Service Manual

4226 Printer

4226-XXX

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LEXMARK™

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- There may be an increased risk of electric shock and personal injury during disassembly and servicing of this product. Professional service personnel should understand this and take necessary precautions.
- The safety features of some parts may not always be obvious. Therefore, replacement parts must have the identical or equivalent characteristics as the original parts.

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- Zusätzliches Risiko eines elektrischen Schlags und körperlicher Verletzung existiert während des Auseinandernehmens und der Wartung des Geräts. Fachpersonal sollte im vollen Verständnis der Lage entsprechende Vorsichtsmaßnahmen ergreifen.
- Ersatzteile müssen gleiche oder gleichwertige Merkmale wie die Originalteile aufweisen, da Sicherheitsvorkehrungen nicht immer offensichtlich sind.

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- Les consignes d'entretien et de réparation de ce produit s'adressent uniquement à un personnel de maintenance qualifié.
- Le démontage et l'entretien de ce produit pouvant présenter certains risques électriques, le personnel d'entretien qualifié devra prendre toutes les précautions nécessaires.
- Les normes de sécurité de certaines pièces n'étant pas toujours explicites, les pièces de rechange doivent être identiques ou conformes aux caractéristiques des pièces d'origine.

Norme di sicurezza

- Le informazioni riguardanti la manutenzione di questo prodotto sono indirizzate soltanto al personale dell'assistenza autorizzato.
- Durante lo smontaggio e il manutenzionamento di questo prodotto, è possibile il rischio accresciuto di scosse elettriche e danni personali. Il personale di assistenza autorizzato, consapevole di ciò, deve adottare le precauzioni necessarie.
- È possibile che le funzioni di sicurezza di alcuni elementi non siano così ovvie, quindi, i pezzi di ricambio devono avere caratteristiche identiche o equivalenti a quelle dei pezzi originali.

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- La información sobre el mantenimiento de este producto fue escrita para el personal de mantenimiento cualificado y no para cualquier otro usuario.
- Existen mayores riesgos de descargas eléctricas y daños personales durante el desmontaje y la reparación de la máquina. El personal cualificado comprende esto y toma las precauciones necesarias.
- Los dispositivos de seguridad de algunas partes quizá no siempre puedan ser reconocidas a simple vista. Por lo tanto, las partes de reemplazo deben poseer características idénticas o equivalentes a las partes originales.

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- Oplysningerne om vedligeholdelse af dette produkt er forberedt med henblik på professionelt servicepersonale, og bør derfor ikke benyttes af andre.
- Risikoen for elektrisk stød øges under demontering og service af dette produkt, hvorfor der bør tages de nødvendige forholdsregler.
- Sikkerhedsforanstaltningerne er ikke altid lige åpenbare for alle reservedele. Der bør derfor kun anvendes originale reservedele eller reservedele med samme egenskaber som de oprindelige.

Informações de Segurança

- As informações de segurança relativas a este produto destinam-se a profissionais destes serviços e não devem ser utilizadas por outras pessoas.
- Risco de choques eléctricos e ferimentos graves durante a desmontagem e manutenção deste produto. Os profissionais destes serviços devem estar avisados deste facto e tomar os cuidados necessários.
- Os dispositivos de segurança de algumas peças poderão não ser sempre suficientemente evidentes. Assim, as peças sobressalentes devem possuir características idênticas ou equivalentes às peças originais.

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- 本产品在拆卸、维修的时候，发生电击、人员受伤的危险性会增高。专业服务人员对这点应有事先的了解，并采取必要的安全措施。
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Preface

This manual is divided into the following chapters:

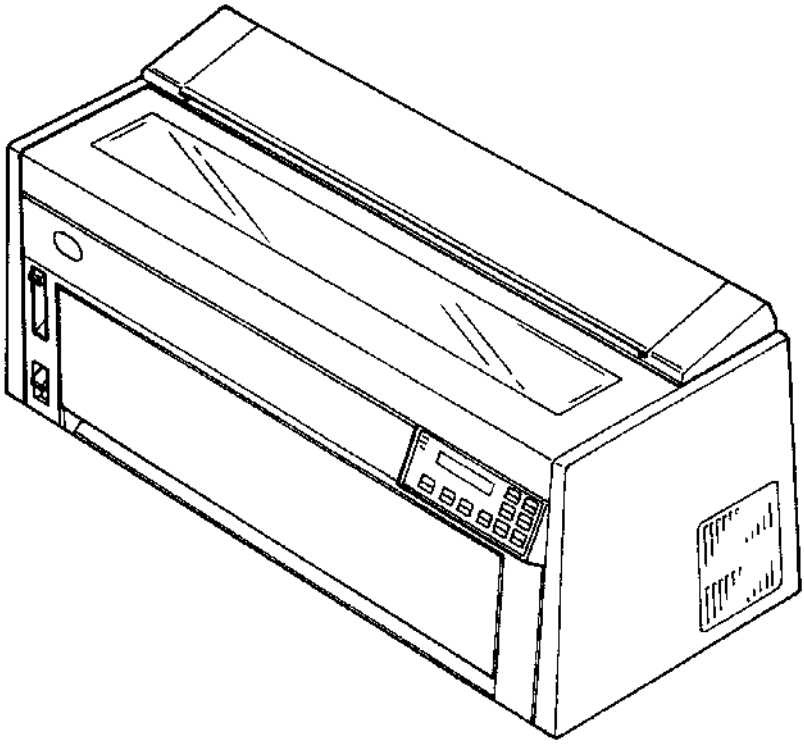
- **General Information** contains a general description of the printer and the maintenance approach used to repair it. Special tools and test equipment are listed in this chapter, as well as general environmental and safety instructions.
- **Diagnostic Information** contains error code table, symptom table, and service checks used to isolate failing field replaceable units (FRUs).
- **Diagnostic Aids** contains tests and checks used to locate or repeat symptoms of printer problems.
- **Repair Information** provides instructions for making printer adjustments and removing and installing FRUs.
- **Connector Locations** uses illustrations to identify the major components and test points on the printer.
- **Preventive Maintenance** contains lubrication specifications, and maintenance information to prevent problems and maintain optimum performance.
- **Parts Catalog** contains illustrations and part numbers for individual FRUs.

1. General Information

Description

The IBM 4226 Printer is a dot matrix impact printer that prints 1-byte code (alphanumeric, symbol) and attaches to the following as an output device:

- Personal System/2
- RISC System/6000
- AS/400
- 9370 System



Maintenance Approach

The diagnostic information in this manual leads you to the correct field replaceable unit (FRU) or part. Use the error indication table, symptom/check table, service checks and diagnostic aids to determine the symptom and repair the failure.

Begin with “Start” on page 2-3.

Print Specifications

Character Size	1-byte code character (Alphanumeric, symbol)	9 (H) X 12 (V) dots 9 (H) X 9 (V) dots
Character Spacing	1-byte code character (Alphanumeric, symbol)	10, 12, 15, 17.1, 20 CPI, Proportional Spacing
Print Speed	1-byte code character (10 CPI)	Draft Print.....400 cps FastDraft Print....533 cps
Maximum Print Width	1-byte code character (10 CPI)	80/136 characters 8 inch/13.6
Line Spacing	Variable in multiples of 1/144 in.	

Power Supply Specifications

Input Voltage	Single phase: 90 to 132 V ac (LV), 50/60Hz 180 to 265 V ac (HV), 50/60Hz
Power Consumption	Operating:.276 VA (all character print)
	Idling:..... 70 VA

Printer Cables

When connecting the printer to a host personal computer, use the following cables:

- Parallel Cable P/N 1525612 or its equivalent.
- Serial Interface Cable RS-232 P/N 6486685.
- Serial Adapter Plug P/N 1319143 - when using a non-IBM serial printer cable.

Note: The RS-422 serial interface cable may also be used.

Tools

The jumper wire is used to put the cover sensor in a closed condition (jumper CJ19-1 to CJ19-2 on the operator panel card) and is contained in the parts packet.

The Push-Pull gauge is used for weight ranges between 400g (0.88 lb) and 500g (1.1 lb).

Abbreviations

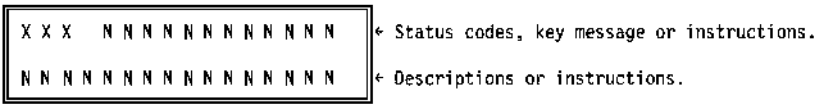
ASIC	Application-Specific Integrated Circuit
CSU	Customer Setup
DRAM	Dynamic Random Access Memory
EPROM	Erasable Programmable Read-Only Memory
ESD	Electrostatic Discharge
FRU	Field Replaceable Unit
HVPS	High Voltage Power Supply
LCD	Liquid Crystal Display
LED	Light-Emitting Diode
LVPS	Low Voltage Power Supply
NVRAM	Nonvolatile Random Access Memory
OEM	Original Equipment Manufacturer
POR	Power-On Reset
POST	Power-On Self Test
ROS	Read-Only Storage
UPR	Used Parts Replacement
V ac	Volts alternating current
V dc	Volts direct current

Using the Operator Panel

This section provides a brief description of the operator panel buttons, lights and settings. Refer to the User's Guide for additional information.

The operator panel has three LED indicator lights (Power, Ready and Check) and an LCD message display. The display presents the printer status, instructions and messages. When an error occurs, a code and a message are automatically displayed and an alarm sounds. Pressing **Start/Stop** will stop the alarm.

Display Format



There are two kinds of status codes:

1. Intervention Request Code (IRC) - IRC "00X" is displayed in three digit hexadecimal with five additional codes as follows:

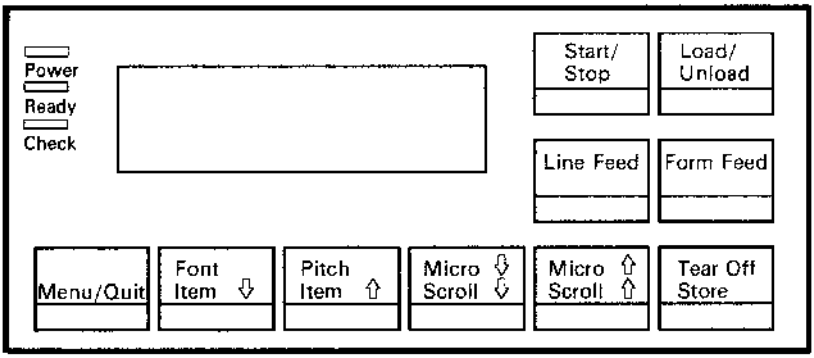
Code	Meaning
001	Paper Out
002	Paper Jam
005	Cover Open
007	Data error in serial interface
00D	I/F error (Check interface mode)

2. Error code “6xx” is displayed in three digit hexadecimal.
   - 6 - Classification Code - 6 for all printers
   - x - Function Code - Error function code
   - x - Detailed Code - Error part code

The following table shows error codes and their associated meaning.

Code	Meaning
631	Display RAM Read/Write Error
632	System RAM Read/Write Error
633	Timer Interrupt Controller Error
634	+ 40 V dc Power Failure
635	Cam Position Error
636	Non-Volatile Memory (NVM) Read/Write Error
637 - 639	Carrier Drive Error
63A	Font ROM Error
63B	Button Scanning Error

Buttons



Button	Description
Start/Stop	• Used to return to **Ready** and to **Start/Stop**. • This is the only active button when the printer is printing. Printing continues until the current line is completed. • When **Start/Stop** is pressed at the tear-off position in manual tear-off mode, the forms are retracted to the line 1 position. • Loads the forms to line 1 position with the Ready indicator on. • Turns off the printer alarm.
Load/Unload	• Loads forms to line position 1. • Retracts the forms to the tractor position. When the printer detects an end-of-form condition, pressing this button ejects the forms from the printer. • Opens the pinch rollers when held for more than two seconds.
FormFeed	• Advances the forms to line 1 position of the next page. • Loads the forms to the line 1 position.

Button	Description
LineFeed	• Advances the forms one line. • When this button is held for more than one second in the offline (not ready state), the forms move continuously until the button is released.
Micro ↑ Micro ↓	• Advance the forms down 0.35 mm (1/72 in.) in either direction. • When this button is held for more than one second, the forms move continuously until the button is released.
Tear Off	• Advance the forms to the tear-off position. • Retracts the forms to line 1 position when the forms are at the tear-off position.
Pitch	• Advances the pitch to the next setting when pressed. • The following pitches can be selected: 10, 12, 15, 17.1, 20, PS Each pitch can be locked which prevents your software from changing pitch settings at the operator panel. When pressing **Pitch**, the printer goes offline and displays the current pitch and font. When a font conflicts with a selected pitch, the **Invalid Pitch** message appears on the display.
Font	• Advances the font to the next setting when pressed. • The following fonts can be selected: FastDraft, Draft, Gothic, Courier • The following Epson Emulation Modes can be selected: Draft (Fast & Normal), Gothic, Courier) Each font can be locked which prevents your software from changing font settings at the operator panel. When pressing **Font**, the printer goes offline and displays the current pitch and font. When a font conflicts with a selected pitch, the **Invalid Pitch** message appears on the display.

Button	Description
Menu/Quit	• Enters the function mode and the printer goes offline. • Exits the function mode and the printer performs the Power-On Self Test (POST).
Item ↑ / **Item** ↓	Scrolls up or down to display the desired function.
Scroll ↑ / **Scroll** ↓	Scrolls up or down to display the desired value in the selected function menu.
Store	Saves the values selected in the menus.

Indicators

Indicator	Description
Power (Green)	Indicates the printer power is on.
Ready (Green)	The printer is on-line and ready to print. The following conditions cause the **Ready** light to turn off: • Pressing **Start/Stop** • End-of-form (EOF) • Paper jam • Cover open • Hardware error • Power-On Self Test failure
Check (Yellow)	Any of the following conditions may have occurred: • End-of-form (EOF) • Paper jam • Cover open • Hardware error • Data transmission error • Interface mode error • Power-On Self Test (POST) failure

Display

The display shows error status codes, function menus and optional values when the printer is in the printer function setting mode.

Alarm

The alarm sounds to indicate the printer status or an error condition when:

- A cover is opened.
- An end-of-form (EOF) condition is detected.
- A paper jam.
- A data transmission error.
- An interface mode error.
- A hardware error.

To stop the alarm, press **Start/Stop**.

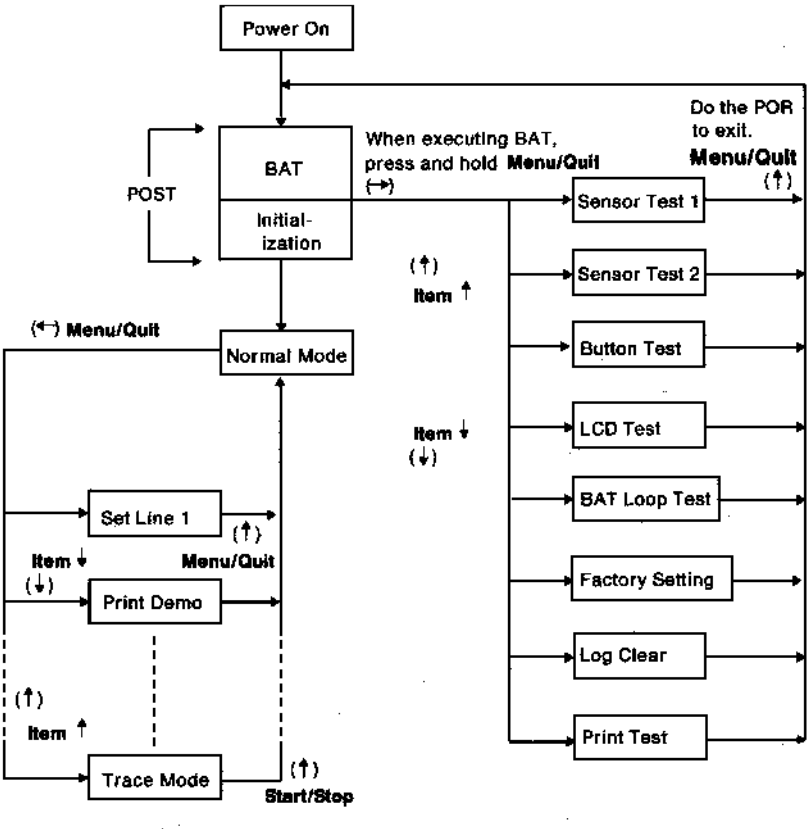
2. Diagnostic Information

Power-On Self Test (POST)

The Power-On Self Tests diagnose the basic hardware printer functions and initialize the default value settings. POST starts automatically when power to the printer is turned on, or when the printer receives an INIT signal from the controller.

- Display and Indicator Function Test - Checks LCD functions and LED indicators.
- RAM Test - Checks that the CPU can write/read the RAM.
- Font ROS Test - Calculates the check-sum value.
- Drive Voltage (+40 V dc) Test - Checks the voltage of the motors and printhead.
- Button Scan Test - Scans all operator panel buttons.
- NVRAM Test - Checks that the NVRAM data is correct.
- Button Scan Test - Checks all buttons on the operator panel.
- Cover Open Check - Checks if any covers are open.
- Carrier Drive Check and Initialization - Checks the carrier positioning.
- Cam Drive Check and Initialization - Checks the cam motor and cam sensor.

If the POST completes successfully, the Power and Ready indicators are on associated with a blank display. If any errors occur during POST, an error indicator shows which test failed.
See “Start” on page 2-3.


Power On
BAT
Initial-
ization
POST
When executing BAT,
press and hold Menu/Quit
Do the POR
to exit.
Menu/Quit
Sensor Test 1
Sensor Test 2
Button Test
LCD Test
BAT Loop Test
Factory Setting
Log Clear
Print Test
Item
Menu/Quit
Normal Mode
Set Line 1
Print Demo
Trace Mode
Start/Stop

Start

Make a quick visual check for defects (loose or broken parts, unplugged connectors, or paper jams).

If there is no power after turning the printer on, go to the “Power Failure Service Check” on page 2-30.

To prevent the printer from starting while service is performed, disconnect the interface cables.

Unload paper from the tractor.

The cover open interlock can be bypassed by placing a jumper on the rear of the operator panel.

If the printer displays an error indication code go to the “Error Indication Table” on page 2-4.

Run the “Print Test” on page 3-4 and refer to the Error Log for details of error indication information. If no error indication appears, refer to the “Symptom Table” on page 2-8.

Error Indication Table

The following table describes the service check entries for the printer error indication codes.

When an error indication changes after you have entered a service check, you have an intermittent problem. If this occurs, leave the service check and go to “Intermittent Problem Service Check” on page 2-23.

Display Indication	Description / Action
Blank	LCD busy condition. Replace the following in the order listed: 1. Operator panel assembly 2. Logic board. Go to the “Operator Panel Service Check” on page 2-24.
001	EOF state is detected, or the EOF switch fails to operate. Go to the “EOF Service Check” on page 2-22.
002	Frequent jams occur, or the jam sensor fails to make contact. Go to the “Paper Feed Service Check” on page 2-25.
005	Cover open condition is not detected, or is not reset. Go to the “POST Failure Service Check” on page 2-28.
007	Data error. Go to the “Abnormal Print Service Check” on page 2-16.

Display Indication	Description / Action
00D	Status of the interface mode switches do not match the setting in the NVM. Go to the “Abnormal Print Service Check” on page 2-16.
631	Display RAM Read/Write Error. This error is detected only in the Display Test. Replace the following in the order listed: 1. Operator panel assembly 2. Logic board. Go to the “Operator Panel Service Check” on page 2-24.
632	System RAM Read/Write Error. Replace the logic board.
633	Timer and Interrupt Controller Error. Replace the logic board.
634 / 638	+ 40 V dc power failed to drop. Go to the “Power Failure Service Check” on page 2-30.
635	Cam Positioning Error. Go to the “Cam Drive Failure Service Check” on page 2-17.
636	Non-Volatile Memory (NVM) Read/Write Error. Replace the logic board.
637	Carrier Drive Timeout Error. Go to the “Carrier Drive Failure Service Check” on page 2-20.
638	No Emitter Pulse Error. Go to the “Carrier Drive Failure Service Check” on page 2-20.

Display Indication	Description / Action
639	Carrier Positioning Error. Go to the “Carrier Drive Failure Service Check” on page 2-20.
63A	Font ROM Error. Replace the logic board.
63B	Button Scanning Error. Replace the following in the order listed: 1. Operator panel assembly 2. Logic board. Go to the “Operator Panel Service Check” on page 2-24.

Sensor Test 1

For the offline test procedure, do the following:

1. POR the printer.
2. Press and hold **Menu/Quit** during POST until the message “Sensor Test 1” is displayed.
3. Press **Item**↑ until “Print Test” is displayed.
4. Press **Start/Stop** to start printing. The message changes to “Printing”.
5. Press and hold **Start/Stop** to stop printing.
6. Turn the power off to exit this test mode.

Sensor Test 2

1. POR the printer.
2. Press and hold **Menu/Quit** during POST until the message “Sensor Test 2” is displayed.
3. Press **Item**↑ until “Print Test” is displayed.
4. Press **Start/Stop** to start printing. The message changes to “Printing”.
5. Press and hold **Start/Stop** to stop printing.
6. Turn the power off to exit this test mode.

Button Test

1. POR the printer.
2. Press and hold **Menu/Quit** during POST until the message “Button Test” is displayed.
3. Press **Item**↑ until “Print Test” is displayed.
4. Press **Start/Stop** to start printing. The message changes to “Printing”.
5. Press and hold **Start/Stop** to stop printing.
6. Turn the power off to exit this test mode.

Symptom Table

1. Select the symptom that best describes the problem.
2. Perform the appropriate action before you go to the indicated service check.

Abnormal Indications

Symptom	Action
All indicators turn on, but do not turn off. Machine model “IBM 4226” is displayed on the message display, the printer stops and an alarm sounds.	Go to the “POST Failure Service Check” on page 2-28.

Abnormal Print Operation Problems

Symptom	Action
Printer will not print, or become Ready. Abnormal operation, incorrect characters, or incorrect line width. Printer is ready but will not print from the computer correctly. Undefined or incorrect characters.	Be sure the interface cable is connected properly. Go to the “Abnormal Print Service Check” on page 2-16.

Intermittent Problems

Symptom	Action
Problem appears to be intermittent.	Go to the “Intermittent Problem Service Check” on page 2-23.

6XX Error Indications

Symptom	Action
6XX Machine Check is displayed.	Turn the printer off and then on. Go to “Error Indication Table” on page 2-4.

Paper Feed Problems

Symptom	Action
Pressing any feed function does not feed paper. Pressing **Load/Unload** does not move paper down to park. Paper stops at the tractor and does not feed. Frequent jams, paper skews or creases. Forms do not travel to TOF or travel past TOF. Line spacing problems.	Go to the “Paper Feed Service Check” on page 2-25.
Error “001 paper Out” cannot be cleared. EOF condition occurs with paper on the tractor. No EOF condition occurs with the end of paper.	Go to the “EOF Service Check” on page 2-22.
Paper did not move.	Check the configuration data for an incorrect paper length setting.

Operator Panel Problems

Symptom	Action
Missing dotted characters, or unreadable characters displayed. **Ready** does not turn off when **Start/Stop** is pressed. Only the Power light turns on. One or more buttons do not function. Power light does not come on but carrier moves. One or more lights do not function. Blank display. Cover open displayed.	Turn the printer off and then on. Go to the “Operator Panel Service Check” on page 2-24.

Power Problems

Symptom	Action
No Power indicator on and no carrier movement. Carrier does not move during POST.	Check the continuity of the power cord and the voltage of the electrical outlet. Go to the “Power Failure Service Check” on page 2-30.

Print Quality Problems

Symptom	Action
No print, but carrier moves as if printing. Carrier moves slowly or stops at every line.	Be sure the printhead cables are not loose or damaged. Be sure the interface cable is connected properly. Check the ribbon cartridge for binds or damage. Go to the “Print Wire Drive Failure Service Check” on page 2-36.
Print density is light.	If the ribbon has reached its end of life or is worn, the ribbon cartridge needs to be replaced. Check the “Printhead to Platen Adjustment” on page 4-6. Go to the “Ribbon Drive Service Check” on page 2-38.

Symptom	Action
Uneven print density across the print line. Specific dots missing.	Be sure the printhead cables are connected correctly to the printhead. Clean the printhead. Run the Print Test, see “Test Execution” on page 3-1. If the print is light at one edge and uniformly gets darker across the page to the other edge, perform the “Printhead to Platen Adjustment” on page 4-6. Go to the “Print Wire Drive Failure Service Check” on page 2-36.
Scattered ink smearing, blurred characters. Fuzzy print.	Clean the printhead. Clean the ribbon guide. If the ribbon has reached its end of life or is worn, the ribbon cartridge needs to be replaced. Go to the “Print Quality Service Check” on page 2-32.
Wavy vertical lines, uneven left margin or character width is reduced.	Clean and lubricate the carrier shaft. Check the“Character Alignment Adjustment” on page 4-5. Go to the “Carrier Drive Failure Service Check” on page 2-20.

Ribbon Feed Problems

Symptom	Action
Ribbon comes off, becomes loose or folded, or jams. Ribbon feeds correctly but is noisy.	Check the ribbon cartridge for binds or damage. Go to the “Ribbon Drive Service Check” on page 2-38.

Noise

Symptom	Action
Printer is noisy during idle. Abnormal sounds when feeding paper, printing or during POST.	Go to the “Abnormal Noise Service Check” on page 2-14.

Service Checks

Abnormal Noise Service Check

	FRU	Action
1	Covers Ribbon Cartridge	Be sure that all covers are correctly mounted with no loose screws or latches. Be sure the ribbon cartridge is installed correctly.
2	Print Unit Assembly	If the printer makes noise during POST or idling, perform a POR and wait a few minutes to complete POST. If the printer continues to make noise during POST, but not idling, turn the printer off and disconnect CP6 from the logic board. If the printer continues to make noise during POST, turn the power off, reconnect CP6 to the logic board, disconnect CP3 from the logic board and turn the power on. If the printer continues to make noise, turn the power off, reconnect CP3 to the logic board, disconnect CP1 from the logic board and turn power on. If the printer continues to make noise, replace the print unit assembly.
3	Ribbon Cartridge Feed Unit Assembly	If the ribbon cartridge is installed correctly, load paper on the tractor and press **Form Feed**. If the printer makes noise during paper loading, replace the feed unit assembly.

	FRU	Action
4	Printhead Ribbon Cartridge	Disconnect CP4 (Printhead) from the logic board and perform the “Print Test” on page 2-32. If the printer makes noise while performing the print test, check for broken print wires or a dirty printhead nose. If there are broken print wires or if the printhead nose is dirty, replace the printhead. If the printer did not make noise during the print test, replace the ribbon cartridge.
5	Form Feed Mechanism	Turn power off and measure the resistance of the following pins using the lowest ohm range: CP2-1 & CP2-5 CP2-2 & CP2-5 CP2-3 & CP2-6 CP2-4 & CP2-6 If the above resistances are not correct, replace the forms motor assembly.
6	Logic Board	Turn power off and remove the feed idler gear. Check the following by rotating the line feed motor gear by hand and observing the parts; replace the appropriate FRU as required: • Broken gear teeth on the feed gears. • Incorrect gear alignment. • Foreign objects in the gears. • No lubricants on the gear teeth. • Lubrication, or excess wear of metal bushing. • Bent or worn feed roller shafts. If the failure remains, replace the logic board.

Abnormal Print Service Check

	FRU	Action
1	Printer Interface Cable	If the printer interface cable is connected correctly, check the continuity of all connector signals. Replace the printer interface cable if necessary.
2	Logic Board	Be sure the interface switch on the logic board is correctly set and that the printer emulation is consistent with the host computer. If the problem remains, replace the logic board.

Cam Drive Failure Service Check

Note: FRUs in this service check may be worn, broken, binding or corroded.

	FRU	Action
1	Logic Board Cam Assembly Upper Pressure Roller Assembly Lower Pressure Roller Assembly	If error code 635 is displayed, POR and observe the upper and lower pressure rollers. If both pressure rollers move up and down smoothly, POR again and observe the cam motion. If the cam motor moves smoothly, replace the logic board. If the cam motor does not move up and down smoothly, check the following mechanical connections: • Linkage between the bracket of the upper pressure roller and cam. • Linkage between the bracket of the lower pressure roller and cam. If both linkage connections are good, POR again and observe the cam motion. If the cam motor moves smoothly, replace the logic board. If the linkage connections are incorrect, replace the appropriate FRU (cam assembly, upper pressure roller assembly, lower pressure roller assembly).
2	Metal Bushing Upper Pressure Roller Assembly Lower Pressure Roller Assembly	The upper or lower feed roller shafts may be binding or worn. Replace the appropriate FRU.

	FRU	Action
3	Cam Sensor	Perform the “Sensor Test 2” on page 2-7. Check that the cam position sensor status changes correctly by using the blade of a screw driver. If the cam sensor status did not change correctly, measure the voltage between TP4 and GND, performing the same check as the previous step. If the cam sensor is good, the voltage changes from + 5 V dc to 0 V dc alternately. • If the voltage changed correctly, replace the cam sensor. • If the voltage did not change correctly, replace the logic board. If the cam sensor status changed correctly, POR and observe the cam motion. If the cam motor moves smoothly, replace the logic board. If the cam motor does not move smoothly, turn power off, disconnect CP3 and remove the cam motor from the bracket. Manually turn the cam drive gear to move the cam one full revolution. If the cam does not move smoothly, replace the cam assembly.

	FRU	Action
4	Cam Motor Assembly	Manually turn the cam drive gear to move the cam one full revolution. If the cam does move smoothly, measure the resistance of the following pins using the lowest ohm range of the meter: CP3-1 & CP3-5 CP3-2 & CP3-5 CP3-3 & CP3-6 CP3-4 & CP3-6 The correct resistance of all measurements is approximately 40 ohms. If the above resistances are not correct, replace the cam motor assembly. • If the above resistances are correct, turn the cam motor shaft by hand. It the motor shaft turns smoothly, replace the logic board. • If the motor shaft does not turn smoothly, replace the cam motor assembly.

Carrier Drive Failure Service Check

Note: When the printer detects an Error Code of 637 or 639, verify the same error exists after removing the jammed paper.

	FRU	Action
1	Carrier Belt Carrier Motor Logic Board	If the error code is 637 or 639, or if there is incorrect vertical print registration, check for breakage, wear or loose tension of the carrier belt. If the belt is good, turn power off and manually move the carrier to check for smooth operation. If the carrier moves smoothly, replace the carrier motor assembly. If the problem remains, replace the logic board. If the carrier does not move smoothly, adjust and lubricate the following parts: • Gap between the printhead and the platen. See “Printhead to Platen Adjustment” on page 4-6. If the printhead gap is incorrect or uneven right to left, reinstall the printhead or replace the upper pressure roller assembly. • Dirt or no oil on the carrier shaft or support. • Binding or broken idler pulley. If the above items are good, remove the carrier belt from the carrier motor pulley and move the carrier manually to check for smooth carrier motion. If the carrier moves smoothly, replace the carrier motor assembly. If the carrier does not move smoothly, replace the carrier frame assembly.

	FRU	Action
2	Logic Board Carrier Motor	If the error code is not 637 or 639, or if the vertical print registration is ok, POR and verify the carrier motor rotates. If the carrier motor rotates slightly, POR and observe the status of the following TPs, using an ILP during carrier movement: • TP9 and GND • TP10 and GND Move carrier slowly in both directionsIf the status changes alternately on both positions, replace the logic board. If the failure re-occurs, reinstall the old logic board and replace the carrier motor assembly.
3	Carrier Motor Logic Board	If the carrier motor does not rotate slightly, measure the voltage between TP1 (+40 V dc Motor) and GND. • If the voltage is between +36 V dc and +42 V dc, disconnect CP1 and measure the resistance between pins 1 and 2 of CP1. If the resistance is infinity, replace the carrier motor assembly. If not, replace the logic board. • If the voltage is not between +36 V dc and +42 V dc, go to the “Power Failure Service Check” on page 2-30.

EOF Service Check

	FRU	Action
1	EOF Switch Assembly	If the left tractor is loose or operating incorrectly, replace the left pin feed. If the left tractor is operating correctly, perform “Sensor Test 1” on page 2-7. If the status did not change correctly, check the switching status using an ILP between TP5 and GND. If the status did change correctly, perform the Sensor Test 1 again and check the EOF switch on/off operation when loading and removing continuous forms. If it does not operate correctly, adjust the locating position of the EOF switch. If the problem remains after adjusting, replace the EOF switch assembly. If the status did not change correctly, replace the EOF switch assembly.
2	Tractor Assembly Logic Board	Check that the TOF sensor status changes correctly by using a piece of paper. If the TOF sensor status does not change correctly, measure the voltage between TP3 and GND, performing the same check as in the previous step. If the TOF sensor is good, the voltage changes from + 5 V dc to 0 V dc alternately. • If the voltages change correctly, replace the TOF sensor arm. • If the voltage changes incorrectly, replace the logic board.

Intermittent Problem Service Check

	FRU	Action
1	Logic Board	Reconnect all connectors to the logic board. Check the following: • Power supply ground • Machine frame ground • Static eliminator brush ground • Printer interface cable ground If the voltages are low, check all dc voltages at the logic board. If the voltages are not correct, replace the power supply. If the failure remains, replace the logic board.
2	Power Supply Printhead Cable Logic Board	Check the customer's outlet voltage and ensure that it is within tolerance. Check the continuity of the power cord. Check all dc output voltages at the connector CN9 pins and ensure they are within tolerance while printing. Check the electric leakage of the ac wiring. If the problem remains, replace the power supply, printhead cable and logic board.
3	Thermal Control Failure	Go to the "Print Wire Drive Failure Service Check" on page 2-36.

Operator Panel Service Check

Note: When the display is blank with no indications, go to the "Power Failure Service Check" on page 2-30.

	FRU	Action
1	Operator Panel Assembly	If the error code 63B, or 631 is displayed, replace the operator panel assembly. If there are undefined or no characters displayed (except missing or extra dots), replace the operator panel assembly. Perform the "Button Test" on page 2-7. If the switches did not operate correctly, replace the operator panel assembly. **Note**: If the problem is not fixed after replacing the operator panel assembly, replace the logic board.
2	Logic Board	If the buttons do not function, replace the logic board. Go to the "Paper Feed Service Check" on page 2-25. If the printer displays "IBM 4226" during POST, replace the logic board. If the message is not correct, but the display is blank and if the carrier moves during POST, go to the "POST Failure Service Check" on page 2-28. If the carrier did not move during POST, replace the operator panel assembly.

Paper Feed Service Check

Remove the paper jam if it exists, load paper and press **Form Feed.**

	FRU	Action
1	Logic Board Forms Motor Assembly	If the paper does not move, go to the following step (2), “Feed Gears” on page 2-26. If the paper moves slightly, remove all paper from the printer. Perform “Sensor Test 1” on page 2-7. Check that the jam sensor status changes correctly by using a piece of paper. If the jam sensor status does not change, measure the voltage between TP6 and GND, while performing “Sensor Test 1” on page 2-7. If the jam sensor is good, the voltage changes from + 5 V dc to 0 V dc alternately. If the voltage does not change, replace the jam sensor assembly. If the voltage does change correctly, replace the logic board. If the jam sensor status changes, check that the TOF sensor status changes correctly by using a piece of paper. If the TOF sensor status does not change correctly, measure the voltage between TP3 and GND, while performing “Sensor Test 1” on page 2-7. If the TOF sensor is good, the voltage changes from + 5 V dc to 0 V dc alternately. If the voltage changes correctly, replace the TOF sensor assembly. If not, replace the logic board.

	FRU	Action
2	Cam Assembly Feed Gears Tractor Pins Tractor Pads	If the TOF sensor status changes correctly, remove the paper jam, load forms and POR. Press **Form Feed** and carefully observe the feed motion. • If the printer detects an error code 002, and if both pressure rollers moved up or down, perform the print test for about ten pages. • If the pressure rollers did not move, check the connection between the upper and lower pressure roller assemblies and cam. If both linkages are good, replace the cam assembly. If a paper jam still occurs, remove the paper jam, perform the print test again and observe if the feed roller shafts rotate. • If the shafts do not rotate, check the feed gears (large feed gear, feed idler gear, feed gear, idler gear) replacing the defective gear. • If the shafts do rotate, and if the paper travels to or past the TOF sensor, verify that the top edge of the paper is correct. If so, turn power off, and turn the feed idler gear clockwise by hand. • If the paper did not move up smoothly, remove the tractor drive idler gear and manually turn the tractor shaft gear clockwise. • If the paper does not move up smoothly, Check if the tractor pins and both tractor pads are broken or loose and replace as required. If the paper does move up smoothly, remove the feed idler gear while manually turning the large gear counterclockwise by hand. • If the large gear does not turn smoothly, check and replace the following parts as required: (metal bushing, feed idler gear, large gear roller shafts). • If the large gear does turn smoothly, continue.

	FRU	Action
3	Logic Board Forms Motor Assembly	If the paper does move smoothly, remove connector CP2 and measure the resistance of the following pins using the lowest ohm range. The correct resistance should be approximately 7 ohms. CP2-1 & CP2-5 CP2-2 & CP2-5 CP2-3 & CP2-6 CP2-4 & CP2-6 • If all the above resistances are correct, replace the logic board. • If they are not correct, replace the forms motor assembly.
4	Feed Gears	Ensure that the feed gears engage correctly. • Turn the forms drive motor while observing the gears. • If the gears do not engage correctly, reinstall the suspected gear. • If the stopper lugs of the suspected gear are loose, broken or worn, replace the defected gear.

POST Failure Service Check

	FRU	Action
1	Logic Board	POR the printer. If the alarm sounds during POST, and the error code displayed is 005, by-pass the cover open sensor CJ19 on the operator panel board by using the jumper wire in the parts packet. • If the alarm still sounds, replace the logic board. If the alarm still sounds, check the following: • Cover magnet of the access cover. • Operator panel position. • Connector terminal surface of the operator panel cable. • If the above items are all correct, replace the logic board. If not, repair or replace the suspected item. If the alarm does not sound and “IBM 4226” is not displayed, check if the power indicator turns on. If it does, replace the logic board. If it does not, go to the “Power Failure Service Check” on page 2-30.
2	Operator Panel Assembly	If the error code displayed is not 005 and the display is blank, verify the check indicator turns on. • If it does, replace the operator panel assembly. • If it does not, replace the logic board.

	FRU	Action
3	Printer Interface Cable	If the alarm does not sound and “IBM 4226” is displayed, check the following: • Turn the power off. • Remove the printer interface cable from the printer. • Turn the power on. Observe the display and Check indicator and if the failure re-occurs, replace the logic board. If the failure does not re-occur, the problem may exist in the printer interface cable or the host. Replace the printer interface cable.

Power Failure Service Check

	FRU	Action
1	Operator Panel	If the operator panel or cable is damaged or disconnected, the machine is completely inoperable. If the power LED is not on steady, check the cable continuity and replace the cable or the operator panel. POR the printer. If the Power indicator turns on, go to the “POST Failure Service Check” on page 2-28.
2	Power Supply	If the printer is completely inoperable, disconnect the power supply cable from the Logic Board. Measure the following voltages. CP 9-1 & CP 9-4 (+ 40 V dc) CP 9-2 & CP 9-5 (+ 40 V dc) CP 9-3 & CP 9-6 (+ 40 V dc) CP 9-9 & CP 9-7 (+ 5 V dc) CP 9-10 & CP 9-8 (+ 5 V dc) If one or more of the voltages are not present, replace the power supply.
3	Logic Board	Measure the voltage between TP2 (printhead drive + 40 V dc) and GND on the logic board. If the voltage at TP2 is between +36 and +42 V dc, measure the voltage between TP1 (motor drive + 40 V dc) and GND on the logic board. If the voltage is between +36 and +42 V dc, replace the logic board.

	FRU	Action
4	Printhead Cables Printhead	If the voltage at TP1 is not between +36 and +42 V dc, disconnect the printhead cables (CP4) from the logic board and turn the printer on. If the Power LED lights, there is a short in the printhead cables or printhead.
5	Forms Motor Ribbon Motor Cam Motor Carrier Motor	Disconnect the forms motor, the ribbon motor, the cam motor and the carrier motor from the logic board. Turn the power on. If the power problem remains, replace the logic board. If the machine POSTs, one of the motors is holding down the +40 V dc line. Reconnect them one at a time, turning the printer on between each connection. Replace the part that causes the power failure.

Print Quality Service Check

This procedure should be used only when you have print quality problems without any other visible machine problem. That is, the machine runs, feeds the correct number of pages without an error indication and stops normally.

The Symptom Description Table provides the details of the problem with defect samples.

Print Test

Two types of print tests are provided for the verification of print quality. One test prints the built-in character image, while the other prints several specific test patterns. The following methods describe the print quality checking procedures.

To run the Print Demo in the utility function:

1. Make sure the "Ready" indicator is on.
2. Press **Start/Stop**; the "Ready" indicator turns off.
3. Press **Menu/Quit**; then press **Item** ↑ or **Item** ↓ to select "Print Demo".
4. Press **Start/Stop**; the Print Demo will start.
5. Press hold **Start/Stop** to stop this test.

If you need correct print samples, see the IBM 4226 Printer User's Reference.

To run the print test procedure:

1. POR the printer.
2. Press and hold **Menu/Quit** during POST until the message "Sensor Test 1" is displayed.
3. Press **Item** ↑ until "Print Test" is displayed.
4. Press **Start/Stop** to start printing. The message changes to "Printing".
5. Press and hold **Start/Stop** to stop printing.
6. Turn the power off to exit this test mode.

If you need the correct print samples, see Chapter 3, Diagnostic Test in the IBM 4226 printer Maintenance Information Manual.

Print Test Patterns

Test Patterns	Function
Pattern 101 (Special Box Pattern)	This test pattern is used to check the TOF position, print registration, print density, or to find dirty or void spots.
Pattern 102 (Draft Font Pattern)	This test pattern is used to verify the style of the selected font and to check the draft print quality.
Pattern 103 (Print Wire Pattern)	this test pattern is used to check the impression of each wire or to find the missing dots.
Pattern 104 (Unidirectional Grid Pattern)	This test pattern is used to check the alignment of vertical and horizontal line spacing in the unidirectional printing mode.
Pattern 105 (Bidirectional Grid Pattern)	This test pattern is used to check the alignment of vertical and horizontal line spacing in bidirectional printing mode.
Pattern 106 (Non-Volatile Memory (NVM) Dump)	This pattern prints the contents of the Non-Volatile Memory (NVM). it consists of two parts, including 32 bytes of customer configuration data, and 16 bytes of error logs with 16 bytes of counters.

Quick Check Table

Symptom	Action
No Print	• Set the lever to position 1 and adjust the gap between the printhead and platen. • If the printhead cable is loose, folded or broken, reconnect or replace it. • If the printer interface mode mismatches the physical connection, change the configuration data or switch the I/F mode selection switch on the rear of the logic board.
Light print Light zone Light spots Scratches Voids	• If the ribbon is worn, replace the ribbon cartridge. • Be sure the ribbon cartridge is installed correctly. • Check for loose ribbon motor and ribbon drive mounting screws. • Be sure the printhead to platen gap is adjusted correctly.
Missing dots Extra dots Horizontal streaks	Be sure the printhead cable connector is seated properly to the printhead and the and the logic board. Be sure the printhead nose is clean. Check the position of the forms thickness lever and be sure it is set to “1”. If the ribbon shield is dirty, replace the ribbon cartridge.
Poor resolution Blurred density Uneven density Fuzzy text Smeared text	Be sure the printhead nose is clean. If the ribbon shield is dirty, replace the ribbon cartridge. If the ribbon is worn, replace the ribbon cartridge. Be sure the printhead to platen gap is equal at left and right ends. If adjusting the gap does not fix the problem, replace the carrier frame assembly.

Symptom	Action
Incorrect registration Incorrect margins Distortion Wavy text	If the carrier drive belt is worn, adjust or replace it. Be sure the carrier motor turns smoothly and silently (no noise), while printing. Clean and lubricate the carrier shaft. Check the tension pulley and bracket for wear or looseness. Tighten the bracket mounting screws or replace the tension pulley assembly. Adjust the character alignment. If you cannot adjust it correctly, readjust the carrier drive belt tension and perform the “Character Alignment Adjustment” on page 4-5 again.
Incorrect vertical registration Incorrect line spacing	Replace or lubricate the feed gears or metal bushing. Be sure the feed motor turns smoothly and silently (no noise) while feeding paper. Replace the forms motor assembly. Replace or tighten any broken tractor pads or pins. Clean or replace the roller shafts.

Print Wire Drive Failure Service Check

	FRU	Action
1	Printhead Logic Board Printhead Cable	If the problem appears as a missing or extra dot, or no print wire, perform the “Print Test” on page 2-32 to determine the failing print wire(s). If the same wires still fail, turn power off, remove the connector CP-4 from the logic board and check the cable continuity with the coil resistance of the specified magnet wire signal in “Resistance Table 1” on page 2-37, using the lowest ohm range. If the resistances are correct, the problem may be the printhead or the logic board. Replace the printhead and if the problem remains, replace the old printhead and replace the logic board. **Note**: it is a good practice to inspect the printhead nose carefully. If all wires are not aligned to the head surface, the case may break or strain print wires in the printhead. If resistances are not correct, remove connector CP18 from the printhead. Check the cable continuity of the specified magnet wire signal and its common signal in “Resistance Table 2” on page 2-37, using the lowest ohm range. If the continuity is good, replace the printhead cable. If the continuity is not good, replace the printhead.

Resistance Table 1

Pin Number	Pin Description
CP4-1 & CP4-2	No. 1 Print Wire Magnet
CP4-20 & CP4-19	No. 2 Print Wire Magnet
P4-4 & CP4-3	No. 3 Print Wire Magnet
CP4-17 & CP4-18	No. 4 Print Wire Magnet
CP4-5 & CP4-6	No. 5 Print Wire Magnet
CP4-15 & CP4-16	No. 6 Print Wire Magnet
CP4-8 & CP4-7	No. 7 Print Wire Magnet
CP4-13 & CP4-14	No. 8 Print Wire Magnet
CP4-10 & CP4-11	No. 9 Print Wire Magnet

Resistance Table 2

Pin Number	Pin Description
CP4-1 & CP18-1	No. 1 Print Wire Magnet
CP4-2 & CP18-2	No. 1 Print Wire Common
CP4-20 & CP18-20	No. 2 Print Wire Magnet
CP4-19 & CP18-19	No. 2 Print Wire Common
CP4-4 & CP18-4	No. 3 Print Wire Magnet
CP4-3 & CP18-3	No. 3 Print Wire Common
CP4-17 & CP18-17	No. 4 Print Wire Magnet
CP4-18 & CP18-18	No. 4 Print Wire Common
CP4-5 & CP18-5	No. 5 Print Wire Magnet
CP4-6 & CP18-6	No. 5 Print Wire Common
CP4-15 & CP18-15	No. 6 Print Wire Magnet
CP4-16 & CP18-16	No. 6 Print Wire Common
CP4-8 & CP18-8	No. 7 Print Wire Magnet
CP4-7 & CP18-7	No. 7 Print Wire Common
CP4-13 & CP18-13	No. 8 Print Wire Magnet
CP4-14 & CP18-14	No. 8 Print Wire Common
CP4-10 & CP18-10	No. 9 Print Wire Magnet
CP4-11 & CP18-11	No. 9 Print Wire Common

Ribbon Drive Service Check

Note: Turn the power off, remove the ribbon cartridge and turn power on.

	FRU	Action
1	Ribbon Cartridge	If the ribbon drive shaft rotates during POST, install the ribbon cartridge and perform the “Print Test” on page 2-32. If the feed knob rotates continuously while printing, rotate the drive knob on the ribbon cartridge manually. If the ribbon does not feed smoothly, replace the ribbon cartridge. If the ribbon feeds smoothly, check the following items and adjust, clean or replace defective parts as necessary: • Dirt on the printhead nose. • Printhead mounting position and loosened screws. • Incorrect gap between the printhead and platen. • Dirty or damaged ribbon shield. If all items are good, go to the “Print Wire Drive Failure Service Check” on page 2-36.

	FRU	Action
2	Ribbon Drive Double Gear Planet Gear Spring Ribbon Drive Assembly	If the ribbon drive shaft does not rotate during POST, turn the power off, remove the ribbon drive assembly and turn power on while observing the ribbon drive motor shaft. If the ribbon drive motor turns normally, check the ribbon planet gear spring for damage. If the spring is mounted incorrectly, install or replace the planet gear spring. If the gear is mounted correctly, check all gears of the ribbon feed. If the gears are not engaged correctly, replace the ribbon drive double gear. If the gears are engaged correctly, replace the ribbon drive assembly.
3	Logic Board Ribbon Drive Motor Assembly	If the ribbon drive motor does not turn normally, turn the printer off, disconnect the ribbon motor connector CP6 from the logic board and measure the resistance of the following pins: CP6-1 & CP6-5 CP6-2 & CP6-5 CP6-3 & CP6-6 CP6-4 & CP6-6 The correct resistance of all measurements is approximately 150 ohm. If all the resistances are correct, replace the logic board. If the resistances are not correct, replace the ribbon drive motor assembly.

3. Diagnostic Aids

Offline Test (Resident Non-Automatic Tests)

Test Execution

Offline test aid in detecting intermittent problems or to observe the NVM contents. To run the test, do the following:

- POR.
- Press and hold Menu/Quit during POST until the "Sensor Test 1" message is displayed.
- Press **Item** ↓ or **Item** ↑to select a test item.
- Press **Start/Stop** to start selected test.
- Press **Menu/Quit** to stop all tests except BAT Loop and the Button tests.
- Turn the power off to exit test mode.

The test menu includes a sensor test which displays the status of the sensors in the following manner:

- Underline - sensor is inactive.
- Box pattern - sensor is active.

If the EOF switch is on, the printer is in the EOF state. If the TOF sensor is on, the paper is under the TOF sensor.

Sensor Test 1

Device	Display	Type	On State
TOF Sensor	TOF	Photointerrupter	Form in printer
EOF Switch	EOF	Micro-switch	No paper on the tractor
Jam Sensor	JAM	Photointerrupter	Paper under the sensor
Gap Lever Position Sensor	GAP	Photointerrupter	The forms thickness lever position is set between 1 and 2.5

Note: The gap lever position is in the off state when the forms thickness lever position is set between 3 and 6.

Sensor Test 2

Device	Display	Type	On State
Cover Open Sensor	Cover	Hole device	Cover open
Cam Sensor	CAM	Photointerrupter	Shut off (cam is at home)
Head or Carrier Motor Thermal Sensor	HEAT	Posistor	High temperature

Button Test

This test verifies the button operation on the operator panel. When any button is pressed, the alarm sounds continuously until the button is released. If two or more buttons are pressed simultaneously, the alarm does not sound. To end the test, perform a POR.

LCD Test

This test verifies the LCD Ram Read/Write functions. All dots on the LCD flash on and off at one-second intervals. If an error is detected, Error Code 631 is displayed and the test stops.

BAT Loop Test

This test is helpful in determining intermittent problems. The test repeats each test item of the BAT. To end the test, perform a POR.

Factory Setting

This test sets the printer to the factory settings.

To run this test:

- Press the **Scroll** ↑ or **Scroll** ↓ to select the setting.
- Press Store

The following settings are selectable at shipment:

Setting	U.S.	Non-U.S.
Page length	11 inches	12 inches
Character set	1	2
Codepage	437	850
Download Codepage	437	850

Log Clear

This test clears the NVM log when **Start/Stop** is pressed.

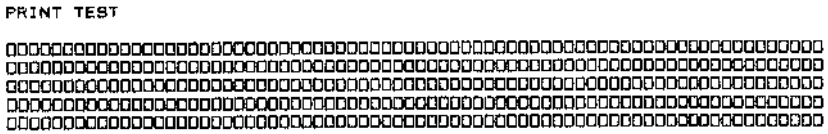
Print Test

This test detects print quality problems and stores the results in the NVM dump area.

WARNING: Do not run this test for more than 10 pages or printhead damage may occur.

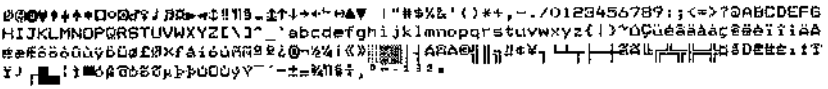
Pattern 101

(Special Box Pattern) - Checks the print registration, print density or dirty / voided spots.



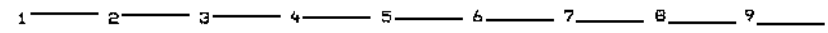
Pattern 102

(Draft Font Pattern) - Verifies the draft font style and print quality.



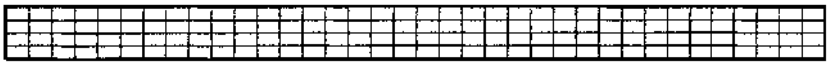
Pattern 103

(Print Wire Pattern) - Checks the impression of each print wire.



Pattern 104

(Unidirectional Grid Pattern) - Checks alignment of vertical and horizontal line spacing in unidirectional mode.

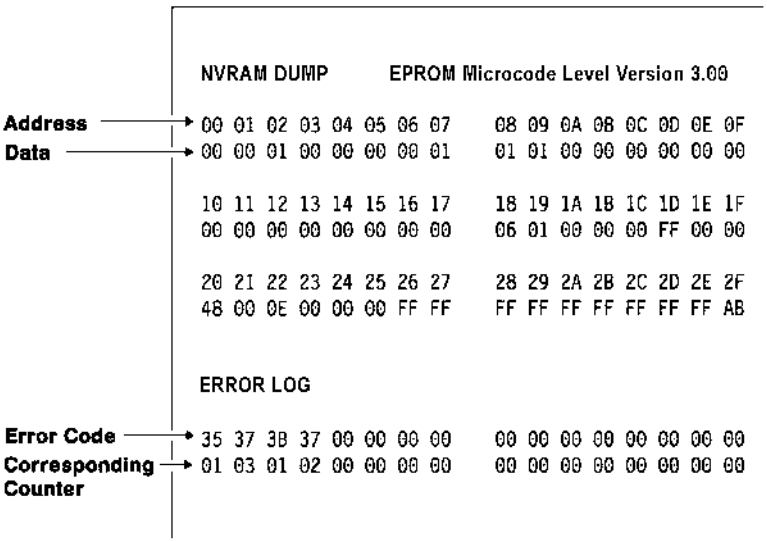


Pattern 105

(Bidirectional Grid Pattern) - Checks alignment of vertical and horizontal line spacing in bidirectional mode.

Pattern 106

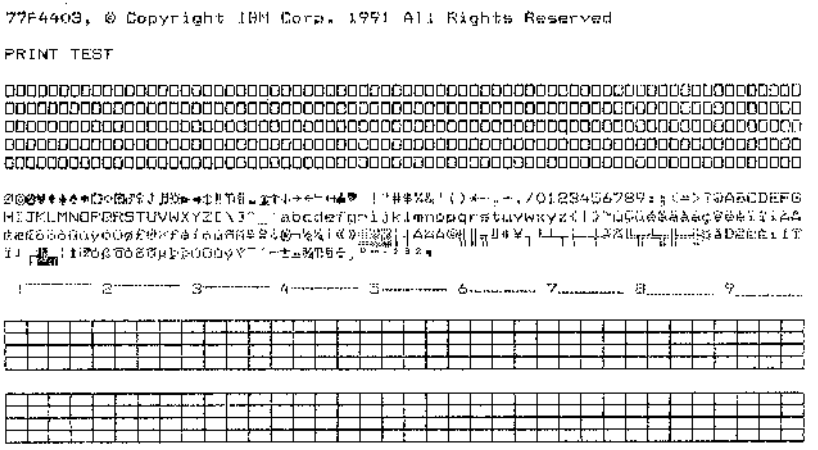
(NVM Dump) - Prints the contents of NVM. This consists of two parts (including 80 bytes of data), address X'00' through X'2F' (which is the configuration or the customer setup data), and address X'50' through X'6F' data (which is the sequential error logs with counter).



Note: Error Log in the Pattern 106.

- Error codes are printed on the top line of the Error Log and their corresponding counters are printed below. (An error code X'00' indicates no errors are registered in the counter.)
- Each new error appears on the left-most position and the previous error code shifts to the right, one position.
- If the new error code is the same as the previous error code, the counter is increased by 1. The maximum count number for the same error is 256 and the counter remains at this value (X'FF'). No more than the 16 most recent error codes can be printed in the error log area.

Print Test Sample



Trace (Hexadecimal Print)

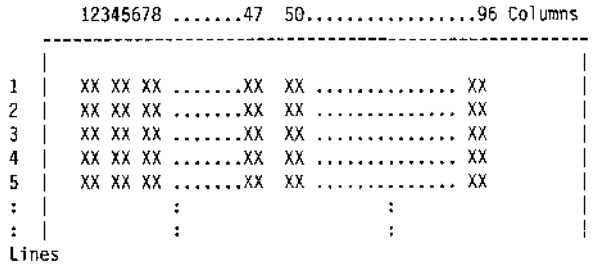
The hex trace mode can help the user test and troubleshoot programs. You can use the hex trace procedure to get a hexadecimal printout of the data stream sent to the printer. All data, including control and character data, print in hexadecimal instead of ASCII.

To activate trace print:

1. Press **Menu/Quit**. The "Set Line 1" message is displayed.
2. Press **Item** ↑ once.
3. The "Trace Mode" is shown on the operator panel.
4. Press **Start/Stop** to start the trace printing.
5. Press **Start/Stop** again to stop the trace printing.
6. When the trace printing ends, do a POR.

When printing with this function, print width is automatically defined by setting default values in NVM. Printing format is as follows:

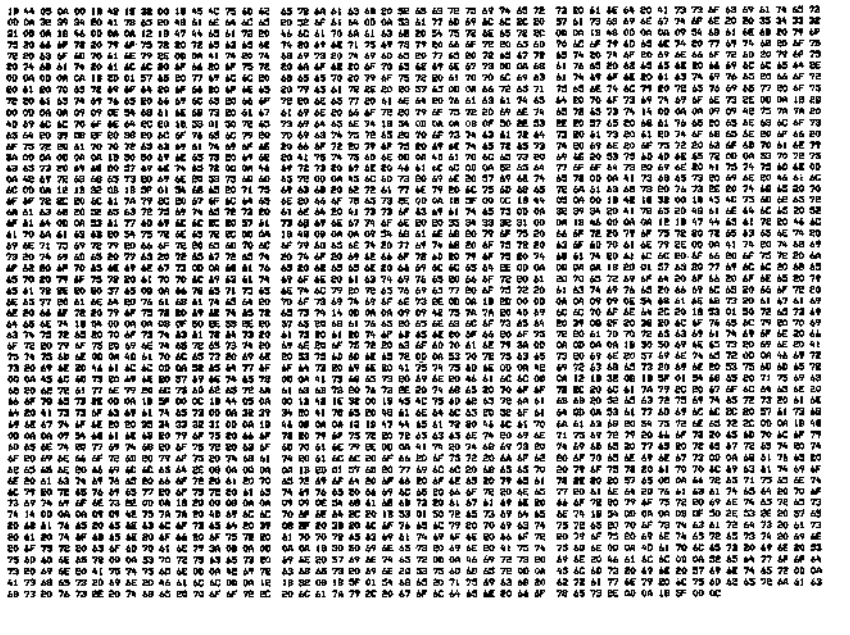
Narrow Width Pattern



Wide Width Pattern

```
         12345678 .......47  50.................96 99.................145 Columns
        ----------------------------------------------------------------------
        |                                                                      |
1       |  XX XX XX .......XX  XX ..............  XX  XX ..............  XX   |
2       |  XX XX XX .......XX  XX ..............  XX  XX ..............  XX   |
3       |  XX XX XX .......XX  XX ..............  XX  XX ..............  XX   |
4       |  XX XX XX .......XX  XX ..............  XX  XX ..............  XX   |
5       |  XX XX XX .......XX  XX ..............  XX  XX ..............  XX   |
:       |           :              :                    :                    |
:       |           :              :                    :                    |
Lines
```

Hexadecimal Print Sample (Wide Width)



4. Repair Information

This chapter contains adjustments and removal procedures. Before analyzing or repairing the printer, you must by-pass the cover open circuit using the jumper wire in the parts packet. When replacing parts, be sure to use the appropriate diagnostic procedure and adjustment.

Handling ESD-Sensitive Parts

Many electronic products use parts that are known to be sensitive to electrostatic discharge (ESD). To prevent damage to ESD-sensitive parts, follow the instructions below in addition to all the usual precautions, such as turning off power before removing logic boards:

- Keep the ESD-sensitive part in its original shipping container (a special “ESD bag”) until you are ready to install the part into the machine.
- Make the least-possible movements with your body to prevent an increase of static electricity from clothing fibers, carpets, and furniture.
- Put the ESD wrist strap on your wrist. Connect the wrist band to the system ground point. This discharges any static electricity in your body to the machine.
- Hold the ESD-sensitive part by its edge connector shroud (cover); do not touch its pins. If you are removing a plugable module, use the correct tool.
- Do not place the ESD-sensitive part on the machine cover or on a metal table; if you need to put down the ESD-sensitive part for any reason, first put it into its special bag.
- Machine covers and metal tables are electrical grounds. They increase the risk of damage because they make a discharge path from your body through the ESD-sensitive part. (Large metal objects can be discharge paths without being grounded.)
- Prevent ESD-sensitive parts from touching other personnel. Install machine covers when not working on the machine, and do not put unprotected ESD-sensitive parts on a table.
- Keep all ESD-sensitive parts in a grounded metal cabinet (case).
- Low humidity increases static electricity during cold weather.

Adjustments

CAUTION: Be sure to unplug the power cord whenever you are working on the printer with any of the covers removed.

Note: Before returning the printer to the customer, reset all customer setup values. Refer to the IBM 4226 Printer User's Reference for instructions.

Carrier Assembly Adjustment

Note: After power is turned off and the ribbon cassette is removed, the moving load of the carrier assembly should be equal in all positions when it is moved left ore right by hand. Whenever you replace or adjust carrier related parts, perform the character alignment adjustment, see "EOF Switch Adjustment" on page 4-6.

Symptoms	Actions
Dry oil pad The carrier drags when you move it left and right by hand.	Remove the printhead and lubricate the two oil pads with an appropriate amount of IBM # 6 oil.
Broken bearings When moving the carrier by hand, it drags intermittently or makes abnormal noise. To check for broken bearings, remove the carrier drive belt.	Replace the carrier motor if the motor bearings are bad or replace the tension pulley assembly if the tension pulley bearing is bad.
Broken ribbon drive assembly When turning the ribbon feed knob by hand, the ink ribbon intermittently drags, sticks or does not turn.	Replace the ribbon cartridge. If the problem still occurs, replace the ribbon drive assembly.

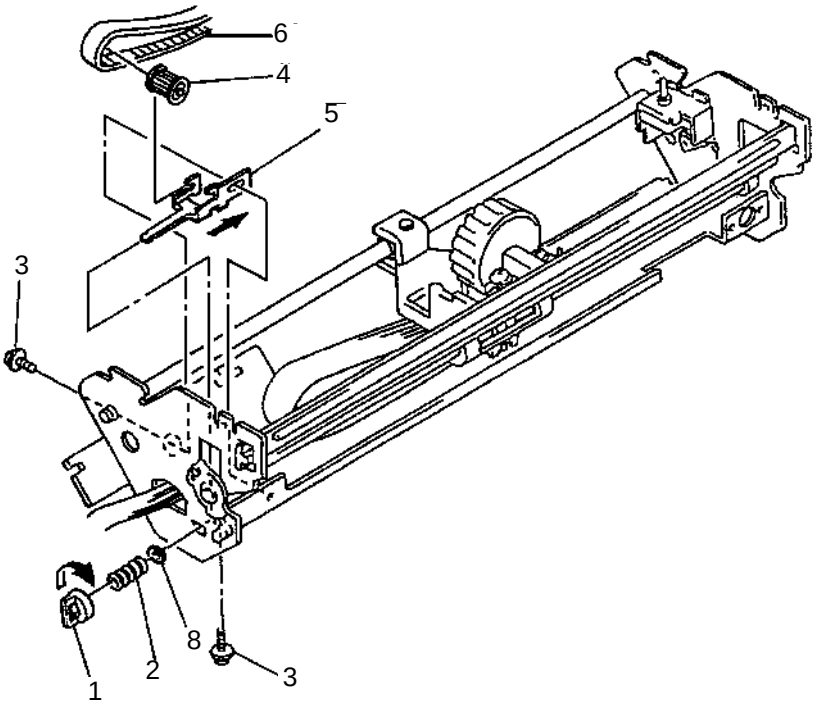
Symptoms	Actions
Broken carrier shaft bushing or support shaft bushing. When moving the carrier by hand, the carrier intermittently drags or does not move.	REplace the carrier frame assembly.
Broken ribbon shield When feeding the form in the printer, the form feeding drags or breaks at the ribbon shield.	Replace the ribbon cartridge.

Carrier Belt Adjustment

Note: Whenever you replace or adjust carrier related parts, perform the character alignment adjustment, see “EOF Switch Adjustment” on page 4-6.

1. Remove the top cover.
2. Remove the front cover.
3. Move the carrier to the left end.
4. Insert the Push-Pull gauge [**7**] through the hole of the plate. Push up the bottom side of the carrier belt [**6**] by the Push-Pull gauge in the direction shown.
5. Be sure that the push gauge value is between 400g (0.88 lb) and 500g (1.10 lb) when both tops of the beet teeth touch.
6. Remove the retainer [**1**] and the spring [**2**].
7. When the belt tension value is higher than the standard value, remove the appropriate number of washers [**8**]. When the belt tension value is lower than the standard value, install the appropriate number of washers [**8**]. Then install the spring [**2**] and retainer [**1**].
8. Move the carrier to the left and loosen the two screws [**3**] that hold the tension pulley bracket [**5**]. This will set the left spring tension.
9. Tighten the two screws [**3**].
10. Perform the check items as described again. If the belt tension value is not the standard value, install or remove the washers until the standard tension value is achieved.

Adjust the ruled line. See “EOF Switch Adjustment” on page 4-6.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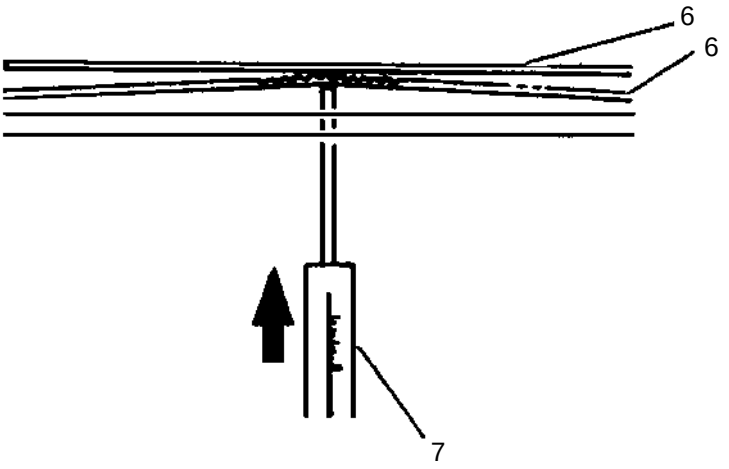
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6
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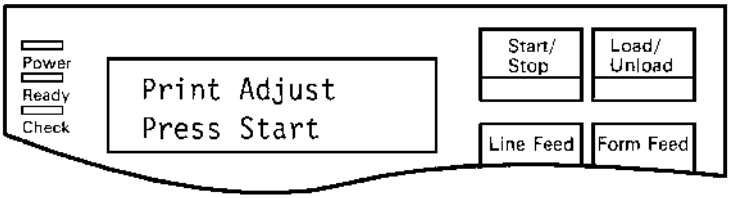
Character Alignment Adjustment

Note: This function is used to adjust the bidirectional ruled line printing so that the deviation of the ruled lines printing from left and right will be minimal.

1. Be sure the forms are set to the line 1 position.
2. Press **Menu/Quit** to enter the function menu.
3. Press **Item**↑ until the **Print Adjust** message appears on the display.



4. Press **Start/Stop** to print the alignment pattern similar to the following:

5. Press **Scroll**↑ or **Scroll** ↓to display the best character alignment value.In the above example, alignment pattern, +3 would be selected as the best character alignment value.
6. Press **Store** to save the selected value.
7. Press **Start/Stop** to print the alignment pattern and check that the best character alignment position is 0. If it is not 0, repeat steps 4 through 7 until the position is 0.

8. After printing, press **Menu/Quit** to return to the not-ready state.

Alignment Pattern

Menu	Menu Meaning	Selection	Selection Meaning
Print Adjust	Ruled line registration adjustment	+ 6 to - 6	1/720 inch space between selected numbers

EOF Switch Adjustment

Note: Switching point when the actuator of the EOF switch is pressed should be 0.5 to 1.0 mm (0.02 - 0.04 inch) between the bottom of the tractor gate and the top of the actuator.

- Loosen the two screws holding the EOF switch and adjust it as described above, then tight the two screws. See “EOF Switch and Jam Sensor Removal” on page 4-18.

Printhead to Platen Adjustment

Insert the feeler gauge between the printhead and platen at both ends of the printer. The printhead to platen gap should be 0.35 mm ± 0.03 mm (0.014 inch) ± 0.0001 inch with the ribbon removed and the forms thickness lever set to position 1. Do not make adjustments at the cut-away areas of the platen.

Note: Inspect the left and right printhead to platen adjustment screws for the presence of a silver colored star washer located between the adjustment screw flat washer and the carrier frame. If the star washer is present, remove the adjusting screw, discard the star washer and reinstall the adjusting screw.

To set the gap:

- When adjusting the left side, position the center of the printhead below and between the first and second left-most upper pressure rollers. Insert the 0.014 inch gauge into the gap from the right side of the printhead with the gauge holder toward the center of the printer and parallel to the platen. A slight drag will be felt when the gap is correct.
- When making the adjustment at the right side, position the center of the printhead below and between the fifth and sixth right-most upper pressure rollers. Insert the gauge into the gap from the left side of the printhead with the gauge holder toward the center of the printer and parallel to the platen. A slight drag will be felt when the gap is correct.
- Re-check the adjustment at the left and right side and repeat if necessary until the proper gap is obtained. Using the .013 inch gauge, there should be very little drag. Using the .015 inch gauge, there should be noticeable drag when the gap is set correctly.

Printhead Cable to Carrier Shaft Gap Adjustment

Be sure the printhead cable is parallel to the carrier shaft.

Tractor Adjustment

Note: The sprocket pins on both left and right pin feeds must be parallel with each other.

- Insert the square tractor shaft into both pin feeds after matching the mark on the pin feeds shaft bearing with the mark on the pin feed base. These marks are located on the paper path side of the pin feeds.

Removal Procedures

Use the following procedures to remove and replace individual FRUs.

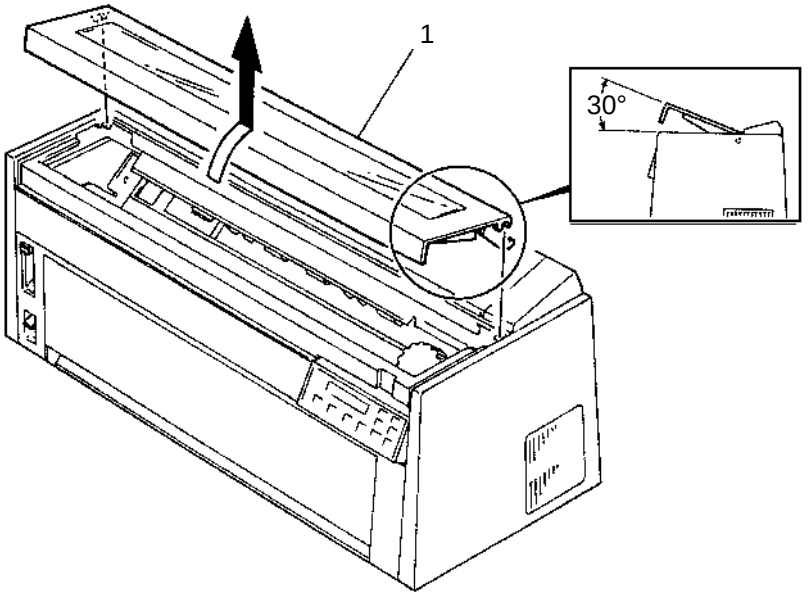
CAUTION: Be sure to unplug the power cord whenever you are working on the printer with one of the covers removed.

Access Cover Removal

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Open the access cover [**1**] slightly (about 30 degrees) and lift the left side of the cover and remove it by sliding it to the left.

Replacement

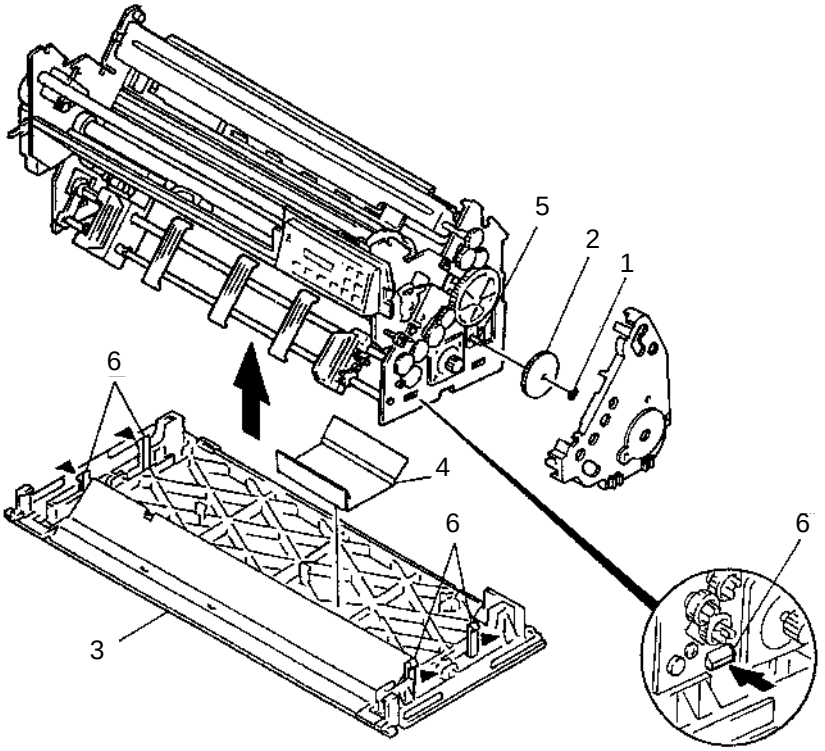
Reverse the removal procedure.



Bottom Plate and Ground Sheet Removal

Observe all ESD procedures when handling logic FRUs and cables.

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the cover assembly.
3. Remove the front cover assembly.
4. Remove the gear cover.
5. Remove the power supply.
6. Remove the C-clip [**1**] and pull out the feed idler gear [**2**].
7. Press the two latches [**6**] on both sides of the bottom plate [**3**] and remove the bottom plate from the printer.
8. Remove the ground plate [**4**] which is adhered to the bottom plate with the double sided tape from the bottom plate.

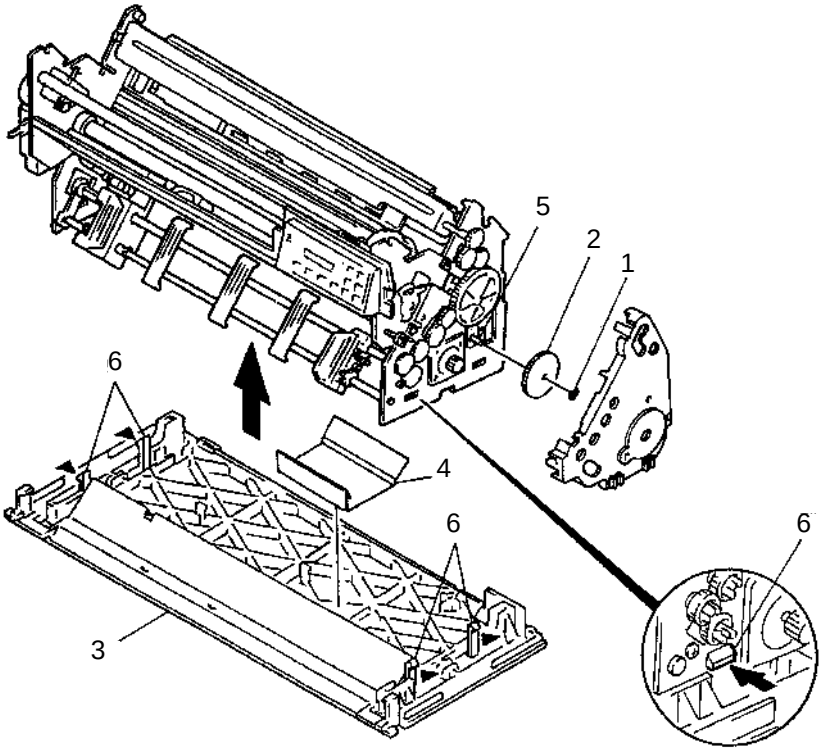


Replacement

Reverse the removal procedure.

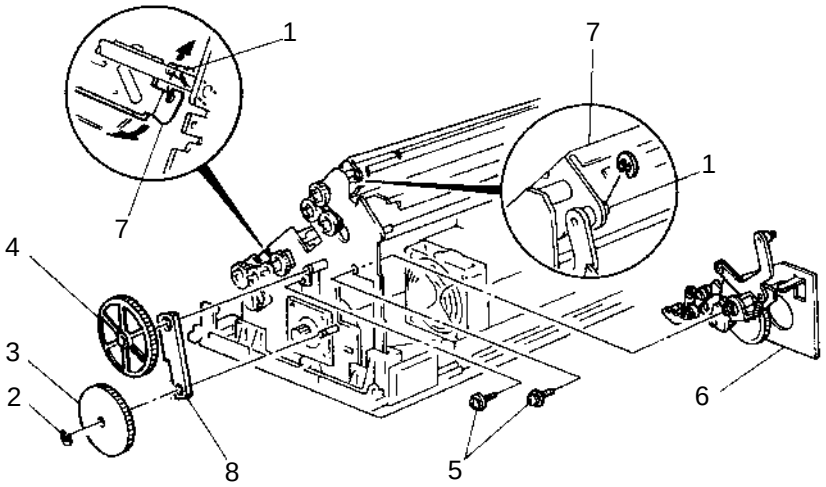
Notes:

- When installing the feed idler gear [**2**], insert the hub of the gear completely into the hole of the friction block [**5**].
- Be sure the ground plate [**4**] that goes between the bottom plate [**3**] is in place.
- Be sure the cables are not trapped between the printer and the bottom plate.



Cam Assembly Removal

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Remove the front cover.
4. Remove the gear cover.
5. Remove the print unit.
6. Disconnect connectors CP3 and CP5 from the logic board.
7. Remove studs [**1**] from each link of the upper and lower pressure roller assembly [**7**].
8. Remove the C-clip [**2**] then pull out the feed idler gear [**3**] and the large gear [**4**] with the friction block [**8**].
9. Remove the two screws [**5**] on the cam assembly [**6**].
10. Remove the cam motor from the cam assembly [**6**].

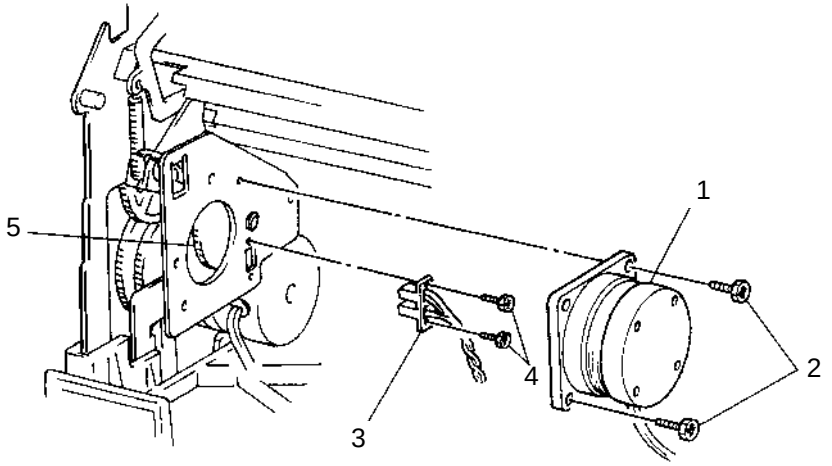


Replacement

- Reverse the removal procedure.
- Lubricate the cam assembly with IBM # 23 grease.
- When installing the gears, insert the hub completely into the holes of the friction block.

Cam Motor and Cam Sensor Removal

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Disconnect the connector CP3 from the logic board.
4. Remove the two screws [**2**] with a wrench and then remove the cam motor [**1**].
5. Disconnect the connector CP5 from the logic board.
6. Remove the two screws [**4**] with a wrench and then remove the cam sensor [**3**].



Replacement

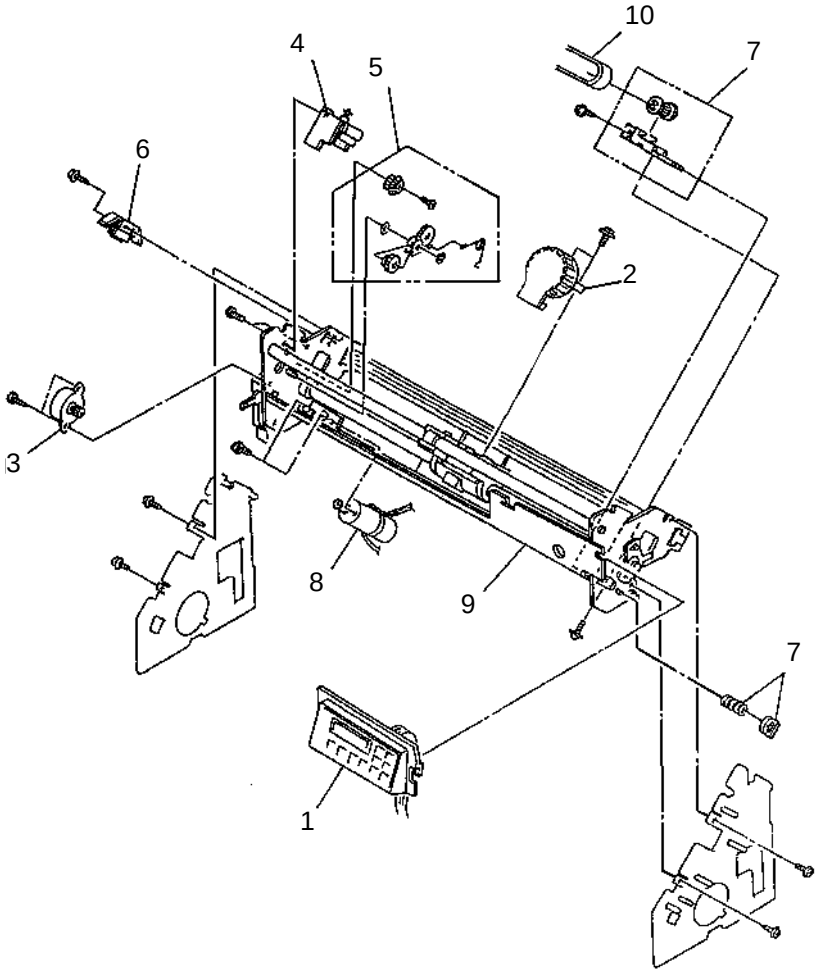
Reverse the removal procedure.

Note: When installing the cam motor [**1**], lightly press the cam motor gear to the cam drive gear [**5**], and then tighten the two screws [**2**].

Carrier Frame Assembly Removal

Note: Whenever you replace or adjust carrier related parts, perform the character alignment adjustment, see “EOF Switch Adjustment” on page 4-6.

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Remove the ribbon cartridge.
4. Remove the front cover.
5. Remove the gear cover.
6. Remove the operator panel [**1**].
7. Remove the print unit assembly.
8. Remove the printhead [**2**].
9. Remove the ribbon drive motor assembly [**3**].
10. Remove the ribbon drive assembly [**4**].
11. Remove the ribbon drive gears [**5**].
12. Remove the gap sensor assembly [**6**].
13. Remove the tension pulley assembly, bracket and tension spring [**7**].
14. Remove the carrier [**8**] and belt [**10**] from the carrier frame [**9**].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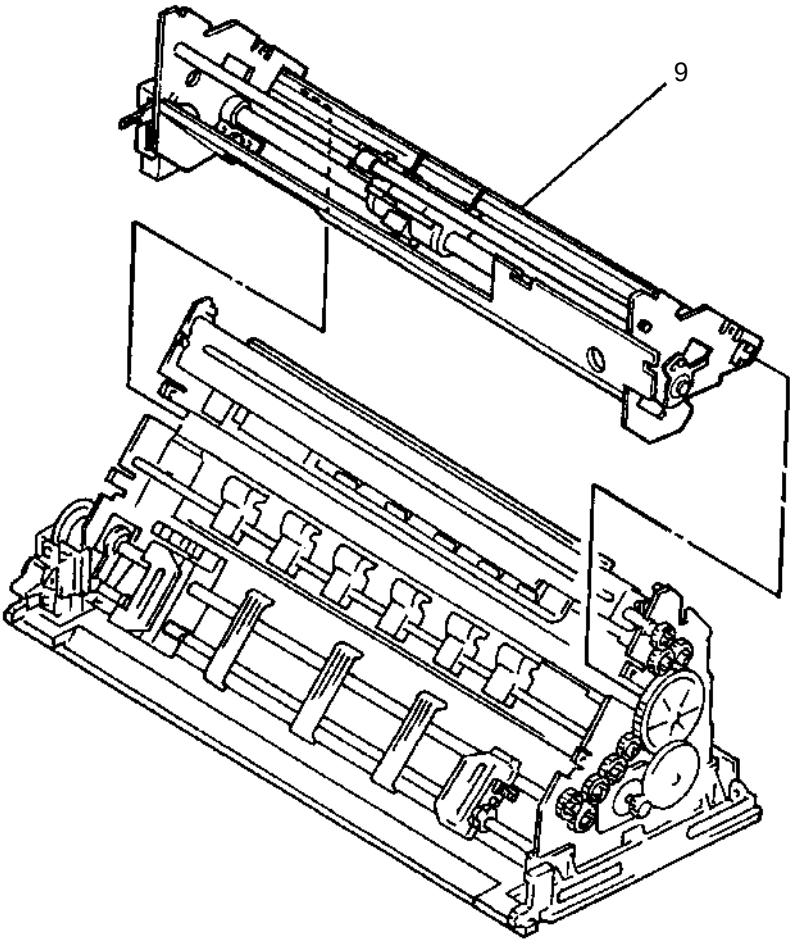


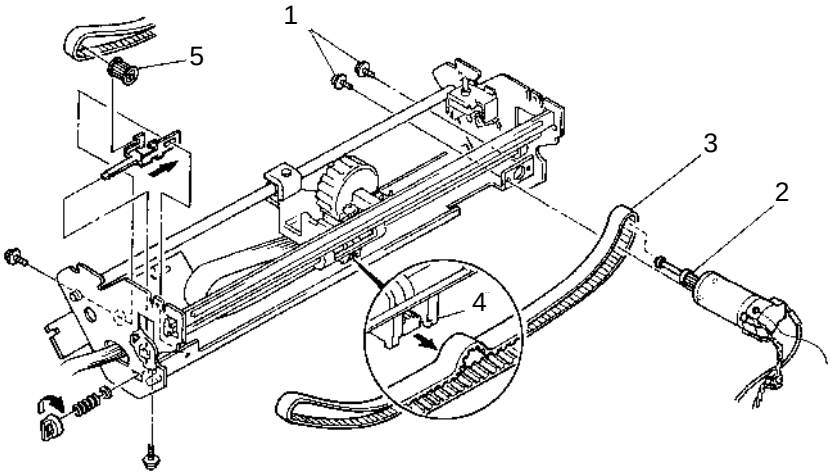
Replacement

Reverse the removal procedure.

Carrier Motor and Belt Removal

Note: Whenever you replace or adjust carrier related parts, perform the character alignment adjustment, see “EOF Switch Adjustment” on page 4-6.

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Remove the operator panel.
4. Remove the print unit.
5. Loosen the tension pulley assembly enough to remove.
6. Remove the two screws [**1**] and remove the carrier motor [**2**].
7. Pull out and remove the carrier belt [**3**] from the carrier [**4**].



Replacement

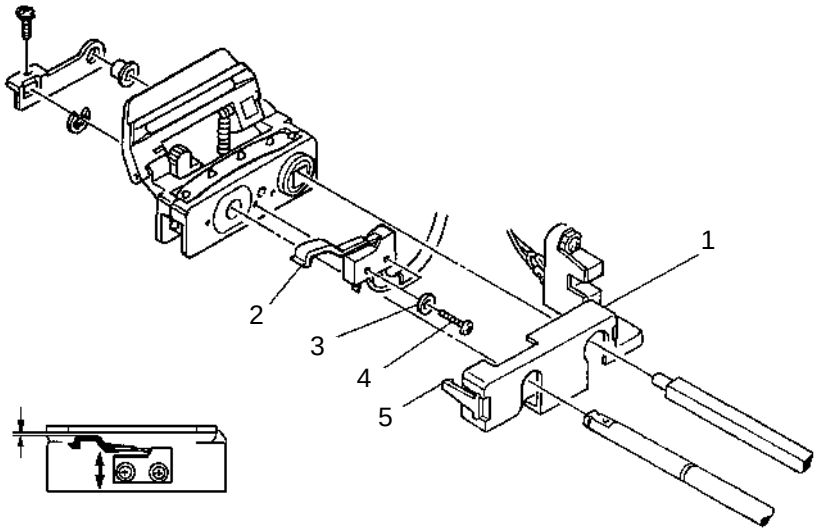
Reverse the removal procedure.

Notes:

- The shaft and bearings of the tension pulley assembly [**5**] may come apart.
- When installing the carrier motor [**2**], install it so that the protrusion on the end of the motor emitter faces toward the outside of the printer.
- Be sure the carrier belt [**3**] and carrier teeth are engaged and the belt is taut.
- After installation is complete, perform the ruled line adjustment.

EOF Switch and Jam Sensor Removal

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Remove the front cover.
4. Remove the power supply.
5. Disconnect the connectors CP12 and CP14 from the logic board.
6. Unlock the core latch.
7. Release the latch [**5**] and remove the jam sensor [**1**].
8. Remove the two screws [**3**] and washers [**4**], then remove the EOF switch [**2**].



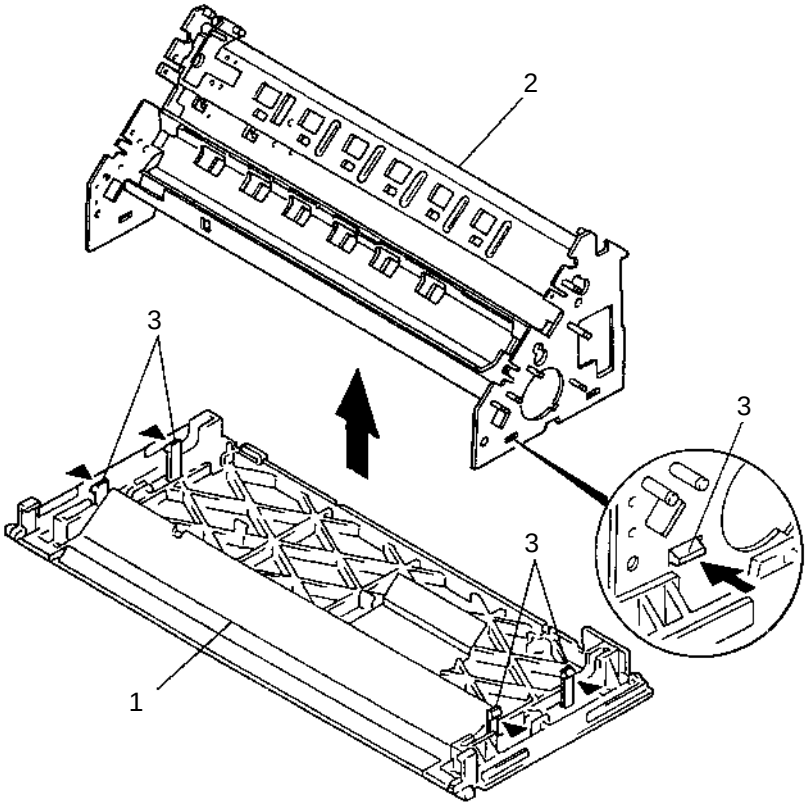
Replacement

Reverse the removal procedure.

Note: When installing the EOF switch, the switching point where the actuator is pressed should be 0.5 to 1.0 mm (0.020 - 0.040 inches) between the bottom of the tractor guide and the top of the actuator.

Feed Frame Assembly Removal

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the two screws [**1**] from the rear side of the printer and remove the top cover assembly [**2**]. To remove the cover, lift the rear side of the cover approximately 10 mm (0.40 inch), then release the front latches [**3**] by gently spreading the cover at the front corners with a screwdriver.

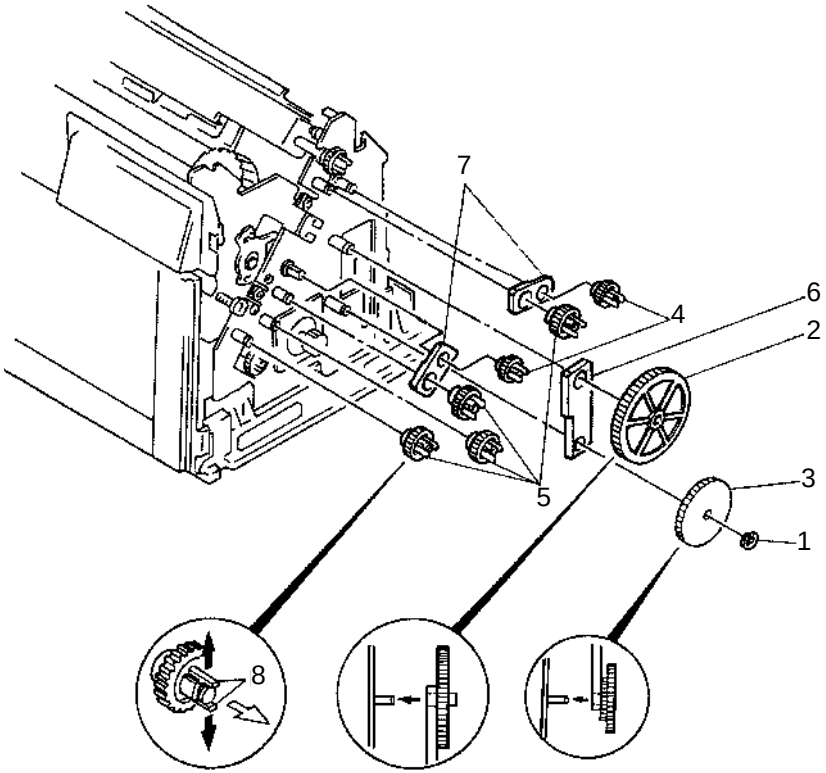


Replacement

Reverse the removal procedure. When installing the top cover assembly, be sure not to damage the paint on the operator panel.

Feed Gears and Friction Blocks Removal

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Remove the gear cover.
4. Remove the C-clip [**1**], pull out the feed idler gear [**3**], large gear [**2**] along with the long friction block [**6**].
5. Remove the four idler gears [**5**] and the two feed roller gears [**4**] with the two short friction blocks [**7**].
6. Remove the friction blocks [**6**] and [**7**] from the studs.



Replacement

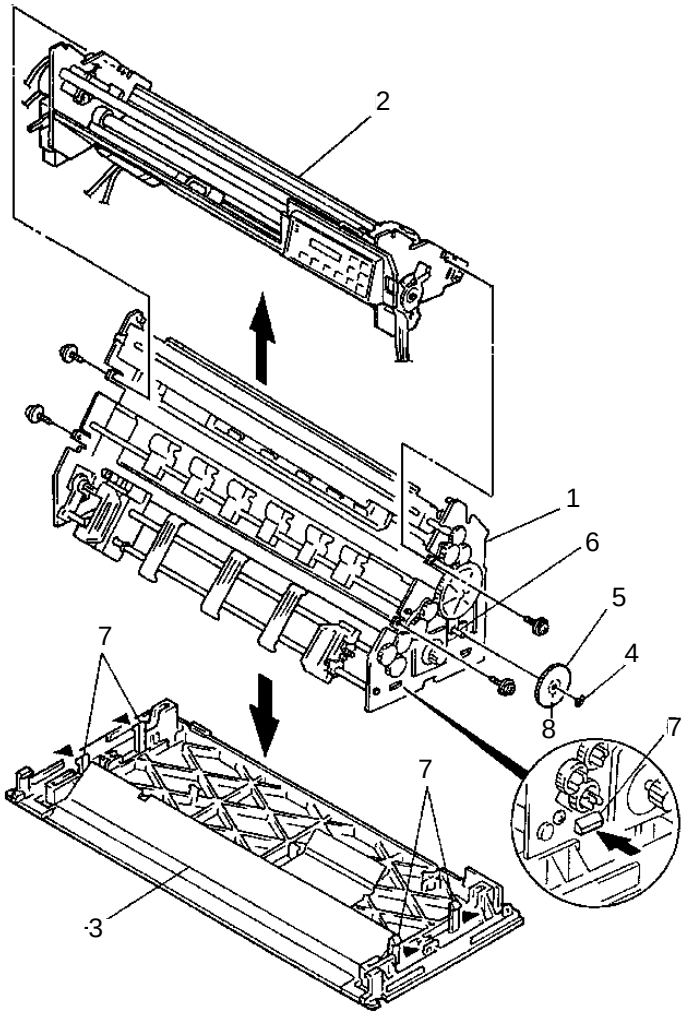
Reverse the removal procedure.

Notes:

- When installing the large gear [**2**] and the feed idler gear [**3**], install them in the direction shown.
- Insert the hub of gears completely into the hole of the friction blocks.

Feed Unit Assembly Removal

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Remove the front cover.
4. Remove the power supply.
5. Remove the gear cover.
6. Remove the print unit assembly [**2**].
7. Remove the C-clip [**4**] and pull out the feed idler gear [**5**].
8. Press the two latches [**7**] on both sides of the bottom cover and remove the feed unit [**1**] from the bottom plate [**3**].



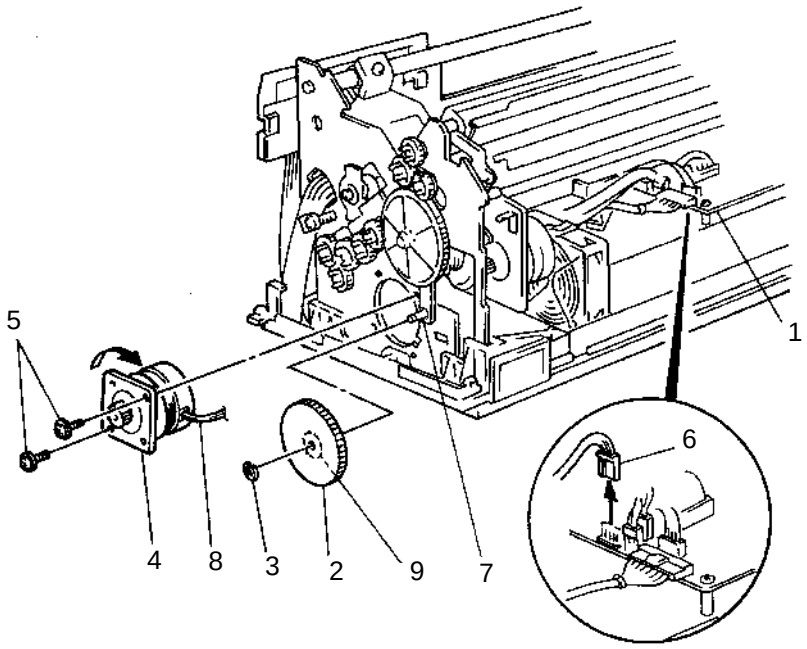
Replacement

Reverse the removal procedure.

Note: When installing the feed idler gear [**5**], insert the hub [**8**] completely into the hole in the friction block [**6**].

Forms Motor Removal

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Remove the gear cover.
4. Disconnect connector CP2 [**6**] from the logic board [**1**].
5. Remove the C-clip [**3**] and the feed idler gear [**2**].
6. Remove the two screws [**5**].
7. Remove the forms motor [**4**] by turning it so that the cable [**8**] dies not interfere with the side plate.



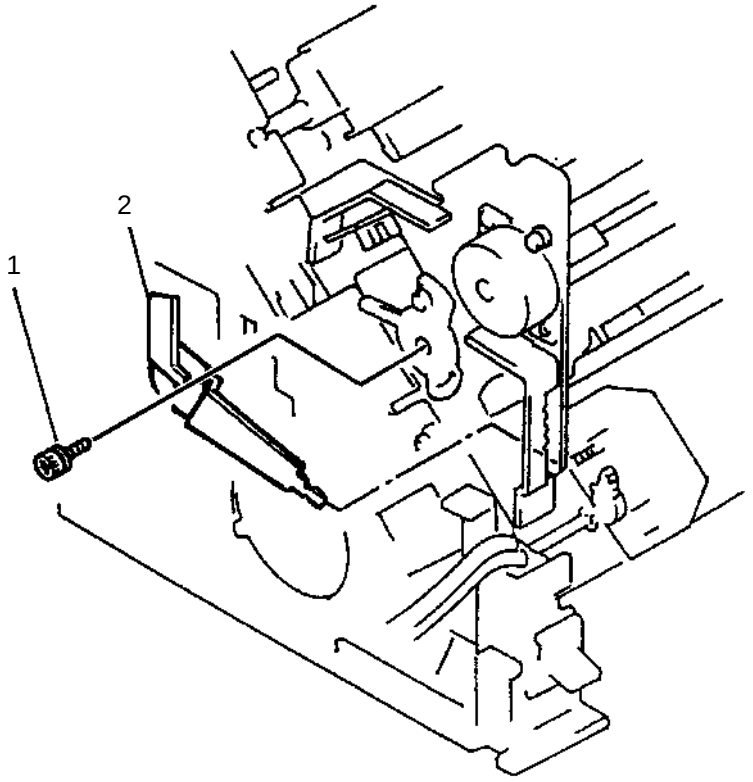
Replacement

Reverse the removal procedure.

Note: When installing the feed idler gear [**2**], insert the hub [**9**] completely into the hole of the friction block [**7**].

Forms Thickness Lever Removal

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Remove the front cover.
4. Remove the screw [**1**] and the forms thickness lever [**2**].



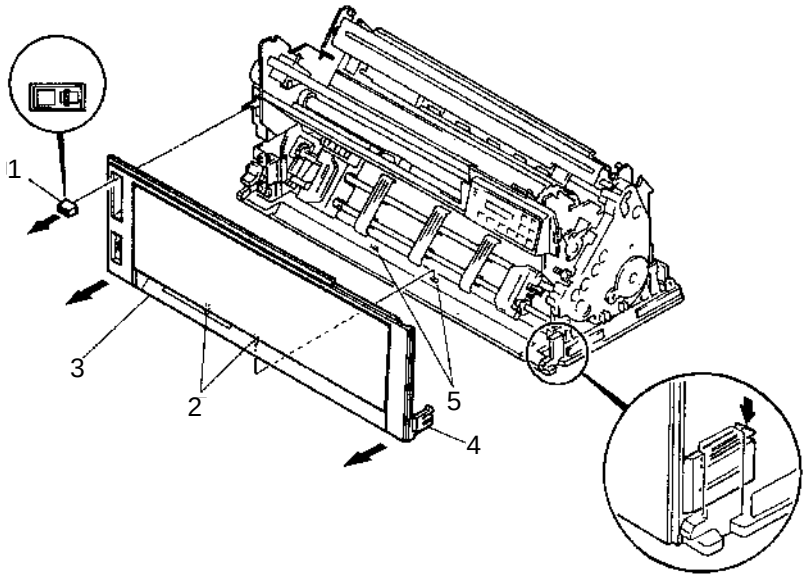
Replacement

Reverse the removal procedure.

Note: Check the gap sensor position in the sensor test.

Front Cover Removal

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover.
3. Pull out and remove the forms thickness lever knob [**1**].
4. Release the two studs [**2**] of the front cover [**3**] by pulling the cover up.
5. Press the front latch [**4**] down on both sides of the cover, removing the cover by pulling it toward the front.



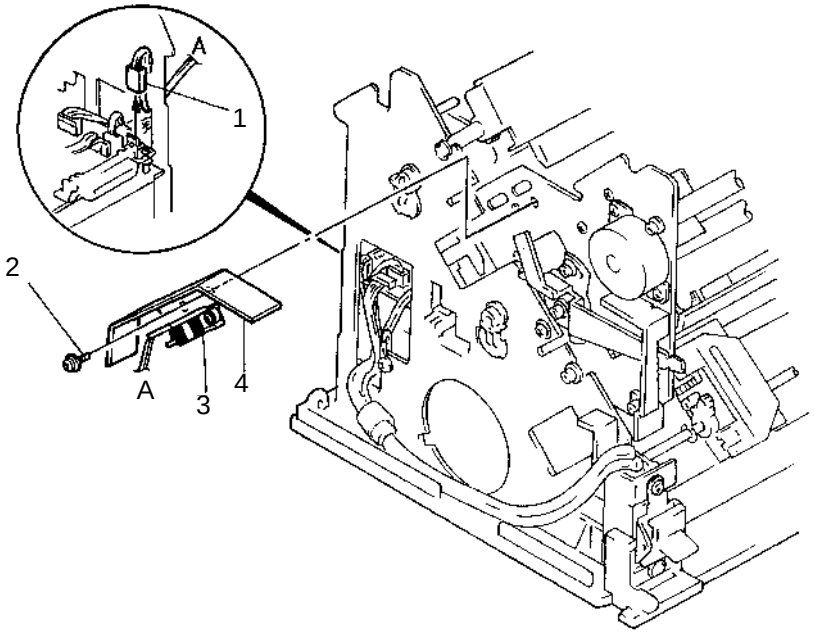
Replacement

Insert the two studs [**2**] into the holes of the bottom plate [**5**], pressing the front cover [**3**] to the rear until it latches.

Gap Sensor Assembly Removal

Observe all ESD procedures when handling logic FRUs and cables.

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Disconnect connector CP15 [**1**] from the logic board.
4. Unlock the core latch.
5. Remove the screw [**2**], then remove the gap sensor assembly [**3**] together with the bracket [**4**].



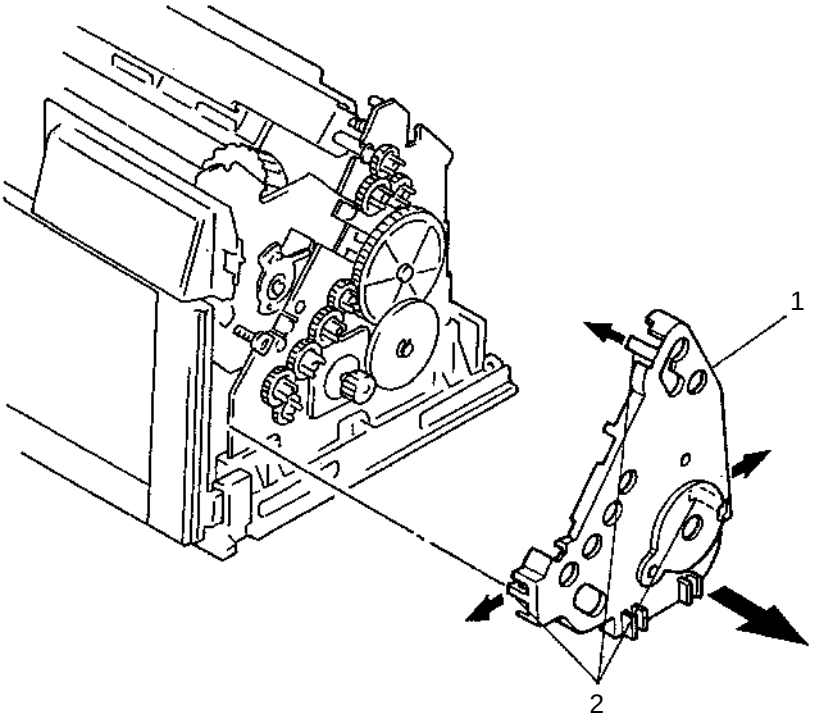
Replacement

Reverse the removal procedure.

Note: Check the gap sensor position in the sensor test.

Gear Cover Removal

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the cover assembly.
3. Release the three latches [**2**] and remove the gear cover [**1**].



Replacement

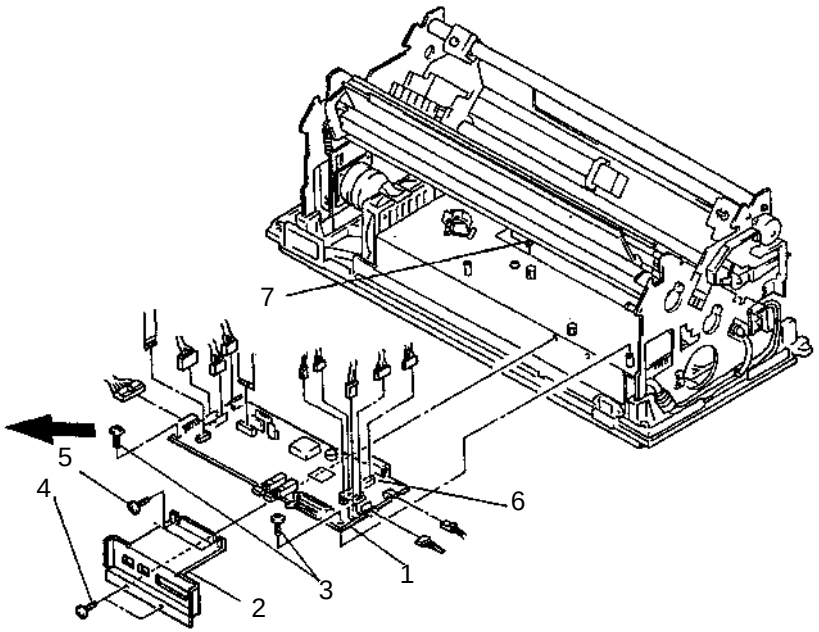
Reverse the removal procedure.

Logic Board Removal

Observe all ESD procedures when handling logic FRUs and cables.

Set the customer configuration values to the same values as were present prior to replacing the logic board. See “Factory Setting” on page 3-3.

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Loosen the one screw [**5**].
4. Remove the one screw [**4**] and remove the cover [**2**].
5. Disconnect all connectors from the logic board [**1**].
6. Remove the two screws [**3**] and slide the logic board [**1**] in the direction shown in the following illustration.
7. Disconnect the fan connector [**6**].

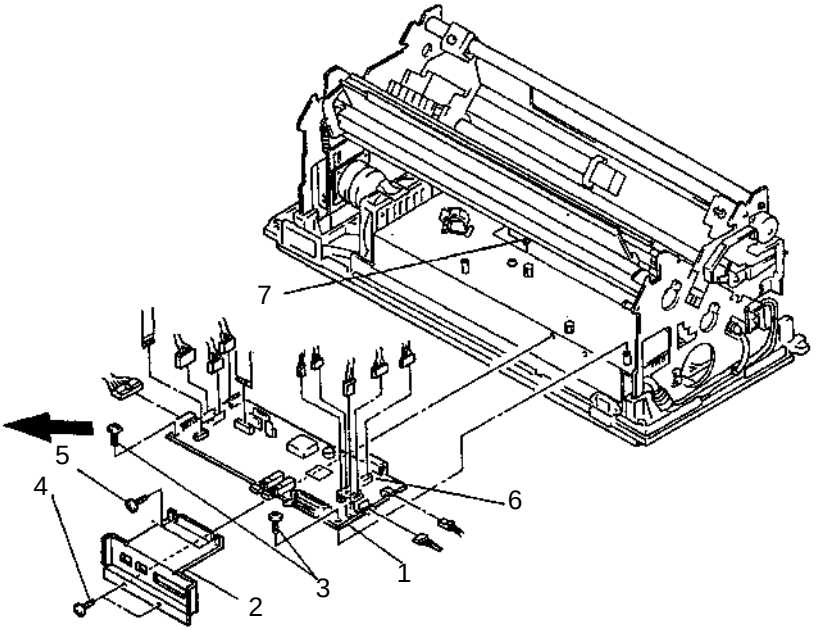


Replacement

Reverse the removal procedure.

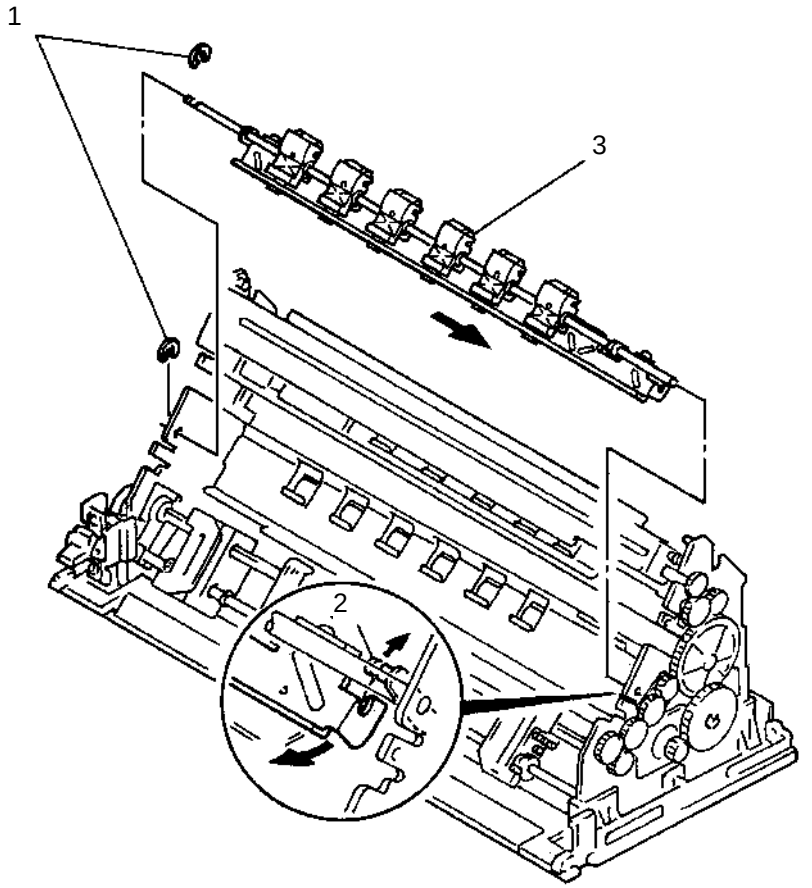
Notes:

- Connect the fan connector [**6**] before installing the logic board [**1**].
- When installing the logic board, insert both sides of the board into the slit of the bracket [**7**] on the power supply, then tighten the two screws [**3**].
- Be sure the bare wire side of the head cable is to the rear of the printer.
- Be sure the bare wire side of the operator panel cable is facing to the left when viewed from the rear of the printer.
- Be sure to pass the printhead cable through the core [**4**] and pass the other cable from the logic board through the core [**6**] as shown.



Lower Pressure Roller Assembly Removal

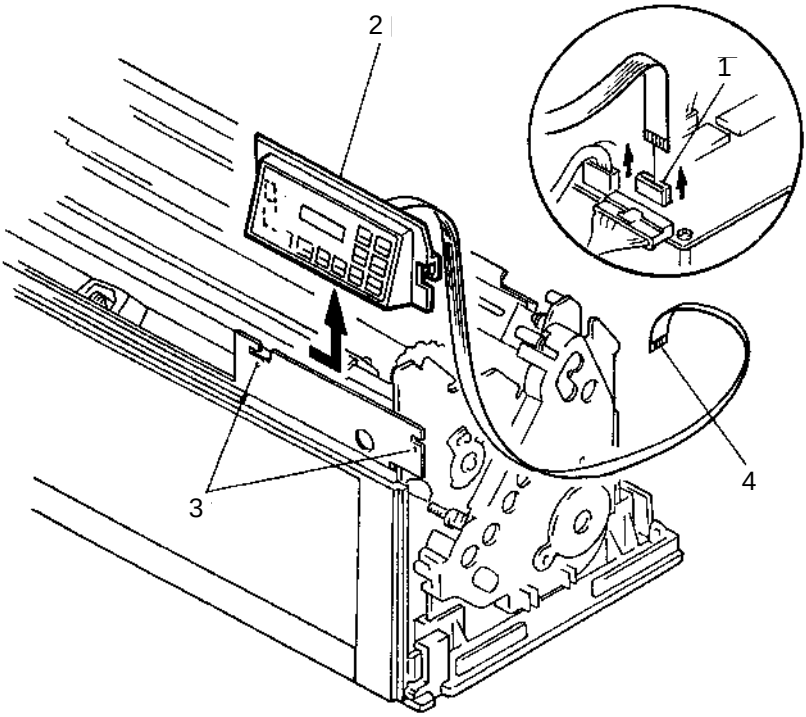
1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Remove the gear cover.
4. Remove the print unit.
5. Remove the two C-clips [**1**] and release the linkage stud [**2**] from the shaft bracket.
6. Slide the lower pressure roller assembly [**3**] to the right and pull out. Replace in reverse order.



Operator Panel Removal

Observe all ESD procedures when handling logic FRUs and cables.

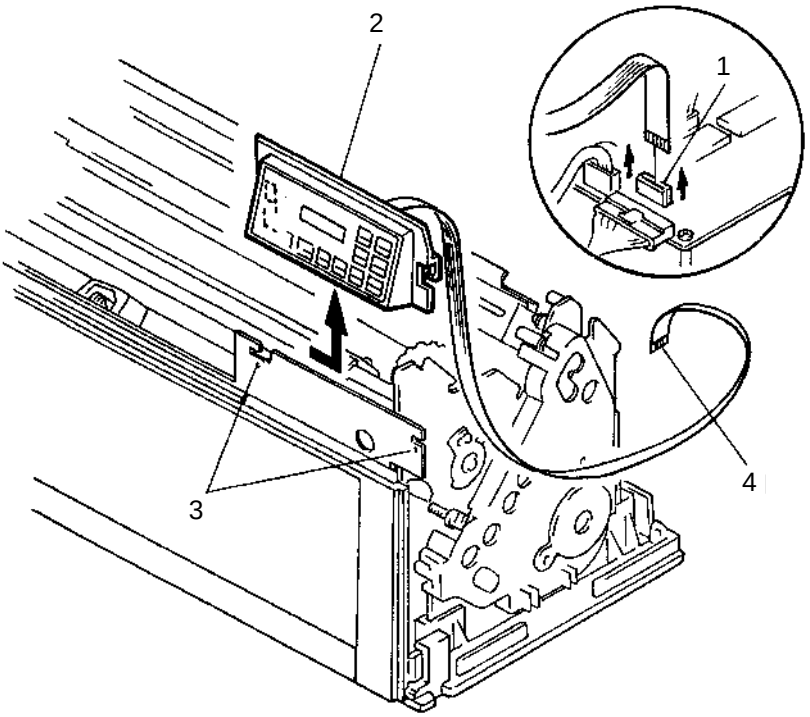
1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Lift the edge of connector CJ10 [**1**] and disconnect the cable.
4. Pull the lower right corner of the operator panel [**2**] to the front and remove the operator panel by sliding it over the studs [**3**] to the right.



Replacement

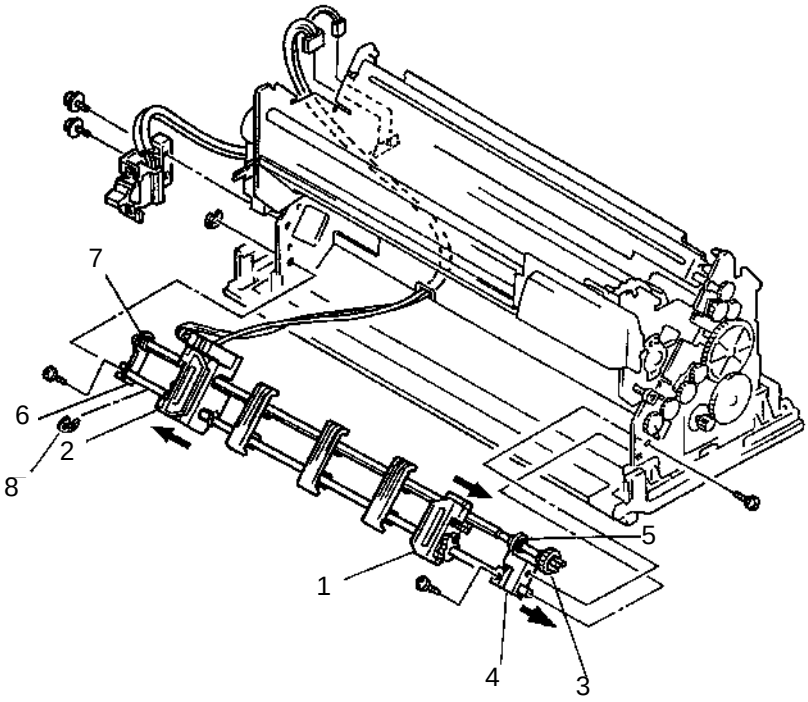
Reverse the removal procedure.

- Lift the edge of the connector CJ10 [**1**] and insert the cable.
- The bare wires side of the cable [**4**] must be on the right side as viewed from the front as shown.
- Seat the cable by pressing the edge of connector CJ10 [**1**] back down.
- When installing the operator panel, be sure the jumper CJ9 on the operator panel is not installed.



Pin Feeds Removal

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Remove the front cover.
4. Remove the tractor assembly.
5. Remove the EOF switch and jam sensor.
6. Remove the tractor gear [**3**] by unlocking the latches, then remove the bracket [**4**] and bushing [**5**].
7. Slide the right pin feed [**1**] to the right end and remove it.
8. Remove the bracket [**6**], bushing [**7**] and C-clip [**8**].
9. Slide the left pin feed [**2**] to the left end.

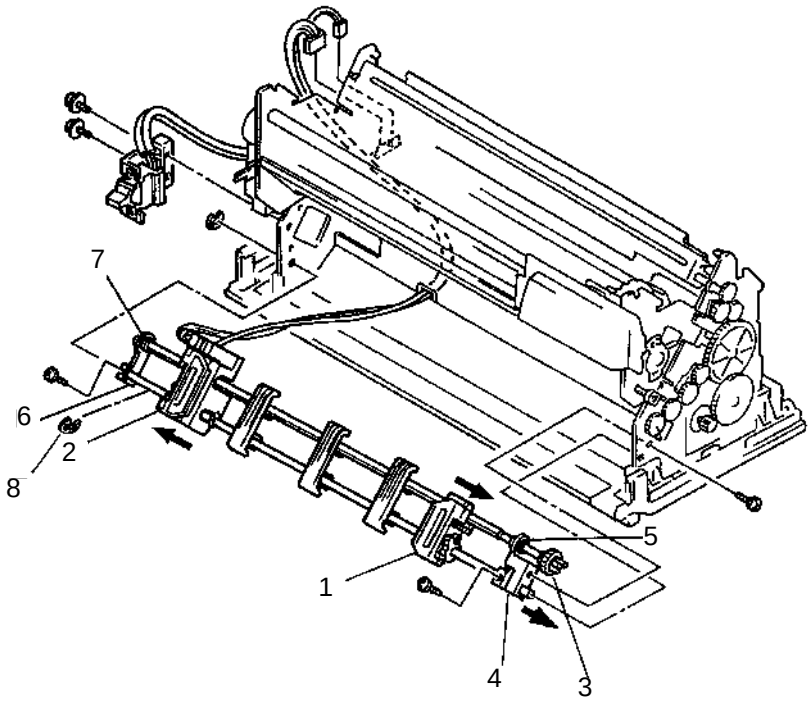


Replacement

Reverse the removal procedure.

Notes:

- When replacing either pin feed, align the white dots on the square holes of the pin feed to the same flat on the shaft.
- When installing the EOF switch, the switching point where the actuator is pressed should be 0.5 to 1.0 mm (0.020 - 0.040 inches) between the bottom of the tractor guide and the top of the actuator.
- When installing the pin feeds, pass the EOF switch cable and the jam sensor cable through the core and lock the core latch.

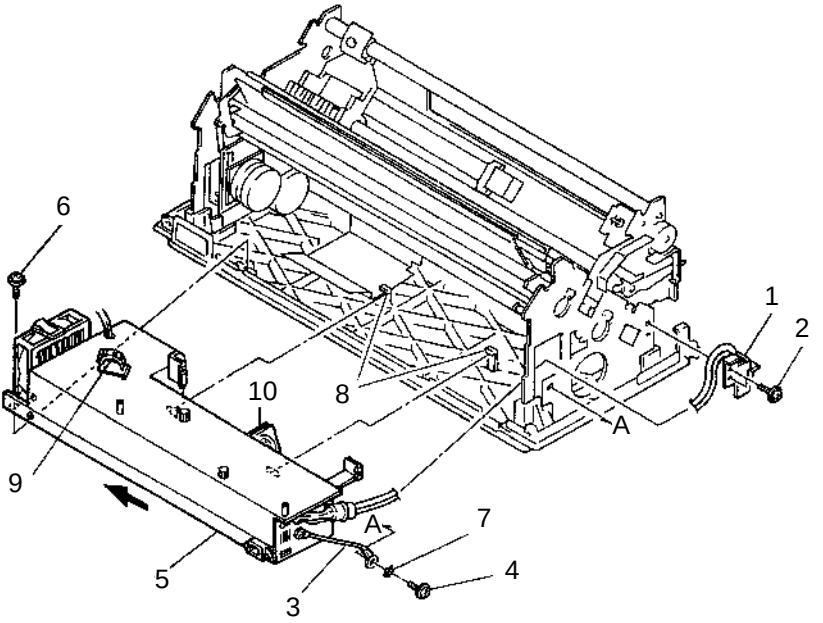


Power Supply Removal

Observe all ESD procedures when handling logic FRUs and cables.

CAUTION: Whenever servicing the power supply, always switch off the power and disconnect the power cord plug from the wall outlet.

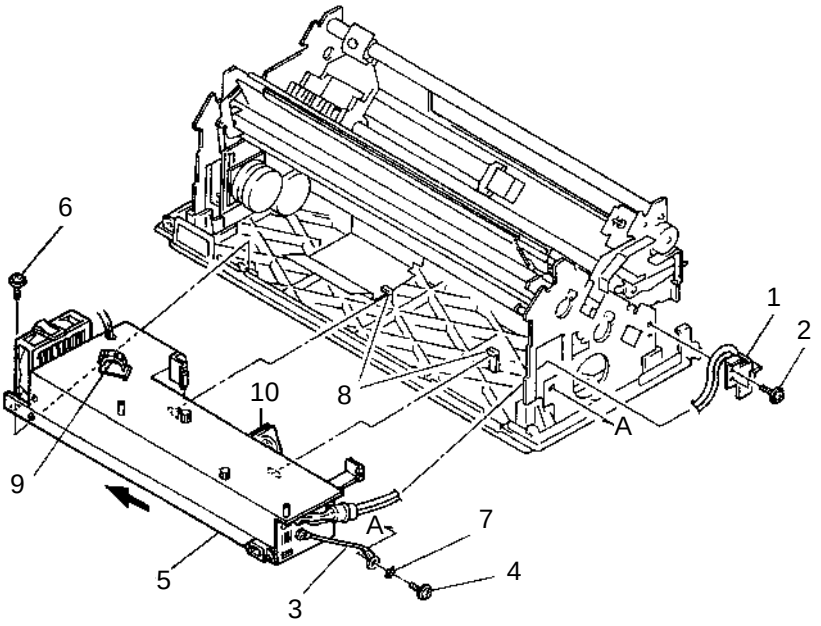
1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Remove the front cover.
4. Remove the logic board.
5. Remove the two screws [**2**] and remove the power switch [**1**].
6. Remove the screw [**4**] and washer [**7**] and remove the ground wire [**3**] from the left side frame.
7. Open the cable clamp [**9**] on the power supply.
8. Remove the screw [**6**] and remove the power supply [**5**] by sliding it to the left.
9. Lift up on the rear of the power supply, being careful to clear the tabs [**9**].



Replacement

Reverse the removal procedure.

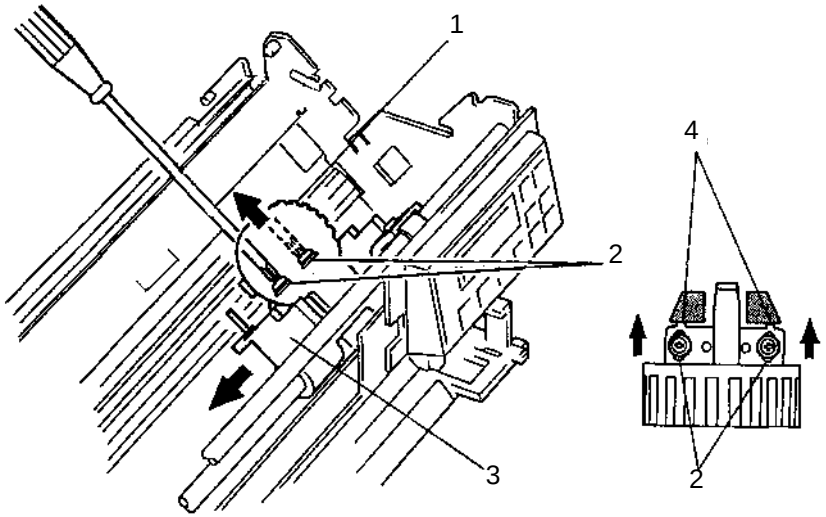
Note: Ensure the cables are not damaged by the power supply fan [**10**] when installing or removing the power supply.



Printhead Removal

CAUTION: The printhead becomes hot after a printer operation. Wait until it cools before removing it.

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Pull up the ribbon guide from the printhead and remove the ribbon cartridge.
4. Remove the upper pressure roller assembly.
5. Be sure the printhead [**1**] is not hot, then remove the two screws [**2**].
6. Remove the printhead [**1**] from the carrier [**3**].
7. Disconnect connector CP18 from the printhead cable.

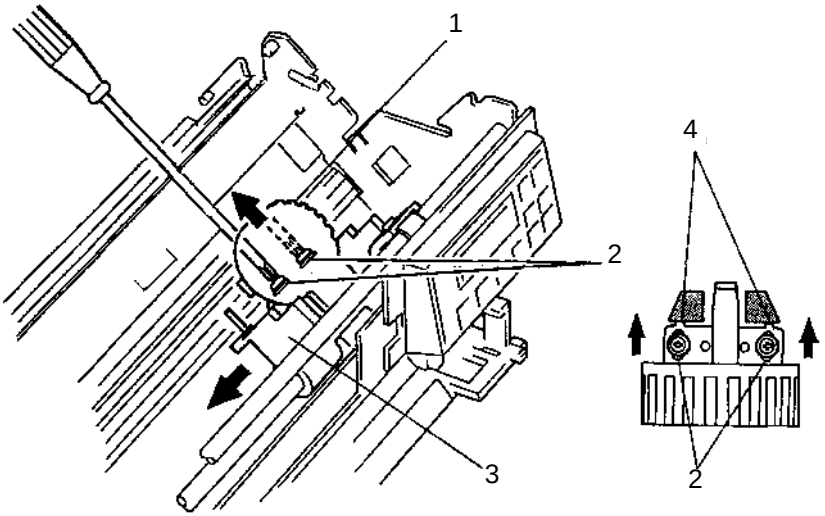


Replacement

Reverse the removal procedure.

Notes:

- Fully insert the printhead cable into the connector.
- Install the printhead [**1**] making certain the tabs [**4**] contact the carrier [**3**].
- When installing the printhead, move it to the far right so the two screws [**2**] are in the middle of the holes. Lightly tighten the two screws.
- Perform the “Printhead to Platen Adjustment” on page 4-6.

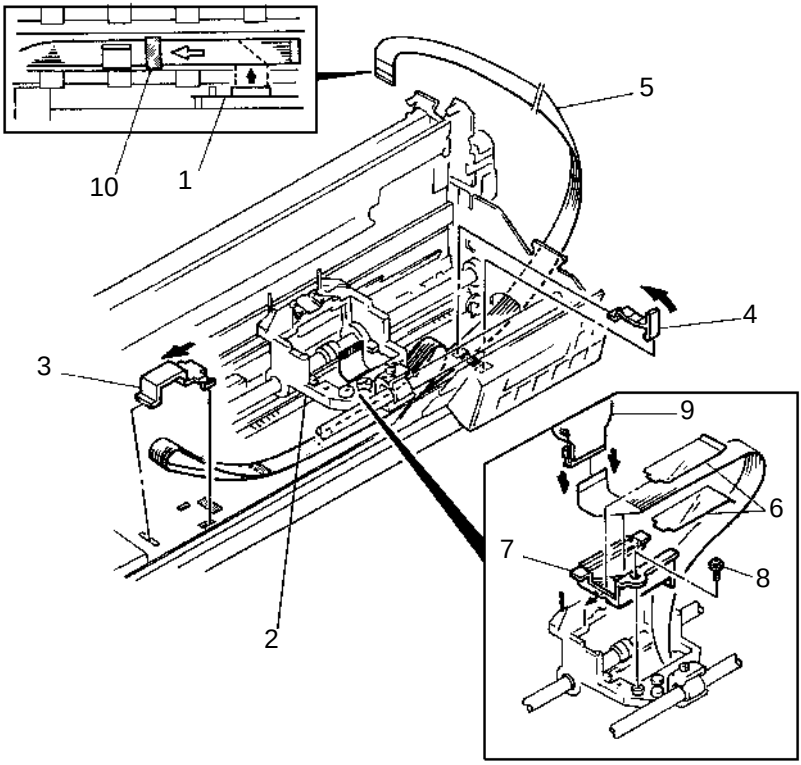


Printhead Cable Removal

Observe all ESD procedures when handling logic FRUs and cables.

WARNING: Be sure the printhead is not hot.

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the cover assembly.
3. Remove the ribbon cartridge.
4. Disconnect connector CP4 from the logic board [**1**].
5. Remove the printhead cable through the core [**10**].
6. Move the carrier [**2**] between the two cable clamps [**3**] and [**4**] and remove the clamps in the direction shown.
7. Be sure the printhead is not hot. Remove the printhead.
8. Remove the screw [**8**], the cable tabs [**6**] and the cable bracket [**7**].
9. Pull out and remove the printhead cable [**5**] through the hole in the side frame. The printhead cable is adhered to the plate with dual sided tape.



Replacement

Reverse the removal procedure.

Note: When installing the printhead cable, remove the protective strip from the tape and attach it to the plate, then pass it through the core [**10**].

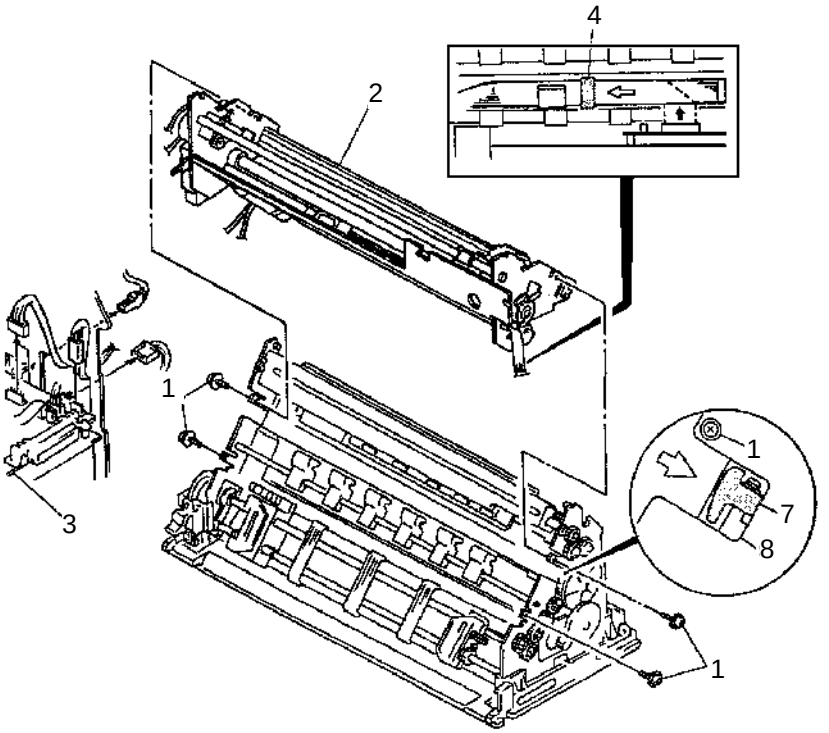
Print Unit Assembly Removal

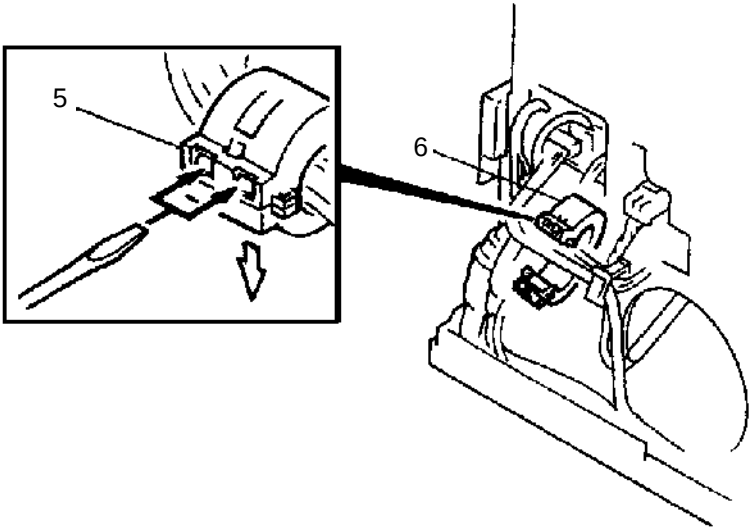
Observe all ESD procedures when handling logic FRUs and cables.

WARNING: Do not loosen or remove the set screws which are factory adjusted.

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Remove the ribbon cartridge.
4. REmove the front cover.
5. Unlock the connector latches CP4 and CP10 and disconnect connectors CP1, CP4, CP6, CP10, CP13, CP15 and CP20 from the logic board [**3**].
6. Unlock the core latch [**5**] using a screwdriver, pushing the core latch in the direction shown, while opening the core [**6**].
7. Remove the gear cover.
8. Remove the four screws [**1**].
9. Remove the operator panel.
10. Remove the print unit assembly [**2**].

Replacement





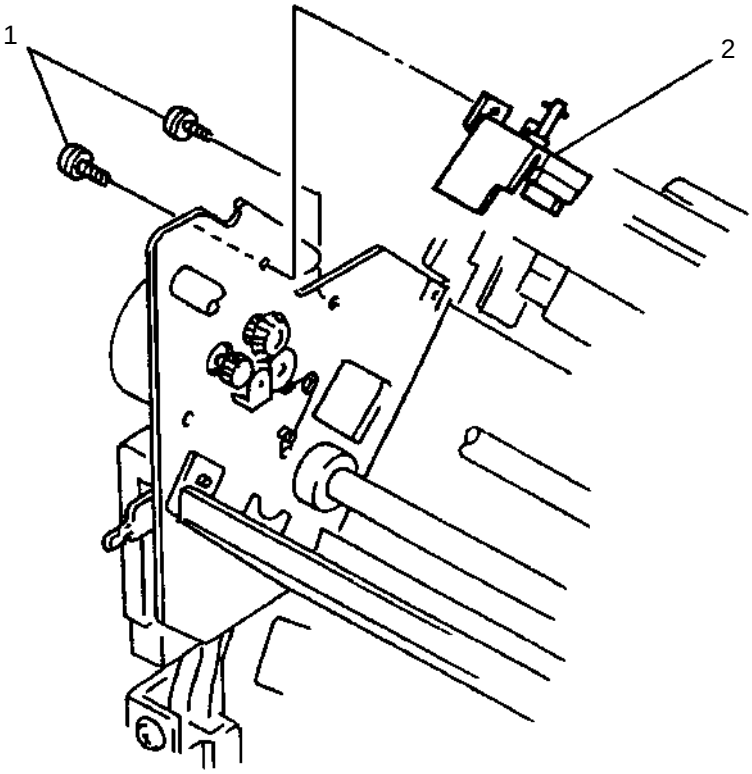
Reverse the removal procedure.

Notes:

- When installing the print unit [**2**], move the carrier to the right end. Place the bottom [**7**] of the platen flat to the surfaces [**8**] of the side plates. Tighten four screws [**1**] in the following order: left lower, left upper, right lower and right upper.
- Be sure to pass the cables through the core [**6**] and lock the core latch when installing the print unit.
- Be sure to pass the printhead cable through the core [**4**].

Ribbon Drive Assembly Removal

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Remove the ribbon cartridge.
4. Remove the two screws [**1**] and remove the ribbon drive assembly [**2**].



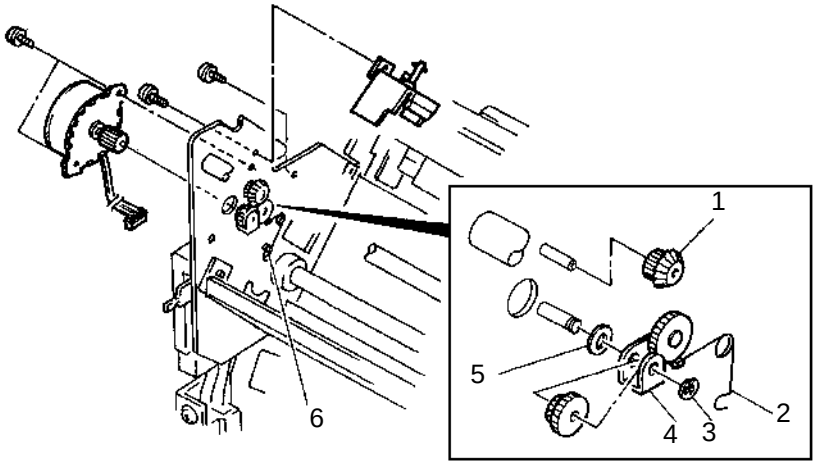
Replacement

Reverse the removal procedure.

Note: When installing the ribbon drive assembly, engage both bevel gears and tighten the two screws [**1**].

Ribbon Drive Gears Removal

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Remove the ribbon drive assembly.
4. Remove the ribbon drive motor.
5. Remove the double gear [**1**].
6. Remove the ribbon gear spring [**2**] from the stud [**6**].
7. Remove the C-clip [**3**] and the planet gear assembly [**4**].



Replacement

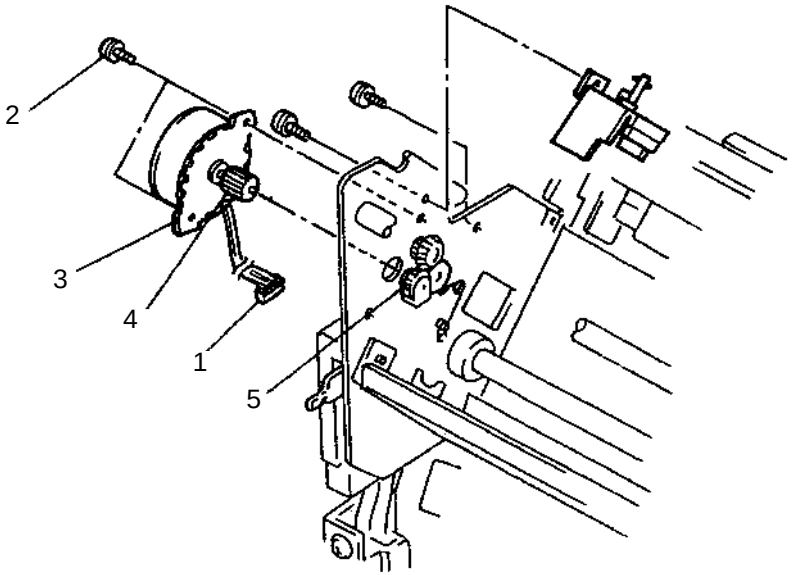
Reverse the removal procedure.

Note: Be careful not to loose spacer [**5**] behind the planet gear assembly.

Ribbon Drive Motor Assembly Removal

Observe all ESD procedures when handling logic FRUs and cables.

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Disconnect connector CP6 [**1**] from the logic board.
4. Unlock the core latch and remove the ribbon drive motor cable from the core.
5. Remove the two screws [**2**] and the ribbon drive motor assembly [**3**].



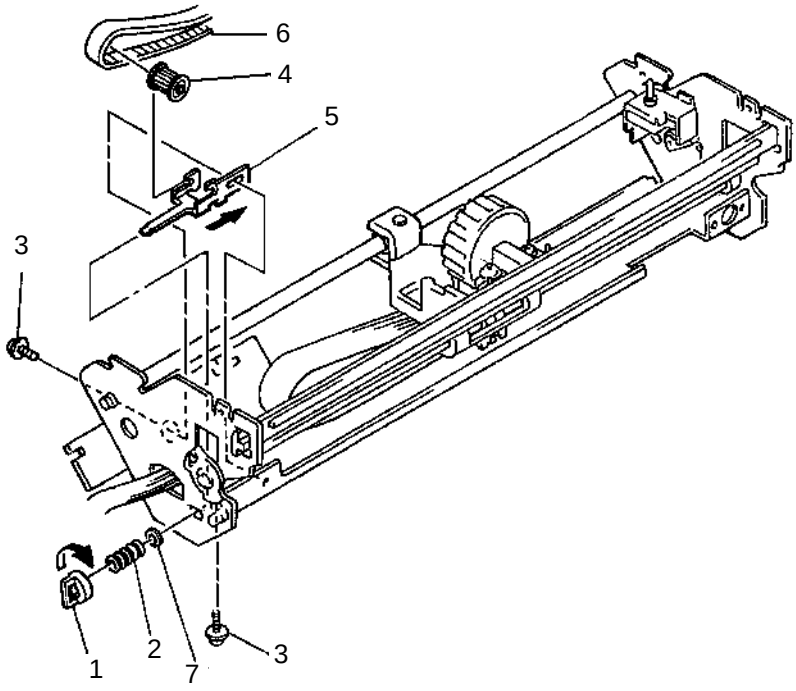
Replacement

Reverse the removal procedure.

- When installing the ribbon drive motor, engage the motor gear [**4**] and the planet gear [**5**], then tighten the two screws [**2**].
- When installing the ribbon driver motor, pass it through the core and lock the core latch.

Tension Pulley Assembly Removal

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Remove the operator panel.
4. Remove the print unit assembly.
5. Press and turn the spring retainer [**1**] 90 degrees and remove it.
6. Remove the tension spring [**2**].
7. Remove the tension adjust washers [**7**], if installed.
8. Remove the two screws [**3**], the tension pulley assembly [**4**] and the carrier belt [**6**].
9. Pull out a part of the bracket [**5**] through the hole in the side frame and remove the bracket.

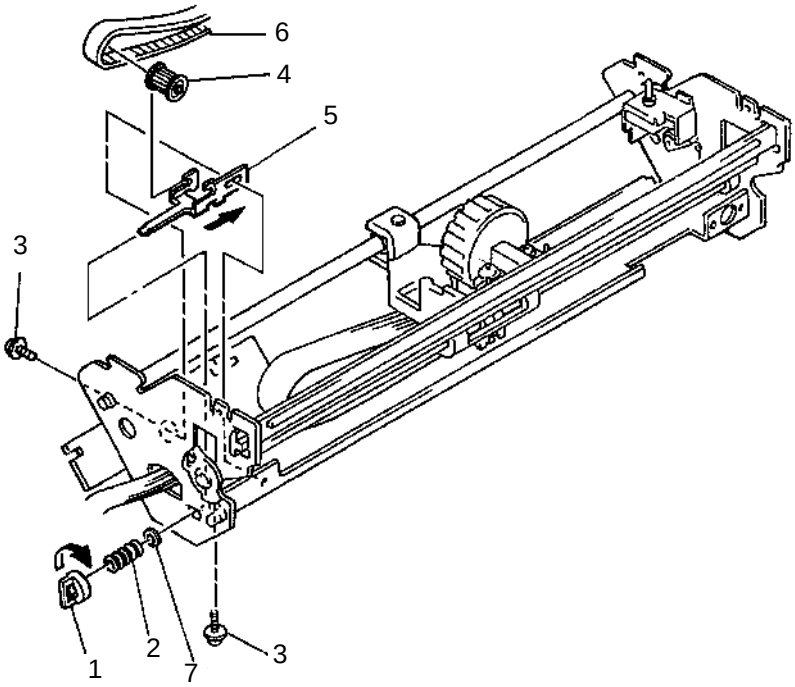


Replacement

Reverse the removal procedure.

Notes:

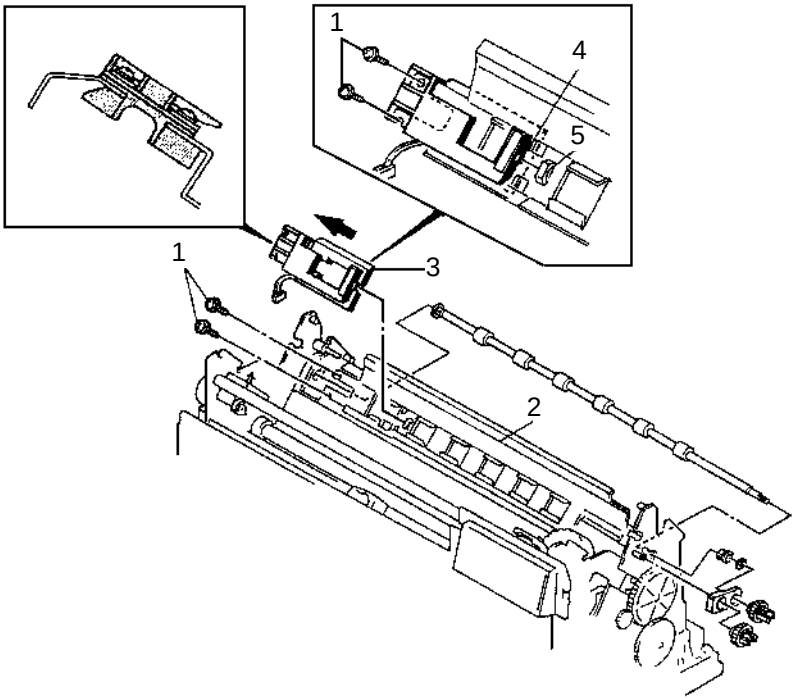
- The shaft and bearings of the tension pulley assembly [**4**] may come apart.
- When installing the tension pulley assembly, move the carrier to the left end and temporarily tighten the two screws [**3**] to hold the tension pulley assembly [**4**].
- Install the spring on the bracket [**5**] and install the spring retainer [**1**].
- Stretch and attach the carrier belt [**6**] and tighten the two screws [**3**]. Be sure the carrier belt [**6**] and the carrier teeth are engaged and the belt is taut.
- After installation is complete, perform the ruled line adjustment.



TOF Sensor Removal

Note: Before removal, observe the relative position of the TOF parts. Reassembly may be difficult.

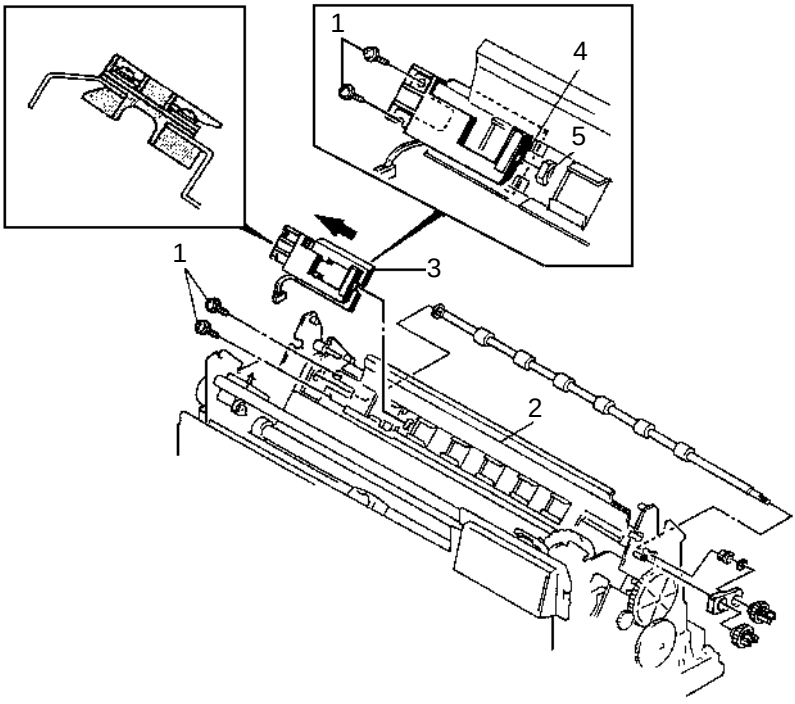
1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Remove the ribbon cartridge.
4. REmove the gear cover.
5. Remove the upper pressure roller assembly.
6. Remove the upper feed roller shaft.
7. Remove the connector CP11 from the logic board.
8. Remove the two screws [**1**].
9. Slide the TOF sensor [**3**] to the left and remove it from the plate [**2**].



Replacement

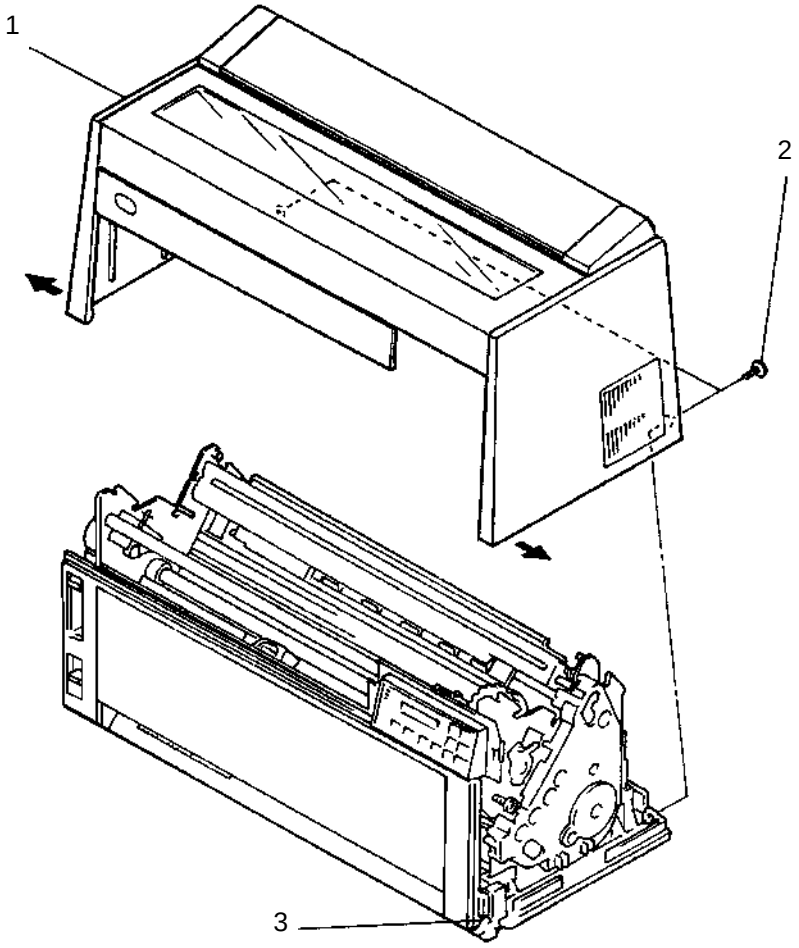
Reverse the removal procedure.

Note: When installing the TOF sensor, be careful not to damage any cables when inserting the TOF sensor studs into the holes on the upper and lower plates. Insert the right tab [**4**] into the slit [**5**] of the plate [**2**].



Top Cover Assembly Removal

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the two screws [**1**] from the rear side of the printer and remove the top cover assembly [**2**]. To remove the cover, lift the rear side of the cover approximately 10 mm (0.40 inch), then release the front latches [**3**] by gently spreading the cover at the front corners with a screwdriver.



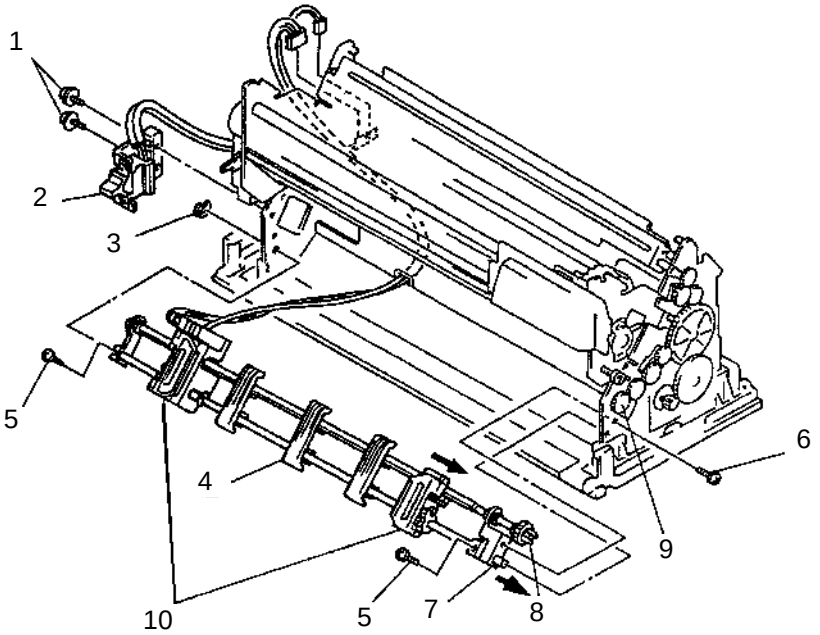
Replacement

Reverse the removal procedure.

Note: When installing the top cover assembly, be sure not to damage the paint on the operator panel.

Tractor Assembly Removal

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Remove the front cover.
4. Disconnect connectors CP12 and CP14 from the logic board.
5. Unlock the core latch.
6. Remove the two screws [**1**] and remove the power switch [**2**].
7. Remove the C-clip [**3**].
8. Remove the two screws [**5**] on the tractor assembly [**4**].
9. Remove the screw [**6**] attaching the tractor assembly to the right side frame.
10. Slide the tractor shaft [**7**] to the right and remove the tractor assembly [**4**].

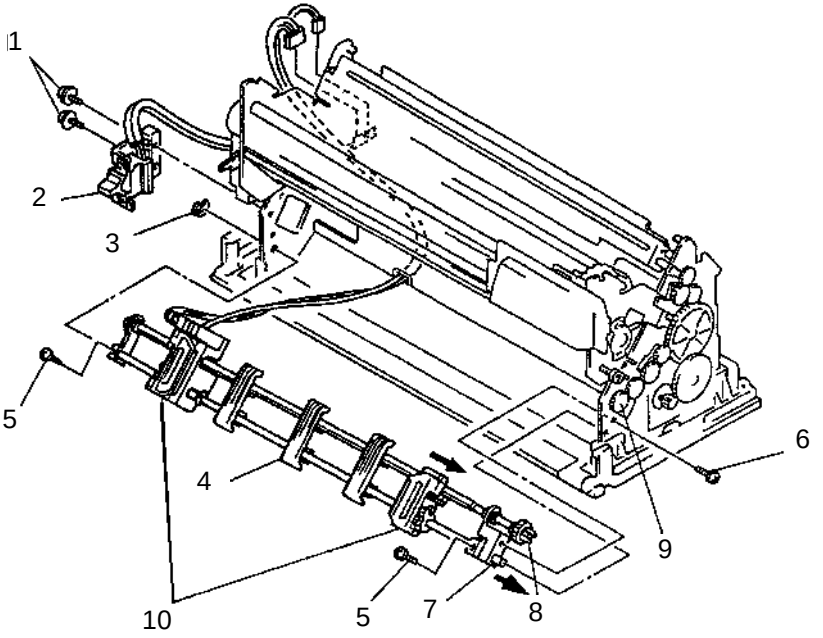


Replacement

Reverse the removal procedure.

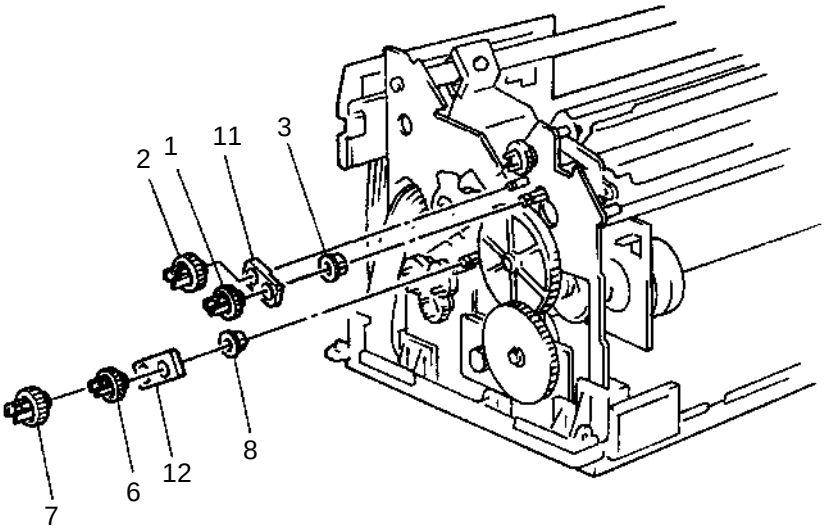
Notes:

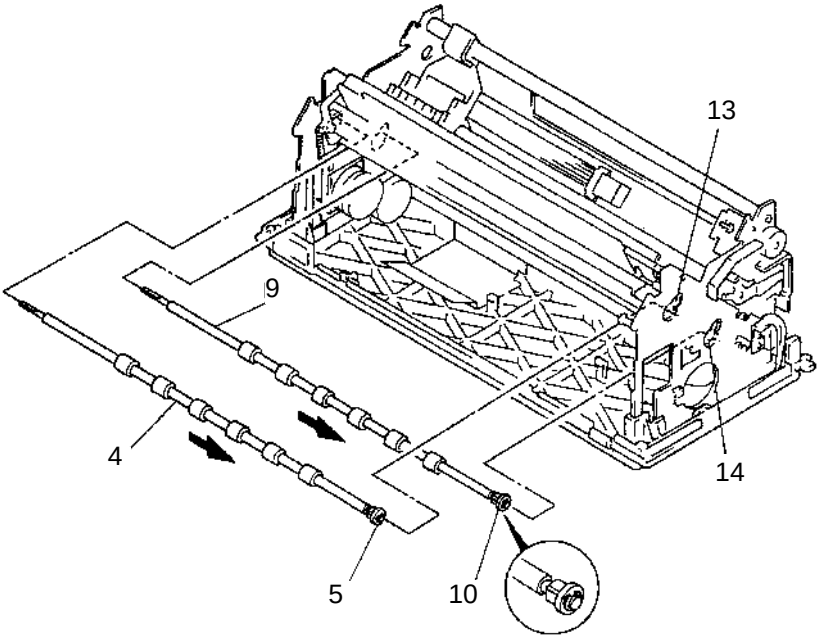
- When installing the tractor assembly, engage the tractor gear [**8**] and the idler gear [**9**] before tightening the screw [**6**].
- When replacing either pin feed [**10**], align the white dots on the pin feed square holes to the same flat side on the shaft.



Upper and Lower Feed Roller Shafts Removal

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Remove the front cover.
4. Remove the gear cover.
5. Remove the upper feed roller gear [**1**], the adjoining idler gear [**2**] and the friction block [**11**].
6. Remove the upper feed roller bushing [**3**].
7. Slide the upper feed roller shaft [**4**] so that the feed roller bushing [**5**] can be removed from the left frame.
8. Remove the upper feed roller shaft [**4**] using the relief hole [**13**].
9. Remove the power supply.
10. Remove the lower feed roller gear [**6**], the adjoining gear [**7**] and the friction block [**12**].
11. Remove the lower feed roller bushing [**8**].
12. Slide the lower feed roller shaft [**9**] so that the lower feed roller bushing [**10**] can be removed from the left frame.
13. Remove the lower feed roller shaft [**9**] using the relief hole [**14**].





Replacement

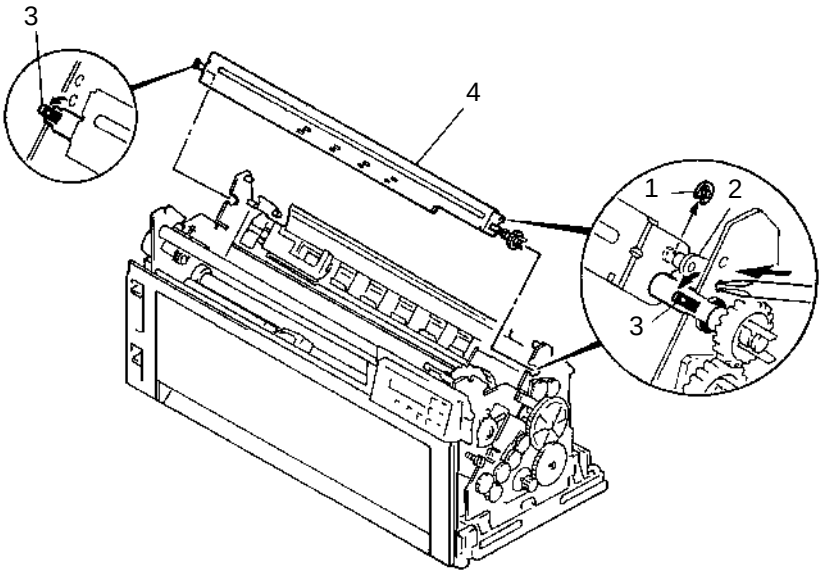
Reverse the removal procedure.

Notes:

- When installing the bushings [**3**] and [**8**], lubricate with IBM # 6 oil, then insert the stud of the bushings into the side plate.
- When installing the gears, insert the hub completely into the hole of the friction blocks.

Upper Pressure Roller Assembly Removal

1. Switch off power, disconnect the power cord plug from the wall outlet and disconnect the interface cable.
2. Remove the top cover assembly.
3. Remove the gear cover.
4. Remove the C-clip [**1**] and the stud [**2**] from the upper pressure roller bracket [**4**].
5. Unlatch the bushing studs [**3**] from both sides of the side plate.
6. Turn the bushings to the position shown and pull up and remove the upper pressure roller assembly [**4**].

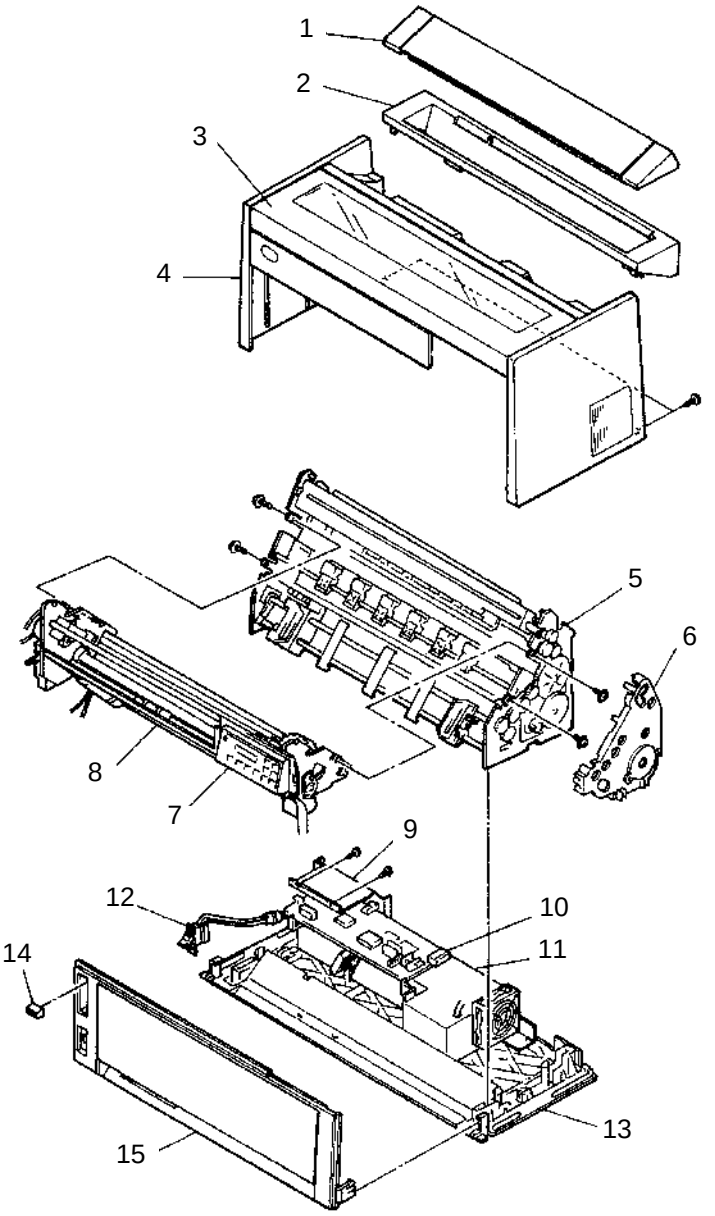


Replacement

Reverse the removal procedure.

5. Connector Locations

Part Name	Ref.	Part Name	Ref.
Access Cover	3	Operator Panel	7
Bottom Plate	13	Power Supply	11
Forms Thickness Lever Knob	14	Power Switch	12
Feed Unit	5	Print Unit	8
Front Cover	15	Rear Guide	2
Gear Cover	6	Rear Hood	1
Logic Board	10	Top Cover	4
Logic Board Cover	9		


1
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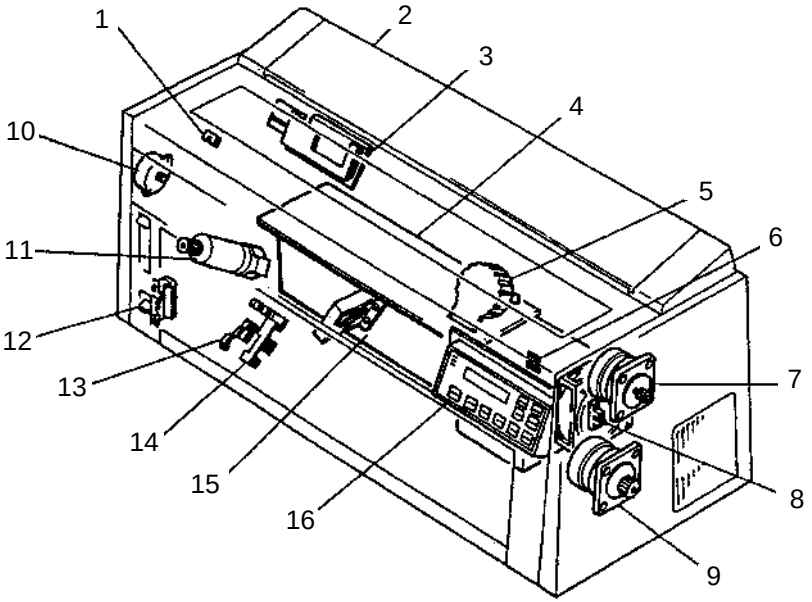
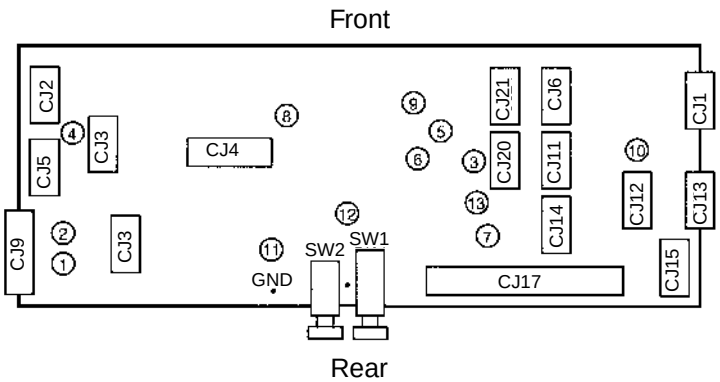
Electrical Part Locations

Part Name	Ref.	Part Name	Ref.
Cam Motor	7	Logic Board	4
Cam Position Sensor	8	Operator Panel	16
Carrier Motor	11	Power Supply	15
Cover Open Sensor	6	Power Switch	12
EOF Switch	13	Printhead	5
Feed Motor	9	Rear Hood	2
Gap Position Sensor	1	Ribbon Feed Motor	10
Jam Sensor	14	TOF Sensor	3

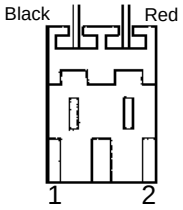


Main Logic Board Connectors

CJ1	Carrier Motor
CJ2	Forms Motor
CJ3	Cam Motor
CJ4	Printhead
CJ5	Cam Sensor
CJ6	Ribbon Motor
CJ9	Power Supply
CJ10	Operator Panel
CJ11	TOF Sensor
CJ12	Jam Sensor
CJ13	Carrier Motor Encoder
CJ14	EOF Sensor
CJ15	Gap Position Sensor
CJ17	Interface Connector
CJ19	*On rear side of panel
CJ20	Carrier Motor Heat Sensor
CJ21	Carrier Motor Cooling Fan
SW1	Interface Mode Switch
SW2	Interface Mode Switch

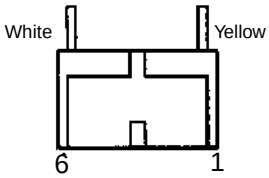


Carrier Motor Connector CP1



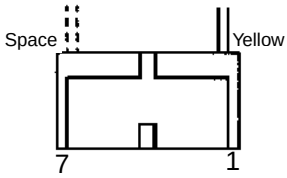
Pin Number	Signal Name
1	Carrier Motor +
2	Carrier Motor -

Forms Motor Connector CP2



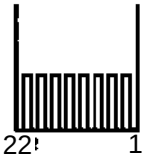
Pin Number	Signal Name
1	Form Feed Motor +A Phase
2	Form Feed Motor -A Phase
3	Form Feed Motor +B Phase
4	Form Feed Motor -B Phase
5	Form Feed Motor Common
6	Form Feed Motor Common

Cam Motor Connector CP3



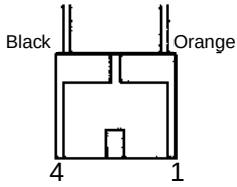
Pin Number	Signal Name
1	Cam Motor +A Phase
2	Cam Motor -A Phase
3	Cam Motor +B Phase
4	Cam Motor -B Phase
5	Cam Motor Common
6	Cam Motor Common
7	N/C

Printhead Connector CJ4



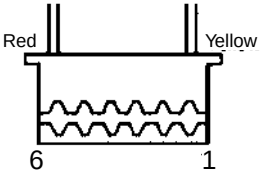
Pin Number	Signal Name
1	Number 1 Print Wire Magnet
2	Number 1 Print Wire Common
3	Number 3 Print Wire Common
4	Number 3 Print Wire Magnet
5	Number 5 Print Wire Magnet
6	Number 5 Print Wire Common
7	Number 7 Print Wire Common
8	Number 7Print Wire Magnet
9	Signal Ground
10	Number 9 Print Wire Magnet
11	Number 9 Print Wire Common
12	+Head Heat Sense
13	Number 8 Print Wire Magnet
14	Number 8 Print Wire Common
15	Number 6 Print Wire Magnet
16	Number 6 Print Wire Common
17	Number 4 Print Wire Magnet
18	Number 4 Print Wire Common
19	Number 2 Print Wire Common
20	Number 2 Print Wire Magnet
21	Frame Ground
22	Frame Ground

Cam Initial Position Sensor Connector CP5



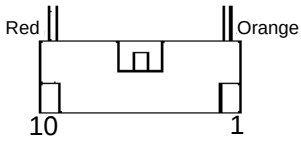
Pin Number	Signal Name
1	Cam Initial Position Sensor Output
2	Signal Ground
3	Cam Initial Position Sensor Anode
4	Signal Ground

Ribbon Feed Motor Connector CP6



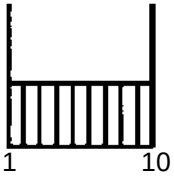
Pin Number	Signal Name
1	Ribbon Motor +A Phase
2	Ribbon Motor -A Phase
3	Ribbon Motor +B Phase
4	Ribbon Motor -B Phase
5	Ribbon Motor Common
6	Ribbon Motor Common

Power Connector CP9



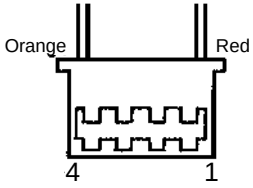
Pin Number	Signal Name
1	+40 V for Head Driver
2	+40 V for Head Driver
3	+40 V for Motor Driver
4	Return of 40 V
5	Return of 40 V
6	Return of 40 V
7	Return of 5 V
8	Return of 5 V
9	+5 V
10	+5 V

Operator Panel Connector CP10



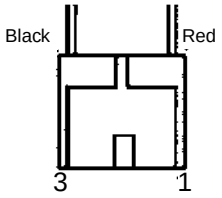
Pin Number	Signal Name
1	OP. +5 V
2	+RSX1
3	+Enable
4	+P/LCD
5	+X2
6	Signal Ground
7	+I/01
8	+I/02
9	+I/03
10	+I/04

TOF Sensor Connector CP11



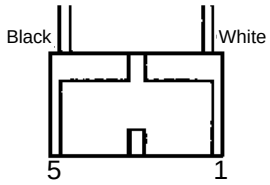
Pin Number	Signal Name
1	TOF Sensor Anode
2	TOF Sensor Output
3	+5 V dc
4	Signal Ground

Jam Sensor Connector CP12



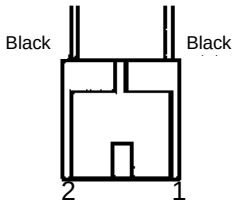
Pin Number	Signal Name
1	Jam Sensor Anode
2	Jam Sensor Output
3	Signal Ground

CM Encoder Connector CP13



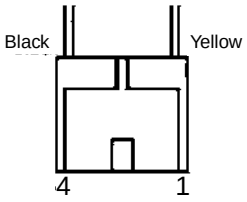
Pin Number	Signal Name
1	+Encoder A
2	+Encoder B
3	+5 V
4	Signal Ground
5	Shield

EOF Switch Connector CP14



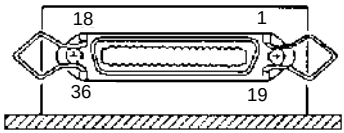
Pin Number	Signal Name
1	+Sense Paper End
2	Signal Ground

Gap Position Sensor Connector CP15



Pin Number	Signal Name
1	Gap Sense Output
2	Gap Sense Anode
3	Signal Ground
4	Signal Ground

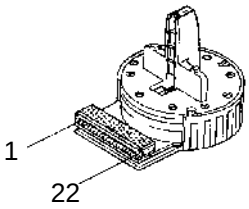
Parallel/Serial Interface Signal Connector CJ17



Logic Card Side

Pin	Signal	Pin	Signal
1	-Data Strobe	19	Signal Ground
2	+Data 1	20	Signal Ground
3	+Data 2	21	Signal Ground
4	+Data 3	22	Signal Ground
5	+Data 4	23	Signal Ground
6	+Data 5	24	Signal Ground
7	+Data 6	25	Signal Ground
8	+Data 7	26	Signal Ground
9	+Data 8	27	Signal Ground
10	-Acknowledge	28	Signal Ground
11	+Busy	29	Signal Ground
12	+Paper End/+TD[1]	30	Signal Ground
13	+Select	31	-INIT/-RD[1]
14	-Auto Feed/+RD[1]	32	-EROR/-TD[1]
15	+TD	33	+RD
16	Signal Ground	34	+DTR
17	Signal Ground	35	+DSR
18	+RTS	36	+CTS

Printhead Connector CJ18



Pin Number	Signal Name
1	Number 1 Print Wire Magnet
2	Number 1 Print Wire Common
3	Number 3 Print Wire Common
4	Number 3 Print Wire Magnet
5	Number 5 Print Wire Magnet
6	Number 5 Print Wire Common
7	Number 7 Print Wire Common
8	Number 7Print Wire Magnet
9	Signal Ground
10	Number 9 Print Wire Magnet
11	Number 9 Print Wire Common
12	+Head Heat Sense
13	Number 8 Print Wire Magnet
14	Number 8 Print Wire Common
15	Number 6 Print Wire Magnet
16	Number 6 Print Wire Common
17	Number 4 Print Wire Magnet
18	Number 4 Print Wire Common
19	Number 2 Print Wire Common
20	Number 2 Print Wire Magnet
21	Frame Ground
22	Frame Ground

Cover Open Connector CJ19

Pin Number	Signal Name
1	- Cover Open Sense
2	Signal Ground

C/M Heat Sensor Connector CJ20

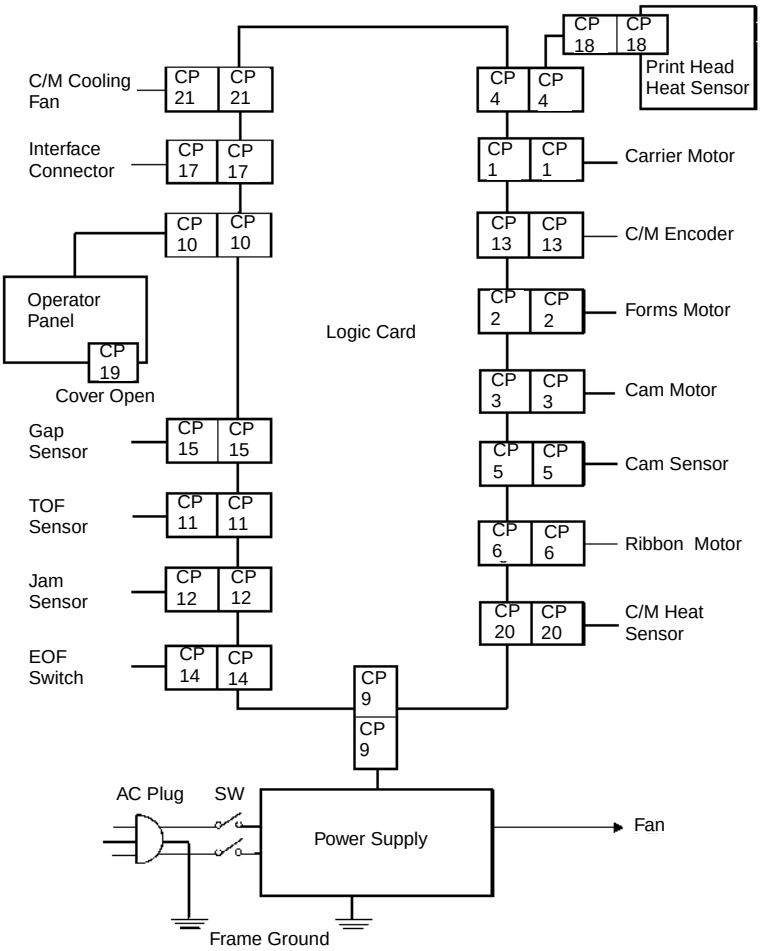
Pin Number	Signal Name
1	+ 5 V dc
2	C/M Heat Sense

Carrier Motor Fan Connector CJ21

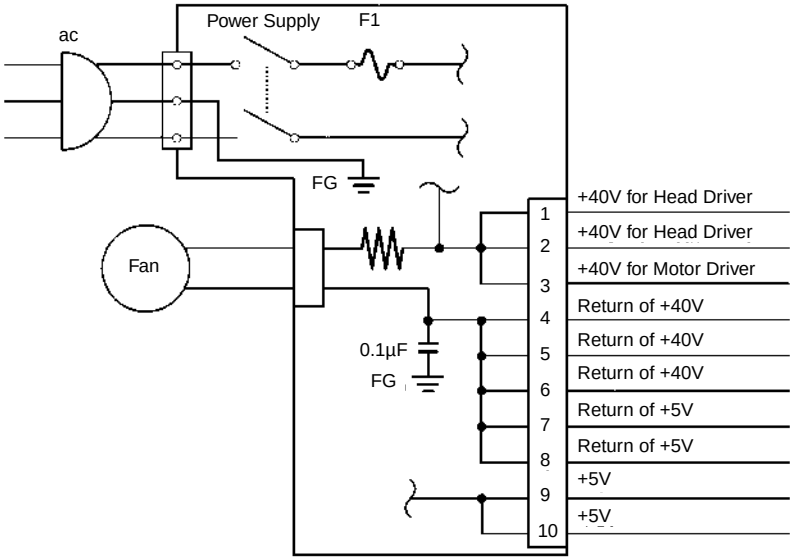
Pin Number	Signal Name
1	Ground
2	+ 40 V dc

Wiring Diagrams

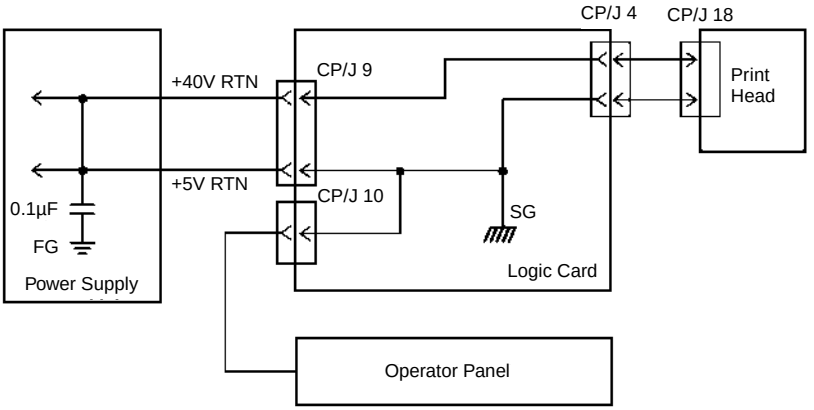
4226 Printer Block Diagram



Power Supply Wiring Diagram



IBM 4226 Printer dc Grounding Diagram



6. Preventive Maintenance

This printer does not require scheduled inspections, however the following parts should be checked for wear or cleaning when servicing the machine. All screws should be tightened during service.

Note: Do not disassemble the printhead.

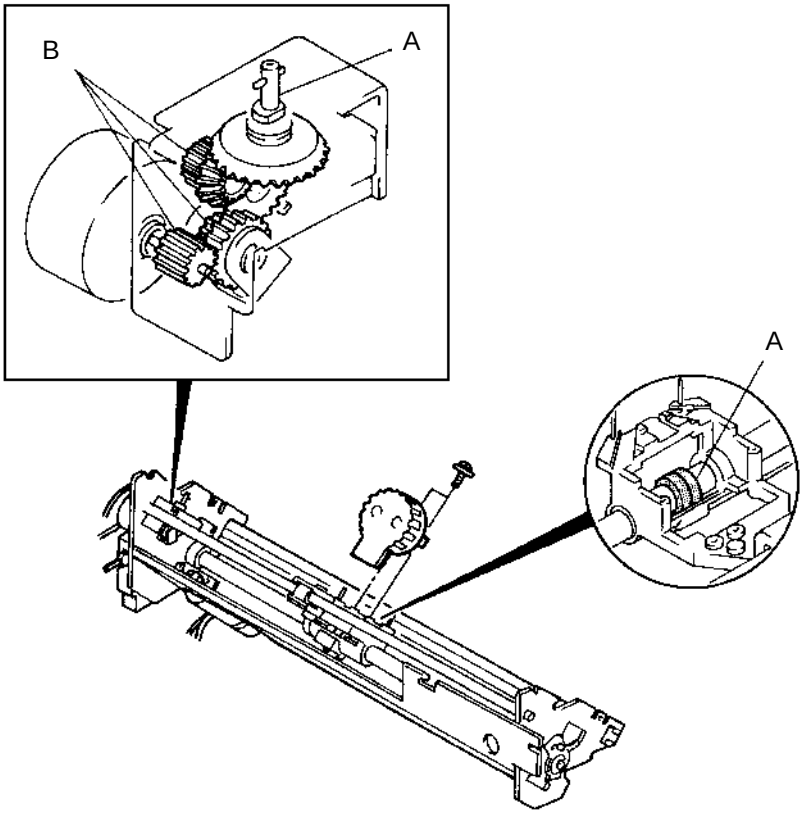
- Carrier rear bearing and belt
- Fan rotation (check for abnormal noise)
- Feed rollers
- gear mesh (backlash)
- Ribbon shield film

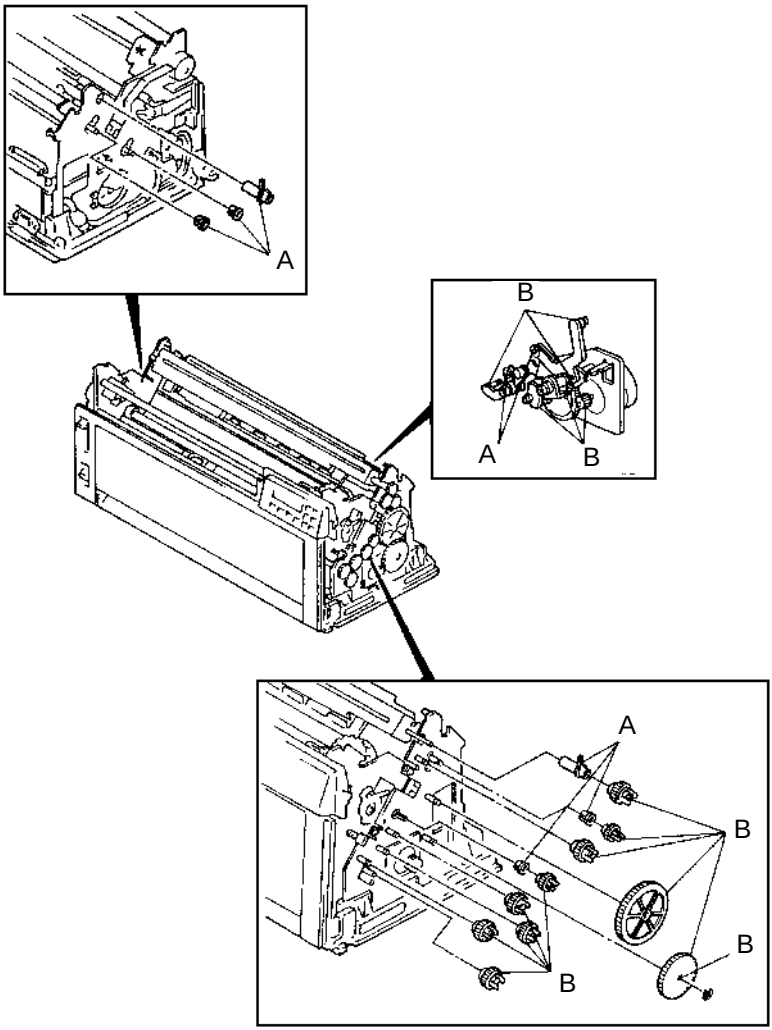
Lubrication

The lubricants and lubrication points for the IBM 4226 Printer are as follows:

- [**A**] indicates the lubrication points for IBM #6 Oil.
- [**B**] indicates the lubrication points for IBM #23 Grease.

Lubrication Points



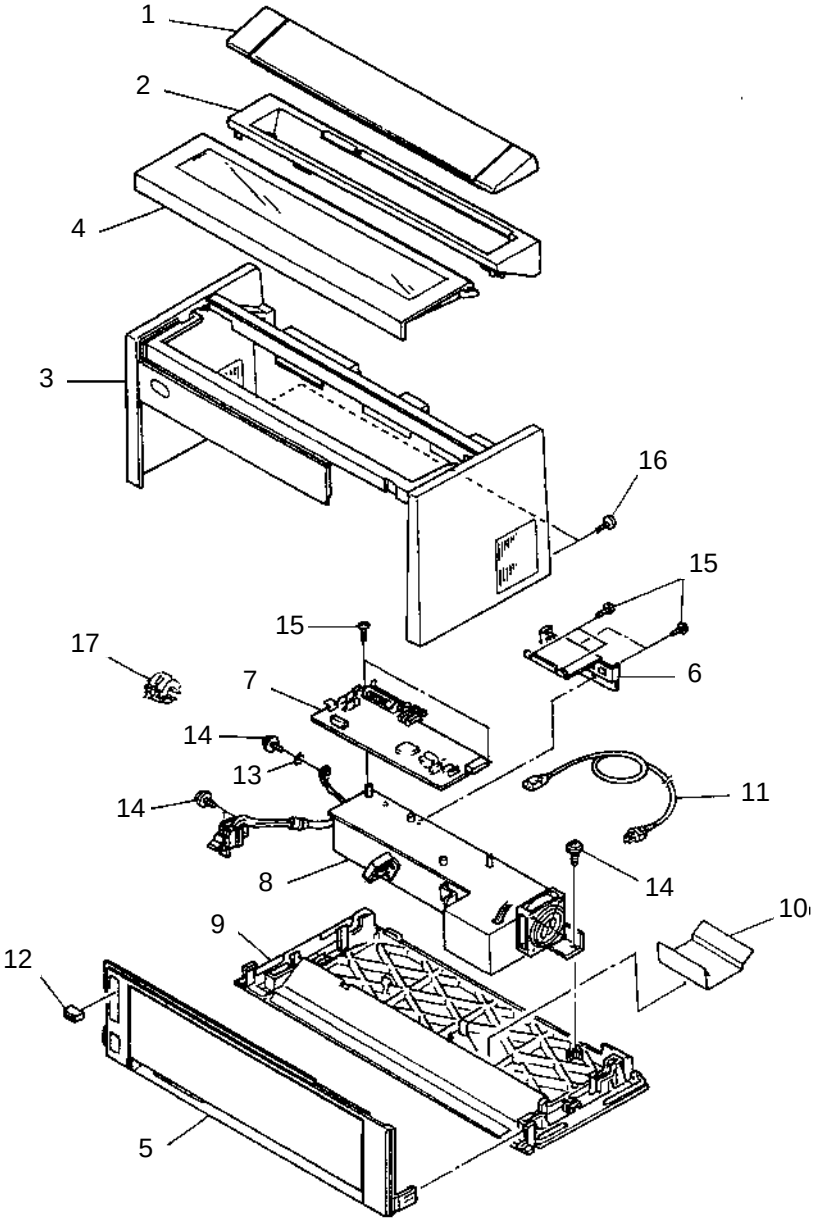

A
B
A
B
A
B
B
B

7. Parts Catalog

How to Use This Parts Catalog

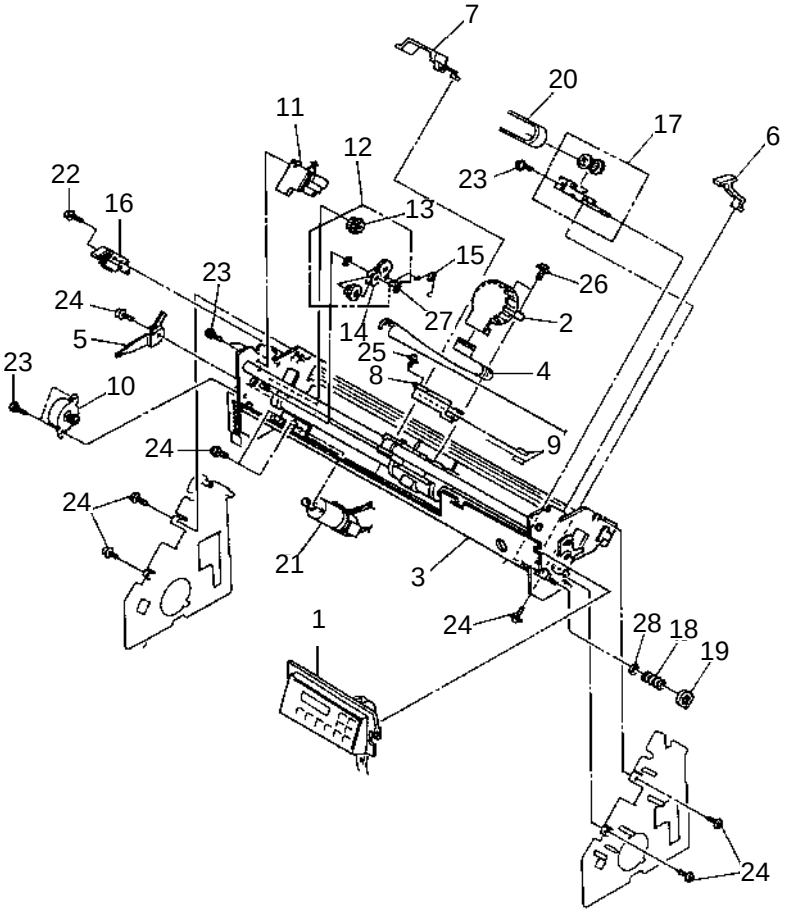
- SIMILAR ASSEMBLIES: If two assemblies contain a majority of identical parts, they are broken down on the same list. Common parts are shown by one index number. Parts peculiar to one or the other of the assemblies are listed separately and identified by description.
- AR: (As Required) in the Units column indicates that the quantity is not the same for all machines.
- NP: (Non-Procurable) in the Units column indicates that the part is non-procurable and that the individual parts or the next higher assembly should be ordered.
- NR: (Not Recommended) in the Units column indicates that the part is procurable but not recommended for field replacement, and that the next higher assembly should be ordered.
- R: (Restricted) in the Units column indicates that the part has a restricted availability.
- NS: (Not Shown) in the Asm-Index column indicates that the part is procurable but is not pictured in the illustration.
- PP: (Parts Packet) in the Description column indicates that the part is contained in a parts packet.

Assembly 1: Cover and Electrical Parts



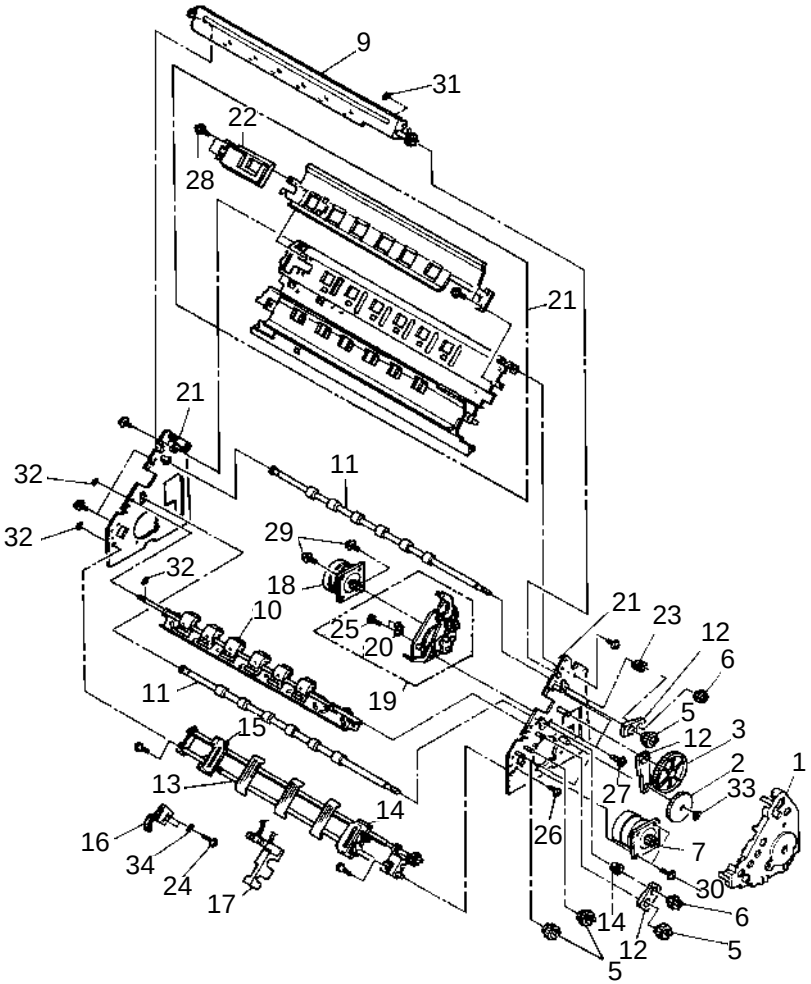
Asm-Index	Part Number	Description
1 -1	79F4485	Rear Hood
2	79F4459	Rear Guide
3	79F4486	Top Cover
4	79F4487	Access Cover
5	79F4458	Front Cover
6	79F4457	Logic Board Cover
7	1368257	Logic Board
NS	1368145	EPROM Kit with 3.17 Version Only
NS	1368256	EPROM Kit 3.18 CGROM 1.47
8	79F4405	Power Supply
9	79F4431	Bottom Plate Assembly
10	38F7682	Ground Plate
11	6952301	Power Cord US, Canada
11	6952300	Power Cord - LV (Central,South America, Asia)
11	1838574	Power Cord - LV (Central, S. America,Philippines)
11	7842123	Power Cord - HV (Mexico)
11	6952291	Power Cord - HV (Argentina and Paraguay)
11	14F0069	Power Cord - HV (Chile and Italy)
11	14F0033	Power Cord - HV (Malaysia, Singapore and UK)
11	13F9979	Power Cord - HV (Indonesia and Europe)
11	14F0087	Power Cord - HV (Israel)
11	6952311	Power Cord - HV (Australia and New Zealand)
11	13F9997	Power Cord - HV (Denmark)
11	14F0051	Power Cord - HV (Switzerland)
12	39F5672	Knob - Gap Lever
13	95F3990	Washer (M4) - Parts Packet
14	95F3990	Screw (M4x8) - Parts Packet
15	95F3990	Screw (M3x6) - Parts Packet
16	95F3990	Screw (M4x8) - Parts Packet
17	95F3991	Cable Core

Assembly 2: Print Unit



Asm-Index	Part Number	Description
2 -1	79F4460	Operator Panel Asm w/ English Overlay
1	79F4461	Operator Panel Asm w/ set of Overlay Labels
2	23F2950	Printhead
3	1180941	Carrier Frame Assembly
4	79F4454	Printhead Cable
5	79F4480	Forms Thickness Lever
6	09F5857	Clamp - Head Cable RBN
7	38F5715	Clamp - Head Cable FPC
8	79F4452	Bracket - Head Cable
9	79F4455	Tab - Head Cable
10	79F4447	Ribbon Drive Motor
11	79F4448	Ribbon Drive Assembly
12	79F4462	Gears B/M - Ribbon Drive
13	79F4449	Gear - R/D Double
14	79F4450	Gear - R/D Planet
15	79F4451	Spring - Planet Gear
16	79F4445	Gap Position Sensor Assembly
17	38F5739	Tension Pulley Assembly
18	79F4453	Tension Spring
19	38F5671	Retainer - Tension Spring
20	56F8193	Carrier Drive Belt
21	79F4456	Carrier Motor Assembly
22 - 26	95F3990	Screw Parts Packet
27	95F3990	C-Clip (E3) parts Packet
28	95F3990	Washer - Tension Adjustment Parts Packet

Assembly 3: Feed Unit



Asm-Index	Part Number	Description
3 -1	79F4443	Gear Cover
2	79F4436	Feed Idler Gear
3	23F2244	Large Gear
4	79F4463	Feed Gear B/M
5	95F5560	Idler Gear
6	23F2254	Feed Roller Gear
7	79F4435	Forms Motor Assembly
8	79F4464	Roller Shaft B/M
9	79F4437	Upper Pressure Roller
10	23F2239	Lower Pressure Roller
11	23F2248	Feed Roller Shaft (Upper and Lower)
12	79F4466	Friction Blocks B/M
13	1368185	Tractor Assembly
NS	1368148	Tractor Door Repair Kit
14	1368183	Right Pin Feed
15	1368184	Left Pin Feed
16	79F4439	EOF Switch
17	1368168	Jam Sensor Assembly
18	6454770	Cam Motor Assembly
19	79F4444	Cam Assembly
20	95F3981	Cam Sensor
21	79F4433	Feed Frame Assembly
22	79F4434	TOF Sensor Assembly
23	6454769	Bush - Feed Roller
24	95F3990	Screw EOF Switch Parts Packet
25 - 30	95F3990	Screw Parts Packet
31- 33	95F3990	C-Clip (E4, E6, E7) Parts Packet
34	95F3990	Washer - EOF Switch Parts Packet

Index

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