

Confidential

Service manual

TM-U220 Series (Type A)

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English

EPSON

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Rev. B

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Contents

Revision Table	iv
For Safe Repair and Maintenance Work	v
Key to Symbols	v
Safety Precautions on Maintenance/Repair/Inspection	vi
Modular Connectors	vi
About this Manual	vii
Aim of the Manual	vii
Manual Content	vii

Chapter 1 **Product Overview**

Notes on Connecting the Power Supply Unit	1-1
Configurations	1-2
Part Names	1-2
Control Panel (LEDs and Button)	1-3
LEDs	1-3
Button	1-3
Power Switch and Power Switch Cover	1-3
Power Switch Cover	1-3
Inserting Roll Paper	1-4
Installing or Replacing the Ribbon Cassette	1-7
Differences between the TM-U300, TM-U200, and TM-U220	1-8

Chapter 2 **Repair Guide**

Repair Process	2-1
Outline of Repair	2-1
Repair Flow	2-1
Confirming the User's Environment	2-1
Confirming the Printer Status	2-1
Self-test	2-2
Service Utility	2-5

Chapter 3 **Troubleshooting**

Preparations for Troubleshooting	3-1
Before Servicing	3-2
Diagnosing Failures	3-2
Symptoms and Solutions	3-3
Symptoms when Power is On	3-3
Symptoms when the All Function Test is Executed	3-15
Symptoms for other operations	3-20
Test Points on the Main Circuit Board Unit	3-21
Resistance Values of Printer Mechanism Components	3-22

Chapter 4 **Disassembly and Assembly**

Lubricants	4-1
Standard Lubrication	4-1
Lubricants	4-1
Lubrication Points	4-1
Tool List	4-1
Notes for Assembly and Disassembly	4-2
Shortest Route for Disassembly of Major Parts	4-3
Disassembling the TM-U220	4-4
Exploded Diagram	4-4
Disassembly Procedures	4-5
Disassembling the Mechanism Assembly	4-6
Exploded Diagram	4-6

Disassembly Procedures	4-7
Disassembling the Carriage Unit	4-8
Exploded Diagram	4-8
Disassembly Procedures	4-9
Disassembling the Rotation Frame Unit	4-10
Exploded Diagram	4-10
Disassembly Procedures	4-11
Disassembling the Roll Paper Guide / Roll Paper Holder	4-12
Exploded Diagram	4-12
Disassembly Procedures	4-13
Disassembling the Autocutter Unit / Fixed Blade Holder Assembly	4-14
Exploded Diagram	4-14
Disassembly Procedures	4-15
Disassembly and Assembly Reference	4-16
Lubrication Reference	4-28
 Chapter 5 Adjustment and Setting	
Setting the Installation Position for the Roll Paper Near-End Detector	5-1
Adjusting the Detection Point for the Roll Paper Near-End Detector	5-2
Setting the Paper Roll Width	5-3
Setting the Autocutter	5-4
Platen Gap Adjustment	5-5
Carriage Belt Tension Adjustment	5-6
Adjust Various Settings	5-7
How to Confirm the Current Settings	5-7
Adjusting the DIP Switches	5-7
Memory Switches	5-10
Memory Switch Setup Mode	5-12
 Chapter 6 Preparation for Shipment	
Inspection and Maintenance	6-1
Maintenance Procedures	6-1
Cleaning	6-1
How to Clean the Cases	6-1
Removing Dirt, Paper Chips, and Dust from Inside the Printer	6-2
 Appendix Parts List	
Reference Number List	A-1

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Revision Table

Revision	Pages	Description
Rev. A	All pages	Newly authorized.
Rev. B	1-2	Part names added.
	1-3	Control panel (LEDs and buttons) added.
	1-4	Inserting roll paper added.
	1-8	Installing and replacing the ribbon cassette added.
	4-3, 4-4	Illustration was changed.
	4-5, 4-16, 4-17	An explanation of the roll paper cover assembly was added.
	4-6, 4-7	Cutter rotation plate (1129) added.
	4-7	Step 6 added to disassembly.
	4-10, 4-11, 4-20	Paper feed roller plate B deleted.
	4-11	An explanation of the platen assembly 1 was added.
	4-30	An explanation of the lubrication reference was added.
	Chapter 6	Inserting roll paper and installing or replacing the ribbon cassette was moved to Chapter 1.

For Safe Repair and Maintenance Work**Key to Symbols**

The symbols in this manual are identified by their level of importance, as defined below. Read the following carefully before handling the product.

 **WARNING:**

You must follow warnings carefully to avoid serious bodily injury.

 **CAUTION:**

Observe cautions to avoid minor injury to yourself, damage to your equipment, or loss of data.

 **Note:**

Notes have important information and useful tips on the operation of your equipment.

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Safety Precautions on Maintenance/Repair/Inspection

WARNING:

- ❑ *Be sure to use the EPSON-supplied fuse on the circuit board. Use of another fuse may result in fire.*
- ❑ *Remove the power cord and all other cables from this product before disassembly or reassembly to prevent electrical shock.*
- ❑ *To prevent the possibility of electrical shock, do not perform maintenance, repair, or inspection during a thunderstorm.*
- ❑ *Shut down your equipment immediately if it produces smoke, a strange odor, or unusual noise. Continued use may lead to fire or electric shock. Immediately unplug the equipment.*
- ❑ *Only disassemble this product as described in this manual. Do not make modifications to the unit. Tampering with this product may result in injury, fire, or electric shock.*
- ❑ *Be sure to use the specified power source. Connection to an improper power source may cause fire or shock.*
- ❑ *Never insert or disconnect the power plug with wet hands. Doing so may result in severe shock.*

CAUTION:

- ❑ *Parts on the circuit board may become hot during operation. Therefore, wait approximately 10 minutes after turning the power off before touching them.*
- ❑ *To avoid injury, take care not to insert fingers or any part of the hand in the paper roll opening where the manual cutter is installed.*
- ❑ *Do not open the paper roll cover without taking the necessary precautions, as this can result in injury from the autocutter fixed blade.*

Modular Connectors

Use the modular connectors specifically designed for the cash drawer and customer display for this product. Do not connect these connectors to an ordinary telephone line.

About this Manual***Aim of the Manual***

This manual was created to provide the information on printer maintenance and repair required by technicians who handle this work.

Manual Content

The manual is made up of the following sections

Chapter 1	Product Overview	Provides an overview of the product.
Chapter 2	Repair Guide	Describes the instructions to complete repair of the product.
Chapter 3	Troubleshooting	Provides information on troubleshooting.
Chapter 4	Disassembly and Assembly	Describes disassembly and assembly procedures. Also, shows exploded diagrams and lubrication point diagrams for this product.
Chapter 5	Adjustments and Settings	Describes adjusting and settings procedures.
Chapter 6	Preparation for shipment	Describes preparation for transport. Also provides information on maintenance, inspection, and cleaning.
Appendix	Parts List	Provides a parts list. Also describes screw types.

Chapter 1

Product Overview

The TM-U220 is a serial impact dot-matrix printer for POS systems that can print on roll paper of various widths. This manual describes the TM-U220 Type A, which has a take-up shaft for journal paper. The following model types are available for the TM-U220.



TM-U220 external views

TM-U220 Model Comparison

	Type A	Type B	Type D
Two-color printing	Yes	Yes	Yes
Autocutter	Yes	Yes	No
Take-up device	Yes	No	No
Paper width	76 / 69.5 / 57.5 mm {3" / 2.74" / 2.26"}	76 / 69.5 / 57.5 mm {3" / 2.74" / 2.26"}	76 / 69.5 / 57.5 mm {3" / 2.74" / 2.26"}
Interface (supplied with printer)*	Serial or parallel	Serial or parallel	Serial or parallel
Characters supported	Alphanumeric (ANK) or multilingual**	Alphanumeric (ANK) or multilingual**	Alphanumeric (ANK) or multilingual**

Note: * Other compatible interfaces, such as USB and Ethernet, are available from the dealer.

** Multilingual support means that the printer can print any one of the following: Japanese Kanji, Simplified Chinese, Traditional Chinese, Thai characters, or Korean characters.

Notes on Connecting the Power Supply Unit

Be sure to use the correct power supply unit, as listed in the table below.

TM-U220 alphanumeric model	TM-U220 multilingual model
1. AC adapter C (packed with the alphanumeric model) 2. PS-180 (option)	PS-180 (packed with the multilingual model)

 **Note:**

The AC adapter C, which is packed with the alphanumeric model, cannot be used with the multilingual model. Be sure to use the PS-180 with the multilingual model. If the AC adapter C power supply is connected to the multilingual model by mistake, the printer may not operate correctly. For example, printing may stop before all lines are printed, or the printer might print the same line repeatedly.

Configurations

This TM-U220 is configured by combining features from the list below.

Table 1-1 Configurations

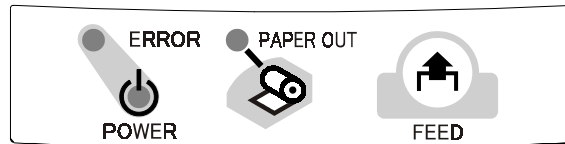
Features	Selection	Description
Interface types	UB-S01 (RS-232) UB-P02II (IEEE 1284 (bidirectional parallel)) EPSON UB universal interface board options	Use an EPSON-approved interface board
Paper width selections	76, 69.5, or 57.5 mm {3", 2.74", or 2.26"}	Be sure to change the paper guide spacer if paper of a different width is used. Then, set the customized value in printer memory for the correct paper width. For details about how to set the paper width, see Chapter 6, "Installation."
Power supply unit types	Exclusive external power supply for the alphanumeric model: AC Adapter C (North America only) (pre-packaged). External power supply unit for the multilingual model: PS-180	Do not use the AC Adapter C with the multilingual model.
Installation positions	Horizontally (default) Vertically by use of the optional WH-10 wall-hanging bracket	

Note: Selections in the table above may be added to or changed in the future.
dpi: dots per 25.4 mm (dots per inch)

Part Names

The figure below shows part names for the TM-U220.



Control Panel (LEDs and Button)**LEDs****POWER**

On when power is on.

ERROR

On when printer is offline. Off when printer is online. Flashes during an error.

PAPER OUT

On when paper is out or nearly out. Flashes during self-test

Button**FEED**

This button feeds roll paper or starts a self-test.

**Note:**

Paper cannot be fed by using this button when a paper out is detected.

Power Switch and Power Switch Cover

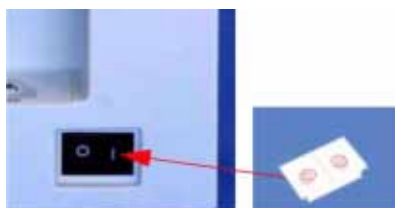
The power switch is on the front of the printer. Press this switch to turn on the printer.

Power Switch Cover

This cover prevents the power from being turned off accidentally during printing. If you need to turn the power on or off while the cover is attached, you can insert a small screwdriver or similar tool into one of the holes in the cover to flip the switch.

**WARNING:**

If an accident occurs while the power switch cover is attached, immediately unplug the power supply cable to avoid fire.

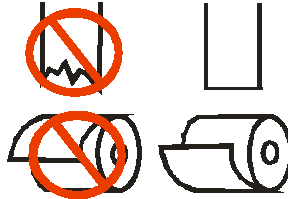


Inserting Roll Paper

⚠ CAUTION:

*Be sure to use only roll paper that meets the specifications.
Be sure not to touch the manual cutter. Otherwise, you may cut your fingers.*

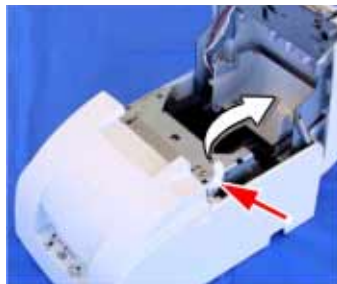
1. Using scissors, cut the leading edge of the roll paper.



2. Turn on the printer and open the roll paper cover by using the tab.



3. Open the unit by using the unit open lever, as shown below.



Unit open lever

4. Insert the roll paper.

**Note:**

Note the direction that the paper comes off the roll, as shown above.

When using two-ply paper, be sure that the top and bottom sheets are aligned at the paper exit. Do not allow paper to be loaded as shown below.

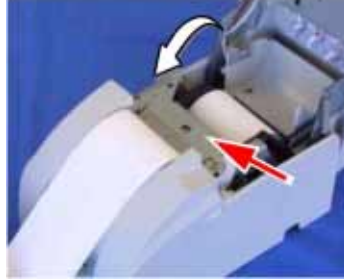


5. If you are not using the take-up flange, pull out a small amount of roll paper and close the roll paper cover. Then, tear off the paper with the manual cutter. You can skip steps 6 through 11.
6. When using 2-ply roll paper, pull out the roll paper to the bottom front of the printer, as shown below.



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7. Close the unit, as shown below.



8. Insert the end of the bottom layer of paper (journal paper) into the paper take-up flange, as shown below.



9. Insert the paper take-up flange into the printer. Be sure that the paper is aligned with the flange, as shown.



10. Feed the paper with the FEED button so that the paper is taken up by the flange.
11. Close the roll paper cover and tear off the roll paper with the manual cutter, as shown below.



Note:

Do not open the roll paper cover during printing or paper feeding.

When using the printer, be sure to cut the roll paper with the manual cutter after paper feeding is complete.

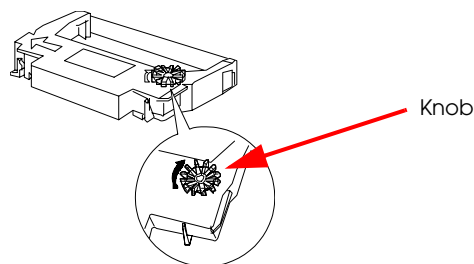
Installing or Replacing the Ribbon Cassette

CAUTION:

EPSON recommends the use of only genuine EPSON ribbon cassettes. Ribbon cassettes not manufactured by EPSON may cause damage to your printer that is not covered by EPSON's warranties.

To install the ribbon cassette for the first time or to replace a used ribbon, follow the steps below.

1. Unpack the ribbon cassette and turn the knob in the direction shown to take up any slack.



2. Open the printer's ribbon cassette cover using the tabs on each side of the cover.



3. Remove the old ribbon, if there is one.
4. Insert cassette as shown below. Put ribbon between print head and platen. Push cassette down until it clicks.



Note:

Make sure the ribbon is installed between the print head and the platen without wrinkles or creases.



5. Again, turn the cassette knob 2 or 3 times to take up slack.
6. Close the printer's ribbon cassette cover.

Differences between the TM-U300, TM-U200, and TM-U220

Specification	TM-U300 (Type A, B, C, D)	TM-U200 (Type A, B, D)	TM-U220 (Type A, B, D)
Print speed	3.5 lines/second (at 40 columns, 16 cpi)	3.5 lines/second (at 40 columns, 16 cpi)	4.7 lines/second (at 40 columns, 16 cpi)
Paper feed speed	25 lines/second	25 lines/second	30 lines/ second
Character tables	Alphanumeric 95, international 32, extended 126 x 7	Alphanumeric 95, international 32, extended 128 x 8	Alphanumeric 95, international 48, extended 128 x 12
Paper loading	Paper roll holding shaft	Semi automatic loading	Drop in loading
Paper near-end sensor	Yes	Option	Configured option
Cover open detector	Yes	No	Yes
Paper width	76 mm	76 mm	76 mm, 69.5 mm, or 57.5 (B and D only)
Number of copies	Original + 2 copies (at 77°F) Original + 1 copy (at all temperatures)	A and B: original + 1 copy; D: original + 2 copies	All models: original + 1 copy
Autocutter (Type A, B only)	Full cut or partial cut set by command	Partial cut default; full cut set by command	Partial/full cut set by command
Auto take-up unit	Type A, C	Type A	Type A
Print area	76 mm paper: Width: 63.34 mm (200 dots x 400 positions) Left margin: 6 mm Right margin: 6.5 mm (approx.)	76 mm paper: Width: 63.34 mm (200 dots x 400 positions) Left margin: 5.9 mm Right margin: 6.76 mm	76 mm paper: Width: 63.34 mm (200 dots x 400 positions) Left margin: 6.8 mm Right margin: 5.8 mm 69.5 mm paper: Width: 57 mm (180 dots x 360 positions) Left margin: 6.7 mm Right margin: 5.8 mm 57.5 mm paper: Width: 47.5 mm (150 dots x 300 positions) Left margin: 4.2 mm Right margin: 5.8 mm
Space from autocut to print start: Space from manual cut to print start:	36 mm Type A, B: 26 mm; Type C, D: 28 mm	27 mm 20.2 mm	27 mm Type D: 22.1 mm; Type A, B: 34.9 mm
Receive buffer	Alphanumeric: 1KB/40 bytes Multilingual: 512 bytes/40 bytes	Alphanumeric: 1KB/40 bytes Multilingual: 512 bytes/40 bytes	Alphanumeric: 4KB/40 bytes Multilingual: 4KB/40 bytes
NV bit image memory	Alphanumeric: none Multilingual: none	Alphanumeric: none Multilingual: none	Alphanumeric: 128KB Multilingual: 128KB
NV user memory	Alphanumeric: none Multilingual: none	Alphanumeric: none Multilingual: none	Alphanumeric: 8KB Multilingual: 8KB
Power supply	PA-6509 or PB-6509 (North America)	PB-6509 (North America)	AC Adapter C — Low-cost universal power supply for impact dot matrix printer supplied in box.
Dimensions (W x D x H)	Type A: 170 x 288 x 183 mm {6.7 x 11.3 x 7.2"} Type B: 170 x 253 x 148 mm {6.7 x 10 x 5.8"} Type C: 158 x 295 x 145 mm {6.2 x 11.6 x 5.7"} Type D: 158 x 235 x 125 mm {6.2 x 9.3 x 4.9"} 	Type A: 160 x 295 x 160 mm {6.3 x 11.6 x 6.3"} Type B: 160 x 248 x 150 mm {6.3 x 9.8 x 5.9"} Type D: 160 x 248 x 133 mm {6.3 x 9.8 x 5.2"} 	Type A: 160 x 286 x 157.5 mm {6.3 x 11.3 x 6.2"} Type B: 160 x 248 x 138.5 mm {6.3 x 9.8 x 5.5"} Type D: 160 x 248 x 138.5 mm {6.3 x 9.8 x 5.5"}
Installation	Horizontally with a 15° slant, maximum. Type B, D: Vertically on wall using WH-10 bracket.	Horizontally with a 15° slant, maximum.	Horizontally with a 15° slant, maximum. Optional IR tray also can be used. Type B, D: Vertically on wall using WH-10 bracket.
Buzzer	None	None	Printer also can be used with annunciator interface.

Chapter 2

Repair Guide

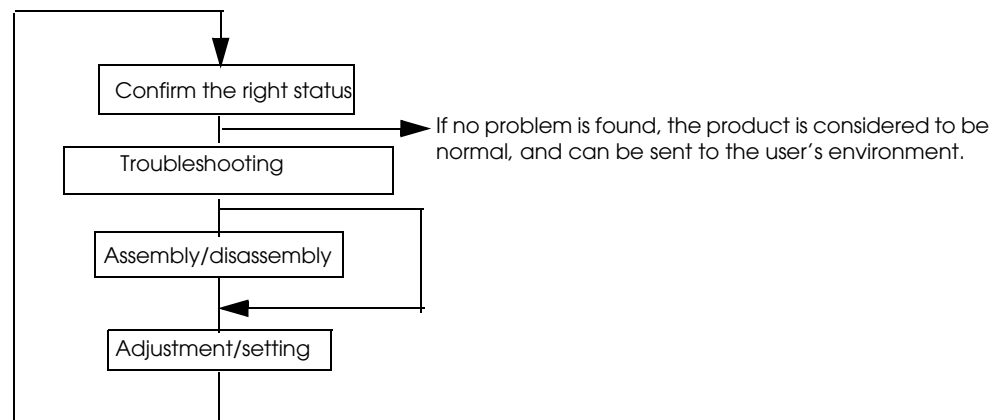
This chapter gives instructions to complete repair of the product. Follow the process in this section for repair.

Repair Process

Outline of Repair

Check each item before and after repair, as shown in the following flowchart. This chapter explains the operations to confirm a “normal state” of operation of items in the flowchart. If an item is in a state other than the “normal state,” follow the instructions in the chapter to troubleshoot based on the symptom.

Repair Flow



Confirming the User's Environment

Confirm the printer's settings by using the service utility.

Confirming the Printer Status

Confirm the status of the printer you are repairing. Confirm that the power turns on/off; run the self-test; run all function tests with the service utility; and check other items, following the table below. Perform the appropriate measures for the symptom.

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Printer Status Checks

Operation	Normal printer operation	When a problem occurs
Power on.	Power LED light comes on. Mechanical initializing operation occurs. ERROR LED light is off.	POWER LED does not light. (See page 3-3.) ERROR LED light. (See page 3-3.) ERROR LED flashes. (See page 3-4.) PAPER OUT LED lights. (See page 3-6.)
Run the self-test. *Refer to page 2-2 for operation.	POWER LED light comes on. Prints the printer status. (See page 2-3.) Prints the roll pattern after the FEED button is pressed. (See page 2-3.) Mechanical initialization occurs. ERROR LED light is off.	Self-test cannot be performed. (See page 3-6.) Printing cannot be performed. (See page 3-7.) The print result is not normal. (See page 3-12.) A paper jam occurs. (See page 3-14.) PAPER OUT LED lights. (See page 3-6.)
Run the "all function test" with the service utility. *Refer to page 2-7 for operation.	Reads printer status. Prints the RECEIPT sheet. (See page 2-9.) Prints the STATUS sheet after confirming the sensor operation. (See page 2-10.) Prints the REPORT sheet. (See page 2-12.)	The communication test fails. (See page 3-16.) The print result is not normal. (See page 3-12.) Drawer kick is not performed. (See page 3-17.) The sensor does not work. (See page 3-18.)
Perform other checks of operation.	Normal opening/closing of roll paper cover. Normal opening/closing of ribbon cover. The case is dirty.	Parts do not move smoothly. (See page 3-20.) The case is dirty. (See page 3-20.)

Once you have confirmed the printer status using the table above, you can perform the necessary functions below.

- Identification of defective parts. (See Chapter 3.)
- Preparation for replacing parts. (Read and follow the precautions and notes at the beginning of Chapter 4.)
- Parts replacement, assembly, and disassembly. (See Chapter 4.)
- Adjustment and setting. (See Chapter 5.)
- Preparation for shipment. (See the Chapter 6 before sending the printer back to the customer.)

Self-test


Operation

The self-test can be run using the service utility or by operating the control panel. See page 2-12 for information about control panel operation.

Before running the self-test, make sure the roll paper and ribbon are installed correctly in the printer. Then, turn power off. To run the self-test, turn the power back on while holding down the FEED button.


The first page of the self-test printout should look like the example in the table below. To print the second part of the self-test, press FEED again.

Printer Status Print

	Normal printout result	Explanation
①	<pre> SELF-TEST Firmware Version:2.91 ESC/POS Boot Version :2.91 ESC/POS </pre>	<p>① Version information Main program version Boot program version</p>
②	<pre> Serial interface Baud rate :9600 bps Data bits :8 bits Parity :none Stop bit :1 bit or more Handshaking :DTR/DSR Receive error:prints '?' </pre>	<p>② Interface classification Interface information</p>
③	<pre> Receive buffer capacity 4K bytes </pre>	<p>③ Receive buffer capacity *1)</p>
④	<pre> Receive buffer full release condition 256 bytes remain </pre>	<p>④ Busy release conditions for receive buffer full *2)</p>
⑤	<pre> Handshaking operation (Busy condition) Offline or receive buffer full </pre>	<p>⑤ Busy condition *3)</p>
⑥	<pre> Resident character Alphanumeric </pre>	<p>⑥ Resident character *4)</p>
⑦	<pre> Paper roll width 76mm </pre>	<p>⑦ Paper roll width *5)</p>
⑧	<pre> Dot spacing between characters 3 Half dots </pre>	<p>⑧ Dot spacing between characters *6)</p>
⑨	<pre> Characters per line (CPL) 40 CPL/33 CPL </pre>	<p>⑨ Characters per line *7)</p>
⑩	<pre> Autocutter unit Installed Memory switch 2 1 2 3 4 5 6 7 8 ON OFF ##### Memory switch 8 1 2 3 4 5 6 7 8 ON OFF ##### </pre>	<p>⑩ Autocutter unit installed/not installed *8)</p>
		<p> Note: *1) Differs depending on DIP SW1-2. *2) Differs depending on MSW 8-7. Prints only when the receive buffer capacity is 4KB. (Does not print when the receive buffer capacity is 40 bytes.) *3) Differs depending on DIP SW1-8. *4) Performs a multilingual CG judgment when printing resident characters. *5) Differs depending on the paper roll width set with the memory switch (customized value). *6) Differs depending on DIP SW2-1. *7) Differs depending on the paper roll width and dots between characters. *8) Differs depending on DIP SW2-2.</p>

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Roll Pattern

Normal print result	Explanation
	<p data-bbox="798 510 941 542">Black (6 lines)</p> <p data-bbox="798 685 925 716">Red (6 lines)</p> <p data-bbox="798 1675 925 1706">Red (6 lines)</p> <p data-bbox="778 1787 981 1818">Paper feeds 2 lines.</p> <p data-bbox="778 1832 1284 1886">Paper is fed to a position where the user can see the ending message at left.</p>

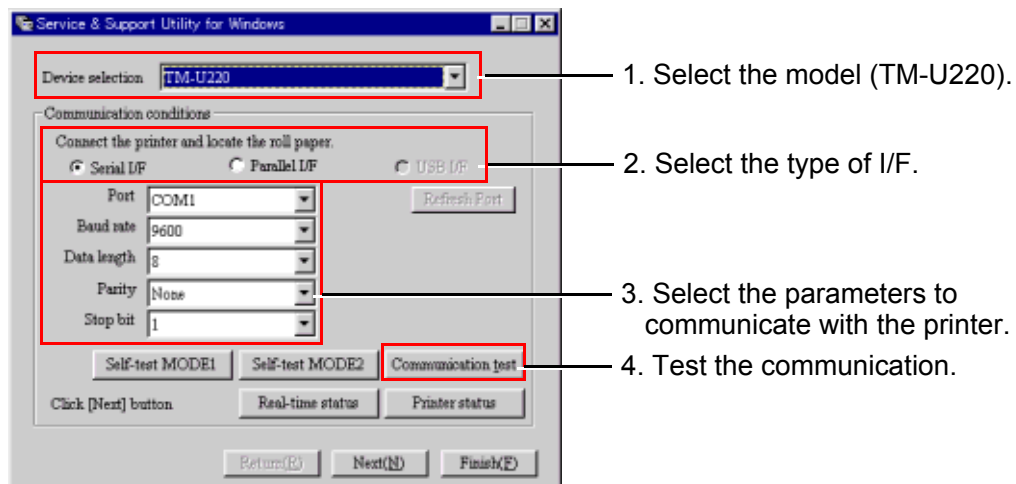
Service Utility

Using the service utility, you can confirm the printer status and change settings. The following section explains the operation for confirming the printer status.

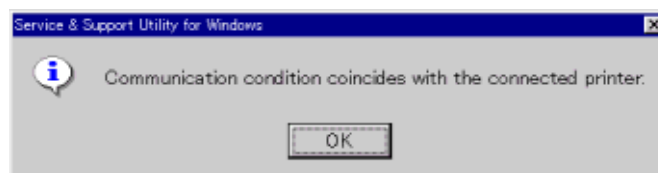
- * To use the repair functions in the service utility, a password is required. Refer to the manual supplied with the service utility for the password.

Start up of the service utility

When you start the service utility, the following communication conditions dialog box appears.



1. Model selection:
Select the TM-U220 (Type A model printer).
2. Communication condition selection:
Select the I/F used with the printer. You can confirm the communication conditions set for the printer by running the self-test. Refer to the self-test section for details.
3. Communication test:
4. Confirm the communication status with the connected printer. Normally, the following message appears.



When the communication conditions are set correctly, the following functions are available.

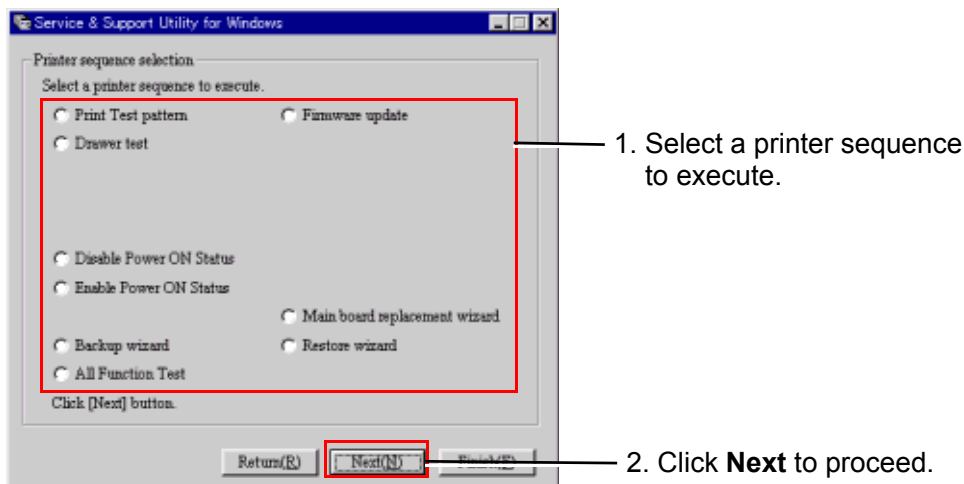
- ❑ Self-test mode 1: Outputs the same results as the self-test printout of status.
- ❑ Self-test mode 2: Outputs the same results as the self-test printout of the roll pattern.

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- ❑ Real-time status: Lets you confirm sensor operations, such as cover open/close, in real time.
- ❑ Printer status: Lets you read and set the printer values collectively. Also, you can save the settings to a file, read the set values in the file, and the display the default state. Refer to the chapter on adjustment settings.

Printer sequence selection

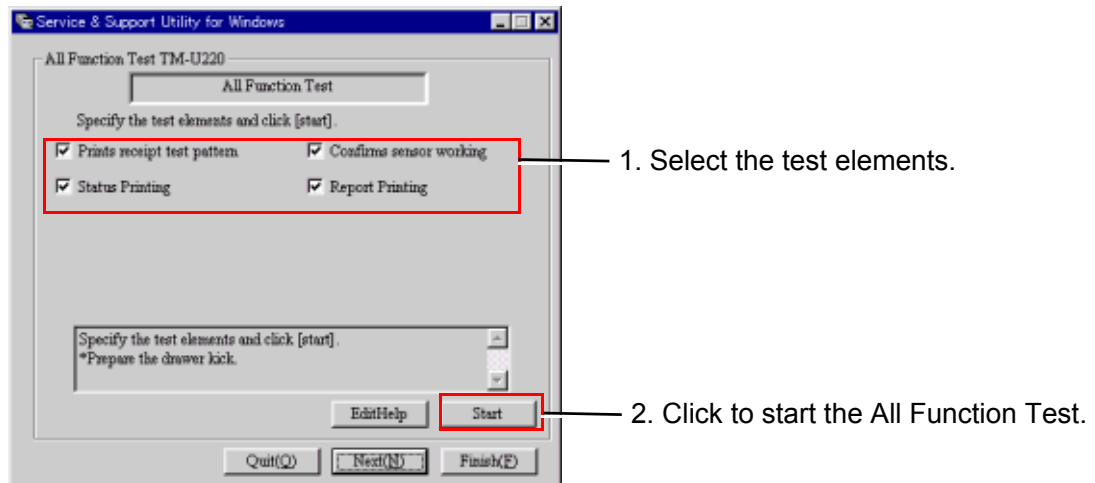
When you click the **Next** button at the bottom of the communication conditions dialog box, the printer sequence selection screen appears.



- ❑ Test printing:
This outputs a test pattern to confirm printer status. Follow the screen instructions to operate.
- ❑ Confirmation of the drawer operation:
You can confirm the drawer open function and the change in the open/close status. Follow the screen instructions to operate.
- ❑ Setting for notification of power on:
You can enable or disable the notification function for power on.
- ❑ Firmware update:
You can update the firmware. Follow the screen instructions to operate.
- ❑ Main circuit board replacement wizard/backup wizard/restore wizard:
You can back up the data in the main circuit board and restore it in the repaired product. Follow the screen instructions to operate.

All Function Test

When you select the all function test in the printer sequence selection screen and click Next, the all function test screen appears.

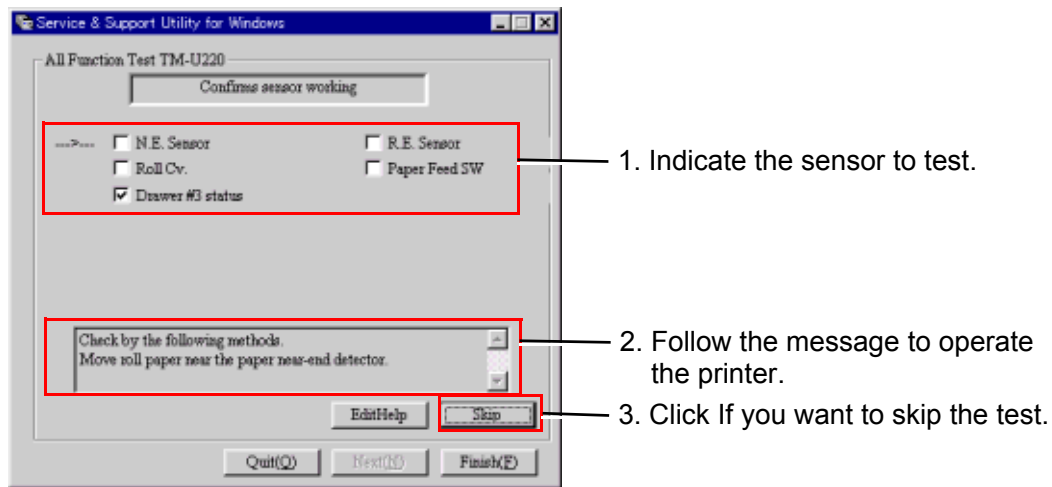


Select the test elements and click the **Start** button to start the all function test.

Using this test, you can check the following functions for the printer.

- Communication function:**
You can confirm that communication with the printer is enabled/disabled.
- Setting function:**
Reads and prints on the status sheet the status settings for EPSON NV memory, memory switches, communication conditions, and customized value.
- Receipt print function:**
Prints patterns to confirm print operations and print quality.
- Roll paper cut function:**
The Type A model autocutter cuts roll paper after each printing on the roll.
- Drawer open/close function:**
Runs a test of drawer open/close operation while printing the receipt pattern. Be sure to connect the drawer kick to the printer before executing the all function test.
- Sensor function:**
Confirms the operation of sensors controlling and detecting printer operations. The checking method for the sensor indicated with the arrow is displayed on the screen. Operate the printer following the instructions on the screen.

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When the sensor detects the printer operation correctly, OK is displayed.


When the sensor is not installed (depending on the printer model), you can skip with the Skip button.

Test results are OK when the tests confirm the normal operation of the sensors.

Output result



When the printer operates normally, the following sheet is printed. Refer to the chapters on “Troubleshooting” and “Adjustment and Setting” when print results differ.


Receipt Print

Normal print result	Explanation
	<p>① Prints execution date. ② Prints execution time. ③ Prints “EPSON/” ④ Prints “TM-U220.” ⑤ Prints product serial number. *1) ⑥ Prints graphic pattern. Checks for missing dots. (See “Dots are missing continuously” on page 3-12.) ⑦ Prints ANK characters. *2) ⑧ Performs full cut. *3)</p> <p>Note:</p> <p>*1) When the serial number is not registered on the product itself, “NG” is printed. *2) When using the 2-color ribbon, prints in 2 colors. *3) When autocutter setting is partial cut, full cut is not performed.</p>

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Status Print

Normal print result	Explanation
 <p>① Date : 2003/05/14 ② Time : 10:32:16 ③ Maker name : EPSON ④ Printer name : TM-U220 ⑤ Serial No : ABCD000001</p> <hr/> <p>⑥ Memory Switch Settings MSW2-3 6818030 MSWB-5 Paper-out MSWB-7 256 Bytes MSWB-8 Auto recoverable</p> <p>⑦ Customized Value Paper width 76mm</p> <p>⑧ --PERTIAL CUT--</p>	<p>① Prints execution date. ② Prints execution time. ③ Prints "EPSON." ④ Prints "TM-U220." ⑤ Prints product serial number. *1) ⑥ Prints setting status of memory switches. *2) ⑦ Prints setting status of customize value. *3) ⑧ Performs partial cut. *4)</p> <p> Note:</p> <p>*1) When the serial number is not registered on the product itself, "NG" is printed. *2, 3) When the default setting is changed, "*" is printed before the memory switch number. *4) When autocutter setting is full cut, partial cut is not performed.</p>

Normal print result	Explanation
<pre> ① Version information Firmware Version:2.91 ESC/POS Boot Version :2.91 ESC/POS Original Version:2.91 ESC/POS Sensor status Paper-end :Paper present Near-end :Paper supply OK Drawer kick-out connector pin 3 :High A/D converter Voltage :A5H Impact head temperature :82H ② Power on status Disabled ③ Main ROM size 4M bits ④ Extended ROM Not installed ⑤ NV bit image Not defined ⑥ User NV memory Not defined ⑦ EPSON NV information 1 EPSON 2 TM-U220 3 ABCD000001 ⑧ Space page Customized ⑨ Command default value Customized </pre>	<p>① Prints program version. Main program version is printed. Boot program version is printed. Original program version is printed.</p> <p>② Prints "power on status" set with printer sequence.</p> <p>③ Displays size of main ROM. (Differs depending on specifications.)</p> <p>④ Displays size of extended ROM. (Differs depending on specifications.)</p> <p>⑤ Prints defined bit image data in NV memory. *1)</p> <p>⑥ Prints defined data in NV user memory. *2)</p> <p>⑦ Prints information on EPSON NV memory. It is changeable with the printer status. *3)</p> <p>Manufacturer name Model name Product serial no.</p> <p>⑧ Prints defined data for the space page.</p> <p>⑨ Prints definition of command default values.</p> <p> Note: *1, 2) Data defined by a user must be backed up and restored.</p>

Confidential

Report Print

Normal print result	Explanation
① Date : 2003/04/30	① Prints execution date.
② Time : 19:35:36	② Prints execution time.
③ Maker name : EPSON	③ Prints "EPSON."
④ Printer name : TM-U220	④ Prints "TM-U220."
⑤ Serial No : ABCD000001	⑤ Prints the serial number for the product.
-----	⑥ Prints the execution status of all function test.
⑥ All Function Test Result	⑦ Prints test results of sensor operation. *1)
RECEIPT Printing Done	
SENSOR Working Done	
STATUS Printing Done	
REPORT Printing Done	
⑦ Sensor Working	
N.E. Sensor OK	
R.E. Sensor OK	
Roll Cover OK	
Paper Feed SW OK	
Drawer #3 status OK	

Note:

*1) When an operation such as cover open sensor check is skipped using the button on the screen, the report shows a problem for that item. (Refer to "Cannot pass one of the tests for a sensor" on page 3-18.)

Running a Self-test

The steps below describe how to run a self-test by operating the control panel.

1. Make sure the printer is turned off and the roll paper cover is closed properly.
2. While holding down the FEED button, turn on the printer using the switch on the front of the printer. The self-test prints the printer settings and then prints the following, cuts the paper, and pauses. (The PAPER OUT light flashes.)

If you want to continue SELF-TEST printing, Please press the FEED button.

3. Press the FEED button to continue printing. The printer prints a pattern using the built-in character set.
4. The self test automatically ends and cuts the paper after printing the following:

***** completed *****

5. The printer is ready to receive data as soon as it completes the self test.



Note:

If you want to pause the self-test manually, press the FEED button. Press the FEED button again to continue the self-test.

Chapter 3

Troubleshooting

Preparations for Troubleshooting

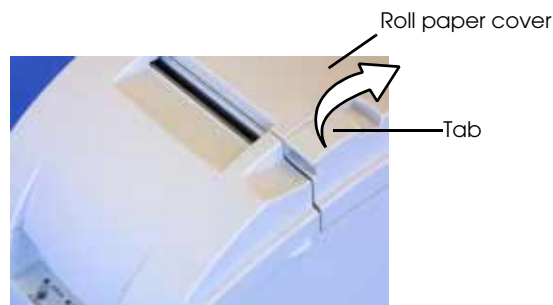
Before troubleshooting, check and, if necessary, correct the following points.

Paper is jammed inside the printer

CAUTION:

Be sure not to touch the manual cutter. Otherwise, you may cut your fingers.

1. Turn the power off.
2. Open the roll paper cover using the tab, as shown in the below illustration.



3. Remove the jammed paper.

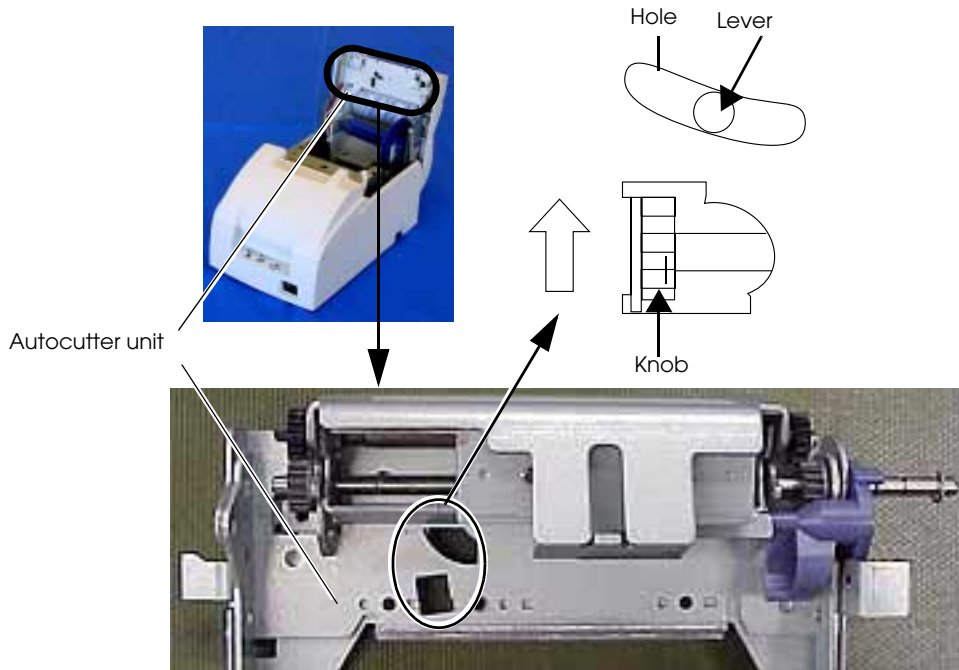
Note:

If you turn the power off accidentally during printing, the cutter blade may stop in the paper feed path. So, paper may not be fed normally at first when you turn the power on again. If the cutter blade does not return to the normal position, the autocutter unit may be jammed. If so, follow the procedure described below to repair the autocutter unit.

1. Power off the unit and open the roll paper cover.
2. Remove the jammed paper.

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- Return the cutter blade to the normal position by rotating the autocutter knob in the direction of the arrow. When the blade is returned to the normal position, the lever moves to the center of the hole in the autocutter frame.



- Lift up the roll paper cover.



Note:

- Besides a paper jam, a foreign object, such as a push pin, can cause the autocutter to lock up. In this case, follow the same procedure described above to return the cutter to its normal position.

Before Servicing

Pages *iv* to *v* at the beginning of this manual provide precautions you should observe to perform work safely and supply the necessary information to service this product safely. Always read that information before starting your work.

Diagnosing Failures

Use one of the following methods to identify the area where a failure occurred.

- See the tables in the section "Symptoms and Solutions" for diagnosing failures by the symptom of the problem.
- See "Test Points on the Main Circuit Board Unit" for failures on the main circuit board unit.

Symptoms and Solutions

Symptoms when Power is On

POWER LED does not light

Table 3-1 POWER LED not Lit

Probable part/probable cause	Checkpoints	Action to correct the problem
External power unit	Check the connections. Make sure the connector is plugged in.	Plug in the connector. Completed if the POWER LED lights.
	Check the output voltage. Make sure 24 V is coming out.	Replace power unit. Completed if the POWER LED lights.
Cable connector (1098)	Check the connectors. Make sure the ones below are plugged in: <input type="checkbox"/> Connector (CN10) on the main circuit board unit (201) <input type="checkbox"/> Connector (CNC3) on the sub circuit board unit (123)	Plug in the connectors. Completed if the POWER LED lights.
Sub circuit board unit (123)	Check the sub circuit board unit for damage. Make sure it looks normal.	Replace the sub circuit board unit (123). Completed if the POWER LED lights.
Main circuit board unit (201) (Refer to page 3-21.)	Check the resistance value of fuses F1 and F4. Make sure neither fuse is blown.	If the circuit board has no damage, such as burns, replace fuse F1 or F4. Completed if the POWER LED lights. If the fuse blows when power is turned on, unplug all connectors from the mechanism assembly (120) and check again. If the POWER LED does not light and the fuse is blown, replace the main circuit board unit.
	Check the operation of SW1.	Replace the main circuit board unit (201). Completed if operation is normal.
	Check the power voltage. Make sure the power voltage has proper voltage rating.	

ERROR LED lights

Table 3-2 ERROR LED On

Probable part/probable cause	Checkpoints	Action to correct the problem
Roll paper cover assembly (119)	Check the roll paper cover assembly. Make sure the roll paper cover is closed.	Close the roll paper cover assembly. Completed if the ERROR LED turns off.
Paper-end state	Check the roll paper.	Load the roll paper properly. Completed if the ERROR LED turns off.

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ERROR LED flashes

Table 3-3 ERROR LED Flashes




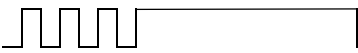

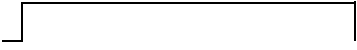
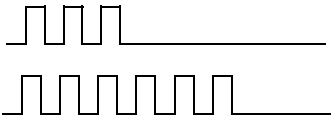
Probable part/probable cause	Checkpoints	Action to correct the problem
Home position detection error 	Check for jammed paper around the carriage. Make sure there is no paper jam.	Remove any jammed paper. Completed if operation is normal.
	Check the tension of the carriage belt (507). Make sure the carriage belt has appropriate tension.	Adjust carriage belt tension (Refer to page 5-6). Completed if operation is normal.
	Check operation of the parts around the carriage by moving the carriage from side to side. Make sure the belt drive pulley (505) rotates by moving the carriage sub assembly (1025) from side to side.	Reinstall the carriage belt (507) into the carriage sub assembly (1025). Completed if operation is normal.
	Check the resistance value of the carriage motor sub assembly (1034). Make sure it is 7.2 Ω or less.	Replace the carriage motor sub assembly (1034). Completed if operation is normal.
	Check the operation of the HP board assembly (518). Make sure the signal changes when you block the sensor.	Replace the HP board assembly (518). Completed if operation is normal.
	Check the connection of main circuit board unit (201) connectors. Make sure they are plugged in securely. CN7: carriage motor sub assembly (1034) CN4: HP board assembly (518)	Plug in the connectors securely. Completed if operation is normal.
	Check if the parts on the main circuit board unit (201) have any damage. Make sure connector CN7 and U8 look normal.	Replace the main circuit board unit (201). Completed if operation is normal.
R/W error in memory 	Check for repeatability. Make sure operation is normal by rebooting.	Replace the main circuit board unit (201). Completed if operation is normal.
High-voltage error 	Check the DC power voltage on the main circuit board unit (201). Make sure the power voltage has the proper voltage rating. (Refer to page 3-21.)	Replace the main circuit board unit (201). Completed if operation is normal.
Low-voltage error 	Check the DC power voltage on the main circuit board unit (201). Make sure the power voltage has proper voltage rating. (Refer to page 3-21.)	Replace the main circuit board unit (201). Completed if operation is normal.

Table 3-3 ERROR LED Flashes

Probable part/probable cause	Checkpoints	Action to correct the problem
CPU execution error 	Check the connection of the I/F circuit board unit (122). Make sure the connector is plugged into the main circuit board unit (201).	Connect the I/F circuit board unit (122). Completed if operation is normal.
	Check parts on the I/F circuit board unit (122) for damage. Make sure the I/F circuit board unit appears normal.	Connect the I/F circuit board unit (122). Completed if operation is normal.
	Check main circuit board unit (201) parts for damage. Make sure the main circuit board unit (201) looks normal.	Replace the main circuit board unit (201). Completed if operation is normal.
Head high-temperature detection circuit error 	Check the print head temperature. Make sure it is not too high.	Wait for the print head temperature to drop. Completed if operation is normal.
	Check connection of the head FFC (521). Make sure it is plugged into the print head unit (503) and connector (CN9) on the main circuit board unit (201).	Connect the head FFC (521). Completed if operation is normal.
	Check the continuity of the print head unit (503). Make sure wires are not broken or shorted out.	Connect the print head unit (503). Completed if operation is normal.
	Check if main circuit board unit (201) parts have any damage. Make sure the main circuit board unit (201) looks normal.	Replace the main circuit board unit (201). Completed if operation is normal.
The ERROR LED flashes 3 or 6 times and then does not operate all. 	Check the setting of DIP SW2-6. OFF: Initial state ON: Rewriting flash memory.	Switch DIP SW2-6 on the main circuit board unit (201) to OFF. Completed if operation is normal. If operation is not normal, rewrite the firmware. Completed if operation is normal.

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PAPER OUT LED lights

Table 3-4 PAPER OUT LED is Lit

Probable part/probable cause	Checkpoints	Action to correct the problem
Roll paper	Check the roll paper. Make sure it is loaded correctly. Make sure enough paper is left.	Replace the roll paper. Completed if the PAPER OUT LED turns off.
Paper end assembly (514)	Check operation of the paper end assembly (514). Make sure the continuity changes when you operate the switch.	Replace the paper end assembly (514). Completed if the PAPER OUT LED turns off.
Near-end sensor	Check operation of the micro switch (1039). Make sure the continuity changes when you operate the switch.	Replace the near-end sensor. Completed if the PAPER OUT LED turns off.
Main circuit board unit (201)	Check the parts for damage. Make sure the following parts look normal. CN6: for lead wires of the near-end sensor CN4: on the HP board assembly	Replace the main circuit board unit (201). Completed if operation is normal.

Symptoms when the self-test is run

Self-test is not printed

Before running the self-test, make sure the roll paper and ribbon are installed correctly in the printer. Then turn power off. To run the self-test, turn the power on while holding down the FEED button. If the test does not print, check the following:

- When the POWER LED does not light: Refer to page 3-3.
- When the ERROR LED lights: Refer to page 3-3.
- When the ERROR LED flashes: Refer to page 3-4.

When only the initializing operation is executed

Table 3-5 Only the Initializing Operation Occurs

Probable part/probable cause	Checkpoints	Action to correct the problem
DIP switch setting	For the serial I/F, check the reset function setting for pins # 6 and # 25. If the I/F cable is connected and the reset function is available, the I/F may always be resetting.	Disable the reset function with the DIP switch setting. Completed if operation is normal.
Main circuit board unit (210)	Check the operation of SE2. Make sure pressing the FEED button feeds paper. Make sure the continuity changes when you operate the switch.	Replace the main circuit board unit (201). Completed if operation is normal.

The printer does not print

The print head operates, but paper is not fed

Table 3-6 The Printer Does not Print

Probable part/probable cause	Checkpoints	Action to correct the problem
Roll paper is inserted incorrectly	Check the roll paper. Make sure it meets specifications. Make sure it is loaded correctly.	Load roll paper that meets specifications. Completed if operation is normal.
Paper jam	Check the paper path. Make sure there is no paper jam.	Open the roll paper cover assembly and remove any jammed paper. Completed if operation is normal.
Gear does not rotate	Check the gear operation. Make sure the following gears rotate: Paper feed gear (1063) Paper feed middle gear B (510) Paper feed middle gear (509) Paper feed reduction gear 1 (1093) Make sure the paper feed motor sub assembly (1046) shaft rotates with rotation of paper feed reduction gear 2 (1058).	Replace the defective gear. Completed if operation is normal.
Paper hold spring (1014)	Check the mounting state. Make sure it is mounted correctly. (See page 4-18.)	Insert the paper hold spring (1014) correctly. Completed if operation is normal.
Paper hold roller (1015)	Check operation. Make sure it rotates smoothly.	Replace the paper hold roller (1015). Completed if operation is normal.
Paper guide roller (1045)	Check the operation. Make sure the roller rotates smoothly.	Clean, so that the paper guide roller (1045) rotates correctly. Completed if operation is normal.
	Check for damage. You should see no damage, such as wear.	Replace the mechanism assembly (120). Completed if operation is normal.

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Table 3-6 The Printer Does not Print

Probable part/probable cause	Checkpoints	Action to correct the problem
PF (paper feed) lead wire set (1047)	Check the connectors. Make sure they are plugged in securely: Paper feed motor sub assembly (1046) Connector (CN8) on the main circuit board unit (201)	Plug in the connectors. Completed if operation is normal.
	Check the wires for breaks and shorts. Make sure no wires are broken or shorted out.	Replace the PF lead wire set (1047). Completed if operation is normal.
Paper feed motor sub assembly (1046)	Check the resistance value. Make sure it is 7.2Ω or less.	Replace the paper feed motor sub assembly (1046). Completed if operation is normal.
Main circuit board unit (201)	Check if the parts have any damage. Make sure the following parts look normal. Connector (CN8) U8	Replace the main circuit board unit (201). Completed if operation is normal.


Paper is fed, but characters are not printed

Table 3-7 Paper is Fed, but Characters do not Print

Probable part/probable cause	Checkpoints	Action to correct the problem
Ribbon cassette	Check the ribbon mounting. Make sure it is installed correctly.	Load the ribbon cassette correctly. Completed if operation is normal.
	Check the ribbon. Make sure it is not wrinkled, kinked, or broken.	Replace the ribbon cassette with a new one. Completed if printing is correct.
Head FFC (521)	Check the continuity with a tester. Make sure wires are not broken or shorted out.	Replace the head FFC (521). Completed if printing is correct.
Print head unit (503)	Check the continuity with a tester. Make sure wires are not broken or shorted out.	Replace the print head unit (503). Completed if printing is correct.
Main circuit board unit (201)	Check parts for damage. Make sure the following parts look normal. Connector (CN9) QM22, QM23, QM24	Replace the main circuit board unit (201). Completed if the print is correct.



Error occurs during printing

Table 3-8 ERROR during Printing

Probable part/probable cause	Checkpoints	Action to correct the problem
Autocutter (AC) error 	Check the connection of the main circuit board unit (201) connector. Make sure the AC lead wire set (1090) is connected.	Plug in the connector. Completed if operation is normal.
	Check the operation of the drive gear sub assembly (1072). Make sure it rotates with rotation of the cutter motor sub assembly (117).	Replace the drive gear sub assembly (1072). Completed if operation is normal.
	Check the operation of the cutter motor sub assembly (117).	Replace the cutter motor sub assembly (117). Completed if operation is normal.
	Check the operation of the micro switch (121). Make sure the continuity changes when you operate the switch.	Replace the micro switch (121). Completed if operation is normal.
	Check the AC lead wire set (1090) for breaks and shorts. Make sure wires are not broken or shorted out.	Replace the AC lead wire set (1090). Completed if operation is normal.
	Check fuse F3 on the main circuit board unit (201). Make sure it is not blown.	If the circuit board has no damage such as burns, replace fuse F3. Completed if operation is normal. If the fuse blows again in operation of the autocutter, replace the main circuit board unit.

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Table 3-8 ERROR during Printing

Probable part/probable cause	Checkpoints	Action to correct the problem
	Check the parts on the main circuit board unit (201) for damage. Make sure the following parts look normal. Connector (CN2) QM1	Replace the main circuit board unit (201). Completed if operation is normal.
Head high-temperature detection circuit error 	Check the print head temperature. Make sure it is not too high.	Wait for the print head temperature to drop. Completed if operation is normal.
	Check the error frequency. Make sure it does not occur too often.	Replace the print head unit (503). If the symptom continues, replace the main circuit board unit (201). Completed if operation is normal.
Roll paper cover open error 	Check the state of the cover when the error occurs. Be sure not to open the roll paper cover during printing.	If MSW 8-8 is OFF, close the roll paper cover again. Completed if operation is normal. If the MSW 8-8 is ON, turn power on again. Completed if operation is normal. If the error occurs when the roll paper cover is not open, refer to "Cannot pass one of the tests for a sensor" on page 3-18.
	Check the error frequency. Make sure it does not occur too often.	Replace the print head unit (503). Completed if operation is normal. If the symptom continues, replace the main circuit board unit (201). Completed if operation is normal.

Paper is not cut correctly

Table 3-9 Cutter not Working Correctly

Probable part/probable cause	Checkpoints	Action to correct the problem
DIP switch setting	Check the setting of DSW 2-2. OFF: Autocutter is disabled. ON: Autocutter is enabled.	Switch DSW 2-2 to ON. Completed if cutting is normal.
Full cut/partial cut setting	Check the full cut and partial cut setting. Make sure the autocutter unit (113) is mounted in the correct position.	Mount the autocutter unit (113) in the correct position. Completed if cutting is normal.
Fixed blade spring (1016)	Check the spring power. Make sure it has enough power to push the fixed blade (513) against the fixed blade holder (1017).	Replace the fixed blade spring (1016). Completed if cutting is normal.
Cutter blade	Check the fixed blade (513). Make sure it does not have any nicks.	Replace the fixed blade (513). Completed if cutting is normal.
	Check the movable cutter blade on the cutter frame assembly (114). Make sure it does not have any nicks.	Replace the cutter frame assembly (114). Completed if cutting is normal.

Ribbon feed mechanism does not operate

Table 3-10 Ribbon Feed Mechanism not Functioning Correctly

Probable part/probable cause	Checkpoints	Action to correct the problem
Ribbon cassette	Check the mounting. Make sure it is installed correctly.	Install the ribbon cassette correctly. Completed if printing is normal.
	Check the ribbon cassette itself. Make sure the ribbon is fed by turning the tab.	Replace the ribbon cassette with a new one. Completed if printing is normal.
Ribbon take-up function	Check the take-up operation. Be sure the following parts move with operation of the carriage sub assembly (1025): <input type="checkbox"/> Belt drive pulley (505) <input type="checkbox"/> Ribbon middle gear (512) <input type="checkbox"/> Ribbon drive plate sub assembly (517) <input type="checkbox"/> Ribbon take-up gear sub assembly (516)	Replace the defective gear. Completed if the operation is normal.
Adjustment roller shaft holders (506)	Check the platen gap adjustment. 0.45 mm: falls with no weight applied 0.55 mm: does not fall	Adjust the platen gap (refer to page 5-5). Completed if printing is normal.

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Print result is not normal

Print is light or irregular

Table 3-11 Light or Irregular Print

Probable part/probable cause	Checkpoints	Action to correct the problem
Ribbon cassette	Check the ribbon mounting. Make sure it is installed correctly.	Install the ribbon cassette correctly. Completed if printing is normal.
	Check the ribbon cassette. Make sure the ribbon is fed by turning the tab.	Replace the ribbon cassette with a new one. Completed if printing is normal.
Ribbon take-up function	Check the take-up operation. Be sure the following parts operate with operation of the carriage sub assembly (1025) <ul style="list-style-type: none"> <input type="checkbox"/> Belt drive pulley (505) <input type="checkbox"/> Ribbon middle gear (512) <input type="checkbox"/> Ribbon drive plate sub assembly (517) <input type="checkbox"/> Ribbon take-up gear sub assembly (516) 	Replace the defective gear. Completed if the operation is normal.
Adjustment roller shaft holders (506)	Check the platen gap adjustment. 0.45 mm: falls with no weight applied 0.55 mm: does not fall	Adjust the platen gap (refer to page 5-5). Completed if printing is normal.

Print is dark

Table 3-12 Dark Print

Probable part/probable cause	Checkpoints	Action to correct the problem
Adjustment roller shaft holders (506)	Check the platen gap adjustment. 0.45 mm: falls with no weight applied 0.55 mm: does not fall	Adjust the platen gap (refer to page 5-5). Completed if printing is normal.

Dots are missing continuously

Table 3-13 Missing Dots

Probable part/probable cause	Checkpoints	Action to correct the problem
Head FFC (521)	Check the continuity with a tester. Make sure no wires are broken or shorted out.	Replace the head FFC (521). Completed if printing is normal.
Print head unit (503)	Check the continuity with a tester. Make sure no wires are broken or shorted out.	Replace the print head unit (503). Completed if printing is normal.
	Check the state of the dot wires. Make sure they are not broken.	

Line spacing is irregular

Table 3-14 Irregular Line Spacing

Probable part/probable cause	Checkpoints	Action to correct the problem
Roll paper is inserted incorrectly	Check the roll paper. Make sure it meets specifications and is loaded correctly.	Load roll paper that meets specifications correctly. Completed if operation is normal.
Paper jam	Check the paper path. Make sure there is no paper jam.	Open the roll paper cover and remove the paper jam. Completed if operation is normal.
Gear does not rotate	Check gear operation. Make sure the following gears rotate with each other. Paper feed gear (1063) Paper feed middle gear B (510) Paper feed middle gear (509) Paper feed reduction gear 1 (1093) Make sure the shaft of platen assembly 3 (522) rotates with the rotation of paper feed reduction gear 2 (1058).	Replace the defective gear. Completed if operation is normal.
Paper hold spring (1014)	Check the spring mounting. Make sure it is mounted correctly. (Refer to page 4-18)	Insert the paper hold spring (1014) correctly. Completed if operation is normal.
Paper hold roller (1015)	Check operation. Make sure it rotates smoothly.	Replace the paper hold roller (1015). Completed if operation is normal.
Paper guide roller (1045)	Check operation. Make sure it rotates smoothly.	Clean, so the paper guide roller (1045) rotates correctly. Completed if operation is normal.

Two-color printing is not performed, or colors are mixed

Table 3-15 Printing is not Two-color, or Colors are Mixed

Probable part/probable cause	Checkpoints	Action to correct the problem
Ribbon cassette	Check the ribbon type. Make sure it is for 2-color printing.	Replace the ribbon cassette with one for 2-color printing. Completed if printing is normal.
	Check the mounting. Make sure the ribbon is installed correctly.	Install the ribbon cassette correctly. Completed if printing is normal.
Two-color shift function	Check the mounting of the spring. Make sure the following springs are mounted correctly. Ribbon take-up spring (1088) Ribbon frame spring (1022)	Mount the springs correctly. Completed if printing is normal.

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Printed contents are not normal

Table 3-16 Abnormal Printing Content

Probable part/probable cause	Checkpoints	Action for the problem
Firmware version	Check the version number. (See page 2-1.) Make sure it is the same as the version used by the customer, or the latest version.	Update the firmware. Completed if printing is normal.
Boot version	Check the version number. (See page 2-1.) Make sure it is the same as the version used by the customer, or the latest version.	Update the firmware. Completed if printing is normal.
DIP switch settings	Check the DIP switch settings printed. Make sure the following items are same as the DIP switch settings. (See page 5-7.) Serial Interface (when serial I/F is installed) Receive buffer capacity Receive buffer full release condition Handshaking operation Characters per line (CPL) Autocutter unit If they are not correct, check the continuity of the DIP switch.	Replace the main circuit board unit (201). Completed if printing is normal.
Resident character	Check the resident character set. Make sure it is same as the character set used by the customer.	Update the firmware. Completed if printing is normal.
	Check if this error message is printed: ### ERROR ### If so, the multilingual font is not correct. Please download the correct one. Make sure the message above is not printed.	Update the firmware. Completed if printing is normal. If printing is not normal, replace the main circuit board unit (201).
Paper width	Check the print item corresponding to the paper width. Make sure the entire area of the paper width is printed.	Match the paper width setting to the paper width. Completed if printing is normal

Paper jam occurs

Table 3-17 Paper Jams

Probable part/probable cause	Checkpoints	Action to correct the problem
Roll paper is inserted incorrectly	Check the roll paper. Make sure it meets specifications and is loaded correctly.	Load roll paper that meets specifications correctly. Completed if operation is normal.
Fixed blade (513)	Check for defects. Make sure you see no defects, such as deformation.	Replace the fixed blade (513). Completed if operation is normal.
Paper hold rollers (1015)	Check operation. Make sure the 2 rollers rotate smoothly.	Replace the paper hold roller(s) (1015). Completed if operation is normal.

Table 3-17 Paper Jams

Probable part/probable cause	Checkpoints	Action to correct the problem
Paper guide rollers (1045)	Check operation. Make sure the 2 rollers rotate smoothly.	Clean, so that both paper guide rollers (1045) rotate correctly. Completed if operation is normal.
	Check for defects. Make sure you see no defects, such as wear.	Replace the mechanism assembly (120). Completed if operation is normal.
Roll paper holder plate (508)	Check for defects. Make sure you see no defects, such as deformation.	Replace the roll paper holder plate (508). Completed if operation is normal.

Printing is loud

Table 3-18 Noisy Printing

Probable part/probable cause	Checkpoints	Action for the problem
Roll paper is inserted incorrectly	Check the roll paper. Make sure it meets specifications and is loaded correctly.	Load roll paper that meets specifications correctly. Completed if printing noise is reduced.
Adjustment roller shaft holders (506)	Check the platen gap adjustment. 0.45 mm: falls with no weight applied 0.55 mm: does not fall	Adjust the platen gap. (Refer to page 5-5.) Completed if the printing noise is reduced.

Symptoms when the All Function Test is Executed

When an error occurs during printing: Refer to page 3-9.

When paper is cut incorrectly: Refer to page 3-11.

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Communication test fails

Table 3-19 Communication Test Failure

Probable part/probable cause	Checkpoints	Action to correct the problem
Communication condition	Check the communication settings. Make sure the settings printed by the self-test are the same as the communication settings shown by the service utility.	Set the correct communication settings. Completed if operation is normal.
I/F cable	Check the I/F cable connection. Make sure the I/F cable is plugged in securely.	Plug in the I/F cable correctly. Completed if operation is normal.
	Check the continuity with a tester. Make sure no wires are cut or shorted out. Be sure the cable is wired correctly.	Replace the I/F cable. Completed if operation is normal.
I/F circuit board unit (122)	Check the connection. Make sure the connector is plugged in securely.	Connect the I/F circuit board unit (122). Completed if operation is normal.
	Check the parts for defects.	Replace the I/F circuit board unit (122). Completed if operation is normal.
Main circuit board unit (201)	Check parts on the main circuit board unit (201) for defects. Make sure connector (CN1) is connected.	Replace the main circuit board unit (201). Completed if operation is normal.

Printing is not normal

When print is light or irregular: Refer to page 3-12.

When print is dark: Refer to page 3-12.

When dots are missing continuously: Refer to page 3-12.

When line spacing is irregular: Refer to page 3-13.

When two-color printing is not performed, or the colors are mixed: Refer to page 3-13.

Printed output is not normal

Table 3-20 Abnormal Output is Printed

Probable part/probable cause	Checkpoints	Action to correct the problem
Communication setting	When a question mark (?) is printed, check communication settings. Make sure DTR/DSR control is selected by DIP switch or memory switch.	Select DTR/DSR control. Completed if ? is not printed.
I/F cable	When a question mark (?) is printed, check the continuity of the I/F cable with a tester. Make sure DTR/DSR cross.	Replace the I/F cable. Completed if the operation is normal.
Printer information setting	Check the printer information setting. Make sure the following information is printed: Maker name: "EPSON" Printer name: "TM-U220" Serial No: Serial number on the manufacturer's plate	Set again, using the printer status function. Completed if printing is normal.
Memory switch setting	Check the memory switch setting. Make sure it is the same as the setting used by customer. If you do not know the customer's setting, make sure it is in the factory default state. (Refer to page 5-10.)	Set again, using the printer status function. Completed if printing is normal.

Drawer 1 or 2 is not kicked out

Table 3-21 Drawer 1 or 2 not Kicked Out

Probable part/probable cause	Checkpoints	Action to correct the problem
Drawer kick	Check the connection. Make sure the cable is plugged in securely. Check each leading pin for drawer 1 or drawer 2.	Plug in the connector. Completed if the drawer is kicked out.
Sub circuit board unit (123)	Check board parts for defects. Make sure connectors (CNC2 and CNC3) are connected securely.	Replace the sub circuit board unit. Completed if the drawer is kicked out.
Main circuit board unit (201)	Check the parts for defects. Verify the parts below. Connector (CN10) Element (U7)	Replace the main circuit board unit. Completed if the drawer is kicked out.

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Cannot pass one of the tests for a sensor

Cannot pass the NE (near-end) sensor test

Table 3-22 Test for the NE Sensor Fails

Probable part/probable cause	Checkpoints	Action to correct the problem
NE lead wire set (1096)	Check connection. Ensure cable is plugged in. Be sure the NE lead wire set (1096) is connected to the connectors below. Micro switch (1039) Connector (CN6) on the main circuit board unit (201)	Plug in the connector. Completed if the test passes.
	Check the continuity with a tester. Make sure wires are not cut or shorted out. Verify that wires are arranged correctly.	Replace the NE lead wire set. Completed if the test passes.
Micro switch (1039)	Check micro switch (1039) operation. Make sure the continuity changes when you operate the switch.	Replace the near-end sensor. Completed if the test passes.
NE detector holder (1042) NE detector lever (1043)	Check the operation. Make sure the NE detector lever rotates smoothly.	Replace the NE detector holder or lever. Completed if the test passes.
Main circuit board unit (201)	Check the parts for defects. Make sure connectors (CNC2 and CN6) are connected.	Replace the main circuit board unit. Completed if the test passes.

Cannot pass the test for the RE (real end) sensor

Table 3-23 Test for the RE Sensor Fails

Probable part/probable cause	Checkpoints	Action to correct the problem
HP board assembly (518)	Check the connection. Make sure the cable is plugged in. Make sure the connector on the HP board assembly (518) is connected to connector (CN4) on the main circuit board unit (201).	Plug in the connector. Completed if the test passes.
	Check the continuity with a tester. Make sure wires are not cut or shorted out. Be sure wiring is arranged correctly.	Replace the HP board assembly (518). Completed if the test passes.
Paper end assembly (514)	Check the continuity of paper end assembly (514) wires with a tester. Make sure wires are not cut or shorted out. Be sure wiring is arranged correctly.	Replace the paper end assembly. Completed if the test passes.
Main circuit board unit (201)	Check the parts for defects. Make sure connector (CN4) is connected.	Replace the main circuit board unit. Completed if the test passes.

Cannot pass the test for the roll cover

Table 3-24 Paper Roll Cover Test Fails

Probable part/probable cause	Checkpoints	Action to correct the problem
Memory switch setting	Check the setting of MSW 8-5. If the setting is OFF, status is not sent from the roll cover, but the RE sensor is changed. Confirm if the setting status is ON.	Change the setting of MSW 8-5 to ON. Completed if the test passes.
HP board assembly (518)	Check the connection. Make sure the cable is plugged in. Make sure the connector on the HP board assembly (518) is connected to connector (CN4) on the main circuit board unit (201).	Plug in the connector. Completed if the test passes.
	Check the continuity with a tester. Make sure wires are not cut or shorted out. Be sure wires are arranged correctly.	Replace the HP board assembly (518). Completed if the test passes.
Cover open assembly (515)	Check the continuity of the wires for the cover open assembly (515) with a tester. Be sure wires are not cut or shorted out. Be sure wires are arranged correctly.	Replace the cover open assembly. Completed if the test passes.
Main circuit board unit (201)	Check the parts for defects. Make sure connector (CN4) is connected.	Replace the main circuit board unit. Completed if the test passes.

Cannot pass the test for the paper FEED button

Table 3-25 Paper FEED Button Test Fails

Probable part/probable cause	Checkpoints	Action to correct the problem
Main circuit board unit (201)	Check the operation of SW2. Make sure roll paper is fed when you press the paper FEED button. Make sure the continuity changes when you press the button.	Replace the main circuit board unit. Completed if the test passes.

Cannot pass the test for drawer 3 status

Table 3-26 Drawer 3 Status Fails

Probable part/probable cause	Checkpoints	Action to correct the problem
Drawer kick	Check the connection. Make sure the cable is plugged in. Check each leading pin for drawer 1 or drawer 2.	Plug in the connector. Completed if the drawer is kicked out.
Sub circuit board unit (123)	Check the parts for defects. Make sure connectors (CNC2 and CNC3) are connected.	Replace the sub circuit board unit. Completed if the drawer is kicked out.
Main circuit board unit (201)	Check the parts for defects. Make sure connector (CN10) is connected.	Replace the main circuit board unit. Completed if the drawer is kicked out.

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Symptoms for other operations

Parts do not move smoothly

Cannot take up the roll paper smoothly

Table 3-27 Opening and Closing the Roll Paper Cover Assembly is not Smooth

Probable part/probable cause	Checkpoints	Action to correct the problem
Paper take-up shaft assembly (134)	Confirm that the paper take-up assembly is attached correctly. Make sure parts are located in the correct positions.	Confirm that the paper take-up shaft assembly (134) is attached correctly. Completed if the paper is taken up correctly when you press the paper FEED button.
Take-up belt (523)	Confirm that the belt is attached and has no defects, such as wear and deformation. Be sure the belt is located in the correct position.	Confirm that the take-up belt (523) is attached correctly. Completed if the belt is driven correctly.

Cannot open and close the ribbon cover smoothly

Table 3-28 Opening and Closing the Ribbon Cover is not Smooth

Probable part/probable cause	Checkpoints	Action to correct the problem
Ribbon cover (109)	Confirm the condition of 2 projections on the cover. Make sure neither is broken.	Replace the ribbon cover (109). Completed if the cover opens and closes smoothly.

Cannot open and close the roll paper cover assembly smoothly

Table 3-29 Opening and Closing the Roll Paper Cover Assembly is not Smooth

Probable part/probable cause	Checkpoints	Action to correct the problem
Frame rotation spacer (1050)	Confirm that the spacer is fixed. Make sure it is located in the correct position.	Confirm that the frame rotation spacer is attached correctly. Completed if cover opens and closes.
Rotation springs	Confirm spring attachment. Make sure they are located in the correct positions.	Confirm that rotation spring R (1006) is attached correctly. Completed if cover opens and closes.
Platen release spring (1056)	Confirm spring attachment. Make sure it is located in the correct position.	Confirm that the platen release spring (1056) is attached correctly. Completed if cover opens and closes.
Hook spring C (1092)	Confirm spring attachment. Make sure it is located in the correct position.	Confirm that hook spring C (1092) is attached correctly. Completed if cover opens and closes.

The case is dirty

Use a dry cloth or one lightly moistened with water to clean case. Be sure to disconnect the power cord from the wall outlet before doing this.

Avoid using alcohol, benzene, thinner, trichloroethylene, or ketone-based substances to remove dirt or foreign matter from the printer, because these substances can affect or damage plastic and rubber parts.

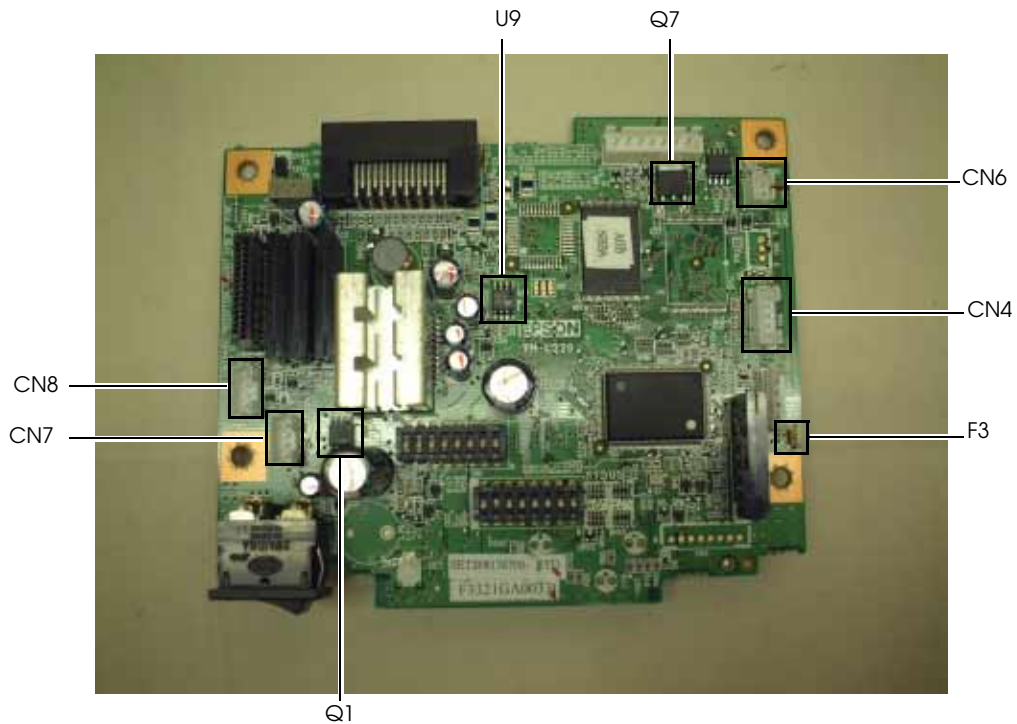
Test Points on the Main Circuit Board Unit

Table 3-30 Test Points on the Main Circuit Board Unit



Power supply	Pin name	Status	Test connector	Component connector	Correct value
Power supply	Semiconductor switch on	—	—	U9, pin 3 or pin 4	5 V
	Semiconductor switch off	—	—	Q1, pins 5 or 6 or 7 or 8	24 V
Logic circuit power supply	Logic circuit power supply	—	—	U9, pin 5	3.3 V
	Logic circuit power supply (GND)	—	—	Bottom assembly frame	0 V
Mechanism power supply	Autocutter (117) power supply	—	—	F3	24 V
	Print head power supply	—	—	Q7, pins 5 or 6 or 7 or 8	24 V
	Roll paper cover open sensor (515) power supply	Cover opened	—	CN4, pin 5	3.3 V
		Cover closed	—		0 V
	HP sensor (518) power supply	On home position	—	CN4, pin 2	0 V
		Not on home position	—		3.3 V
	NE sensor (1096) power supply	Sufficient roll paper installed	—	CN6, pin 1	3.3 V
		Sufficient roll paper not installed	—		0 V
	RE sensor (514) power supply	Roll paper installed	—	CN4, pin 4	0 V
		Roll paper not installed	—		3.3 V
Drawer power supply	—	—	—	CNC3, pin 5	24 V

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The locations of the main elements on the main circuit board unit are identified below.



Resistance Values of Printer Mechanism Components

Part Name	Internal Element	Function	Where to Check	Normal Status
Carriage motor (1034)	4-phase stepping motor 	Head carriage drive	Remove the cable connector connected to CN7 on the main circuit board. Test between pin 1 and pin 3 and between pin 2 and pin 4.	Approx. 7.2 Ω (per 1 phase)
Receipt paper feed motor (1046)	4-phase stepping motor 	Receipt paper feed	Remove the cable connector connected to CN8 on the main circuit board. Test between pin 1 and pin 3 and between pin 2 and pin 4.	Approx. 7.2 Ω (per 1 phase)

Chapter 4

Disassembly and Assembly

This chapter gives instructions to disassemble and assemble the product. Also, the text explains maintenance and cleaning.

Lubricants

Lubrication is critical to retaining the printer at its initial performance level throughout its life, as well as avoiding potential problems. Always lubricate at prescribed intervals, using the correct lubricants.

Standard Lubrication

- ❑ During disassembly and reassembly, clean the parts first, then lubricate them.
- ❑ Lubricate or overhaul after every 7.5 million lines printed.

Lubricants

The types of lubricants used greatly affect the printer's performance and durability, and a lubricant's low-temperature characteristics require special attention. EPSON has conducted thorough analyses of the technical data and wide-ranging experimentation on different lubricants. The EPSON selection of lubricants prescribed for use with the printer is based on the results of such research. The prescribed EPSON lubricants are available in 40 cc (40 gr) metal cans or plastic containers (the smallest unit of supply).

The three types of lubricants used with this printer are G-15, G-36, and O-13.

Lubrication Points

The table on the next page describes the lubrication points, types, and classes. Also see the explanations contained in the diagrams in this chapter.

Tool List

- ❑ Use the tools below for assembly, disassembly, and adjustment.

Items	Parts code	Note
Gap gauge	1080567	Size: 0.45 mm
	1080568	Size: 0.55 mm
Tension gauge	1213123	—
E-ring holder	1074111	Size: 2.3
	1080545	Size: 3
	1080546	Size: 4



- ❑ Use the grease or oil types indicated below for lubrication.

Items	Parts code	Note
Oil	1041442	O-13
Grease	1080605	G-15
	1080619	G-36

- ❑ Use items in the list below when operating the printer.

Items	Parts code	Note
AC adapter	2081786	—
Ribbon cassettes	S0152440000	ERC-38 (B)
	S0152450000	ERC-38 (B/R)
	S0152460000	ERC-38 (P)

Notes for Assembly and Disassembly

- ❑ For assembly, reverse the procedures described under “Disassembly.”
- ❑ The  symbol in the disassembly procedure indicates that the item needs to be checked.
- ❑ The  symbol in the disassembly procedure indicates an item that needs to be lubricated.

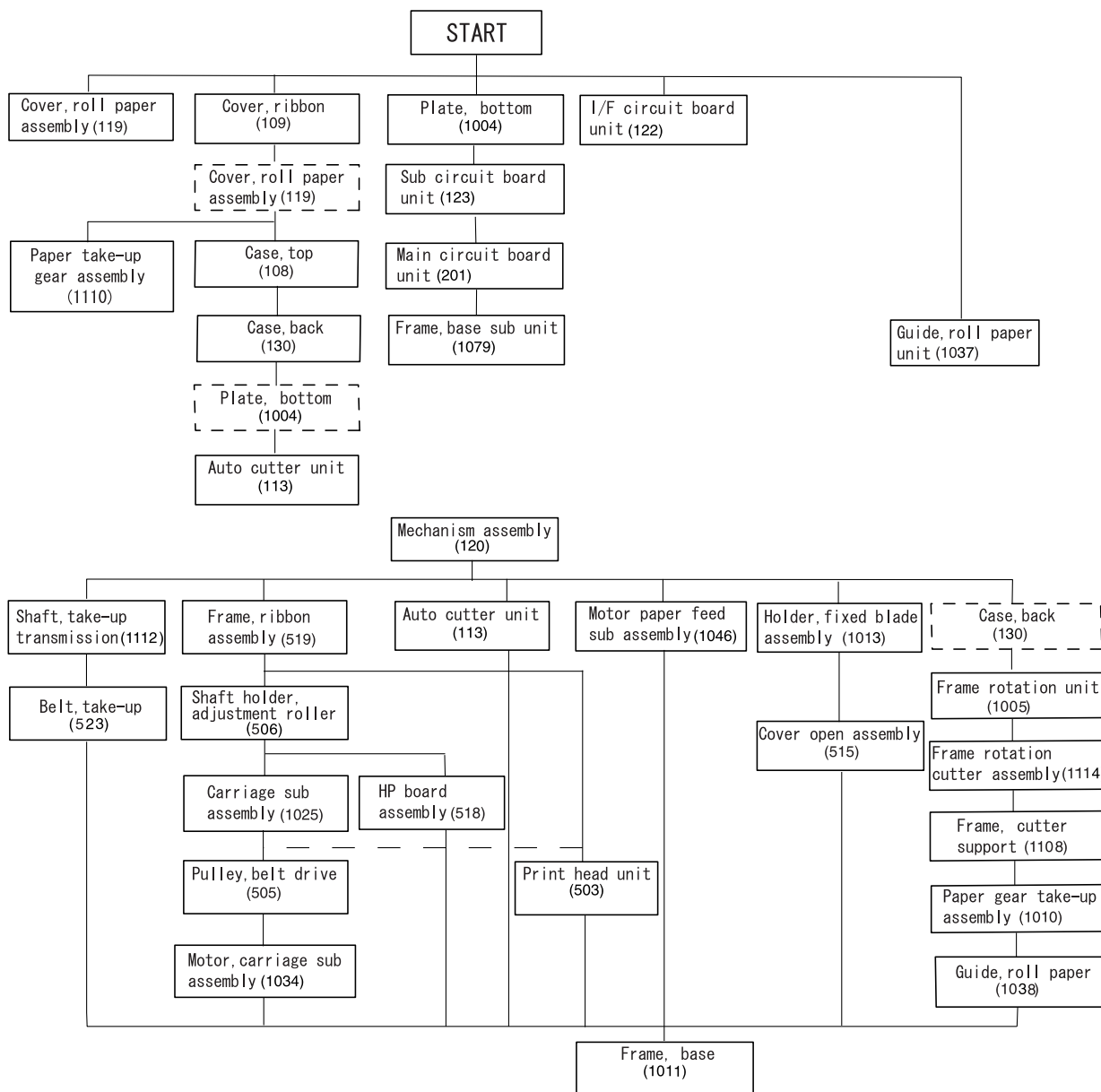


CAUTION:

- ❑ Wear a grounded wrist band when handling the internal circuit boards to prevent damage from static electricity.
- ❑ When removing an internal circuit board, place it on an anti-static rubber sheet or similar surface to prevent damage from static electricity.
- ❑ Be careful not to subject the circuit boards to shock or vibration, because this may damage them.
- ❑ Do not touch the circuit board or cable terminals with your hands to prevent contamination that may result in a malfunction. Hold circuit boards only by their edges.
- ❑ Always remove the power supply unit from the printer before working. Power is flowing to the internal circuit boards even if you turn the printer off at the power supply switch. You may damage the printer if you work while the power supply is still attached.
- ❑ Remove all peripheral equipment connected to the printer before starting work.
- ❑ Do not perform any work that is not described in this chapter. Doing so may result in injury or damage to the printer.

Shortest Route for Disassembly of Major Parts

The diagram below shows the shortest route for disassembly of major parts. Perform disassembly by following this diagram as well as the explanations for the target item.



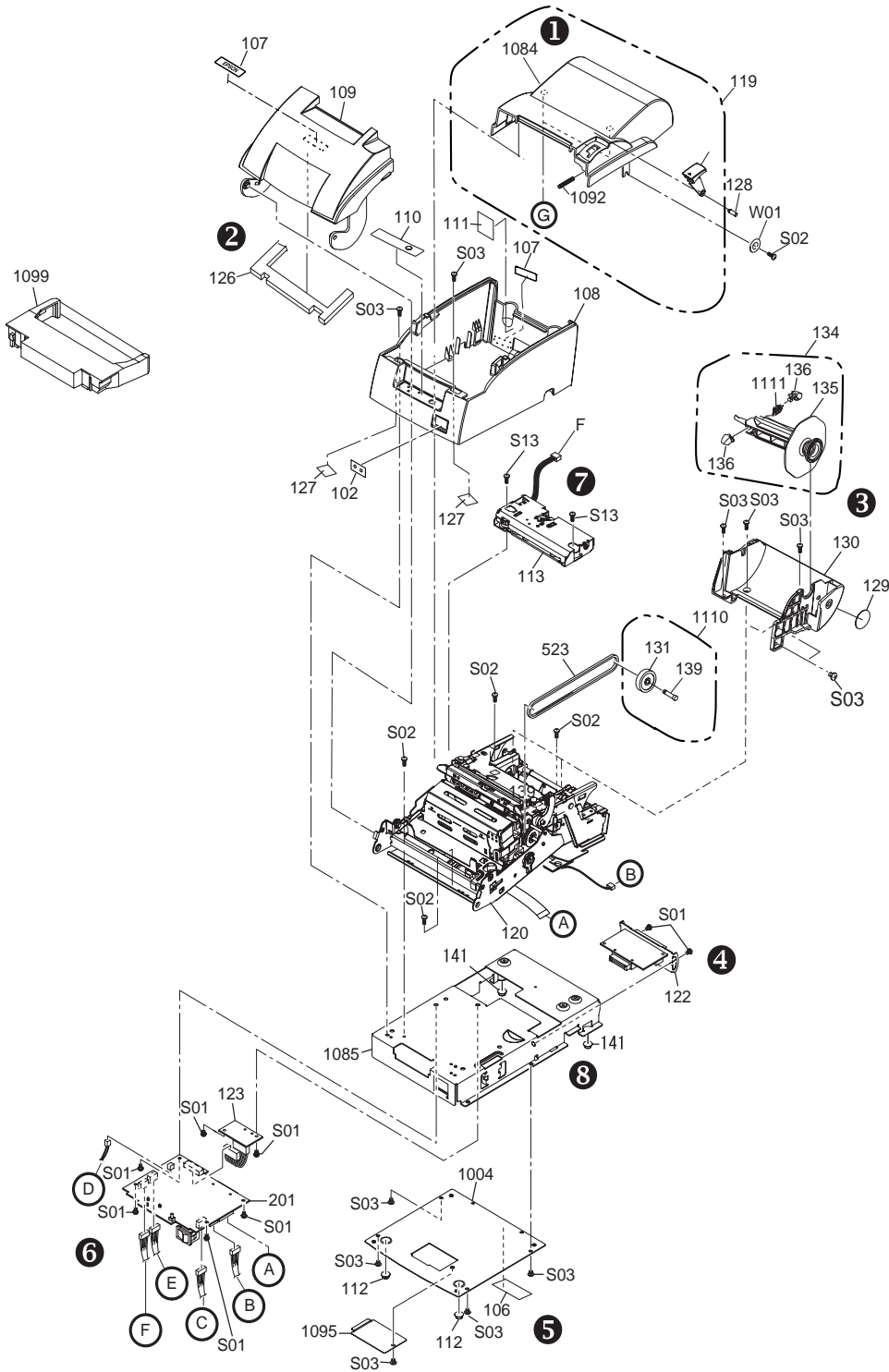
How to use the key map:

1. Find the component enclosed in a box with solid black lines (not dotted lines) that you want to remove.
2. Trace the line upward from that component to **START**.
3. You need to remove all components or units in the path back to **START**.





Note that the steps for disconnecting cables and removing plates on the units are not described in this key map.

Disassembling the TM-U220

Exploded diagram

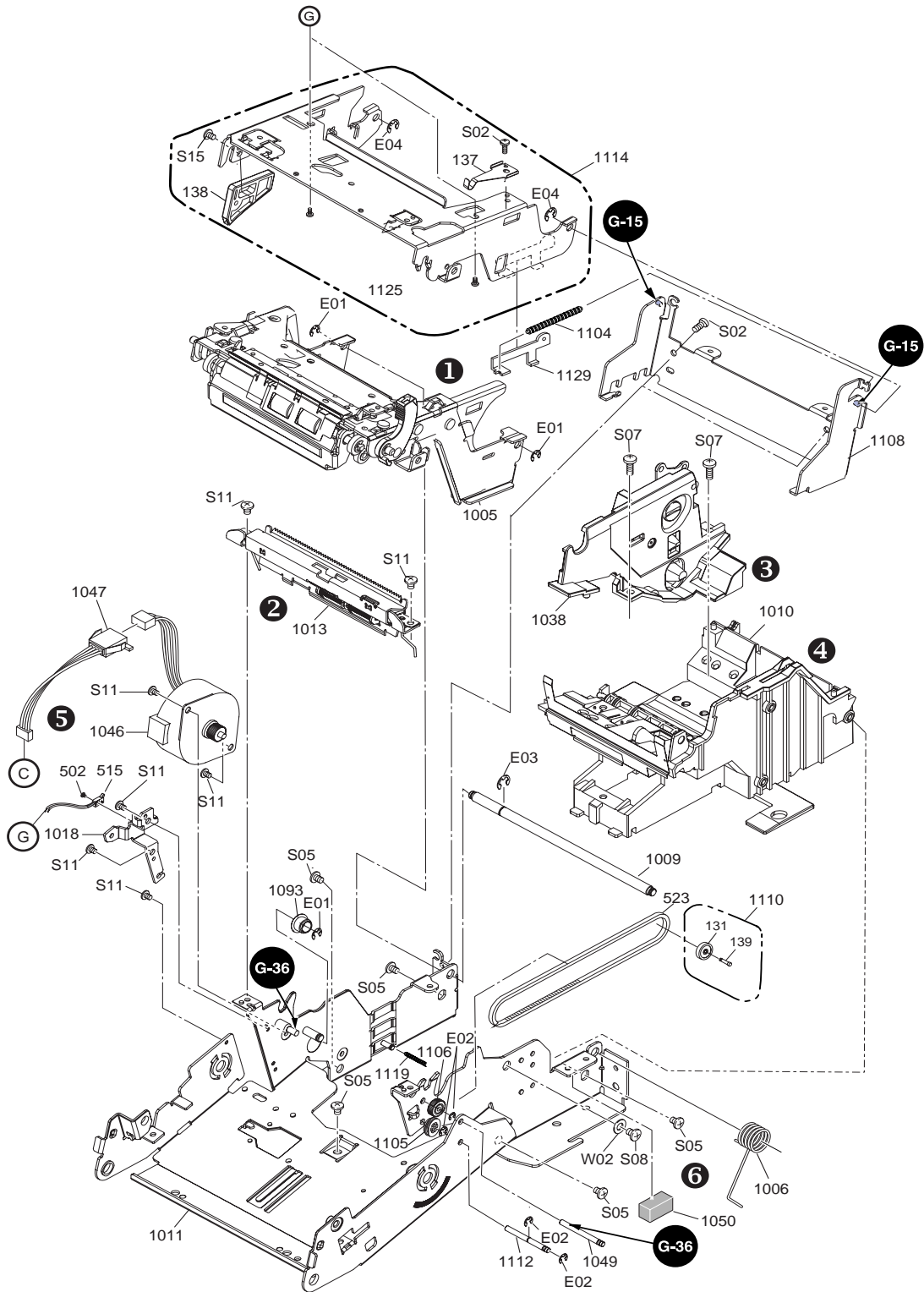


Disassembly Procedures








Disassembly steps	Part names	Disassembly procedures
❶	Roll paper cover assembly (119)	<ul style="list-style-type: none"> <input type="checkbox"/> Open the roll paper cover assembly (119). <input type="checkbox"/> Push and take out the open lever shaft (1001), and then remove 1 screw (S02). <input type="checkbox"/> Release the hooks in 3 positions as shown in the diagram, and remove 2 screws (S03). <input type="checkbox"/> Remove the roll paper cover assembly (119).  When removing the roll paper cover assembly, release the 3 hooks. (See page 4-16.)
❷	Top case (108)	<ul style="list-style-type: none"> <input type="checkbox"/> Remove 2 screws (S03). <input type="checkbox"/> Open the ribbon cover (109). <input type="checkbox"/> Remove the top case (108) and ribbon cover (109) together.  When attaching the top case be sure not to catch the cables in the frame. (See page 4-19.)
❸	Back case (130) Paper take-up gear assembly (1110) Take-up belt (523)	<ul style="list-style-type: none"> <input type="checkbox"/> Remove 2 screws (S02). After that, remove the back case (130). <input type="checkbox"/> Remove the paper take-up gear assembly (1110). <p>When attaching the paper take-up gear assembly (1110), be sure that the take-up gear shaft (139) is attached from the correct direction.</p>
❹	I/F circuit board unit (122)	<ul style="list-style-type: none"> <input type="checkbox"/> Remove the I/F circuit board unit (122).
❺	Bottom plate (1004)	<ul style="list-style-type: none"> <input type="checkbox"/> Remove 4 screws (S03), and remove the bottom plate (1004).
❻	Main circuit board unit (201)	<ul style="list-style-type: none"> <input type="checkbox"/> Remove connectors attached to the main circuit board unit (201). <input type="checkbox"/> Remove 4 screws (S01), and remove the main circuit board unit (201).  When reattaching each cable to the main circuit board, be sure each cable is attached correctly. (See page 4-27.)
	Sub circuit board unit (123)	<ul style="list-style-type: none"> <input type="checkbox"/> Remove 2 screws (S01), and remove the sub circuit board unit (123).
❼	Autocutter unit (113)	<ul style="list-style-type: none"> <input type="checkbox"/> Remove 2 screws (S02), and remove the autocutter unit (113).  When attaching the autocutter, confirm that the cutting pattern is selected correctly (partial cut or full cut). (See page 5-4.)
❽	Bottom frame assembly (1085)	<ul style="list-style-type: none"> <input type="checkbox"/> Remove 4 screws (S02), and remove the bottom frame assembly (1085). After that, remove the mechanism assembly (120).

Disassembling the Mechanism Assembly

Exploded diagram

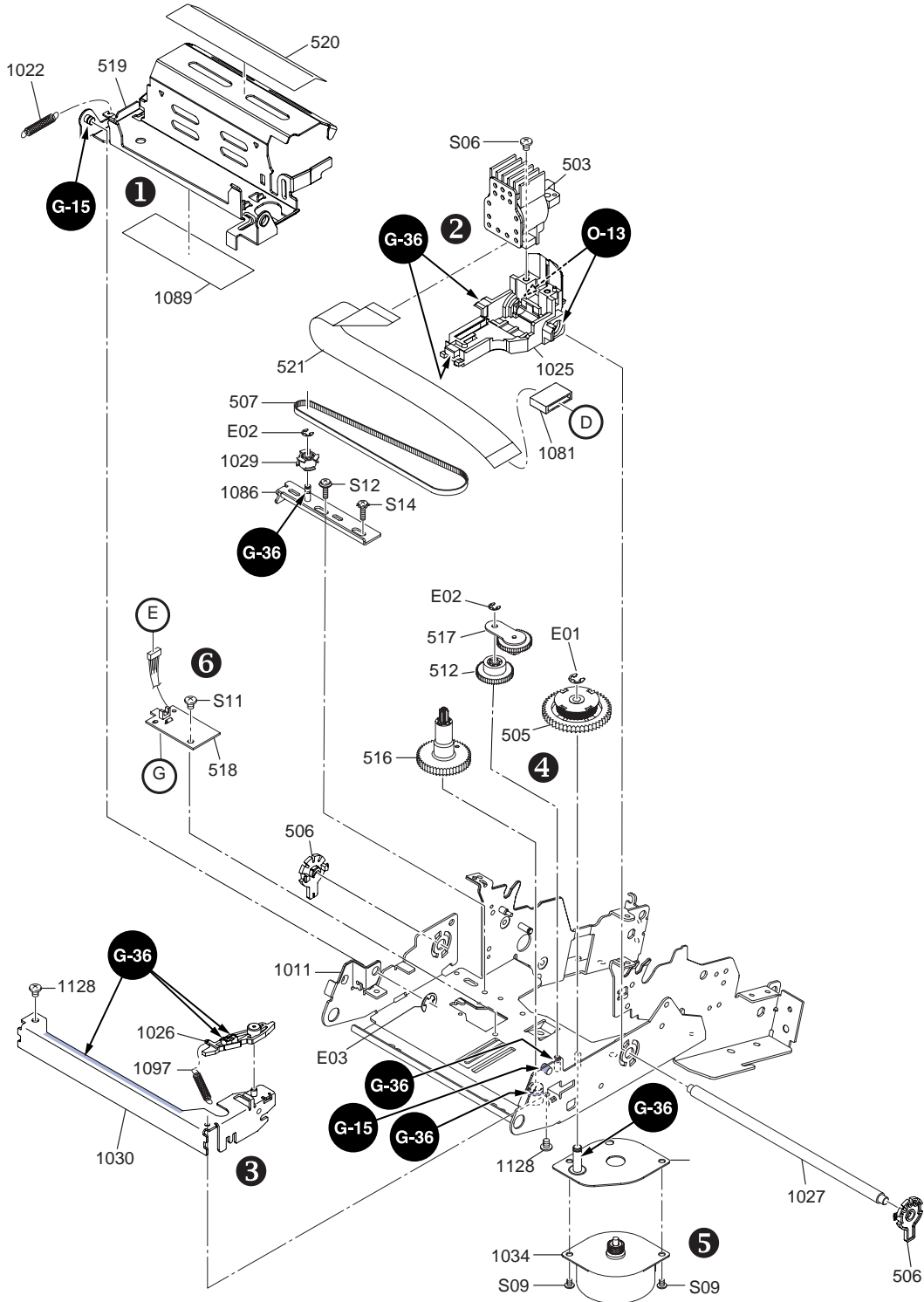


Disassembly Procedures



Disassembly steps	Part names	Assembly procedures
①	Take-up belt (523) Platen rotation frame 2 (1125) Frame rotation unit (1005) Cutter support frame (1108)	<ul style="list-style-type: none"> <input type="checkbox"/> Remove the back case (130). <input type="checkbox"/> Remove the take-up gear shaft (139). After that, remove the paper take-up gear assembly (131). <input type="checkbox"/> Remove the take-up belt (523).  When reattaching the take-up gear shaft (139) and take-up belt (523), be sure the shaft is attached correctly. (See page 4-22.) Also, when attaching platen rotation plate 2 (137), be sure the plate is attached correctly. (See page 4-20.) <input type="checkbox"/> Remove the cutter rotation plate (1129). <input type="checkbox"/> Remove platen rotation frame 2 (1125). <input type="checkbox"/> With platen rotation frame 1 unit closed, remove E-ring 3 (E01). <input type="checkbox"/> Release rotation spring R (1006) from the hooks. <input type="checkbox"/> Remove E-ring 4 (E03), and remove the rotation shaft (1009). <input type="checkbox"/> Remove the frame rotation unit (1005).  Remove the unit while spreading its sides to the right and left. (See page 4-10.)  Lubricate the frame rotation unit (1005) with G-36. <input type="checkbox"/> Remove 2 screws (S02), and remove the cutter support frame (1108).  Lubricate the cutter support frame (1108) with G-15.
②	Fixed blade holder assembly (1013)	<ul style="list-style-type: none"> <input type="checkbox"/> Remove 2 screws (S11), and remove the fixed blade holder assembly (1013).
③	Roll paper guide unit (1038)	<ul style="list-style-type: none"> <input type="checkbox"/> Remove 2 screws (S05), and remove the roll paper guide (1038).
④	Roll paper holder (1010)	<ul style="list-style-type: none"> <input type="checkbox"/> Remove 2 screws, and remove the back case (130). <input type="checkbox"/> Remove 2 screws (S08), and remove 5 screws (S05) with 1 washer (W02), and then remove the roll paper holder (1010).
⑤	Cover open assembly (515) Paper feed motor sub assembly (1046)	<ul style="list-style-type: none"> <input type="checkbox"/> Remove 1 screw (502) securing the cover open assembly (515). <input type="checkbox"/> Remove 2 screws (S11), and remove the paper feed motor sub assembly (1046).
⑥	Platen fixing shaft R (1049) Middle take-up gear (1106) Take-up transmission shaft (1112) Take-up transmission gear (1105) Base frame (1011)	<ul style="list-style-type: none"> <input type="checkbox"/> Remove 1 E-ring 2.3 (E02), and remove platen fixing shaft R (1049) and the middle take-up gear (1106).  Lubricate platen fixing shaft R (1049) with G-36. <input type="checkbox"/> Remove 1 E-ring 2.3 (E02), and remove the take-up transmission shaft (1112) and take-up transmission gear (1105).  Lubricate the take-up transmission shaft (1112) with G-36. <p>After this, you can remove the base frame (1011).</p> <ul style="list-style-type: none">  Lubricate the base frame (1011) with G-36.

Disassembling the Carriage Unit

Exploded diagram

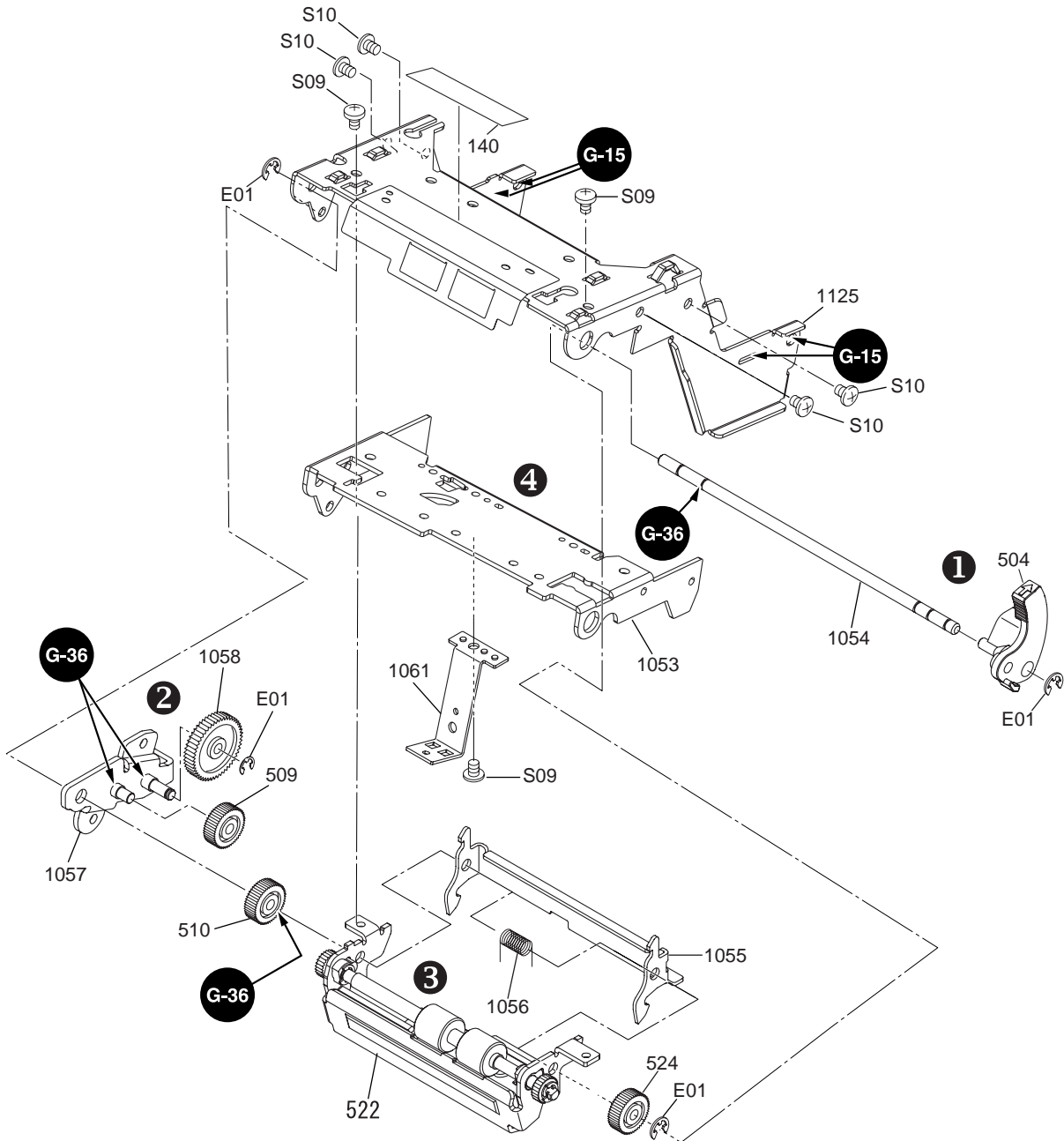


Disassembly Procedures

Reassembly steps	Part names	Assembly procedures
①	Ribbon frame assembly (519)	<ul style="list-style-type: none"> <input type="checkbox"/> Remove the ribbon frame spring (1022). <input type="checkbox"/> Remove 1 E-ring 4 (E03), and remove the ribbon frame assembly (519). <input type="checkbox"/> After this, you can remove the print head unit (503). ◆ Lubricate the carriage sub assembly (1025) with O-13.
②	Carriage sub assembly (1025) Carriage belt (507) Head FFC (521)	<ul style="list-style-type: none"> <input type="checkbox"/> Remove the right and left adjustment roller shaft holders (506). <input type="checkbox"/> Pull out the carriage shaft (1027). <input type="checkbox"/> Remove the head FFC (521) from the carriage sub assembly (1025). <input type="checkbox"/> Loosen 2 screws (S12, S14) securing the belt tension plate sub assembly (1086). <input type="checkbox"/> Remove the carriage belt (507), together with the carriage sub assembly (1025). <input type="checkbox"/> Remove the belt tension plate sub assembly (1086). <input type="checkbox"/> Remove the head FFC (521). <p> Note for replacing the adjustment roller shaft holders (See page 4-22): When you need to remove the adjustment roller shaft holders (506), you must replace each holder with a new part. This is necessary because the part changes when you remove it.</p> <p>Note for attaching the carriage sub assembly (1025) (See page 4-24): When you reassemble the carriage sub assembly (1025), you also need to adjust the unit's platen gap. (See page 5-5.)</p> <p>Note for attaching the carriage belt (507) (See page 4-23): When you reattach the carriage belt, adjust its tension. (See page 5-6.)</p> <p>Confirm the head FFC (521) is connected correctly. (See page 4-23.)</p> <ul style="list-style-type: none"> ◆ Lubricate the carriage sub assembly (1025) with O-13. ◆ Lubricate the belt tension plate sub assembly (1086) with G-36.
③	Carriage guide plate (1030) Carriage guide plate sub assembly (1026)	<ul style="list-style-type: none"> <input type="checkbox"/> Remove 2 screws (S11), and remove the carriage guide plate (1030). <input type="checkbox"/> Remove the carriage guide plate sub assembly (1026). ◆ Lubricate the carriage guide plate (1030) and the belt tension plate sub assembly (1086) with G-36.
④	Ribbon drive plate sub assembly (517) Ribbon middle gear (512) Ribbon take-up gear sub assembly (516) Belt drive pulley (505)	<ul style="list-style-type: none"> <input type="checkbox"/> Remove 1 E-ring 2.3 (E02), and remove the ribbon drive plate sub assembly (517). <input type="checkbox"/> Remove the ribbon middle gear (512). <input type="checkbox"/> Remove the ribbon take-up gear sub assembly (516). <input type="checkbox"/> Remove 1 E-ring 3 (E01), remove the belt drive pulley (505).
⑤	Carriage motor sub assembly (1034)	<ul style="list-style-type: none"> <input type="checkbox"/> Remove 2 screws (S09), and remove the carriage motor sub assembly (1034).
⑥	HP board assembly (518) Base frame (1011)	<ul style="list-style-type: none"> <input type="checkbox"/> Remove 1 screw (S11), and remove the HP board assembly (518). <p> When replacing the HP board assembly (518), you need to remove the solder. Resolder when attaching the HP board assembly (518). (See page 4-24.)</p> <p>After this, you can remove the base frame (1011).</p> <ul style="list-style-type: none"> ◆ Lubricate the base frame (1011) with G-15 and G-36.

Disassembling the Rotation Frame Unit

Exploded diagram

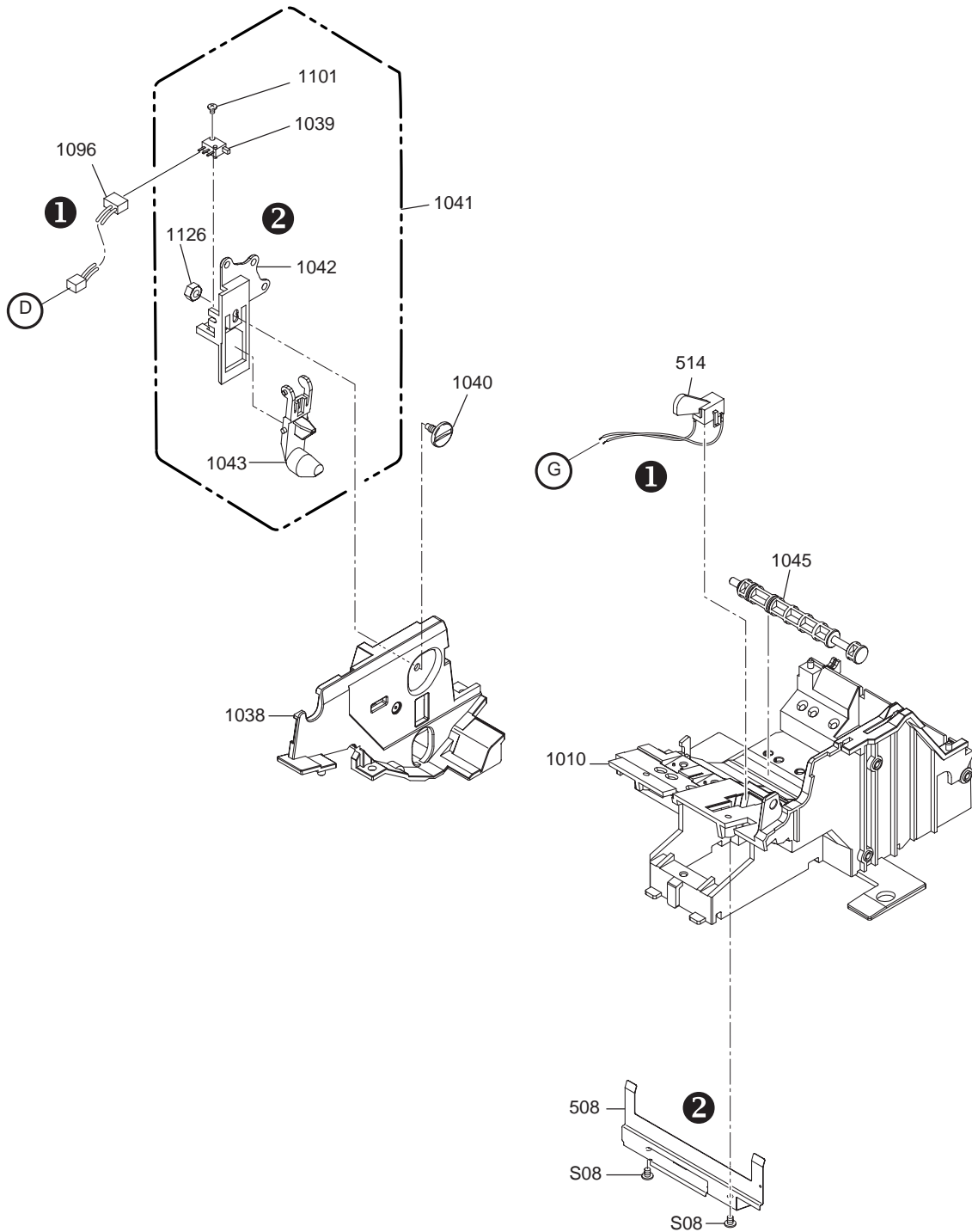


Disassembly Procedures

Reassembly steps	Part names	Assembly procedures
①	Platen release lever (504)	<ul style="list-style-type: none"> ❑ Remove 2 E-rings 3 (E01), and remove the platen release lever (504) and platen shaft (1054). ◆ Lubricate the platen shaft (1054) with G-15.
②	Gear plate D sub assembly (1057) Paper feed middle gear (509) Paper feed middle gear B (510)	<ul style="list-style-type: none"> ❑ Remove 2 screws (S10), and remove the gear plate D sub assembly (1057). ❑ Remove 1 E-ring 3 (E01), and remove the paper feed reduction gear 2 (1058). ❑ Remove the paper feed middle gear (509) and paper feed middle gear B (510). ◆ Lubricate the gear plate D sub assembly (1057) with G-15.
③	Platen assembly 3 (522)	<ul style="list-style-type: none"> ❑ Remove 1 E-ring 3 (E01), and pull out the platen shaft (1054). ❑ In doing so, remove the paper feed middle gear B (510), the platen release plate (1055), and the platen release lever (504) together. Take care not to lose the platen release spring (1056). ❑ Remove platen assembly 3 (522). ❑ Remove 1 screw (S09), and remove the bottom holding plate BM (1061). 📖 When installing the frame rotation unit (1005) on the base frame assembly, check how to lead the autocutter unit (113) cable. (See page 4-19.)
④	Platen frame (1053) Platen rotation frame 2 (1125)	<ul style="list-style-type: none"> ❑ Remove 3 screws (S10), and remove the platen frame (1053). <p>After this, you can remove the platen rotation frame 2 (1125).</p> <ul style="list-style-type: none"> ◆ Lubricate the platen rotation frame 2 (1125) with G-15.

Disassembling the Roll Paper Guide / Roll Paper Holder

Exploded diagram



Disassembly Procedures

Use the steps below for disassembling the roll paper holder.

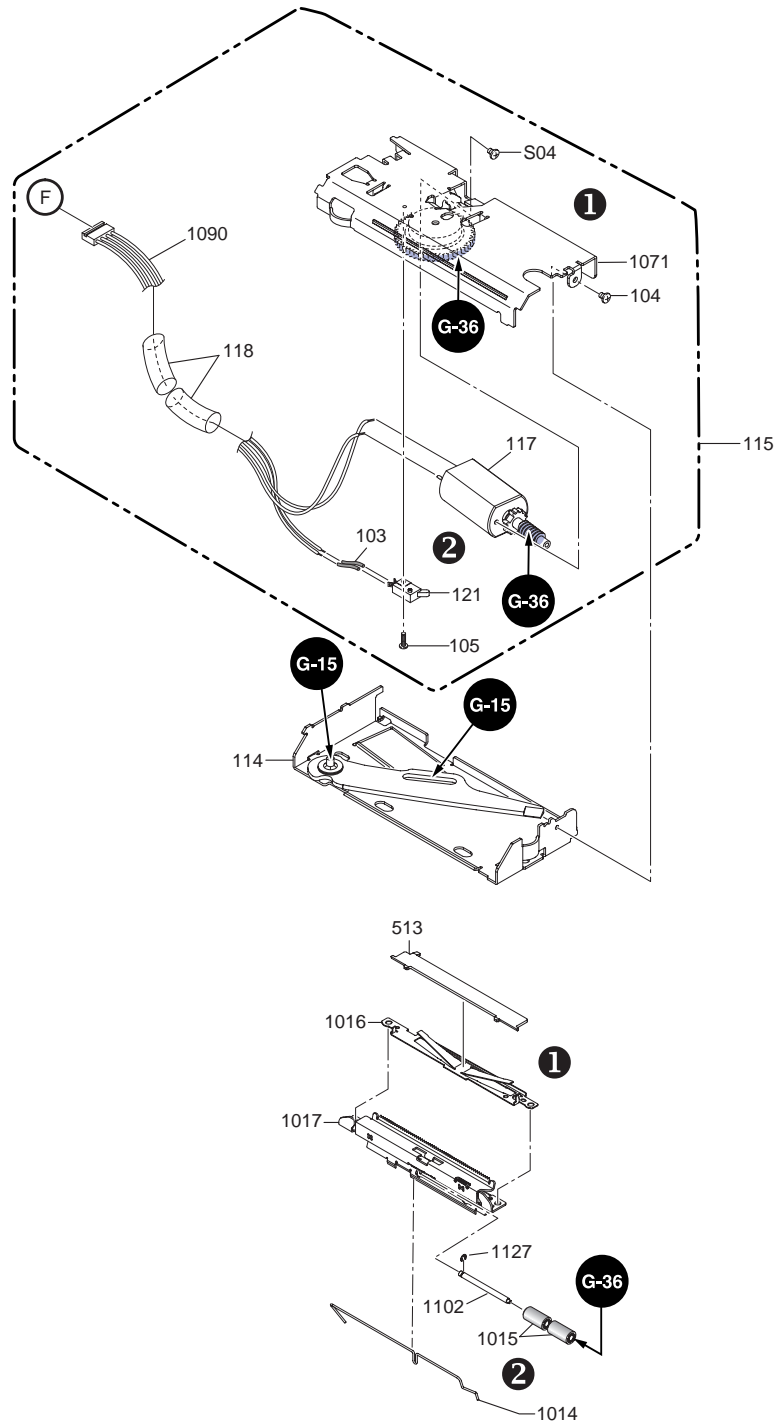
Reassembly steps	Part names	Assembly procedures
①	Paper end assembly (514)	<input type="checkbox"/> Remove the paper end assembly (514). <input type="checkbox"/> When replacing the paper end assembly (514), you need to pull out the wire attached on the HP circuit board. (See page 4-24.)
②	Roll paper holder (1010)	<input type="checkbox"/> Remove 2 screws (S05), and remove the roll paper holder plate (508). <input type="checkbox"/> Remove the roll paper holder (1010).

Use the steps below for disassembling the roll paper guide.

Reassembly steps	Part names	Assembly procedures
①	NE lead wire set (1096) Paper end assembly (514)	<input type="checkbox"/> Remove the NE lead wire set (1096). <input type="checkbox"/> Remove the paper end assembly (514).
②	Roll paper guide (1038)	<input type="checkbox"/> Turn the detector adjustment screw (1040), and remove the NE detector assembly (1041) and the nut (1126). Then, remove the roll paper guide (1038).

Disassembling the Autocutter Unit / Fixed Blade Holder Assembly

Exploded diagram



Disassembly Procedures

Use the steps below for disassembling the autocutter unit.

Reassembly steps	Part names	Assembly procedures
①	Cutter cover assembly (115)	<ul style="list-style-type: none"> ☐ Remove the cutter cover assembly (115). ◆ Lubricate the cutter frame assembly (114) with G-36.
②	Cutter motor sub assembly (117) Micro switch (121)	<ul style="list-style-type: none"> ☐ Remove 1 screw (S04), and remove the cutter motor sub assembly (117). ☐ Remove 1 screw (105), and remove the micro switch (121). ☐ Remove 2 guard tubes C (118). 📖 When removing a guard tube C (118), you need to pull out the wire attached to the motor. (See page 4-19.) ◆ Lubricate the paper hold roller (1015) with G-36.

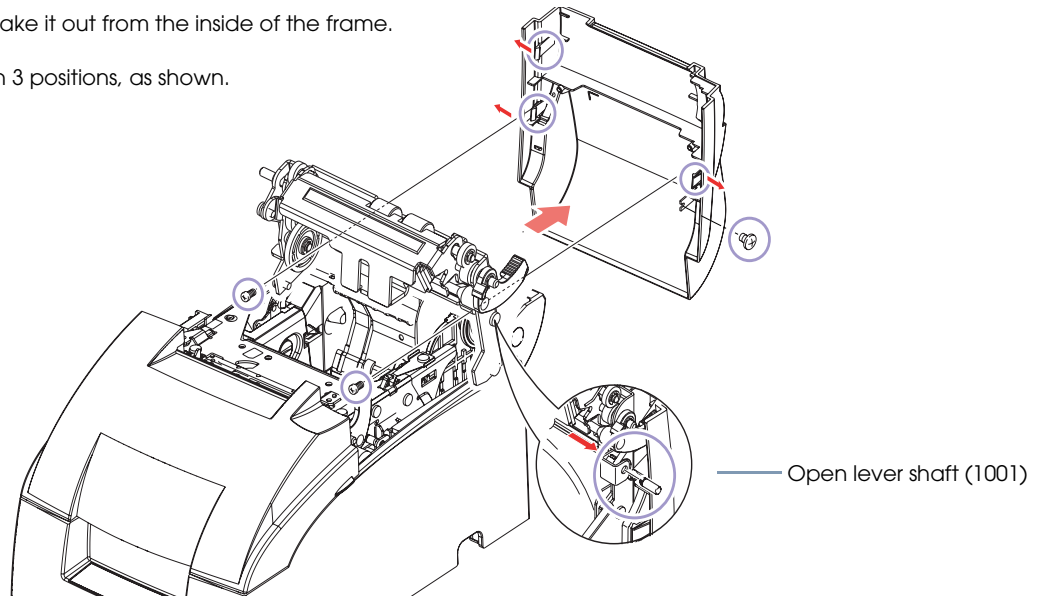
Follow the steps below to disassemble the fixed blade holder assembly.

Reassembly steps	Part names	Assembly procedures
①	Fixed blade (513)	<ul style="list-style-type: none"> ☐ Remove the fixed blade (513). ☐ Remove the fixed blade spring (1016). ☐ Remove the fixed blade holder (1017). 📖 When you replace the paper hold roller (1015), you need to remove 1 E-ring 2.3 (E02).
②	Paper hold roller (1015)	<ul style="list-style-type: none"> ☐ Remove the paper hold roller (1015) and the paper hold roller shaft (1102). ☐ Remove the paper hold spring (1014). 📖 When installing the paper hold spring (1014), check how to attach the hook. (See page 4-18.) ◆ Lubricate the paper hold roller (1015) with G-36.

Disassembly and Assembly Reference

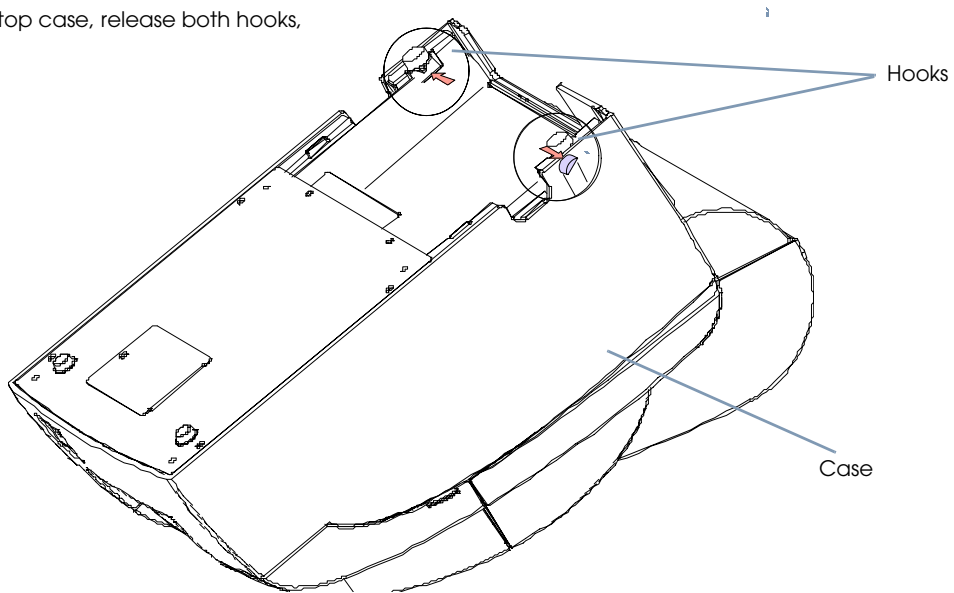
Removing the Roll Paper Cover Assembly

1. Push the shaft and take it out from the inside of the frame.
2. Remove 1 screw.
3. Release the hooks in 3 positions, as shown.
4. Remove 2 screws.



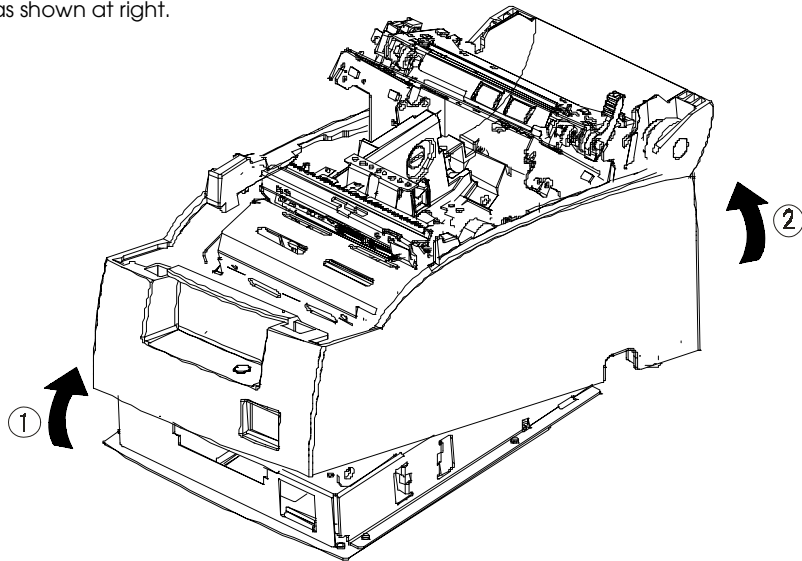
Removing and Attaching the Top Case

When removing the top case, release both hooks, as shown at right.



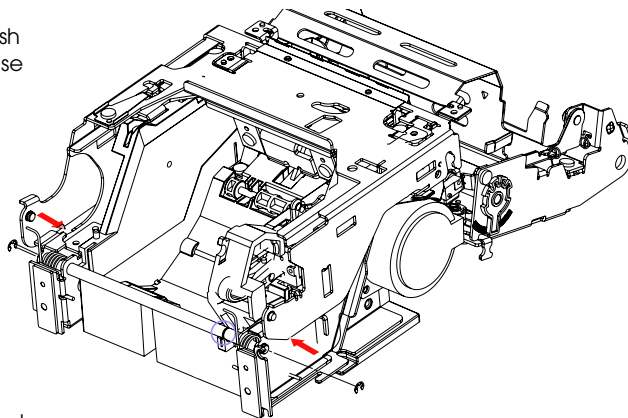
Removing and Attaching the Top Case (Continued)

Lift the case to remove as shown at right.

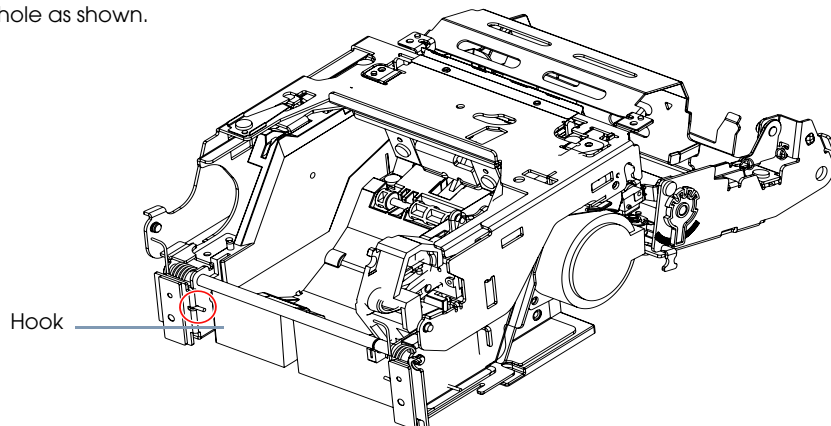


Removing and Attaching Rotation Spring R

When removing the springs, push the springs to the inside to release each hook, as shown.

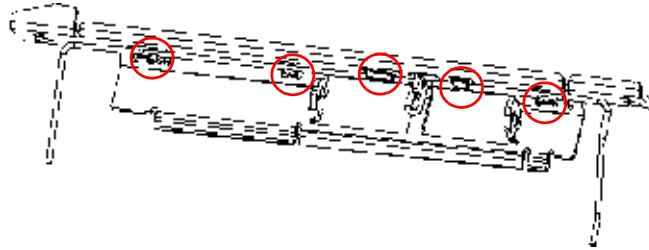


When attaching the springs, insert each hook in the hole as shown.

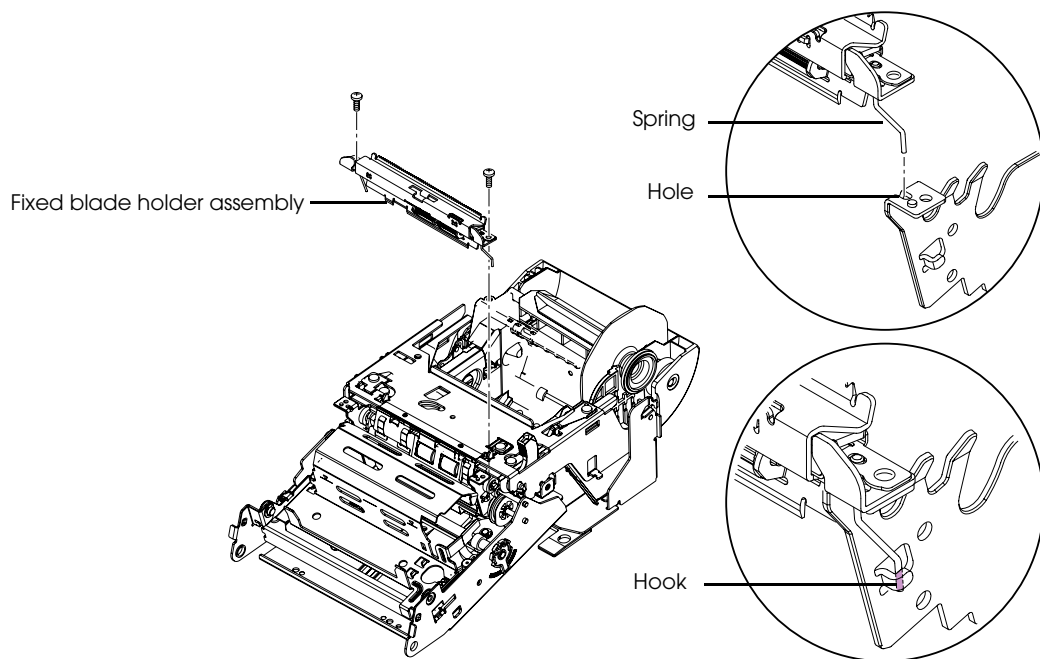


Attaching the Paper Hold Spring

Place the paper hold spring on the fixed blade holder, as shown.

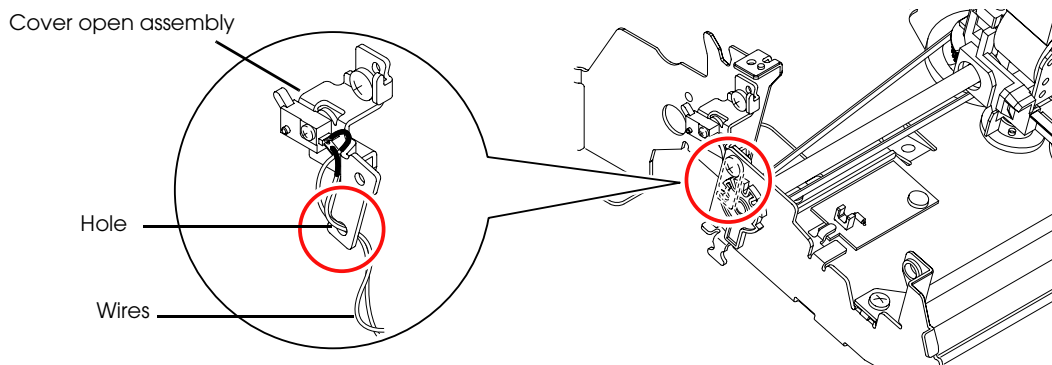


Attaching the Fixed Blade Holder Assembly and Manual Cutter Holder

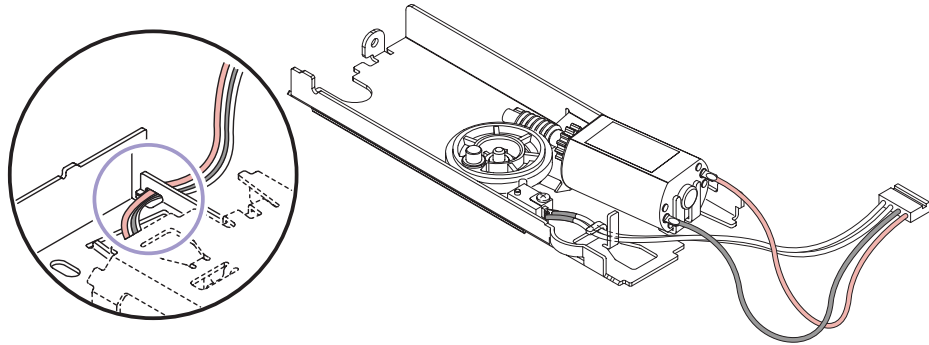


Attaching the Cover Open Assembly

When attaching the cover open assembly to the frame, be sure that the wires are threaded through the hole.

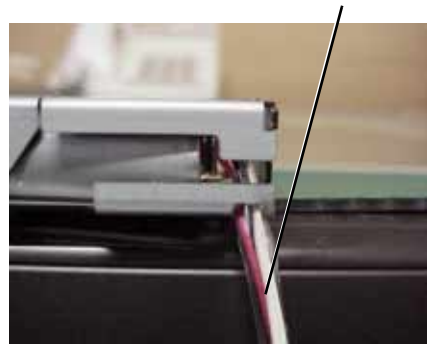


Leading the Autocutter Unit Wires

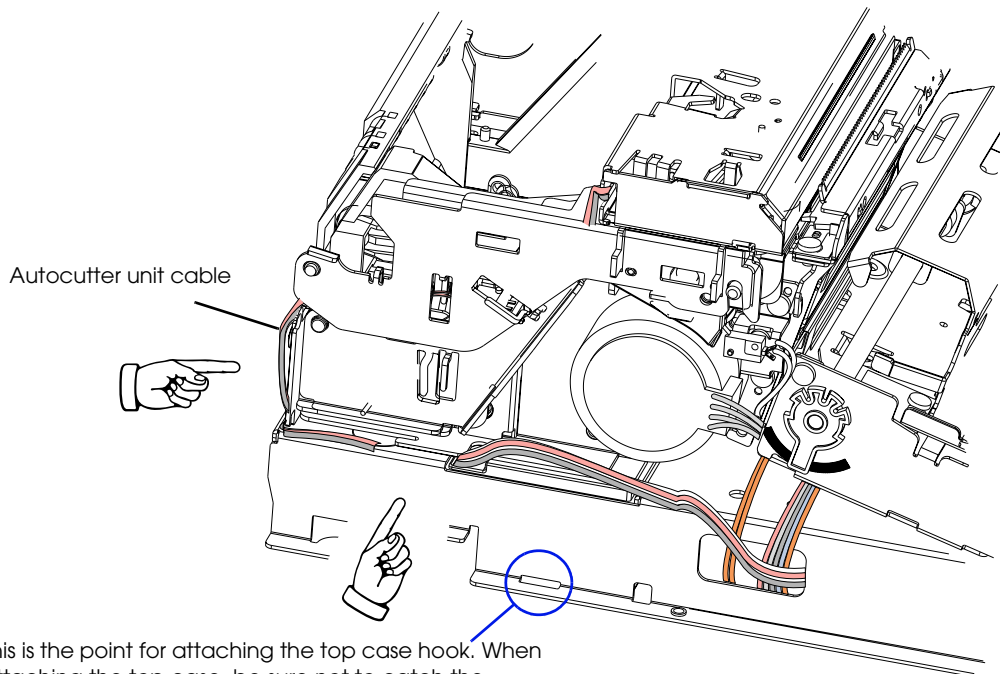


Guard tube and lead wires

Guard tube and lead wires



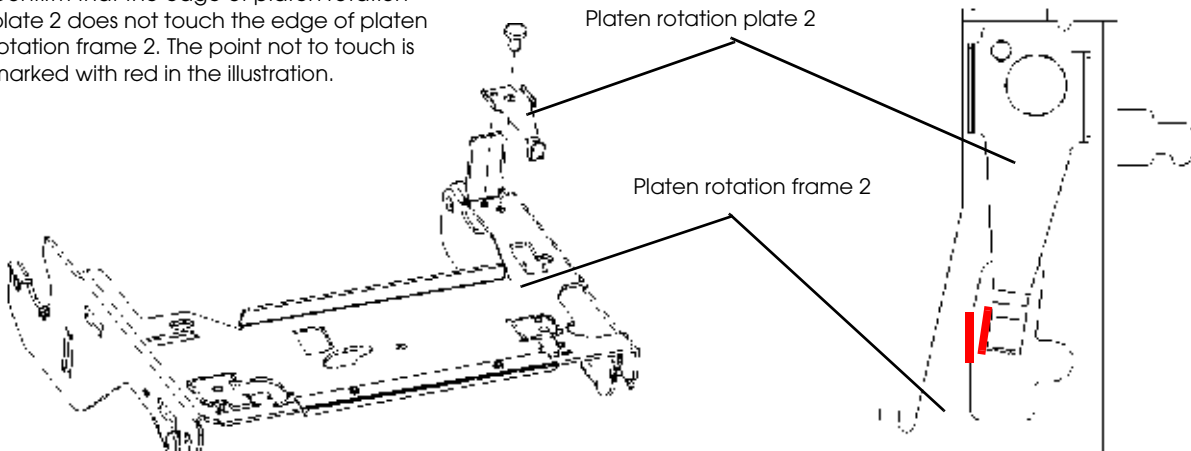
Be sure there is slack in the cable, as shown.



This is the point for attaching the top case hook. When attaching the top case, be sure not to catch the autocutter unit cable at this point.

Attaching Platen Rotation Plate 2

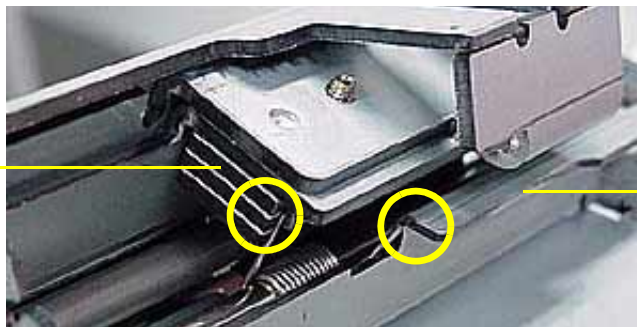
Confirm that the edge of platen rotation plate 2 does not touch the edge of platen rotation frame 2. The point not to touch is marked with red in the illustration.



Attaching the Platen Release Spring

When attaching the platen release spring, you need to put it on the plate as shown.

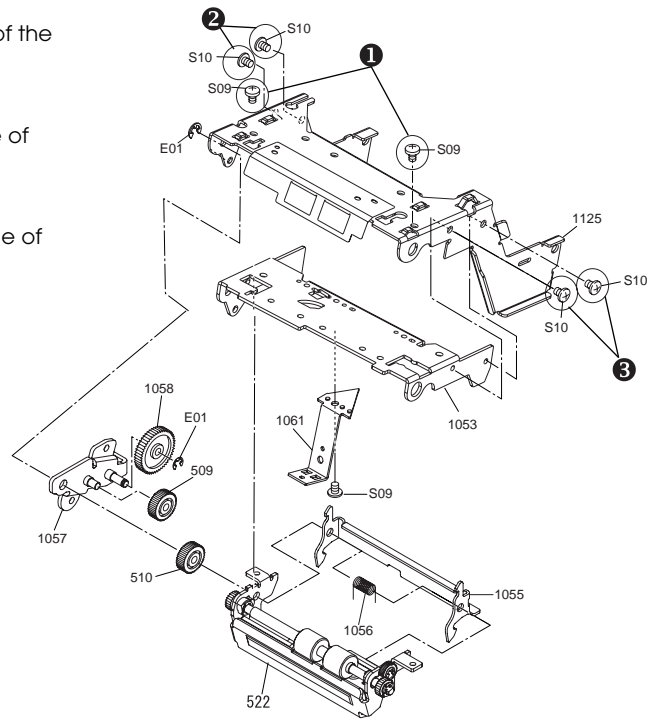
Insulator plate assembly



Platen release plate

Attaching Platen Assembly 3 (522)

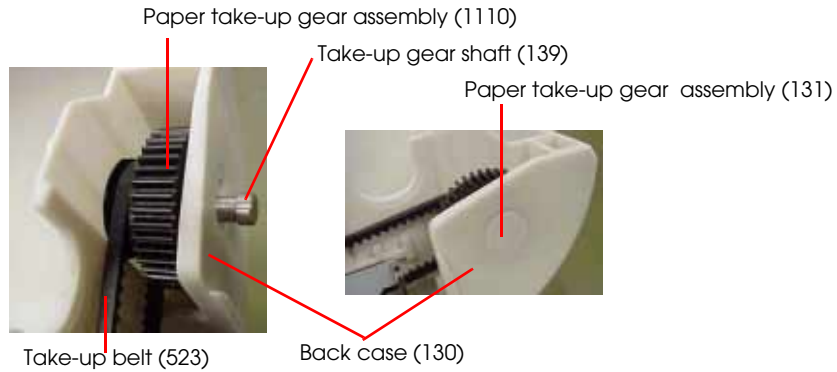
1. Attach platen assembly 3 (522) to the platen frame (1053) with 2 screws (S09) from upper of the platen rotation frame 2 (1125).
2. Attach platen assembly 3 (522) to the platen frame (1053) with 2 screws (S10) from left side of the platen rotation frame 2 (1125).
3. Attach platen assembly 3 (522) to the platen frame (1053) with 2 screws (S10) from right side of the platen rotation frame 2 (1125).



Attaching the Take-up Belt

Install the back case (130) onto the mechanism assembly. After that, install the take-up belt (523) and paper take-up gear assembly (131) onto the back case.

Put the back case sheet over the hole in the back case.



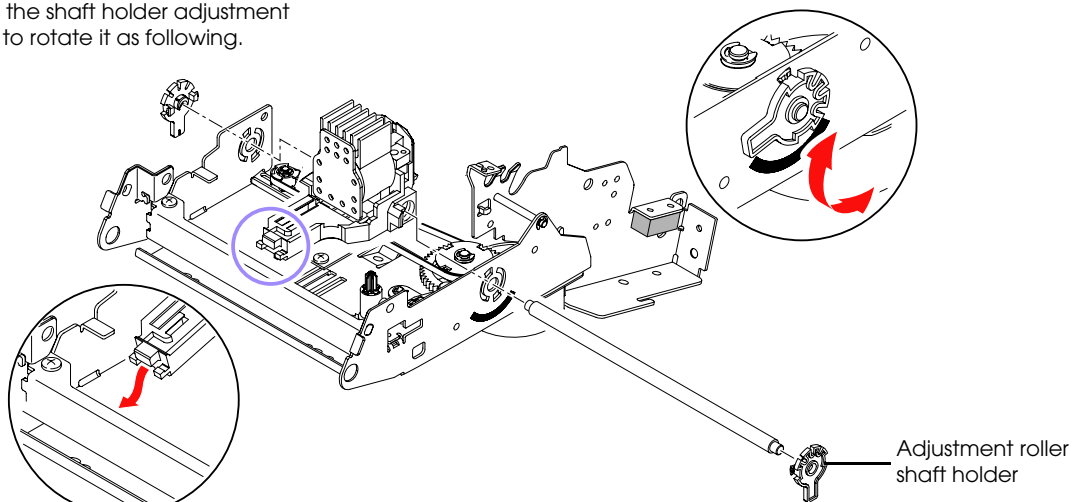
Hook the take-up belt (523) to the take-up transmission gear (1105).

Middle take-up gear (1106) Take-up transmission gear (1105) Take-up belt (523) Take-up transmission shaft (1112)

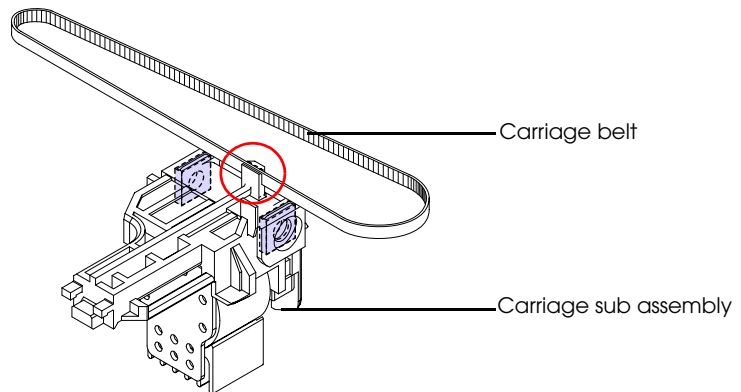


Removing the Adjustment Roller Shaft Holder

When removing the shaft holder adjustment roller, you need to rotate it as following.

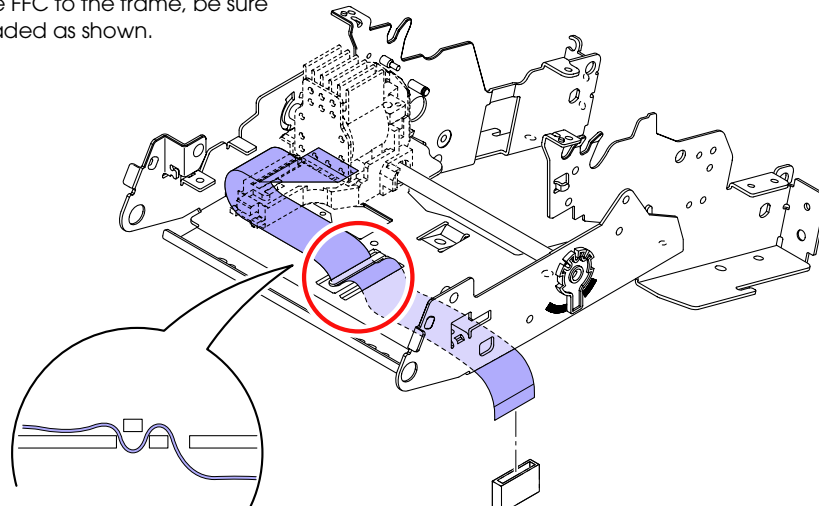


Attaching the Carriage Belt



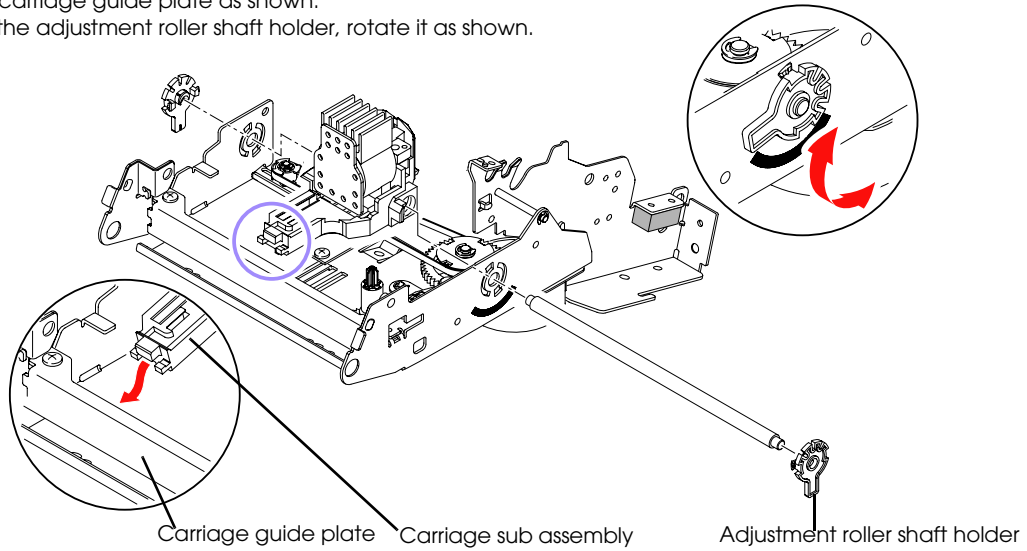
Attaching the Head FFC

When attaching the FFC to the frame, be sure that the FFC is threaded as shown.



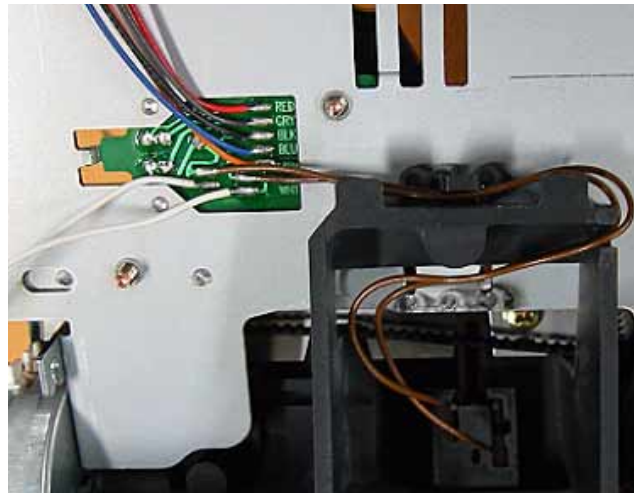
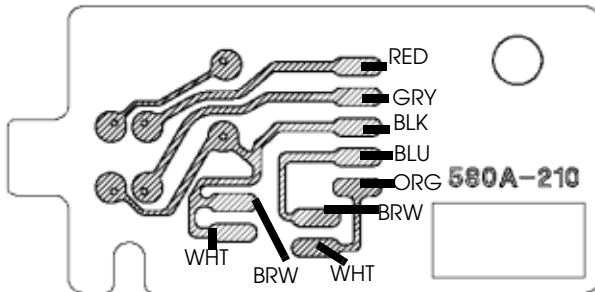
Attaching the Carriage Sub Assembly

When assembling the carriage unit, be sure the carriage sub assembly is attached to the carriage guide plate as shown.
When removing the adjustment roller shaft holder, rotate it as shown.

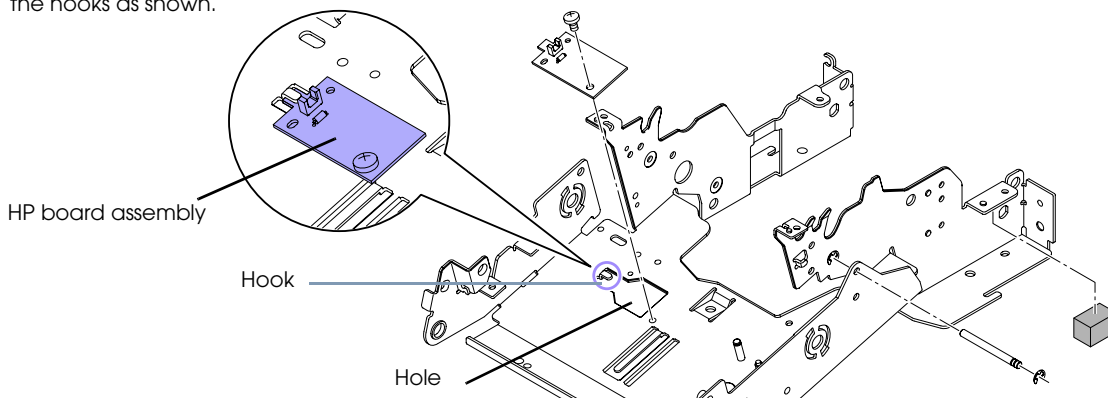


Attaching the HP Board Assembly

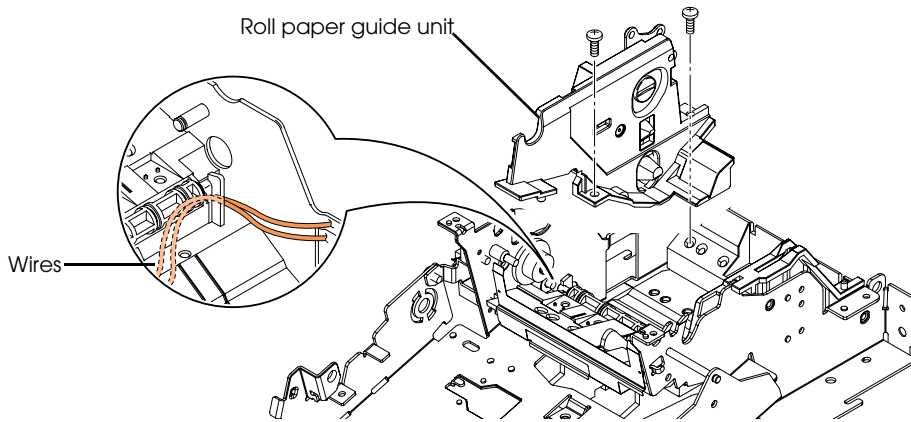
When replacing the HP board assembly, be sure the wires are soldered to the board as shown below.



When attaching the HP board assembly, be sure the wires are threaded through the hole and the board is attached to the hooks as shown.

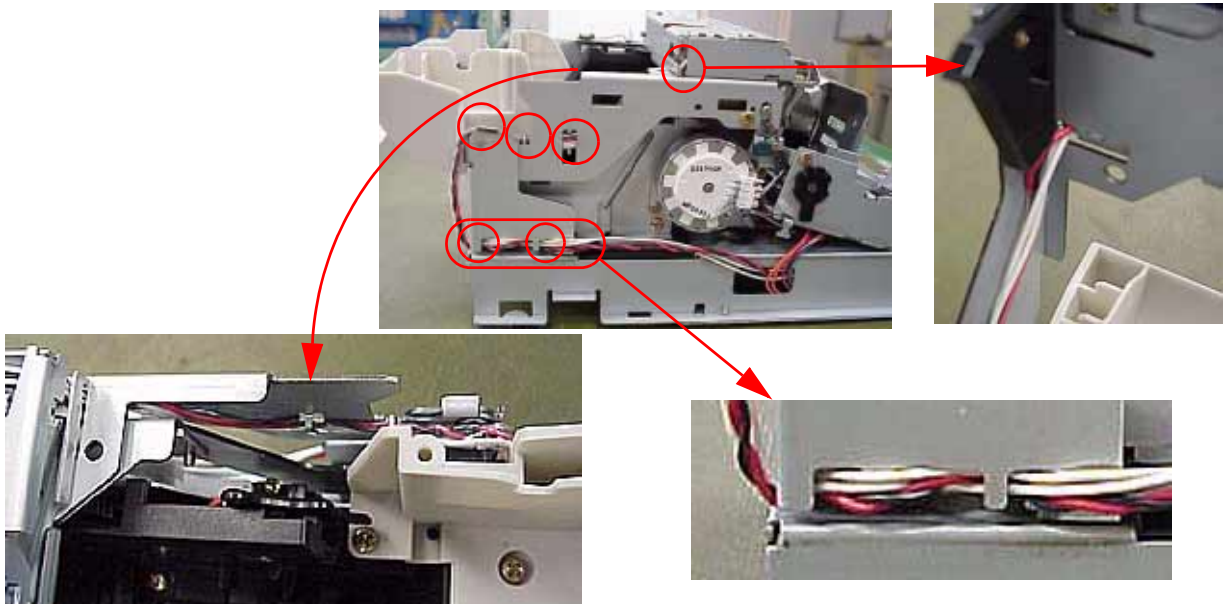
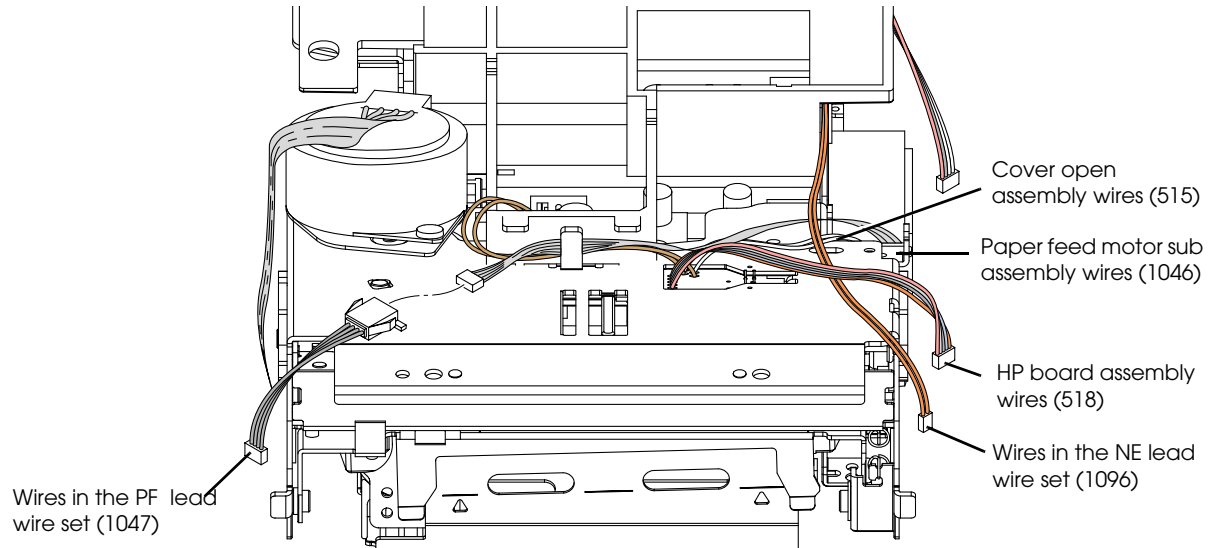


Attaching the Roll Paper Guide Unit

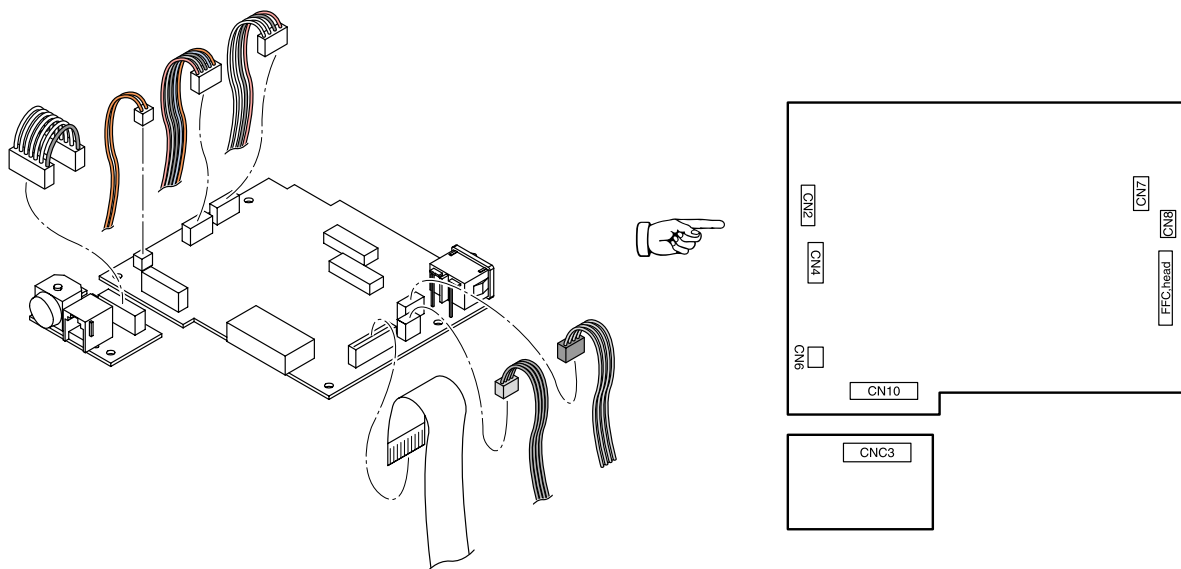


Wiring Placement for Each Cable

The illustration below indicates paths for the cable wiring.

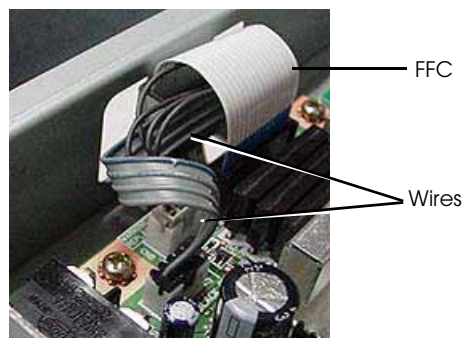
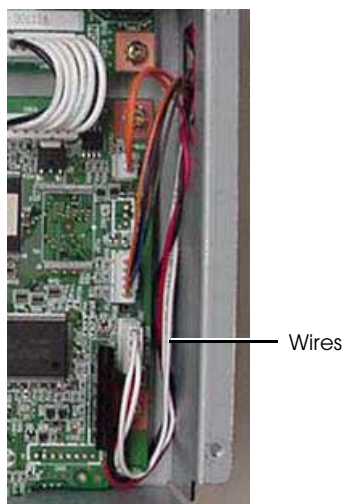


Attaching Each Cable to the Main Circuit Board



- CN2: Connecting the cable for the autocutter unit (113)
- CN4: Connecting the cable for the HP board assembly (518)
- CN6: Connecting the cable for the NE lead wire set (1096)
- CN7: Connecting the cable for the carriage motor sub assembly (1034)
- CN8: Connecting the cable for the PF lead wire set (1047)
- CN10: Connecting the cable from CNC3.

When connecting the cables to the main circuit board, be sure there is slack in the lead wires, as shown.

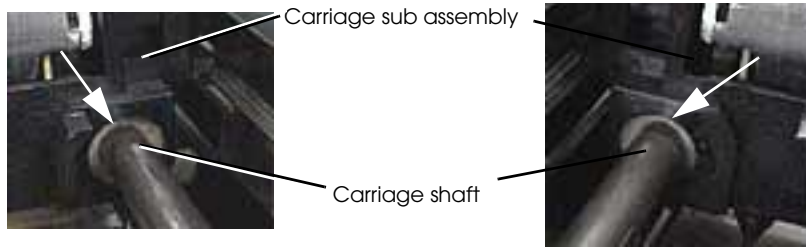


Lubrication Reference

Lubrication

Some lubrication points are indicated in the illustrations below. See the first few pages of this chapter for additional information about lubrication, and also see the oil drop icons beside text passages in the disassembly procedure tables for various printer components.

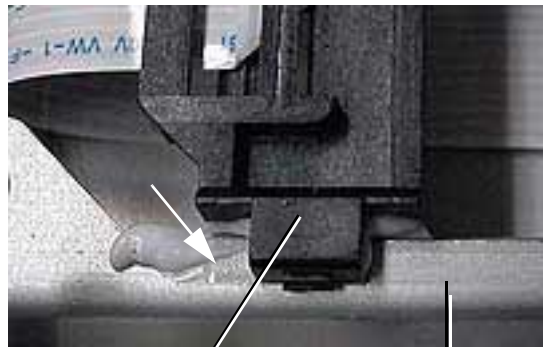
Lubricate the contact points between the carriage shaft and carriage sub assembly (2 points) with O-13.



Lubricate 1 point on the carriage sub assembly with G-36.



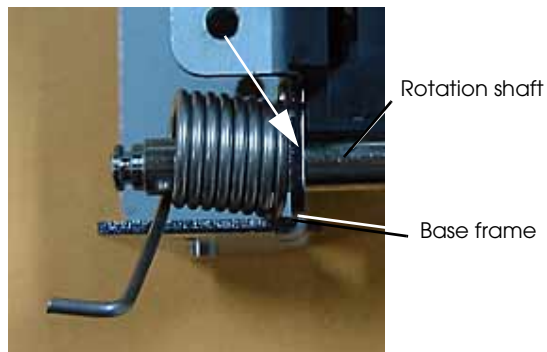
Lubricate one point on the carriage guide plate with G-36.



Lubricate the switching points on the carriage guide plate sub assembly (ribbon switch lever) with G-36.

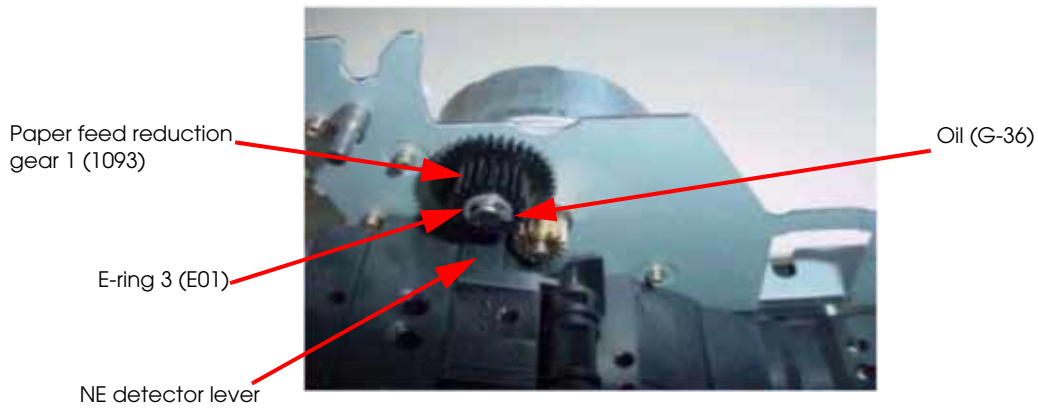


Lubricate the point of contact between the rotation shaft and base frame with G-36.

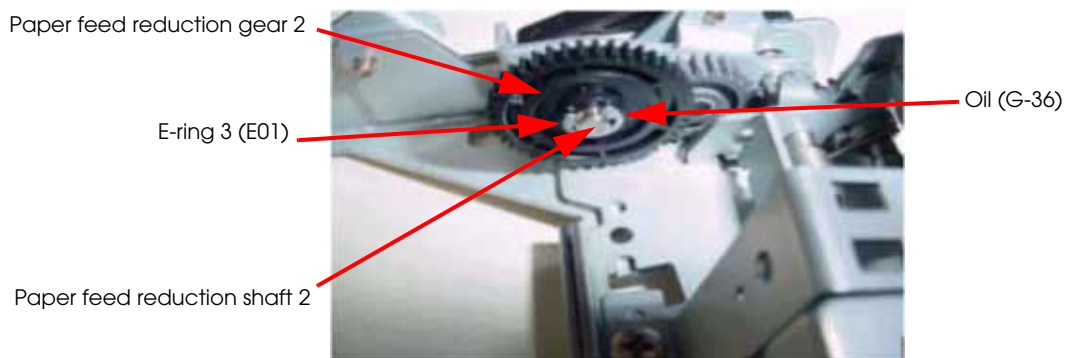


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Oil the joint of the paper feed reduction gear 1 (1093) and the NE detector lever (1043).

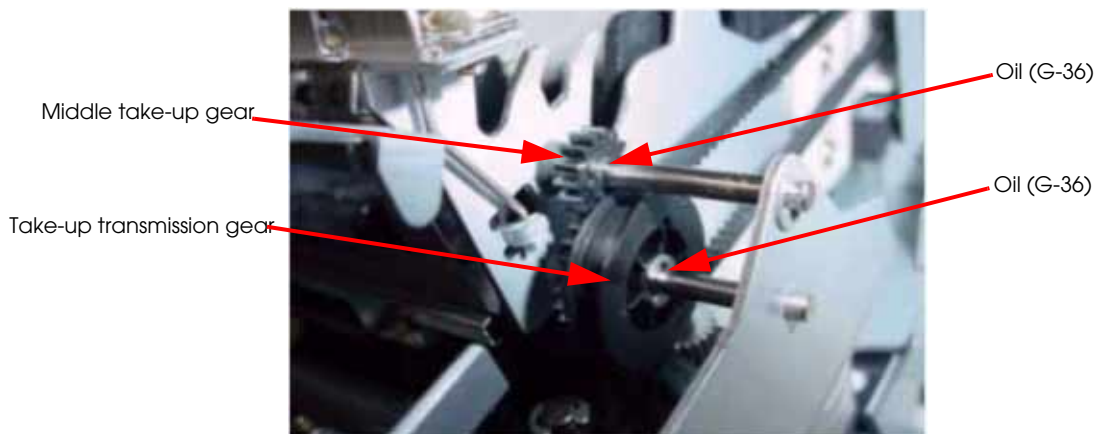


Oil the joint of the paper feed reduction gear 2 and the paper feed reduction shaft 2.



Oil the joint of the middle take-up gear and platen fixing shaft R.

Oil the joint of the take-up transmission gear and the take-up transmission shaft.

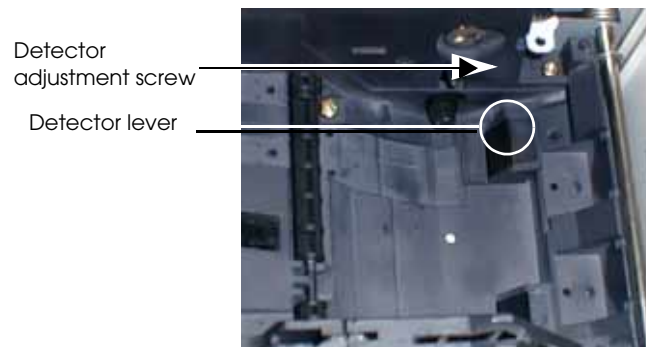


*Chapter 5***Adjustment and Setting**

Setting the Installation Position for the Roll Paper Near-End Detector

This printer allows you to change the installation position for the roll paper near-end detector using the following steps.

1. Loosen the detector adjustment screw with a coin or similar tool. Turn the screw at least 3 or 4 times.
2. Push the detector lever in until it touches the back of the hole.
3. While pushing the detector lever, turn the tab until the lever clicks into place in the desired hole.



4. Secure the detector adjustment screw.
5. Make sure the detector lever moves smoothly.

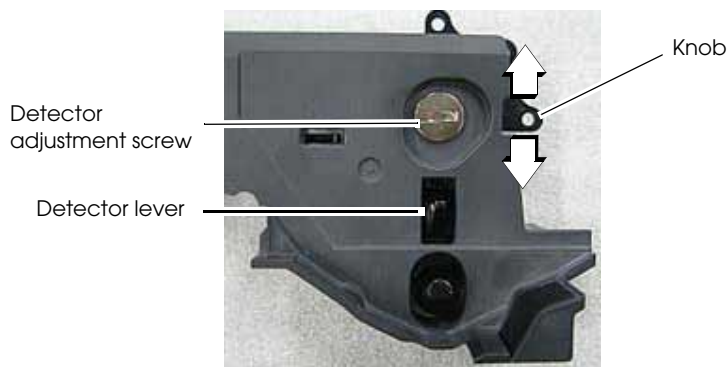
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Adjusting the Detection Point for the Roll Paper Near-End Detector

Below are 2 reasons the roll paper NE detector might require an adjustment:

- ❑ To adjust the detection for the diameter of the roll paper core.
- ❑ To adjust the amount of remaining paper before the sensor detects a near end.

1. Open the roll paper cover, and remove the paper roll.
2. Loosen the detector adjustment screw with a coin or similar tool.
3. Adjust the detector by sliding the lever in either of the directions shown below.



4. Tighten the detector adjustment screw.
5. Check to be sure that the detecting lever moves freely.
6. Replace the paper roll.

Setting the Paper Roll Width

The TM-U220 accommodates 76 mm {3"}, 69.5 mm {2.74"}, and 57.5 mm {2.26"} width paper rolls with no adjustments. For the each roll width, use the roll paper spacer included with the printer.

 **Note:**

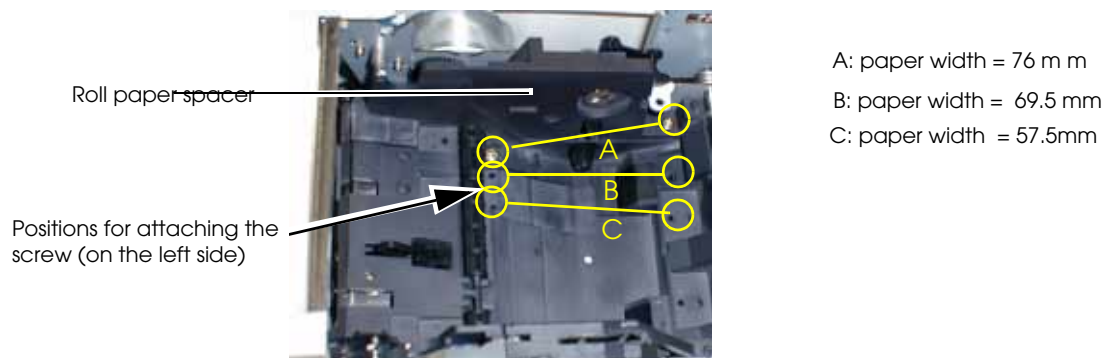
- ❑ The default paper width setting value saved in NV memory is 76 mm. So, if the customer does not use 76 mm width paper, return the printer only after setting the memory switch to the customer's paper width value using the appropriate method for each printer function below.

Use the TM Service Utility (See page 2-5.)

Use the Memory Switch Setup Mode (See page 5-12.)

- ❑ For printer models with a paper near-end detector, be careful not to pinch the near-end detector lead wires between the roll paper spacer and the roll paper holder, and be sure to push the lead wires inside, so that the paper-end detector lead wires do not contact the motor gear.

1. Open the paper roll cover.
2. To set the each roll paper width, position the spacer as shown in the illustration below.



3. Position the roll paper spacer for the appropriate paper width. (See figure above.)
4. Tighten the spacer with 2 screws included with the spacer. (See figure above.)

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Setting the Autocutter

The TM-U220 autocutter can be set to either “partial cut” or “full cut” using the steps below.



Note:

Do not change the cutting type from partial cut to full cut after the printer has been used. Otherwise, the printer may not be reliable, because the wear-out level of the cutter blade differs.

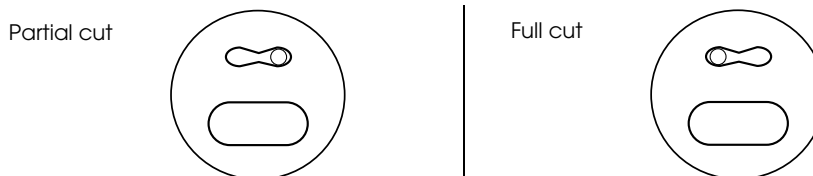
1. Make sure the power supply is disconnected.
2. Open the roll paper cover, and remove it. (See page 4-16.)
3. Loosen the screw as indicated in following figure.



4. Lift the top of the cutter unit upward towards you, and remove from the dowel.



5. When you select partial cut (default), you have to adjust the dowel to the right, as shown. When you select full cut, you have to adjust the dowel to left, as shown.



6. Tighten the 2 screws. Attach the roll paper cover again, and install the shaft that was taken out in step 2.



Note:

- ❑ Run the self-test to confirm the cutter action. (See page 2-2.)

Platen Gap Adjustment

Adjust the platen gap on the reassembled TM-U220 printer unit. Use the following steps to adjust the platen gap for the printer. Adjust the printer's platen gap when you have performed any one of the following:

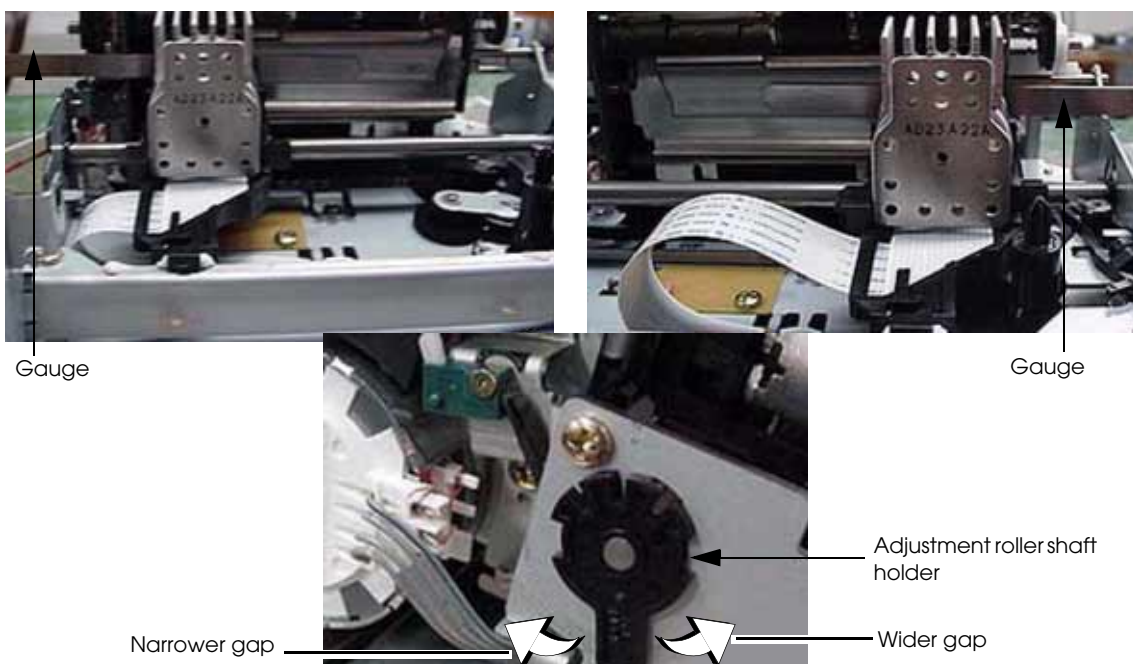
Disassembly Items Requiring Platen Gap Adjustment of the Printer

- | |
|------------------------------------------------------------------------------------|
| <input type="checkbox"/> When you have replaced or removed the platen assembly. |
| <input type="checkbox"/> When you loosened the screws fastening the carriage unit. |
| <input type="checkbox"/> When you replaced or removed the print head. |

**Note:**

Once removed, do not reuse an adjustment roller shaft holder. Also, the platen gap adjustment uses the standard of "0.45 mm thickness gauge falls; 0.55 mm thickness gauge does not fall"

1. Open the platen rotation frame, and tighten the adjustment roller shaft holder firmly.
2. Hold up the platen rotation frame and make sure the adjustment roller shaft holder is tightened firmly on the both sides.
3. Move the print head unit to the left; insert the gauge from the left side; and adjust the gap while rotating the adjustment shaft holder.
4. Move the print head unit to the right; insert the gauge from the right side; and adjust the gap while rotating the adjustment shaft holder.
5. Move the print head unit to the left; insert the gauge from the left side; and check the gap. If it does not meet the standard, adjust the gap while rotating the adjustment shaft holder.
6. Move the print head unit to the right; insert the gauge from the right side; and check the gap. If it does not meet the standard, adjust the gap while rotating the adjustment shaft holder.



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Carriage Belt Tension Adjustment

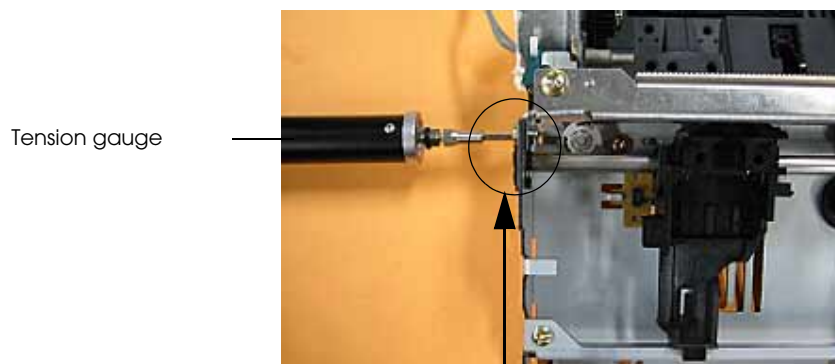
1. Loosen the screw for the belt tension plate assembly. Hook the end of the tension gauge to the hole in the belt tension plate assembly, adjust the tension properly, and tighten with the screw.
2. Check the belt tension.



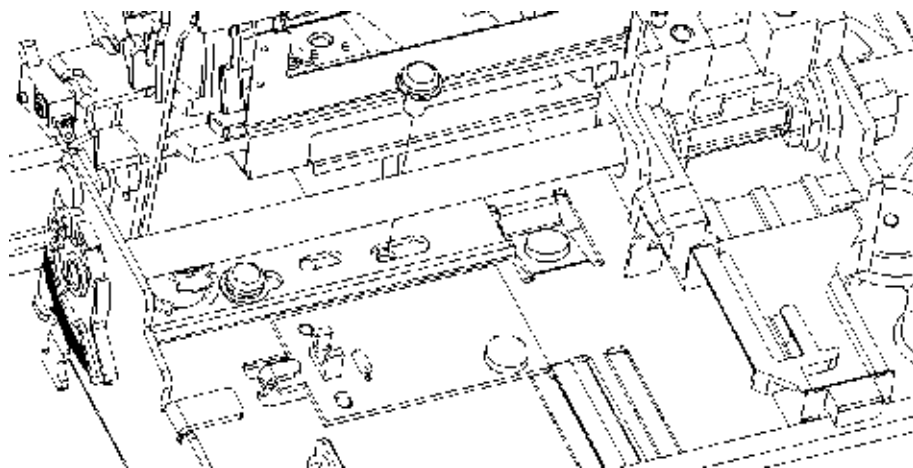
Note:

Make sure the belt tension plate is stable when loosening the screw that you tightened for the belt tension plate while pulling the carriage belt with the tension gauge by 7.35N.

3. Tighten the belt tension plate assembly again with the screw.



Hook the end of the tension gauge and adjust the tension.



Adjust Various Settings

The items below can be adjusted for this printer:

- DIP switches (communication condition, busy condition, print column, receive buffer capacity, etc.)
- Memory switches (serial communication conditions, roll paper width, cover open status handling, etc.)
- Roll paper width (76 mm / 69.5 mm / 59.5 mm): adjusted with the spacer and memory switch
- Roll paper near-end detector position

The current settings can be confirmed by the self-test. (See page 2-2.)



Note:

When you use a serial interface model with 1200 bps, 2400 bps, or 19200 bps, you have to adjust the "serial interface selection" DIP switch and the "serial communication condition" memory switch.

When you adjust these items, we recommend that you confirm whether the new setting is enabled or disabled. Confirming by performing a self-test. (See page 2-2.)

How to Confirm the Current Settings

Use a self-test to confirm the current settings. (See page 2-2.)

Adjusting the DIP Switches

The printer has 2 sets of DIP switches. The function of the DIP switches is different for each interface model.

If you need to change settings, follow the steps below to make your changes:

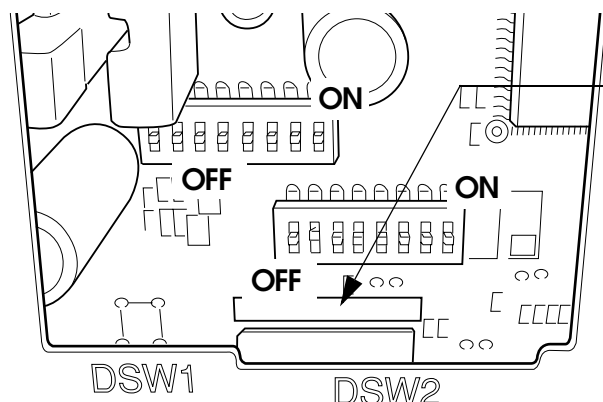


CAUTION:

Turn off the power while removing the DIP switch cover to prevent an electric short, which can damage the printer.

Use a Phillips (crosshead) screwdriver to remove the screw holding the DIP switch cover.

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Look at the numbers and letters in the area indicated in the illustration. If the last letters are "US," use the "US" tables on the next page. If the last letters are "STD," use the "STD" tables below.



Note:

The switch functions are shown in the following sections.

US DIP switch functions are slightly different from the STD functions.

STD Tables

Serial Model

(DIP Switch 1)

SW	Function	On	Off
1	Data receive error	Ignored	Prints "?"
2	Receive buffer capacity	40 bytes	4KB
3	Handshaking	XON/XOFF	DTR/DSR
4	Word length	7 bits	8 bits
5	Parity check	Yes	No
6	Parity selection	Even	Odd
7	Transmission speed	4800 bps	9600 bps
8	Busy condition	Receive buffer full	Receive buffer full or offline

(DIP Switch 2)

SW	Function	On	Off
1	Print column selection	42/35	40/33
2	Reserved (autocutter enabled/ disabled)	Fixed to On	—
3	Reserved	—	Fixed to Off
4	Serial interface selection	Memory switch	DIP switch
5	Reserved	—	Fixed to Off
6	Reserved	—	Fixed to Off
7	Pin 6 reset signal	Used	Not used
8	Pin 25 reset signal	Used	Not used

Parallel / USB / Ethernet Model (Not for Serial Models)

(DIP Switch 1)

SW	Function	On	Off
1	Auto line feed	Enabled	Disabled
2	Receive buffer capacity	40 bytes	4KB
3-7	Reserved	—	Fixed to Off
8	BUSY condition	Receive buffer full	Receive buffer full or offline

(DIP Switch 2)

SW	Function	On	Off
1	Print column selection	42/35	40/33
2	Reserved (Autocutter enabled/ disabled)	Fixed to On	—
3-7	Reserved	—	Fixed to Off
8	Pin 31 reset signal	Used	Not used



Note:

See the tables on the next page when the letters in the illustration above are "US."

See "Notes for DIP Switch 2-1" on page 5-9 for further information on the settings for DIP SW 2-1.

When you use a serial interface model with 1200 bps, 2400 bps, or 19200 bps, adjust the "serial interface selection" DIP switch function and the "serial communication condition" memory switch.

US Tables

Serial Model

(DIP Switch 1)

SW	Function	On	Off
1	Data receive error	Ignored	Prints “?”
2	Receive buffer capacity	40 bytes	4KB
3	Handshaking	XON/XOFF	DTR/DSR
4	Word length	7 bits	8 bits
5	Parity check	Yes	No
6	Parity selection	Even	Odd
7	Transmission speed	4800 bps	9600 bps
8	Busy condition	Receive buffer full	Receive buffer full or offline

(DIP Switch 2)

SW	Function	On	Off
1	Print column	42/35	40/33
2	Reserved (Autocutter enabled/disabled)	Fixed to On	—
3	Pin 6 reset signal	Used	Not used
4	Pin 25 reset signal	Used	Not used
5	Reserved	—	Fixed to Off
6	Reserved	—	Fixed to Off
7	Reserved	—	Fixed to Off
8	Serial interface selection	Memory switch	DIP switch

Parallel / USB / Ethernet Model (Not for Serial Models)

(DIP Switch 1)

SW	Function	On	Off
1	Auto line feed	Enabled	Disabled
2	Receive buffer capacity	40 bytes	4KB
3	Reserved	—	Fixed to Off
4-7	Reserved	—	Fixed to Off
8	Busy condition	Receive buffer full	Receive buffer full or offline

(DIP Switch 2)

SW	Function	On	Off
1	Print column selection	42/35	40/33
2	Reserved (Autocutter enabled/disabled)	Fixed to On	—
3	Reserved	—	Fixed to Off
4	Pin 31 reset signal	Used	Not used
5-8	Reserved	—	Fixed to Off



Note:
See the previous page for STD tables.

Notes for DIP Switch 2-1

DIP switch 2-1 defines the number of print columns per line as shown in the following table.

Paper width	Character font	DIP switch 2-1 status	
		ON	OFF
76 mm	Font A (9 x 9)	35	33
	Font B (7 x 9)	42	40
69.5 mm	Font A (9 x 9)	32	30
	Font B (7 x 9)	40	36
57.5 mm	Font A (9 x 9)	27	25
	Font B (7 x 9)	33	30

Units: cpl (characters per line)

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Memory Switches

This printer has memory switches, which are software switches that can be set to On or Off with the memory switch setting utility. Available memory switch settings include MSW 2, MSW 8, the customized value setting, and serial communication condition. Settings are shown in the table below. (The default for all settings is Off.)



Note:

Memory switches can be changed using either of the following methods.

- Memory switch setting utility
- Memory switch setup mode (There are limitations on the settings available.)

For the memory switch settings that can be changed using the memory switch setup mode, see page 5-12.

Memory switch settings are stored in NV memory. Therefore, even if the printer is turned off, the settings are maintained. Excessive use of this function may destroy the NV memory. As a guideline, do not use this function more than 10 times a day.

Memory Switch 2

SW	Function	On	Off
1	Reserved	—	Fixed to Off
2	Reserved	—	Fixed to Off
3	Selection of the Simplified Chinese character code system	GB2312	GB18030
4 ~ 8	Reserved	—	Fixed to Off



Note:

MSW 2-3:

Setting memory switch MSW 2-3 affects Simplified Chinese models only.

Memory Switch 8

SW	Function	On	Off
1 ~ 4	Reserved	—	Fixed to Off
5	Selection for cover open status	Cover open	Paper end
6	Reserved	—	Fixed to Off
7	Condition to release Busy in the receive buffer	Remaining space \geq 138 bytes	Remaining space \geq 256 bytes
8	Printer cover open during operation	Can recover by correction of the error and command	Automatically recovers

 **Note:**

MSW 8-5:

When Off is selected, the status bit for "roll paper end sensor" is transmitted from the printer every time the roll paper cover is opened or closed. When On is selected, the status bit for "roll paper cover open / close" is changed and is transmitted from the printer every time the roll paper cover is opened or closed.

MSW 8-8:

When Off is selected, the status bit for "automatically recoverable error" is changed and transmitted from the printer every time the roll paper cover is opened. When On is selected, the status bit for "mechanical error" is changed and transmitted from the printer every time the roll paper cover is opened.

MSW 8-5 and 8-8 can be set using the memory switch setup mode. See page 5-12.

Customized Value

Function	Selectable values	
Roll paper width	57.5 mm	69.5 mm
	76 mm (default value)	—

 **Note:**

These values can be set using the memory switch setup mode. (See page 5-12.)

Also, when adjusting the roll paper width, see page 5-3.

Serial Communications

Function	Selectable values	
baud rate	1200 bps	2400 bps
	4800 bps	9600 bps
	19200 bps	—
Parity	None	Odd
	Even	—
Handshake	DSR/DTR	XON/XOFF
Data length	7 bit	8 bit

 **Note:**

There are 2 methods for changing serial communication conditions: hardware DIP switches and software memory switches, set using the service utility. DIP SW2 selects which settings are effective: DIP switches or memory switches.

Also, these memory settings can be set using the memory switch setup mode described below.

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Memory Switch Setup Mode

The following settings are available in the memory switch setup mode:

- Basic serial communication conditions (serial interface only)
- Receive buffer full release condition (MSW 8-7)
- Roll paper width (customized value)
- Cover open status (MSW 8-5)



Note:

All new settings are lost if the power is turned off during the memory switch setup mode. Be sure to follow the proper procedure, and turn the power off at the correct time.

Starting memory switch setup mode

Use the following steps to start memory switch setup mode.

1. Open the roll paper cover.
2. Turn the power on while pressing the paper FEED button.
3. Press the FEED button twice while the POWER, ERROR, and PAPER OUT LEDs are lighting.
4. Close the cover. The printer prints the current settings for the memory switches and instructions.
5. Follow the printed instructions to set the switches.



Note:

During memory switch setup, the PAPER OUT LED may flash. The number of times the LED flashes indicates the number of times to press the FEED button before closing the roll paper cover.

Ending memory switch setup mode

Once the setting is performed, the contents of the setting are stored. Then, the printer initializes. When initialization is finished, the printer returns to normal operating mode.

Selecting individual settings

- Basic serial interface settings

To select transmission conditions, first choose "Serial interface settings"; then select data length, handshake, or parity.

Press the FEED button the number of times required to select the desired “Serial interface settings” transmission conditions.

Press FEED button	Setting selected
0 ~ 3 times:	No change
4 times:	19200 bps
5 times:	9600 bps
6 times:	4800 bps
7 times:	2400 bps
8 times:	1200 bps
9 or more times:	No change

bps: Indicates the number of transmitted bits per second (bps).

Data length, handshake, or parity

Press the FEED button the number of times required to select the desired data length, handshake, or parity setting to be used for transmissions.

Press FEED button	Setting selected		
	Data Length	Handshake	Parity
0 times:	No change		
1 time:	8 bits	DTR/DSR control	No parity
2 times:			Even
3 times:			Odd
4 times:		XON/XOFF control	No parity
5 times:			Even
6 times:			Odd
7 times:	7 bits	DTR/DSR control	No parity
8 times:			Even
9 times:			Odd
10 times:		XON/XOFF control	No parity
11 times:			Even
12 times:			Odd
13 or more times:	No change		

Chapter 6

Preparation for Shipment

Follow the instructions below before sending the printer back to the customer.

Inspection and Maintenance

Perform inspection and maintenance procedures described below properly to allow this unit to operate for the years of trouble-free operation for which it is designed.

Maintenance Procedures

The inspection procedures described in the below table.

Periodic Inspection

Checkpoints	Standards	Remedies
Dust, paper particles, or dirt on and in the printer	Do not allow dust, paper particles, or dirt to build up on or in the printer.	Clean the printer thoroughly with a vacuum cleaner.
	Do not leave small pieces of paper in the paper path.	Remove any pieces of paper from the paper path.
Lubrication	See the explanations in this chapter.	Lubricate the points shown in the diagrams.
Operation check	When you check each printer component, you should find no abnormalities.	Check the printer following "Repair Guide," in Chapter 2.
Shape of the springs	No spring should be bent or deformed.	Replace any deformed springs.
Ribbon cassette	The ribbon cassette should be properly installed in the printer.	See "Installing or Replacing the Ribbon Cassette" on page 1-7.

Cleaning

How to Clean the Cases



WARNING:

To avoid electric shock, be sure to disconnect the power cord from the electrical outlet.

Use a dry cloth to wipe away dirt. If the dirt proves difficult to remove, slightly moisten the cloth with water or a mild detergent solution.



CAUTION:

Never clean the case with disinfectant, bleach, alcohol, benzene, thinner, chlorine, or ketone; otherwise the dirt may become difficult to remove. Also, these chemicals may cause the case to discolor, dissolve, or deform.

Removing Dirt, Paper Chips, and Dust from Inside the Printer

Wipe off stains with a clean, dry cloth. If the stains do not wipe off, use a neutral detergent.



CAUTION:

Check the amount of lubrication on each cleaned area and lubricate as needed. See "Lubricants" at the beginning of Chapter 4.

Also see the explanations for the lubrication points contained in the diagrams in Chapter 4.

*Appendix***Parts List****Reference Number List**

Table A-1 Parts List by Reference Number

Ref. #	Service Manual Name	Parts Price List Name	Qty.	Supplied as a part?
102	Power switch cover	Cover,power switch	1	Yes
103	M-T88 shield tube	Shield tube M-T88	2	Yes
104	Manual cutter screw	Screw>manual cutter	1	Yes
105	Switch 1 screw	Screw,switch,1	1	Yes
106	Caution C seal	Seal,caution,C	1	Yes
107	Logo plate	Logo plate	2	Yes
108	Top case	Case,top	1	Yes
109	Ribbon cover	Cover,ribbon	1	Yes
110	Switch panel	Switch panel	1	Yes
111	Operation label A	Label,operation,A	1	Yes
112	Rubber foot	Rubber foot	2	Yes
113	Autocutter unit	Auto cutter unit	1	Yes
114	Cutter frame assembly	Frame, cutter assembly	1	Yes
115	Cutter cover assembly	Cover, cutter assembly	1	No
117	Cutter motor sub assembly	Motor, cutter sub assembly	1	Yes
118	Guard tube C	Guard tube,C	1	Yes
119	Cover Roll paper assembly	Cover,roll paper assembly,AA	1	Yes
120	Mechanism assembly	Mechanism assembly,A	1	Yes
121	Micro switch	Micro switch	1	Yes
122	I/F circuit board unit	I/F circuit board unit	1	Yes
123	Sub circuit board unit	Sub circuit board unit	1	Yes
124	AC adapter	AC adapter	1	Yes
125	AC cable, USA	AC cable, USA	1	Yes
126	Front sheet	sheet, front	1	Yes
128	Lever open shaft A	Shaft,lever open,A	1	Yes
130	Back case	Case,Back,AA	1	Yes
131	Paper take-up gear assembly	Paper Take-up gear assembly	1	Yes
134	Paper take-up shaft assembly	Paper take-up shaft assembly	1	Yes
135	Take-up flange	Take-up flange	1	Yes
136	Take-up flap	Take-up flap	1	Yes

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Table A-1 Parts List by Reference Number

Ref. #	Service Manual Name	Parts Price List Name	Qty.	Supplied as a part?
137	Platen rotation plate 2	Plate,platen rotation,2	1	Yes
138	Cover open lever A	Lever ,cover open,A	1	Yes
139	Take-up gear shaft	Shaft,take-up gear	1	Yes
140	Operation label D	Label,operation,D	1	Yes
141	Rubber foot B	Rubber foot,B	2	Yes
201	Main circuit board unit	Main circuit board unit	1	Yes
502	Switch 1 screw	Screw,switch,1	1	Yes
503	Print head unit	Print head unit	1	Yes
504	Platen release lever	Lever,platen release	1	Yes
505	Belt drive pulley	Pulley,belt drive	2	Yes
506	Adjustment roller shaft holder	Shaft holder,adjustment roller	1	Yes
507	Carriage belt	Carriage belt	1	Yes
508	Roll paper holder plate	Holder roll paper plate	1	Yes
509	Paper feed middle gear	Gear,paper feed middle	1	Yes
510	Paper feed middle gear B	Gear,paper feed middle, B	1	Yes
512	Ribbon middle gear	Gear,ribbon middle	1	Yes
513	Fixed blade	Fixed blade	1	Yes
514	Paper end assembly	Paper end assembly	1	Yes
515	Cover open assembly	Cover open assembly	1	Yes
516	Ribbon take-up gear sub assembly	Gear, ribbon take-up sub assembly	1	Yes
517	Ribbon drive plate sub assembly	Plate,ribbon drive sub assembly	1	Yes
518	HP board assembly	HP board assembly	1	Yes
519	Ribbon frame assembly	Frame,ribbon assembly	1	Yes
520	Operation label C	Label,operation,C	1	Yes
521	Head FFC	FFC,head	1	Yes
522	Platen assembly 3	Platen assembly,3	1	Yes
523	Take-up belt	Belt,take-up	1	Yes
1001	Open lever shaft	Shaft,lever open	1	No
1003	Open lever	Lever,open	1	No
1004	Bottom plate	Plate,bottom	1	No
1005	Frame rotation unit	Frame rotation unit	1	No
1006	Rotation spring R	Spring,rotation,R	1	No
1009	Rotation shaft	Shaft,rotation	1	No
1010	Roll paper holder	Holder,roll paper	1	No
1011	Base frame	Frame,base	1	No
1012	Base frame	Frame,base	1	No
1013	Fixed blade holder assembly	Holder,fixed blade assembly	1	No

Table A-1 Parts List by Reference Number

Ref. #	Service Manual Name	Parts Price List Name	Qty.	Supplied as a part?
1014	Paper hold spring	Spring,paper hold	1	No
1015	Paper hold roller	Roller,paper hold	2	No
1016	Fixed blade spring	Spring,fixed blade	1	No
1017	Fixed blade holder	Holder,fixed blade	1	No
1018	Cover open plate	Plate,cover open	1	No
1022	Ribbon frame spring	Spring,ribbon frame	1	No
1023	Ribbon frame shaft L	Shaft,ribbon frame,L	1	No
1024	Ribbon frame	Frame,ribbon	1	No
1025	Carriage sub assembly	Carriage sub assembly	1	No
1026	Carriage guide plate sub assembly	Plate,carriage guide sub assembly	1	No
1027	Carriage shaft	Shaft,carriage	1	No
1028	Carriage motor plate sub assembly	Plate,carriage motor sub assembly	1	No
1029	Belt tension pulley	Pulley,belt tension	1	No
1030	Carriage guide plate	Plate,carriage guide	1	No
1032	Belt pulley shaft	Shaft,belt pulley	1	No
1033	Belt tension plate	Plate belt tension	1	No
1034	Carriage motor sub assembly	Motor,carriage sub assembly	1	No
1035	Ribbon take-up gear shaft	Shaft,ribbon take-up gear	1	No
1036	Middle ribbon gear shaft	Shaft,ribbon middle gear	1	No
1037	Roll paper guide	Guide,roll paper	1	No
1038	Roll paper guide unit	Guide,roll paper unit	1	No
1039	Micro switch	Micro switch	1	No
1040	Detector adjustment screw	Detector adjustment screw	1	No
1041	NE detector assembly	N.E.detector assembly	1	No
1042	NE detector holder	Holder,N.E.detector	1	No
1043	NE detector lever	Lever,N.E.detector	1	No
1044	Roll paper holder assembly	Holder roll paper assembly	1	No
1045	Paper guide roller	Roller,paper guide	1	No
1046	Paper feed motor sub assembly	Motor paper feed sub assembly	1	No
1047	PF lead wire set	Lead wire set,PF	1	No
1048	Paper feed reduction shaft 1	Shaft,paper feed reduction,1	1	No
1049	Platen fixing shaft R	Shaft,platen fix,R	1	No
1050	Rotation frame spacer	Spacer,frame rotation	1	No
1052	Cover open lever	Lever,cover open	1	No
1053	Platen frame	Frame,platen	1	No
1054	Platen shaft	Shaft,platen	1	No
1055	Platen release plate	Plate,platen release	1	No

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Table A-1 Parts List by Reference Number

Ref. #	Service Manual Name	Parts Price List Name	Qty.	Supplied as a part?
1056	Platen release spring	Spring,platen release	1	No
1057	Gear plate D sub assembly	Plate,gear,D sub assembly	1	No
1058	Paper feed reduction gear 2	Gear,paper feed reduction,2	1	No
1059	Paper feed reduction shaft 2	Shaft,paper feed reduction,2	1	No
1060	Middle paper feed shaft	Shaft,paper feed middle	1	No
1061	Bottom holding plate bm	Holding plate,bm,bottom	1	No
1063	Paper feed gear	Gear, paper feed	1	No
1069	S Push N, 3, F / Zn	S Push N,3,F / Zn	1	No
1071	Cutter cover sub assembly	Cover, cutter sub assembly	1	No
1072	Drive gear sub assembly	Gear, drive sub assembly	1	No
1073	Insulator plate assembly	Plate,insulator assembly	1	No
1074	Platen	Platen	1	No
1075	Paper feed roller	Paper feed roller	1	No
1076	Platen assembly 1	Platen assembly,1	1	No
1077	Belt tension plate assembly	Plate belt tension assembly	1	No
1078	Carriage	Carriage	1	No
1079	Base frame sub unit	Frame,base sub unit	1	No
1080	Micro switch	Micro switch	1	No
1081	Ferrite core	Ferrite core	1	No
1084	Roll paper cover BA	Cover,roll paper,BA	1	No
1085	Bottom frame assembly	Frame,bottom assembly	1	No
1086	Belt tension plate sub assembly	Plate belt tension sub assembly	1	No
1088	Ribbon take-up spring	Spring,ribbon take-up	1	No
1089	FFC cover tape	Tape,FFC cover	1	No
1090	AC lead wire set	Lead wire set,AC	1	No
1091	Micro switch	Micro switch	1	No
1092	Hook spring C	Spring,hook,C	1	No
1093	Paper feed reduction gear 1	Gear,paper feed reduction, 1	1	No
1094	Gear drive	Gear drive	1	No
1095	IC cover	IC Cover	1	No
1096	NE lead wire set	Lead wire set, NE	1	No
1097	Ribbon release spring	Spring,ribbon release	1	No
1099	Ribbon cassette	Ribbon cassette	1	No
1100	CBS-TITE screw, 3X12, F/ZN	C.B.S-TITE SCREW,3X12,F/ZN	2	No
1101	CBB-TITE screw, 2X8, F/ZN	C.B.B-TITE SCREW,2X8,F/ZN	1	No
1102	Paper hold roller shaft	Shaft, paper hold roller	1	No
1104	Cutter rotation spring	Spring,rotation cutter	1	No

Table A-1 Parts List by Reference Number

Ref. #	Service Manual Name	Parts Price List Name	Qty.	Supplied as a part?
1105	Take-up transmission gear	Gear,take-up transmission	1	No
1106	Middle take-up gear	Gear,take-up middle	1	No
1107	Cutter support frame sub assembly	Frame cutter support sub assembly	1	No
1108	Cutter support frame	Frame,cutter support	1	No
1109	Cutter support shaft	Shaft,cutter support	1	No
1110	Paper take-up gear assembly	Paper take-up gear assembly	1	No
1111	Take-up flapper spring	Take-up flapper spring	1	No
1112	Take-up transmission shaft	Shaft,take-up transmission	1	No
1114	Rotation cutter frame assembly	Frame rotation cutter assembly	1	No
1115	Cutter rotation frame sub assembly	Frame rotation cutter sub assembly	1	No
1116	Cutter rotation frame	Frame,rotation cutter	1	No
1117	Cutter paper guide	Paper guide,cutter	1	No
1118	Rotation frame spacer	Spacer,frame rotation	1	No
1119	Roll paper guide spring	Spring,roll paper guide	1	No
1120	Roll paper guide plate	Plate,roll paper guide	1	No
1121	Manufacturer's plate	Manufacture's plate	1	No
1122	Roll paper cover	Cover,roll paper	1	No
1123	Open lever	Lever,open	1	No
1124	Platen rotation frame 2 unit	Frame platen rotation,2 unit	1	No
1125	Platen rotation frame 2	Frame,platen rotation,2	1	No
1126	Nut	Nut	1	Yes
1127	E-ring 2.3	E-ring 2.3	1	No
1128	CBS-TITE, 3X5, F/ZN	C.B.S- TITE,3X5,F/ZN	2	No
1129	Cutter rotation plate	Plate,rotation cutter	1	No
E01	E-ring 3	E-ring,3	9	Yes
E02	E-ring 2.3	E-ring,2.3	5	Yes
E03	E-ring 4	E-ring,4	2	Yes
E04	E-ring 3	E-ring,3	2	Yes
S01	CPS(O) screw, 3X6	C.P.S.(O) Screw,3X6	8	Yes
S02	CPS-TITE, 3X5,F/ZN	C.P.SITITE,3X5,F/ZN	8	Yes
S03	CBS screw, 3X6	C.B.S. Screw,3X6	12	Yes
S04	CB screw, 2X2.5, F/ZN	C.B. Screw,2X2.5,F/ZN	1	Yes
S05	CBP-TITE screw, 3X8, F/ZN	C.B.P-TITE Screw,3X8,F/ZN	5	Yes
S06	Screw (P tight)	SCREW(P tight)	1	Yes
S07	CBP-TITE, 3X10, F/ZN	C.B.P-TITE,3X10,F/ZN	2	Yes
S08	CBP-TITE screw, 3X6, F/ZN	C.B.P-TITE Screw,3X6,F/ZN	3	Yes
S09	CBS-TITE, 3X4, F/ZN	C.B.S-TITE,3X4,F/ZN	5	Yes

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Table A-1 Parts List by Reference Number

Ref. #	Service Manual Name	Parts Price List Name	Qty.	Supplied as a part?
S10	CBS screw, 3X6, F/ZN	C.B.S. Screw,3X6,F/ZN	5	Yes
S11	CBS- TITE, 3X5, F/ZN	C.B.S- TITE,3X5,F/ZN	9	Yes
S12	CPSPS screw	C.P.S.P.S. Screw	1	Yes
S13	CBS-TITE, 3X4, F/ZN	C.B.S-TITE,3X4,F/ZN	2	Yes
S14	CPS(O) screw	C.P.S.(O) Screw	1	Yes
S15	CBP-TITE screw, 3X6, F/ZN	C.B.P-TITE Screw,3X6,F/ZN	1	Yes
W01	Plain washer	Plane washer	1	Yes
W02	Plain washer	Plane washer	1	Yes

EPSON

SEIKO EPSON CORPORATION

Printed in Japan