

SY34-0613-2

IBM 4975 Printer
Models O2L and O2R
Maintenance Information

Federal Communications Commission (FCC) Notice

Warning: The IBM 4975 Printer Models 01A, 01L, 01R, 02L, and 02R comply with FCC requirements for attachment to Class A computing devices. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide a reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

The IBM 4975 Printer Model 02R, with the appropriate IBM attachment feature, complies with FCC requirements for attachment to Class B personal computers. This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna,
- Relocate the equipment with respect to the receiver,
- Move the equipment away from the receiver,
- Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: **How to Identify & Resolve Radio-TV Interference Problems**. This booklet is available from the US Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

Third Edition (February, 1984)

This is a major revision of and obsoletes SY34-0613-1.

Use this publication only for the purpose stated in the Preface.

Changes are periodically made to the information herein; any such changes will be reported in subsequent revisions or Technical Newsletters.

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Safety Guidelines

If you are aware of the guidelines for working with electrical and mechanical equipment and practice these guidelines, you can work safely with this equipment.

You need not fear electricity, but you must respect it.

You should take every safety precaution possible and observe the following safety practices while maintaining IBM equipment:

1. You should not work alone under hazardous conditions or around equipment with dangerous voltage. Always advise your manager if this is a potential problem.
 2. Remove all power before removing or assembling major components, working in the immediate area of power supplies, performing mechanical inspection of power supplies, or installing changes in machine circuitry.
 3. Power supplies, pumps, blowers, motor generators, and other units with voltages that exceed 30 Vac or 42.4 Vdc must not be serviced with power on when the unit is removed from its normal installed position within the machine, unless maintenance documentation clearly states otherwise. (This is done to ensure that proper grounding is maintained.)
 4. Unplug the power supply cord whenever possible before working on the machine. The wall box switch, when turned off, should be locked in the off position or tagged with a DO NOT OPERATE tag (form Z229-0237). Be aware that a non-IBM attachment to an IBM machine may be powered from another source and controlled by a different disconnect or circuit breaker.
 5. When it is absolutely necessary to work on equipment having exposed live electrical circuitry, observe the following precautions:
 - a. Another person familiar with power-off controls must be in the immediate vicinity. (Someone must be there to turn off power if it should become necessary.)
 - b. Do not wear any jewelry, chains, metallic frame eyeglasses, or metal cuff links. (In the event of contact, there will be more current flowing because of the greater contact area afforded by the metal.)
 - c. Use only insulated pliers, screwdrivers, and appropriate probe tips/extendors. (Remember, worn or cracked insulation is unsafe.)
 - d. Use only one hand when working on energized equipment. Keep the other hand in your pocket or behind your back. (Remember, there must be a complete circuit for electrical shock. This procedure helps eliminate a path that could complete a circuit through you.)
 - e. When using test equipment, be certain that controls are set correctly and that insulated probes of proper capacity are used.
 - f. Avoid contacting ground potential (metal floor strips, machine frames, and so on); use suitable rubber mats purchased locally, if necessary.
6. Follow special safety instructions when working with extremely high voltages. These instructions are outlined in CEMs and the safety portion of maintenance documentation. Use extreme care when checking high voltage.
 7. Avoid use of tools and test equipment that have not been approved by IBM. Electrical hand tools (wire-wrap guns, drills, and so on) should be inspected periodically.
 8. Replace worn or broken tools and test equipment.
 9. After maintenance, restore all safety devices, such as guards, shields, signs, and ground leads. Replace any safety device that is worn or defective. (These safety devices are there to protect you from a hazard. Don't defeat their purpose by not replacing them at the completion of the service call.)
 10. Safety glasses must be worn when:
 - Using a hammer to drive pins, and so on.
 - Power hand drilling.
 - Using spring hooks and attaching springs.
 - Soldering, wire cutting, removing steel bands.
 - Parts cleaning, using solvents, chemicals, and cleaners.
 - Working with electrolytic capacitors that have blowout plugs.
- Use safety glasses for all other conditions that might be hazardous to your eyes.
11. Never assume that a circuit is deenergized. Check it first.

12. Always be alert to potential hazards in your working environment (that is, damp floors, nongrounded extension cords, power surges, missing safety grounds, and so on).
13. Do not touch live electrical circuits with the surface of plastic dental mirrors. The surface of the dental mirror is conductive and can result in machine damage and personal injury.
14. Four steps should be taken in the event of an electrical accident:
 - a. **USE CAUTION—DON'T BE A VICTIM YOURSELF.**
 - b. **TURN POWER OFF.**
 - c. **HAVE SOMEONE ELSE GET MEDICAL HELP.**
 - d. **ADMINISTER RESCUE BREATHING IF VICTIM IS NOT BREATHING.**
15. Do not use solvents, cleaners, or oils that have not been approved by IBM.
16. Lift by standing or pushing up with strong leg muscles. This takes the strain off the back muscles. Do not lift any equipment or parts that you feel uncomfortable with.
17. Each Customer Service Representative (CSR) is responsible to be certain that no action on his/her part renders the product unsafe or exposes hazards to customer personnel.
18. Place removed machine covers in a safe, out-of-the-way location while servicing the machine. These covers must be placed on the machine before the machine is returned to the customer.
19. Always place your tool kit away from a walk area (such as under a desk or table) where no one can trip over it.
20. Avoid wearing loose clothing that may be caught in machinery. Shirt sleeves must be left buttoned or rolled up above the elbow. Long hair and scarves must be secured.
21. Ties must be tucked in shirt or have a tie clasp (preferably nonconductive) about 3 inches from the end when servicing a machine.
22. Before starting equipment, make sure that fellow CSRs and customer personnel are not in a hazardous position.
23. Maintain good housekeeping in the area of the machines while performing and after completing maintenance.

24. Avoid touching moving mechanical parts when lubricating, checking for play, and so on.

Prevention is the key to electrical safety. You should always be conscious of electrical safety and practice *good habits*, as follows:

- Make certain that the customer's power receptacle meets IBM equipment requirements.
- Inspect line cords and plugs. Check for loose, damaged, or worn parts.
- Before removing a component, which can retain a charge from the machine, review the procedure in the maintenance documentation. Wear safety glasses and **CAREFULLY** discharge the necessary components *exactly* as directed by the service procedure.
- Do not use an ordinary lamp as an extension trouble light.

Never *assume* anything about a machine or circuit. No machine is completely safe *all* the time. The exact condition of a machine may be unknown. Here are some of the reasons why:

- The power receptacle could be incorrectly wired.
- Safety devices or features could be missing or defective.
- The maintenance and/or modification history may be uncertain or unclear.
- A possible design deficiency could exist.
- The machine may have suffered transportation damage.
- The machine may have an unsafe alteration or attachment.
- An engineering change (EC) or sales change may have been improperly installed.
- The machine may have deteriorated due to age or environmental extremes.
- A component could be defective, creating a hazard.
- Some component of the machine may have been incorrectly assembled.

Relating to safety, these are some of the ways the condition of the machine can be affected. *Before you begin a service call or procedure, exercise good judgment and proceed with caution.*

Electrical Accidents

Administering First Aid

In implementing rescue procedures in an electrical accident, one must:

- *Use Caution.* If the victim is still in contact with the electrical current source, it may be necessary to use the room Emergency Power Off (EPO) or disconnect switch to remove the electrical current.

If the EPO or disconnect switch cannot be located, use a dry stick or another nonconducting object to pull or push the victim away from contact with the electrical equipment.

- *Act Quickly.* If the victim is unconscious, he/she may need rescue breathing and possible external cardiac compression if the heart is not beating.
- *Call Fire Rescue* (Rescue Squad, Emergency, Ambulance, Hospital, and so on). Have someone summon medical aid.

Determine if the victim needs rescue breathing.

1. Make certain that the victim's airway is open and that it is not obstructed. Check the mouth for objects that may be blocking the airway, such as gum, food, dentures, or even the tongue. Position the victim on his back and place one hand beneath the victim's neck and the other hand on his forehead. Then lift the neck with one hand and tilt the head backward with pressure on the forehead from the other hand **A**.

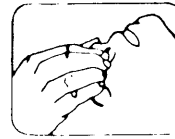


2. Now you must *look, listen, and feel* to determine if the victim is breathing freely. Place your cheek close to the victim's mouth and nose to listen and feel for the exhaling of air.

At the same time, look at the chest and upper abdomen to see if they rise and fall. If the victim is not breathing properly, you should:

- a. With the head in a backward tilt **A**, continue to exert pressure on the victim's forehead with your hand while rotating this same hand so that you can pinch the victim's nostrils together with the thumb and index finger **B**.

B

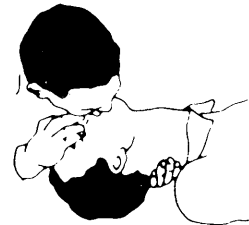


CAUTION

Use extreme care when administering rescue breathing to a victim who may have breathed in toxic fumes. **DO NOT INHALE AIR EXHAUSTED BY THE VICTIM.**

- b. Open your mouth wide and take a deep breath. Make a tight seal with your mouth around the victim's mouth and blow into the victim's mouth **C**.

C



- c. Remove your mouth and allow the victim to exhale while watching for the victim's chest to fall **D**.

D



- d. Repeat this cycle once every 5 seconds until the victim breathes for himself or medical help arrives.

Reporting Accidents

It is a CSR's responsibility to report all electrical accidents, potential electrical hazards, and "near-miss" accidents to your field manager. Remember, a near-miss accident might be the result of a design deficiency, and prompt reporting will ensure that the situation will be resolved quickly.

It is important to report even a minor shock because the conditions that caused it need only be varied slightly to cause serious injury.

Safety Notices

This document may contain the following safety notices:

DANGER

This notice advises of a condition that could present a potential hazard where serious personal injury or loss of life is possible unless care is used.

CAUTION

This notice advises of a condition that could present a potential hazard where personal injury, except as defined for a DANGER notice, is possible unless care is used.

Warning: This notice advises of a potential condition that could cause machine or program damage unless care is used.

This publication is for IBM Customer Service Representatives (CSRs) and customer service personnel who maintain the IBM 4975 Printer Models 02L and 02R.

This publication is written using the **IBM CE** Limited Vocabulary.

The following information is included in this publication:

- Introduction to the printer
- Overview of the maintenance strategy
- Location drawings of each functional unit
- Description of the testing procedures
- Operational description of each functional unit
- Service checks
- Adjustment procedures
- Removal and replacement procedures
- Reference information.

Related Publications

Additional 4975 information can be found in:

- *IBM Series/1 Multi-Function Attachment Feature and 4975 Printer Description*, GA34-0144
- *IBM Series/1 Multi-Function Attachment Feature Theory Diagrams*, SY34-0609
- *IBM 4975 Printer Parts Catalog*, S134-0064
- *IBM 4975 Printer Operator's Guide*, GA34-0149

Additional information can be found in publications listed in the *IBM Series/1 Graphic Bibliography*, GA34-0055.

Danger, Caution, and Warning Notices

WARNING notices alert you to conditions that could damage the machine. **DANGER** and **CAUTION** notices alert you to conditions that could cause personal injury.

DANGER

Do not attempt to service the printer subassemblies after you have removed them from the machine if the cables are attached and the power is on.

Using the IBM 4975 Maintenance Information Manual

Use the information in this manual as reference material when diagnosing machine failures. Information about maintenance procedures, diagnostic aids, and operational descriptions is included.

Reference Methods

Reference methods used in this manual are:

- Maintenance Analysis Procedures (MAPs) — four-digit reference numbers
- On-page.

MAP four-digit reference numbers are assigned to location drawings and to specific maintenance procedures. The four-digit number is the reference from the MAP to the specific procedure within this manual.

1. For example, 3352 is the procedure you refer to for the removal, reinstallation, and adjustment of the print head forms guide.
2. The on-page references are: **this page, see below, and so on.**
3. For figures with named or numbered parts, the reference is to the specific number or name of the part (see Chapter 4).

When multiple procedures are required to perform a specific removal or adjustment, the referenced procedure is written as follows:

Step X. Remove the cover (3051).

This reference, 3051, is the procedure for removing the cover.

Content Summary

This manual contains five chapters and three appendices, as follows:

Chapter 1, "Introduction,"

Contains the specifications for the IBM 4975 Printer Models 02L and 02R Printer and a brief description of its major functional units. It also contains a description of the tools necessary to service the printer.

Chapter 2, "Locations,"

Contains a set of location drawings.

Chapter 3, "Maintenance Procedures,"

Contains maintenance procedures for repairing or installing field replaceable units (FRUs) that the MAPs call out.

Maintenance procedures include service checks, removals, reinstalls, and adjustments. All procedures have a four-digit number assigned as a reference from the MAPs to that specific procedure in this manual.

Chapter 4, "Theory,"

Contains a theoretical discussion of the functional units.

Chapter 5, "Preventive Maintenance,"

Contains the lubrication procedures.

Appendix A, "Error Indicator Lights,"

Contains a chart that explains the error light codes.

Appendix B, "Wiring Diagrams,"

Contains the wiring diagrams.

Appendix C, "Glossary of Terms and Abbreviations,"

Contains definitions of terms and abbreviations that are not common, but are used in this manual and in the MAPs.

Contents

Chapter 1. Introduction	1-1	Reinstallation	3-22
Introduction	1-1	Right Side-Frame	3-23
Printer Description	1-1	Removal	3-23
Printing Specifications	1-1	Reinstallation	3-23
Maintenance Tools	1-2	3201 Forms Feed Platen Gear	3-24
Chapter 2. Locations	2-1	Service Check	3-24
3001 Front and Left Side View	2-1	Adjustment	3-24
3002 Front and Right Side View	2-3	3202 Forms Feed Motor Gear Adjustment	3-25
3003 Bottom View	2-4	3203 Forms Feed Motor/Emitter	3-26
3004 Base View	2-5	Removal	3-26
3005 Logic/Control Board—Model 02L	2-6	Reinstallation	3-26
3005 Logic/Control Board—Model 02R	2-7	3204 Forms Feed Emitter Adjustment	3-27
Chapter 3. Maintenance Procedures	3-1	3205 Forms Feed Motor Adjustment	3-28
3051 Access Cover	3-1	Service Check	3-28
Removal	3-1	Adjustment	3-28
Reinstallation	3-1	3206 A-frame Alignment	3-30
3052 Top Cover	3-2	Service Check	3-30
Removal	3-2	Adjustment	3-31
Reinstallation	3-2	3207 End-Of-Forms Switch	3-32
3053 Placing the Printer in the Service Position ..	3-4	Service Check	3-32
3054 Placing the Printer in Operating Position ..	3-6	Adjustment	3-32
3101 Platen and Paper Deflector	3-8	Removal	3-35
Removal	3-8	Reinstallation	3-35
Reinstallation	3-8	3208 Mode Switch	3-37
3102 Platen Release	3-11	Service Check	3-37
Service Check	3-11	Removal	3-37
Adjustment	3-11	Reinstallation	3-37
3103 Platen Pressure Rolls	3-12	3251 Print Emitter	3-38
Service Check	3-12	Hold-Down Bracket Adjustment	3-38
Adjustment	3-12	Print Emitter Removal	3-38
3104 Platen Gears	3-14	Print Emitter Replacement	3-38
Removal	3-14	3252 Print Emitter Pickup	3-41
Reinstallation	3-14	Removal	3-41
3105 Platen Locator Tabs	3-15	Reinstallation	3-41
Adjustment	3-15	3253 Print Emitter Adjustment	3-42
3151 Forms Tractor and Rear Document		3301 Carrier and Main Shaft	3-45
Insertion Device (RDID)	3-17	Adjustment	3-45
Removal	3-17	Removal	3-46
Reinstallation	3-17	Reinstallation	3-48
3152 Forms Tractor	3-18	3302 Carrier Support Shaft	3-50
Chain Guide Adjustment	3-18	Removal	3-50
Left Tractor Adjustment	3-19	Reinstallation	3-50
3153 Forms Guide Rack	3-20	3304 Carrier Leaf Spring, Helper Spring, and	
Removal	3-20	Bearing	3-51
Reinstallation	3-20	Removal	3-51
3154 Static Eliminator	3-21	Reinstallation	3-51
Removal	3-21	3305 Carrier Belt Tensioner	3-52
Reinstallation	3-21	Removal	3-52
3155 Forms Tractor Side-Frame	3-22	Reinstallation	3-52
Left Side-Frame	3-22	3306 Print Head Carrier Motor	3-53
Removal	3-22	Removal	3-53
		Reinstallation	3-53
		3351 Print Head	3-55

Service check	3-55	Reinstallation	3-84
Adjustment	3-55	3452 Circuit Breaker	3-86
Removal	3-56	Removal	3-86
Reinstallation	3-56	Reinstallation	3-86
3352 Print Head Forms Guide	3-59	3453 Power Supply	3-88
Adjustment	3-59	Removal	3-88
Removal	3-59	Reinstallation	3-88
Reinstallation	3-59	3454 Power Supply Board	3-91
3353 Print Head Cable	3-60	Removal	3-91
Removal	3-60	Reinstallation	3-91
Reinstallation	3-60	3455 AC Capacitor	3-92
Alternate Method	3-60	Removal	3-92
3354 Oil Felt	3-63	Reinstallation	3-92
Removal	3-63	3456 Power Supply Transformer	3-95
Reinstallation	3-63	Removal	3-95
3355 Print Head Ribbon Shield	3-64	Reinstallation	3-95
Adjustment	3-64	3457 Fan	3-96
Removal	3-64	Removal	3-96
Reinstallation	3-64	Reinstallation	3-96
3356 Print Head Ribbon Lifter	3-66	3458 Resistor Assembly	3-99
Adjustment	3-66	Removal	3-99
Removal	3-66	Reinstallation	3-99
Reinstallation	3-66	3501 Logic/Control Board	3-100
3357 Copy Control Dial	3-68	Removal	3-100
Removal	3-68	Reinstallation	3-100
Reinstallation	3-68	3502 Logic/Control Board Safety Cover	3-102
3358 Print Head Retract Ramp	3-69	Removal	3-102
Adjustment	3-69	Reinstallation	3-102
3359 Pivot Block and Yoke	3-71	3503 Signal Cable	3-104
Removal	3-71	Model 02L	3-104
Reinstallation	3-71	Removal	3-104
3360 Print Head Solenoid	3-72	Reinstallation	3-104
Service Check	3-72	Model 02R	3-105
Adjustment	3-72	Removal	3-105
Removal	3-74	Reinstallation	3-105
Reinstallation	3-74	3504 Print Cartridge	3-106
3401 Ribbon Drive Assembly	3-76	Removal	3-106
Removal	3-76	Reinstallation	3-106
Reinstallation	3-76	Cleaning the Cartridge Contacts	3-107
3402 Ribbon Drive Clutches	3-77	Cleaning Connector Contacts	3-108
Removal	3-77	3651 Print Quality	3-111
Reinstallation	3-77	3652 Print Test Sample	3-112
3403 Ribbon Drive Shaft	3-78	3654 Test Mode	3-115
Removal	3-78	Returning the Printer to Operating Mode	3-115
Reinstallation	3-78	3654 Test Mode (continued)	3-116
3404 Ribbon Drive Cords	3-79	To operate the printer in wrap mode:	3-116
Removal	3-79	To return the printer to operating mode:	3-116
Reinstallation	3-79	Chapter 4. Theory	4-1
3405 Ribbon Cartridge	3-81	Functional Units	4-1
Removal	3-81	Power Supply	4-1
Reinstallation	3-81	Forms Feed Emitter	4-1
3441 Power Switch	3-82	Print Emitter and Print Emitter Pickup	4-1
Removal	3-82	Ribbon Drive	4-2
Reinstallation	3-82	Print head	4-2
3451 Line Filters	3-84	Print Cartridge	4-3
Removal	3-84		

Logic/Control Board	4-3	50 Hz WTC Only Transformer (Part 2426491)	7-5
Logic/Control Board Switches	4-3	Wiring Diagram—Model 02L	7-6
Chapter 5. Preventive Maintenance	5-1	Wiring Diagram—Model 02R	7-7
Lubrication and Checks	5-1	Printer Cable Diagrams	7-8
Oil Felt Lubrication	5-4	Logic/Control Board to Print Head	7-8
Chapter 6. Error Indicator Lights Models 02L and		DC Power Cable P2	7-9
 02R	6-1	Signal Cable	7-10
Chapter 7. Wiring Diagrams	7-1	Stepper Motor Cables	7-12
B001 AC Safety Ground Locations	7-1	Forms Feed Emitter Cable	7-13
B002 Power Supply Distribution	7-2	Print Head Cable and Connector	7-14
60 Hz	7-2	Chapter 8. Glossary	8-1
World Trade (60 Hz)	7-3	Index	X-1
50 Hz With Fuses on Transformer	7-4		

Chapter 1. Introduction

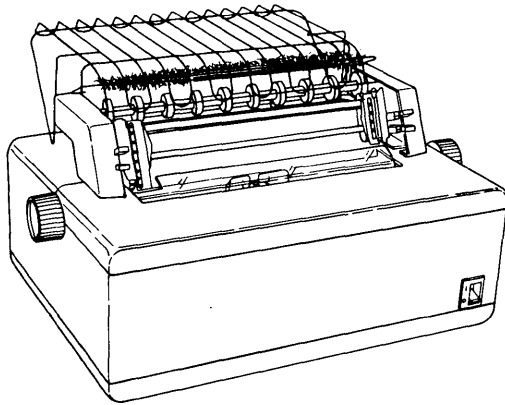
Introduction

The IBM 4975 Printer Models 02L and 02R can be used for various printing needs in data processing, data collection, data entry, and communications systems. The 4975 can be used as a system printer or a work station printer.

Printer Description

This printer:

- Is available in two models, with printing speeds of 80 characters per second (CPS). Model, character density, and line length determine printing speed
- Forms characters using a series of dots contained in an eight high dot matrix
- Has vertical spacing of six or eight lines per inch (lpi), selected by the operator or by program control, and special spacing of 2.6458 mm (0.01042 in.) under program control
- Has horizontal spacing of 10 or 15 characters per inch (cpi), selected by the operator or by program control.



IBM 4975 Printer

- Can use one to four part continuous forms
- Control unit (pcu) contains test routines for use by the operator and maintenance personnel for problem determination and for verifying repairs

Printing Specifications

Maximum print line width — 335.3 mm (13.2 in.)

Maximum print positions at 10 cpi — 132

Maximum print positions at 15 cpi — 198

Adjustable forms width — 76.2 to 450 mm (3.0 to 17.7 in.)

Forms length — 76.2 to 318 mm (3.0 to 12.5 in.)

Note: The minimum length, fold to fold, must be 152.4 mm (6.0 in.)

The maximum length for forms stacking is 318 mm (12.5 in.) paper but, longer forms can be used at the user's option.

The 4975 model 02L:

- Is directly connected (without a modem, at a distance of up to 4000 feet) to the attachment card using the EIA¹ RS422 interface
- Communicates at 4800 bps.

The 4975 model 02R:

- Can be connected with a modem (leased-line only) or without a modem to the attachment card using the EIA RS232C interface
- Communicated at either 1200, 2400, or 4800 bps (using external or internal clocking).

Maintenance Tools

Customer Service Representative Tool Case

The basic CSR tool case, the metric tool supplement (part 1749235), the IBM multimeter, and jumper wires are the only tools required to service the printer.

IBM General Logic Probe II

The General Logic Probe (GLP) II is a hand held unit used to sense logic signals for several technologies.

The General Logic Probe II kit (part 453212) includes:

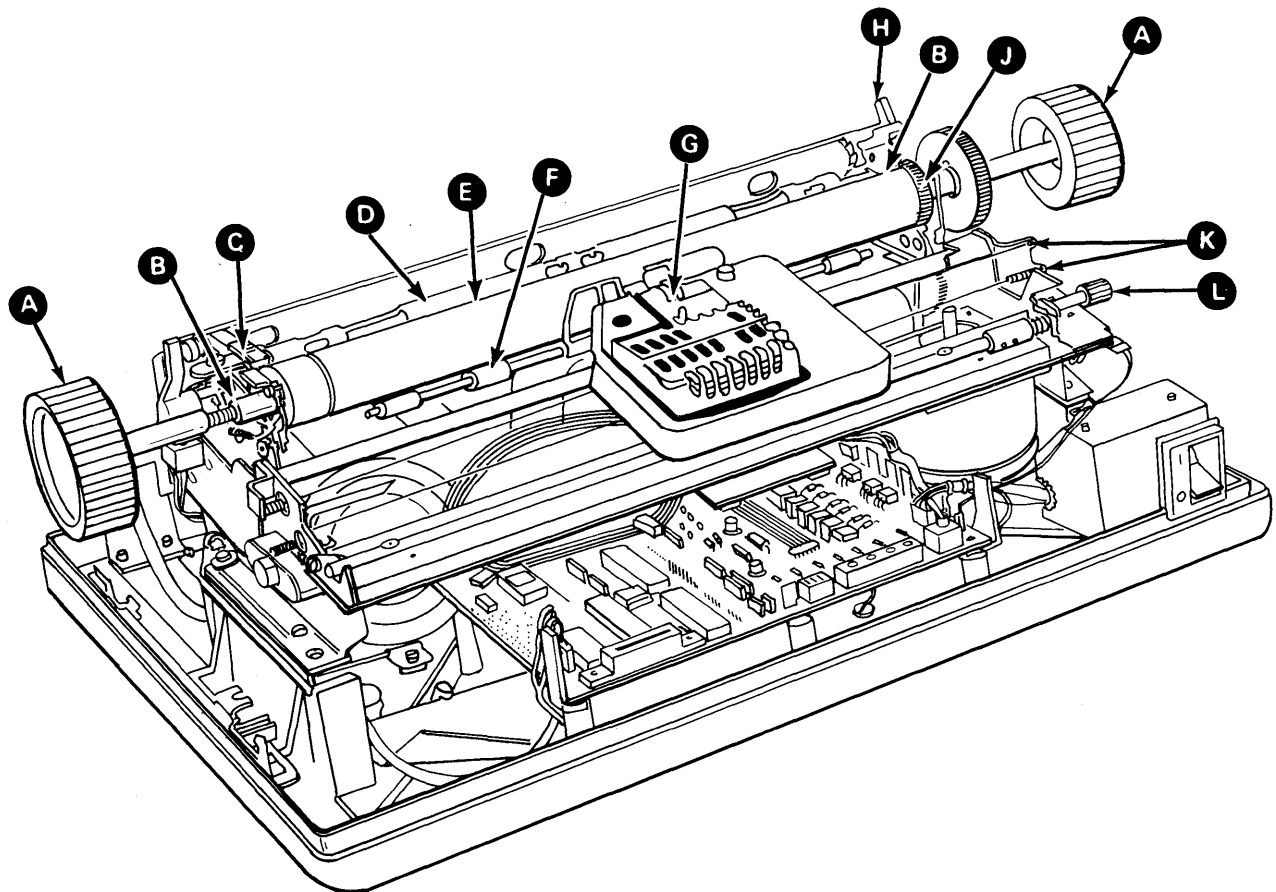
- The IBM General Logic Probe II unit
- Standard accessories
- *IBM General Logic Probe II Manual, SY34-0127*

Each of these parts may be ordered separately. The general logic probe manual describes the features of the probe and the functions and restrictions of each feature. See that manual for detailed information.

Chapter 2. Locations

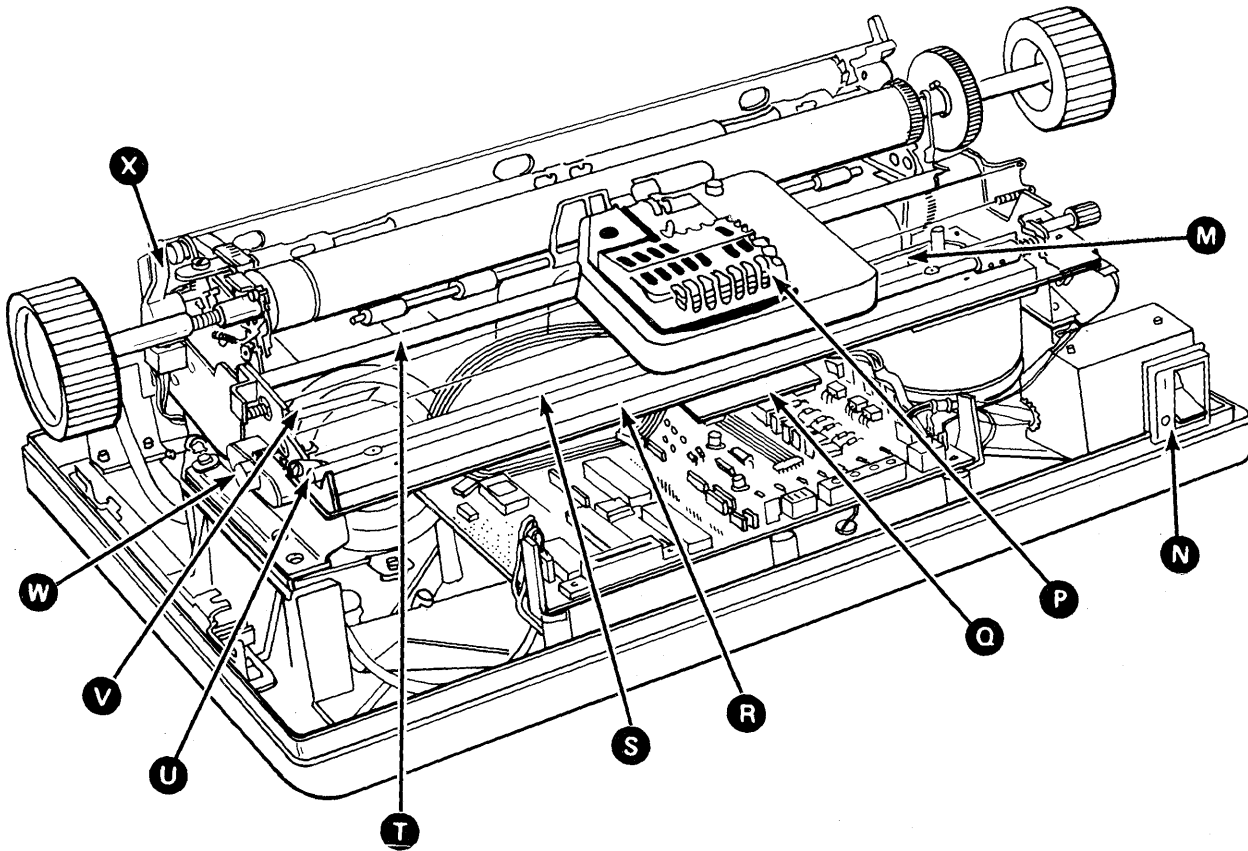
3001 Front and Left Side View

- A** Paper-advance knob (2)
- B** Platen-release lever (2)
- C** End-of-forms switch
- D** A-frame
- E** Platen
- F** Platen pressure rolls
- G** Copy-control dial
- H** Paper-release lever
- J** Platen gear
- K** Ribbon drive cords
- L** Horizontal adjustment knob



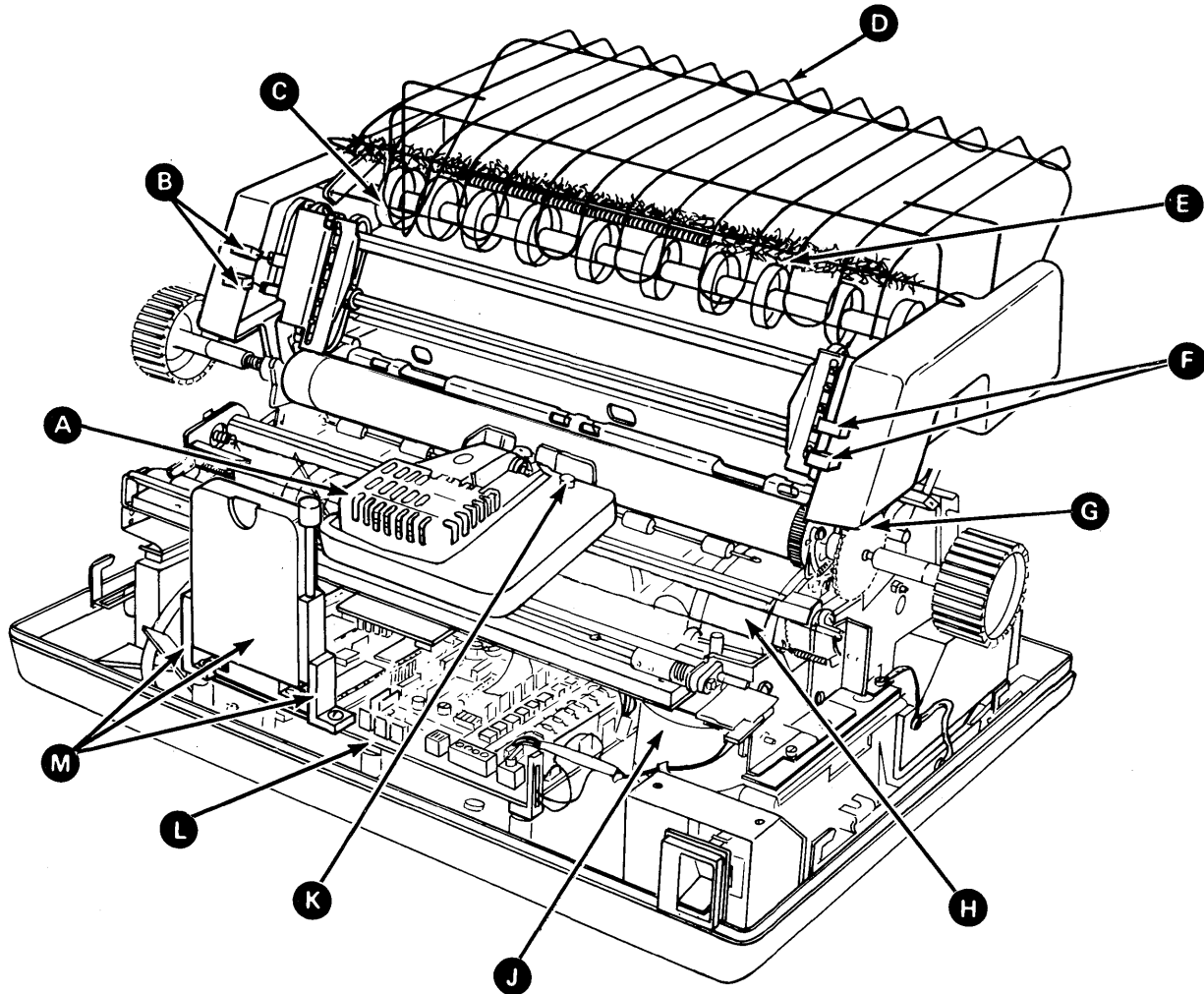
- M** Print head drive belt
- N** Power switch
- P** Print head
- Q** Print emitter pick-up
- R** Print emitter
- S** Carrier support shaft

- T** Carrier main shaft
- U** Emitter hold-down bracket
- V** Print head retract ramp
- W** Belt tensioner
- X** Mode switch



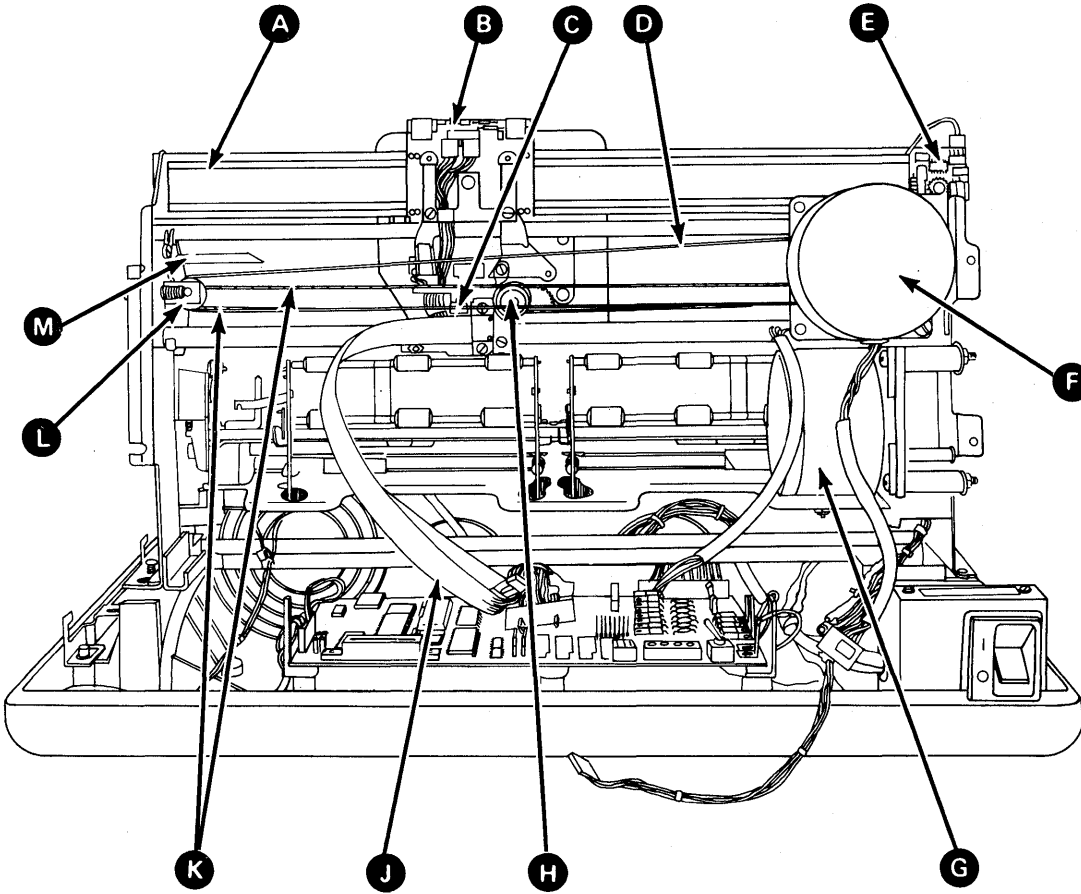
3002 Front and Right Side View

- | | |
|---------------------------------------|-------------------------------------|
| A Print head | G Forms tractor drive gear |
| B Left tractor release levers | H Forms feed motor |
| C Tractor rollers | J Print head carrier motor |
| D Forms guide rack | K Ribbon advance knob |
| E Static eliminator | L Logic/control board |
| F Right tractor release levers | M Print cartridge and holder |



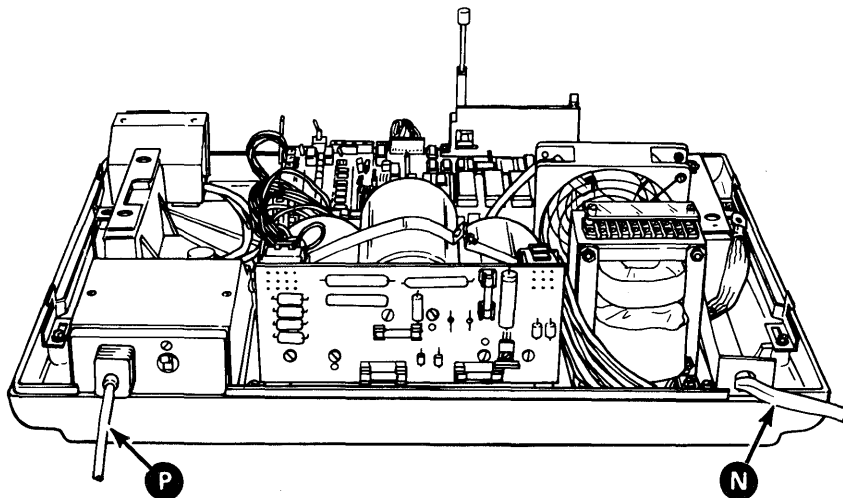
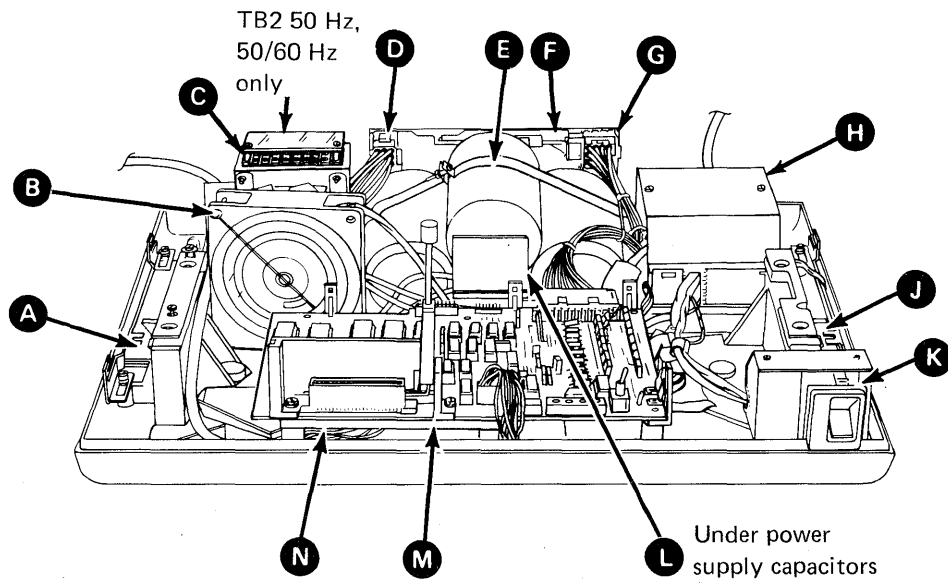
3003 Bottom View

- A** Print emitter
- B** Print emitter pick-up
- C** Carrier belt clamp
- D** Print head carrier drive belt
- E** Print emitter circuit board
- F** Print head carrier motor
- G** Forms feed motor
- H** Ribbon drive clutches
- J** Print head cable
- K** Ribbon drive cords
- L** Carrier drive belt tensioner
- M** Print head retract ramp



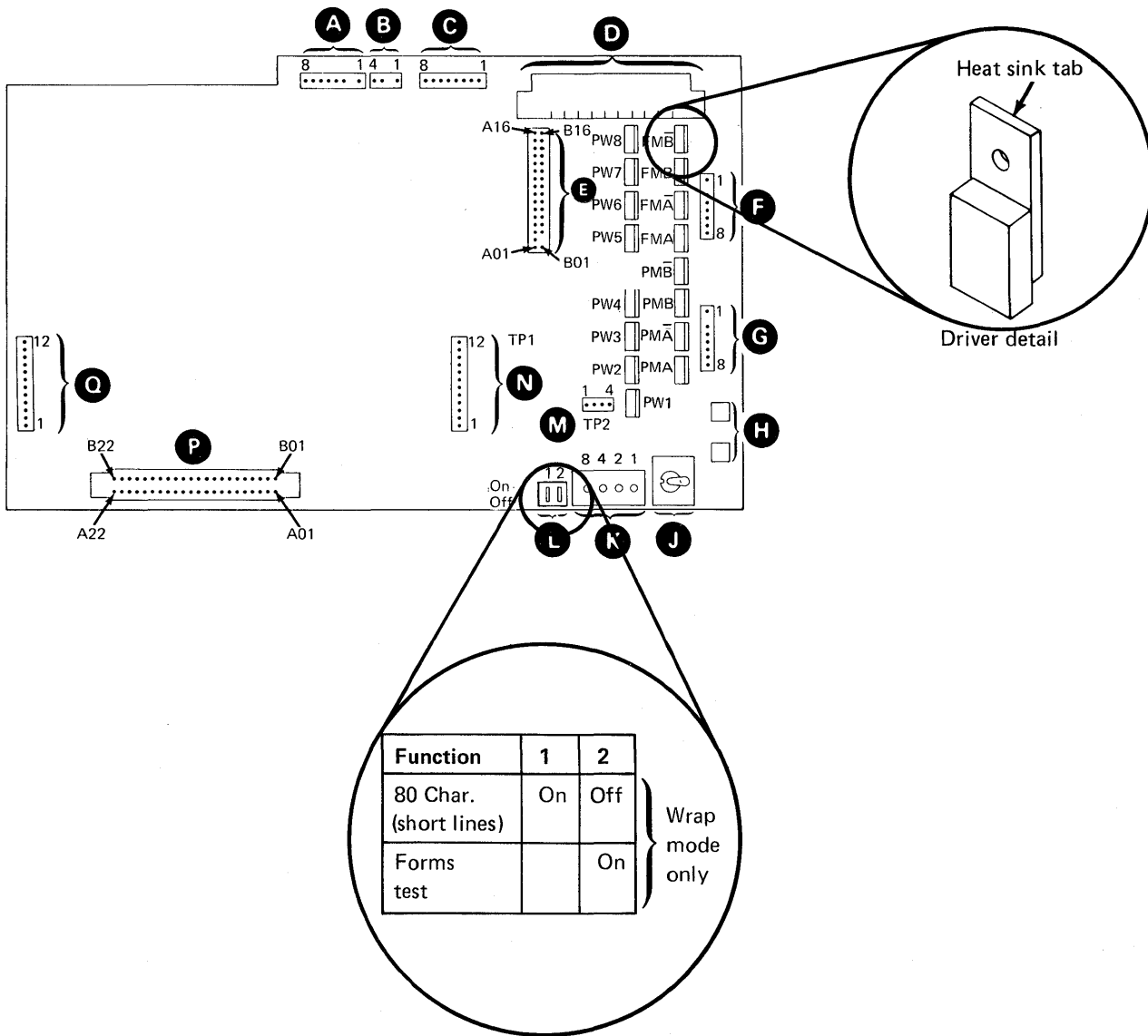
3004 Base View

- | | |
|-----------------------------------|------------------------------------|
| A Left cover latch bracket | H AC distribution box |
| B Fan | J Right cover latch bracket |
| C Power transformer | K Power switch box |
| D P1/J1 | L AC capacitor |
| E Power supply capacitors | M Logic/control board |
| F Power supply board | N Signal cable |
| G P2/J2 | P AC power cable |



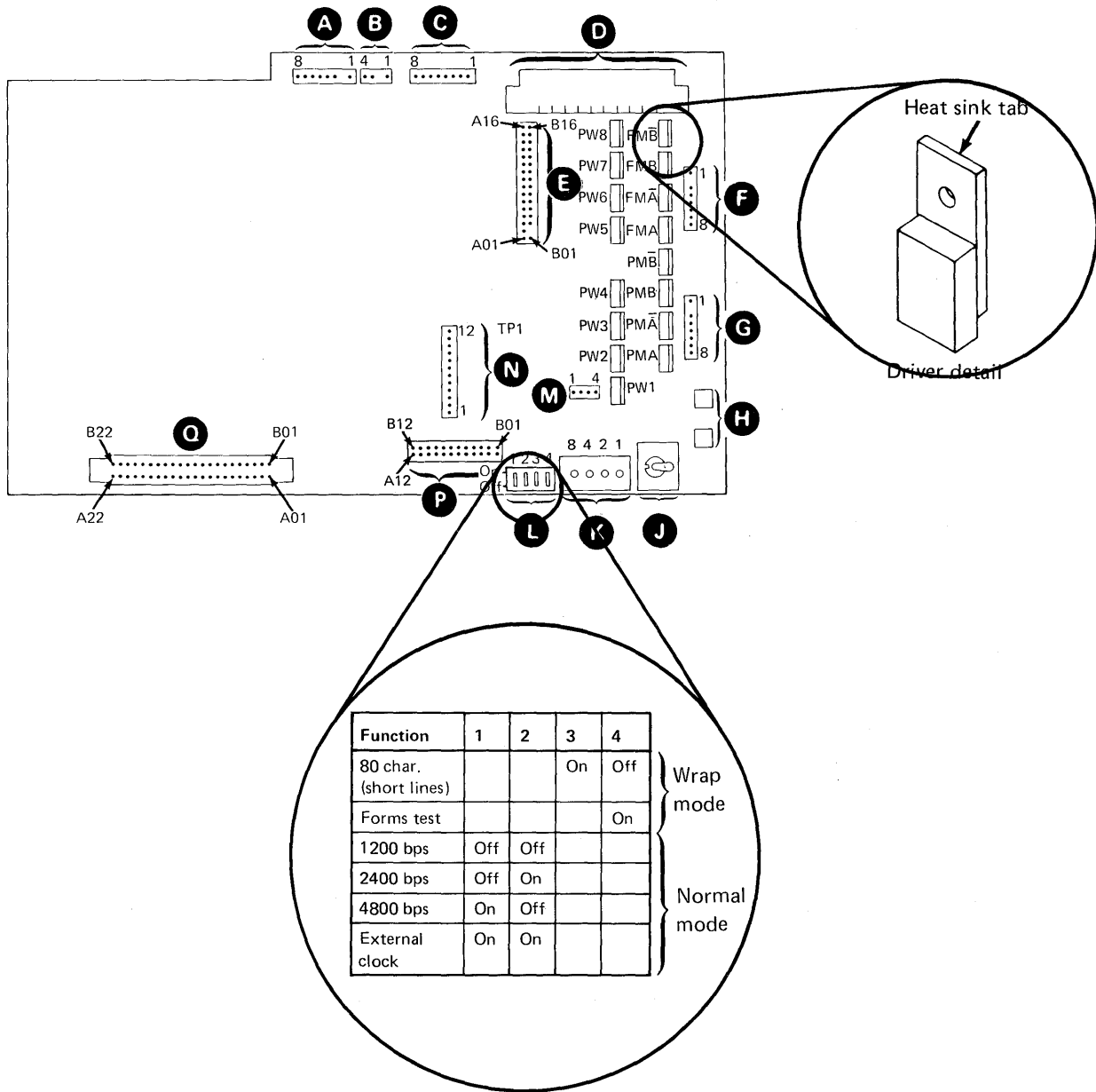
3005 Logic/Control Board—Model 02L

- A** End-of-forms/print emitter board cable connector J8
- B** Mode switch connector J13
- C** Forms emitter connector J9
- D** Power supply connector J3
- E** Print head/left margin/head lift/print emitters connector J4
- F** Forms motor connector J5
- G** Print head motor connector J7
- H** Resistor lugs
- J** Test switch
- K** Error indicator
- L** Switches (see detail)
- M** TP2
- N** TP1
- P** Print cartridge socket
- Q** Signal cable connector J6



3005 Logic/Control Board—Model 02R

- A** End-of-forms/print emitter board cable connector J8
- B** Mode switch connector J13
- C** Forms emitter connector J9
- D** Power supply connector J3
- E** Print head/left margin/head lift connector J4
- F** Forms motor connector J5
- G** Print head motor connector J7
- H** Resistor lugs
- J** Test switch
- K** Error indicator
- L** Switches (see detail)
- M** TP2
- N** TP1
- P** Signal cable connector J6
- Q** Print cartridge socket

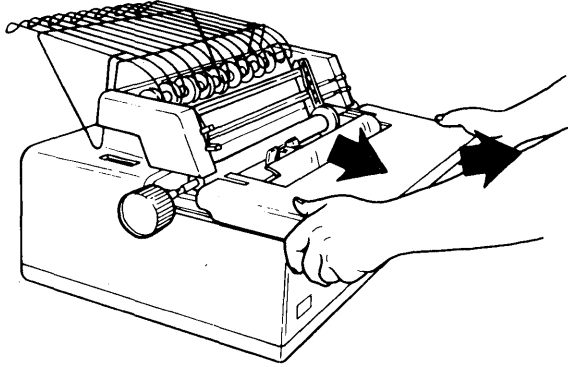


Chapter 3. Maintenance Procedures

3051 Access Cover

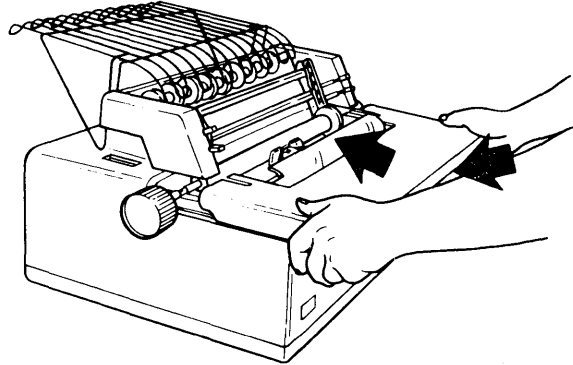
Removal

Slide the access cover toward the front of the printer and lift it off.



Reinstallation

Hold the front edge of the access cover higher than the rear edge and slide the cover onto the printer.



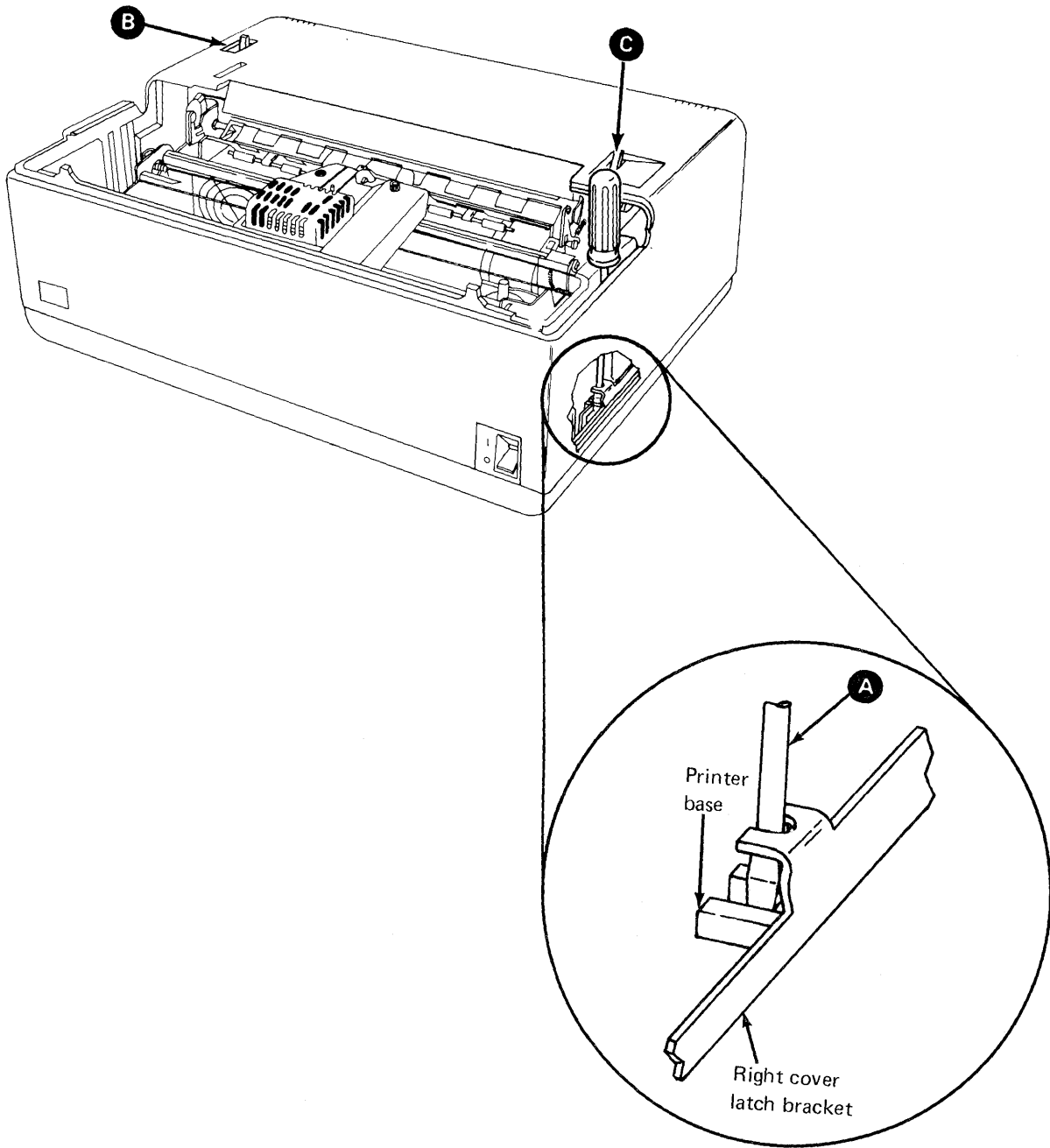
3052 Top Cover

Removal

1. Switch off the printer power.
2. Remove the forms tractor (3151).
3. Remove the access cover (3051).
4. Remove the platen (3101).
5. Remove the horizontal adjustment knob.
6. Move the paper-release lever **C** toward the front of the printer.
7. Set the mode switch **B** to the Wait position.
8. Using a screwdriver as shown at **B**, slide the right and left cover-latch brackets to the front to release the cover.
9. Lift the top cover off.

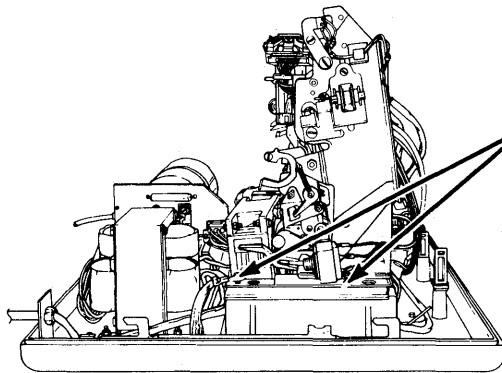
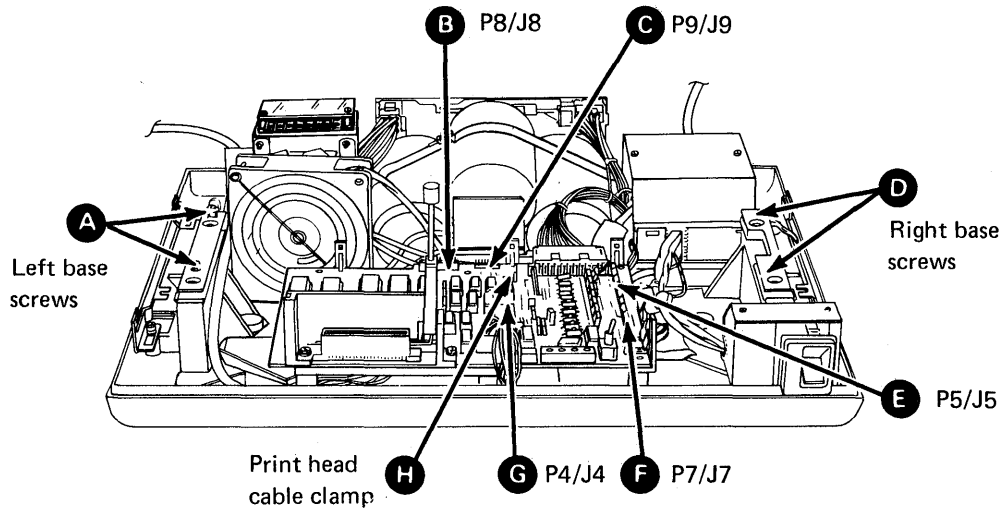
Reinstallation

1. Ensure that the paper-release lever is in the forward position.
2. Ensure that the mode switch **B** is in the straight up position.
3. Lower the top cover over the printer until the cover engages the base molding. The cover is self-aligning and only fits one way.
4. Using a screwdriver as shown at **A**, slide the right and left cover-latch brackets toward the rear until they are tightly under the cover latch springs.
5. Reinstall the horizontal adjustment knob.
6. Reinstall the platen (3101).
7. Reinstall the access cover (3051).
8. Reinstall the forms tractor (3151).

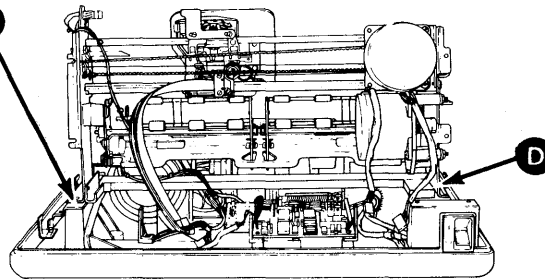


3053 Placing the Printer in the Service Position

1. Switch off the printer power.
2. Remove the top cover (3052).
3. Remove the logic/control board safety cover (3502).
4. Remove the print head cable clamp **H** and disconnect print cable connector P4 **G**.
5. Disconnect:
 - a. Forms feed emitter cable connector P9 **C**.
 - b. Motor cable connectors P5 **E** and P7 **F**.
 - c. End-of-forms/print emitter cable connector P8 **B**.
6. Remove the base screws **D** on the right end of the printer.
7. Loosen the base screws **A** on the left end of the printer.
8. Remove the paper deflector (3101).
9. Slide the printer to the right to clear the screws **A** and lift the printer from the printer base.
10. Place the printer into the service position on the base, and hold the printer in this position by installing a base screw **A** on the left side and a base screw **D** on the right side.



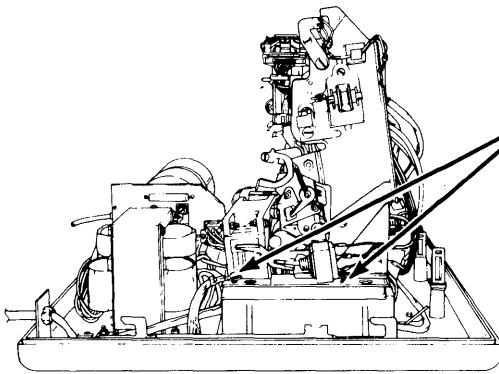
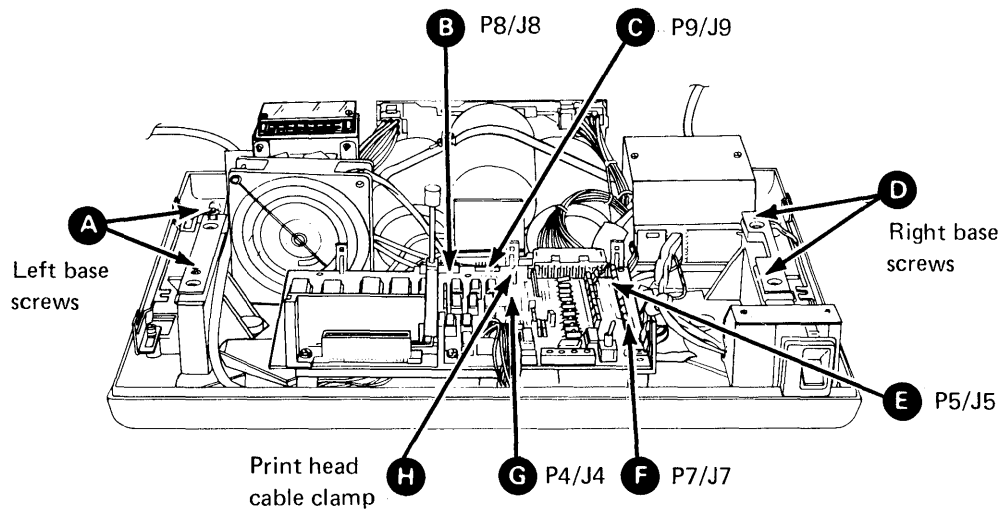
Left end view of service position



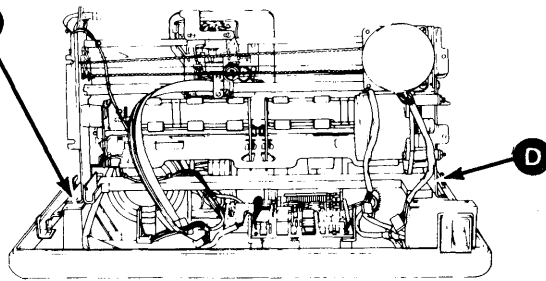
Front view of service position

3054 Placing the Printer in Operating Position

1. Remove the front base screw **D** on the right side, and loosen the front base screw **A** on the left side.
2. Place the printer back into the operating position on the printer base.
3. Reinstall and tighten the base screws **D** on the right side.
4. Tighten the base screws **A** on the left side.
5. Connect:
 - a. Forms feed emitter cable connector P9 **C**.
 - b. Motor cable connectors P5 **E** and P7 **F**.
 - c. End-of-forms/print emitter cable connector P8 **B**.
6. Connect print head cable connector P4 **G** and install the print head cable clamp **H**. Ensure that the print head cable is against the flat spring.
7. Reinstall the logic/control board safety cover (3502).
8. Reinstall the top cover (3052).



Left end view of service position



Front view of service position

3101 Platen and Paper Deflector

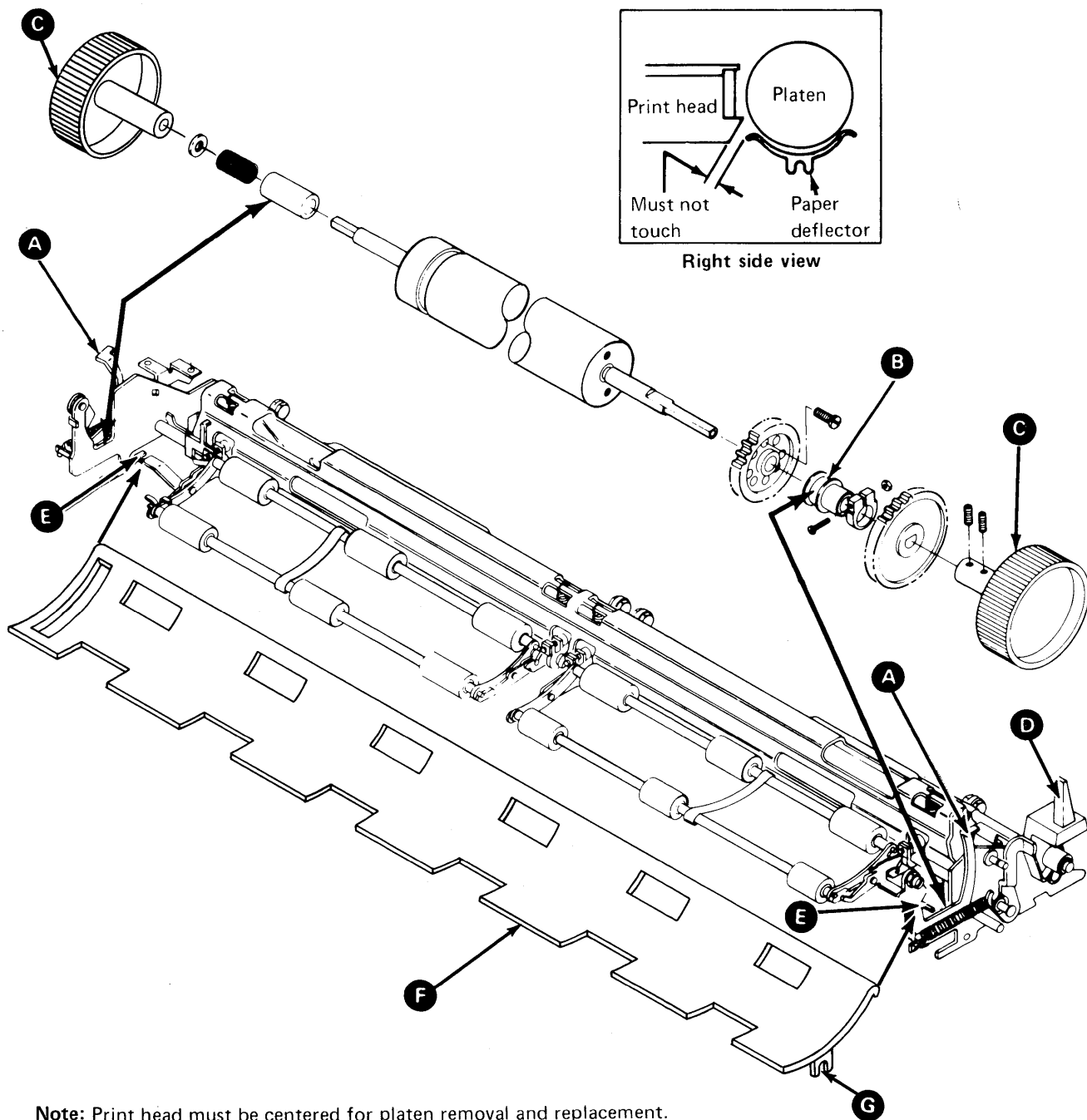
Removal

1. Switch off the printer power.
2. Remove the forms tractor (3151).
3. Remove the access cover (3051).
4. Move the print head to the center of the platen with your hand.
5. Lift both paper-advance knobs **C** while pressing down on both platen release levers **A**.
6. Remove the platen.
7. The paper deflector **F** may now be lifted out.

Reinstallation

1. Reinstall the paper deflector by placing it with the openings toward the front, ensuring that the slotted tabs **G** on the bottom of the deflector engage the locators **E** at each end.
2. Reinstall the platen as follows:
 - a. Set the paper-release lever **D** to the forward position.
 - b. Ensure that the paper deflector **F** is seated correctly, with the tabs **G** engaging the locators **E**.

Note: The locators may need adjusting. Refer to "3105 Platen Locator Tabs."
 - c. Move the print head to the center of the platen with your hand.
 - d. Align the groove **B** in the gear end of the platen shaft with the right side frame. Then, press down on both ends of the platen, ensuring that the gears mesh correctly.
 - e. Ensure that the platen release levers **A** are completely seated.
 - f. Move the paper-release lever **D** to the rear position.
3. Reinstall the access cover (3051).
4. Reinstall the forms tractor (3151).



Note: Print head must be centered for platen removal and replacement.

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3102 Platen Release

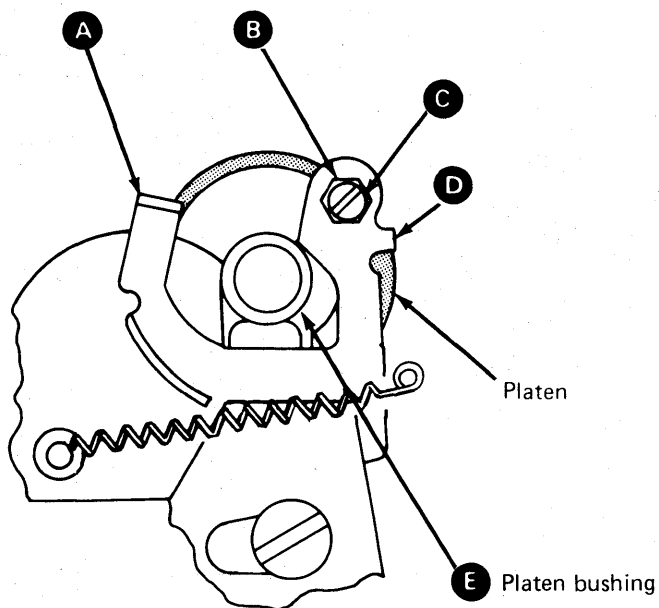
Service Check

1. Remove the access cover (3051).
2. Press down on either platen bushing **E**. The platen-release levers **A** should hold the bushings tightly against the frame; no movement should occur when removing pressure from the bushings.
3. If either bushing moved in step 2, perform the following adjustment:

Adjustment

This procedure is used for both the left and right adjusting nuts. However, when adjusting the left nut, ensure that the platen-release lever **A** does not touch the print head forms guide when the carrier moves to the extreme left **D**.

Left side view

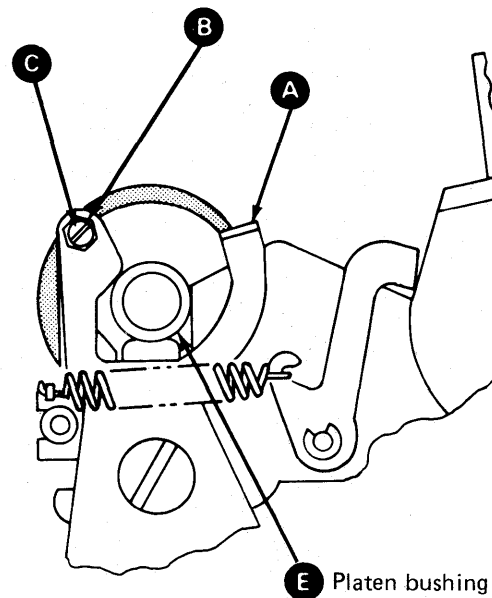


1. Switch off the printer power.
2. Remove the top cover (3052).
3. Reinstall the platen (3101).

Note: When adjusting the right nut, remove the right paper-advance knob and the forms tractor drive gear (3104).

4. Loosen the screw **C** that locks the nut **B** so that the screw is partially tight.
5. Press down the platen bushing **E** and turn the nut so when the bushing is released, the platen-release lever holds the bushing tightly against the frame.
6. Hold the nut **B** in this position and tighten the locking screw **C**.
7. Check the platen gear for binds (3201); adjust if necessary.
8. Remove the platen (3101).
9. Reinstall the top cover (3052).

Right side view



3103 Platen Pressure Rolls

Service Check

1. Remove the access cover (3051).
2. Remove the top cover (3052).
3. Check for a 1 mm (0.040 in.) gap between the pressure rolls **G** and the platen with the paper-release lever **E** in the forward position.
4. Move the paper release lever to the rear position.
5. Check for a 0.00 to 0.51 mm (0.00 to 0.020 in.) gap between the paper-release lever and platen.
6. Insert a 0.05 mm gauge (0.002 in.) between the platen and the pressure rolls at 1, 2, 3, and 4 (front and rear rolls). The pressure rolls should touch and put pressure on the platen.

If any of the adjustments are not correct, perform the adjustment.

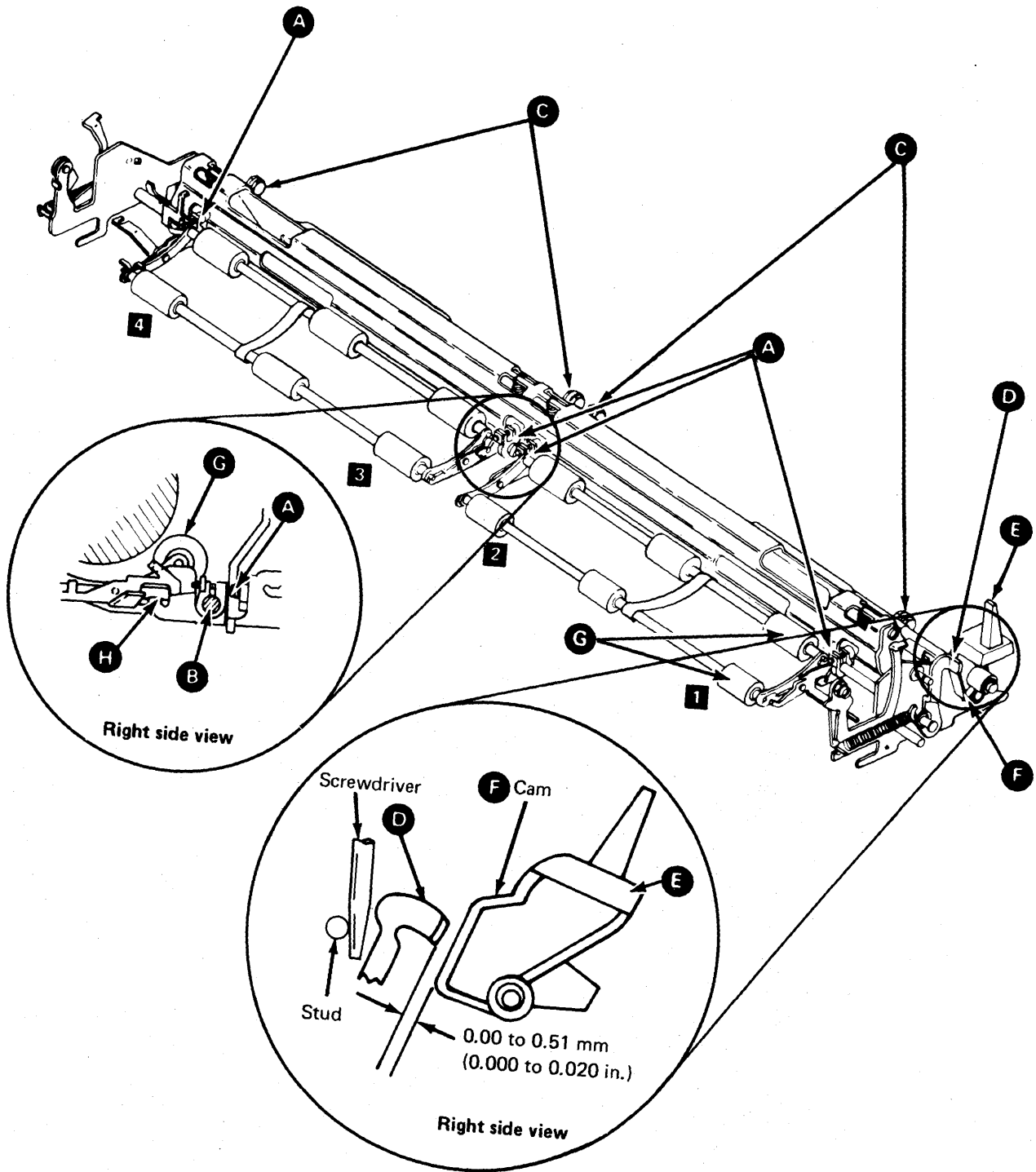
Adjustment

1. Switch off the printer power.
2. Remove the top cover (3052).
3. Remove the paper deflector (3101) and install the platen (do not install the paper deflector).
4. Put the paper-release lever **E** in rear position.
5. Loosen the four clamping hubs **A** along the paper-release lever shaft.
6. Loosen the end-of-forms switch override arm setscrew (3207).
7. Hold the cam follower **D** to the cam **F** by inserting a screwdriver between the stud and the cam follower.

8. Loosen the four nuts holding both pressure roll arm **C** assemblies.
9. Move the arms to the rear position; then move the arms forward until no gap is present between the rear pressure rolls and the platen; tighten the four nuts.
10. Check for drag on the pressure rolls **G** with a 0.05 mm (0.002 in.) gauge inserted between the platen and the pressure rolls.
11. Repeat steps 8,9, and 10 until the adjustment is correct.
12. Pivot the clamping hubs **A** toward the platen so that the bellcrank **H** seats on the bottom of the four openings; then tighten the four clamping hubs **A**.

Note: Ensure that all pressure rolls remain in contact with the platen when doing this adjustment.

13. Remove the screwdriver (inserted in step 7), move the paper-release lever **E** to the forward position, and check for 1 mm (0.040 in.) gap between the platen and the pressure rolls **G**.
14. Repeat steps 12 and 13 until the adjustment is correct.
15. Move the paper-release lever **E** to the rear position, and tighten the end-of-forms override arm setscrew; check the end-of-forms switch (3207), and adjust it if necessary.
16. Remove the platen (3101).
17. Reinstall the paper deflector (3101).
18. Reinstall the top cover (3052).



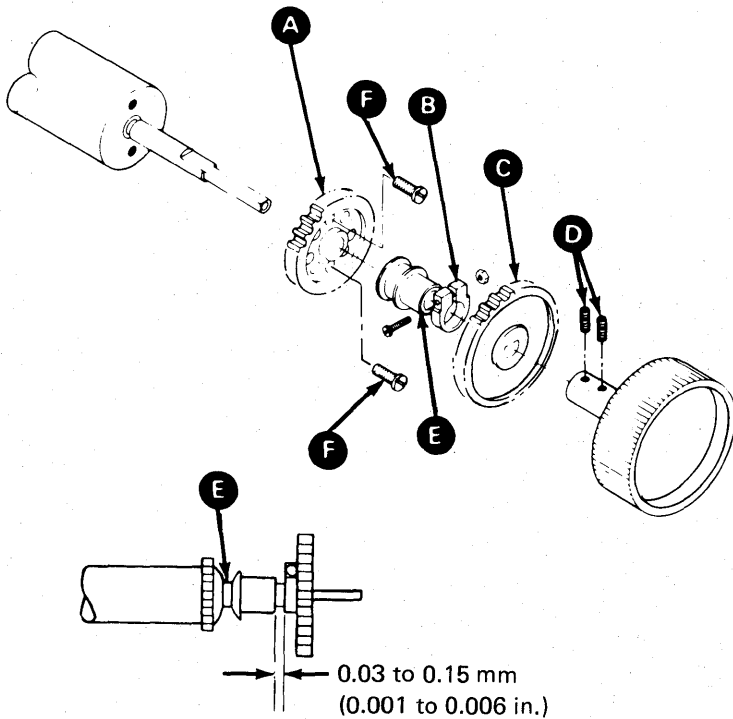
3104 Platen Gears

Removal

1. Switch off the printer power.
2. Remove the forms tractor (3151).
3. Remove the platen (3101).
4. Remove the paper-advance knob from the right end of the platen after removing the two setscrews **D**.
5. Loosen the clamping hub **B** on the forms tractor drive gear **C**.
6. Remove the gear **C** and the bushing **E**.
7. Remove screws **F** holding the platen gear **A**.
8. Remove the platen gear **A**.

Reinstallation

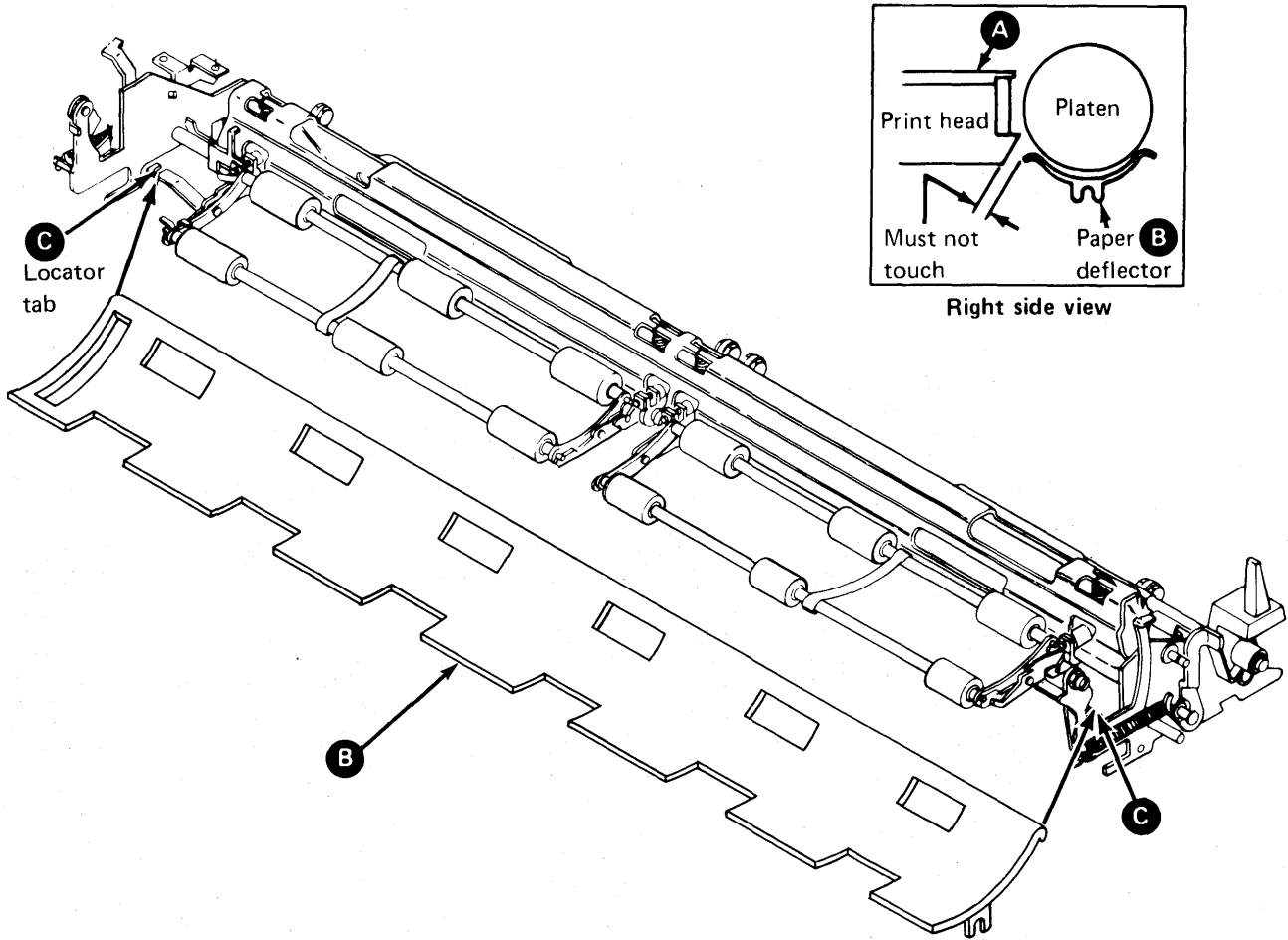
1. Reinstall the platen gear **A** on the platen shaft.
2. Reinstall and tighten the gear holding screws **F**.
3. Reinstall the bushing **E**.
4. Reinstall the forms tractor drive gear **C**. Tighten the clamping hub **B** so that the bushing **E** turns freely with a 0.3 to 0.15 mm (0.001 to 0.006 in.) gap to the gear hub **B**.
5. Reinstall the paper-advance knob and tighten the two setscrews **D**.
6. Reinstall the platen (3101).
7. Reinstall the forms tractor (3151).



3105 Platen Locator Tabs

Adjustment

1. Remove the access cover (3051).
2. Remove the platen (3101).
3. Set the copy-control dial to 0.
4. Bend the locator tabs **C** so that a gap is present between the paper deflector **B** and the print head tip **A**.
5. Move the print head and check the gap in the middle and right side of the print line.
6. Restore the copy-control dial to the original setting.
7. Reinstall the platen (3101).
8. Reinstall the access cover (3051).



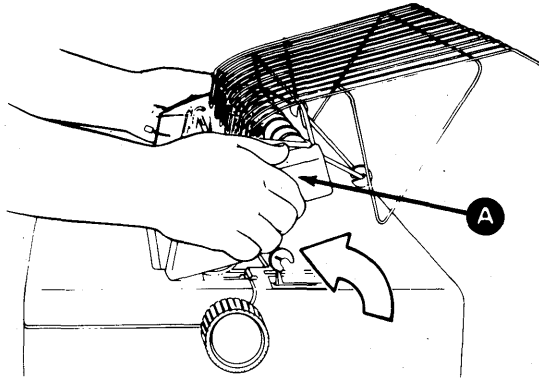
Note: Print head must be centered for platen removal and replacement.

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3151 Forms Tractor and Rear Document Insertion Device (RDID)

Removal

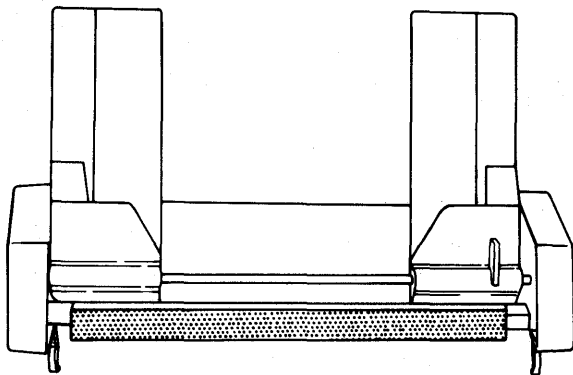
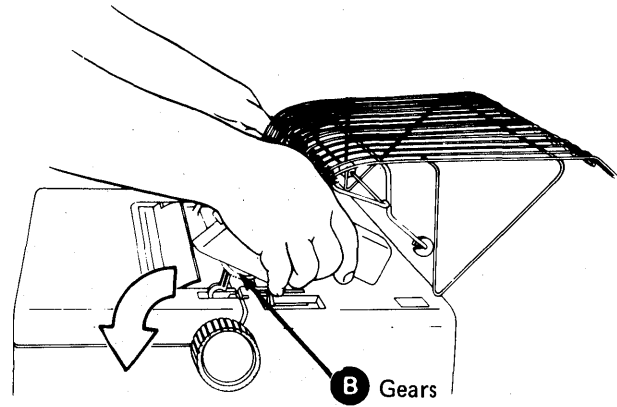
Remove forms from the unit. Grasp both end covers **A** and pivot the unit toward the front of the printer until the rear legs release; then lift straight up to clear the cover.



Reinstallation

Place the unit on top of the printer, and press on the end covers **A** to seat the rear legs into the rear openings. Then pivot the unit forward and press down to seat the front legs on the platen shaft.

Note: When installing the forms tractor, ensure that the gears **B** mesh correctly, the paper-advance knobs turn, and the forms tractors turn.

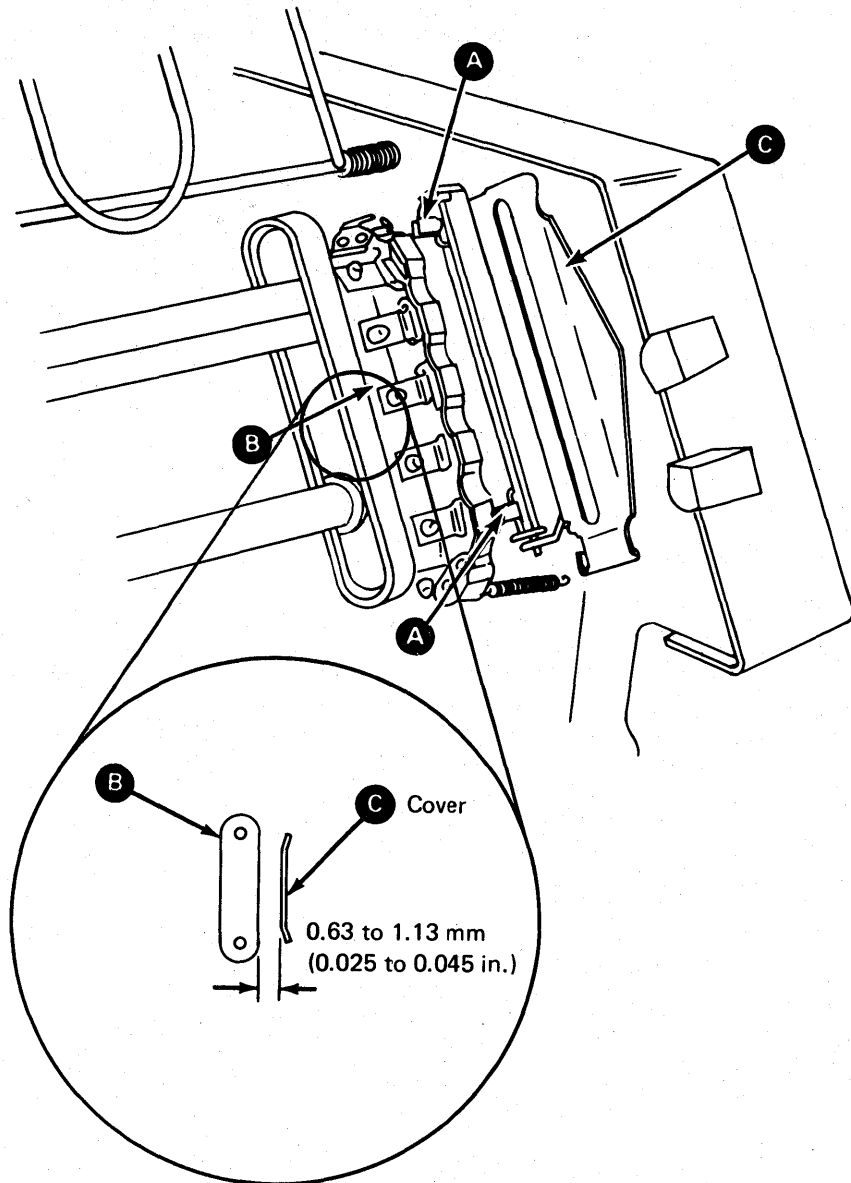


Rear document insertion device
(for use with cut forms)

3152 Forms Tractor

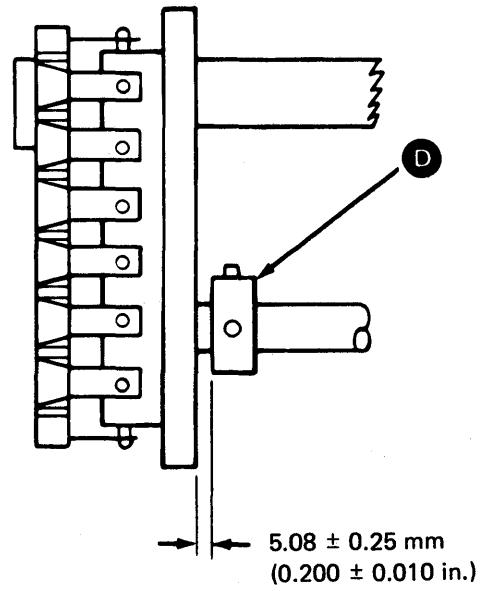
Chain Guide Adjustment

1. Switch off the printer power.
2. Form the cover stops **A** so that the gap between the chain guide **B** and cover **C** is 0.63 to 1.13 mm (0.025 to 0.045 in.).



Left Tractor Adjustment

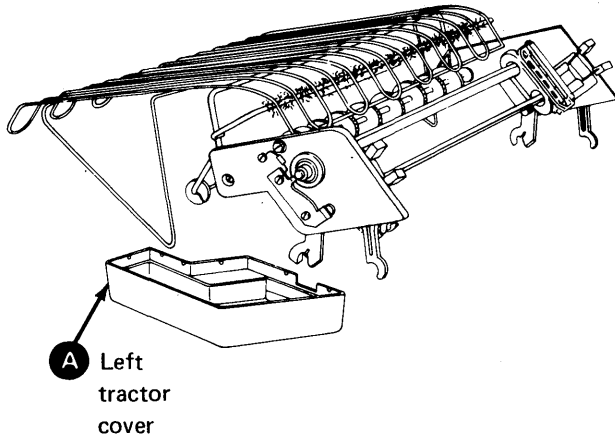
With the left tractor all the way to the left, adjust the collar **D** to permit 5.08 ± 0.25 mm (0.200 ± 0.010 -in.) movement of the tractor.



3153 Forms Guide Rack

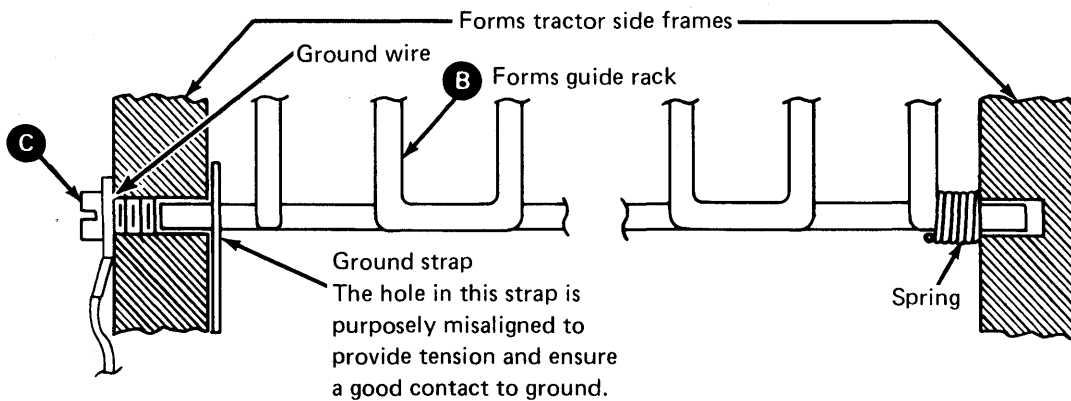
Removal

1. Remove the forms tractor (3151).
2. Pull off the left tractor cover **A**.
3. Remove the self-tapping screw **C** from the tractor left side frame.
4. Slide the forms guide rack **B** to the left until the right end clears the tractor right side frame.
5. Remove the forms guide rack.



Reinstallation

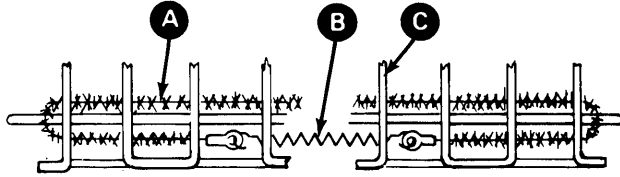
1. Insert the forms guide rack into the tractor left side frame through the hole in the ground strap. Slide the rack to the left until the right end clears the tractor right side frame; ensure that the spring is installed on the forms guide rack.
2. Slide the right end of the rack into the tractor right side frame.
3. Reinstall the screw **C** in the left side frame.
4. Reinstall the left tractor cover **A**.
5. Reinstall the forms tractor (3151).



3154 Static Eliminator

Removal

1. Disconnect the static eliminator **A** from the spring **B**.
2. Remove the static eliminator from the forms guide rack support bars **C**.



Forms guide rack viewed from the front showing detail of static eliminator installation.

Reinstallation

Reinstall the static eliminator **A** behind the forms guide rack support bars, as shown at **C**, so that it does not interfere with forms movement.

3155 Forms Tractor Side-Frame

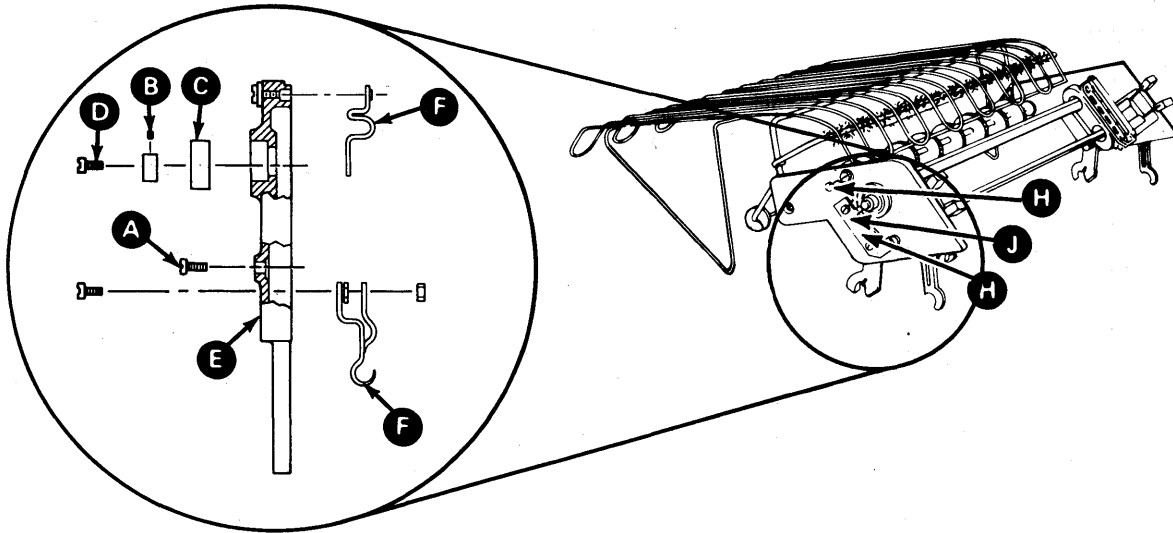
Left Side-Frame

Removal

1. Remove the forms tractor from the printer (3151).
2. Remove the forms guide rack (3153).
3. Remove the screw **A** from the support shaft.
4. Remove the screws **H** that hold the resistor **J** to the left side-frame. Also remove the two ground straps **F** that are in the left side-frame.
5. Loosen the two setscrews on the collar **B**; remove the collar.
6. Remove the screw **D** from the tractor roller shaft.
7. Remove the left side-frame **E** from the support and main shafts.
8. Remove the main shaft bearing **C** from the left side-frame.

Reinstallation

1. Reinstall the resistor **J** and the two ground straps **F**.
2. Reinstall the main shaft bearing **C**.
3. Reinstall the left side-frame **E** on the support and main shafts.
4. Reinstall the screw **D** on the tractor roller shaft.
5. Reinstall the collar **B** on the main shaft with the two set screws.
6. Reinstall the screw **A** on the support shaft.
7. Reinstall the forms guide rack (3153).
8. Reinstall the forms tractor on the printer (3151).
9. Set a CE meter to the Rx1 scale; check for approximately 0 ohms between the forms guide rack (3002) and the printer base. If the meter does not indicate approximately 0 ohms, perform step 1 of this procedure.



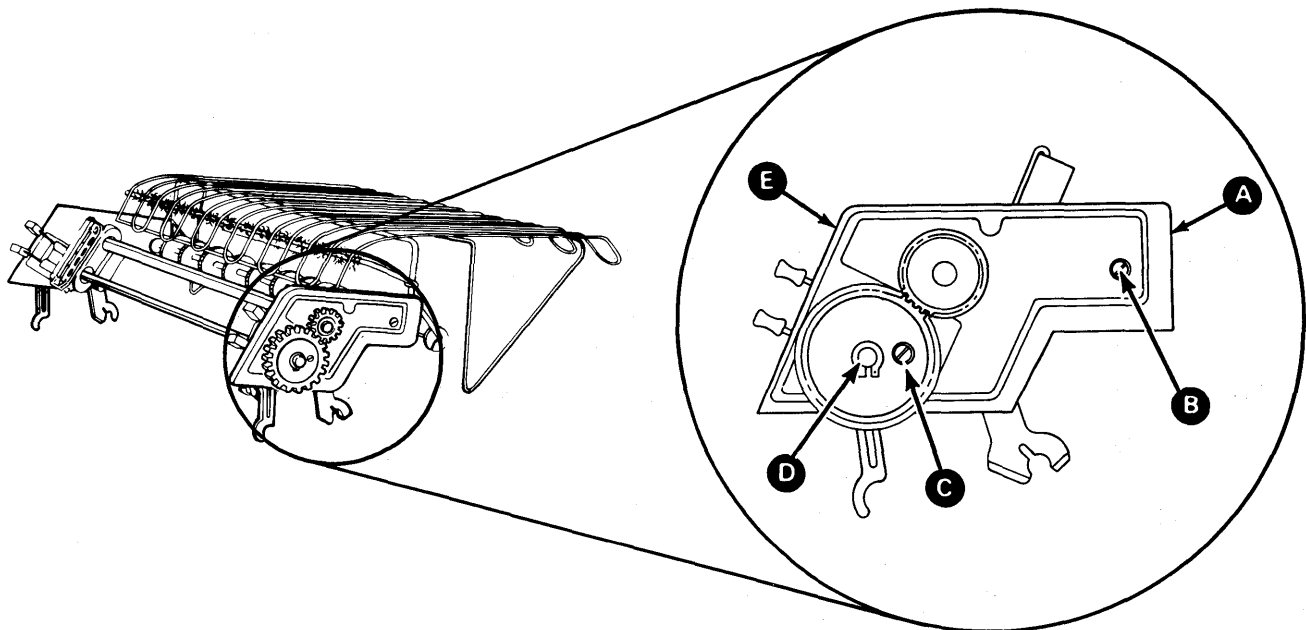
Right Side-Frame

Removal

1. Remove the forms tractor from the printer (3151).
2. Remove the forms guide rack (3153).
3. Remove the retaining clip **D** from the idler gear **E**; pull the idler gear off the shaft.
4. Loosen the two setscrews **B** on the collar; remove the collar.
5. Pull out the main shaft.
6. Remove the support shaft screw **C**.
7. Remove the screw **B** from the tractor roller shaft.
8. Pull the right side-frame **A** off the support shaft.

Reinstallation

1. Push the right side-frame **A** on the support shaft.
2. Reinstall the screw **C** on the support shaft.
3. Reinstall the screw **B** on the tractor roller shaft.
4. Reinstall the main shaft.
5. Reinstall the collar **B** on the main shaft with the two set screws; ensure that the tractor pins are aligned.
6. Push the idler gear **E** onto the shaft and install the retaining clip **D**.
7. Reinstall the forms guide rack (3153).
8. Reinstall the tractor (3151).



3201 Forms Feed Platen Gear

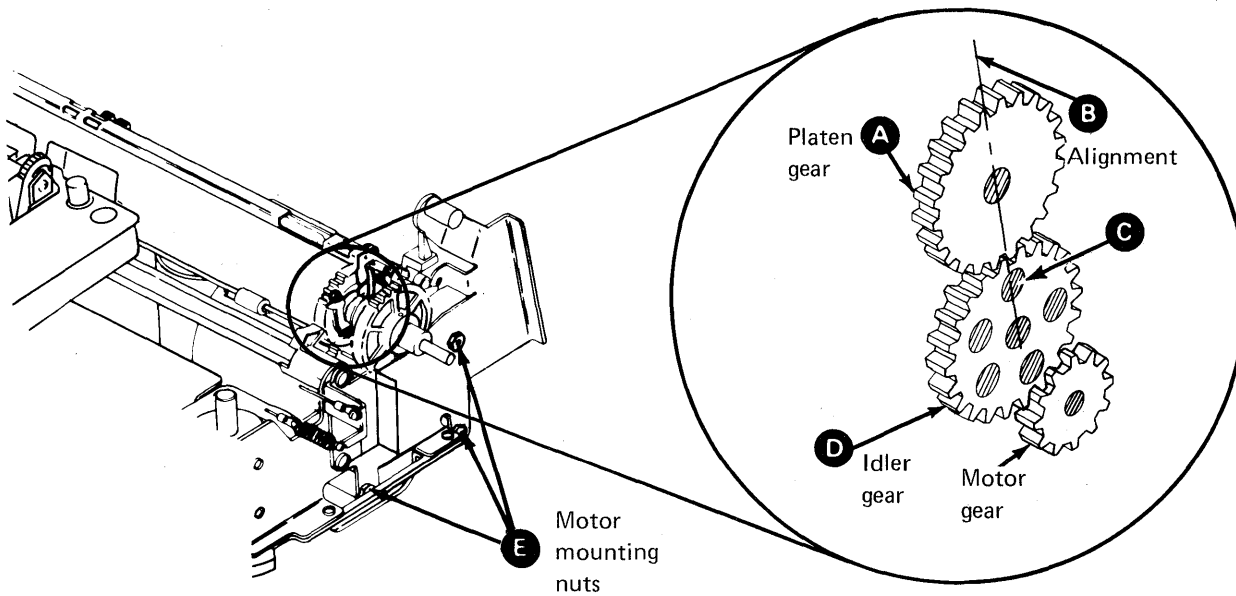
Service Check

1. Switch off the printer power.
2. Turn the platen knobs one rotation. If a bind occurs, perform the following adjustment:

Adjustment

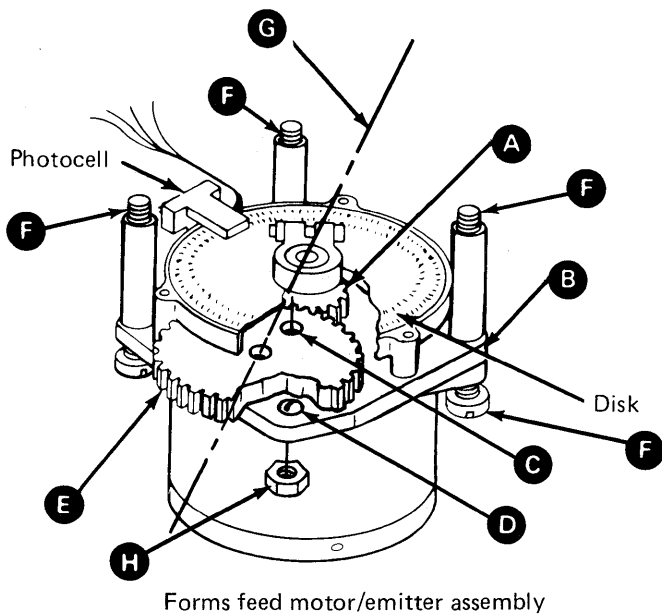
1. Switch off the printer power.
2. Remove the top cover (3052).
3. Loosen the three forms feed stepper motor/emitter mounting nuts **E**.

4. Turn the gears until one of the holes **C** in the idler gear is radially aligned with the gear shafts, as shown at **B**.
5. Reinstall the platen (3101).
6. Place the stepper motor up and to the rear so that the gears mesh tightly.
7. Tighten the three mounting nuts **E**.
8. Check for binds and adjust again if necessary.
9. Remove the platen (3101).
10. Reinstall the top cover (3052).



3202 Forms Feed Motor Gear Adjustment

1. Switch off the printer power.
2. Remove the top cover (3052).
3. Remove the printer from the printer base and place the printer in the service position (3053).
4. Remove the forms feed stepper motor/emitter assembly (3203).
5. Loosen the three screws **F** that hold the emitter base **B** on the stepper motor.
6. Turn the gear **E** so that the screw **D** can be loosened by inserting a screwdriver through the hole **C** in the gear **E**.
7. Turn the gears so that the hole **C** in the idler gear is radially aligned with the gear shafts **G**.
8. Turn the emitter base **B** on the motor so that the idler gear **E** and the motor gear **A** mesh tightly.
9. Tighten the screws **D** and **F**, and the nut **H**.
10. Check for binds and adjust again, if necessary.
11. Reinstall the stepper motor assembly.
12. Check the platen gear for binds (3201) and adjust, if necessary.
13. Assemble the printer to the printer base (3053).
14. Perform the forms feed motor adjustment (3205).
15. Reinstall the top cover (3052).



3203 Forms Feed Motor/Emitter

Removal

1. Switch off the printer power.
2. Remove the top cover (3052).
3. Place the printer in the service position (3053).

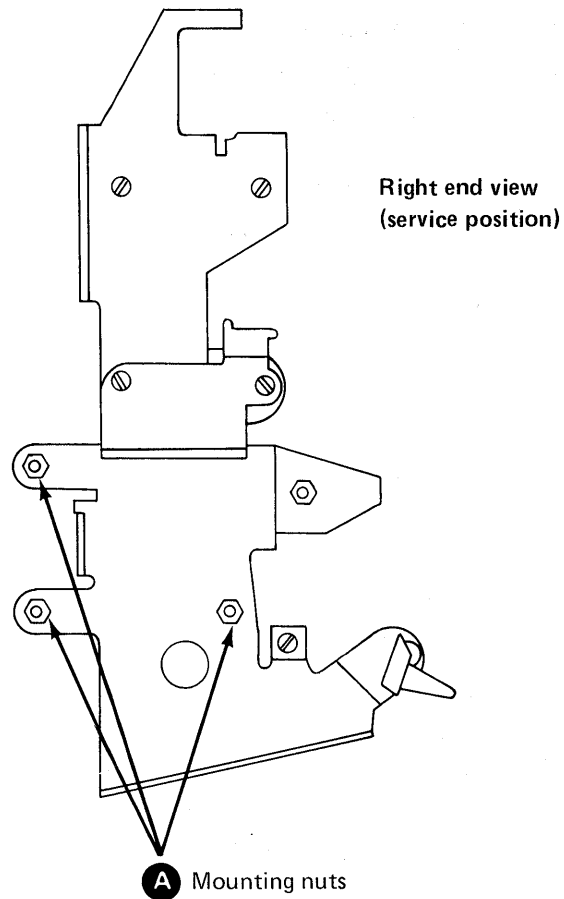
CAUTION

The forms feed motor may be hot.

4. While holding the forms feed motor, remove the three mounting nuts **A** from the right side frame.
5. Disconnect the forms motor cable from J5 (3005).
6. Disconnect the forms emitter connector J9 (3005).
7. Remove the motor/emitter assembly.

Reinstallation

1. Reinstall the forms feed motor on the right side frame. Perform the platen gear adjustment (3201) before completely tightening the mounting nuts **A**.
2. Connect the forms emitter connector J9 (3005).
3. Connect the forms motor connector J5 (3005).
4. Check the emitter adjustments (3205) and adjust, if necessary.
5. Assemble the printer to the printer base (3053).
6. Reinstall the top cover (3052).

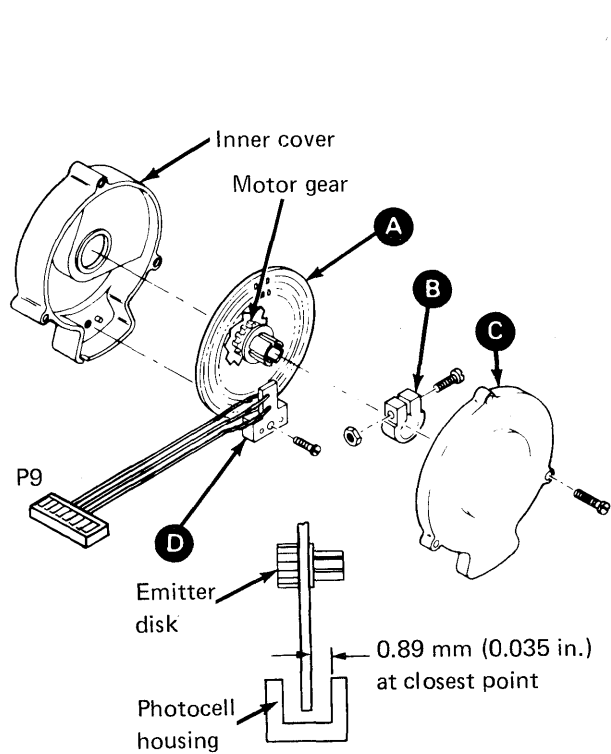


3204 Forms Feed Emitter Adjustment

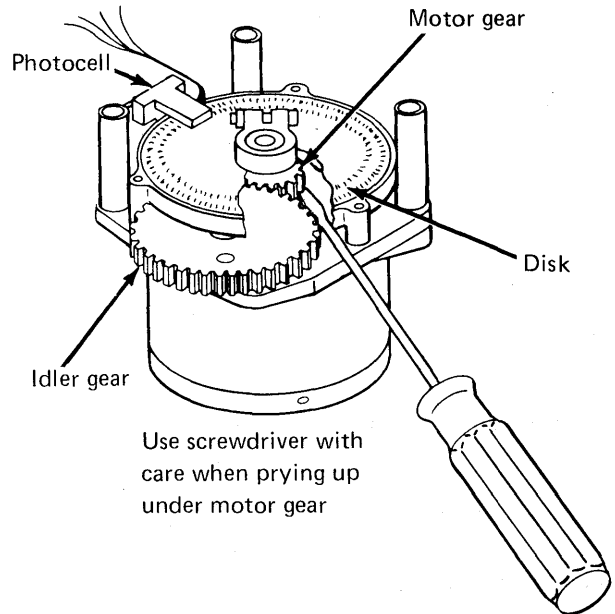
1. Remove the forms feed motor/emitter assembly (3203).
2. Remove the emitter cover **C**.
3. Loosen the clamping hub **B** and center the disk **A** in the photocell assembly **D**.

CAUTION

Do not scratch the black paint around the disk openings.



4. Adjust the emitter disk to photocell clearance for a minimum of 0.089 mm (0.035 in.).
5. Check the gap at several points around the disk.
6. Tighten the clamping hub **B**.
7. Check the gap and adjust again, if necessary.
8. Reinstall the emitter cover **C**.
9. Reinstall the forms feed motor/emitter assembly (3203).
10. Perform the forms feed motor adjustment (3205).



3205 Forms Feed Motor Adjustment

Service Check

1. Switch off the printer power.
2. Remove the access cover (3051).
3. Switch on the printer power.
4. Set the switch **G** to the on position.
5. Set the test switch **E** to the test mode.
6. Ensure that the paper-release lever **B** is in the rear position.
7. Ensure that the mode switch **D** is toward the front of the printer.
8. Look at the display **F**. The adjustment is correct if all lights are off or if only light 1 is on. If light 2, light 4, light 8, or any combination of lights 2, 4, and 8 are on, then perform the adjustment.

Adjustment

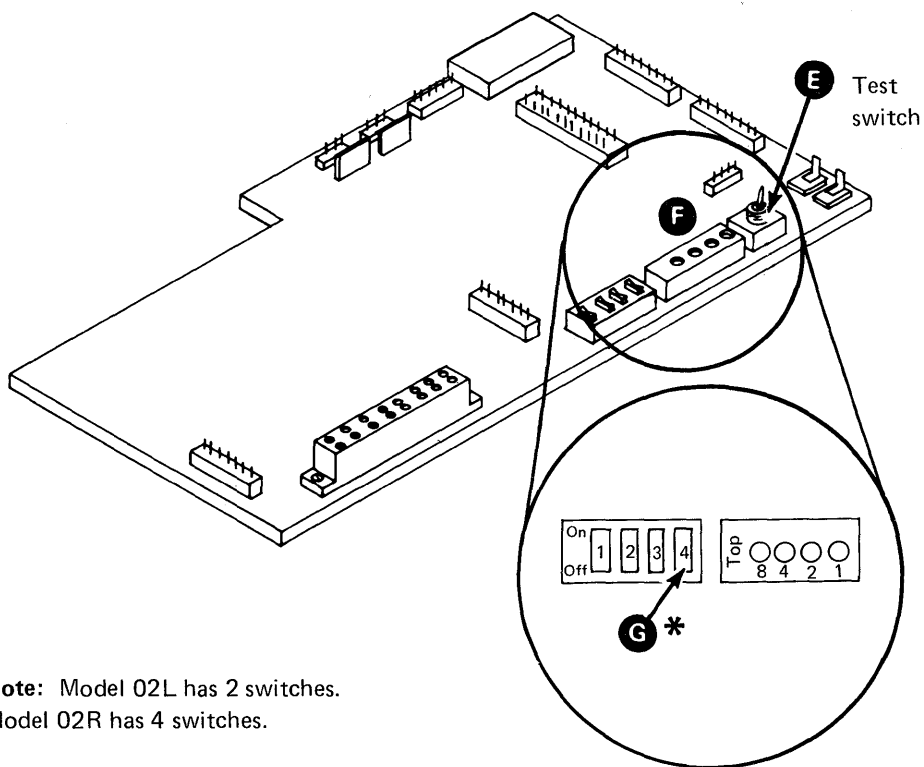
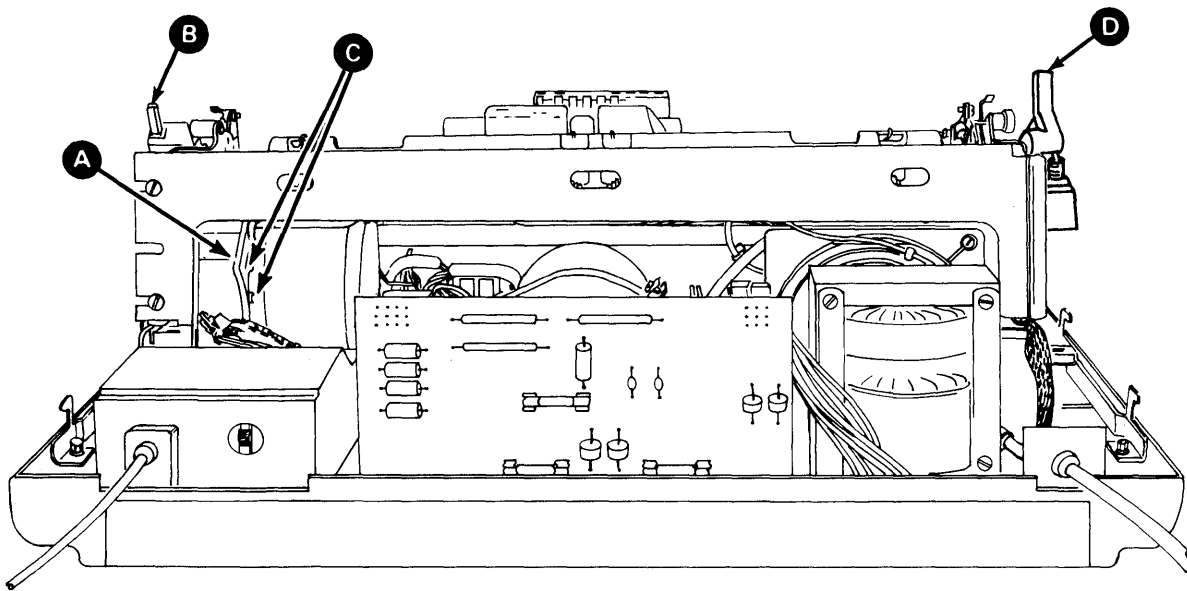
1. Switch off the printer power.
2. Return the mode switch to the Wait position.
3. Remove the top cover (3052).
4. Set the switch **G** to the on position.
5. Set the test switch **E** to the test mode.
6. Ensure that the paper-release lever **B** is in the rear position.

7. Ensure that the mode switch **D** is toward the front of the printer.
8. Switch on the printer.
9. Partially loosen the two screws **C** so that the emitter housing **A** can be moved. The screws should be tight enough to keep the emitter from sliding down.

Note: The 8-light indicates that the emitter setting is beyond limits. Move the emitter in either direction to make the 8-light turn off; then continue with this procedure.

10. Move the emitter housing **A** up or down to make the display **F** indicate the lowest possible number (all lights off).
11. Tighten one of the screws **C** until an indicator turns on. Tighten the other screw **C** until the indicator turns off.
12. Repeat the previous step until the two screws **C** are tight.
13. Perform the service check.
14. Remove the platen (3101).
15. Reinstall the top cover (3052).

Note: The forms feed motor may run backward if this adjustment is not correct.

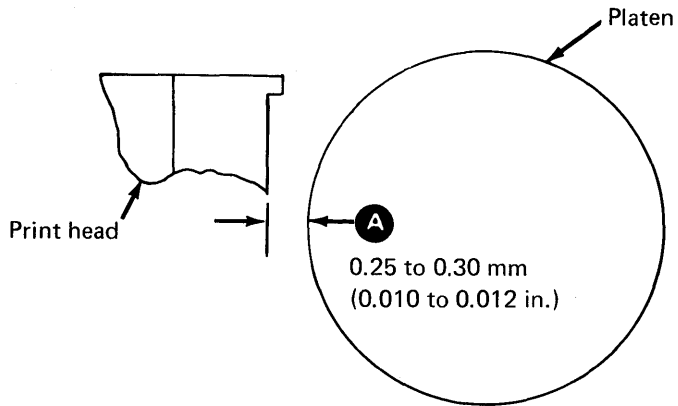


* Note: Model 02L has 2 switches.
 Model 02R has 4 switches.

3206 A-frame Alignment

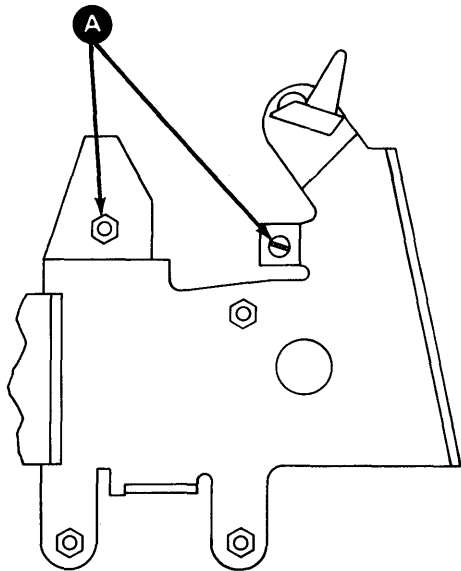
Service Check

1. Switch off the printer power.
2. Remove the top cover (3052).
3. Remove the ribbon shield (3355).
4. Set the copy-control dial to 0.
5. Measure the gap **A** between the platen and the print head at both ends of the platen. The gap should be 0.25 to 0.30 mm (0.010 to 0.012 in.).
6. If the gap at either end is not correct, perform the following adjustment starting at step 5.

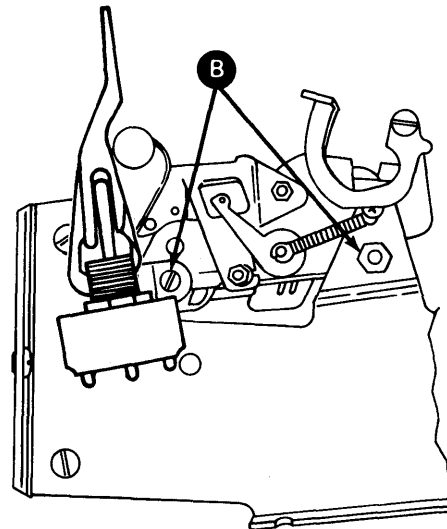


Adjustment

1. Switch off the printer power.
2. Remove the top cover (3052).
3. Remove the ribbon shield (3355).
4. Set the copy-control dial to 0.
5. Loosen the A-frame mounting screws **A** or **B** in the printer side frame at the end that needs adjustment.
6. Tap on the A-frame side plate to obtain a gap of 0.025 to 0.30 mm (0.010 to 0.012 in.).
7. Tighten the A-frame mounting screws. Check the gap and adjust again, if necessary.
8. After adjusting either end of the A-frame, always check the other end to ensure that the gap is still correct.
9. Reinstall the ribbon shield (3355).
10. Check the platen gear for binds (3201) and adjust, if necessary.
11. Check the end-of-forms switch adjustment (3207) and adjust, if necessary.
12. Reinstall the top cover (3052).
13. Set the copy-control dial for correct printing (3357).



Right end



Left end

3207 End-Of-Forms Switch

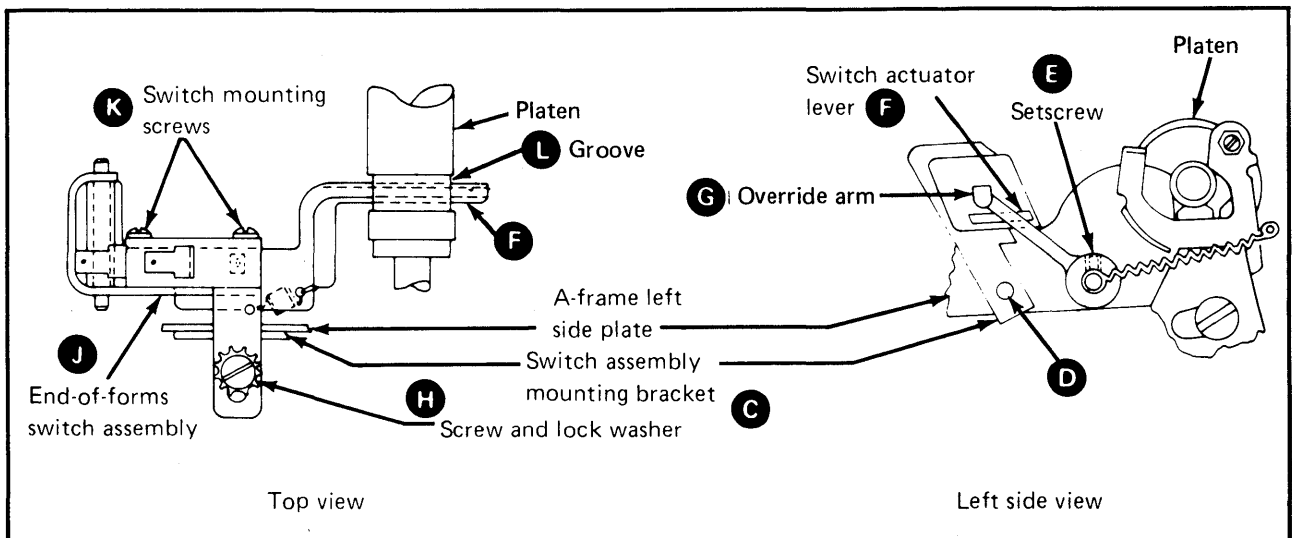
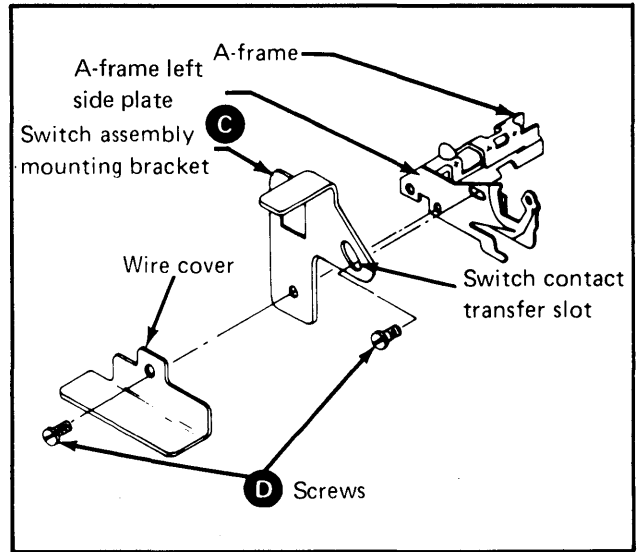
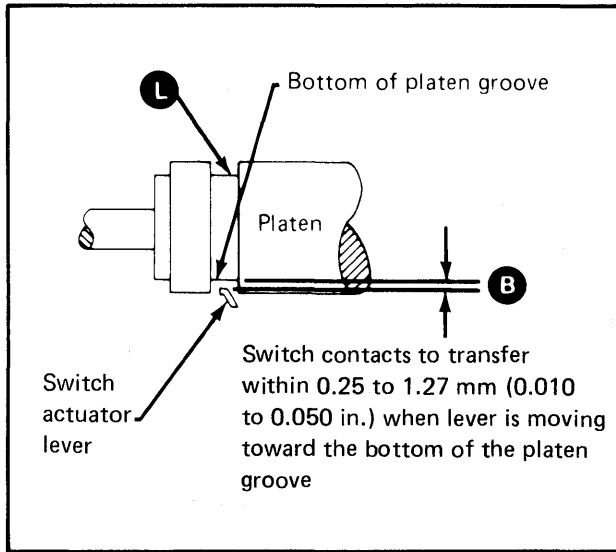
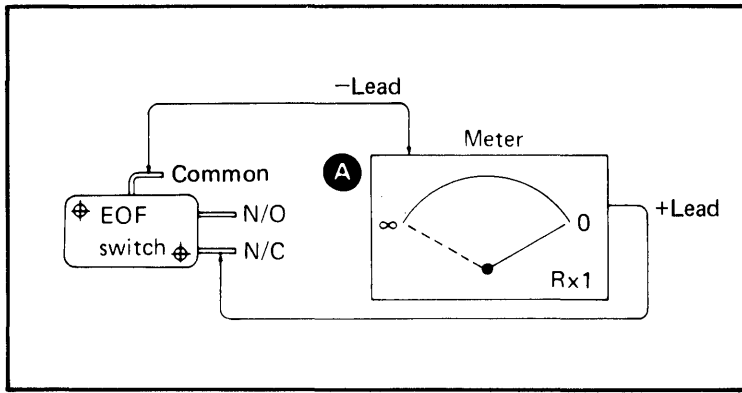
Service Check

1. Switch off the printer power.
2. Remove the top cover (3052).
3. Remove the paper deflector and reinstall the platen (3101).
4. Ensure that the actuator lever **F** is approximately centered in the platen groove **L**. If not, loosen the end-of-forms switch assembly mounting screw **H** and move the assembly **J** so that the actuator lever is centered.
5. Set a CE meter to the R x 1 scale.
6. Connect the positive CE meter lead to N/C and the negative lead to the switch common **A**.
7. Check that the contacts transfer from 0.25 to 1.27 mm (0.010 to 0.050 in.) from the bottom of the platen groove **L** while moving the platen-release lever forward and backward.

Adjustment

1. Perform the pressure roll service check (3103).
2. Switch off the printer power.
3. Remove the top cover (3052).
4. Move the paper-release lever to the forward position.
5. Remove the paper deflector and install the platen (3101).
6. Ensure that the actuator lever **F** is approximately centered in the platen groove **L**. If not, loosen the end-of-forms switch assembly mounting screw **H** and move the assembly **J** so that the actuator lever is centered.

7. Set a CE meter to the R x 1 scale.
8. Connect the positive CE meter lead to N/C and the negative lead to the switch common **A**.
9. Loosen the holding screws **D** and pivot the switch assembly mounting bracket **C** forward.
10. Insert a 0.76 mm (0.030 in.) gauge between the top of the actuator lever and the bottom of the platen groove **L**. Slowly pivot the mounting bracket toward the rear until the switch contacts open.
11. Tighten the screws **D**.
12. Check, and adjust again if necessary.
13. Remove the platen (3101).
14. Reinstall the paper deflector and the platen (3101).
15. Move the paper-release lever backward and forward to ensure that the switch override arm **G** opens and closes the switch contacts.
16. Move the paper-release lever to the rear position.
17. Put sheets of paper together until they have a thickness of 0.30 to 0.51 mm (0.012 to 0.020 in.). Place the paper between the platen and the actuator lever.
18. Loosen the setscrew **E** and pivot the override arm so that the end of the arm stops on top of the actuator lever, without moving the lever.
19. Tighten the setscrew.
20. Check and adjust again if necessary.
21. Disconnect the CE meter.
22. Remove the platen (3101).
23. Reinstall the top cover (3052).



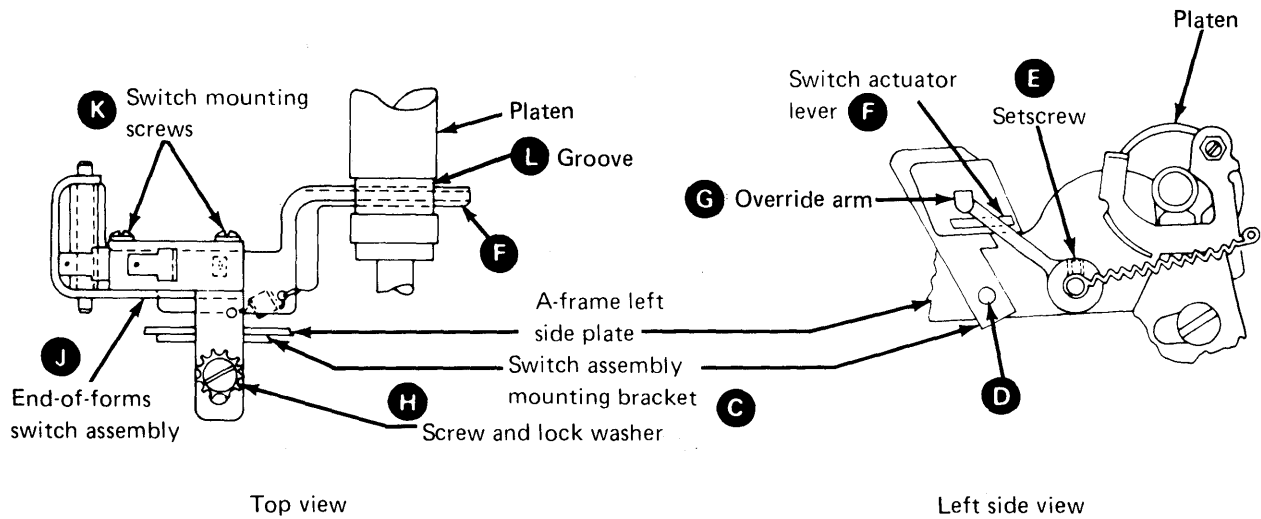
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Removal

1. Switch off the printer power.
2. Remove the top cover (3052).
3. Label and remove the wires from the end-of-forms switch.
4. Remove the end-of-forms switch assembly **J** by removing the screw and lock washer **H**.
5. Remove the switch from the assembly by removing the two mounting screws **K**.

Reinstallation

1. Reinstall the switch wires.
2. Reinstall the switch on the switch assembly **J**.
3. Reinstall the end-of-forms switch assembly.
4. Connect the wires to the switch.
5. Perform the end-of-forms switch adjustment (3207) starting at Step 3.



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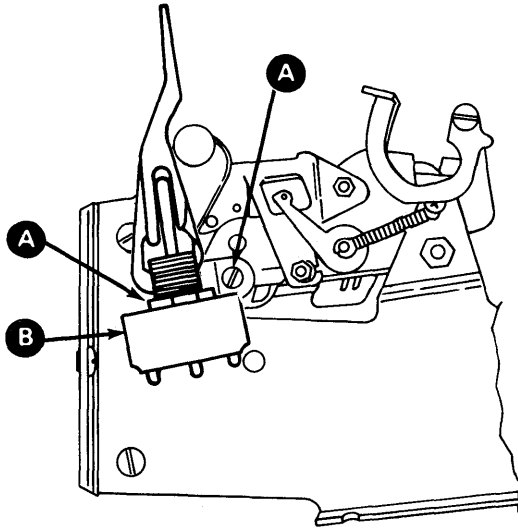
3208 Mode Switch

Service Check

Ensure that the wires to the mode switch are securely attached to the switch.

Removal

1. Remove the top cover (3052).
2. Label and remove wires from the mode switch **B**.



3. Remove the bracket mounting screws **A**.
4. Remove the switch from the bracket.

Reinstallation

1. Reinstall the mode switch in the switch bracket.
2. Reinstall the bracket on the side plate with the mounting screws **A**.
3. Reinstall the wires on the mode switch **B**.
4. Reinstall the top cover (3052).

3251 Print Emitter

Hold-Down Bracket Adjustment

1. Switch off the printer power.
2. Remove the top cover (3052).
3. Loosen the two screws **E**.
4. Push the emitter hold-down bracket **F** down and toward the rear when tightening the screws. The bracket is adjusted for two conditions:
 - a. You must not have any vertical movement of the print emitter board **D**.
 - b. The emitter board must slide freely when the horizontal fine adjustment shaft **B** is turned in either direction.
5. Reinstall the top cover (3052).

Print Emitter Removal

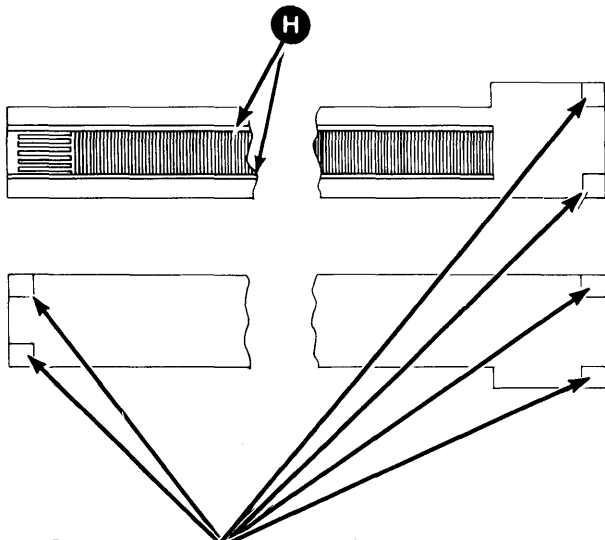
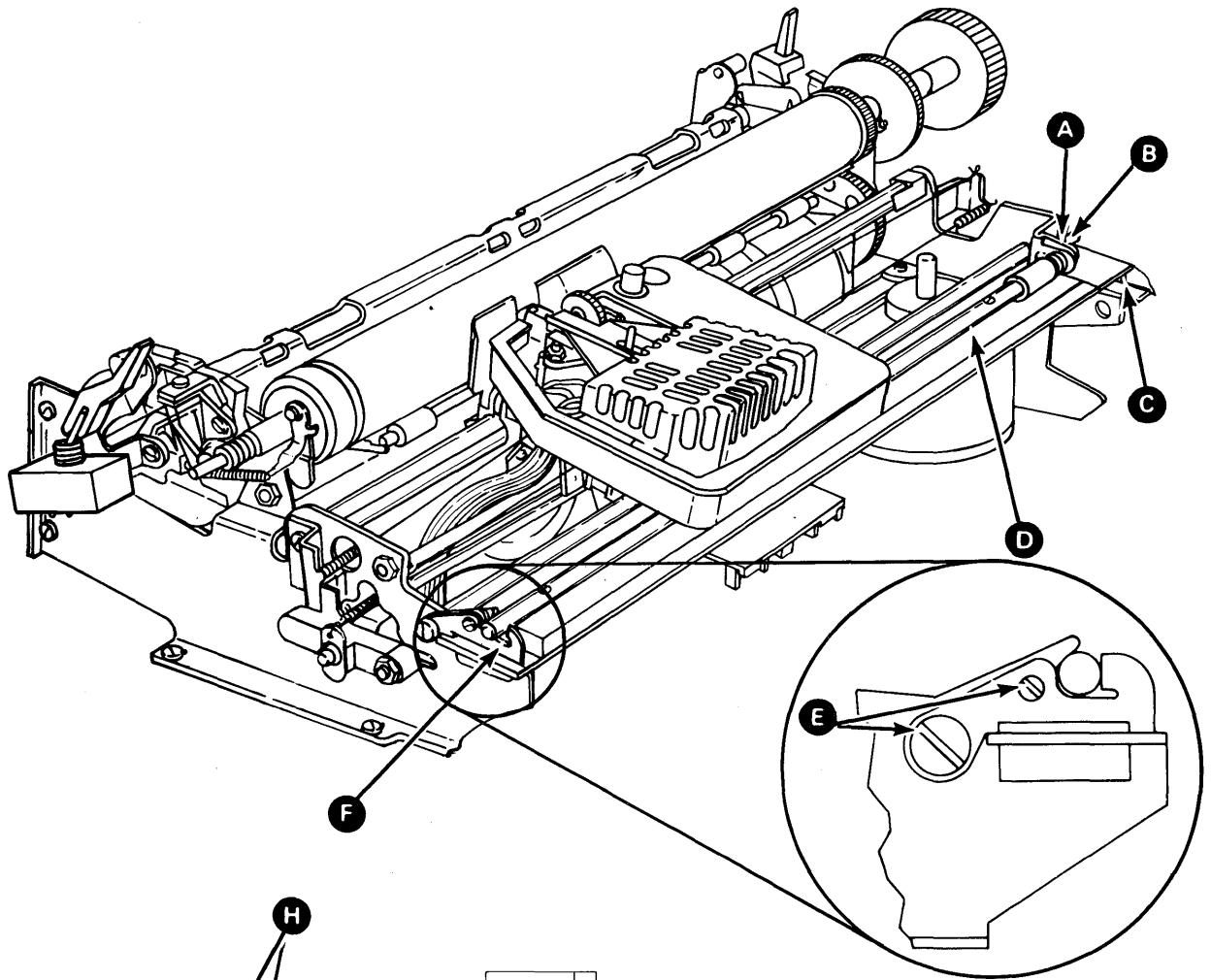
1. Switch off the printer power.
2. Remove the top cover (3052).
3. Disconnect P8 **C** from the emitter board.
4. Remove the emitter hold-down bracket **F** by removing the two screws **E**.
5. Remove the emitter support shaft retaining screw **A** from the right end of the shaft.

Note: The horizontal adjustment shaft and the spring **B** also come off; retain both.

6. Remove the emitter board **D** by pulling out the left end.

Print Emitter Replacement

1. When installing the emitter, put a light coating of IBM No. 23 grease on the bearing strips **H** and side frame contact points **J**. Also, install the spring **B**.
2. Reinstall the horizontal adjustment shaft **B** and the emitter support shaft retaining screw **A** at the right end of the support shaft.
3. Reinstall the emitter hold-down bracket **F**, but do not tighten the screws.
4. Perform emitter hold-down bracket adjustment.
5. Connect P8 **C** to the emitter board.
6. Perform the emitter adjustment (3253).
7. Reinstall the top cover (3052).



J Side frame contact points

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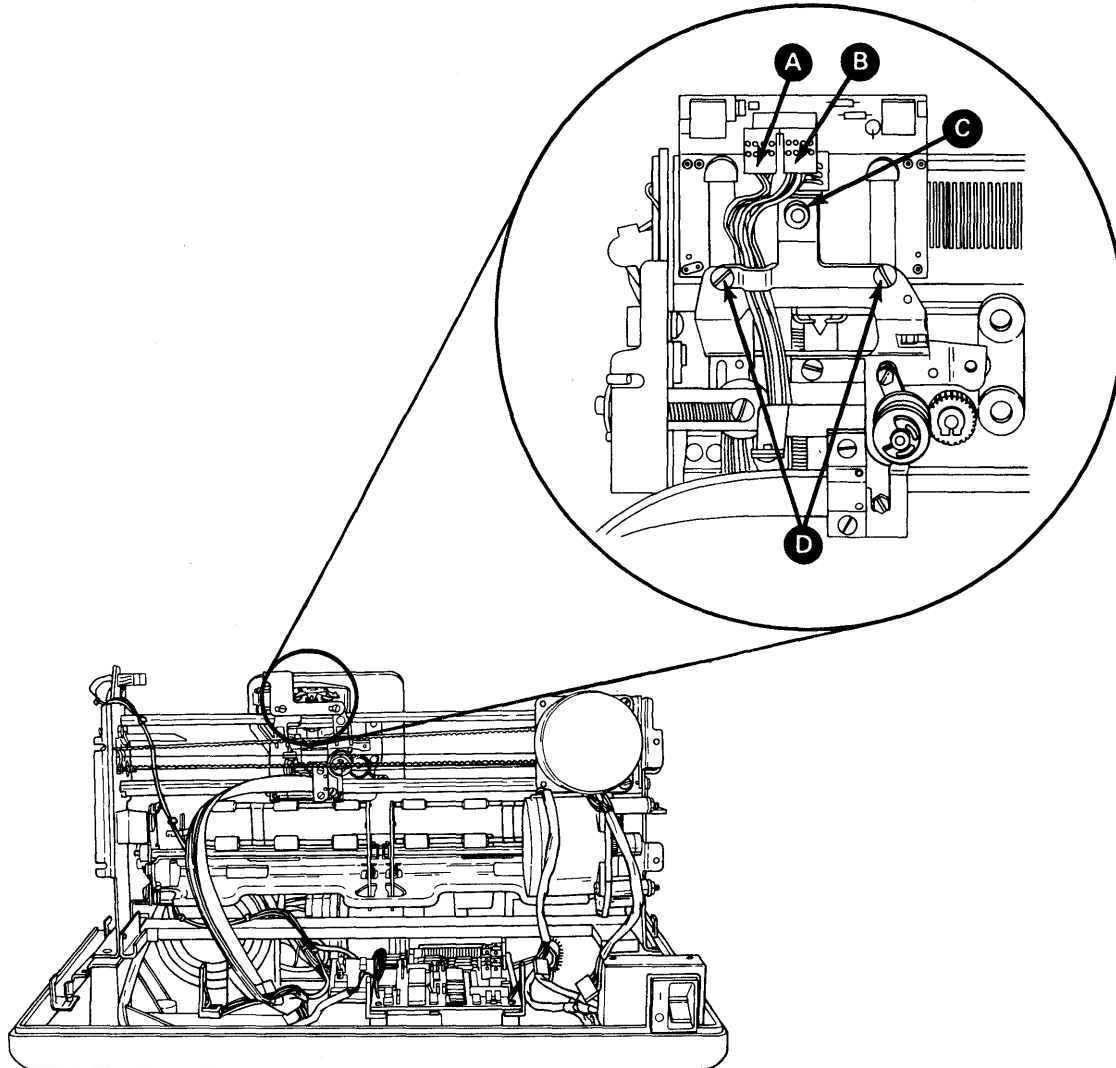
3252 Print Emitter Pickup

Removal

1. Switch off the printer power.
2. Remove the top cover (3052).
3. Place the printer in the service position (3053).
4. Disconnect P10A from J10A **A** and P10B from J10B **B**.
5. Remove the two screws **D** that hold the emitter pickup and the clamp to the carrier; do not lose the spring at **C**.

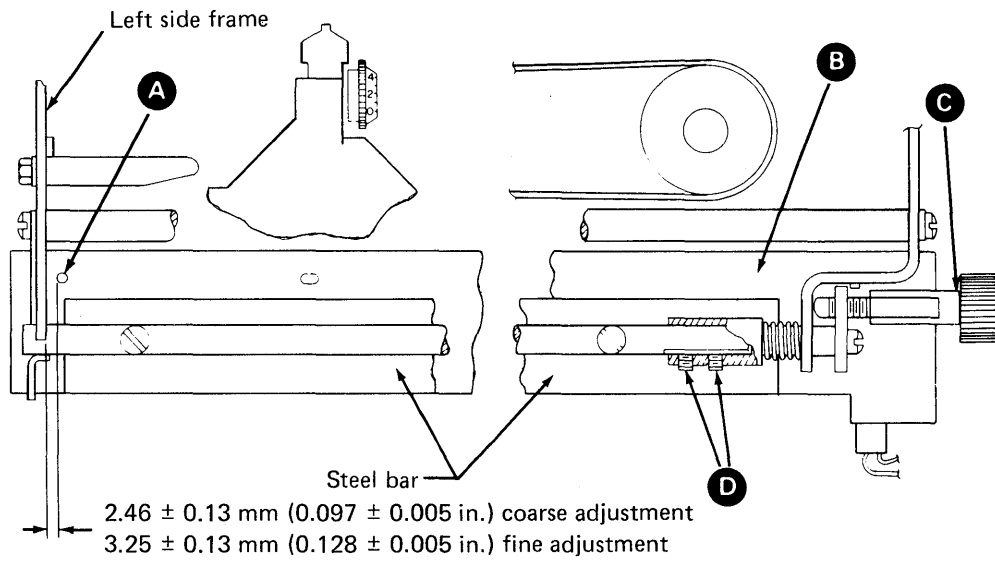
Reinstallation

1. Ensure that the coil spring is located between the emitter pickup and the clamp at **C**; then install the two screws **D**.
2. Connect P10A and P10B, as shown.
3. Perform the print-emitter to print-emitter pickup adjustment (3253).

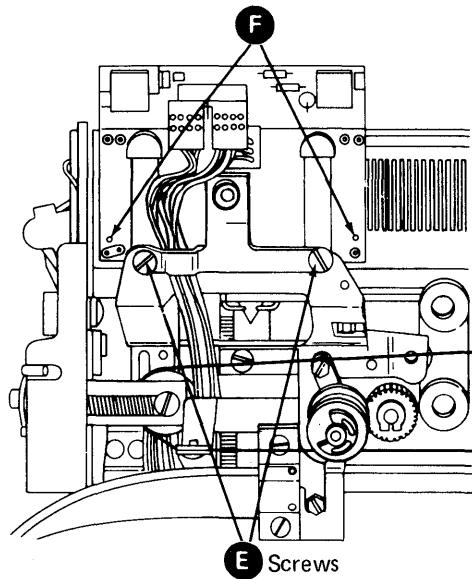


3253 Print Emitter Adjustment

1. Switch off the printer power.
2. Remove the top cover (3052).
3. Place the printer in the service position (3053).
4. Reinstall the horizontal adjustment knob **C**.
5. Move the emitter assembly **B** as far to the left as possible by turning the horizontal adjustment knob counterclockwise.
6. Loosen the coarse adjustment setscrews **D**.
7. Slide the emitter assembly as far to the right as possible. Do not touch the horizontal adjustment knob.
8. Move the print head carrier all the way to the right.
9. Insert a code plate alignment tool (part 460028) into the leftmost alignment hole **A** in the emitter assembly.
10. Slide the emitter assembly to the left until the gap between the alignment tool and the left side frame is 2.46 ± 0.13 mm (0.097 ± 0.005 in.). Do not touch the horizontal adjustment knob.
11. Tighten the coarse adjustment setscrews **D**.
12. Turn the horizontal adjustment knob to obtain a gap of 3.25 ± 0.13 mm (0.128 ± 0.005 in.) between the alignment tool and the left side frame.
13. Remove the alignment tool.
14. Loosen the two screws **E** that fasten the emitter pickup to the carrier.
15. Move the print head against the left side frame.
16. Insert the code plate alignment tools through both holes **F** in the emitter pickup and into the holes in the emitter assembly. Do not touch the horizontal adjustment knob.
17. Ensure that the alignment tools are in place and the print head carrier is tightly against the left side frame. Tighten the two screws **E**.
18. Remove the alignment tools.
19. Assemble the printer to the printer base (3053).
20. Remove the horizontal adjustment knob.
21. Reinstall the top cover (3052).



Top view



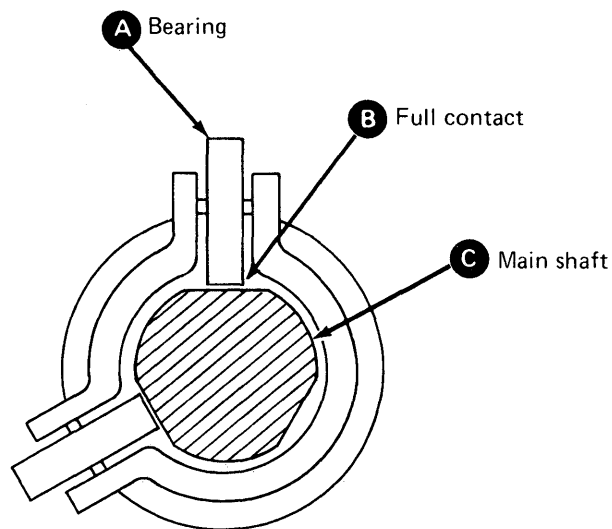
Printer in service position

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3301 Carrier and Main Shaft

Adjustment

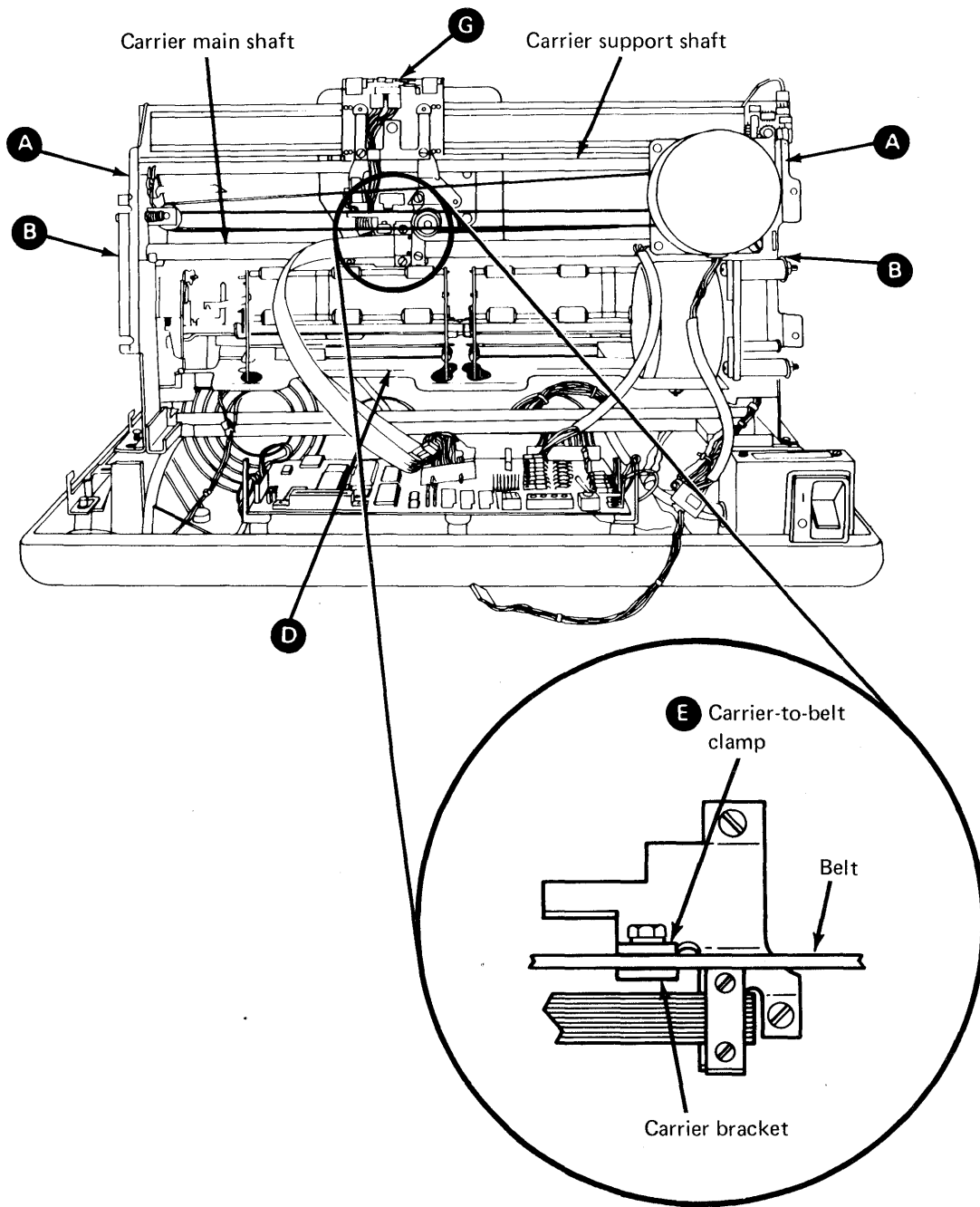
1. Switch off the printer power.
2. Remove the top cover (3052).
3. Adjust the carrier main shaft, which has three flat sides, as follows:
 - a. Loosen the holding screws at each end of the main shaft **C**.
 - b. Place the shaft so that the full width of the carrier bearing **A** rolls on the shaft flat surface **B**.
 - c. Hold the shaft in this position with an adjustable wrench (do not damage the flat



- surfaces) and tighten the holding screws at each end of the shaft.
- d. To check the adjustment, insert a strip of carbon paper, approximately 5 mm (0.2 in.) wide and 127 mm (5 in.) long, between the bearing and shaft **B**.
- e. Roll the carrier bearing over the carbon paper.
- f. Check for a smooth, even mark. Adjust again if necessary.
4. Reinstall the top cover (3052).

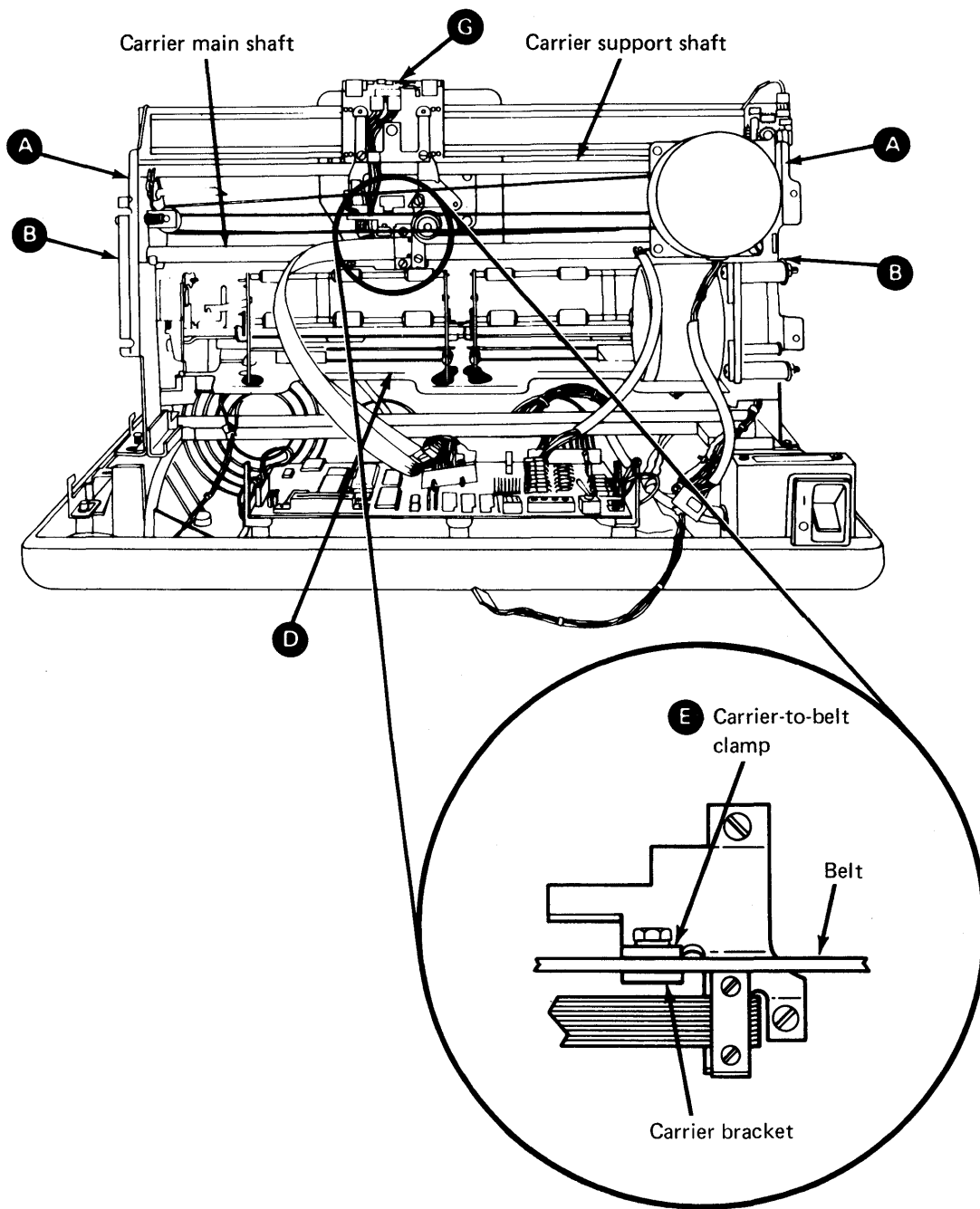
Removal

1. Switch off the printer power.
2. Remove the top cover (3052).
3. Remove the ribbon cartridge (3405).
4. Remove the print head (3351).
5. Place the printer in the service position (3053).
6. Remove the belt clamp **E**.
7. Remove the print emitter pickup (3252) **G**.
8. Unwind the ribbon drive cords from the drive clutches; do not disconnect the springs attached to the side frames.
9. Remove the screws **B** from each end of the carrier main shaft.
10. Loosen the screws **A** in the ends of the carrier support shaft. Pull the side frames apart enough to release the main shaft.
11. Pivot the carrier and main shaft around the carrier support shaft to clear the A-frame **D**.
12. Remove the carrier and the shaft.
13. Remove the ribbon drive assembly (3401) from the carrier.



Reinstallation

1. Reinstall the ribbon drive assembly (3401) on the carrier.
2. Pivot the carrier and main shaft around the carrier support shaft to clear the A-frame **D**; place the assembly back into the printer.
3. Tighten the screws **A** in the ends of the carrier support shaft.
4. Reinstall and tighten the screws **B** in each end of the carrier main shaft.
5. Reinstall the ribbon drive cords (3404).
6. Reinstall the print emitter pickup (3252).
7. Reinstall the carrier belt clamp **E**. Ensure that the belt alignment is correct before tightening the clamp (3305).
8. Perform the print emitter adjustment (3253).
9. Assemble the printer to the printer base (3053).
10. Reinstall the print head (3351).
11. Reinstall the ribbon cartridge (3405).
12. Perform the carrier main shaft adjustment.
13. Reinstall the top cover (3052).



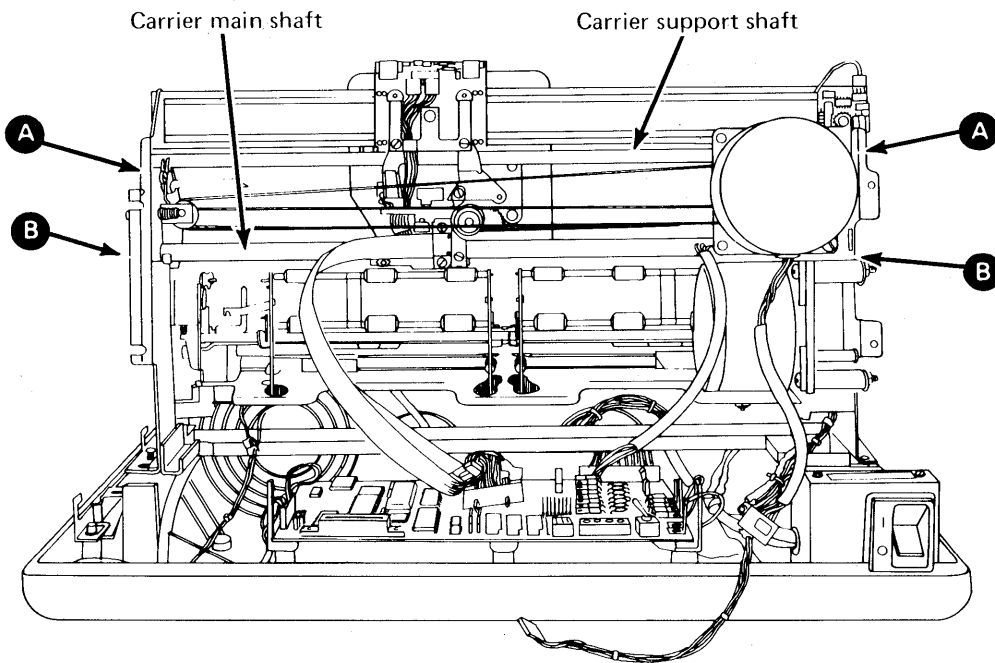
3302 Carrier Support Shaft

Removal

1. Switch off the printer power.
2. Remove the top cover (3052).
3. Place the printer in the service position (3053).
4. Remove the print emitter (3251).
5. Loosen the screws **B** in each end of the carrier main shaft.
6. Remove the screws **A** from each end of the carrier support shaft.
7. Pull the side frames apart enough to release the support shaft; remove the shaft.

Reinstallation

1. Reinstall the carrier support shaft and tighten the screws **A**.
2. Tighten the screws **B** in each end of the carrier main shaft.
3. Reinstall the print emitter (3251).
4. Perform the carrier main shaft adjustment (3301).
5. Perform the print-emitter to pickup adjustment (3253) and carrier support shaft adjustment.
6. Assemble the printer to the printer base (3053).
7. Reinstall the top cover (3052).



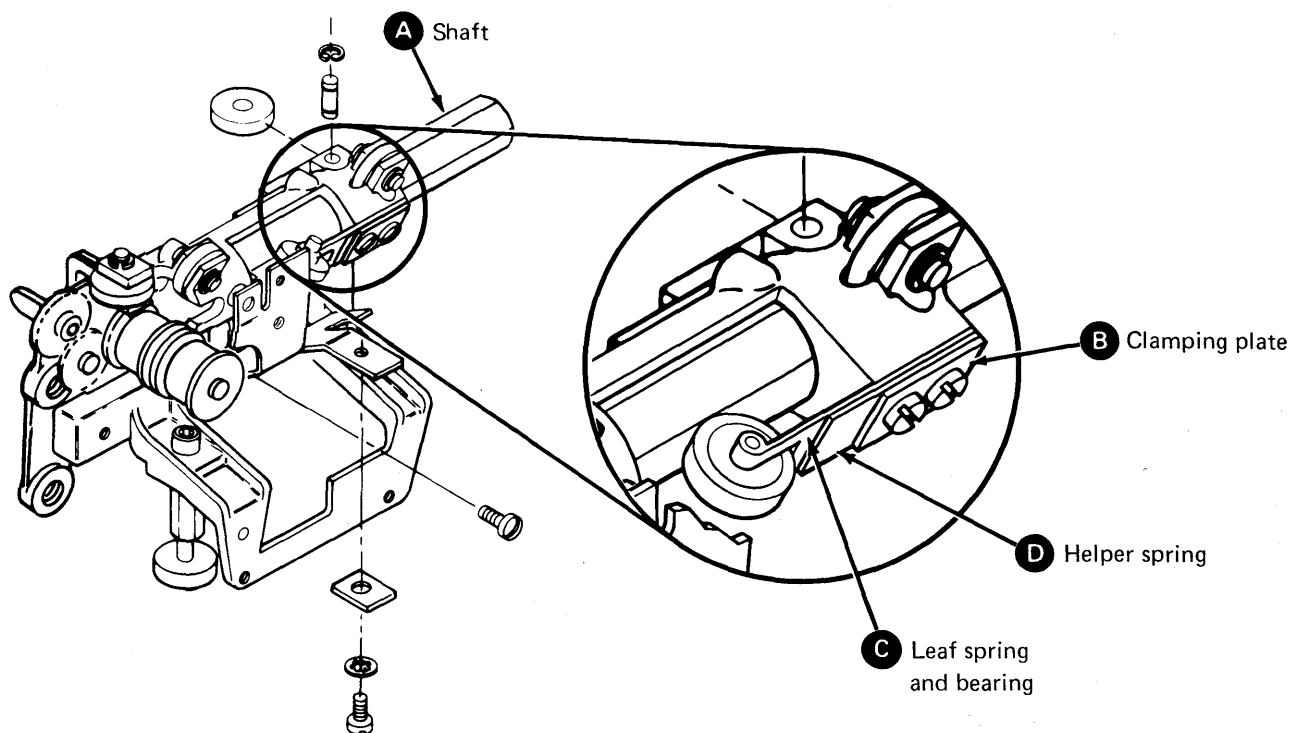
3304 Carrier Leaf Spring, Helper Spring, and Bearing

Removal

1. Switch off the printer power.
2. Remove the top cover (3052).
3. Place the printer in the service position (3053).
4. Remove the two screws from the leaf spring, helper spring, and bearing assembly **C**, and remove the assembly.

Reinstallation

1. Reinstall the leaf spring, helper spring, and bearing assembly using the two screws. Ensure that the long end of the clamping plate **B** and helper spring **D** are toward the bearing.
2. Ensure that the helper spring **D** is positioned between the clamping plate **B** and the carrier leaf spring **C**.
3. Ensure that the bearing surface is parallel to the flat surface of the shaft **A**. Check by looking through the holes in the left side frame. Proper alignment here is important.
4. Assemble the printer to the printer base (3053).
5. Reinstall the top cover (3052).



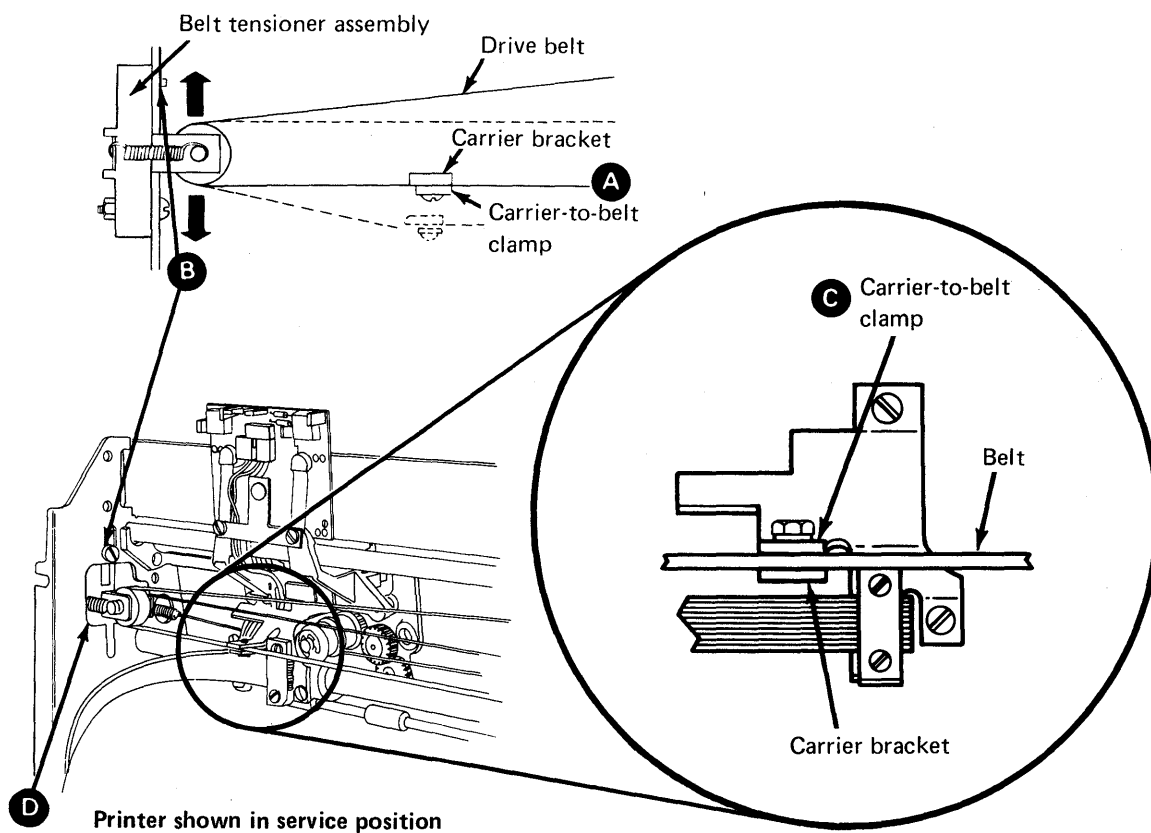
3305 Carrier Belt Tensioner

Removal

1. Switch off the printer power.
2. Remove the top cover (3052).
3. Loosen the carrier-to-belt clamp **C**; slip the belt out of the clamp.
4. Remove the belt from the motor pulley.
5. Remove the screw **B** and the belt tensioner assembly **D**.

Reinstallation

1. Reinstall the belt tensioner but do not tighten the screw **B** completely.
2. Reinstall the belt on the motor pulley.
3. Slip the belt into the carrier-to-belt clamp.
4. Move the belt tensioner as shown by the arrows, so that the drive belt **A** is aligned with the carrier bracket.
5. Tighten the clamp **C** and screw **B**.
6. Restore the printer to the operating position (3053).
7. Reinstall the top cover (3052).



3306 Print Head Carrier Motor

Removal

1. Switch off the printer power.
2. Remove the top cover (3052).
3. Place the printer in the service position (3053).
4. Slide the drive belt **A** off the motor pulley.

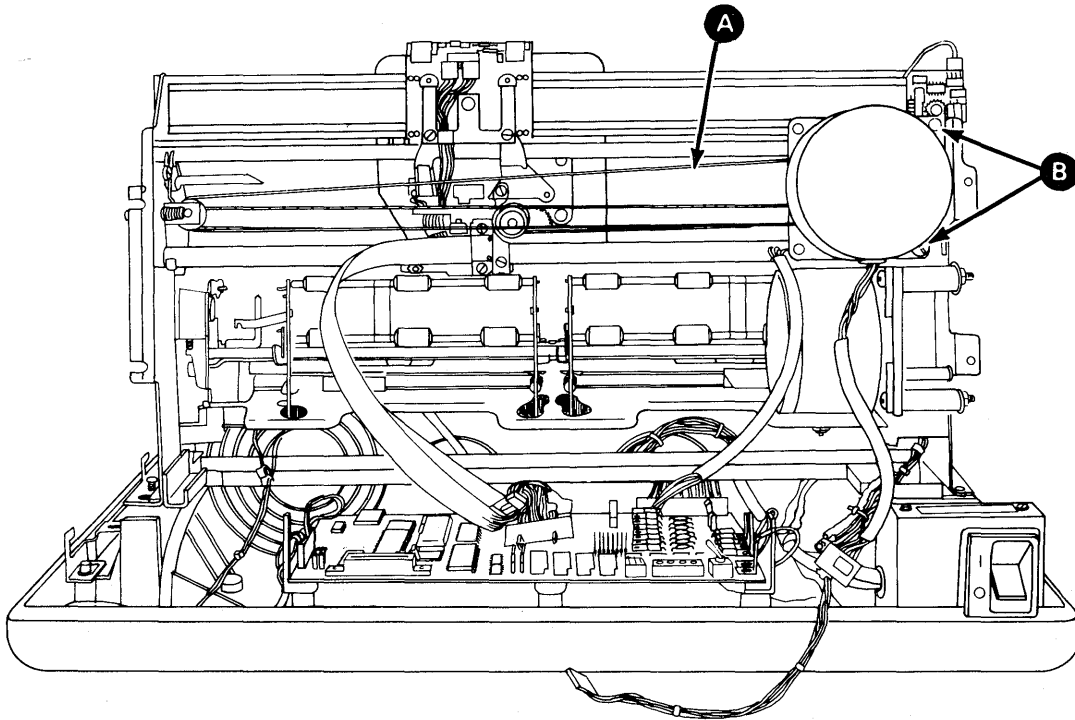
CAUTION

The print head motor may be hot.

5. Remove the two screws **B** holding the motor to the right side frame.
6. Remove the motor and bracket from the printer.

Reinstallation

1. Reinstall the motor and bracket to the printer with the two screws **B**.
2. Reinstall the drive belt **A** on the motor pulley.
3. Assemble the printer to the printer base (3053).
4. Reinstall the top cover (3052).



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3351 Print Head

CAUTION

The print head may be hot after continued use. Always let this print head cool before removing it.

Service check

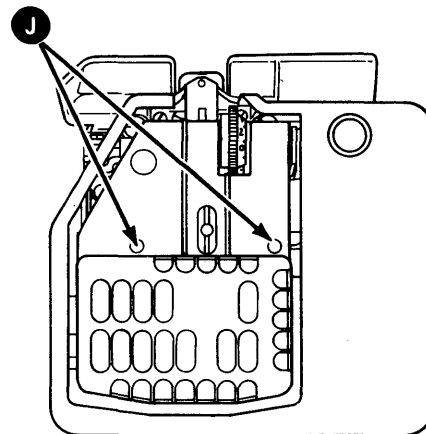
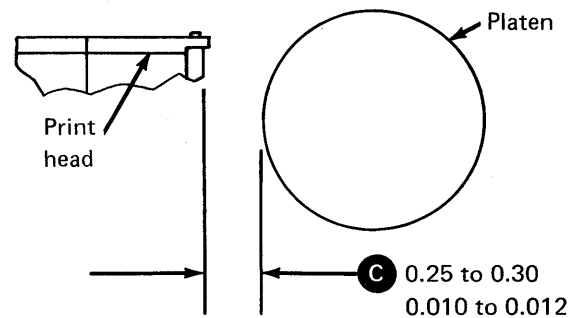
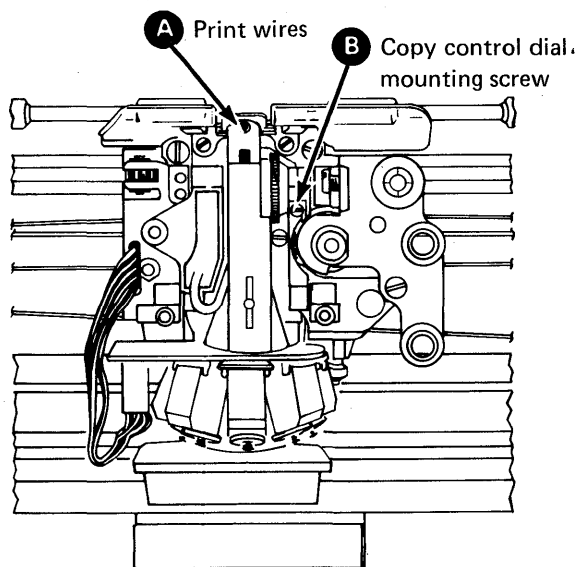
1. Switch off the printer power.
2. Set the copy-control dial to 0.
3. Remove the ribbon cartridge (3405).
4. Remove the print head forms guide (3352).
5. Remove the ribbon shield (3355).
6. Check for a gap of 0.25 to 0.30 mm (0.010 to 0.012 in.) between the print head and the platen **C**.
7. If the gap is not correct, perform the following adjustments:

Adjustment

1. Perform steps 1 to 8 of the removal procedure.
2. Reinstall the platen (3101) and turn it until the

right-hand platen knob setscrews are at the top.

3. Adjust the print head to platen gap, as follows: (With the print head in the center of the platen.)
 - a. Loosen the copy-control dial mounting screw **B**. The print head moves toward the platen.
 - b. Set the copy-control dial to 0.
 - c. Place a 0.25 mm (0.010 in.) gauge between the platen and the print head wires **C**.
 - d. Tighten the copy-control dial mounting screw **B**.
 - e. Check the adjustment and adjust again, if necessary.
4. Remove the platen (3101).
5. Reinstall and adjust the ribbon shield (3355).
6. Reinstall print head cover.
7. Reinstall the print head forms guide (3352).
8. Reinstall the ribbon cartridge (3405).
9. Reinstall the access cover (3051).



Removal

CAUTION

The print head may be hot after continued use. Always let the head cool before removing it.

1. Switch off the printer power.
2. Remove the access cover (3051).
3. Move the print head to the center of the printer.
4. Remove the paper deflector and platen (3101).
5. Remove the ribbon cartridge (3405).
6. Remove the head cover (two screws) at **J**.
7. Remove the print head forms guide (3352).
8. Remove the print head ribbon shield (3355).
9. Remove the copy-control dial (3357).
10. Remove the print head cable from EC3 **D**. Disconnect head lift solenoid wires from EC4 **H**.
11. Remove the print head ribbon lifter (3356).
12. Push the print head to the rear **B** and insert straightened paper clips **A** into the holes of both print head shafts.
13. Pull the print head forward until the print head tip clears the shafts; push the tip down under the shafts **C**.
14. Remove the paper clips from the shaft holes.
15. Slide the shafts forward to clear the rear print head mounting holes **F**. Lift up the rear of the print head; then lift it forward to remove it. Keep the shaft springs (in the rear mounting holes) **F** for reassembly.
16. Remove the oil wick clip and felt pad **G**.

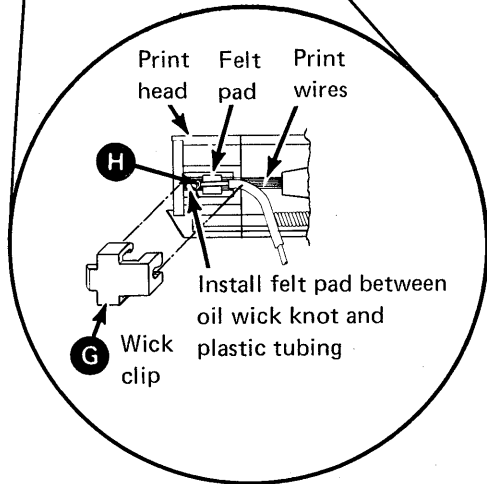
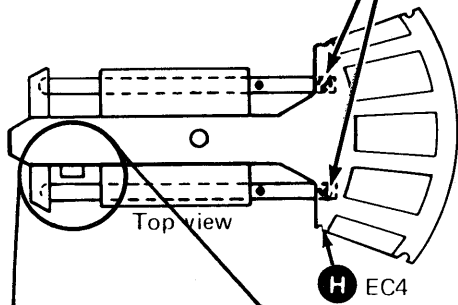
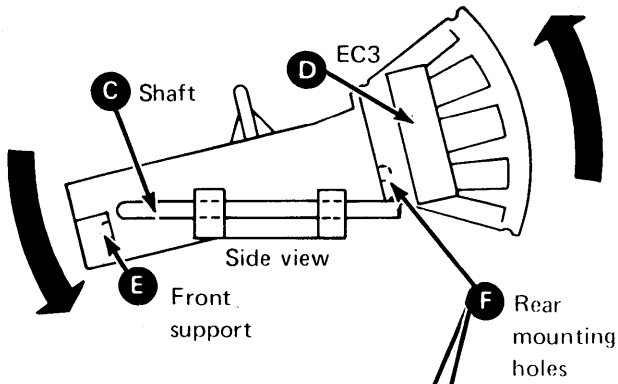
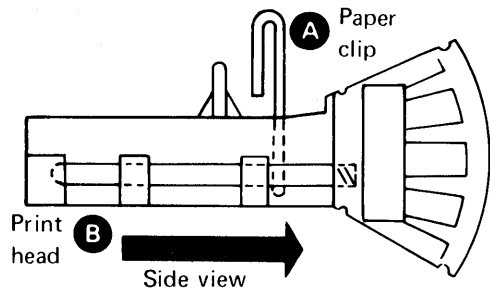
Reinstallation

Lubricate the following with IBM No. 6 oil:

- The felt washers on each shaft.
- The rear slide points on each shaft.

Also, install the oil wick and felt pad **H** in the print head.

1. Place the shaft springs in the print head rear mounting holes **F**; install the oil wick retaining clip **G** on the print head tip.
2. Place the print head front support **E** under the shafts; slide the print head to the rear so that it is in the correct position in the yoke. The oil wick should be between the print head and the yoke.
3. Push the shafts to the rear and insert straightened paper clips into the holes of both shafts **A**.
4. Push the print head forward, permitting the shafts to press on the springs in the rear mounting holes **F**; raise the front of the print head so that the tips of the shafts enter the depressions in the front support. Both shafts must be seated in the front support of the print head.
5. Remove the paper clips and check for free head movement front and back.
6. Connect the print head cable to EC3 **D**. Connect the head lift solenoid wires to EC4 **H**.
7. Reinstall print head ribbon lifter (3356).
8. Reinstall the copy-control dial (3357).
9. Perform steps 2 through 5 of the print head adjustment.
10. Adjust the ribbon lifter (3356).
11. Reinstall the print head cover and two screws **J**.
12. Reinstall the ribbon cartridge (3405).
13. Push the print head on and off the retract ramp to ensure that the print head retracts correctly.
14. Reinstall the access cover (3051).

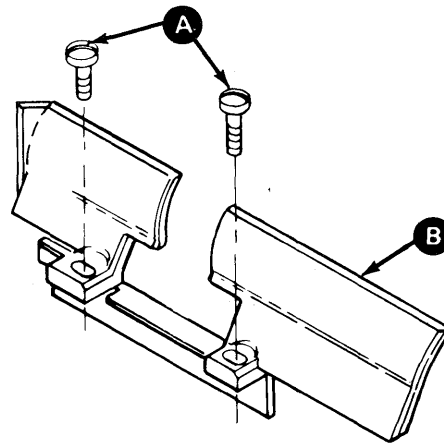
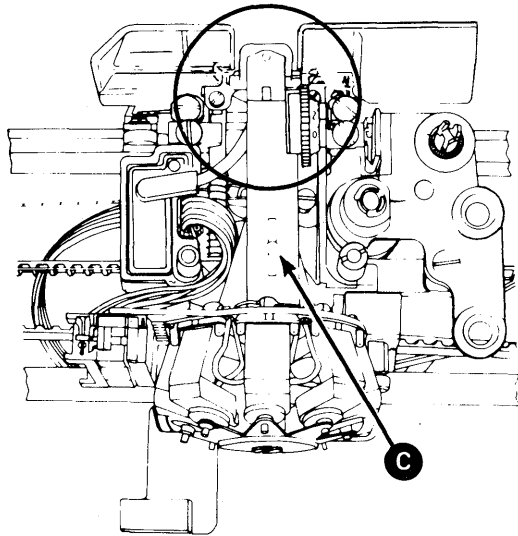


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3352 Print Head Forms Guide

Adjustment

1. Switch off the printer power.
2. Remove the forms tractor (3151).
3. Remove the access cover (3051).
4. Remove the platen (3101).
5. Remove the ribbon cartridge (3405).
6. Loosen the forms guide mounting screws **A**.
7. Push both ends of the forms guide **B** as far as possible toward the platen, and center the guide within the mounting holes.
8. Tighten the forms guide mounting screws **A**.
9. Reinstall the platen (3101).
10. Reinstall the ribbon cartridge (3405).
11. Reinstall the access cover (3051).



12. Reinstall the forms tractor (3151).

Removal

1. Perform steps 1 through 5 of the adjustment procedure.
2. Move the print head to the center of the platen.
3. Remove the forms guide mounting screws **A** and retract the print head by hand (using the post **C**); remove the guide.

Reinstallation

1. Retract the print head by hand and set the forms guide in place.
2. Reinstall the forms guide with the screws **A** partially tightened.
3. Perform the adjustment procedure starting with step 7.

3353 Print Head Cable

Removal

1. Switch off the printer power.
2. Remove the top cover (3052).
3. Remove the print head cover (two screws) **J**.
4. Place the printer in the service position (3053).
5. Remove the print emitter pickup (3252).
6. Remove the carrier-to-belt clamp at **E**, and slip the belt out of the clamp.
7. Remove the cable clamping bracket **B** (two screws).
8. Disconnect EC3 from the print head, and remove the cable from the opening in the casting **F**.
9. Remove the two screws **G** from the cable clamp assembly (long flat spring with plastic on ends).

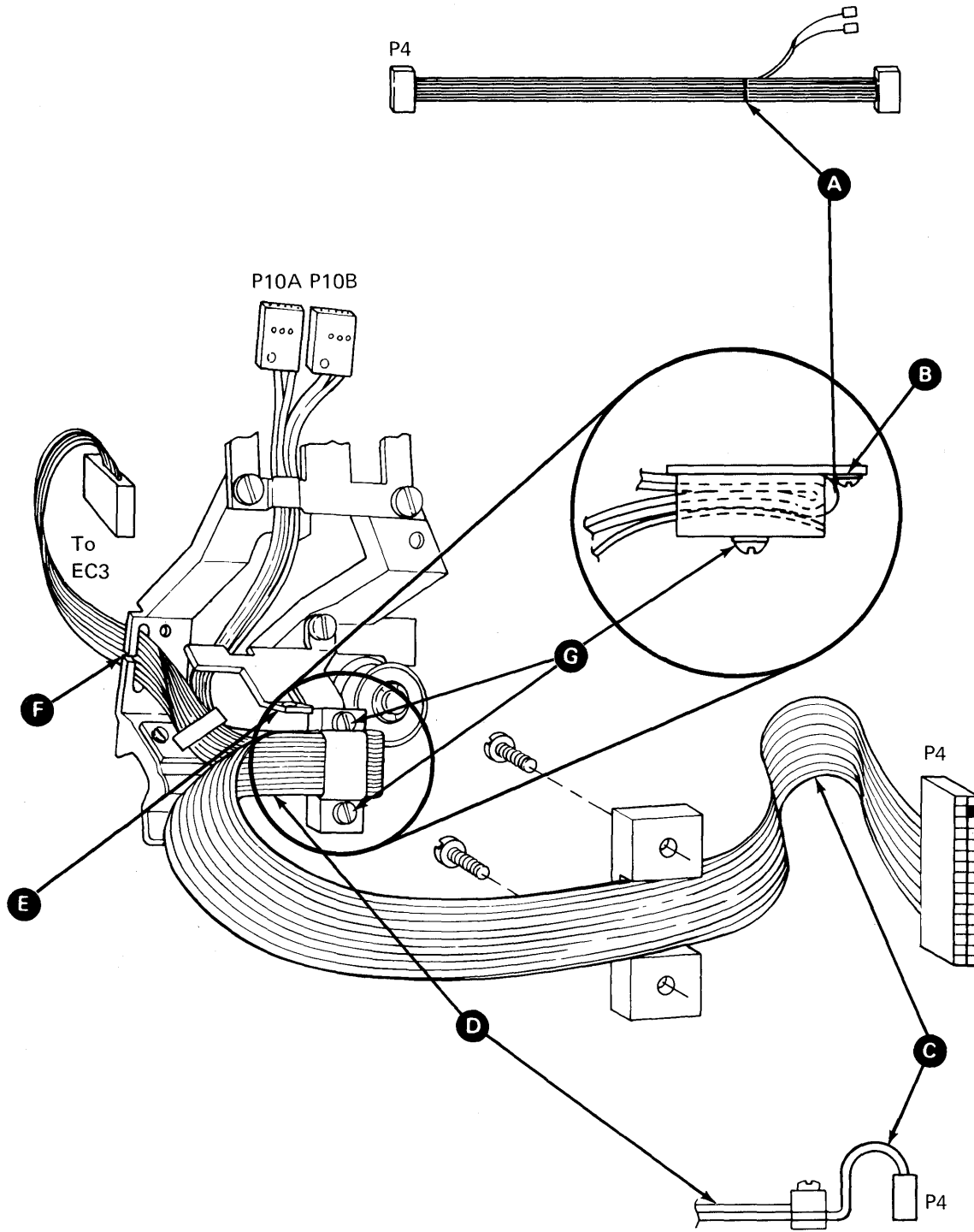
Reinstallation

1. Fold the cable on the mark **A**.
2. Attach the cable clamp assembly and cable to the bracket by installing the two screws **G**.
3. Make a 90° counterclockwise twist in the cable and put the cable into the opening **F**.
4. Connect EC3 to the print head.
5. Fasten the cable bracket **B** in place (two screws).
6. Reinstall the belt in the carrier-to-belt clamp **E**, and tighten the clamp.
7. Form the cable against the flat spring **D**.
8. Form a loop in the cable **C** at the end of the flat spring **D**.
9. Reinstall the print head cover (two screws).
10. Reinstall the print emitter pickup (3252).
11. Perform the print emitter to pickup adjustment (3253).
12. Assemble the printer to the printer base (3053).

Alternate Method

Use the alternate method when the cable and cable bracket are available as an assembly.

The alternate method is the same as the above procedure except eliminate step 9 in the removal, and eliminate steps 1 and 2 in the reinstallation.



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3354 Oil Felt

Removal

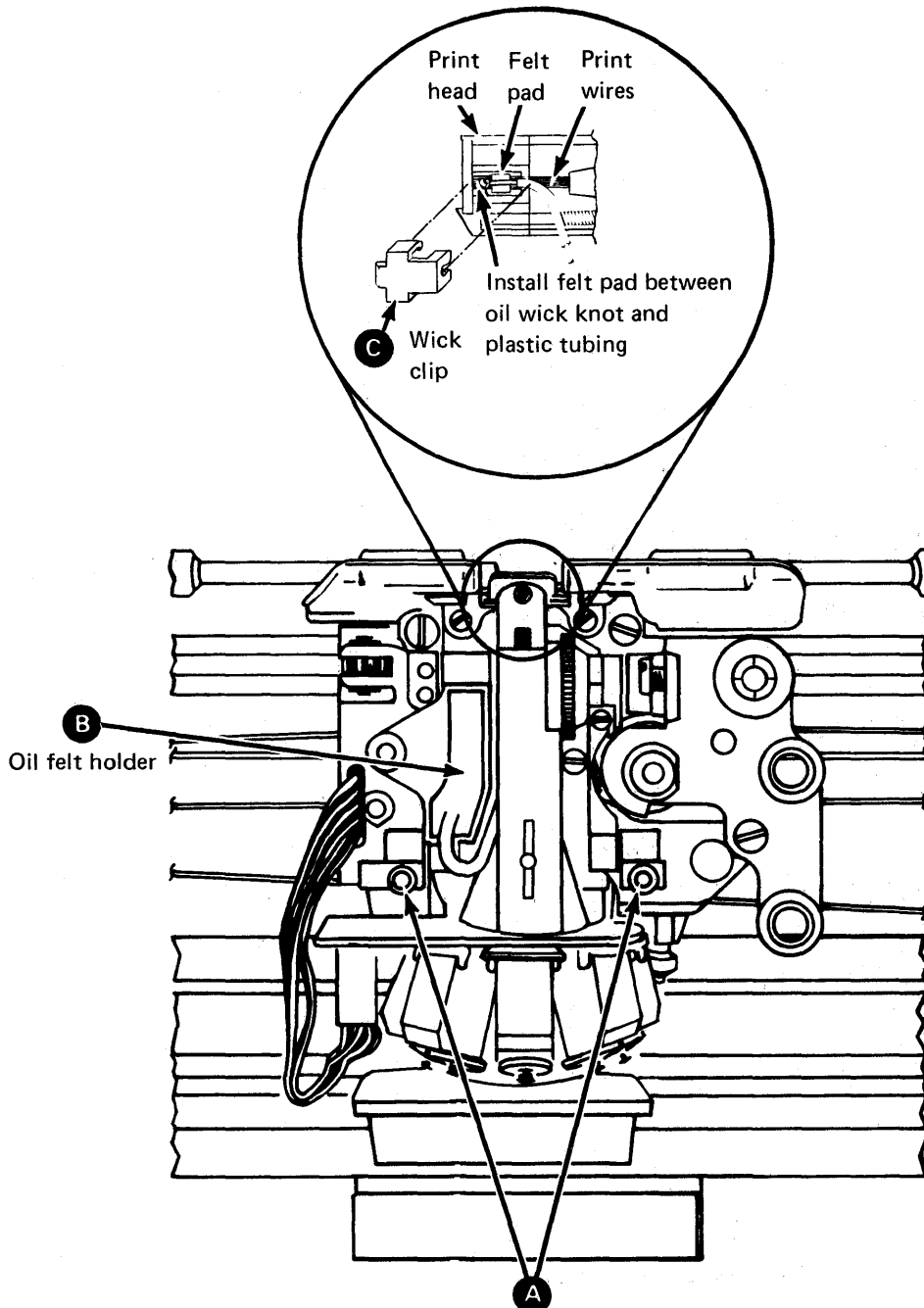
1. Switch off the printer power.
2. Remove the access cover (3051).
3. Remove the ribbon cartridge (3405).
4. Remove the print head cover (two screws) **A**.
5. Pull the oil wick out of the print head tip **C**.
6. Lift the oil wick out of the oil wick holder **B**.

Reinstallation

1. Reinstall the oil wick in the oil wick holder **B**.
2. Saturate the oil wick with IBM No. 6 oil and place it in the print head tip **C**.

Note: If a oil felt holder is being installed, lubricate the felt as described in "Oil Felt Lubrication" in Chapter 5.

3. Reinstall the print head cover (two screws) **A**.
4. Reinstall the ribbon cartridge (3405).
5. Reinstall the access cover (3051).



3355 Print Head Ribbon Shield

Adjustment

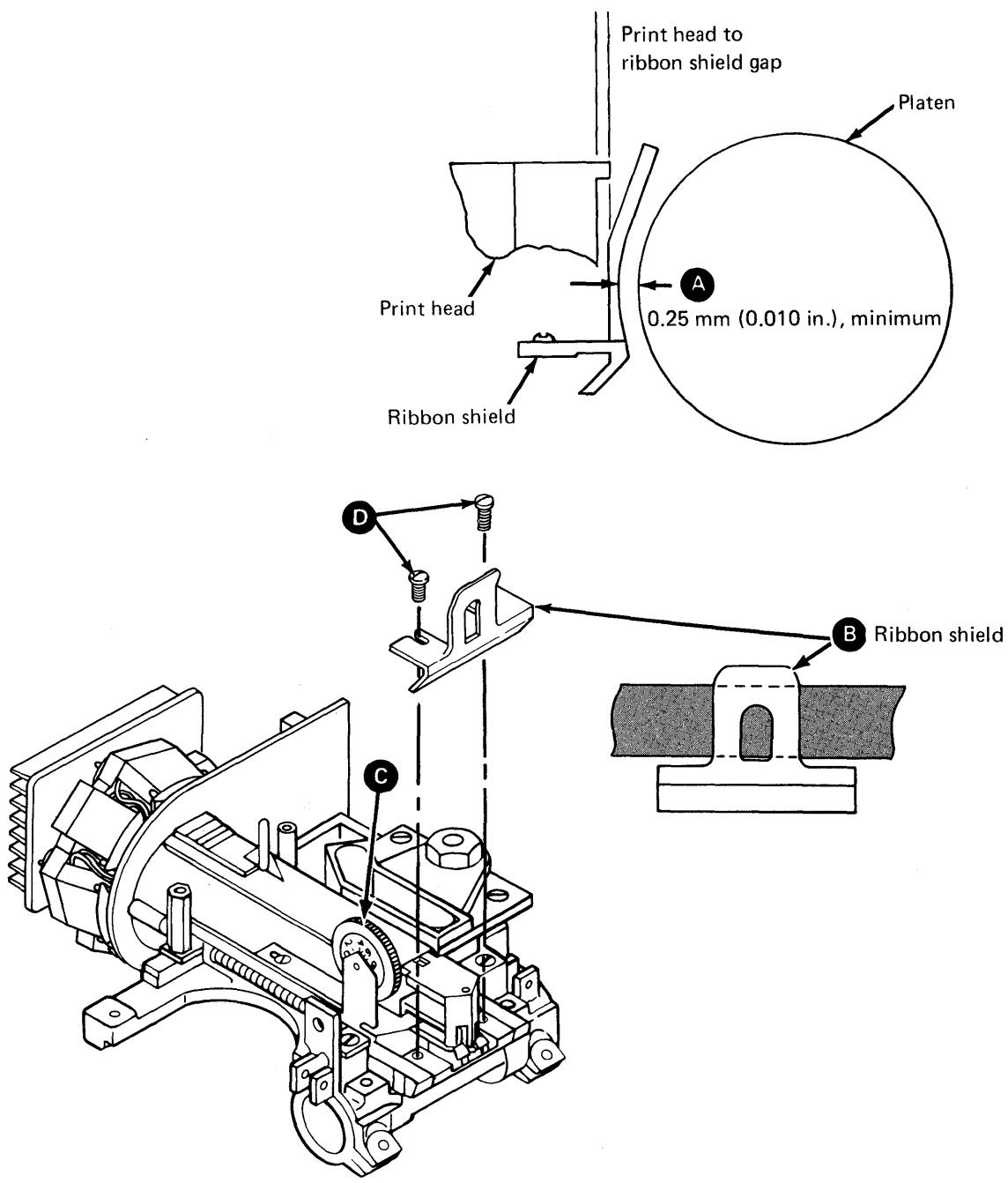
1. Switch off the printer power.
2. Remove the access cover (3052).
3. Remove the paper deflector (3101).
4. Remove the ribbon cartridge (3405).
5. Remove the print head forms guide (3352).
6. Loosen the two ribbon shield mounting screws **D**.
7. Reinstall the platen without the paper deflector (3101).
8. Set the copy-control dial **C** to 0.
9. Put sheets of paper together until they have a thickness of 0.25 to 0.51 mm (0.010 to 0.020 in.). Place the paper between the print head **B** and the platen.
10. Push the print head against the paper and tighten the ribbon shield screws **D**. This is to ensure parallel alignment between the ribbon shield and the platen.
11. Remove the paper and the platen. Ensure that the lower edge of the ribbon shield window is pressing against the carbide tip of the print head.
12. Reinstall the print head forms guide (3352).
13. Reinstall the ribbon cartridge (3405). Check for free ribbon travel between the carbide tip of the print head and the ribbon shield.
14. Reinstall the paper deflector (3101).
15. Reinstall the platen.
16. Reinstall the access cover (3051).

Removal

1. Switch off the printer power.
2. Remove the top cover (3052).
3. Remove the paper deflector and platen (3101).
4. Remove the ribbon cartridge (3405).
5. Remove the print head forms guide (3352).
6. Loosen the ribbon shield mounting screws **D** and remove the shield **B**.

Reinstallation

1. Reinstall the ribbon shield **B** but do not tighten the mounting screws **D**.
2. Perform the adjustment procedure, beginning with step 3.



3356 Print Head Ribbon Lifter

Adjustment

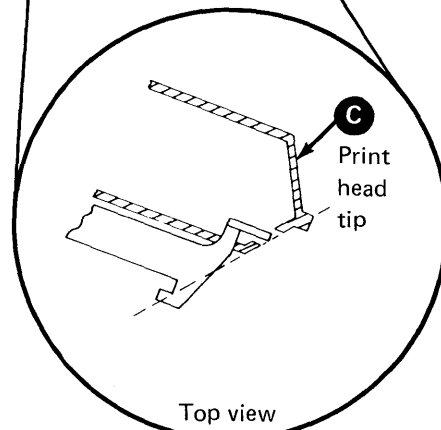
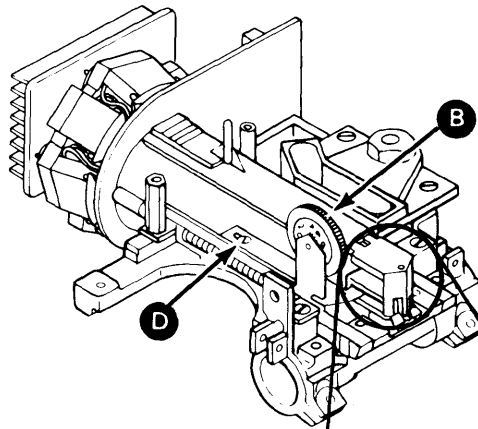
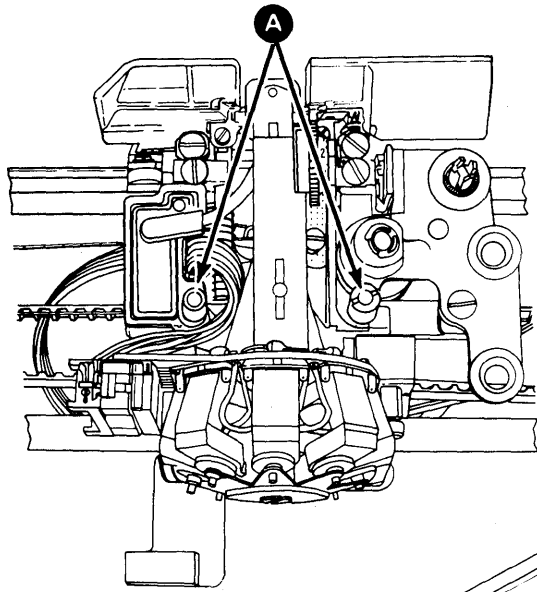
1. Switch off the printer power.
2. Remove the access cover (3051).
3. Move the print head to the center of the platen.
4. Remove the ribbon cartridge (3405).
5. Remove the print head cover (two screws) at **A**.
6. Loosen the mounting screw **B**.
7. Set the copy control dial **D** to 8.
8. Adjust the ribbon lifter until it is even with the edge of the print head tip **C**, and ensure that it does not touch either side of the print head or the ribbon shield window.
9. Tighten the mounting screw **B**.
10. Reinstall the print head cover and two screws **A**.
11. Set the copy control dial **D** to 0.
12. Reinstall the ribbon cartridge (3405).
13. Reinstall the access cover (3051).

Removal

1. Switch off the printer power.
2. Remove the access cover (3051).
3. Remove the print head cover (two screws) at **A**.
4. Move the print head to the center of the platen.
5. Remove the paper deflector and platen (3101).
6. Remove the ribbon cartridge (3405).
7. Remove the print head forms guide (3352).
8. Remove the ribbon shield (3355).
9. Remove the copy control dial (3357, steps 1 – 4).
10. Remove the ribbon lifter mounting screw **B** and the lifter.

Reinstallation

1. Reinstall the ribbon lifter.
2. Reinstall, but do not tighten, the ribbon lifter mounting screw **B**.
3. Reinstall the copy control dial (3357).
4. Perform steps 2 thru 6 of the print head adjustment (3351).
5. Perform the ribbon lifter adjustment (3356).
6. Reinstall the print head cover (two screws).
7. Reinstall the ribbon cartridge (3405).
8. Reinstall the access cover (3051).

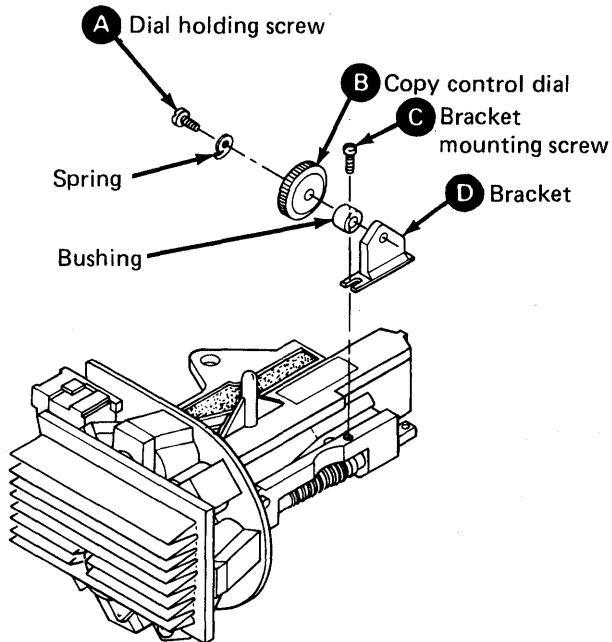


Small straight edge can be used to adjust ribbon lifter even with edge of print head tip

3357 Copy Control Dial

Removal

1. Switch off the printer power.
2. Remove the access cover (3051).
3. Loosen the copy-control dial bracket mounting screw **C**.
4. Slide the bracket **D** forward and lift it out.
5. Remove the dial holding screw **A**.
6. Remove the copy-control dial **B**.



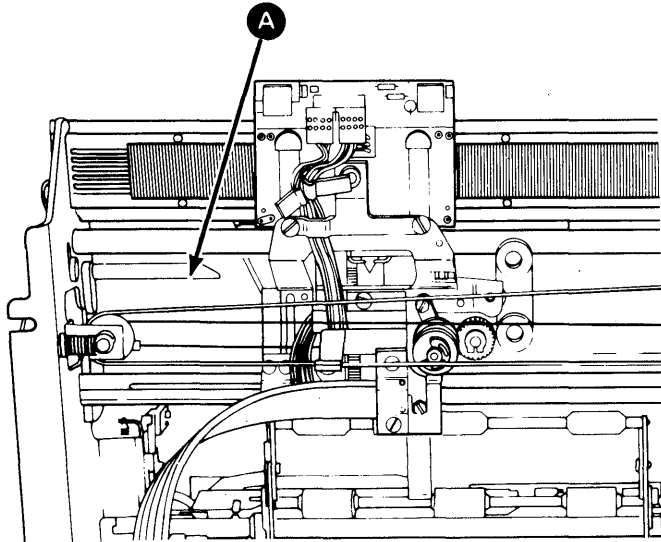
Reinstallation

1. Reinstall the copy-control dial on the bracket **D** with the holding screw **A**.
2. Slide the bracket opening under the mounting screw **C**.
3. Perform the print head adjustment (3351).
4. Perform the print head retract ramp adjustment (3358).
5. Reinstall the access cover (3051).

3358 Print Head Retract Ramp

Adjustment

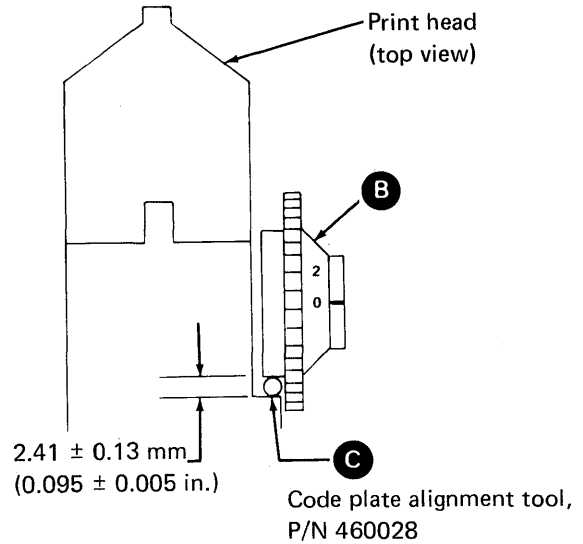
1. Switch off the printer power.
2. Remove the top cover (3052).
3. Set the copy-control dial **B** to 0.



Printer in service position

Note: This adjustment is only valid for sheet metal ramp.

4. Form the retract ramp **A** so that the copy-control dial is 2.41 ± 0.13 mm (0.095 ± 0.005 in.) from the print head. Use a code plate alignment tool (part 460028), as shown, at **C** to measure this distance.
5. Reinstall the top cover (3052).



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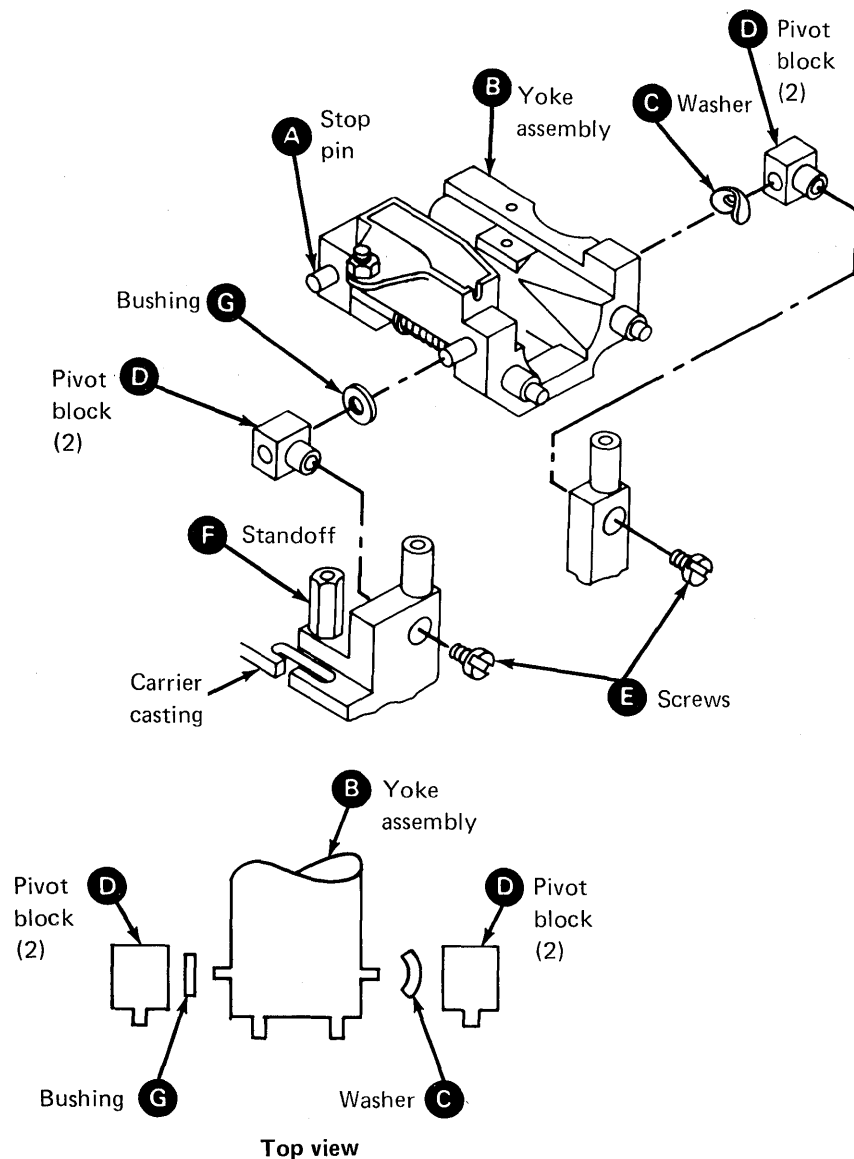
3359 Pivot Block and Yoke

Removal

1. Switch off the printer power.
2. Remove the top cover (3052).
3. Remove the print head (3351).
4. Remove the solenoid assembly (3360).
5. Remove the solenoid standoff stud **F**.
6. Remove the pivot blocks **D** and the yoke assembly **B** by removing the two screws **E** and pulling the yoke assembly forward.

Reinstallation

1. Place the bushing **G** and the pivot block **D** on the left side of the yoke.
2. Place the washer **C** and the pivot block **D** on the right side of the yoke.
3. Hold the unit together and slip the two pivot blocks into the carrier mounting holes (Ensure that pin **A** is in the opening in the carrier.).
4. Reinstall the screws **E** and ensure that the yoke pivots freely.
5. Reinstall the solenoid standoff stud **F**.
6. Reinstall the solenoid assembly (3360).
7. Reinstall the print head (3351).
8. Reinstall the top cover (3052).



3360 Print Head Solenoid

Service Check

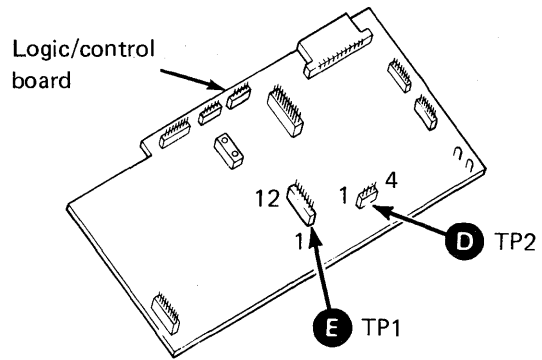
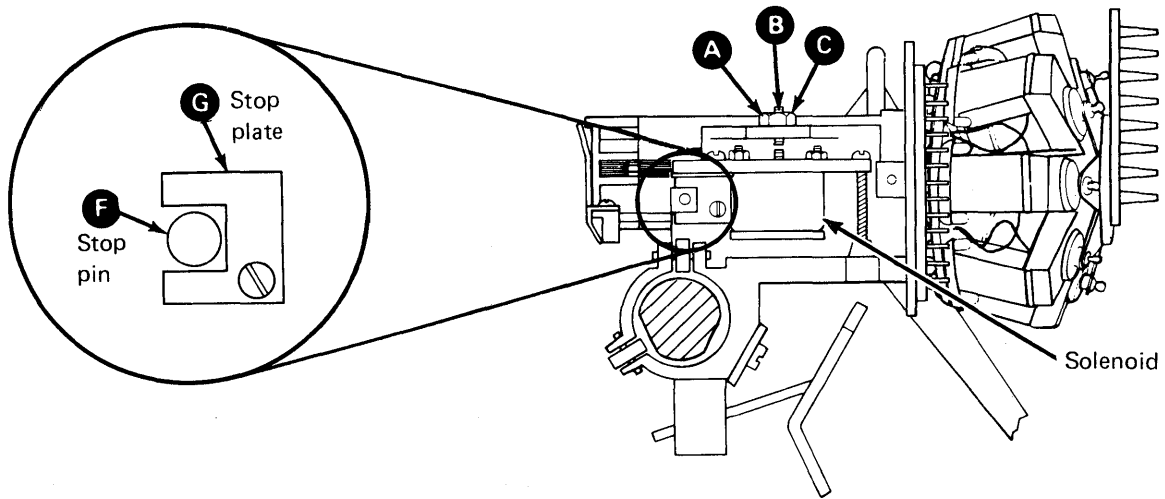
1. Switch off the printer power.
2. Put the printer in test mode (3654).
3. Switch on the printer power and observe the high density test mode print pattern. If rounded characters (such as O, S, or C) are distorted at the top or bottom, perform the solenoid adjustment.
4. If the characters print correctly, return the printer to operating mode (3654).

Adjustment

1. Switch off the printer power.
2. Remove the access cover (3051).
3. Loosen the locking nut **A** on the adjusting screw **B** and back out the screw until it is even with the bottom of the mounting bracket **C**.
4. Remove the +24 Vdc fuse (F2) from the power supply board.
5. Connect a jumper wire from TP2-4 **D** (ground) to TP1-8 **E**.
6. Switch on the printer power. (The solenoid is held in the operating position.)
7. Turn the adjusting screw **B** in until the stop pin **F** just touches the top of the stop plate **G**; tighten the locking nut **A**.

8. Switch off the printer power.
9. Remove the jumper wire from TP2 and TP1.
10. Reinstall the +24 Vdc fuse (F2) on the power supply board.
11. Put the printer in test mode (3654).
12. Switch on the printer power and observe the high density test mode print pattern. If rounded characters such as O, S, or C are distorted at the top or bottom, the print head needs more adjustment. The print head lift may be fine-adjusted by doing the following:
 - a. Switch off the printer power.
 - b. Loosen the locking nut **A** and turn the adjusting screw **B** 1/4 of a turn.

Note: Turn the screw clockwise if the characters are flat at the tops and bottoms; turn the screw counterclockwise if the characters are excessively rounded.
 - c. Tighten the locking nut.
 - d. Switch on the printer power and check the print pattern again. Repeat 12a and 12b to cancel the distortion.
13. Switch off the printer power and return the printer to operating mode (3654).
14. Reinstall the access cover (3051).

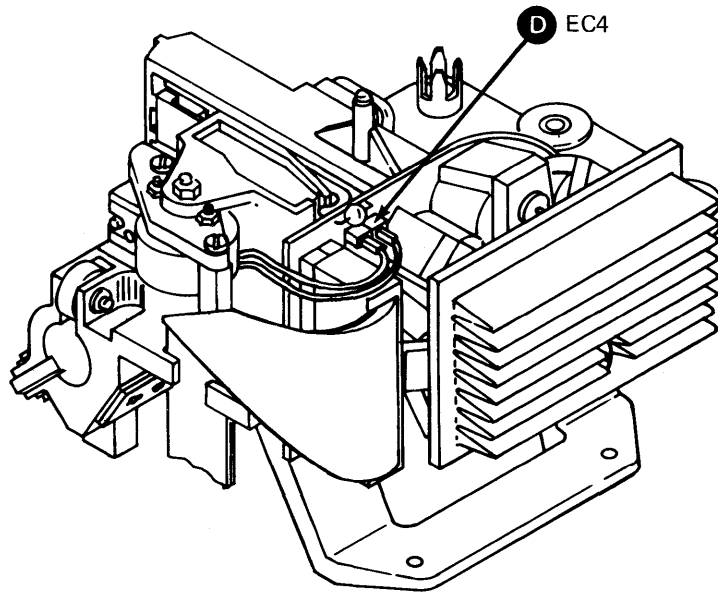
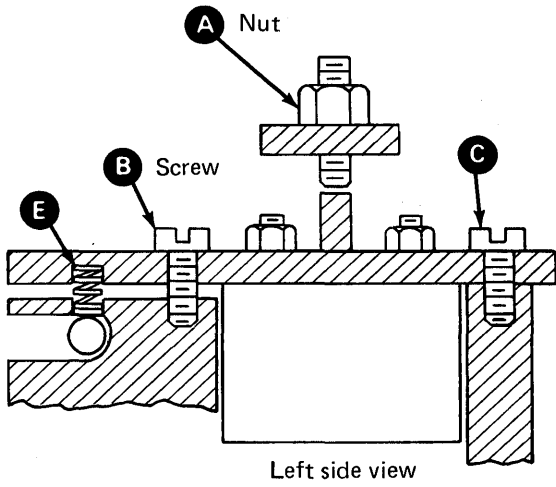


Removal

1. Switch off the printer power.
2. Remove the access cover (3051).
3. Loosen the nut **A** on the adjustment screw.
4. Loosen screw **B**.
5. Remove screw **C**; remove the solenoid assembly. Retain the head return spring **E**.
6. Disconnect the solenoid wires from EC4 **D**.
7. Remove the solenoid.

Reinstallation

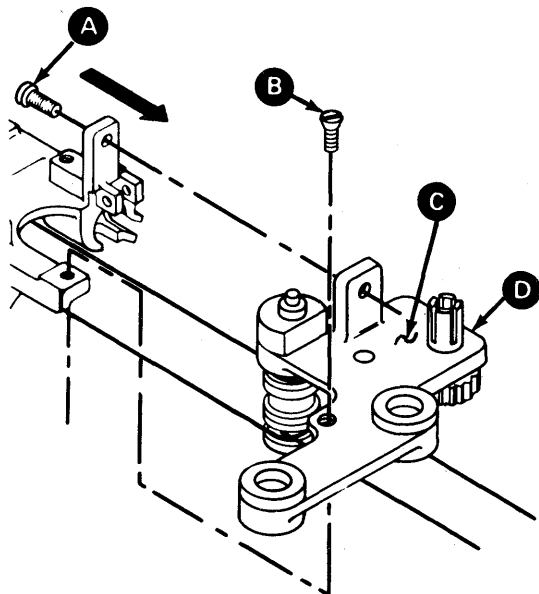
1. Connect the solenoid wires to EC4 **D**. (Leads can be connected to either pin.)
2. Reinstall the solenoid assembly by installing and tightening screws **C** and **B**. Ensure that the head return spring **E** is under the solenoid plate.
3. Reinstall, but do not tighten, the nut **A**.
4. Perform the solenoid adjustment (3360).
5. Reinstall the print head cover.
6. Reinstall the access cover (3051).



3401 Ribbon Drive Assembly

Removal

1. Switch off the printer power.
2. Remove the access cover (3051).
3. Remove the ribbon cartridge (3405).
4. Remove the print head cover.
5. Remove the ribbon drive assembly mounting screws **A** and **B**.
6. Unwind the ribbon drive cords from the drive clutches; leave the springs attached to the side frames.
7. Remove the ribbon drive assembly **D**.



Reinstallation

1. Reinstall the ribbon drive cords on the drive clutches (3404, steps 3 and 4).
2. Reinstall the ribbon drive assembly **D** with screws **A** and **B**; do not tighten the screws.
3. Push down on the ribbon drive at **C**; tighten screw **A** and then tighten screw **B**.
4. Reinstall the print head cover.
5. Reinstall the ribbon cartridge (3405).
6. Reinstall the top cover (3052).

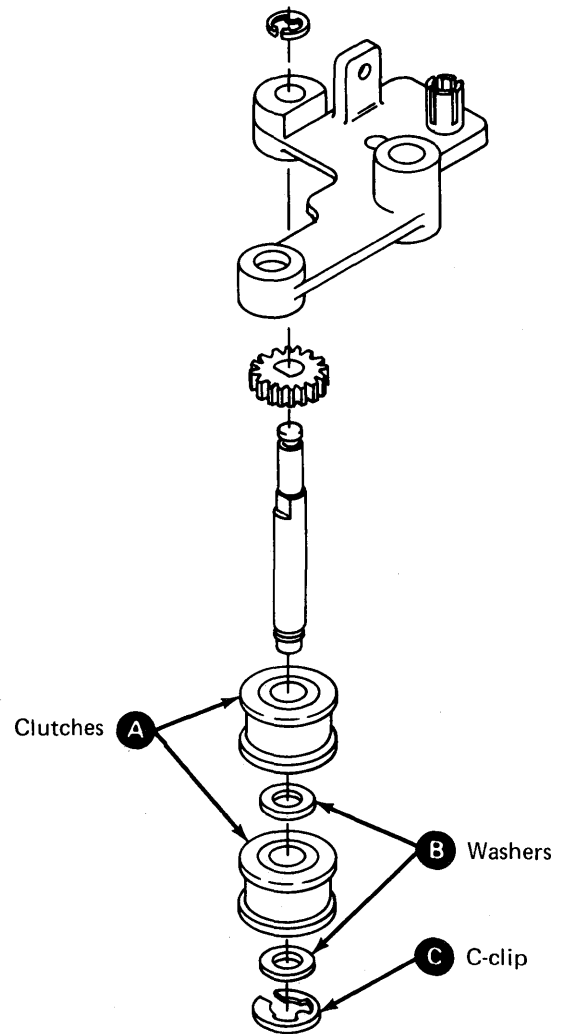
3402 Ribbon Drive Clutches

Removal

1. Remove the ribbon drive assembly (3401).
2. Remove the retaining clip **C**.
3. Remove the drive clutches **A** and washers **B**.

Reinstallation

1. Put a light film of IBM No. 23 grease on the clutch end of the shaft before installing the clutches.
2. Reinstall the clutches **A** and washers **B** on the drive shaft so that both clutches slip clockwise and drive counterclockwise (when seen from the clutch end of the shaft).
3. Reinstall the retaining clip **C**.
4. Reinstall the ribbon drive assembly (3401).



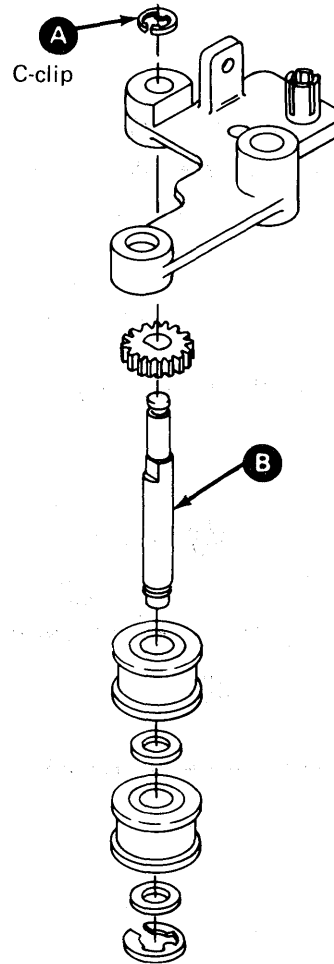
3403 Ribbon Drive Shaft

Removal

1. Remove the ribbon drive assembly (3401).
2. Remove the ribbon drive clutches (3402).
3. Remove the retaining clip **A** from the top end of the drive shaft.
4. Remove the drive shaft **B**.

Reinstallation

1. Insert the drive shaft **B** into the ribbon drive assembly.
2. Reinstall the retaining clip **A**.
3. Reinstall the ribbon drive clutches (3402).
4. Reinstall the ribbon drive assembly (3401).



3404 Ribbon Drive Cords

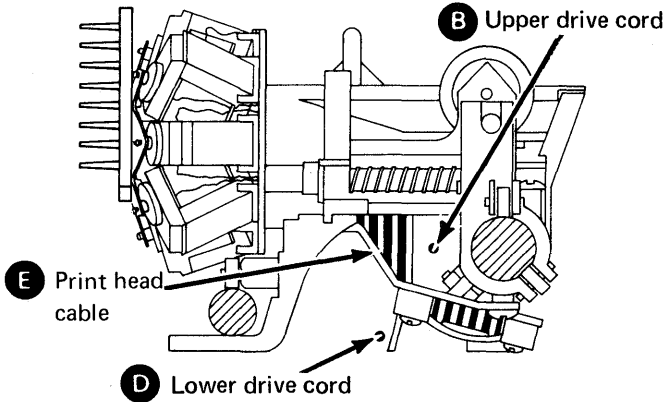
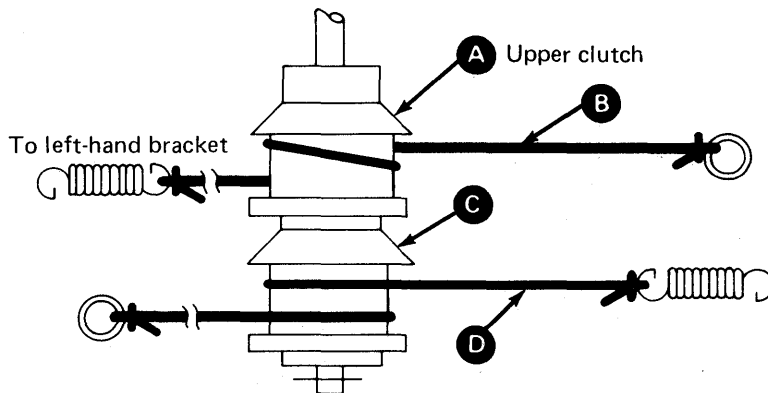
Removal

1. Remove the ribbon drive assembly (3401).
2. Disconnect the drive cords from the side frames and remove the cords.

Reinstallation

1. Attach the spring end of one drive cord to the left side frame.
2. Attach the spring end of the other drive cord **D** to the right side frame.

3. Reinstall the drive cord **B** on the upper clutch **A**; attach the cord to the right side frame. This cord should be behind the print head cable **E**.
4. Reinstall the drive cord on the lower clutch **C** as shown at **D**; attach the cord to the left side side frame. This cord should be in front of the print head cable **E**.
5. Reinstall the ribbon drive assembly (3401, steps 2 and 3).



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3405 Ribbon Cartridge

Removal

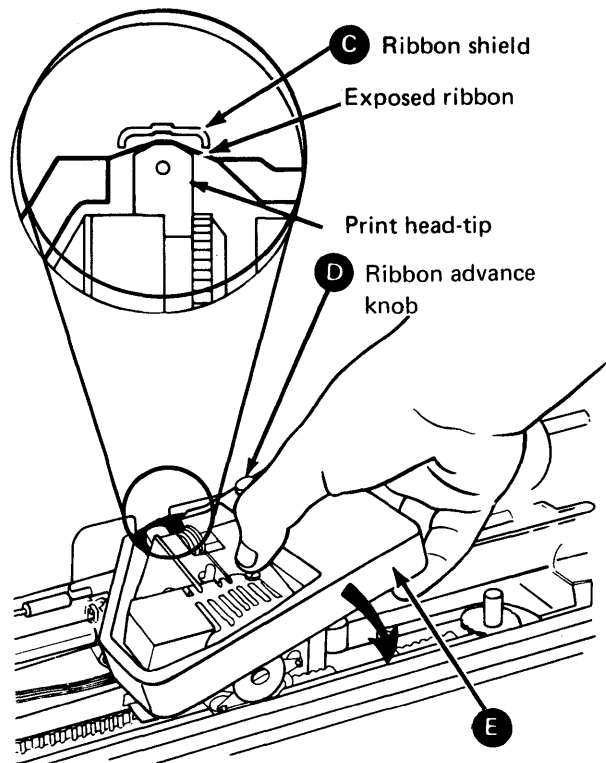
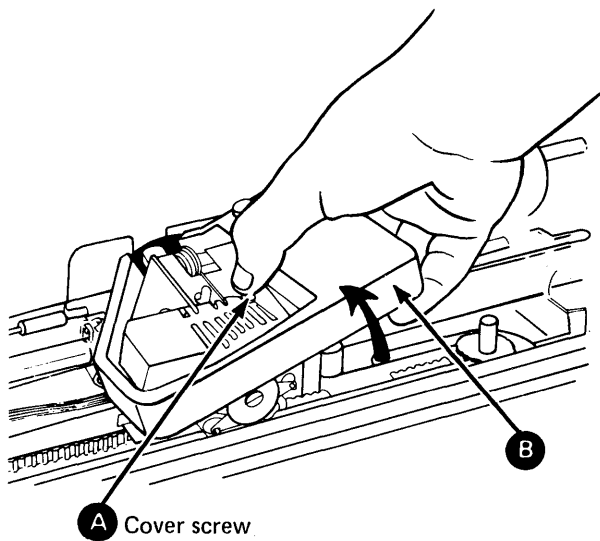
1. Switch off the printer power.
2. Remove the access cover (3051).
3. Move the print head to the center of the platen.
4. Hold the right side of the cartridge **B**.
5. Press down on the print head cover mounting screw **A**, and lift the cartridge until the cartridge locator studs release from the locator holes.

Reinstallation

1. Holding the cartridge as shown at **E**, insert the ribbon between the print head and the ribbon

shield **C**. If the ribbon is too loose, turn the ribbon-advance knob **D** clockwise.

2. Press the cartridge down until the cartridge studs are in the correct position.
3. Move the print head left and right to ensure that the ribbon has a smooth, continuous left to right movement (the ribbon-advance knob turns clockwise).
4. Reinstall the access cover (3051).



3441 Power Switch

DANGER

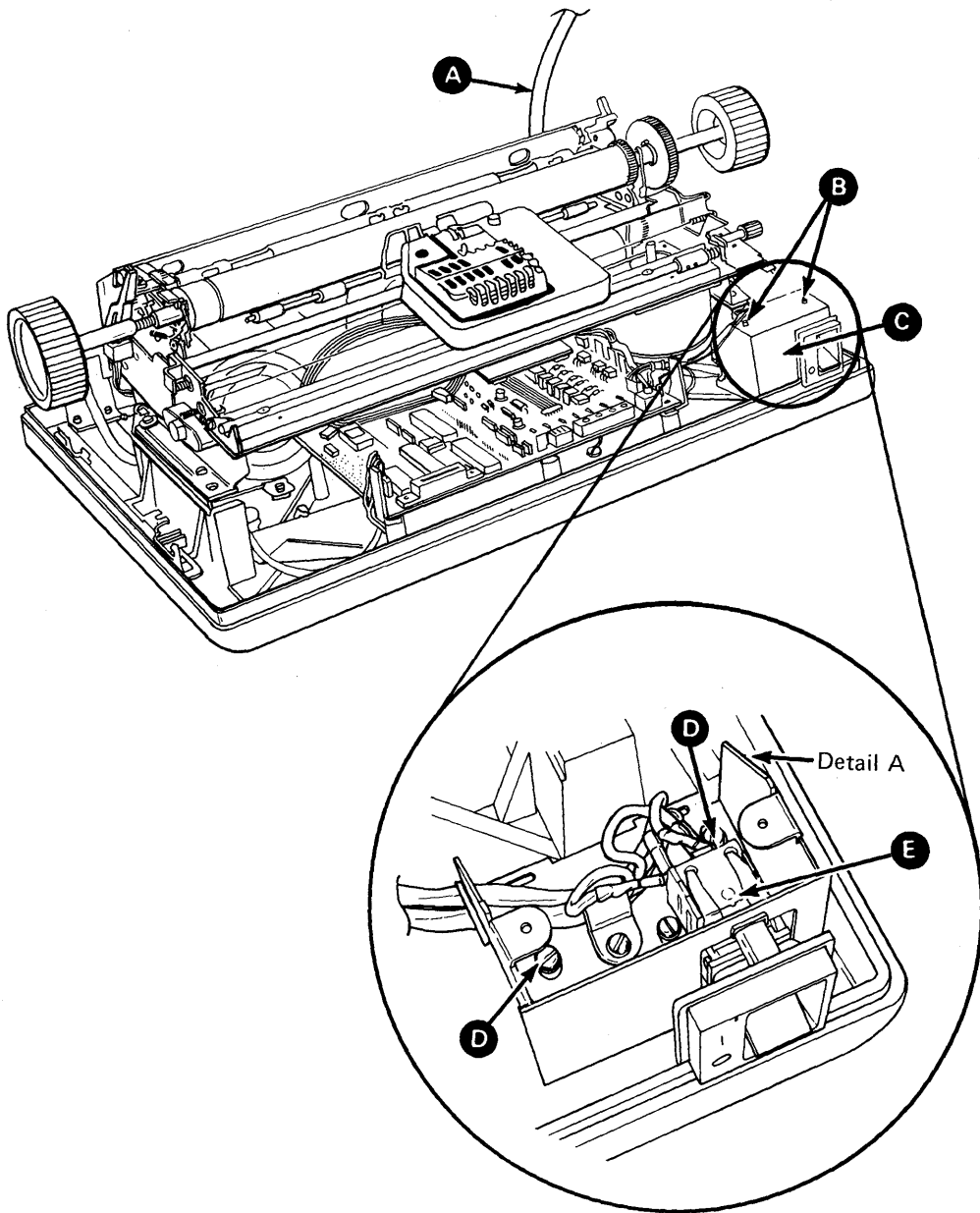
Line voltage is present at the power switch terminals any time the ac power cable is connected.

Removal

1. Switch off the printer power.
2. Disconnect the ac power cable **A**.
3. Remove the top cover (3052).
4. Remove the two screws **B** and remove the switch box cover **C**.
5. Remove the switch box mounting screws **D** and remove the switch box.
6. Label and remove the wires from the power switch.
7. Remove the two screws **D** and power switch **E**.

Reinstallation

1. Reinstall the switch wires.
2. Reinstall the power switch in the switch box with the two screws **E**.
3. Place the switch box into position and install the mounting screws **D**.
4. Reinstall the switch box cover with the two screws **B**.
5. Reinstall the top cover (3052).
6. Connect the ac power cable **A**.



3451 Line Filters

DANGER

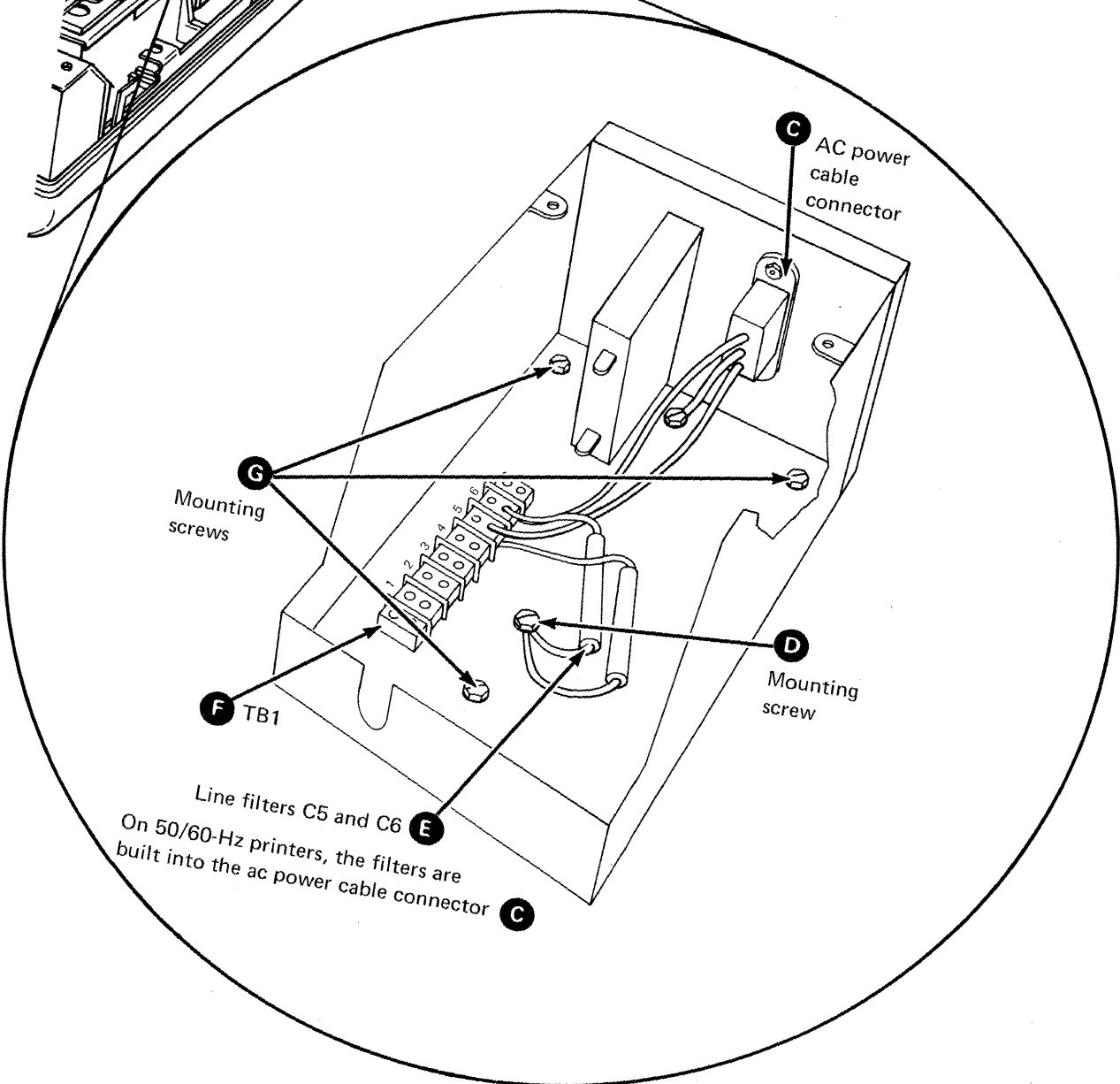
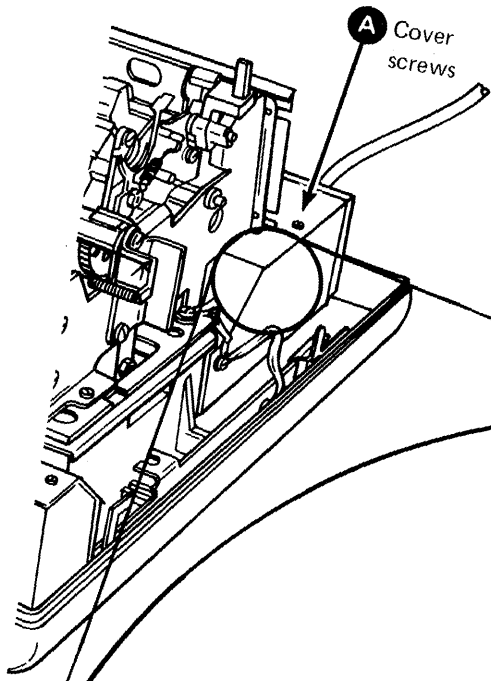
Line voltage is present at the power switch terminals any time the ac power cable is connected.

Removal

1. Switch off the printer power.
2. Disconnect the ac power cable **C**.
3. Remove the top cover (3052).
4. Remove the two screws **A** and remove the distribution box cover.
5. Remove the line filter grounding screw **D**.
6. Remove the line filter wires from TB1 **F**.
7. Remove the line filters **E**.

Reinstallation

1. Reinstall the line filters.
2. Connect the filter wires to TB1 **F**.
3. Reinstall the line filter grounding screw **D**.
4. Reinstall the distribution box cover with the two screws **A**.
5. Reinstall the top cover (3052).
6. Connect the ac power cable at **C**.



3452 Circuit Breaker

DANGER

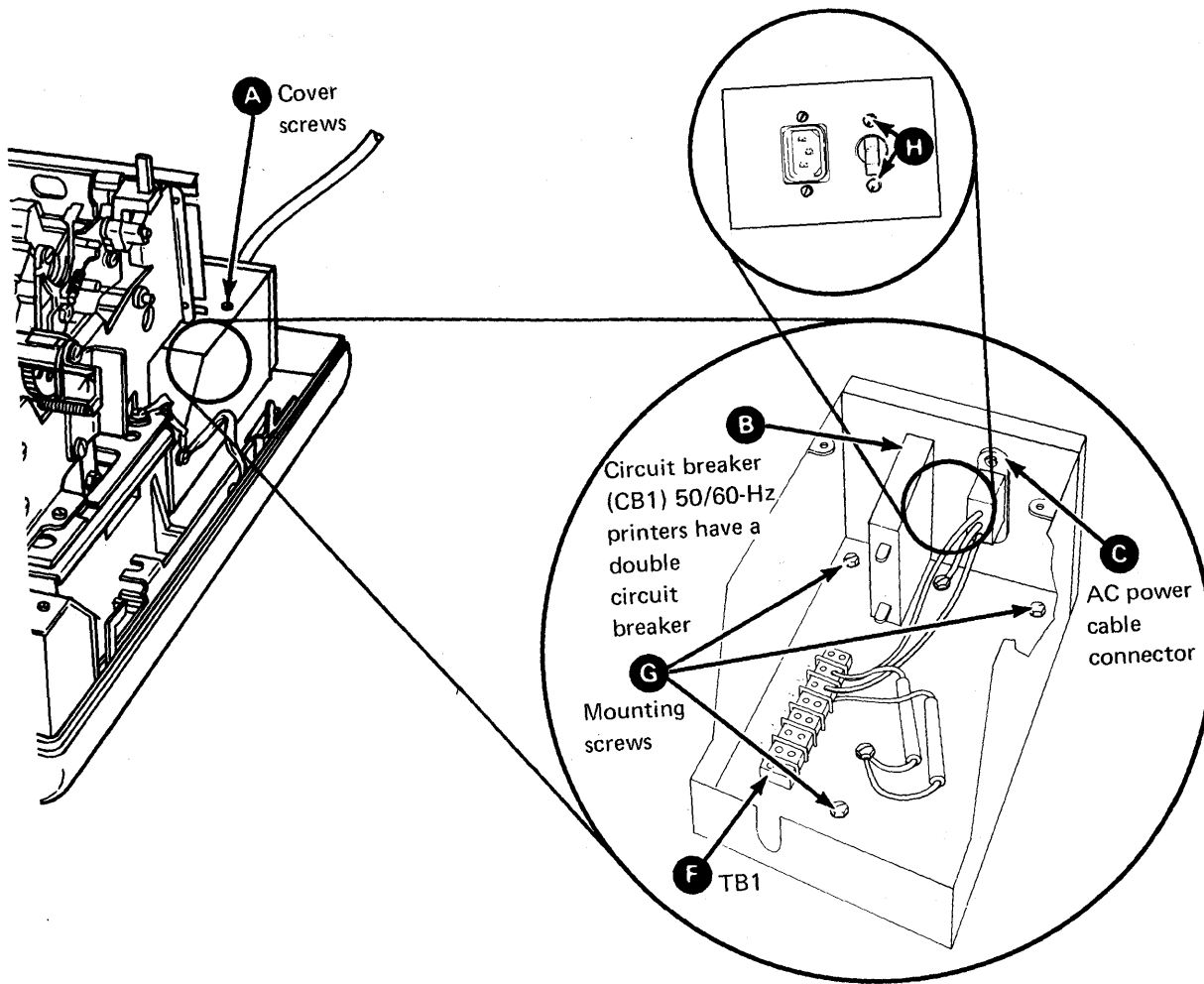
Line voltage is present at the power switch terminals any time the ac power cable is connected.

Removal

1. Switch off the printer power.
2. Disconnect the ac power cable at **C**.
3. Remove the top cover (3052).
4. Remove the two screws **A** and remove the distribution box cover.
5. Remove the three distribution box mounting screws **G**.
6. Lift the box to gain access to the circuit breaker mounting screws **H**.
7. Remove the circuit breaker mounting screws **H**.
8. Remove the circuit breaker wires; label each wire.
9. Remove the circuit breaker **B**.

Reinstallation

1. Reinstall the circuit breaker **B**.
2. Reinstall the circuit breaker mounting screws **H**.
3. Reinstall the circuit breaker wires.
4. Reinstall the distribution box mounting screws **G**. Tighten the screws with the box all the way to the rear.
5. Reinstall the distribution box cover with the two screws **A**.
6. Reinstall the top cover (3052).
7. Connect the ac power cable.



3453 Power Supply

DANGER

Line voltage is present at the power switch terminals any time the ac power cable is connected.

Removal

1. Switch off the printer power.
2. Disconnect the ac power cable **E**.
3. Remove the top cover (3052).

CAUTION

Some parts in the power supply may be hot.

4. Separate the printer from the printer base (3053).

Note: For 50/60-Hz power supplies, the fan wires and ac power leads must be disconnected at TB2 **B** on the transformer; then, continue with step 7.

5. Remove the cover from the ac distribution box (two screws) **F**.
6. Remove the two transformer wires from TB1-1 and TB1-2 **G**.
7. Remove the ground wire **C**.
8. Remove the six power supply mounting screws **D**.

Note: All ground wires, straps, and cable clamps that are attached to the mounting screws must be installed on the same screws.

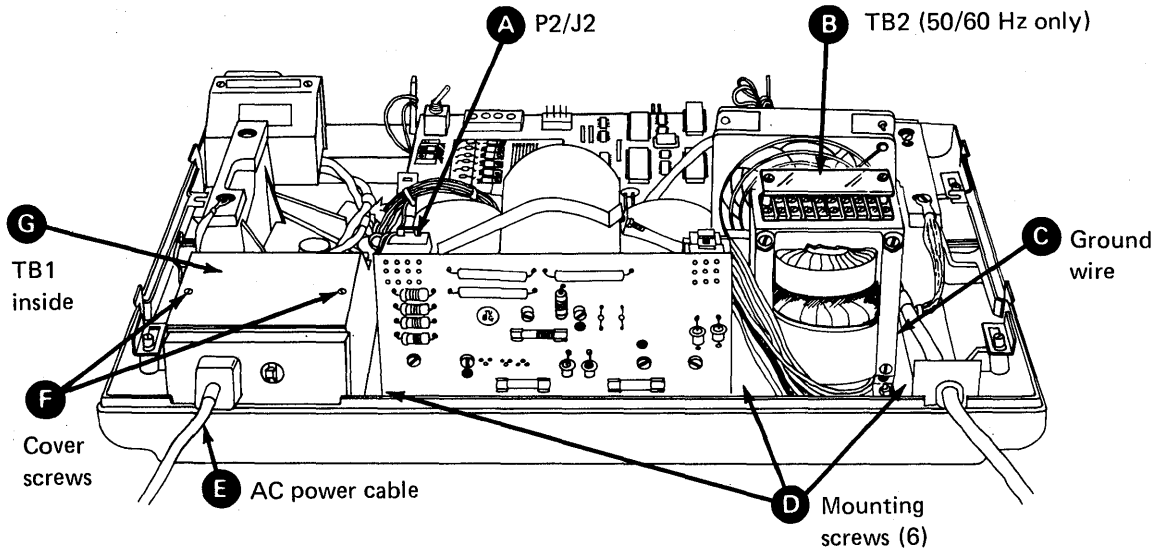
9. Disconnect power cable connector P2 **A** from the power supply board.
10. Remove the power supply.

Reinstallation

1. Place the power supply on the printer base.
2. Connect power cable connector P2 **A** to the power supply board.
3. Reinstall the six mounting screws **D**. Ensure that the wires, straps, and cable clamps are installed on the same screws.

Note: For 50/60-Hz power supplies, the fan wires and ac power wires must be connected at TB2 **B** on the transformer (B001); then continue at step 6.

4. Connect the two black transformer primary wires to TB1-1 and TB1-2 **G** in the ac distribution box.
5. Reinstall the cover on the distribution box (two screws) **F**.
6. Reinstall the ac power ground wire **C**.
7. Reassemble the printer to the printer base (3053).
8. Reinstall the top cover (3052).
9. Connect the ac power cable **E**.



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3454 Power Supply Board

DANGER

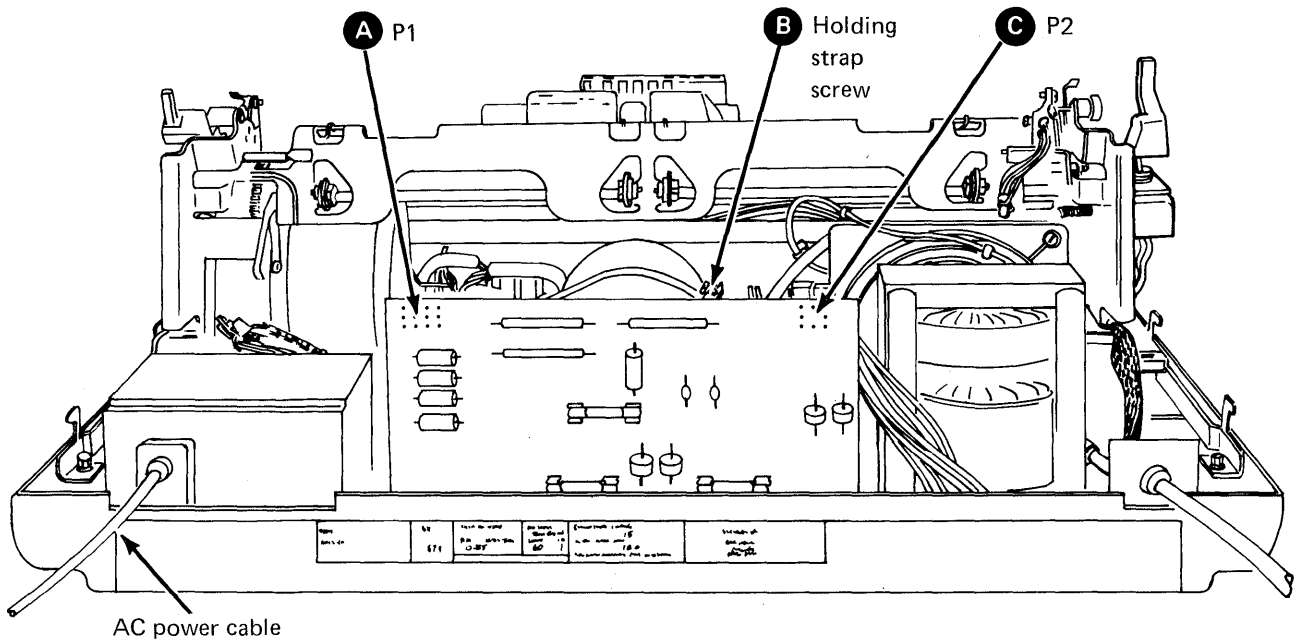
Line voltage is present at the power switch terminals any time the ac power cable is connected.

Removal

1. Switch off the printer power.
2. Disconnect the ac power cable.
3. Remove the top cover (3052).
4. Disconnect power supply cable connectors P1 **A** and P2 **C**.
5. Remove the screw and nut **B** from the capacitor holding straps.
6. Spread the straps apart and remove the power supply board assembly.

Reinstallation

1. Set the power supply board assembly into place and install the holding strap with the screw and nut **B**.
2. Connect cable connectors P1 **A** and P2 **C**.
3. Reinstall the top cover (3052).
4. Connect the ac power cable.



3455 AC Capacitor

DANGER

Line voltage is present at the power switch terminals any time the ac power cable is connected.

Removal

1. Switch off the printer power.
2. Disconnect the ac power cable **A**.
3. Remove the top cover (3052).
4. Remove the power supply board assembly (3454).

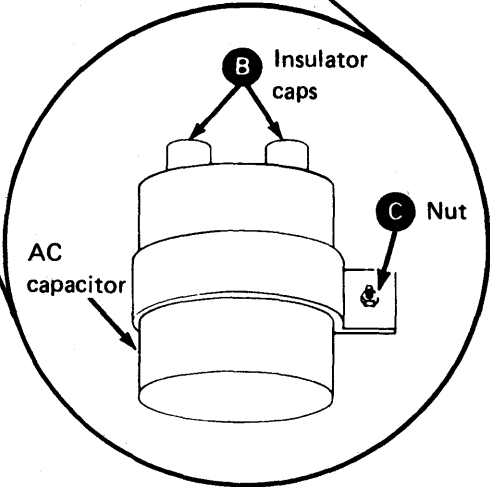
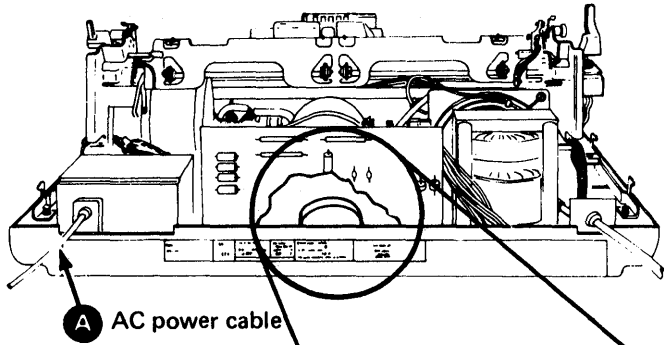
CAUTION

The ac capacitor may hold an electrical charge. Remove the insulating caps carefully; then discharge the capacitor.

5. Remove the insulator caps **B**. To ensure that the ac capacitor is discharged, short out the terminals with an insulated-handle screwdriver.
6. Remove the nut **C** and release the capacitor holding strap.
7. Disconnect the wires and remove the ac capacitor.

Reinstallation

1. Connect the wires to the capacitor.
2. Reinstall the insulator caps **B**.
3. Reinstall the ac capacitor with the holding strap and nut **C**.
4. Reinstall the power supply board assembly (3454).
5. Reinstall the top cover (3052).
6. Connect the ac power cable.



Located under power supply capacitors

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3456 Power Supply Transformer

DANGER

Line voltage is present at the power switch terminals any time the ac power cable is connected.

Removal

1. Switch off the printer power.
2. Disconnect the ac power cable **D**.
3. Remove the power supply (3453).
4. Remove the power supply board assembly (3454).

CAUTION

The ac capacitor may hold an electrical charge. Remove the insulating caps carefully; then discharge the capacitor.

5. Disconnect the two transformer primary wires from the ac capacitor (3455 step 5).

Note: On 50 Hz, 50/60-Hz transformers, the ac capacitor wires must be disconnected from TB2 **A** on the transformer.

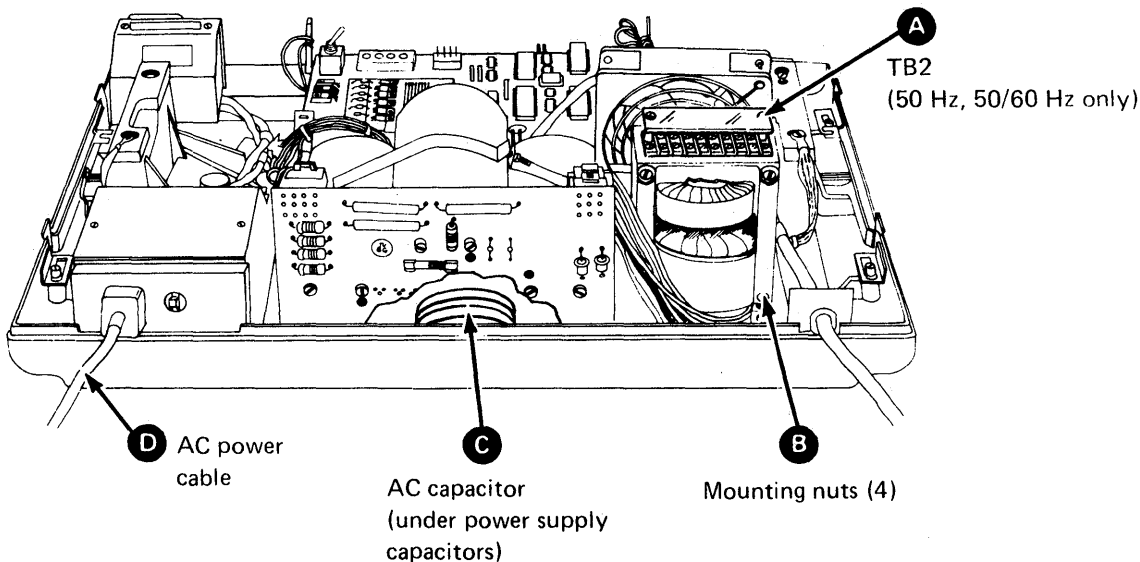
6. Remove the four nuts **B** and remove the transformer. Note that the star washer is under the transformer corner at the ground symbol.

Reinstallation

1. Reinstall the transformer with the four nuts **B**. Also install the star washer under the transformer corner at the ground symbol.
2. Connect the two primary transformer wires to the ac capacitor **C**.

Note: On 50 Hz, 50/60-Hz transformers, the ac capacitor wires must be connected to TB2 **A** on the transformer (B002).

3. Reinstall the power supply board assembly (3454).
4. Reinstall the power supply (3453).
5. Connect the ac power cable.



3457 Fan

DANGER

Line voltage is present at the power switch terminals anytime the ac power cable is connected.

Removal

1. Switch off the printer power.
2. Disconnect the ac power cable **C**.
3. Remove the top cover (3052).
4. Separate the printer from the printer base (3053).

Note: On 50 Hz, 50/60-Hz printers, remove the fan wires from TB2 **A** and omit steps 5 and 6.

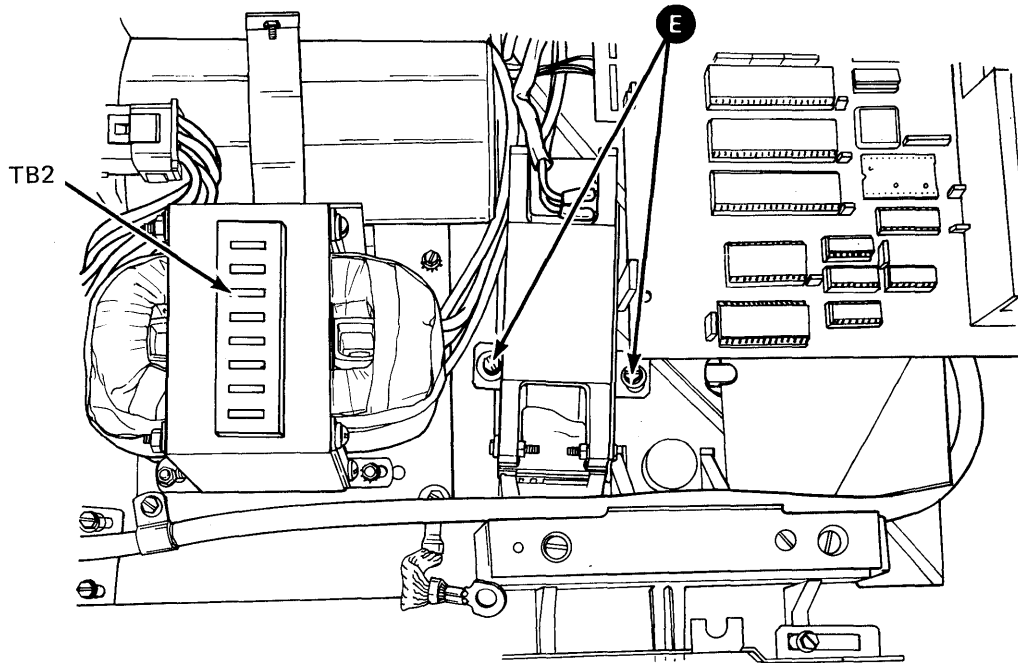
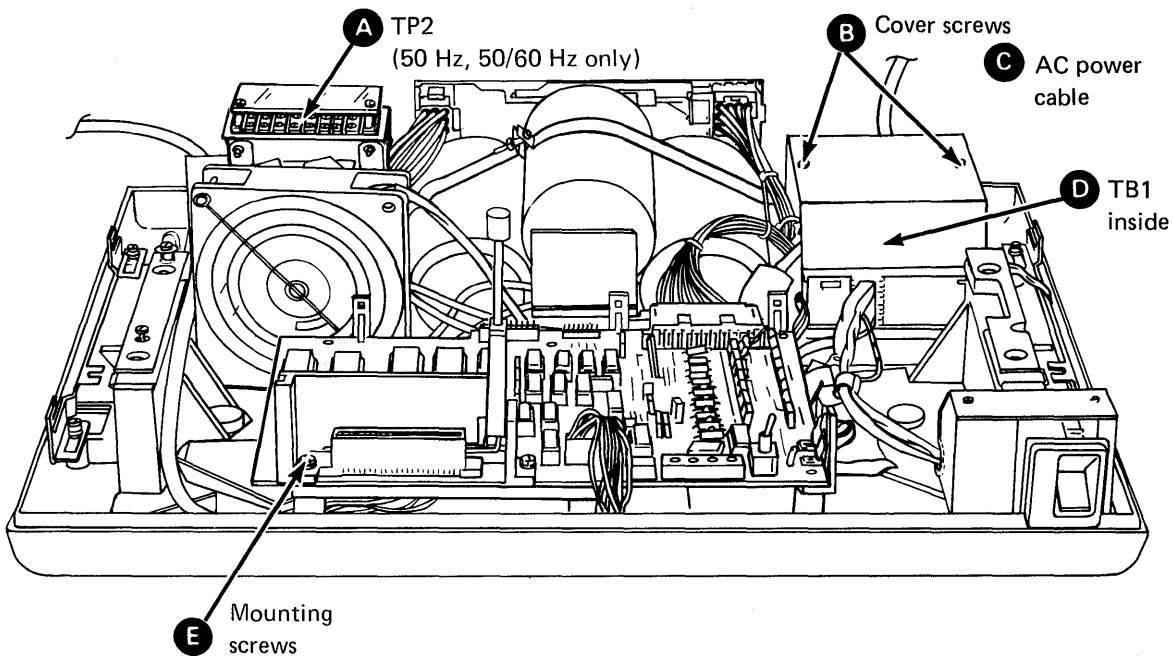
5. Remove the cover from the ac distribution box (two screws) **B**.
6. Remove the fan wires from TB1-1 and TB1-2 **D**.
7. Remove the two fan **E** mounting screws.

Reinstallation

1. Reinstall the fan with the mounting screws **E**.

Note: On 50 Hz, 50/60-Hz printers, remove the fan wires from TB2 **A** and omit steps 2 and 3.

2. Connect the fan wires to TB1-1 and TB1-2 **D**.
3. Reinstall the ac distribution box cover (two screws) **B**.
4. Assemble the printer to the printer base (3053).
5. Reinstall the top cover (3052).
6. Connect the ac power cable **C**.

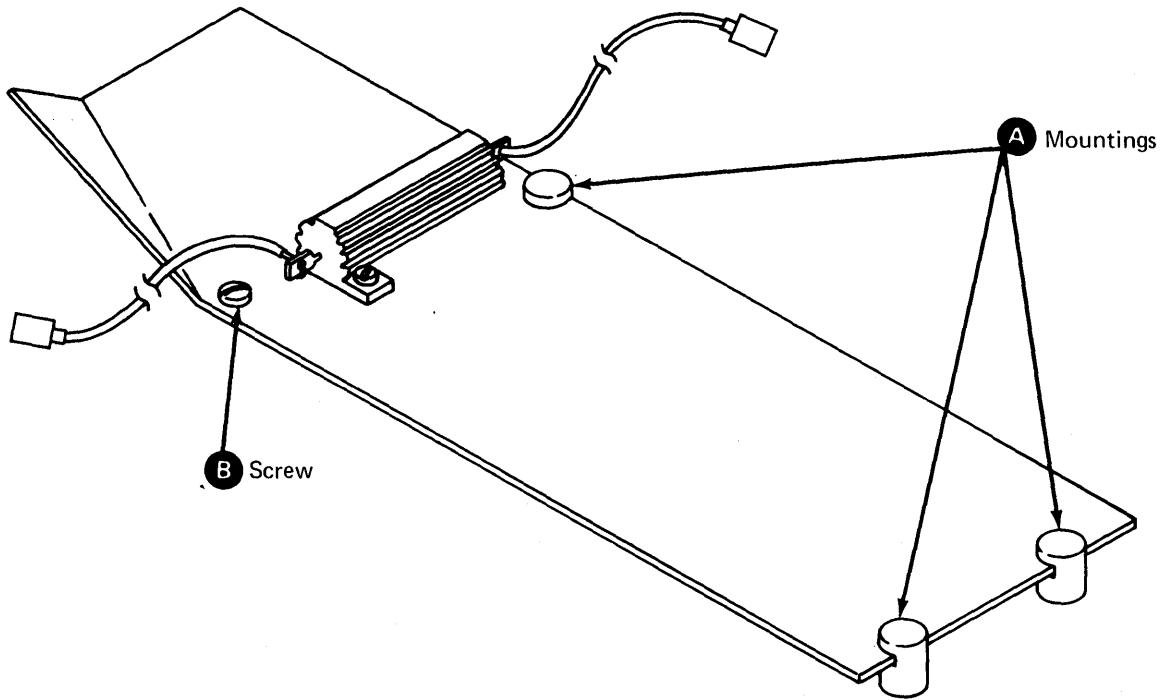


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3458 Resistor Assembly

Removal

1. Switch off the printer power.
2. Remove the top cover (3052).
3. Remove the logic/control board (3501).
4. Remove the resistor assembly mounting screw **B**.
5. Slide the assembly forward and to the left until it is free from the three mountings **A** on the base.



Reinstallation

1. Slide the resistor assembly to the rear and to the right until it is positioned within the three mountings **A** on the base.
2. Reinstall the assembly mounting screw **B**.
3. Reinstall the logic/control board (3501).
4. Reinstall the top cover (3052).

3501 Logic/Control Board

Removal

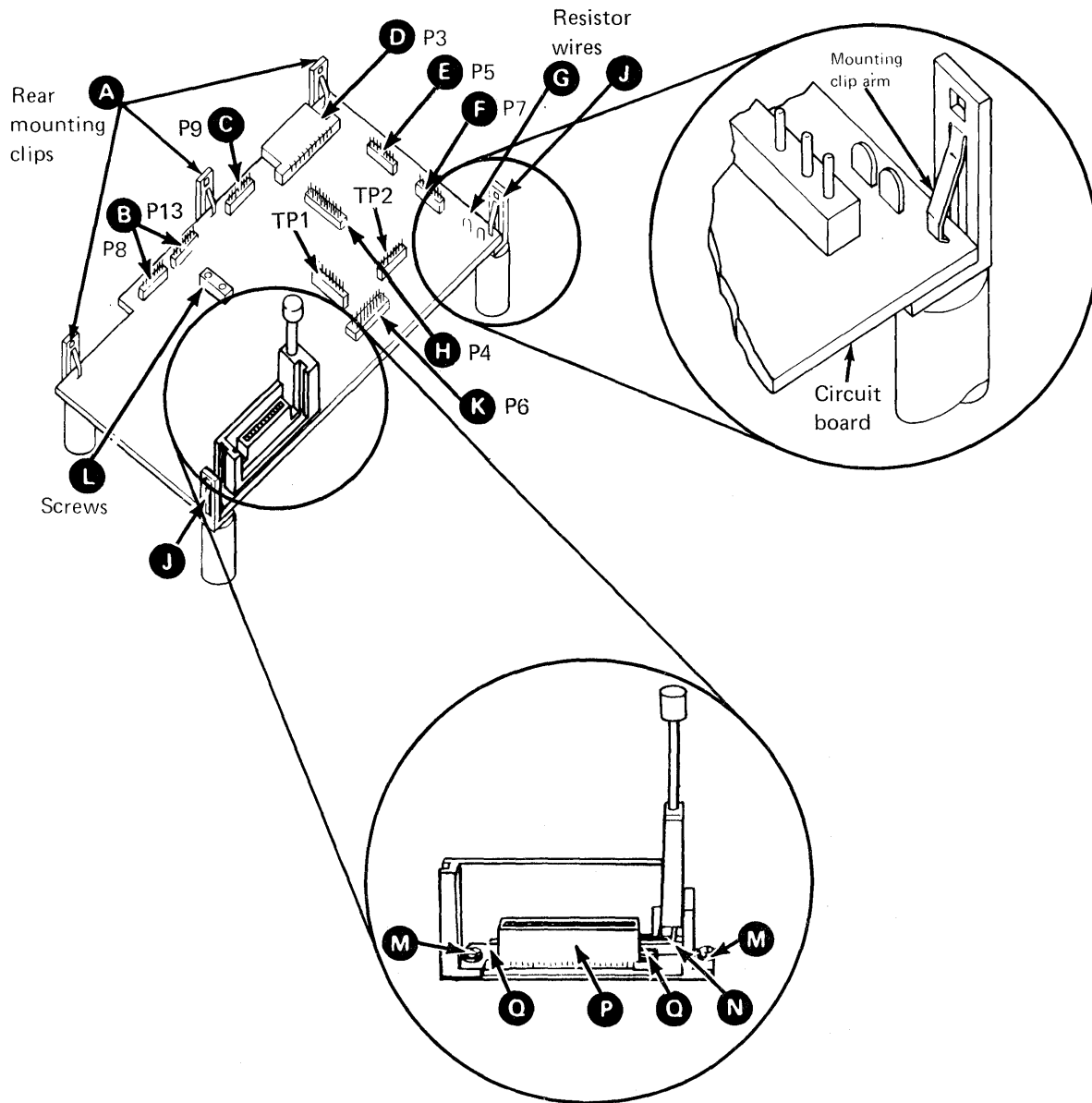
1. Switch off the printer power.
2. Remove the top cover (3052).
3. Remove the logic/control board safety cover (3502).
4. Disconnect:
 - a. Motor cable connectors P5 **E** and P7 **F**.
 - b. End-of-forms/print emitter cable connector P8 **B**.
 - c. Mode switch cable connector P13 **B**.
 - d. Forms emitter cable connector P9 **C**.
 - e. Signal cable connector P6 **K**.
 - f. The resistor wires **G**.
5. Remove the print head cable clamp mounting screws **L** and disconnect print head cable connector P4 at **H**.
6. Remove the two cartridge bracket mounting screws **M**; remove the cartridge bracket.
7. Remove the cartridge socket mounting screws **Q**.
8. Press outward on the right and left logic/control board mounting clip arms **J** and lift the front of the card until it is free of the arms.
9. Remove the logic/control board by pulling it forward until it is released from the three rear mounting clips **A**.
10. Disconnect power supply cable connector P3 **D**.

Reinstallation

Note: See Logic/Control Board Layout (3005) and Wiring Diagram (Appendix B) as required to aid in

installation.

1. Connect power supply cable connector P3 **D**.
2. Slide the rear edge of the logic/control board against the three rear mounting clips **A** and under the clip arms.
3. Lower the front edge of the board into place; it should be held by the right and left mounting clips **J**.
4. Reinstall the two cartridge socket mounting screws **Q**.
5. Reinstall the cartridge bracket.
6. Reinstall cartridge bracket mounting screws **M**.
7. Connect print head cable connector P4 **H** and install the cable clamp with the screws **L**. Ensure that the cable is flat against the flat spring.
8. Connect:
 - a. Power motor cable connectors P5 **E** and P7 **F**.
 - b. End-of-forms/print emitter cable connector P8 **B**.
 - c. Mode switch connector P13 **B**.
 - d. Forms emitter cable connector P9 **C**.
 - e. Signal cable connector P6 **K**.
 - f. The resistor wires **G**.
9. Reinstall the logic/control board safety cover (3502).
10. Reinstall the top cover (3052).



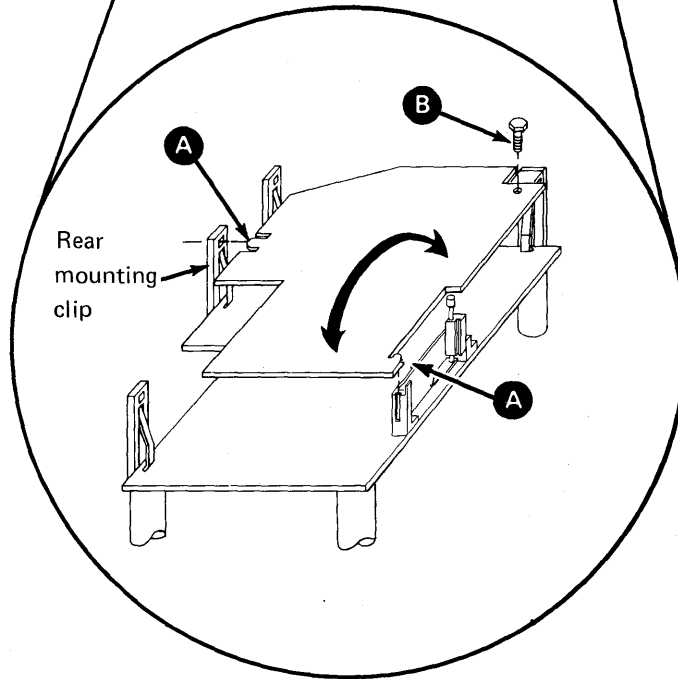
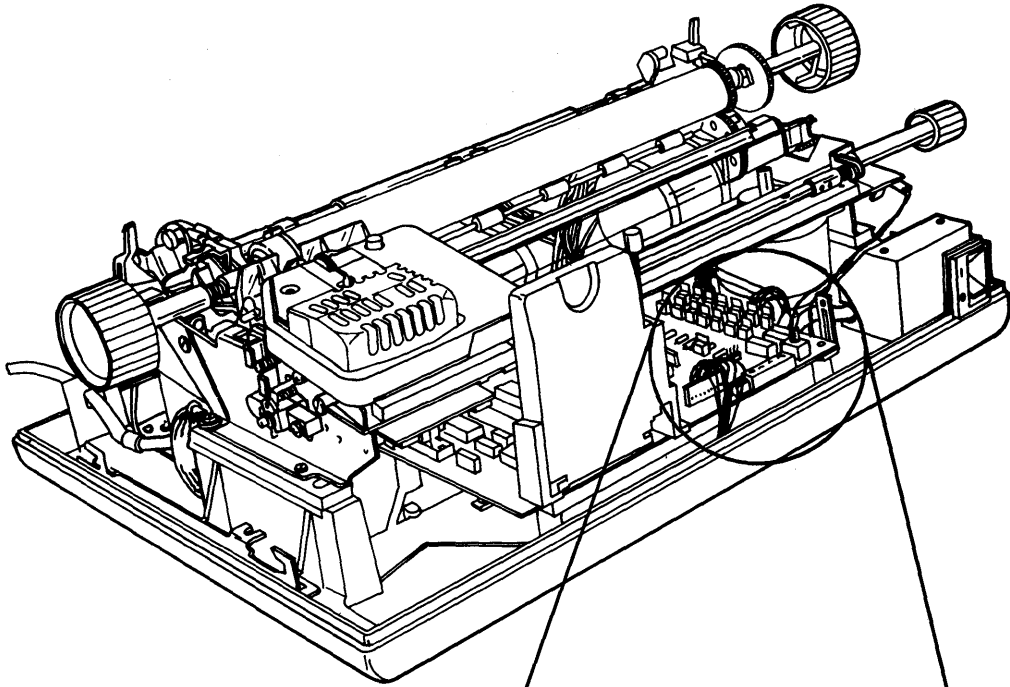
3502 Logic/Control Board Safety Cover

Removal

1. Remove the top cover (3052).
2. Remove the cover mounting screw **B**.
3. Pull the cover forward until the cover mounting tabs **A** are out of the openings in the rear and left mounting clips.

Reinstallation

1. Place the cover mounting tabs **A** into the openings in the rear and left mounting clips.
2. Lower the cover into place and install the cover mounting screw **B**.
3. Reinstall the top cover (3052).



3503 Signal Cable

Model 02L

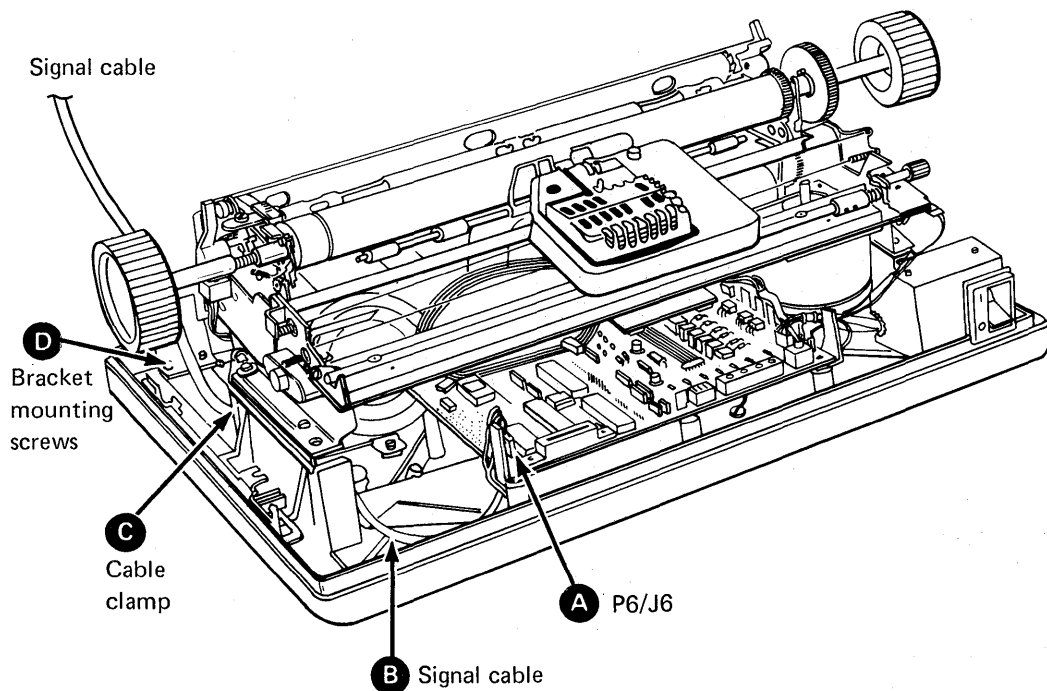
Removal

1. Switch off the printer power.
2. Disconnect the signal cable **B**.
3. Remove the top cover (3052).
4. Remove the logic/control board safety cover (3502).
5. Disconnect the signal cable from logic/control board connector J6 **A**.
6. Loosen the power supply mounting screw that holds the signal cable clamp **C**.
7. Remove the screw **D** that holds the cable mounting bracket to the printer base. Do not remove this bracket from the cable.

8. Remove the signal cable from the printer.

Reinstallation

1. Reinstall the signal cable into the printer.
2. Reinstall screw **D** and fasten the cable mounting bracket to the printer base.
3. Place the cable in the cable clamp **C** and tighten the power supply mounting screw.
4. Connect the signal cable to logic/control board connector J6 **A**.
5. Reinstall the logic/control board safety cover (3502).
6. Reinstall the top cover (3052).
7. Connect the signal cable to the host device.



Model 02R

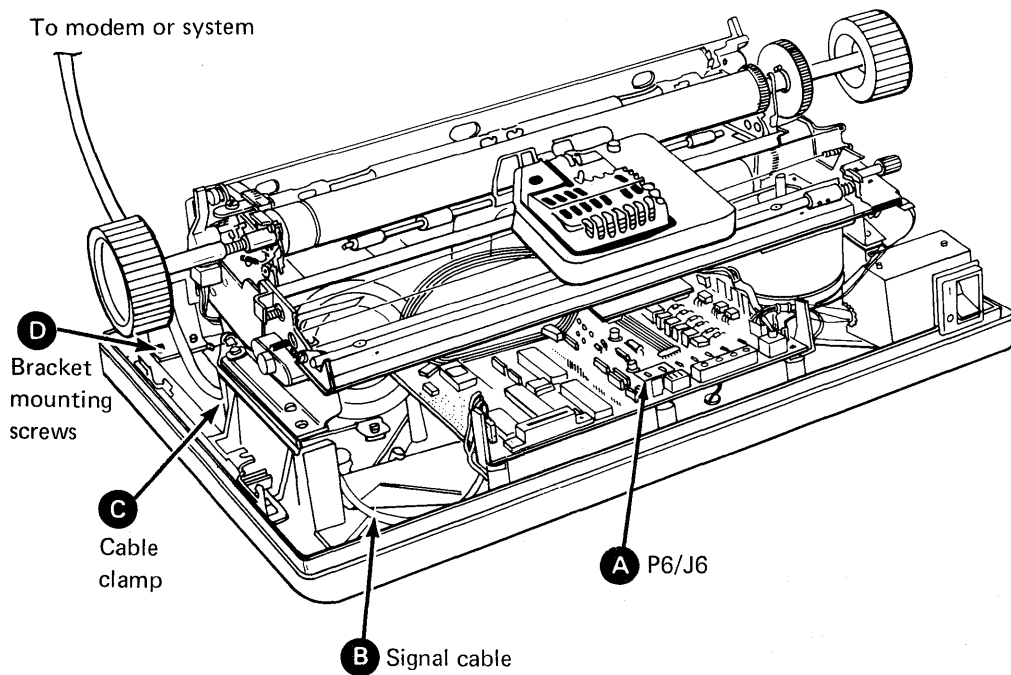
Removal

1. Switch off the printer power.
2. Disconnect the signal cable **B** from the modem or the host system.
3. Remove the top cover (3052).
4. Remove the logic/control board safety cover (3502).
5. Disconnect the signal cable from logic/control board connector J6 **A**.
6. Loosen the power supply mounting screw that holds the signal cable clamp **C**.
7. Remove the screw **D** that holds the cable mounting bracket to the printer base. Do not remove this bracket from the cable.

8. Remove the signal cable from the printer.

Reinstallation

1. Reinstall the signal cable into the printer.
2. Reinstall screw **D** and fasten the cable mounting bracket to the printer base.
3. Place the cable in the cable clamp **C** and tighten the power supply mounting screw.
4. Connect the signal cable to logic/control board connector J6 **A**.
5. Reinstall the logic/control board safety cover (3502).
6. Reinstall the top cover (3052).
7. Reconnect the signal cable.



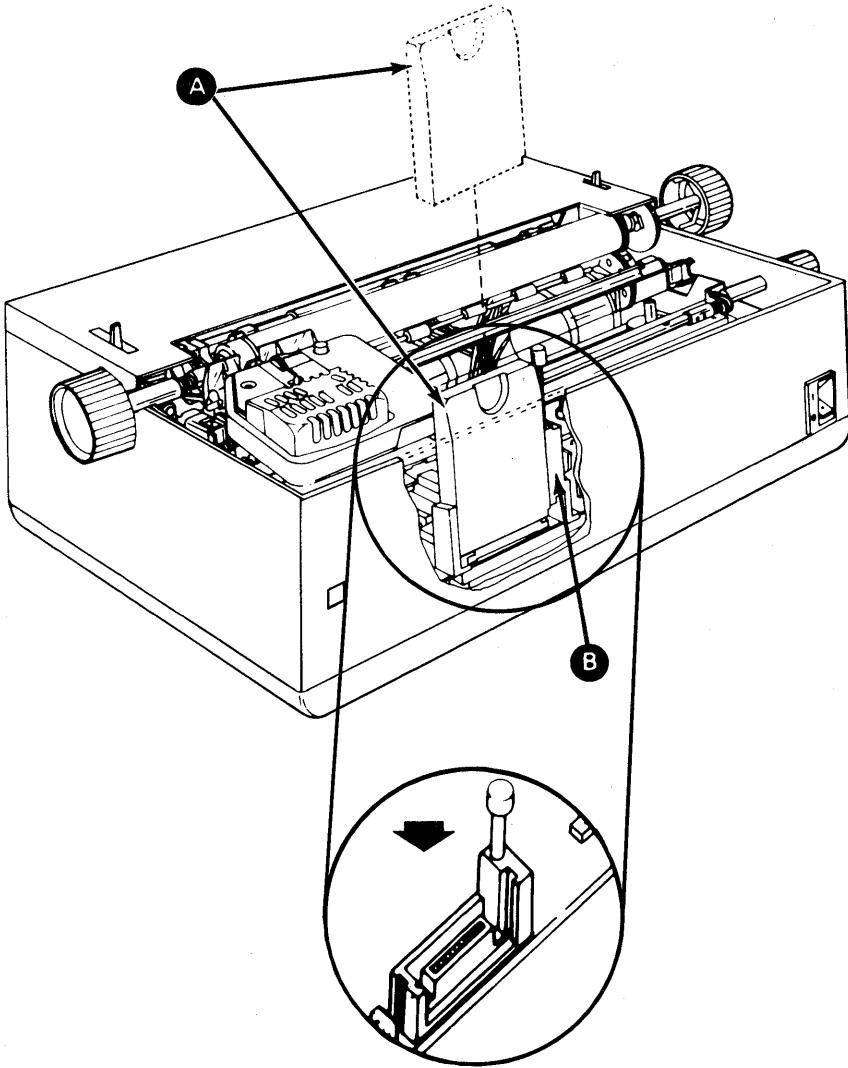
3504 Print Cartridge

Removal

1. Switch off the printer power.
2. Remove the access cover (3051).
3. Press and hold the cartridge-release plunger **C**.
4. Lift cartridge **A** from the cartridge connector **B**.

Reinstallation

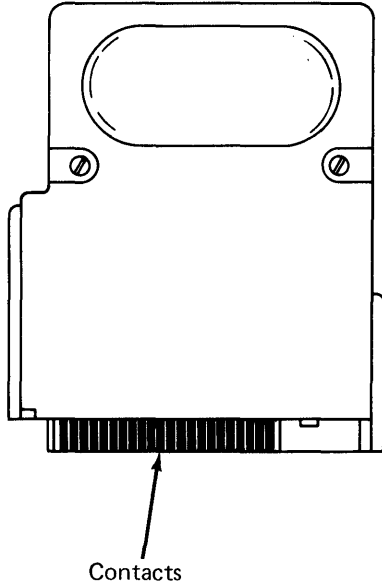
1. Press and hold the cartridge-release plunger **C**.
2. Reinstall the print cartridge **A** in the cartridge connector **B**.
3. Reinstall the access cover (3051).
4. Switch on the printer power.



3504 Print Cartridge (Continued)

Cleaning the Cartridge Contacts

1. Remove the print cartridge from the printer. (See 3504 "Removal" for the procedure to remove the print cartridge.)



2. Clean the gold contacts on both sides of the cartridge by wiping the contacts with a lint-free cloth saturated in isopropyl alcohol. Make sure that no lint remains on the contacts after you clean them.

3504 Print Cartridge (Continued)

Cleaning Connector Contacts

1. Switch off the printer power; then, unplug the power cord from the ac outlet.
2. Remove the print cartridge from the printer. (See 3504 "Removal" for the procedure to *remove* the print cartridge.)
3. If there is dust or lint on the connector contacts, brush the connector with a small clean nylon brush (such as a paint brush).
4. Put the cartridge in the printer. (See 3504 "Reinstallation" for the procedure to *replace* the print cartridge.)
5. Connect the power cord to the ac outlet.

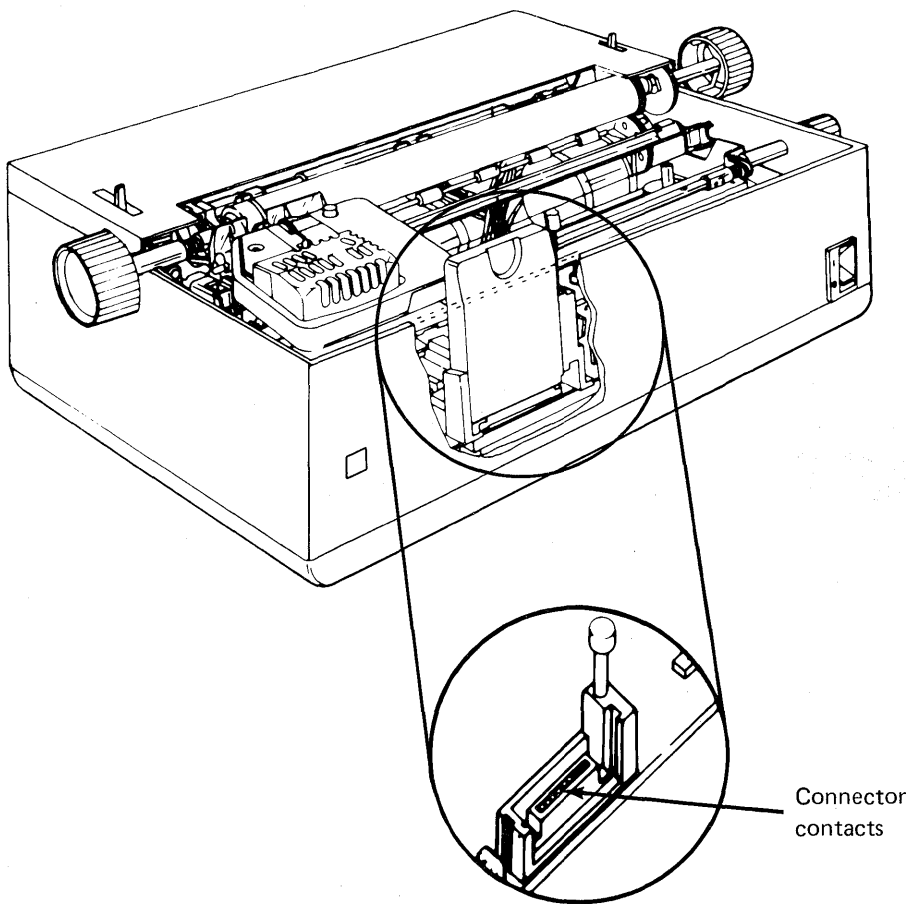
6. Switch on the printer power.
7. When the printer power-on test is completed, observe the error lights. (The access cover must be removed for you to see the error lights.)

DANGER

Do not put your hands in the printer; only look at the error lights.

If the error lights are off, test the printer using the wrap test. See 3654 "To Operate the Printer in Wrap Mode" for the procedure to run the wrap test.

If the error lights are set to 1101, perform the following steps (see the illustration on the next page for the location of the error lights in the printer).



3504 Print Cartridge (Continued)

Perform these steps because the error lights are still set to 1101 and you already tried to brush the dust or lint from the connector contacts.

1. Switch off the printer power; then, unplug the power cord from the ac outlet.
2. Remove the print cartridge from the printer. See 3504 "Removal" for the procedure to *remove* the print cartridge.
3. Fold a lint-free cloth into a pad small enough to insert into the connector.
4. Saturate the pad with isopropyl alcohol.
5. Open the cartridge-connector by pushing and holding down the plunger. Insert the pad into the connector. Then release the plunger to close the contacts. The contacts should grip the pad.
6. Remove the pad by pulling it straight up.
7. Repeat step 3 until all the contacts are cleaned. Make sure that no lint remains on the contacts after you clean them.

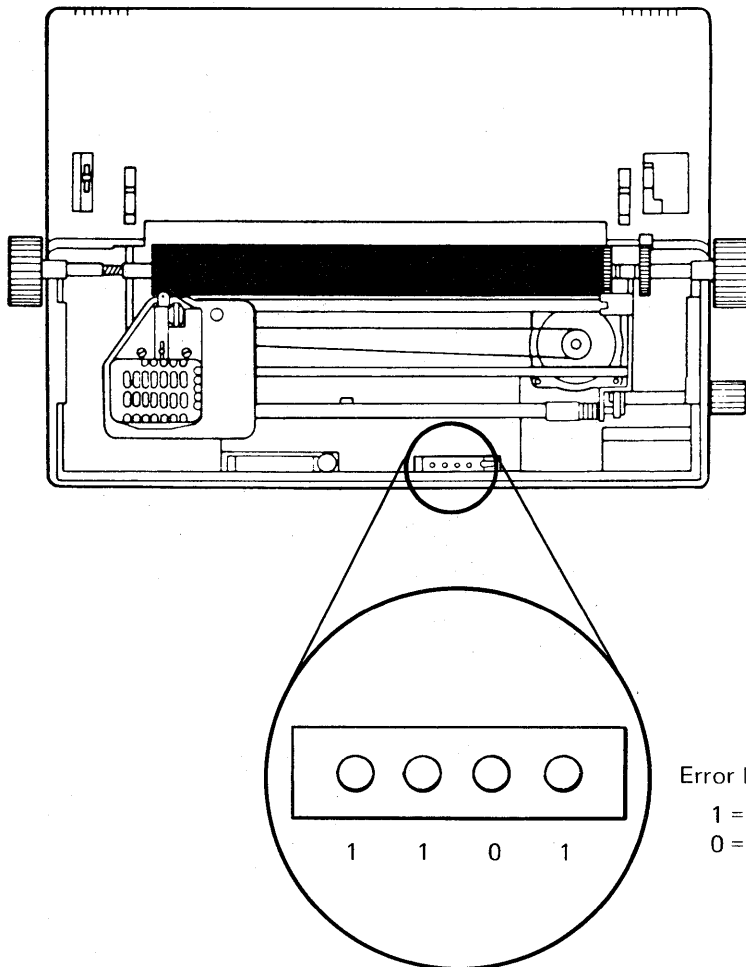
8. Replace the cartridge in the printer. (See 3504 "Reinstallation" for the procedure to *replace* the print cartridge.)
9. Connect the power cord to the ac outlet.
10. Switch on the printer power.
11. When the printer power-on test are completed, observe the error lights. (The access cover must be removed for you to see the error lights.)

DANGER

Do not put your hands in the printer; only look at the error lights.

If the error lights are off, test the printer using the wrap test. See 3654 "To Operate the Printer in Wrap Mode" for the procedure to run the wrap test.

If the error lights are not off, see the entry MAP chart.



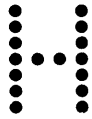
Error lights

1 = error light is turned on
0 = error light is turned off

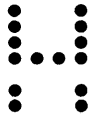
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3651 Print Quality

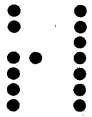
A Character printed correctly



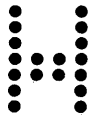
B Missing horizontal row of dots



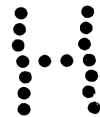
C Random missing dots



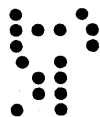
D Extra dots



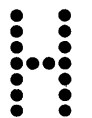
E Dots within a character are not aligned vertically



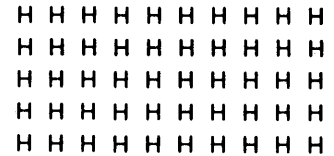
F Unintelligible printing



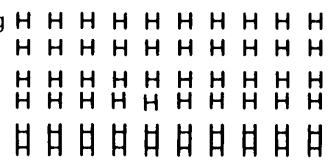
G Wrong character width



H Correct printing



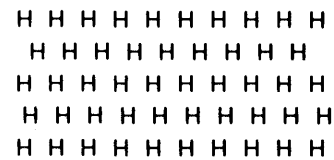
J Incorrect line spacing



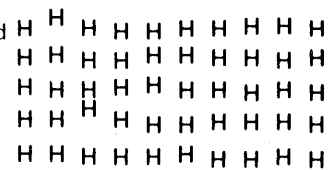
K Incorrect character spacing



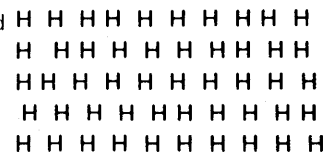
L Printing misaligned vertically



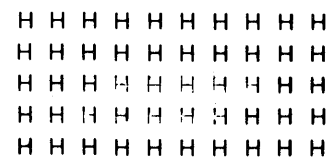
M Printing misregistered vertically



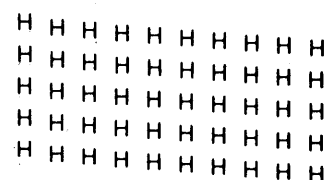
N Printing misregistered horizontally



P Defective ribbon
Oil spot on ribbon
Defective platen



Q Printing not aligned with the forms
(crooked printing)



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3654 Test Mode

1. Switch off the printer power.
2. Remove the access cover (3051).
3. Set the test switch **A** to the right.

Note: If the printer is a model 02R, connect the test connector **B** (part 2704136 or part 6327815) to the end of the signal cable **C**.

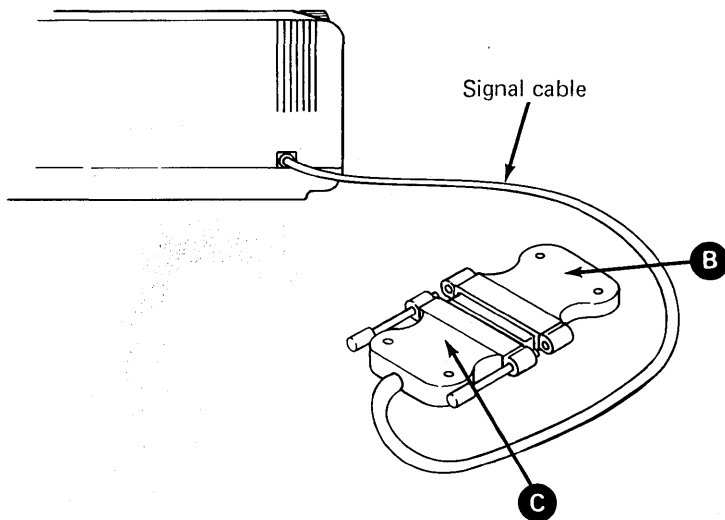
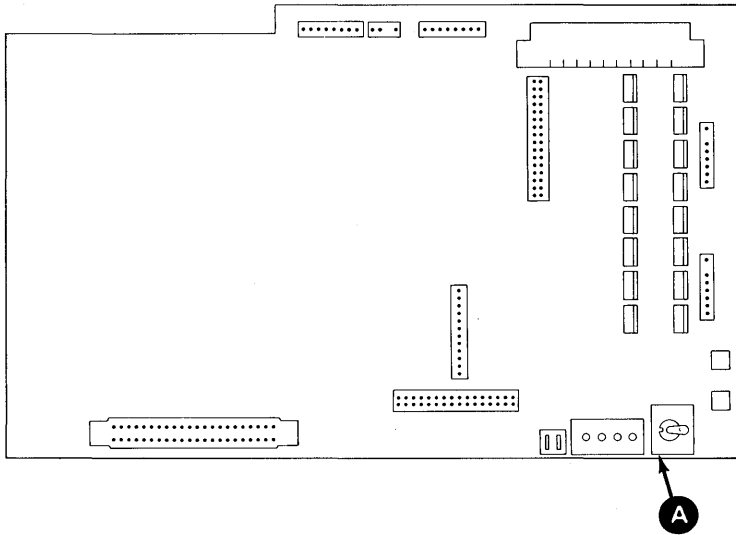
4. Switch on the printer power.
5. Observe the test.
6. Switch off the printer to stop the test.

Returning the Printer to Operating Mode

1. Switch off the printer power.

Note: If you used test connector **B**, disconnect it from the signal cable **C**.

2. Set the test switch **A** to the left.
3. Reinstall the access cover (3051).



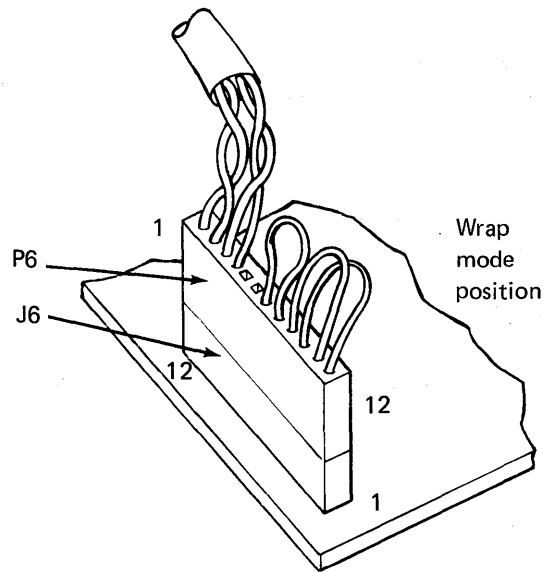
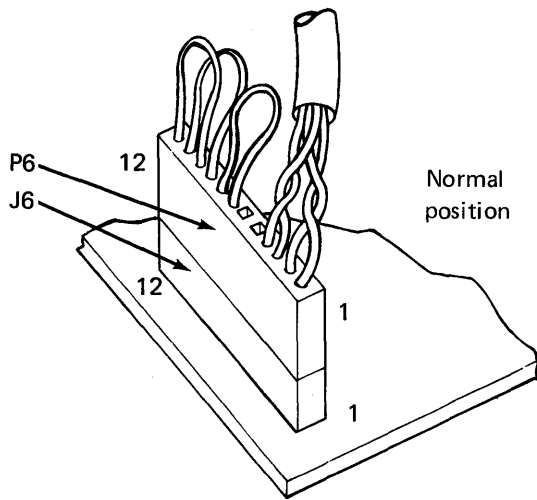
3654 Test Mode (continued)

To operate the printer in wrap mode:

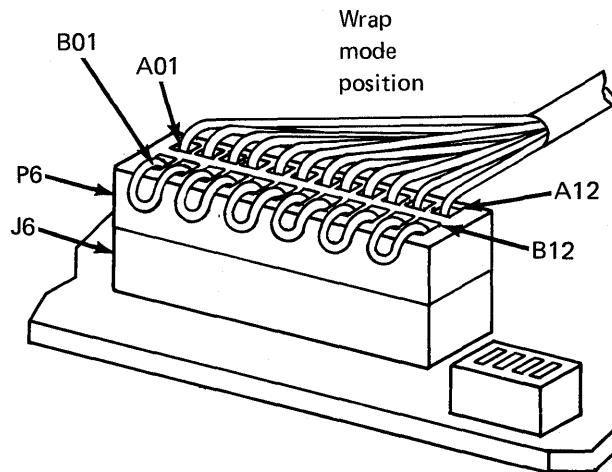
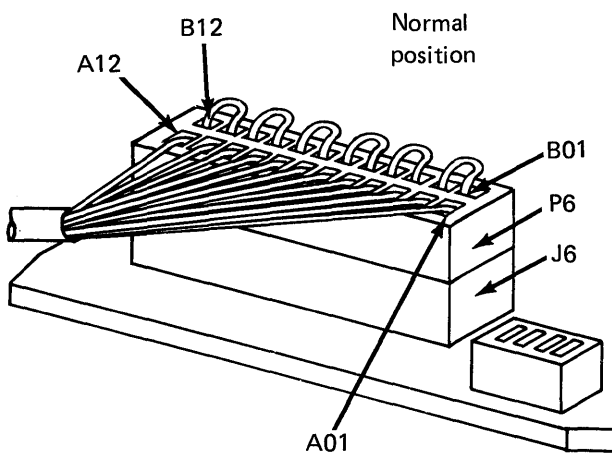
1. Switch off the printer power.
2. Remove the top cover (2052).
3. Remove the planar board safety cover (2502).
4. Disconnect P6 from J6 and reconnect P6 to J6 in reverse (P6-1 to J6-12).
5. Switch on the printer power.

To return the printer to operating mode:

1. Switch off the printer power.
2. Disconnect P6 from J6 and reconnect P6 to J6 (P6-1 to J6-1).
3. Reinstall the planar board safety cover (2502).
4. Reinstall the top cover (2052).
5. Switch on the printer power.



4975 Printer Model 02L



4975 Printer Model 02R

Chapter 4. Theory

Functional Units

Power Supply

The power supply provides power to the logic/control board, forms feed motor, print head carrier motor, and the print head magnets. The ac power to the power supply is controlled by a switch on the front of the printer and a circuit breaker/switch in a distribution box that contains the ac receptacle and line filters.

The power supply provides the ac and dc power used within the unit; the supply uses a single-phase ac power source to provide ac voltage to the fan, and the following dc voltages: +5, +11, and +24 Vdc.

Note: The model 02R (remote) has a -12 Vdc power supply for the EIA interface.

Forms Feed Emitter

The forms feed emitter consists of a disk, attached to the forms feed/emitter motor shaft, that permits pulses

to be produced. The pulses are counted to determine how far the motor moves, and are used in a feedback loop to keep the motor running.

Print Emitter and Print Emitter Pickup

The print emitter and print emitter pickup are used by the printer to generate the left margin signal and the print emitter signals.

The printer emitter pickup is mounted on the bottom of the print head carrier and slides along the length of the stationary print emitter as the carrier moves left or right.

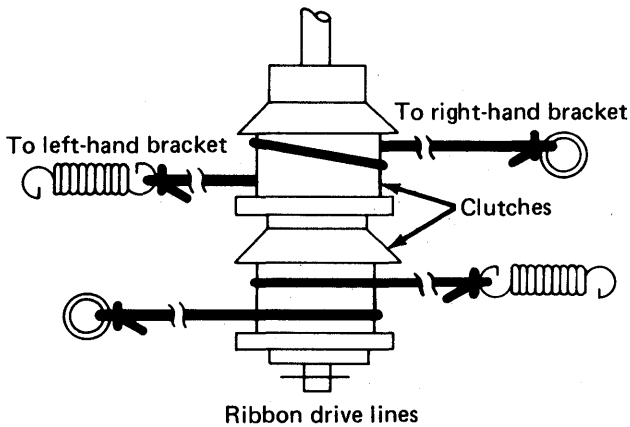
The logic/control board monitors and counts emitter pulses to determine:

- The direction the print head is moving
- How far the print head is from the left margin
- When to activate the print wire magnets.

Ribbon Drive

The ribbon cartridge and ribbon drive mechanism are mounted on the print head carrier and move with the carrier. Two ribbon feed rolls in the cartridge move the ribbon past the print wires and back into the cartridge.

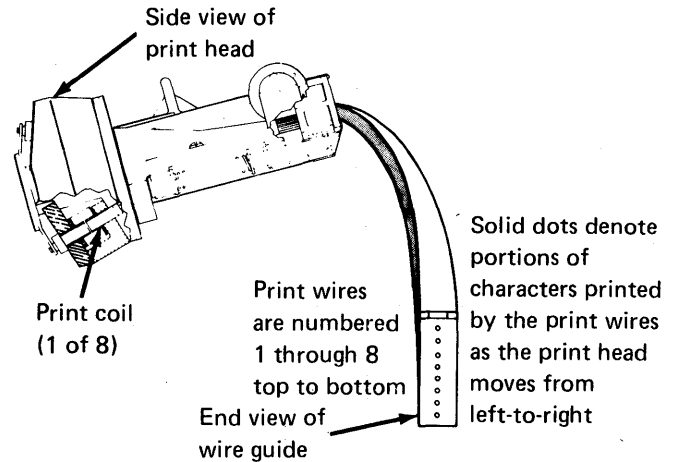
The ribbon feed rolls are moved by two stationary ribbon drive lines. The ends of these lines are attached to both sides of the printer frame and loop around two clutches located underneath the print head carrier. The clutches drive in one direction and slip in the other. The lines are looped so that both clutches drive in the same direction and supply clockwise ribbon movement, regardless of which direction the carrier is moving.



Print head

The print head has eight vertically arranged print wires. The wires are numbered 1 through 8, from top to bottom. Characters are formed by patterns of dots that are made when the print wires strike the ribbon.

At 160 cps, the character dot matrix is 7-high by 7-wide. At 40 cps, the character dot matrix is 14-high by 13-wide. Print wire 8 can be used for characters with curved or diagonal lower elements, or for under-score.

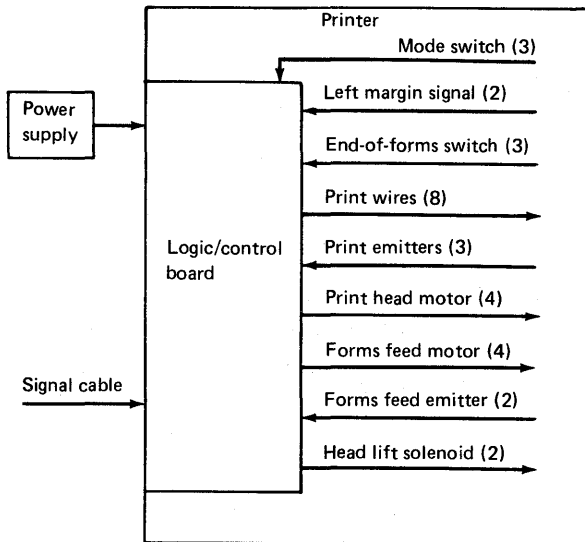


Print Cartridge

The print cartridge contains the logic to generate proportional spacing between characters and the 10 cpi format. The print cartridge must be in position during a print operation.

Logic/Control Board

The logic/control board receives command information from the host system. The logic/control board sends an interrupt request to the host system. In addition to communicating with the host system, the logic/control board contains all logic for controlling the printer.

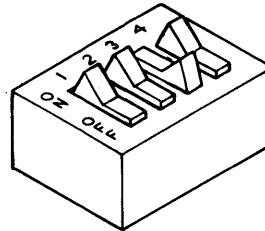


Note: The number in parentheses is the number of wires.

Logic/Control Board Switches

The logic/control board switches are to be used by Customer Engineers as an aid in servicing the IBM 4975 Printer and to select the data line speed (model 02R only).

The switches have different functions for Model 02L and for Model 02R.



80 Character width

Model 02L

- Switches function only when the printer is in the test mode.
- Switch 1 on limits the width of the test printout to 80 characters. If switch 1 is off, the test printout width is 132 characters.
- Switch 2 on runs the forms emitter test. This test causes the platen to turn backward and forward. As the platen assembly moves, the error indicator shows the amount of forms emitter adjustment that is needed.

Function	1	2
80 char. lines	On	
Forms test		On

Model 02R

- Switch 1 and switch 2 allow for internal clocking at data rates of 1200, 2400, and 4800 bps. When switch 1 and switch 2 are off, the rate is 1200 bps. When switch 1 is off, the rate is 2400 bps. When switch 2 is off, the rate is 4800 bps. When both switches 1 and 2 are on the rate is selected by the system.
- Switch 3 on limits the width of the test printout to 80 characters. If switch 3 is off, the test printout width is 132 characters.
- Switch 4 on runs the forms emitter test. This test causes the platen to turn backward and forward. As the platen assembly moves, the error indicator shows the amount of forms emitter adjustment that is needed.

Function	1	2	3	4
80 char. lines			On	
Forms test				On
1200 bps	Off	Off		
2400 bps	Off	On		
4800 bps	On	Off		
External clock	On	On		

Chapter 5. Preventive Maintenance

Lubrication and Checks

Perform printer preventive maintenance (PM) on any 01 service call if a check of the incident reports show that more than a year has passed since the preceding PM. See the following pages for the lubrication points.

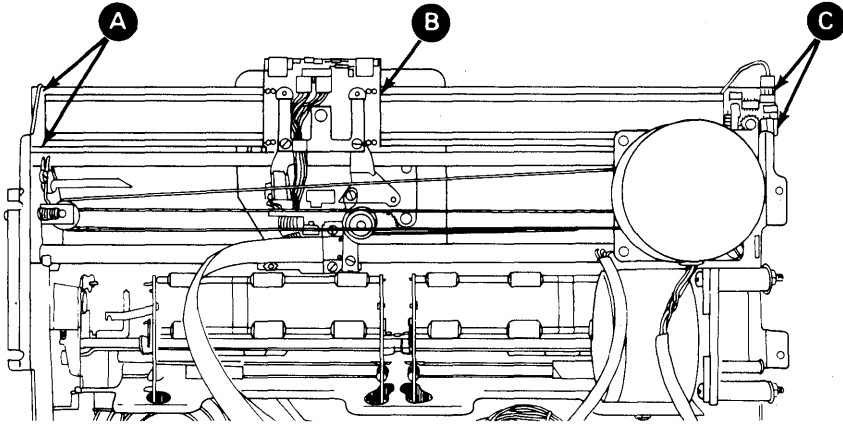
<i>Unit</i>	<i>Operation</i>	<i>Lubricant</i>	<i>Notes</i>
Ribbon drive	Check drive cords and pulleys; replace if worn.		Perform: "3404 Ribbon Drive Cords" removal and replacement.
Print head	Clean the wire guide tip and side grooves. Lubricate support shaft felt-washers and rear slide points.	IBM No. 6	Drop.
Print cartridge	Clean the cartridge contacts and cartridge connector contacts. Use lint-free cloth (IBM part 2108930) and isopropyl alcohol (IBM part 2200200).		Perform: "Cleaning the Cartridge Contacts." See "3504 Print Cartridge."
Oil felt reservoir	Lubricate felt pad.	IBM No. 6	Saturate.
Head ramp	Clean and lubricate.	IBM No. 23	Light film.
Print emitter	Lubricate: Pickup pads Contact points between emitter board and side frame. Horizontal fine adjustment threads and shaft sides. Point where round shaft (mounted to top of emitter) slides in hold down bracket and left side frame.	IBM No. 23 IBM No. 23 IBM No. 23 IBM No. 23	Light film. Light film. Light film. Light film.
Carrier drive	Lubricate belt spring guide shaft.	IBM No. 6	Drop.
Platen	Lubricate bushings. Tighten setscrews in platen knobs.	IBM No. 6	Drop.
Power supply	Check fan operation.		

Note: Excess oil may fall from the print wires to the ribbon and cause poor print quality.

Lubrication and Checks (Continued)

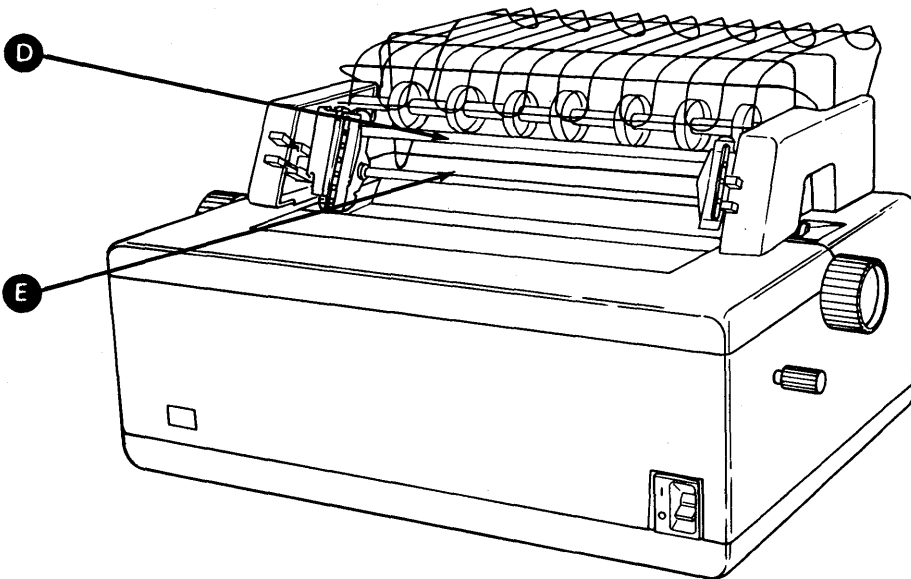
IBM No. 23 grease

- A** Contact points between emitter board and left frame
- B** Pickup pads (4)
- C** Contact points between emitter board and right frame



IBM No. 23 grease

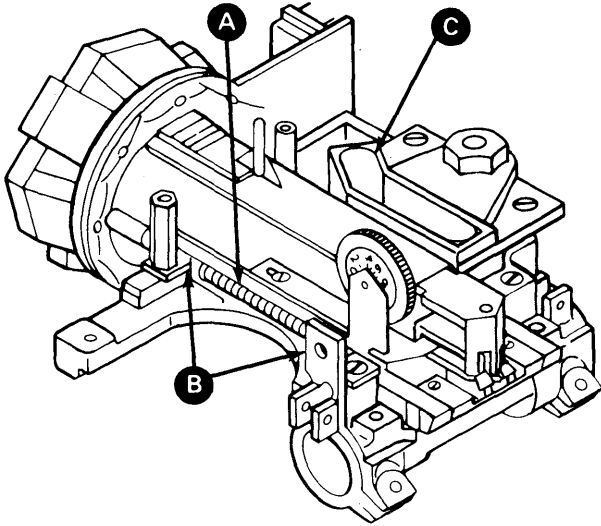
- D** Top forms tractor shaft (light film)
- E** Bottom forms tractor shaft (light film)



Lubrication and checks (Continued)

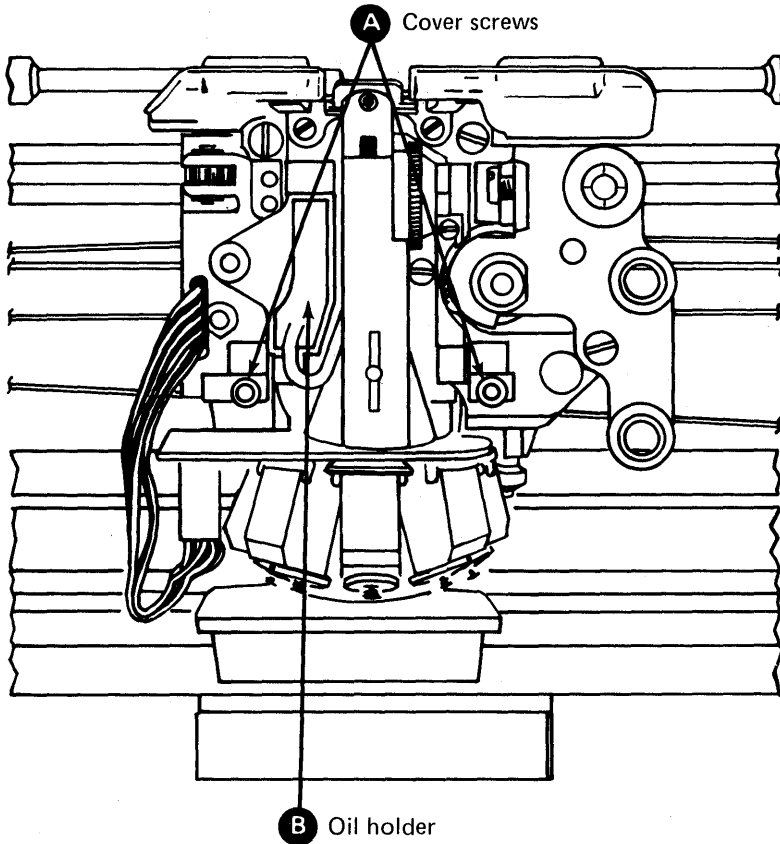
IBM No. 6 oil

- A** Support bars (2)
- B** Felt washers
- C** Oil holder

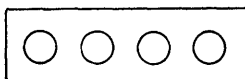


Oil Felt Lubrication

1. Switch off the printer power.
2. Remove the access cover (3051).
3. Remove the ribbon cartridge (3405).
4. Remove the two print head cover screws **A**.
5. Remove the print head cover.
6. Remove the plastic cover from the oil holder **B**.
7. Soak the felt with IBM No. 6 oil.
8. Install the plastic cover on the oil holder **B**.
9. Install the print head cover.
10. Install the two print head cover screws **A**.
11. Install the ribbon cartridge (3405).
12. Install the access cover (3051).



Chapter 6. Error Indicator Lights Models 02L and 02R



8 4 2 1

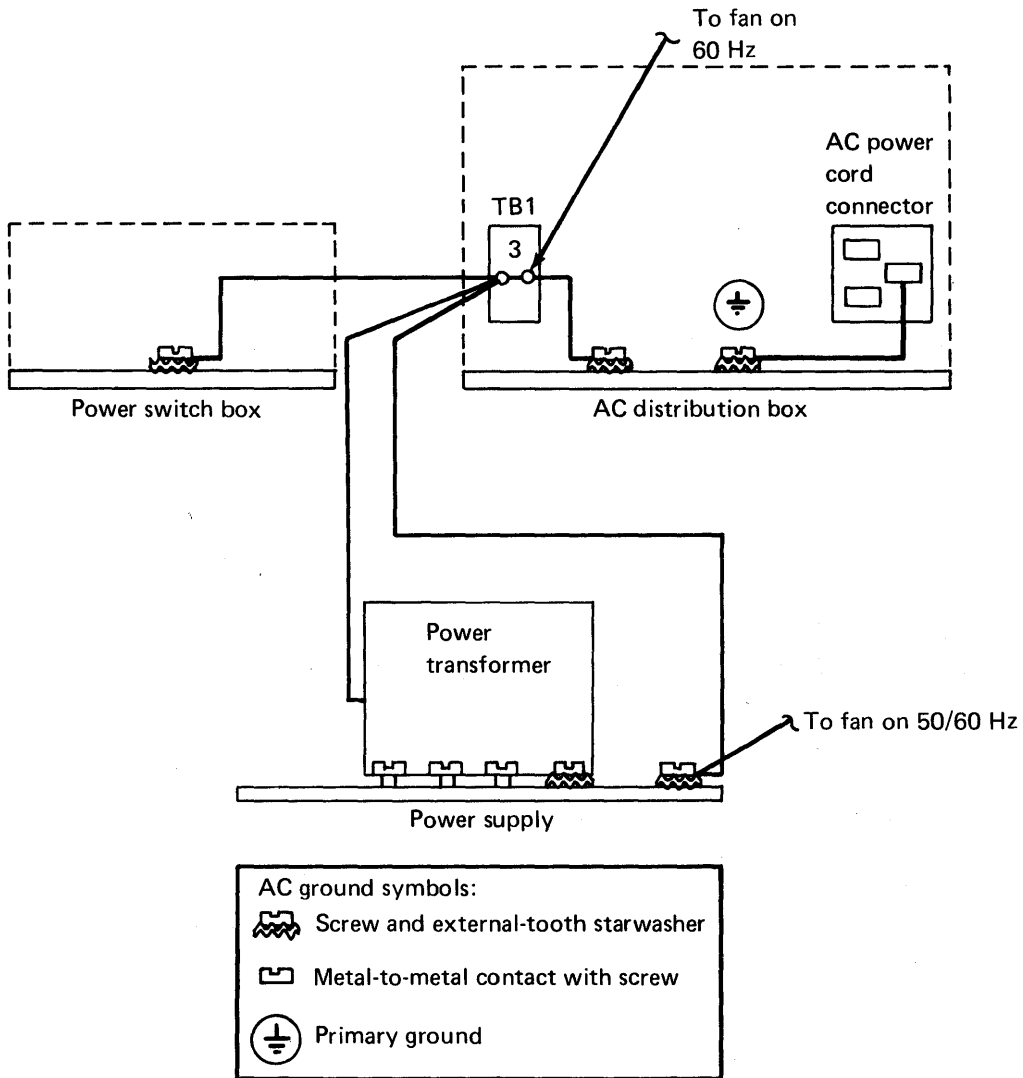
Mode switch in the wait (center) position			Mode switch in the print (front) position		
Indicators 8 4 2 1	Hex	Definition	Indicators 8 4 2 1	Hex	Definition
0 0 0 0	0	No error	0 0 0 0	0	No error
0 0 0 1	1	Mode switch error	0 0 0 1	1	Power supply error (11 volts)
0 0 1 0	2	Left margin error	0 0 1 0	2	Power supply error (24 volts)
0 0 1 1	3	EOF switch error	0 0 1 1	3	Wait switch was active
0 1 0 0	4	Usart error	0 1 0 0	4	Forms emitter
0 1 0 1	5	Power supply error	0 1 0 1	5	Left margin error
0 1 1 0	6	Cartridge error	0 1 1 0	6	Emitter sequence error
			0 1 1 1	7	Forms stalled
			1 0 0 0	8	Buffer overrun error
			1 0 0 1	9	TP error/Usart error
			1 0 1 1	B	Forms on overflow line
			1 1 0 0	C	EOF or EOF switch error
			1 1 0 1	D	Cartridge parameter error
			1 1 1 0	E	No emitter error
			1 1 1 1	F	Invalid length error

All positions not shown are unused.

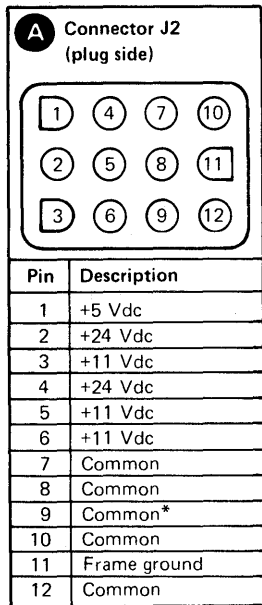
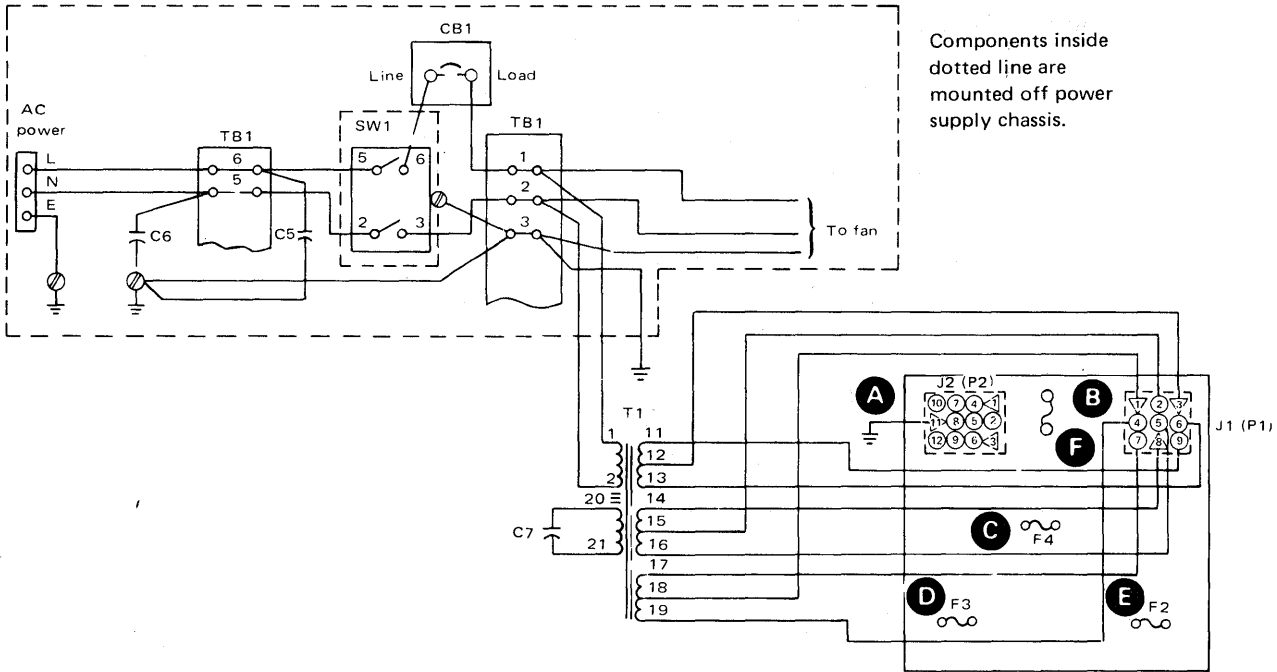
0 = Off
1 = On

Chapter 7. Wiring Diagrams

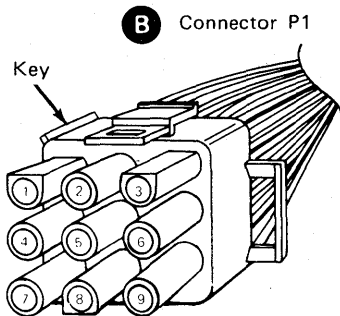
B001 AC Safety Ground Locations



This diagram is for instructional purposes only.



*For Model 02R, pin 9 is -12 Vdc.



Fuse	Supply	Rating
F1*	-12 Vdc	-1A Slo-Blo
F2	24 Vdc	10A Med-Blo
F3	11 Vdc	8A Med-Blo
F4	5 Vdc	5A Slo-Blo

*F1 is installed on model 02R only.

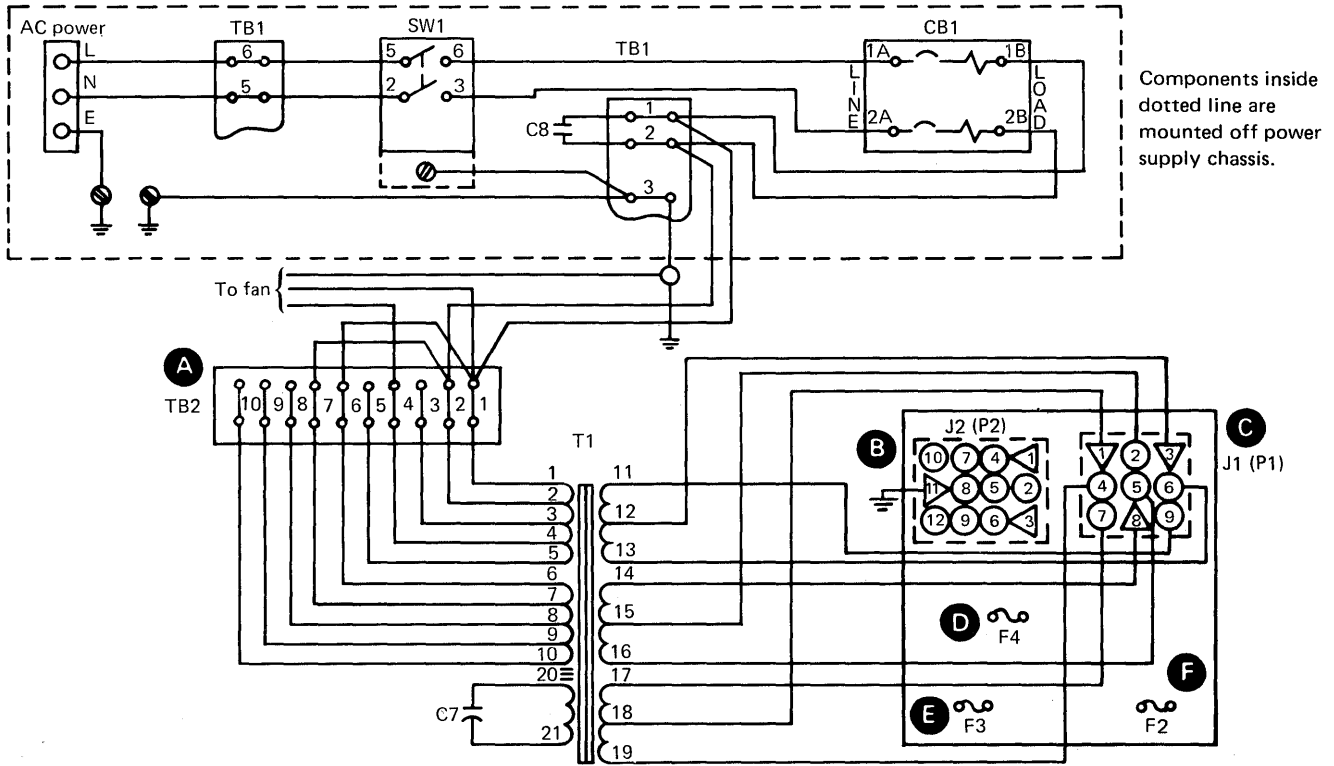
Voltage supply	Voltage tolerance	Ripple tolerance
+5 Vdc	+4.6 to +5.5	0.15
+11 Vdc	+10.12 to +12.1	0.22
+24 Vdc	+22.08 to +26.4	0.48

Ripple voltage can be measured most accurately with an oscilloscope. However, an alternate way to get an indication of ripple voltage is with a CE meter (PN1749231).

- Connect a capacitor (0.22 uF or larger, 50 Vdc or higher) in series with one of the meter leads.
- Set the meter to a range that will read 2.5 Vac.
- Connect one meter lead to the dc voltage in question, the other lead to frame ground. (Remember, a capacitor is in series with one of the leads.)
- If the meter pointer leaves zero on the meter scale, excess ripple voltage may be present.

This diagram is for instructional purposes only.

World Trade (60 Hz)



A TB2 Connections

Vac	Input Wires	Jumper
100	1,2	1-6, 2-7
110	1,3	1-6, 3-8
120	1,4	1-6, 4-9
127	1,5	1-6, 5-10
200	1,7	2-6
208	1,8	2-6
220	1,8	3-6
240	1,9	4-6

C Connector P1 (plug side)

Pin	Description
1	Common
2	Common
3	Common
4	6.1 Vac
5	12.3 Vac
6	25 Vac
7	6.1 Vac
8	12.3 Vac
9	25 Vac

B Connector J2 (plug side)

Pin	Description
1	+5 Vdc
2	+24 Vdc
3	+11 Vdc
4	+24 Vdc
5	+11 Vdc
6	+11 Vdc
7	Common
8	Common
9	Common
10	Common
11	Frame ground
12	Common

F Fuse Supply Rating

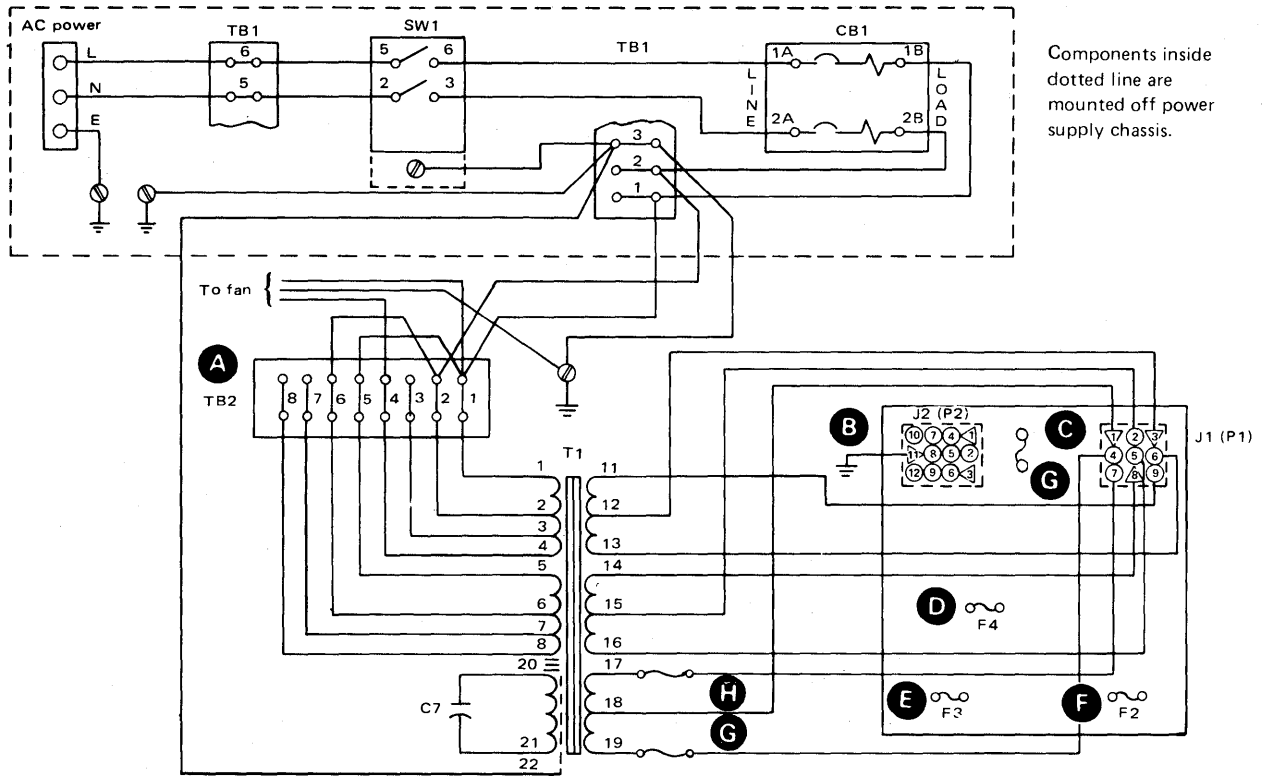
Fuse	Supply	Rating
F2	24 Vdc	10A Med-Blo
F3	11 Vdc	8A Med-Blo
F4	5 Vdc	5A Slo-Blo

Voltage supply	Voltage tolerance	Ripple tolerance
+5 Vdc	+4.6 to +5.5	.200
+11 Vdc	+10.12 to +12.1	.430
+24 Vdc	+22.08 to +26.4	.960

Ripple voltage can be measured most accurately with an oscilloscope. However, an alternate way to get an indication of ripple voltage is with a CE meter (PN1749231).

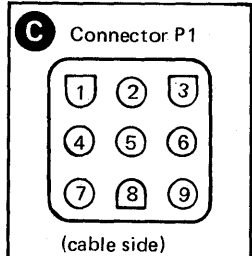
- Connect a capacitor (0.22 uF or larger, 50 Vdc or higher) in series with one of the meter leads.
- Set the meter range to 2.5 Vac.
- Connect one meter lead to the dc voltage in question, the other lead to frame ground. (Remember, a capacitor is in series with one of the leads.)
- If the meter pointer leaves zero on the meter scale, excess ripple voltage may be present.

50 Hz With Fuses on Transformer

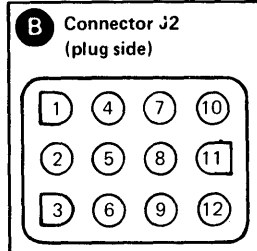


A TB2 Connections

Vac	Input Wires	Jumper(s)
100	1,2	1-5, 2-6
110	1,3	1-5, 3-7
200	1,6	2-5
220	1,7	3-5
230	1,8	3-5
240	1,8	4-5



Pin	Description
1	Common
2	Common
3	Common
4	6.1 Vac ±10%
5	12.3 Vac ±10%
6	25 Vac ±10%
7	6.1 Vac ±10%
8	12.3 Vac ±10%
9	25 Vac ±10%



Pin	Description
1	+5 Vdc
2	+24 Vdc
3	+11 Vdc
4	+24 Vdc
5	+11 Vdc
6	+11 Vdc
7	Common
8	Common
9	Common*
10	Common
11	Frame ground
12	Common

*For Model 02R, pin 9 is -12 Vdc.

Fuse	Supply	Rating
F1*	-12 Vdc	-1A Slo-Blo
F2	24 Vdc	10A Med-Blo
F3	11 Vdc	8A Med-Blo
F4	5 Vdc	5A Slo-Blo
F5	5 Vac	5A Slo-Blo
F6	5 Vac	5A Slo-Blo

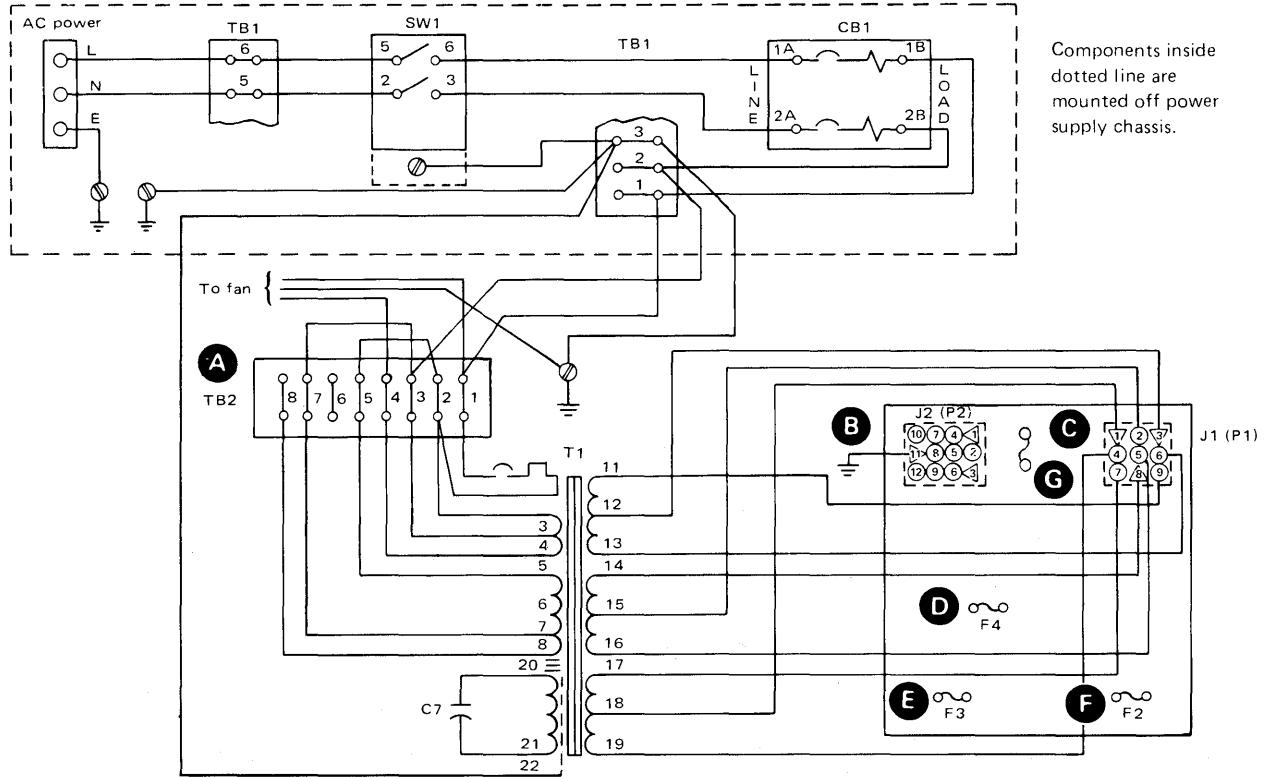
*F1 is installed on model 02R only.

Voltage supply	Voltage tolerance	Ripple tolerance
+5 Vdc	+4.6 to +5.5	0.15
+11 Vdc	+10.12 to +12.1	0.22
+24 Vdc	+22.08 to +26.4	0.48

Ripple voltage can be measured most accurately with an oscilloscope. However, an alternate way to get an indication of ripple voltage is with a CE meter (PN1749231).

- Connect a capacitor (0.22 uF or larger, 50 Vdc or higher) in series with one of the meter leads.
- Set the meter to a range that will read 2.5 Vac.
- Connect one meter lead to the dc voltage in question, the other lead to frame ground. (Remember, a capacitor is in series with one of the leads.)
- If the meter pointer leaves zero on the meter scale, excess ripple voltage may be present.

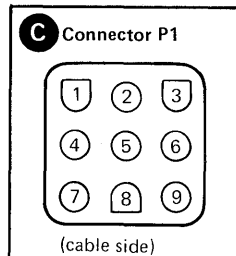
50 Hz WTC Only Transformer (Part 2426491)



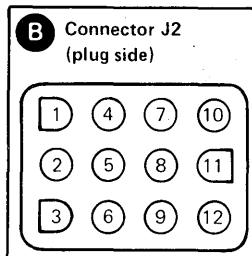
Components inside dotted line are mounted off power supply chassis.

A TB2 Connections

Vac	Input Wires	Jumper(s)
110	1,3	2-5, 3-1
220	1,7	3-5
230	1,8	3-5
240	1,8	4-5



Pin	Description
1	Common
2	Common
3	Common
4	6.1 Vac ±10%
5	12.3 Vac ±10%
6	25 Vac ±10%
7	6.1 Vac ±10%
8	12.3 Vac ±10%
9	25 Vac ±10%



Pin	Description
1	+5 Vdc
2	+24 Vdc
3	+11 Vdc
4	+24 Vdc
5	+11 Vdc
6	+11 Vdc
7	Common
8	Common
9	Common*
10	Common
11	Frame ground
12	Common

*For Model 02R, pin 9 is -12 Vdc.

Fuse	Supply	Rating
G F1*	-12 Vdc	-1A Slo-Blo
F F2	24 Vdc	10A Med-Blo
E F3	11 Vdc	8A Med-Blo
D F4	5 Vdc	5A Slo-Blo

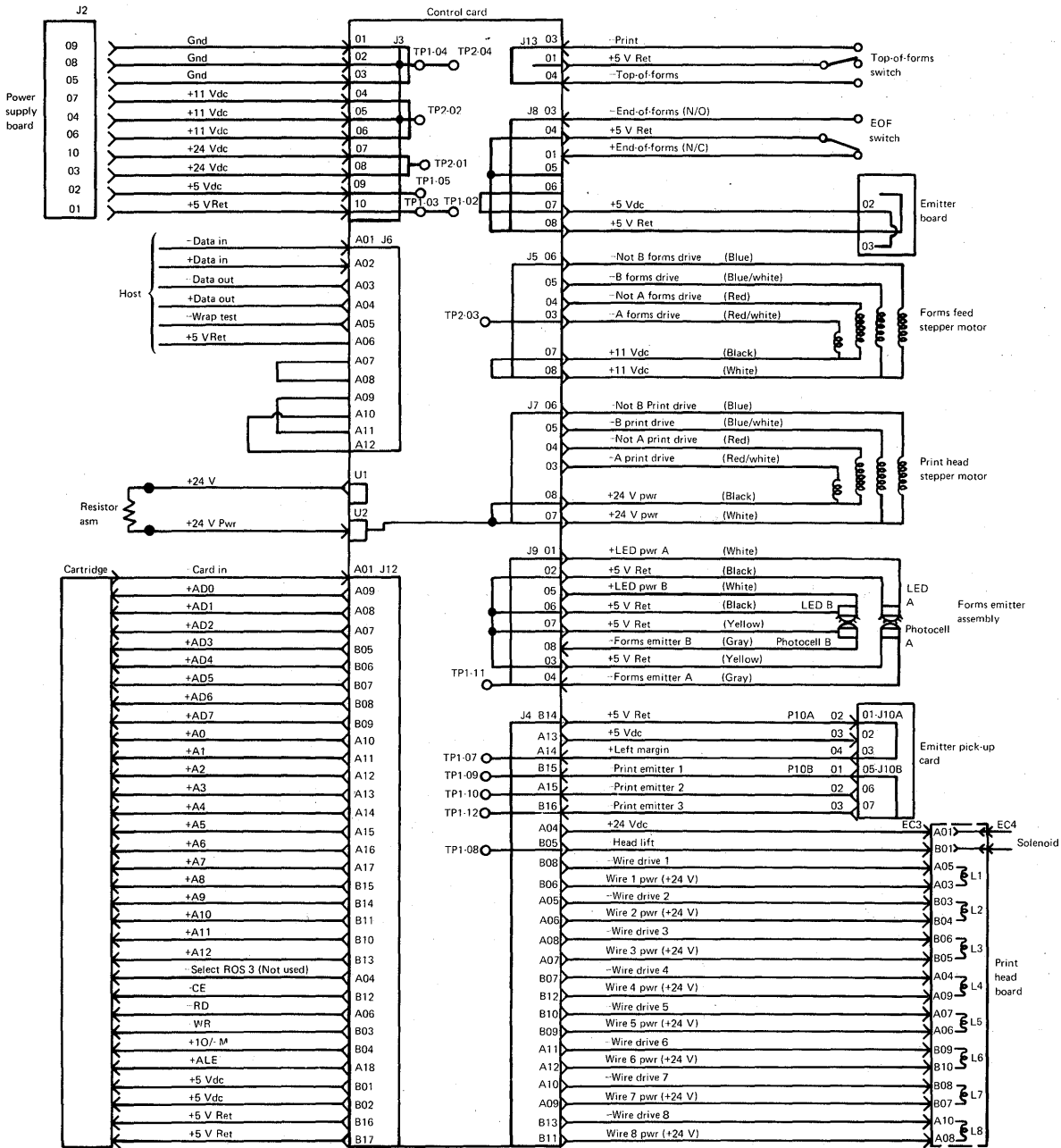
*F1 is installed on model 02R only.

Voltage supply	Voltage tolerance	Ripple tolerance
+5 Vdc	+4.6 to +5.5	0.15
+11 Vdc	+10.12 to +12.1	0.22
+24 Vdc	+22.08 to +26.4	0.48

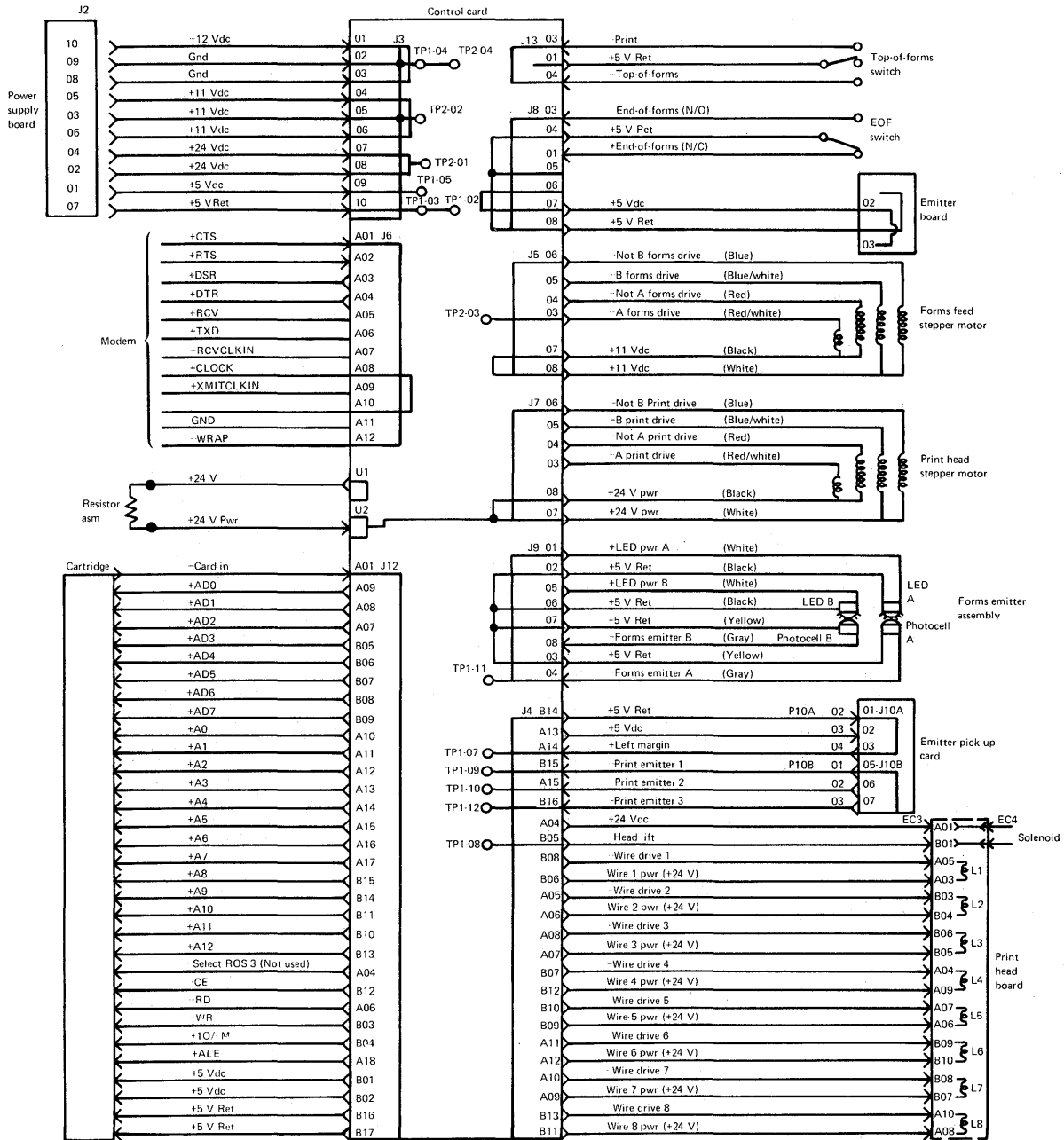
Ripple voltage can be measured most accurately with an oscilloscope. However, an alternate way to get an indication of ripple voltage is with a CE meter (PN1749231).

- Connect a capacitor (0.22 uF or larger, 50 Vdc or higher) in series with one of the meter leads.
- Set the meter to a range that will read 2.5 Vac.
- Connect one meter lead to the dc voltage in question, the other lead to frame ground. (Remember, a capacitor is in series with one of the leads.)
- If the meter pointer leaves zero on the meter scale, excess ripple voltage may be present.

Wiring Diagram—Model 02L

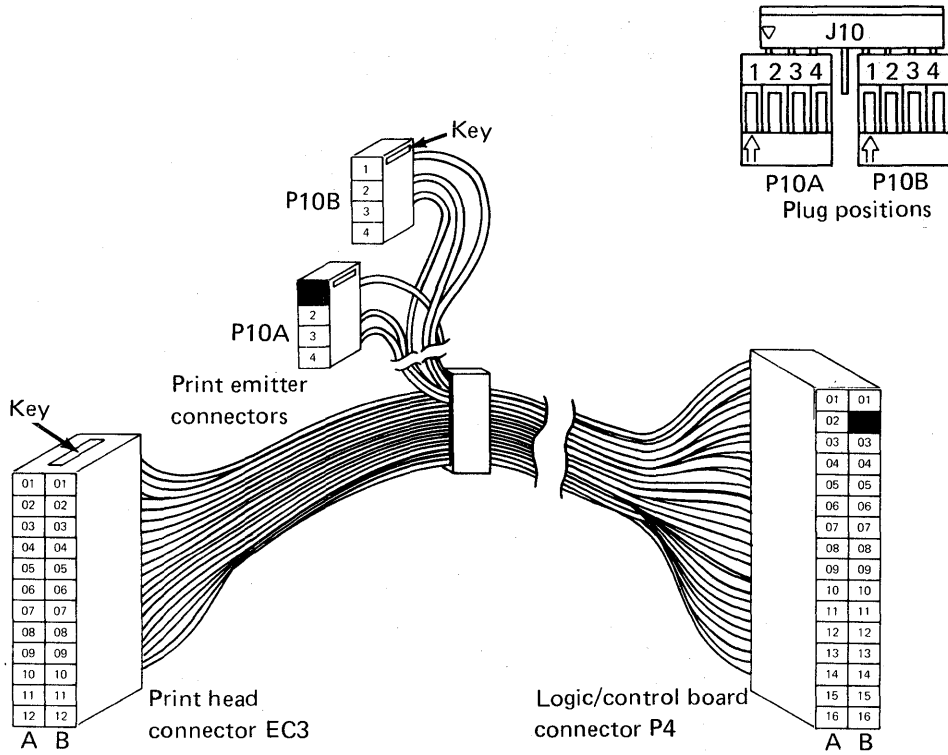


Wiring Diagram—Model 02R



Printer Cable Diagrams

Logic/Control Board to Print Head



Connector EC3 (Note 1.)	Line name	Connector P4 (Note 2.)
—	Polarizing plug	B02
A01	+ 24 Vdc	A04
A05	Wire drive 1	B08
B03	Wire drive 2	A05
B06	Wire drive 3	A08
A04	Wire drive 4	B07
A07	Wire drive 5	B10
B09	Wire drive 6	A11
B08	Wire drive 7	A10
A10	Wire drive 8	B13
A03	Wire 1 power	B06
B04	Wire 2 power	A06
B05	Wire 3 power	A07
A09	Wire 4 power	B12
A06	Wire 5 power	B09
B10	Wire 6 power	A12
B07	Wire 7 power	A09
A08	Wire 8 power	B11
B01	— Headlift	B05

Connector P10A	Line name	Connector P4
1	Polarizing plug	—
2	+ 5 Vdc	A13
3	Ground	B14
4	+ Left margin	A14

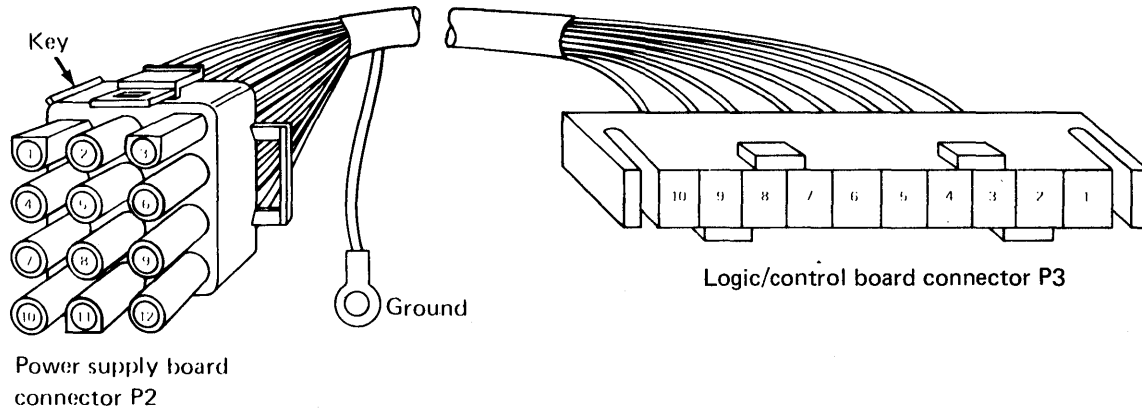
Connector P10B	Line name	Connector P4
1	— Print emitter 1	B15
2	— Print emitter 2	A15
3	— Print emitter 3	B16
4	Not used	—

Notes:

1. A02, A11, A12, B02, B11 and B12 are not used on EC3.
2. A01, A02, A03, A16, B01, B03 and B04 are not used on P4.

This diagram is for instructional purposes only.

DC Power Cable P2



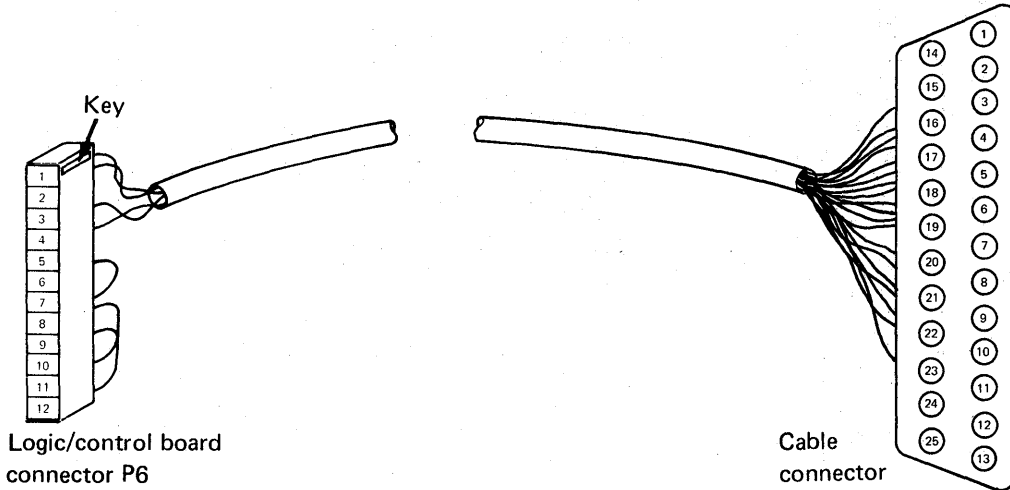
Connector P2	Line name	Connector P3
1	+ 5 Vdc	9
2	+ 24 Vdc	8
3	+ 11 Vdc	5
4	+ 24 Vdc	7
5	+ 11 Vdc	4
6	+ 11 Vdc	6
7	} Common* }	10
8		3
9		2
10		1
11	Frame ground	--
12	Not used	--

*For Model 02R, P2 pin 9 and P3 pin 2 are -12 Vdc.

This diagram is for instructional purposes only.

Signal Cable

Model 02L

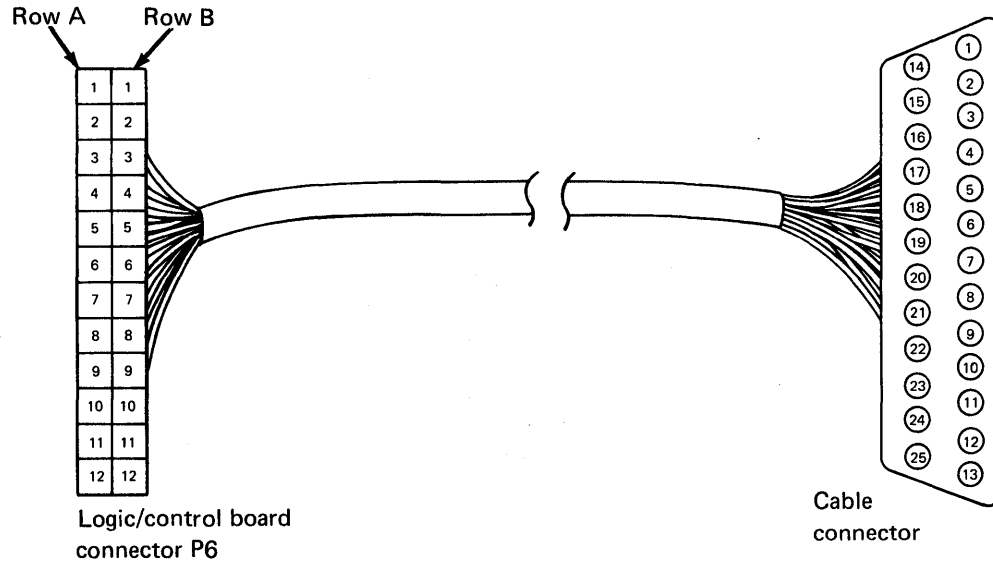


Connector P6		Cable connector*
Pin	Line name	Pin
1	- Data in	17
2	+ Data in	15
3	- Data out	25
4	+ Data out	19
5	} Not used	-
6		-
7	} Connected by jumper	-
8		-
9	} Connected by jumper (+ wrap)	-
11		-
10	} Connected by jumper (- wrap)	-
12		-

*Pins 1-14, 16, 18, and 20-24 are not used.

This diagram is for instructional purposes only.

Model 02R

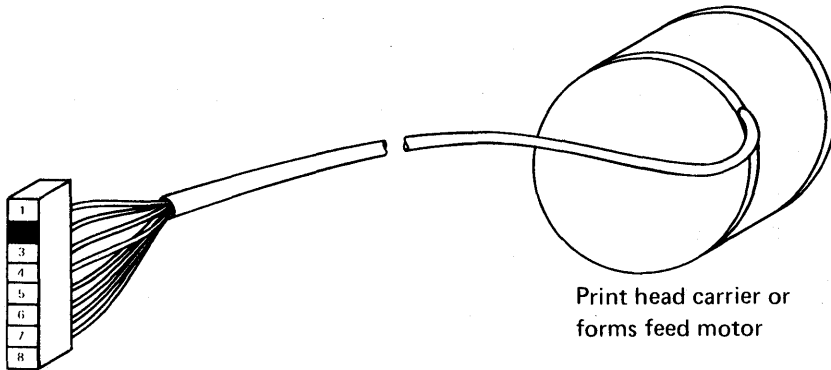


Connector P6	Signal name	Cable connector	
		Pins	PC Pins
A1	Clear to send (CTS)	5	20
A2	Request to send (RTS)	4	—
A3	Data set ready (DSR)	6	20
A4	Data terminal ready (DTR)	20	6,5,8
A5	Receive data	3	2
A6	Transmit data	2	3
A7	Receive clock	17	—
A8	Blank	—	—
A9	Transmit clock	15	—
A10	Blank	—	—
A11	Ground	7	7
A12	Blank	—	—

Connector P6	
B-pins	Jumpers
B01	J1
B02	J1
B03	J2
B04	J2
B05	J3
B06	J3
B07	J4
B08	J4
B09	J5
B10	J5
B11	J6
B12	J6

This diagram is for instructional purposes only.

Stepper Motor Cables



Logic/control board
connector P5 or P7

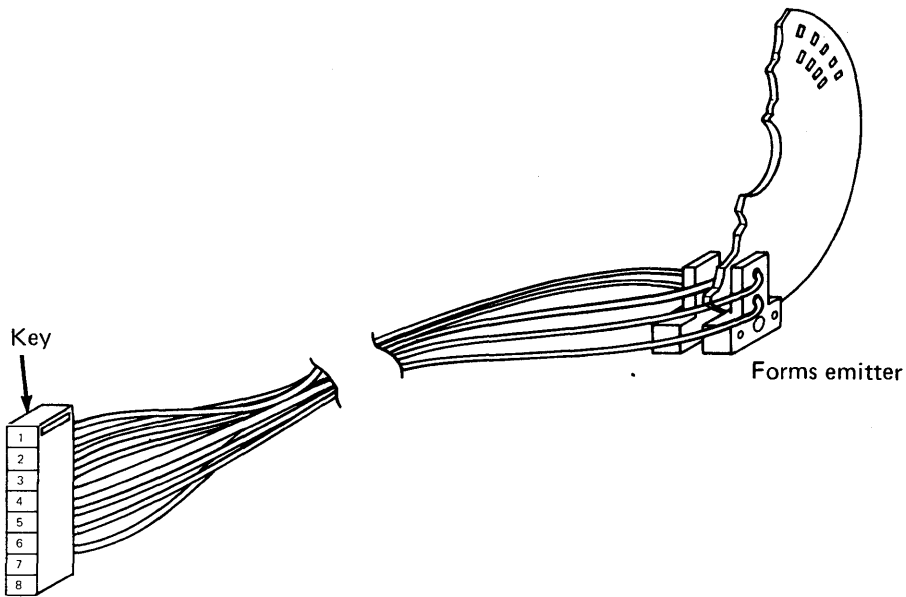
Print head carrier or
forms feed motor

Connector P7	
Pin	Line name
1	Not used
2	Polarizing plug
3	A print drive
4	Not A print drive
5	B print drive
6	Not B print drive
7	+ 24 Vdc
8	+ 24 Vdc

Connector P5	
Pin	Line name
1	Not used
2	Polarizing plug
3	A forms drive
4	Not A forms drive
5	B forms drive
6	Not B forms drive
7	+ 11 Vdc
8	+ 11 Vdc

This diagram is for instructional purposes only.

Forms Feed Emitter Cable



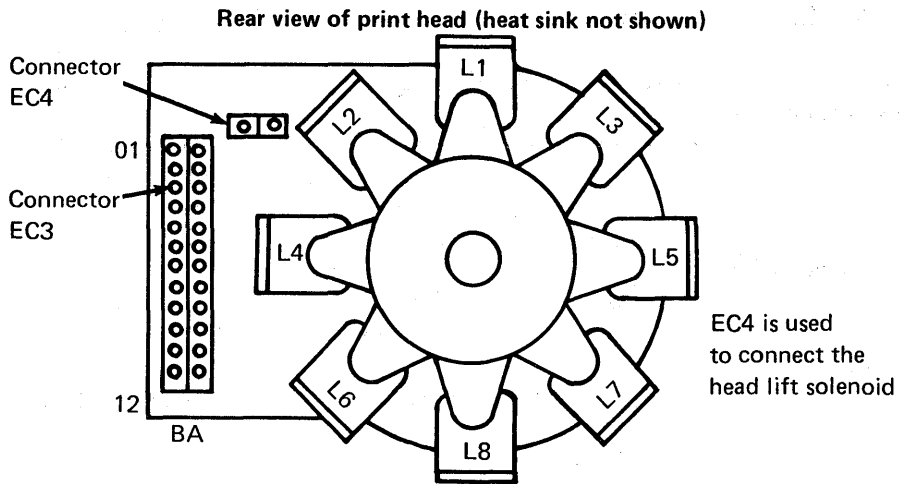
Logic/control board
connector P9

Note: Ensure that the white mark in the pin 1 position
is on the latch side (front) of the board.

Connector P9	
Pin	Line name
1	+ LED power A
2	Ground
3	Ground
4	- Forms emitter A
5	+ LED power B
6	Ground
7	Ground
8	- Forms emitter B

This diagram is for instructional purposes only.

Print Head Cable and Connector



This diagram is for instructional purposes only.

Chapter 8. Glossary

A-frame: A machine part or assembly that has the general shape of the letter "A."

bellcrank: a mechanical device that converts rotational motion into linear motion.

bidirectional: Moving in two directions.

carbon: A black material used in paper to make copies of documents.

cartridge: A container for ink or printer ribbon.

cps: Characters per second.

deflector (paper): A device that guides the printer paper around the platen.

hub: The center of a wheel.

insertion: To put one thing into another.

lifter (ribbon): A device that lifts the print ribbon.

load: Put paper in the printer.

mesh: The fit between two or more gears.

mm: Millimeter.

rack: A guide for paper.

ramp: A part (installed under the print head) that causes the print head to move away from the platen.

retract: To move backward.

standoff: A long cylinder or bar used to fill the space between a screw head and a screw hole.

stud: A bar or cylinder used to align a mechanical part or assembly.

TB: Terminal board.

Vac: Volts alternating current.

Vdc: Volts direct current.

WTC: World Trade Corporation

Yoke: A type of carrier; see procedure "3359 Pivot Block and Yoke" for illustration.

Index

A

A-frame alignment 3-30
access cover
 See cover
alignment, A-frame 3-30

B

bearing, carrier 3-51
belt tensioner
 See print head, belt tensioner

C

carrier
 See print head, carrier
cover
 access 3-1
 top 3-2

D

deflector, paper 3-8
 See also platen
document insertion device
 See tabs, locator, rear document insertion device

E

eliminator, static 3-21
emitter motor
 See tabs, locator, feed platen gear, emitter
emitter, print 3-38
end-of-forms switch 3-32

F

frame, side
 See tabs, locator, tractor, side frame
FRU locations 2-1

G

gear, motor 3-25
gears, platen
 See platen, gears
guide rack
 See tabs, locator, guide rack

L

leaf spring 3-51
locations, FRU 2-1
 base view 2-5
 bottom view 2-4
 front and left side view 2-1
 front and right side view 2-3
logic/control board 2-6
 model 02L 2-6
 model 02R 2-7

M

main shaft
mode switch 3-37
motor
 forms feed 3-28
motor gear 3-25
motor, emitter 3-26

O

operating position 3-6

P

paper deflector 3-8
platen 3-8
 forms feed (platen) gear 3-24
 gears 3-14
 See also tabs, locator, feed platen gear
 locator tabs 3-15
 pressure rolls 3-12
 release 3-11
position, service 3-4, 3-6
print
 emitter 3-38, 3-42
 emitter pickup 3-41
 hold-down bracket 3-38
print head
 belt tensioner 3-52
 carrier 3-45, 3-50
 leaf spring 3-51

R

rack, forms
 See tabs, locator, guide rack
release, platen 3-11
rolls, pressure 3-12

S

service position 3-4
shaft
 main 3-45
 support 3-50
switches
 end-of-forms 3-32
 mode 3-37

T

tabs, locator
 See also platen, locator tabs
 feed platen gear 3-24, 3-25
 emitter 3-26, 3-27
 guide rack 3-20
 static eliminator 3-21
 motor 3-28
 rear document insertion device 3-17
 tractor 3-17, 3-18
 chain guide 3-18
 left tractor adjustment 3-19

side frame 3-22, 3-23
tensioner, belt 3-52
top cover

See cover

IBM 4975 Printer Models 02L and 02R
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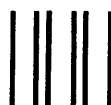
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