space Error (ALARM 5B)	113
.....RAP 03: Head Homing Error (ALARM 53)	114
.....RAP 04: Ribbon Homing Error (ALARM 57)	115
.....RAP 05: Bail Home Error (ALARM 5C)	116
.....RAP 06: Wrong Character, Character Omission, or Dot Omission	117
.....RAP 07: Ribbon Feed Trouble	118
.....RAP 08: Line Feed Trouble	119
.....RAP 09: Malfunction of Operator Panel Switch	120
.....RAP 10A: Data Receive Failure	121
.....RAP 10B: Parallel Interface Problem	122

Table of Contents

Page

.....RAP 10C: Serial Interface Problem	123
.....RAP 10D: Data Receive Failure (Alarm Light Lit)	124
.....RAP 11: Color Ribbon Shift Problem	125
4.8 Printer Tests	126
....4.8.02 Font Test	127
....4.8.03 Serial Interface - Loopback Test	128
....4.8.04 Hexadecimal Dump	129
4.9 Resistance Checks - General Information	130
....4.9.02 Printhead Resistance Check	131
....4.9.03 Line Feed Motor Resistance Check	132
....4.9.04 Space Motor Resistance Check	133
....4.9.05 Ribbon Motor Resistance Check	134
A Board Diagrams	
A.1 Overview - General Information	135
A.2 Index To Charts	136
....A.2.01 Main Controller Board (TFCB)	137
.....ML395/395C Jumper Plugs SP2 : Jim Fitzpatrick/Project Leader/Okidata; 11/18/96	138
....A.2.02 Power Supply Board (POW)	139
....A.2.03 Interface Board (TFIF)	140
.....Change sp102 jumper : Eric Tomenga/OKI_ELECTRIC/US	141
.....Shorting Plug SP102 : Jim Fitzpatrick/Project Leader/Okidata; 11/18/96	142
....A.2.04 Sensor Board (LQEW)	143
....A.2.05 Operator Panel (TFOP)	144
B Illustrated Parts Listing	
B1.1 Overview - General Information	145
....B.1.02 Definition of Terms	146
....B.1.03 Parts Ordering Information	147
B.2 Charts	148
....B.2.01 Upper Cover Assembly	149
....B.2.02 Printer Unit General Assembly	150
....B.2.03 Operator Panel	151
....B.2.04 Carriage Assembly (Black and White)	152
....B.2.05 Carriage Assembly (Color)	153
....B.2.06 Printer Unit - Black and White (1 of 3)	154
....B.2.07 Printer Unit - Black and White (2 of 3)	155
....B.2.08 Printer Unit - Black and White (3 of 3)	156
....B.2.09 Printer Unit - Color (1 of 3)	157
....B.2.10 Printer Unit - Color (2 of 3)	158
....B.2.11 Printer Unit - Color (3 of 3)	159
....B.2.12 Cables and Connectors	160
....B.2.13 Options	161

Table of Contents

Page

....B.2.14 Pull Tractor Assembly (Option)	162
....B.2.15 Bottom Tractor Feed Unit (Push) [BTF] (Option)	163
....B.2.16 BTF Pull-Up Roller Assembly (Option)	164
....B.2.17 Consumables	165
....B.2.18 Packing Materials	166
....B.2.19 Documentation	167



Service Guide ML395/395C

Chapter 0 About This Manual

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Technical Training Group
Okidata
532 Fellowship Road
Mount Laurel, NJ 08054-3499
Okilink Login Name: Technical Training

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1.1 OVERVIEW

1.1.01 General Information

The Microline 395 is a high speed, dot matrix printer, which utilizes a 24 wire printhead. The Microline 395 comes standard with both an RS232-C Serial Interface and a Centronics Parallel Interface. The printer is available in either a standard version (Microline 395; single color output) or a color capable version (Microline 395C; multiple color output). The Microline 395 is capable of emulating the Epson LQ 850/1050 or the IBM Proprinter XL24 printers. The Microline 395C emulates the Epson LQ 2550, Epson LQ850/1050 or the IBM Proprinter XL24.

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1.2 PRODUCT SPECIFICATIONS

1.2.01 Paper Feed Method

Built-in push tractor

Friction feed

1.2.02 Paper Path

Bottom Feed

Rear Feed

Top Feed

1.2.03 Printhead Type

Staggered, 24 pin, stored energy printhead

1.2.04 Interface Methods

Both are Standard

Centronics Parallel Interface

RS232-C Serial Interface

1.2.05 Print Speed

Pitch	Head Gap Setting	High Speed Draft	Utility	Near Letter Quality	Letter Quality
10 cpi	1,2		405 cps	202 cps	135 cps
12 cpi	1,2	607 cps	486 cps	242 cps	162 cps
15 cpi	1,2	607 cps	303 cps		202 cps
17.1 cpi	1,2		347 cps		231 cps
20 cpi	1,2		405 cps		270 cps
10 cpi	3+		352 cps	175 cps	117 cps
12 cpi	3+		422 cps	211 cps	140 cps
15 cpi	3+	528 cps	263 cps		175 cps
17.1 cpi	3+	528 cps	300 cps		200 cps
20 cpi	3+		352 cps		234 cps

cpi - Characters Per Inch

cps - Characters Per Second

1.2.06 Symbol Sets

Standard ASCII

Epson Character Set

IBM Character Set I and Set II

IBM Proprinter All Character Set

International Characters

Line Graphics

Code Page 850, 863,437

1.2.07 Standard Fonts

Utility (Used in Utility and High Speed Draft Modes)

Courier

Swiss

Roman

Orator

1.2.08 Line Feed Increments

1/6" n/180"

1/8" n/216"

n/60" n/360"

n/72"

1.2.09 Line Feed Time

55 ms @ 6 LPI

8.0 IPS (inches per second) slew rate @ gap 1,2

6.0 IPS (inches per second) slew rate @ gap 3+

1.2.10 Paper Out Detection

Printhead distance from edge of paper when End of Paper is detected

Rear Feed: 5.8"

Bottom Feed: 2.4"

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1.3 PAPER SPECIFICATIONS

1.3.01 Types

Letter

Legal

Labels - *Bottom feed only*

Continuous Forms

Envelopes

Card Stock

Transparency

1.3.02 Weight

12 - 24 lb. (Continuous Form Paper)

16 - 24 lbs (Cut Sheet Paper)

1.3.03 Number of Copies

1 - 4 (4 Part Form Maximum)

1.3.04 Maximum Thickness

.014 inches (Rear Feed)

.020 inches (Bottom Feed)



1.4 PHYSICAL SPECIFICATIONS

1.4.01 Printer Dimensions

Width: 16.42"

Height: 7.09"

Length: 22.44"

1.4.02 Printer Weight

37 lbs.

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1.5 POWER REQUIREMENTS

1.5.01 Input Power

Input Voltage

120 VAC +10%, -15%

220/240 +10%, -15%

Frequency

50/60 hz. +/-2%

1.5.02 Power Consumption

During Self Test : 180 VA

During Standby : 60 VA

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1.6 ENVIRONMENTAL CONDITIONS

1.6.01 Ambient Temperature and Relative Humidity

While in operation: 41°F to 104°F @ 20% - 80% Relative Humidity

While in storage: 14°F to 122°F @ 5% - 95% Relative Humidity

1.6.02 Printer Noise Level (10 cpi - LQ Mode)

Standard noise level: 58 dba

Quite mode noise level: 56 dba

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1.7 AGENCY APPROVALS

North America

FCC Class B

UL 1950 - D3

CSA 950 - D3

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1.8 OPTIONS

1.8.01 Cut Sheet Feeders

CSF 3001 - Single bin Cut Sheet Feeder

CSF 3002 - Dual bin Cut Sheet Feeder

1.8.02 Pull Tractor Assembly

The Pull Tractor Assembly is required for bottom feeding if the optional Bottom Push Tractor Unit is not installed.

1.8.03 Bottom Push Tractor Unit

Card Stock and Labels

NOTE: *A Pull Tractor Assembly or Bottom Push Tractor must be used to feed labels.*

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1.9 CONSUMABLES

1.9.01 Black Ribbon Cartridge

Microline 395 and Microline 395C

Type: Nylon Fabric Ribbon

Ribbon Life: 5 million characters

1.9.02 Color Ribbon Cartridge

Microline 395C

Type: Four band color ribbon (Yellow, Magenta, Cyan, Black)

Ribbon Life:

Black: 2.1 million characters

Cyan: 1.9 million characters

Magenta: 1.9 million characters

Yellow: 1.3 million characters

1.9.03 Film Ribbon

Can be used in both the Microline 395 and Microline 395C.

Ribbon Life

400K Characters at 10 cpi in LQ mode

1.10 MEMORY SPECIFICATIONS

1.10.01 ROM

Resident Program ROM = 128 Kbytes

Resident Fonts = 384 Kbytes

1.10.02 RAM

Total RAM = 64 Kbytes

Print Buffer = 23 Kbytes

I/F Buffer = 8 K bytes

DLL Buffer = 22 Kbytes

Command Buffer = 11 Kbytes

1.10.03 EEPROM

Internal Control, Menu = 256 bits



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2.1 ELECTRICAL OPERATION

2.1.01 General Information

The Control Board consists of the microprocessor and its peripheral circuits, the drive circuits. The power to the Control Board is supplied by the power supply unit. The power to the other electrical parts is distributed via the connectors on the Control Board.

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2.1.02 Microprocessors (MPUs) and Peripheral Circuits

Microprocessors (Q16: 80C154HGS and Q11: 80C154VGS)

The Microprocessors are the nucleus of the control circuit. The peripheral circuits operate under program control by these microprocessors. The Master MPU (Q16) controls the interface, code processing and the Slave MPU. The Slave MPU (Q11) controls the spacing and printing functions.

Program ROM for Master MPU (Q6: 27C101)

This Program ROM contains the control program for the printer. The master microprocessor operates by execution of this program.

Program ROM for Slave MPU (Q17: 2764)

This Program ROM contains the control program for the printer. The slave microprocessor operates by execution of this program.

DRAM (Q18 and Q19)

The Dynamic RAM chips, each consisting of 64x4 Kbits, are used as the Receive Buffer and Print Buffer. The total buffer size is 64x8 Kbits.

CGROM (Q7)

This is a 1 Mbit ROM which stores the resident character fonts.

EEPROM (Q20)

This 256-bit serial Electrically Erasable and Programmable ROM stores the menu **data. Motor Control LSI (Q9: MSM6990)**

This LSI controls the following functions:

Space Motor Speed Control

To obtain the carriage speed instructed by the Microprocessor, the LSI generates the pulse switch timing and overdrive time

Dot ON Timing generation

I/O Port (Input port used to read Operator Panel switches)
Address Latch (for lower 8 bits of the slave MPU)

LSI (Q8: MSM74H002)

This LSI drives the 24 pin printhead. The following describes the function of the LSI.

Printhead Drive Control

Printhead Drive Correction

Modifies the drive time under the following circumstances

Correction for edge pin driving

Correction for drive voltage fluctuations

Correction for head gap setting

Interface LSI (Q12: MSM60306)

The MSM60306 is an external interface LSI and controls the following functions.

Interface Control

Controls both the parallel and serial interface functions

Pin 4 of this LSI enables selection of the serial or parallel interface

Address Latch (for lower 8 bits of the master MPU)

MMU (Memory Management Unit) LSI (Q13: LC92018B-728)

This LSI is connected between the Master and Slave MPUs and performs these functions.

Master/Slave MPU Interface

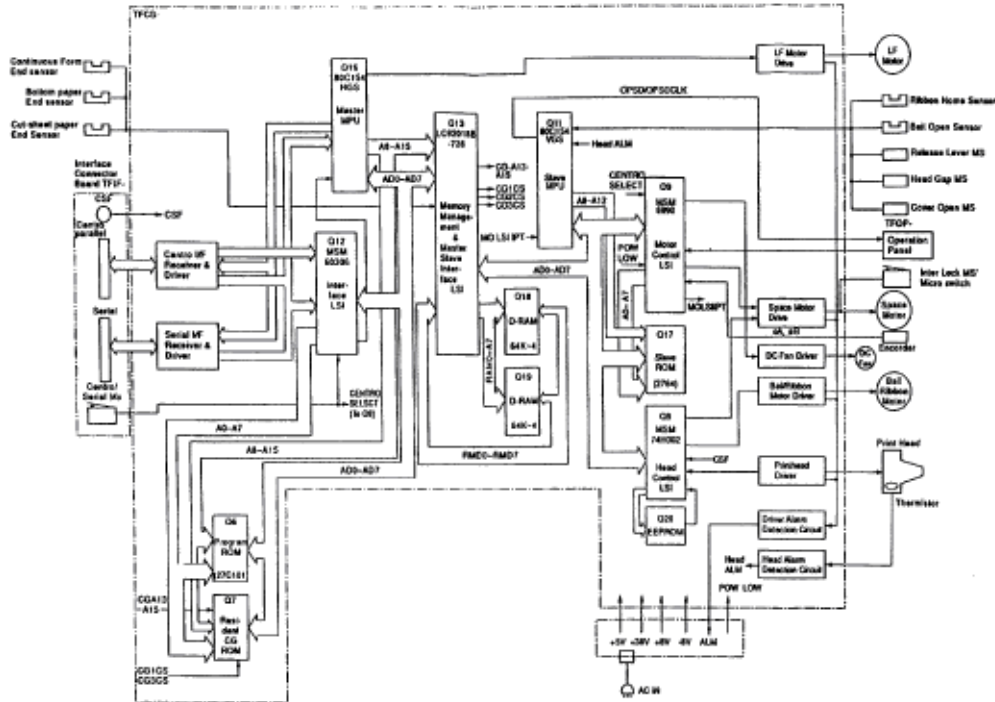
Transfers commands and data between the Master and Slave MPUs

Memory Control

Extends the addressable memory by switching banks in/out

Dynamic RAM Refresh

Block Diagram of Microline 395



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2.1.03 Initialization

The Printer is initialized whenever the power is turned ON or when the I-PRIME signal is received at the parallel interface. Initialization is started when the RST-P signal is sent from the reset circuit to the MPUs and LSIs.

When RST-P is generated, ROM program execution starts with the mode setting of Q8, Q9, Q12 and Q13. Next, ROM and RAM are checked for errors, RAM is initialized and the carriage, bail and ribbon (color model only) are homed. The program finally establishes the interface signals (output level of ACK, BUSY, etc.), then turns the SELECT lamp ON to inform the host computer that the printer is ready to receive data.

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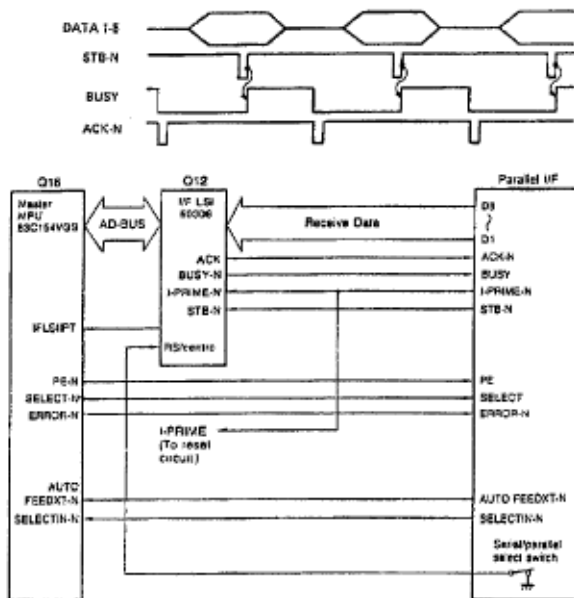
2.1.04 Interface Control

The Microline 395 is capable of serial or parallel operation. The desired interface method is selected by sliding the interface cover to expose the desired connector. When this is done, the interface select switch is turned ON or OFF to inform the Interface Control LSI (Q12) of the selected interface.

Parallel Interface

When the interface select switch is turned OFF, the parallel interface is selected and the Interface Control LSI is in the parallel mode.

The data from the interface is received through connector (CN-1) and the Interface LSI (Q12) latches this data to the internal register in the LSI at the rising edge of the STB-N signal. The BUSY signal is turned ON as the data is processed. When processing is completed, the BUSY signal is turned OFF and an ACK signal is sent to the host to request more data. The BUSY signal is also turned ON when the printer is not able to receive data (buffer is full, printer is deselected or an error condition exists).



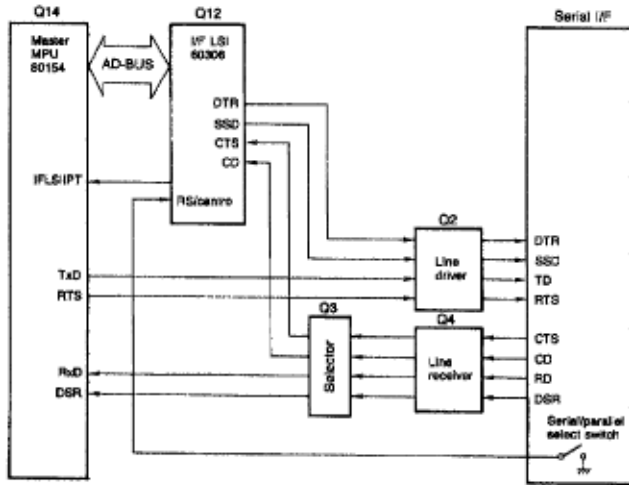
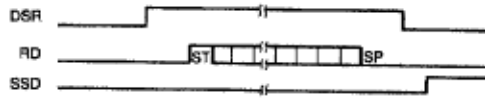
RS232-C Serial Interface

When the interface select switch is turned ON, the serial interface is selected and the Interface Control LSI is in the serial mode.

Then the RS232-C interface signals (DSR, CTS, CD and RD) are converted to TTL levels by the line receiver (Q4) and input to the Master MPU, Slave MPU and MMU. The Master MPU converts the serial data to parallel data.

The interface signals (DTR, RTS, SSD and TD) output from the Master MPU and Interface LSI are

converted from TTL levels to RS232-C levels by the line driver (Q2) and sent to the serial interface connector.



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2.1.05 Printhead Drive Circuit

This circuit is used to drive the 24 print wires.

The signals HD1 through HD24 control the individual print wires. The HD ON signal (even/odd trigger) enables the drive circuit when printing is desired.

The head drive duration is determined by an RC integrating circuit, which modifies the HD ON pulse width. The pulse width of the HD ON signal varies with the number of pins being driven.

Printhead Drive Time

The drive time *increases* as more pins are driven.

The drive time *decreases* as less pins are driven.

The drive time also increases if the head gap lever is placed in positions 4 through 9.

An RC circuit also is used to compensate for the fluctuation of drive voltage (+38 vdc).2-1-04B.pcx

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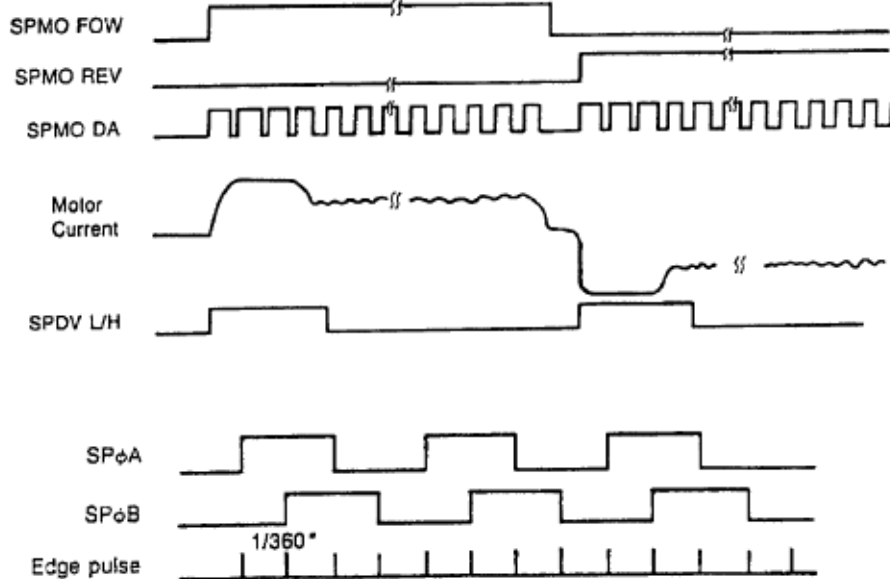
2.1.06 Spacing Drive Circuit

The Motor Control LSI (Q9) outputs the SPMO DA signal upon receiving the spacing command from the Slave MPU (Q11). This is a fixed cycle pulse signal.

To control the motor speed, the Motor Control LSI varies the pulse duty cycle according to the speed data from the Slave MPU.

The SPMO FOW or SPMO REV signal from the Head Control LSI (Q8) changes the current direction in the DC motor to run the motor in either the forward or reverse direction.

As the space motor rotates, it generates feedback pulse signals SPφA and SPφB. The Motor Control LSI detects the edge pulses from these signals and divides the frequency to output the MO LSI IPT signal for use in Dot Timing.





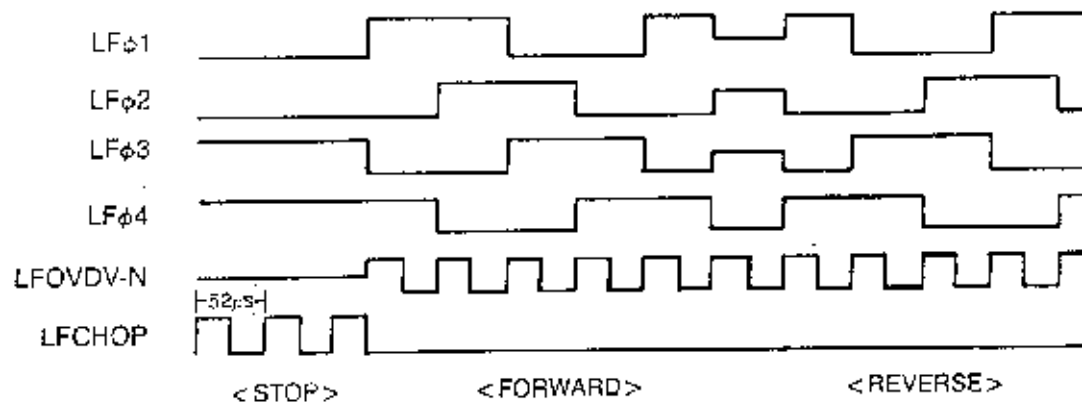
Service Guide ML395/395C

Chapter 2 Principles of Operation

2.1.07 Line Feed Circuit

The Line Feed Motor Shaft is held stationary by +8 vdc supplied according to the pulse duty cycle of the LFCHOP signal (the holding current is approximately 30 ma) whenever in a stopped position.

During line feed operation, the Line Feed Motor is driven by +38 vdc in accordance with the LFOVDV-N signal. The signals LFφ1 through LFφ4 establish the proper phase relationship for driving the motor.



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2.1.08 Alarm Circuits

Fault Alarm Circuit (in Power Supply Unit)

This protective circuit turns off the Power Supply when a fault occurs in the printhead, line feed, or bail/ribbon motor drive circuits, thus preventing secondary component failure.

To accomplish this, the circuit monitors the overdrive signal of each drive circuit. If the duration of any drive circuit exceeds a predetermined length of time, the appropriate signal (HDE ALM, HDO ALM, LF COM or RBN COM) will be sent to the fault alarm circuit. The fault alarm circuit generates the ALM signal (high) which causes the power supply to turn all DC power OFF.

Printhead Overheat Alarm Circuit

In order to protect the printhead coils, this circuit monitors the printhead temperature by using a thermistor contained in the printhead. The CPU senses this circuit every time a line is printed.

When printing, the printhead temperature rises. If the head temperature reaches approximately 115 degrees Celsius, a head overheat condition (ALARM 1) is generated.

When ALARM 1 is detected, bi-directional printing stops. Uni-directional printing continues. If the printhead temperature continues to rise, ALARM 2 is generated. All printing stops.

Printing resumes when the head temperature falls below the ALARM 1 level.

Cover Open Alarm Circuit

When the front access cover is opened, the COVOPEN-N signal is sent to the Slave MPU from the cover interlock microswitch. The Slave MPU relays the switch status to the Master MPU. The Master MPU will halt printing at the completion of the current line and light the ALARM Lamp.

2.1.09 Paper End Detection Circuit

Whenever the Release Lever is in the Continuous Feed position, Paper End is detected by the microswitch on the Push Tractor (rear feed) or the Paper End sensor on the sensor board (bottom feed).

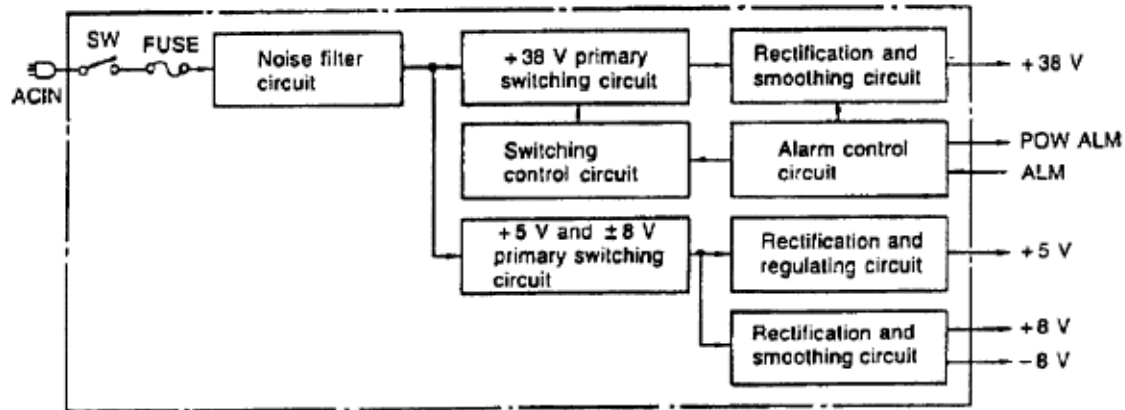
Whenever the Release Lever is in the Sheet Feed position, Paper End is detected by a photosensor located in the paper pressure guide.

When the printer detects an out of paper condition, the PE-N signal goes low, the printing is stopped and the ALARM LAMP is turned ON.

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2.1.10 Power Supply

This switching power supply converts the AC input voltage to +5 vdc, +/-8 vdc and +38 vdc for use throughout the printer.



Voltage/Signal	Purpose
+5 vdc	IC Logic Levels - LED Drive Voltage
+8 vdc	Serial I/F Logic Levels - LF Motor Locking Voltage
-8 vdc	Serial I/F Logic Levels
+38 vdc	Printhead Space Motor LF Motor Bail/Ribbon Motor Drive Voltage
POW ALM	Output from the Power Supply in the event of an abnormal temperature rise in the power supply unit or an overcurrent condition of the +38 vdc. The Main Control Board suppresses this condition by temporarily suspending printing. If the condition does not change the Main Control Board will enable the FAN ALARM (Alarm 60) See Section 4
ALM	Output from the Main Control Board upon detection of an overdrive condition in the printhead LF motor or bail/ribbon motor drive circuits.

2.2 MECHANICAL OPERATION

2.2.01 The Printhead Mechanism

The Microline 395 uses a highly efficient stored energy type printhead. Power is not consumed until the printwires are activated, thereby extending the printhead life to approximately 200 million characters.

The printhead uses 24 printwires (two columns of 12 wires each). Each wire is welded to an armature. Behind this armature is a spacer ring.

Each of the 24 printwire armatures have a permanent magnet behind them. The magnets attract the armatures, drawing the printwires into the wire guide, thus keeping the wires inside the printhead. A coil is wrapped around each of the permanent magnets.

When a dot is to be printed, current is passed through the appropriate coil. This creates an electromagnetic field which opposes the magnetic field of the permanent magnet. The armature can then spring forward and the print wire (which is attached to the armature) strikes the ribbon and imprints a dot on the paper.

When current is removed from the coil, the magnetic field of the permanent magnet attracts the armature, causing the printwire to retract into the wire guide once again.

The printhead contains a built-in thermistor used to monitor the printhead temperature.

The parts listed below make up the printhead.

Wire Guide

Print Wires

Armature Assembly

Spacer

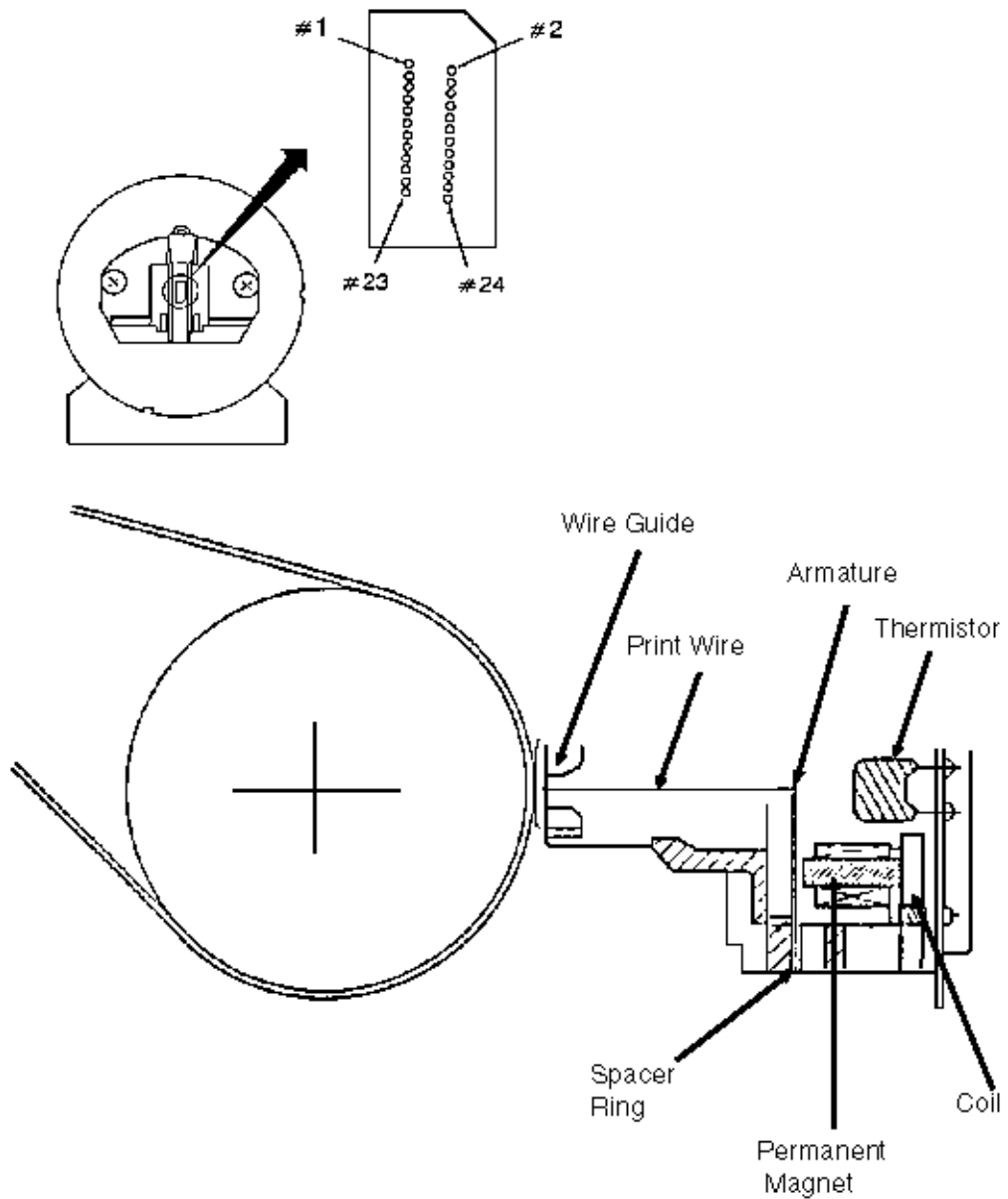
Permanent Magnet Assembly

Thermistor

Printed Circuit Board with Coils

Head Gap Adjusting

The head gap adjusting mechanism adjusts the gap between the platen and printhead. This is accomplished by moving the adjusting lever on the left side of the printer mechanism. When the lever is moved the carriage shaft rotates. Since the carriage shaft is attached to the printer mechanism with eccentric collars, as the carriage shaft rotates, the distance between the platen and carriage shaft changes.



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2.2.02 Spacing

Spacing is performed when the servo motor drives the carriage along the carriage shaft, parallel to the platen. The spacing mechanism consists of the:

Servo Motor

Drive Pulley

Idle Pulley

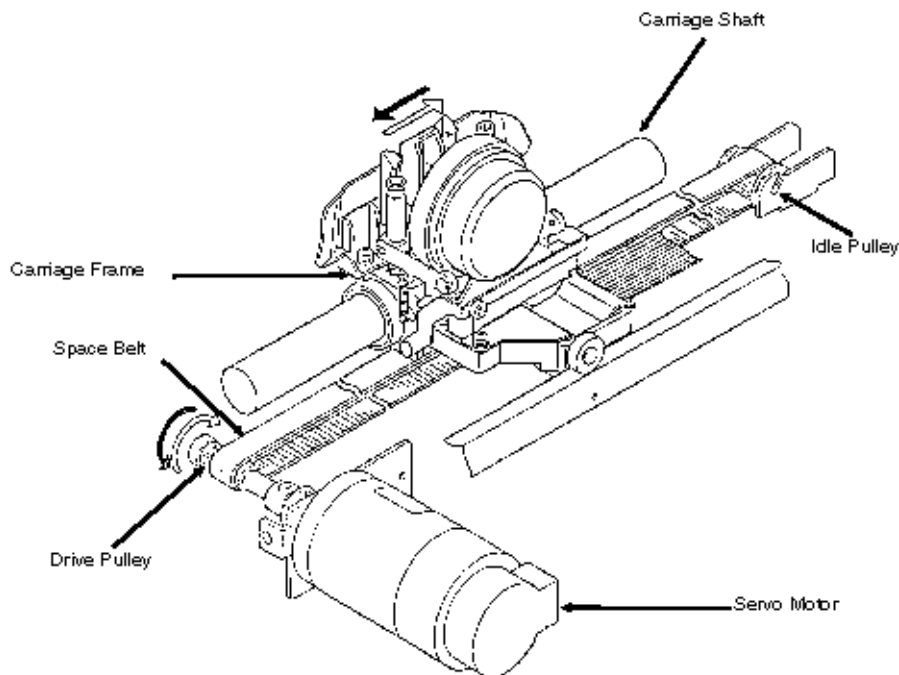
Carriage Shaft

Carriage Frame

Space Belt

Spacing Operation

The carriage containing the printhead moves parallel to the platen along the main carriage shaft. Power from the space motor is transferred via the space belt, which is attached to the bottom of the carriage frame. The carriage is designed to move 1.6 inches when the servo motor performs one rotation.



2.2.03 Ribbon Drive

The ribbon drive mechanism moves the ribbon in synchronization with the space motor operation.

The ribbon drive mechanism consists of the following items.

Ribbon Drive Assembly

Ribbon Cartridge

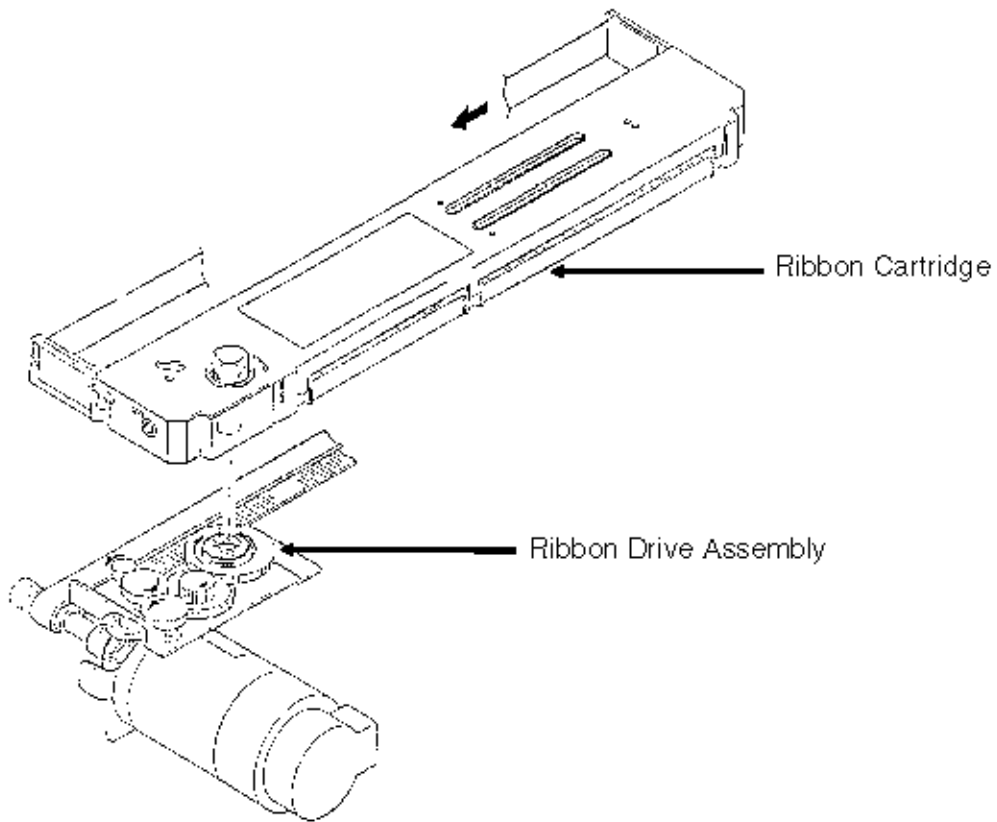
Ribbon Cartridge

An endless ribbon with a single direction feed is used. Ink is supplied from an ink tank, which is built-in to the ribbon cartridge.

Ribbon Feed Operation

The rotation of the space motor is transmitted to the drive gear in the ribbon cartridge through the ribbon feed gear assembly, thereby feeding the ink ribbon.

The feed direction of the ribbon is maintained by switching the rotational direction of the gears in the ribbon drive assembly. This ensures unidirectional ribbon movement when bidirectional printing is used.



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2.2.04 Paper Feed

Paper feeding is performed by turning the platen and the pin tractor, which is driven by the line feed pulse motor.

The paper feed mechanism consists of the following items.

Pulse Motor (with gears)

Idler Gear

Change Spring

Change Gear

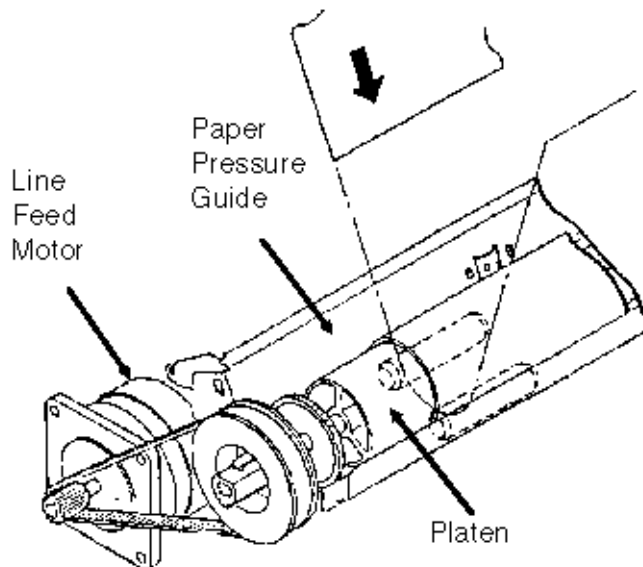
Platen

Tractor Feed Unit

Paper Pressure Guide

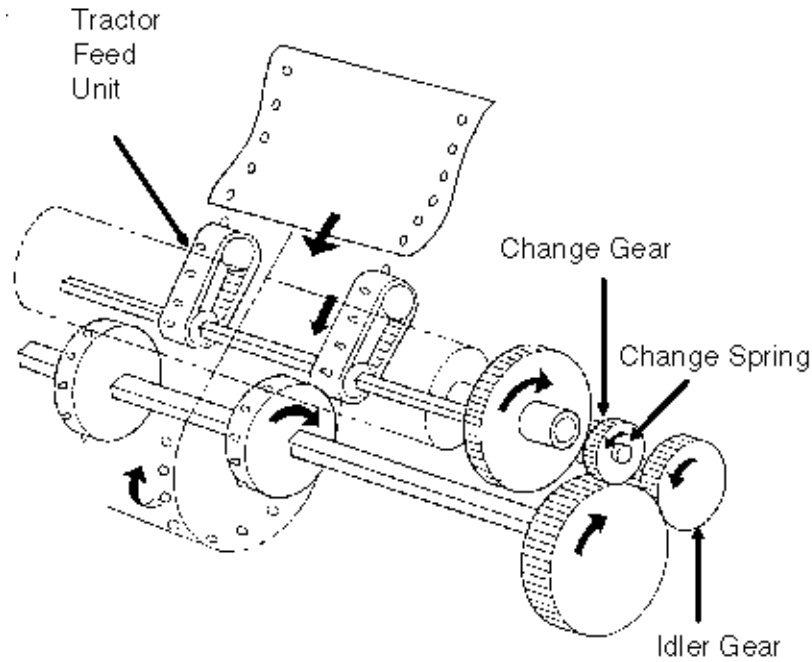
Friction Feed

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



Tractor Feed

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

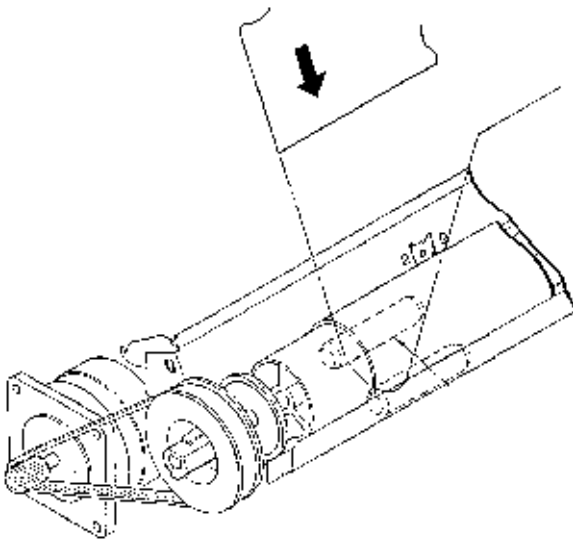


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2.2.05 Paper-End Detection

Cut-Sheet Paper-End

When the release lever is in the SHEET FEED position, the photosensor located in the paper pressure guide is active. If sheet paper is installed, the paper is detected by the sensor and the sensor is turned on. When the printer is out of sheet paper, the sensor is turned off indicating a paper-end condition.

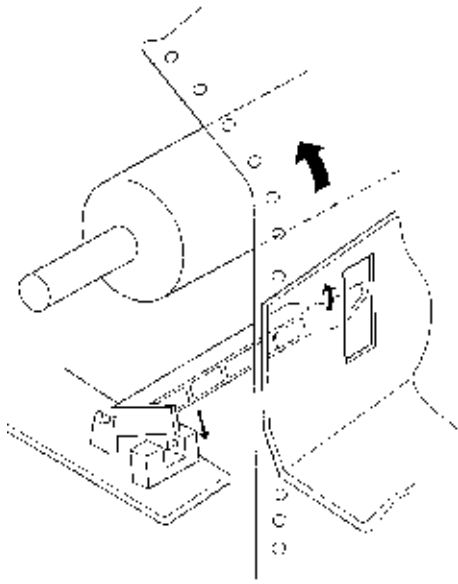


Bottom Feed Paper-End

(Used with optional Pull Tractor)

When the release lever is in the TRACTOR FEED position, the switch on the left push tractor and the paper-end sensor on the sensor board are active. If paper is detected by either of these sensors, paper-end is inhibited.

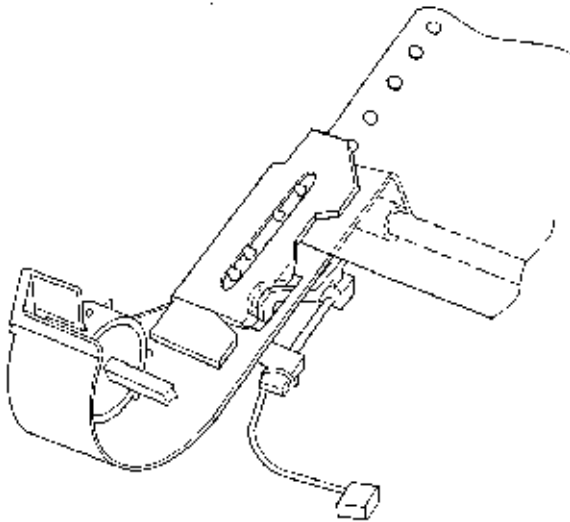
When bottom feed paper is installed, it moves the bottom paper-end lever to turn the sensor ON. When a paper out condition exists, the lever blocks the sensor indicating a paper-end condition.



Rear Feed Paper-End

When the release lever is in the TRACTOR FEED position, the switch on the left push tractor and the paper-end sensor on the sensor board are active. If paper is detected by either of these sensors, paper-end is inhibited.

When rear feed paper is installed, pressure is placed on the microswitch, located in the left push tractor. Since the switch is turned ON, paper is detected.



2.2.06 Automatic Paper Loading

Automatic Paper Loading is used to consistently set the print start position when using cut-sheet or continuous sheet paper. The procedure is listed below.

Cut-Sheet Paper

1. Push the Paper Release Lever to the Cut-Sheet position.
2. Insert the paper from behind the platen.
3. Press the FORM FEED switch.
4. The Paper Bail will automatically open.
5. The Line Feed operation will load the paper.
6. The Paper Bail will automatically close.

NOTE: *If the paper does not move, the Auto-Load motion becomes invalid and is treated like an ordinary paper-end.*

Continuous Sheet (Rear Feed) SASF

1. Push the Paper Release Lever to the Continuous Sheet side (front of printer).
2. Insert the paper into the push tractor. The white guide line on the tractor **MUST** be visible.
3. Press the FORM FEED switch.
4. The Paper Bail will automatically open.
5. The Line Feed operation will load the paper.
6. The Paper Bail will automatically close.

NOTE: *If the paper does not advance after the line feed motor has fed the equivalent of 2.4 inches of paper, the Auto-Load process stops. This situation is treated like an ordinary paper-end condition.*

2.2.07 Paper Park

The Paper Park feature operates as follows.

The PARK/TOF switch is pressed.

Reverse line feed retracts the paper until a paper-end condition exists or until 14 inches of paper has been retracted. The paper will remain on the push tractor, but out of the printing path.

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3.1 MAINTENANCE

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 unit until you have followed the failure analysis procedures in Section Four of this Service Handbook.

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

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

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3.1.02 Maintenance Items

The following items are required to service the unit.

#1 Phillips Screwdriver (with magnetic tip)

#2 Phillips Screwdriver (with magnetic tip)

#3 Phillips Screwdriver (with magnetic tip)

Straight-slot Screwdriver

Needle Nose Pliers (4 inch)

Diagonal Cutters

Tension Gauge (capable of measuring 1 pound of pressure)

7 mm open-ended wrench

Ruler (capable of measuring 1/16 inch increments)

3/32 inch socket with driver

Feeler Gauge

Digital Multimeter

Shop Vacuum

Cloth (soft and lint-free)

All-Purpose Cleaner

Dow Corning Molycoat BR-2 or Molycoat ME-300L or equivalent

Contact Kleen (Okidata P/N 51802301)

3.1.03 Maintenance Precautions

1. Do not disassemble the unit if it is operating normally.
 2. Before starting disassembly and assembly, always power OFF the unit and detach the AC power cord.
 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.
-

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.

Part Item Comment Appendix B Number Description 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.

Microline 395C-Plus Only (Color Version)

[3.2.24 Ribbon Shift Arm and Shift Arm Spring](#)

[3.2.25 Roller Lever](#)

[3.2.26 Ribbon Guide](#)

[3.2.27 Bail Open Cam and Bail Open Gear](#)

[3.2.28 Ribbon Shift Cam and Ribbon Shift Gear](#)

[3.2.29 Ribbon Shift Cam Lever Assembly](#)

Optional Bottom Push Tractor Unit (BPTU)

[3.2.30 Printer Unit](#)

[3.2.31 BTFD PCB](#)

[3.2.32 Tension Spring](#)

[3.2.33 Sheet Guide](#)

[3.2.34 Bottom Cover](#)

[3.2.35 Drive Pulley and Mini-Pitch Belt](#)

[3.2.36 Line Feed Motor](#)

[3.2.37 Tractor Assembly](#)

NOTE: Refer to Appendix B (Illustrated Parts Listing) for the location of the printers major assemblies.

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3.2.01 Preliminary Items Printhead

WARNING:

The printhead will be HOT immediately after printing.

1. Open the printer access cover.
2. Remove the ribbon cartridge (1).
3. Place the head gap adjusting lever (2) to the range 9 position.
4. Remove the two mounting screws (3).
5. Lift the printhead (4) from the connector to remove it.

NOTE: When installing the printhead, pull the printhead towards the stopper (in the direction of Arrow A)

P/N 50099905 Printhead: Assembly RSPL B.2.02 

P/N 52103601 Ribbon Cartridge (Black) Nylon Consumable B.2.02  ,  , 

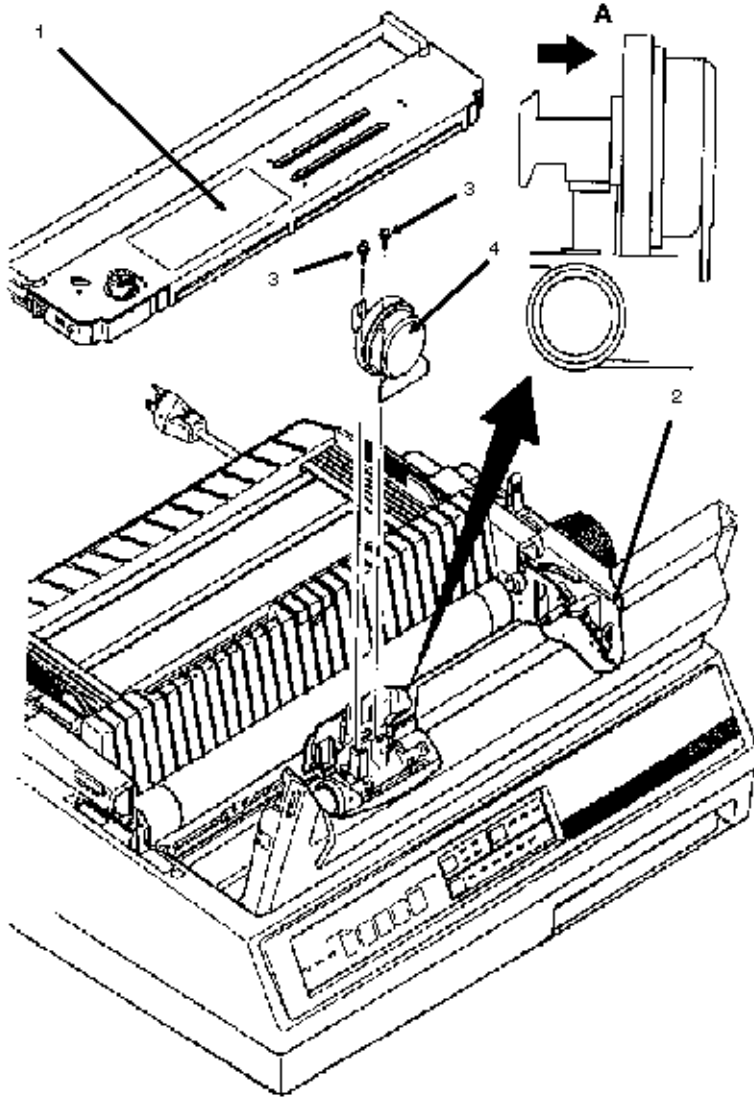
P/N 52103701 Ribbon Cartridge (Color) Consumable B.2.02  ,  , 

P/N 52103801 Ribbon Cartridge (Black) Film Consumable B.2.02  ,  , 

P/N 56609701 Cord: AC 120V RSPL B.2.02  , 

P/N 56624101 Cord: AC (220V) ML Series Option RSPL B.2.02  ,  ,  , 

P/N 70000803 IBM PC Cable Kit (Interface Cable) B.2.02  , 

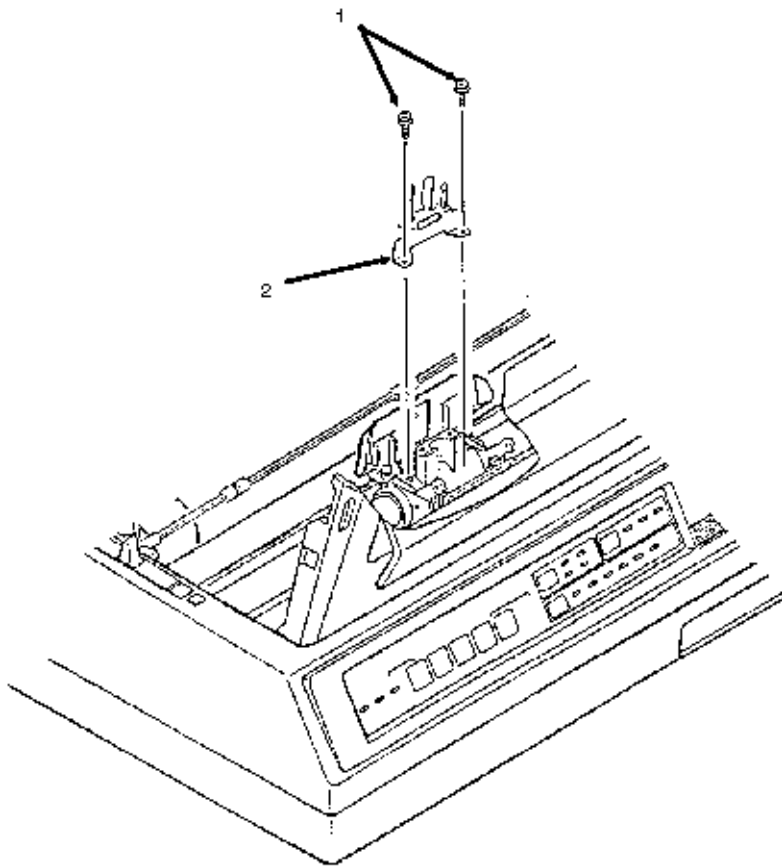


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3.2.02 Ribbon Guide

1. Remove the printhead (3.2.01).
2. Remove the two mounting screws (1).
3. Lift the ribbon guide (2) and remove it.

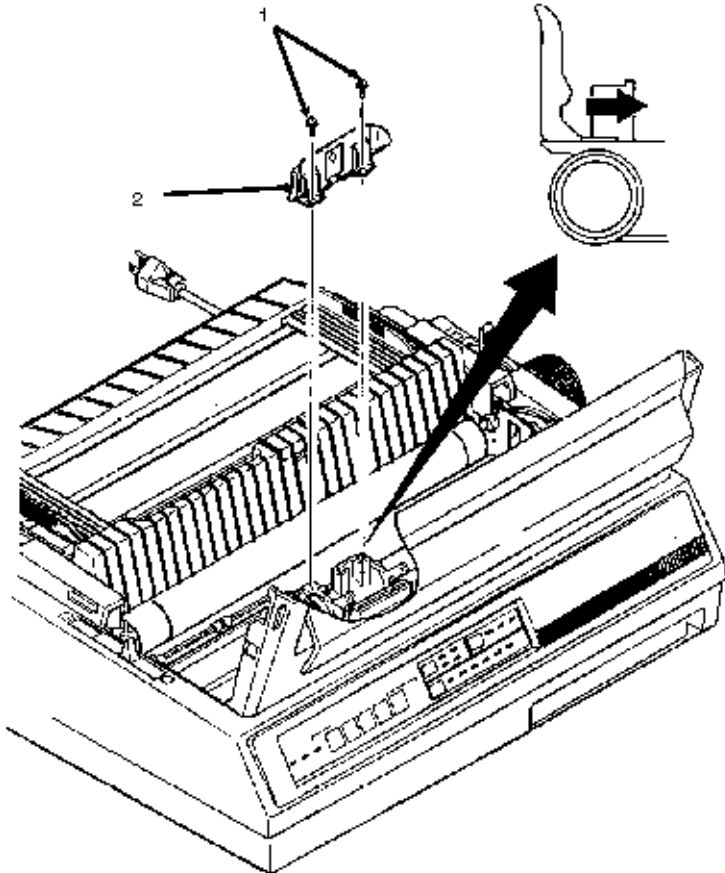
P/N 53055901 Guide: Ribbon (Black) RSPL B.2.04



3.2.03 Ribbon Protector

1. **Remove the printhead (3.2.01).**
2. **Remove the ribbon guide (3.2.02).**
3. Remove the two mounting screws (1).
4. Lift the ribbon protector (2) and remove it.

P/N 53527001 Protector: Ribbon RSPL **B.2.04**, **05**



3.2.04 Upper Cover Assembly

1. Disconnect the interface cable (1).
2. Detach the platen knob (2).
3. Remove the two cover mounting screws (3) at the rear of the printer.
4. Lift the rear access cover (4) to the open position.
5. Lift the upper cover at the back and tilt it towards the front to remove it.

NOTE:

When installing the upper cover assembly:

Move the release lever (5) towards the front of the printer.

Move the bail arm lever (6) towards the back of the printer.

Check that the paper bail moves properly.

P/N 50212441 Cover: Middle Assembly RSPL B.2.01 

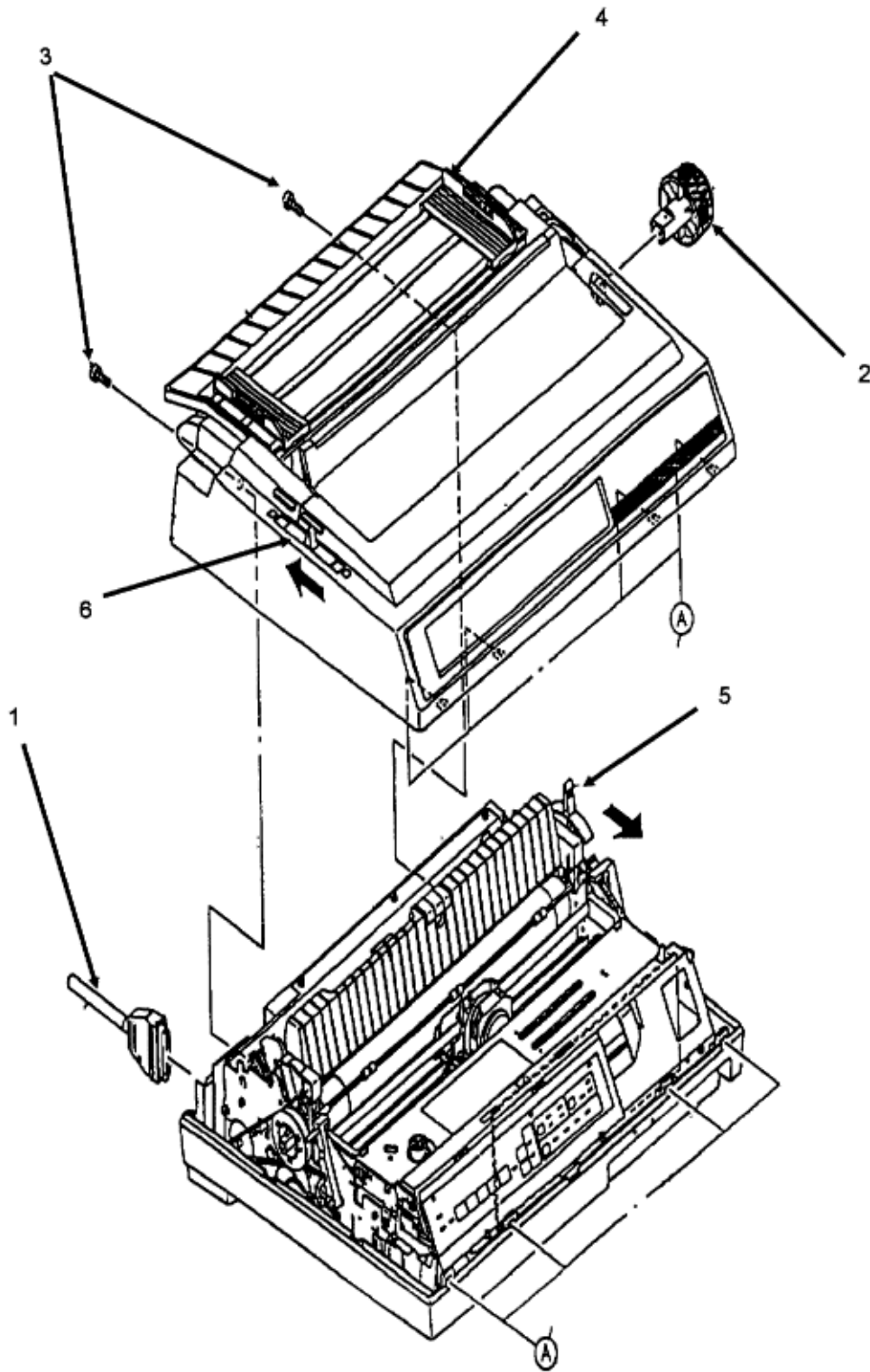
P/N 50212442 Cover: Middle Assembly RSPL B.2.01 (Color) 

P/N 50215701 Cover: Access (ML395) RSPL B.2.01 

P/N 50215703 Cover: Access (ML395C) RSPL B.2.01 


P/N 50215801 Cover: Rear Assembly RSPL B.2.01 

P/N 53478601 Platen Knob RSPL B.2.02 



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3.2.05 Operator Panel Assembly

1. **Remove the upper cover assembly (3.2.04).** 
2. Disconnect the operator panel cable (1) from CN10 (2) on the control board.
3. Remove the two mounting screws (3).
4. Detach the operator panel holder (4) by moving it upward, and then pulling toward the front of the printer.
5. Open the eleven claws and detach the operator panel (5) from the operator panel holder.

P/N 50100001 Panel: Operator ML395 RSPL B.2.03 

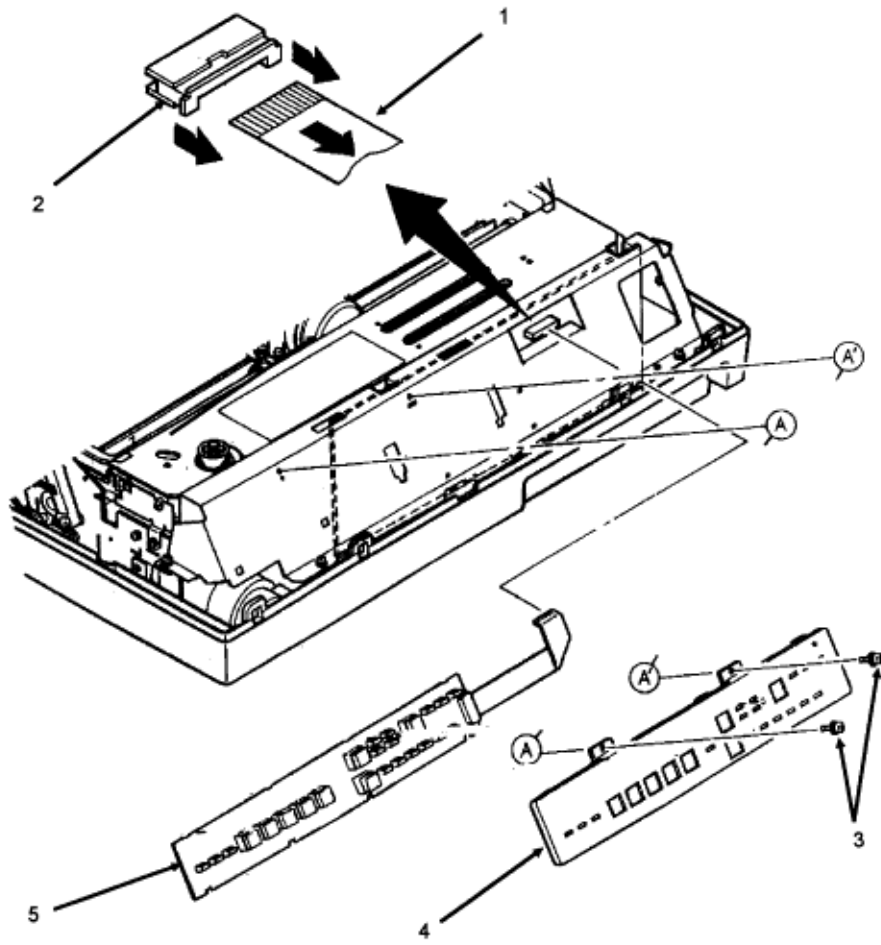
P/N 50910505 Spring: Cover Open RSPL B.2.03 

P/N 55071701 PCB: TFOP Op Panel RSPL B.2.03 

P/N 56212601 Switch: Interlock (Assembly) RSPL B.2.03  **12** 


P/N 56614301 Cable: Microswitch RSPL B.2.03  **12**  **(Cover Open)**

P/N 56628403 Cable: Op (ML395) RSPL B.2.03 



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3.2.06 Control Board (TFCB)

1. Remove the upper cover assembly (3.2.04). 
2. Remove the ribbon cartridge.
3. Release the lock of connector CN10 (1) and detach the operator panel cable (2).
4. Remove the five shield cover mounting screws (3).
5. While slightly lifting the shield cover (4), detach connector CN13 (5) and CN11 (6) from the control board (7), then remove the shield cover.
6. Detach the remaining connectors from the control board.
7. Loosen the mounting screw and remove the control board.

NOTES:

When assembling the printer:

Do not allow cables to get caught under the control board.

Insert the control board into the groove in the base tray (8).

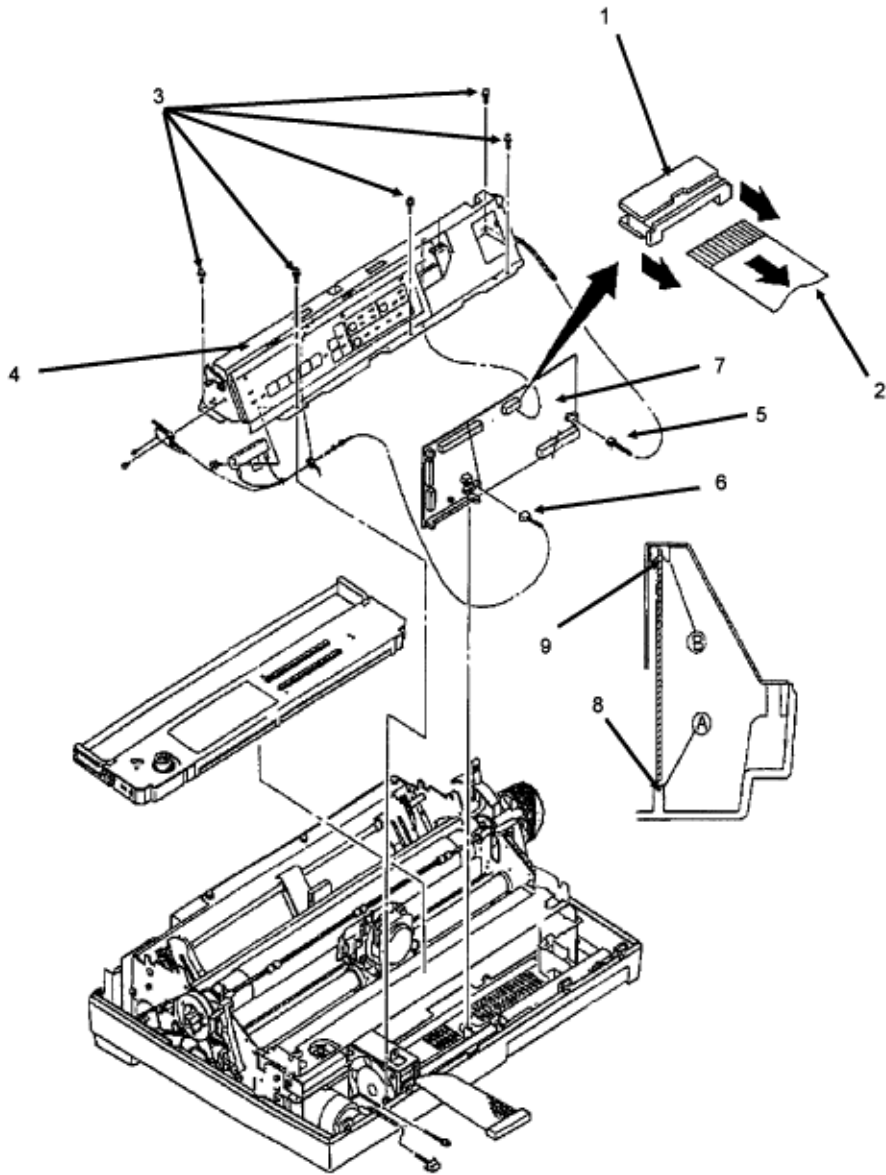
Place the control board into the groove (9) in the shield cover, then attach the shield cover.

[P/N 55071811 PCB: TFCB-1 \(w/o ROM\) RSPL B.2.02](#) 

[P/N 55071812 PCB: TFCB-2 \(w/o ROM\) RSPL B.2.02 \(Color\)](#) 

[P/N 56301703 Fuse: 2A, 125V RSPL B.2.02](#) 


[P/N 56619201 IF - Main Board Connection \(50P\) RSPL B.2.02](#)  **[12](#)** 



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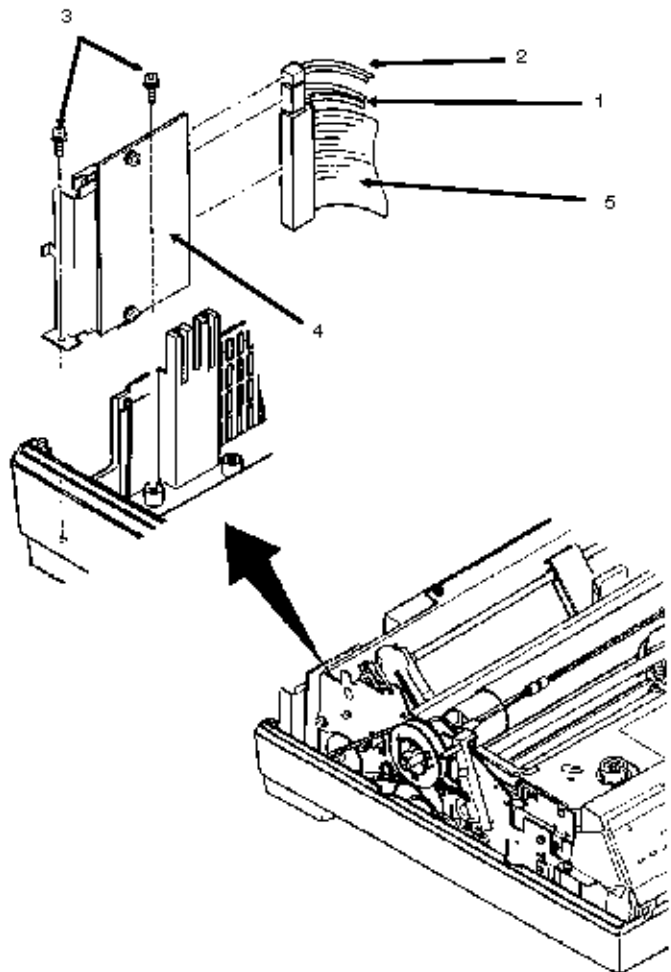
3.2.07 Interface Connector Board (TFIF or LQPN)

NOTE: To allow easier access to the mounting screw and cables, configure the interface connector board to use the serial interface connector.

1. Remove the upper cover assembly (3.2.04). 
2. Disconnect connectors CN102 (1) and CN103 (2).
3. Remove the two mounting screws (3).
4. Lift the interface connector board (4).
5. Detach connector CN101 (5).
6. Remove the interface connector board.

NOTE: After assembly, configure the interface connector board (if necessary).

P/N 55034501 PCB: Assembly I/F Connector TFIF or LQPN RSPL B.2.02 



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3.2.08 Printer Mechanism

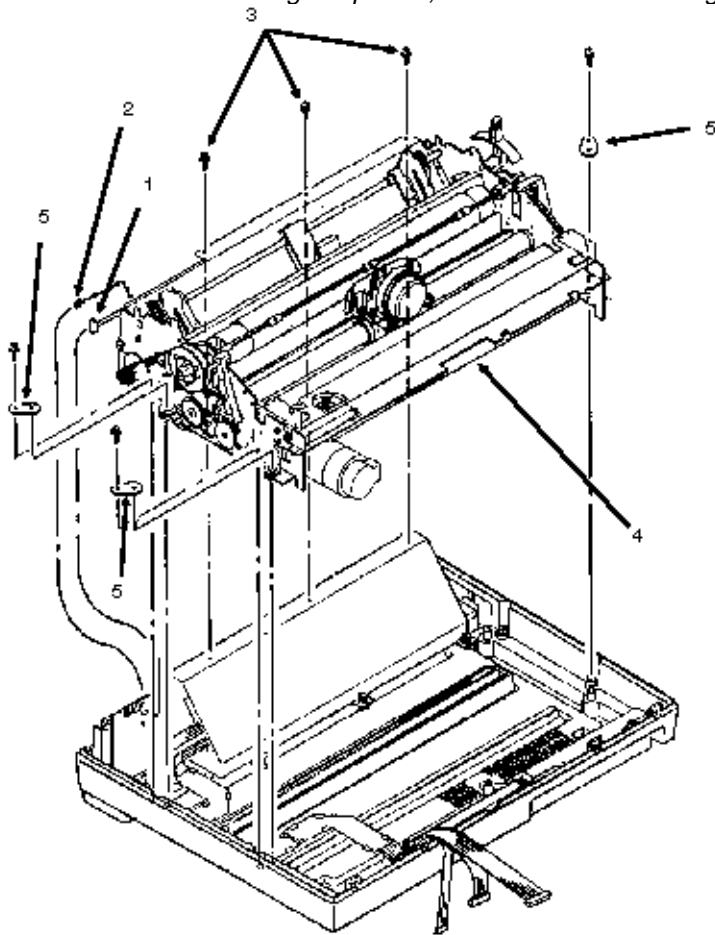
1. Remove the control board (3.2.06).

2. Detach connectors CN102 (1) and CN103 (2) from the interface connector board.
3. Remove the three mounting screws (3) at the rear of the printer mechanism (4).
4. Remove the three mounting screws and brackets (5). There are two on the left side of the printer mechanism and one on the right side.

CAUTION: Do not grasp the ribbon cartridge bracket, paper chute, or the guide shaft of the sheet feeder assembly when lifting the printer during the next step. These parts are easily bent.


5. While holding the base tray, lift the printer mechanism and remove it.

NOTE: When assembling the printer, do not allow cables to get caught under the control board.



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3.2.09 Platen Assembly

1. **Remove the upper cover assembly (3.2.04)** 
2. Loosen the three 7 mm line feed motor mounting bolts (1).
3. Move the line feed motor (2) closer to the platen (3) and detach the line feed drive belt (4).
4. Remove the E-ring, washer, spring and idle gear (5).
5. Remove the screw and detach the gear pulley, washer and bushing (6).
6. Remove the screw and detach the gear and bushing (7).
7. Push in the platen lever (8), lift the bail, and remove the platen assembly.

NOTE: **Perform the line feed belt tension adjustment (3.3.02)**  **after replacing the line feed drive belt.**

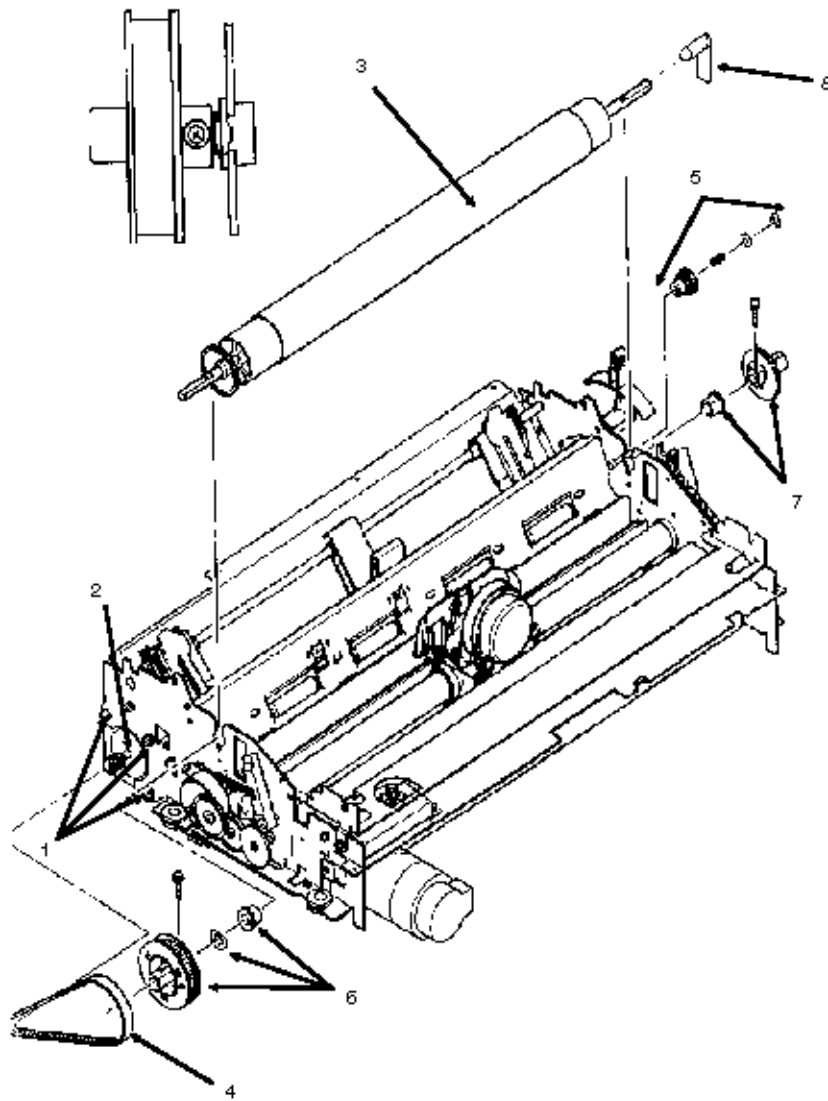
P/N 50215902 Separator: Sheet RSPL B.2.02 

P/N 50054101 Platen Assembly RSPL B.2.06 , **09** 

P/N 51214501 Gear: Platen "A" RSPL B.2.06 , **09** 

P/N 51215001 Pulley: Platen RSPL B.2.06 , **09** 

P/N 51302790 Belt: Mini Pitch (Line Feed) RSPL B.2.06 , **09** 



3 0 0 0 -

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3.2.10 Line Feed Motor

1. Remove the printer mechanism (3.2.09).

2. Remove the three mounting bolts and washers (1).

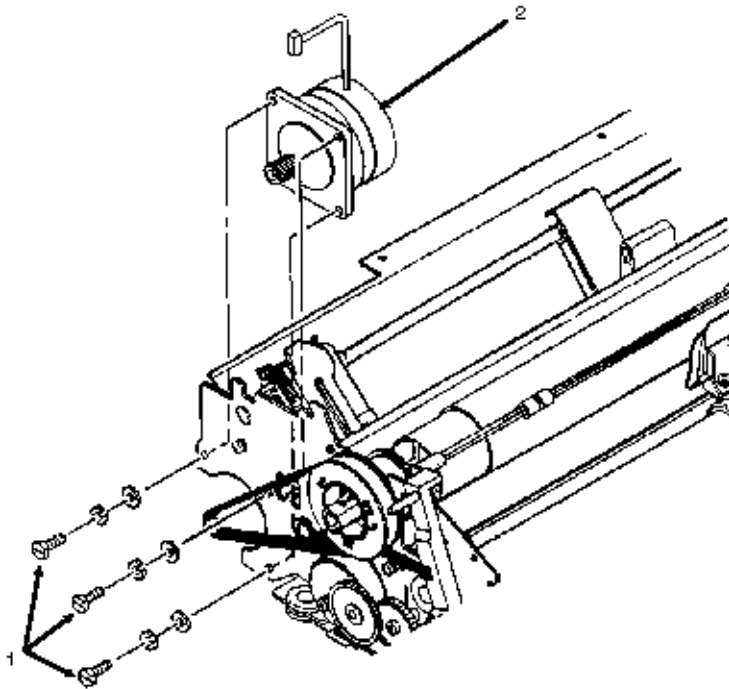
3. Remove the line feed motor (2).

NOTE:

When installing the line feed motor, the cable should be positioned toward the top.

Adjust the line feed belt tension (3.3.02) after installing the line feed motor.

P/N 56510601 Motor: Line Feed (ML395) RSPL B.2.06, 09



3.2.11 Head Cable Assembly

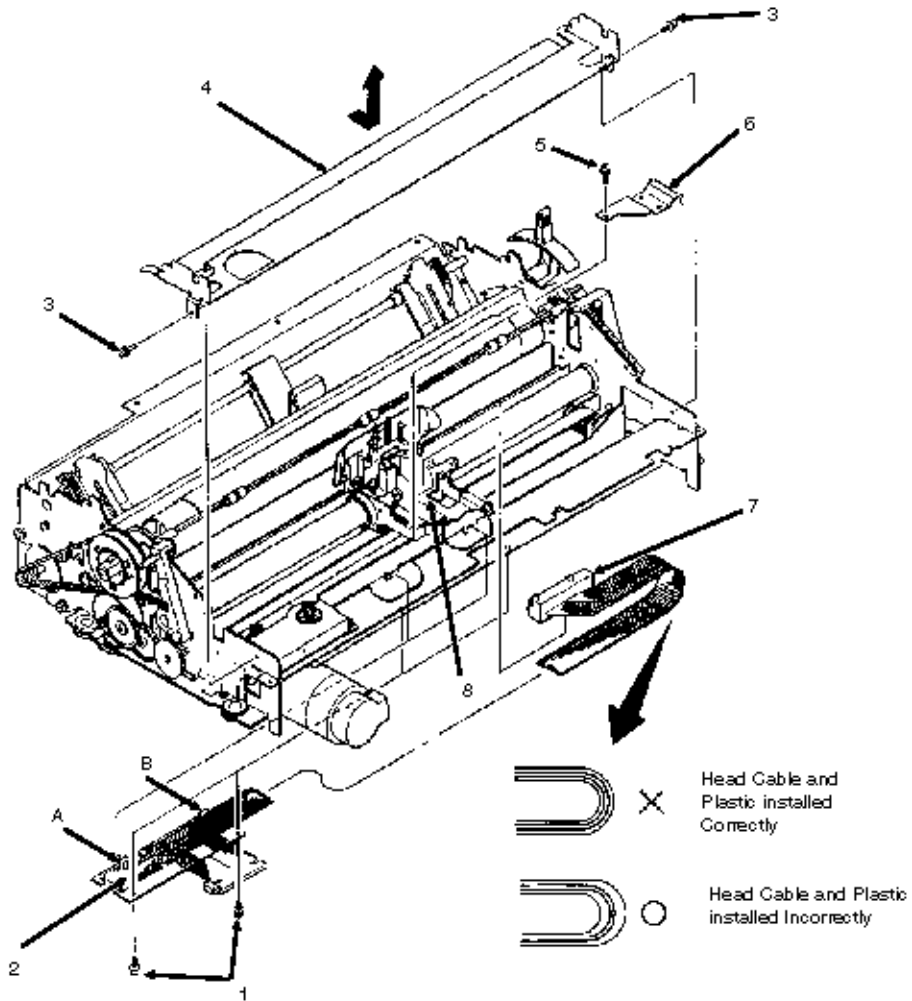
1. Detach the printhead (3.2.01).

2. Remove the printer mechanism (3.2.09).

3. Work from the bottom of the printer mechanism and loosen the two mounting screws (1).
4. Detach tabs (A) and (B) from the frame and remove the cable holder (2).
5. Remove the two ribbon cartridge bracket mounting screws (3).
6. Detach the cartridge bracket (4).
7. Remove the mounting screw (5)
8. Detach the connector clamp (6).
9. Detach the head cable connector (7) from the carriage frame (8).
10. Lift the front of the printer mechanism and remove the head cable assembly by pulling downward.

P/N N/A Clamp B.2.04 . **05** 

P/N 56614201 Cable: Printhead (Assembly) RSPL B.2.04 . **05** , **12** 



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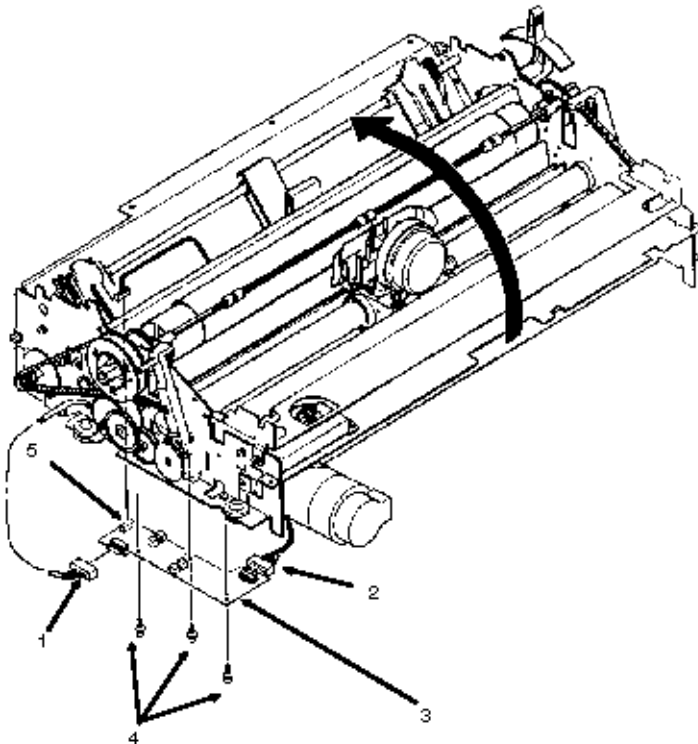
3.2.12 Sensor Board

1. Remove the printer mechanism (3.2.09).

2. Raise the front of the printer mechanism.
3. Disconnect cables CN2 (1) and CN3 (2) from the sensor board (3).
4. Remove the three sensor board mounting screws (4).
5. Disconnect connector CN1 (5) and detach the sensor board.

P/N 55050501 PCB: Sensor Board RSPL B.2.06 . 09  (LQEW or LPRW)

P/N 56619104 Cord: Sensor PCB Connection RSPL B.2.06 . 09 . 12 



3.2.13 Ribbon Feed Assembly

1. Remove the printer mechanism (3.2.08).

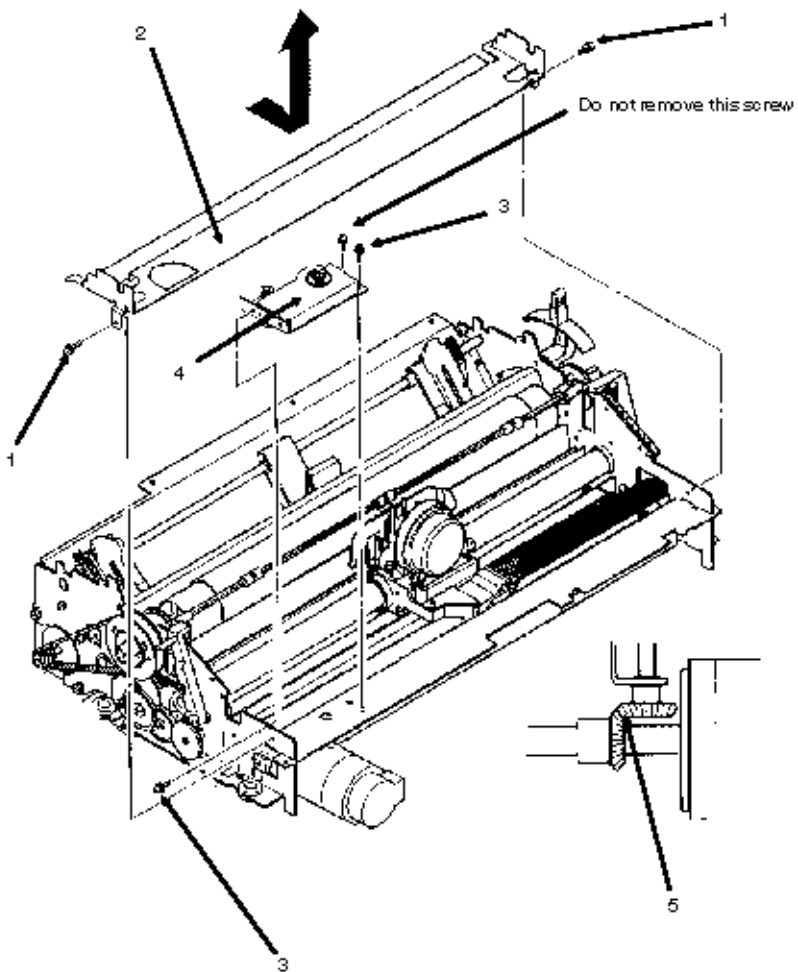
2. Remove the two ribbon cartridge bracket mounting screws (1).
3. Detach the cartridge bracket (2).
4. Remove the two mounting screws (3).
5. Detach the ribbon feed assembly (4).

NOTE:

When assembling, install the ribbon drive assembly so that the gear teeth contact properly (5).

The gears must not bind together.

P/N 50054301 Feed: Ribbon Assembly RSPL B.2.06 , 09 



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3.2.14 Space Motor Assembly

1. Remove the printhead (3.2.01). 

2. Remove the ribbon feed assembly (3.2.13). 

3. Loosen the two belt pulley bracket mounting screws (1).

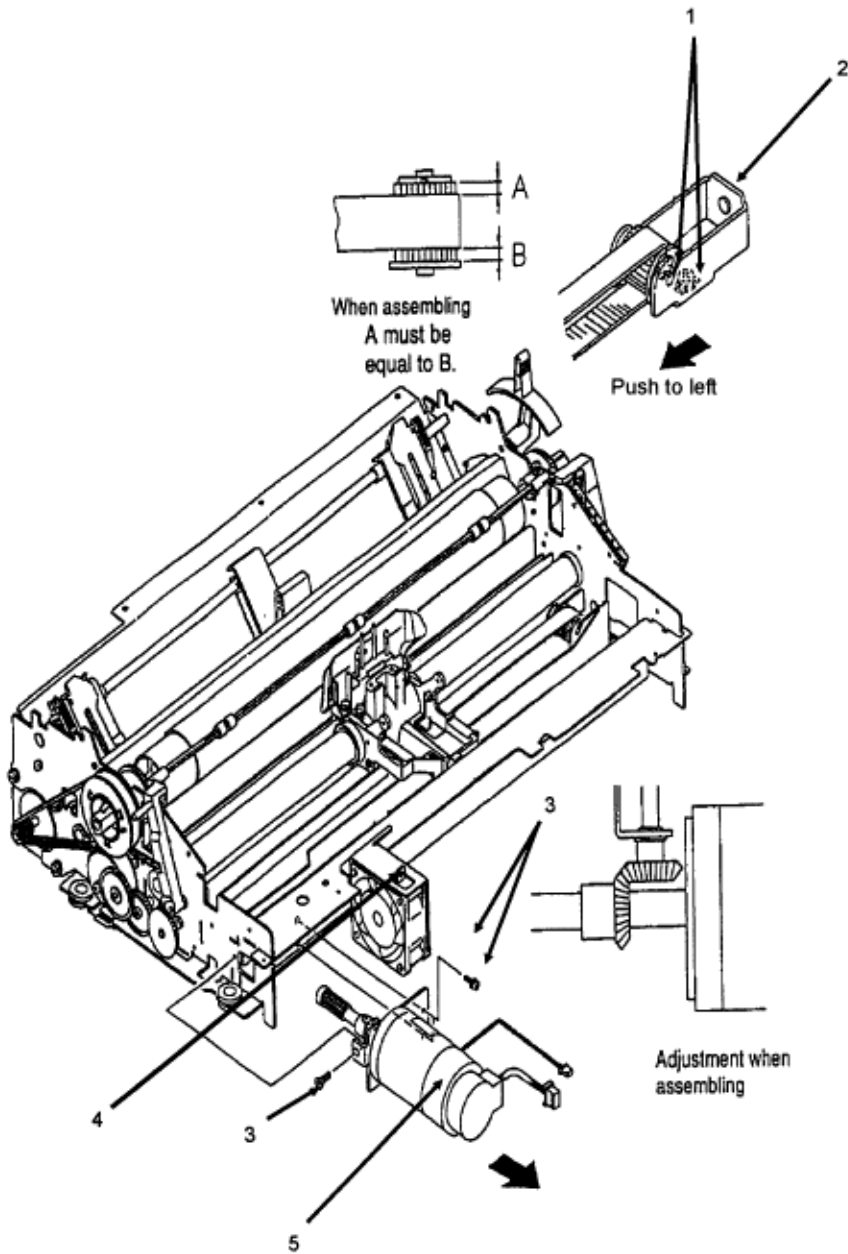
4. While pushing the belt pulley bracket (2) to the left, temporarily tighten the two screws. This will ease the tension on the space belt.

5. Remove the three space motor mounting screws (3).

6. Using needle-nosed pliers, detach the nylon cable clamp (4) from the cooling fan.

7. Remove the space motor (5) by pulling it toward the front of the printer.

P/N 56506205 Motor: Space (ML395) RSPL B.2.06  **.09** 



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3.2.15 Space Belt

1. Remove the printhead (3.2.01).
2. Remove the head cable assembly (3.2.11).
3. Remove the space motor assembly (3.2.14).
4. Remove the mounting screw (1).
5. Detach the belt clamp (2).
6. Remove the belt pulley (3) from the bracket (4) and detach the space belt (5).

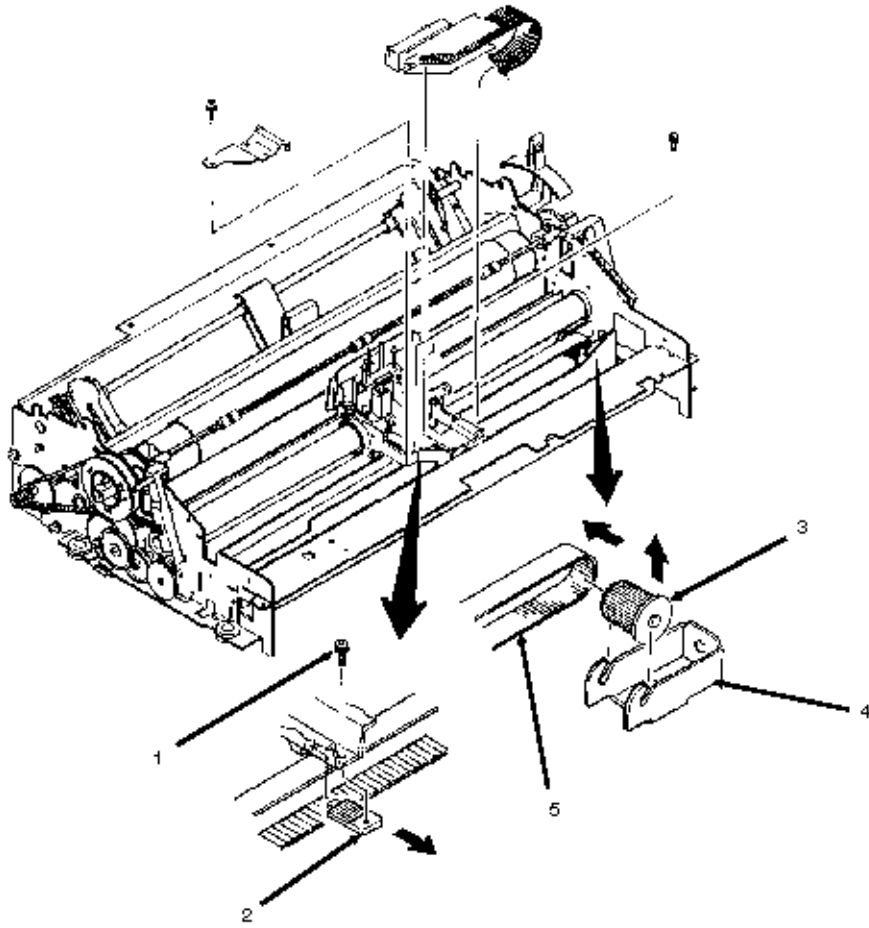
NOTE:

When installing the belt clamp:

Place the ribbed side of the belt clamp facing up as shown.

P/N 50702301 Belt Clamp B.2.04, 05

P/N 51303101 Belt: Mini Pitch (Space) RSPL B.2.04, 05



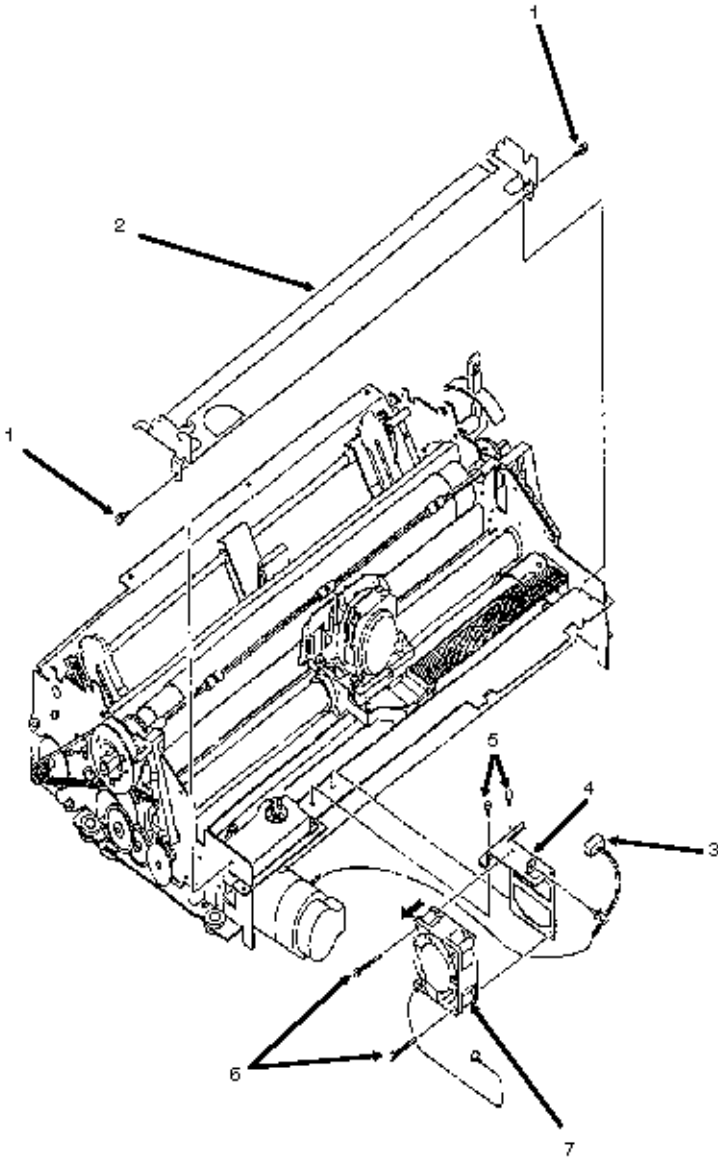
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3.2.16 Cooling Fan

1. Remove the printer mechanism (3.2.08).

2. Remove the two ribbon cartridge bracket mounting screws (1).
3. Detach the cartridge bracket (2).
4. Using needle-nosed pliers, detach the nylon cable clamp (3) from the fan cover (4).
5. Remove the two fan cover mounting screws (5).
6. Remove the cooling fan / fan cover assembly.
7. Remove the two cooling fan mounting screws (6).
8. Detach the cooling fan (7).

P/N 56509501 Fan: Cooling RSPL B.2.06 . 09



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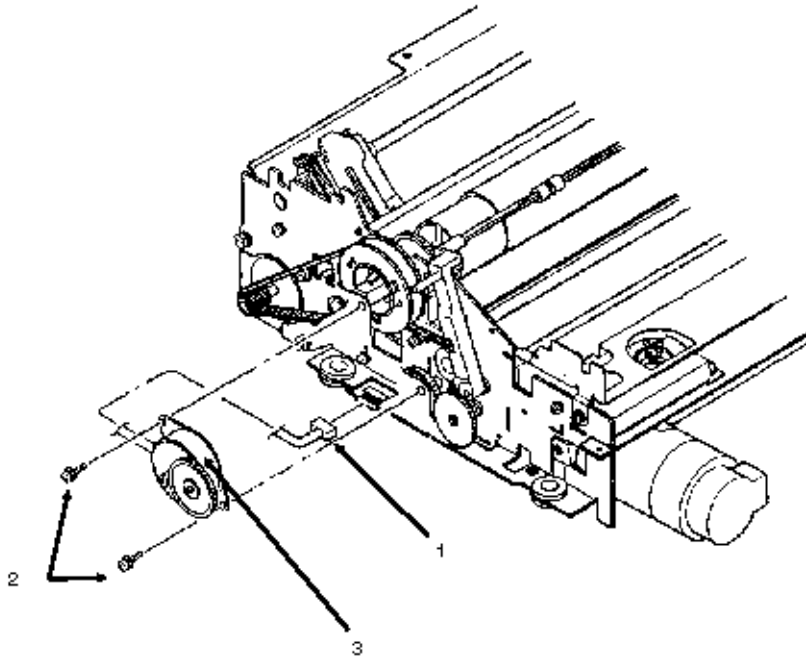
3.2.17 Bail/Ribbon Motor Assembly

1. Remove the printer mechanism (3.2.09).

2. Disconnect connector CN2 (1).
3. Remove the two mounting screws (2).
4. Detach the bail/ribbon motor assembly (3).

NOTE: When assembling, install the bail/ribbon motor assembly so that the gear teeth contact properly. The gears must not bind together.

P/N 56506301 Motor: Step (Bail Arm) Assembly RSPL B.2.06, 09



3.2.18 Paper Bail Assembly

[1. Remove the printer mechanism \(3.2.08\).](#) 

[2. Remove the bail/ribbon motor assembly \(3.2.17\).](#) 

3. Detach the bail arm springs (1).

NOTE: The left bail arm spring is longer than the right bail arm spring. Be sure to install each spring on the proper side.

4. Remove the bail arm idle gear (2).

5. Detach the E snap ring and remove the bail open cam (3).

6. Detach the E snap ring (4) and remove the left bail arm (5) from the indicator shaft assembly (6) by pulling to the left.

7. Remove the right bail arm (7) by pulling to the right while expanding the clamps (8).

8. Detach the right bail arm from the indicator shaft assembly.

[P/N 50054401 Indicator Bar Assembly RSPL B.2.06](#)  [10](#) 

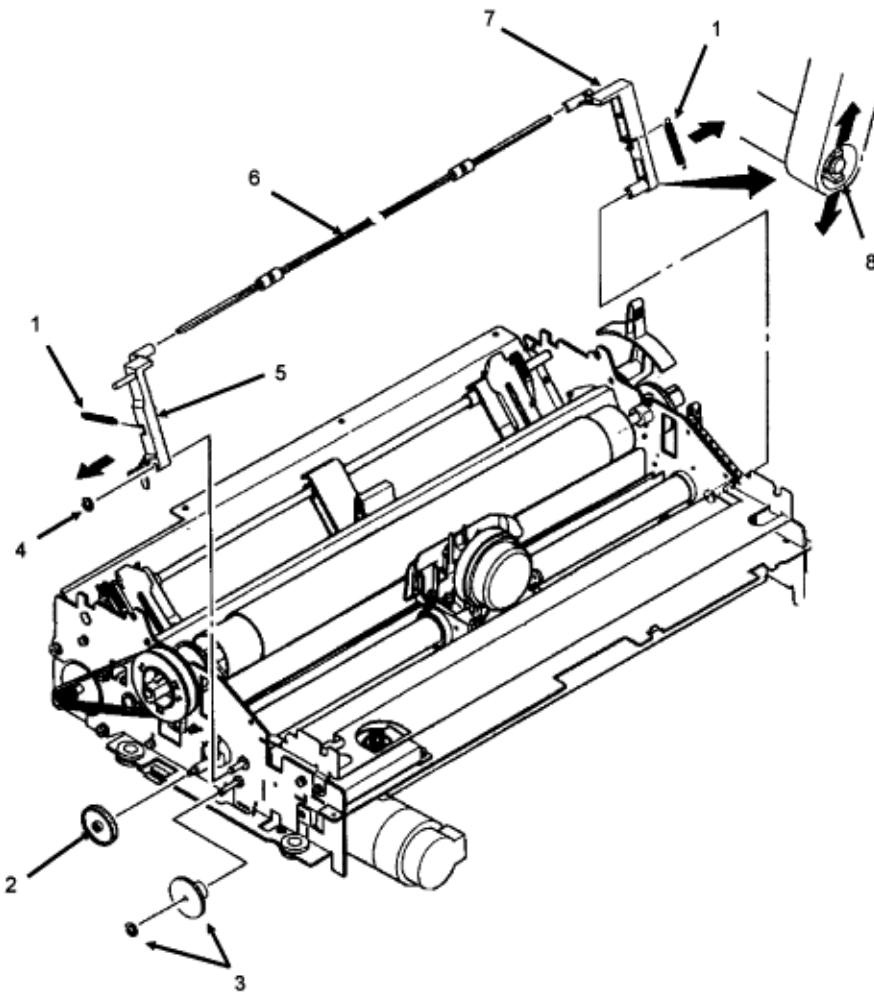
[P/N 50910701 Spring: Bail Arm \(Left\) RSPL B.2.06](#)  [10](#) 

[P/N 50910801 Spring: Bail Arm \(Right\) RSPL B.2.06](#)  [10](#) 

[P/N 51210201 Gear: Idler \(Bail Arm\) RSPL B.2.06](#)  [10](#) 

[P/N 53478501 Bail Arm \(Left\) RSPL B.2.06](#)  [10](#) 

[P/N 53478502 Bail Arm \(Right\) RSPL B.2.06](#)  [10](#) 



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3.2.19 Carriage and Carriage Shaft

1. Loosen the screw (1) and slide it towards the back of the printer.
2. Loosen the mounting screw (2) and detach the left eccentric collar (3).

NOTE: *The protrusions on the eccentric collars face the outside of the printer.*

3. Remove the screw and detach the blue printhead gap adjusting lever. (Not shown)
4. Loosen the screw (4) and detach the right eccentric collar (5).
5. Remove the two rubber carriage bumpers (6).
6. Slide the carriage shaft (7) to the right and remove the carriage (8).
7. Continue sliding the carriage shaft to the right then remove the carriage shaft.

NOTE: *When installing, be sure that the larger extension at the end of the carriage shaft is positioned at the right side of the printer.*

P/N Spacer B.2.04 , **05** 

P/N Spacer: Round B.2.04 , **05** 

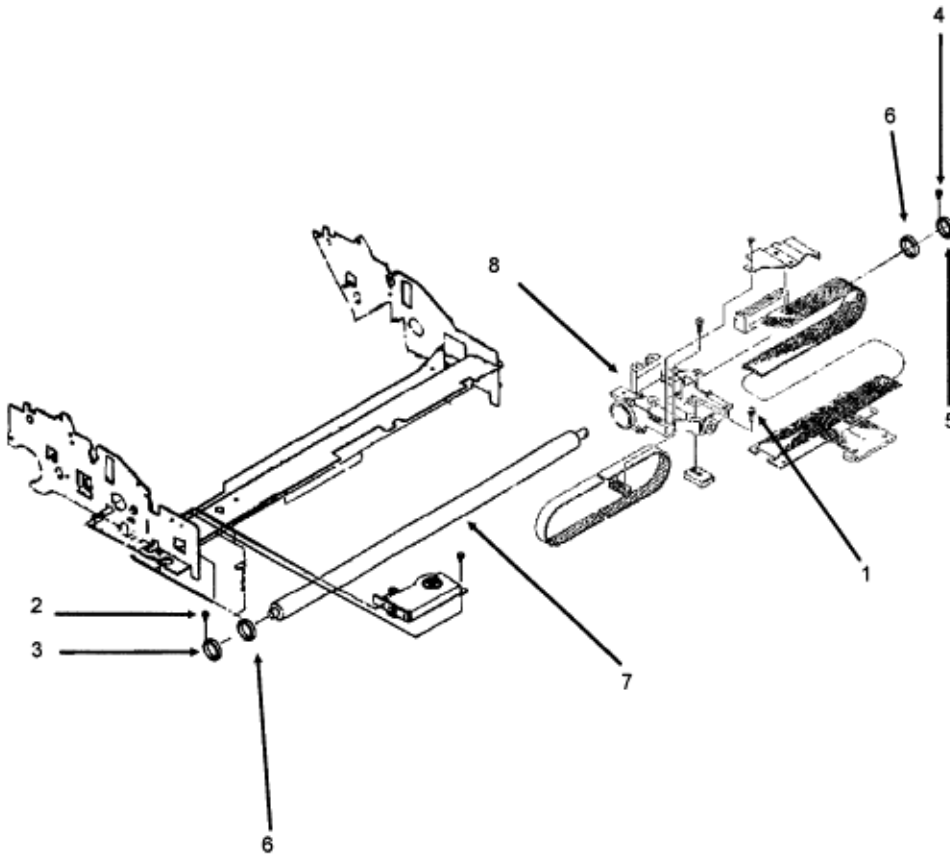
P/N 50057601 Carriage Assembly (Black) B.2.04 , **07** 

P/N 50069401 Carriage Assembly (Color) B.2.05 , **10** 

P/N 50703701 Collar: Eccentric Carriage Rail RSPL B.2.07 , **10** 

P/N 51110301 Shaft: Carriage RSPL B.2.07 , **10** 

P/N 53478401 Lever: Adjust (Printhead Gap) RSPL B.2.07 , **10** 



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3.2.20 Paper Pressure Guide

1. Remove the two springs (1) located on each side of the paper pressure guide (2).
2. Remove the detent spring (3) located on the release lever at the right side of the printer.
3. Separate the claws and remove the release lever (4).
4. Remove the release link.
5. Remove the paper pressure bar (5) by sliding it to the right.

NOTE: The flat side of the paper pressure bar faces up.

6. Using needle-nose pliers, squeeze the nylon latch (6) to release the switch harness (7) which is located at the left side of the printer mechanism.
7. Lift and remove the paper pressure guide.

P/N 50907502 Spring: Paper Chute RSPL B.2.07  **, 10** 

P/N 50910201 Spring: Detent (Release Lever) RSPL B.2.07  **, 10** 

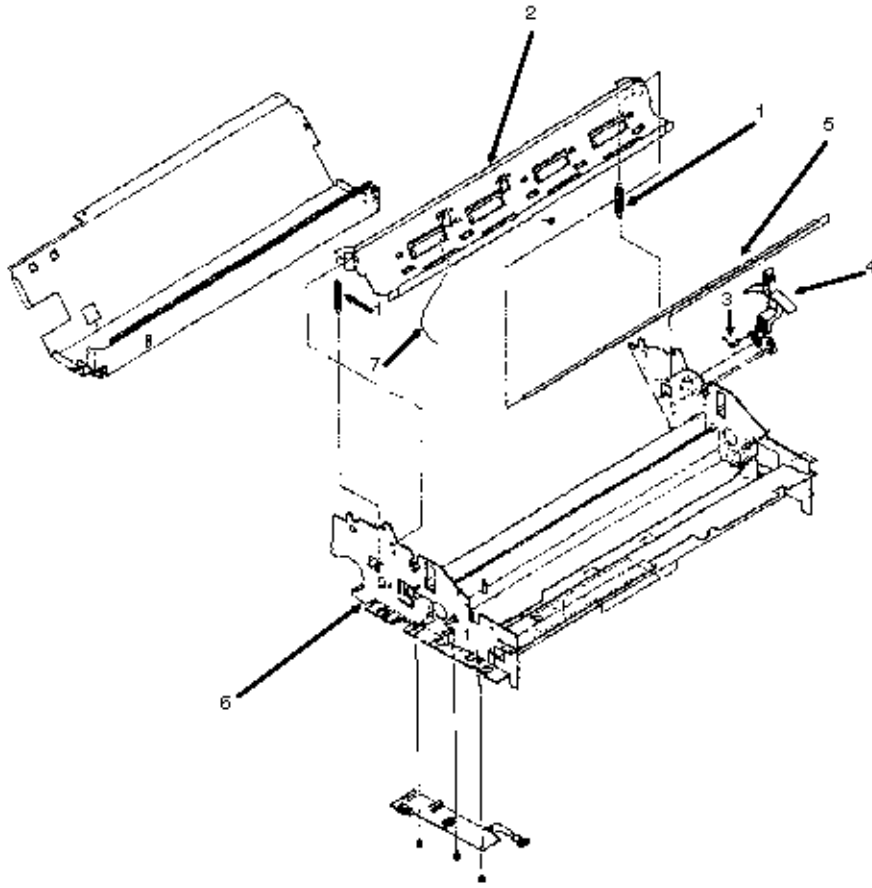
P/N 50910305 Spring: Idle Gear RSPL B.2.07  **, 10** 

P/N 51214401 Gear: Idle (Release Lever) RSPL B.2.07  **, 10** 

P/N 53478706 Lever: Release RSPL B.2.07  **, 10** 

P/N 53478801 Block: Release Lever Guide RSPL B.2.07  **, 10** 

P/N 55034801 Sensor: Cut-Sheet Paper-End RSPL B.2.07  **, 10** 



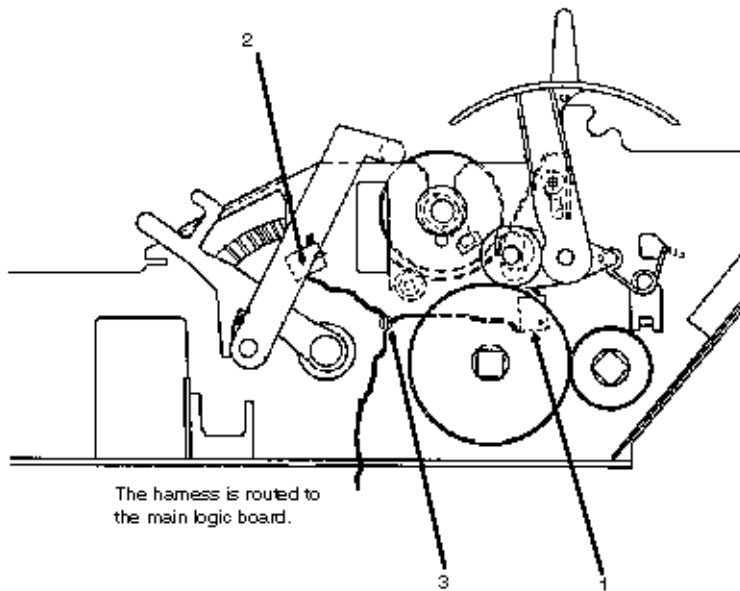
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3.2.21 Printhead Gap / Release Lever Microswitches

1. Remove the mounting screw to remove the release lever microswitch (1).
2. Push down on the mounting tab and remove the printhead gap microswitch (2).
3. Using a needle nose pliers, detach the nylon cable clamp (3) and remove the harness and switches from the printer mechanism.

P/N 53068602 Indicator: PH Gap (Adj Bracket) RSPL B.2.07  **11** 

P/N 56209901 Switch: Micro RSPL B.2.07  **11**  **(Adj & Release Lever)**



3.2.22 Push Tractor Assembly

1. Remove the lower center guide (1).
2. Separate the claws (2) and remove the two drive gears (3) from the right side of the printer mechanism.
3. Using a needle nose pliers, remove the nylon cable clamp (4).
4. Slide the upper drive shaft (5) to the left and remove it.
5. Slide the lower drive shaft (6) to the left.
6. Remove the upper center guide (7), being careful not to lose the friction ring (8).
7. Remove the lower drive shaft.
8. Loosen the two screws (9) [one is located on each side of the printer mechanism].
9. Lift and remove the push tractor assemblies (10) and locking shaft (11).

NOTE: To remove the tractors from the locking shaft, raise the lock lever and slide the tractor off.

When installing the push tractor assembly, take the following precautions:

1. First, install the friction ring in the upper center guide. If the upper center guide moves easily along the locking shaft, you must rotate the friction ring 45 degrees, using a standard screwdriver (12).
2. Check the installation; if the guide moves with difficulty, it is properly installed.
3. Synchronize the tractors by aligning the synchronization marks in the same direction.
4. Position the guide holes (13) in the tractor drive gears in the same direction.
5. Position the groove of the upper center guide behind the paper pressure guide (14).
6. The left tractor assembly must be positioned between the two locking tabs (15).

[P/N 50054501 Tractor: Push \(Left\) Assembly RSPL B.2.08](#)  [11](#) 

[P/N 50054601 Tractor: Push \(Right\) Assembly RSPL B.2.08](#)  [11](#) 

[P/N 51002301 Friction: Piece RSPL B.2.08](#)  [11](#) 

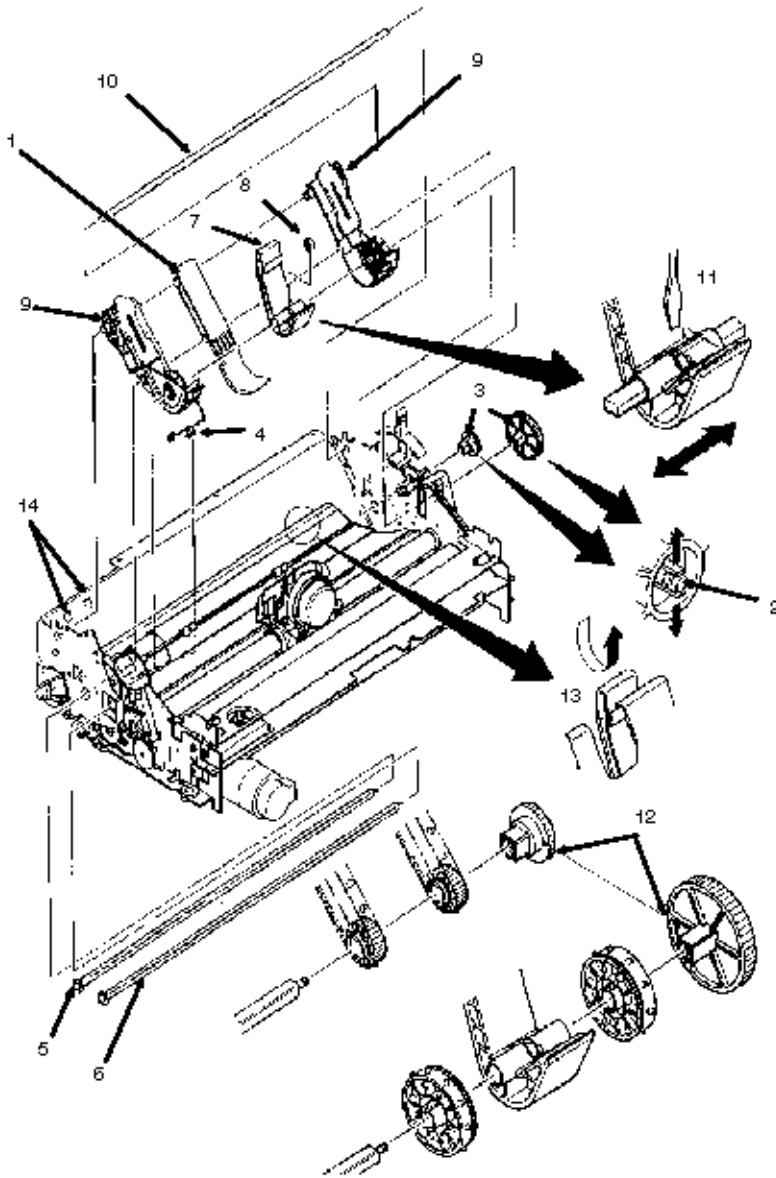
[P/N 51002401 Guide: Center, Upper RSPL B.2.08](#)  [11](#) 

[P/N 51002501 Guide: Center Lower A RSPL B.2.08](#)  [11](#) 

[P/N 51002601 Guide: Center Lower B RSPL B.2.08](#), 11

[P/N 51214201 Gear: Drive A RSPL B.2.08](#), 11

[P/N 51214301 Gear: Drive B RSPL B.2.08](#), 11



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3.2.23 Power Supply Unit

1. Remove the printer mechanism (3.2.08).

2. Disconnect the two cables (1) from the left side of the power supply unit (2).
3. Remove the four power supply mounting screws (3).
4. Remove the power supply unit by pulling toward the left-front side of the printer. You must raise the power supply unit slightly so it will become detached from the two guides (A) in the lower cover.

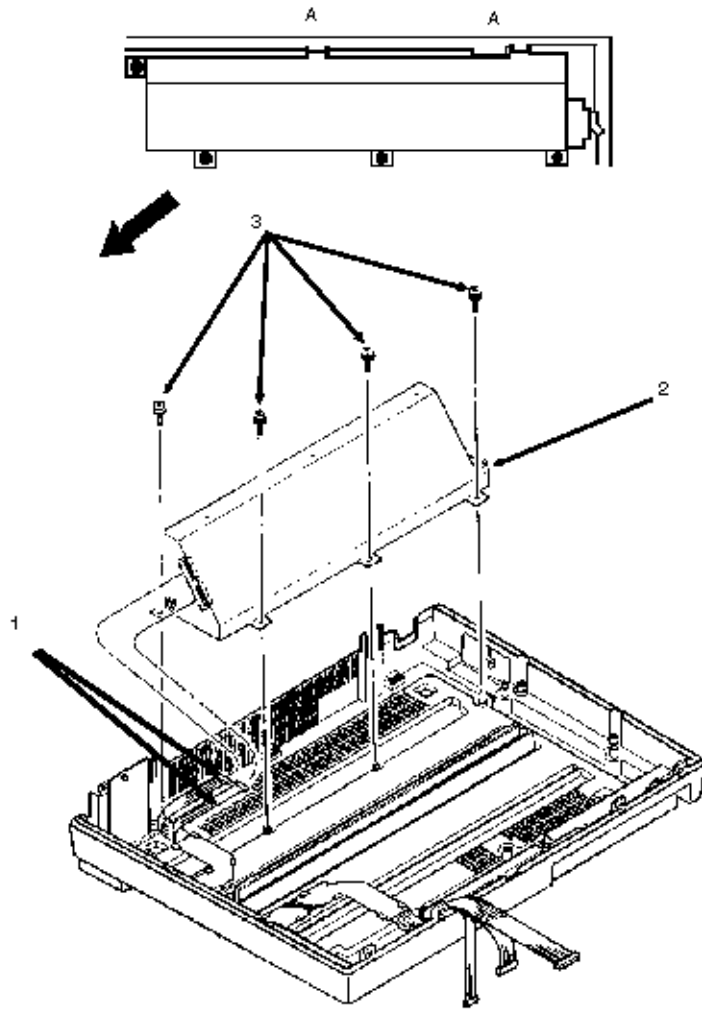
NOTE: Be careful not to damage the cables with the power supply unit mounting bracket (located at the left/rear of the power supply unit).

P/N 56411201 Power Supply Assembly (120V) RSPL B.2.02 

P/N 56506302 Power Supply Assembly Option RSPL B.2.02 , **13**  (220/240V)

P/N 56614101 Cord: Power Connection (9 pin) RSPL B.2.02 , **12** 

P/N 56614801 Cord: Power Connection (13 pin) RSPL B.2.02 , **12** 



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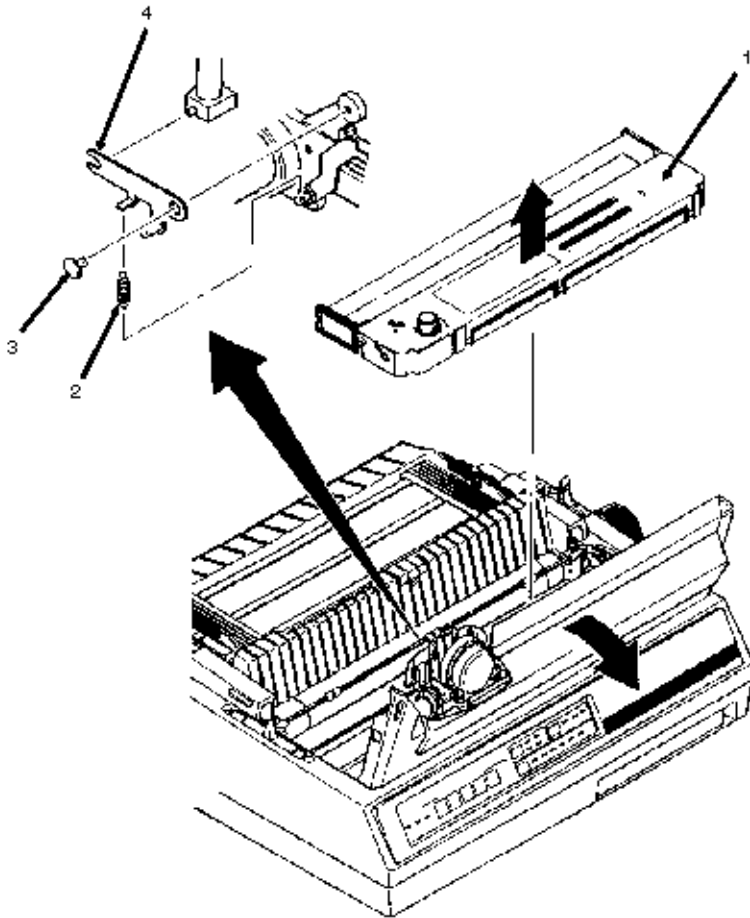
3.2.24 Ribbon Shift Arm Spring / Ribbon Shift Arm
Microline 395C - Color Model Only

1. Detach the printer access cover.
2. Remove the ribbon cartridge (1).
3. Remove the shift arm spring (2).
4. Remove the 7 mm mounting bolt (3) and detach the ribbon shift arm (4).

P/N 50315401 Screw (Color) RSPL B.2.05 

P/N 50924001 Spring: Shift Arm (Color) RSPL B.2.05 

P/N 53478901 Arm: Ribbon Shift (Color) RSPL B.2.05 



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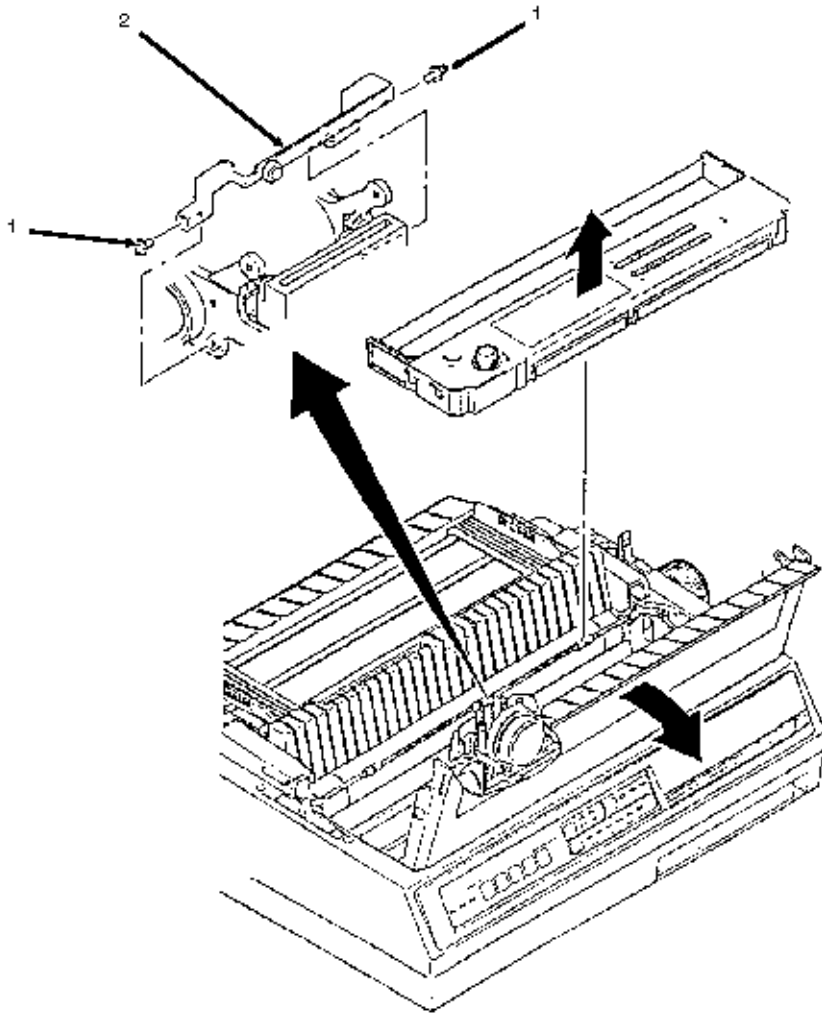
3.2.25 Roller Lever

1. Open the printer access cover.
2. Remove the ribbon cartridge.

3. Remove the shift arm spring (3.2.23).

4. Remove the two 7 mm bolts (1) and detach the roller lever (2).

P/N 53479001 Lever: Roller (Color) RSPL B.2.05



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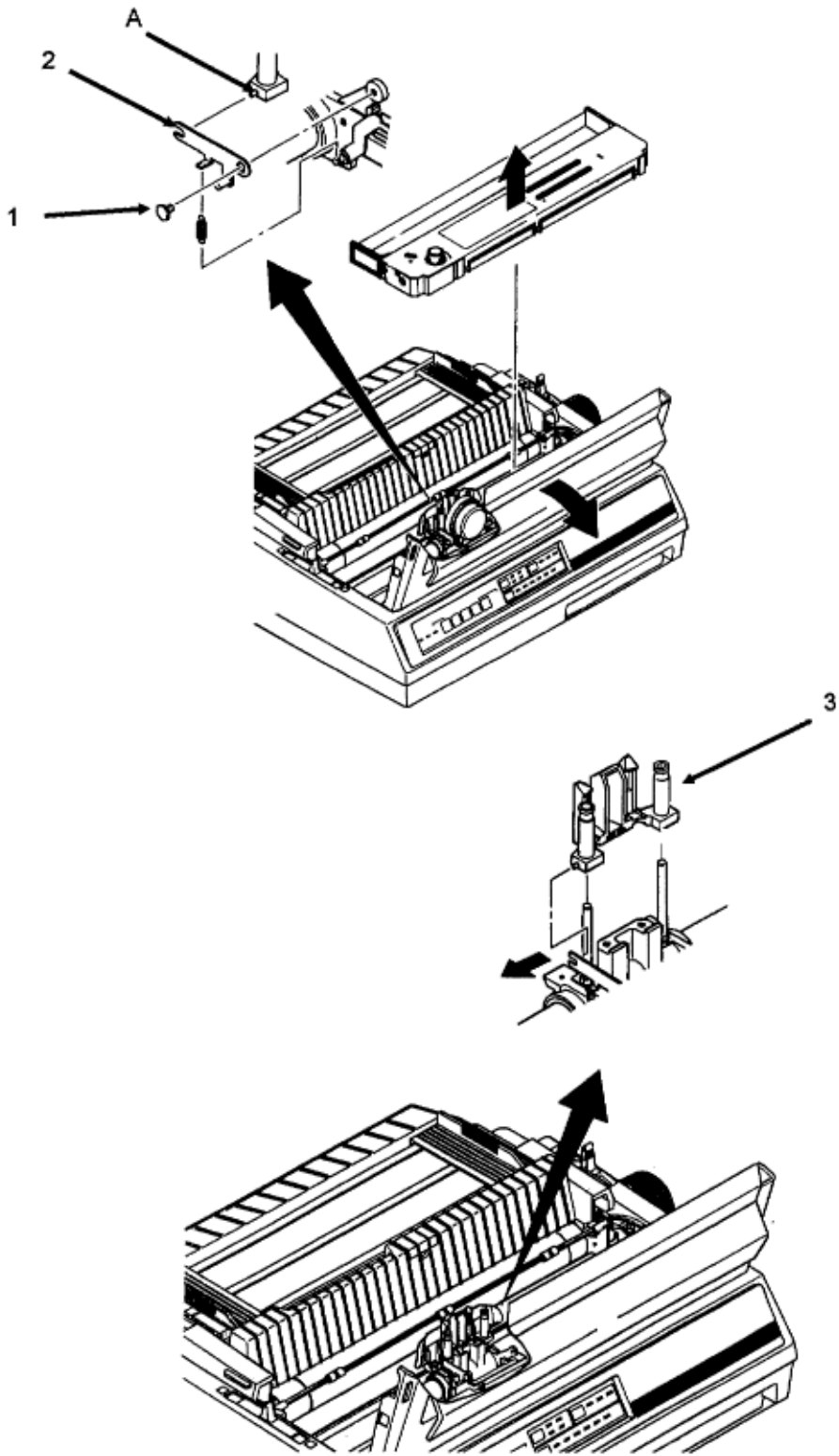
3.2.26 Ribbon Guide

1. Remove the printhead (3.2.01).

2. Loosen the 7 mm ribbon shift arm mounting bolt (1) and detach the ribbon shift arm (2) from projection A of the ribbon guide (3).
3. Remove the two printhead mounting screws.
4. Lift the printhead from the printer. As you lift the printhead, the ribbon guide can be removed.

P/N 50605701 Ribbon Guide Post (Color) B.2.05 

P/N 53056002 Guide: Ribbon (Color) RSPL B.2.05 



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3.2.27 Bail Open Cam and Bail Open Gear

1. Remove the printer mechanism (3.2.08).

2. Detach the E snap ring (1).
3. Remove the bail open gear (2).
4. Remove the bail open cam (3).
5. Remove the plastic ring (4).

Caution:*Installation*

When installing, make sure that the plastic ring is positioned against the rim on the bail open cam.

Installation may be easier if the bail open cam is installed on the shaft first, followed by the bail open gear.

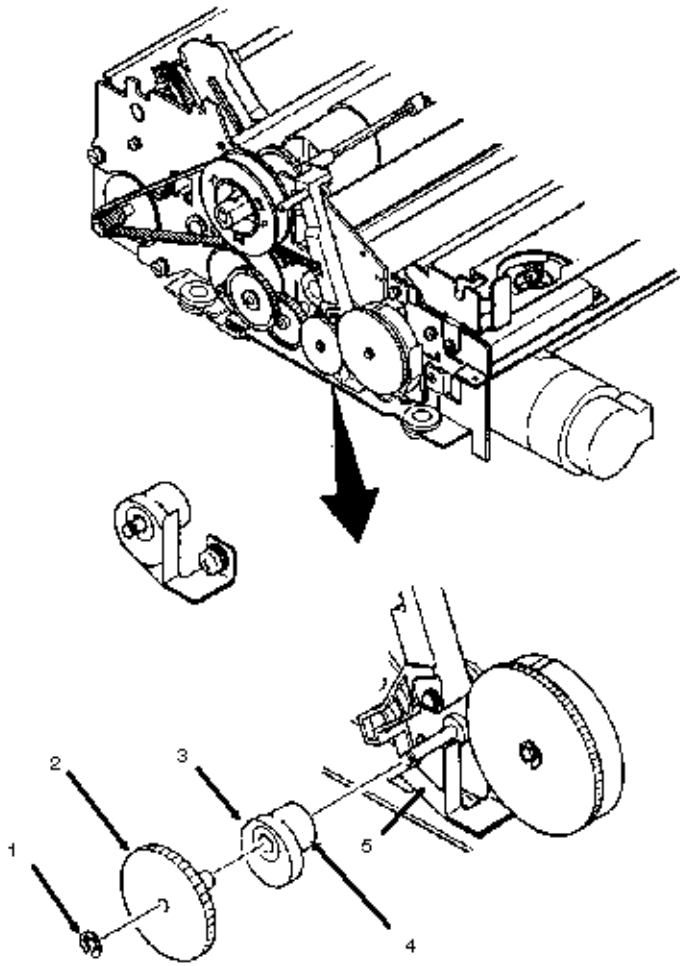
Press down on the spring (5) slightly when installing the cam and ring.

The plastic ring MUST rest against the spring.

P/N 50911001 Brake Spring - B (Color) B.2.11 

P/N 51214601 Gear: Bail Open (Color) RSPL B.2.11 

P/N 51222601 Cam: Bail Open (Color) RSPL B.2.11 



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3.2.28 Ribbon Shift Cam and Ribbon Shift Gear

1. Remove the printer mechanism (3.2.08).

2. Detach the E snap ring (1).
3. Remove the ribbon shift gear (2).
4. Remove the washer.
5. Remove the ribbon shift cam (3).

NOTE:

Assembly

Hold back the spring (4) while pushing the gear and cam on the shaft.

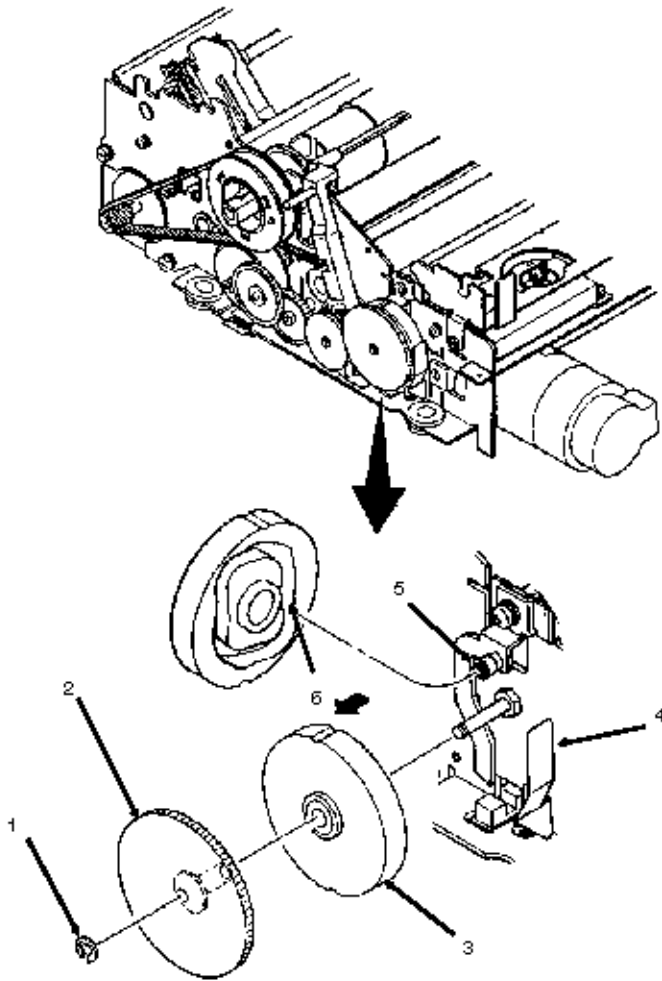
Place the roller (5) in the groove (6) of the ribbon shift cam.

Perform the Microline 395C color adjustment (3.3.03).

P/N 50910901 Brake Spring - A B.2.11

P/N 51215101 Gear: Ribbon Shift (Color) RSPL B.2.11

P/N 51222501 Cam: Ribbon Shift (Color) RSPL B.2.11



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3.2.29 Ribbon Shift Cam Lever Assembly

1. Remove the printer mechanism (3.2.08). 

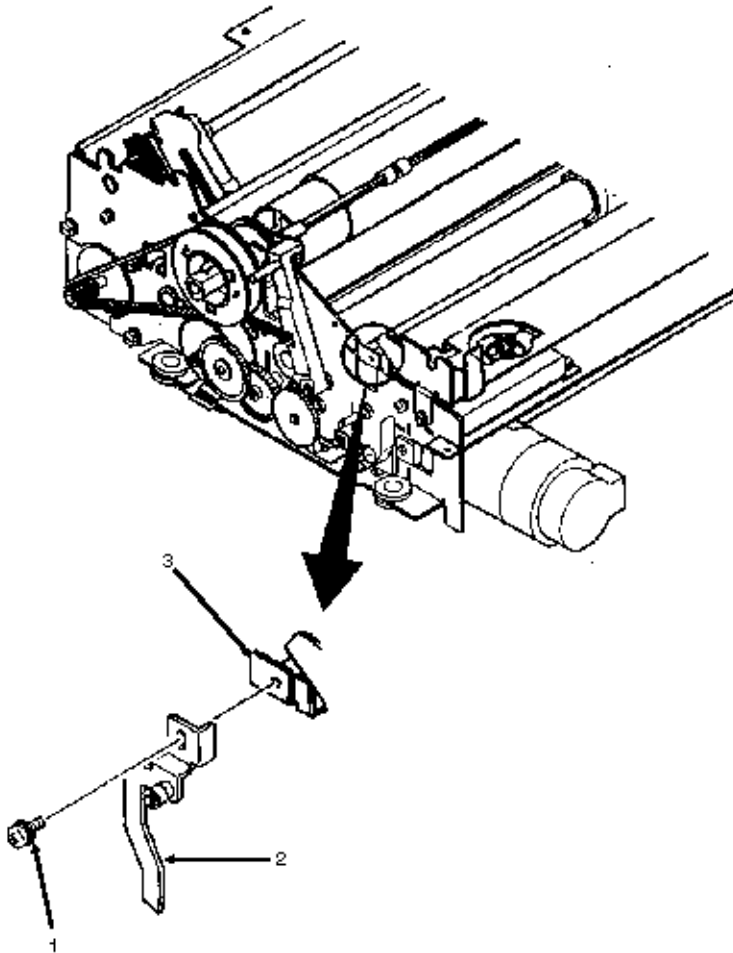
2. Remove the ribbon shift cam and ribbon shift gear (3.2.27). 

3. Remove the mounting screw (1).

4. Detach the ribbon shift cam lever (2) from the cartridge bracket (3).

NOTE: After assembly, perform the Microline 395C color adjustment (3.3.03). 

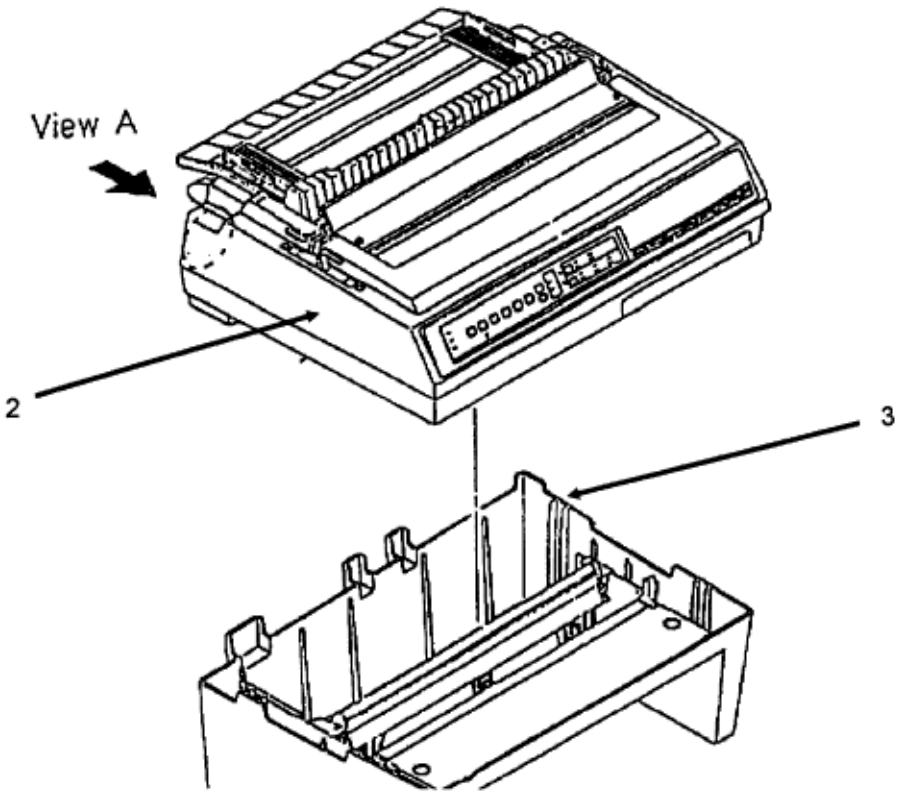
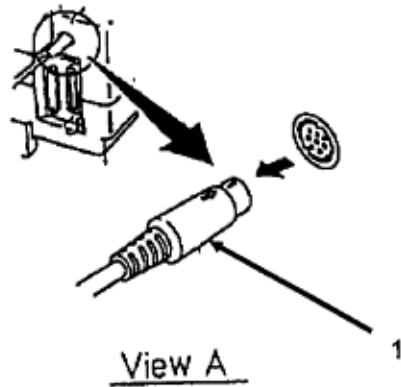
P/N 50054701 Lever: Shift Cam (Color) RSPL B.2.11 



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3.2.30 Printer Unit**Bottom Push Tractor Unit (Optional)**

1. Turn the power switch OFF and remove the AC power cord from the outlet.
2. Remove the DIN connector (1).
3. Lift the printer unit (2) from the bottom push tractor unit (3).



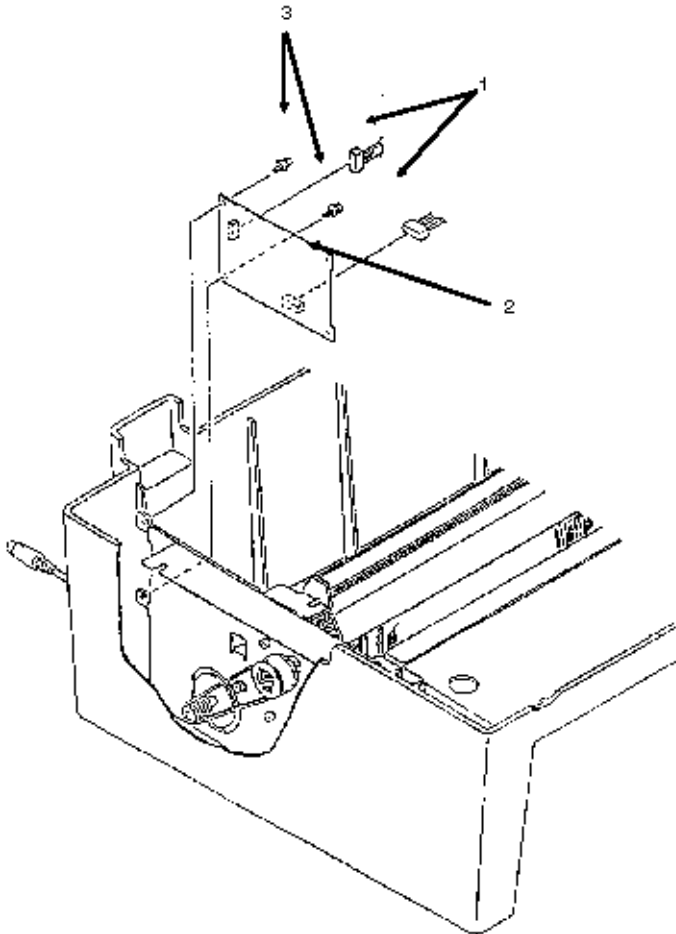
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3.2.31 BTFD Printed Circuit Board

1. Remove the printer unit (3.2.30).

2. Disconnect the two cables (1) [CN1 and CN2] from the BTFD board (2).
3. Remove the two mounting screws (3)
4. Detach the BTFD board.

P/N 55066102 PCB: BTFD-2 (BTF) Option RSPL B.2.15

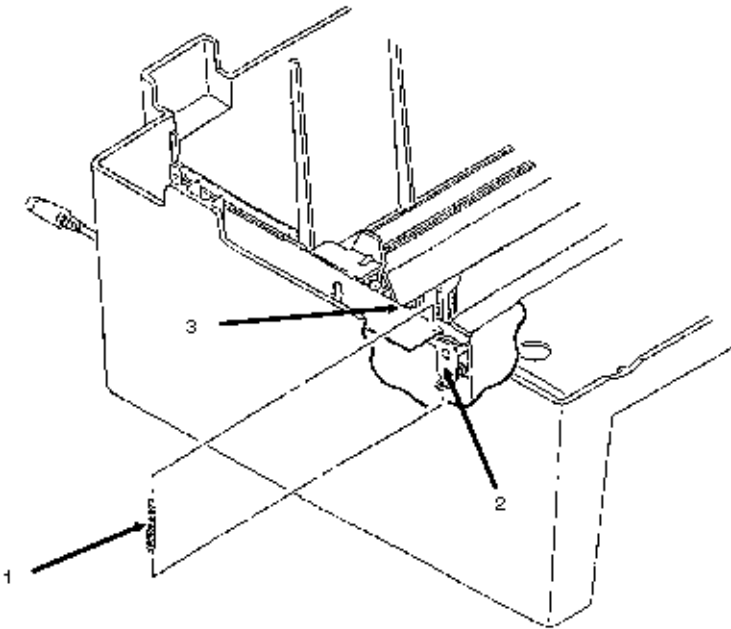


3.2.32 Tension Spring

1. Remove the printer unit (3.2.30).

2. Detach the tension spring (1) from between the bottom cover (2) and the blind plate (3).

P/N 50922001 Spring: (BTF) Option RSPL B.2.15

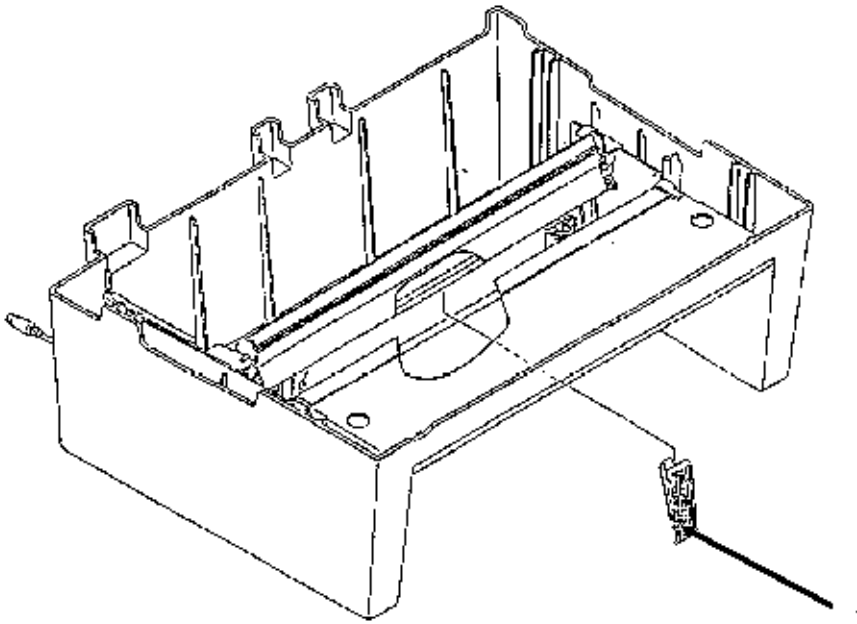


3.2.33 Sheet Guide

1. Remove the printer unit (3.2.30). 

2. Remove the sheet guide (1).

[P/N 51002201 Guide: Sheet \(BTF\) Option RSPL B.2.15](#) 



3.2.34 BTF Front Door Assembly**1. Remove the printer unit (3.2.30).** 

2. Detach connector CN1 (1) from the BTFD board (2).

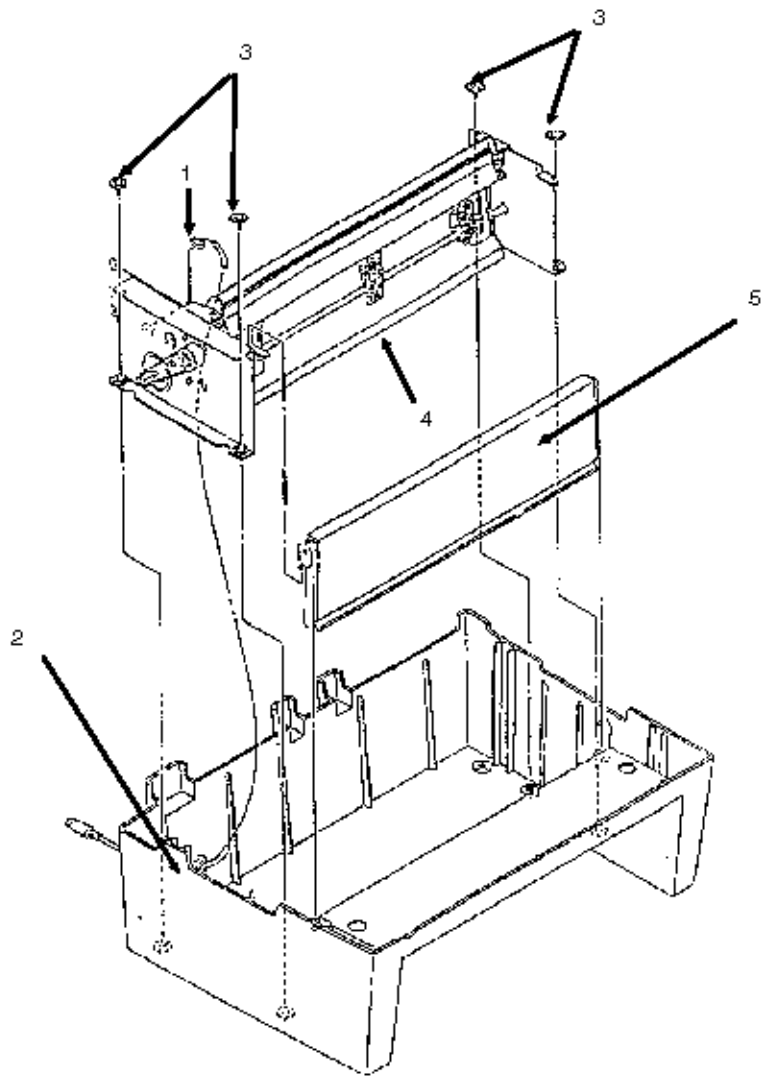
3. Remove the tension spring (3.2.32). 

4. Remove the four mounting screws (3).

5. Remove the bottom push mechanism (4).

6. Detach the door assembly (5).

P/N 53063701 Door: Front (Assembly) (BTF) Option RSPL B.2.15 



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3.2.35 Drive Pulley and Mini-pitch Belt

1. [Remove the printer unit \(3.2.30\)](#).

2. [Remove the bottom push mechanism \(3.2.34\) - Steps 2, 3, 4, 5](#).

3. Detach the lock/flange (1) of the drive pulley (2).

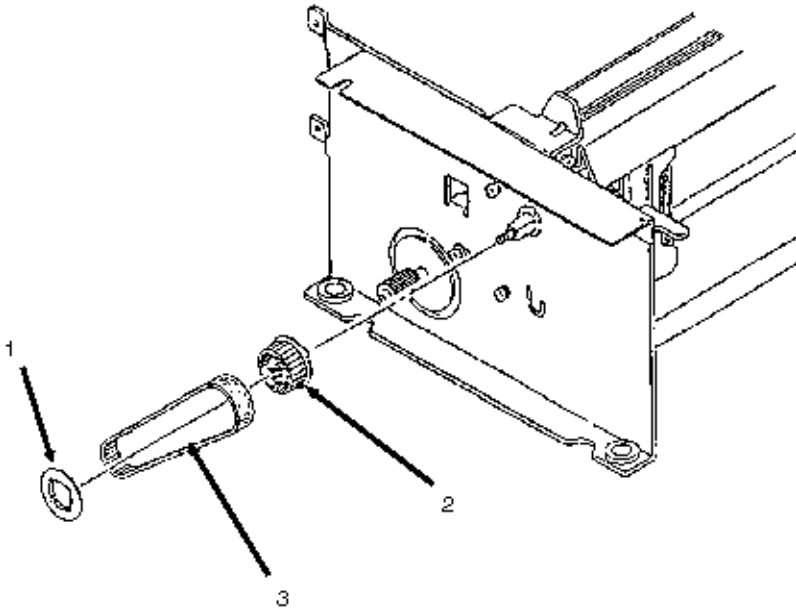
4. Remove the mini-pitch belt (3).

5. Remove the drive pulley.

NOTE: If you are only removing the mini-pitch belt, it is not necessary to remove the drive pulley.

[P/N 51228801 Pulley: Drive \(BTF\) \(ML395\) Option RSPL B.2.15](#)

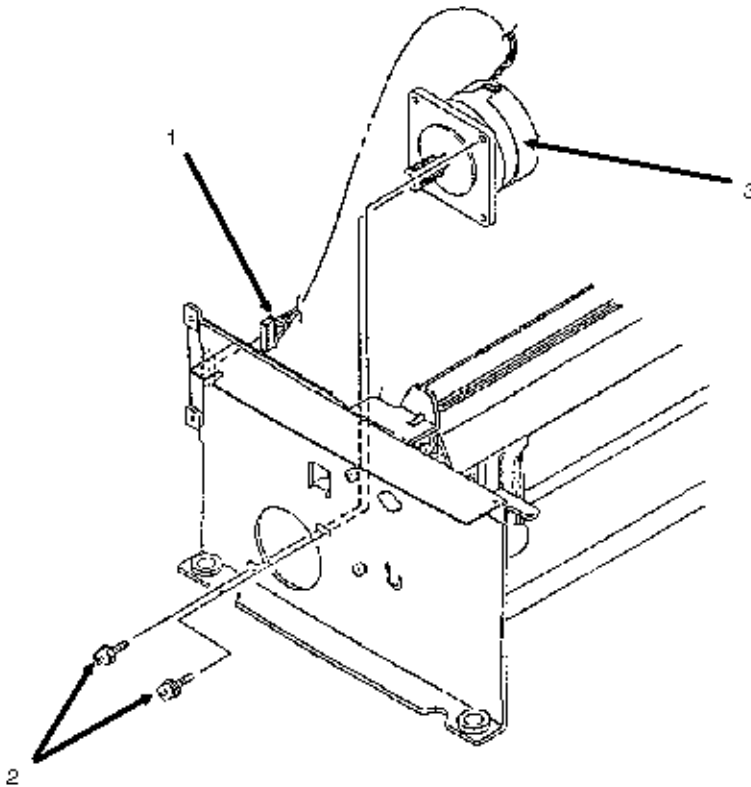
[P/N 54111291 Belt: Mini Pitch \(125 teeth\) Option RSPL B.2.15](#)



3.2.36 Line Feed Motor

1. Remove the printer unit (3.2.30).
2. Remove the bottom push mechanism (3.2.34 - Steps 2,3,4,5).
3. Detach connector CN2 (1) from the BTFD board.
4. Remove the two mounting screws (2).
5. Detach the line feed motor (3).

P/N 56509401 Motor: Line Feed (BTF) Option RSPL B.2.15 

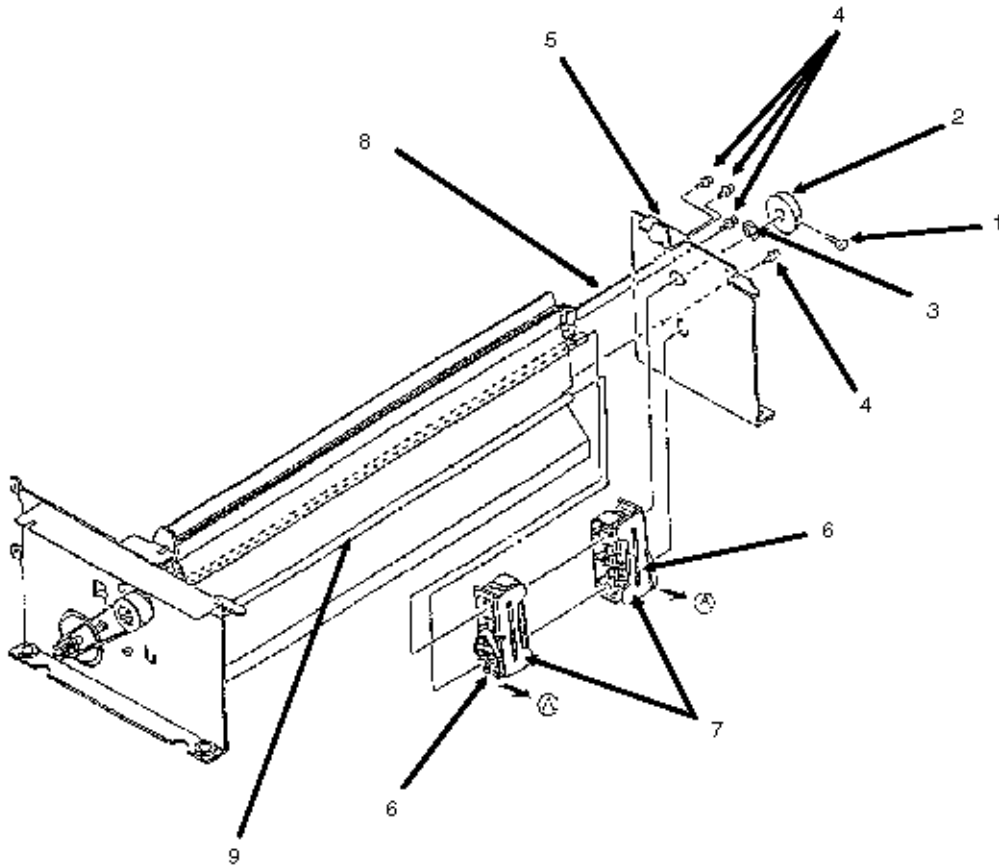


3.2.37 Tractor Assembly

1. Remove the printer unit (3.2.30).
2. Remove the bottom push mechanism (3.2.34 - Steps 2,3,4,5).
3. Remove the screw (1), the balancer (2), and the E-clip (3).
4. Remove the four mounting screws (4) and detach the side frame (5).
5. Pull the tractor lock levers (6) in the direction of Arrow A.
6. Slide the tractor assemblies (7) from the drive shaft (8) and the lock shaft (9).

[P/N 50057402 Tractor: Pin \(Left\) BTF Option RSPL B.2.15](#)

[P/N 50057502 Tractor: Pin \(Right\) BTF Option RSPL B.2.15](#)



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3.3 PRINTER ADJUSTMENTS

3.3.01 Printhead Gap

1. Remove the printhead (3.2.01). 

2. Remove the ribbon guide (3.2.02). 

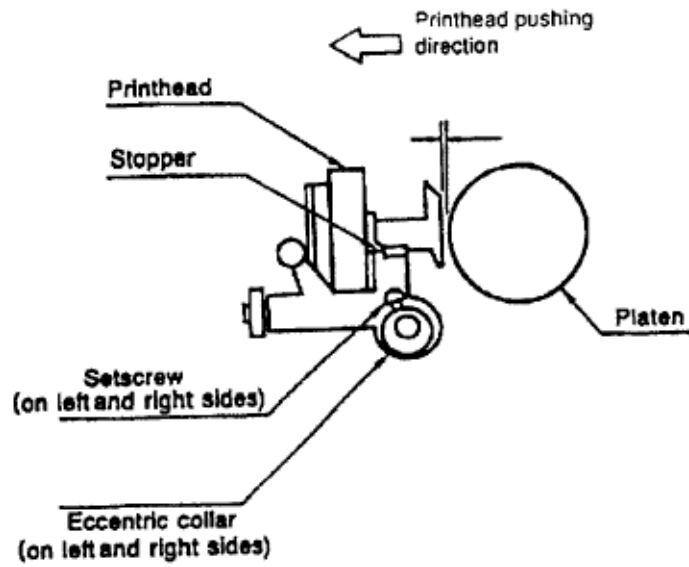
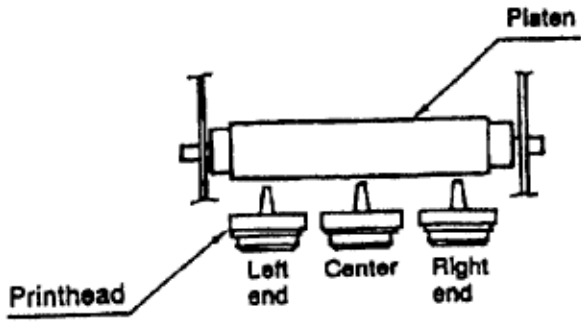
3. Remove the ribbon protector (3.2.03). 

4. Install the printhead.
5. Set the printhead gap lever to position 1.
6. Set the paper release lever to the OPEN position.
7. Loosen the left and right eccentric collar setscrews.

STEP A

8. Place the printhead at the left side of the platen.
9. Rotate the left adjusting collar until you obtain a .015" (+/- .002") gap between the printhead and the platen.
10. Place the printhead at the right side of the platen.
11. Rotate the right adjusting collar until you obtain a .015" (+/- .002") gap between the printhead and the platen.
12. When the correct gap has been attained, tighten the left and right eccentric collar setscrews.
13. Check the gap at the left side, center and right side of the platen. If the printhead gap is not within specification, go to STEP A.
14. Remove the printhead.
15. Install the ribbon protector, ribbon guide and printhead.

CAUTION: *Be sure to pull the printhead toward the stopper whenever it is installed.*

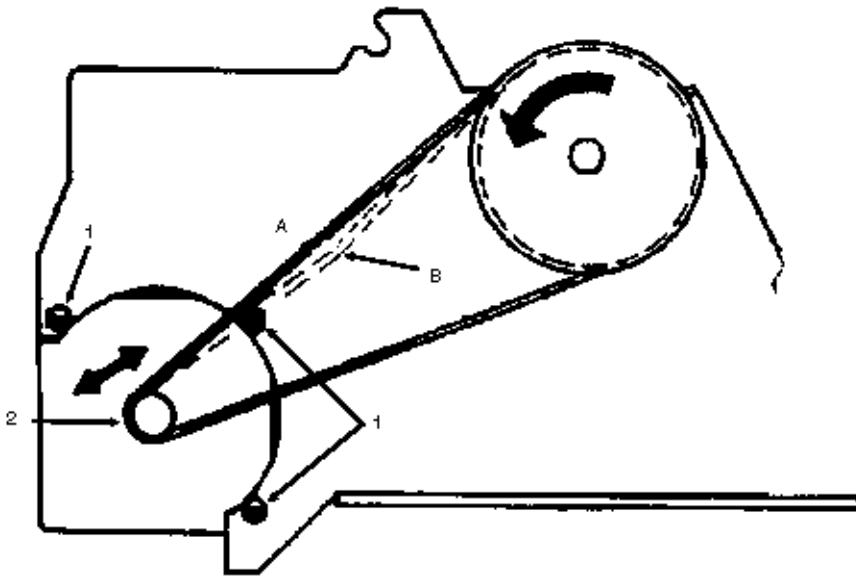


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3.3.02 Line Feed Belt Tension

NOTE: Rotate the platen pulley at least once before making the adjustment

1. Loosen the three line feed motor mounting bolts (1).
2. Using a tension gauge, apply .5 pound of pressure at point A.
3. Adjust the line feed motor (2) position to obtain a 1/16 inch deflection at point B.
4. Tighten the three mounting bolts.



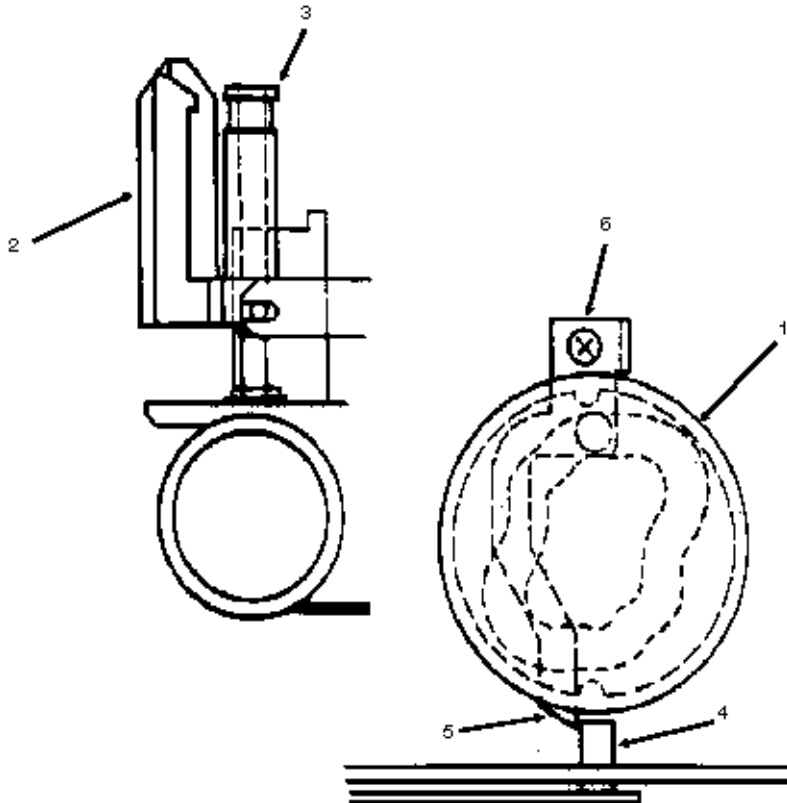
3.3.03 Color Adjustment (Microline 395C Printer)

Ribbon Home Adjustment

1. Detach the upper cover assembly (3.2.04). 

2. Remove the printer mechanism (3.2.08). 

3. Rotate the ribbon shift cam (1) so the ribbon guide (2) is at the top of the post (3).
4. The gap from the end face of the ribbon sensor (4) to the shift cam lever (5) must be .020".
5. If adjustment is necessary, loosen the shift cam lever mounting screw (6) and position the lever to obtain the desired clearance.
6. Check that the ribbon guide remained at the top of the post. If it moved, repeat the procedure.



3.3.04 Key Combinations**Table**

Key Combination	Function
SELECT + FORM FEED (Hold during power ON)	Activates Hexadecimal Dump Mode
SELECT + PARK (Hold during power ON)	Resets Printer Menu to factory defaults
QUIET + LINE FEED (Hold during power ON)	Resets Top of Form to factory default
LINE FEED (Hold during power ON)	Activate Font Test To end Font Test press SELECT
QUIET (Press with printer deselected / OFF-LINE)	Activate Menu To exit press SELECT
PARK (Hold during power ON)	Activate Rolling ASCII Test To end Rolling ASCII Test press SELECT

3.3.05 Menu Operation

Menu Mode

1. Verify that paper and the ribbon are installed.
2. Power ON the printer.
3. Press SELECT and place the printer OFF-LINE (SELECT will *not* be lit).
4. Press QUIET to enter Menu Mode.
5. The line shown below will print.

Printer Control Emulation Mode Epson LQ 6. Go to Step A to print the current menu.

Go to Step B to change the menu.

Step A

Press PRINT to print the current Menu.

Press EXIT to exit Menu Mode.

The printer will go ON-LINE. (SELECT will light.)

Step B

Press GROUP to move through the groups of the Menu.

A line prints, showing the Group.

Press ITEM to move through the items in a group.

A line prints, showing the Item.

Press SET to change the setting for an item.

A line prints, showing the Setting.

Press EXIT to exit Menu Mode.

The printer will go ON-LINE. (SELECT will light.)

Menu Print

1. Verify that paper and the ribbon are installed.
 2. Power ON the printer.
 3. Press SELECT and place the printer OFF-LINE (SELECT will *not* be lit).
 4. Press QUIET to enter Menu Mode.
 5. The line shown below will print.
Printer Control Emulation Mode Epson LQ 6. Press PRINT to print the current Menu.
 7. Press EXIT to exit Menu Mode.
 8. The printer will go ON-LINE. (SELECT will light.)
-

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Service Guide ML395/395C

Chapter 3 Maintenance & Disassembly

Sample Menu

Printer Control	Emulation Mode	EPSON LQ
Font	Print Mode	LQ
Font	Typestyle	Courier
Font	Pitch	18 CPI
Font	Style	Normal
Font	Size	Single
Font	Smoothing	No
General Control	Graphics	Uni-directional
General Control	Paper Out Override	No
General Control	Print Registration	8
General Control	Operator Panel Function	Full Operation
General Control	Ribbon Selection	Black Ribbon
General Control	Reset Inhibit	No
General Control	Page Width	13.6"
General Control	Auto LF	No
General Control	Auto CR (IBM)	No
General Control	Form Tear-Off	Off
General Control	Menu Line	6
Rear Feed	Line Spacing	6 LPI
Rear Feed	Skip Over Perforation	No
Rear Feed	Page Length (Inches)	11"
Bottom Feed	Line Spacing	6 LPI
Bottom Feed	Skip Over Perforation	No
Bottom Feed	Page Length (Inches)	11"
Cut Sheet	Line Spacing	6 LPI
Cut Sheet	Page Length	11"
Cut Sheet	Paper/Transparency	Paper
Symbol Sets	Character Set	Set I
Symbol Sets	Code Page	USA
Symbol Sets	Language Set	American
Symbol Sets	Zero Character	Slashed
General Interface	Max Receive Buffer	8K
General Interface	Print Suppress Effective	Yes
General Interface	Auto Feed XT (EPSON)	Valid
General Interface	CPU Compensation	Standard

Menu Settings

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

Group	Item	Setting
Printer Control	Emulation Mode	<i>Epson LQ</i> IBM PPR IBM X24 AGM
Font	Print Mode	<i>LQ</i> NLQ Utility HSD
	Typestyle	<i>Courier</i> Roman Swiss Orator DLL
	Pitch	<i>10 cpi</i> 12 cpi 15 cpi 17.1 cpi 20 cpi Proportional
	Style	<i>Normal</i> Italics
	Size	<i>Single</i> Double Triple
	Smoothing	<i>No</i> Yes
General Control	Graphics	Bi-directional <i>uni-directional</i>
	Paper Out Override	<i>No</i> Yes
	Print Registration	+5 +4 +3 +2 +1 <i>0</i> -1 -2 -3 -4 -5
	Operator Panel Function	<i>Full Operation</i>
Limited Operation		
	Ribbon Selection (Appears for Color Ribbon Model 395C)	Black Ribbon Film Ribbon
Black Yellow <i>Magenta</i> Cyan Violet Orange Green		
	Ribbon Selection (Appears for Black Ribbon Model 395)	<i>Black Ribbon</i> Film Ribbon
	Reset Inhibit	<i>No</i> Yes
	Page Width	<i>13.6"</i> 8"
	Auto LF	<i>No</i> Yes

	Auto CR (IBM emulation only)	No Yes
	Form Tear-Off	Off 300 mS 2 sec 4 sec
	Menu Line	6 1

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

Group	Item	Setting
Rear Feed	Line Spacing	6 LPI 8 LPI
	Skip Over Perforation	No Yes
	Page Length	12" 11" 11 2/3" 14" 17" 3" 3.5" 4" 5.5" 6" 7" 8" 8.5"
Bottom Feed	Line Spacing	6 LPI 8 LPI
	Skip Over Perforation	No Yes
	Page Length	12" 11" 11 2/3" 14" 17" 3" 3.5" 4" 5.5" 6" 7" 8" 8.5"
Cut Sheet	Line Spacing	6 LPI 8 LPI
	Page Length	12" 11" 11 2/3" 14" 17" 3" 3.5" 4" 5.5" 6" 7" 8" 8.5"
	Paper Transparency	Paper Transparency
Symbol Sets	Character Set	Set I Set II Epson
	Language Set	American French German British Danish I Swedish Italian Spanish I Japanese Norwegian Danish II Spanish II Latin American French Canadian Dutch Publisher
	Code Page	USA Multilingual Canada French
	Zero Character	Slashed Unslashed
General Interface	Max. Receive Buffer	1 Line 8 K 23 K
	Print Suppress Effective	No Yes
	Auto Feed XT	Invalid Valid
	CPU Compensation	Standard Special
Serial Interface	Parity	None Odd Even
(Appears ONLY when	Serial Data 7/8 Bits	8 Bits 7 Bits

serial interface is in use)	Protocol	Ready / Busy X-ON / X-OFF
	Busy Line	SSD- SSSD+ DTR RTS
	Baud Rate	19200 bps 9600 bps 4800 bps
2400 bps 1200 bps 600 bps 300 bps		
	DSR Signal	Valid Invalid
	DTR Signal	Ready on Power UP
Ready on Select		
	Busy Time	200 mS 1 sec

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Menu Reset

CAUTION:

Okidata strongly recommends printing the menu BEFORE resetting to factory defaults. ALL customized settings are lost when the menu is reset to factory defaults.

1. Print the Menu. When the menu is reset to factory defaults, ALL customized settings WILL BE lost.
2. Power OFF the printer.
3. Press SELECT and PARK while powering ON the printer.
4. The Menu is reset to Factory Defaults.

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Limited Operation

General Information

The Operator Panel Function Item in the Printer Menu can be set to enable (FULL OPERATION) or disable (LIMITED OPERATION). If the printer is part of a customized system or if it is used by different operators, a system manager may be using this feature to maintain proper print settings. FONT, PRINT QUALITY, and CHARACTER PITCH (on the operator panel) do not work when the printer is set for LIMITED OPERATION.

Procedure

CAUTION:

Check with the system manager BEFORE changing the setting for the operator panel function!

1. Verify that paper is loaded and that the ribbon is installed.
 2. Power OFF the printer.
 3. Press and hold QUIET while powering ON the printer.
 4. Press GROUP until GENERAL CONTROL prints.
 5. Press ITEM until OPERATOR PANEL FUNCTION prints.
 6. Press SET until FULL OPERATION prints.
 7. Press EXIT to exit Menu Mode.
 8. The printer will go ON-LINE. (SELECT will light.)
-

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3.3.06 Top of Form

General Information

Top of form is the place on the page where printing begins.

When the printer advances paper to the next page, it stops at the top of form.

The Microline 395 and 395C printers store the top of form independently for the three standard paper feed paths.

Top

Rear

Bottom

Each top of form is set using the same procedure.

Procedure

1. Select the desired paper path.
2. Load paper into the printer by pressing FORM FEED.
3. Press SELECT until the printer is OFF-LINE. (SELECT will NOT be lit).
4. The red line on the plastic ribbon protector indicates the base of the printing line. Use this red line as a guide.
5. Press and hold PARK while pressing one of the two microfeed switches (up or down arrow).
UP advances the paper. The space used for the Top of Form increases.
DOWN retracts the paper. The space used for the Top of Form decreases.
6. Release PARK.
7. Press SELECT and place the printer ON-LINE. (SELECT will be lit).

Reset to Factory Defaults

1. Power OFF the printer.
 2. Press and hold LINE FEED and QUIET while powering ON the printer.
 3. The Top of Form is reset to factory defaults.
-

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3.3.07 Paper Park

General Information

Paper park allows the user to switch from continuous feed paper to single-sheet paper without removing the continuous feed paper from the printer. The continuous feed paper will be retracted from the platen and down into the printer housing without disengaging it from the built-in tractor.

After a single-sheet paper is printed, pull the bail lever forward and the continuous feed paper will move back into the print position.

Paper park cannot be used when the optional pull tractor is installed.

Procedure

1. Tear off any printed pages.
2. Make sure the printer is selected. The SELECT lamp must be lit.
3. Press PARK.
4. The paper will retract from the paper path.
5. Move the paper selection to the single sheet position (towards the back of the printer).
6. Load the single sheet paper.
7. Print the single sheet.

To return to continuous feed printing, follow this procedure.

1. Move the paper selection lever to the continuous form position (to the front of the printer).
 2. Pull the bail lever forward.
 3. The paper will advance to the loading position.
 4. Push the bail lever back and adjust the top of form (if necessary).
-

3.3.08 Forms Tear Off

General Information

This feature (when activated) will automatically advance continuous feed paper to the tear-off position after it finishes printing the last page in the document. A few seconds after the printing stops, the printer will move the paper up to the tear-off position, aligning the perforation with the serrated edge on the access cover. The operator will be able to tear off the last printed page without wasting paper or readjusting the printer. When the printer receives data to print, it will automatically return the paper to the top of form position for printing.

Forms Tear Off can only be used with continuous feed paper fed in from the rear on the built-in push tractor. It CANNOT be used with the optional pull tractor.

NOTES:

Some programs, such as high resolution graphics packages, pause occasionally while sending data to the printer.

If the pause lasts more than the selected interval, the paper will advance to the tear-off position until more data is received.

No data is lost, but the extra paper movement causes uneven print registration.

If this problem occurs, disable (set to OFF) the Menu Setting for Forms Tear Off.

Procedure

1. Load continuous feed paper into the printer.
2. Verify that the ribbon is installed.
3. Power ON the printer.
4. Verify that the printer is ON-LINE (SELECT lamp is lit).
5. Press SELECT and place the printer OFF-LINE (SELECT will *not* be lit).
6. Press QUIET to enter Menu Mode.
7. The line shown below will print.

Printer Control Emulation Mode <current setting> 8. Press GROUP until the following line is printed.

General Control Graphics <current setting> 9. Press ITEM until the following line is printed.

General Control Forms Tear Off <current setting> 10. Press SET to change the menu setting for Forms Tear Off.

To activate Forms Tear Off, the setting must be 300 mS, 2 sec., or 4 sec. To deactivate Forms Tear Off, the setting must be OFF. 11. Press EXIT to exit Menu Mode.

12. The printer will go ON-LINE. (SELECT will light.)

Application of the Forms Tear Off Feature

Point of Sale

1. Set menu selection General Control, Forms Tear Off, to OFF-LINE.
2. The printer will print the receipt.
3. The printer will advance the receipt to the tear off position and go OFF-LINE.
4. Tear off the receipt.
5. Press SELECT to place the printer ON-LINE.

Continuous Invoices

6. Set menu selection General Control, Forms Tear Off, to 300 ms.
7. The printer will print the invoices without stopping.
8. If the final invoice does not print, issue a FORM FEED command at the end of the job. This will force the last invoice to the print position to complete the job.

NOTE: *The page will be advanced to the tear off position after waiting two or four seconds (depending on the menu selection) for a print signal. The paper will then be retracted to the next print position.*

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3.4 CLEANING

3.4.01 General Information

WARNING

When cleaning the printer, power OFF the printer and detach the AC power cable from the printer and the AC outlet.

Cleaning Interval

Every six months or 300 hours of operation

Cleaning Tools

Lint free cloth

Soft cloth

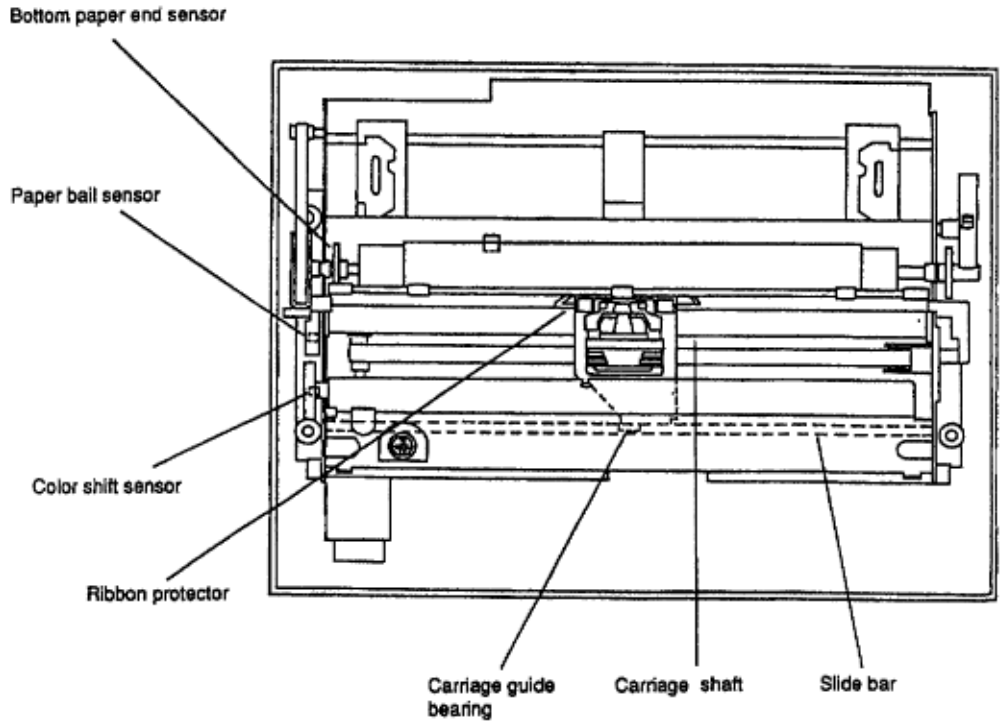
Vacuum cleaner

Platen cleaner

Long cotton swabs

All purpose cleaner

Areas to Clean



@

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3.5 LUBRICATION

3.5.01 General Information

When lubricating the printer, refer to the lubrication diagrams on the following pages. Each lubrication point lists a code for the type of lubricant to be used along with a code for the amount of lubricant required. These codes are defined below.

Lubrication Interval

Once a year or every 600 hours of operation

Recommended Lubricant

Machine Oil : 10w-30 or equivalent (shown as PM on lubrication diagrams)

Moly-grease: Alvania grease #2 EP or equivalent (shown as GEP on lubrication diagrams)

Lubricant Amounts

Apply Abundantly: (shown as A on lubrication diagrams)

3-4 Drops of Oil / .008 inches of Grease: (shown as B on lubrication diagrams)

One drop of Oil: (shown as C on lubrication diagrams)

CAUTION:

Do not allow lubricant to contact the following areas.

Sensors

Platen (rubber face)

Printhead

Mini-pitch belt

Space belt

Ribbon

Tractor Pins

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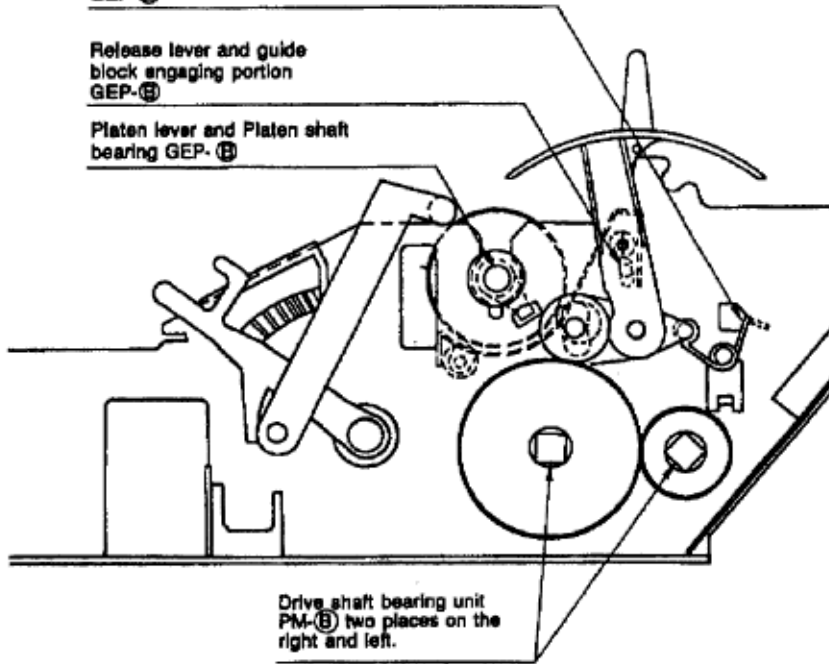
Lubrication Points (Monochrome and Color)

Lubrication points

Detent spring and side frame engaging portion
GEP-Ⓔ

Release lever and guide block engaging portion
GEP-Ⓔ

Platen lever and Platen shaft bearing
GEP-Ⓔ



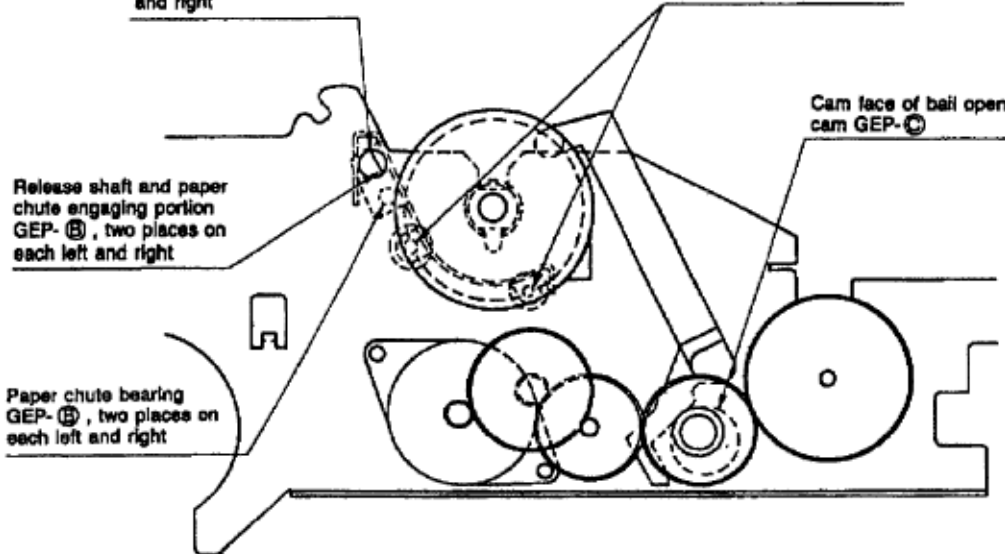
Release shaft and side frame bearing
GEP-Ⓔ, two places on each left and right

Pressure roller bearing
PM-Ⓔ, eight places

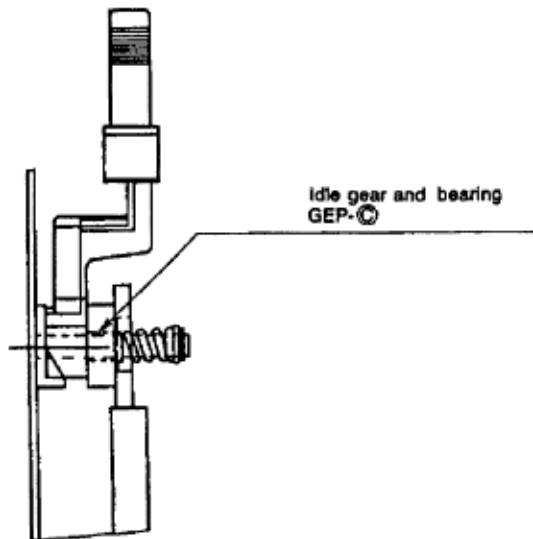
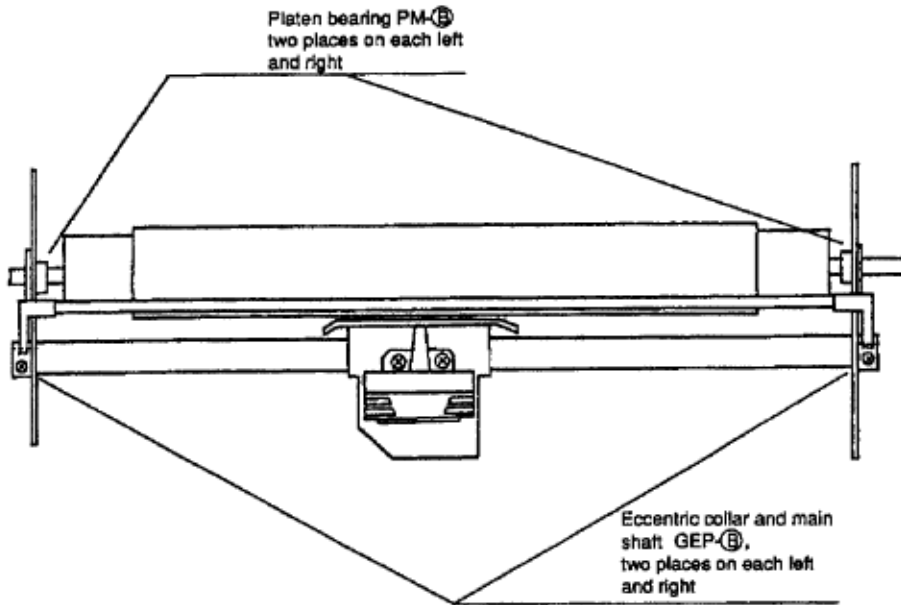
Cam face of bail open cam
GEP-Ⓔ

Release shaft and paper chute engaging portion
GEP-Ⓔ, two places on each left and right

Paper chute bearing
GEP-Ⓔ, two places on each left and right



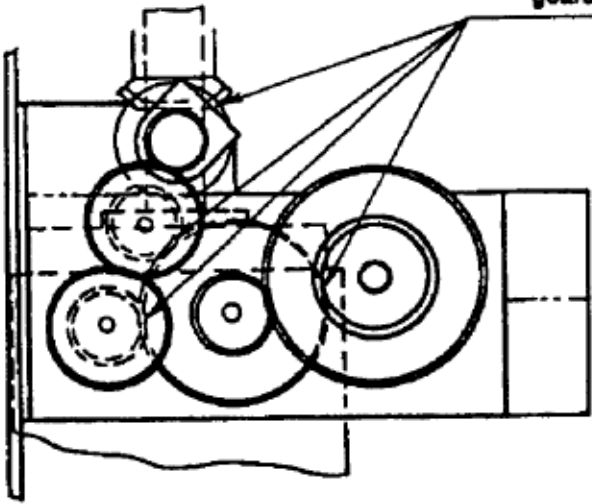
Lubrication Points (Monochrome and Color)



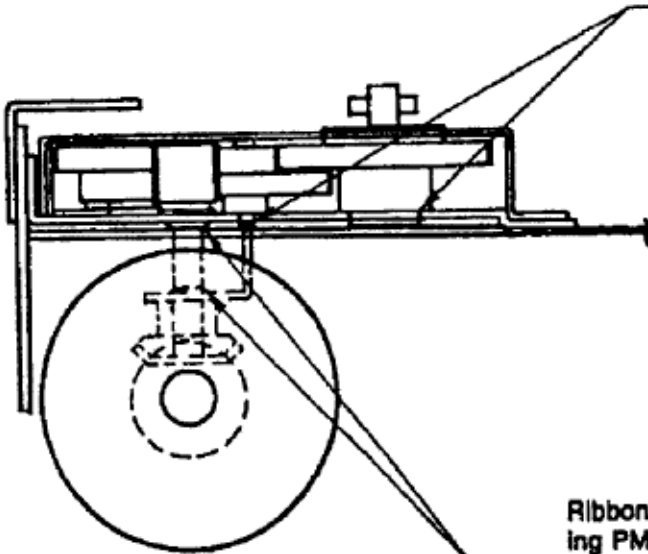


Lubrication Points (Monochrome and Color)

Tooth faces of ribbon
feed assembly GEP-Ⓢ (6
gears and 9 tooth faces)



Ribbon feed assembly
gear bearing GEP-Ⓢ,
three places

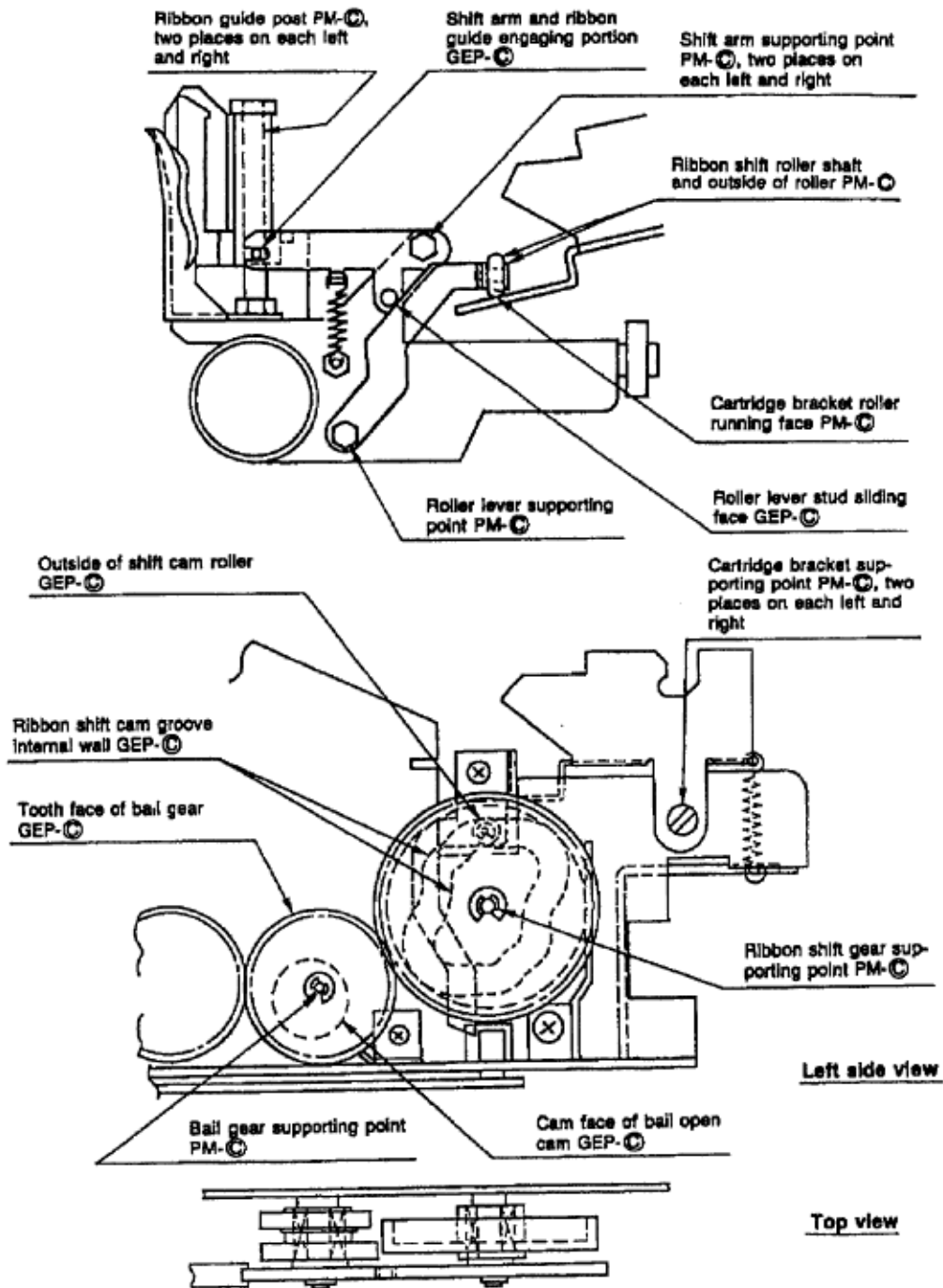


Ribbon drive shaft bear-
ing PM-Ⓢ, two places



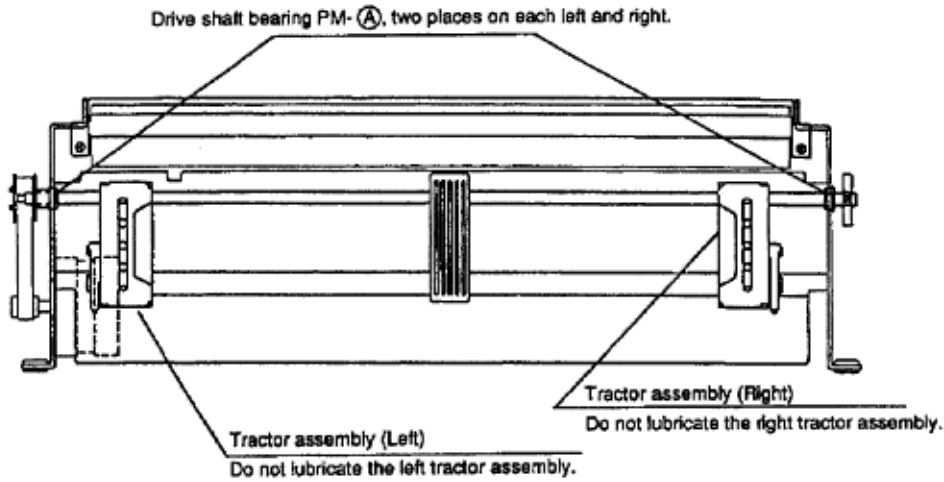
Lubrication Points (Color)

Lubrication points of color model

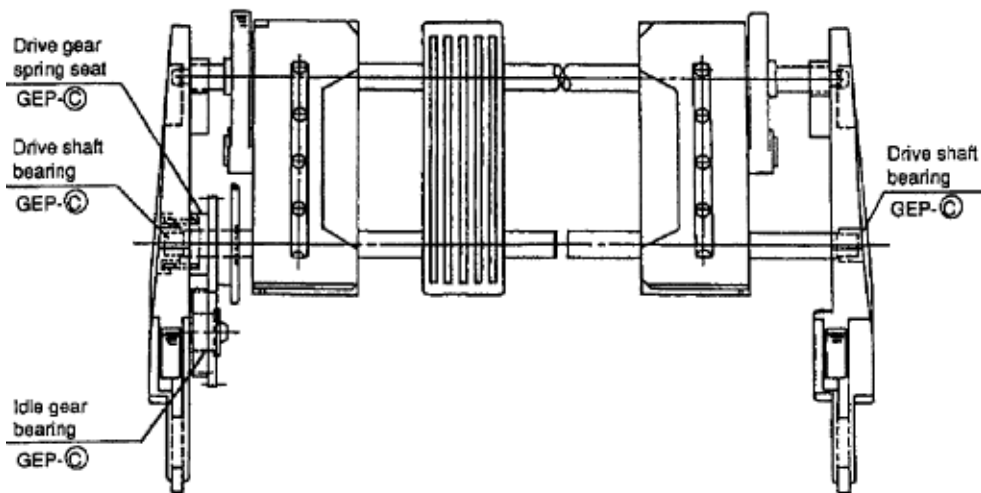


Lubrication Points (Options)

Lubrication points of bottom push tractor unit (option)



Lubrication points of pull tractor unit (option)



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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.
-

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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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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

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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.

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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!

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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

Units 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

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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.

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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.

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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.

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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?
-

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4.4.02 Problem Categories

There are three categories of problems that you might encounter when servicing the Microline 395 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 PRINT QUALITY, FONT, 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 paper jam or paper-end (out of paper) condition.

4.4.03 START HERE Flowchart

START

Does the failure occur immediately after the unit is powered ON?

YES Which of the following resembles the problem?

Power is not supplied to the printer

Refer to RAP 01

No spacing operation

Refer to RAP 02

ALARM lamp is blinking

Refer to Section 4.6

NO The problem occurs during printing.

Refer to the RAP Index - Section 4.7

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.
 3. Always place the Head Gap Lever in the position appropriate for the paper that you are using.
-

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4.4.05 Common Problems

1. Nothing happens when the printer is powered ON.

Make sure the printer is plugged in.

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

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

2. The ALARM lamp is lit.

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

If the ALARM lamp does not go out after paper is loaded, refer to Section 4.5 of this Service Handbook.

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

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

4. The paper keeps jamming.

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

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

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

This indicates a Printhead Overheat Condition. When the printer prints for a long period of time, heat will build up in the printhead. When the printhead temperature reaches approximately 115 degrees Celsius, the printer will print unidirectionally. If the temperature continues to rise, printing will stop until the printhead cools. Printing will resume after the printhead cools.

6. Static electricity causes the paper to stick.

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

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

Before sending a file to a printer, many word processors send an initialization string. This string contains codes that reset the printer to a default set of features. Otherwise, the printer might print using features set

for a previous job. The codes will override panel or menu settings.

Check the word processors manual to see if the initialization string can be modified. If so, remove any codes that interfere with the printers settings.

To set the printer to ignore the reset code, follow this procedure.

1. Press SELECT until the SELECT lamp goes out.
2. Press QUIET.
3. The first Group/Item/Setting will print.
4. Press GROUP until GENERAL CONTROL prints.
5. Press ITEM until RESET INHIBIT prints.
6. Press SET until YES prints.
7. Press EXIT to exit the Menu Mode.

This will stop the reset code from resetting the printer, but other codes in the initialization string may still override the printer Menu and / or front panel settings.

8. Output is missing dots.

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

Setting 1 is for one or two part forms.

Setting 2 is for three or four part forms.

Settings 3, 4, and 5 are for envelopes and extra-thick paper.

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

Refer to RAP 03.

9. Strange symbols and incorrect fonts appear during a print run.

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

OR

Incorrect printer commands are embedded within the software.

To check the selected emulation, follow this procedure.

1. Verify that the printer is loaded with paper.
2. Deselect the printer. The SELECT lamp will NOT be lit.
3. Press QUIET to enter Menu Mode.
4. A line prints, indicating the emulation selected.

5. Press SET to change the emulation.

6. Press SELECT to exit Menu Mode.

If the emulation is correct, check the software documentation on how to select a printer driver. Verify that the selected driver is correct for the emulation. Refer to the Microline 395 Printer Handbook. Drivers near the top of the list are more compatible with the printer than drivers near the bottom of the list. If the software does NOT offer any driver on the list, check with the software manufacturer to see if additional drivers have been added since the software was purchased.

Verify that any embedded commands in the software have been correctly entered.

10. FONT, PRINT QUALITY, and CHARACTER PITCH (on the operator panel) do not work.

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

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

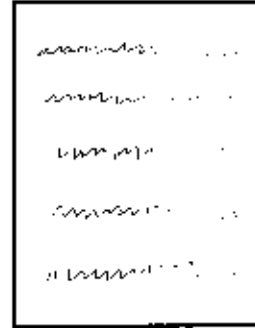
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4.5 ABNORMAL OUTPUT

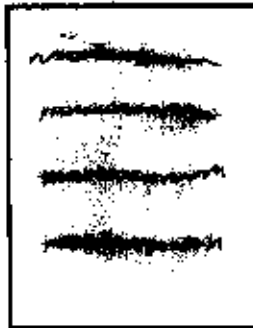
4.5.01 Output Samples



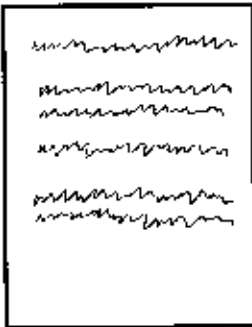
Light Print on Entire Page



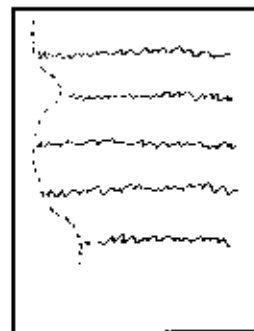
Uneven Print Density



Smeared Print



Inconsistent Line Feed



Drifting Margin

Light Print on the Entire Page

Possible Causes:

1. Ribbon is "dried out". Replace the ribbon.
2. Head gap lever is in the incorrect position. Place the lever in correct position.
3. 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.

Smearred Print

Possible Causes:

1. Head gap lever is in the incorrect position. Place the lever in correct position.
2. Paper is not within specification. Refer to Section One for paper specification.
3. Ribbon protector is missing or broken. Replace the ribbon protector.

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. Make sure that the line feed belt tension is within specification. If it is not, tighten the line feed belt.
3. 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. Make sure that the space belt tension is within specification. If it is not, tighten the belt.



Service Guide ML395/395C

Chapter 4 Failure & Repair Analysis

4.6 FAULT ALARMS

4.6.01 General Information

When an error condition exists, the ALARM LAMP will flash. The operator panel is used to display printer error conditions. The type of error condition can be determined by decoding the operator panel lamps.

Refer to the Alarm Codes Table in this section to identify both the error condition and the recommended corrective action for each condition.

NOTE: The Alarm Codes Table only applies in situations when the ALARM LAMP is flashing.

Alarm Codes Table

ORA	UTL	NLQ	10	15	20	PROP	Alarm Description	Code	Corrective Action
		ON				ON	MPU Internal RAM Error	11	Replace controller board
		ON			ON		Program ROM Error	12	Replace Master ROM
		ON			ON	ON	Resident CG Error	13	Replace controller board
		ON		ON		ON	EEPROM Error	15	Replace EEPROM
		ON		ON	ON		MPU Watchdog Timer Error	16	Replace controller board
	ON					ON	Slave CPU ROM/RAM Error	21	Replace Slave ROM
	ON				ON		Slave/Master Matching Error	22	Replace Master / Slave ROM
	ON				ON	ON	Master/Slave Interface Error	23	Replace controller board

	ON			ON			Slave CPU Watchdog Timer Error	24	Replace controller board
	ON	ON				ON	MPU External RAM Error	31	Replace controller board
ON							Switch Mode Compare Error	40	Replace controller board
ON						ON	Command FIFO Check Error	41	Replace controller board
ON					ON		SIG Command Error	42	Replace controller board
ON					ON	ON	Print Bus Error	43	Replace controller board
ON				ON			Position Sense Error	44	Replace controller board
ON				ON		ON	Cell Load Error	45	Replace controller board
ON				ON	ON		Cell Store Error	46	Replace controller board
ON		ON			ON		Print Overrun Error	52	Replace controller board
ON		ON			ON	ON	Head Homing Error	53	See RAP 03
ON		ON		ON			Slave CPU Initial Error	54	Replace controller board
ON		ON		ON		ON	Thermistor Open Error	55	Replace Printhead
ON		ON		ON	ON	ON	Ribbon Homing Error	57	Refer to RAP 04
ON		ON	ON			ON	EEPROM Write Error	59	Replace controller board

ON		ON	ON		ON	ON	Spacing Error	5B	See RAP 02
ON		ON	ON	ON			Bail Arm Error	5C	See RAP 05
ON	ON						Fan Alarm	60	Replace Power Supply
ON	ON					ON	Bottom Feed Connection Error	61	Check Bottom Feed Unit

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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 printers problem.
 3. Go to the appropriate RAP.
 4. All RAPs begin with a START statement, followed by questions or another type of statement.
-

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4.7.02 RAP Index

RAP Number	Description
01	Power Lamp Does Not Light
02	Space Error (ALARM 5B)
03	Head Homing Error (ALARM 53)
04	Ribbon Homing Error (ALARM 5C)
05	Bail Home Error (ALARM 5C)
06	Wrong Character, Character Omission, or Dot Omission
07	Ribbon Feed Trouble
08	Line Feed Trouble
09	Malfunction of Operation Panel switch
10A	Data Receiving Failure
10B	Parallel Interface Problem
10C	Serial Interface Problem
10D	Data Receive Problem Alarm Light Lit
11	Color Ribbon Shift Problems

@

RAP 01: Power Lamp Does Not Light

NOTE: *If the printer operates normally, but the POWER LAMP does not light, replace the Operator Panel.*

Refer to Appendix A for voltage test points and connector locations.

START

Is the AC cable connected to an AC outlet and the printer?

NO Connect the AC cable.

Has the problem been resolved?

YES End of procedure

NO Go to the next step listed below.

YES Is the F1 fuse on the power supply unit open?

YES Replace the fuse F1. If it opens again, replace the power supply unit.

Has the problem been resolved?

YES End of procedure

NO Go to the next step listed below.

NO Are the +5Vdc and +38Vdc present on the control board? Check for +38Vdc at both ends of capacitor C2. Check for +5Vdc between pin 16 of Q2 and the power bar.

NO Are cables CN3 and CN7 on the control board correctly connected?

NO Connect cables CN3 and CN7 at the control board.

YES Replace the power supply unit. *OR* Replace the connection cable.

YES Replace the control board.

Has the problem been resolved?

NO Contact Okidata Technical Support.

YES End of procedure.

RAP 02: Space Error (ALARM 5B)

START

Is the carriage assembly binding or jammed?

YES Check around the space motor mechanism for any obstructions. Then, remove the cause of the carriage jam.

NO Replace the program and slave ROMs.

Has the problem been resolved?

YES End of procedure.

NO Is fuse F1 on the control board blown?

YES Replace fuse F1

NO Go to A.

Has the problem been resolved?

YES End of procedure.

NO Go to A.

A

Is +38Vdc present on the control board? Check on both ends of the capacitor C2.

YES Are cables CN1 and CN5 on the control board correctly connected?

YES Replace the control board.

NO Connect them correctly.

Has the problem been resolved?

YES End of procedure.

NO Replace the space motor.

NO Are cables CN3 and CN7 on the control board correctly connected?

YES Replace the power supply unit or connection cable.

NO Connect them correctly.

Has the problem been resolved?

YES End of procedure.

NO Replace the space motor.

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RAP 03: Head Homing Error (ALARM 53)

START

Is +38vdc present on the control board? Check for an open fuse on control board.

YES Is connector CN1 on the control board correctly installed?

YES Replace the control board.

NO Correctly install the connector.

Has the problem been resolved?

YES End of procedure.

NO Contact Okidata Technical Support.

NO Are cables CN3 and CN7 on the control board correctly connected to the power supply unit?

YES Replace the power supply unit.

NO Correctly connect the cables.

Has the problem been resolved?

YES End of procedure.

NO Replace the space motor.

Has the problem been resolved?

YES End of procedure.

NO Contact Okidata Technical Support.

RAP 04: Ribbon Homing Error (ALARM 57)

START

Is the printer the color model?

NO Is shorting plug SP3 of the control board open?

NO Set it open.

YES Go to A.

YES Manually rotate the ribbon shift cam counterclockwise. Does it rotate smoothly?

NO Check the areas listed below.

No paper scrap or foreign matter on the gear

Smooth gear meshing

No friction at each fulcrum of the carriage bracket, roller lever and ribbon shift arm

YES Is cable CN2 on the sensor board connected correctly?

NO Connect it correctly.

YES Is cable CN4 on the control board connected correctly?

NO Connect it correctly.

YES Is there dirt or dust on the ribbon home sensor on the sensor board?

YES Clean the sensor.

NO Go to A.

A

Replace the control board.

Has the problem been resolved?

YES End of procedure.

NO Replace the bail/ribbon motor.

Has the problem been resolved?

YES End of procedure.

NO Replace the sensor board.

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RAP 05: Bail Home Error (ALARM 5C)

START

Manually rotate the bail open gear counterclockwise.

Does it rotate smoothly?

NO Perform the following.

Remove any paper scrap or foreign material near the bail/ribbon motor gear, idle gear and bail open gear.

Check the meshing of each of the above gears.

YES Is cable CN4 on the control board connected correctly?

NO Connect it correctly.

YES Are cables CN2/CN3 on the sensor board connected correctly?

NO Connect them correctly.

YES Is there dirt or dust on any of the sensors on the sensor board?

YES Clean the sensors.

NO Is the bail arm lever damaged?

YES Replace the bail arm lever.

NO Replace the control board.

Has the problem been resolved?

YES End of procedure.

NO Replace the sensor board.

Has the problem been resolved?

YES End of procedure.

NO Replace the bail/ribbon motor.

RAP 06: Wrong Character, Character Omission, or Dot Omission

START

Are cables CN2 and CN6 on the control board connected correctly?

NO Connect them correctly.

YES Is cable CN101 on the interface connector board connected correctly?

NO Connect it correctly.

YES Is the interface cable connected correctly?

NO Connect it correctly

YES Are the +/- 8vdc output voltages supplied by the control board? Check at both ends of C9 for the positive voltage. Check at both ends of C8 for the negative voltage.

YES Replace the printhead.

Has the problem been resolved?

YES End of procedure.

NO Go to A

NO Are cables CN3 and CN7 on the control board properly connected to the power supply unit?

NO Connect them correctly.

YES Replace the power supply unit.

A

Replace the PROMs on the control board. Has the problem been resolved?

YES End of procedure.

NO Replace the control board.

Has the problem been resolved?

YES End of procedure.

NO Are the cables connected to CN2 and CN6 on the control board damaged?

YES Replace the cables.

NO Check the MENU Settings related to the interface. Baud Rate Character Format Protocol
BUSY Signal output selection

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RAP 07: Ribbon Feed Trouble

START

Remove the ribbon cartridge and rotate the ribbon cartridge ribbon feed knob.

Does it rotate smoothly?

YES Check to see if the ribbon lock mechanism has been disengaged.

NO Replace the ribbon cartridge.

Manually shift the carriage to the left and to the right.

Does the ribbon feed shaft rotate?

NO Replace the ribbon feed assembly.

After the replacement, adjust the backlash between the space motor gear and bevel gear.

YES Check that the ribbon feed shaft is correctly engaged with the ribbon feed roller of the ribbon cartridge.

RAP 08: Line Feed Trouble

START

Manually rotate the platen knob.

Does it rotate smoothly?

NO Set the release lever to the open side.

Does the platen knob rotate smoothly?

NO Adjust the mini-pitch belt tension.

YES Perform the following.

1. Check for correct phasing of push tractor (left or right).
2. Replace the push tractor (left or right).
3. Check for smooth meshing of platen gear, idle gear, and drive gear.
4. Remove any foreign matter or dust on the platen gear, idle gear, or drive gear.

YES Is cable CN6 on the control board connected correctly?

NO Connect it correctly.

YES Is cable CN101 on the interface connector board connected correctly?

NO Connect it correctly.

YES Is cable CN102 on the interface connector board connected correctly?

NO Connect it correctly.

YES Replace the control board.

Has the problem been resolved?

YES End of procedure.

NO Replace the line feed motor.

After replacing the line feed motor, adjust the belt tension.

RAP 09: Malfunction of Operator Panel Switch

START

Is cable CN1 on the operator panel connected correctly?

NO Connect it correctly.

YES Is cable CN10 on the operator panel connected correctly?

NO Connect it correctly.

YES Replace the operator panel.

Has the problem been resolved?

YES End of procedure.

NO Replace the control board.

RAP 10A: Data Receive Failure

START

Is the SELECT lamp blinking?

YES Modify the menu to Ignore DC3.

NO Is the ALARM lamp ON?

YES Refer to RAP 10D.

NO Is the SELECT lamp ON?

NO Place the printer ON-LINE.

YES Is the interface cable connected correctly?

NO Connect it correctly.

YES Is cable CN101 on the interface connector board connected correctly?

NO Connect it correctly.

YES Is cable CN6 on the operator panel connected correctly?

NO Connect it correctly.

YES Are you using a parallel interface?

YES Refer to RAP 10B.

NO Refer to RAP 10C.



RAP 10B: Parallel Interface Problem

START

Replace the Master and Slave Program ROMs.

Has the problem been resolved?

YES End of procedure.

NO Replace the control board.

Has the problem been resolved?

YES End of procedure.

NO Perform the following:

1. Replace the interface connector board.
2. Replace the cable connected to CN6 on the control board.

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RAP 10C: Serial Interface Problem

START

Correctly set the interface menu parameters.

1. Baud rate.
2. Character format.
3. Protocol.
4. Busy signal polarity.

Has the problem been resolved?

YES End of procedure.

NO Are +/-8vdc outputs provided on the control board?

NO Replace the power supply unit.

YES Refer to RAP 10B.

Has the problem been resolved?

YES End of procedure.

NO Replace the power supply board.

Has the problem been resolved?

YES End of procedure.

NO Perform the procedures listed below.

1. Replace the interface connector board.
2. Replace the cable connected to CN6 on the control board.

RAP 10D: Data Receive Failure (Alarm Light Lit)

START

Remove the upper cover.

Press and hold the cover open microswitch while powering ON the printer.

Does the alarm lamp come on?

NO Perform the operations listed below.

1. Correctly connect cable CN13 on the control board.
2. Check the alignment between the front access cover and the COVER OPEN switch.
3. Replace the COVER OPEN microswitch/cable assembly.

YES Is the paper properly installed?

NO Install the paper properly.

YES Does the continuous form end microswitch function correctly?

NO Perform the operations listed below.

1. Correctly connect CN103 on the interface connector board.
2. Replace the sheet feeder assembly L.

YES Does the single sheet end sensor function correctly?

NO Perform the operations listed below.

1. Check that there is no dirt or dust on the sensor surface.
2. Correctly connect CN1 on the sensor board.
3. Replace the sensor cable assembly.

YES Does the bottom feed paper end sensor function correctly?

NO Perform the operations listed below.

1. Check that there is no dirt or dust on the sensor on the sensor board.
2. Correctly connect cable CN4 on the control board.
3. Replace the sensor board.

YES Go to A.

A

Does the release lever microswitch function correctly?

NO Perform the operations listed below.

1. Correctly connect cable CN9 on the main control board.
2. Replace the release lever, microswitch, and cable assembly.

YES Replace the control board.

Has the problem been resolved?

YES End of procedure.

NO Contact Okidata Technical Support.

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RAP 11: Color Ribbon Shift Problem

START

Does the ribbon shift mechanism operate properly?

NO Go to A.

YES Is BLACK RIBBON set on the menu?

NO Go to B.

YES Set another color.

Has the problem been resolved?

NO Go to B.

YES End of procedure.

A

Is the ribbon installed properly?

NO Correct the ribbon installation.

YES Go to C.

B

Are CN4 on the control board and CN2 on the sensor board connected correctly?

NO Connect the cables correctly.

YES Replace the control board.

Has the problem been resolved?

YES End of procedure.

NO Replace the ribbon/bail motor assembly.

Has the problem been resolved?

YES End of procedure.

NO Go to A.

C

Check the parts listed below.

1. Shoulder screw
2. Ribbon shift arm and spring
3. Roller lever
4. Ribbon cartridge balance spring

Are they normal?

NO Correct the installation or replace the defective assembly.

YES Check the parts listed below.

1. Ribbon shift cam and gear
2. Ribbon shift cam/lever assembly

Has the problem been resolved?

YES End of procedure.

NO Go to D.

D

Check the parts listed below.

1. Ribbon shift cam and gear
2. Ribbon shift cam/lever assembly

Are they normal?

YES Replace the sensor board.

NO Correct the installation or replace the defective assembly.

Has the problem been resolved?

YES End of procedure.

NO Replace the control board.

4.8 PRINTER TESTS

4.8.01 Rolling ASCII Print Test

General Information

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

Use the Rolling ASCII Test to check the items listed below.

Print Quality

Across the entire length of a line

Down the entire page

Line Spacing

Character Formation

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

CAUTION:

If 13.6 inch Paper Width is selected in the Menu, and you run this test with 8.5 inch wide paper loaded, the Microline 395 will print on the platen. This may damage the platen, ribbon and printhead.

Procedure

1. Check the Paper Width setting in the Menu. Load the appropriate width paper or modify the menu setting.
2. Verify that the printer is loaded with paper.
3. Verify that the ribbon is installed.
4. Turn the printer power OFF.
5. Press and hold the PARK/TOF switch while powering ON the printer. If the printer is powered on and the Rolling ASCII Test does not start, you may have released the PARK/TOF switch too soon.
6. To stop the Rolling ASCII Test, press the SELECT switch or power OFF the printer.

Rolling ASCII Print Test Sample

```
ML395      IE  A P  F/W 01.13  YR408- -1314
          RES 01.11
!"#%&'()*+,-./0123456789:;<=>?@ABCDEFGHI JKLMNOPQRSTUVWXYZ[\]^_`abcde
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGH: IJKLMNQRSTUvwxyz[\]^_`abcde
"#%&'()*+,-./0123456789:;<=>?@ABCDEFGHI: KLMNOPQRSTUVWXYZ[\]^_`abcde
#%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJ LMNOPQRSTUVWXYZ[\]^_`abcde
$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKI MNOPQRSTUVWXYZ[\]^_`abcde
%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKL: NOPQRSTUVWXYZ[\]^_`abcde
&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLM: OPQRSTUVWXYZ[\]^_`abcde
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN: PQRSTUVWXYZ[\]^_`abcde
()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO: RSTUvwxyz[\]^_`abcde
}()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO: RSTUvwxyz[\]^_`abcde
*+,-./0123456789:;<=>?@ABCDEFGHIJK
```

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4.8.02 Font Test

General Information

This test will print samples of these fonts.

LQ - ROMAN 10 cpi,

LQ - SWISS 10 cpi,

LQ - COURIER 10 cpi, 12 cpi, 15 cpi, 17.1 cpi, 20 cpi

LQ - ORATOR 10 cpi,

LQ - 12 cpi

UTILITY - 10 cpi, 12 cpi, 15 cpi

HSD - 15 cpi

LQ - SWISS Double Width / Height

LQ - SWISS Proportional

LQ - ROMAN Proportional

LQ - ORATOR 10 cpi, 12 cpi

LQ - COURIER Proportional

Procedure:

1. Verify that the printer is loaded with paper.
2. Power OFF the printer.
3. Press and hold the LINE FEED switch while powering ON the printer. If the font test does not print after you power ON the printer, you may have released the LINE FEED switch too soon.
4. To stop the test, press the SELECT switch or power OFF the printer.

Font Test Sample

ML395 IE A P F/W 01.13 YR4084-1314
RES 01.11

LQ-ROMAN 10 CPI

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTU VWXYZ[\]^_`abcdefghijklmnop
pqrstuvwxyz{|}~ !"#\$%&'()*+,-./0123456789:;<=>?@ABCL:FGHIJKLMNQRSTU VWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz{|}~

LQ-ROMAN PROPORTIONAL

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTU VWXYZ [\]^_`abcdefghijklmnopqrstu vwxyz{
}~ !"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTU VWX Z[\]^_`abcdefghijklmnopqrstu vwxy
z{}

LQ-SWISS 10 CPI

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTU VWXYZ[\]^_`abcdefghijklmnop
pqrstuvwxyz{|}~ !"#\$%&'()*+,-./0123456789:;<=>?@ABCL:FGHIJKLMNQRSTU VWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz{|}~

LQ-SWISS PROPORTIONAL

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTU VWXYZ [\]^_`abcdefghijklmnopqrstu vwxyz{
}~ !"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTU VWX Z[\]^_`abcdefghijklmnopqrstu vwxy
z{}

LQ-COURIER 10 CPI

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTU VWXYZ[\]^_`abcdefghijklmnop
pqrstuvwxyz{|}~ !"#\$%&'()*+,-./0123456789:;<=>?@ABCL:FGHIJKLMNQRSTU VWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz{|}~

LQ-COURIER 12 CPI

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTU VWXYZ[\]^_`abcdefghijklmnopqrstu vwxyz{
}~ !"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTU VWXYZ[\]^_`abcdefghijklmnopqrstu vwxyz{
}~ !"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTU VWXYZ[\]^_`abcdefghijklmnopqrstu vwxyz{
}~

LQ-ORATOR 10 CPI

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTU VWXYZ[\]^_`ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]^_`ABCDEFGHIJKLMNQRSTU VWXYZ[\]^_`
ABCDEFGHIJKLMNQRSTU VWXYZ[\]^_`

LQ-ORATOR 12 CPI

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTU VWXYZ[\]^_`ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]^_`ABCDEFGHIJKLMNQRSTU VWXYZ[\]^_`
ABCDEFGHIJKLMNQRSTU VWXYZ[\]^_`
ABCDEFGHIJKLMNQRSTU VWXYZ[\]^_`

LQ-12 CPI

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTU VWXYZ[\]^_`abcdefghijklmnopqrstu vwxyz{
}~ !"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTU VWXYZ[\]^_`abcdefghijklmnopqrstu vwxyz{
}~

4.8.03 Serial Interface - Loopback Test

NOTE: In order to run this test, a serial loopback test connector must be attached to the printers serial port.

Procedure

1. Place the printer in the Serial Diagnostic Mode

Set the DIAGNOSTIC TEST menu item to YES.

2. Turn the printer power OFF.

3. Attach the loopback test connector to the printers serial port.

4. Install continuous feed paper.

5. Power ON the printer.

6. The message LOOP TEST will be printed.

7. The size of the Message Buffer will be printed.

8. One of the following messages will be printed next.

If the message **OK** is printed, the serial interface function has been tested and no problems were found.

If the message **IF BAD** is printed, 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 then stores the characters.

12. The data is then printed.

13. The test will run until the SELECT switch is pressed or the printer is powered OFF.

Serial Loopback Plug Diagram

TD	2
RD	3
RTS	4
CTS	5
CD	8
SSD	11
DTR	20
DSR	6

RS232-C (DB 25P Plug)

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4.8.04 Hexadecimal Dump

General Information

Hexadecimal Dump Mode allows you to test the data being sent from the computer to the printer. When the printer is in Hex Dump Mode, all data received (including text and printer commands) will be printed in both hexadecimal and ASCII format.

NOTE: *In ASCII format, all non-printable characters are 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 Hex 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 hexadecimal dump 65 63 69 6D 61 6C 20 64 75 6D 70 2E 0D 0A

Procedure

1. Verify that paper is loaded.
2. Verify that the ribbon is installed.
3. Power OFF the printer.
4. Press and hold SELECT and FORM FEED while powering ON the printer.
5. The printer will print the line shown below.

HEX DATA DUMP

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

4.9 RESISTANCE CHECKS

4.9.01 General Information

The following resistance charts are included in this section.

Printhead Resistance

Line Feed Motor Resistance

Space Motor Resistance

Ribbon Motor Resistance

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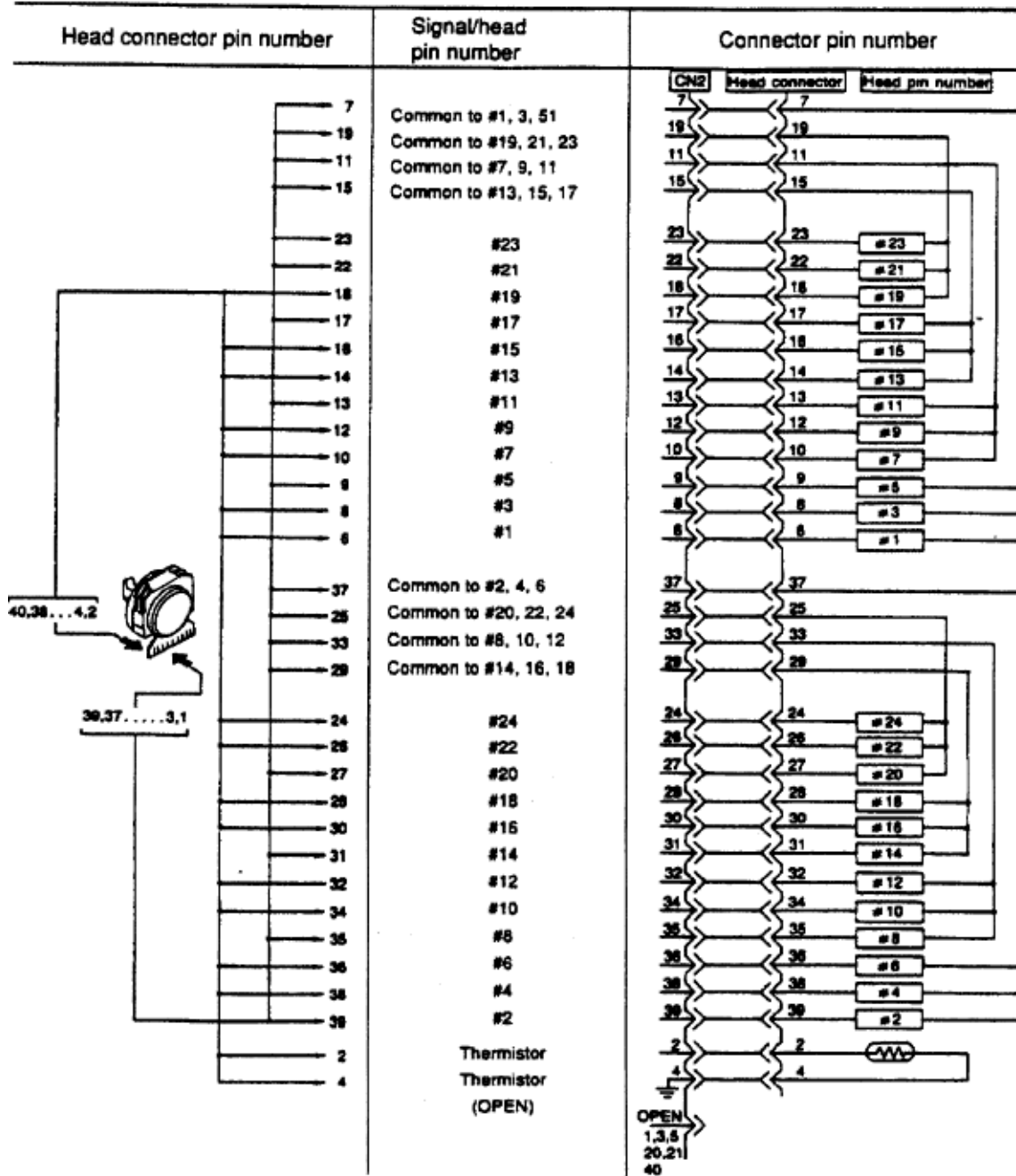


Service Guide ML395/395C

Chapter 4 Failure & Repair Analysis

4.9.02 Printhead Resistance Check

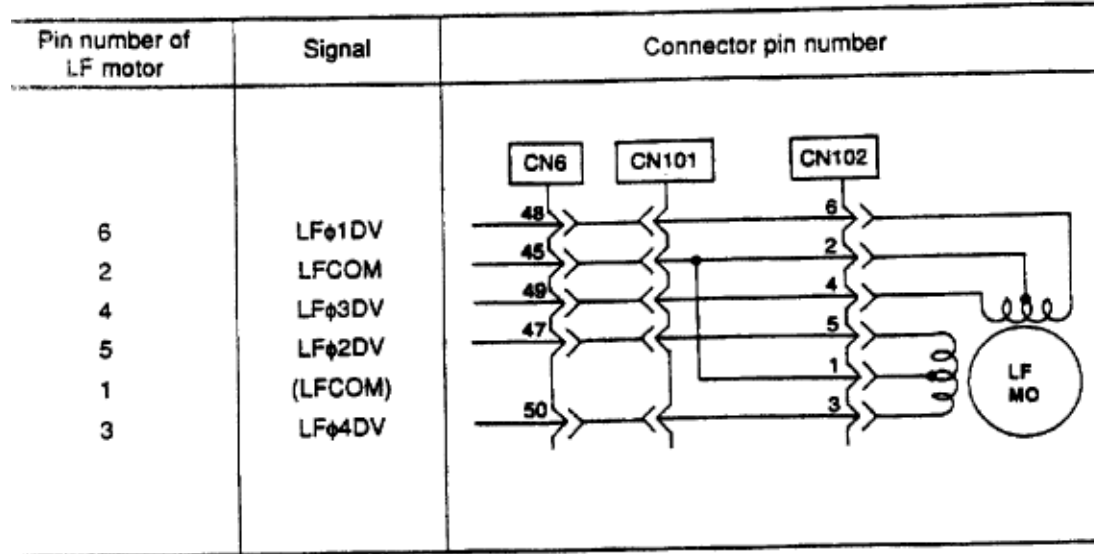
The resistance of each coil should be about 4.5 ohms.



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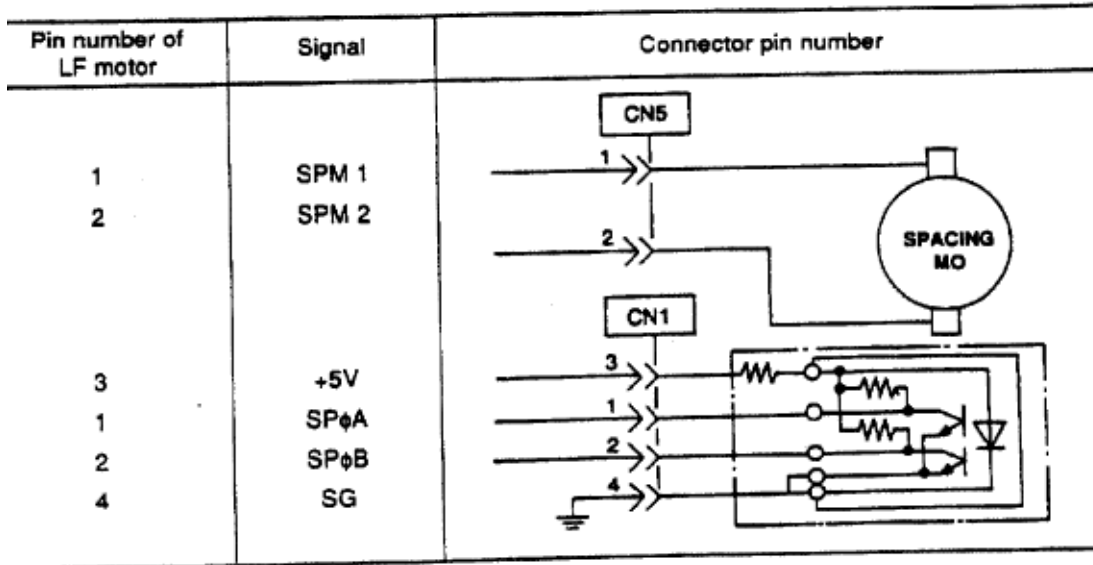
4.9.03 Line Feed Motor Resistance Check

The resistance of each coil should be about 5.6 ohms.



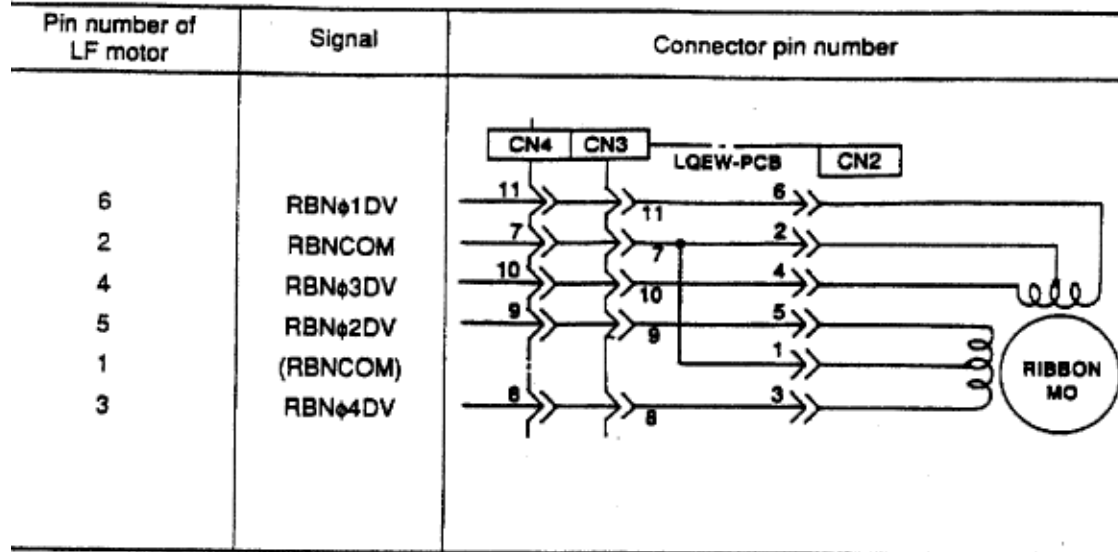
4.9.04 Space Motor Resistance Check

The resistance of the motor should be about 11.4 ohms.



4.9.05 Ribbon Motor Resistance Check

The resistance of each coil should be about 34 ohms



A.1 OVERVIEW

A.1.01 General Information

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

The following areas are covered.

Firmware

Fuses

Jumpers

Sensors

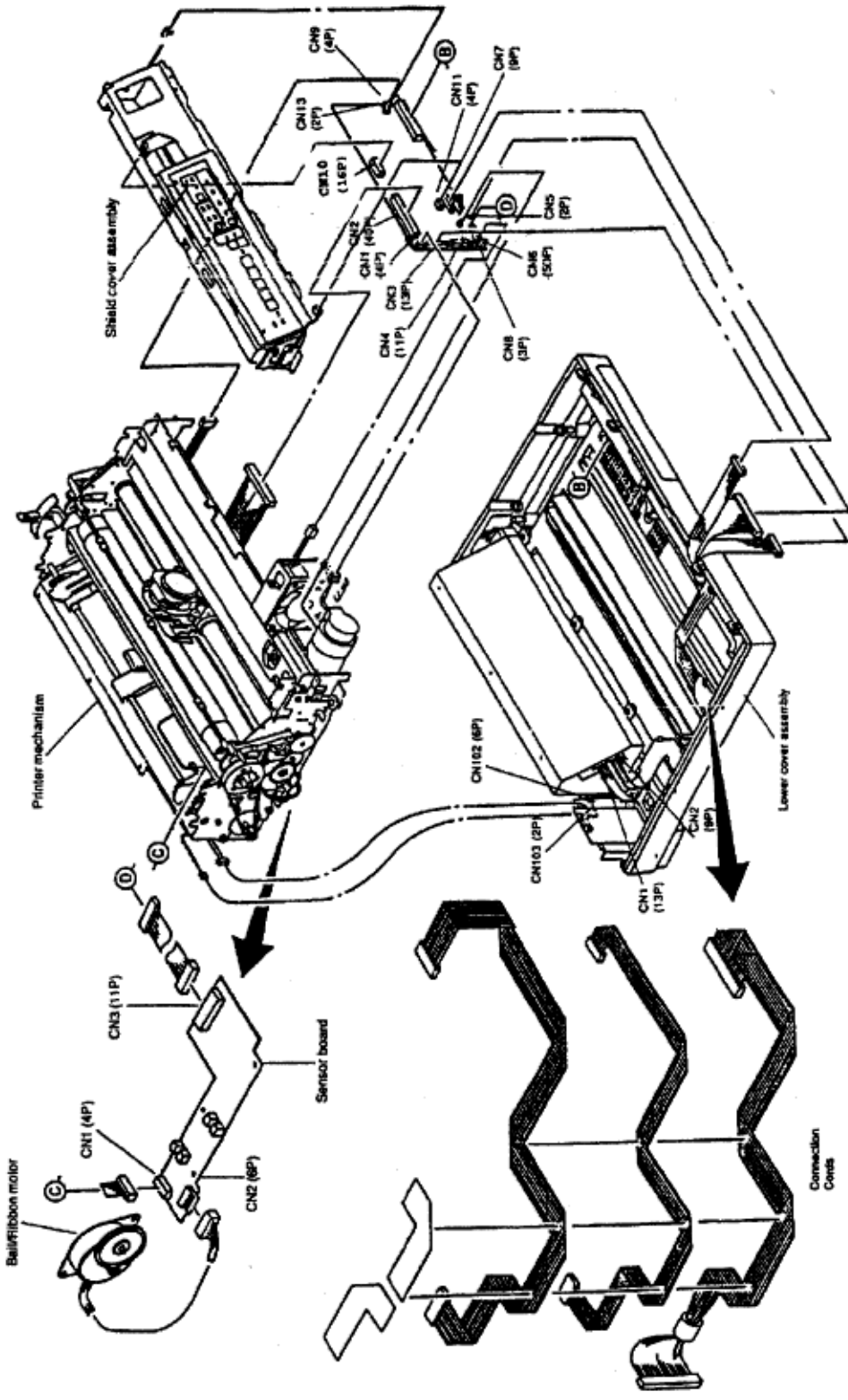
Switches

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	TFCB-1,2	A.2.01
Power Supply Board	POW	A.2.02
Interface Board	TFIF	A.2.03
Sensor Board	LQEW	A.2.04
Operator Panel Board	TFOP	A.2.05



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A.2.01 Main Controller Board (TFCB)**Firmware**

Q6: Program ROM of Master MPU

Q7: Character Generator ROM

Q17: Program ROM of Slave MPU

Fuses

F1 2.0 Amp 125V. Protects the +38 vdc circuit

Jumpers

SP1

Hard wired

SP2

A Side: indicates that the Font ROM is masked within the CPU (Q-11).

B Side: indicates that the Font ROM is located in IC socket (Q-7)

SP3

OPEN - Monochrome Model

SHORTED - Color Model

Sensors

NONE

Switches

NONE

Test Points

+ 38 vdc Printhead, space/linefeed/bail-ribbon motor drive voltage.

Check on both ends of Capacitor C2.

+ 5 vdc Logic IC/LED drive voltage.

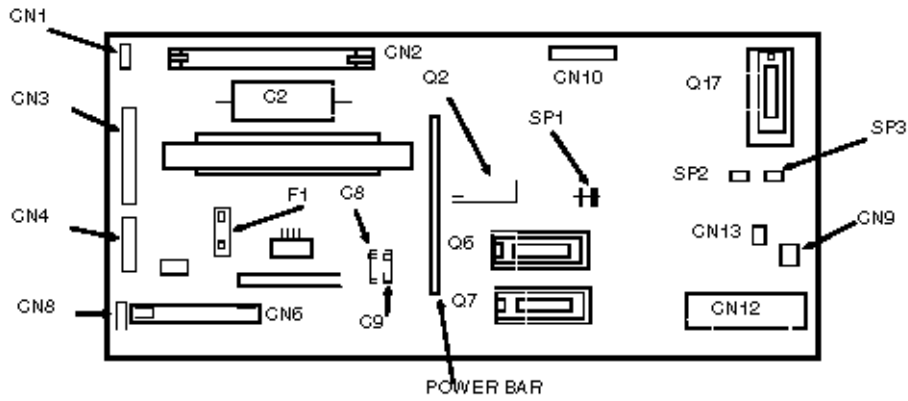
Check between pin 16 of Q2 and the power bar.

+ 8 vdc Line feed motor holding voltage and serial interface line voltage.

Check both ends of C9.

-8 vdc Serial interface line voltage.

Check both ends of C8.



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Service Manual for the ML395/395C
Chapter A Board Diagrams



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A.2.02 Power Supply Board (POW)**Firmware**

NONE

Fuses

F1 10.0 Amp 125V : AC line fuse

Jumpers

NONE

Sensors

NONE

Switches

NONE

Test Points

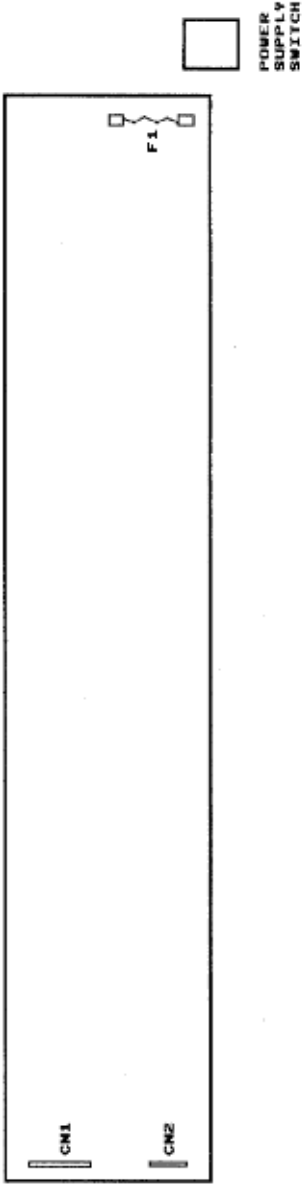
+ 38 vdc: Check CN1 Pin 6

+ 8 vdc: Check CN2 Pin 6

- 8 vdc: Check CN2 Pin 7

+ 5 vdc: Check CN2 Pin 4

Signal Ground: Check CN2 Pin 2 or Pin 3



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A.2.03 Interface Board (TFIF)**Firmware**

NONE

Fuses

NONE

Jumpers

SP101

A Side - Auto Feed XT signal of Centronics I/F valid

B Side - Auto Feed XT signal of Centronics I/F invalid

SP102

A Side - I-Prime signal of Centronics I/F is invalid

B Side - I-Prime signal of Centronics I/F is valid

SP103

A Side - + 5 vdc is output to pin 18 of Centronics I/F.

B Side - + 5 vdc is not output to pin 18 of Centronics I/F.

Sensors

NONE

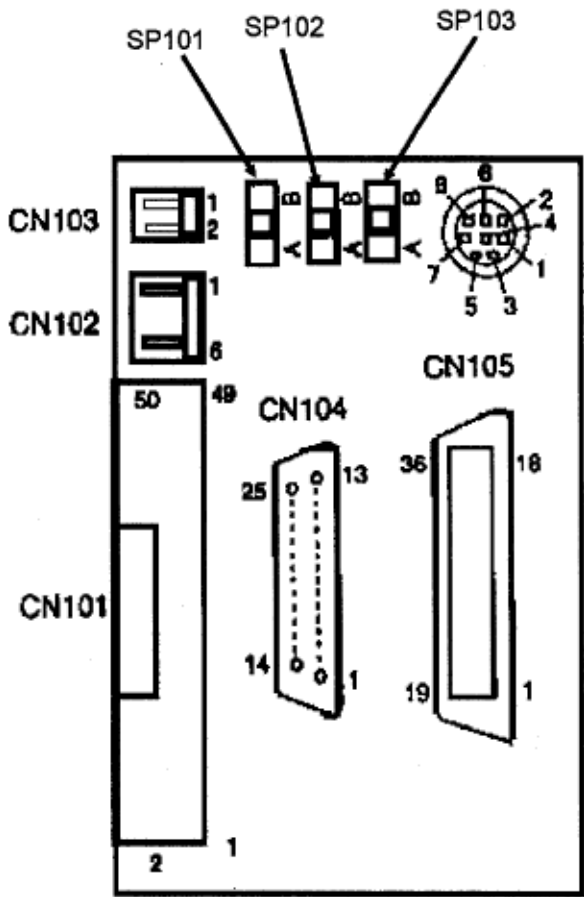
Switches

SW101

This switch toggles between serial and parallel interface

Test Points

NONE



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Chapter

**Change sp102 jumper to the following:
SP102**

A Side - I-Prime signal of Centronics I/F is invalid

B Side - I-Prime signal of Centronics I/F is valid

per Don Deswert

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Chapter A Board Diagrams



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A.2.04 Sensor Board (LQEW)**Firmware**

NONE

Fuses

NONE

Jumpers

NONE

Sensors

Bottom Paper Sensor (BES)

Bail Arm Sensor (BHS)

Ribbon Shift Sensor (RHS)

Located on sensor board in color model *ONLY*

CN1 Connector for Cut-Sheet Paper Photosensor

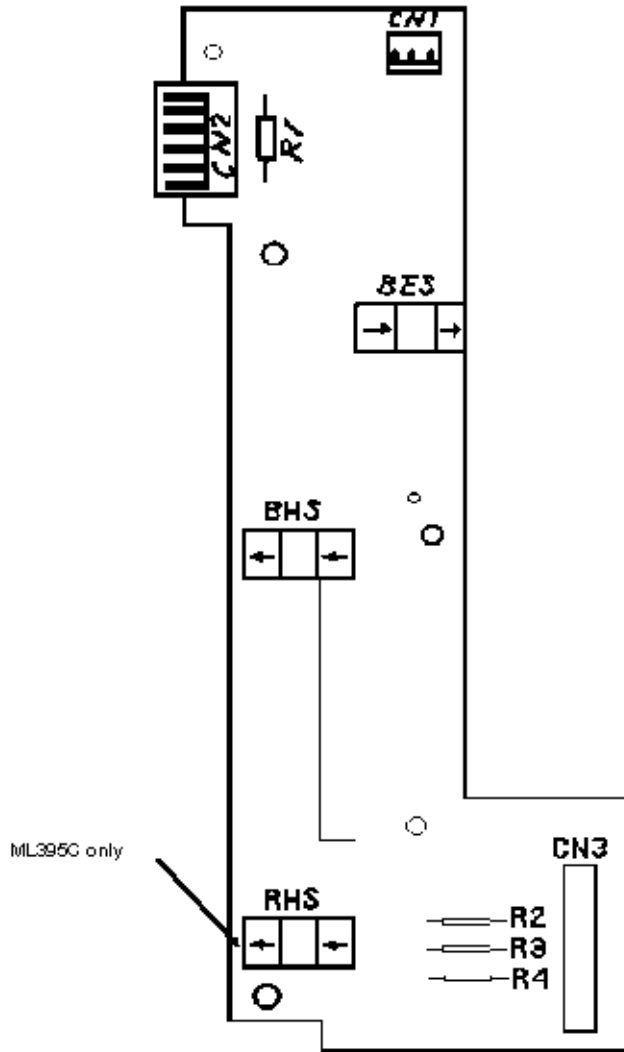
The Cut-Sheet Paper Photosensor is located on the Paper Pressure Guide

Switches

NONE

Test Points

NONE



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A.2.05 Operator Panel (TFOP)**Firmware**

NONE

Fuses

NONE

Jumpers

NONE

Sensors

NONE

Switches

10 contact switches which control the following functions.

Select/Deselect (SEL)

Line Feed (LF)

Form Feed (FF)

Top of Form Set/ Park (TOF)

Quite Mode Select (QU)

Print Quality (PQ)

Character Pitch (CP)

Font Select (FSEL)

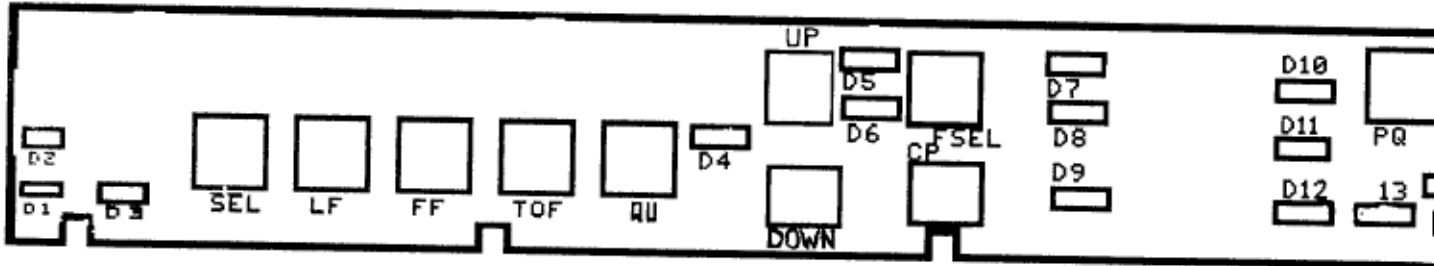
Micro Feed Up (UP)

Micro Feed Down (DOWN)

NOTE: The silk screening of QU and SEL on the operator panel board (TFOP) is incorrect. Their positions are reversed.

Test Points

NONE



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Service Guide ML395/395C

Chapter 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).

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

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 Oki-J P/N	Description	Comments Refer to B.1.02	Disassembly 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

Please refer to either of 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.

REMEMBER

Current part numbers, recommended stocking levels, and pricing information are available through Okilink II and Faxable Facts. Refer to the Introduction of this Service Handbook for information on accessing these resources.

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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 products 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.

395

This part is used exclusively by the Microline 395 printer.

395C

This part is used exclusively by the Microline 395C Printer.

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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)

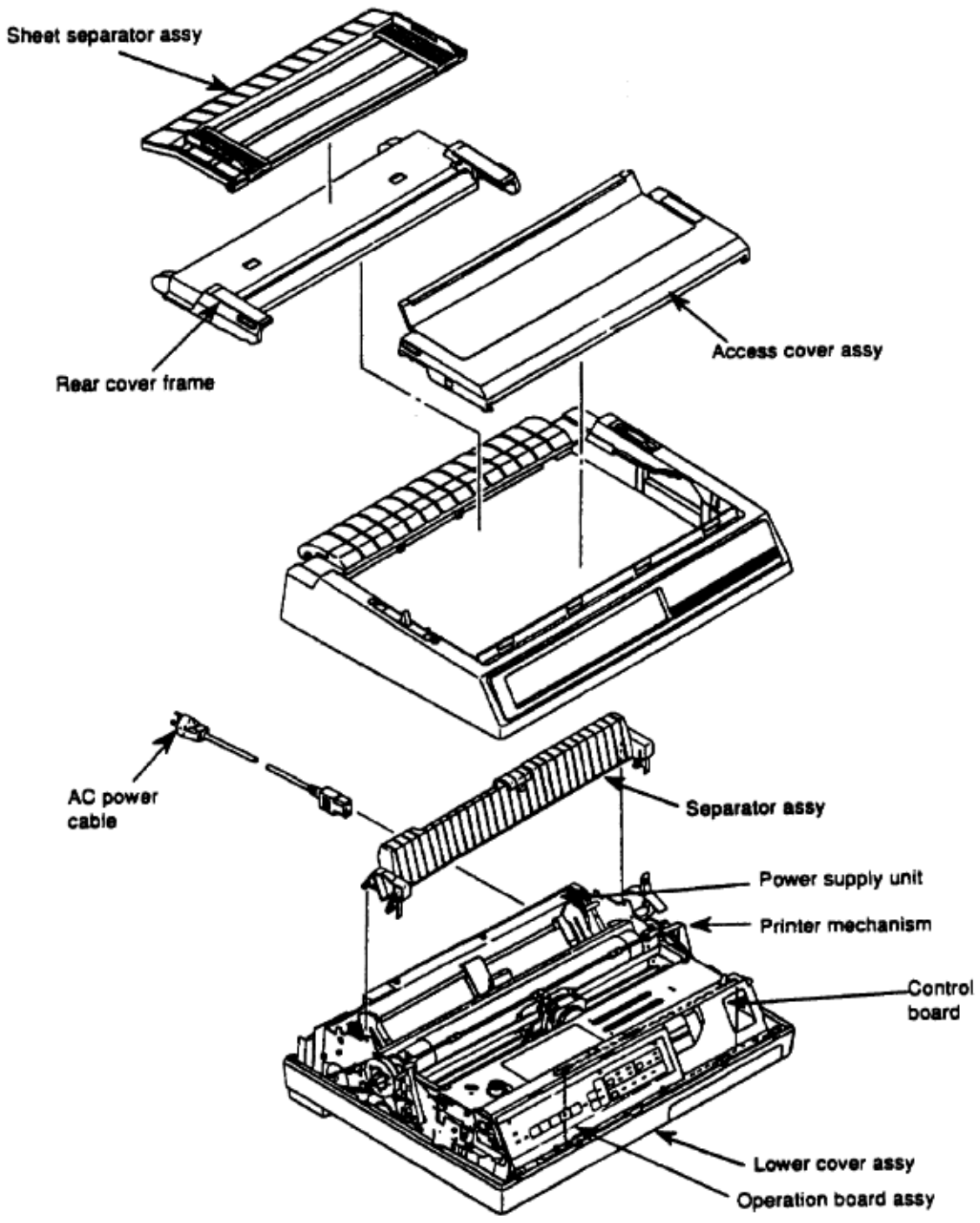
Use this Appendix, Okilink II, Faxable Facts, or contact Okidata Technical Support to find the correct part number. Refer to the Service Center Reference Guide for information on contacting Okidata.

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B.2 CHARTS

Index to Charts



Below is an index to the illustrated parts breakdown charts.

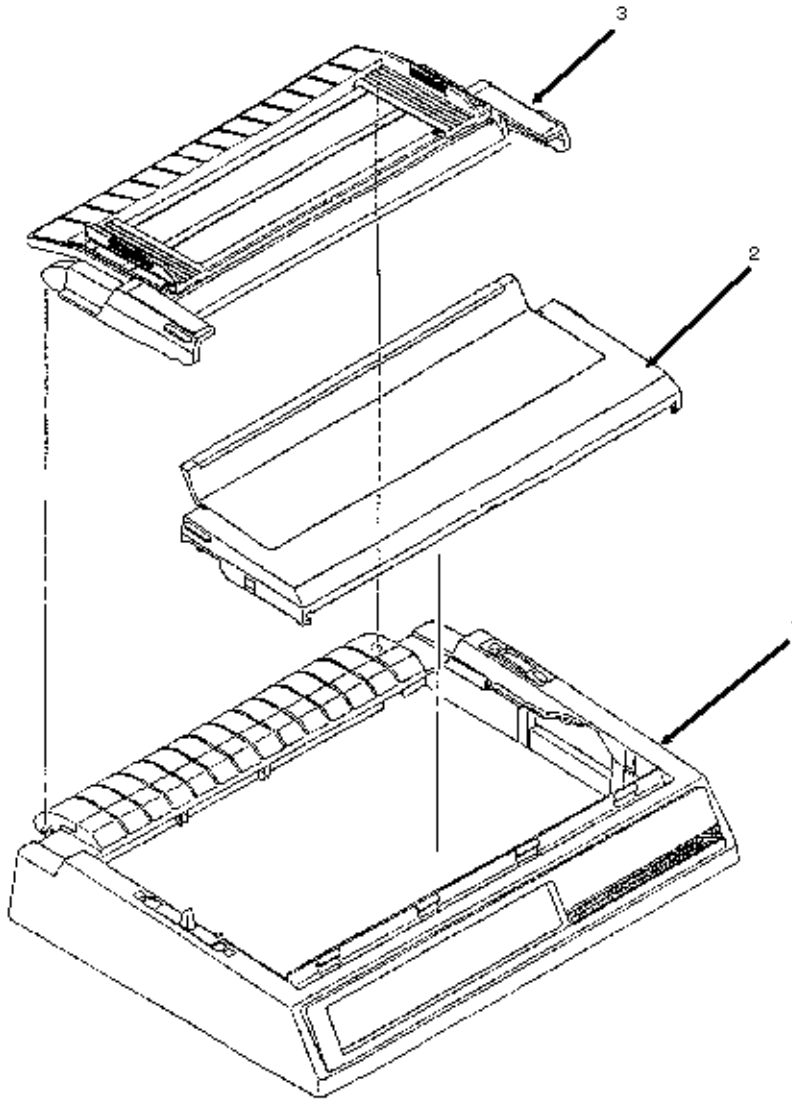
Description	Section
Upper Cover Assembly	B.2.01 

Printer Unit General Assembly	B.2.02 
Operator Panel	B.2.03 
Carriage Assembly (Black and White)	B.2.04 
Carriage Assembly (Color)	B.2.05 
Printer Unit - Black and White (1 of 3)	B.2.06 
Printer Unit - Black and White (2 of 3)	B.2.07 
Printer Unit - Black and White (3 of 3)	B.2.08 
Printer Unit - Color (1 of 3)	B.2.09 
Printer Unit - Color (2 of 3)	B.2.10 
Printer Unit - Color (3 of 3)	B.2.11 
Cables and Connectors	B.2.12 
Options	B.2.13 
Tractor Assembly (Option)	B.2.14 
Bottom Push Tractor [BTF](Option)	B.2.15 
BTF Pull-Up Roller Assembly (Option)	B.2.16 
Consumables	B.2.17 
Packing Materials	B.2.18 
Documentation	B.2.19 





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B.2.01 Upper Cover Assembly

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.



Item	Okidata P/N Oki-J P/N	Description	Comments Refer to B.1.02	Disassembly Procedure
1	50212441 2PA4016-4723G41	Cover: Middle Assembly (ML395)	RSPL	3.2.04

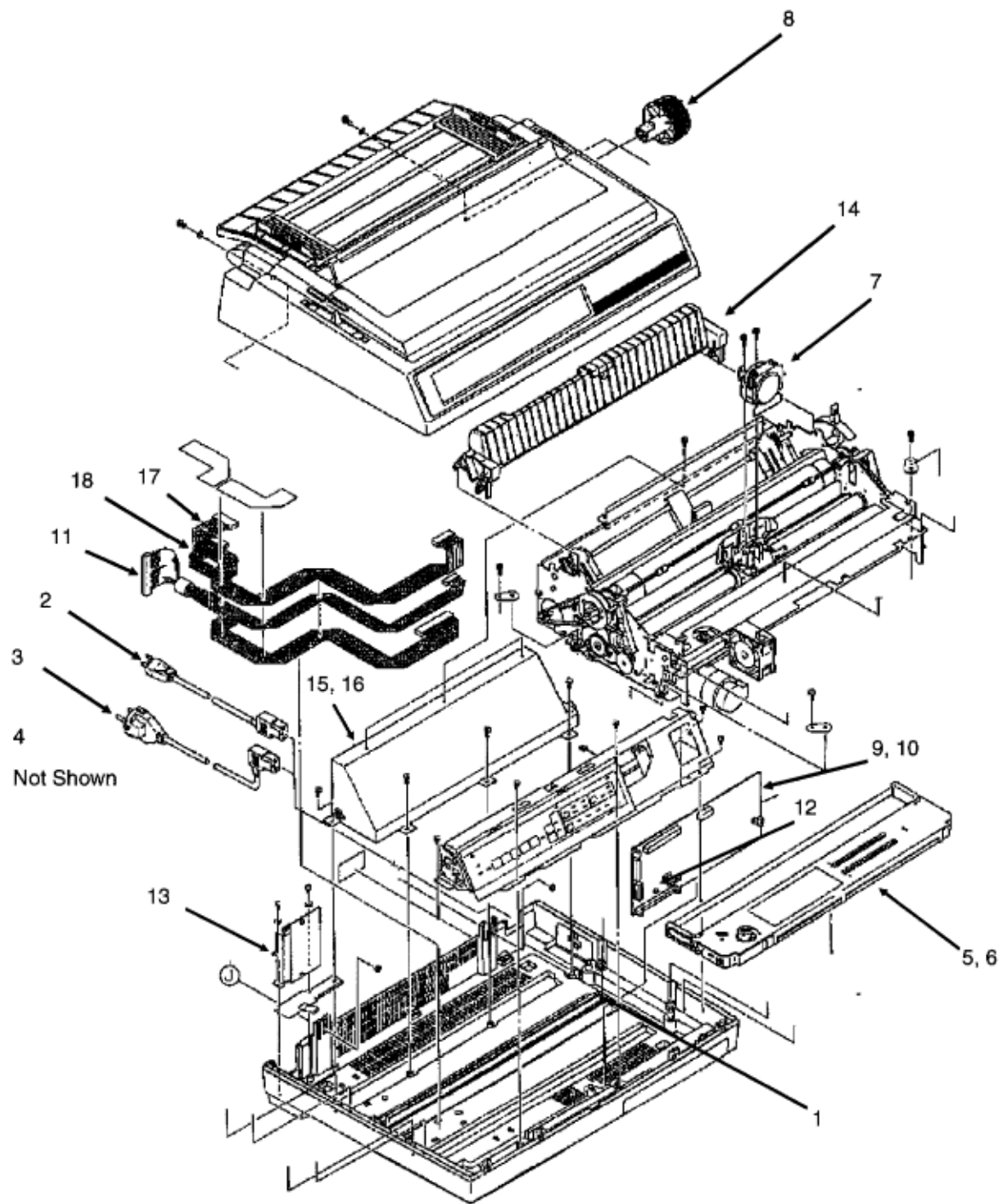
1	50212442 2PA4016-4723G42	Cover: Middle Assembly (ML395 Color)	RSPL	3.2.04 
2	50215701 1PA4049-5837G1	Cover: Access (ML395)	RSPL	3.2.04 
2	50215703 1PA4049-5837G3	Cover: Access (ML395 Color)	RSPL	3.2.04 
3	50215801 1PA4094-5841G1	Cover: Rear (Assembly)	RSPL	3.2.04 

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B.2.02 Printer Unit General Assembly

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.



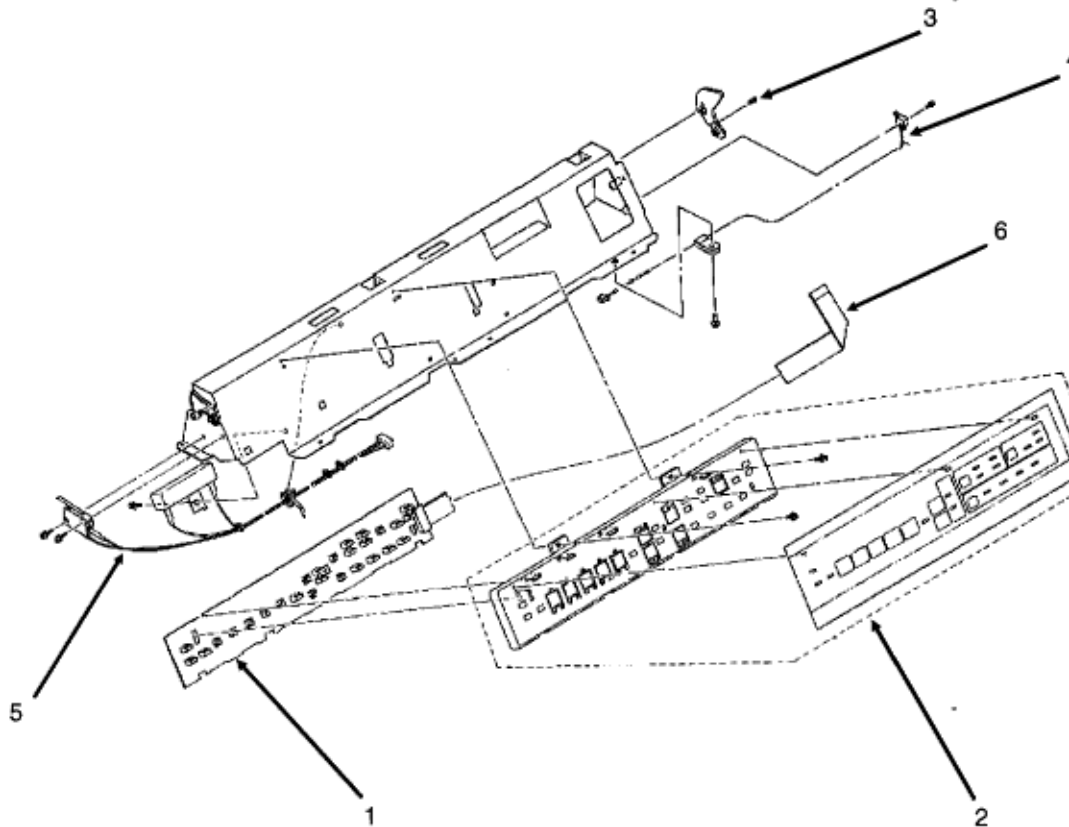
Item	Okidata P/N Oki-J P/N	Description	Comments Refer to B.1.02 📄	Disassembly Procedure
1	N/A 4PB4043-4331P1	Bottom Guide Plate		N/A

2	56609701 3YS4011-1315P1	Cord: AC 120V	RSPL	3.2.01
3	56624101 3YS4011-1265P1	Cord: AC (220V) ML Series Right Ang	Option RSPL	3.2.01
4	70000803 N/A	IBM PC Cable Kit (Interface Cable)		3.2.01
5	52103601 N/A	Ribbon Cartridge (Black) Nylon	Consumable	3.2.01
5	52103801 N/A	Ribbon Cartridge (Black) Film	Consumable	3.2.01
6	52103701 N/A	Ribbon Cartridge (Color)	Consumable	3.2.01
7	50099905 4YA4023-1451G5	Printhead: Assembly ML395	RSPL	3.2.01
8	53478601 3PP4043-2501P1	Knob: Platen	RSPL	3.2.04
9	55071811 4YA4050-3085G11	PCB: TFCB-1 (w/o ROM) ML395 (Black)	RSPL	3.2.06
10	55071812 4YA4050-3085G12	PCB: TFCB-2 (w/o ROM) ML395C (Color)	RSPL	3.2.06
11	56619201 3YS4011-7912G1	Cord: I/F Main PCB Connection (50P)	RSPL	3.2.06
12	56301703 540A2036M1322	Fuse: 3.15A 125V Main Brd TFCB	RSPL	3.2.06
13	55034501 4YA4042-1293G11	PCB: LQPN - I/F Conn (Assembly)	RSPL	3.2.07
14	50215902 3PA4043-4278G1	Separator: Sheet	RSPL	3.2.09
15	56411201 4YB4049-1709P1	Power Supply Assembly 120V	RSPL	3.2.23
16	56406302 4YB4049-1278P2	Power Supply Assembly (220/240V)	Option RSPL	3.2.23
17	56614101 4YS4011-6295G1	Cord: Power Connection (9 Pin)	RSPL	3.2.23
18	56614801 4YS4011-6253G3	Cord: Power Connection (13 pin)	RSPL	3.2.23



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B.2.03 Operator Panel

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.



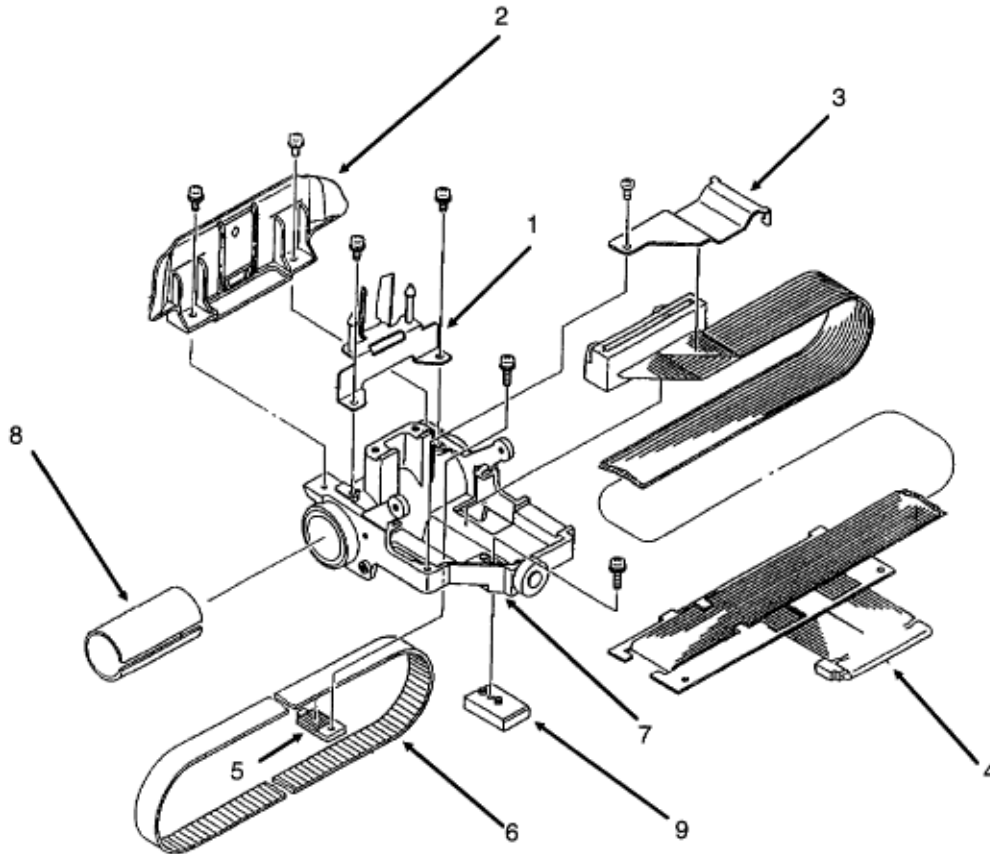
Item	Okidata P/N Oki-J P/N	Description	Comments Refer to B.1.02 📄	Disassembly Procedure
1	55071701 4YA4050-3106G1	PCB: TFOP Op Panel	RSPL	3.2.05 📄
2	50100001 3PP4043-2712G5	Panel: Operator ML395	RSPL	3.2.05 📄
3	50910505 4LB-192200-5	Spring: Cover Open	RSPL	3.2.05 📄
4	56614301 3YX4043-2759G1	Cable: Microswitch (Cover Open)	RSPL	3.2.05 📄

5	56212601 3YX4043-4228G1	Switch: Interlock (Assembly)	RSPL	3.2.05 
6	56628403 4LP-5466-37	Cable: OP (ML395)	RSPL	3.2.05 

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B.2.04 Carriage Assembly (Black and White)

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.



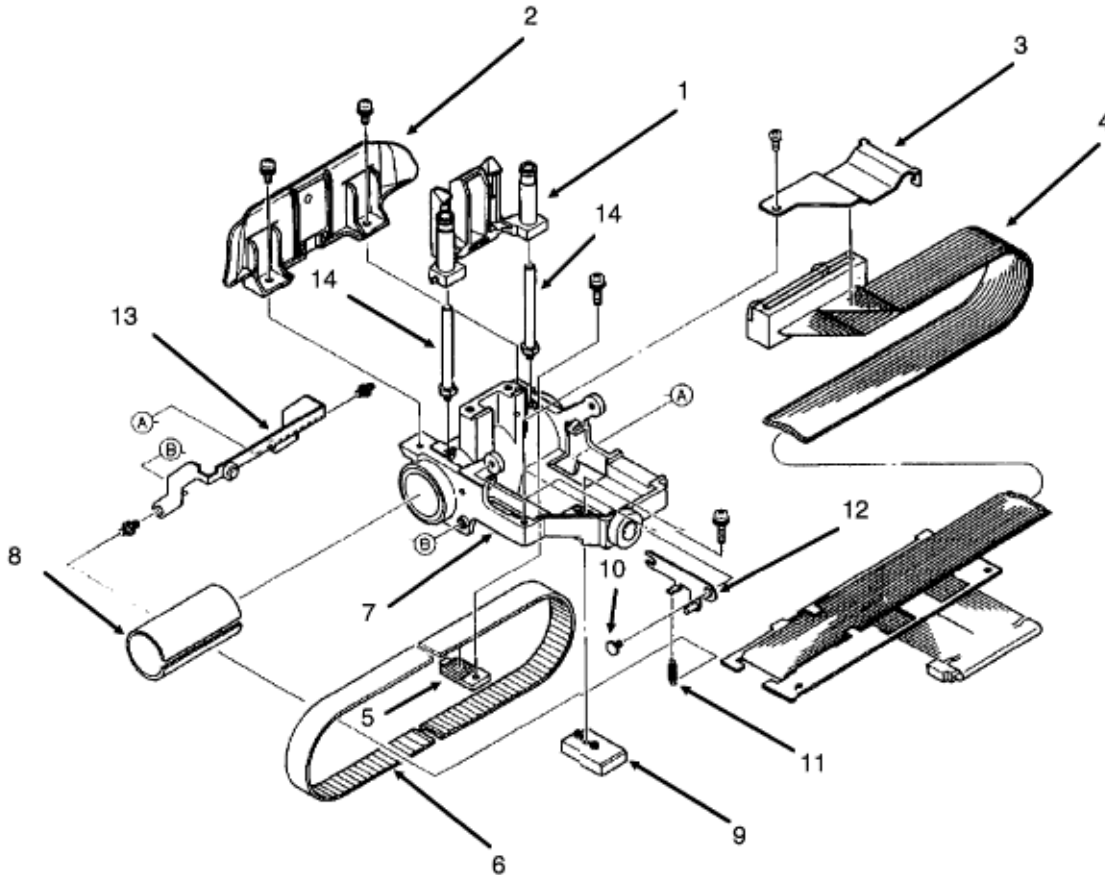
Item	Okidata P/N Oki-J P/N	Description	Comments Refer to B.1.02	Disassembly Procedure
1	53055901 4PP4043-2643G1	Guide: Ribbon (Black)	RSPL	3.2.02
2	53527001 4PP4043-3954G1	Protector: Ribbon	RSPL	3.2.03
3	N/A N/A	Clamp		3.2.11
4	56614201 3YX4043-2713G1	Cable: Printhead (Assembly)	RSPL	3.2.11

5	50702301 N/A	Belt Clamp		3.2.15 
6	51303101 4PB4044-1492P3	Belt: Mini Pitch (Space)	RSPL	3.2.15 
7	50057601 2YX4043-2610G3	Carriage Assembly (Black)		3.2.19 
8	N/A N/A	Spacer: Round		3.2.19 
9	N/A N/A	Spacer		3.2.19 

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B.2.05 Carriage Assembly (Color)

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.



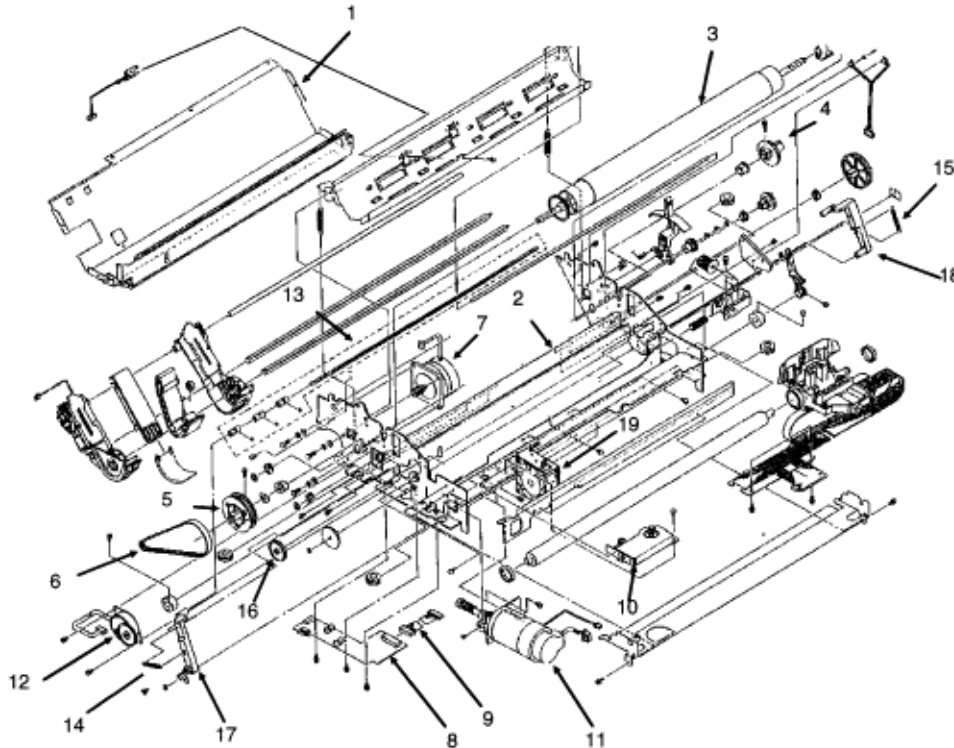
Item	Okidata P/N Oki-J P/N	Description	Comments Refer to B.1.02	Disassembly Procedure
1	53056002 3PP4043-2477P2	Guide: Ribbon (Color)	RSPL	3.2.26
2	53527001 4PP4043-3954G1	Protector: Ribbon	RSPL	3.2.03
3	N/A N/A	Clamp		3.2.11

4	56614201 3YX4043-2713G1	Cable: Printhead (Assembly)	RSPL	3.2.11 
5	50702301 N/A	Belt Clamp		3.2.15 
6	51303101 4PB4044-1492P3	Belt: Mini Pitch (Space)	RSPL	3.2.15 
7	50069401 N/A	Carriage Assembly (Color)		3.2.19 
8	N/A N/A	Spacer: Round		3.2.19 
9	N/A N/A	Spacer		3.2.19 
10	50315401 4PP4043-2745P1	Screw (Color)	RSPL	3.2.24 
11	50924001 4PP4043-3803P1	Spring: Shift Arm (Color)	RSPL	3.2.24 
12	53478901 4PP4043-2776G1	Arm: Ribbon Shift (Color)	RSPL	3.2.24 
13	53479001 4PP4043-2741G1	Lever: Roller (Color)	RSPL	3.2.25 
14	50605701 N/A	Ribbon Guide Post (Color)		3.2.26 

















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B.2.06 Printer Unit - Black and White (1 of 3)

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.

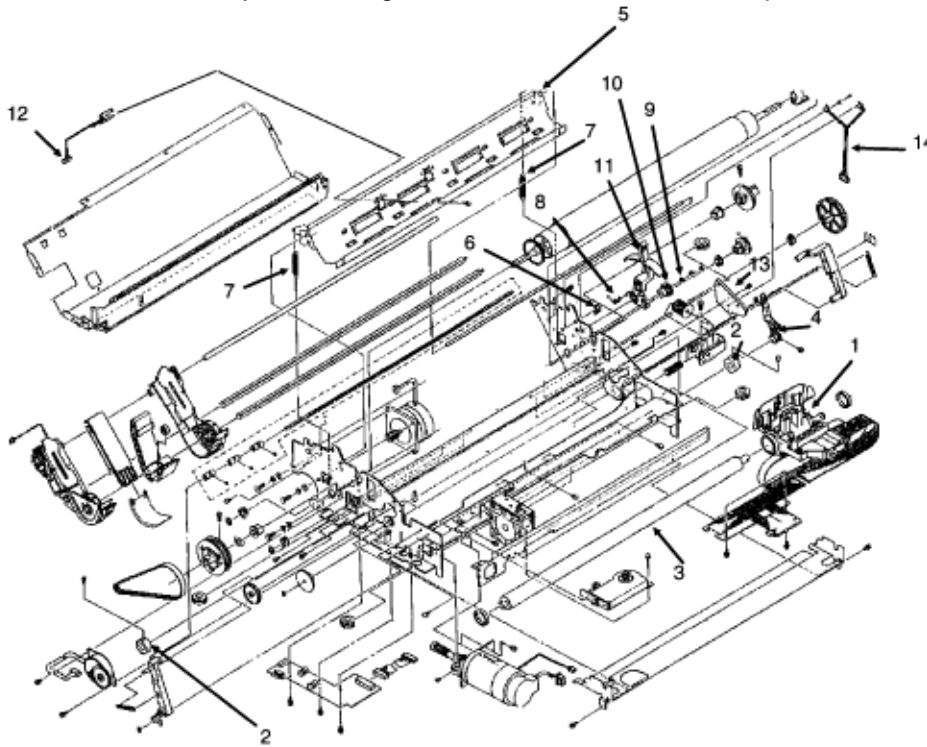


Item	Okidata P/N Oki-J P/N	Description	Comments Refer to B.1.02	Disassembly Procedure
1	N/A 3PB4043-4227P1	Bottom Rear Guide		N/A
2	N/A 3PB4043-4357P1	Bottom Guide		N/A
3	50054101 4PA4043-2556P1	Platen: Assembly	RSPL	3.2.09
4	51214501 3PP4043-2466P1	Gear: Platen "A"	RSPL	3.2.09










5	51215001 4PP4043-2465G1	Pulley: Platen	RSPL	3.2.09 
6	51302790 4LP-1313-239	Belt: Mini Pitch (Line Feed)	RSPL	3.2.09 
7	56510601 3PB4043-4373P1	Motor: Line Feed (ML395)	RSPL	3.2.10 
8	55050501 4YA4042-1462G1	PCB: Sensor (LQEW or LPRW)	RSPL	3.2.12 
8	55050502 4YA4042-146262	PCB: Sensor [LQEW-Z]	RSPL	3.2.12 
9	56619104 4YS4011-4321P1	Cord: Sensor PCB Connection	RSPL	3.2.12 
10	50054301 4PA4043-2584G1	Assembly: Ribbon Feed	RSPL	3.2.13 
11	56506205 3YX4043-2550G5	Motor: Space (ML395)	RSPL	3.2.14 
12	56506301 3PB4043-2601P1	Motor: Step (Bail Arm) Assembly	RSPL	3.2.17 
13	50054401 4PA4043-2711G1	Assembly: Indicator Shaft	RSPL	3.2.18 
14	50910701 4PP4043-2628P1	Spring: Bail Arm (Left)	RSPL	3.2.18 
15	50910801 4LB-193100-2	Spring: Bail Arm (Right)	RSPL	3.2.18 
16	51210201 5LR-193134-1	Gear: Idle (Bail Arm)	RSPL	3.2.18 
17	53478501 3PP4043-2509P1	Bail Arm (Left)	RSPL	3.2.18 
18	53478502 3PP4043-2510P1	Bail Arm (Right)	RSPL	3.2.18 
19	56509501 4YX4043-4219G1	Fan: Cooling	RSPL	3.2.16 

B.2.07 Printer Unit - Black and White (2 of 3)

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.



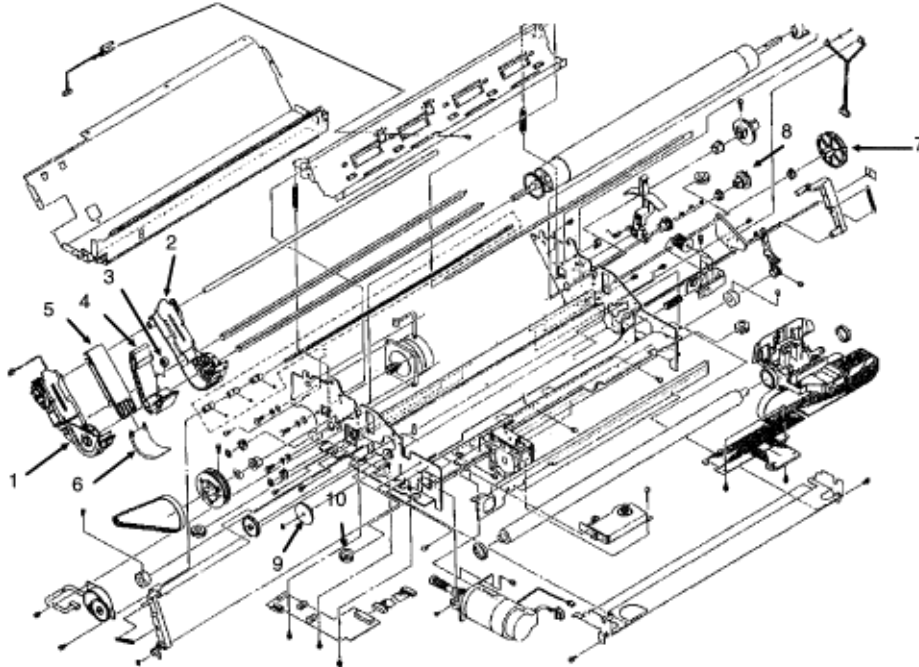
Item	Okidata P/N Oki-J P/N	Description	Comments Refer to B.1.02	Disassembly Procedure
1	50057601 2YX4043-2610G3	Carriage Assembly (Black)		3.2.19
2	50703701 4PP4043-2507P1	Collar: Eccentric Carriage Rail	RSPL	3.2.19
3	51110301 4PB4043-2565P1	Shaft: Carriage	RSPL	3.2.19
4	53478401 3PP4043-2504P1	Lever: Adjust (Printhead Gap)	RSPL	3.2.19
5	N/A 4PB4043-2579P1	Cut Sheet Guide		3.2.20

6	53478801 4PP4043-2460P1	Block: Release Lever Guide	RSPL	3.2.20 
7	50907502 4LB-193400-1	Spring: (Paper Chute)	RSPL	3.2.20 
8	50910201 4PB4043-2754P1	Spring: Detent (Release Lever)	RSPL	3.2.20 
9	50910305 4LB-190600-6	Spring: Idle Gear	RSPL	3.2.20 
10	51214401 4PP4043-2458P1	Gear: Idle (Release Lever)	RSPL	3.2.20 
11	53478706 3PP4043-2459P6	Lever: Release	RSPL	3.2.20 
12	55034801 4YX4043-2576G1	Sensor: Cut-Sheet Paper-End	RSPL	3.2.20 
13	53068602 3PP4043-2505P2	Indicator: PH Gap (Adj Bracket)	RSPL	3.2.21 
14	56209901 4YX4043-2784G1	Switch: Micro (Adj & Release Lever)	RSPL	3.2.21 

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B.2.08 Printer Unit - Black and White (3 of 3)

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.



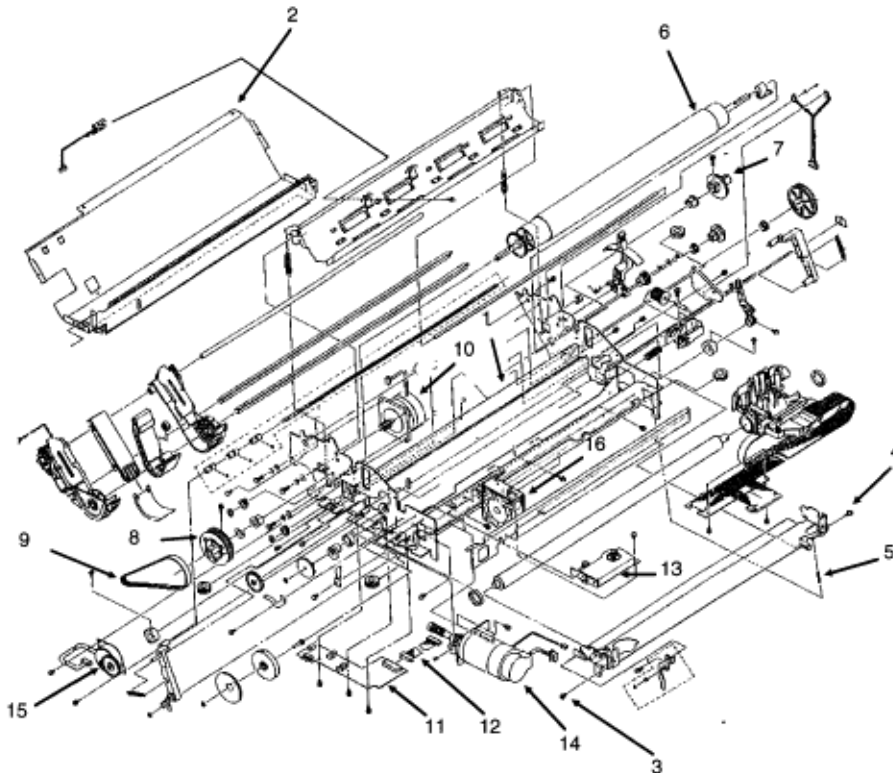
Item	Okidata P/N Oki-J P/N	Description	Comments Refer to B.1.02	Disassembly Procedure
1	50054501 3YX4043-2561G1	Tractor: Push (Left) Assembly	RSPL	3.2.22
2	50054601 3PA4043-2562G1	Tractor: Push (Right) Assembly	RSPL	3.2.22
3	51002301 4PP4043-2451P1	Friction: Piece	RSPL	3.2.22
4	51002401 3PP4043-2451P1	Guide: Center - Upper	RSPL	3.2.22
5	51002501 3PP4043-2453P1	Guide: Center Lower A	RSPL	3.2.22
6	51002601 3PP4043-2454P1	Guide: Center Lower B	RSPL	3.2.22

7	51214201 4PP4043-2456P1	Gear: Drive A	RSPL	3.2.22 
8	51214301 4PP4043-2457P1	Gear: Drive B	RSPL	3.2.22 
9	51214701 3PP4043-2764P1	Cam: Bail Open (Black)	RSPL	3.2.27 
10	50512923 N/A	Rubber Grommet (in base)		N/A













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B.2.09 Printer Unit - Color (1 of 3)

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.



Item	Okidata P/N Oki-J P/N	Description	Comments Refer to B.1.02	Disassembly Procedure
1	N/A 3PB4043-4227P1	Bottom Rear Guide		N/A
2	N/A 3PB4043-4357P1	Bottom Guide		N/A
3	50312103 4LB-130100-3A	Screw: Shoulder (Left) Color	RSPL	N/A
4	50312106 4LB-130100-6A	Screw: Shoulder (Right) Color	RSPL	N/A
5	50910601 4PP4043-2642P1	Spring: Cartridge Balance (Color)	RSPL	N/A

6	50054101 4PA4043-2556P1	Platen: Assembly	RSPL	3.2.09 
7	51214501 3PP4043-2466P1	Gear: Platen "A"	RSPL	3.2.09 
8	51215001 4PP4043-2465G1	Pulley: Platen	RSPL	3.2.09 
9	51302790 4LP-1313-239	Belt: Mini Pitch (Line Feed)	RSPL	3.2.09 
10	56510601 3PB4043-4373P1	Motor: Line Feed (ML395)	RSPL	3.2.10 
11	55050501 4YA4042-1462G1	PCB: Sensor (LQEW or LPRW)	RSPL	3.2.12 
11	55050502 4YA4042-146262	PCB: Sensor [LQEW-Z]	RSPL	3.2.12 
12	56619104 4YS4011-4321P1	Cord: Sensor PCB Connection	RSPL	3.2.12 
13	50054301 4PA4043-2584G1	Assembly: Ribbon Feed	RSPL	3.2.13 
14	56506205 3YX4043-2550G5	Motor: Space (ML395)	RSPL	3.2.14 
15	56506301 3PB4043-2601P1	Motor: Step (Bail Arm) Assembly	RSPL	3.2.17 
16	56509501 4YX4043-4219G1	Fan: Cooling	RSPL	3.2.16 

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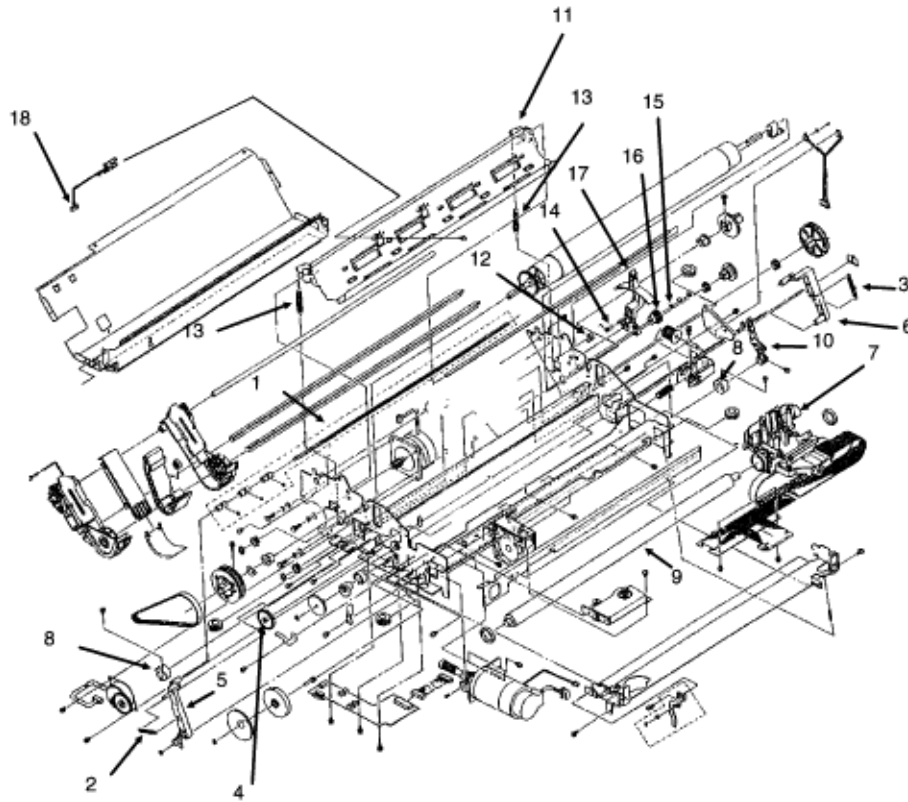


Service Guide ML395/395C

Chapter B Illustrated Parts Listing

B.2.10 Printer Unit - Color (2 of 3)

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.



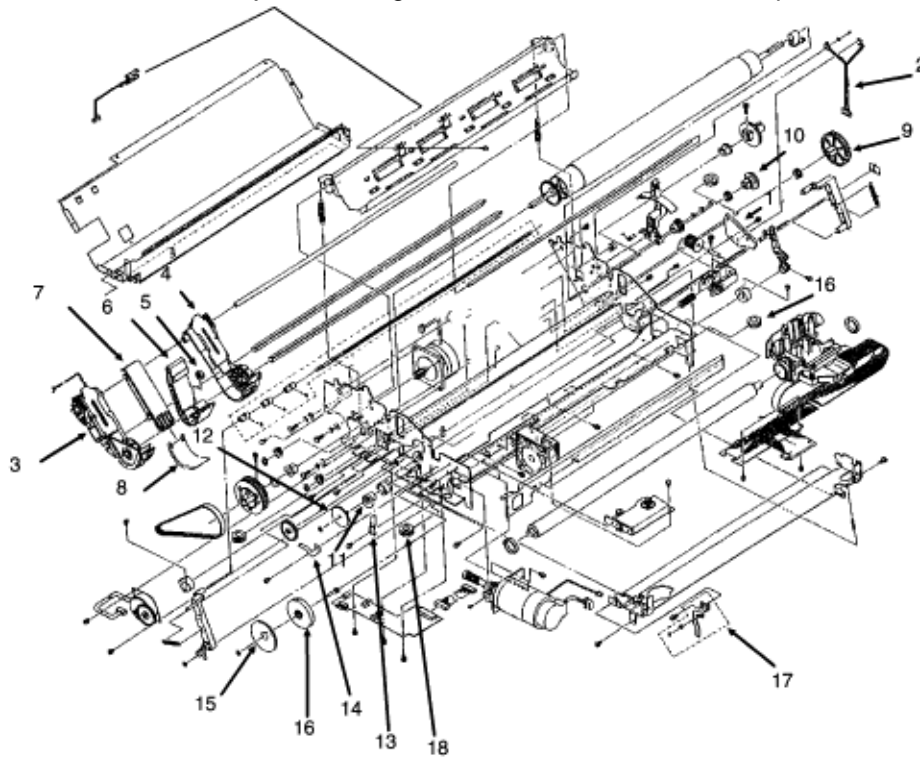
Item	Okidata P/N Oki-J P/N	Description	Comments Refer to B.1.02	Disassembly Procedure
1	50054401 4PA4043-2711G1	Assembly: Indicator Shaft	RSPL	3.2.18
2	50910701 4PP4043-2628P1	Spring: Bail Arm (Left)	RSPL	3.2.18
3	50910801 4LB-193100-2	Spring: Bail Arm (Right)	RSPL	3.2.18
4	51210201 5LR-193134-1	Gear: Idle (Bail Arm)	RSPL	3.2.18
5	53478501 3PP4043-2509P1	Bail Arm (Left)	RSPL	3.2.18

6	53478502 3PP4043-2510P1	Bail Arm (Right)	RSPL	3.2.18 
7	50069401 N/A	Carriage Assembly (Color)		3.2.19 
8	50703701 4PP4043-2507P1	Collar: Eccentric Carriage Rail	RSPL	3.2.19 
9	51110301 4PB4043-2565P1	Shaft: Carriage	RSPL	3.2.19 
10	53478401 3PP4043-2504P1	Lever: Adjust (Printhead Gap)	RSPL	3.2.19 
11	N/A 4PB4043-2579P1	Cut Sheet Guide MM		3.2.20 
12	53478801 4PP4043-2460P1	Block: Release Lever Guide	RSPL	3.2.20 
13	50907502 4LB-193400-1	Spring: (Paper Chute)	RSPL	3.2.20 
14	50910201 4PB4043-2754P1	Spring: Detent (Release Lever)	RSPL	3.2.20 
15	50910305 4LB-190600-6	Spring: Idle Gear	RSPL	3.2.20 
16	51214401 4PP4043-2458P1	Gear: Idle (Release Lever)	RSPL	3.2.20 
17	53478706 3PP4043-2459P6	Lever: Release	RSPL	3.2.20 
18	55034801 4YX4043-2576G1	Sensor: Cut-Sheet Paper-End	RSPL	3.2.20 













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B.2.11 Printer Unit - Color (3 of 3)

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.



Item	Okidata P/N Oki-J P/N	Description	Comments Refer to B.1.02	Disassembly Procedure
1	53068602 3PP4043-2505P2	Indicator: PH Gap (Adj Bracket)	RSPL	3.2.21
2	56209901 4YX4043-2784G1	Switch: Micro (Adj & Release Lever)	RSPL	3.2.21
3	50054501 3YX4043-2561G1	Tractor: Push (Left) Assembly	RSPL	3.2.22
4	50054601 3PA4043-2562G1	Tractor: Push (Right) Assembly	RSPL	3.2.22
5	51002301 4PP4043-2451P1	Friction: Piece	RSPL	3.2.22

6	51002401 3PP4043-2451P1	Guide: Center - Upper	RSPL	3.2.22 
7	51002501 3PP4043-2453P1	Guide: Center Lower A	RSPL	3.2.22 
8	51002601 3PP4043-2454P1	Guide: Center Lower B	RSPL	3.2.22 
9	51214201 4PP4043-2456P1	Gear: Drive A	RSPL	3.2.22 
10	51214301 4PP4043-2457P1	Gear: Drive B	RSPL	3.2.22 
11	51222601 3PP4043-3321P1	Cam: Bail Open (Color)	RSPL	3.2.27 
12	51214601 4PP4043-2499P1	Gear: Bail Open (Color)	RSPL	3.2.27 
13	50911001 N/A	Brake Spring - B (Color)		3.2.27 
14	50910901 N/A	Brake Spring - A		3.2.28 
15	51215101 4PP4043-2729P1	Gear: Ribbon Shift (Color)	RSPL	3.2.28 
16	51222501 2PP4043-3325P1	Cam: Ribbon Shift (Color)	RSPL	3.2.28 
17	50054701 4PA4043-2710G1	Lever: Shift Cam (Color)	RSPL	3.2.29 
18	50512923 N/A	Rubber Grommet (in base)		N/A

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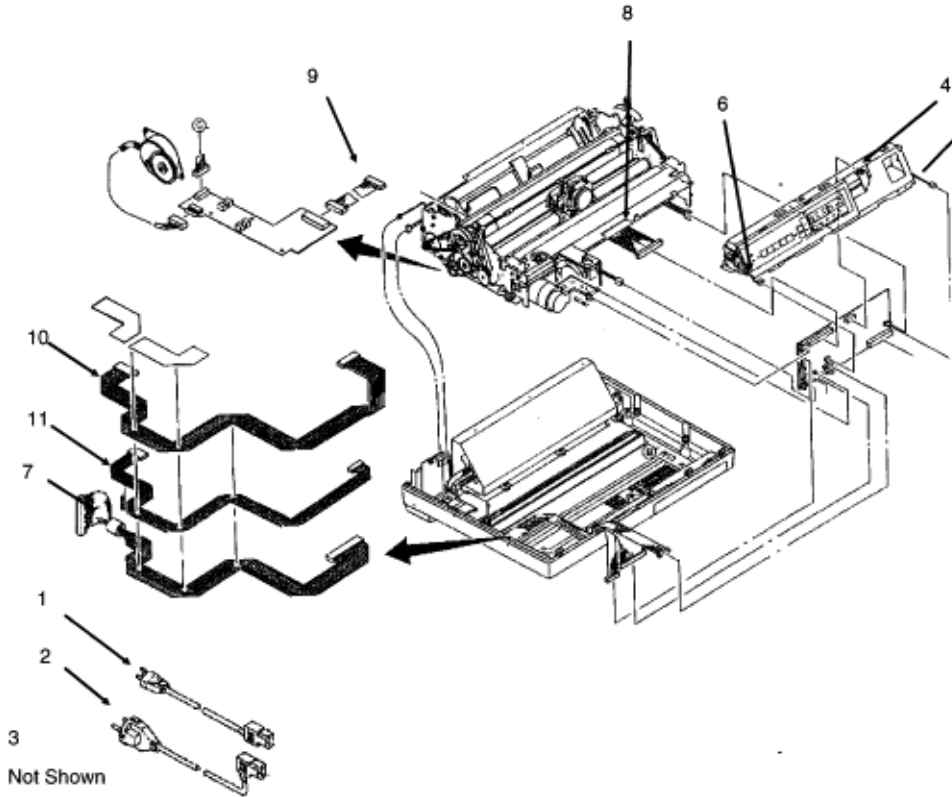


Service Guide ML395/395C








Chapter B Illustrated Parts Listing

B.2.12 Cables and Connectors

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.



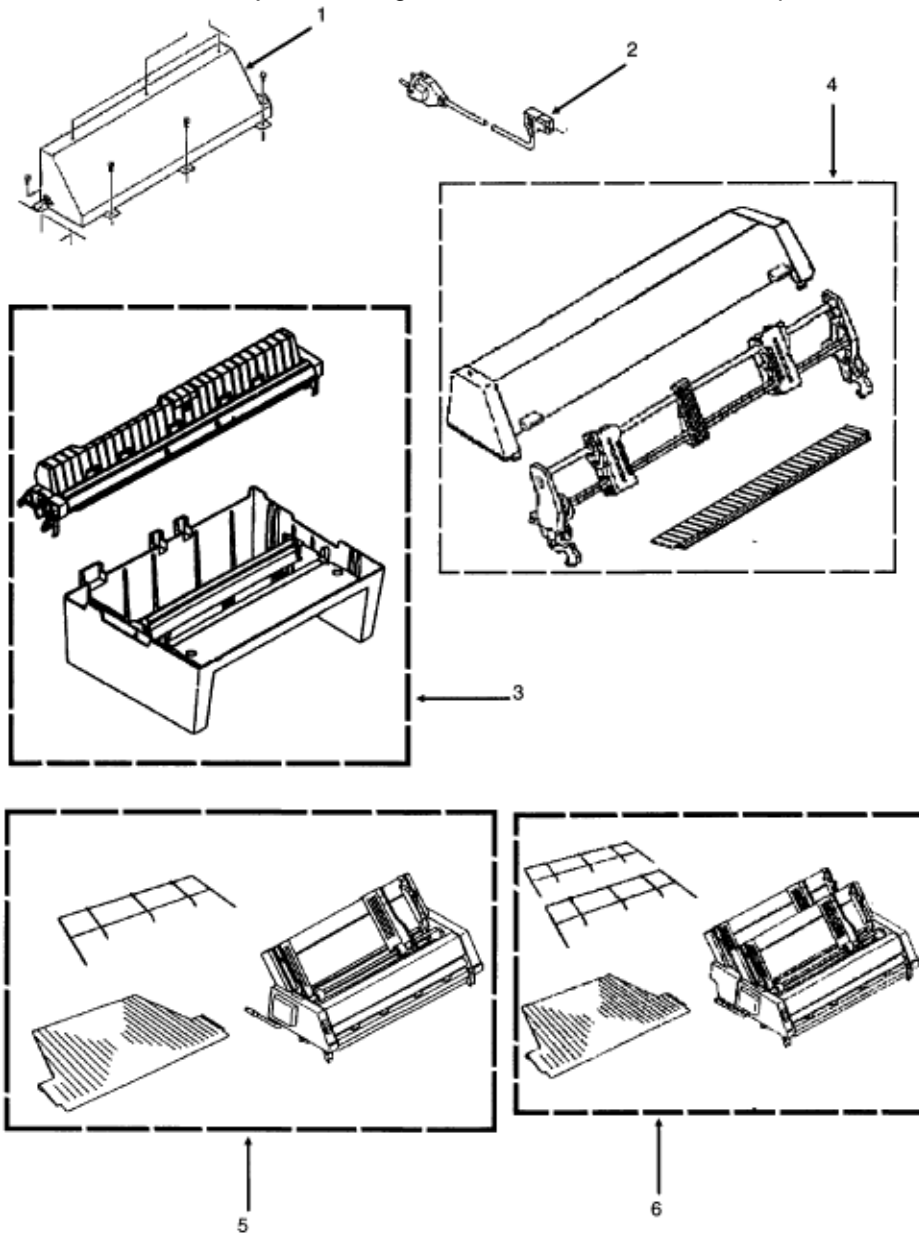
Item	Okidata P/N Oki-J P/N	Description	Comments Refer to B.1.02	Disassembly Procedure
1	56609701 3YS4011-1315P1	Cord: AC 120V	RSPL	3.2.01
2	56624101 3YS4011-1265P1	Cord: AC (220V) ML Series Right Ang	Option RSPL	3.2.01
3	70000803 N/A	IBM PC Cable Kit (Interface Cable)		3.2.01
4	56614608 N/A	Operator Panel Cable		3.2.05





4	56628403 4LP-5466-37	Cable: OP (ML395)	RSPL	3.2.05 
5	56614301 3YX4043-2759G1	Cable: Microswitch (Cover Open)	RSPL	3.2.05 
6	56212601 3YX4043-4228G1	Switch: Interlock (Assembly)	RSPL	3.2.05 
7	56619201 3YS4011-7912G1	Cord: I/F Main PCB Connection (50P)	RSPL	3.2.06 
8	56614201 3YX4043-2713G1	Cable: Printhead (Assembly)	RSPL	3.2.11 
9	56619104 4YS4011-4321P1	Cord: Sensor PCB Connection	RSPL	3.2.12 
10	56614101 4YS4011-6295G1	Cord: Power Connection (9 Pin)	RSPL	3.2.23 
11	56614801 4YS4011-6253G3	Cord: Power Connection (13 pin)	RSPL	3.2.23 

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B.2.13 Options

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.



Item	Okidata P/N Oki-J P/N	Description	Comments Refer to B.1.02 	Disassembly Procedure
1	56406302 4YB4049-1278P2	Power Supply Assembly (220/240V)	Option RSPL	3.2.23 
2	56624101 3YS4011-1265P1	Cord: AC (220V) ML Series Right Ang	Option RSPL	3.2.01 
3	70021601 N/A	Bottom Push Tractor Feed Unit	Option	3.2.30 
4	70011701 N/A	Pull Tractor Assembly (Top Mount)	Option	N/A
5	70010601 N/A	Cut-Sheet Feeder Single Bin CSF 30001	Option	N/A
6	70010701 N/A	Cut-Sheet Feeder Dual Bin CSF 30002	Option	N/A

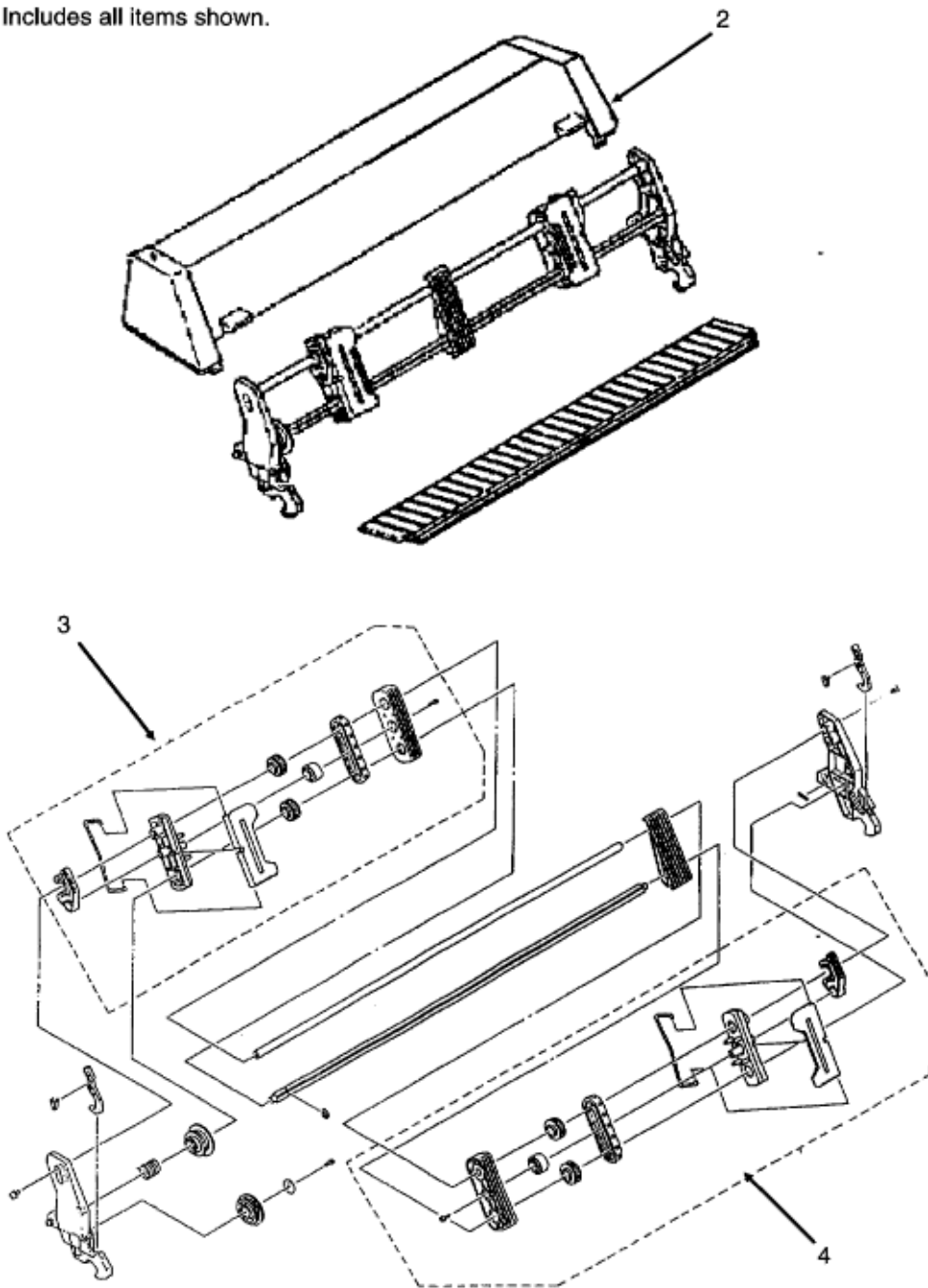
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B.2.14 Pull Tractor Assembly (Option)

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.

1 - Includes all items shown.



Item	Okidata P/N Oki-J P/N	Description	Comments Refer to B.1.02 	Disassembly Procedure
1	56406302 4YB4049-1278P2	Power Supply Assembly (220/240V)	Option RSPL	3.2.23 

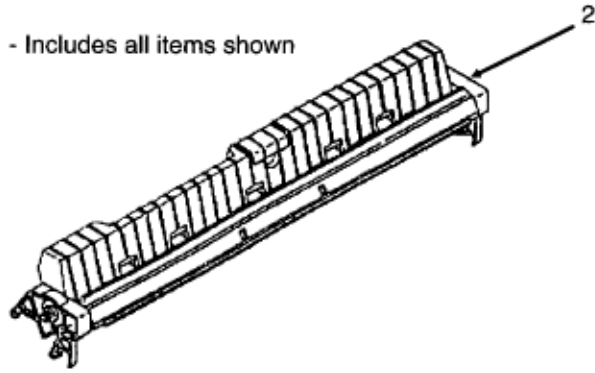
2	56624101 3YS4011-1265P1	Cord: AC (220V) ML Series Right Ang	Option RSPL	3.2.01 
3	70021601 N/A	Bottom Tractor Feed Unit (Push)	Option	3.2.30 
4	70011701 N/A	Pull Tractor Assembly (Top Mount)	Option	N/A
5	70010601 N/A	Cut-Sheet Feeder Single Bin CSF 30001	Option	N/A
6	70010701 N/A	Cut-Sheet Feeder Dual Bin CSF 30002	Option	N/A

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B.2.15 Bottom Tractor Feed Unit (Push) [BTF] (Option)

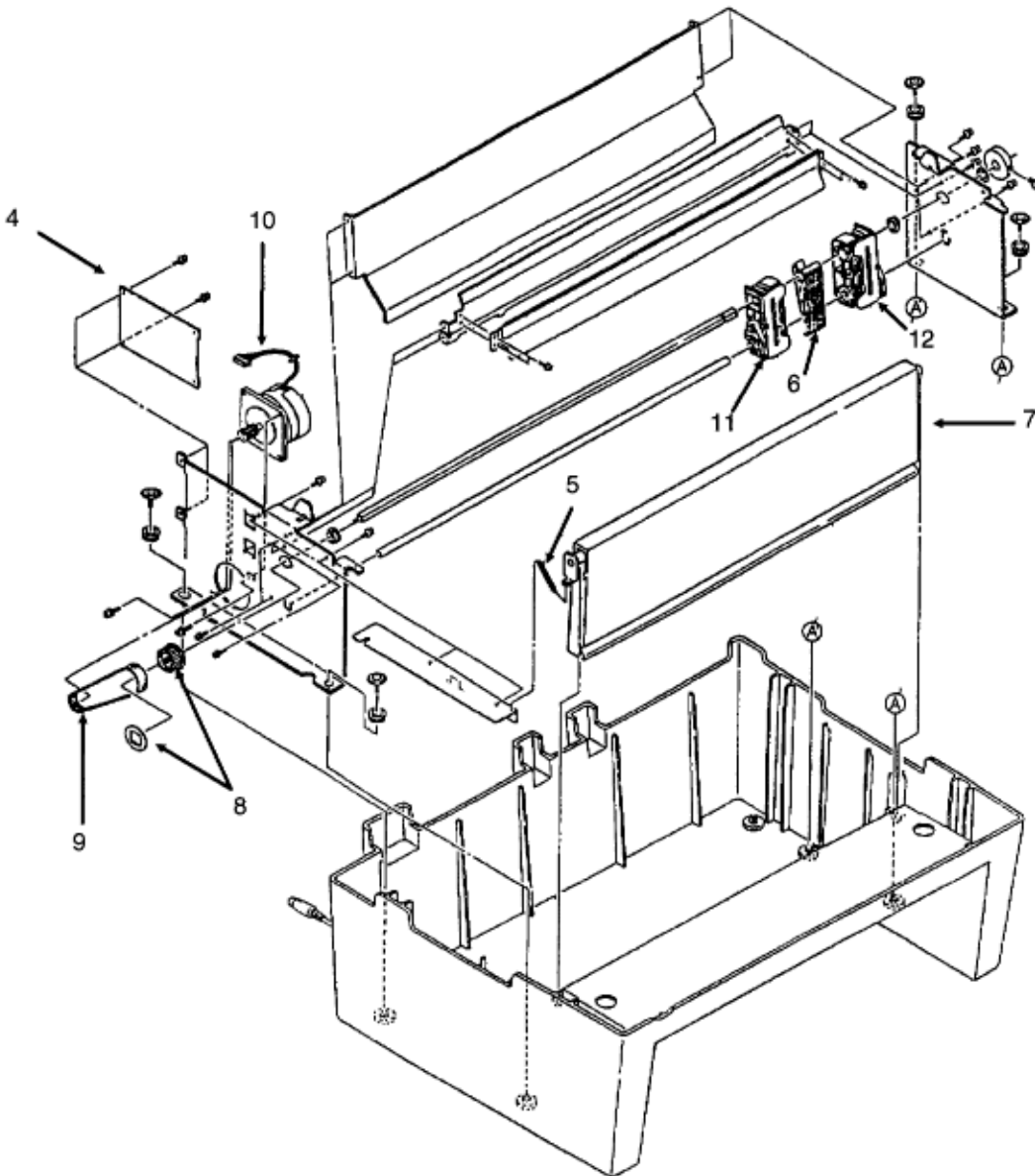
Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.






1 - Includes all items shown



3

Not Shown



Item	Okidata P/N Oki-J P/N	Description	Comments Refer to B.1.02 	Disassembly Procedure
1	70021601 N/A	Bottom Tractor Feed Unit (Push)	Option	3.2.30 
2	50215901 4YA4043-4280G1	Pull-Up Roller Assembly	Option RSPL	N/A
3	50212604 2PA4016-4722G4	Cover: Acoustic (Pull Tractor) BTF	Option RSPL	N/A
4	55066102 4YA4042-1513G2	PCB: BTFD-2 (BTF)	Option RSPL	3.2.31 
5	50922001 4PP4043-4300P1	Spring: (BTF)	Option RSPL	3.2.32 
6	51002201 4PP4025-2653P1	Guide: Sheet (BTF)	Option RSPL	3.2.33 
7	53063701 3PA4094-6159G1	Door: Front (Assembly) (BTF)	Option RSPL	3.2.34 
8	51228801 3PP4053-2693P1	Pulley: Drive (BTF) (ML395)	Option RSPL	3.2.35 
9	54111291 4LP-1313-191	Belt: Mini Pitch (125 teeth)	Option RSPL	3.2.35 
10	56509401 3PB4043-4249P1	Motor: Line Feed (BTF)	Option RSPL	3.2.36 
11	50057402 4PA4043-2684G2	Tractor: Pin (Left) BTF	Option RSPL	3.2.37 
12	50057502 4PA4043-2685G2	Tractor: Pin (Right) BTF	Option RSPL	3.2.37 

NOTE: *The Pull-Up Roller Assembly is part of the Bottom Push Tractor Unit.*

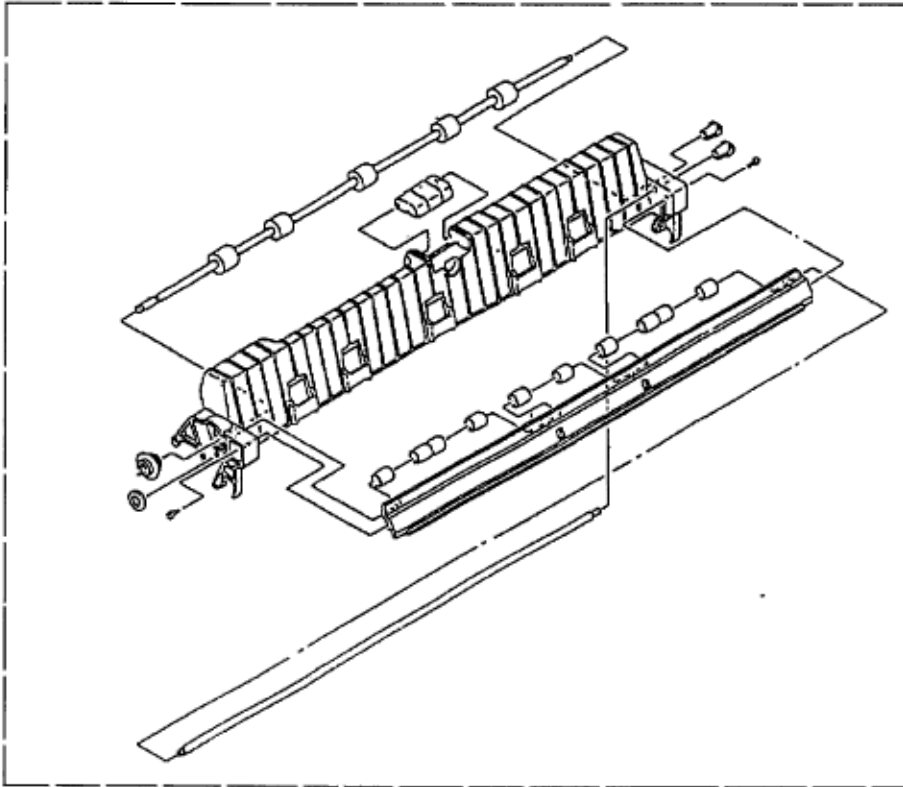
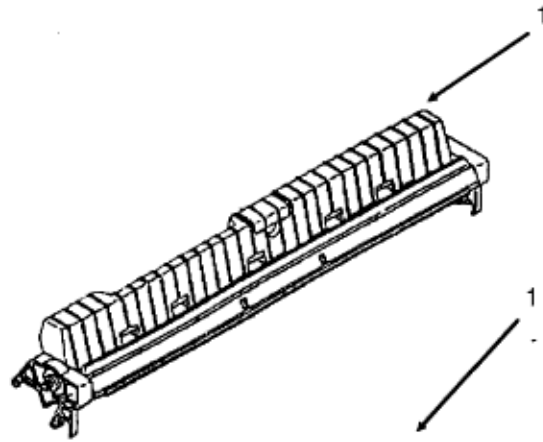
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B.2.16 BTF Pull-Up Roller Assembly (Option)

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.

2

Not Shown



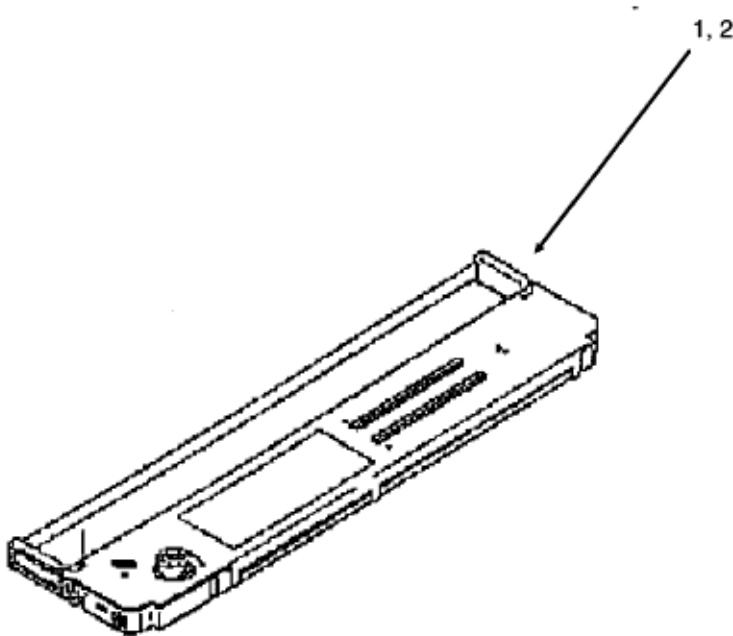
Item	Okidata P/N Oki-J P/N	Description	Comments Refer to B.1.02 	Disassembly Procedure
1	50215901 4YA4043-4280G1	Pull-Up Roller Assembly	Option RSPL	N/A
2	50212604 2PA4016-4722G4	Cover: Acoustic (Pull Tractor) BTF	Option RSPL	N/A

NOTE: *The Pull-Up Roller Assembly is part of the Bottom Push Tractor Unit.*

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B.2.17 Consumables

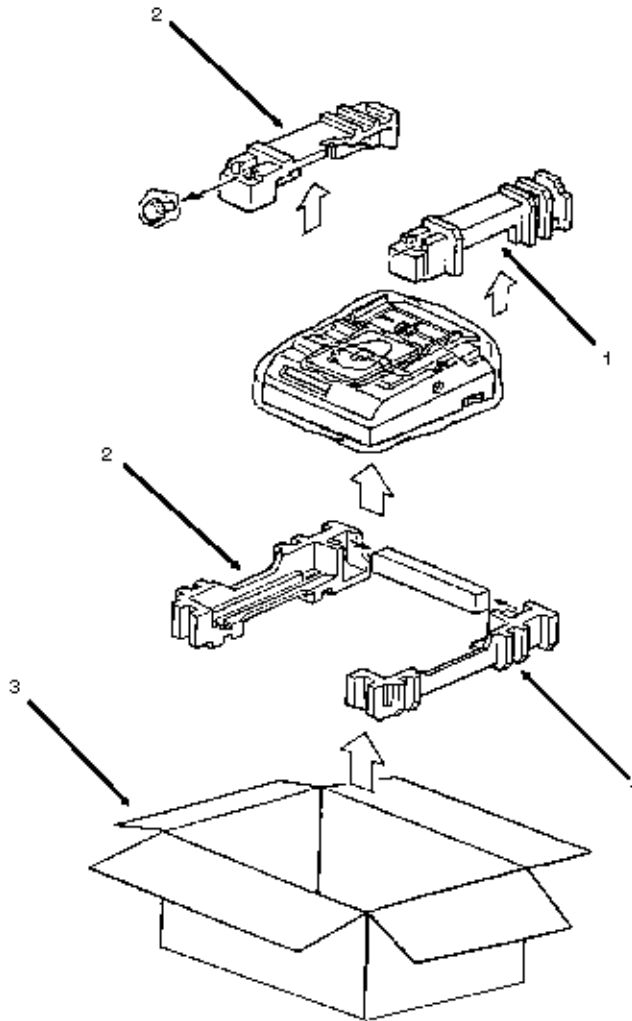
Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.



Item	Okidata P/N Oki-J P/N	Description	Comments Refer to B.1.02	Disassembly Procedure
1	52103601 N/A	Ribbon Cartridge (Black) Nylon	Consumable	3.2.01
1	52103801 N/A	Ribbon Cartridge (Black) Film	Consumable	3.2.01
2	52103701 N/A	Ribbon Cartridge (Color)	Consumable	3.2.01

B.2.18 Packing Materials

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.



Item	Okidata P/N Oki-J P/N	Description	Comments Refer to B.1.02 📄	Disassembly Procedure
1	53528901 N/A	Foam: End Cap Right	RSPL	N/A
2	53528902 N/A	Foam: End Cap Left	RSPL	N/A

3	53532002 N/A	Box: Spare (PM3410/393/395)	RSPL	N/A
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Service Guide ML395/395C

Chapter B Illustrated Parts Listing

B.2.19 Documentation

Part numbers are subject to change. Refer to Okilink II for current part numbers and pricing information.

Item	Okidata P/N Oki-J P/N	Description	<u>Comments</u> <u>Refer to B.1.02</u> 	Disassembly Procedure
1 #	58231601 N/A	Kit: ML395/395C Serv Train	Document	N/A
1 #	58231602 N/A	Kit: ML395/395C Serv Train	Document	N/A
2	59259101 N/A	Handbook: ML395/395C Printer	Document	N/A
2	59259102 N/A	Handbook: ML395/395C Printer	Document	N/A
3	52065001 N/A	Label: ML395/395C Kit	Document	N/A
4	58094502 N/A	Sheet: ML395/395C Read Me 1st	Document	N/A
5	59260501 N/A	Handbook: ML395/395C Service	Document	N/A
5	59260502 N/A	Handbook: ML395/395C Service	Document	N/A
6	57519901 N/A	Video: ML395/395C Serv Train	Document	N/A
6	57519902 N/A	Video: ML395/395C Serv Train	Document	N/A
7	52065004 N/A	Label: ML395/395C Video	Document	N/A
8	59258901 N/A	Manual: ML395/395C Maintenance	Document	N/A
6	N/A N/A	Okidata Service Center Reference Guide	Document	N/A
7	53547501	Okidata Support 3-Ring Binder	Document	N/A

8	58067201	ABCD Warranty Claim Forms (Pkg of 20)	Document	N/A
9	58052401	Warranty Summary Forms (Pkg of 20)	Document	N/A
10	N/A N/A	Printer Drivers	Refer to Okilink	N/A
11	N/A N/A	Product Updates	Document Refer to Okilink	N/A
12	N/A N/A	Recommended Spare Parts List	Document Refer to Okilink	N/A
13	N/A N/A	Software	Refer to Okilink	N/A
14	N/A N/A	Technical Service Bulletins	Document Refer to Okilink	N/A
16	N/A N/A	Troubleshooting Manual	Document 400e	N/A
17a *	N/A N/A	Marketing Literature	Document	N/A
18 **	N/A 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.

** An Okidata Marketing Literature Order Form can be obtained by faxing your request to Okidata Marketing Communications. Refer to the Service Center Reference Guide for information on contacting Okidata.

See Below

58231601 Microline 395/359C Service Training Kit

This kit was replaced by P/N 58231602.

Includes

52065001 Label: ML395/395C Kit

59260501 Handbook: ML395/395C Service

59259101 Handbook: ML395/395C Printer

57519901 Video: ML395/395C Service Training

52065004 Label: ML395/395C Video

58231602 Microline 395/359C Service Training Kit

This kit replaces by P/N 58231601.

Includes

52065001, Rev B Label: ML395/395C Kit

59260502 Handbook: ML395/395C Service

59259102 Handbook: ML395/395C Printer

57519902 Video: ML395/395C Service Training

52065004 Label: ML395/395C Video

58094502 ML395/395C Sheet: Read Me 1st

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