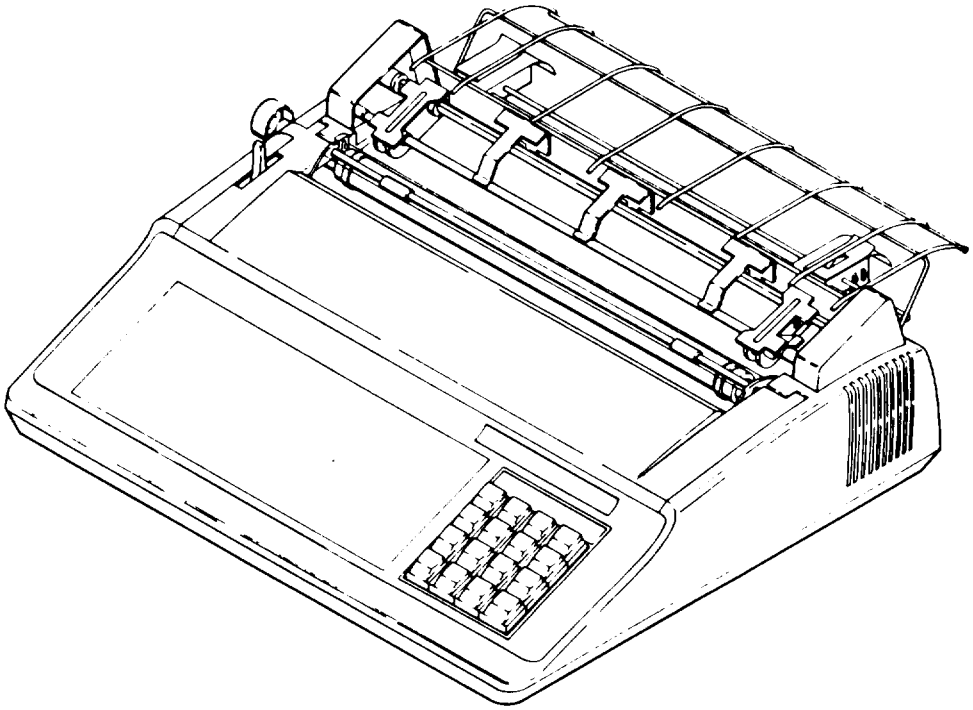
TM 11-7025-233-23

ORGANIZATIONAL AND DIRECT SUPPORT
MAINTENANCE MANUAL

TELEPRINTER
TT-804/MYQ-4A



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(NSN 7010-01-153-0775)

HEADQUARTERS DEPARTMENT OF THE ARMY

13 MAY 1985

WARNING

HAZARDOUS MATERIAL

Do not mutilate or disassemble the lithium battery that is located on the logic board. The lithium metal in it is very active material that burns in the presence of water or high humidity. Do not put battery in fire, attempt to charge, heat above 212°F (l00°C), or solder directly to cell. Do not overdischarge individual cells to reverse voltage greater than 3 volts. The battery may burst and burn or release hazardous materials.

WARNING

HIGH VOLTAGE

is used in the operation of this equipment.

ELECTROCUTION

may result if personnel fail to observe safety precautions.

Never work on electronic equipment unless there is another person nearby. He/she should be familiar with the operation and hazards of the equipment. He/she should also be competent in giving first aid. When you are helped by operators, you must warn them about dangerous areas.

Whenever possible, the power supply to the equipment must be shut off before beginning work on the equipment. If it is necessary to work on the equipment with power on, do not touch anything in the power supply area. Take special care to ground every capacitor likely to hold a dangerous potential. When working inside the equipment after the power has been turned off, always ground every part before touching it.

Be careful not to contact high-voltage connections when installing or operating this equipment.

Whenever possible, keep one hand away from the equipment to reduce the hazard of current flowing through vital organs of the body.

WARNING

Do not be misled by the term “low voltage”. Voltages as low as 50 volts may cause death.

For artificial respiration, refer to FM 21-11.

WARNING

Remove rings, bracelets, wristwatches, and neck chains before working around electronic equipment. Jewelry can catch on equipment and cause injury, or may short across an electrical circuit and cause severe burns or electrical shock.

5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

1 DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL

2 IF POSSIBLE ,TURN OFF THE ELECTRICAL POWER

3 IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A WOODEN POLE OR A ROPE OR SOME OTHER INSULATING MATERIAL

4 SEND FOR HELP AS SOON AS POSSIBLE

5 AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION

TECHNICAL MANUAL

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C.,

ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL

TELEPRINTER TT-804/MYQ-4A

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual, direct to: Commander, US Army Communications and Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703. A reply will be furnished to you.

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HOW TO USE THIS MANUAL

This manual tells you how to troubleshoot and maintain Teleprinter TT-804/MYQ-4A.

LOCATION OF SUBJECTS IN MANUAL

In this manual, paragraphs are numbered in order by chapter. For example, paragraph 2-3 is the third paragraph in chapter 2. Pages are also numbered this way. Using this numbering system, there are three easy ways to locate the information you need in this manual.

- Front cover locators
- Alphabetical index
- Index of maintenance procedures

Use the front cover locators and marked pages to quickly find the parts of the manual shown on the cover. These locators mark portions of the manual which are used often. If the information you need is not listed on the front cover, use the alphabetical index at the back of this manual. It lists all subjects covered in the manual and directs you to the subject by paragraph number. When you need a specific maintenance procedure, use the index at the start of chapter 3 or 4. This index lists all the maintenance procedures in the chapter and directs you to each procedure by page number.

MAINTENANCE PROCEDURES

Maintenance procedures in this manual have two features which help you perform them more easily:

- Initial setup boxes
- First-time performance aids

An initial setup box is used at the start of any procedure which requires setup items before you perform it. This box lists items needed to perform the procedure. If the box does not appear at the start of a procedure, no setup items are needed.

If you are using this manual to perform a procedure for the first time, always read through the entire procedure before you start. Always perform the task steps in the order given. This will help assure correct performance. Use the illustrations beside the tasks steps to find the parts of the equipment called out in the steps. Some steps include a reference to another paragraph. Go to that paragraph if you are not sure how the step is done.

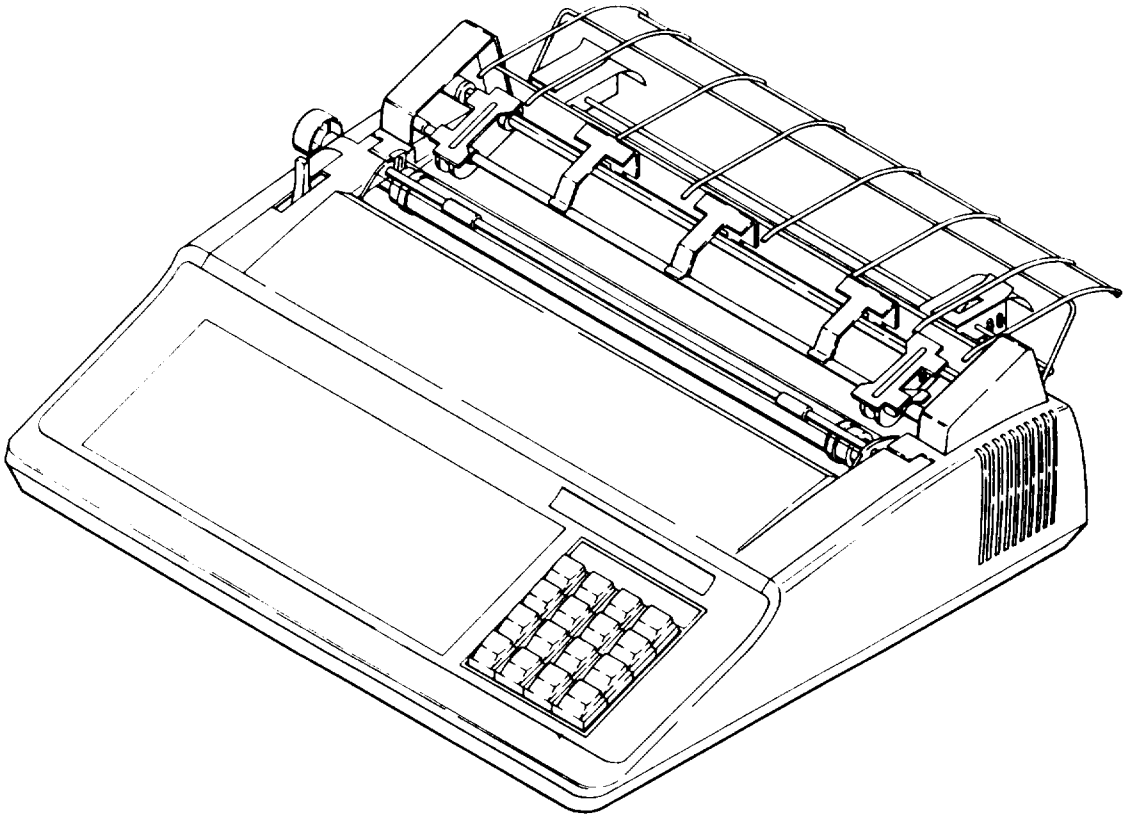


Figure 1-O. Teleprinter TT-804/MYQ-4A

CHAPTER 1
INTRODUCTION

Section 1. GENERAL INFORMATION

1-1. SCOPE

Teleprinter TT-804/MYQ-4A (fig. 1-O) is an asynchronous, dot matrix impact serial printer. In the rest of this manual it will be called the teleprinter or console printer. Use this manual for organizational and/or direct support maintenance of the teleprinter.

1-2. INDEX OF PUBLICATIONS

Refer to the latest issue of DA PAM 310-1 to determine whether there are new editions, changes or additional publications pertaining to the teleprinter.

1-3. MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System (TAMMS).

1-4. DESTRUCTION OF ARMY ELECTRONICS MATERIEL

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

1-5. ADMINISTRATIVE STORAGE

Administrative storage of equipment issued to and used by Army activities will have Preventive Maintenance Checks and Services (PMCS) performed before storing. When removing the equipment from administrative storage, the PMCS checks should be performed to assure operational readiness. Disassembly and repacking of equipment for limited storage are covered in TM 740-90-1.

1-6. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your teleprinter needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Quality Deficiency Report) . Mail it to us at Commander, U. S. Army Communications and Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, NJ 07703. We'll send you a reply.

1-7. REFERENCE INFORMATION

This listing includes the nomenclature cross reference list, the list of abbreviations and an explanation of terms (glossary) used in this manual.

1-8. NOMENCLATURE CROSS REFERENCE LIST

Common names are used throughout this manual, but you must use the official nomenclature when filling out report forms, sending and EIR, or finding referenced technical manuals.

Common Name	Official Nomenclature
Teleprinter, or Console Printer	Teleprinter TT-804/MYQ-4A

1-9. LIST OF ABBREVIATIONS

ASCII	American Standard Code for Information Interchange
BPS	Bits per second
CPI	Characters per inch
CPS	Characters per second
EIA	Electronic Industries Association
FF	Form Feed
LED	Liqht emitting diode
LF	Line feed
PPI	Print Position Indicator
RO	Receive only
VT	Vertical Tab

1-10. GLOSSARY

ASCII. American Standard Code for Information Interchange. The standard used for transmission of data between computer systems and remote terminals over telephone lines.

ASYNCHRONOUS. Data communication mode which is not time related. Uses stop and start bits instead of time pulses to organize data for transmission.

BAUD. A unit of measure of data transmission.

BAUD RATE. Rate at which data bits are transmitted (bits per second).

EIA. Electronic Industries Association. A trade organization of the electronics industry which sets technical standards used by government agencies and the electronics industry.

ERASABLE PROM CHIP. Programmable read only memory chip used on the 2K extended line buffer board. It can be erased using ultraviolet light and reprogrammed.

PROM CHIP. Programmable read only memory chip. A Read Only Memory (ROM) that can be programmed only once.

RAM. Random access memory. A memory that has stored information immediately available when addressed, regardless of the previous memory address location.

ROM. Read only memory. A fixed memory that cannot be rewritten.

Section II. EQUIPMENT DESCRIPTION AND DATA

1-11. EQUIPMENT PURPOSE, CAPABILITIES AND FEATURES

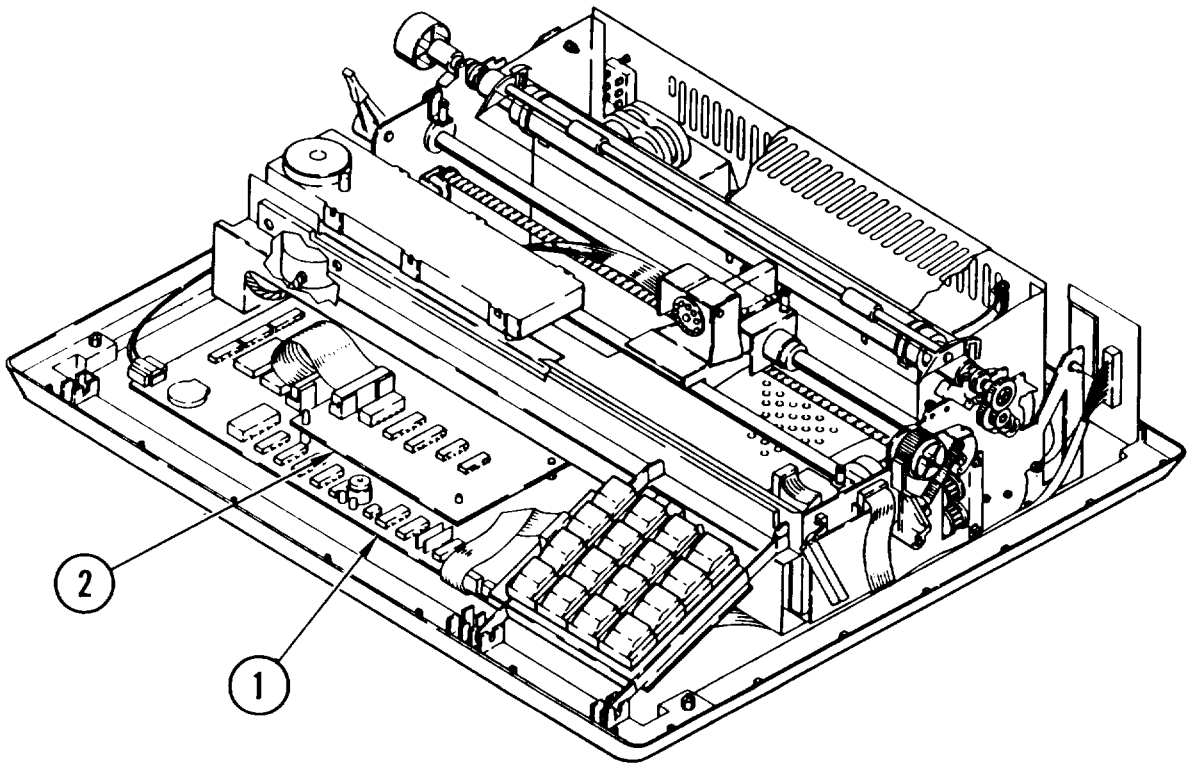
The teleprinter is an asynchronous dot matrix impact receive only (RO) printer. It can:

- Perform an initial power-on test, an operational function test, and a computer-generated diagnostics test
- Display fault conditions on the print position indicator (PPI) on the control panel
- Print characters in 132 print positions
- Print 10, 13.2, or 16.5 characters per inch (cpi) horizontal; 2, 3, 4, 6, 8 and 12 cpi vertical
- Print on paper from one to six parts thick
- Automatically line feed paper
- Sense paper out and stop print operation

1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

The major components of the teleprinter are the logic circuitry, power supply, print mechanism, paper handling components, control panel, print position indicator, and data interface panel.

a. Logic Circuitry. The logic circuitry (fig. 1-1) consists of the logic board, and the extended line buffer board.

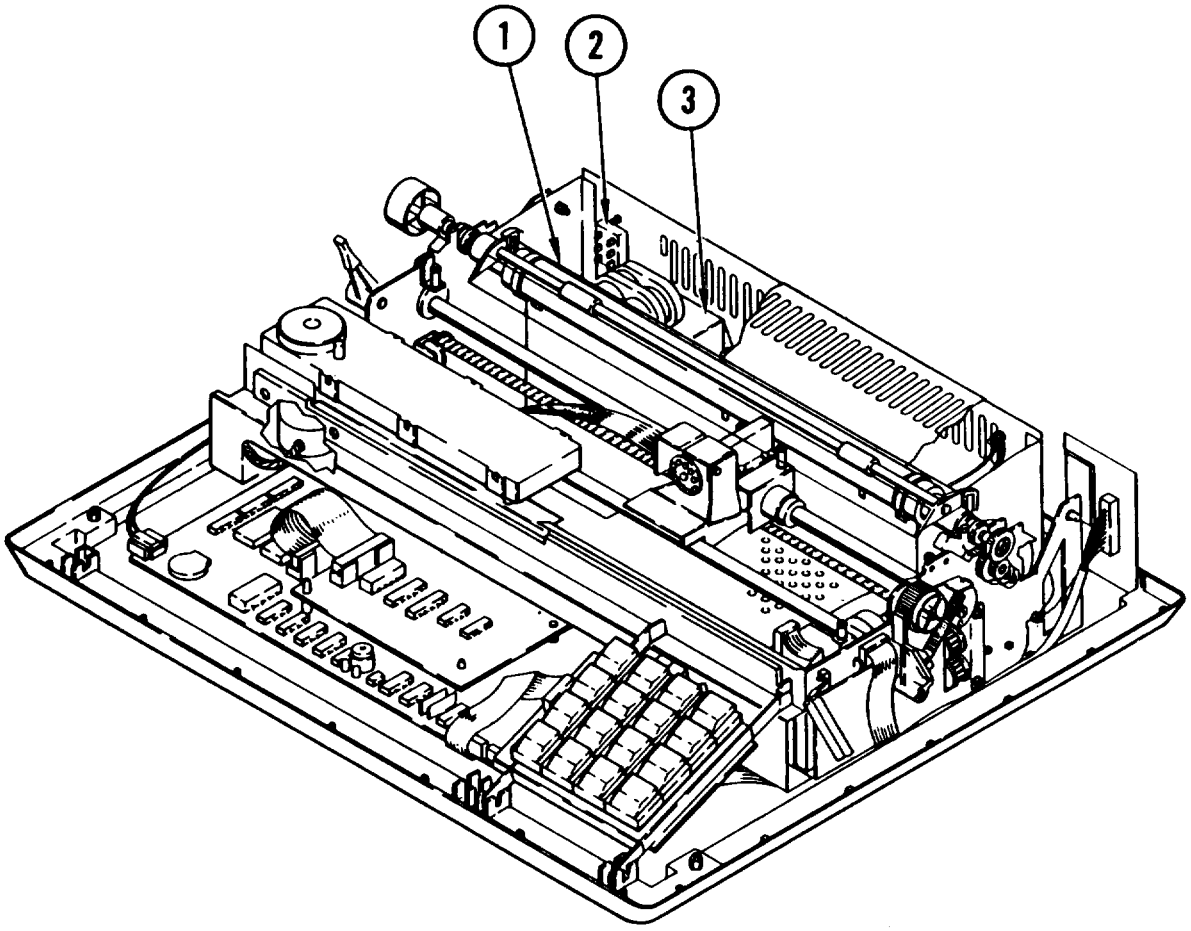


(1) Logic Board (T3MC/2) - This board controls the print operation.

(2) 2K Extended Line Buffer Board - Allows data transmission up to 9600 baud rate.

Figure 1-1. Logic Circuitry

b. Power Supply Assembly. The power supply assembly (fig. 1-2) consists of the power supply board, ac power switch, and line filter.



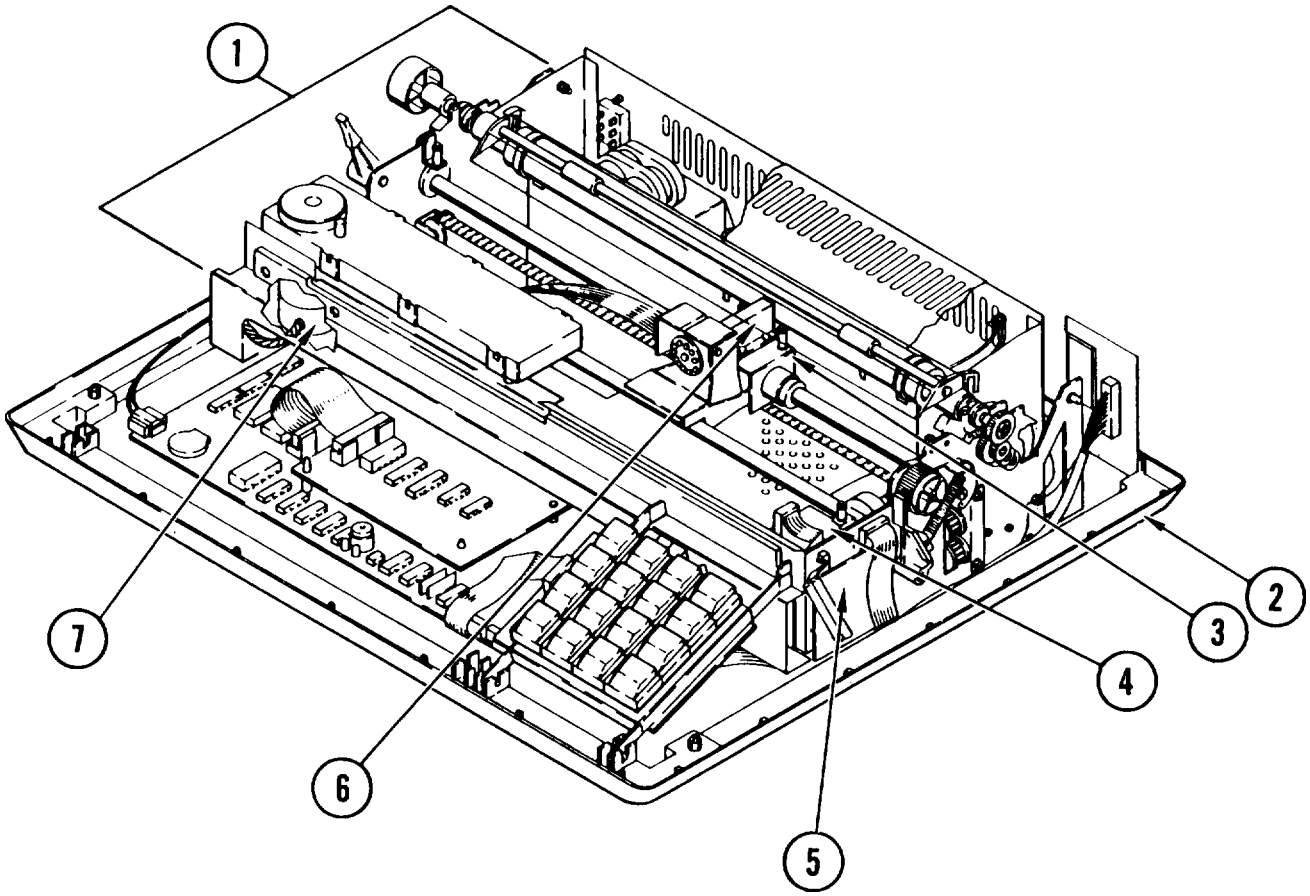
(1) Power Supply Circuit Board - The power supply board (PPS/2) contains Pulse width modulation control and transformer for +13V, -13V supplies and an OV center tap; +13V and -13V power ready circuits; and fault detection circuits.

(2) Ac Power Switch - Slide switch. Controls ac Power to Printer.

(3) Line Filter - Filters out noise signals from power line.

Figure 1-2. Power Supply

c. Print Mechanism. The print mechanism (fig. 1-3) is mounted on the frame and drive assembly and consists of the carriage assembly, encoder assembly, carriage servo drive board (T3SD/1), print head, and ribbon drive motor.



(1) Frame and Drive Assembly - Modular assembly, replaceable as a unit, mounted on the bottom cover, and supports the print mechanism.

(2) Bottom Cover - A support assembly, replaceable as a separate unit. On it are mounted the power supply assembly, frame and drive assembly, logic and 2K buffer boards, control panel, and RS-232C data set cable panel.

(3) Carriage Assembly - Supports and moves printhead along guide rails.

(4) Encoder Assembly - Consists of a dc servo motor which drives the print head assembly, and an encoder circuit board which senses motor position and allows for character spacing of 10, 13.2, and 16.5 characters per inch.

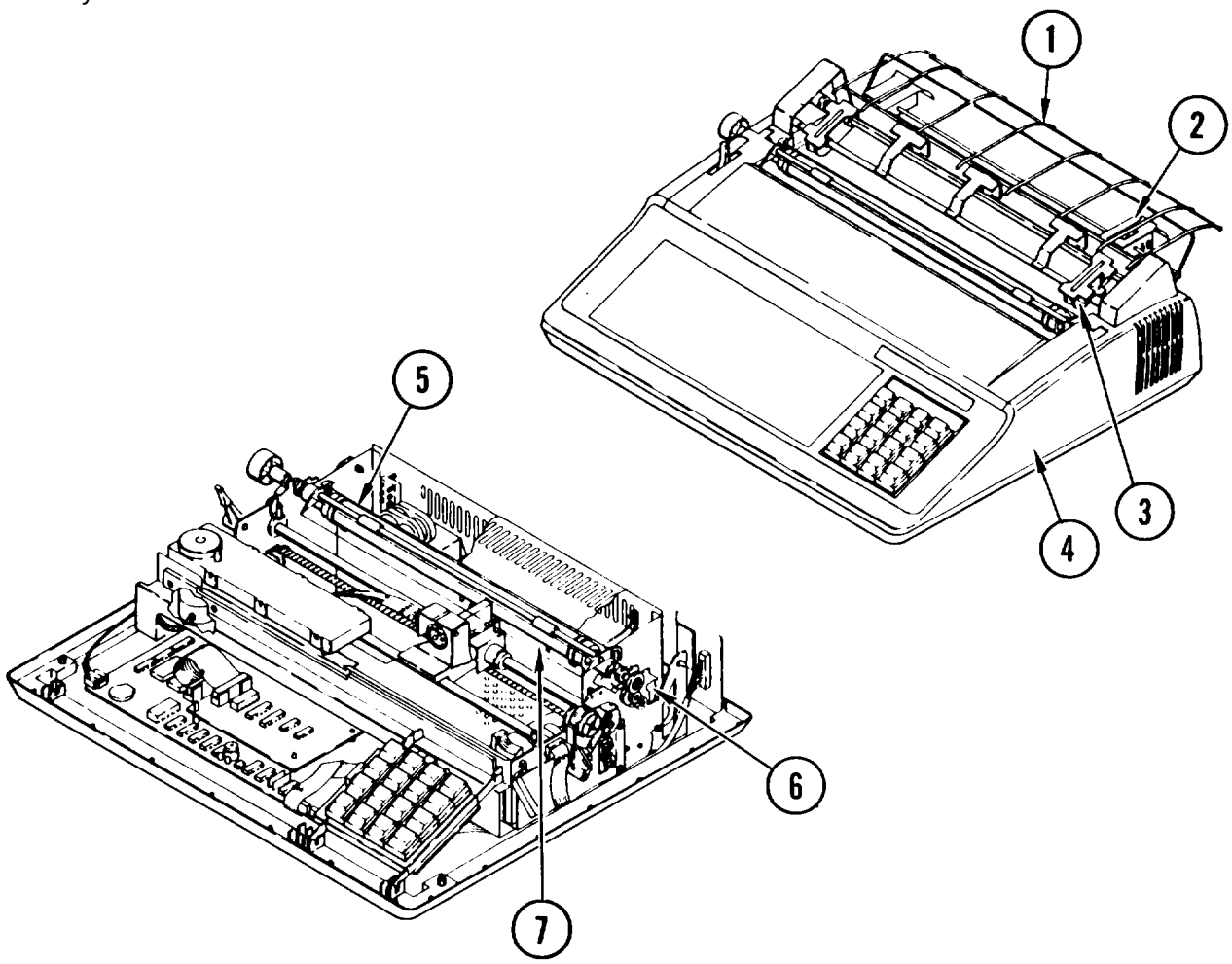
(5) Carriage Servo Drive Board (T3SD/1) - Controls carriage servo drive motor.

(6) Print Head - A servo-positioned dot matrix print head which forms characters by selecting dots to be printed from an array of 63 possible dot locations for each printed character.

(7) Ribbon Drive Motor - Stepper drive motor which drives ribbon only while carriage is in motion.

Figure 1-3. Print Mechanism

d. Paper Handling Components. Paper handlinq components (fig. 1-4) are mounted on the frame and drive assembly or top cover, and consist of paper rack, paper out switch, tractor assembly, platen, paper stepper motor, and paper pan assembly.



(1) Paper Rack - Mounted in top cover, supports paper and paper out switch.

(2) Paper Out Switch - Stops print operation when paper runs out.

(3) Tractor Assembly - Mounted on frame and drive assembly, and consists of pin-feed tractors that advance paper through the printer.

(4) Top Cover - Protects printer from dust and damage.

(5) Platen - Provides durable hammerstop to printhead. Also acts as friction feed roller that advances paper when tractor assembly is not used.

(6) Paper Stepper Drive Motor - Drives reduction gears which move platen and tractor assembly.

(7) Paper Pan Assembly - Houses pressure rollers and optional paper out switch (used without tractor assembly). Acts as paper guide and support.

Figure 1-4. Paper Handling Components

e. Control Panel. The control panel (fig. 1-5) is an alphanumeric cluster of 16 keys on the T3NC circuit board and allows operator control of basic printer functions.

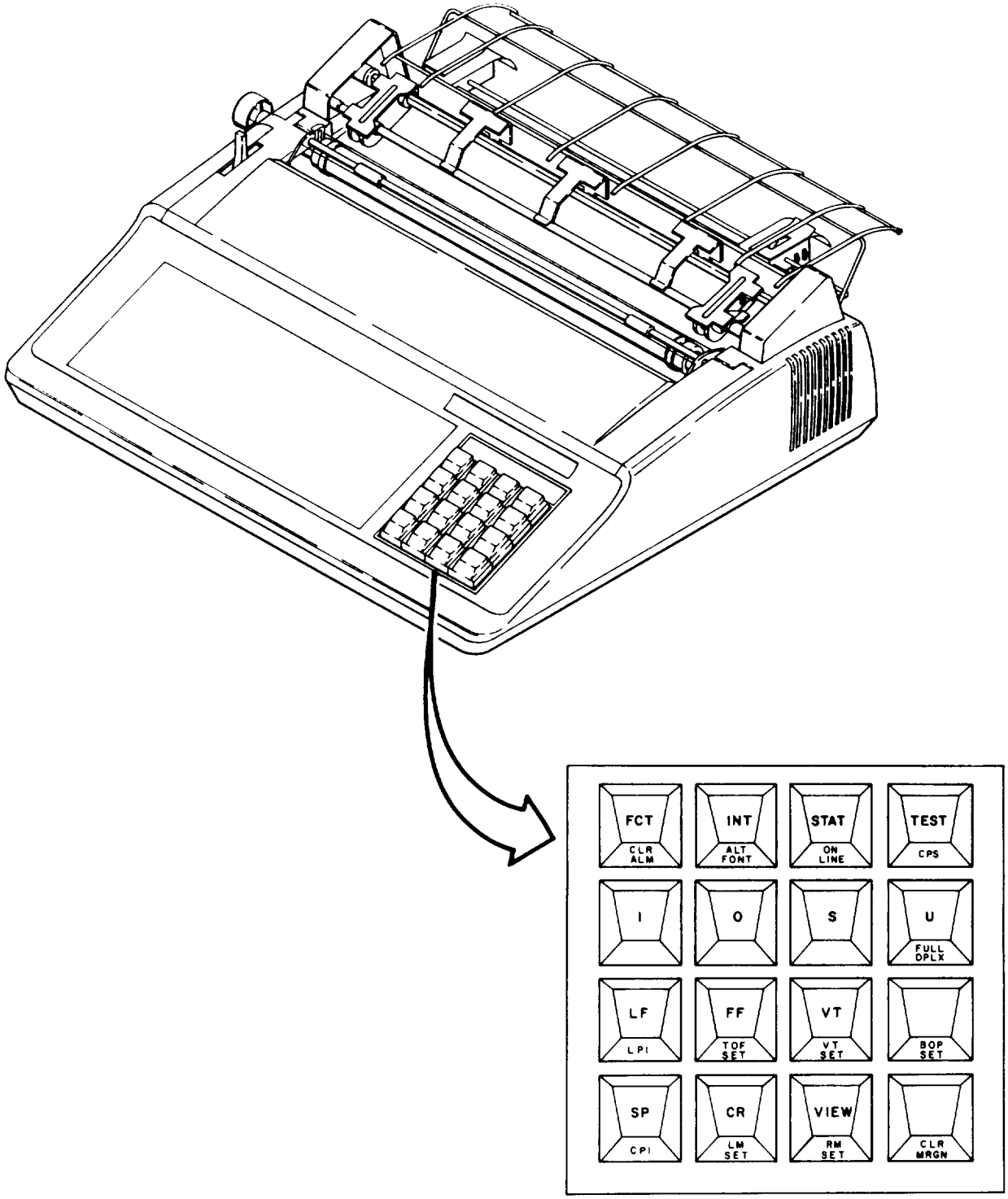


Figure 1-5. Control Panel

f. Print Position Indicator. The print position indicator (fig. 1-6) is a circuit board (T3PPI/1) which includes three segmented LEDs that provide flashing coded alphanumeric diagnostic information during operational malfunction. During normal operation these LEDs display the number of the print column to be printed next.

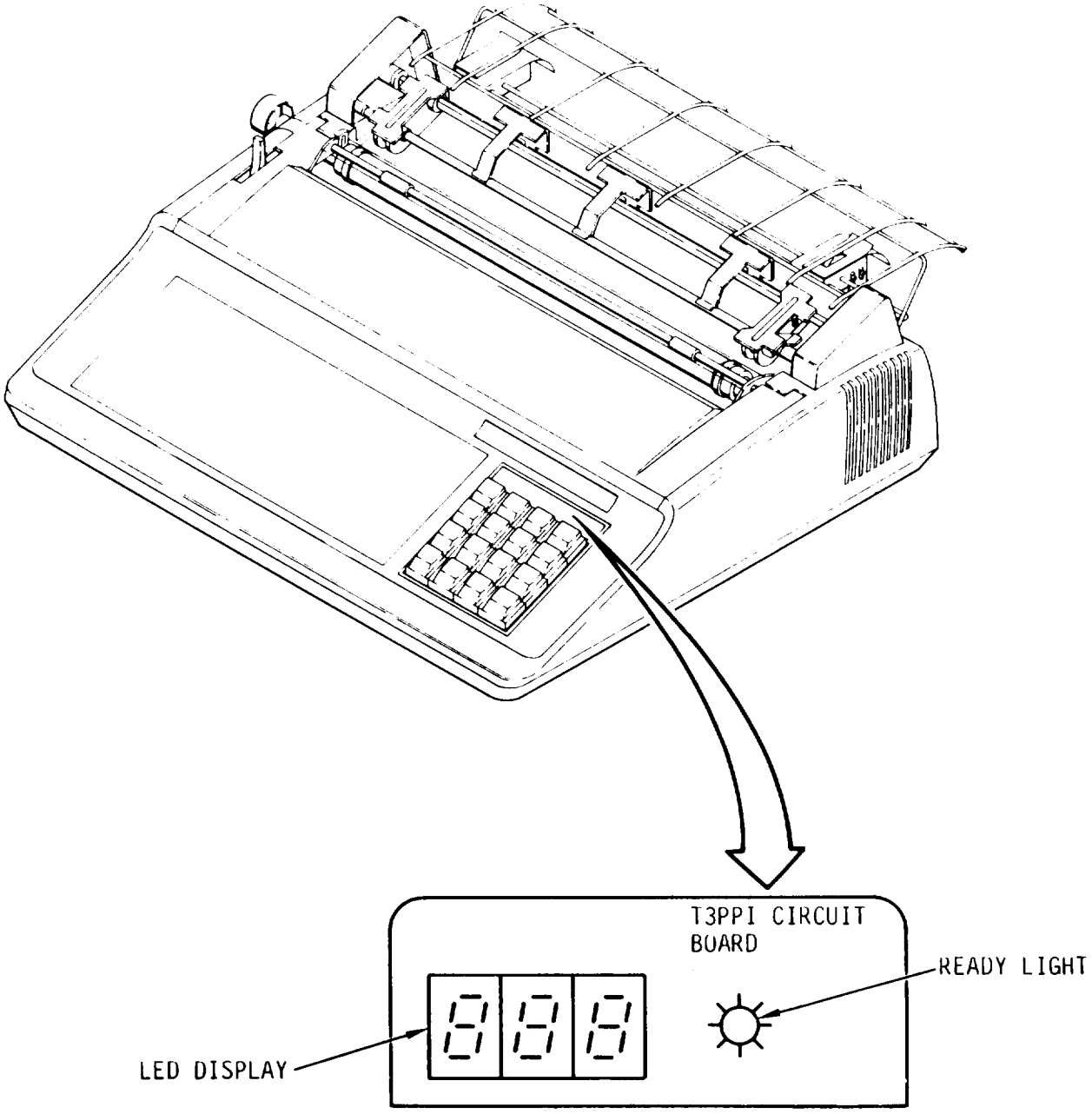


Figure 1-6. Print Position Indicator

g. Data Interface Panel. The data interface panel (fig. 1-7) is a metal plate containing pin connectors to which RS-232C data set cable is attached.

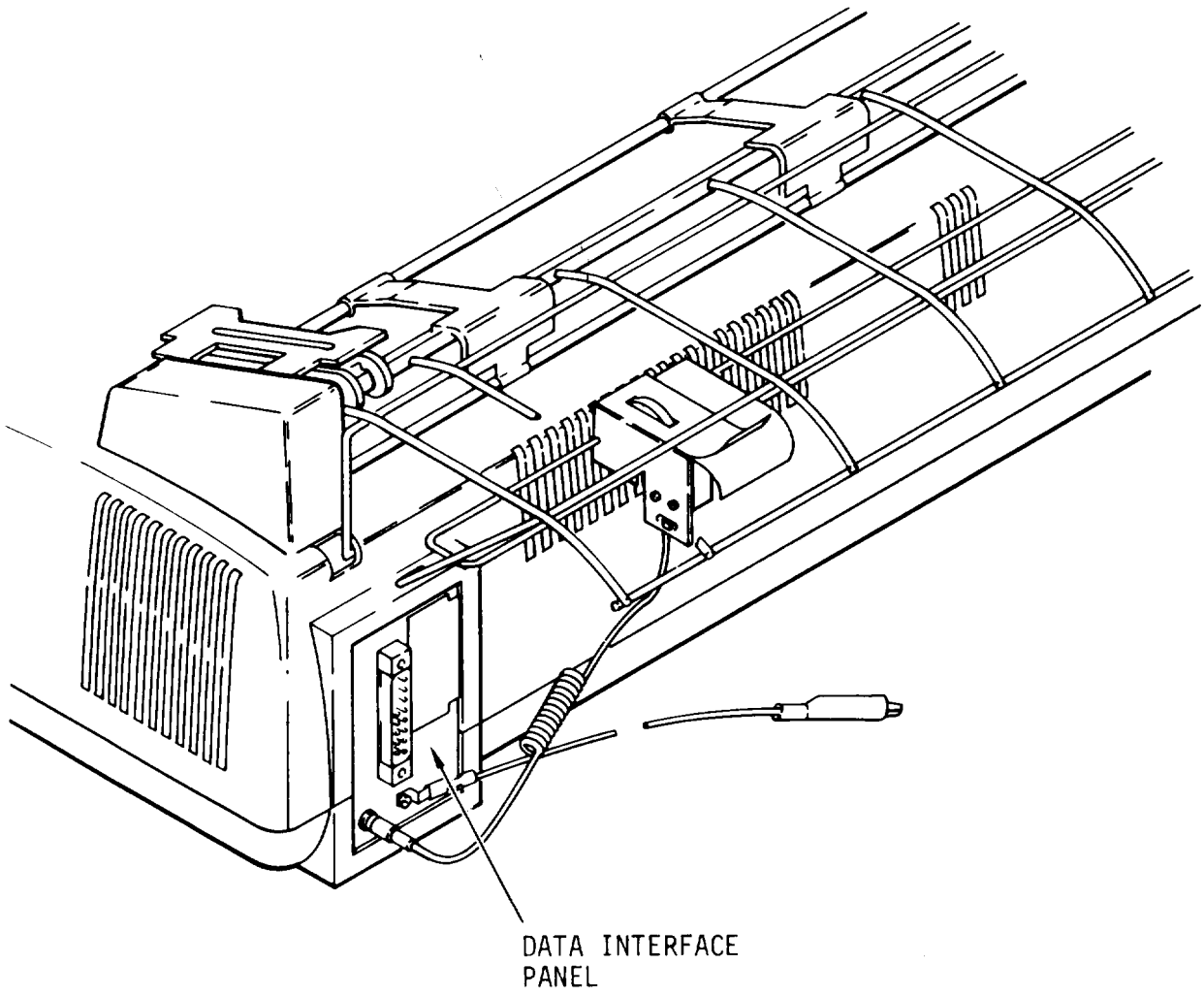


Figure 1-7. Data Interface Panel

1-13. EQUIPMENT IDENTIFICATION PLATE

An equipment identification plate (fig. 1-8) is located on the front of the teleprinter.

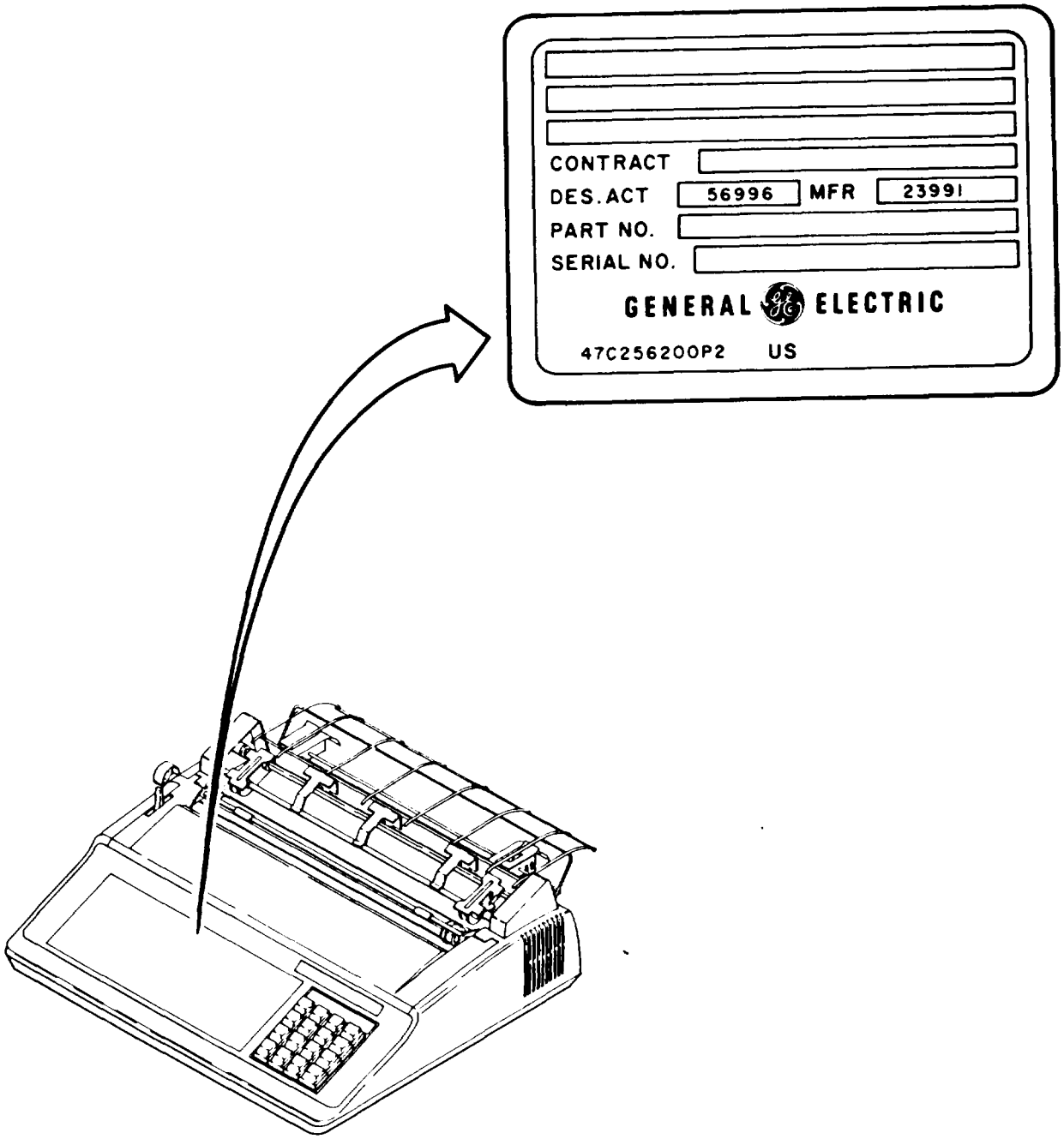


Figure 1-8. Teleprinter Identification Plate.

1-14. EQUIPMENT DATA

Weight and dimensions:
- Weight 23.0 lb (10.4 kg)
- Height 5.5 in. (14.0 cm)
- Width 22.0 in. (56.0 cm)
- Depth 18.5 in. (47.0 cm)

Operating environment:
- Temperature
  - Operating +4O°F to +104°F (+4.4°C to +40°C)
  - Storage -40°F to =160°F (-40°C to =71.1°C)
- Relative humidity 5% to 95% (noncondensing)

Power requirements:
- Voltage
  - Domestic 117 V ac
  - International 200-240 V ac
- Frequency 50/60 Hz
- Power (printing) 90 Watts

Functional characteristics:
- Print speed 120 cps with 150 cps catch up speed, with 640-character interval buffer and 2K line buffer
- Type Serial impact
- Print positions 132 (maximum)
- Print format 10, 13.2, 16.5 cpi, (horizontal)
  2, 3, 4, 6, 8 and 12 lpi (vertical)
- Print character set 94-character ASCII
- Font 7 x 9 dot matrix

Transmission requirements:
- Code 128 ASCII characters
- Interface EIA RS-232C
- Baud rate 150, 300, 600, 1200, 2400, 4800, 9600 bps
- Type Asynchronous

CHAPTER 2
TECHNICAL PRINCIPLES OF OPERATION

2-1. GENERAL

This chapter tells how the teleprinter works. This information will help during troubleshooting. It will also make maintenance tasks easier.

2-2. FUNCTIONAL DESCRIPTION

The teleprinter is a receive or read-only device. It operates under control of a host system such as a computer to print information directed to it. It can send status signals to the host system, but it cannot transmit any data to it.

It is an electromechanical device. It is electrically powered and electronically controlled by circuits on printed circuit boards. Paper movement and all printing operations, however, are by mechanical devices.

2-3. LOGIC BOARD

The logic board operates and controls the teleprinter. It receives and processes commands and data from the system to which it is connected and sends data on its own status back to the system. Its functions include distributing and controlling power to all electrically operated teleprinter components. It also provides the signals to print characters, to move the ribbon, to move the carriage, and to advance the paper. It also stores its own self-test programs. This board includes the following circuits and components:

- Clock oscillator driver for servo control circuits
- Driver for logic circuits
- Program interval timer and a ribbon drive motor timer
- Control logic for the carriage drive and paper feed servomotors
- Print head drive circuits
- Character generator
- Logic for the print position indicator (PPI) and the control panel
- ROM and RAM
- Two 8085A microprocessors
- Audio transducer (speaker)

All electrically-operated teleprinter components connect to the logic board (fig. 2-1).

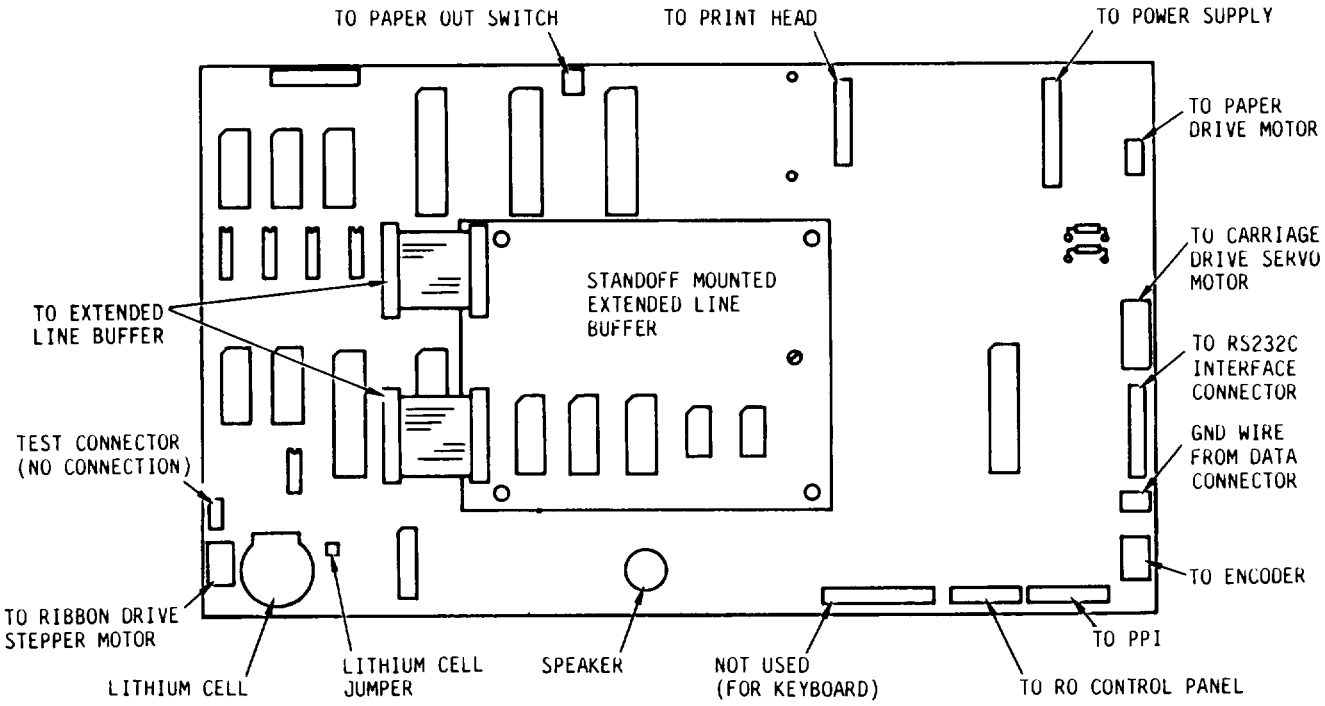


Figure 2-1. Logic Board Connections

2-4. Lithium Cell. The logic board includes a lithium cell (fig. 2-1) to supply power to memory chips storing operator-programmed functions whenever line power is off. Loss of charge, failure of the cell, or removal of the jumper next to the cell causes loss of these memory functions. Without them, the teleprinter has no references and will not operate until the cell is operational and the memory reprogrammed.

2-5. EXTENDED BUFFER

The teleprinter prints at 120 cps. Usually, data is received at a much higher rate. So that the teleprinter isn't constantly sending a busy signal to tell the computer to wait until it catches up, a buffer on the logic board stores 640 characters for the printing mechanism to work on while the computer tends to other business. As the transmission baud rate increases, the 640-character buffer becomes inadequate. The extended buffer adds storage for an additional 2000 characters, making high speed transmission practical and improving efficiency at lower rates. The extended buffer mounts on and connects to the logic board.

2-6. POWER SUPPLY

Entering power passes through a line filter and the power switch, then goes directly to the power supply circuit board containing all the other power supply components. The power supply provides all voltages required by the teleprinter and a power-ready signal for fault detection circuitry (fig. 2-2). All power supply outputs go to the logic circuit board for control and for distribution to the teleprinter components.

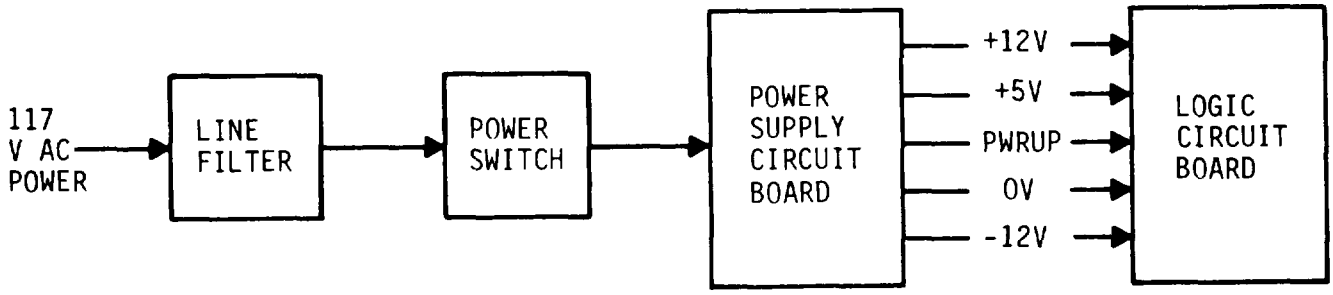


Figure 2-2. Power Supply

The switching power supply is a universal type that can be configured with jumper J2 for either nominal 117 V ac 60 Hz or 200 - 240 V ac 50 Hz international voltages (para 4-61). Jumper J1, when cut or removed, must be replaced by a fuse in the F1 fuse clip. A fuse is installed in the F1 fuse clip in those locations where the three-wire power source is terminated in a non-polarized outlet into which the printer power cord is to be connected.

Jumper J2 is connected to the P4 plug on the board for nominal 117 V ac power and is connected to P5 plug on the board for 200 - 240 V ac power sources.

WARNING

Line voltage is present at the line filter input and output leads when the ac power switch is set to OFF, and the teleprinter is still connected to the ac line voltage source. Avoid contact.

CAUTION

When measuring voltage levels on the power board, connect the common lead of the measuring device to the Z bus on the board (fig D-1). Failure to use this bus as the common will result in improper reading of voltage levels on the board.

2-7. CARRIAGE MECHANISM

The carriage (fig. 2-3) on which the print head mounts is attached to a drive belt spanning the width of the teleprinter. Two fixed pulleys on the right side wrap the drive belt around the motor shaft. The shaft is ribbed to engage ribs on the belt to prevent slip. Belt slippage at the carriage or motor would cause the electronics to lose control of the carriage and its position.

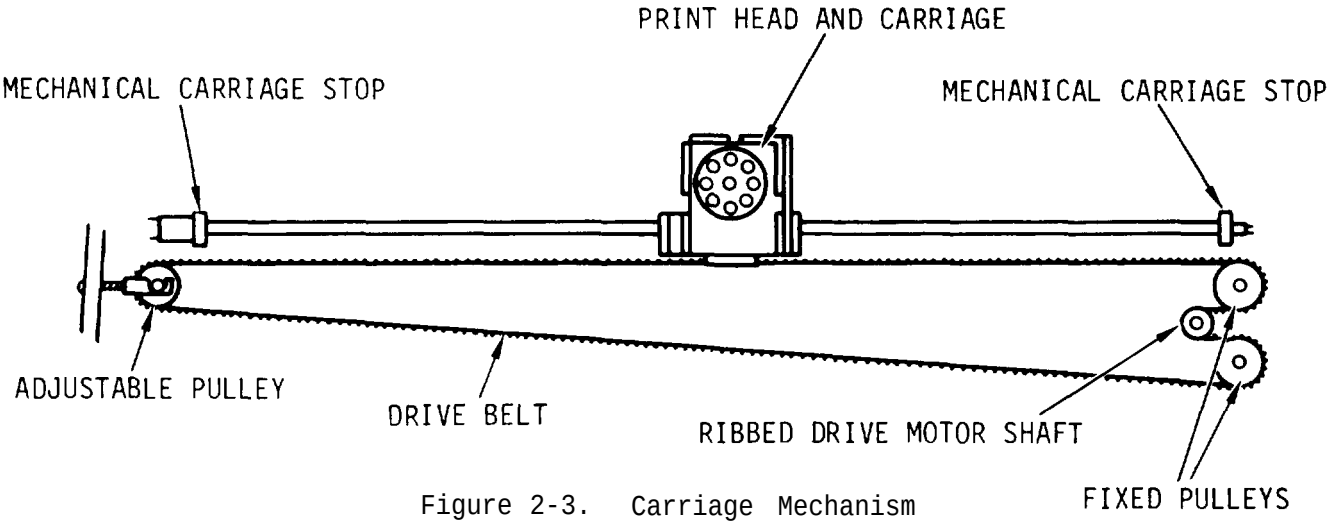


Figure 2-3. Carriage Mechanism

The single pulley on the left side is mounted on an adjustable bracket. The adjustment is used for belt removal and belt tension control.

In the carriage drive and control circuit, (fig. 2-4), the drive motor is a dc servo type, turning in either direction the amount specified by the logic board. An encoder on the motor shaft has board-mounted circuitry to translate shaft rotation and direction into coding used to determine and remember carriage position. The encoder board also includes the circuitry which controls character spacing. Character spacing is operator selected. The encoder board also has circuits used by the paper drive. The encoder board is an integral part of the encoder and is not replaceable in the field.

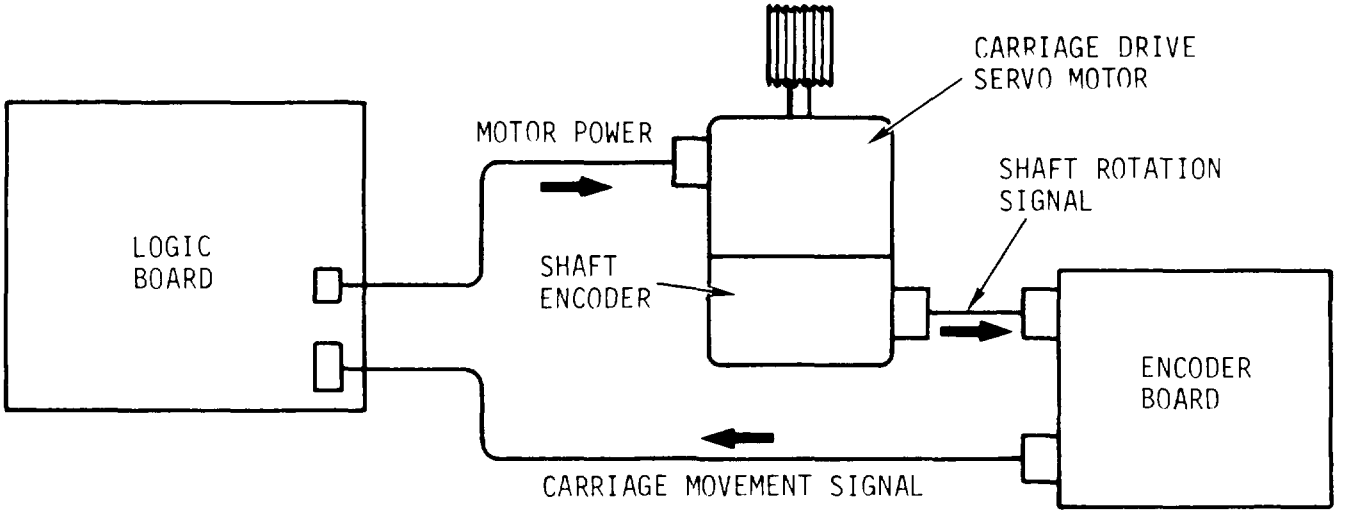


Figure 2-4. Carriage Drive Control

2-8. PRINT HEAD

The print head mounts on the carriage and has a circuit board attached. The board has no test points and is not replaced separately.

Printed characters are formed by the print head. Hammers in the nozzle are activated to strike the ribbon between them and the paper to imprint dots on the paper. The character generator on the logic board identifies the dot pattern needed to form each character and causes the hammers to print them. There are 63 dot positions possible in the 9 x 7 matrix of hammers.

2-9. PAPER FEED

Paper is fed by a stepper motor which advances the paper one step each time it is energized by logic board circuitry. The platen and spring-loaded pressure rollers move the paper between them by friction. The platen is gear driven (fig. 2-5).

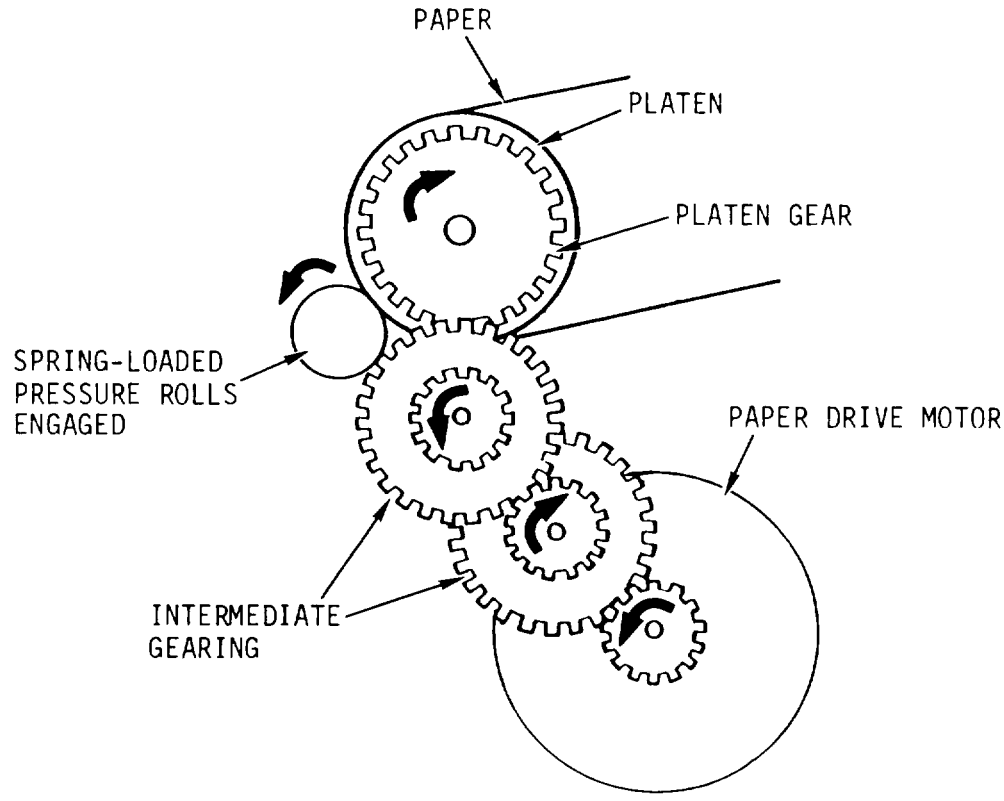


Figure 2-5. Paper Driven by Platen Friction

There are three pressure rollers. A roller lever on the left side can be set to place the two outside rollers in contact with the platen and retract the center roller, to place the center roller in contact with the platen and retract the two outside rollers, or to retract all three rollers (fig. 2-6). These positions allow paper alinement and pressure adjustment for form width and thickness.

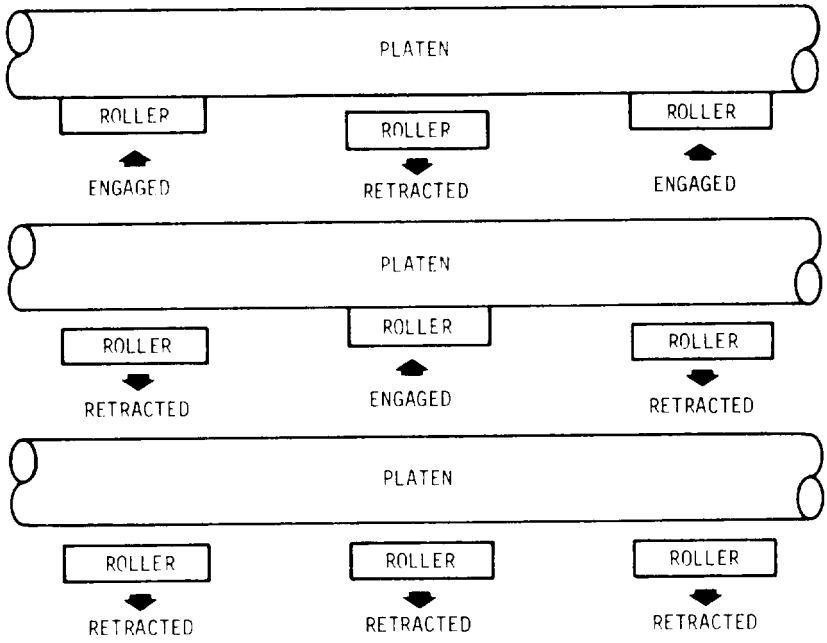


Figure 2-6. Pressure Roller Positions

When the teleprinter includes a pin-feed tractor (fig. 2-7), it also has a gear drive which meshes with the other paper feed drive gears. To avoid tearing pin feed holes instead of feeding paper, the roller lever must be set (center position) to retract all three pressure rollers so that only the pin feed tractor moves the paper.

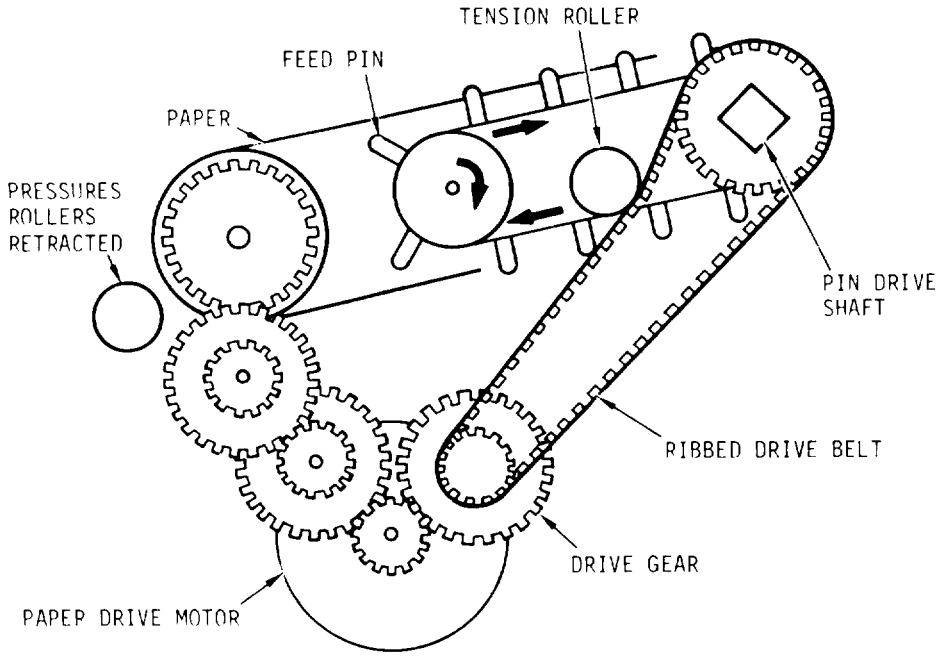


Figure 2-7. Pin-Feed Paper Drive

2-10. RIBBON DRIVE

The ribbon cartridge fits onto the end of the ribbon drive motor shaft. The shaft turns the cartridge mechanism to move the ribbon. The logic board controls the ribbon drive stepping motor so that the ribbon advances only while the teleprinter is receiving data and the carriage is in motion.

2-11. CONTROL PANEL

The control panel (fig. 2-8) allows the operator to set, control and store teleprinter functions in memory and to display status on the print position indicator. This panel mates with the T3NC circuit board which provides a matrix signal for each key on the panel. The T3NC board connects to and provides its signals to the logic board. The T3NC board has no power connections, fuses, or jumpers. It is replaceable.

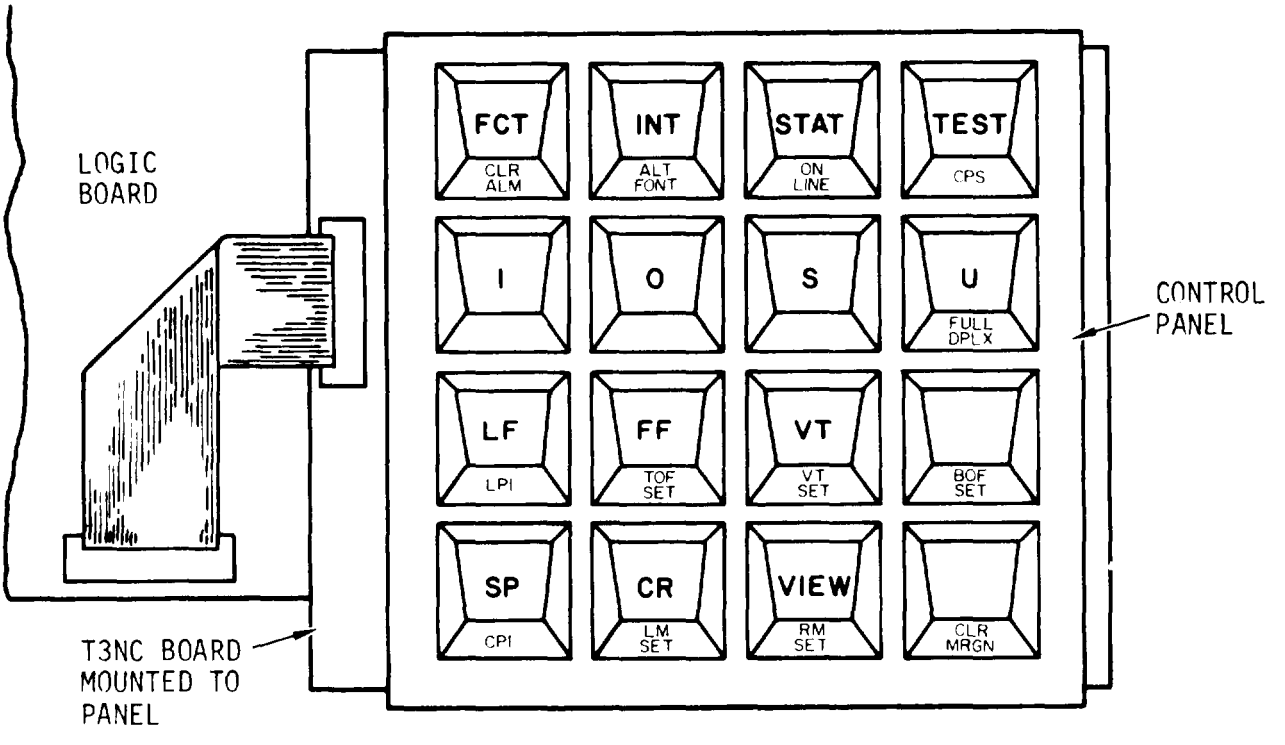


Figure 2-8. Control Panel

2-12. PRINT POSITION INDICATOR

The print position indicator (PPI) is a display device and a circuit board (fig. 2-9). In normal operation, it indicates carriage position by displaying the column number in which the next character will be printed. At startup and when a malfunction occurs, diagnostic codes are displayed. Operational status codes are also displayed by the PPI (table 2-1). All displays come from the logic board.

The T3PPI circuit board on which the display LEDs are mounted contain no test points, jumpers, or fuses. The board can be replaced.

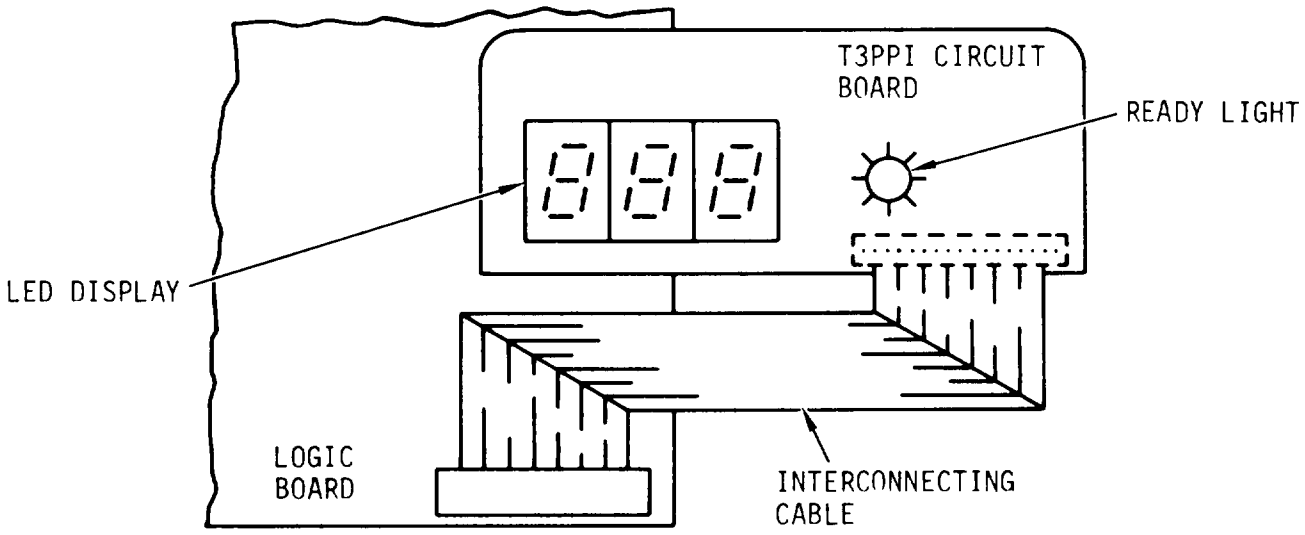


Figure 2-9. Print Position Indicator

Without a paper out switch, the teleprinter has no way to tell if there is paper to print on or not. The logic therefore assumes that there will be paper and Prints whenever there is data to print. If there is no paper, i t prints on the platen.

With a paper out switch, the paper restrains the actuating arm, holding the contacts open. The logic sees the open contacts as meaning paper is present. When the end of the paper passes the switch, the actuator arm is released and the contacts close, signalling the end of the paper to the logic board. The logic lights a P O (paper out) alarm on the PPI, stops printing, and transmits a break to the data source.

Table 2-1. PPI Indicator Display Summary

PPI DISPLAY READOUT	CONDITION INDICATED/ACTION REQUIRED
E--	Printer failure. Print fault caused by the print head's failure to move or a failure in the power supply, etc. Once the fault is corrected, the display may be cleared by pressing the CLR ALM key.
P-O	Paper out, Check paper.
INT	Received interrupt (spacing signal at least 110 msec. long). Causes the keyboard to lock and halts all data transmission. Unlock the keyboard by pressing the FCT key.
FUL	Indicates that the buffer is full, when the printer is strapped to send a BREAK. Wait for printer to empty buffer.
OFL	Buffer overflow. Occurs when characters are received after the receive buffer is full. Further received characters are lost. Host system must retransmit data.
FSU	Forms set up. Indicates vertical format mode is on.
OSU	Option set up. Indicates strapping option mode is on.
ASU	Answerback set up. Indicates answerback programming mode is on.
HDX FDX	Indicates half or full duplex operating conditions.
LOC ON-L	Indicates either local or on line operating condition.
ALF OFF	Indicates a selected automatic line feed feature is a disabled automatic line feed feature.
SEC ALT	Indicates current selected font style either standard or alternate. This feature available with APL or other alternate character set.
1 through 888	Numerical display. Used to indicate: o Current print position (1-217) o Line transmission rate (char/sec) (15, 30, 60, 120, 240, 480, 960) o Vertical lines per inch density (2, 3, 4, 6, 8, 12) o Horizontal print density (10, 13, 16)

When the switch is present and connected, paper must be loaded to permit teleprinter operation. The paper out switch is on a removable bracket that clips onto the paper rack where it engages the edge of the paper (fig. 2-10).

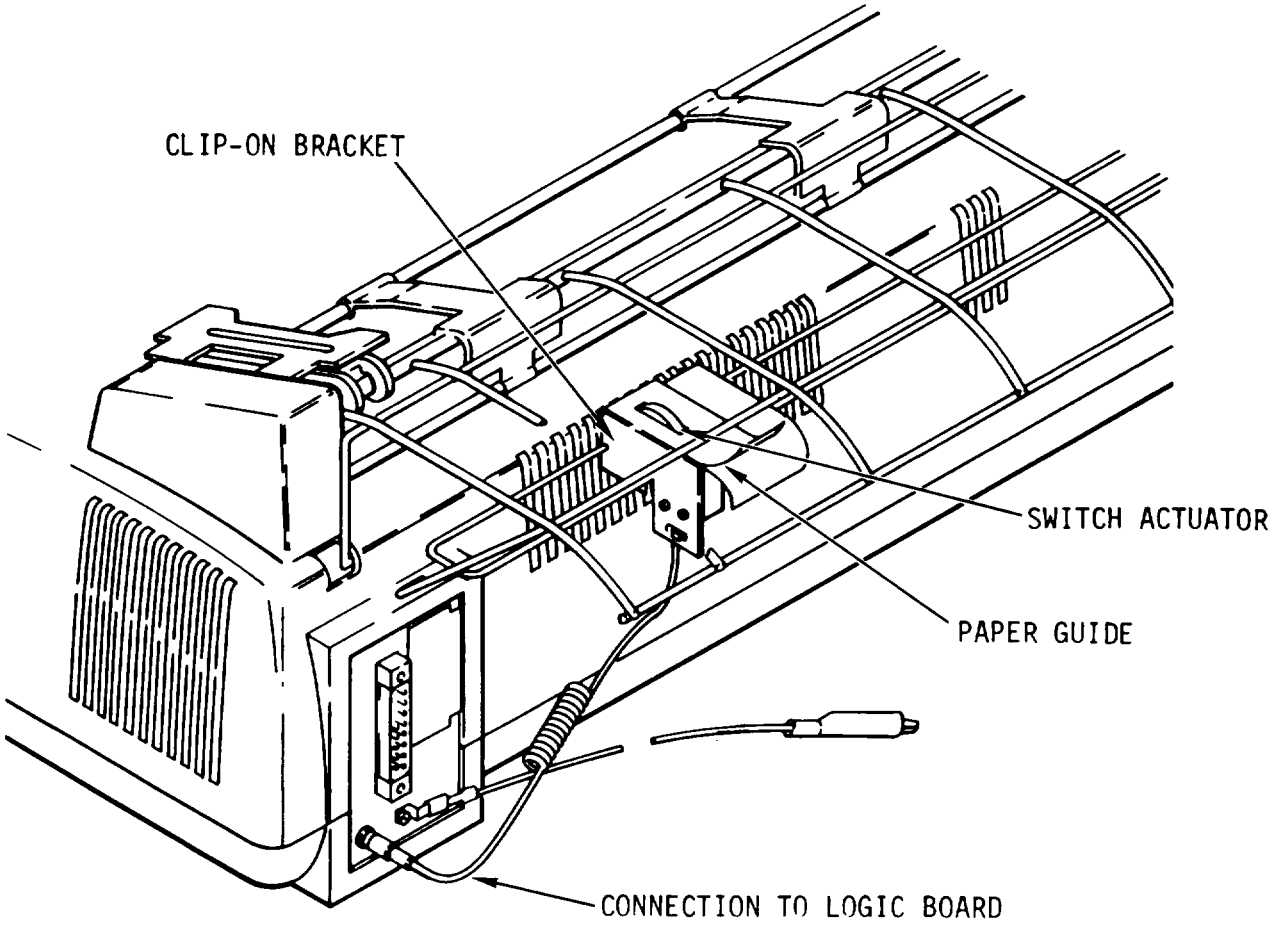


Figure 2-10. External Paper Out Switch

CHAPTER 3
ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

3-1. COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment refer to the Modified Table of . Organization and Equipment (MTOE) applicable to your unit.

3-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

Refer to TM 11-701O-2O5-23P for a complete listing and description of special tools, TMDE and support equipment required by organizational maintenance. Also refer to appendix B for a list of tools pertaining to the console printer.

3-3. SPARES AND REPAIR PARTS

Refer to TM 11-701O-2O5-23P for a complete listing and description of spares and repair parts required for organizational maintenance of this equipment.

Section II. SERVICE UPON RECEIPT

3-4. UNPACKING

Upon receipt of new equipment, check packing list and instructions for any precautions or specific unpacking procedures.

3-5. CHECKING UNPACKED EQUIPMENT

Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on SF 364, Discrepancy in Shipment Report.

Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions of TM 38-750.

Check the equipment to ensure that required Modification Work Orders have been applied in accordance with DA PAM 310-1.

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

3-6. GENERAL

Organizational maintenance PMCS is the required inspection and care of the equipment necessary to keep it in good operating condition. Routine checks like equipment inventory, cleaning, dusting, washing, checking for frayed cables, storing items not in use, covering unused receptacles and checking for loose nuts and bolts are not listed in your PMCS. They are things you should do anytime you see they must be done. If YOU find a routine check like one of these listed in your PMCS, it was listed because operators reported problems with this item.

3-7. PMCS PROCEDURES

PMCS procedures are done at fixed intervals for the following purposes:

- Make sure that the equipment is operable
- Prevent equipment problems in future operation
- Identify and resolve minor problems in the equipment before they become major problems
- Scheduled cleaning of the equipment

3.8. ITEM NUMBER COLUMN

The checks/services in the PMCS table are numbered in order of performance. Use this ITEM number when filling out DA Form 2404 (Equipment Inspection and Maintenance Worksheet).

3-9. ITEM TO BE INSPECTED COLUMN

The items listed in this column are based on the major components of the equipment and use common names of these components.

3-10. PROCEDURE COLUMN

This column gives you the check or service procedure which you must perform on the item.

3-11. EQUIPMENT WILL BE REPORTED NOT READY/AVAILABLE IF COLUMN

This column tells you under what conditions the equipment will be unable to perform its primary mission. When you notice this condition during PMCS you must report it on the proper form and tell your supervisor.

Table 3-1. Monthly Organizational Preventive Maintenance Checks and Services

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
1	Teleprinter Operation	Check operation of teleprinter as follows: 1. Power ON teleprinter. 2. Run self test. 3. Power OFF teleprinter.	Self test will not run or shows faulty operation.
2	Teleprinter	Inspect and clean interior: 1. Power OFF. Pull ac power plug from outlet. 2. Remove paper. 3. Remove tractor assembly and paper rack. 4. Remove platen. 5. Remove top cover. 6. Remove power supply cover. 7. Lift up control panel. CAUTION Circuit boards damage easily. Take care not to strike with brush. 8. Using vacuum cleaner with soft bristle brush, clean interior of printer. WARNING Isopropyl alcohol is flammable Do not use near high heat or open flame. 9. Dampen lint-free cloth with isopropyl alcohol.	

Table 3-1. Monthly Organizational Preventive Maintenance Checks and Services -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
		10. Wipe paper pan. 11. Wipe Platen. NOTE Light deposit of black carbon on support rails is normal. 12. If rails must be cleaned, wipe with dry lint-free cloth. If dry cloth not effective, moisten lightly with isopropyl alcohol and wipe. CAUTION Do not lubricate rails. Oil will cause carriage bearing failure.	
3	Carriage Drive Belt	Check and adjust as follows: 1. Move carriage along support rails. 2. Check if drive belt moves evenly on motor drive shaft and pulleys.	Drive belt loose, cut, or pulleys out of alinement.
4	Print Head Cable	Check print head cable as follows: 1. Move carriage along support rails. 2. Check if paper board covers are in place over circuit boards. 3. Check if print head cable moves freely.	
5	Tractor Drive Belt	Check belt for wear.	Belt worn or cut.

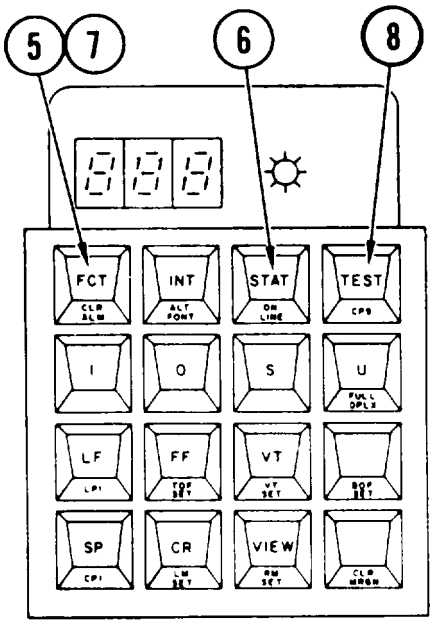
Table 3-1. Monthly Oganizational Preventive Maintenance Checks and Services -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
6	Carriage Drive Belt	Check belt for wear.	Belt worn or cut.
7	Tractor Drive and Gear Pulleys	Check pulleys for dirt and wear. Clean with bristle brush.	
8	Platen Drive and Inter-mediate Pulleys	Check pulleys for dirt and wear. Clean with bristle brush.	
9	Ribbon Guide Rollers	Check if ribbon guide rollers rotate freely. If necessary, clean as follows: 1. Remove retaining rings from top of rollers. 2. Remove rollers from roller support posts. WARNING Isopropyl alcohol is flam-mable. Do not use near high heat or open flame. 3. Dampen lint-free cloth with isopropyl alcohol. 4. Wipe rollers and support posts thoroughly. 5. Check straightness of roller support posts. 6. Replace rollers and retaining rings. 7. Lower control panel. 8. Replace power supply cover. 9. Replace top cover.	Roller support posts broken or bent.

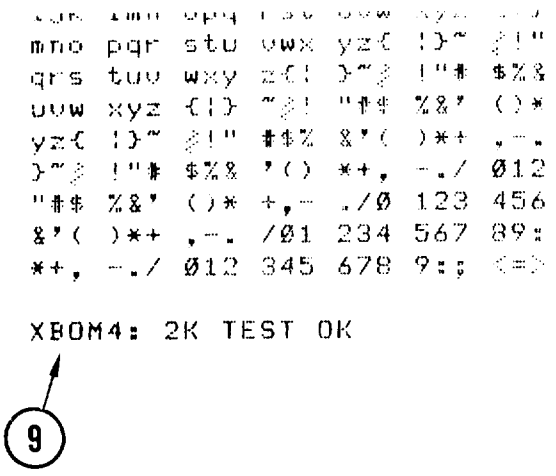
Table 3-1. Monthly Organizational Preventive Maintenance Checks and Services -- Continued

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available If:
		10. Replace platen. 11. Replace paper rack and tractor assembly. 12. Install paper. 13. Push ac power plug into outlet.	

3-12. SELF TEST TELEPRINTER



1. Check that paper is installed in printer.
2. Check that ribbon cartridge is installed in printer.
3. Check that paper shield and access cover are closed.
4. Power ON printer.
5. Press and hold the FCT switch on the control panel.
6. Press the STAT switch once or twice until LOC appears on the status indicator.
7. Release the FCT switch.
8. Press and hold the TEST switch until 10 or 20 lines are printed.



9. Wait two or three seconds until last line is printed.
10. Check that last line of printout appears as shown.
    - If so, go to step 11
    - If not, troubleshoot printer
11. Power OFF printer.

CHAPTER 4
DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

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Section I. REPAIR PARTS, SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

4-1. COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

4-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

Refer to TM 11-701O-2O5-23P for a complete listing and description of special tools, TMDE and support equipment required by direct support maintenance. Also refer to appendix B for a list of tools pertaining to the console printer.

4-3. SPARES AND REPAIR PARTS

Refer to TM 11-701O-2O5-23P for a complete listing and description of spares and repair parts required for direct support maintenance of this equipment.

Section II. TROUBLESHOOTING

4-4. GENERAL

The most effective way to troubleshoot a fault in this equipment is to follow a routine which guides you through the five phases of troubleshooting (fig. 4-1). By following this routine you assure accurate use of fault isolation and fix procedures. You also improve your troubleshooting skills.

4-5. TROUBLESHOOTING PHASES

Each of the five phases in this routine is designed to accomplish a specific goal.

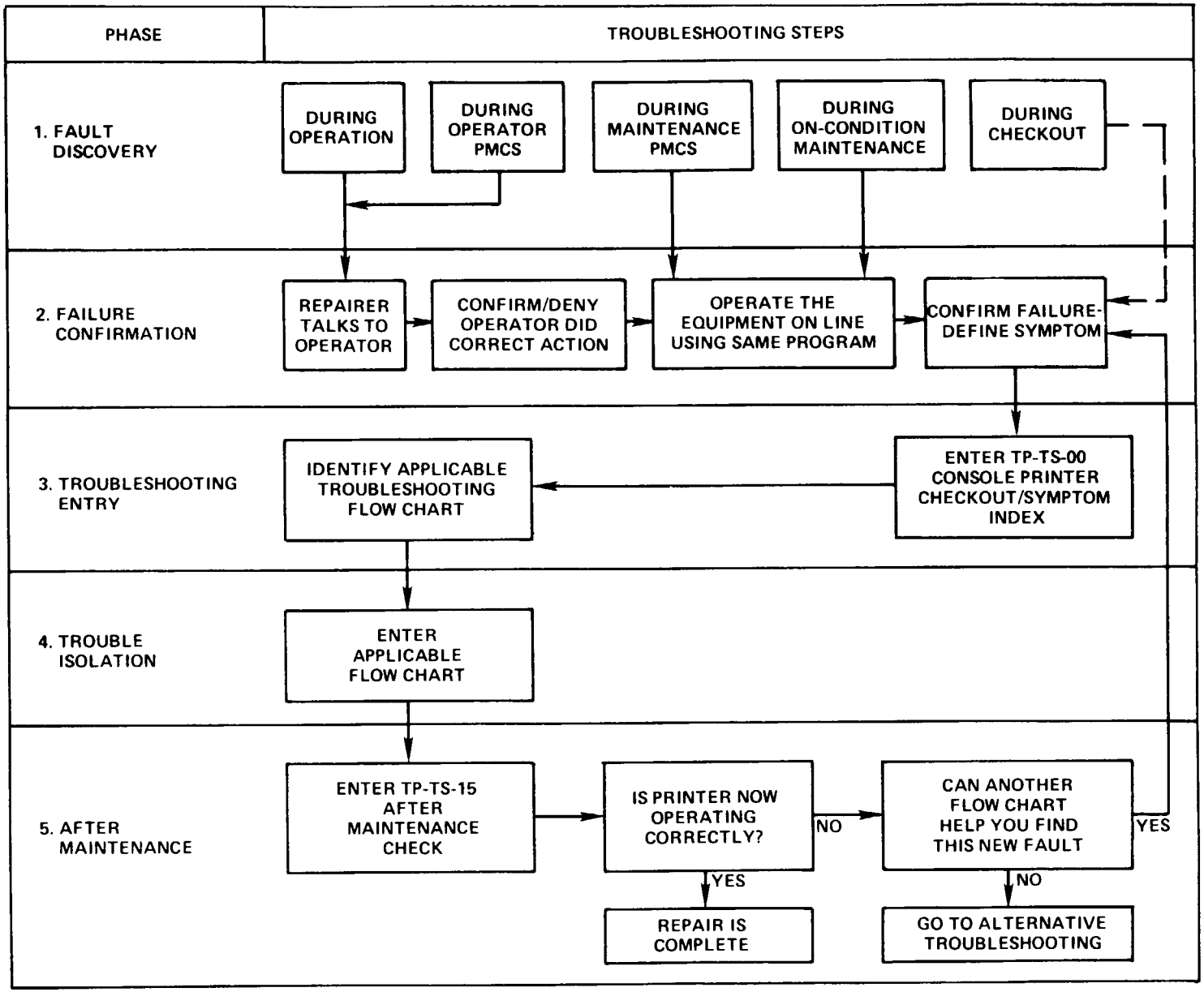


Figure 4-1. Troubleshooting Phases

a. Fault Discovery. Usually, the operators or supervisor will notice faulty performance first. They must report the fault on the proper form so you will have the facts you need for the need for the next phase.

b. Failure Confirmation. Based on the facts provided, you must confirm the failure and define the symptom. The symptom is the first clue you will use in the troubleshooting process.

c. Troubleshooting Entry. Using the symptom defined during phase two, find the troubleshooting low chart which will help you isolate the fault in the equipment. The checkout and symptom index chart (chart-00) will help you do this.

d. Trouble Isolation. Follow the step-by-step procedures in the flow chart to isolate and correct the cause of the equipment failure.

e. After Maintenance. When you have made the fix recommended in the trouble-shooting procedure, you must check your work. Use the chart titled After Maintenance Check. It tells you how to test your repair and make sure the equipment now works as it should.

4-6. ALTERNATIVE TROUBLESHOOTING TECHNIQUES

When a failure causes a symptom which is not covered in the symptom index or not corrected by the troubleshooting procedure in the flow chart, you must try alternative techniques.

a. Understand Principles of Operation. Sometimes the symptom may have no specific procedure given to troubleshoot it. When this happens, remember that the equipment always operates the same way. By comparing the faulty operation with expected or normal operation you may find the cause of the failure and be able to fix it.

CAUTION

All circuitry on the power supply board has direct connection to the ac power line. Do not make any continuity checks on this board unless the test instrument is connected to an isolation transformer.

b. Check the Circuits. All electronic equipment uses circuits to route power through the components. Any break in continuity will cause some type of failure. By running continuity checks on suspect circuits you may find the cause of the failure. Use the schematic diagrams in appendix D to check the circuits in this equipment.

c. Check Past Maintenance Records. If the unusual failure occurred before, it should appear in the maintenance records for the equipment. The records should also tell you how the failure was corrected. Use the same fix this time.

a. Trial and Error Repair. Usually trial and error repairs should be avoided. They are costly and can induce additional symptoms. However, when your experience with the equipment leads you to suspect a definite cause, you should try the repair as a last resort before shipping the equipment to depot for maintenance.

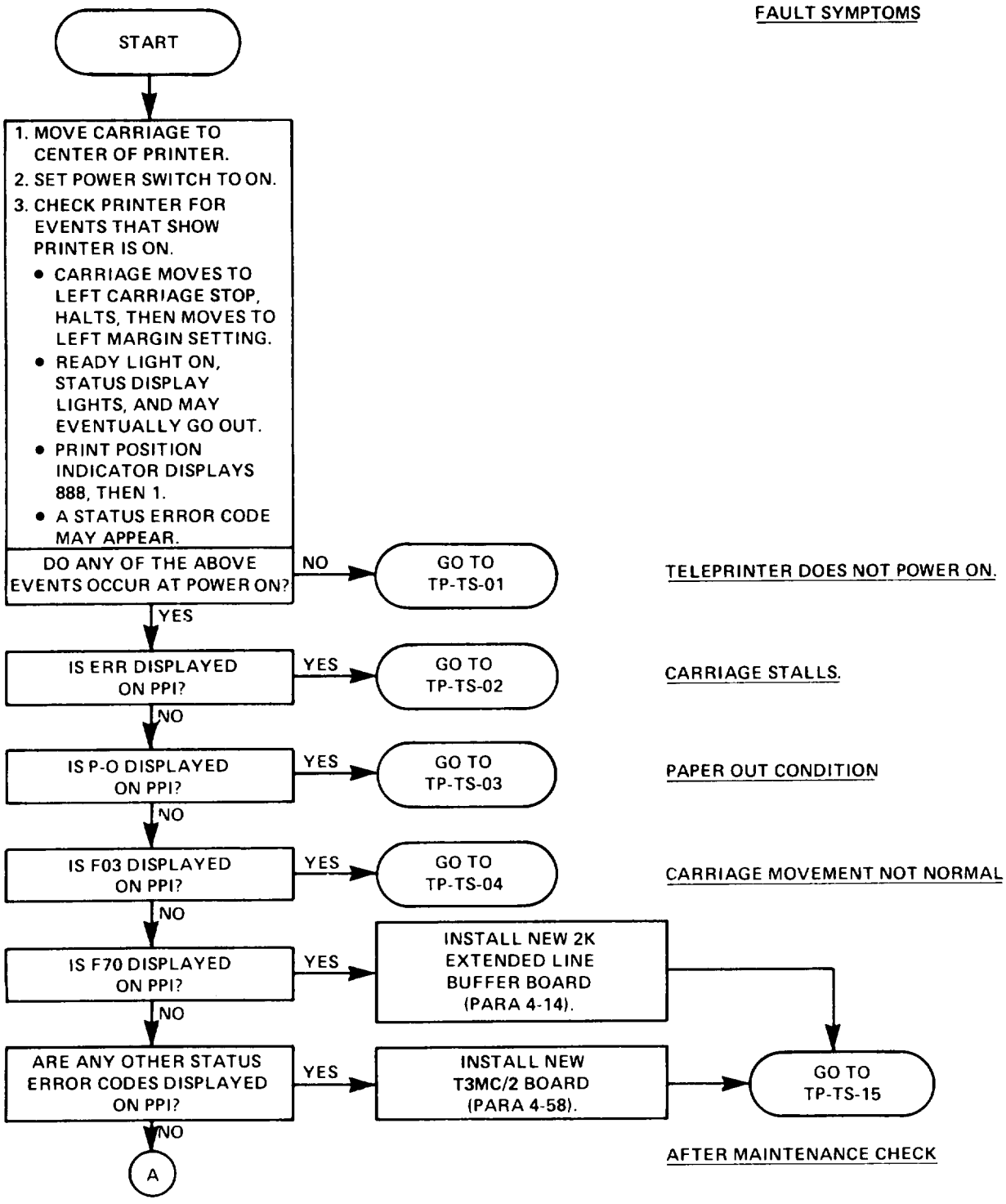
4-7. TROUBLESHOOTING PROCEDURES

The troubleshooting procedures are arranged as flow charts. The charts consist of background information, specific instructions and decision points. Symbols (table 4-1) are used to organize the charts and guide you through a step-by-step trouble isolation procedure for each known failure symptom.

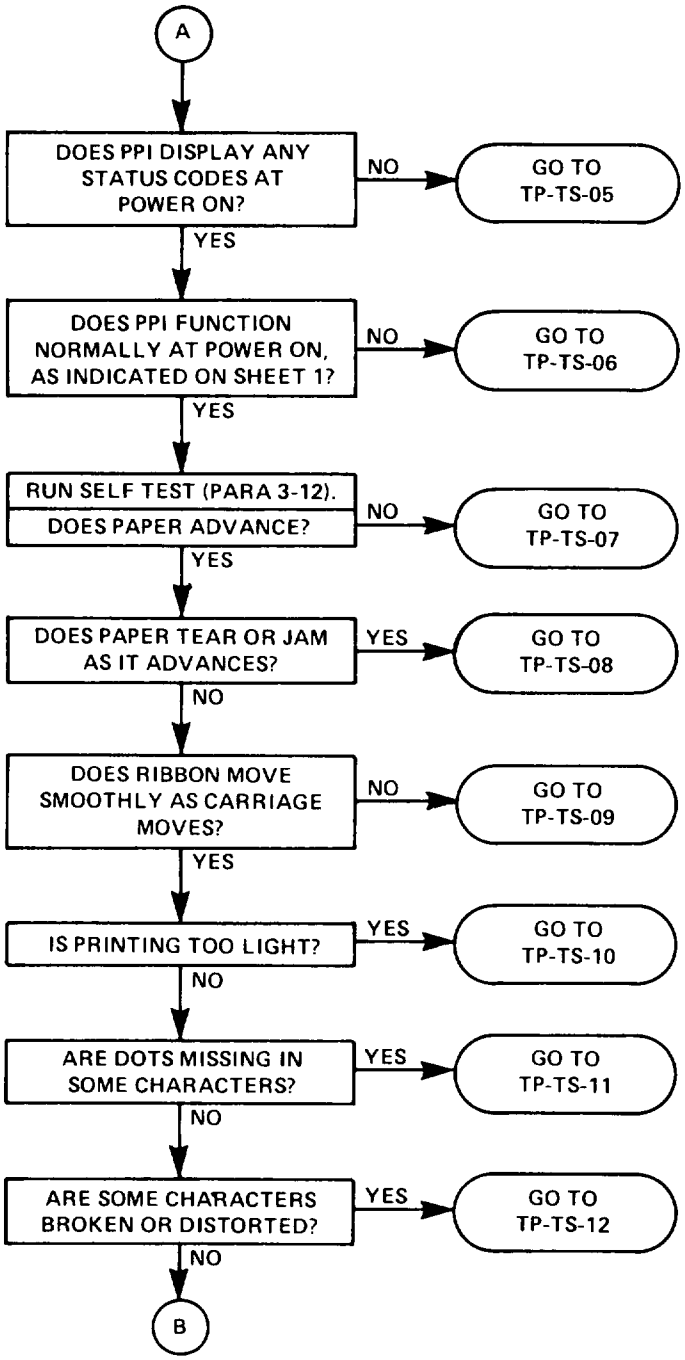
Table 4-1. Flow Chart Symbols

SYMBOL	MEANING
START	This is a STARTING POINT symbol. This is where you enter a troubleshooting flow chart.
NOTE	This is a NOTE symbol. It contains information you need to do your work, but which is not a procedural step.
CAUTION	This is a CAUTION symbol. It alerts you to the possible danger of breaking equipment in the steps that follow.
WARNING	This is a WARNING symbol. It alerts you to possible danger in the steps that follow.
INFORMATION	This is an INFORMATION symbol. It contains information that helps you make a test or understand the troubleshooting process.
TEST QUESTION NO →	This is a TEST/DECISION SYMBOL. It contains a test you must do and a question you must answer. If the results of a test tell you the answer is YES, you will follow the YES arrow to the next symbol. If your answer is NO, you will follow the NO arrow.
YES (A) (A)	These are CONNECTING POINT symbols. They are used in pairs. If the arrow points to the circle, it is the point where you leave a branch of the flow chart. If the arrow points away from the circle, it is the point where you go back into the flow chart. For example, you would go from → (A) on one page to (A) → on the next page.
INSTALL NEW ITEM (PARA 3-X)	This is a CORRECTIVE ACTION symbol. It tells you what to do to correct the problem. It will also refer you to the paragraph that contains the needed repair or adjustment procedure.
GO TO XX-XX-XX	This is a GO TO symbol. It tells you to go to another flow chart. The X's in the symbol at the left stand for a chart code.
GO TO TM FOR SYSTEM	Other forms for GO TO symbol: This symbol tells you to go to the system Technical Manual for further troubleshooting, such as running a T&V program.
GO TO START	This symbol tells you to go back to the START point of the same flow chart.

TP-TS-00	TELEPRINTER CHECKOUT/SYSTEM INDEX	1 OF 3



TP-TS-00	TELEPRINTER CHECKOUT/SYSTEM INDEX	2 OF 3



FAULT SYMPTOMS

POWER ON BUT NO STATUS CODE

PPI DOES NOT FUNCTION NORMALLY.

PAPER DOES NOT ADVANCE.

PAPER TEARS OR JAMS WHILE ADVANCING

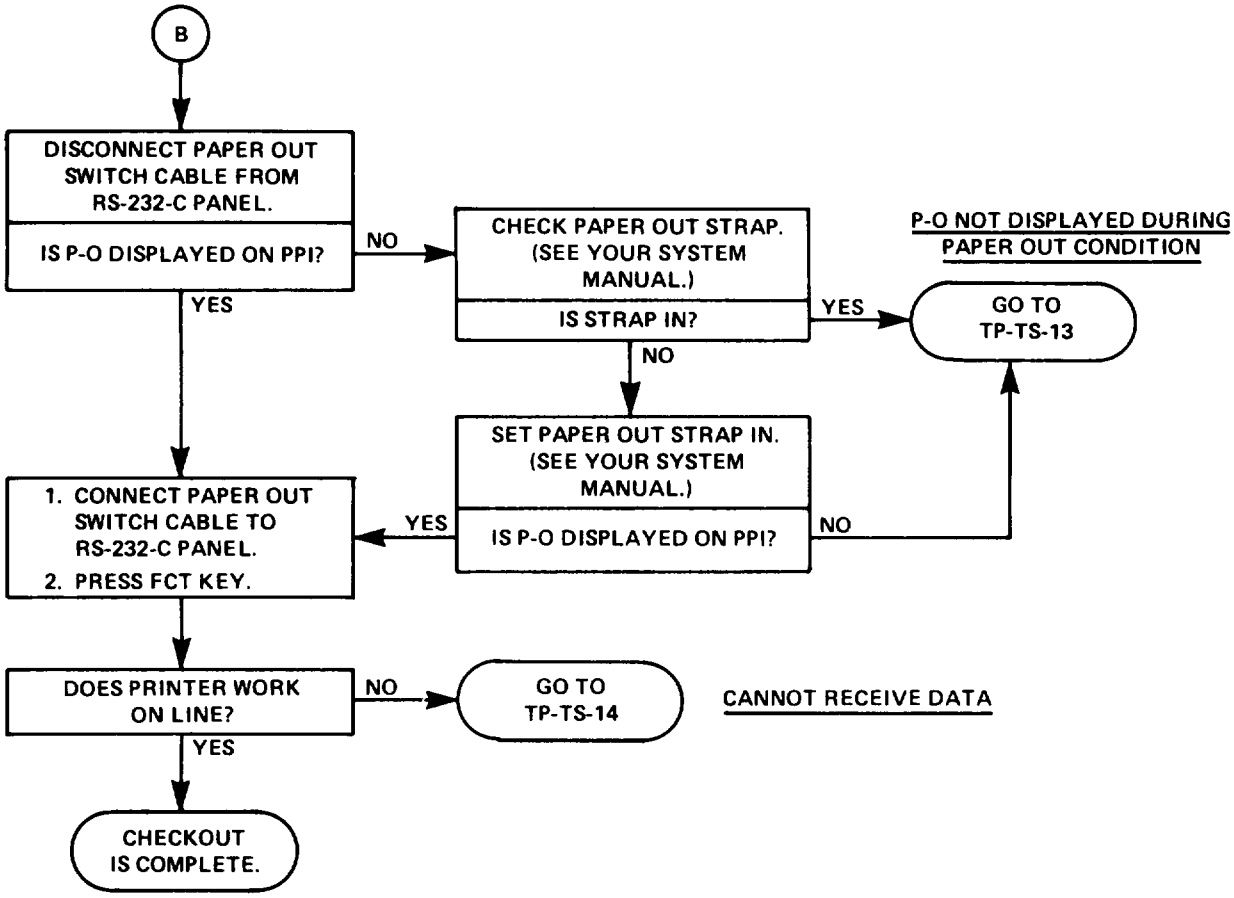
RIBBON DOES NOT MOVE, OR MOVES ERRATICALLY.

PRINTING TOO LIGHT.

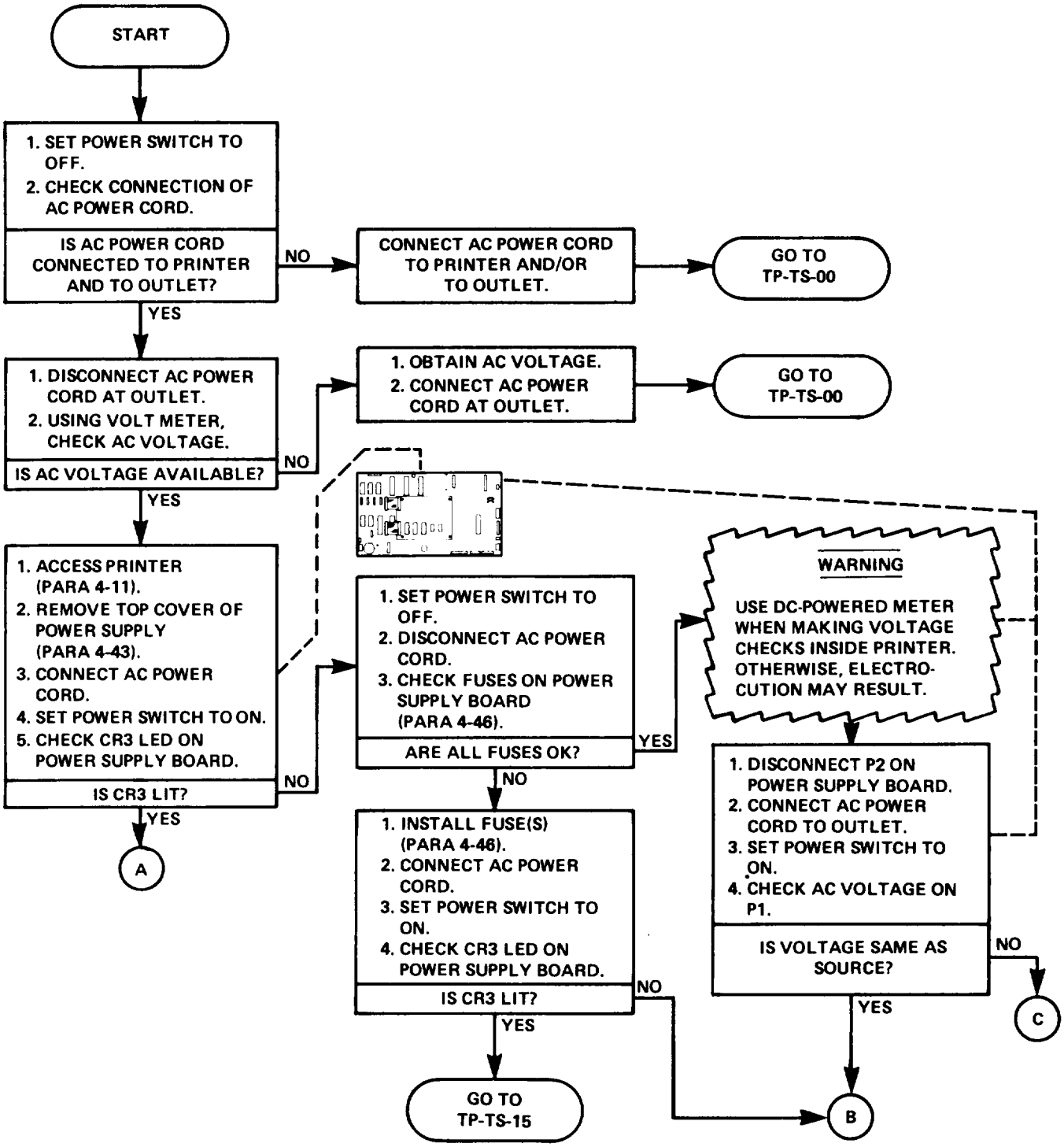
DOTS MISSING IN CHARACTERS

CHARACTERS BROKEN OR DISTORTED

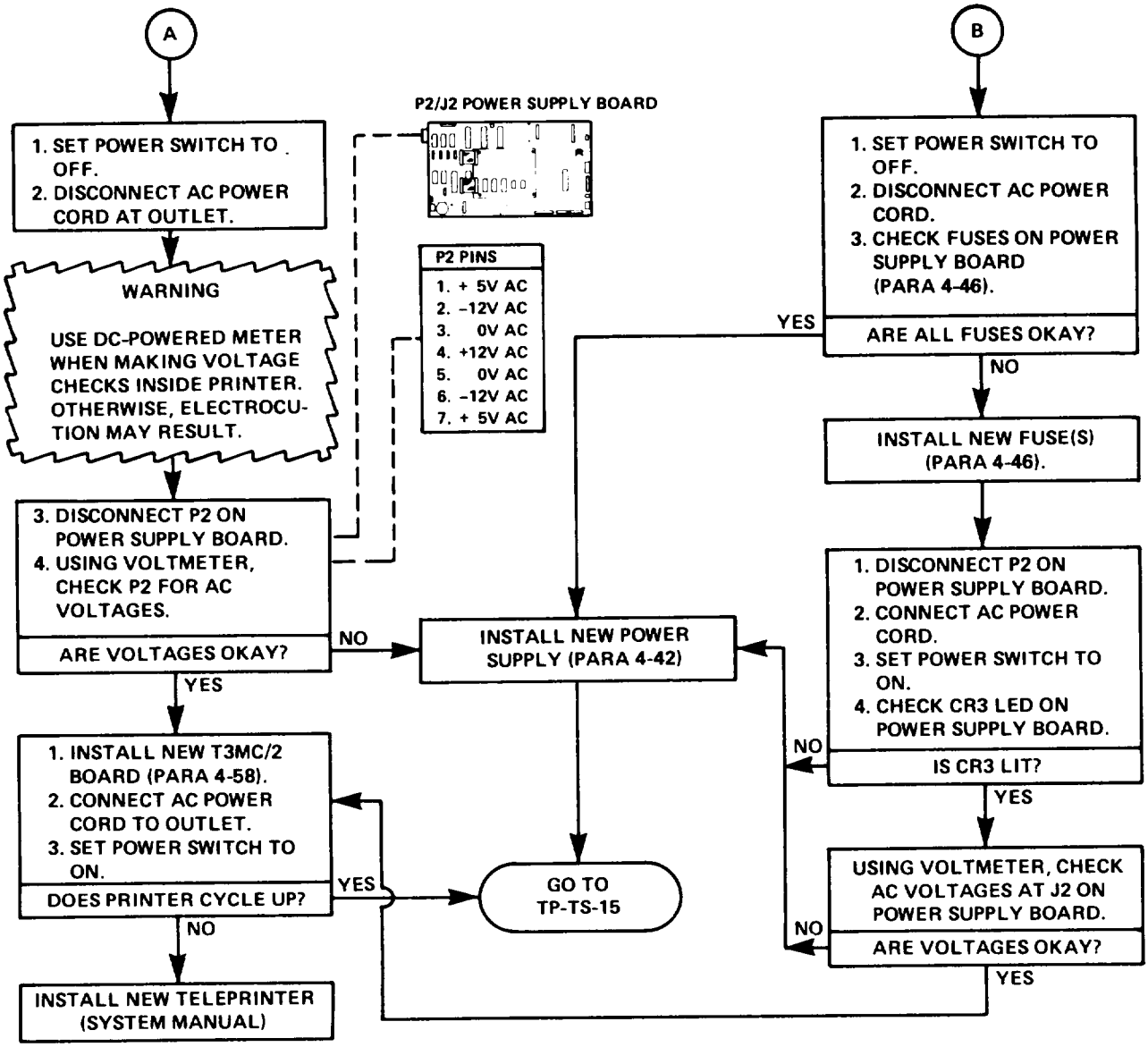
TP-TS-OO	TELEPRINTER CHECKOUT/SYSTEM INDEX	3 OF 3



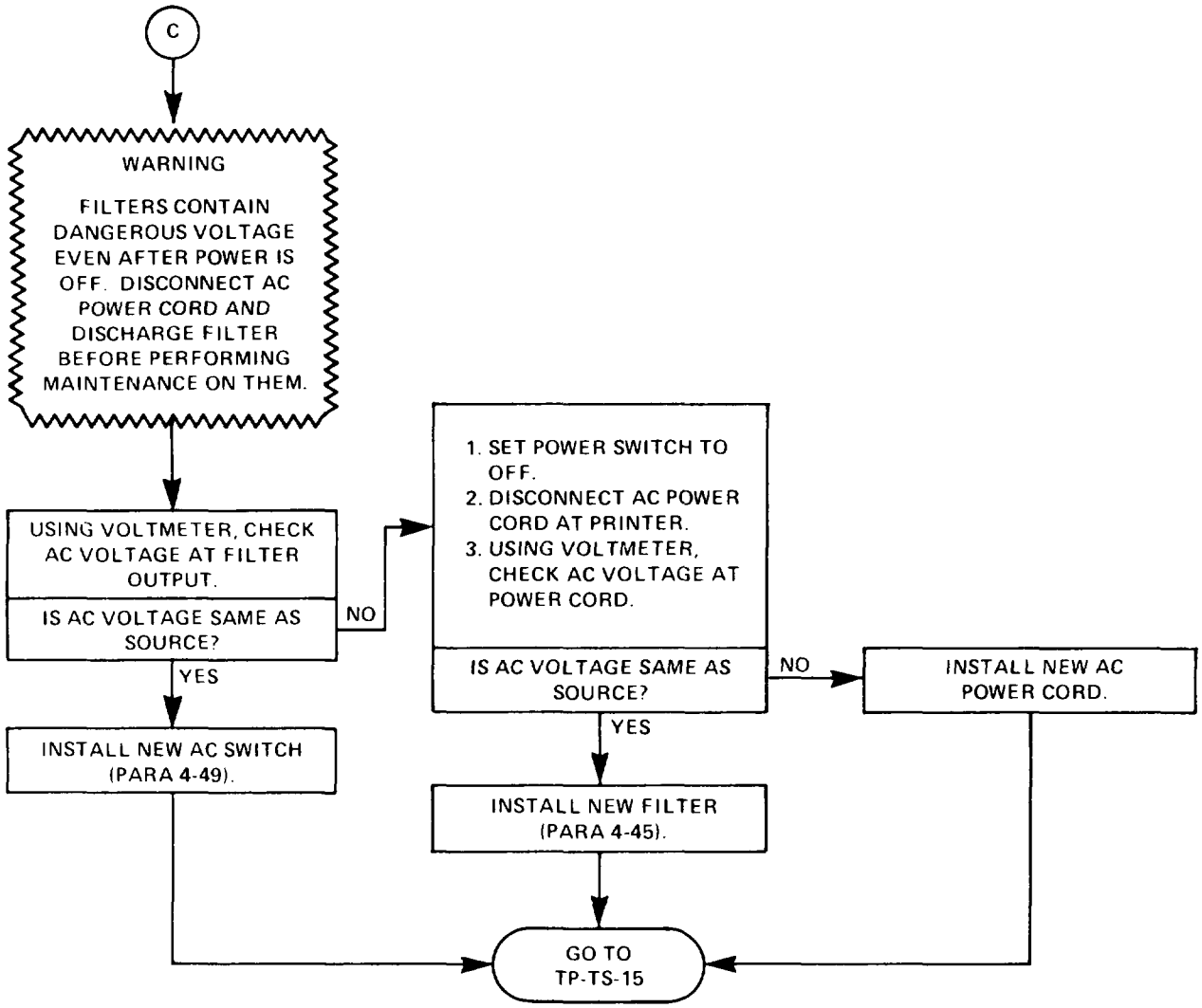
TP-TS-01	TELEPRINTER WILL NOT POWER ON	1 OF 3



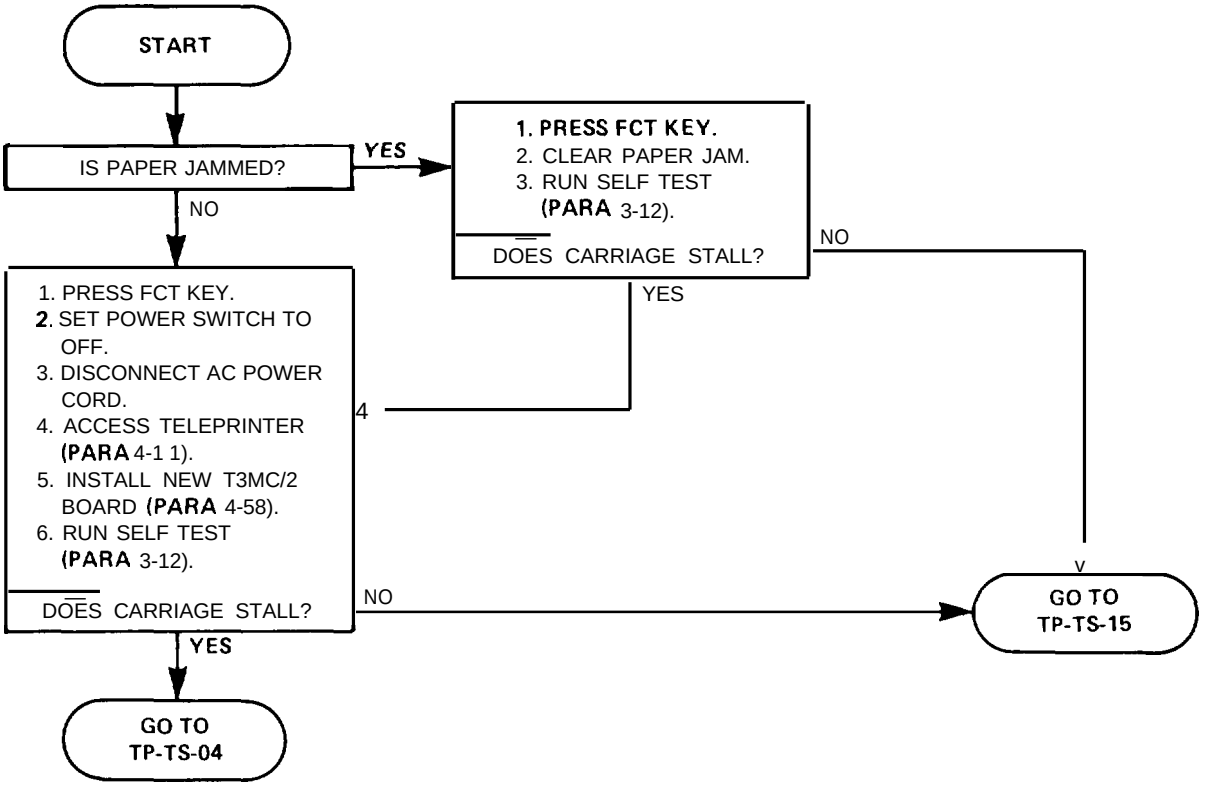
TP-TS-02	TELEPRINTER WILL NOT POWER ON	2 OF 3



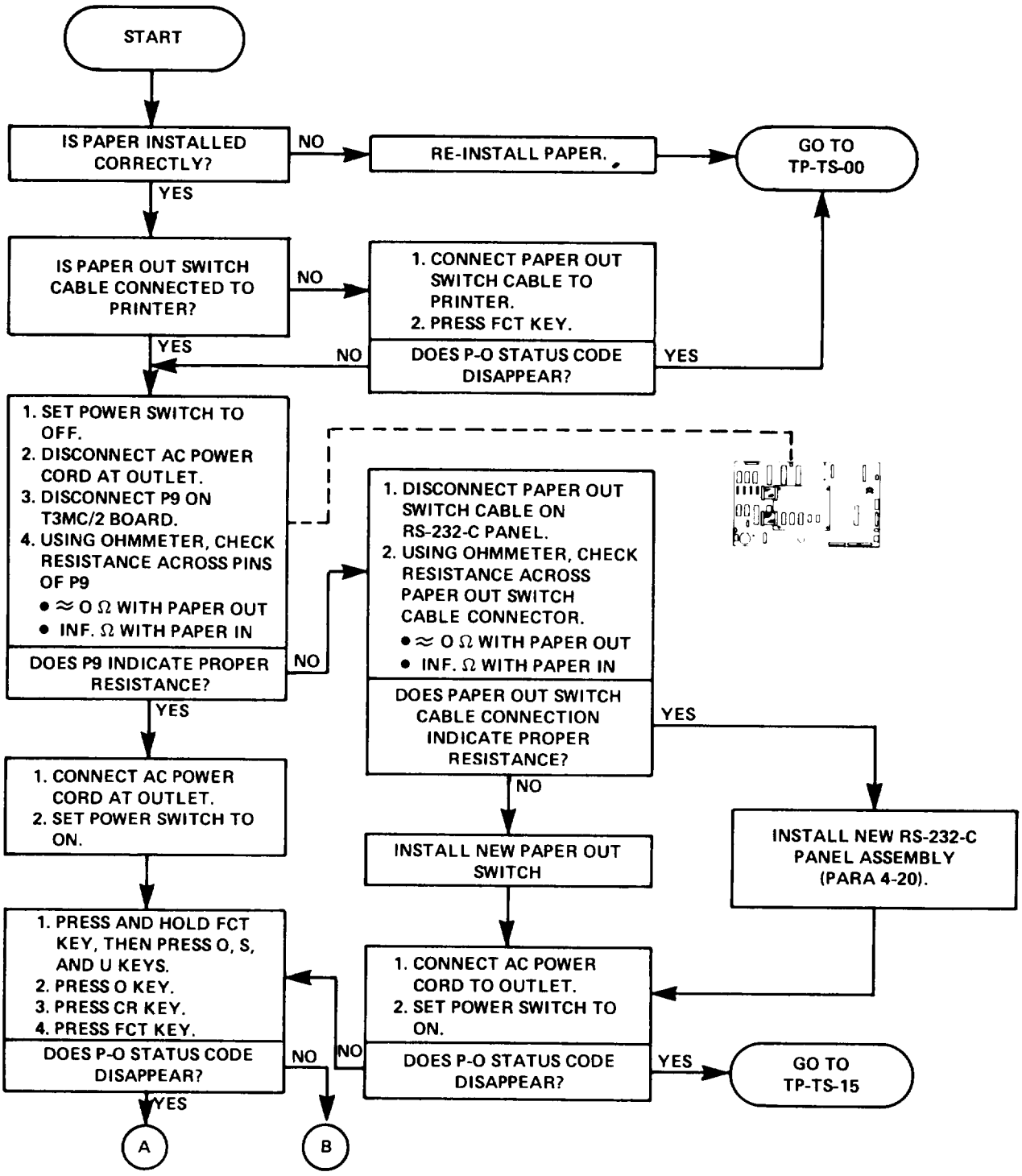
TP-TS-01	TELEPRINTER DOES NOT POWER ON	3 OF 3



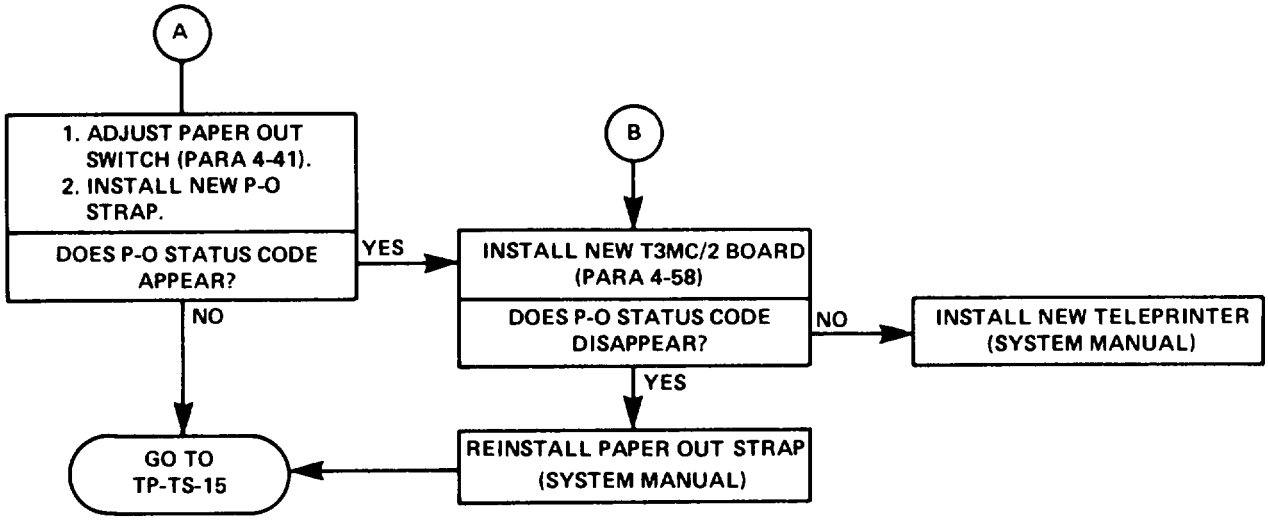
TP-TS-02 | CARRIAGE STALLS



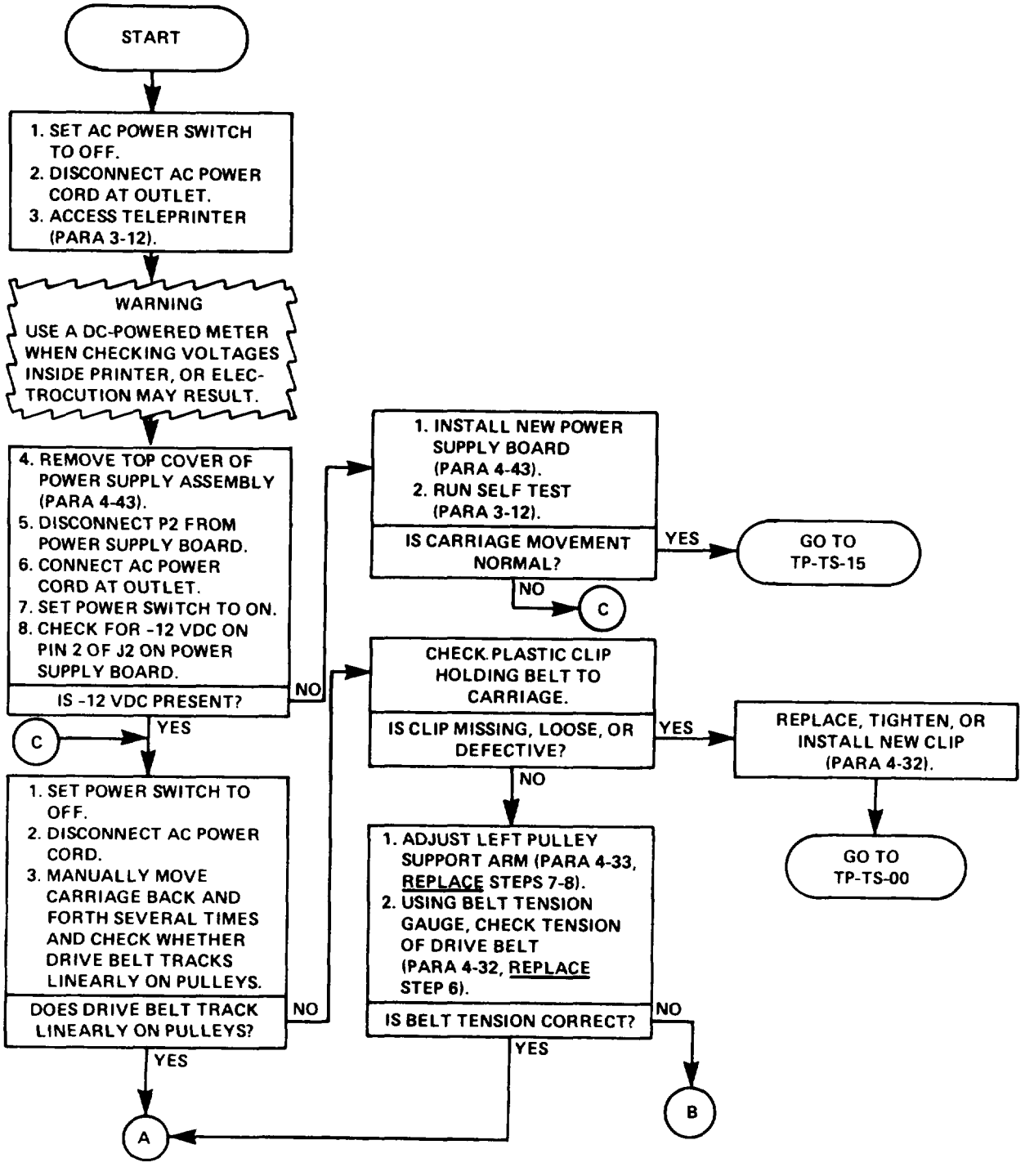
TP-TS-03	STATUS CODE P-O	1 OF 2



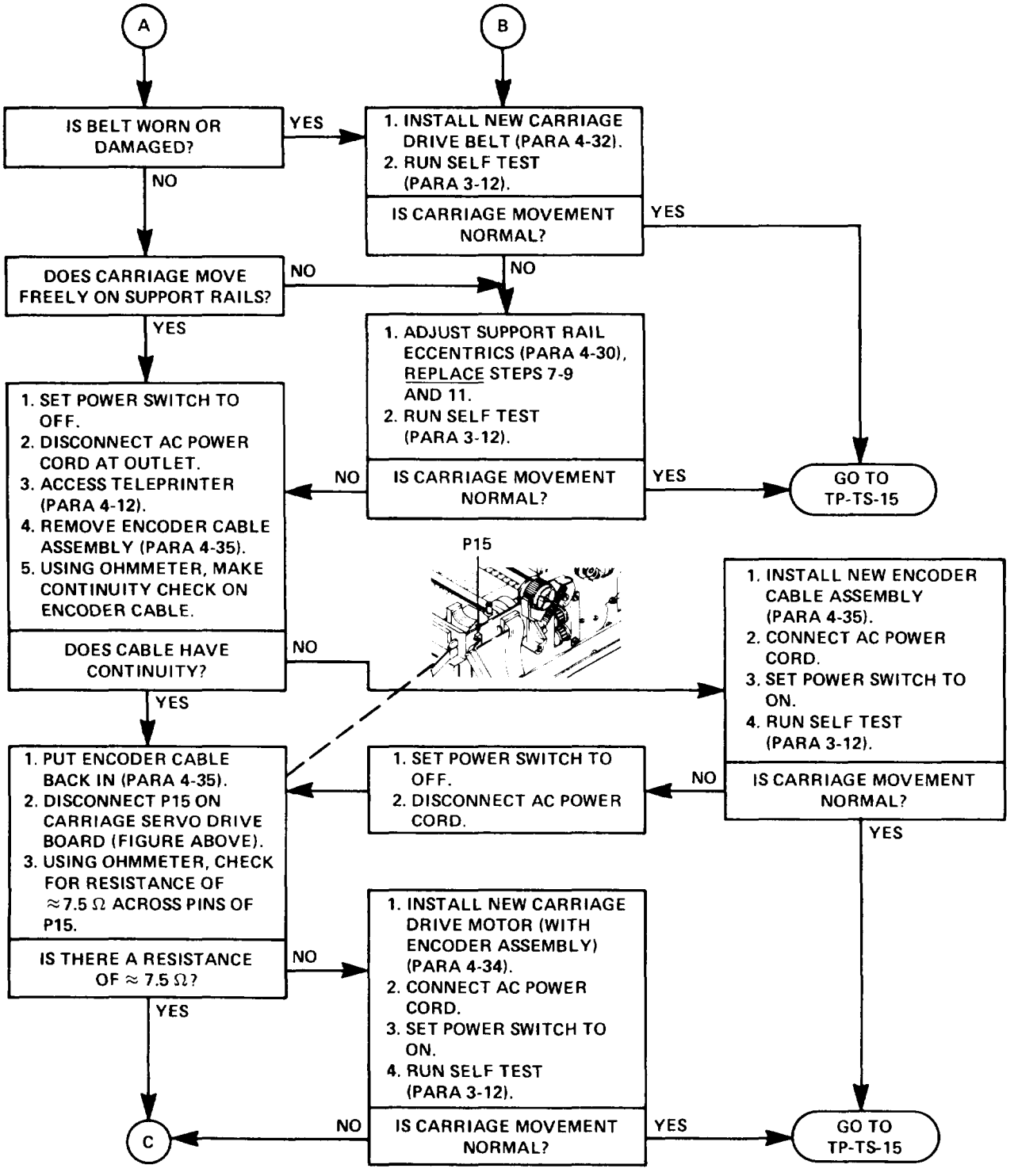
TP-TS-03	STATUS CODE P-O	2 OF 2



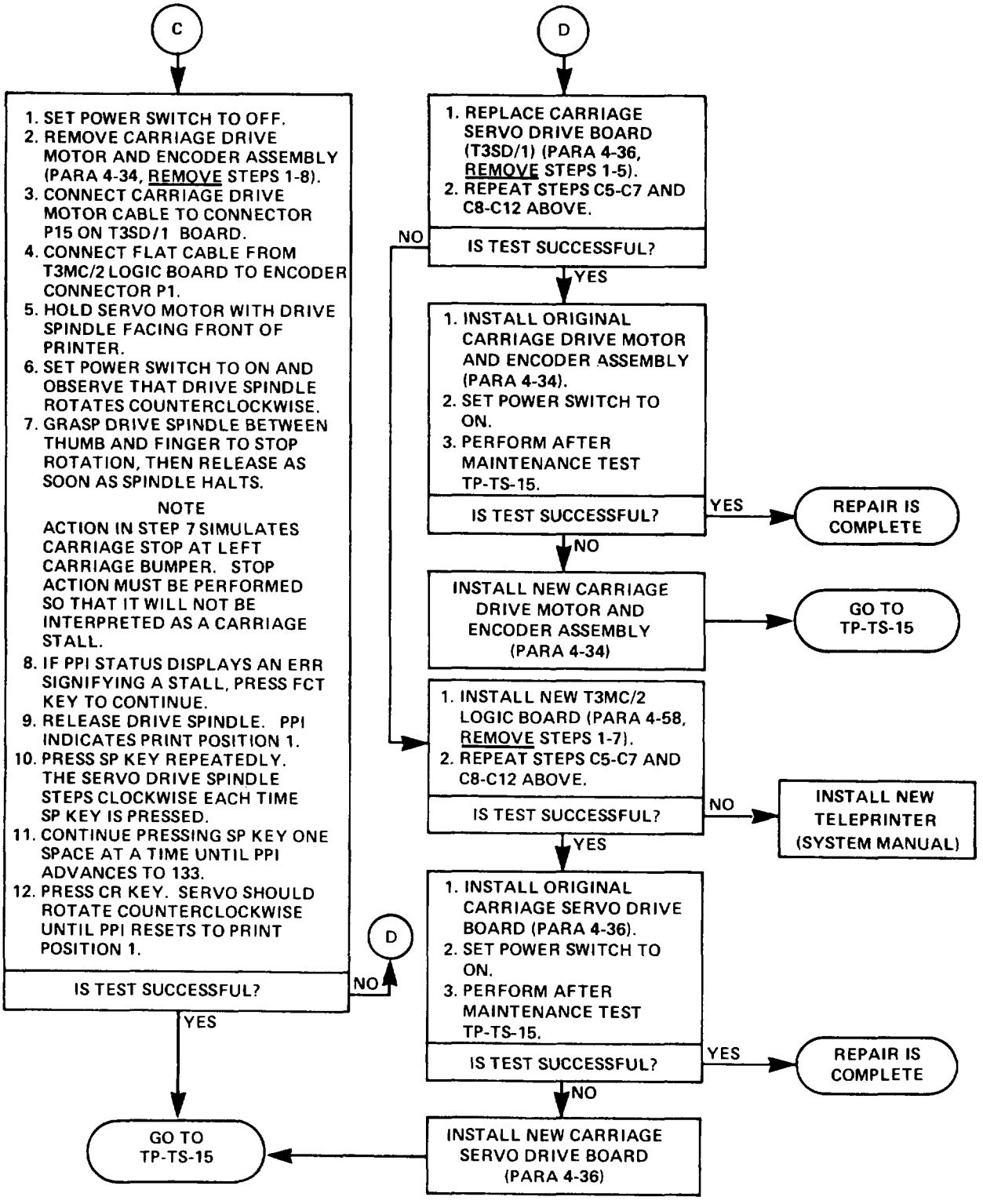
TP-TS-04	CARRIAGE MOVEMENT NOT NORMAL	1 OF 3



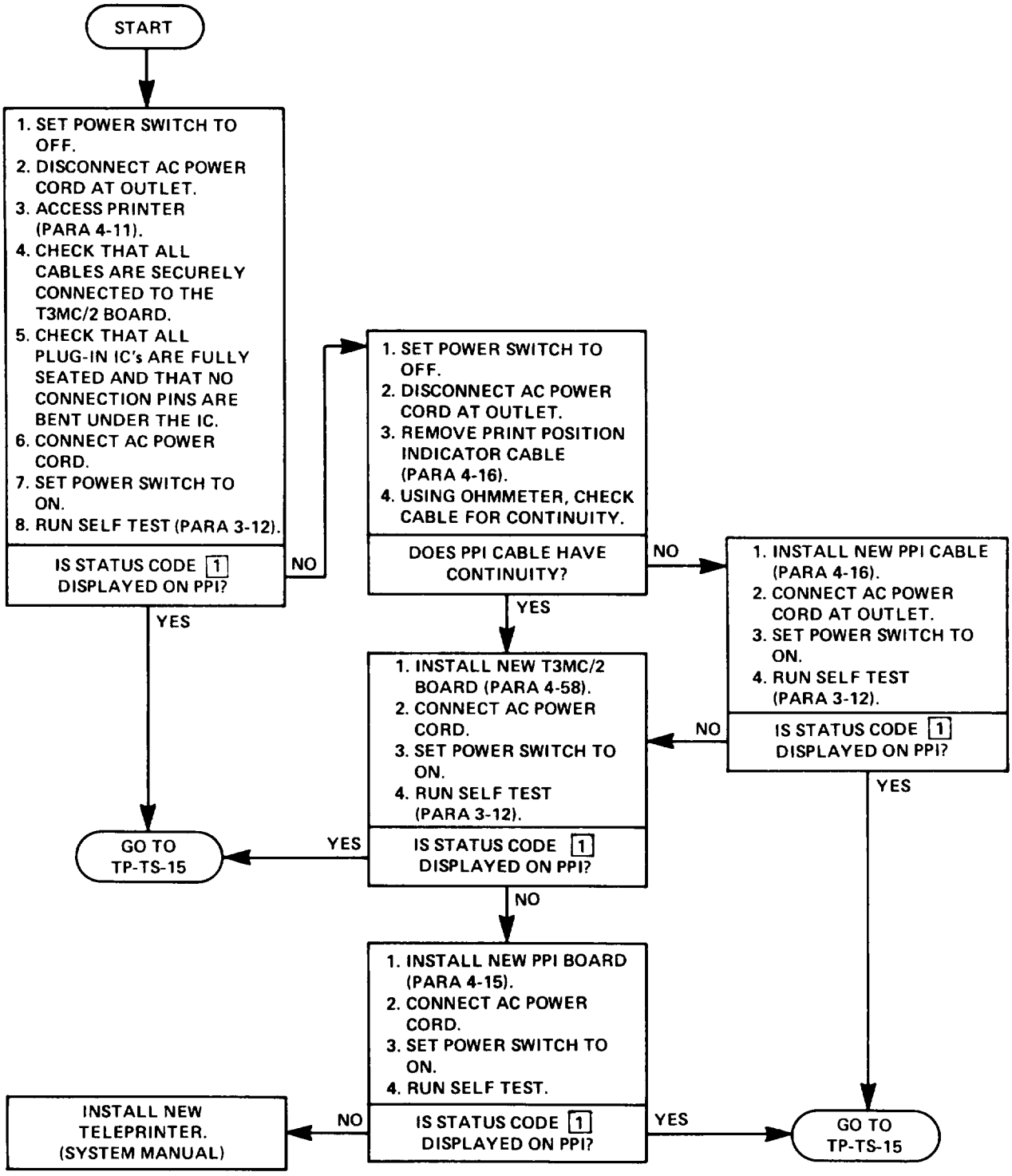
TP-TS-04	CARRIAGE MOVEMENT NOT NORMAL	2 OF 3



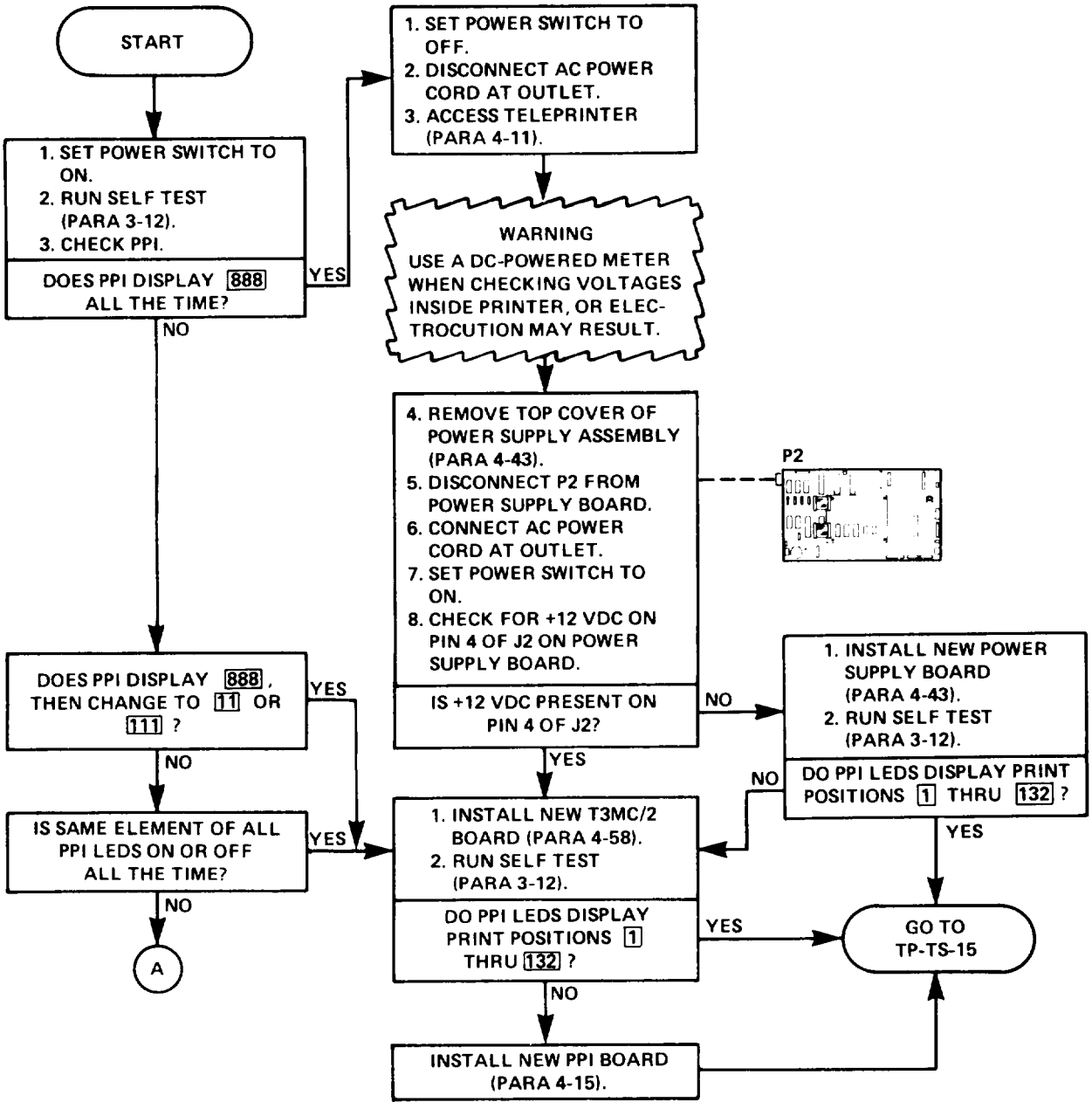
TP-TS-04	CARRIAGE MOVEMENT NOT NORMAL	3 OF 3



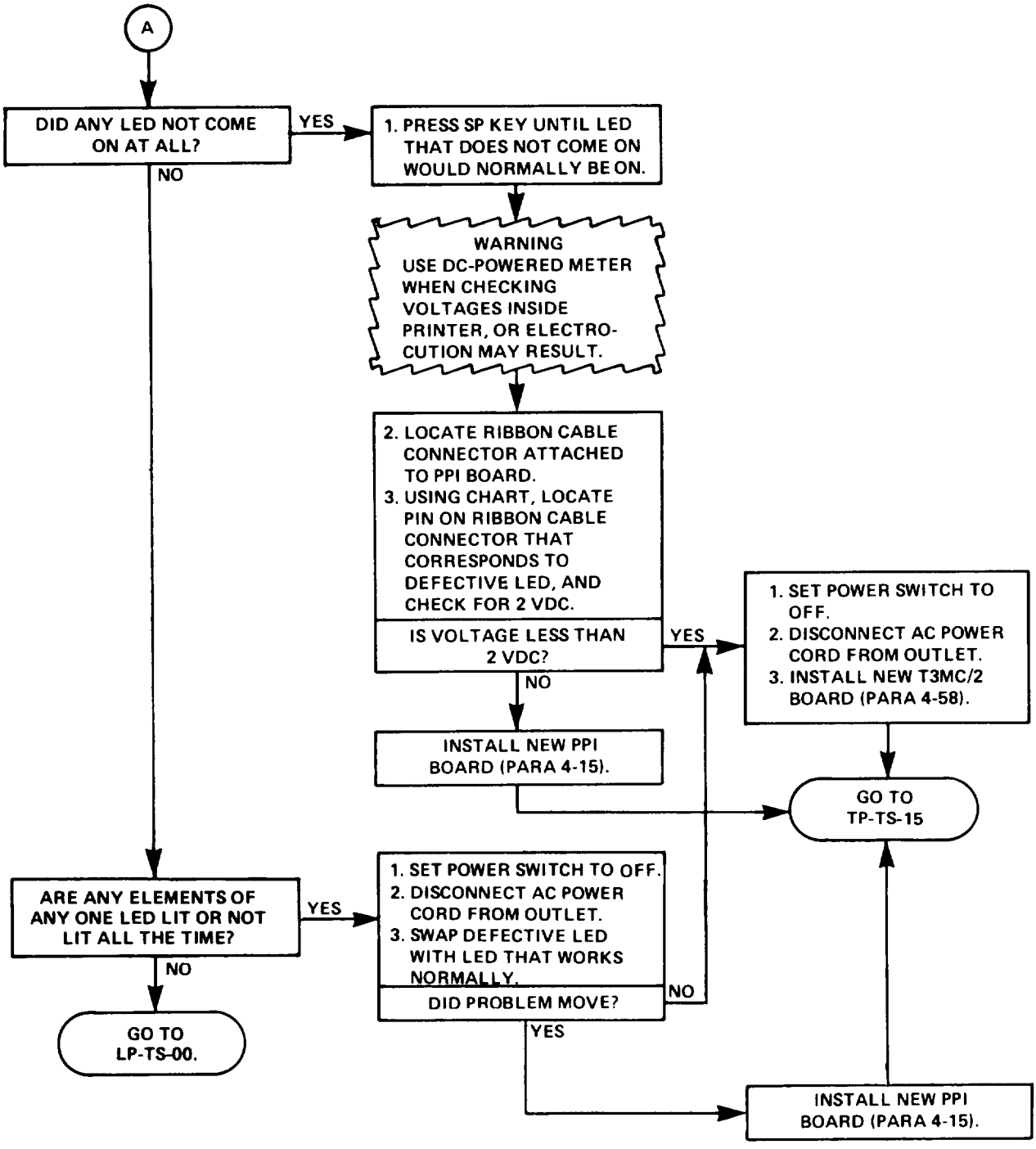
TP-TS-05 | POWER ON, BUT NO STATUS CODE

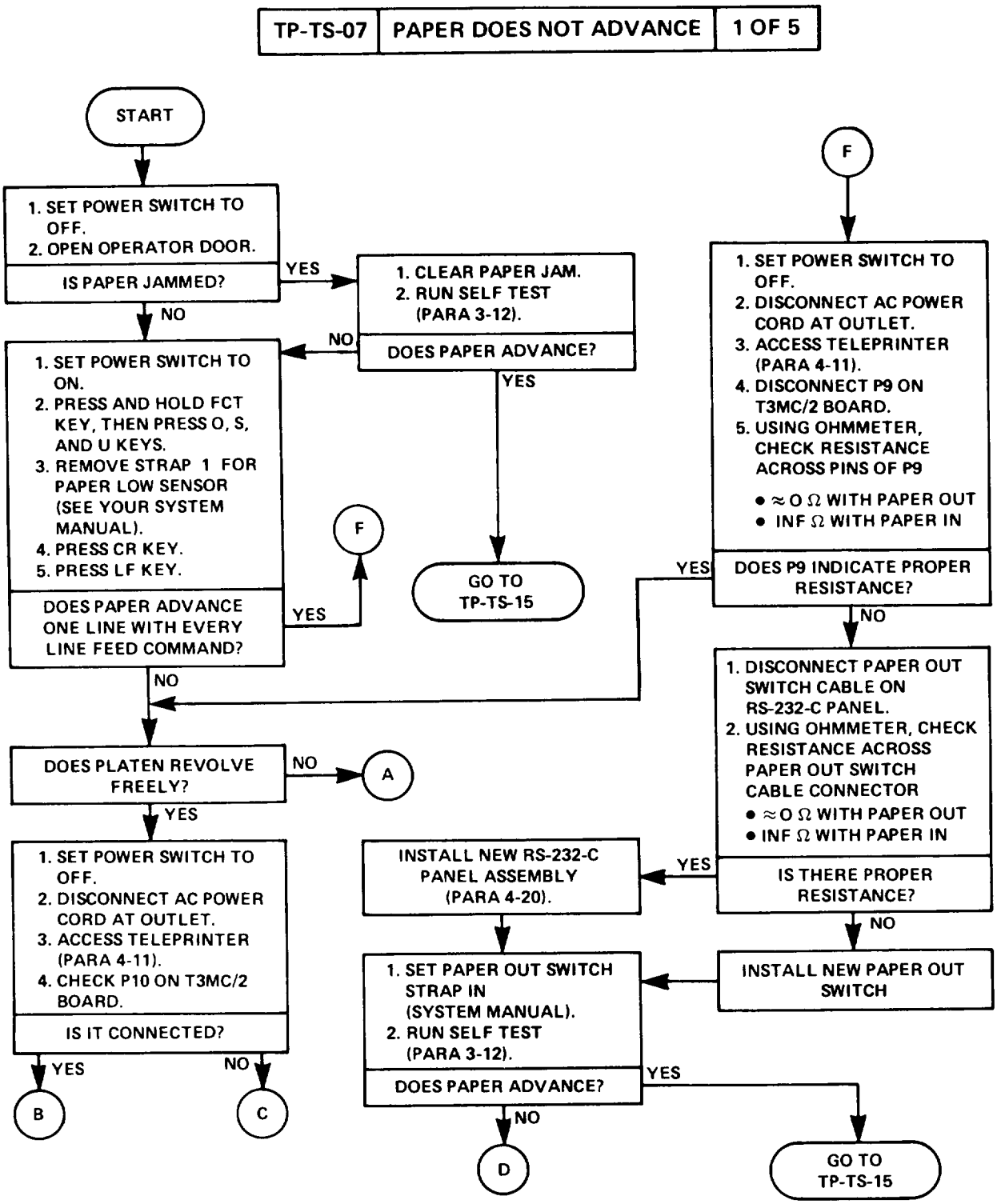


TP-TS-06	PPI DOES NOT FUNCTION NORMALLY	1 OF 2

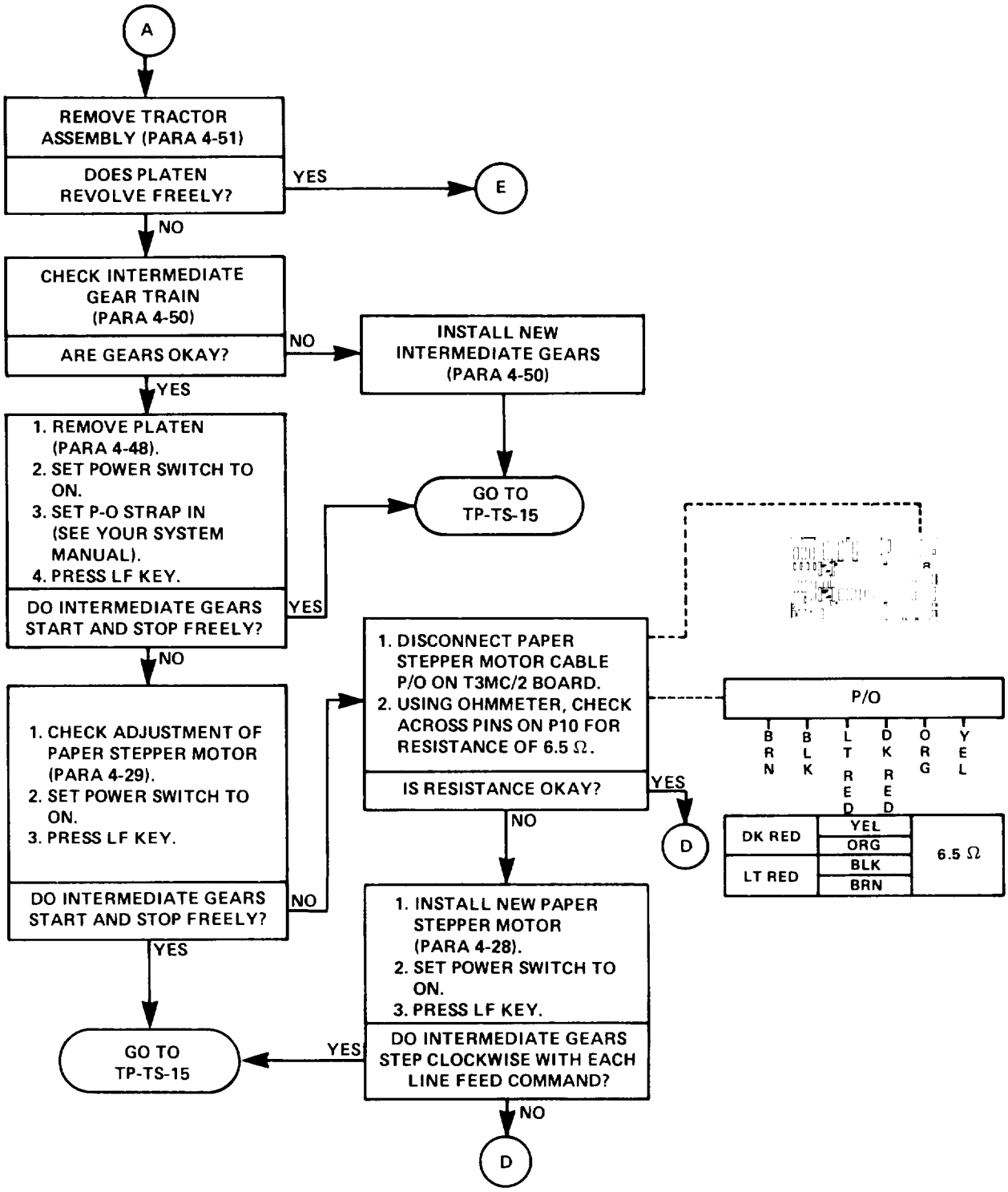


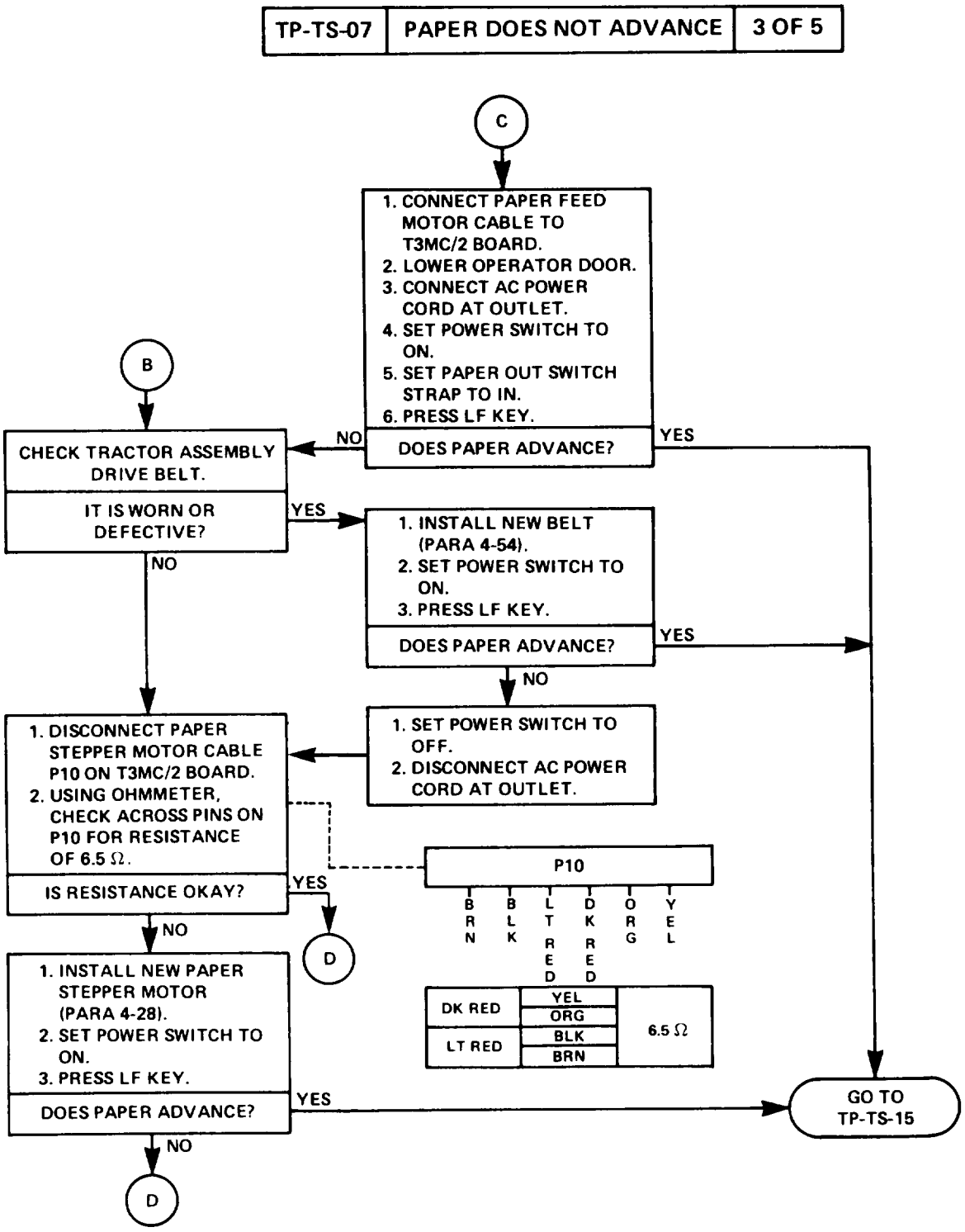
TP-TS-06	PPI DOES NOT FUNCTION NORMALLY	2 OF 2



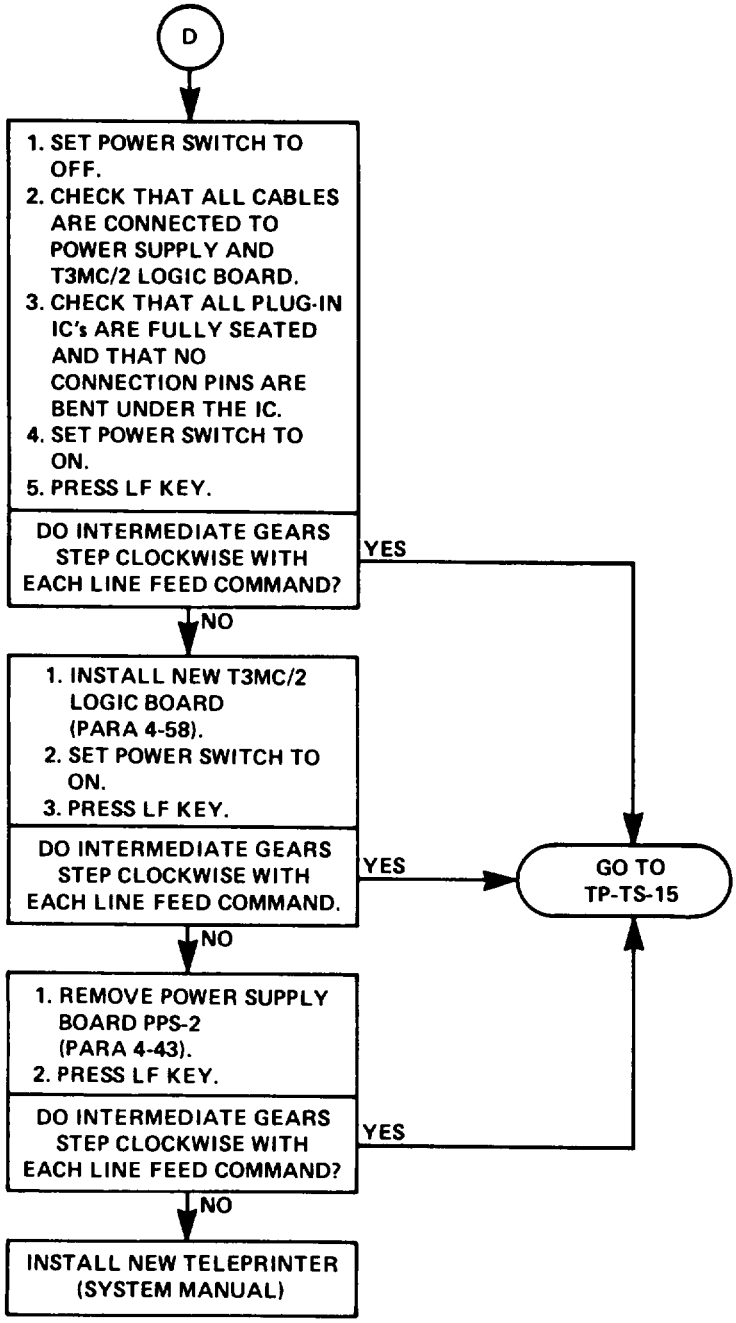

TP-TS-07
PAPER DOES NOT ADVANCE
1 OF 5
START
1. SET POWER SWITCH TO OFF.
2. OPEN OPERATOR DOOR.
IS PAPER JAMMED?
YES
1. CLEAR PAPER JAM.
2. RUN SELF TEST (PARA 3-12).
DOES PAPER ADVANCE?
NO
YES
NO
1. SET POWER SWITCH TO ON.
2. PRESS AND HOLD FCT KEY, THEN PRESS O, S, AND U KEYS.
3. REMOVE STRAP 1 FOR PAPER LOW SENSOR (SEE YOUR SYSTEM MANUAL).
4. PRESS CR KEY.
5. PRESS LF KEY.
DOES PAPER ADVANCE ONE LINE WITH EVERY LINE FEED COMMAND?
YES
F
GO TO TP-TS-15
NO
DOES PLATEN REVOLVE FREELY?
NO
A
YES
1. SET POWER SWITCH TO OFF.
2. DISCONNECT AC POWER CORD AT OUTLET.
3. ACCESS TELEPRINTER (PARA 4-11).
4. CHECK P10 ON T3MC/2 BOARD.
IS IT CONNECTED?
YES
NO
B
C
F
1. SET POWER SWITCH TO OFF.
2. DISCONNECT AC POWER CORD AT OUTLET.
3. ACCESS TELEPRINTER (PARA 4-11).
4. DISCONNECT P9 ON T3MC/2 BOARD.
5. USING OHMMETER, CHECK RESISTANCE ACROSS PINS OF P9
• ≈ O Ω WITH PAPER OUT
• INF Ω WITH PAPER IN
DOES P9 INDICATE PROPER RESISTANCE?
YES
NO
1. DISCONNECT PAPER OUT SWITCH CABLE ON RS-232-C PANEL.
2. USING OHMMETER, CHECK RESISTANCE ACROSS PAPER OUT SWITCH CABLE CONNECTOR
• ≈ O Ω WITH PAPER OUT
• INF Ω WITH PAPER IN
IS THERE PROPER RESISTANCE?
YES
NO
INSTALL NEW RS-232-C PANEL ASSEMBLY (PARA 4-20).
INSTALL NEW PAPER OUT SWITCH
1. SET PAPER OUT SWITCH STRAP IN (SYSTEM MANUAL).
2. RUN SELF TEST (PARA 3-12).
DOES PAPER ADVANCE?
YES
NO
D
GO TO TP-TS-15

TP-TS-07	PAPER DOES NOT ADVANCE	2 OF 5

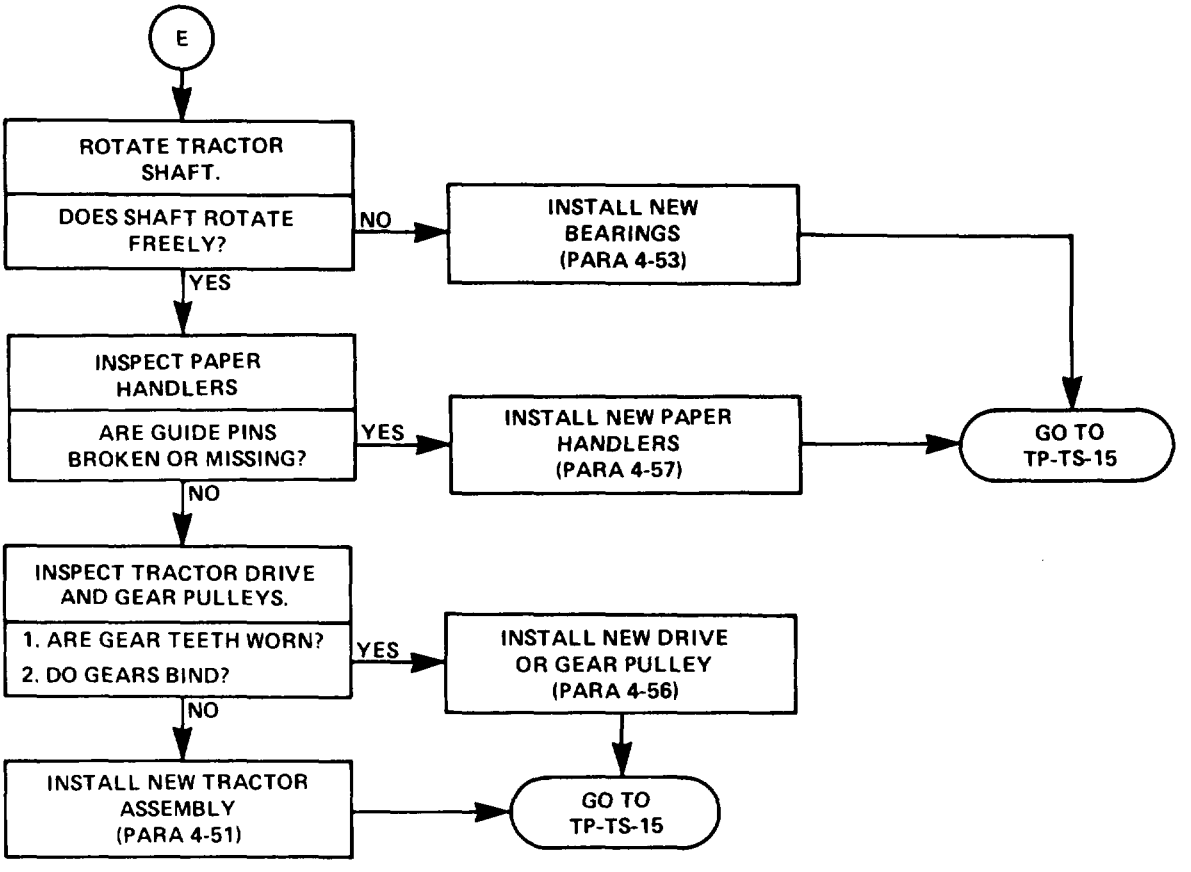



TP-TS-07
PAPER DOES NOT ADVANCE
3 OF 5
C
1. CONNECT PAPER FEED MOTOR CABLE TO T3MC/2 BOARD.
2. LOWER OPERATOR DOOR.
3. CONNECT AC POWER CORD AT OUTLET.
4. SET POWER SWITCH TO ON.
5. SET PAPER OUT SWITCH STRAP TO IN.
6. PRESS LF KEY.
DOES PAPER ADVANCE?
NO
YES
B
CHECK TRACTOR ASSEMBLY DRIVE BELT.
IT IS WORN OR DEFECTIVE?
YES
NO
1. INSTALL NEW BELT (PARA 4-54).
2. SET POWER SWITCH TO ON.
3. PRESS LF KEY.
DOES PAPER ADVANCE?
YES
NO
1. SET POWER SWITCH TO OFF.
2. DISCONNECT AC POWER CORD AT OUTLET.
1. DISCONNECT PAPER STEPPER MOTOR CABLE P10 ON T3MC/2 BOARD.
2. USING OHMMETER, CHECK ACROSS PINS ON P10 FOR RESISTANCE OF 6.5 Ω.
IS RESISTANCE OKAY?
YES
NO
D
P10
BRN
BLK
LT RED
DK RED
ORG
YEL
DK RED
YEL
ORG
LT RED
BLK
BRN
6.5 Ω
1. INSTALL NEW PAPER STEPPER MOTOR (PARA 4-28).
2. SET POWER SWITCH TO ON.
3. PRESS LF KEY.
DOES PAPER ADVANCE?
YES
NO
GO TO TP-TS-15
D

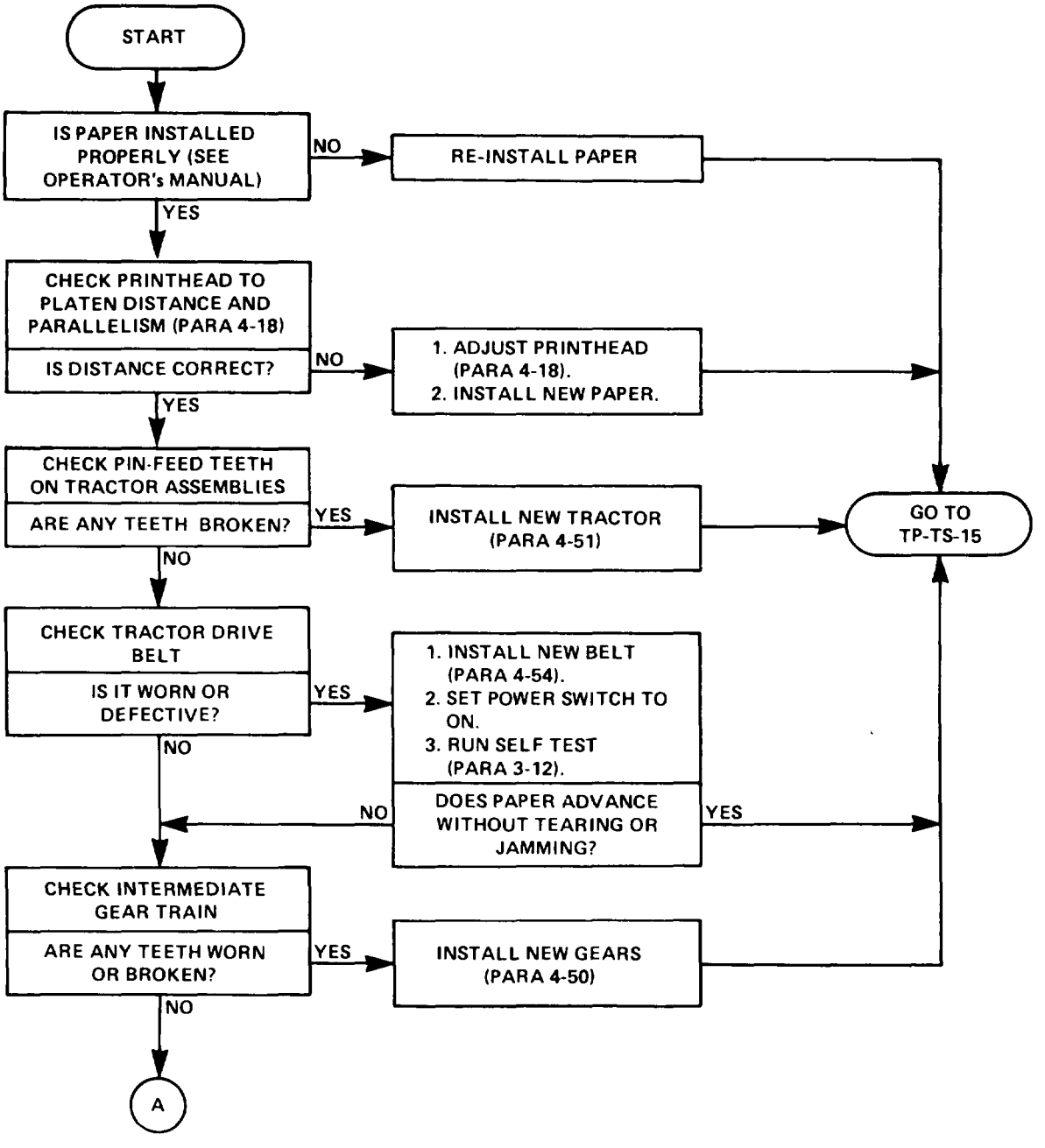
TP-TS-07	PAPER DOES NOT ADVANCE	4 OF 5



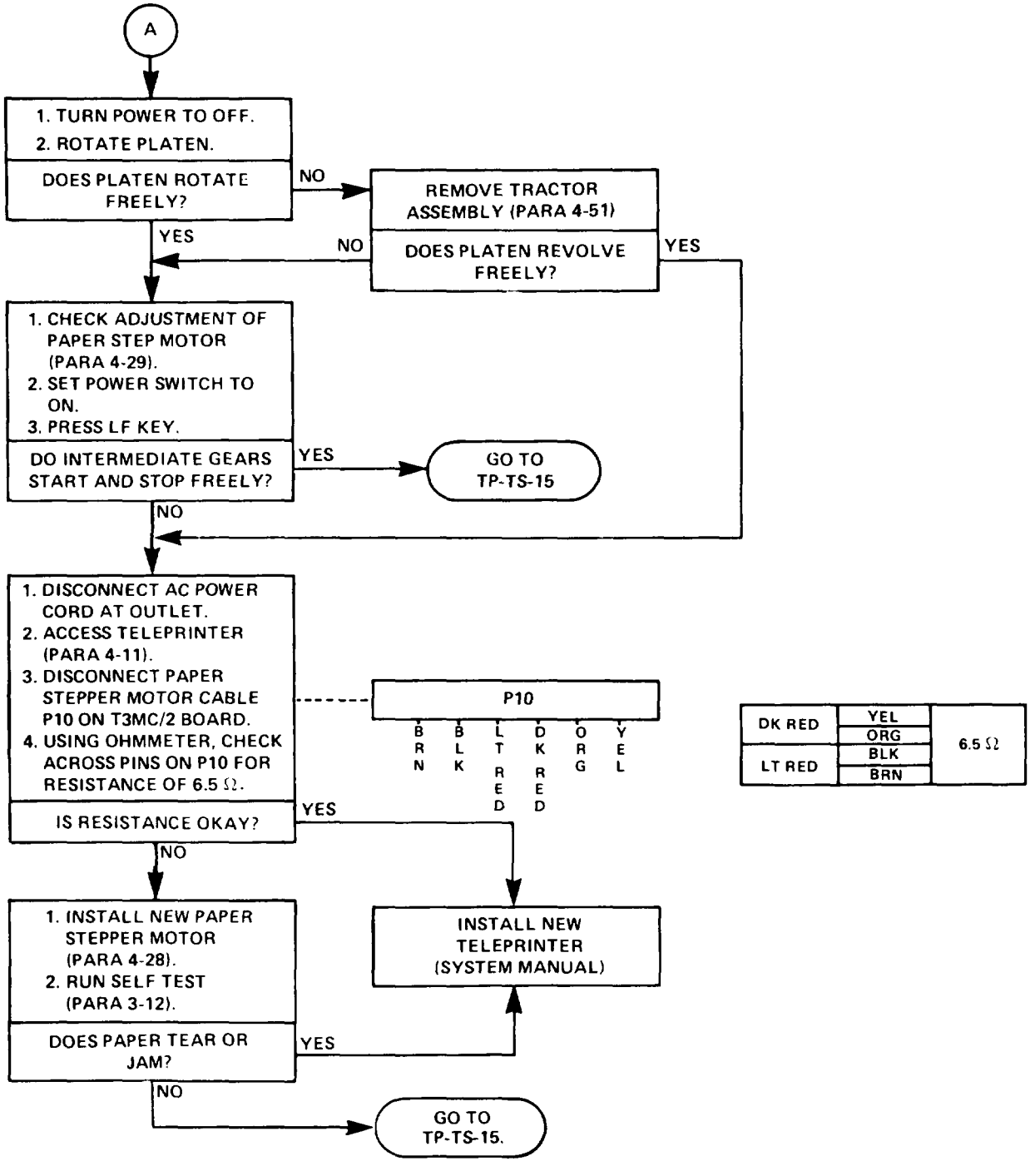
TP-TS-07	PAPER DOES NOT ADVANCE	5 OF 5



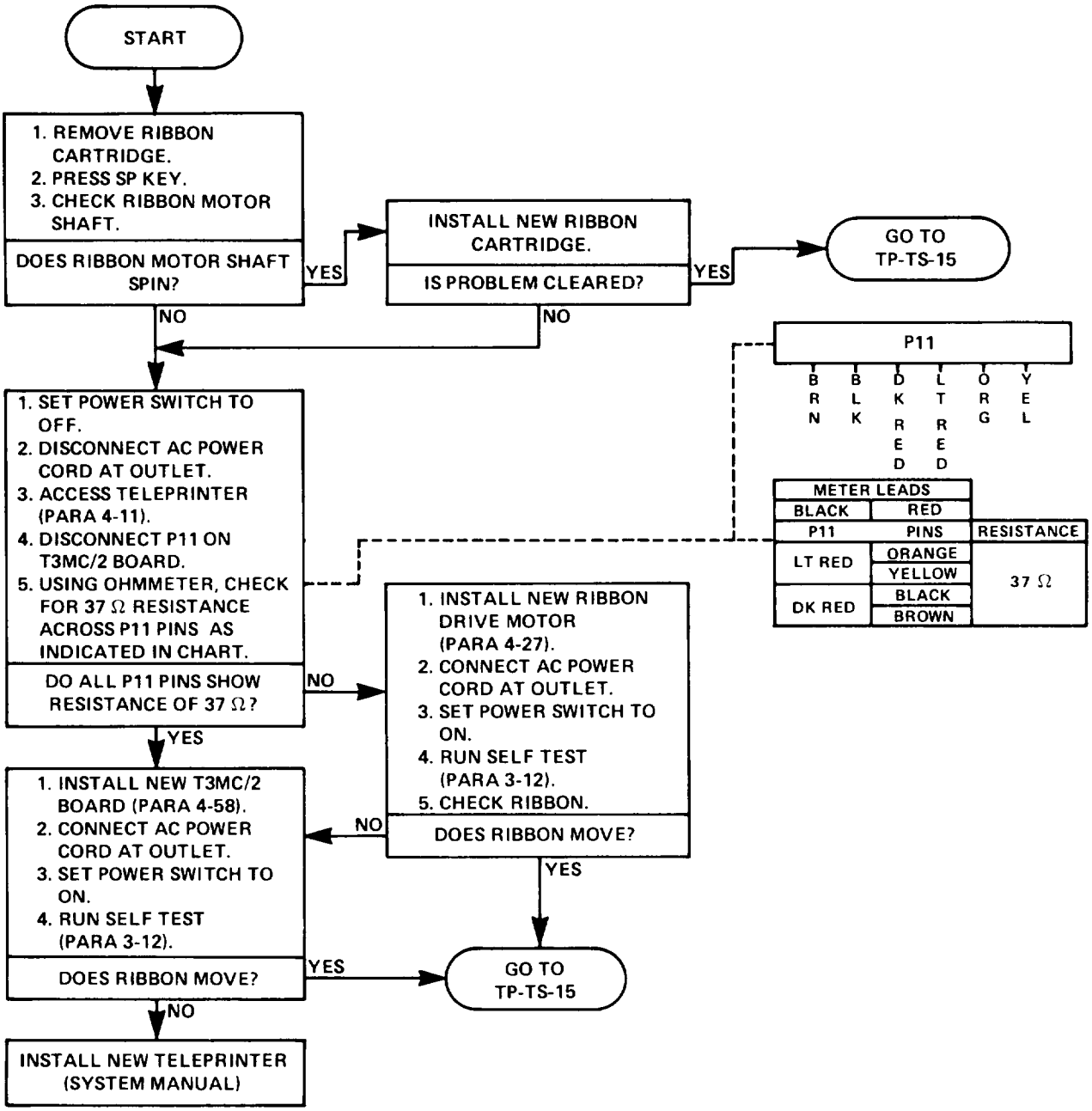
TP-TS-08	PAPER TEARS OR JAMS DURING PRINTING	1 OF 2

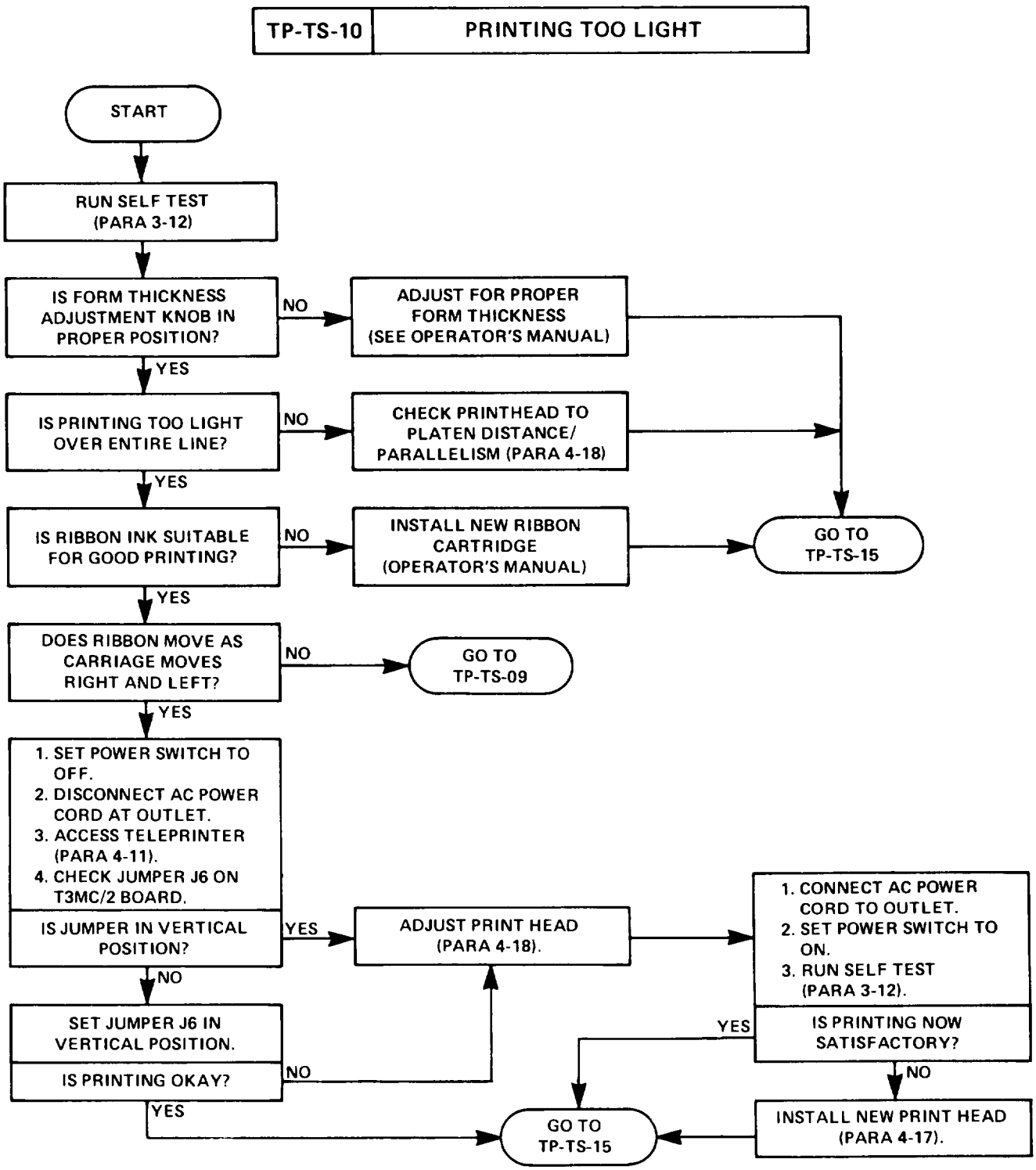


TP-TS-08	PAPER TEARS OR JAMS DURING PRINTING	2 OF 2

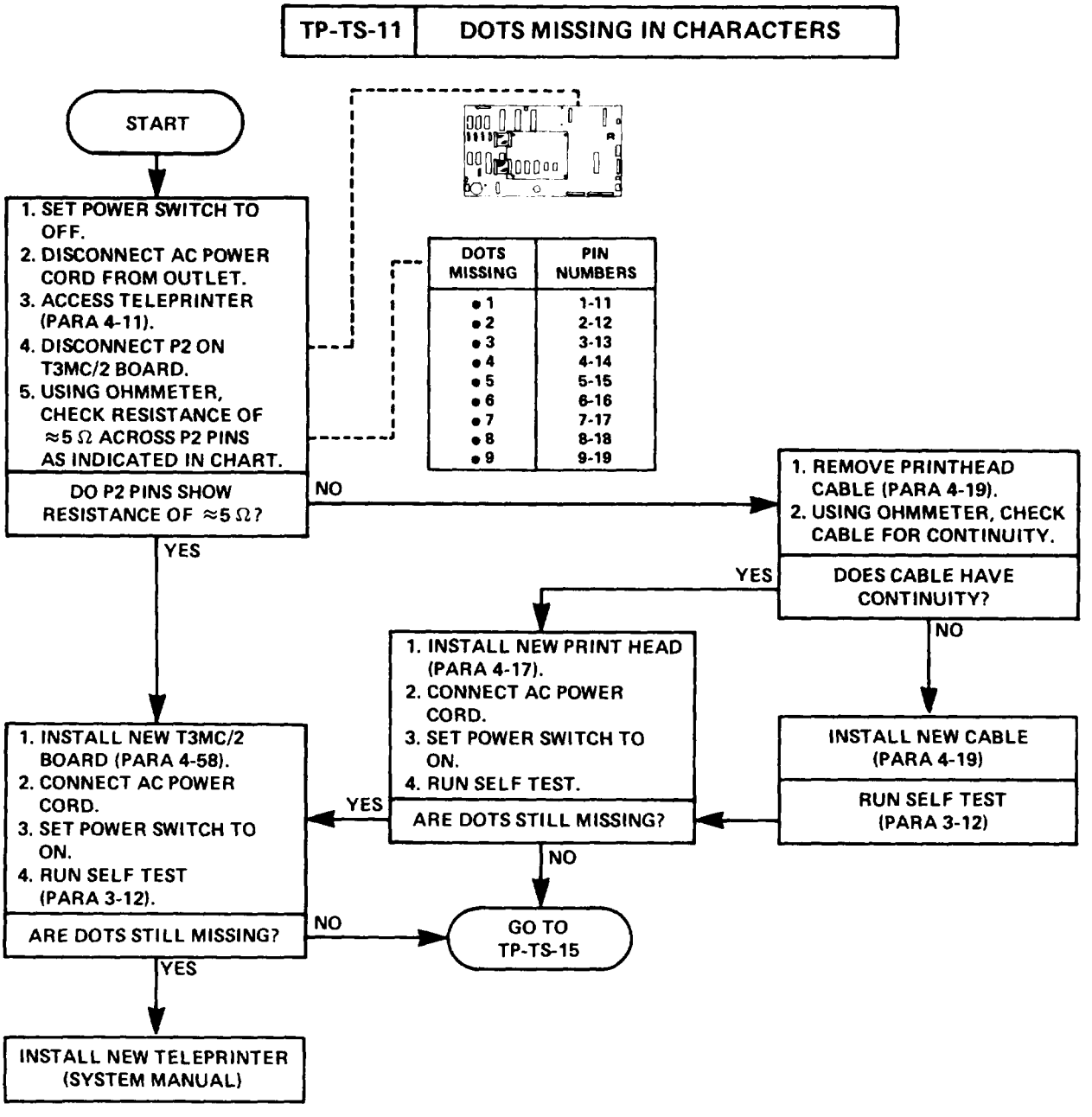


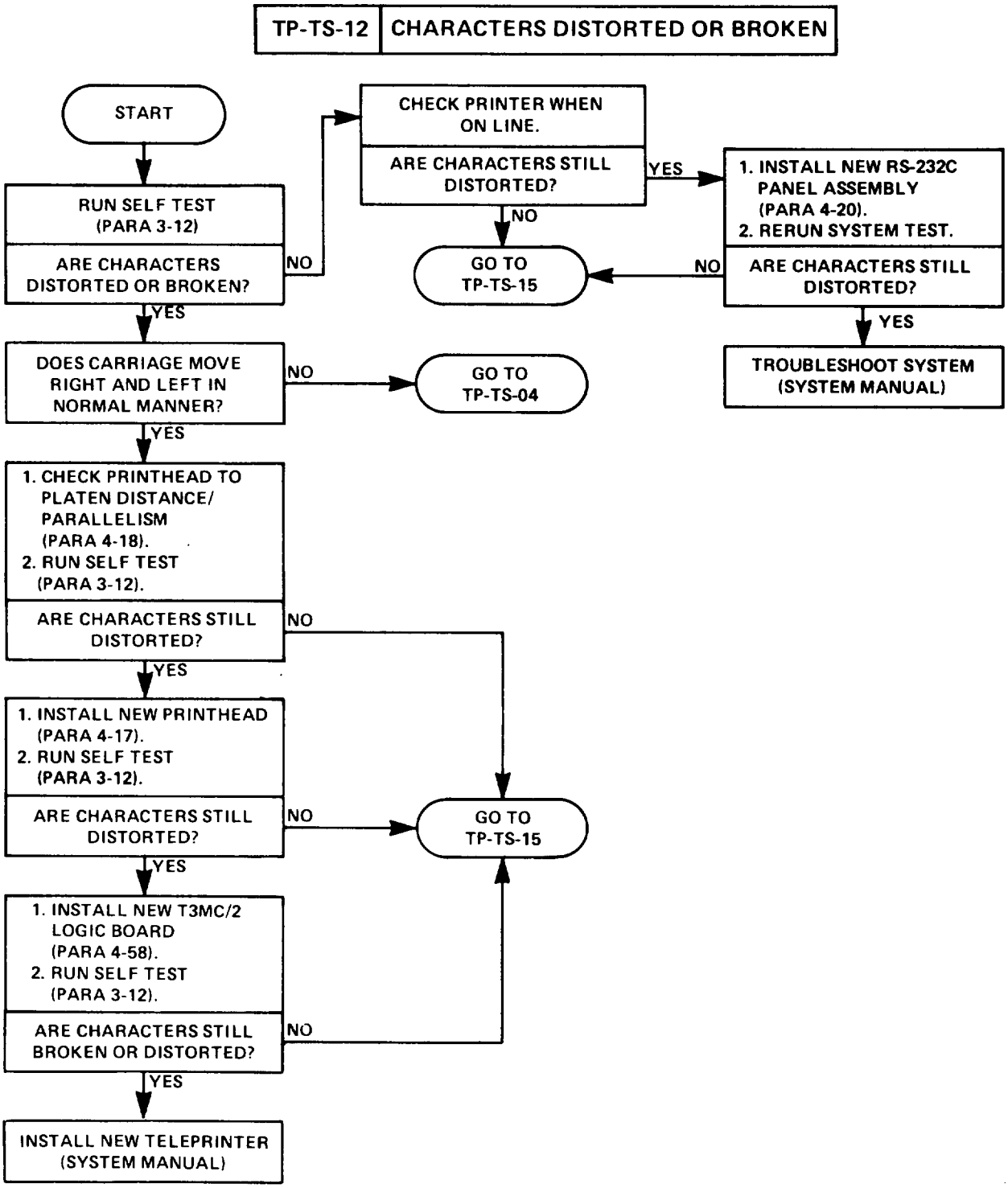
TP-TS-09 RIBBON DOES NOT MOVE, OR MOVES ERRATICALLY

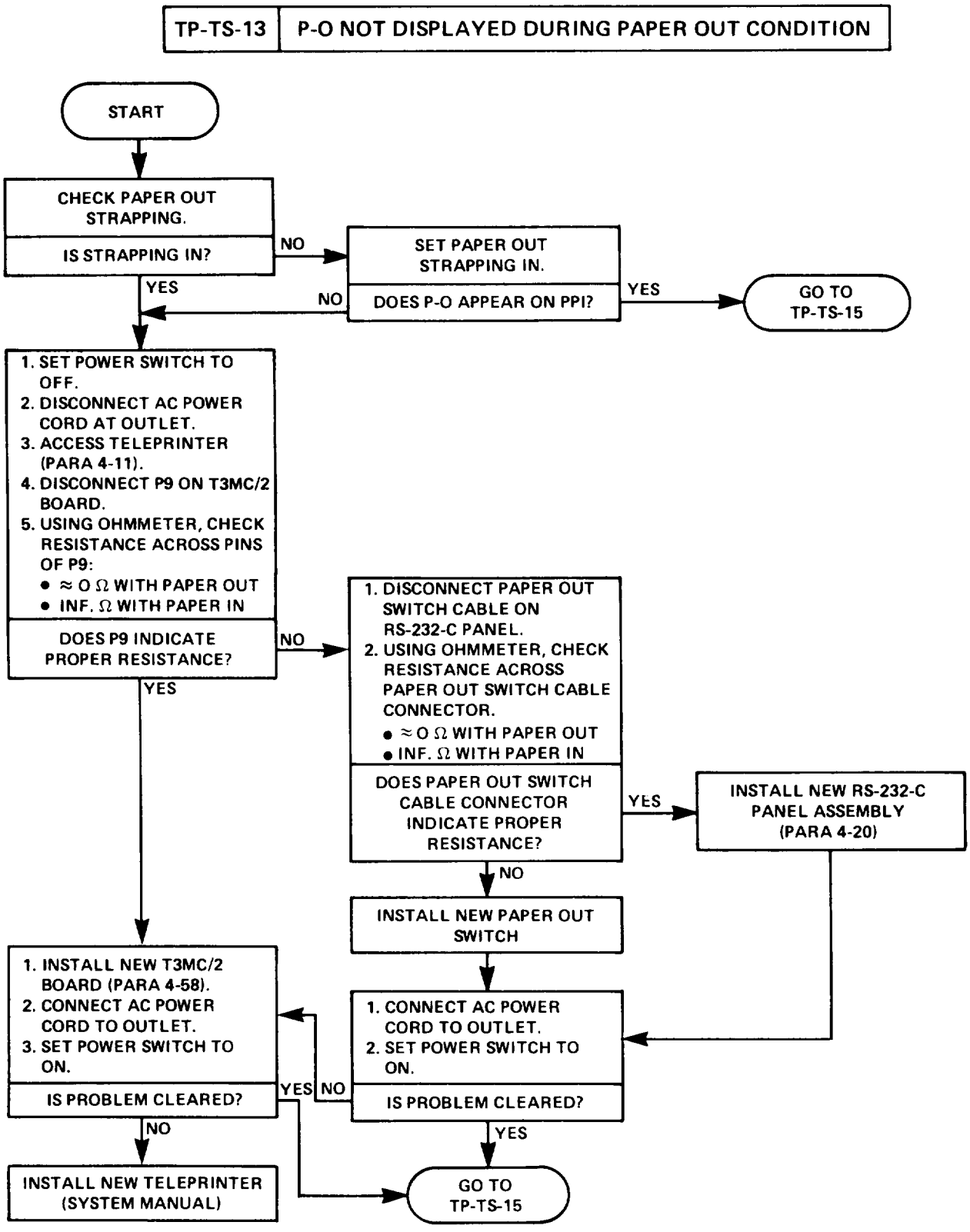


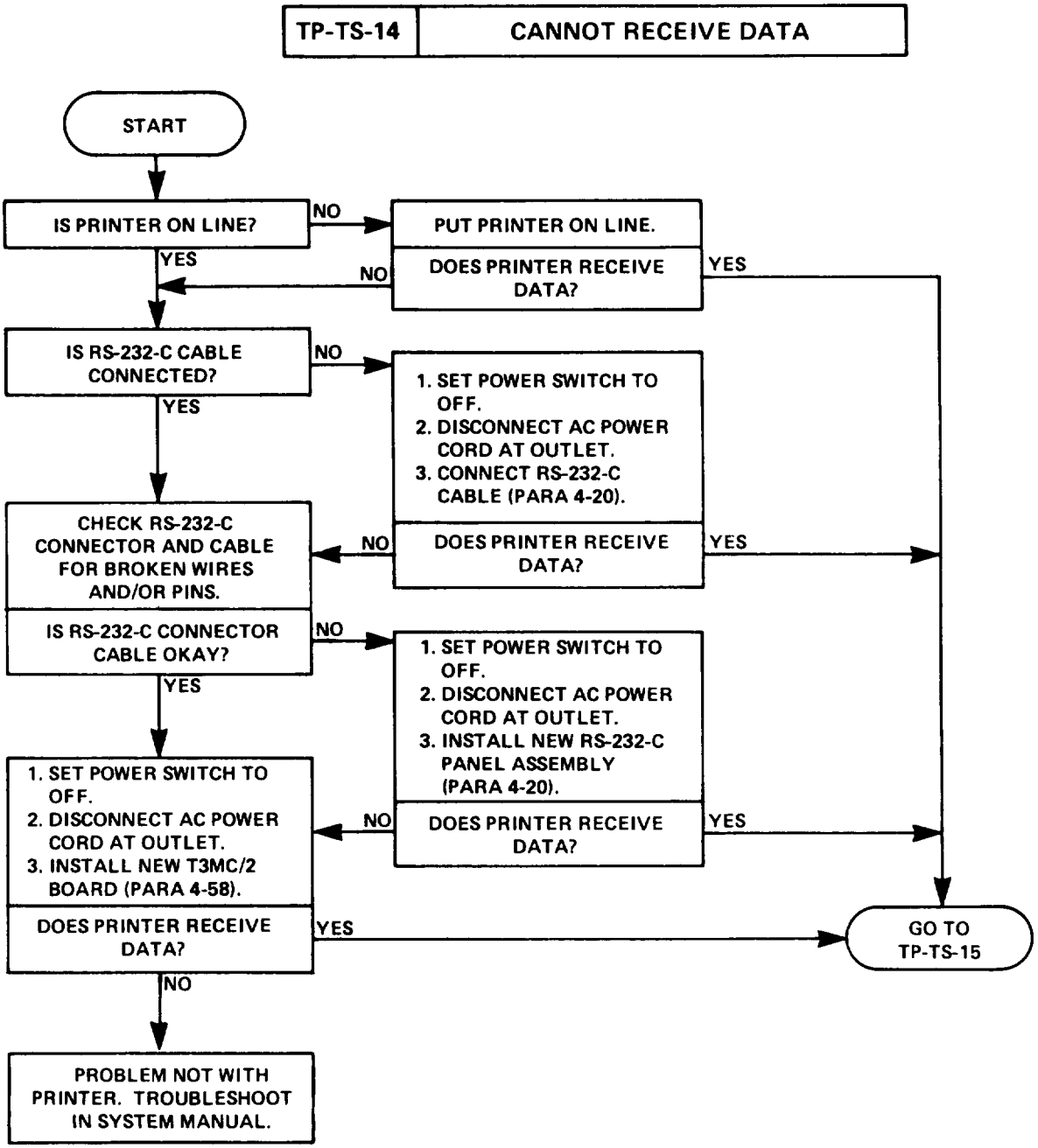

TP-TS-10
PRINTING TOO LIGHT
START
RUN SELF TEST (PARA 3-12)
IS FORM THICKNESS ADJUSTMENT KNOB IN PROPER POSITION?
NO
ADJUST FOR PROPER FORM THICKNESS (SEE OPERATOR'S MANUAL)
YES
IS PRINTING TOO LIGHT OVER ENTIRE LINE?
NO
CHECK PRINTHEAD TO PLATEN DISTANCE/ PARALLELISM (PARA 4-18)
YES
IS RIBBON INK SUITABLE FOR GOOD PRINTING?
NO
INSTALL NEW RIBBON CARTRIDGE (OPERATOR'S MANUAL)
GO TO TP-TS-15
YES
DOES RIBBON MOVE AS CARRIAGE MOVES RIGHT AND LEFT?
NO
GO TO TP-TS-09
YES
1. SET POWER SWITCH TO OFF.
2. DISCONNECT AC POWER CORD AT OUTLET.
3. ACCESS TELEPRINTER (PARA 4-11).
4. CHECK JUMPER J6 ON T3MC/2 BOARD.
IS JUMPER IN VERTICAL POSITION?
YES
ADJUST PRINT HEAD (PARA 4-18).
1. CONNECT AC POWER CORD TO OUTLET.
2. SET POWER SWITCH TO ON.
3. RUN SELF TEST (PARA 3-12).
IS PRINTING NOW SATISFACTORY?
YES
NO
INSTALL NEW PRINT HEAD (PARA 4-17).
NO
SET JUMPER J6 IN VERTICAL POSITION.
IS PRINTING OKAY?
NO
YES
GO TO TP-TS-15

TP-TS-11 DOTS MISSING IN CHARACTERS

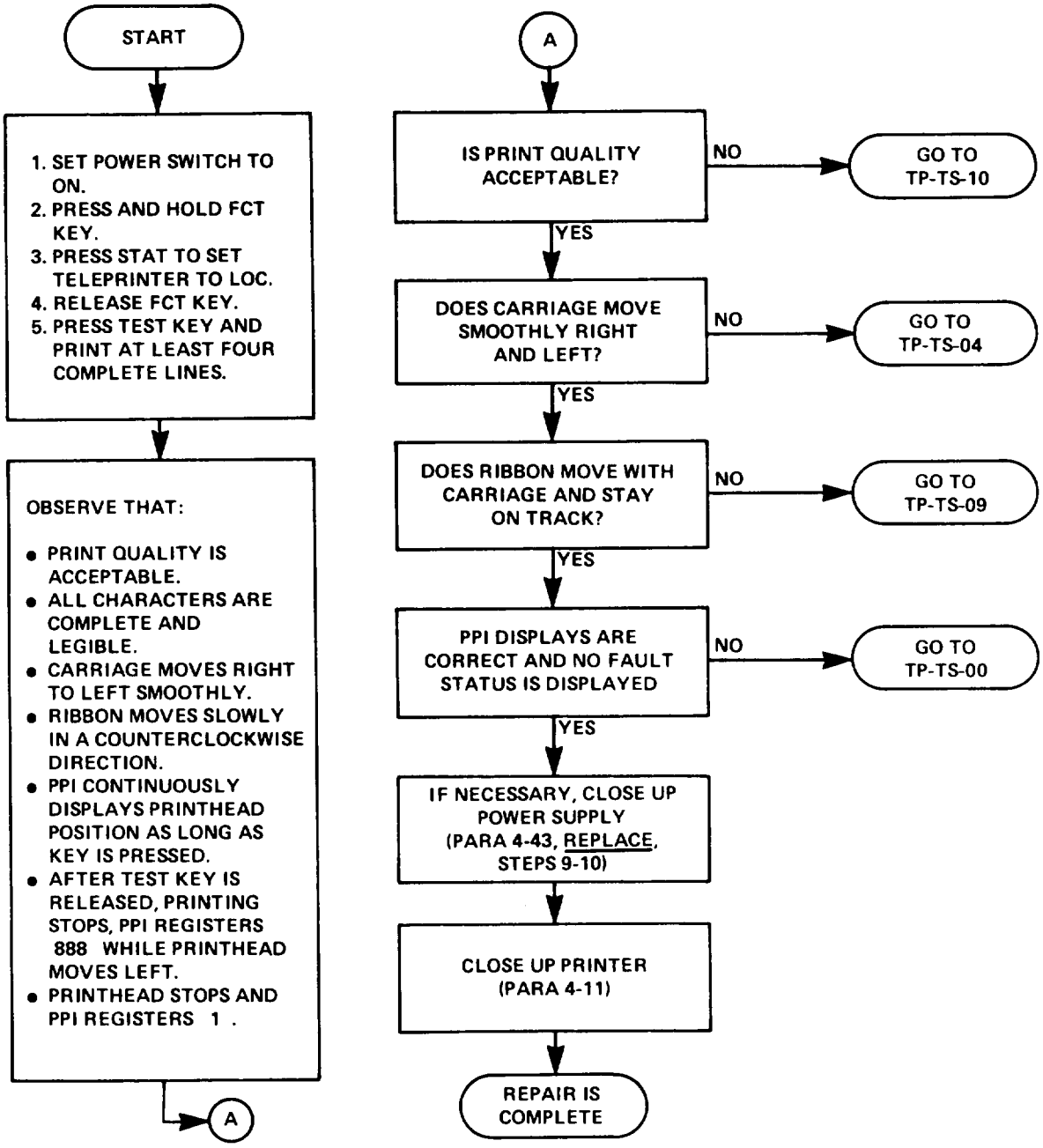



TP-TS-12
CHARACTERS DISTORTED OR BROKEN
START
RUN SELF TEST (PARA 3-12)
ARE CHARACTERS DISTORTED OR BROKEN?
NO
YES
CHECK PRINTER WHEN ON LINE.
ARE CHARACTERS STILL DISTORTED?
YES
NO
1. INSTALL NEW RS-232C PANEL ASSEMBLY (PARA 4-20).
2. RERUN SYSTEM TEST.
ARE CHARACTERS STILL DISTORTED?
NO
YES
GO TO TP-TS-15
TROUBLESHOOT SYSTEM (SYSTEM MANUAL)
DOES CARRIAGE MOVE RIGHT AND LEFT IN NORMAL MANNER?
NO
YES
GO TO TP-TS-04
1. CHECK PRINTHEAD TO PLATEN DISTANCE/ PARALLELISM (PARA 4-18).
2. RUN SELF TEST (PARA 3-12).
ARE CHARACTERS STILL DISTORTED?
NO
YES
1. INSTALL NEW PRINTHEAD (PARA 4-17).
2. RUN SELF TEST (PARA 3-12).
ARE CHARACTERS STILL DISTORTED?
NO
YES
GO TO TP-TS-15
1. INSTALL NEW T3MC/2 LOGIC BOARD (PARA 4-58).
2. RUN SELF TEST (PARA 3-12).
ARE CHARACTERS STILL BROKEN OR DISTORTED?
NO
YES
INSTALL NEW TELEPRINTER (SYSTEM MANUAL)


TP-TS-13
P-O NOT DISPLAYED DURING PAPER OUT CONDITION
START
CHECK PAPER OUT STRAPPING.
IS STRAPPING IN?
NO
SET PAPER OUT STRAPPING IN.
DOES P-O APPEAR ON PPI?
YES
NO
YES
GO TO TP-TS-15
1. SET POWER SWITCH TO OFF.
2. DISCONNECT AC POWER CORD AT OUTLET.
3. ACCESS TELEPRINTER (PARA 4-11).
4. DISCONNECT P9 ON T3MC/2 BOARD.
5. USING OHMMETER, CHECK RESISTANCE ACROSS PINS OF P9:
• ≈ O Ω WITH PAPER OUT
• INF. Ω WITH PAPER IN
DOES P9 INDICATE PROPER RESISTANCE?
NO
YES
1. DISCONNECT PAPER OUT SWITCH CABLE ON RS-232-C PANEL.
2. USING OHMMETER, CHECK RESISTANCE ACROSS PAPER OUT SWITCH CABLE CONNECTOR.
• ≈ O Ω WITH PAPER OUT
• INF. Ω WITH PAPER IN
DOES PAPER OUT SWITCH CABLE CONNECTOR INDICATE PROPER RESISTANCE?
YES
INSTALL NEW RS-232-C PANEL ASSEMBLY (PARA 4-20)
NO
INSTALL NEW PAPER OUT SWITCH
1. INSTALL NEW T3MC/2 BOARD (PARA 4-58).
2. CONNECT AC POWER CORD TO OUTLET.
3. SET POWER SWITCH TO ON.
IS PROBLEM CLEARED?
YES
NO
NO
INSTALL NEW TELEPRINTER (SYSTEM MANUAL)
1. CONNECT AC POWER CORD TO OUTLET.
2. SET POWER SWITCH TO ON.
IS PROBLEM CLEARED?
YES
GO TO TP-TS-15


TP-TS-14
CANNOT RECEIVE DATA
START
IS PRINTER ON LINE?
NO
PUT PRINTER ON LINE.
YES
DOES PRINTER RECEIVE DATA?
NO
YES
IS RS-232-C CABLE CONNECTED?
NO
1. SET POWER SWITCH TO OFF.
2. DISCONNECT AC POWER CORD AT OUTLET.
3. CONNECT RS-232-C CABLE (PARA 4-20).
YES
CHECK RS-232-C CONNECTOR AND CABLE FOR BROKEN WIRES AND/OR PINS.
NO
DOES PRINTER RECEIVE DATA?
YES
IS RS-232-C CONNECTOR CABLE OKAY?
NO
1. SET POWER SWITCH TO OFF.
2. DISCONNECT AC POWER CORD AT OUTLET.
3. INSTALL NEW RS-232-C PANEL ASSEMBLY (PARA 4-20).
YES
1. SET POWER SWITCH TO OFF.
2. DISCONNECT AC POWER CORD AT OUTLET.
3. INSTALL NEW T3MC/2 BOARD (PARA 4-58).
NO
DOES PRINTER RECEIVE DATA?
YES
GO TO TP-TS-15
NO
PROBLEM NOT WITH PRINTER. TROUBLESHOOT IN SYSTEM MANUAL.

TP-TS-15	AFTER MAINTENANCE CHECK



Section III. MAINTENANCE PROCEDURES

4-8. GENERAL

The individual maintenance procedures in this section contain the corrective actions required to fix a failure which was isolated during troubleshooting.

4-9. EQUIPMENT HANDLING PRECAUTIONS

As with most data processing equipment, the teleprinter is very sensitive to dirt, dust, and even smoke. Follow the rules below to avoid damage to the equipment.

a. Make sure hands, hair, clothing, and shoes are clean before working on the console printer.

b. Do not touch board connector terminals with any tool, bare hands, or a dirty cloth. Tools will damage the fragile connector. Dirt or body sweat will cause corrosion.

c. If a board is to be transported, place it in its original shipping container. If unavailable, pack it carefully with clean packing material that will prevent physical damage and will not cause corrosion.

d. Ground your body to discharge static electricity by touching a metal chassis or cabinet before touching a board. A static discharge from you to a board can destroy integrated circuits on the board.

e. Do not use masking tape labels.

f. Hold boards by their edges whenever you handle them.

g. Store and ship boards in static free bags.

h. Store boards in a humidity controlled environment.

i. Do not smoke in the area where boards are used or stored.

j. Do not put beverages on or near boards. An accidental spill can cause corrosion and chemical damage.

k. Never leave boards lying around unprotected.

4-10. MAINTENANCE PROCEDURES

Before you start a corrective maintenance procedure, you should gather all the items or help listed in the initial setup box for that procedure. Read the procedure carefully and do only what each step tells you to do. Some steps are followed by a reference. Use the reference any time you are not sure what you must do for that step. Always do the steps in the order they are given unless the procedure requires decision steps. When decision steps are involved, go in the order indicated by the decision.

4-11. ACCESS/CLOSE UP PRINTER

INITIAL SETUP

Common Tools
- Tool kit

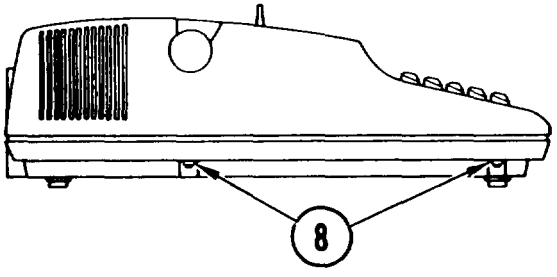
Access

1. Power OFF printer.
2. Pull ac plug from outlet.
3. Remove paper.

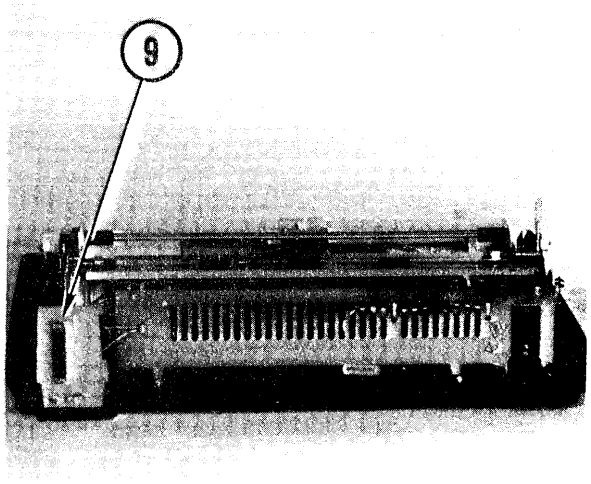
NOTE

In some installaions it may be necessary to remove hold down clamps before printer can be accessed. See your system manual for removal instructions.

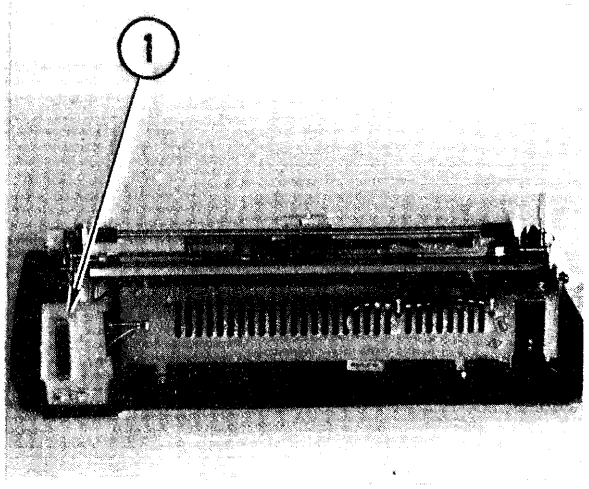
4. Remove paper rack.
5. Remove tractor assembly (para 4-51, Remove, steps 2-3).
6. Remove platen (para 4-48, Remove, steps 3-7).
7. Remove ribbon cartridge.
8. Using medium screwdriver, pry open two latches on each side of printer.



4-11. ACCESS/CLOSE UP PRINTER (CONT)



9. Hold down RS-232C panel assembly while lifting off top cover.



Close Up

1. Set top cover in position. make sure slot in cover slides evenly on edges of RS-232C panel assembly.

2. Push in two latches on each side of printer.

3. Replace tractor assembly (para 4-51, Replace, steps 1-4).

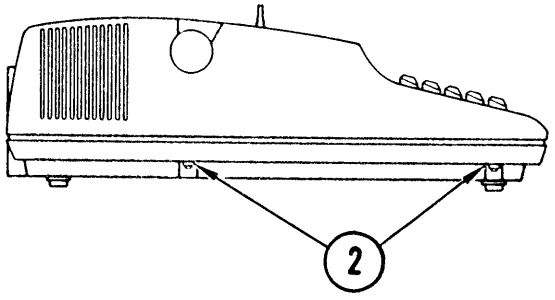
4. Replace paper rack.

5. Open access cover,

6. Lift paper shield.

7. Replace ribbon cartridge.

8. Replace platen (para 4-48, Replace, steps 1-6).



NOTE

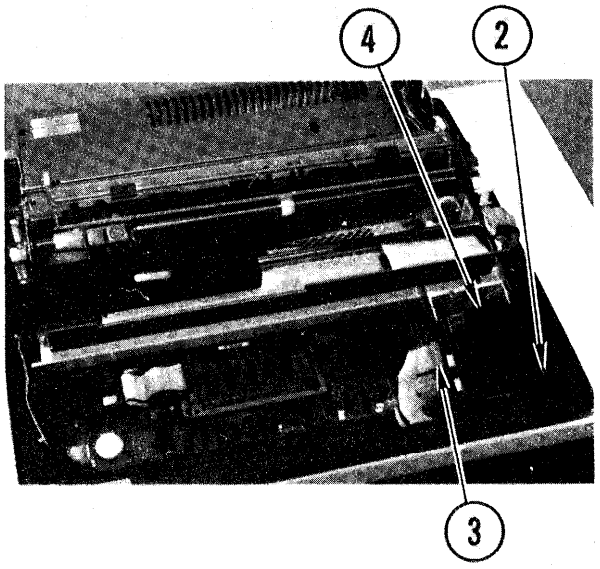
In some installations it may be necessary to replace hold down clamps at close-up of printer. See your system manual for close up instructions.

9. Connect ac power cord to outlet.

4-12. REMOVE/REPLACE CONTROL PANEL

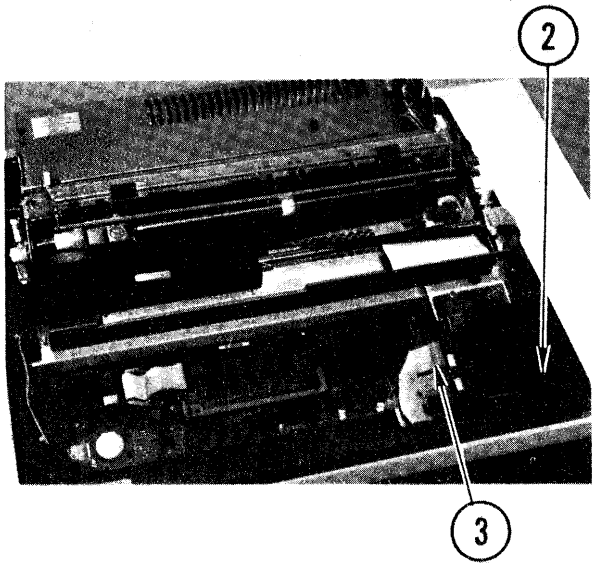
INITIAL SETUP

Common Tools
- Tool kit



Remove

1. Access printer (para 4-1 1).
2. Loosen nut and washers and disconnect ground wire.
3. Disconnect ribbon cable
4. Remove control panel assembly.



Replace

1. Set control panel assembly in position.
2. Connect ground wire. Tighten nut and washers.
3. Connect ribbon cable.
4. Close up printer (para 4-11).
5. Run self test (para 3-12).

4-13. REMOVE/REPLACE CONTROL PANEL KEYBUTTON, KEYSWITCH, AND SPRING

INITIAL SETUP

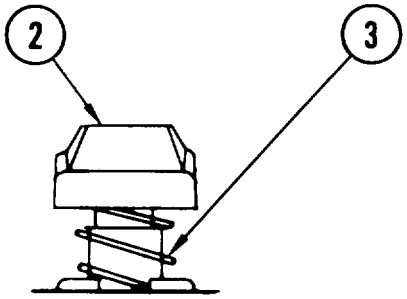
Common Tools	Special Tools
● Tool kit	l Keybutton removal tool l Keyswitch removal tool

Remove

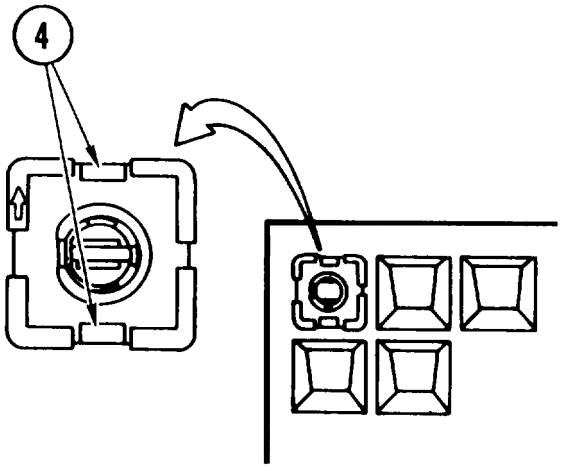
1. Power OFF printer.

NOTE

Keyswitch component may be removed without removing top cover.



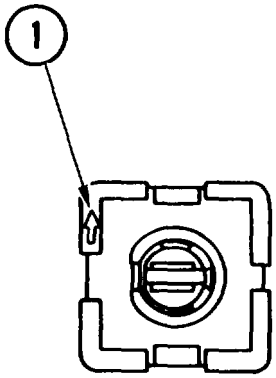
2. Using keybutton removal tool, remove switch cap button.
3. Remove spring.



4. Aline keyswitch removal tool with slots in keyswitch housing.
5. Slide tool down over switch.
6. Lift out switch.

4-13. REMOVE/REPLACE CONTROL PANEL KEYBUTTON, KEYSWITCH, AND SPRING (CONT)

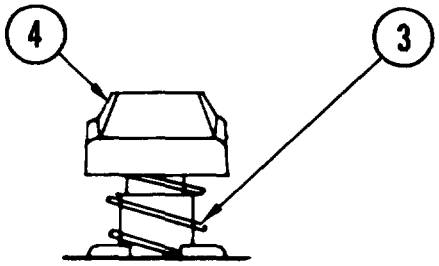
Replace



CAUTION

Do not damage aluminum foil on end of plunger. The aluminum foil is thin and fragile.

1. Check that arrow on switch housing points toward front or rear of printer, not left or right.
2. Insert switch into control panel with fingers and press into place.

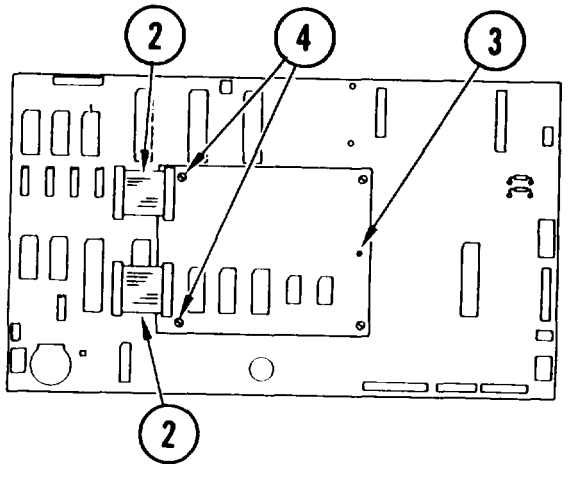


3. Insert spring.
4. Replace keybutton.

4-14. REMOVE/REPLACE 2K EXTENDED LINE BUFFER BOARD

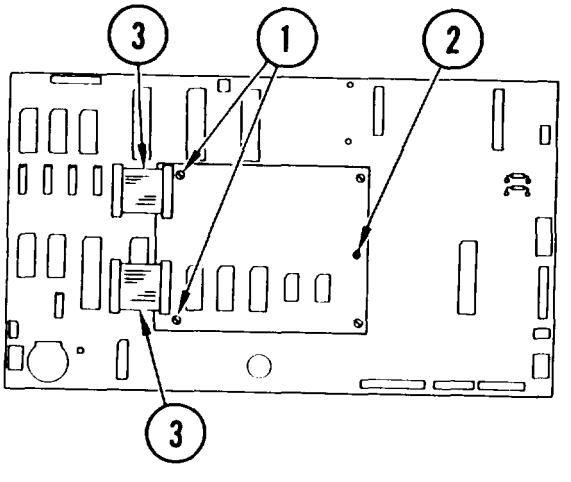
INITIAL SETUP

Common Tools
- Tool kit



Remove

1. Remove side frame support (para 4-21) .
2. Disconnect two ribbon cable connectors.
3. Loosen screw until buffer board is disengaged from logic board.
4. Using pliers, squeeze each plastic standoff and loosen locking device to free board.
5. Remove board from printer.



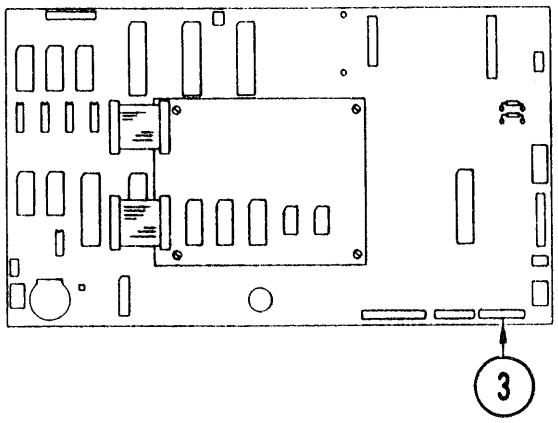
Replace

1. Install buffer board on plastic standoffs on logic board. Push down on the board until it snaps in place.
2. Tighten screw.
3. Connect two ribbon cable connectors from buffer board to logic board.
4. Replace side frame support (para 4-21) .

4-15. REMOVE/REPLACE PRINT POSITION INDICATOR BOARD (T3PPI/1)

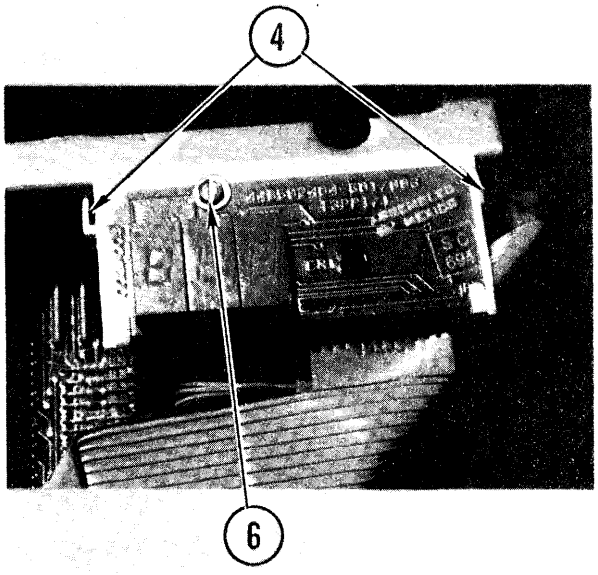
INITIAL SETUP

Common Tools
- Tool kit



Remove

1. Access printer (para 4-11).
2. Move control panel out of way.
3. Disconnect PPI ribbon cable connector (P2) from logic board.

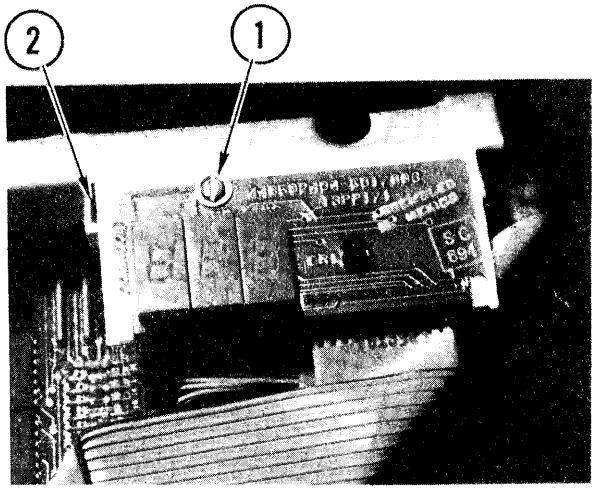


CAUTION

Lift PPI board straight out to avoid bending pins.

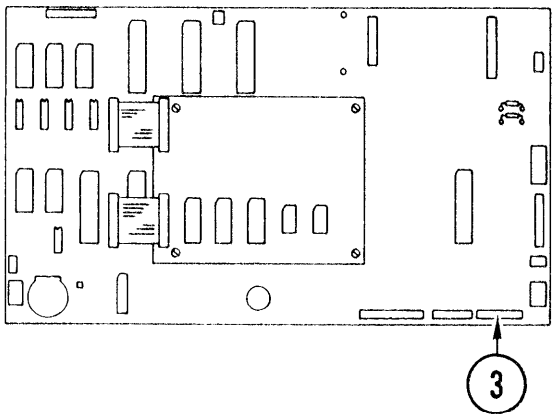
4. Push inward on bracket clips, then lift rear of board to disengage assembly from frame support.
5. Lift out PPI board and plastic support bracket.
6. If necessary, remove screw securing PPI board to bracket.

4-15. REMOVE/REPLACE PRINT POSITION INDICATOR BOARD (T3PPI/1) (CONT)



Replace

1. If necessary, secure PPI board to bracket with screw and washer.
2. Snap PPI board and bracket into position on support frame.

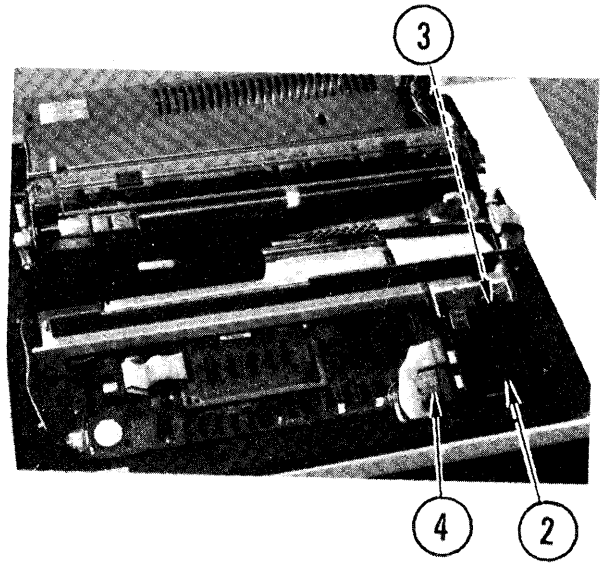


3. Connect PPI ribbon cable connector P2 to logic board.
4. Place control panel in position.
5. Close up printer (para 4-11).
6. Run self test (para 3-12).

4-16, REMOVE/REPLACE PRINT POSITION INDICATOR CABLE

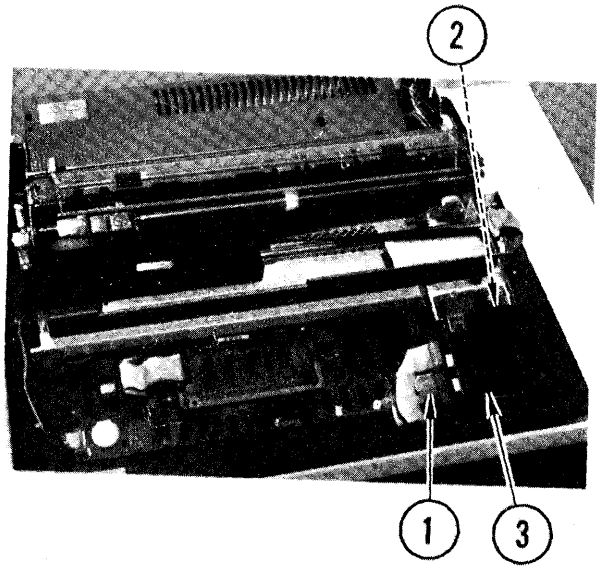
INITIAL SETUP

Common Tools
- Tool kit



Remove

1. Access printer (para 4-11).
2. Move control panel out of way.
3. Disconnect PPI cable from print position indicator board.
4. Disconnect PPI cable from connector P2 of the logic board.



Replace

1. Connect PPI cable to P2 of logic board.
2. Connect PPI cable to print position indicator board.
3. Place control panel in position.
4. Close Up printer (para 4-11).
5. Rum self test (para 3-12).

4-17. REMOVE/REPLACE PRINT HEAD

INITIAL SETUP

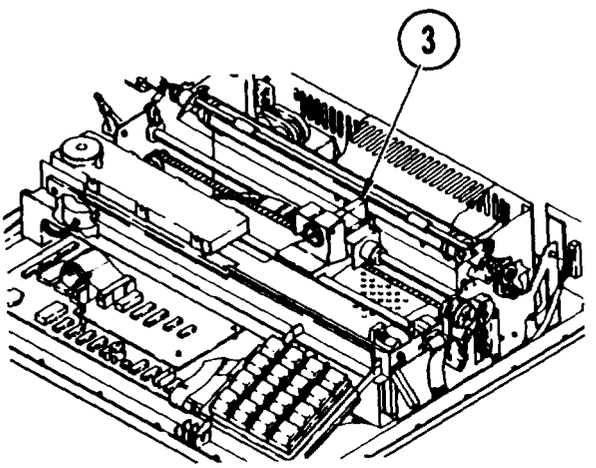
Common Tools
- Tool kit

Remove

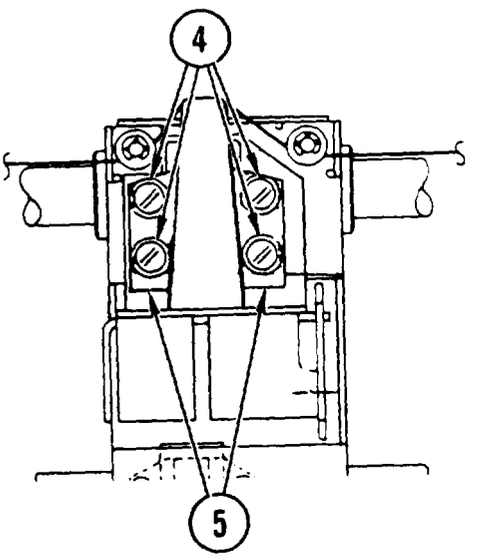
1. Access printer (para 4-11).

WARNING

Print head becomes hot after heavy usage. Avoid touching until cooled.

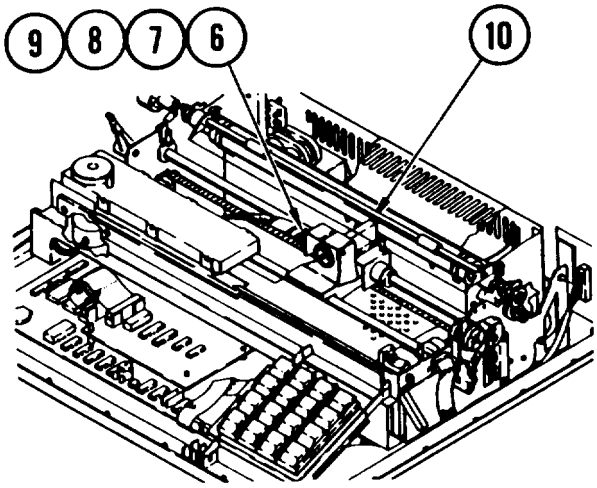


2. Raise paper shield.
3. Locate print head.

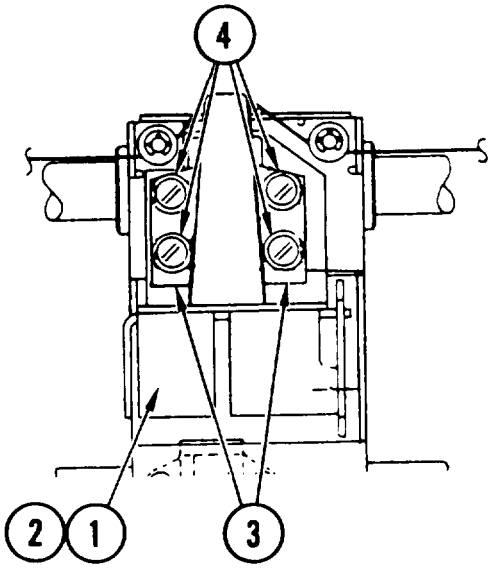


4. Remove screws, lockwashers, and flat washers.
5. Remove two nozzle clamps.

4-17. REMOVE/REPLACE PRINT HEAD (CONT)



6. Move carriage to center position.
7. Pull up print head and cut tie wrap on cable connector.
8. Pull print head and ribbon cable out from carriage.
9. Disconnect print head cable from bottom of print head.
10. Remove print head.



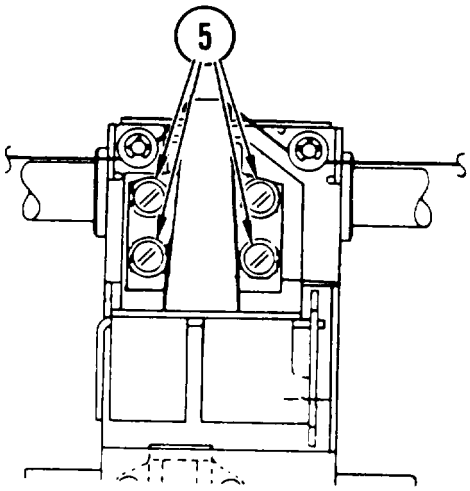
Replace

1. Connect ribbon cable to bottom of print head.
2. Install tie wrap around cable connector.
3. Place nozzle clamps in position with flanges on outside edges facing downward.
4. Fasten print head and nozzle clamps with screws, lockwashers, and flat washers. Do not tighten screws.
5. Close up printer (para 4-11, Close Up, steps 1-4, 8, and 9).
6. Adjust print head (para 4-18, steps 2-3 and 5-15).

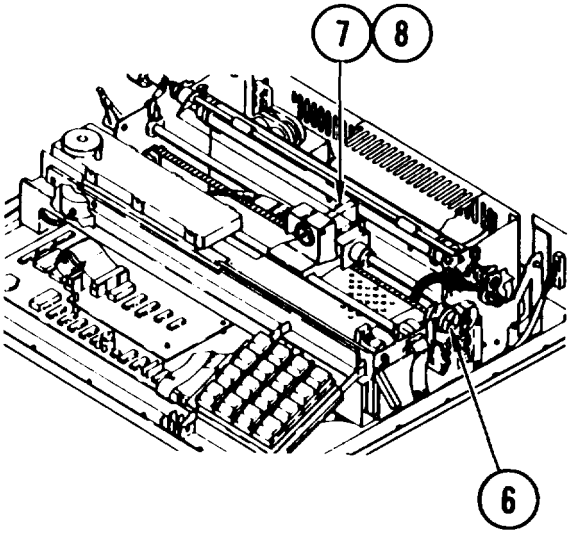
4-18. ADJUST PRINT HEAD

INITIAL SETUP

Common Tools
- Tool kit



1. Remove paper.
2. Open front panel.
3. Lift up paper shield.
4. Remove ribbon cartridge.
5. Loosen nozzle clamp mounting screws.



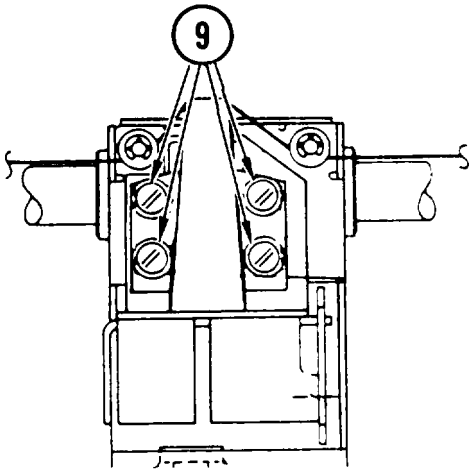
6. Rotate forms thickness knob in direction shown until print head moves to fully forward position (minimum gap).
7. Move carriage to center position.

NOTE

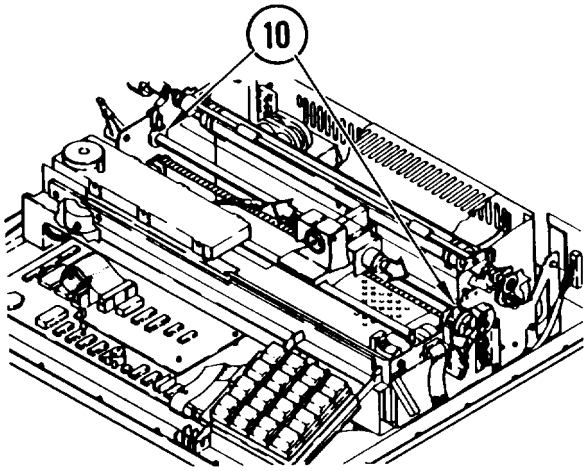
Adjust print head to insure it does not bind against platen when forms thickness adjustment knob is set for minimum gap.

8. Using feeler gauge, set gap between print head nozzle and platen at 0.010 ± .002 inches (0.254 ± .05 mm).

4-18. ADJUST PRINT HEAD (CONT)



9. Tighten nozzle clamp mounting screws.



10. Slide carriage to left bumper, then to right bumper. Check gap between print head nozzle and platen at each bumper.

- If gap at each position is same as gap set in step 8, go to step 11
- If gap at either position is different from gap set in step 8, loosen mounting screw in right eccentric and aline both eccentrics (para 4-30, Replace, steps 7-12)

11. Replace ribbon cartridge.

12. Close front panel.

13. Install paper.

14. Lower paper shield.

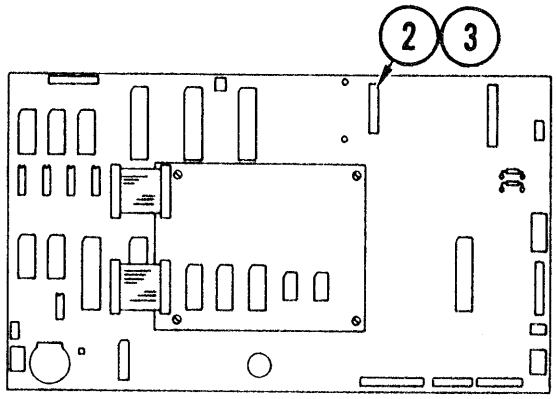
15. Run self test (para 3-12).

4-19. REMOVE/REPLACE PRINT HEAD CABLE

INITIAL SETUP

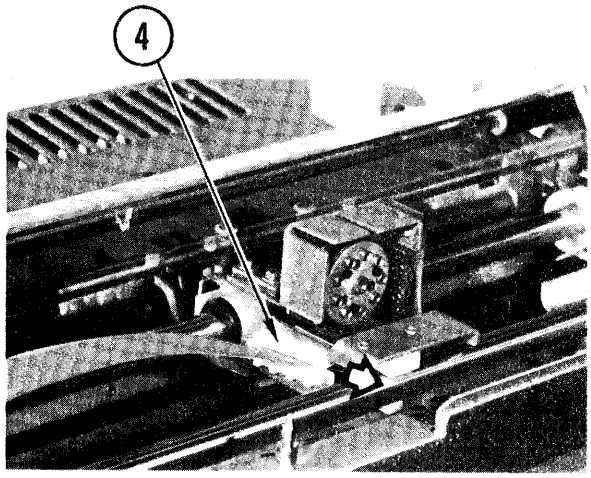
Common Tools
- Tool kit

Materials/Spare Parts
- Tags
- Pen or pencil



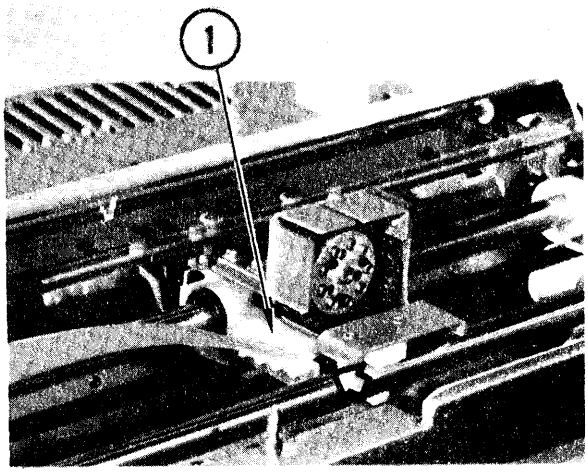
Remove

1. Remove print head (para 4-17).
2. Remove upper clamp securing ribbon cable on logic board,
3. Tag and disconnect ribbon cable from J2 on logic board.



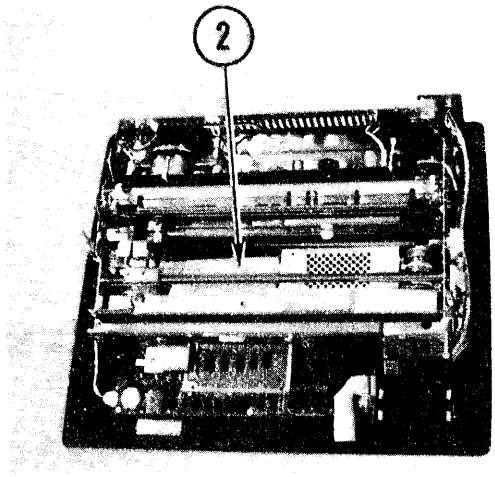
4. Carefully slide print head cable assembly out of groove in carriage, as shown.

4-19. REMOVE/REPLACE PRINT HEAD CABLE (CONT)

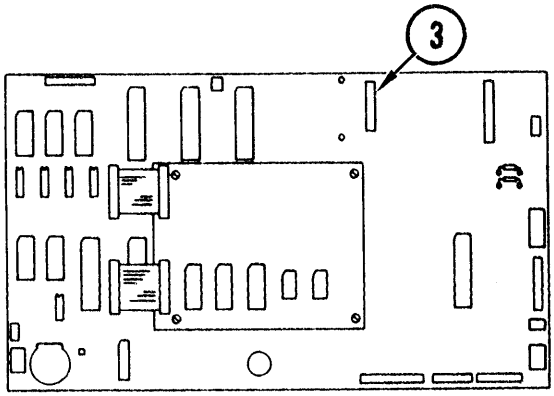


REPLACE

1. Carefully slide print head cable into groove on carriage assembly.



2. Place ribbon cable on top of protective covering.



3. Connect ribbon cable to J2 connector on logic board.
4. Replace upper clamp on ribbon cable.
5. Replace print head (para 4-17).

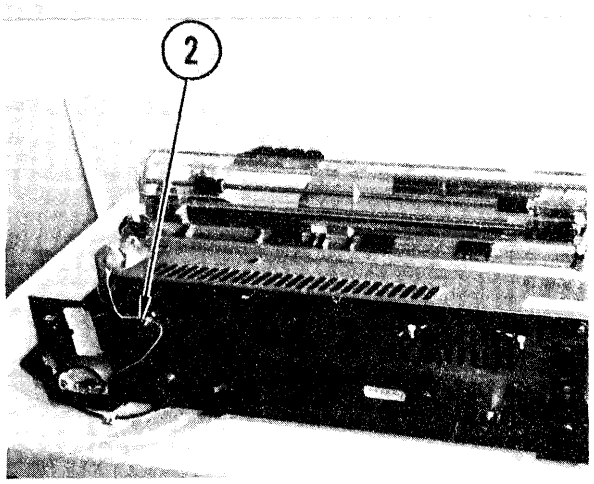
4-20. REMOVE/REPLACE RS-232C PANEL ASSEMBLY

INITIAL SETUP

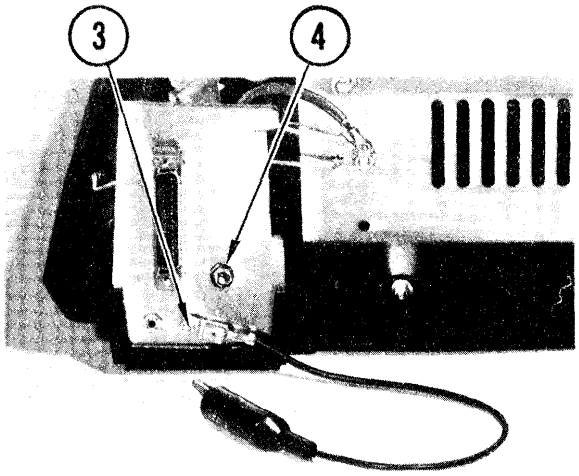
Common Tools
- Tool kit

Materials/Spare Parts
- Tags
- Tie wraps
- Pen or pencil

Remove

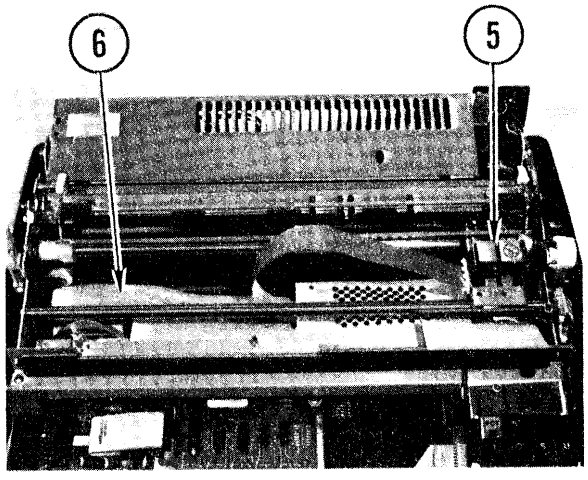


1. Access printer (para 4-11).
2. Remove nut and washer. Tag, and pull off panel assembly ground wire from back of power supply assembly.



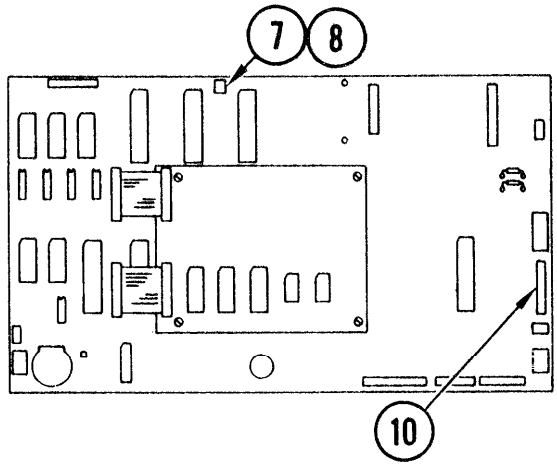
3. Remove screw, nut, and washers. Pull off alligator clip ground wire.
4. Remove nut and washer. Tag and remove ground wire from ground stud. Remove ground stud.

4-20. REMOVE/REPLACE RS-232C PANEL ASSEMBLY (CONT)



5. Move carriage assembly to far right position.

6. Lift up protective covering.

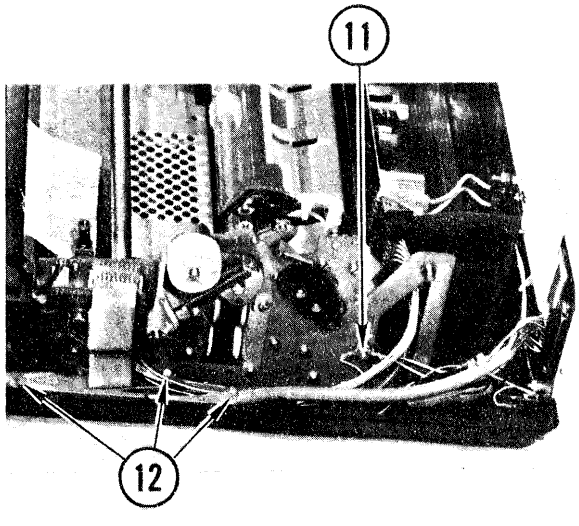


7. Disconnect plastic protective cover and connector P9 on logic board. Retain cover.

8. Tie 24-inch string around P9 two-wire cable at connector end for use as guide string in replacement.

9. Remove print position indicator board (para 4-15, Remove, steps 2 and 4).

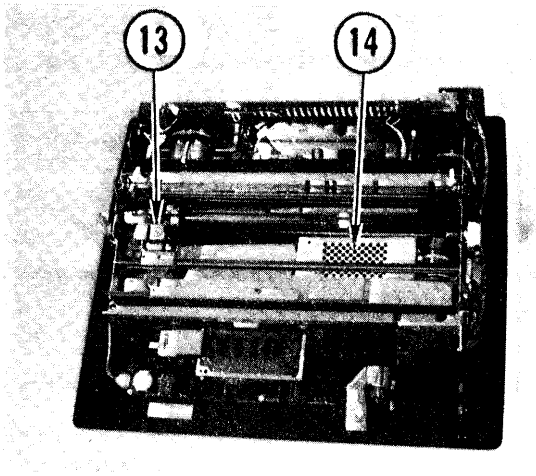
10. Disconnect connector P7 on logic board.



11. Loosen nut and washer. Tag and pull off panel assembly ground wire.

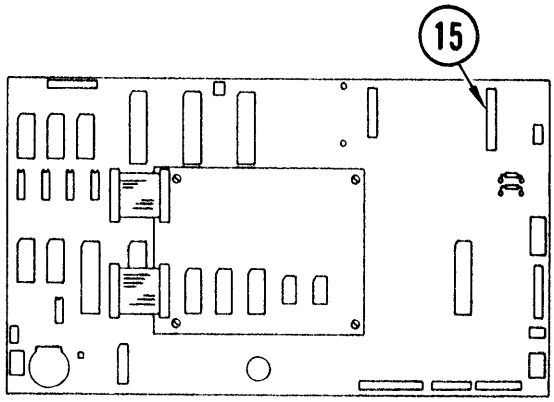
12. Cut three tie wraps.

4-20. REMOVE/REPLACE RS-232C PANEL ASSEMBLY (CONT)

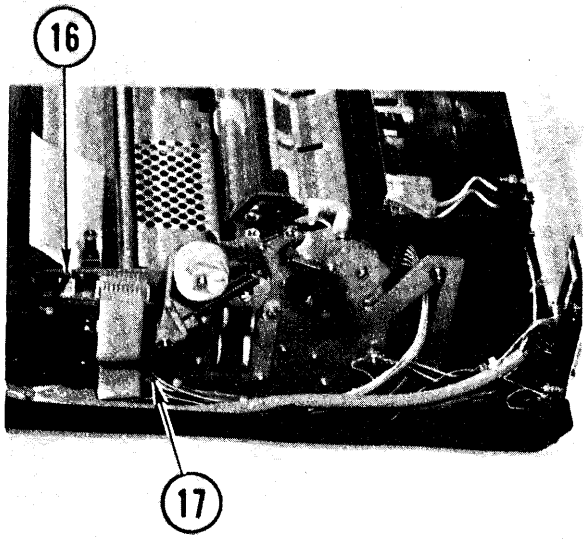


13. Slide carriage assembly to far left position.

14. Lift protective cover.



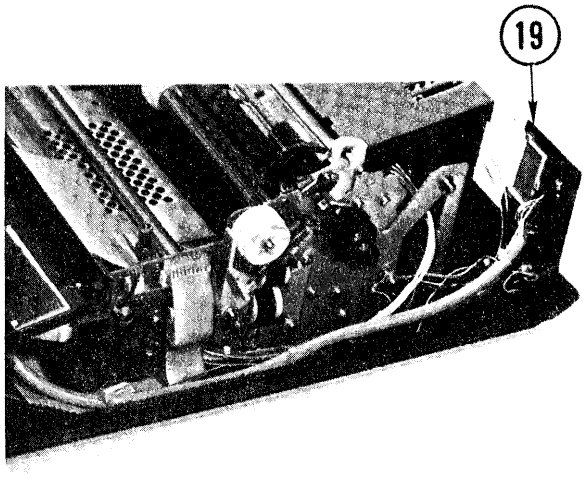
15. Disconnect connector P8 on logic board.



16. Disconnect connector on upper left edge of carriage servo drive board.

17. Carefully fish two-wire cable and connector P9 through printer and hole in side frame, and under wire harnesses.

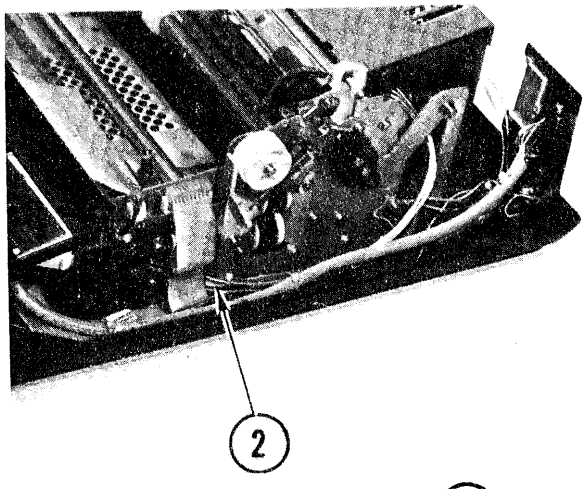
4-20. REMOVE/REPLACE RS-232C PANEL ASSEMBLY (CONT)



18. Remove string from P9 cable. Leave string in printer.

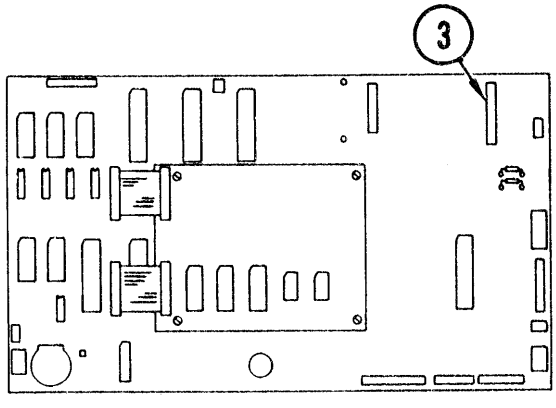
19. Lift out RS-232C panel assembly from printer.

Replace



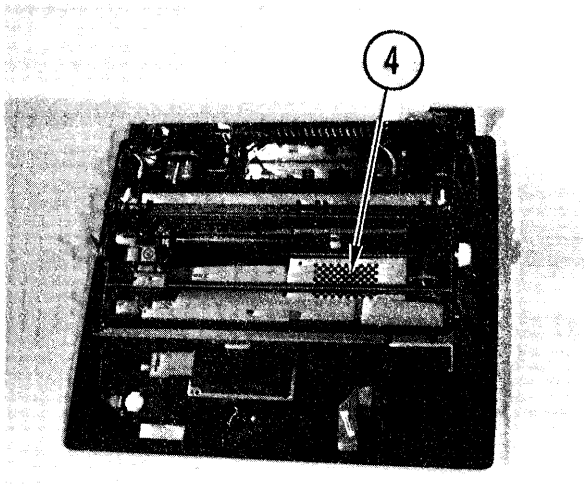
1. Insert RS-232C panel assembly into mount on bottom cover.

2. Tie the 24-inch guide string to two-wire P9 cable. Carefully fish connector P9 and cable under wire harnesses, through hole in side frame, and through printer.



3. Connect connector P8 to logic board.

4-20. REMOVE/REPLACE RS-232C PANEL ASSEMBLY (CONT)



4. Lower protective covering.

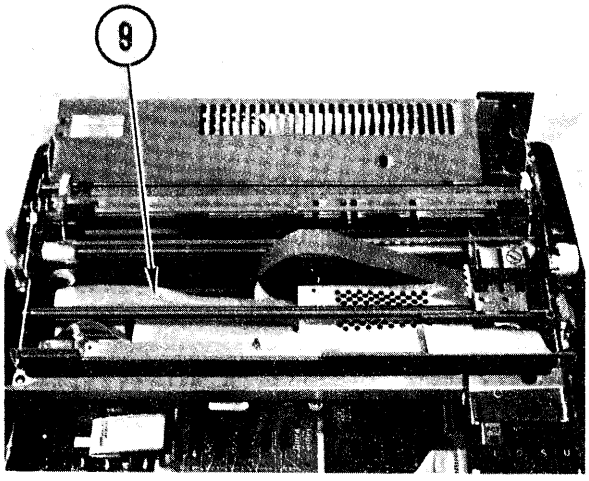
5. Remove guide string from two-wire P9 cable.

6. Slide carriage assembly to far right position.

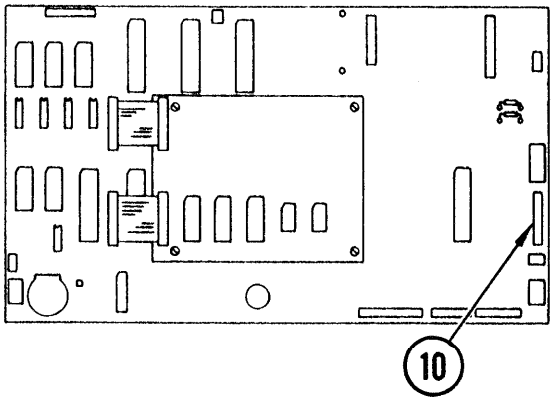
7. Slide plastic protective cover onto logic board so lower hooks on cover attach to edge of board, and J9 connector pins go through two small holes in front of cover.

8. Insert connector P9 into plastic protective cover and connect to connector J9 on logic board, as shown.

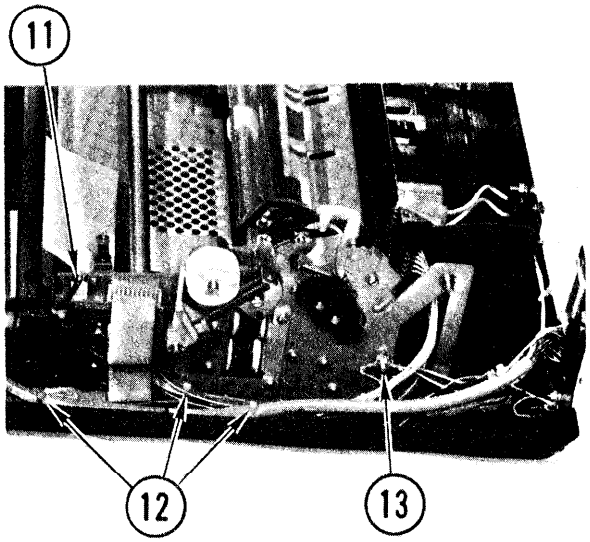
9. Lower protective covering.



4-20. REMOVE/REPLACE RS-232C PANEL ASSEMBLY (CONT)



10. Connect connector P7 to logic board.



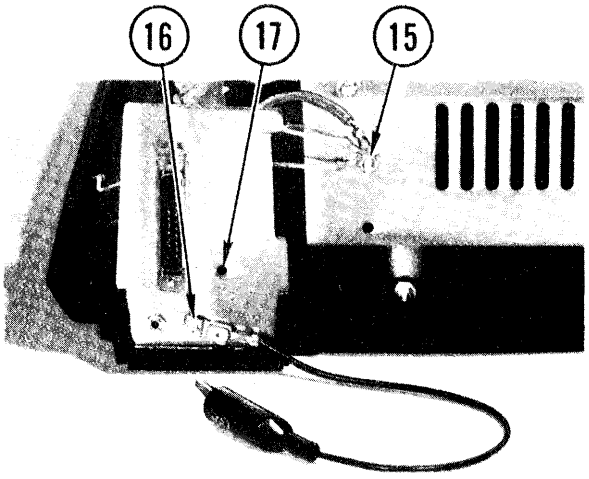
11. Connect connector to top left edge of carriage servo drive board.

12. Install three tie wraps.

13. Connect panel assembly cable ground wire. Tighten nut and washers.

14. Replace print position indicator board (para 4-15, Replace, steps 2 and 4).

15. Replace panel assembly ground wire. Replace and tighten nut, screw and washer.



16. Replace alligator clip ground wire. Replace and tighten screw, nut, and washers.

17. Replace ground stud and ground wire on ground stud. Replace and tighten nut and washer.

18. Close up printer (para 4-11).

19. Install paper.

20. Tear off paper so only two forms remain in printer.

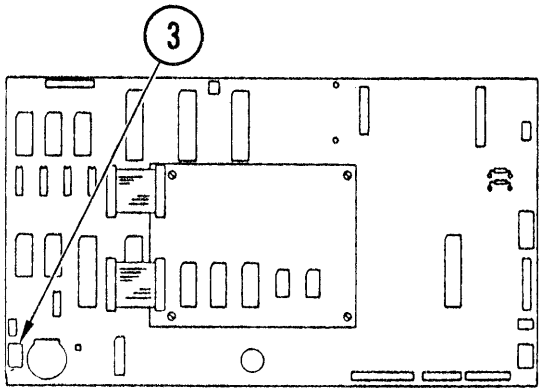
21. Run self test. Make sure that status indicater displays P-O when paper runs out,

22. Install paper.

4-21. REMOVE/REPLACE SIDE FRAME SUPPORT

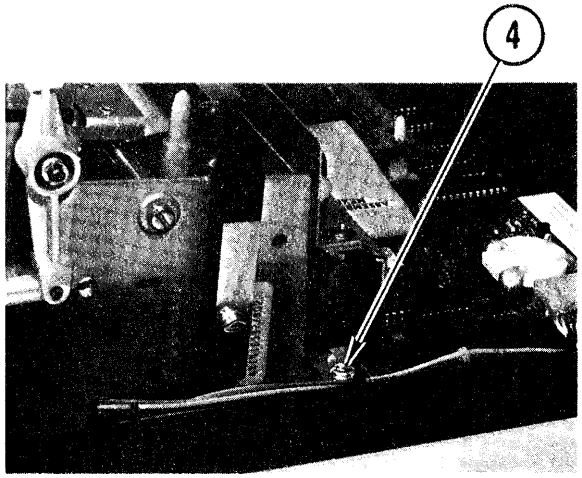
INITIAL SETUP

Common Tools	Materials/Spare Parts
● Tool kit.	● Tie wraps



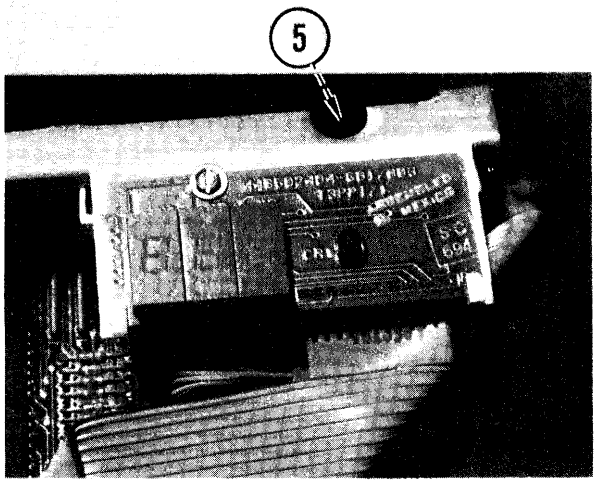
Remove

1. Access printer (para 4-11).
2. Remove control panel (para 4-12).
3. Disconnect protective cover and cable connector P11 on logic board.



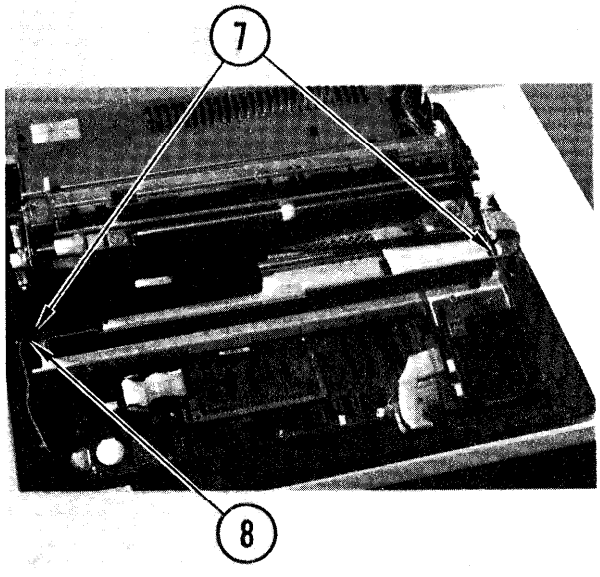
4. Remove left retaining screw from frame support.

4-21. REMOVE/REPLACE SIDE FRAME SUPPORT (CONT)



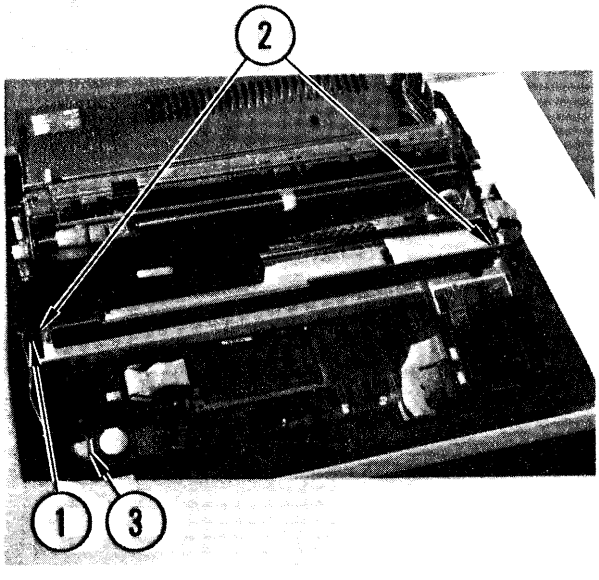
5. Remove right retaining screw from frame support.

6. Remove print position indicator board (para 4-15, Remove, steps 3-5).



7. Lift frame support off mounting tabs.

8. While lifting frame support out of printer, carefully feed ribbon motor cable throuqh cutout in side frame.



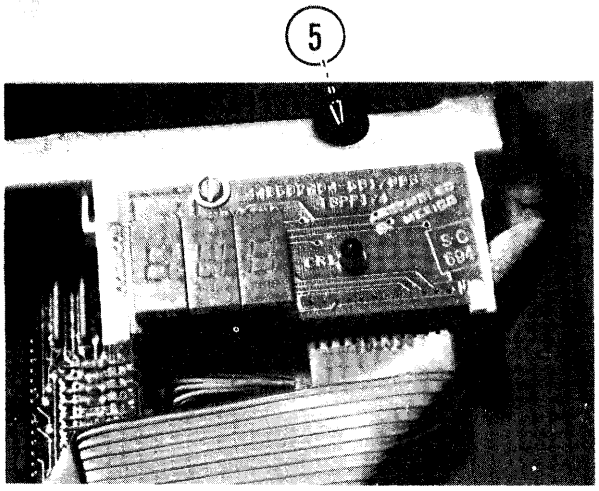
REPLACE

1. Carefully route ribbon motor cable through cutout in side frame.

2. Position frame support on mounting tabs.

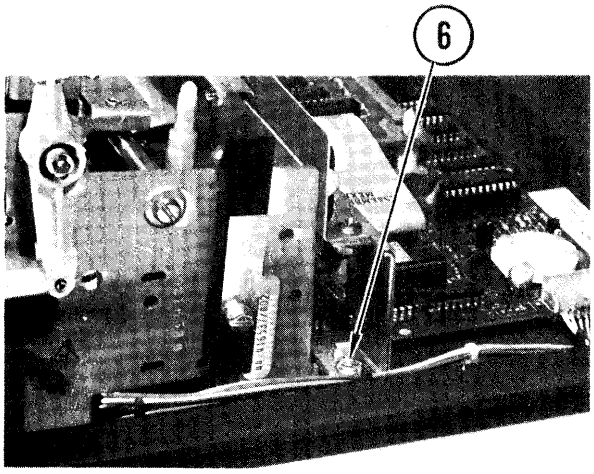
3. Connect protective cover and cable connector P11 to logic board.

4-21. REMOVE/REPLACE SIDE FRAME SUPPORT (CONT)



4. Replace print position indicator board (para 4-15, Replace, steps 2-3.

5. Replace and tighten right retaining screw.



6. Replace and tighten left retaining screw.

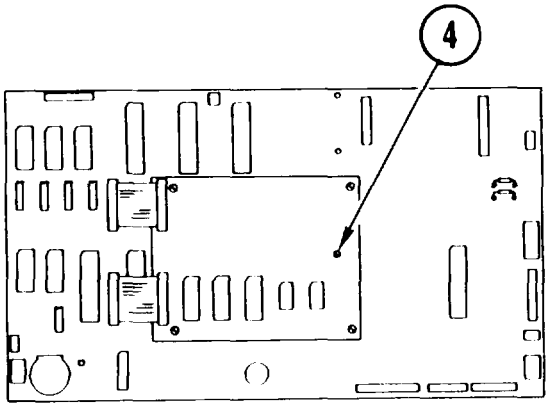
7. Replace control panel (para 4-12).

4-22. REMOVE/REPLACE BOTTOM COVER

INITIAL SETUP

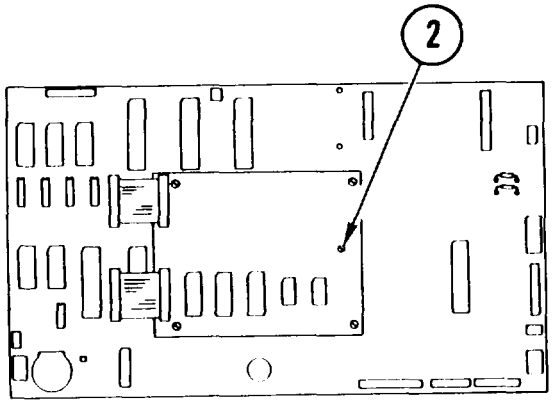
Common Tools
- Tool kit

Materials/Spare Parts
- Tie wraps



Remove

1. Remove power supply assembly (para 4-42) .
2. Remove frame and drive assembly (para 4-23, Remove, steps 4-16).
3. Remove RS-232C panel assembly (para 4-20, Remove, steps 2, 7, 10, and 19).
4. Loosen screw until buffer board is disengaged from logic board.
5. Remove logic board (para 4-58, Remove, steps 5-7).



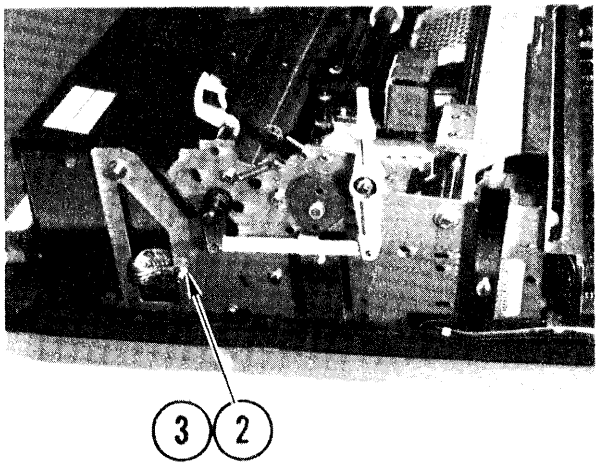
Replace

1. Replace logic board (para 4-58, Replace, steps 3 and 4).
2. Tighten screw on buffer board.
3. Replace RS-232C panel assembly (para 4-20, Replace, steps 2, 7, 8, 10, and 16).
4. Replace frame and drive assembly (para 4-23, Replace, steps 1-4, 6-12, 14, 15).
5. Replace power supply assembly (para 4-42).

4-23. REMOVE/REPLACE FRAME AND DRIVE ASSEMBLY

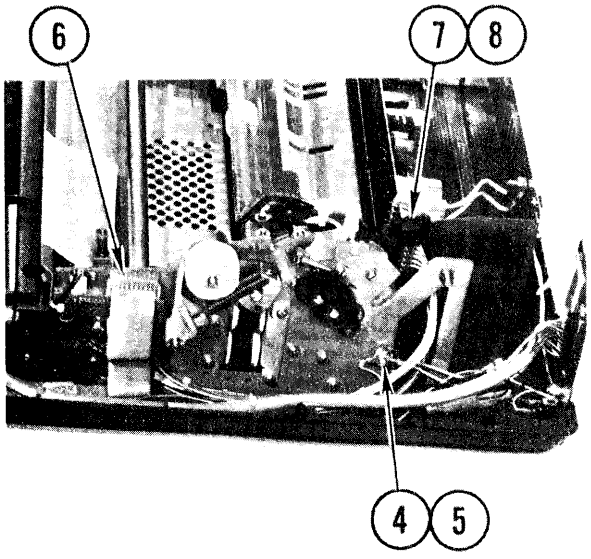
INITIAL SETUP

Common Tools	Materials/Spare Parts
● Tool kit	● Tags ● Pen or pencil



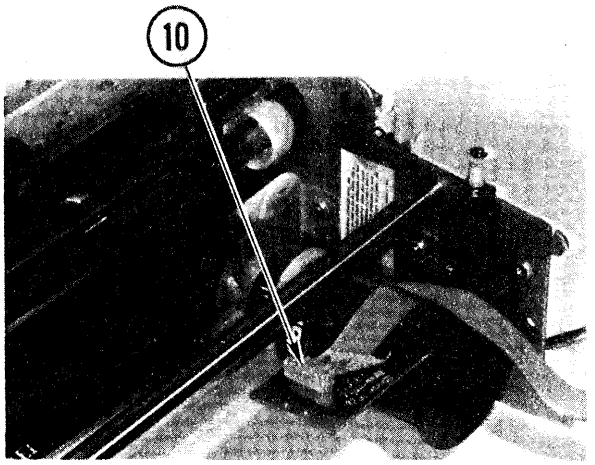
Remove

1. Access printer (para 4-11).
2. At left rear corner of printer loosen nut on RF cable grounding stud.
3. Remove RF cable from frame.



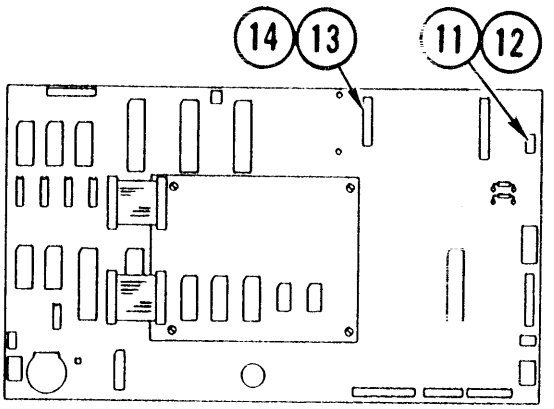
4. At right rear corner of printer, loosen nut on grounding stud.
5. Remove RF cable and all ground wires from frame.
6. Tag and remove ribbon cable connector from carriage servo drive board.
7. Tag and remove cable from connector on side of power supply assembly (para 4-43, Remove, steps 2-6).
8. Pull cable free of frame.

4-23. REMOVE/REPLACE FRAME AND DRIVE ASSEMBLY (CONT)



9. Remove side frame support (para 4-21).

10. Tag and disconnect encoder cable connector from P1 on encoder board.



11. Tag cable to paper drive motor at P10 on logic board.

12. Lift front of frame and drive assembly, and disconnect cable connector at P10 on logic board.

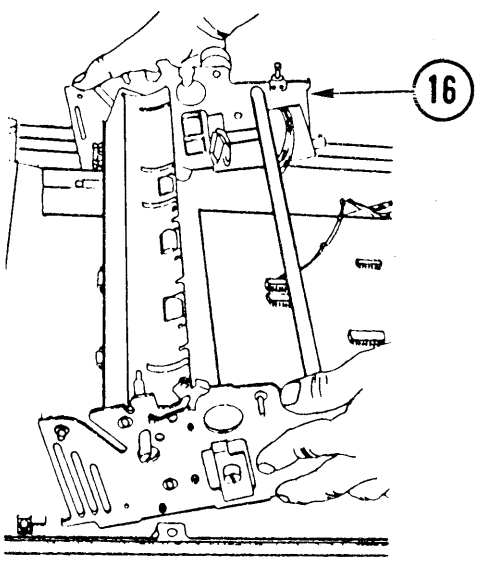
13. Using pliers, squeeze each plastic standoff to free print head ribbon cable retainer.

14. Tag and disconnect print head ribbon Cable at J2 on logic board.

15. Cut tie wrap securing paper stepper motor cable.

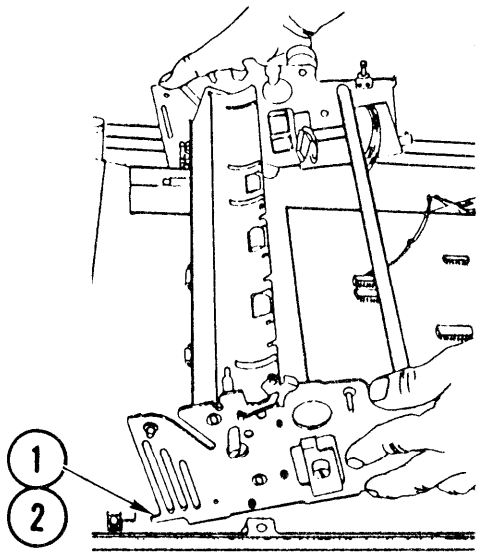
CAUTION

Use care to ensure no cables are snagged when removing the frame and drive assembly.



16. Facing front of printer, grasp each side of frame and drive assembly and lift up and back to remove.

4-23. REMOVE/REPLACE FRAME AND DRIVE ASSEMBLY (CONT)



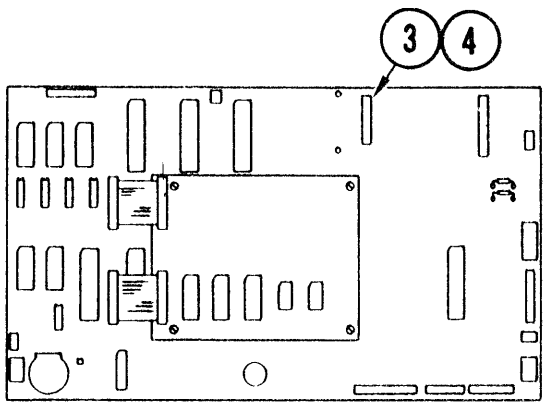
Replace

CAUTION

Ensure no loose cables are caught under frame and drive assembly when it is placed on bottom cover.

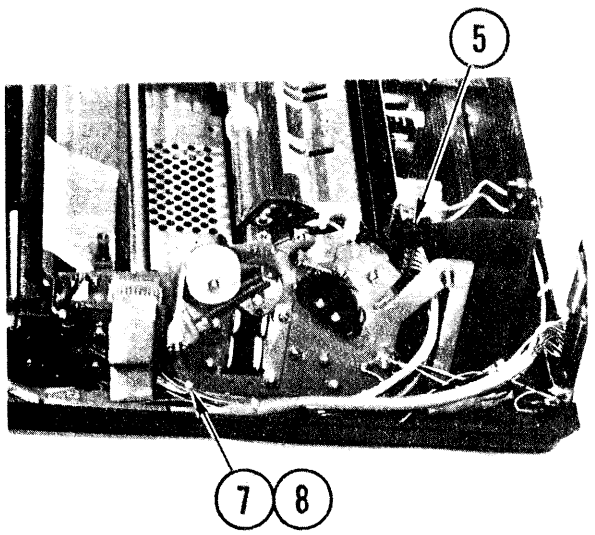
1. Facing front of printer, grasp each side of frame and drive assembly. Slide forward until tabs set into bottom cover lugs.

2. Set bottom tabs into mating slots in bottom cover.



3. Connect print head ribbon cable at J2 on logic board.

4. Press print head ribbon cable retainers down on plastic standoffs until they snap into place.



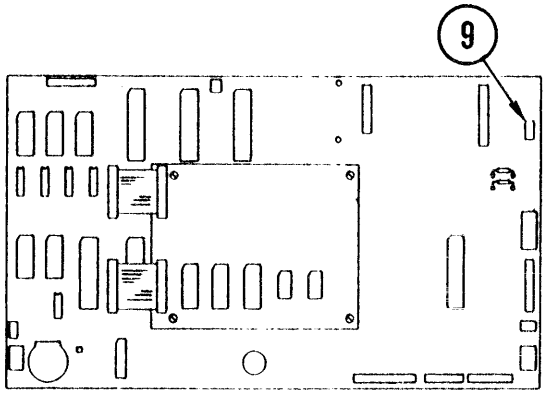
5. Insert power supply cable connector J2 throuqh hole in side frame and connect to P2 on power supply board (para 4-43, Replace, steps 7-10.

6. Lift up front of frame and drive assembly.

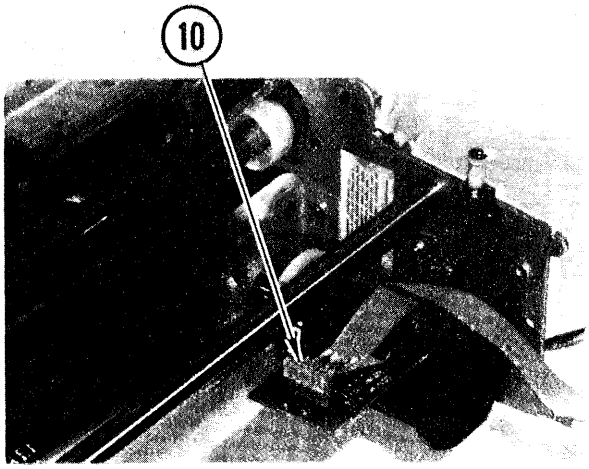
7, Thread paper stepper motor cable connector J10 through cutout in side frame.

8. Install tie wrap securing paper stepper motor cable,

4-23. REMOVE/REPLACE FRAME AND DRIVE ASSEMBLY (CONT)

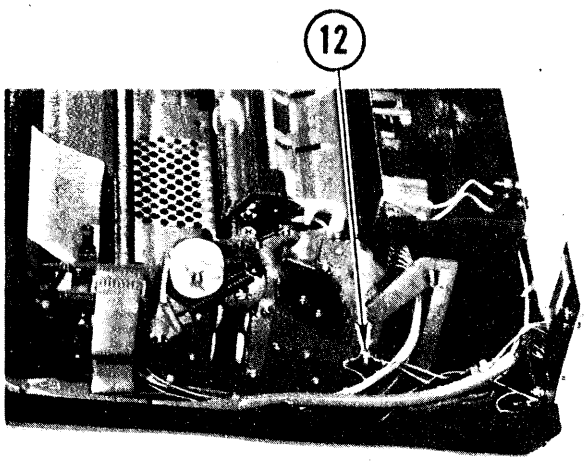


9. Connect paper stepper motor cable connector J10 to P10 on logic board.



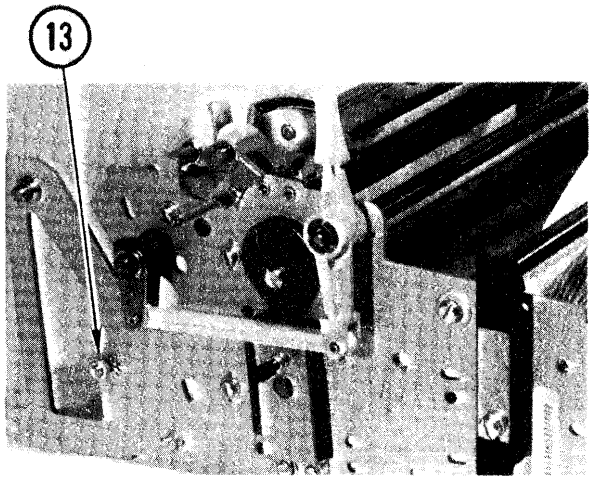
10. Connect encoder cable connector to P1 on encoder board.

11. Replace side frame support (para 4-21, Replace, steps 1 -6).

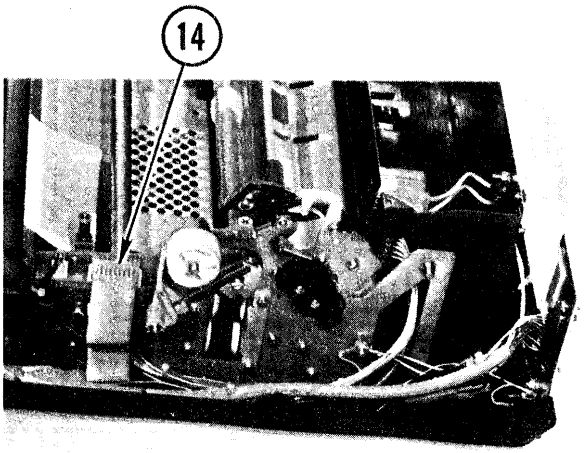


12. Replace RF cable and all ground wires under lockwashers on right side. Tighten nut.

4-23. REMOVE/REPLACE FRAME AND DRIVE ASSEMBLY (CONT)



13. Replace RF cable under lockwashers on left side. Tighten nut.



14. Replace ribbon cable connector on carriage servo drive board.

15. Replace control panel (para 4-12).

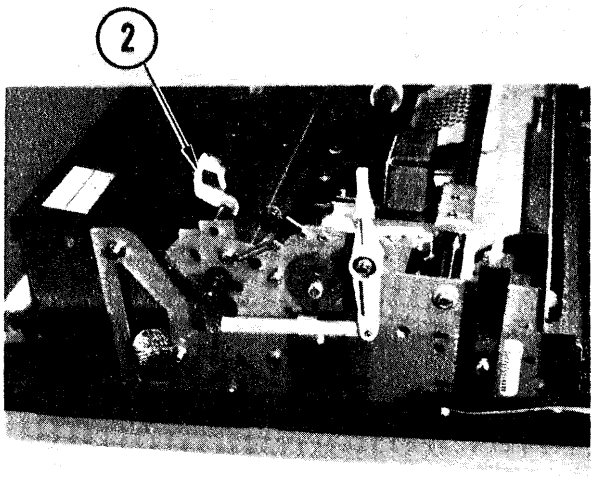
4-24. REMOVE/REPLACE PAPER SHIELD

1

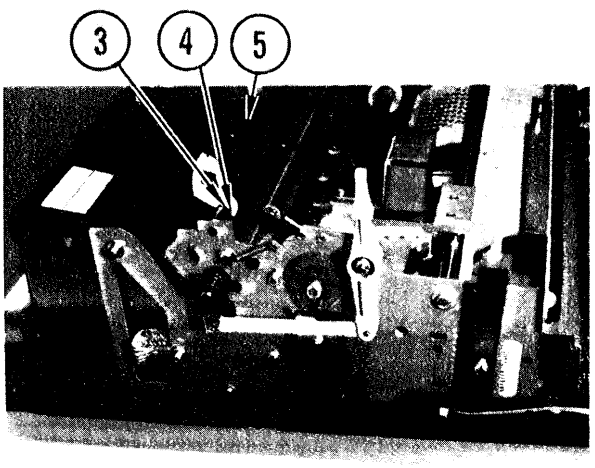
INITIAL SETUP

Common Tools
- Tool kit

Remove

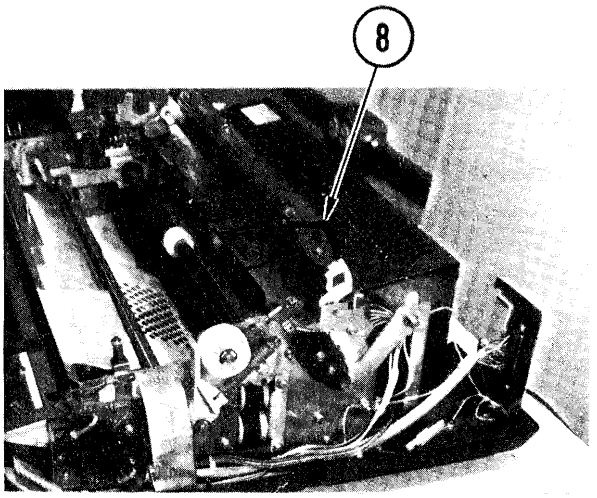


1. Access printer (para 4-11).
2. Remove inside retaining rings from both shield arm shafts.

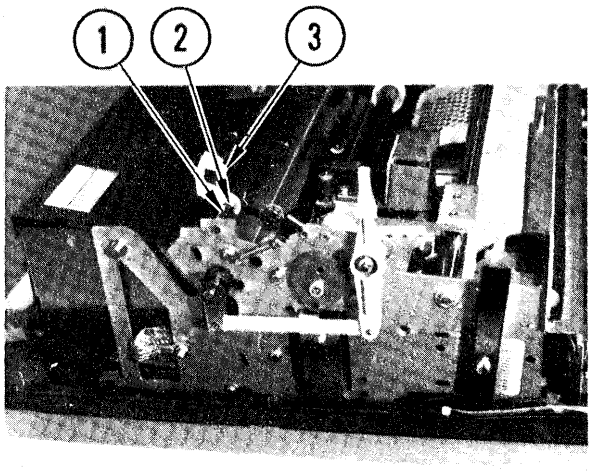


3. Remove outside retaining rings from both ends of roller shaft.
4. Slide shaft to right through assembly until it clears left shield arm.
5. Lift left shield from assembly.

4-24. REMOVE/REPLACE PAPER SHIELD (CONT)

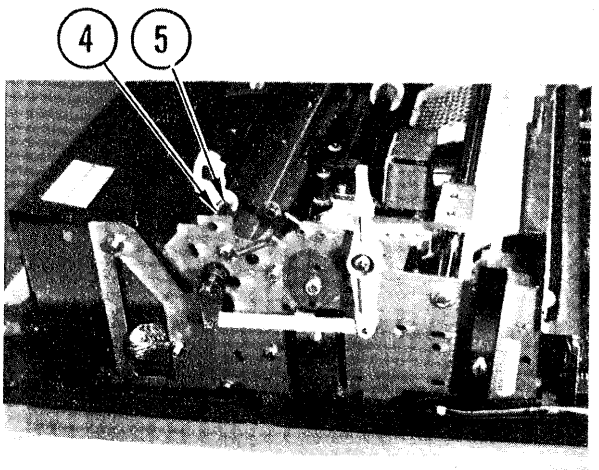


6. Slide shaft to left through assembly until it clears right shield arm.
7. Lift right shield from assembly.
8. Lift out paper shield.
   - If plastic spacers are being removed, go to step 9
   - If not, skip step 9
9. Remove right and left spacers from shield arms.



Replace

1. Set shield arms into position over shafts.
2. Replace retaining rings on both shield arm shafts.
3. If removed, replace plastic spacers.

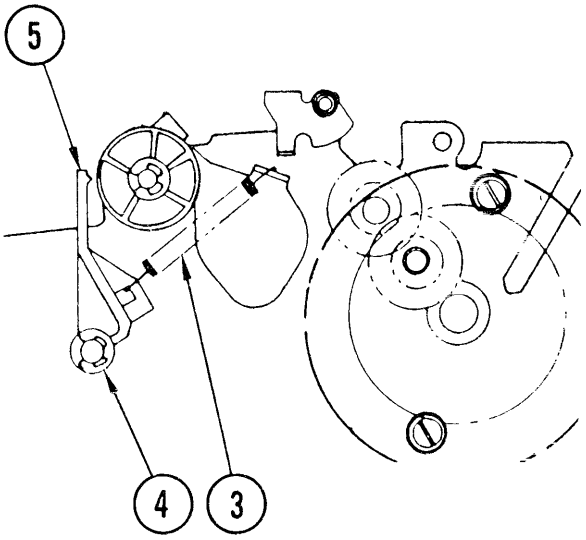


4. Insert roller shaft through holes in paper shield and shield arms.
5. Replace retaining rings on both ends of roller shaft.
6. Close up printer (para 4-11).

4-25. REMOVE/REPLACE DETENT

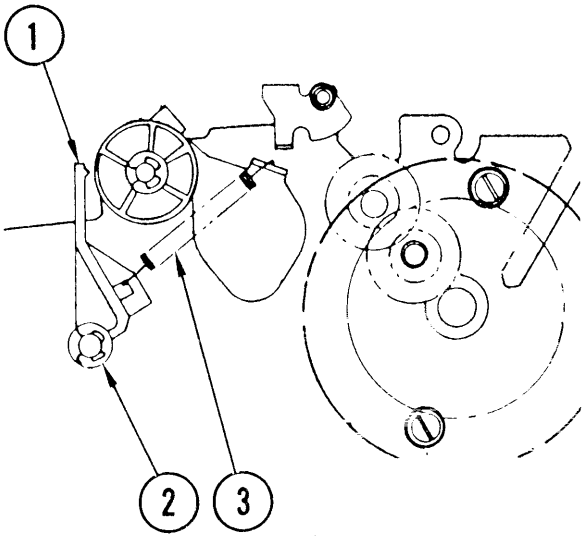
INITIAL SETUP

Common Tools
- Tool kit



Remove

1. Access printer (para 4-11).
2. Locate detent and spring on right hand side of printer.
3. Remove spring.
4. Remove retaining ring on detent shaft.
5. Slide off detent.



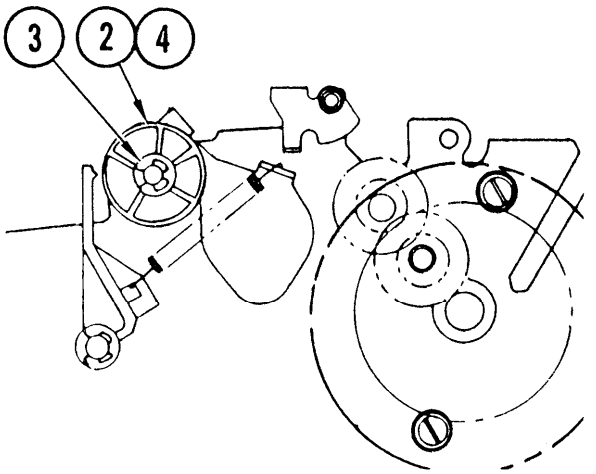
Replace

1. Slide detent on shaft.
2. Replace retaining ring on shaft.
3. Replace spring.
4. Close up printer (para 4-11).

4-26. REMOVE/REPLACE PAPER THICKNESS KNOB

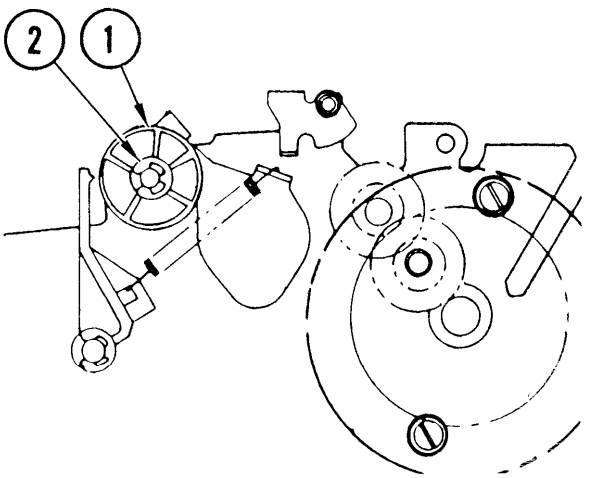
INITIAL SETUP

Common Tools
- Tool kit



Remove

1. Access printer (para 4-11).
2. Locate paper thickness knob on right hand side of printer.
3. Remove retaining ring from shaft.
4. Slide knob off shaft.



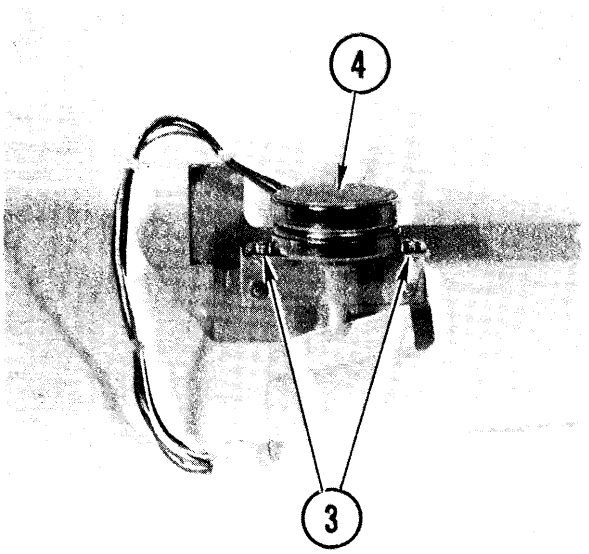
Replace

1. Slide paper thickness knob on shaft.
2. Replace retaining ring on shaft.
3. Close up printer (para 4-11).

4-27. REMOVE/REPLACE RIBBON DRIVE MOTOR

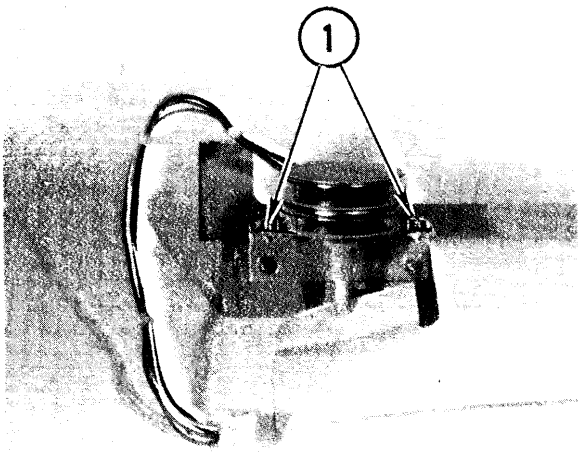
INITIAL SETUP

Common Tools
- Tool kit



Remove

1. Access printer (para 4-11),
2. Remove side frame support (para 4-21).
3. Remove screws and lockwashers securing ribbon drive motor to bracket on frame support.
4. Remove motor.



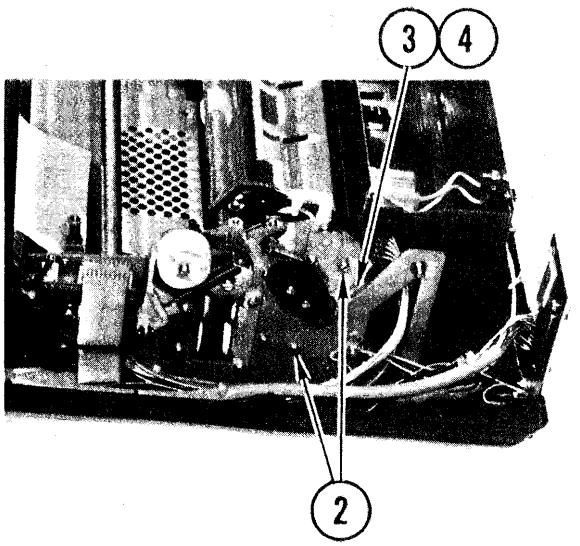
Replace

1. Secure ribbon drive motor to bracket on frame support with screws and lockwashers. Tighten.
2. Replace side frame support (para 4-21).

4-28. REMOVE/REPLACE PAPER STEPPER MOTOR

INITIAL SETUP

Common Tools
- Tool kit



Remove

1. Remove frame and drive assembly (para 4-23).
2. Remove screws and washers securing motor to frame.
3. Remove motor.
4. Retain motor spacer.

Replace

1. Mount and aline motor (para 4-29).
2. Replace frame and drive assembly (para 4-23).

4-29. ADJUST PAPER STEPPER MOTOR

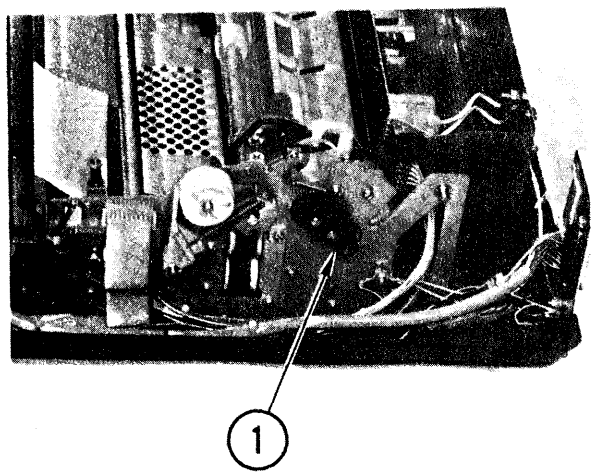
INITIAL SETUP

Common Tools	Special Tools
● Tool kit	● Alinement tool

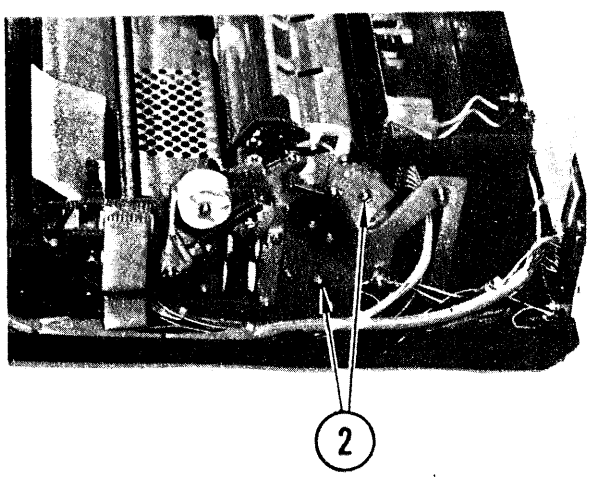
Adjust

CAUTION

Motor drive gear must be alined with intermediate gear to avoid binding and spacing of gears.

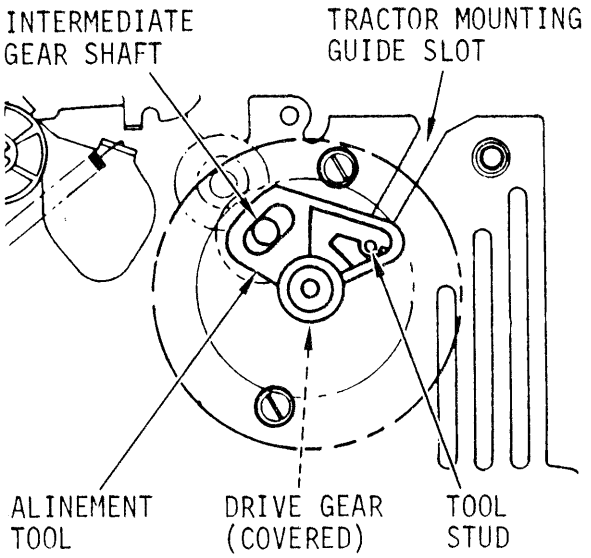


1. Position motor and motor spacer on inside of frame so drive gear meshes with intermediate gear.



2. Replace and tighten screws loosely.
3. Remove intermediate gear (para 4-50).

4-29. ADJUST PAPER STEPPER MOTOR (CONT)



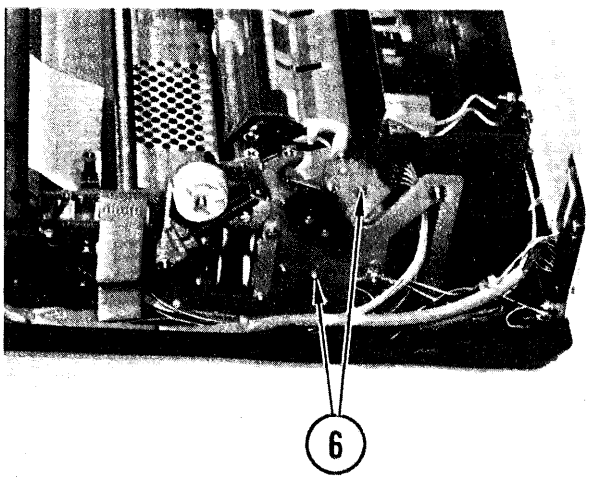
4. Position alinement tool so that:

   - Tool stud bottoms out in tractor mounting guide slot
   - Round recessed area of tool covers motor drive gear easily (loosen motor mounting screws if necessary)
   - Oblong opening in tool fits over intermediate gear shaft

5. Check adjustment. Alinement tool, with stud in mounting guide, should fit easily over drive gear and gear shaft. If not, repeat steps 4-5.

NOTE

Do not remove alinement tool until mounting screws are tightened.



6. Tighten screws.

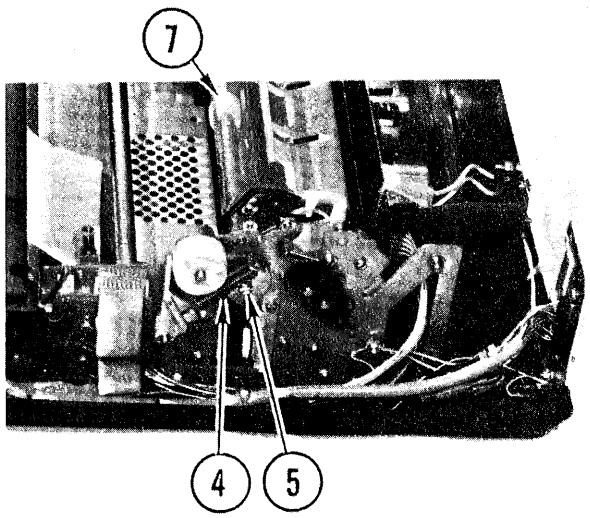
7. Remove alinement tool.

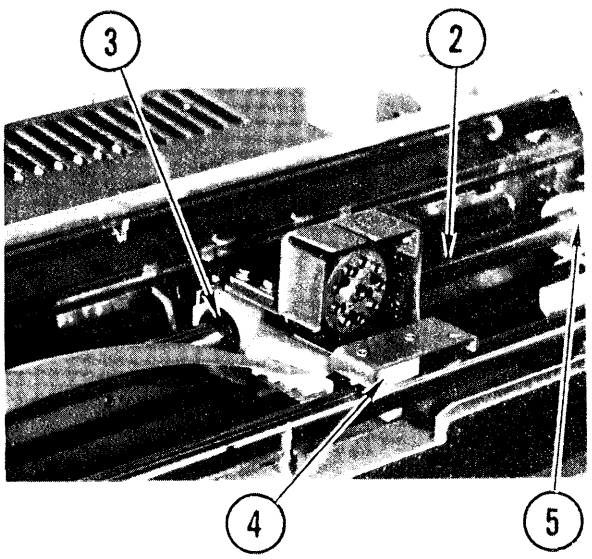
8. Replace intermediate gear (para 4-50, Replace, steps 1-5).

4-30. REMOVE/REPLACE CARRIAGE ASSEMBLY

INITIAL SETUP

Common Tools	Special Tools
● Tool kit	● Dowel pins





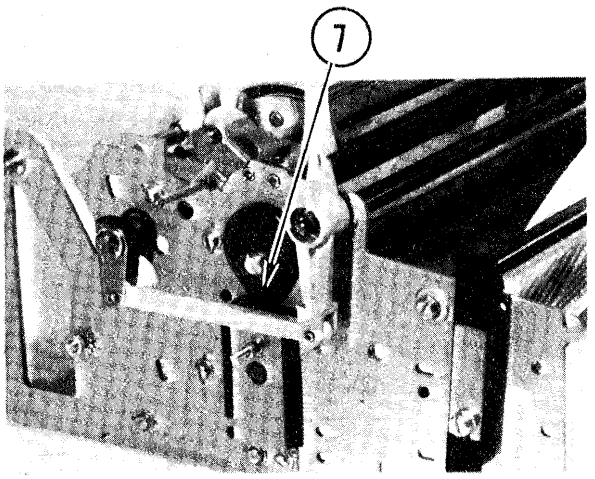
Remove

1. Access printer (para 4-11).
2. Remove print head (para 4-17, Remove, steps 3-10).
3. Remove carriage assembly left idler pulley (para 4-33, Remove, steps 3-7).
4. Remove spring from run-load lever on right side frame.
5. Remove screw from rear rail on right side and lift off run-load lever and right eccentric.
6. Slide rail to left, and lift up.
7. Remove right carriage bumper.
8. Remove carriage assembly drive belt (para 4-32, Remove, steps 3-5).
9. Remove carriage assembly from printer.
10. Slide ribbon cable out of groove in cartridge.

Replace

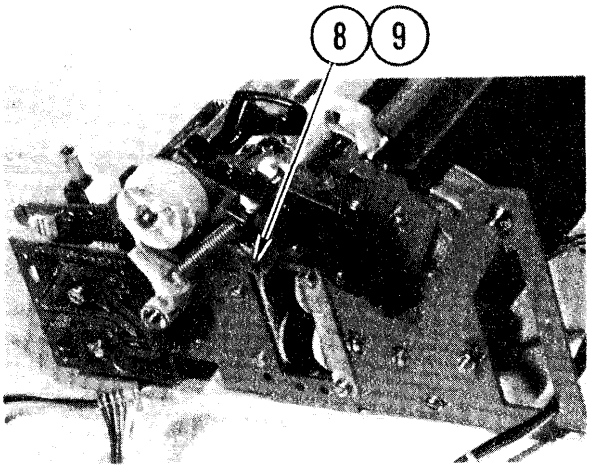
1. Replace carriage assembly drive belt (para 4-32, Replace, steps 1-2).
2. Slide rail to left and lift up.
3. Insert rail through holes in carriage assembly.
4. Mount carriage assembly clevis on front rail.
5. Place right carriage bumper on rear carriage rail.

4-30. REMOVE/REPLACE CARRIAGE ASSEMBLY (CONT)



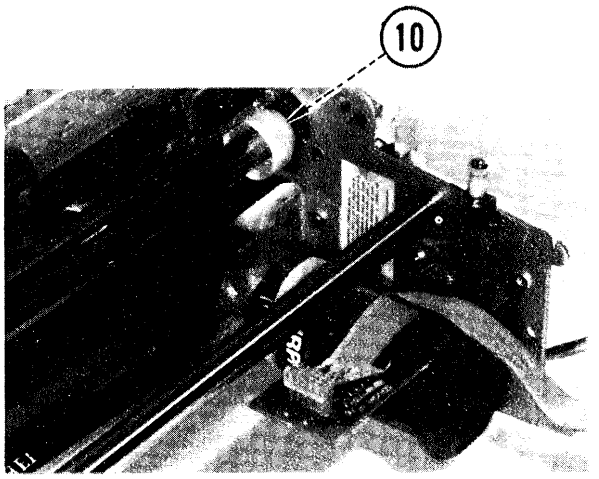
6. If run-load lever should separate from right eccentric, install on existing spring dowel pin.

7. Insert external dowel pin in hole in lobe of left side eccentric, and push pin through alinement hole in frame.



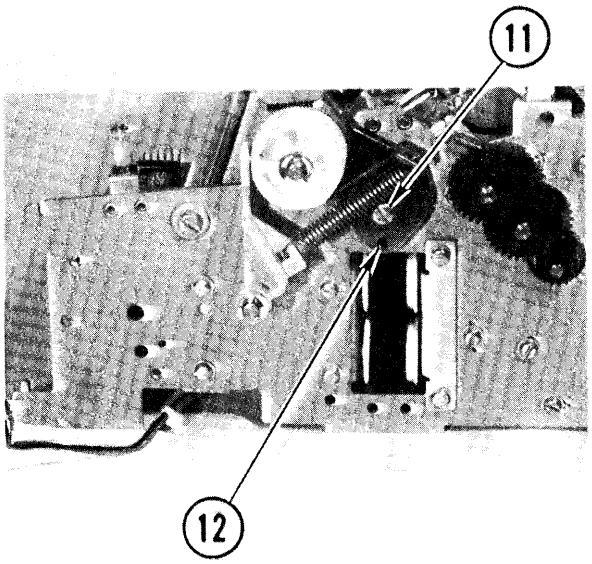
8. Insert external dowel pin in hole in lobe of right side eccentric.

9. Place right eccentric in mounting hole in frame, and push dowel pin through alinement hole in frame.



10. Position rail in eccentric.

4-30. REMOVE/REPLACE CARRIAGE ASSEMBLY (CONT)



11. Replace and tighten screw and washers, and replace spring.

12. Remove dowel pins from left and right eccentrics.

13. Replace side frame support (para 4-21, Replace, steps 1-6).

14. Replace control panel (para 4-12, Replace, steps 1-3).

15. Slide carriage assembly back and forth to observe centering of belts and pulleys and ease of carriage travel.

16. Place carriage against right side bumper.

17. Replace carriage assembly left idler pulley (para 4-33, Replace, steps 2-10).

18. Slide ribbon cable into groove on carriage.

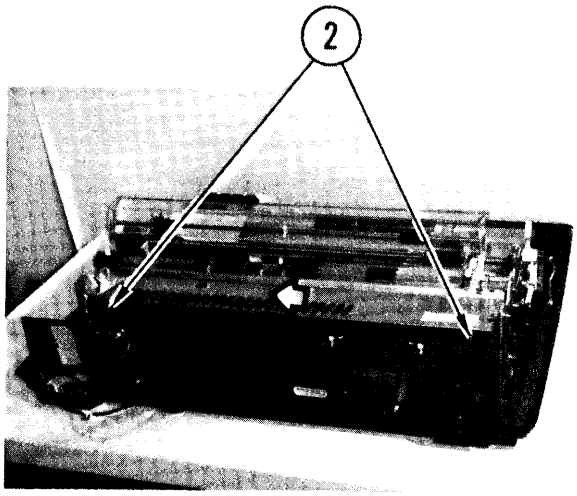
19. Replace print head (para 4-17).

4-31. CONVERT POWER SUPPLY FROM 117 V AC TO 220 V AC

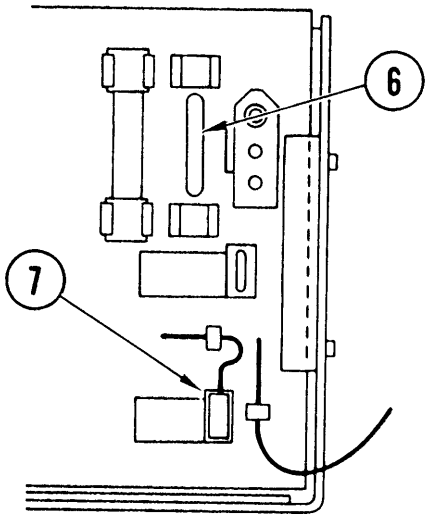
INITIAL SETUP

Common Tools
- Tool kit

Materials/Spare Parts
- 250 V, 2A fuse

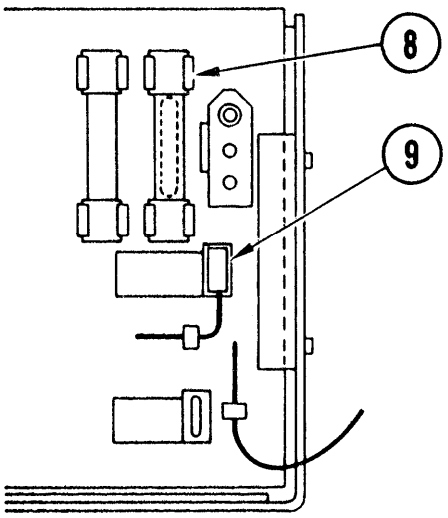


1. Access printer (para 4-11).
2. Loosen two screws securing power supply cover.
3. Lift cover up to unhook fasteners.
4. Slide cover in direction shown. Lift to remove.
5. Remove power supply board (para 4-43, Remove, steps 5-11).



6. Cut and remove jumper J1.
7. Unplug jumper J2 from 117 V ac slide connector.

4-31. CONVERT POWER SUPPLY FROM 117 V AC TO 220 V AC (CONT)



8. Install fuse in fuse clip F1.

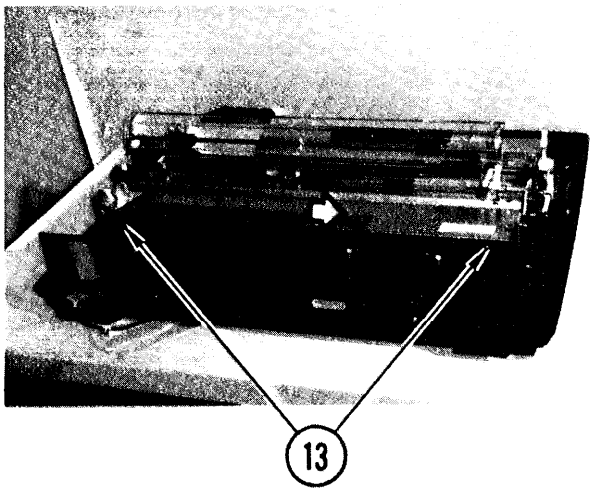
9. Install jumper J2 in the slide connector labeled 220 V ac.

CAUTION

Input voltage requirement must be plainly indicated on power supply to avoid damage to printer.

10. Indicate on a wire tag that power supply has been converted to 220 V ac, and attach to power supply cage.

11. Replace power supply board (para 4-43, Replace, steps 1-8).



12. Slide Dower supply cover into position, as shown.

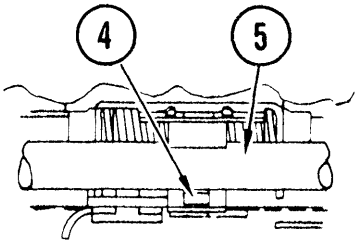
13. Tighten screws.

14. close up printer (para 4-11).

4-32. REMOVE/REPLACE CARRIAGE ASSEMBLY DRIVE BELT

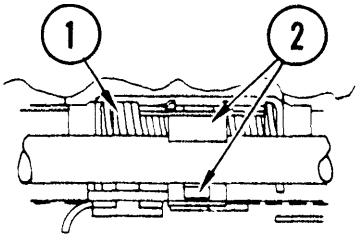
INITIAL SETUP

Common Tools	Special Tools
● Tool kit	● Belt tension gauge



Remove

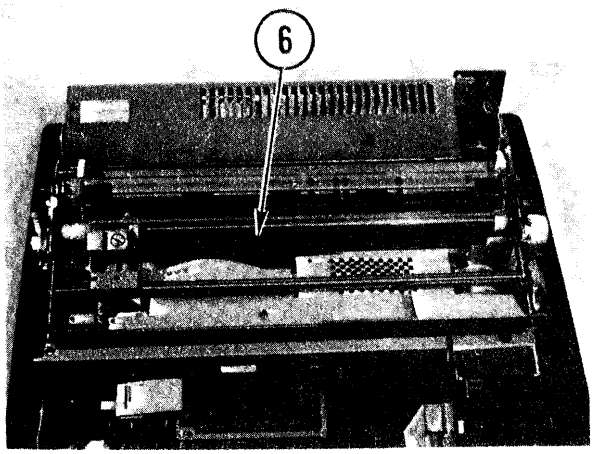
1. Remove carriage drive motor (para 4-34).
2. Remove carriage assembly left idler pulley (para 4-33, Remove, steps 3-7).
3. Lift up front of frame and drive assembly.
4. Pull off carriage belt mounting clip.
5. Pull off belt.



Replace

1. Place carriage drive belt in grooves on underside of carriage assembly.
2. Insert belt-mounting clip into slots on underside of carriage assembly.

4-32. REMOVE/REPLACE CARRIAGE ASSEMBLY DRIVE BELT (CONT)



3. Lower frame and drive assembly.

4. Replace carriage drive motor (para 4-34, Replace, steps 5-13).

5. Replace carriage assembly left idler pulley (para 4-33, Replace, steps 2-10).

6. Position belt tension gauge under top center of drive belt, and pull up till it touches the carriage drive rail.

   - If tension on belt is 16 oz., go to step 7
   - If tension on belt is less than 16 oz, replace belt

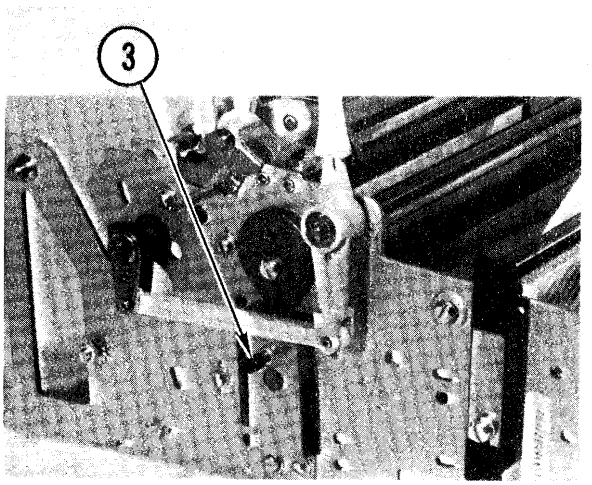
7. Replace frame and drive assembly (para 4-23).

4-33. REMOVE/REPLACE CARRIAGE ASSEMBLY IDLER PULLEYS

INITIAL SETUP

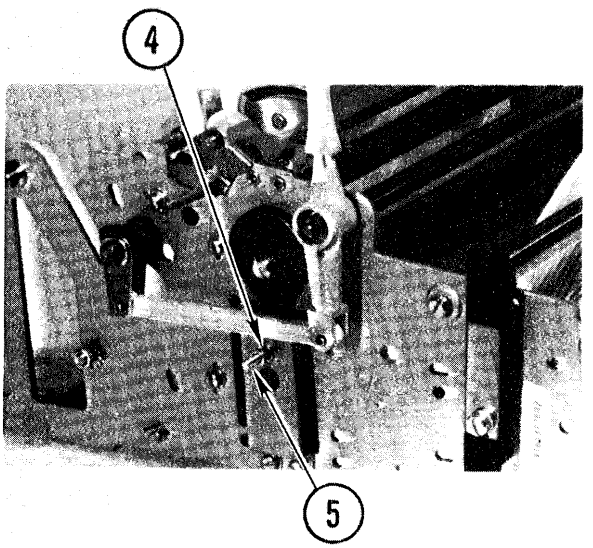
Common Tools
- Tool kit

Personnel Required
- Two



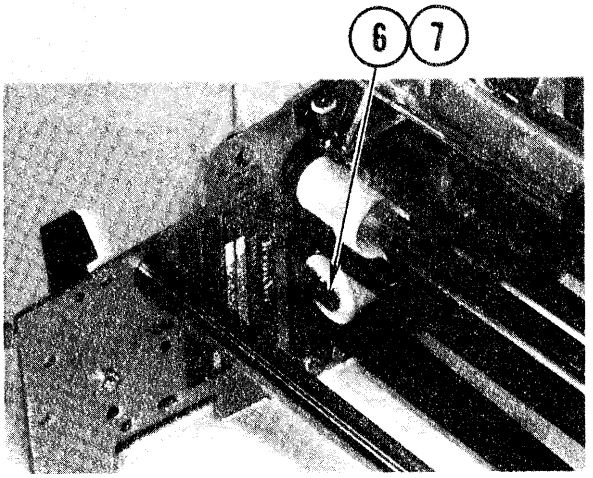
Remove

1. Access printer (para 4-11).
2. There are three idler pulleys.
   - If you are removing left idler pulley, do steps 3-7
   - If you are removing one or both right idler pulleys, do step 8
3. Remove plastic cap.



4. Loosen nut on tension screw.
5. Turn tension screw clockwise with fingers to loosen.

4-33. REMOVE/REPLACE CARRIAGE ASSEMBLY IDLER PULLEYS (CONT)



6. Lift out belt and pulley from spring bracket arms.

7. Remove pulley and shaft. Retain shaft.

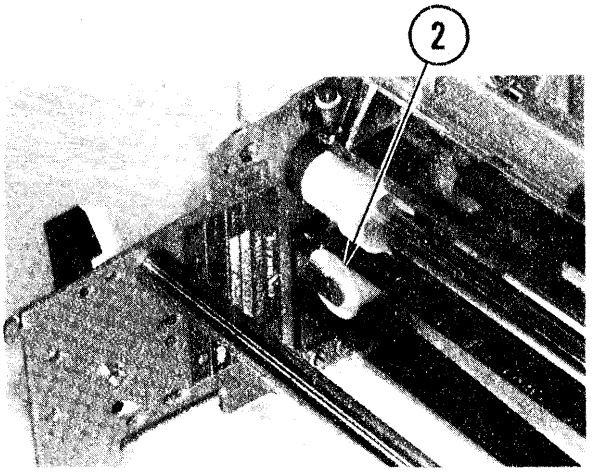
8. Remove carriage drive motor (para 4-34, Remove, steps 2-6).

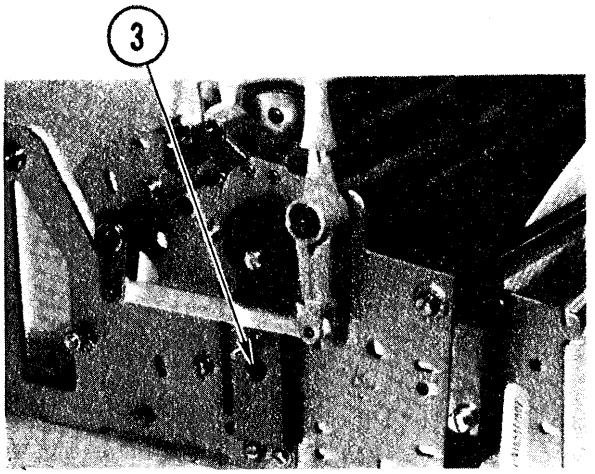
Replace

1. There are three idler pulleys.

   - If you are replacing left idler pulley, do steps 2-10 and 15-16
   - If you are replacing one or both right idler pulleys, do steps 12-16

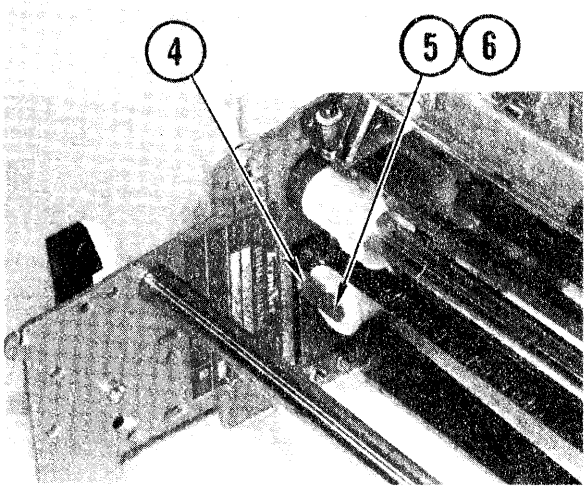
3. Hold pulley, shaft, and drive belt with one hand.





3. With other hand insert screwdriver through hole and press spring support to release tension until pulley shaft is over notches in spring support.

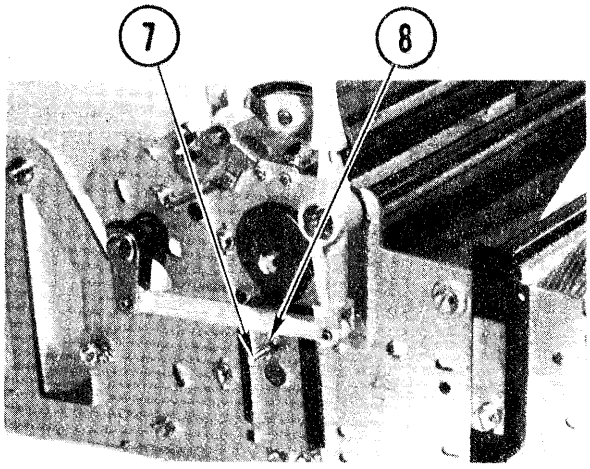
4-33. REMOVE/REPLACE CARRIAGE ASSEMBLY IDLER PULLEYS (CONT)



4. Ask your partner to spread apart one of the support arms with a long narrow screwdriver.

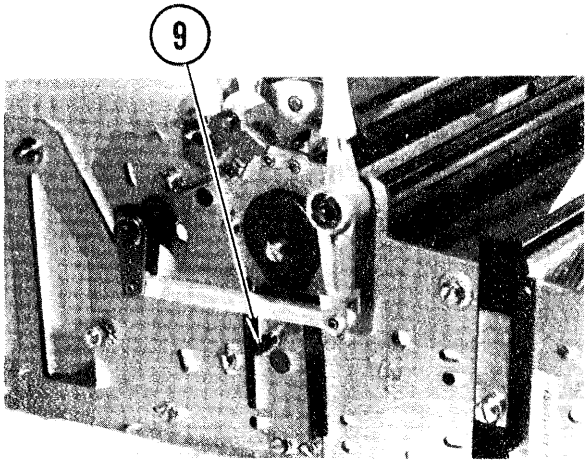
5. Insert the pulley shaft, with flanged edges in vertical position, into notches in support arm.

6. Snug down pulley shaft in support arm notches.



7. Turn tension screw counterclockwise with fingers to tighten.

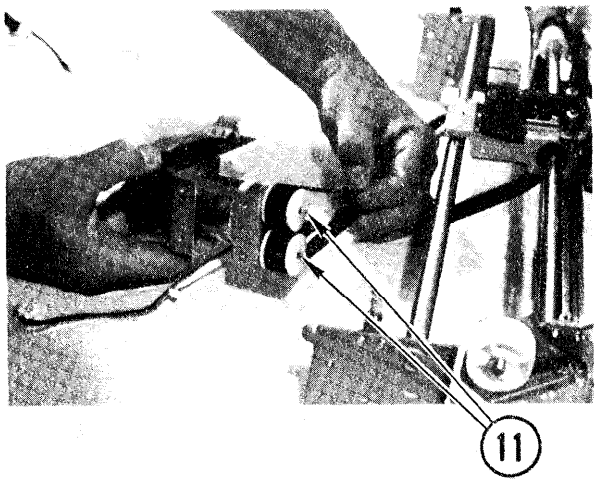
8. Tighten nut.



9. Replace plastic cap.

10. Check tension on carriage drive belt (para 4-32, Replace, step 6).

4-33. REMOVE/REPLACE CARRIAGE ASSEMBLY IDLER PULLEYS (CONT)



11. Place pulley(s) on shaft(s) attached to carriage drive motor mounting plate.

12. Replace carriage drive motor (para 4-34, Replace, steps 5-13).

13. Check tension on carriage drive belt (para 4-32, Replace, step 6).

14. Replace frame and drive assembly (para 4-23, Replace, steps 1-15).

15. Close up printer (para 4-11).

16. Run self test (para 3-12).

4-34. REMOVE/REPLACE CARRIAGE DRIVE MOTOR (WITH ENCODER ASSEMBLY)

INITIAL SETUP

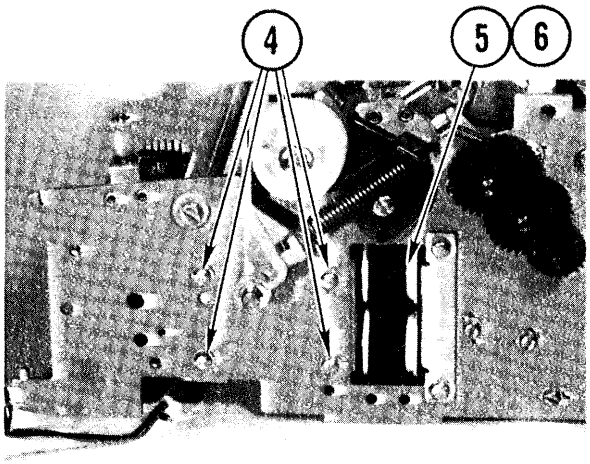
Common Tools
- Tool kit

CAUTION

Observe the following precautions when handling and storing carriage drive motor:

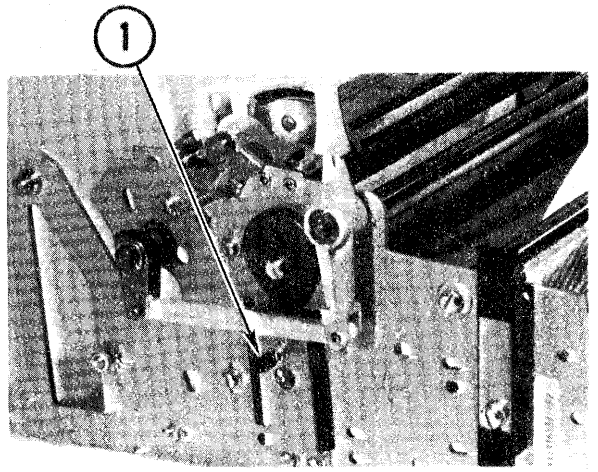
- Do not attempt any mechanical or electrical adjustment of the motor or encoder assembly (adjustments are factory set and secured in place)
- Do not jar or drop the encoder assembly. Dropping the encoder housing as little as two inches may change the servo motor settings

Remove



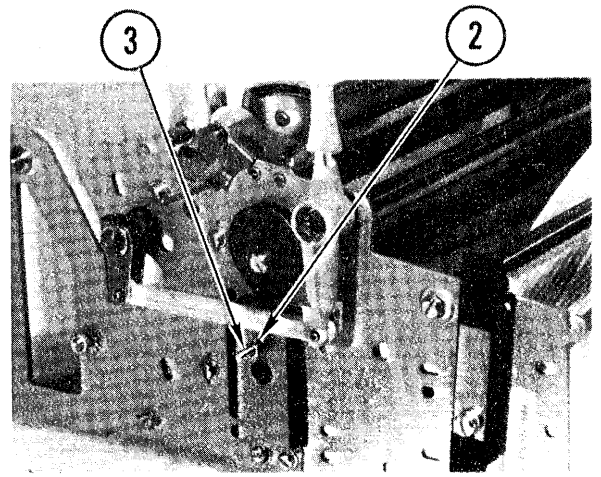
1. Access printer (para 4-11).
2. Remove frame and drive assembly (para 4-23).
3. Remove carriage servo drive board (para 4-36, Remove, steps 2-5).
4. Remove screws, lockwashers, and flat washers that mount the motor to right side of frame,
5. Slide carriage drive belt off motor pulleys,
6. Remove and retain pulleys.
7. Remove carriage drive motor and encoder assembly.

4-34. REMOVE/REPLACE CARRIAGE DRIVE MOTOR (WITH ENCODER ASSEMBLY) (CONT)



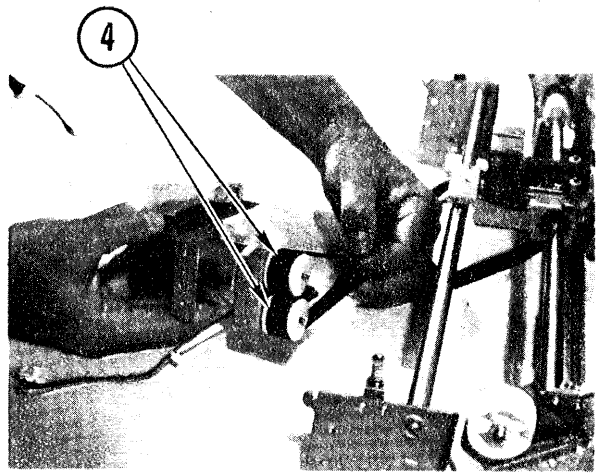
Replace

1. Remove plastic cap.



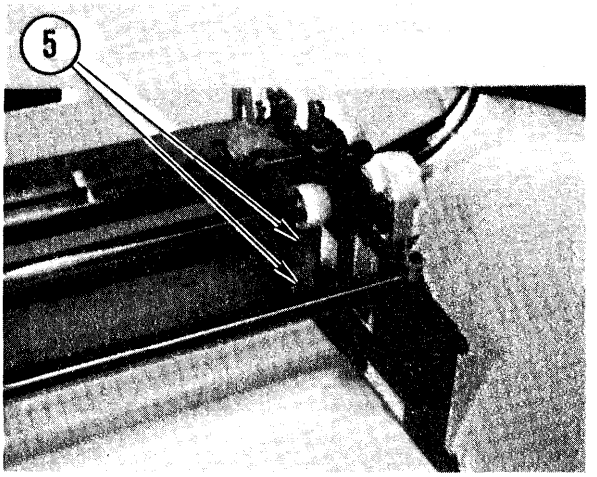
2. Loosen nut on tension screw.

3. Turn tension screw clockwise with fingers to loosen.

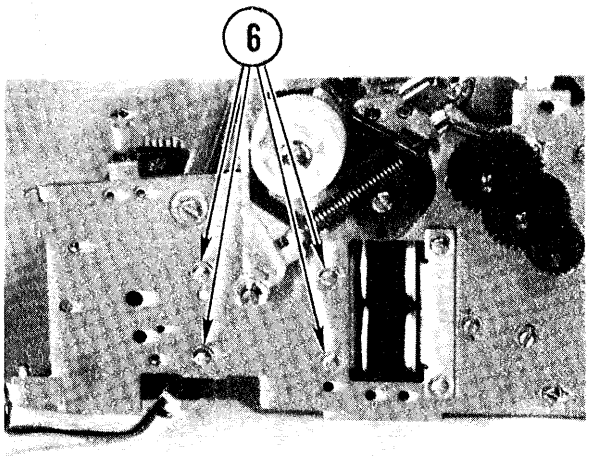


4. Replace pulleys on shafts, then place carriage drive belt around motor shaft and pulleys, as shown.

4-34. REMOVE/REPLACE CARRIAGE DRIVE MOTOR (WITH ENCODER ASSEMBLY) (CONT)



5. Place carriage drive motor and encoder assembly in position on frame. Make sure pulley shafts are inserted fully in holes on mounting plate.



6. Replace and tighten four mounting screws, lockwashers, and flat washers.

7. Replace left idler pulley (para 4-33, Replace, steps 7-10).

8, Replace carriage servo drive board (para 4-36, Replace, steps 1-4).

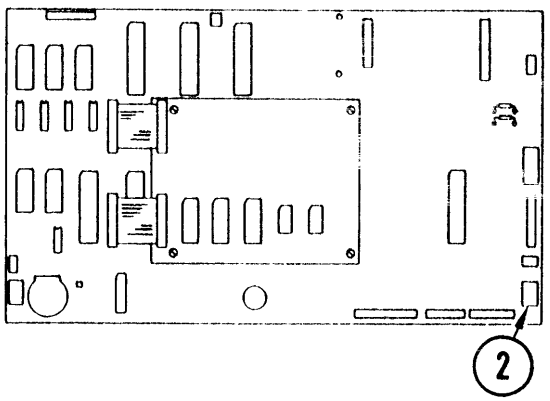
9. Replace frame and drive assembly (para 4-23).

4-35. REMOVE/REPLACE ENCODER CABLE ASSEMBLY

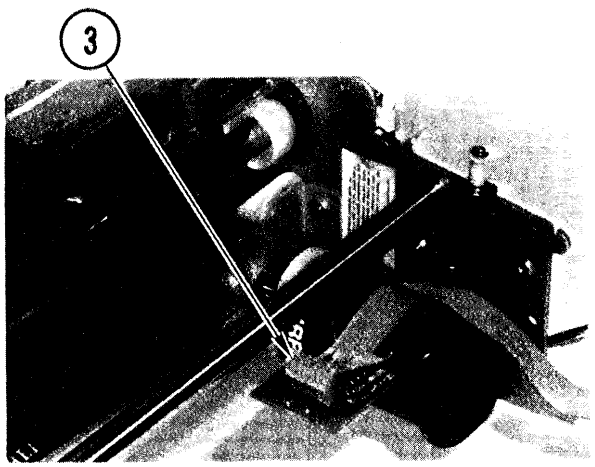
INITIAL SETUP

Common Tools
- Tool kit

Remove

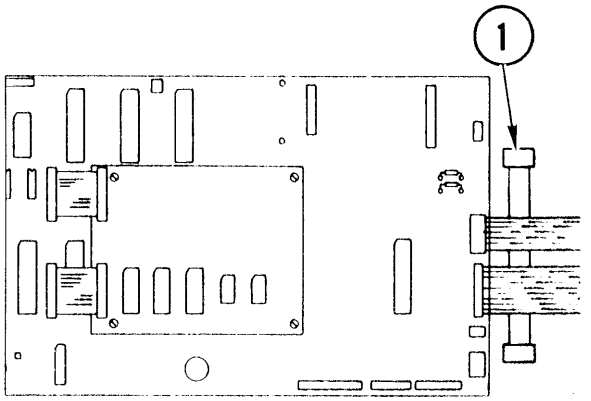


1. Remove side frame support (para 4-21).
2. Disconnect cable connector P4 on logic board.



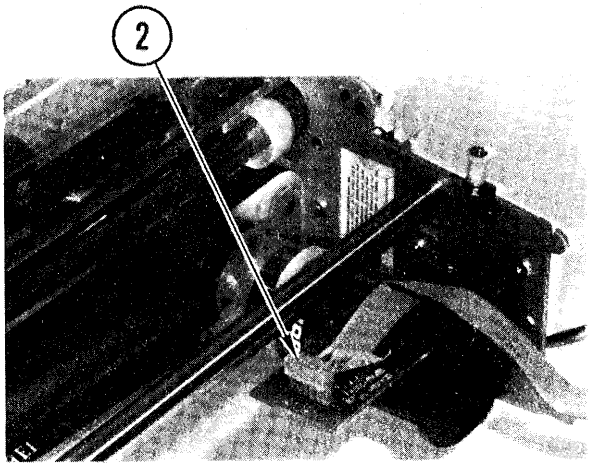
5. Disconnect cable connector PI on encoder board.
4. Remove cable from printer.

4-35. REMOVE/REPLACE ENCODER CABLE ASSEMBLY (CONT)

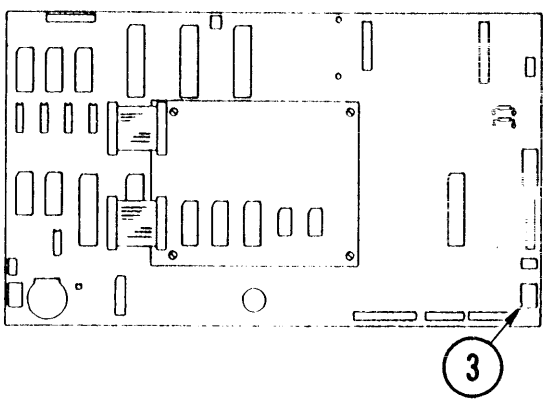


Replace

1. Feed encoder J1 connector and cable under connector cables P7 and P12 to encoder board.



2. Connect J1 to P1 connector of encoder board.



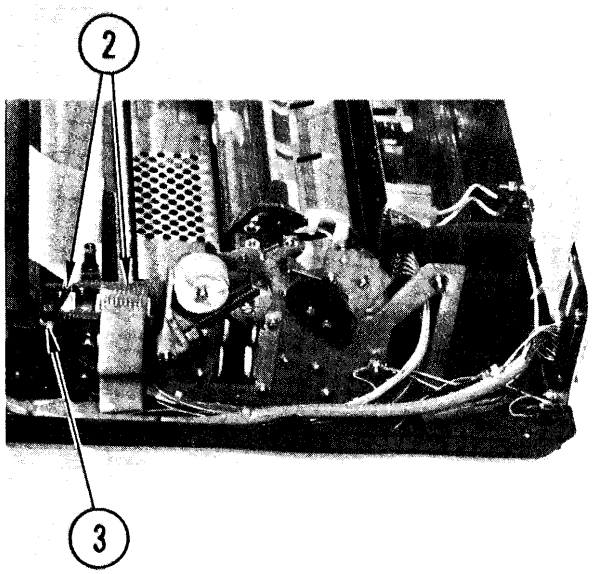
3. Connect J4 connector and protective cover to P4 on logic board.

4. Replace side frame support (para 4-21).

4-36. REMOVE/REPLACE CARRIAGE SERVO DRIVE BOARD (T3SD/1)

INITIAL SETUP

Common Tools	Materials/Spare Parts
● Tool kit	● Tie wraps

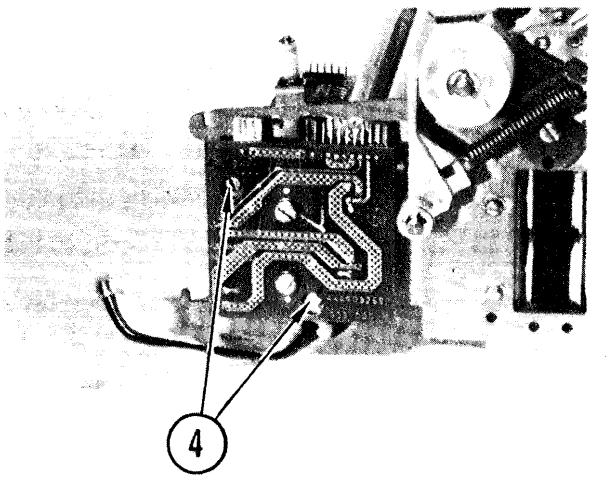


Remove

1. Access printer (para 4-11).
2. Disconnect cable connectors from upper left and right edges of the carriage servo drive board.
3. Cut tie wrap. Pull cable away from board.

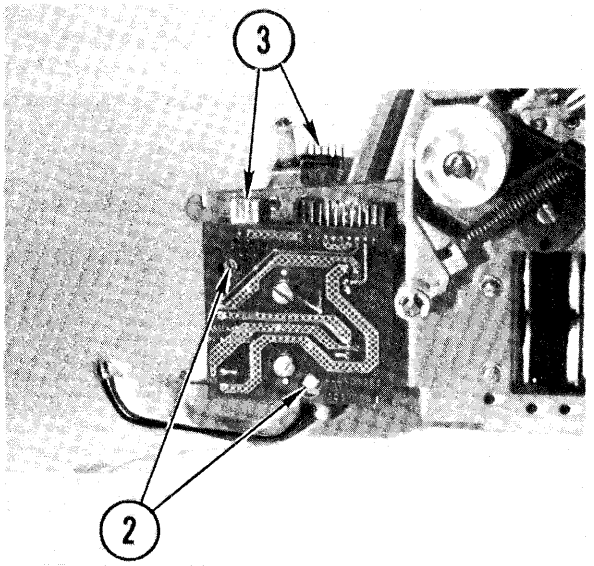
CAUTION

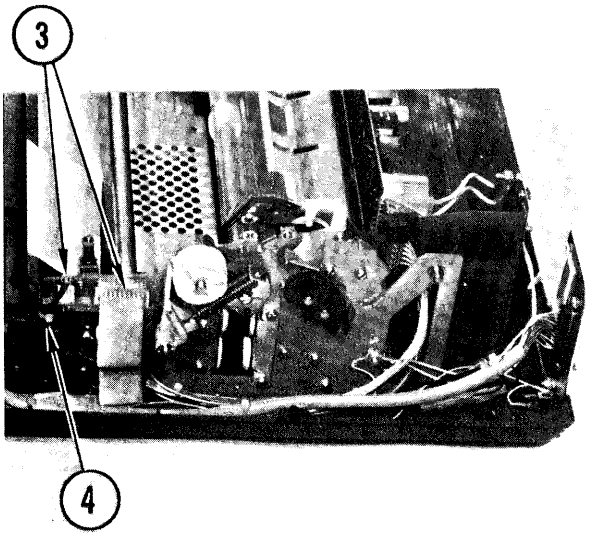
Board must not be Separated from heat sink to which it is attached. Take care to remove correct screws. (Do not remove screws on board).



4. Insert screwdriver through holes in board. Remove screws and washers.
5. Remove board from printer.

4-36. REMOVE/REPLACE CARRIAGE SERVO DRIVE BOARD (T3SD/1) (CONT)





Replace

1. Position board with heatsink against printer frame.
2. Replace and tighten screws and washers.
3. Connect cable connectors to upper left and right edges of board.
4. Install tie wrap.
5. Close up printer (para 4-11).
6. Run self test (para 3-12).

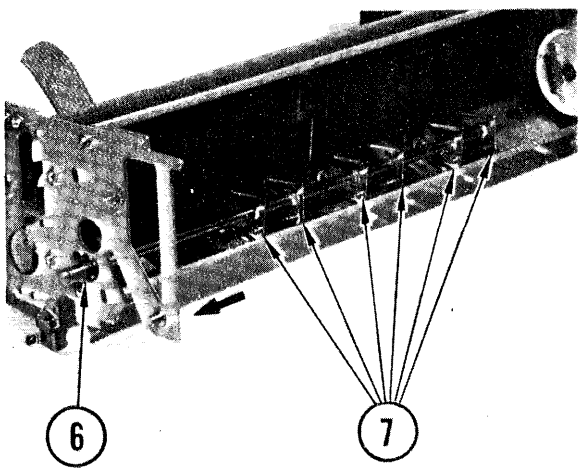
4-37. REMOVE/REPLACE PAPER PAN ASSEMBLY

INITIAL SETUP

Common Tools
- Tool kit

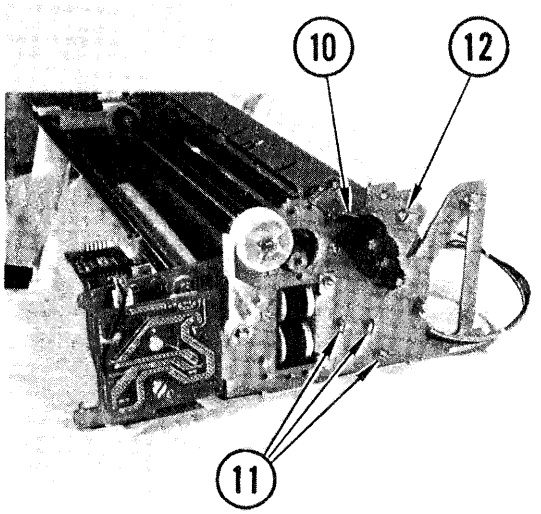
Remove

1. Remove paper shield (para 4-24 Remove, steps 1-6).
2. Remove print head (para 4-17, Remove, steps 3-10).
3. Remove frame and drive assembly (para 4-23, Remove, steps 2-16).
4. Remove paper roller lever assembly (para 4-40, Remove, steps 2-5).
5. Turn frame and drive assembly upside down.



6. Remove retaining rings on pressure roller rod, one on each side of left side frame.
7. Carefully work rod out through pressure roller arms in direction shown. Pull rod out through left side frame.
8. Remove carriage assembly (para 4-30, Remove, steps 3-7).
9. Lift guide rail out of printer.

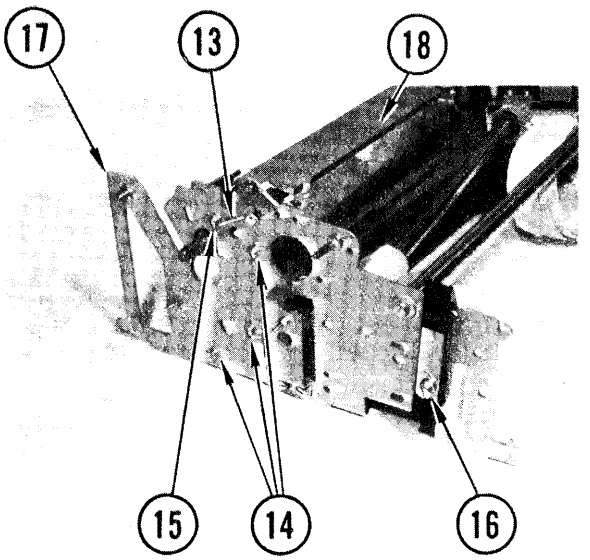
4-37. REMOVE/REPLACE PAPER PAN ASSEMBLY (CONT)



10. On right side frame, remove spring.

11. On outer side of right side frame, remove three screws, washers, and mounting plates attaching paper pan assembly to frame.

12. Remove screw, washer, spring retainer, and mounting plate.



13. On left side frame, remove spring.

14. On outer side of left side frame, remove three screws, washers, and mounting plates attaching paper pan assembly to frame.

15. Remove screw, washer, spring retainer, and mounting plate.

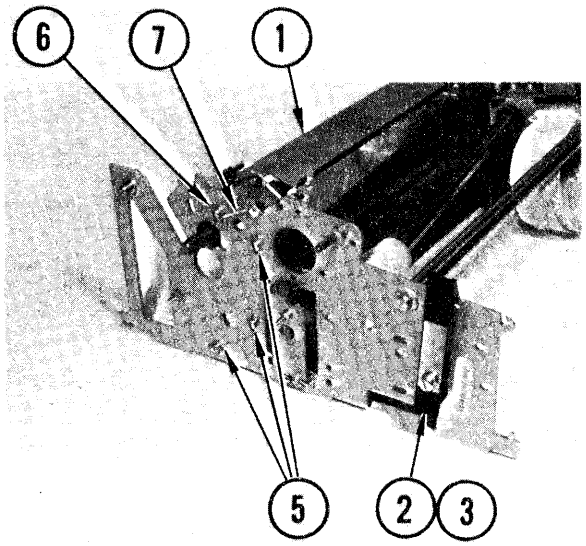
16. Remove screw and washer from front rail.

17. Carefully pull left side frame away from paper pan assembly mounting tabs.

18. Lift paper pan assembly out of mounting slots in right side frame.

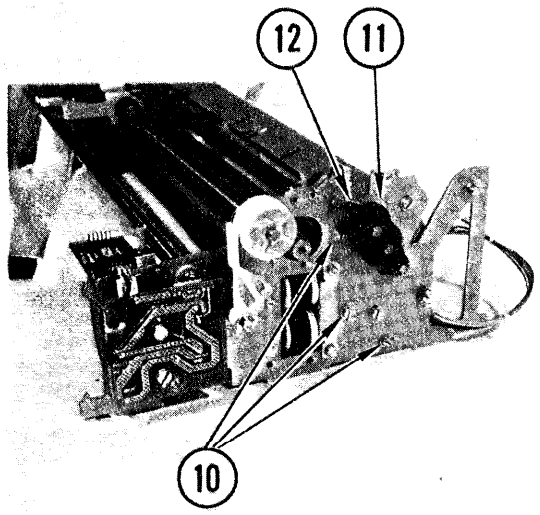
19. Lift paper pan assembly out of frame and drive assembly.

4-37. REMOVE/REPLACE PAPER PAN ASSEMBLY (CONT)



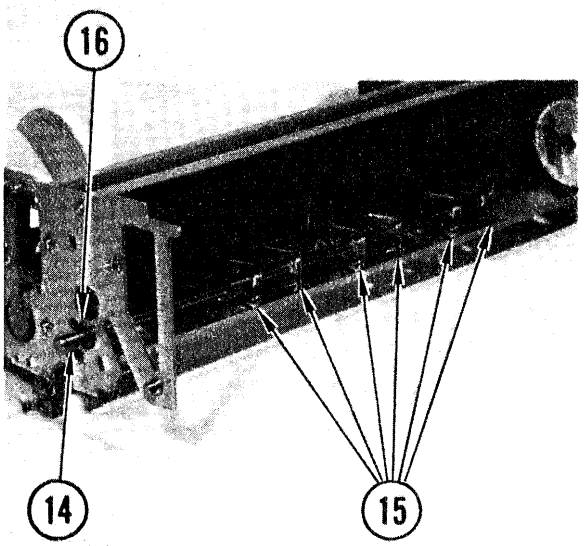
Replace

1. Position paper pan assembly between left and right side frames of the frame and drive assembly.
2. Insert front rail into inner recessed area of left side frame.
3. Replace and tighten screw and washer.
4. Insert mounting tabs of paper pan assembly into openings in left side frame.
5. Insert and tighten three mounting plates, screws, and washers.
6. Insert and tighten mounting plate, screw, flat washer, and spring retainer.
7. Attach spring.



9. Insert mounting tabs of paper pan assembly into openings in right side frame.
10. Insert and tighten three mounting plates, screws, and washers.
11. Insert and tighten mounting plate, screw, flat washer, and spring retainer.
12. Attach spring.
13. Turn frame and drive assembly upside down.

4-37. REMOVE/REPLACE PAPER PAN ASSEMBLY (CONT)



14. Insert pressure roller rod through opening In left side frame. Make sure 1/2-inch flat edge is on left side of rod.

15. Carefully work rod through pressure roller arms, Make sure pressure rollers remain in place.

16. Replace retaininq rings on pressure roller rod, one on each side of left side frame.

17. Replace carriage assembly left idler pulley (para 4-33, Replace, steps 2-10).

18. Insert guide rail through opening in left side frame.

19. Replace carriaqe assembly (para 4-30, Replace, steps 3-12).

20. Replace paper roller lever assembly (para 4-40, Replace, steps 1-3).

21. Replace frame and drive assembly (para 4-23).

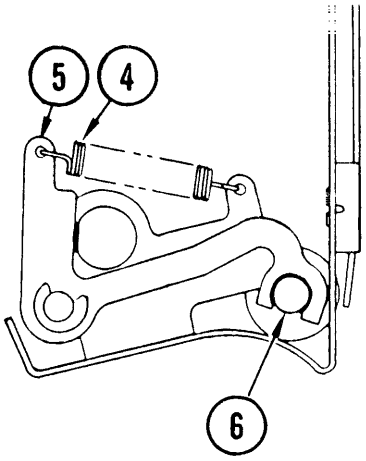
22. Replace paper shield (para 4-24, Replace, steps 1-5).

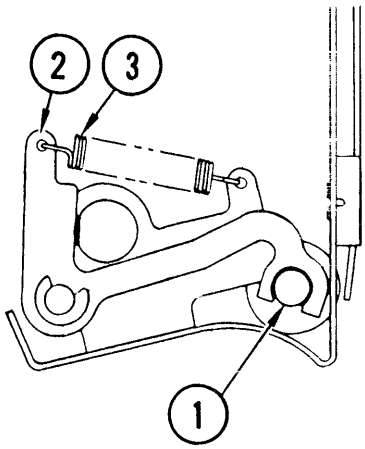
23. Replace print head (para 4-17).

4-38. REMOVE/REPLACE PRESSURE ROLLER ASSEMBLY

INITIAL SETUP

Common Tools
- Tool kit





Remove

1. Access printer (para 4-11).
2. Remove frame and drive assembly (para 4-23, Remove, steps 2-10).
3. Turn frame and drive assembly over to provide access to the pressure rollers.
4. Disconnect springs at ends of arms.
5. Rotate arms to free roller.
6. Remove rollers by lifting out at an angle.

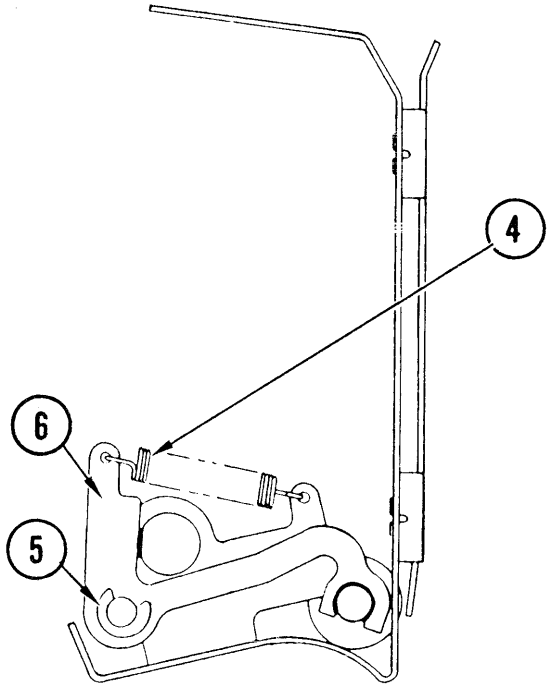
REPLACE

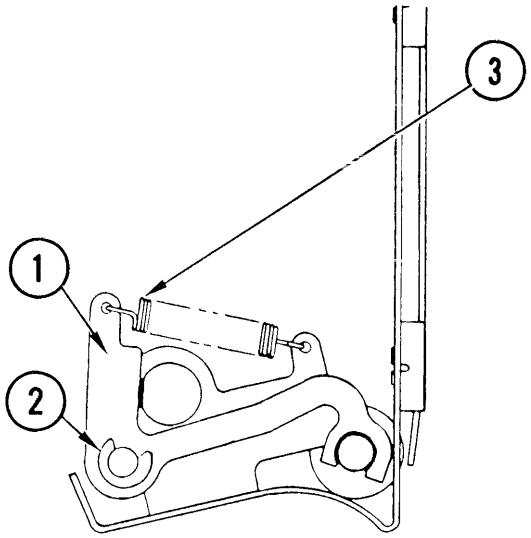
1. Place roller assemblies in the openings of the paper pan.
2. Rotate arms to engage roller assembly shafts.
3. Reattach springs to ends of arms.
4. Turn frame and drive assembly to upright position.
5. Replace frame and drive assembly (para 4-23).

4-39. REMOVE/REPLACE PRESSURE ROLLER ARM

INITIAL SETUP

Common Tools
- Tool kit





Remove

1. Access printer (para 4-11).
2. Remove frame and drive assembly (para 4-23, Remove, steps 2-10).
3. Turn frame and drive assembly upside down.
4. Disconnect springs from pressure roller arms.
5. Remove retaining rings holding the arms to the rod.
6. Remove arms from printer.

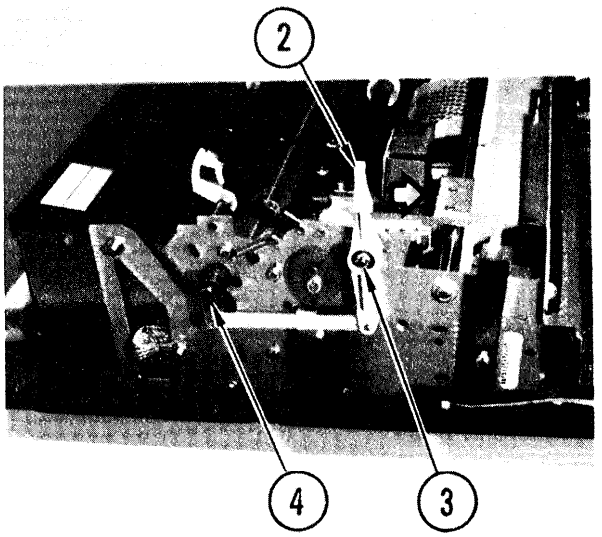
Replace

1. Replace arms on the rod. Make sure oressure roller shafts are engaged.
2. Replace retaining rings on rod.
3. Reconnect springs to arms.
4. Replace frame and drive assembly (para 4-23).

4-40. REMOVE/REPLACE ROLLER LEVER ASSEMBLY

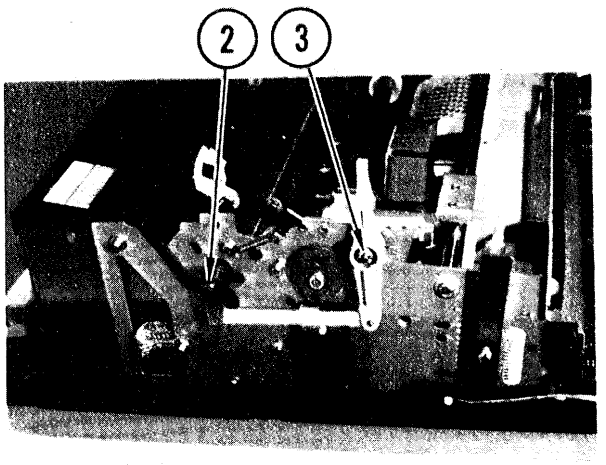
INITIAL SETUP

Common Tools
- Tool kit



Remove

1. Access printer (para 4-11).
2. Position paper roller lever as shown.
3. Remove retaining ring on paper roller lever shaft.
4. Remove outer retaining ring on rear shaft of paper roller lever assembly.
5. Slide paper roller lever assembly off shafts.



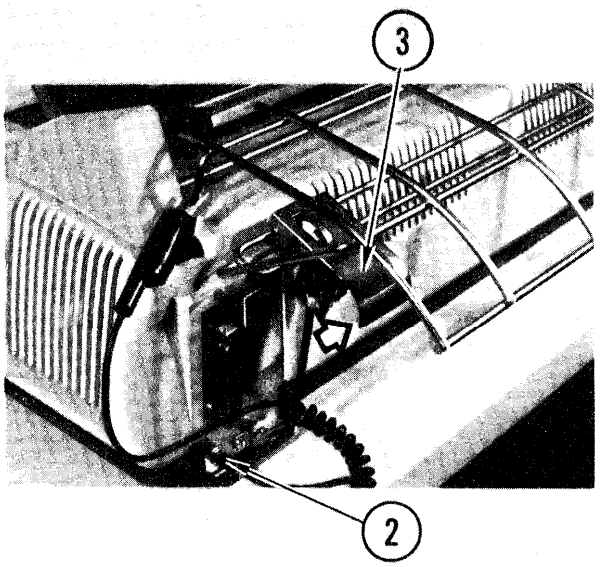
Replace

1. Slide paper roller lever assembly onto shafts.
2. Replace retaining ring on rear shaft of paper roller lever assembly.
3. Replace retaining ring on paper lever shaft of paper roller lever assembly.
4. Close Up printer (para 4-11).

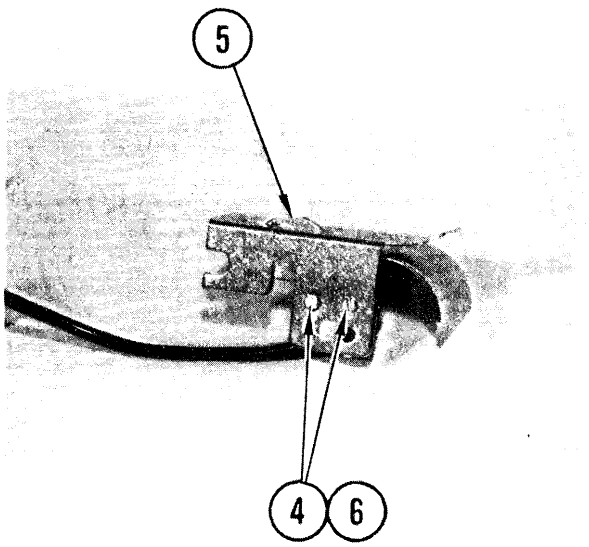
4-41. ADJUST PAPER OUT SWITCH

INITIAL SETUP

Common Tools
- Tool kit

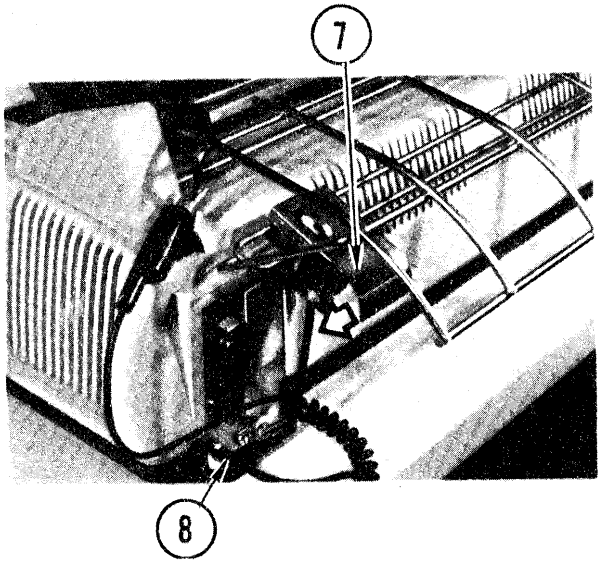


1. Remove paper.
2. Unplug jack.
3. Lift paper guide up and out. Remove from paper rack.



4. Loosen two screws.
5. Adjust switch so that highest point of switch finger protrudes 3/16 in. above bracket slot.
6. Tighten two screws.

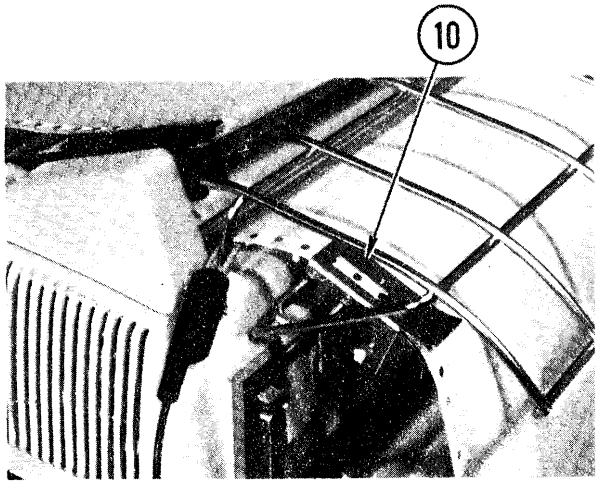
4-41. ADJUST PAPER OUT SWITCH (CONT)



7. Attach paper guide to paper rack.

8. Plug in jack.

9. Install three paper forms in printer.



10. Make sure paper holds down paper switch finger.

NOTE

It may be necessary, after maintenance on the paper out switch and harness assembly, to reset the paper out switch strap option. See your system manual for strapping instructions.

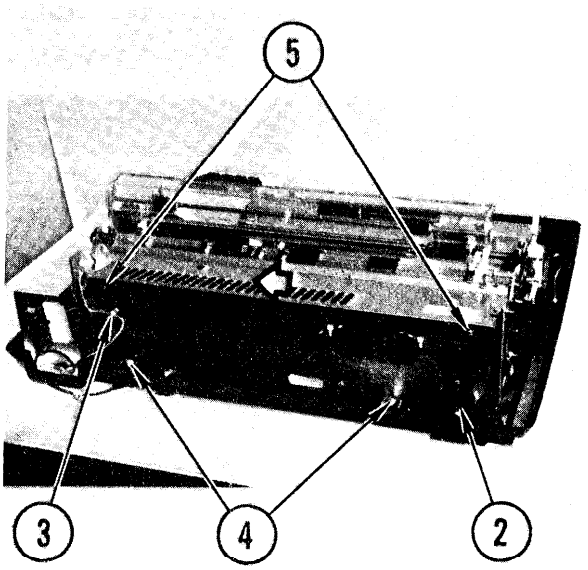
11. Run self test (para 3-12). Check that P-O is displayed on status indicator when paper runs out. If not, troubleshoot printer.

12. Install paper.

4-42. REMOVE/REPLACE POWER SUPPLY ASSEMBLY

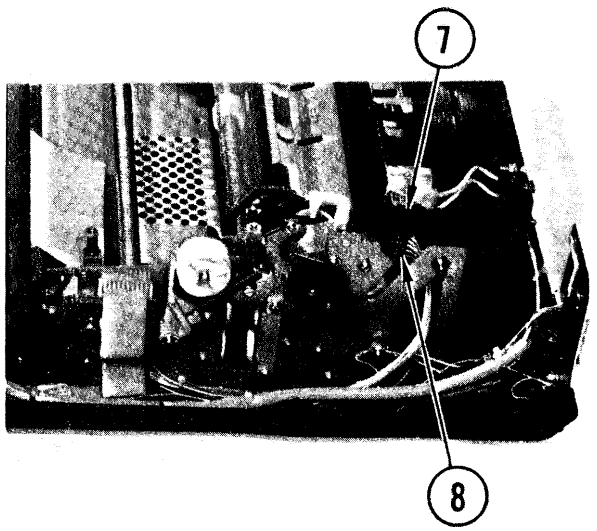
INITIAL SETUP

Common Tools
- Tool kit



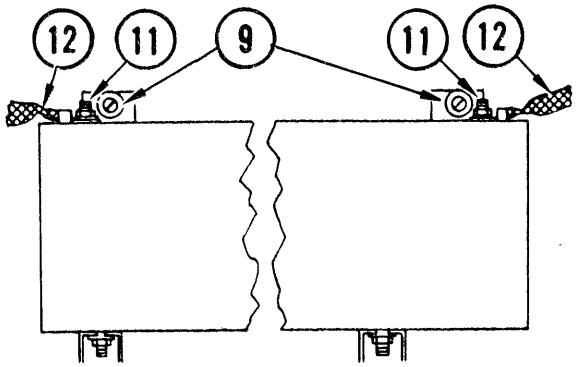
Remove

1. Access printer (para 4-1 1).
2. Pull ac plug from outlet.
3. Remove nut. Slide off ground wires and washers.
4. Loosen nuts.
5. Loosen screws.
6. Lift up and slide cover in direction shown.' Remove cover.



7. Lift off protective bracket.
8. Disconnect cable connector P2 on power supply board.

4-42. REMOVE/REPLACE POWER SUPPLY ASSEMBLY (CONT)



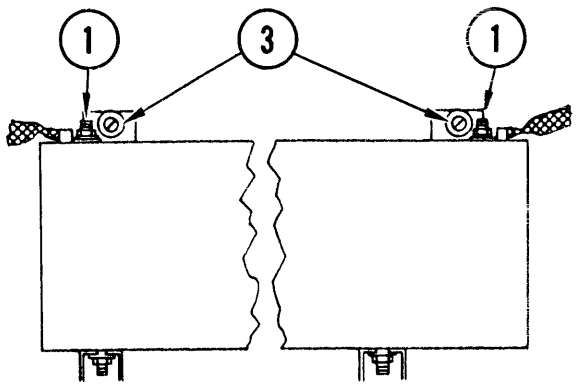
9. Loosen screws at outside forward corners of power supply assembly until power supply assembly can be lifted.

10. Lift power supply assembly to provide access to RF cable attachment nuts.

11. Loosen RF cable attachment nuts.

12. Slip off cables.

13. Lift out power supply assembly.

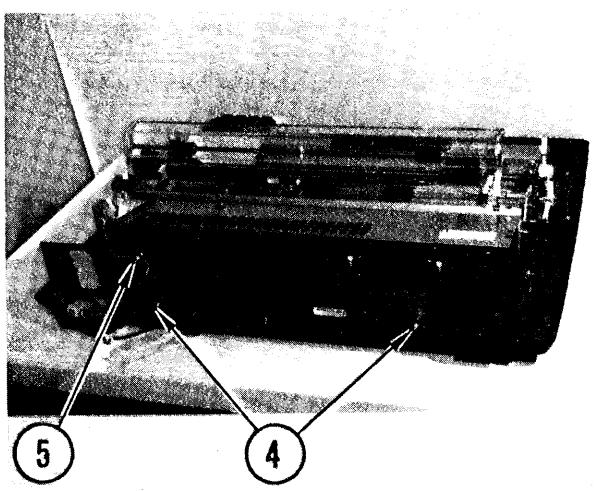


Replace

1. Place RF cables on studs on front of power supply assembly. Tighten nuts.

2. Lower power supply assembly into place.

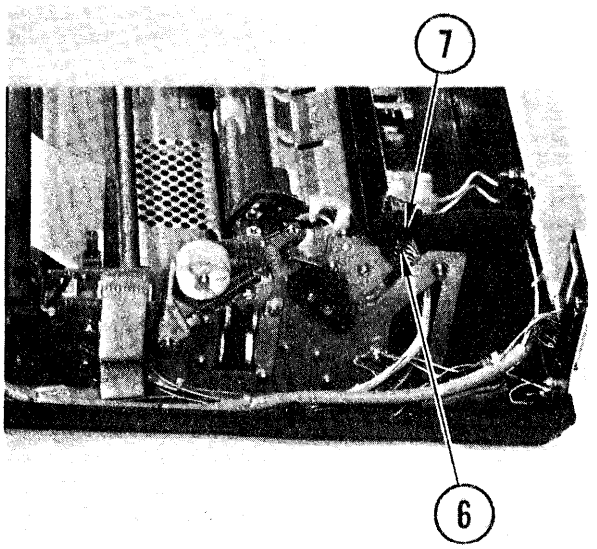
3. Tighten front corner mounting screws.



4. Tighten nuts on rear corner mounting screws. Do not overtighten.

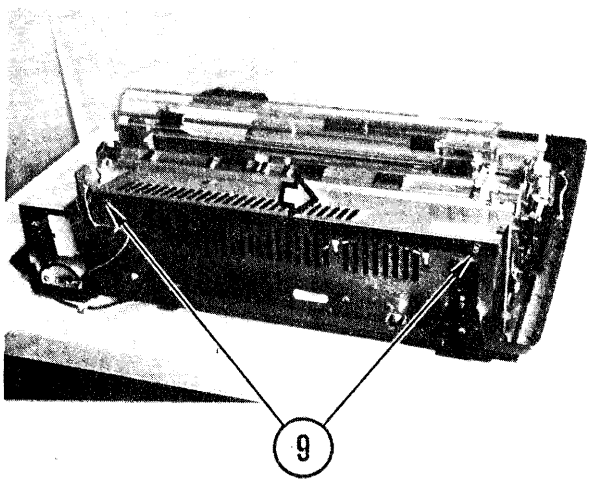
5. Replace ground wires, washers, and nut on ground stud. Tighten.

4-42. REMOVE/REPLACE POWER SUPPLY ASSEMBLY (CONT)



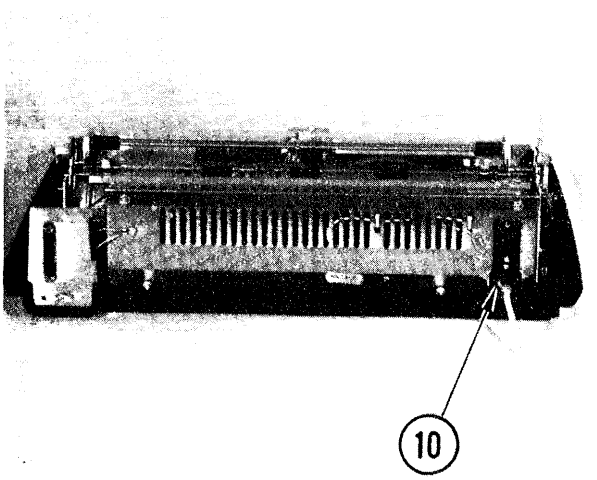
6. Connect cable connector P2 on power supply board.

7. Replace protective bracket.



8. Slide cover in direction shown, and press down to close.

9. Tighten screws.



10. Push in ac plug.

11. Close up printer (para 4-11).

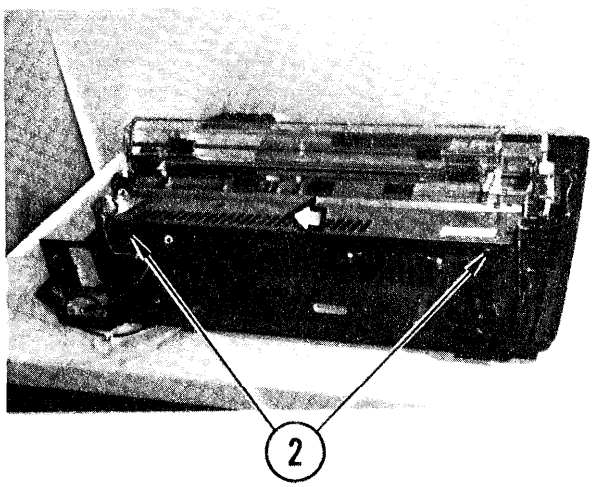
12. Run self test (para 3-12).

4-430 REMOVE/REPLACE POWER SUPPLY BOARD (PPS/2)

INITIAL SETUP

Common Tools
- Tool kit

Materials/Spare Parts
- Tags
- Pen or pencil

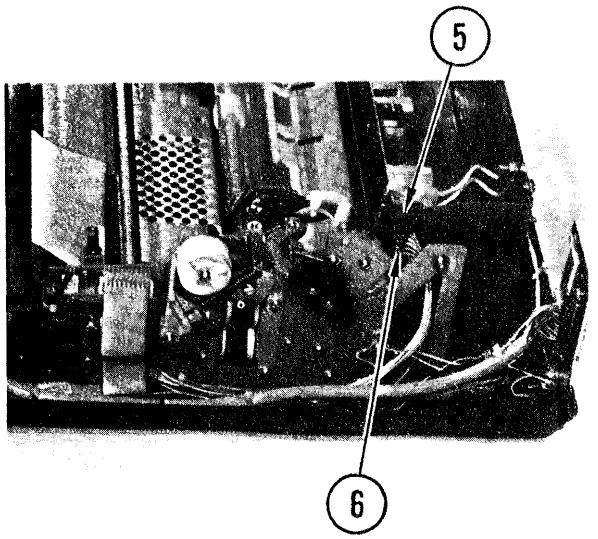


Remove

1. Access printer (para 4-11).
2. Loosen two screws.
3. Lift up and slide cover in direction shown.
4. Lift off cover.

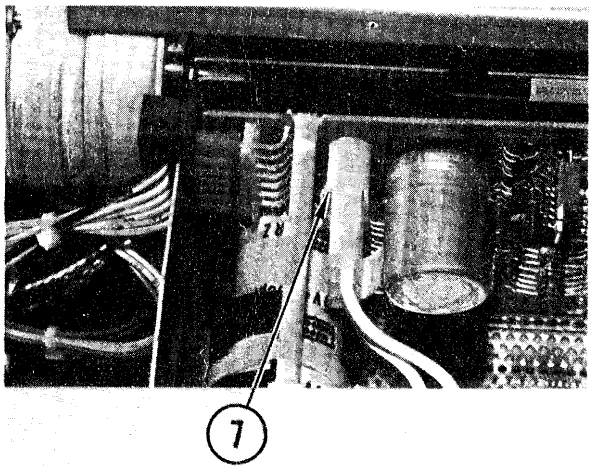
WARNING

Capacitors may retain dangerous voltage even after printer is powered OFF. Discharge capacitors before performing maintenance near them.

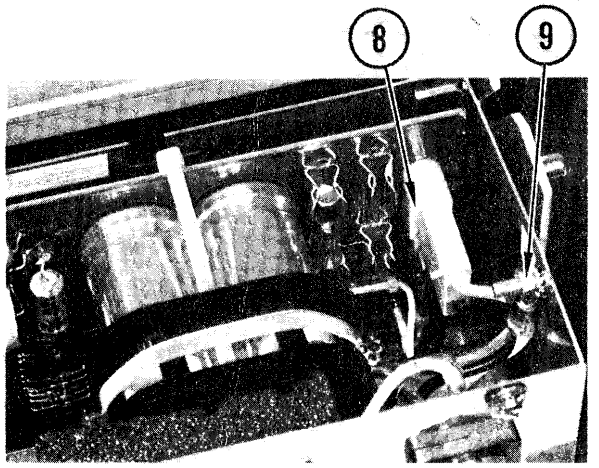


5. Lift off protective bracket.
6. Tag and disconnect P2 connector from power supply board.

4-43. REMOVE/REPLACE POWER SUPPLY BOARD (PPS/2) (CONT)

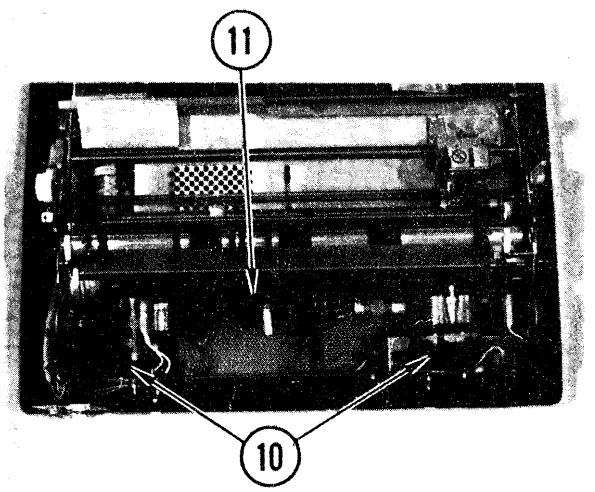


7. Pull out on locking edge of holddown wafer, and disconnect cable connector P3.



8. Pull out on locking edge of holddown wafer, and disconnect cable connector P1.

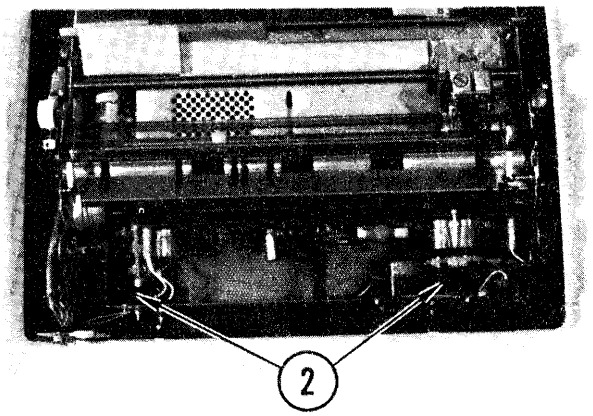
9. Remove nut. Pull off ground wire and lockwashers.



10. Remove insulating pads.

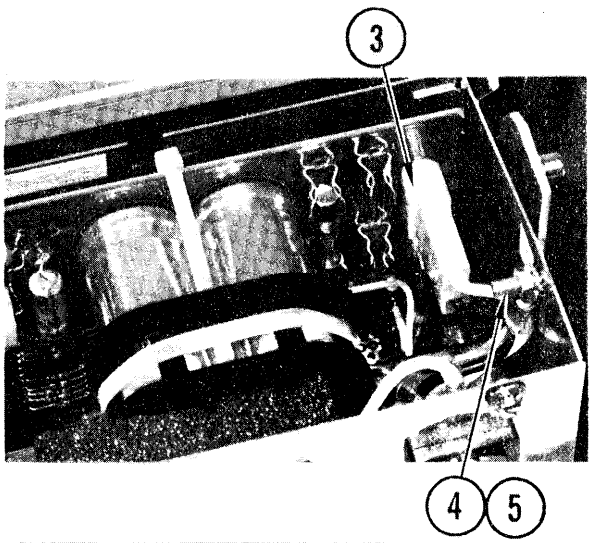
11. Lift out board.

4-43. REMOVE/REPLACE POWER SUPPLY BOARD (PPS/2) (CONT)

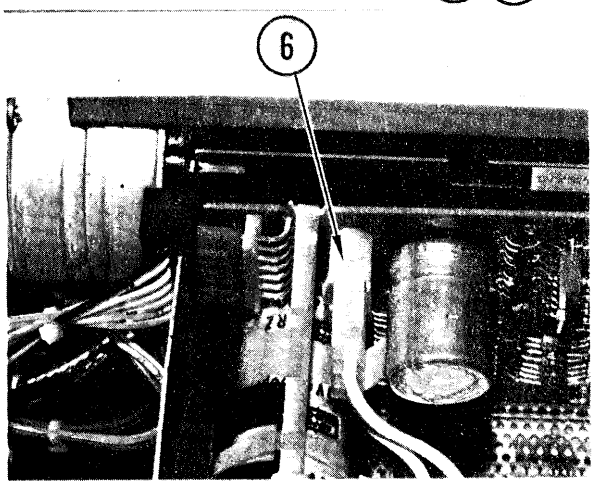


Replace

1. Slide board down into card guides.
2. Replace insulating pads.

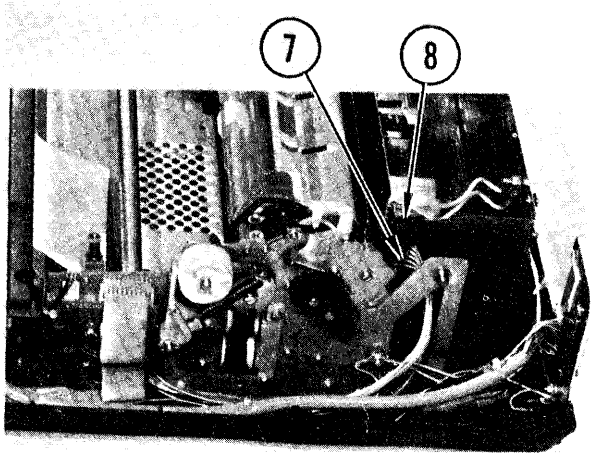


3. Connect cable connector P1. Make sure it locks into holddown wafer.
4. Replace ground wire and lockwashers.
5. Replace and tighten nut.

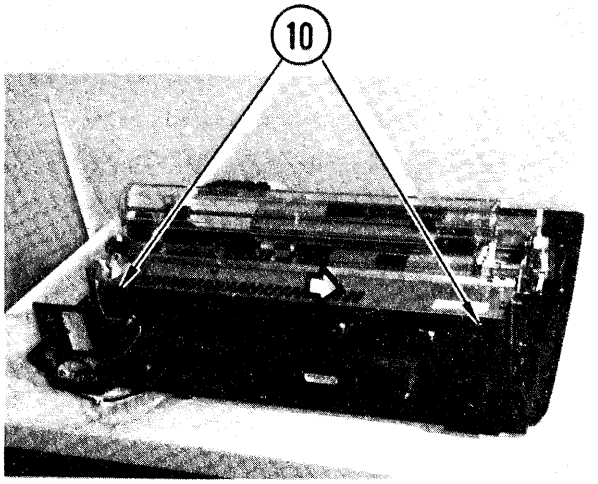


6. Connect cable connector P3. make sure it locks into holddown wafer.

4-43. REMOVE/REPLACE POWER SUPPLY BOARD (PPS/2) (CONT)



7. Connect P2 connector.
8. Replace protective bracket.



9. Slide power supply cover into position, as shown.
10. Tighten screws.
11. Close up printer (para 4-11).
12. Run self test (para 3-12).

4-44. REMOVE/REPLACE FILTER

INITIAL SETUP

Common Tools
- Tool kit

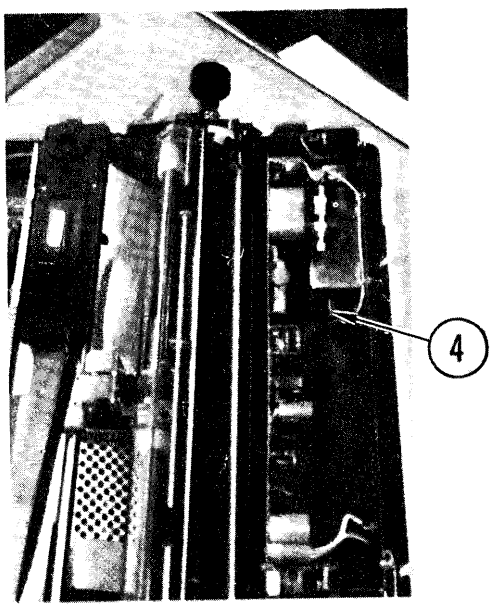
Materials/Spare Parts
- Tags
- Pen or pencil

Remove

1. Access printer (para 4-11).
2. Pull out ac plug.
3. Remove power supply board (para 4-43).

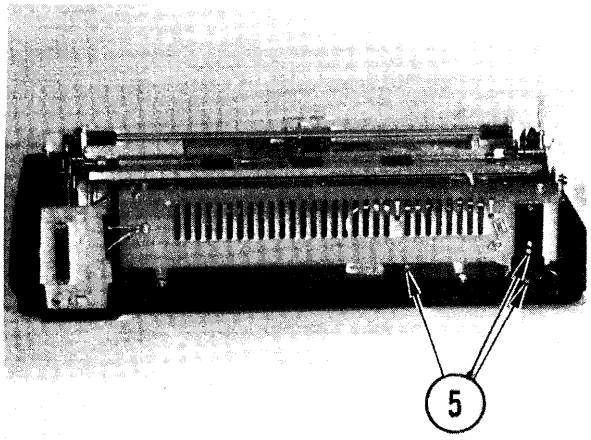
WARNING

Filter may retain dangerous voltage even after printer is powered OFF. Discharge filter before performing maintenance on it.

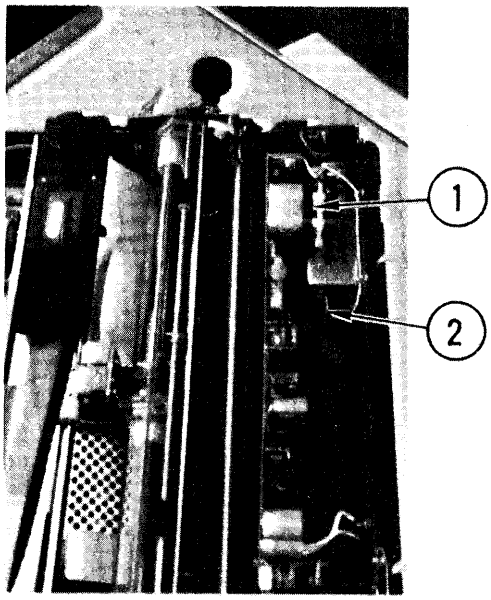


4. Tag and disconnect two connectors on filter.

4-44. REMOVE/REPLACE FILTER (CONT)

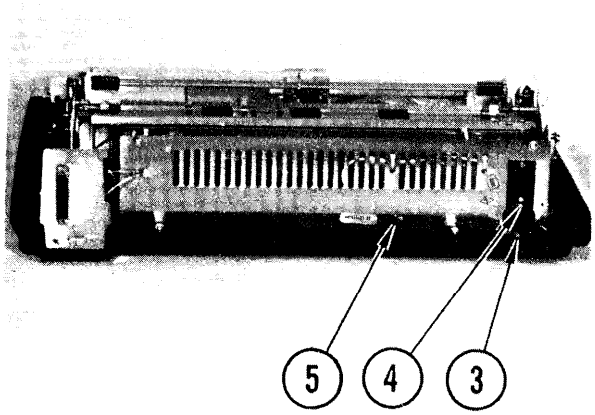


5. Remove three mounting screws and washers.
6. Slide filter out from under ac power switch.
7. Lift out filter.



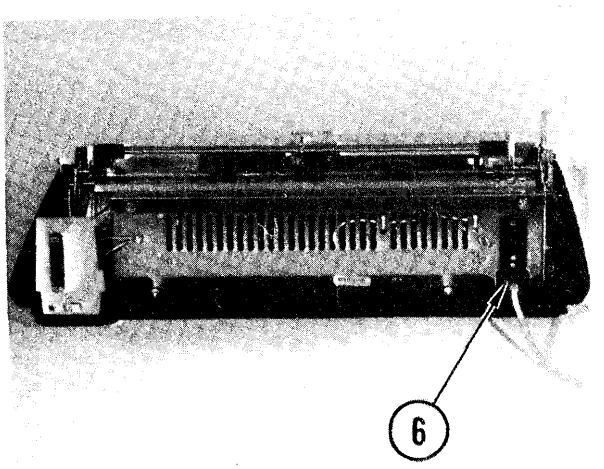
Replace

1. Slide filter into position under ac power switch.
2. Connect two connectors,



3. Replace and tighten shortest screw and washer.
4. Replace and tighten screw.
5. Replace and tighten screw and washer.

4-44. REMOVE/REPLACE FILTER (CONT)



6. Push in ac plug.

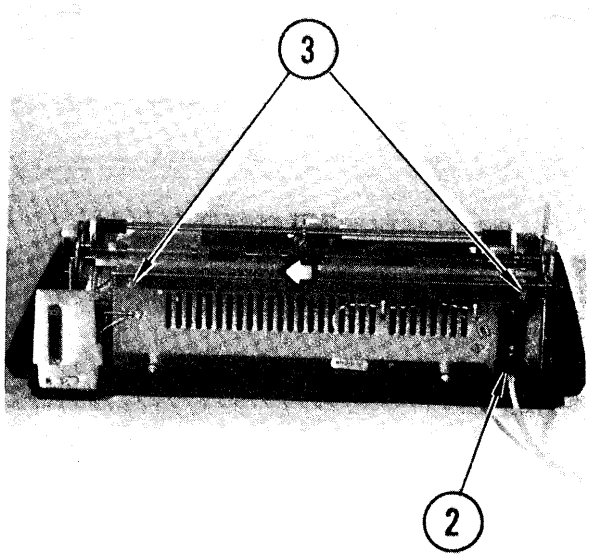
7. Replace power supply board (para 4-43).

4-45. REMOVE/REPLACE AC POWER SWITCH

INITIAL SETUP

Common Tools
- Tool kit

Materials/Spare Parts
- Tie wraps
- Tags
- Pen or pencil

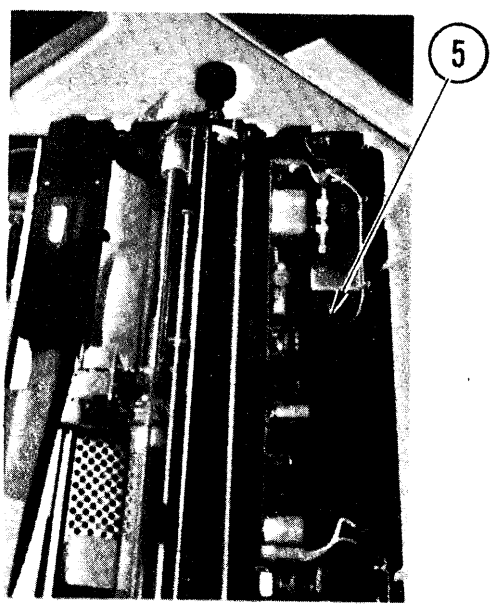


Remove

1. Access printer (para 4-11).
2. Pull out ac plug.
3. Loosen two screws and washers.
4. Slide cover as shown, and lift to remove.

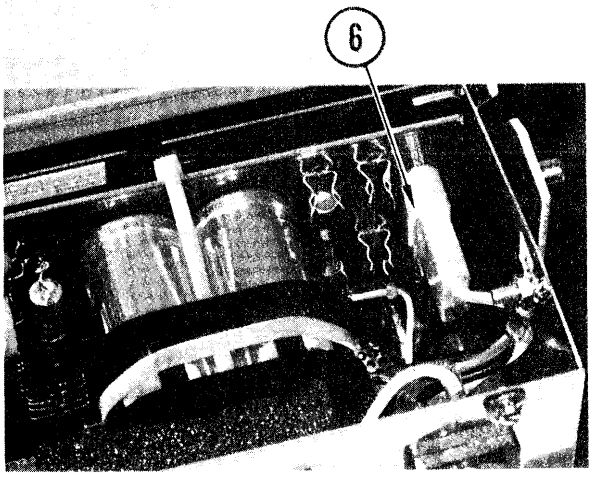
WARNING

Filter may retain dangerous voltage even after printer is powered OFF. Discharge filter before performing maintenance on it.

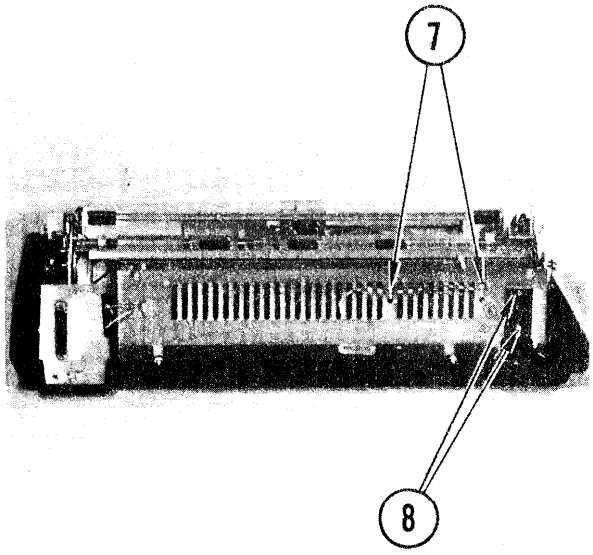


5, Note position and pull off connectors from rear of filter.

4-45. REMOVE/REPLACE AC POWER SWITCH (CONT)



6. Pull out on locking edge of holddown wafer. Disconnect cable connector P1.



7. Cut tie wraps.

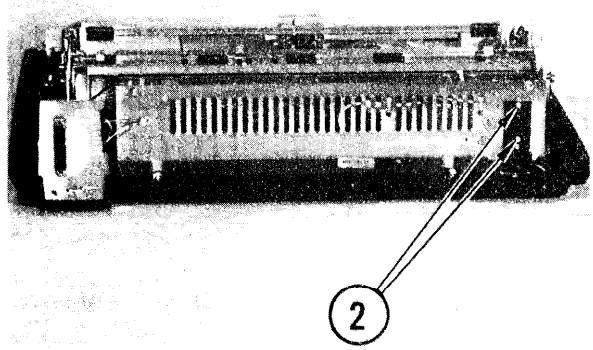
8. Remove two screws.

9. Pull out switch and cable harness.

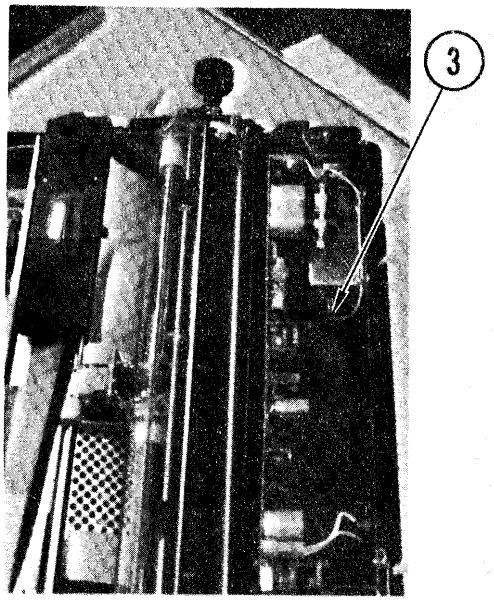
Replace

1. Insert cable harness through hole in power supply chassis, and place ac switch in position.

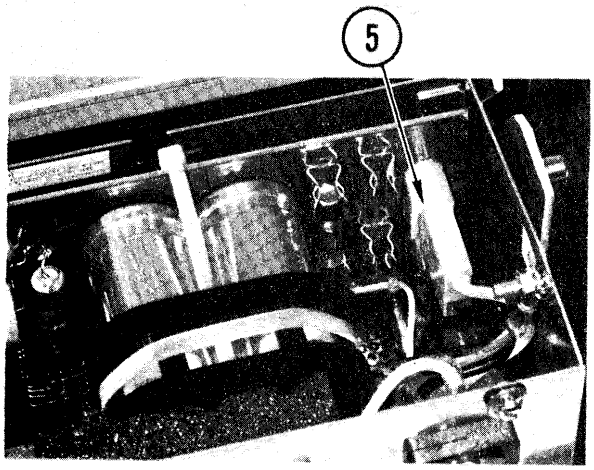
2. Replace long screw on top and short screw on bottom of ac switch. Tighten.



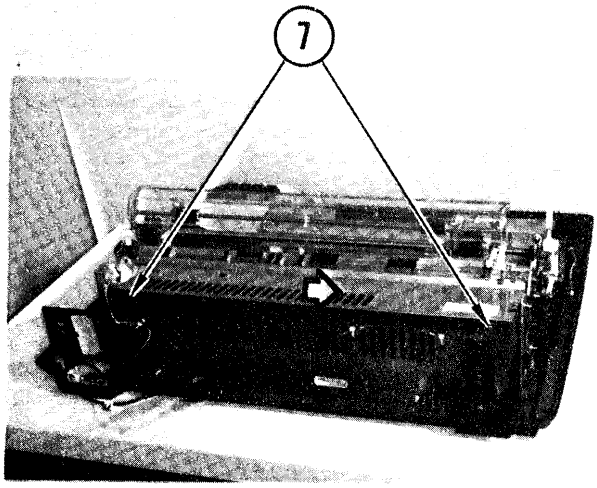
4-45. REMOVE/REPLACE AC POWER SWITCH (CONT)



3. Connect connectors to filter,
4. Install tie wraps.



5. Connect cable connector P1. Make sure it locks into holddown wafer.

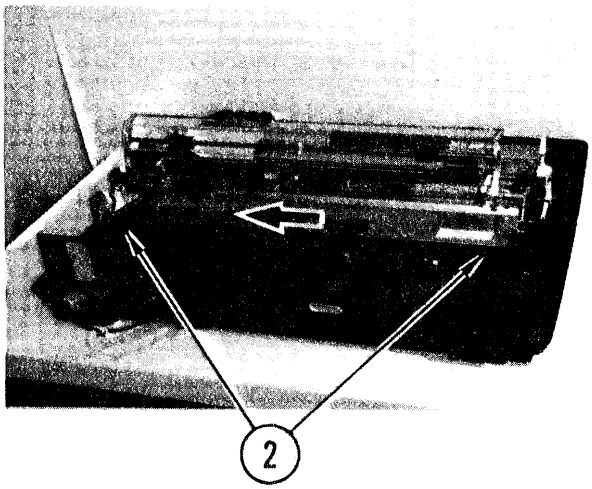


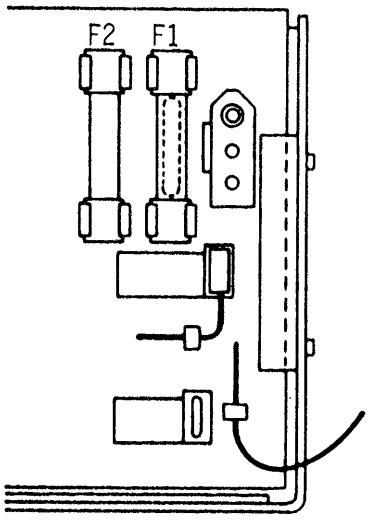
6. Slide power supply cover into position, as shown.
7. Tighten screws.
8. Push in ac plug.
9. Close up printer (para 4-11).
10. Run self test (para 3-12).

4-46. REMOVE/REPLACE POWER SUPPLY FUSE

INITIAL SETUP

Common Tools	Materials/Spare Parts	Special Tools
● Tool kit	● 250V, 2A fuse	● Fuse puller





Remove

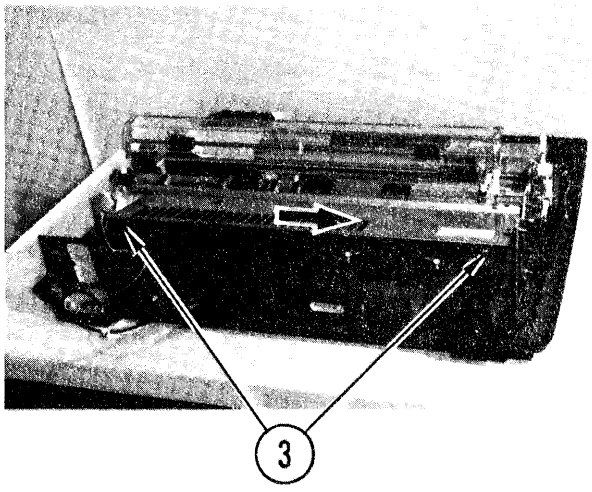
1. Access printer (para 4-11).
2. Loosen two screws securing power supply cover.
3. Lift cover up to unhook fasteners.
4. Slide cover in direction shown. Lift to remove.

WARNING

Discharge capacitor before proceeding with step 5.

5. Remove fuse.
   - If power supply is 117 V ac, remove fuse F2
   - If power supply is 220 V ac, remove defective fuse F1 and/or F2

4-46. REMOVE/REPLACE POWER SUPPLY FUSE (CONT)



Replace

1. Install fuse.
   - If power supply is 117 V ac, install F2 fuse
   - If power supply is 220 V ac, install F1 and/or F2 fuse
2. Slide power supply cover into position, as shown.
3. Tighten screws.
4. Close up printer (para 4-11).
5. Run self test (para 3-12).

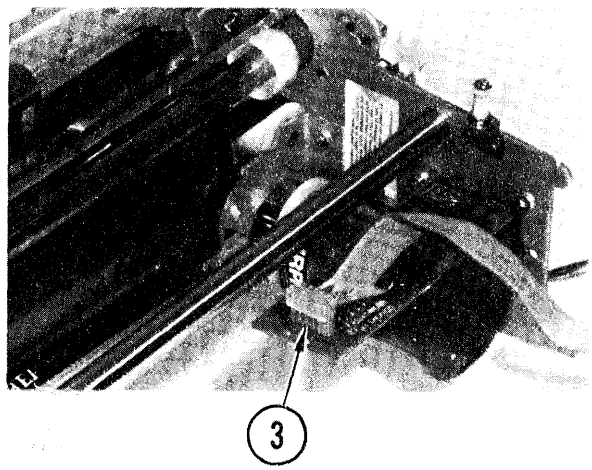
4-47. REMOVE/REPLACE POWER SUPPLY CABLE

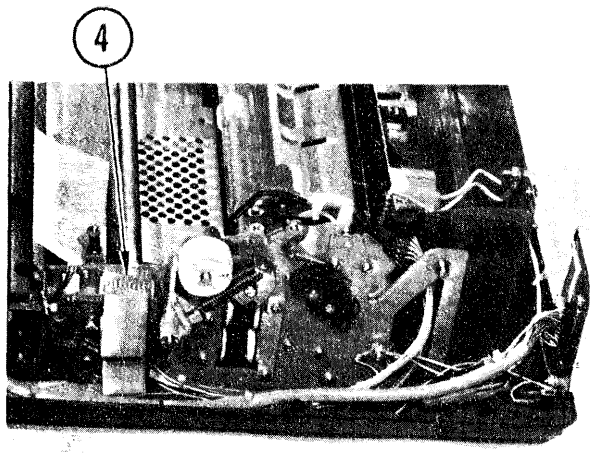
INITIAL SETUP

Common Tools	Materials/Spare Parts
● Tool kit	● Tags ● Pen or pencil

Remove

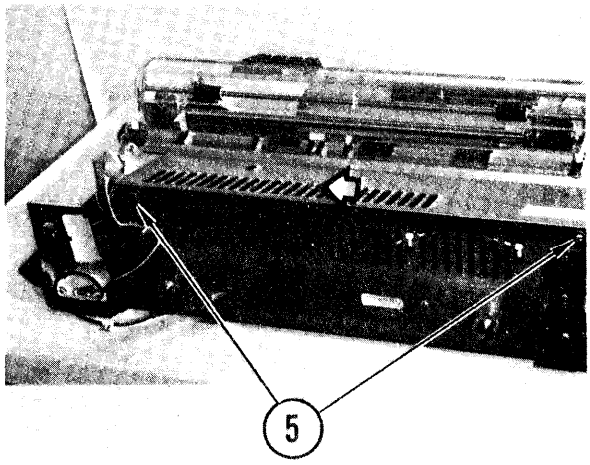
1. Access printer (para 4-11).
2. Remove side frame support (para 4-21).
3. Tag and disconnect cable connector J1 on encoder board.





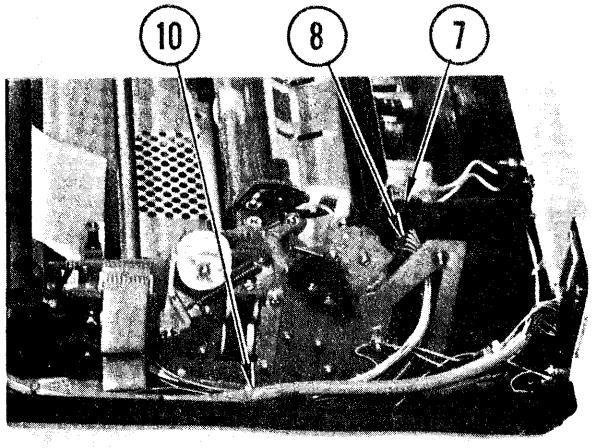
4. Tag and disconnect cable connector on top riqht side of carriage servo drive board,

4-47. REMOVE/REPLACE POWER SUPPLY CABLE (CONT)



5. Loosen screws.

6. Slide cover in direction shown, and lift off.



7. Remove protective bracket.

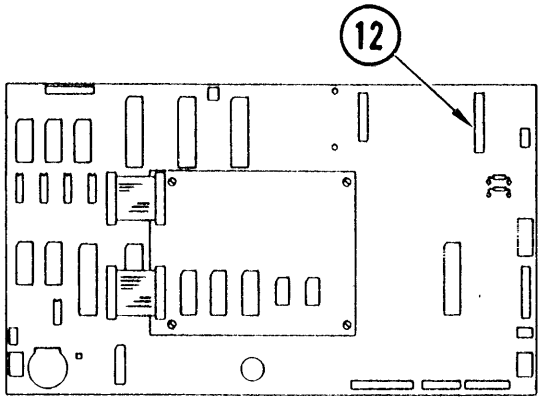
8. Disconnect cable connector P2 on power supply board.

9. Thread cable and cable connector through hole in side frame.

10. Cut tie wrap.

11. Lift up front of frame and drive assembly.

12. Disconnect cable connector at P8 on logic board.



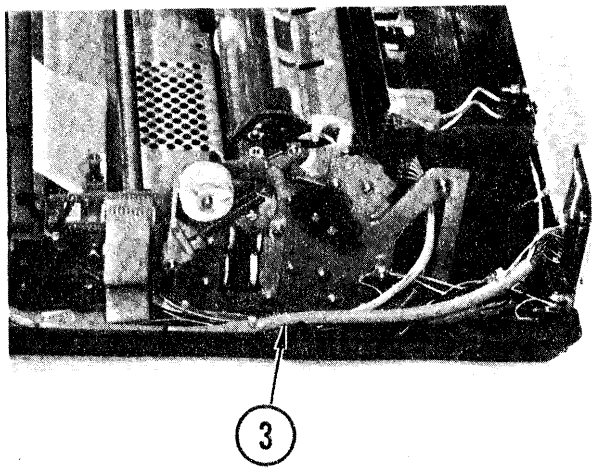
13. Remove cable.

Replace

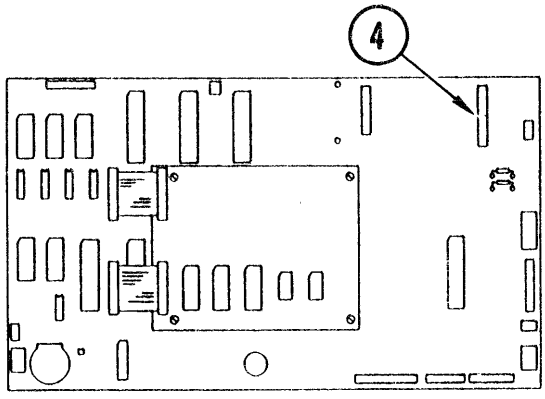
1. Lift up front end of frame and drive assembly.

2. Insert J8 connector end of cable under frame and drive assembly, and thread under servo drive board and encoder assembly.

4-47. REMOVE/REPLACE POWER SUPPLY CABLE (CONT)

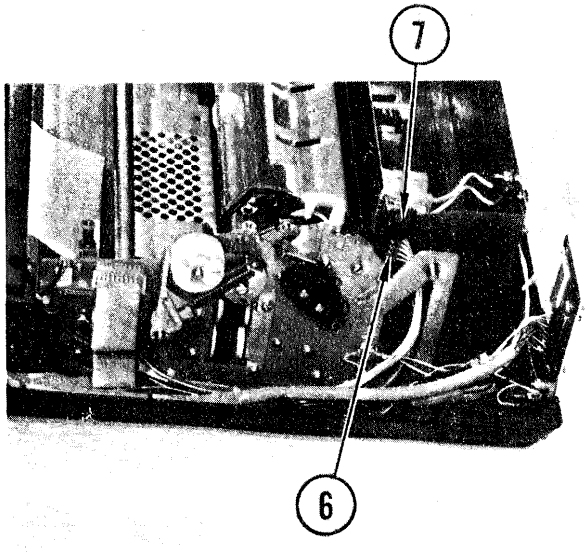


3. Lift bottom cover, and install tie wrap.



4. Connect J8 connector to P8 connector or logic board.

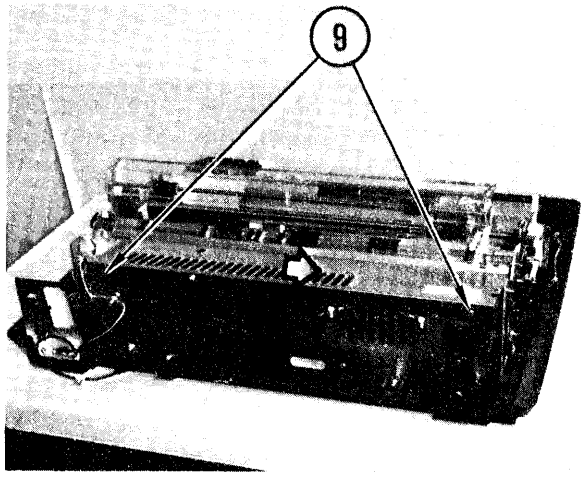
5, Lower frame and drive assembly.



6. Thread cable connector J2 through hole in side frame, and connect to p2 on power supply board.

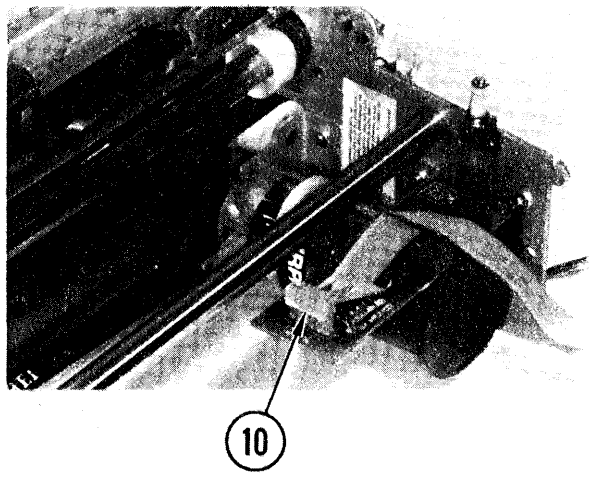
7. Install protective bracket.

4-47. REMOVE/REPLACE POWER SUPPLY CABLE (CONT)

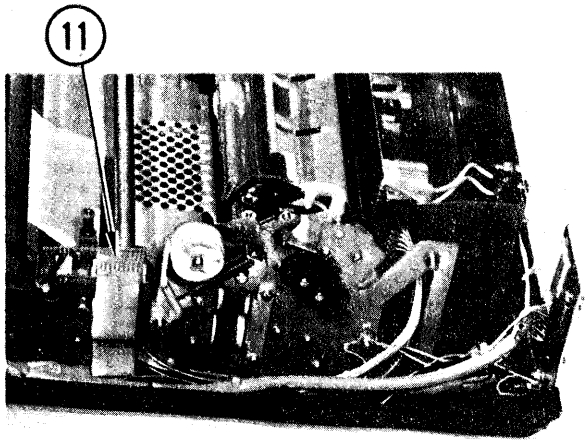


8. Slide cover in direction shown, and press down to close.

9. Tighten screws.



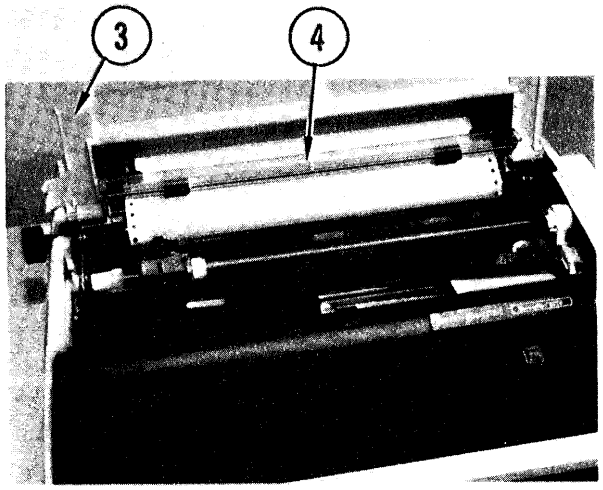
10. Connect cable connector to P1 on encoder board.



11. Connect cable connector to right side of carriage servo drive board.

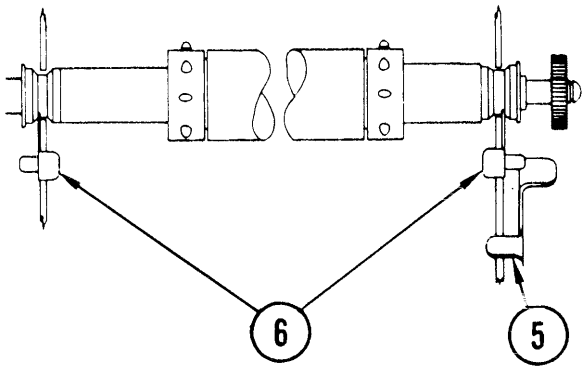
12. Replace side frame support (para 4-21).

4-48. REMOVE/REPLACE PLATEN



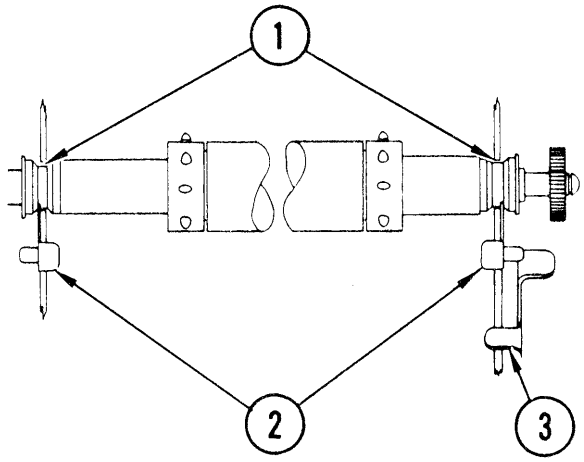
Remove

1. Power OFF printer.
2. Remove paper.
3. Open access cover.
4. Lift up paper shield.



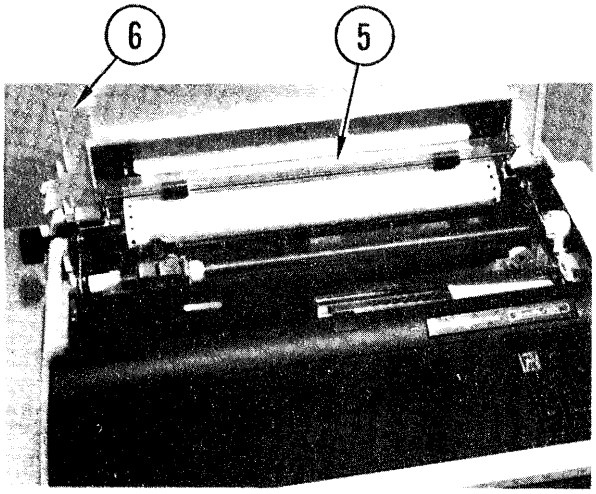
5. Push run-load lever forward to load position.
6. Lift up left clamp to unlatch platen, then right clamp.
7. Remove platen.

4-48. REMOVE/REPLACE PLATEN (CONT)



Replace

1. Set platen on side frame so inner groove in platen bushings rests on chassis.
2. Lift up holddown clamps. Press platen into place.
3. Pull run-load lever back to run position.
4. Install paper.

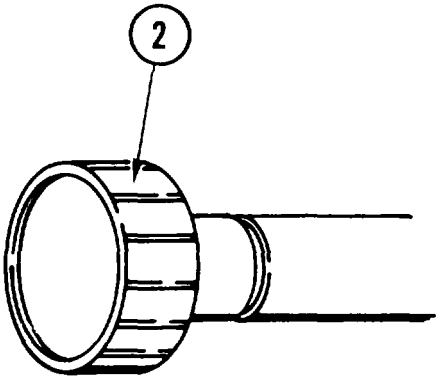


5. Pull down paper shield.
6. Close access cover.
7. Run self test (para 3-12).

4-49. REMOVE/REPLACE PLATEN KNOB

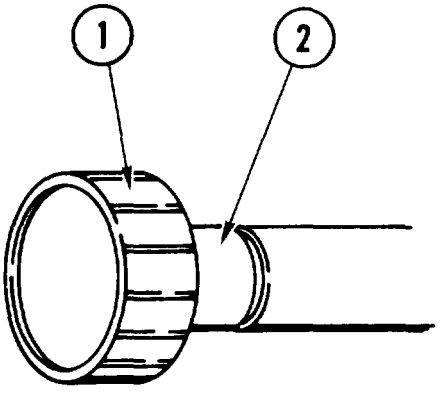
INITIAL SETUP

Common Tools
l Tool kit



Remove

1. Remove platen from printer (para 4-48).
2. Pull off knob from platen shaft.



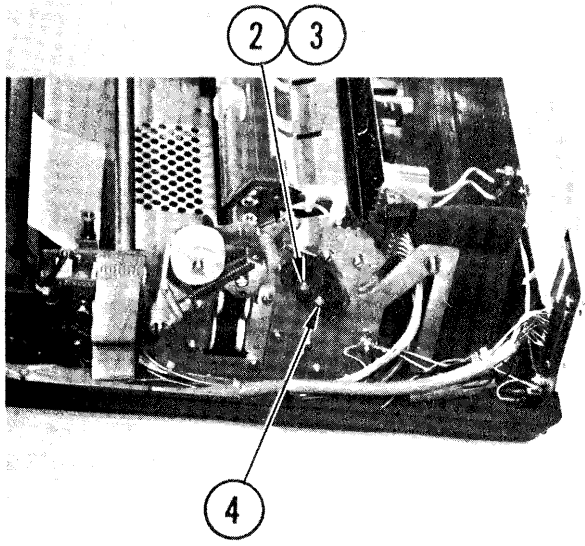
Replace

1. Position knob on platen shaft.
2. Push knob onto platen shaft until it is positioned securely.
3. Replace platen (para 4-48).

4-50. REMOVE/REPLACE INTERMEDIATE GEAR

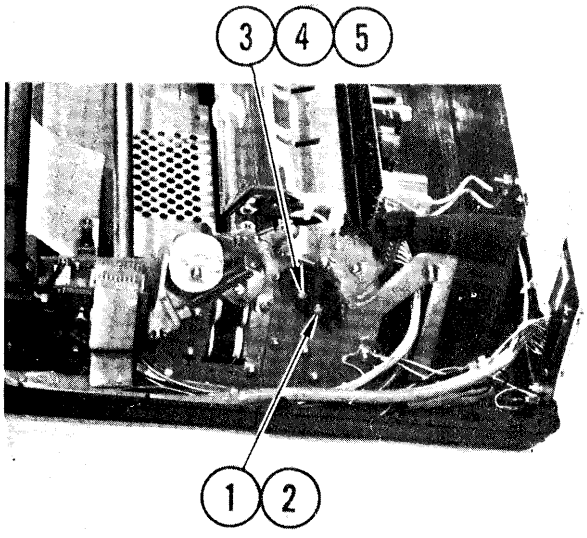
INITIAL SETUP

Common Tools
- Tool kit



Remove

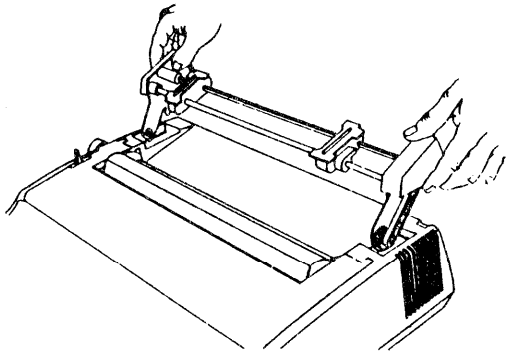
1. Access printer (para 4-11).
2. Remove retaining ring on upper gear.
3. Slide upper gear from support shaft.
4. Slide lower (middle) gear from support shaft.



Replace

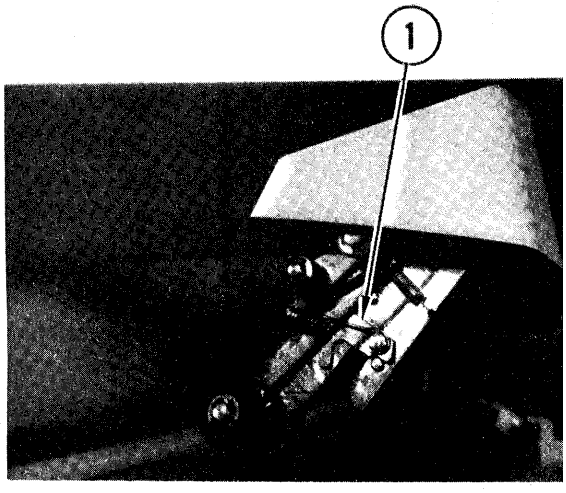
1. Slide lower (middle) gear onto support shaft.
2. Rotate gear to mesh with driver gear.
3. Slide upper gear onto support shaft.
4. Rotate gear to mesh with lower (middle) gear.
5. Replace retaining ring on upper gear support shaft.
6. Close up printer (para 4-11).

4-51. REMOVE/REPLACE TRACTOR ASSEMBLY



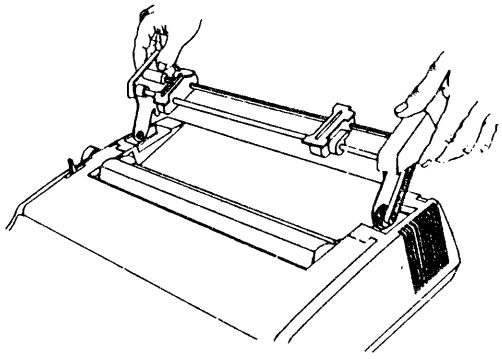
Remove

1. Access printer (para 4-11, Access, steps 1-4).
2. At back of printer grasp side tractor covers, as shown.
3. Pull up and back to remove.



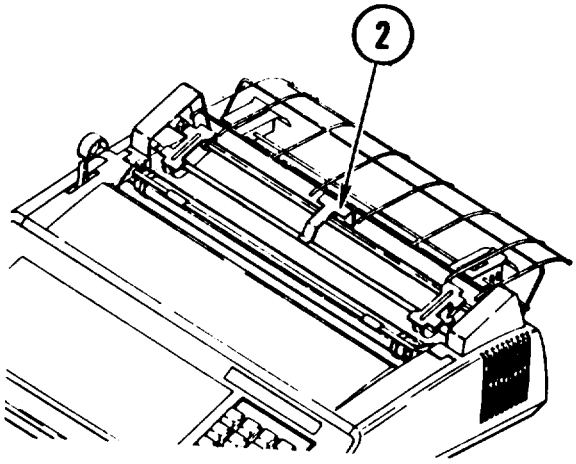
Replace

1. Check that actuator latch is open on each side of tractor assembly.



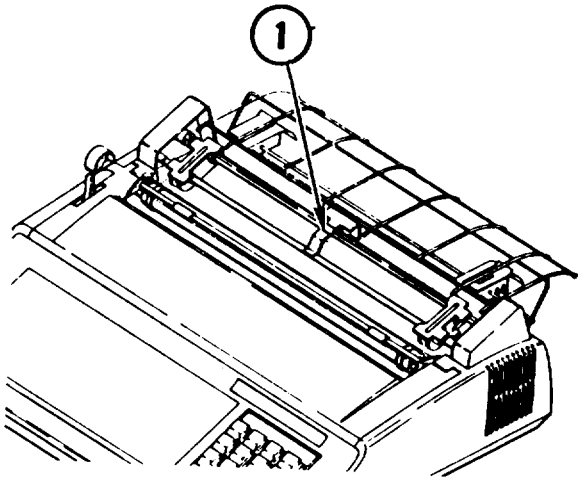
2. Grasp side tractor covers, as shown.
3. Insert tractor assembly into printer, as shown.
4. Press down until tractor assembly locks into position.
5. Replace paper rack.
5. Install paper.
7. Run self test (para 3-12).

4-52. REMOVE/REPLACE TRACTOR ASSEMBLY PAPER SUPPORT



Remove

1. Remove paper.
2. Lift paper support off shafts.



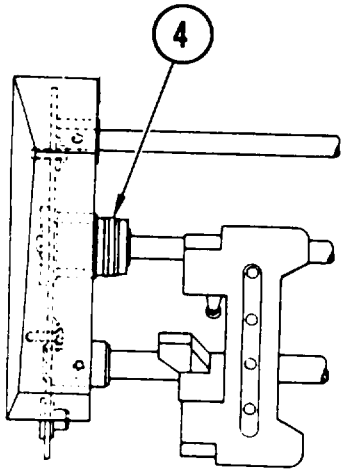
Replace

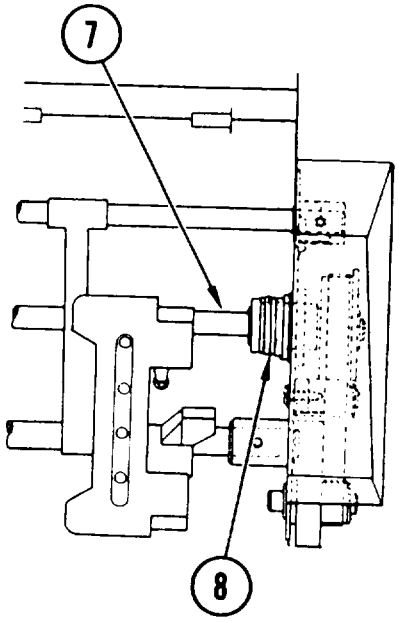
1. Place paper support over shafts and snap into position.
2. Install paper.

4-53. REMOVE/REPLACE TRACTOR ASSEMBLY BEARING

INITIAL SETUP

Common Tools
- Tool kit

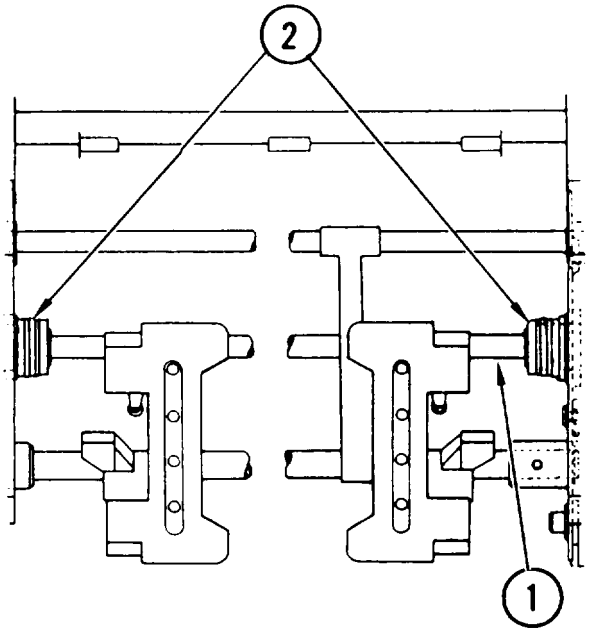




Remove

1. Remove tractor assembly (para 4-51).
2. Remove paper support (para 4-52).
3. Remove both paper handlers (para 4-57, Remove, steps 3-7).
4. Remove left end drive shaft bearing.
5. Remove drive belt (para 4-54, Remove, steps 2-5).
6. Remove drive pulley (para 4-56, Remove, steps 3-5).
7. Slide out shaft assembly.
8. Remove right drive shaft bearing.

4-53. REMOVE/REPLACE TRACTOR ASSEMBLY BEARING (CONT)



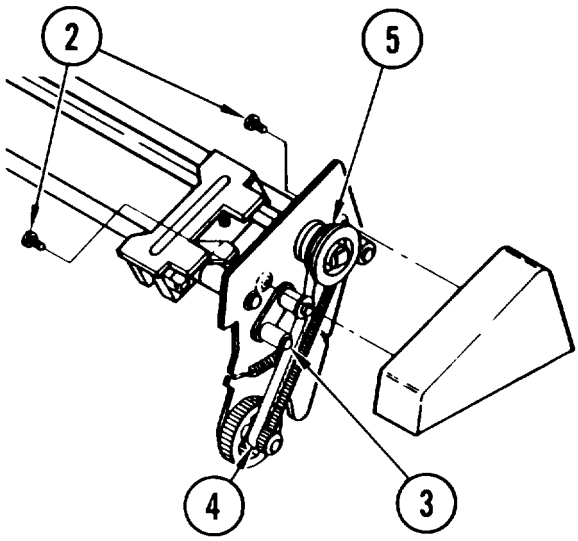
Replace

1. Slide square shaft into right side frame.
2. Replace bearings.
3. Replace paper handlers (para 4-57, Replace, steps 1-5).
4. Replace drive pulley (para 4-56, Replace, steps 2-4).
5. Replace drive belt (para 4-54, Replace, steps 1-6).
6. Replace paper support (para 4-52).
7. Replace tractor assembly (para 4-51).

4-54. REMOVE/REPLACE TRACTOR ASSEMBLY DRIVE BELT

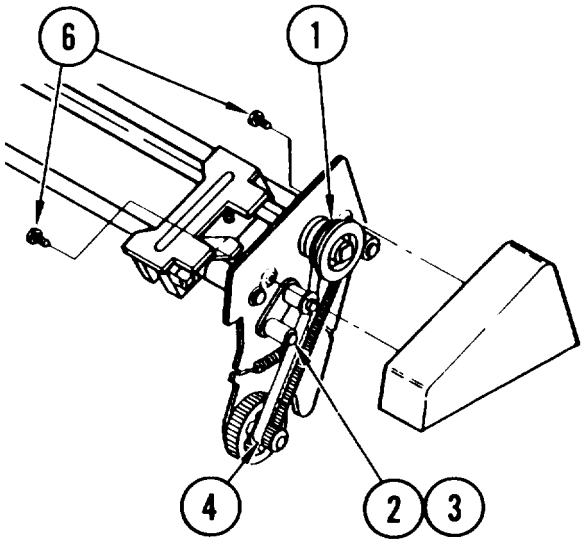
INITIAL SETUP

Common Tools
- Tool kit



Remove

1. Remove tractor assembly (para 4-51).
2. Remove two screws securing right end cover to tractor assembly.
3. Press up on tension adjustment pulley to relieve tension.
4. Slip drive belt off gear pulley.
5. Remove drive belt from drive pulley.



Replace

NOTE

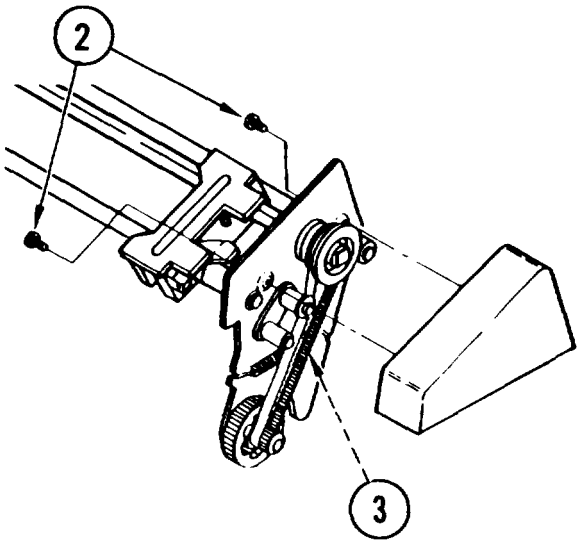
When replacing belt, smooth surface should be facing outward.

1. Place drive belt around drive pulley.
2. Position top of belt under tension adjustment pulley.
3. Press up on tension adjustment pulley to relieve tension.
4. Place belt around gear pulley.
5. Release tension adjustment pulley.
6. Replace right end cover with two screws.
7. Replace tractor assembly (para 4-51).

4-55. REMOVE/REPLACE TRACTOR ASSEMBLY SPRINGS

INITIAL SETUP

Common Tools
- Tool kit

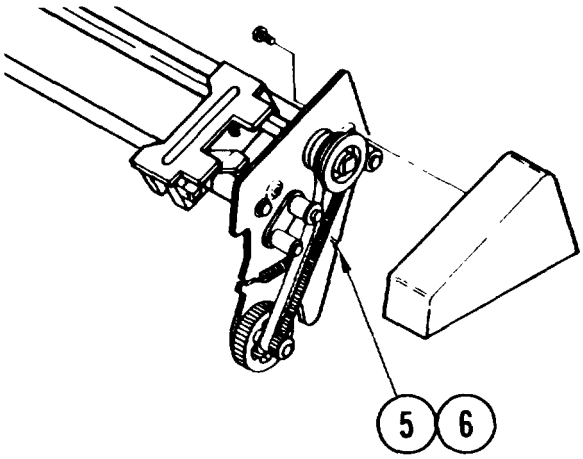


Remove

1. Remove tractor assembly (para 4-51).
2. Remove right and/or left tractor covers by unscrewing two screws on each side.
3. To remove right tractor spring(s), remove drive belt (para 4-54, Remove, steps 2-5).
4. Locate spring you will remove.

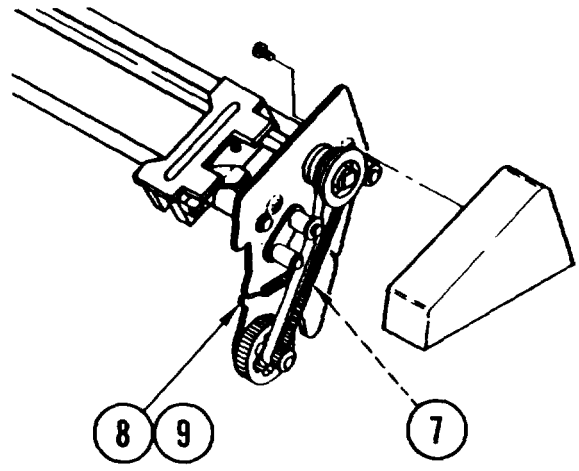
   o If removing locking spring, go to step 7

   l If removing belt tensioning spring go to step 5



5. Using long nose pliers, lift spring end from notched side of frame.
6. Remove spring.

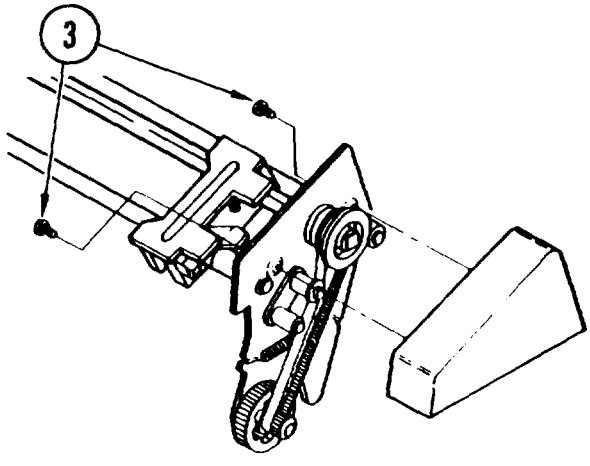
4-55. REMOVE/REPLACE TRACTOR ASSEMBLY SPRINGS (CONT)



7. Push up on latch to place in open position.
8. Using long nose pliers, lift spring end from notched side frame.
9. Remove spring from side frame.

Replace

1. Install spring on tractor assembly.
   - If replacing left locking spring, go to step 3
   - If replacing right locking spring and/or belt tension spring, go to step 2

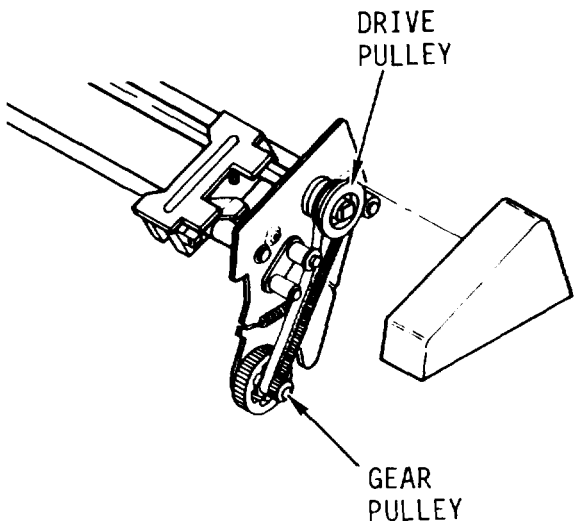


2. Replace drive belt (para 4-54, Replace, steps 1-6).
3. Replace tractor cover and secure with two screws.
4. Replace tractor assembly (para 4-51).

4-56. REMOVE/REPLACE TRACTOR ASSEMBLY DRIVE AND GEAR PULLEYS

INITIAL SETUP

Common Tools
- Tool kit

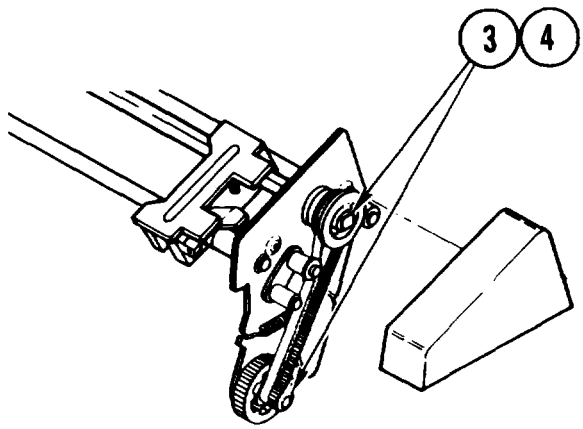


NOTE

Use this procedure for removal/ replacement of drive pulley and/or gear pulley.

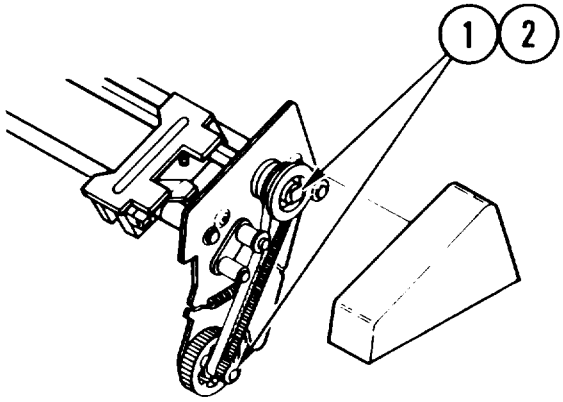
Remove

1. Remove tractor assembly (para 4-51).
2. Remove drive belt (para 4-54, Remove, steps 2-5).



3. Remove retaining ring.
4. Slide pulley off shaft.

4-56. REMOVE/REPLACE TRACTOR ASSEMBLY DRIVE AND GEAR PULLEYS (CONT)



Replace

1. Slide pulley onto shaft.
2. Secure retaining ring.
3. Replace drive belt (para 4-54, Replace, steps 1-6).
4. Replace tractor assembly (para 4-51).

4-57. REMOVE/REPLACE TRACTOR ASSEMBLY PAPER HANDLERS

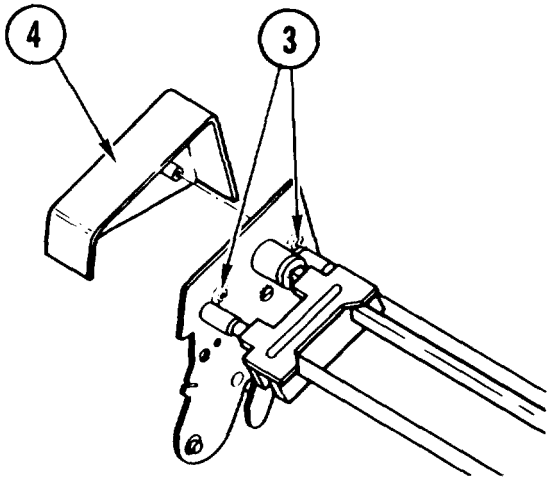
INITIAL SETUP

Common Tools
- Tool kit

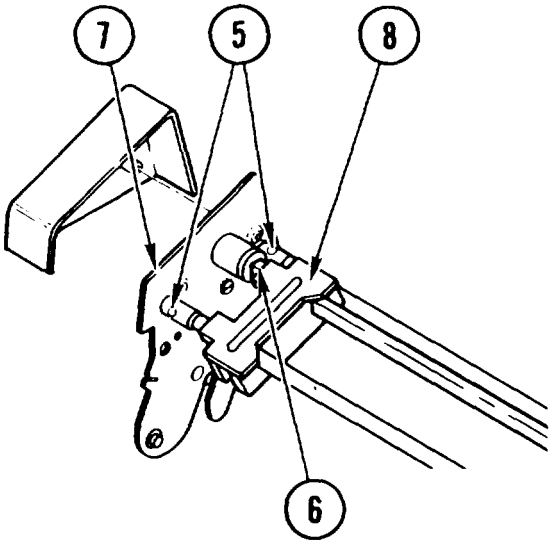
NOTE

There are two paper handlers. Use this procedure to remove/replace either of them.

Remove

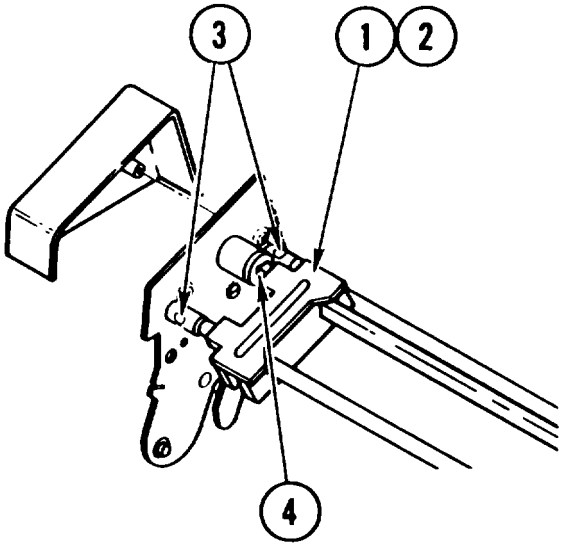


1. Remove tractor assembly (para 4-51).
2. Remove paper support (para 4-52).
3. Remove screws holding left tractor cover in place.
4. Remove tractor cover.



5. Utilizing l/16-inch punch and hammer, use short, steady hammer taps to carefully punch pins from left end of both shafts.
6. Remove retaining ring from square shaft on inside of left side frame.
7. Remove side frame assembly from shafts.
8. Unlock paper handler lever and slide paper handler off shafts from the left end.

4-57. REMOVE/REPLACE TRACTOR ASSEMBLY PAPER HANDLER (CONT)

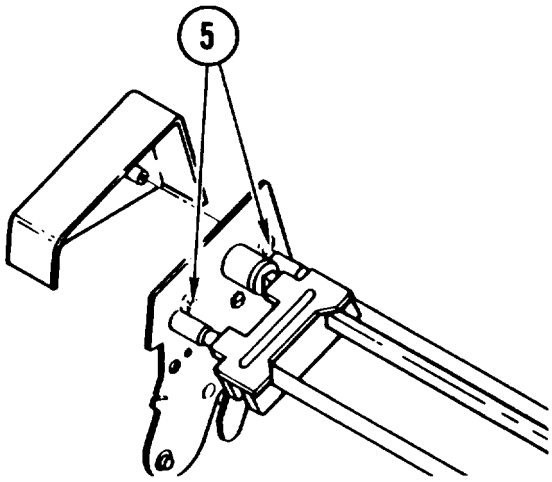


Replace

NOTE

Dots on inner sides of right and left paper handlers must be alined with each other on tractor shaft.

1. Push paper handler onto shafts from left end.
2. Set paper handler in position and lock paper handler lever.
3. Insert side frame assembly over shafts and secure with pins.
4. Replace retaining ring on square shaft.



5. Replace left tractor cover with screws.
6. Replace paper support (para 4-52).
7. Replace tractor assembly (para 4-51).

4-580 REMOVE/REPLACE LOGIC BOARD (T3MC/2)

INITIAL SETUP

Common Tools	Materials/Spare Parts
● Tool kit	● Tags ● Pen or pencil

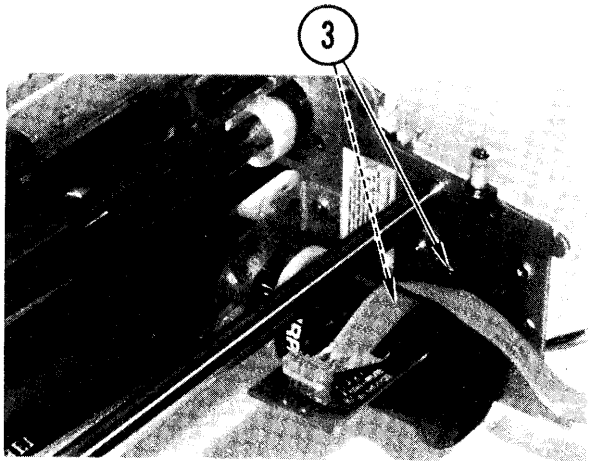
WARNING

Do not mutilate or disassemble the lithium battery that is located on the logic board. The lithium metal in it is very active material that burns in the presence of water or high humidity. Do not put battery in fire, attempt to charge, heat above 212°F (100°C), or solder directly to cell. Do not over-discharge individual cells to reverse voltage greater than 3 volts. The battery may burst and burn or release hazardous materials.

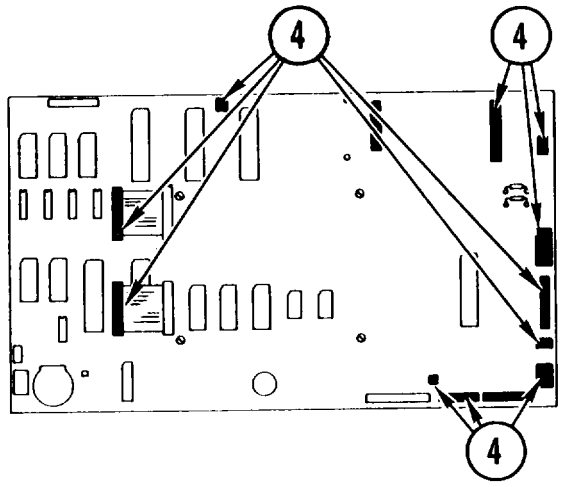
CAUTION

Moving or flexing a printed wire board can cause a short circuit. Handle board carefully.

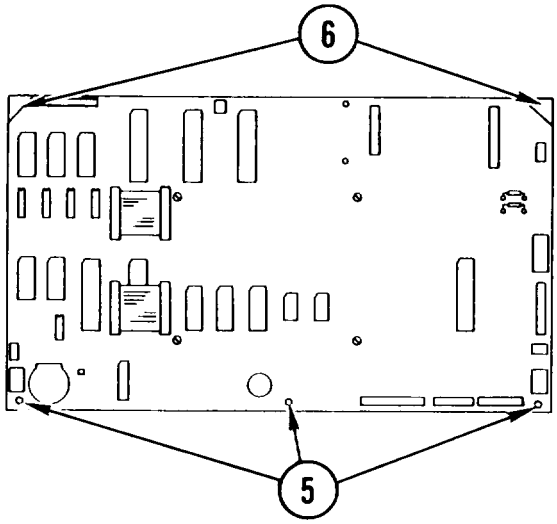
1. Access printer (para 4-11).
2. Remove 2K extended line buffer board (para 4-14).
3. Remove screws. Lift off encoder board.



4-58. REMOVE/REPLACE LOGIC BOARD (T3MC/2) (CONT)



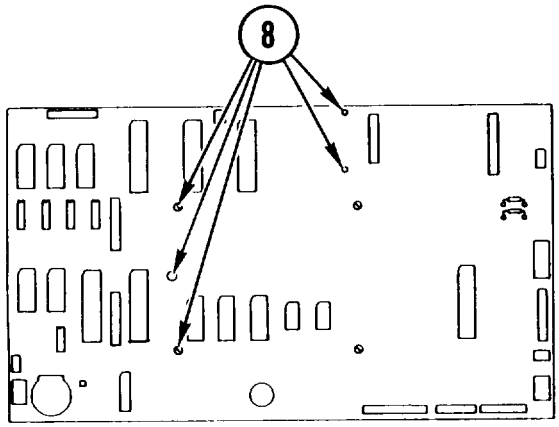
4. Tag and disconnect all cable connectors on logic board.



5. Remove three screws.

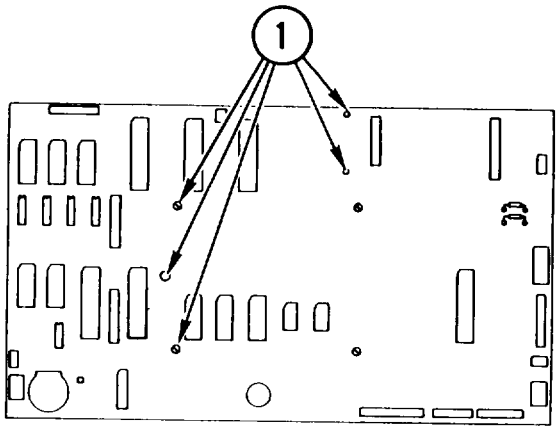
6. Slide board out of supports.

7. Remove board from printer.



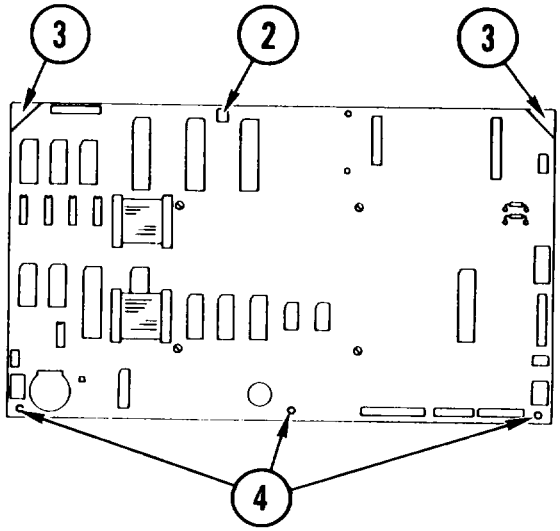
8. Remove five plastic standoffs from logic board. Save standoffs.

4-58. REMOVE/REPLACE LOGIC BOARD (T3MC/2) (CONT)



Replace

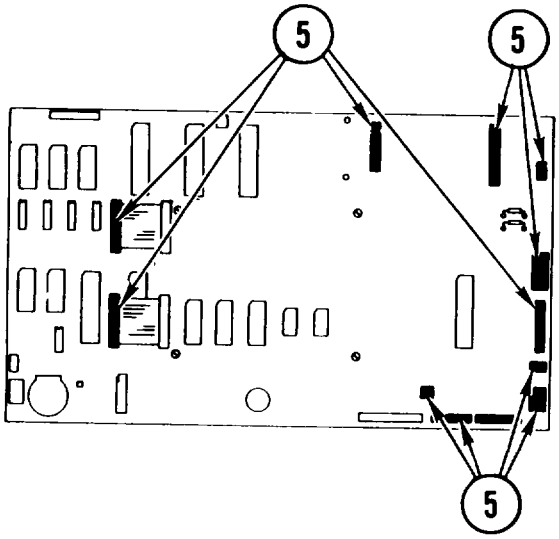
1. Attach five plastic standoffs to logic board.



2. Connect cable connector P9 to logic board (para 4-20, Replace, steps 7-8) .

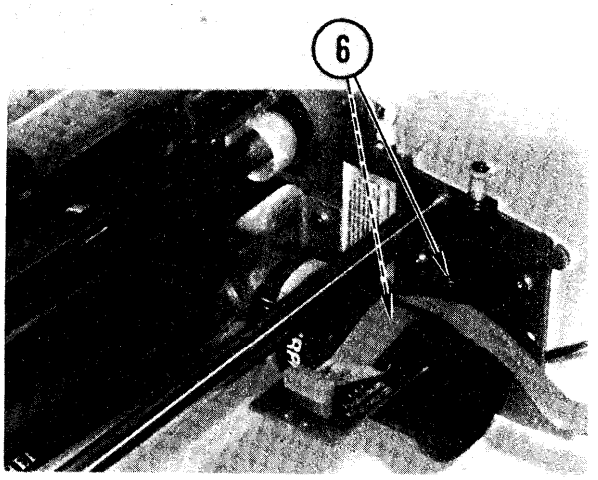
3. Insert logic board rear corners into three supports.

4. Replace and tighten screws.



5. Connect al 1 cable connectors to logic board.

4-58. REMOVE/REPLACE LOGIC BOARD (T3MC/2) (CONT)



6. Place encoder board in position on carriage drive motor.

7. Replace and tighten screws.

8. Replace 2K extended line buffer board (para 4-14).

APPENDIX A

REFERENCES

A-1. SCOPE

This appendix lists all forms, field manuals and technical manuals referenced in, or required for use with, this technical manual.

A-2. FORMS

Equipment Inspection and Maintenance Worksheet . . . . . DA Form 2404
Quality Deficiency Report . . . . . Form SF 368
Discrepancy in Shipment Report . . . . . Form SF 364
Recommended Changes to Equipment Technical Manuals . . . . . DA Form 2028-2
Recommended Changes to Publications and Blank Forms . . . . . DA Form 2028
Maintenance Request . . . . . DA Form 2407

A-3. TECHNICAL MANUALS

Procedures for Destruction of Electronic Materiel to Prevent Enemy Use (Electronics Command) . . . . . TM 750-244-2
The Army Maintenance Management System (TAMMS) . . . . . TM 38-750
Administrative Storage of Equipment . . . . . TM 740-90-1

A-4. MISCELLANEOUS PUBLICATIONS

Consolidated Index of Army Publications and Blank Forms . . . . . DA PAM 310-1

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. GENERAL

This Maintenance Allocation Chart (MAC) provides a summary of maintenance operations for the Teleprinter TT-804/MYQ-4A. This document assigns categories of maintenance for specific maintenance functions on repairable items and identifies tools and equipment required to perform each function. Each maintenance function is assigned to the lowest level of maintenance prepared to perform that function. It should be understood that each maintenance function can also be performed at all higher levels of maintenance. The higher levels of maintenance will have tools and test equipment to perform the maintenance functions assigned to and normally performed by lower levels of maintenance.

B-2. MAINTENANCE FUNCTION DEFINITIONS.

Maintenance Functions are limited to and defined as follows:

a. Inspect. Determination of the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. Test. Verification of serviceability and detection of beginning failure by measuring mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Performance of operations required periodically to keep an item in proper operating condition. Such operations would include cleaning, preservation, draining, painting, or replenishment of fuel/lubricants/hydraulic fluids or compressed air supplies.

d. Adjust. Maintenance within prescribed limits by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

e. Aline. Adjustment of specified variable elements of an item to the maximum or desired performance.

f. Calibrate. Determination and cause corrections to or adjustments to instruments or test measuring and diagnostic equipment used in precision measurement. Consists of comparing two instruments, one a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. Emplacement, seating, or fixing into position an item, part, or module (component or assembly) in a manner to allow proper functioning of the equipment/system.

h. Replace. Substitution of a serviceable like-type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. Application of maintenance services (inspect, test, service, adjust, aline, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module/component/assembly, and item or system. This function does not include trial and error replacement of consumable spare type items such as fuses, lamps, or electronic tubes.

j. Overhaul. Periodic maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (e.g., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like-new condition.

k. Rebuild. Restoration of unserviceable equipment to a like-new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hour, miles, etc.) considered in classifying Army equipment/components.

B-3. EXPLANATION OF MAC COLUMN ENTRIES.

a. Group Number. This column lists group numbers, the purpose of which is to identify components, assemblies, subassemblies and modules with the next highest assembly.

b. Component/Assembly. This column contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Maintenance Function. This column lists the functions to be performed on the item listed in the Component/Assembly column.

d. Maintenance Category. This column specifies, by the listing of a “worktime” fiqure in the appropriate subcolumn(s), the lowest level of maintenance authorized to-perform the function listed in the Maintenance Function column. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance categories, appropriate “worktime” figures will be shown for each category. The number of man-hours specified by the “worktime” figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC.

Subcolumns of the Maintenance Category column are:

C -- Operation/Crew
O -- Organizational
F -- Direct Support
H -- General Support
D -- Depot

e. Tools and Equipment. This column specifies by code those common tool sets (not individual tools) and special tools, test, and supporting equipment required to perform the designated function.

B-4. EXPLANATION OF SECTION 111 COLUMN ENTRIES.

a. Tool or Test Equipment Reference Code. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool or test equipment for the maintenance functions.

b. Maintenance Category. The codes in this column indicate the maintenance category allocated the tool or test equipment.

c. Nomenclature. This column lists the noun name and nomenclature of tools and test equipment required to perform the maintenance functions.

d. National/NATO Stock Number. This column presents the National/NATO Stock number of the specific tool or test equipment when these numbers are assigned.

e. Tool Number. This column lists the manufacturer's part number of the tool, followed by the Federal Supply Code for the Manufacturer (5 digit) in parentheses, when these numbers are fully identified.

B-5. EXPLANATION OF SECTION IV COLUMN ENTRIES.

d. Reference Code. The letters in this column coincide with the letters used in column 6 of the Maintenance Allocation Chart.

b. Remarks. This column lists the remarks which correspond with the reference code letters.

Section II.

MAINTENANCE ALLOCATION CHART

DASCONET 75-[illegible]

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
04	TELEPRINTER ASSY	TEST	.0	.0	.2	.0	.0	0001 0002 0008	
		REPLACE	.0	.0	.5	.0	.0	0002	
		REPAIR	.0	.0	1.2	.0	.0	0002 0004 0005 0006 0007	
		OVERHAUL	.0	.0	.0	.0	4.1		A
0401	LINE BUFFER,2K EXT	TEST	.0	.0	.1	.0	.0	0001	
		REPLACE	.0	.0	.4	.0	.0	0002	
		OVERHAUL	.0	.0	.0	.0	1.0		A
0402	TRACTOR ASSY	REPLACE	.0	.0	.2	.0	.0	0002	
		REPAIR	.0	.0	1.0	.0	.0	0002	
0403	CONTROL PANEL	REPLACE	.0	.0	.3	.0	.0	0002	
		REPAIR	.0	.0	1.0	.0	.0	0002	
0405	PANEL ASSY	TEST	.0	.0	.1	.0	.0	0001	
		REPLACE	.0	.0	.3	.0	.0	0002	
		REPAIR	.0	.0	.5	.0	.0	0002	
0406	BOTTOM ASSY,PRINTER	TEST	.0	.0	.3	.0	.0	0001 0002	
		REPAIR	.0	.0	.5	.0	.0	0002 0003	
040601	CCA T3 MC/2	REPLACE	.0	.0	.6	.0	.0	0002	
		OVERHAUL	.0	.0	.0	.0	1.0		A
040602	FRAME&DRIVE ASSY	TEST	.0	.0	.3	.0	.0	0001 0002	
		REPLACE	.0	.0	.5	.0	.0	0002	
		REPAIR	.0	.0	.8	.0	.0	0002	
		OVERHAUL	.0	.0	.0	.0	1.0		A
04060201	ENCODER ASSY	TEST	.0	.0	.3	.0	.0	0001 0002	
		REPLACE	.0	.0	.2	.0	.0	0002	
		OVERHAUL	.0	.0	.0	.0	1.0		A
04060202	PAPER PAN ASSY	TEST	.0	.0	.3	.0	.0	0002	
		REPLACE	.0	.0	.2	.0	.0	0002	
		REPAIR	.0	.0	1.0	.0	.0	0002	
040603	POWER SUPPLY ASSY	TEST	.0	.0	.2	.0	.0	0001 0002	
		REPLACE	.0	.0	.2	.0	.0	0002	
		REPAIR	.0	.0	1.0	.0	.0	0002	
04060301	CCA PPS/2	TEST	.0	.0	.2	.0	.0	0001 0002	
		REPLACE	.0	.0	.2	.0	.0	0002	
		OVERHAUL	.0	.0	.0	.0	1.0		A
04060302	POWER SUPPLY SUBASY	TEST	.0	.0	.3	.0	.0	0001 0002	
		REPLACE	.0	.0	.3	.0	.0	0002	
		REPAIR	.0	.0	1.0	.0	.0	0002	
0407	PLATEN ASSY	REPLACE	.0	.0	.1	.0	.0		
		REPAIR	.0	.0	.1	.0	.0	0002	

Section III.

END ITEM: TT-804/MYQ-4A

TOOL AND TEST EQUIPMENT REQUIREMENTS
(DARCOM-R 750-16)

TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
0001	F	MULTIMETER,DIGITAL	6625-01-139-2512	AN/PSM-45
0002	F	TOOL KIT ELECTRONIC	5180-01-023-4982	JTK-17LMLD
0003	F	WRENCH SET, SOCKET	5120-00-247-0748	213-SFS
0004	F	PIN,DOWEL,CRG ALIGN	5315-01-G35-9899	44A501679-001
0005	F	TOOL REMOVAL SM	5120-01-G35-9897	44B502296-001
0006	F	TOOL REMOVAL, BTN	5120-01-G35-9898	44B503800-001
0007	F	TOOL ALIGNMENT	5120-01-G35-9896	44C415272-001
0008	F	PLIERS,90 DEG, LN	5120-01-G35-9894	9HT30749

SECTION IV MAINTENANCE ALLOCATION CHART FOR TELEPRINTER TT-804/MYQ-4A

Reference Code	Remarks

A. Overhaul by Contractor

APPENDIX C

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

C-1. SCOPE

This appendix lists expendable supplies and materials you are authorized for the support of the teleprinter.

C-2. GENERAL

This list identifies items that do not have to accompany the teleprinter and that do not have to be turned in with it.

C-3. EXPLANATION OF LISTING

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment.

Section II. EXPENDABLE SUPPLIES AND MATERIALS

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
		8135-00-292-2343	Tag, Blank	MX
		7510-00-281-5234	Pencil, General Writing SS-P-166	DZ
		7520-00-904-1265	Marker, Tube Type, Fine Tip	DZ
		7510-00-551-9823	Tape, Transparent 3“ Core	RO
		7530-00-264-5460	Label, White	BK
		5975-00-727-5153	Strap, Tiedown, 2.72 inch 96906 MS3367-4-9	HD

APPENDIX D

SCHEMATIC DIAGRAMS

D-1. GENERAL

The power supply schematic diagram, figure FO-1, provides information for checking the dc operating voltages.

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PAGE NO	PARA GRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
2-25	2-28			Recommend that the installatior antenna alignment procedure be changed throughout to specify a 2^{o} IFF antenna lag rather than 1^{o}. REASON: Experience has shown that with only a 1^{o} lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2^{o} without degradation of operation.
3-10	3-3		3-1	Item 5, Function column. Change "2 db" to "3db." REASON: The adjustment procedure the the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator.
5-6	5-8			Add new step f.1 to read, "Replace cover plate removed in step e.1, above." REASON: To replace the cover plate.
		FO3		Zone C 3. On J1-2, change "+24 VDC to "+5 VDC." REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.

PRINTED NAME GRADE OR TITLE AND TELEPHONE NUMBER
SSG I. M. DeSpiritof 999-1776

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