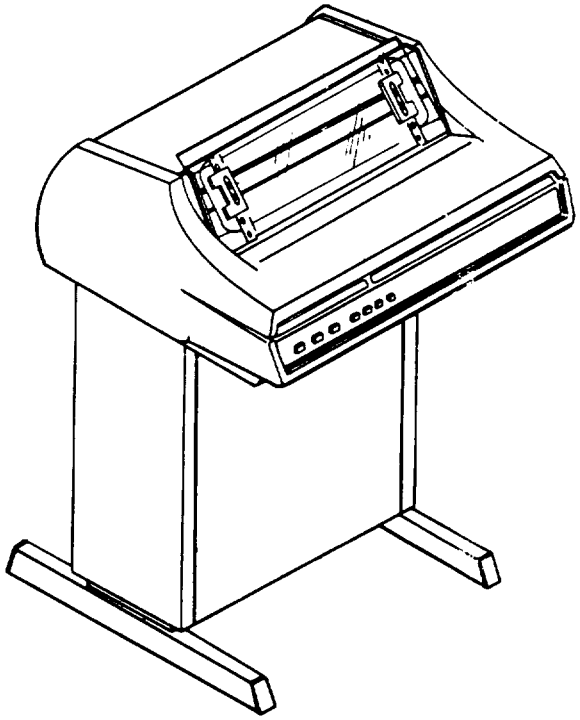
ORGANIZATONAL AND DIRECT SUPPORT MAINTENANCE MANUAL

LINE PRINTER
RP-273/MYQ-4



(NSN 7010-01-079-1516)

HEADQUARTERS DEPARTMENT OF THE ARMY

FEBRUARY 1984

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. 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.

WARNING

Isopropyl alcohol is flammable. Keep away from heat and open flame.

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 DRY WOODEN POLE OR A DRY 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
No. 11-7025-210-23

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 10 February 1984

ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL LINE PRINTER RP-273 /MYQ-4

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, UA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the 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.

HOW TO USE THIS MANUAL

This manual tells you how to troubleshoot and maintain Line Printer RP-273/MYQ-4.

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.

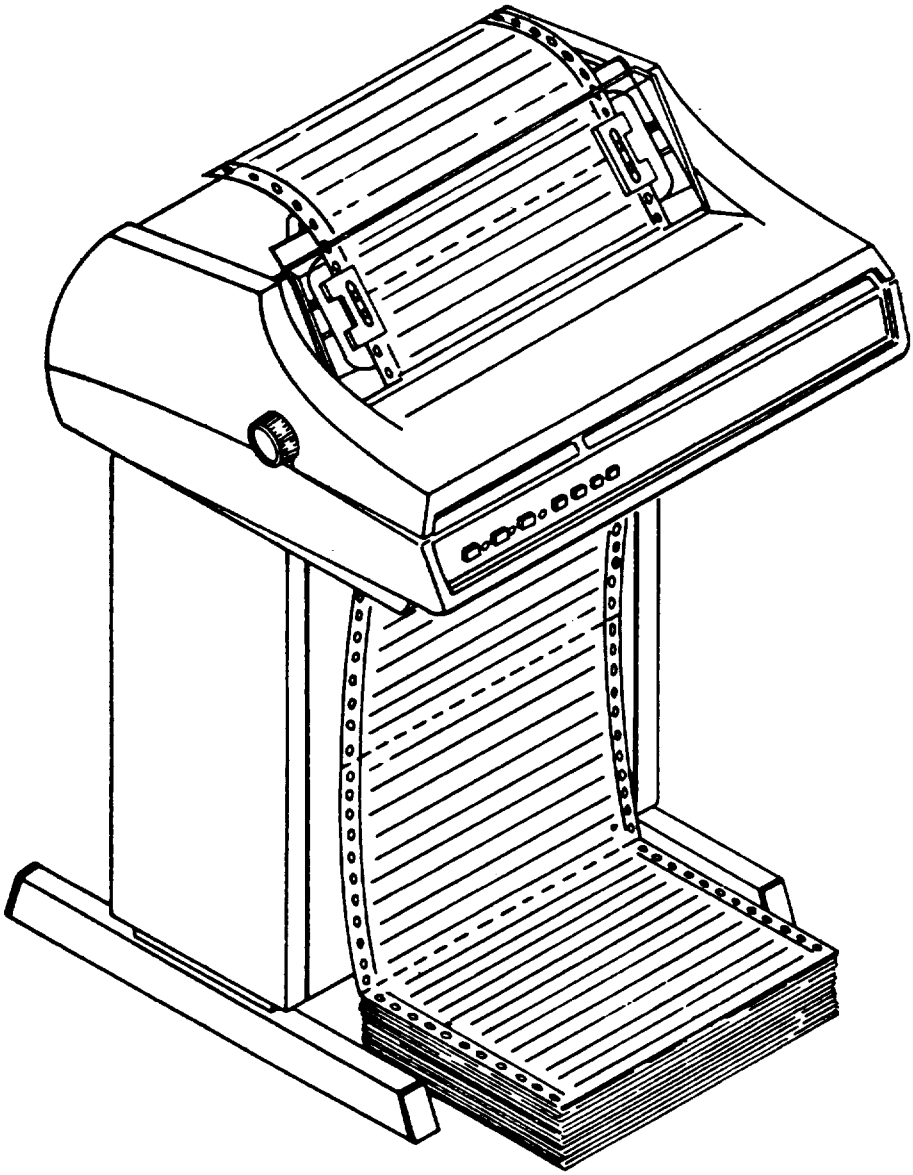


Figure 1-0. Line Printer RP-273/MYQ-4

CHAPTER 1
INTRODUCTION

Section I. GENERAL INFORMATION

1-1. SCOPE

Line Printer RP-273/MYQ-4 (fig. 1-0) is a compact, self-contained unit that prints computer output data on continuous form paper at a rate of up to 340 lines per minute. In the rest of this manual it will be called line printer. Use this manual for organizational and/or direct support maintenance of the line printer.

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 line printer.

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 line printer 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
Line printer or printer	Line Printer RP-273/MYQ-4

1-9. LIST OF ABBREVIATIONS

CRBAR	Crowbar (signal)
CR#	Crowbar# (signal)
FEH	Fire Even Hammers (signal)
FF	Form Feed (signal)
FOH	Fire Odd Hammers (signal)
HVL	High Voltage Low (signal)
HVS	High Voltage Switcher (board)
INT	interface (board)
LCP	control panel (board)
LHD	Line Hammer Decoder (board)
LMB	mother (board)
LOG	logic (board)
lpi	lines per inch
lpm	lines per minute
OV	signal ground (signal)
PSR	Power Supply Regulator (board)
TVFC	vertical format unit (board)
VFU	Vertical Format Unit
XPS	power control (board)
VT	Vertical Tab (signal)

1-10. GLOSSARY

A complete glossary of unusual terms is given in the back of this manual. (Glossary-1)

Section II. EQUIPMENT DESCRIPTION AND DATA

1-11. EQUIPMENT, PURPOSE, CAPABILITIES AND FEATURES

The line printer prints computer output data on continuous form paper. It can:

- Print from 230 to 340 lines per minute using three sets of impact print characters on a moving belt
- Print from one to 132 columns
- Print 6 or 8 lines per inch
- Print on paper from 1 to 6 parts thick when front-loaded
- Print on paper 1 part thick when rear-loaded
- Print on paper from 3.0 in. (7.6 cm) to 14.875 in. (37.8 cm) wide
- Renew its ink supply with a re-inker
- Advance paper to the first line of a new page or leave selected lines blank, under control of a vertical format unit (VFU) prepunched tape or the slew strobe assembly
- Sense and indicate rear low paper supply (11 in. - 27.9 cm of paper remaining)
- Sense and indicate paper out, and stop printer operation
- Sense and indicate printer fault, and stop printer operation.

1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

Figure 1-1 locates and describes major components of the line printer.

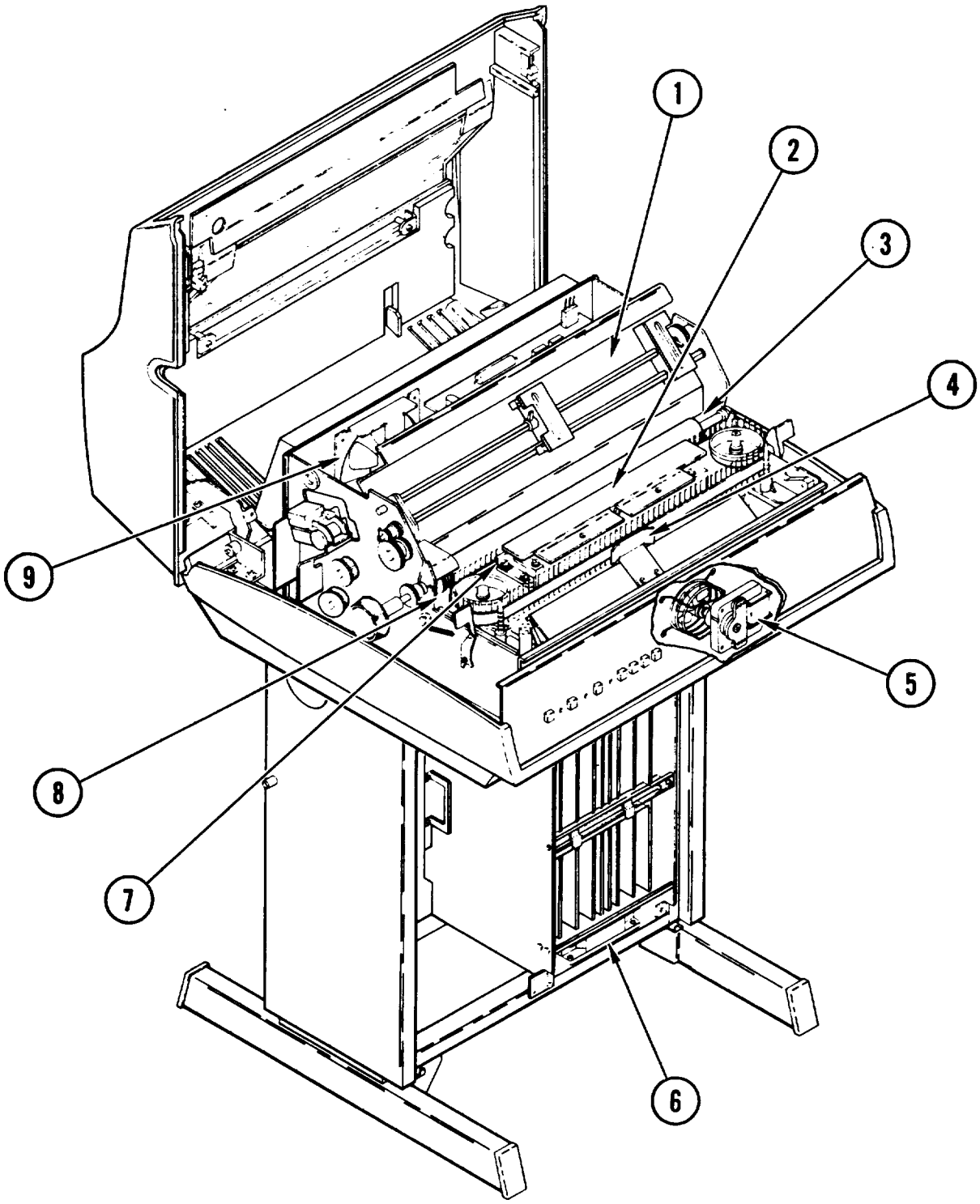


Figure 1-1. Line Printer Major Components (1 of 2)

1	**Cosmetic Shield**	Protects line printer from dust, absorbs noise, covers mechanical assembly.
2	**Horizontal Reference Scale**	Used to measure density and number of printed characters in a line.
3	**Run/Load Switch**	Controls positioning of the toggle assembly.
4	**Front Belt Guide**	Guides front print belt movement, preventing snarls and tangles.
5	**Front Cooling Fan**	Circulates air to stabilize temperature generated by the control panel board (LCP/3) and other mechanical assemblies.
6	**Bottom Cooling Fan**	Circulates air to stabilize temperature generated by circuit boards in bustle assembly.
7	**Magnetic Belt Guide**	Guides rear print belt movement, preventing snarls and tangles.
8	**Paper Out Switch**	Sounds bell (optional) and powers off line printer when paper is out.
9	**Rear Cooling Fan**	Circulates air to stabilize temperature generated by power supply.

Figure 1-1. Line Printer Major Components (2 of 2)

1-13. EQUIPMENT IDENTIFICATION PLATE

An equipment identification plate (fig. 1-2) is located on the side of the printer.

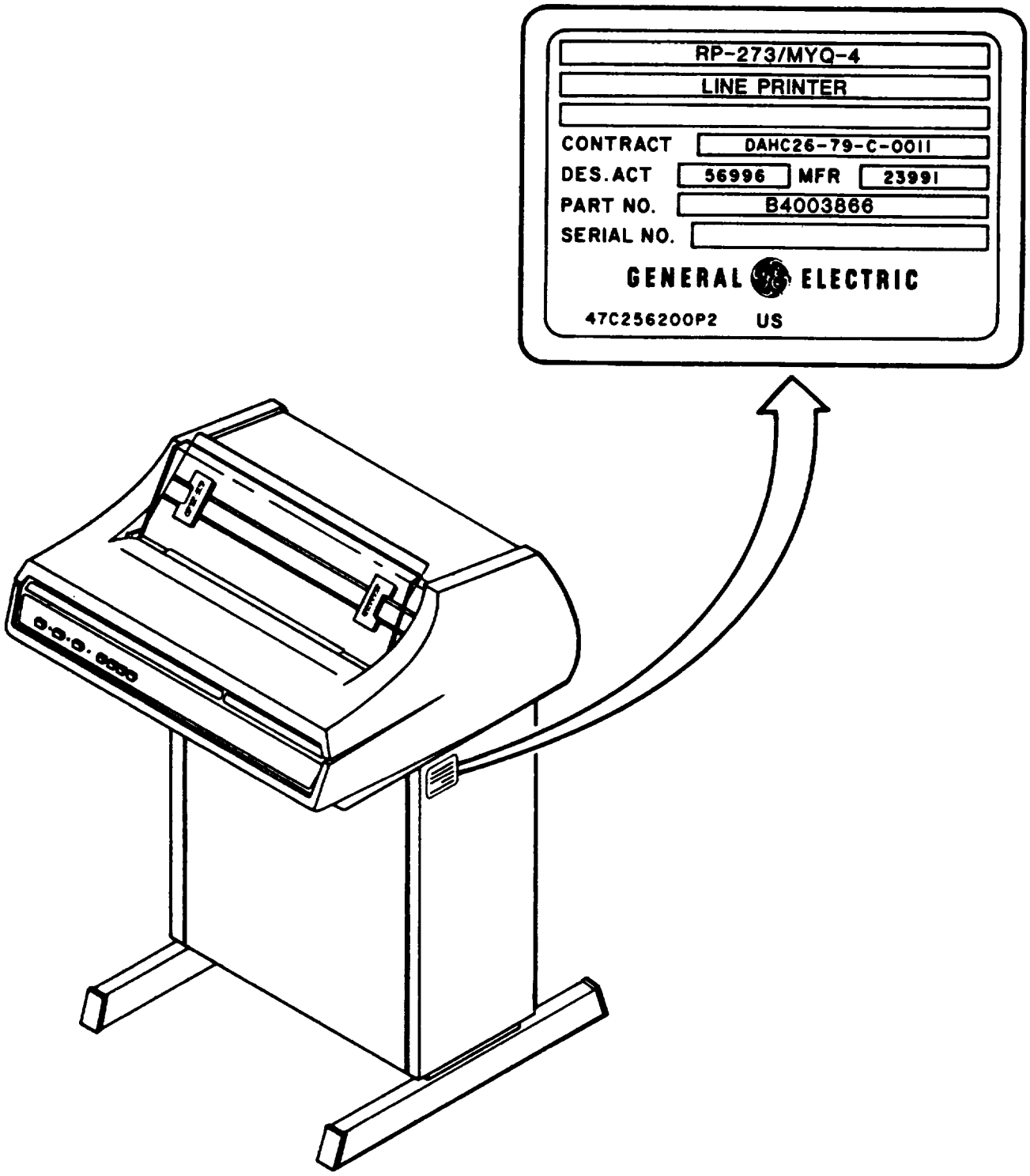
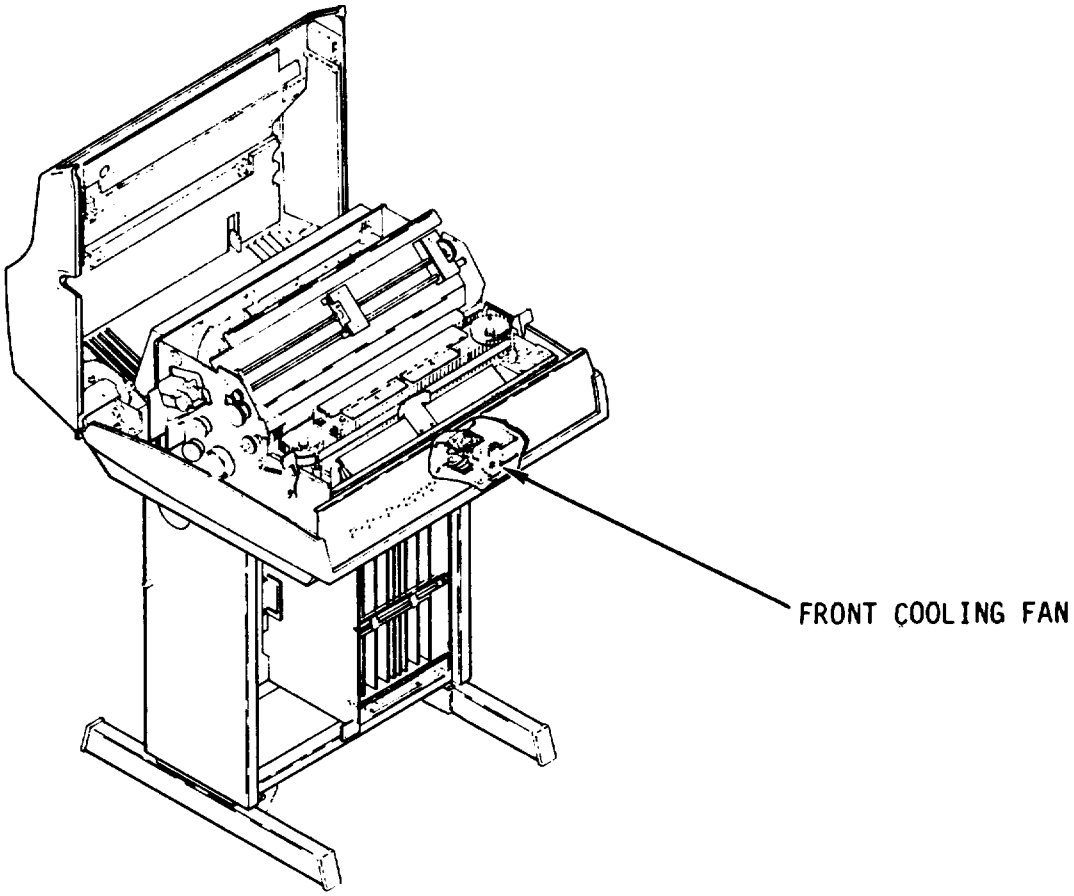


Figure 1-2. Equipment Identification Plate

1-14. DIFFERENCE BETWEEN MODELS

Twenty units have a front cooling fan (fig. 1-3) to stabilize the temperature of the hammer bank assembly. No other unit has a front cooling fan.



NOTE

Printers with the following serial numbers have a front cooling fan:

Serial Numbers	Quantities
011731 thru 011743	13
011514	1
010606 and 010607	2
010609	1
012705 thru 012707	3
Total	20

Figure 1-3. Printers With Front Cooling Fan

1-15. EQUIPMENT DATA

Weight and Dimensions:

Weight	(approximate)	135 lb	(61.2 kg)
Height	(without paper rack)	36.16 in.	(91.8 cm)
	(with paper rack)	37.80 in.	(96.0 cm)
	(with top open)	48.39 in.	(122.9 cm)
Width		26.14 in.	(66.4 cm)
Depth	(without paper rack)	21.54 in.	(54.7 cm)
	(with paper rack)	29.32 in.	(74.2 cm)
	(with optional paper shelf)	35.47 in.	(90.1 cm)
	(with optional paper shelf at maximum extension)	37.97 in.	(96.4 cm)

Operating Environment:

Temperature 32°F to 110°F (0°C to 43.5°C)
Relative Humidity 10% to 95% (noncondensing)
Altitude 0 to 12, 000 feet (3, 660 m)

Electrical Requirements:

Voltage 117 V ac to 120 V ac
Frequency 60 Hz
Power Consumption 350 watts nominal (printing)
90 watts nominal (standby)

Paper Requirements:

Type Pin-Feed (Fan-Fold)
Width 3.0 in. to 14.875 in. (7.6 cm to 37.8 cm)

Weight	1 part	15.0 lb	(6.8 kg) paper
	2, 3, 4 part	13.5 lb	(6.1 kg) paper,
		8.0 lb	(3.6 kg) carbon
	5, 6 part	12.0 lb	(5.4 kg) paper,
		8.0 lb	(3.6 kg) carbon
Thickness (maximum)		0.025 in.	(0.64 mm)

Functional Characteristics:

Print speeds 510 characters per second limit
230 lines per minute (minimum)
340 lines per minute (minimum)
Fonts on print belt 3
Print positions 132 (maximum)
Print format 10 cpi, horizontal; 6 to 8 lpi vertical
Print character set 94-character ASCII
Type Print belt and hammer bank using impact burst groups
Vertical slew 8.2 in. (20.8 cm) per second

Transmission Requirements:

Code ASCII 7+l(odd/even parity)
Interface EIA RS-232-C
Speed 60,000 cps
Type Asynchronous

CHAPTER 2
TECHNICAL PRINCIPLES OF OPERATION

2-1. GENERAL

This chapter tells how the line printer works. The information will help you perform troubleshooting and corrective maintenance procedures.

2-2. FUNCTIONAL DESCRIPTION

The line printer is an electromechanical device whose major components are a printing mechanism, logic circuitry, control circuitry and a power supply. Interaction of major components is illustrated in figure 2-1.

2-3. PRINTING MECHANISM

The printing mechanism consists of the main drive, the ribbon drive mechanism, the hammer and print belt assembly, and the components used in paper handling.

a. Main Drive. The ac motor under the LPS board provides the drive power (fig. 2-2) for the line printer. It drives the jackshaft, which drives the line feed clutch, the hammer and print belt assembly, and the ribbon drive mechanism.

b. Ribbon Drive Mechanism. The left print belt pully shaft drives the ribbon drive mechanism (fig. 2-3) through a series of reduction gears. The ribbon drive mechanism uses a clutch on the bottom end of its drive shaft to ensure only counter-clockwise movement of the shaft. A drive coupling on the top end of the drive shaft engages a hub in the ribbon cartridge. The hub is designed to break if the ribbon hangs up or jams.

c. Hammer and Print Belt Assembly. The line printer uses a flexible print belt (fig. 2-4) to carry the type fingers used for printing. The fingers are mounted in vertical slots in the belt. Each finger has a type character or symbol on the upper end. There are 3 sets of 64 characters in the print belt. Each set of characters has one special index finger which contains a marker at the bottom end. The position of each character in the print belt is relative to this special wide index finger which is detected by a photoelectric light beam. This wide index finger triggers an electronic counting circuit which counts the finger movement of the belt. As the fingers in the belt move past each possible print column position, the column position is compared with the stored input data to determine when the finger is in the correct position and the appropriate hammer is fired. There is a hammer in each print position, for a total of 132 hammers.

(1) The ac motor drives the print belt by means of the jackshaft and the left belt-drive system (fig. 2-5). The print belt travels counter-clockwise at a constant rate in front of the paper and platen. The inking ribbon passes between the type fingers and the paper. Printing takes place when a type finger is driven by a hammer against the ribbon and paper.

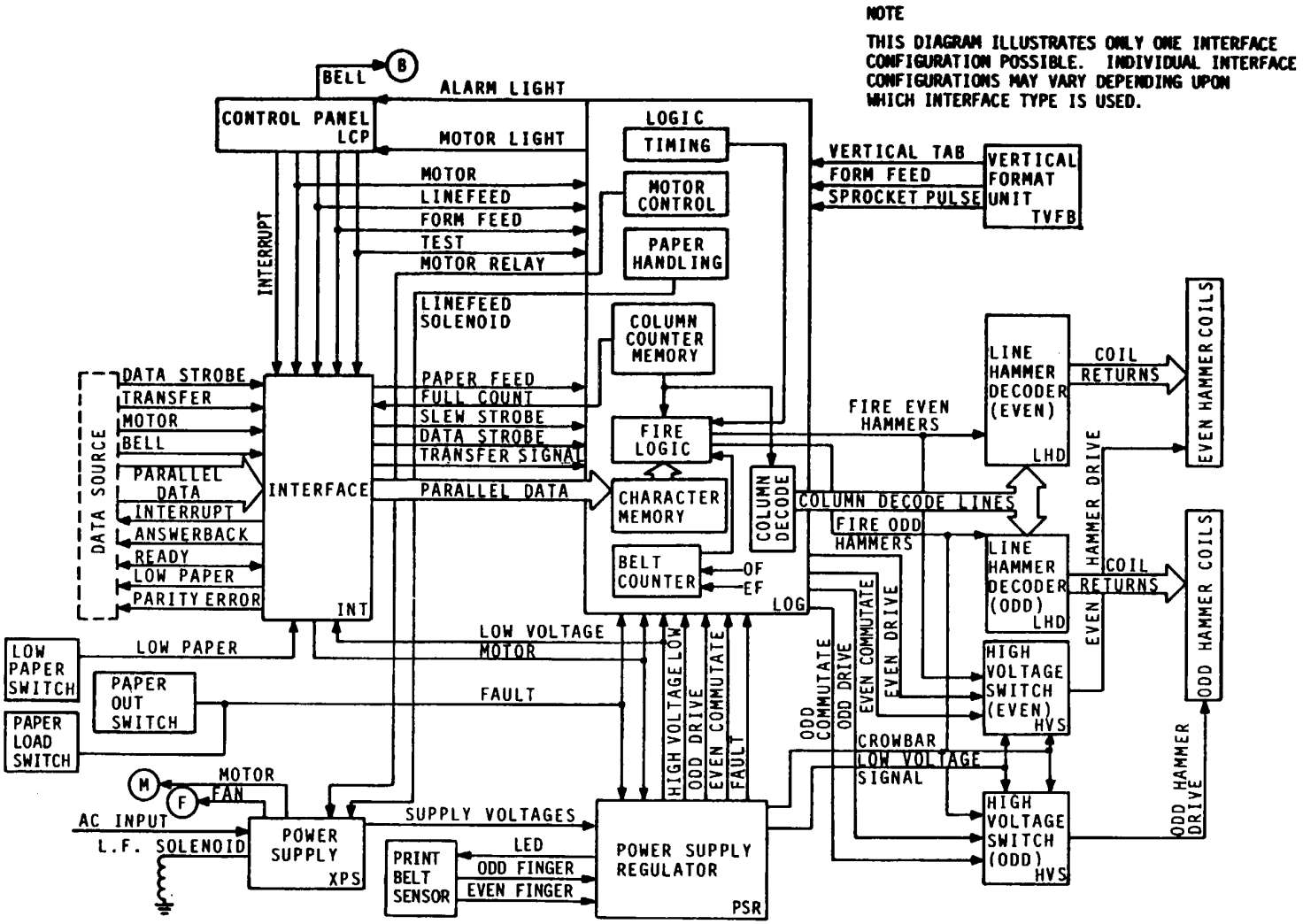


Figure 2-1. Line Printer functional Block Diagram

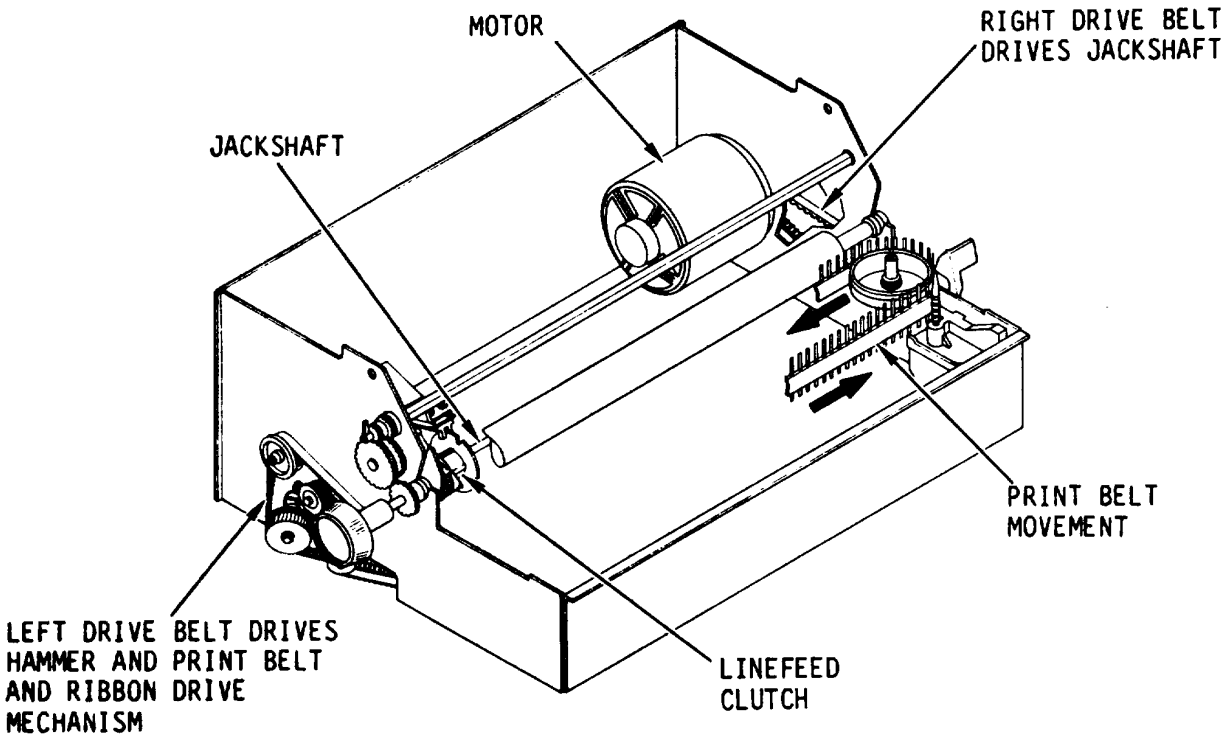


Figure 2-2. Main Drive

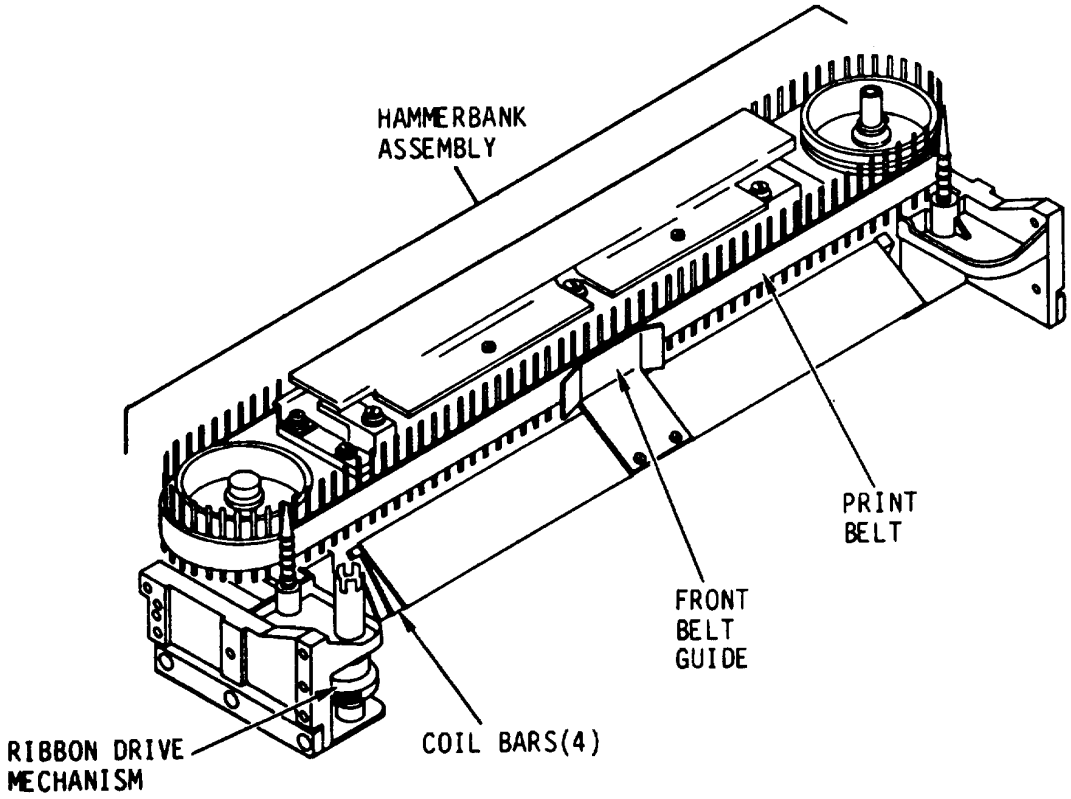


Figure 2-3. Ribbon Drive Mechanism

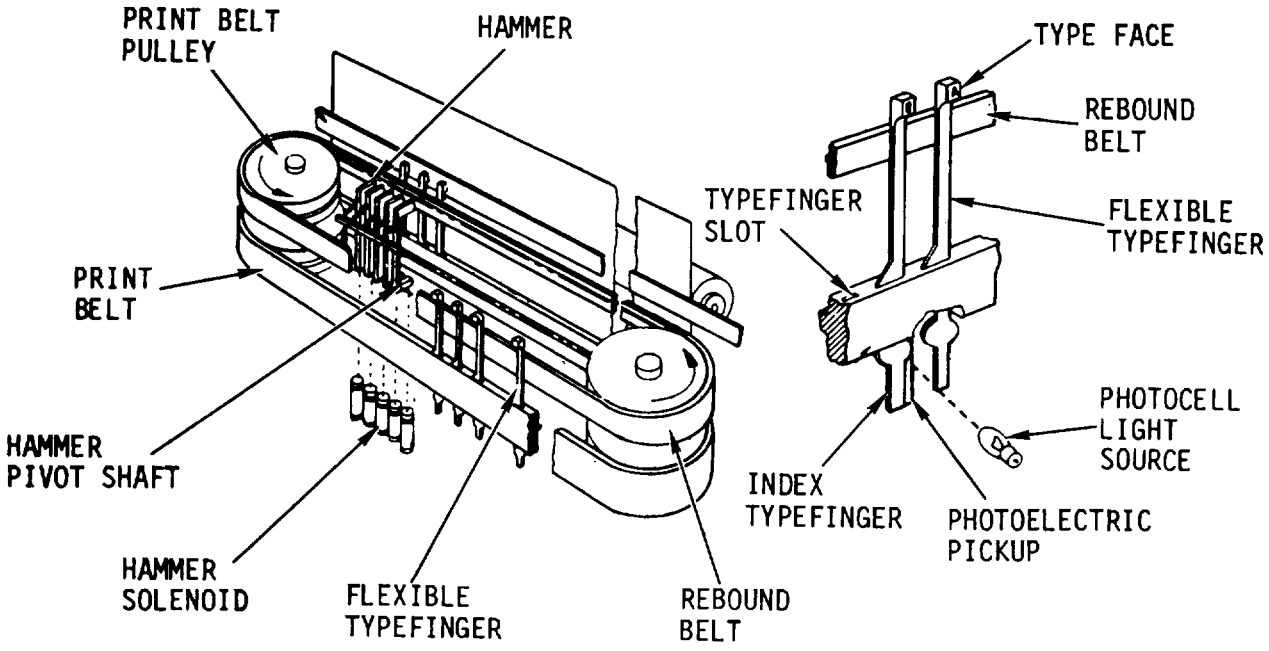


Figure 2-4. Hammerbank Assembly

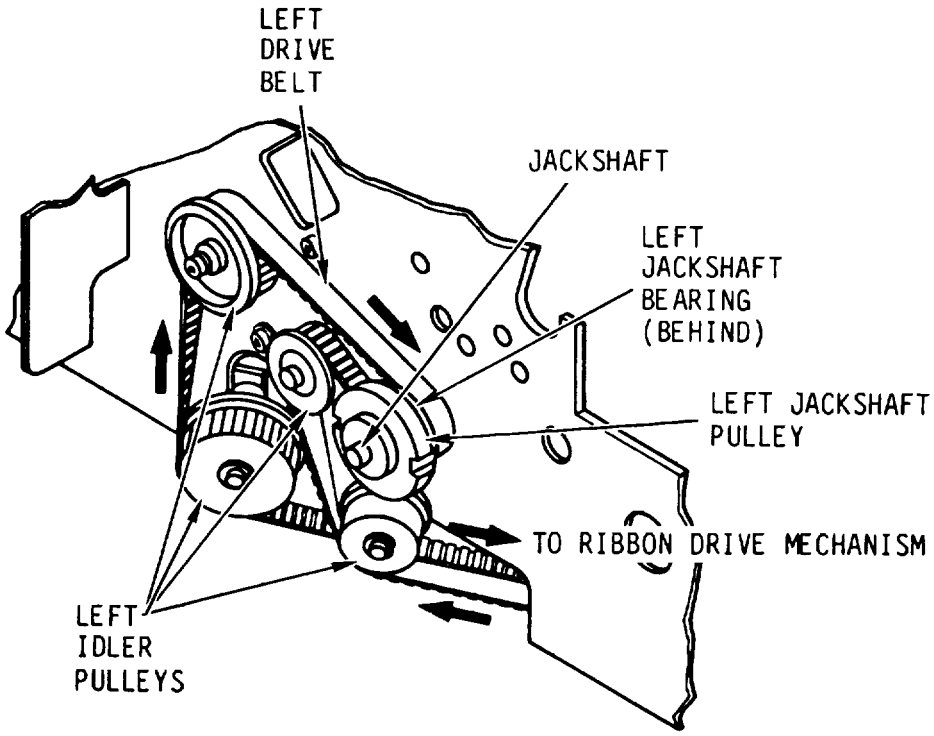


Figure 2-5. Left Drive Belt System

(2) All of the individual hammers (fig. 2-6) are mounted on a common pivot rod. Each hammer is connected by its clevis to a solenoid plunger. The clevis engages a curved slot at the base of the hammer. The other end of the clevis is linked to the solenoid plunger. When the solenoid coil is energized by the hammer drive circuit, the clevis is pulled down by the plunger, causing the hammer to pivot forward about the pivot rod. The face of the hammer travels forward approximately 0.077 inch (2.0 mm) while being pulled by the clevis.

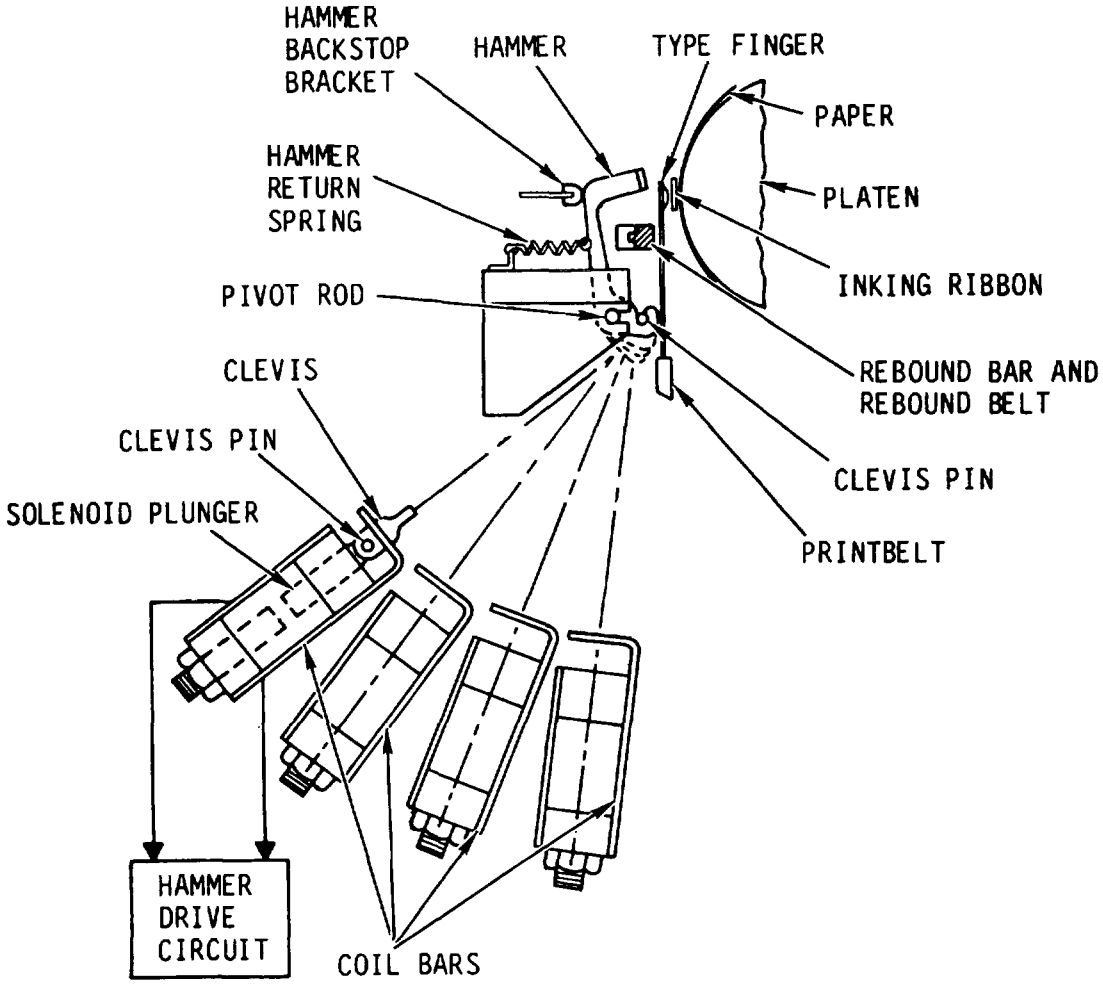


Figure 2-6. Hammer Impact Process

(3) The swinging of a hammer against a type finger is electronically controlled by a timing process which uses an electronic buffer storage and counting system. When a character printout is selected by input data, the line printer buffers or stores the input data and permits multiple hammer firing when selected type fingers are in the correct position.

(4) The solenoids are mounted and spaced uniformly in banks on the coil bar assemblies. There are four coil bar assemblies mounted parallel to each other with an angular displacement. The bars are supported at the ends of the belt pulley castings.

(5) The solenoid plunger enters a hole in the top member of the coil bar. The bottom portion of the coil bar has a threaded hole to receive a threaded solenoid pole piece. The penetration of the pole piece in the coil bar is adjustable, and its position or depth is secured by a locking nut. This allows a travel adjustment of the upper plunger. The timing process of activating a hammer is effected by the photocell position. The time from coil energization to hammer strike is approximately 1.3 milliseconds. When the hammer is at rest, it is held against the hammer backstop bracket by the hammer return spring.

(6) A narrow belt which rotates about a second set of pulleys directly on top of the print belt pulleys serves as a traveling rebound belt for the print fingers. The traveling rebound belt and the rebound bar act as a stop for a type finger after a character has been printed. This prevents the type fingers from oscillating and snagging on the hammers.

d. Paper Handling Components. The paper is moved through the printer by the interaction of paper handling components (fig. 2-7) which consist of the right and left tractors, tie rod, drive shaft, friction brake, 6/8 lines per inch (lpi) selector cam, low paper sensor, paper out switch, and platen.

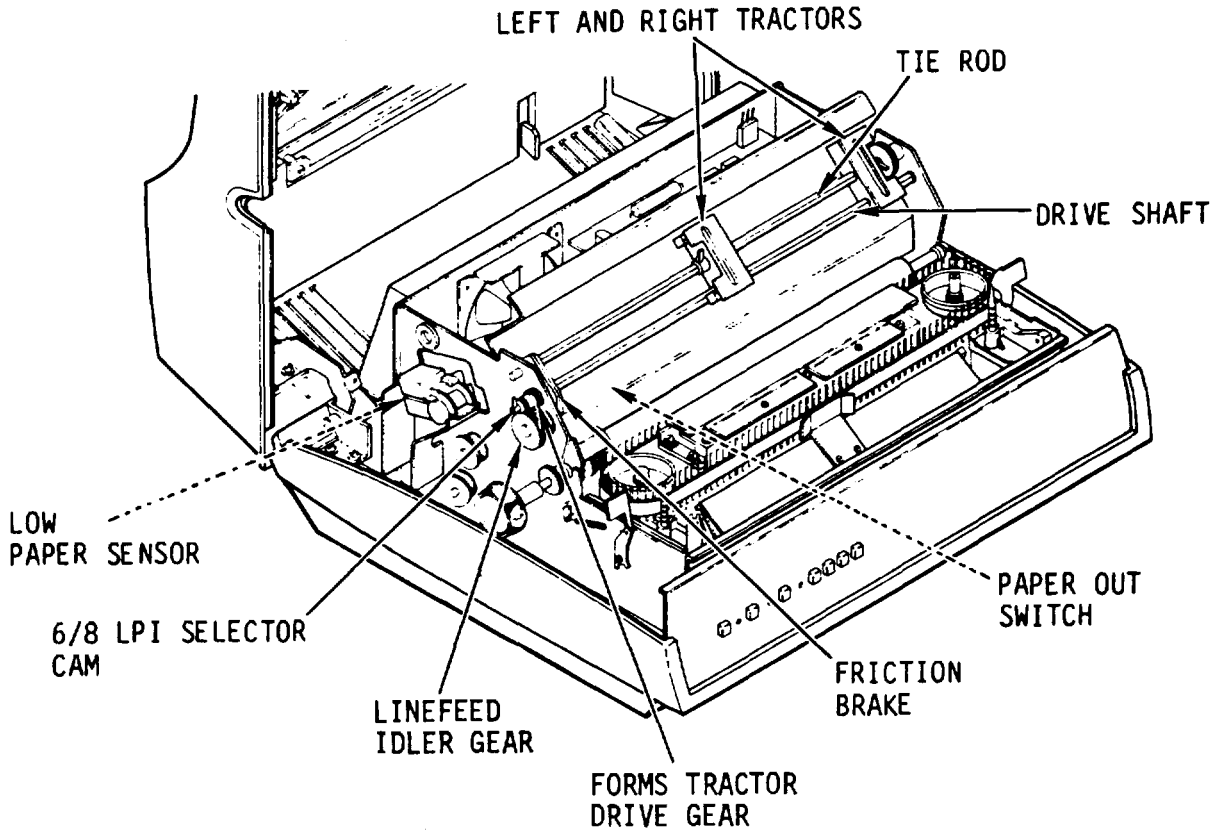


Figure 2-7. Paper Handling Components

(1) The paper is advanced by rotating the platen knob manually or by electrical/ mechanical feed. The linefeed solenoid and linefeed clutch are the components (fig. 2-8) used for normal line feed.

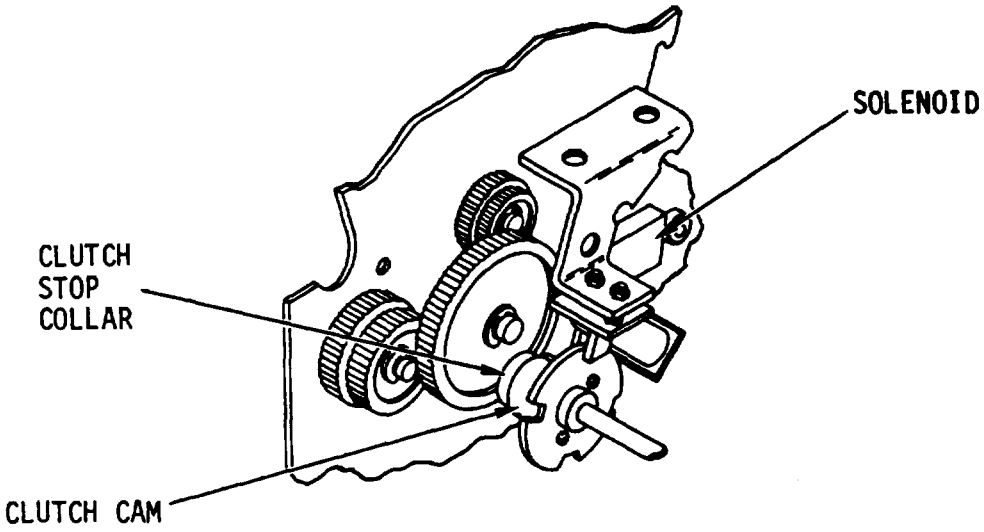


Figure 2-8. Normal Linefeed Components

(2) When a line feed is selected, the linefeed solenoid (fig. 2-9) is energized with + 25 volts for 12.5 milliseconds. This pulls the linefeed solenoid arm away from the cam and allows the clutch to rotate 1/4 of a revolution. This causes gears connected to the linefeed drive gear to advance the paper one line.

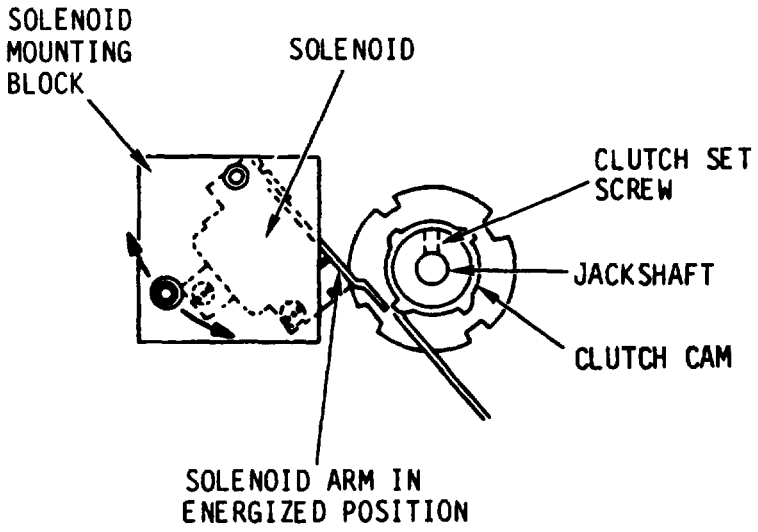


Figure 2-9. Linefeed Operation

(3) The paper is advanced rapidly (slewed) by the slew strobe assembly (fig. 2-10). This assembly consists of a strobe disc attached to the right side of the linefeed clutch and a strobe detector bracket-mounted to the left side frame. The strobe detector contains a small printed wire board called the TVFC/1 board. It

has a connector cable and plug for connection to the main Vertical Tab (VT), Form Feed (FF), and VFU cable assemblies. The slew strobe assembly is activated when appropriate paper slew commands are received from a data source such as the vertical format unit.

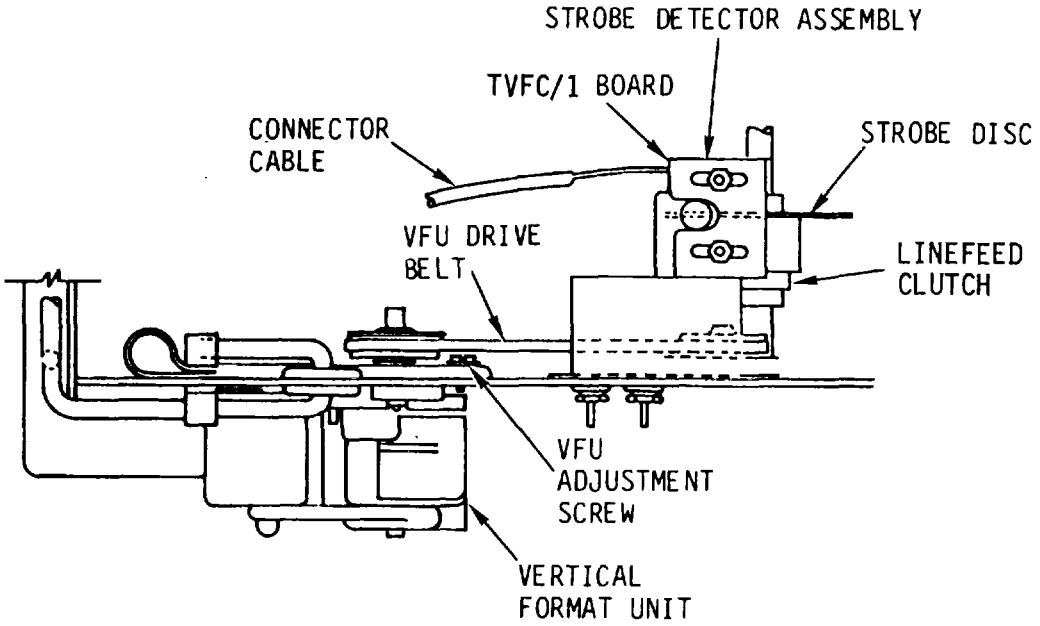


figure 2-10. Slew Strobe Assembly Paper Advance

(4) The vertical format unit (VFU) provides preprogrammed linefeed data to the slew strobe assembly. It is a data source (fig. 2-11) for the slew strobe assembly. The data punched on the VFU tape is read by the detector assembly. The data is sent by the VFU cable to the mother board (LMB/16) and the TVFC/1 board. The slew strobe assembly then advances paper to positions determined on the VFU tape.

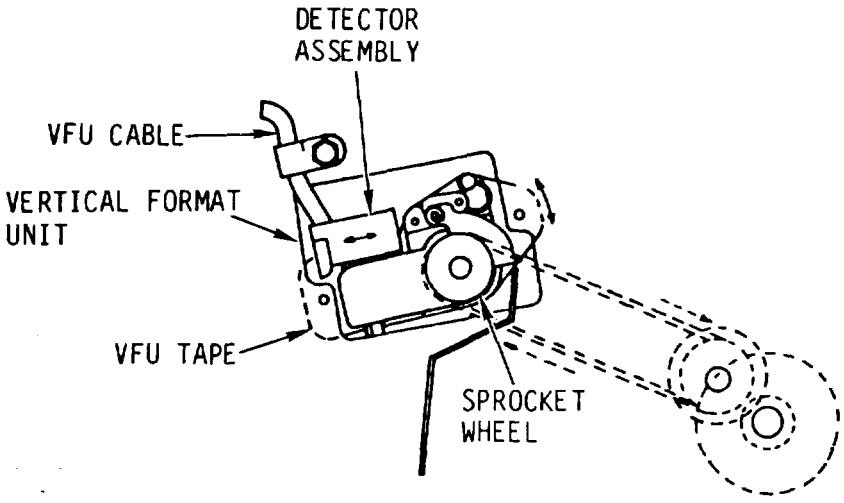


Figure 2-11. Slew Strobe Data Source

2-4. LOGIC CIRCUITRY

The main electronic logic module is mounted in the bustle assembly (fig. 2-12). It contains large scale integrated circuits on printed wire boards.

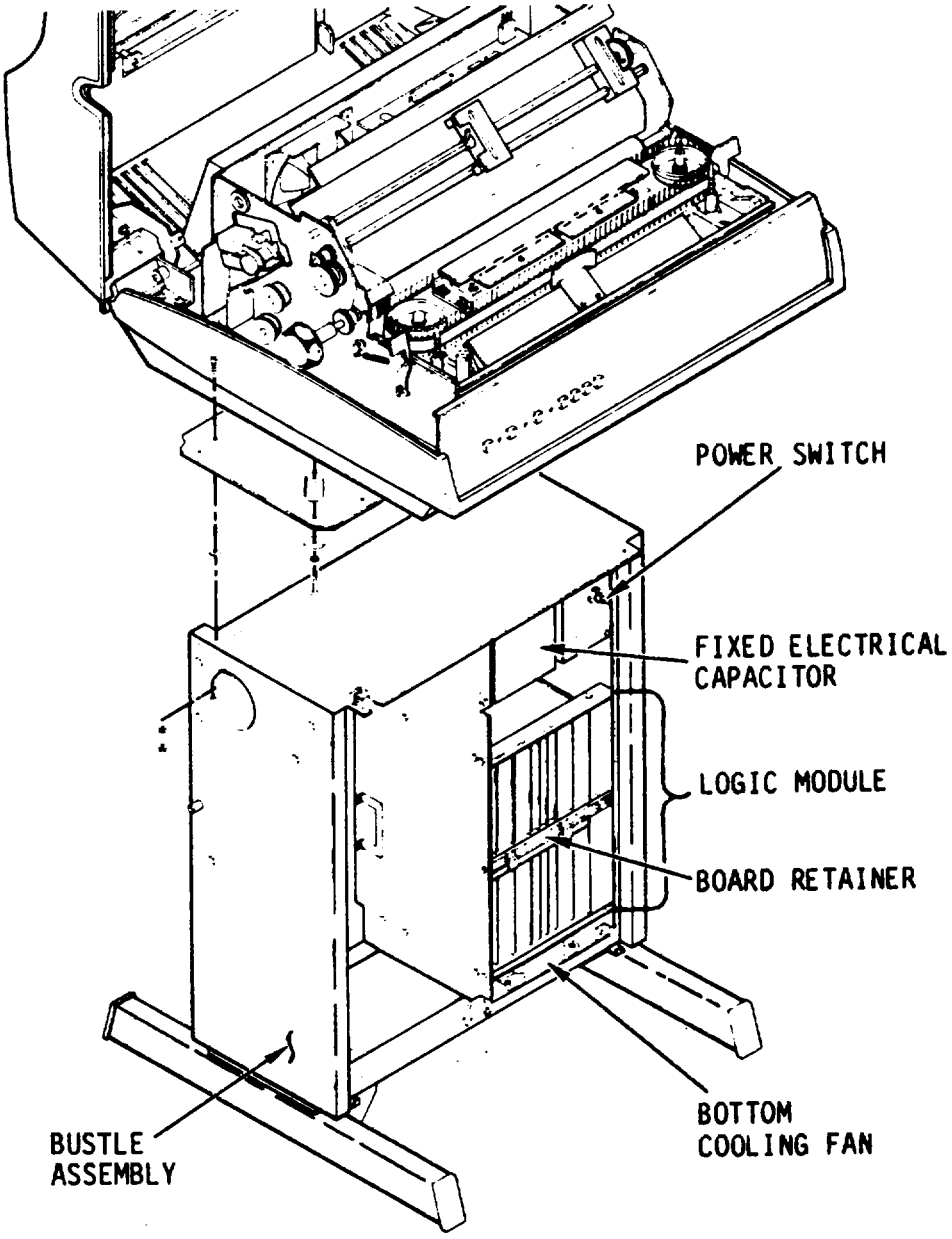


Figure 2-12. Bustle Assembly

a. Mother Board (LMB/16). The mother board (LMB/16), located on the back of the bustle assembly, is a back-plane board into which the bustle circuit boards are connected.

b. High Voltage Switcher Boards (HVS/6). The two high voltage switcher boards (HVS/6) in the bustle are identical and interchangeable. They are installed in the even HVS and odd HVS bustle positions and control voltages used for firing all of the even and odd hammers. The HVS boards provide protection against overcurrent or overvoltage to protect the hammer coils.

c. Line Hammer Decoder Boards (LHD/1). The two line hammer decoder boards (LHD/1) in the bustle are identical and interchangeable. Each board controls hammer firing of all odd hammers or all even hammers depending on which bustle slot the board is inserted.

d. Power Supply Regulator Board (PSR/1). The power supply regulator board (PSR/1) in the bustle receives raw, unregulated dc voltages from the rectifiers on the power control board (XPS/3). The PSR board has five functions.

(1) It regulates the four low voltage (+15, +5, -15, and -12 volt) power supplies.

(2) Its crowbar circuit turns off the high voltage supply in case of overcurrent detection.

(3) It regulates the high voltage +157 volts unregulated dc power from the XPS/3 board. The output of the high voltage regulator is 109 V.

(4) Its protection circuits sense for high or low voltage conditions.

(5) Its photoelectric sensing circuits pick up and amplify signals from the type finger photo transistors.

e. Logic Board (LOG/8). The logic board (LOG/8) contains the circuitry associated with processing data from the unbuffered parallel interface board (CINT/2) to the line printer print mechanism. It also contains the paper handling logic, the motor control logic, the alarm logic and clocking and timing for print synchronization.

(1) Paper handling logic works in conjunction with the vertical format unit photosensor board (TVFC/1) housed in the slew strobe assembly.

(2) Motor control logic is activated when it receives a motor-on or motor-off command from the data source.

(3) Alarm logic is activated when the line printer is out of paper, when there is a slow speed on the print belt, or when there is a low voltage on any of the power supplies on the PSR.

(4) Clocking and timing for print synchronization is based on a 2-phase clock system derived from a 3.2 MHz crystal clock oscillator. The two Pico fuses (fig. 2-13) protect the clock timing circuits.

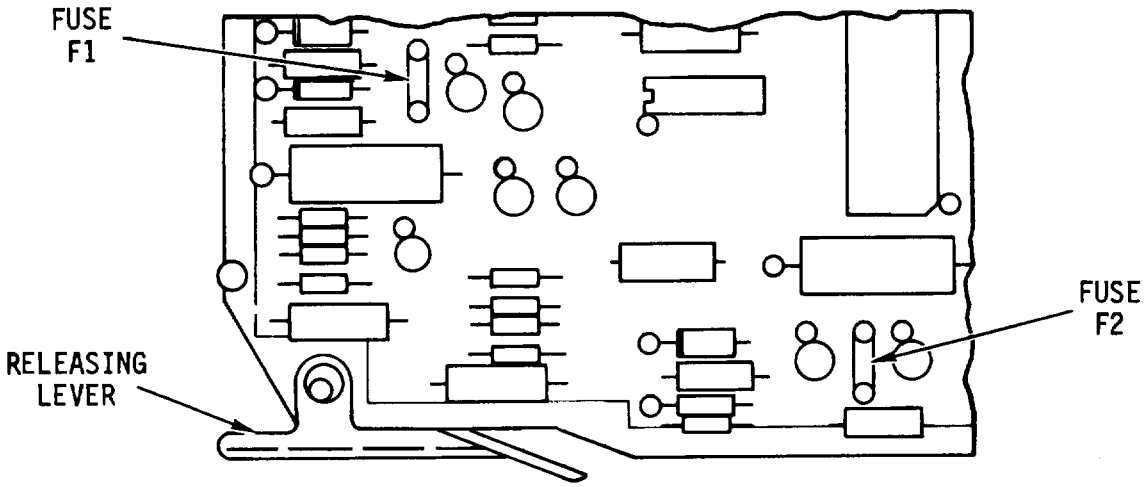


Figure 2-13. Pico Fuses F1/F2 on Logic Board

f. Unbuffered Parallel Interface Board (CINT/2). The unbuffered parallel interface circuit board (CINT/2) is installed in the bustle slot labeled INT where it engages the mother board. The CINT/2 board receives all data and controls signals through a 25-pin connector. It contains logic to perform a parity check. The board also contains decode circuitry to execute paper control commands, i.e., line feed, form feed, or slew. Finally, the CINT/2 board contains interface logic for other control commands and status signals such as bell and low paper. The line printer receives one full line of data at the maximum transfer rate of 60, 000 characters/second. After the full line of data has been received by the logic board (LOG/8) from the interface board (CINT/2), the logic board will send a busy signal to the data source through the interface board. During this "busy" time, the line printer will execute any paper feeding commands received, print the line of data, and execute a line feed. While the line feed is being executed, another line of data may be entered from the data source.

2-5. POWER SUPPLY

Power enters the line printer through the power cord and goes through the cover interlock switch and the power switch. Both of these switches must be closed before power exists on the power control (XPS/3) board (fig. 2-14).

The power control board (fig. 2-15) receives power from the 117 V ac power source and, through the power transformer located on the main frame, supplies low voltage unregulated power to the power supply regulator board (PSR/1). In addition, the XPS board contains all power supply fuses, the ac line filter, motor circuit, and line feed solenoid driver.

The incoming ac power passes through the line filter inside the ac switch box. The line filter prevents line-generated RFI from entering the power supplies and also prevents unit-generated RFI from conducting back into the ac line. The fuse F5 protects the 117 V ac primary circuit.

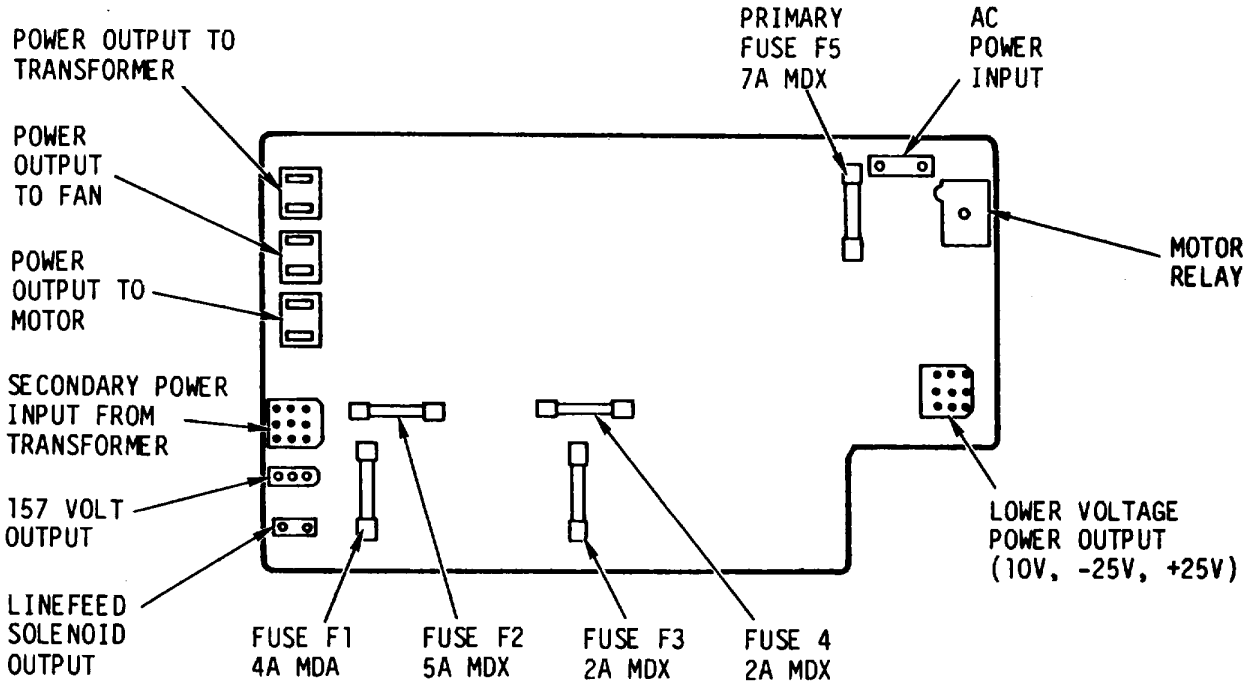


Figure 2-14. Power Control (XPS/3) Board

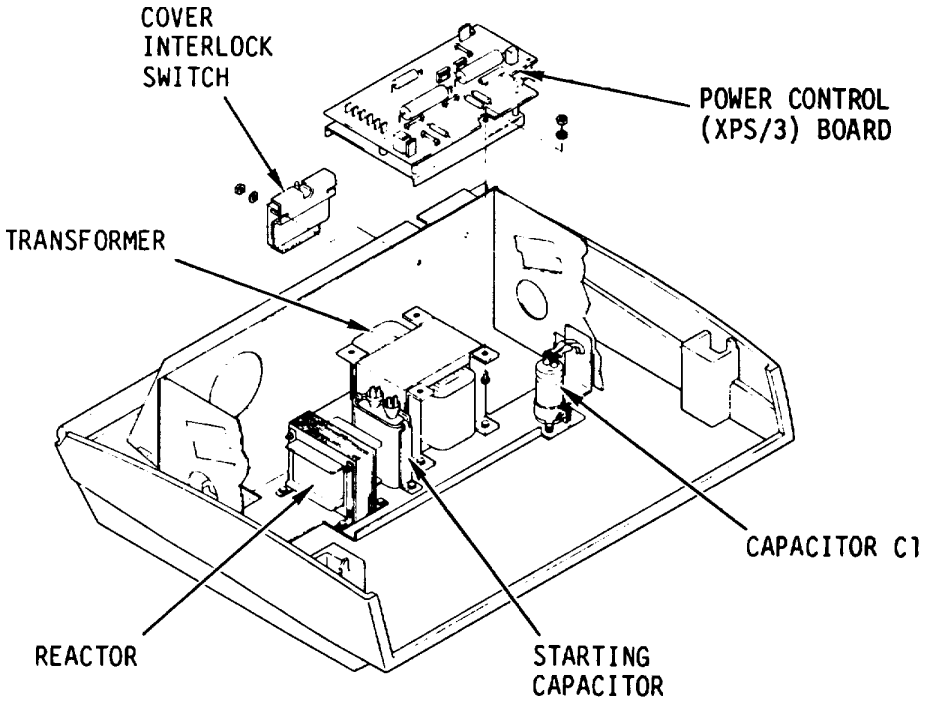


Figure 2-15. Power Supply

The power control board also contains the motor circuits. The motor is fed from the line side of the RFI filter. The motor circuit includes the motor relay and associated circuitry to reduce voltage transients generated by the relay contacts. Thermal overload protection is internal to the motor.

The 157 volt power supply provides power to the +109 volt regulator found on the. PSR board. Fuse Fl provides protection against failure of the +109 volt regulator.

The low voltage power supplies provide unregulated low voltage power to the low voltage regulators on the PSR board. The +25 volt, -25 volt, and +10 volt unregulated power supplies the +15 volt, -15 volt, and +5 volt regulators (fig. 2-16). In addition, -25 volt unregulated power is also used to supply the -12 volt regulator.

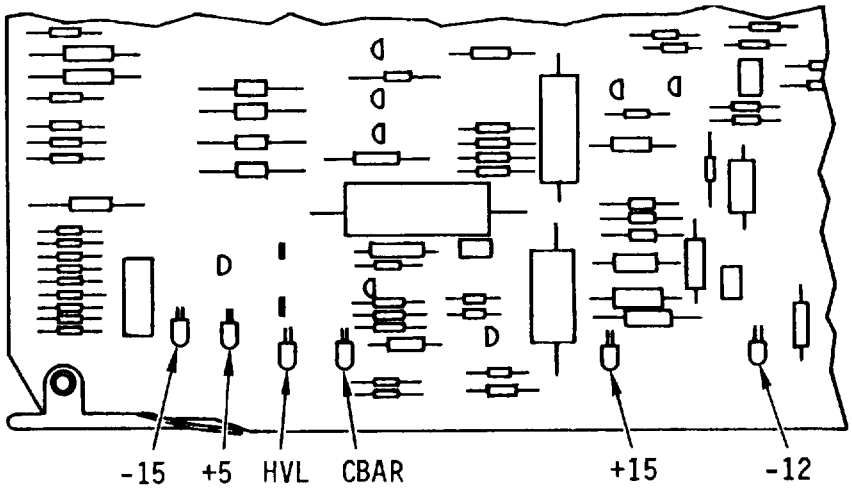


Figure 2-16. Power Supply Regulator (PSR/1) Circuit Board Indicators

2-6. CONTROL CIRCUITRY

The control panel circuit board (LCP/3) (fig. 2-17) seats and provides the interconnections for all pushbutton control switches and indicators on the control panel.

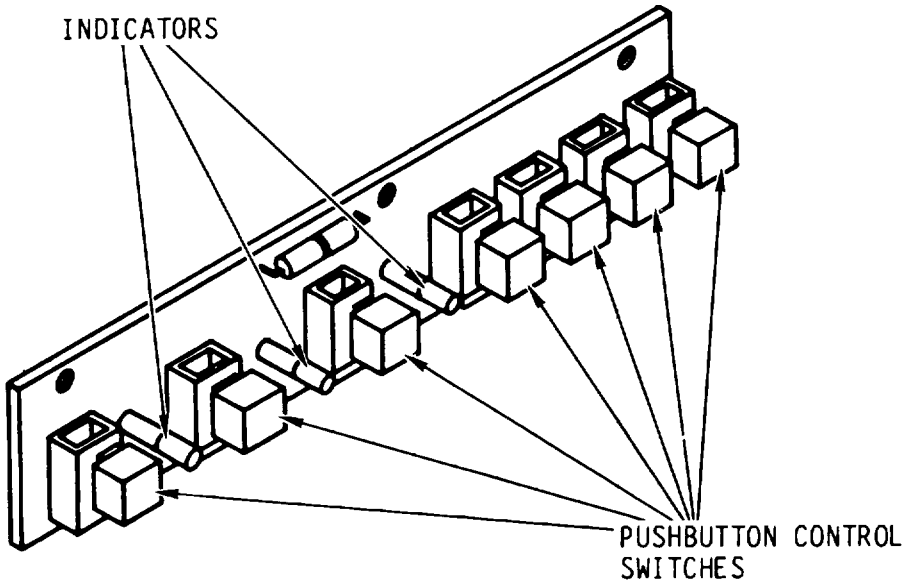


Figure 2-17. Control Panel (LCP/3) Circuit Board

CHAPTER 3
ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Index of Maintenance Procedures

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 11-7010-203-23P 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 line printer.

3-3. SPARES AND REPAIR PARTS

Refer to TM 11-7010-203-23P 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 . Organizational Preventive Maintenance Checks and Services Semiannual Schedule

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available if
1	Print Mechanism Belts or Pulleys	Check condition of motor drive pulley, left and right jack-shaft pulleys, and four left idler pulleys as follows: 1. Power off. 2. Pull ac plug from outlet. 3. Lift top cover 4. Remove paper. 5. Turn motor drive pulley counterclockwise to check belts and pulleys. **WARNING** **Fumes of FREON-TF are poisonous; provide thorough ventilation when used. Do not use near open flame or hot surface. Do not get on skin.** 6. Clean pulleys in place using FREON-TF and clean cotton swab. **CAUTION** **Use oil and grease sparingly to prevent dirt collection. Do not use alcohol or any other cleaning agent on OILITE bearings. These agents will damage OILITE bearings.** **Lubricate four idler pulleys by applying two drops of oil on shaft next to bearing.**	Belts or pulleys slip because of dirt, cracks, or wear. Pulleys hind.

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

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available if
2	Print Mechanism Bearings	Lubricate left jackshaft bearing by applying two drops of oil to bearing between jackshaft pulley and side frame. Lubricate right jackshaft bearing by applying two drops of oil on jackshaft next to end of bearing on outside of side frame.	Bearing binds. Bearing binds.
3	Print Mechanism Jackshaft	Check adjustment of jackshaft as follows: 1. Using feeler gauge, check left jackshaft end play. It should be 0.003-0.008 in. (0.08-0.20 mm) between outside edge of left jackshaft bearing and left pulley assembly. 2. Using feeler gauge, check right jackshaft end position. It should be flush to 0.06 in. (1.5 mm) beyond outside edge of pulley.	Jackshaft is not properly adjusted.
4	Print Mechanism Drive Belts	Check tension of left and right drive belts. 1. Using belt tension gauge, apply a force of 4 oz. to center of belt span. 2. Using a machinist's rule, measure deflection caused by force. It should measure between 0.05 and 0.23 inches.	

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

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available if
5	Print Mechanism Photocell	Check photocell condition. Clean, if necessary, as follows: 1. Lift up platen latch on each side of frame. 2. Grasp platen. First lift right end a little, then sideways a little. 3. Lift platen out. 4. Using a squeezeball blower, blow dust away from photocell. 5. Remove moisture with clean cotton swab. Check adjustment of photocell as follows: 1. Run self-test. print alinement failure. 2. Using horizontal reference scale, check print aline-ment.	Photocell dirty or moist. Self-test indicates
6	Print Mechanism Front Belt Guide	Check adjustment of front belt guide as follows: 1. Remove ribbon cartridge. 2. Using feeler gauge, check clearance between belt guide and ribbon. It should measure 0.050-0.070 in. (1.3 to 1.8 mm).	Belt guide improperly alined with print belt.

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

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available if
7	Platen	**WARNING** **Isopropyl alcohol is flammable. Keep away from heat and open flames.** Check condition of platen. Clean, if necessary, with soft clean cloth moistened with isopropyl alcohol.	
		Lubricate platen bushing by applying two drops of oil to shaft on each end of platen.	Platen bushing binds.
8	Print Mechanism Linefeed Idler Gear shaft.	Lubricate linefeed idler gear by applying two drops of oil between bearing and	Gear bearing binds.
9	Print Mechanism Platen Drive Gears	Check condition of three platen drive gears above jackshaft on inside left frame as follows: 1. Loosen three screws in power supply cover. 2. Remove cover. 3. Remove two screws from each side of cosmetic shield. 4. Pull out cosmetic shield. 5. Using flat-tipped screw-driver, press down lightly on solenoid arm, and hold.	Gears slip because of dirt, cracks, or wear.

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

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available if
		6. Moving three platen gears manually, clean with soft bristle brush and FREON-TF. 7. Vacuum dirt from beneath gears. Lubricate platen drive gears by lightly coating gear teeth with grease.	
10	Print Mechanism Tractor Drive Gear	Check condition of forms tractor drive gear. Clean by removing dried grease and dirt from gear with clean lint-free cloth and FREON-TF.	Gear slips because of dirt, cracks, or wear.
11	Print Mechanism VFU Drive Belt	Check tension of VFU drive belt. 1. Using belt tension gauge, apply a force of 2 oz. (57g) to the center of bottom belt span. 2. Using machinist's rule, check deflection of belt. It should measure 0.07-0.13 inches.	VFU belt tension does not meet specifications.
12	Print Mechanism Friction Brake	Check condition of friction brake as follows: 1. Push in platen knob and turn slightly back and forth. 2. If drag is too light or missing, the hubs are worn or compression springs sprung. Lubricate friction brake by applying one drop of oil to each end of hub.	Brake slips because of excessive wear on hub and/or damage to compression springs. Hubs worn or compression springs sprung. Brake binds.

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

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available if
13	Motor	Lubricate motor in the oil hole on both ends of motor as follows: 1. Locate right oil hole on top of motor casting between and at the base of the double flanges. 2. From inside of right frame extend spout of oil can down to oil hole. 3. Apply two drops of oil. 4. Using flexible mirror, locate left oil hole. It is also on top of motor casting and at the base of the double flanges. 5. Bend spout of oil can inwards and extend in to oil hole. 6. Apply two drops of oil.	Motor drive shaft turns with loud noise.
14	Power Supply	Check power supply for loose or broken parts, chafed or frayed wires, loose connections, and loose tie wraps or cable clamps.	
15	Line Printer Interior	Clean interior of line printer as follows: **CAUTION** **Be careful with printed wire boards when cleaning line printer interior. They are easily damaged.** 1. Vacuum up dust from interior of printer.	

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

Item No.	Item To Be Inspected	Procedures	Equipment Will Be Reported Not Ready/ Available if
	Line Printer Interior (cont)	2. Wipe off ink stains with soft lint-free cloth moistened with isopropyl alcohol. 3. Place cosmetic shield carefully in position. 4. Replace and tighten two screws on each side. 5. Replace power supply cover. 6. Tighten three screws. **CAUTION** **Make sure that platen is properly seated. Otherwise, damage to platen will result.** 7. Install platen. 8. Replace ribbon cartridge. 9. Install paper. 10. Close top cover. 11. Push ac plug in outlet. 12. Power ON. 13. Run self-test.	

Section IV. TROUBLESHOOTING

3-12. GENERAL

Table 3-2 lists the common malfunctions which you may find during the operation or maintenance of the line printer or its components. You should perform the tests/inspections in the order listed.

This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, tell your supervisor.

Table 3-2. Troubleshooting

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. MOTOR DOES NOT RUN.
Step 1. Check if top cover is closed tight. Close cover.
Step 2. Check if left/right drive belts are too tight. If so, tell your supervisor.
Step 3. Check if interlock switch is operational. If not, tell your supervisor.
2. MOTOR RUNS BUT NO PRINTING OR BAD PRINTING.
Step 1. Check if photocell is dirty. Clean photocell (para 3-15).
Step 2. Check if photocell is properly adjusted. If not, tell your supervisor.
Step 3. Check if left/right drive belts are off. If so, tell your supervisor.
Step 4. Check play in print belt. If belt is too loose, tell your supervisor.
Step 5. Check if motor drive pulley binds. Lubricate motor.
Step 6. Check if linefeed idler gear binds. Lubricate idler gear.
Step 7. Check if Jackshaft bearings bind. Lubricate bearings.

Table 3-2 . Troubleshooting -- Continued

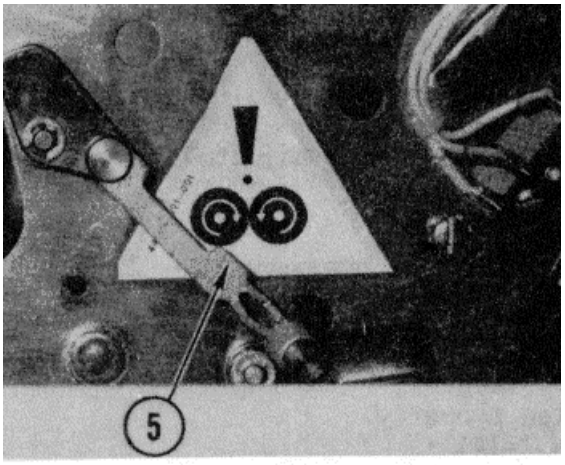
MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	
Step 8.	Check if idler pulleys bind. Lubricate pulleys.
Step 9.	Check if jackshaft is properly adjusted. If not, tell your supervisor.
Step 10.	Check if front belt guide is properly adjusted. If not, tell your supervisor.
3. PRINTER LINEFEEDS UNEVENLY.	
Step 1.	Check if obstruction holds paper. Clear paper path.
Step 2.	Check if platen is seated properly. Reseat platen (para 3-14).
Step 3.	Check if platen bushings bind. Lubricate bushings.
Step 4.	Check if friction brake binds. Lubricate.
Step 5.	Check if friction brake slips. If so, tell your supervisor.
Step 6.	Check if linefeed idler gear slips. If so, tell your supervisor.
Step 7.	Check if linefeed idler gear is broken or worn. if so, tell your supervisor.
Step 8.	Check if platen drive gears are broken or worn. If so, tell your supervisor.
Step 9.	Check VFU drive belt tension. If not as specified, tell your supervisor.

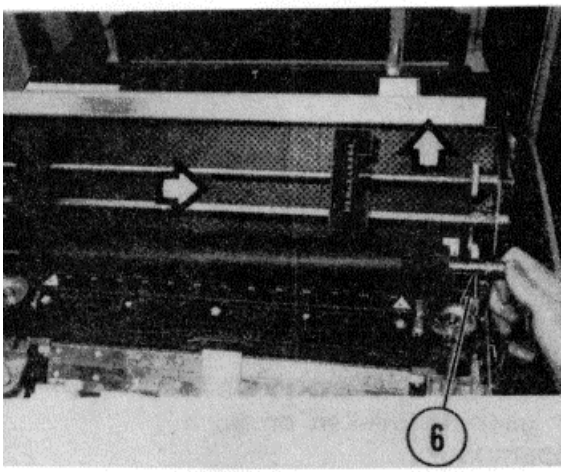
Section V. MAINTENANCE PROCEDURES

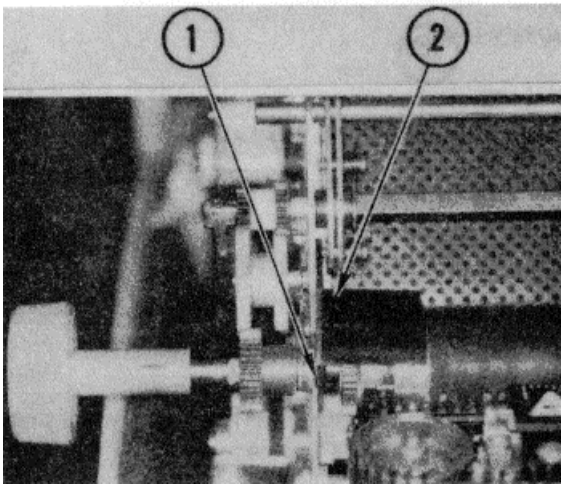
13-13. GENERAL

This section contains the maintenance procedures you are authorized to perform on the line printer. These include cleaning, removal and installation of components, and testing.

3-14. REMOVE/REPLACE PLATEN







Remove

1. Power OFF.
2. Open cover.
3. Remove paper.
4. Remove ribbon cartridge.
5. Lift up platen latch on each side of frame.
6. Grasp platen. Lift right end a little. Slide sideways in direction shown.
7. Lift platen out.

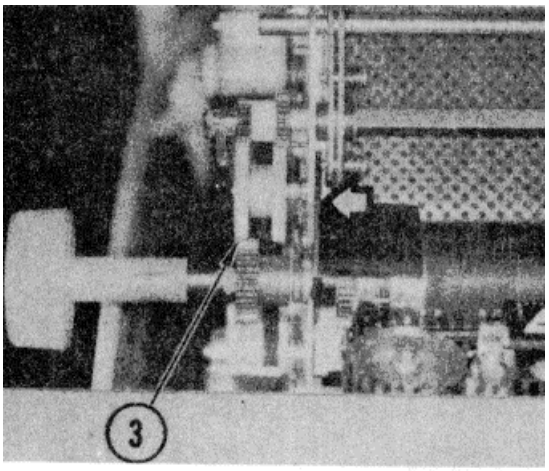
Replace

CAUTION

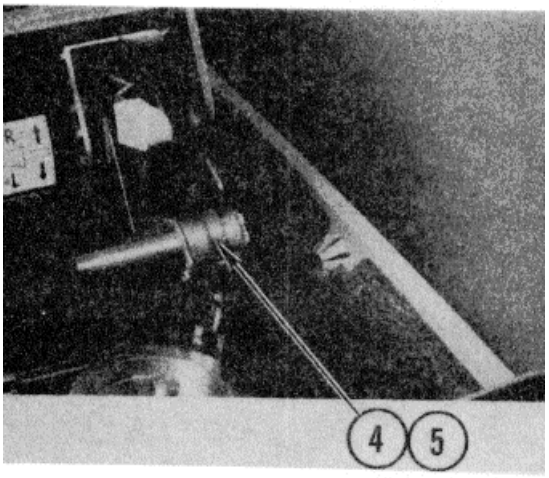
Make sure platen is seated properly. Otherwise, platen gears will be damaged.

1. Lower platen onto printer chassis.
2. Make sure plastic spacer fits under friction brake.

3-14. REMOVE/REPLACE PLATEN (CONT)

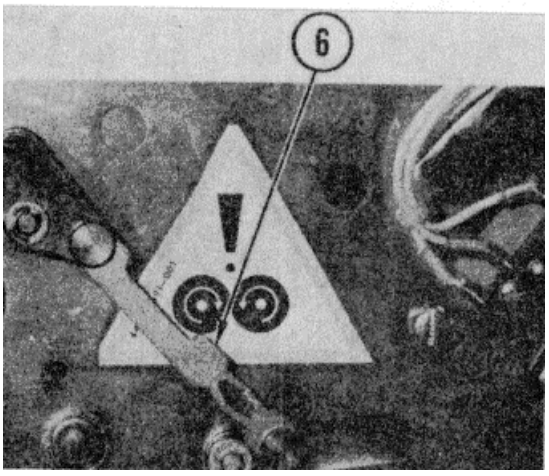


3. Slide platen in direction shown and rotate carefully until gears mesh.



4. Lower other end of platen onto printer chassis. Make sure chassis contacts platen bushing between two guide rings on bushing.

5. Push down securely.



6. Push down platen latch on each side of frame.

7. Replace ribbon cartridge.

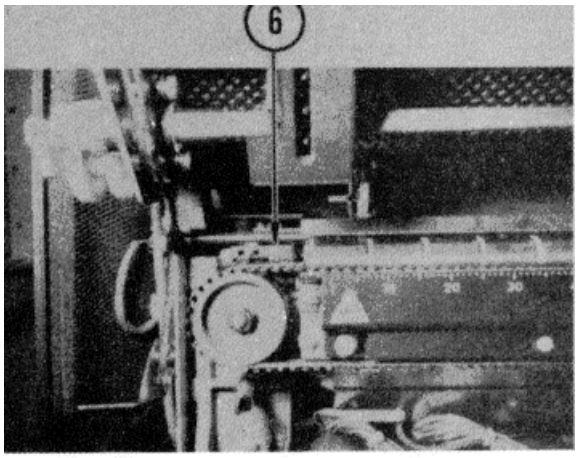
8. Install paper.

9. On control panel, press TEST button.

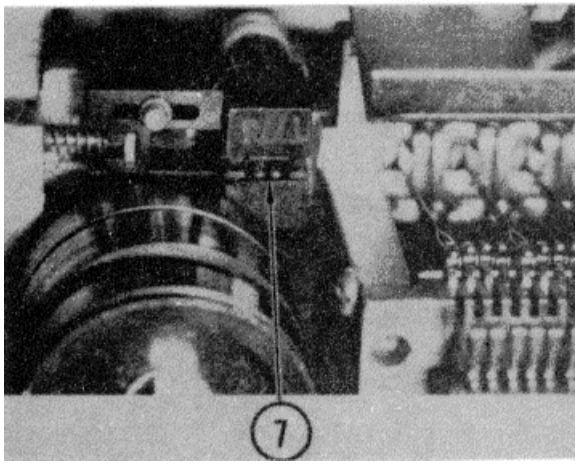
3-15. CLEAN PHOTOCELL

INITIAL SETUP

Common Tools
- Tool kit



1. Power OFF printer. Pull ac plug from outlet.
2. Open cover.
3. Remove paper.
4. Remove ribbon cartridge.
5. Remove platen (para 3-14).
6. Locate photocell.



7. Using blower-squeeze ball, blow air here.
8. Replace platen (para 3-14).
9. Replace ribbon cartridge.
10. Install paper.
11. Close cover.
12. Push ac plug into outlet. Power ON.
13. On control panel, press TEST button.

CHAPTER 4
DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

Index of Maintenance Procedures

Index of Maintenance Procedures -- Continued

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 11-7010-203-23P for a complete listing and description of special tools, TMDE and support equipment required by direct support maintenance.

4-3. SPARES AND REPAIR PARTS I

Refer to TM 11-7010-203-23P 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 find 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.

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 next phase.

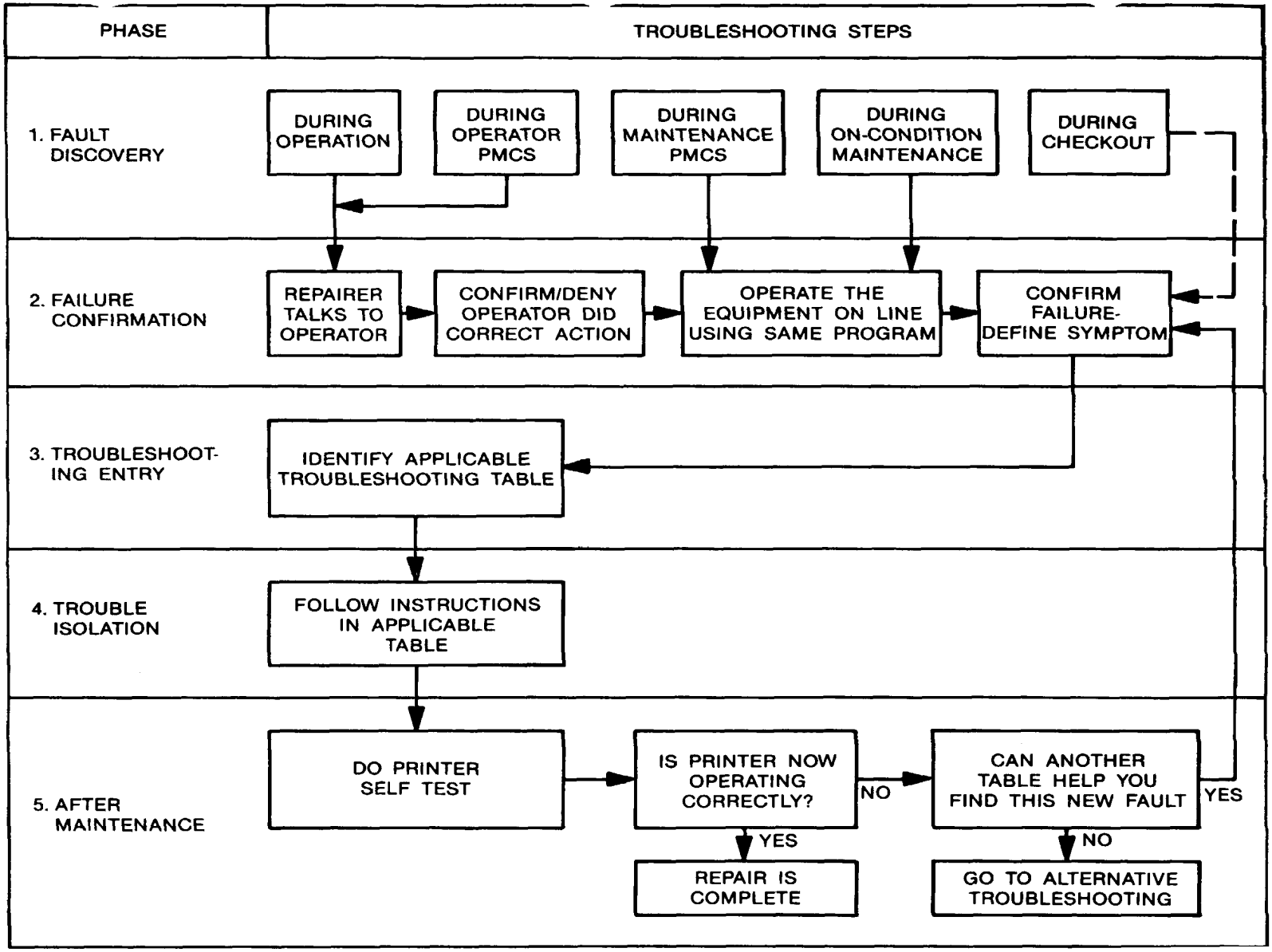


Figure 4-1. Troubleshooting

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 table (tables 4-2, 4-3) which will help you isolate the fault in the equipment.

d. Trouble Isolation. Follow the troubleshooting steps outlined in paragraph 4-7, then do the step-by-step corrective actions provided in table 4-2 or 4-3 to isolate and correct the cause of the equipment failure.

e. After Maintenance. When you have made the repair recommended in the troubleshooting procedure, you must check your work. Run a self-test and make sure the printer 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, 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 he able to fix it.

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 foldout schematic diagrams at the rear of this manual 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.

d. Trial and Error. 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 five troubleshooting procedures are illustrated in figure 4-1. Carefully follow the procedures step-by-step to save time in isolating the problem and making the repair.

Begin troubleshooting by doing a self-test. Examine the printed pattern and printer action to see if you can learn the cause of the problem. If you cannot determine the cause of the malfunction by doing the test, use the information in the following paragraphs to isolate the fault.

4-8. MECHANICAL AND ELECTRICAL FAULT ISOLATION

Printer malfunctions may occur because of faults in mechanical or electrical components. Mechanical faults are easier to find, therefore check for mechanical problems before you check electrical components.

4-9. MECHANICAL NOISE ISOLATION

If a mechanical malfunction causes an unusual noise or binding, you can isolate it to the right or left side of the printer as follows:

- Power off Slip left drive belt off left drive pulley

NOTE

With left drive belt off the drive pulley, the printer will run only 1 to 1-1/2 seconds, then stop. You may need to restart the motor several times in quick succession to provide enough listening time to verify on which side of the printer the noise is located.

If the noise or binding is still occurring, the malfunction must be in one of the following units:

- Motor
- Right jackshaft bearing
- Linefeed clutch
- VFU mechanism

If the noise or binding condition is not occurring while the motor runs, the malfunction must be in one of the following units:

- Left idler pulleys
- Print belt pulleys
- Print belt
- Ribbon drive

Using the information gained by this check, go to paragraphs 4-10 and 4-11. Use the troubleshooting data in those paragraphs to further isolate the faulty unit.

4-10. ELECTRICAL MALFUNCTION ISOLATION

If an electrical malfunction occurs, it will be indicated by the following:

- Lighted ALARM indicator on control panel. (Will also light when various mechanical malfunctions occur.)
- A blown fuse on the power control board (XPS) or the logic board (LOG) as shown in table 4-1.
- Lighted status indicators on printed wiring boards. (See paragraph 4-11.)

Table 4-1 . Fuse Locations and Circuits Protected

FUSE	LOCATION	CIRCUIT
4A MDA	XPS (F1) *	+157V
5A MDX	XPS (F2) *	10V
2A MDX	XPS (F3) *	+25V
2A MDX	XPS (F4) *	25V
7A MDX	XPS (F5) *	117V
1/8A PICO	LOG (F1) **	PHASE 1 CLOCK
1/8A PICO	LOG (F2) **	PHASE 2 CLOCK

* See figure 2-14.

** See figure 2-13.

4-11. STATUS INDICATORS AND TROUBLESHOOTING

The status indicators (fig. 4-2) are light emitting diodes (LED) on the outside edges of five printed wire boards. You can see the indicators by removing the pedestal cover. An explanation of the condition that exists when each indicator is lit is shown in figure 4-2. Troubleshooting with these indicators is defined in table 4-2.

Table 4-2 provides data for identifying a faulty PWB or other fault. This table lists various conditions in which the ALARM indicator and the status indicators will be lit or blinking. For each condition of the indicators there is a list of probable causes, corrective actions, and maintenance procedures. If the fault cannot be isolated and repaired with this information, go to paragraph 4-12 and do further troubleshooting with the aid of table 4-3.

NOTE

Table 4-2 does not include every possible condition and probable cause. You will be able to find other faults by noting which indicators are lit or not lit and analysing the situation they represent.

CAUTION

Replacement fuses must be the single strap type shown below.

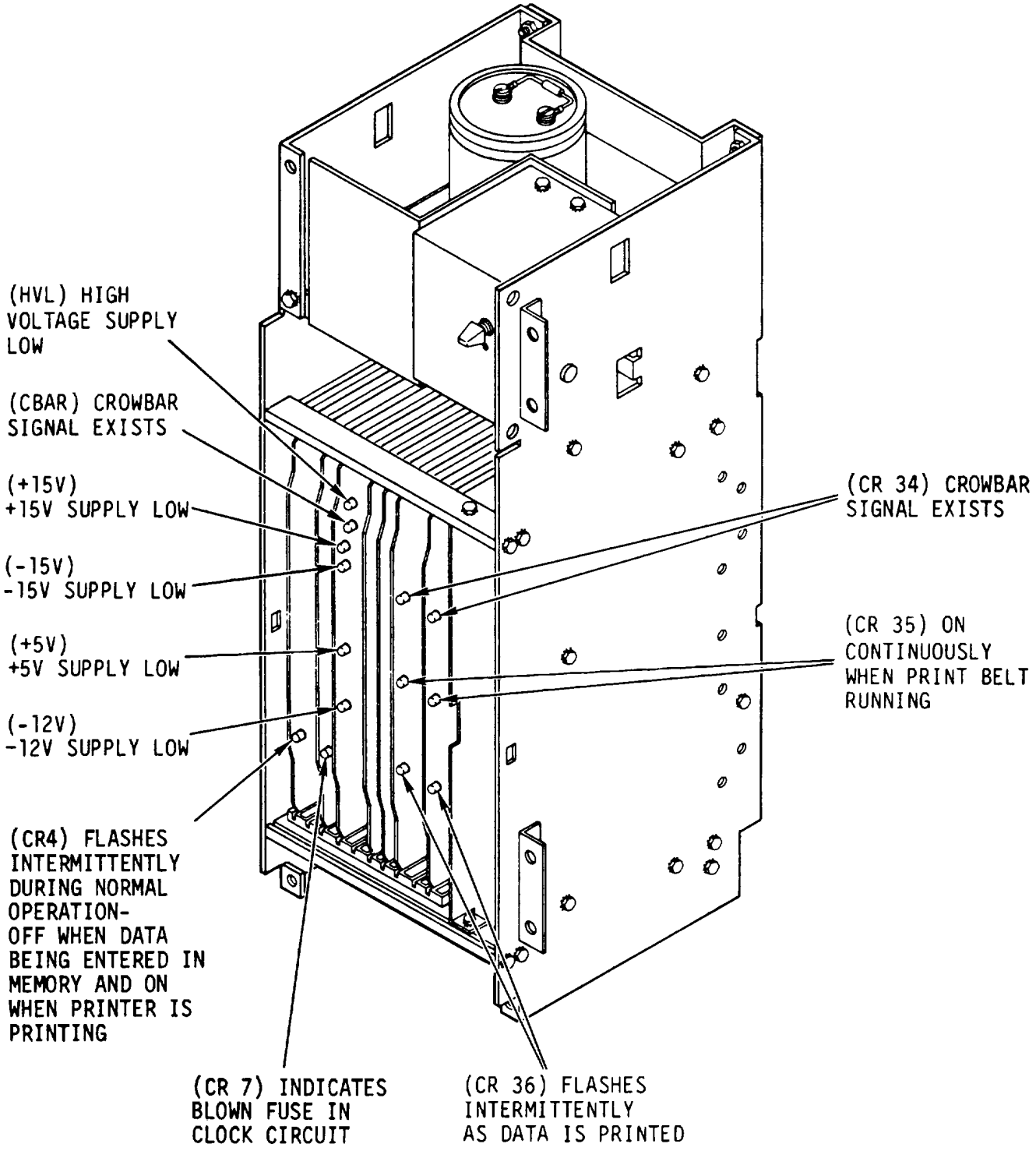


Figure 4-2. Status Indicators

Table 4-2. Indicator Conditions and Probable Fault Causes

LED INDICATORS/BOARDS

SYMPTOM	ALARM	CR34/HVS	CR35/HVS	CR36/HVS	HVL/PSR	CBAR/PSR	+15V/PSR	-15V/PSR	+5V/PSR	-12V/PSR	CR7/LOG	PROBABLE CAUSE	CORRECTIVE ACTION	SEE PARAGRAPH
1.	O	O	●	●	O	O	O	O	O	O	O	No fault - All conditions normal.		
	Printer running and printing normally.											**WARNING** Remove ac power from printer before removing any printed wire boards.		
2.	●	●	O	O	O	●	O	O	O	O	O	a. LHD* board. b. HVS* board.	a. Replace LHD board b. Replace HVS board	4-23 4-23
	Motor off.											NOTE When condition 2 occurs, remove LHD board from same position (odd or even) where CR34 on HVS is lit. With LHD removed, turn printer on. If motor continues to run, CR34 goes out, and CR35 comes on, the removed LHD board is probably faulty. However, if CR34 lights, the HVS board containing the lighted CR34 is probably faulty.		
												a. PSR board. b. Print belt photocell. c. Shorted hammerbank coil. d. LOG board.	a. Replace PSR board b. Replace photocell c. Replace hammerbank d. Replace LOG board	4-23 4-50 4-46 4-23
3.	O	O	O	●	O	O	O	O	O	O	O			
						or								
	O	●	O	O	O	●	O	O	O	O	O	a. HVS* b. LHD*	a. Replace HVS board b. Replace LHD board	4-23 4-23
	Motor runs - No printing in ODD or EVEN positions.											NOTE When condition 3 occurs, interchange the two HVS boards. If print omission has changed from even to odd (or vice versa), replace HVS board for columns not printing (even or odd). If print omission does not change, replace the LHD board for columns not printing.		

LEGEND

O = Indicator not lighted
● = Indicator lighted
● = Indicator blinking

* EVEN or ODD position faulty LHD or HVS depending upon which HVS has CR34 lit.

Table 4-2. Indicator Conditions and Probable Fault Causes Continued

SYMPTOM	LED INDICATORS/BOARDS ALARM / CR34/HVS / CR35/HVS / CR36/HVS / HVL/PSR / CBAR/PSR / +15V/PSR / -15V/PSR / +5V/PSR / -12V/PSR / CR7/LOG	PROBABLE CAUSE	CORRECTIVE ACTION	SEE PARAGRAPH
	LEGEND O = Indicator not lighted ● = Indicator lighted ◐ = Indicator blinking			
4.	● O O O O O O O O O O Motor off.	a. Out of paper b. Top cover not closed tight c. Low belt speed caused by mechanical binding or slippage d. LOG board e. Print belt photocell defective	a. Install paper b. Close top cover tightly c. Replace pulley shaft bearings Adjust drive belts d. Replace LOG board e. Replace photocell	 4-53/54 4-32/33 4-23 4-50
5.	O O ● O O O O O O O ● Motor runs - No printing.	a. Fuse F1/F2 blown on LOG board b. LOG board	a. Replace Log Board b. Replace Log board	4-23 4-23
6.	any one ● ● O O O ● O O O O O Motor off. or O O O O O O O O O O ●	a. XPS board (low voltage supply low) b. LOG board c. LMB board	a. Replace XPS board b. Replace LOG board c. Replace LMB board	4-65 4-23 4-23
7.	O ● ● O ● ● O O O O O Motor runs - No printing	a. PSR board (high voltage supply low) b. XPS board c. Blown fuse (F1) d. Shorted capacitor (top of bustle)	a. Replace PSR board b. Replace XPS board c. Replace on fuse XPS board d. Replace shelf assembly capacitor	4-23 4-65 4-65 4-24
8.	● O O O O ● O O O O O Motor off.	a. PSR board	a. Replace PSR board	4-23
9.	● ● O O O ● ● O O O O Motor off.	a. PSR board b. XPS board c. Blown fuse (F3)	a. Replace PSR board b. Replace XPS board c. Replace fuse on XPS board	4-23 4-65 4-65
10.	● ● O O O ● O ● O ● O Motor off.	a. PSR board b. XPS board c. Blown fuse (F4)	a. Replace PSR board b. Replace XPS board c. Replace fuse on XPS board	4-23 4-65 4-65
11.	● ● O O O ● O O ● O O Motor off - Power off.	a. PSR board b. XPS board c. 15000 uf capacitor (C1) opens up or wire leads disconnected d. Blown fuse (F2)	a. Replace PSR board b. Replace XPS board c. Connect leads or replace capacitor d. Replace fuse on XPS board	4-23 4-65 4-64 4-65
12.	O O O O O O O O O O O Motor off - All indicators off - Fans running.	a. Blown fuse (F5) b. Interlock switch c. Defective transformer	a. Replace fuse on XPS board b. Replace interlock switch c. Replace transformer	4-65 4-27 4-63

Table 4-2. Indicator Conditions and Probable Fault Causes--Continued,

SYMPTOM	LED INDICATORS/BOARDS ALARM CR34/HVS CR35/HVS CR36/HVS HVL/PSR CBAR/PSR +15V/PSR -15V/PSR +5V/PSR -12V/PSR CR7/LOG	LEGEND 0 = Indicator not lighted ● = Indicator lighted ◐ = Indicator blinking PROBABLE CAUSE	CORRECTIVE ACTION	SEE PARAGRAPH
13.	● ● 0 0 ● ● 0 0 0 0 0 Printer runs normally then stops. CR34 lit on only one HVS.	a. Corroded contacts on HVS board(s)	a. Swap HVS boards. Press and hold TEST button 3-4 minutes. Replace PSR board	4-23
14.	0 0 ◐ ◐ 0 0 0 0 0 0 0 Printer running - No SELECT indicator	a. INT board	a. Replace INT board	4-23

Table 4-3 . Troubleshooting Symptom Table

ITEM	SYMPTOM	INDICATORS LIT	PROBABLE CAUSE	CORRECTIVE ACTION	SEE PARAGRAPH
1.	PRINTER WILL NOT TURN ON				
	a. Motor & fan won't run	None	1. Printer not plugged	1. Plug in power cord	
			2. Primary fuse missing or blown	2. Replace fuse on XPS board	4-65
			3. XPS board	3. Replace XPS board	4-65
			4. Ac switch & filter	4. Replace ac switch & filter	4-22
	b. Motor won't run Indicators will light	Alarm	1. Paper out switch	1. Install paper or replace switch	4-26
			2. RUN/LOAD switch	2. Replace switch	4-66
			3. Low voltage (ac input)	3. Troubleshoot ac power	
			4. INT board	4. Replace INT board	4-23
			5. LOG board	5. Replace LOG board	4-23
	c. Motor won't run Indicators will light	None	1. XPS board	1. Replace XPS board	4-65
			2. Pushbutton switch	2. Replace LCP board	4-23
			3. Starting capacitor shorted or leads off	3. Connect leads or replace capacitor	4-64
			4. Defective motor	4. Replace motor	4-31
			5. Print fingers caught	5. Reseat print belt	4-57
			6. Hammer caught in fingers	6. Replace hamberbank assembly	4-46
2.	MOTOR STARTS BUT WILL NOT KEEP RUINING				
			Electrical		
	(Primary fuse may blow)		1. PSR board a. 2-3 seconds only	1. Replace PSR board Electrical	4-23
			2. Loose or broken wire to photocell	2. Tighten wire or replace photocell'	4-50
			3. HVS board	3. Replace HVS Board	4-23
			4. Mother board (LIB)	4. Replace mother board	4-21
			Mechanical		
			1. Right or left drive belt too tight	1. Adjust belt(s)	4-32/33
			2. Print finger missing	2. Replace print finger	4-59/60
			3. Print finger bent or catching	3. Aline print finger	4-59/60
			4. Misalignment of pulleys	4. Adjust magnetic belt guide	4-56
			5. Drive belt off & belt guide	5. Reseat and adjust drive belt	4-32/33
			6. Print finger not seated	6. Reseat print finger	4-59/60
			7. Jackshaft and/or motor pulley loose	7. Adjust jackshaft pulley	4-38 Reseat motor

Table 4-3 . Troubleshooting Symptom Table -- Continued

ITEM	SYMPTOM	INDICATORS LIT	PROBABLE CAUSE	CORRECTIVE ACTION	SEE PARAGRAPH
	b. Printer runs minutes to hours then stops		Electrical Static Noise		
			1. Open bonding strap	1. Connect bonding strap	
			2. Loose or intermittent connect ion	2. Check cable connections	
			Electrical		
			1. PSR Board	1. Replace PSR board	4-23
			2. Mother Board (LMB)	2. Replace mother board	4-21
			3. XPS Board	3. Replace XPS board	4-65
			Mechanical		
			1T.Vrni-melt dirty or dry replace belt	1. Clean and lubricate belt or	4-58 4-57
			2. Right or left drive belt	2. Adjust belt or replace belt	4-32 or 4-33
			3. No clearance at left	3. Adjust pulley position	4-38
			4. Misalignment between pulleys & belt guide	4. Adjust magnetic belt guide	4-56
			5. Cooling fan not running	5. Replace fan	4-25/29/30
			6. Uneven print belt movement	6. Replace pully shaft bearings	4-53/54
	c. Motor will not turn off after 60 seconds of no data.		Electrical		
			1. INT board	1. Replace INT board	4-23
3.	MOTOR RUNS BUT NO PRINTING OR BAD PRINTING				
	a. No printing in some columns		1. Broken common wire on	1. Replace hammerbank	4-46
			2. LOG board	2. Replace LOG board4-23	
			3. LHD board	3. Swap LHO boards. Replace faulty board	4-23
			4. Broken wire on coil bank (missing one column)	4. Replace hammerbank	4-46
	b. Prints extra characters in some columns		1. LOG board	1. Replace LOG board	4-23
			2. INT board	2. Replace INT board	4-23
			3. LHD board	3. Swap LHO boards. Replace faulty board.	4-23
	c. A specific character does not print or is smudged		1. Bent print finger	1. Straighten finger	4-59/60
			2. Top part of finger missing	2. Replace finger	4-59/60
	d. Prints but snags fingers on one character only		1. Bent print finger	1. Straighten finger	4-59/60
			2. Top part of print finger missing	2. Replace finger	4-59/60

Table 4-3 . Troubleshooting Symptom Table -- Continued

ITEM	SYMPTOM	INDICATORS LIT	PROBABLE CAUSE	CORRECTIVE ACTION	SEE PARAGRAPH
	e. Prints but snags fingers on one column only		1. Bent clevis	1. Replace hammerbank assembly	4-46
			2. Plunger binding in coil	2. Replace hammerbank assembly	4-46
			3. Hammer throw adjustment	3. Replace hammerbank assembly	4-46
	f. Prints but snags fingers on odd or on even columns only		1. LHD board	1. Swap LHO boards. Replace faulty board	4-23
			2. HYS board	2. Swap HVS boards. Replace faulty board	4-23
	g. Prints but snags fingers at any column or character		1. Bent print finger	1. Straighten finger	4-59/60
			2. Photocell timing	2. Adjust photocell timing	4-51
				or install new photocell	4-50
			3. LHD board	3. Swap LHD boards. Replace faulty board	4-23
			4. HVS board	4. Swap HVS boards. Replace faulty board	4-23
	h. Gapping (not associated with a particular column).		1. Photocell defective	1. Replace photocell	4-50
			2. PSR board	2. Replace PSR board	4-23
			3. Print belt slippage	3. Replace pulley shaft bearings	4-53/54
	i. Gapping (associated with a particular column).		1. Worn clevis & plunger	1. Replace hammerbank assembly	4-46
4.	PRINTS LIGHT ON ONE PART OF CHARACTER				
	a. Light on top or bottom. all columns		1. Hammerbank not seated properly	1. Reseat hammerbank	4-46
	b. Light on top, one character only		1. Finger not seated in belt	1. Reseat finger	4-59/60
	c. Light on left		1. Hammer throw adjustment	1. p lace hammerbank assembly	4-46
			2. Bent clevis	2. Replace hammerbank assembly	4-46
			3. Plunger binding in coil bank	3. Replace hammerbank assembly	4-46
			4. PSR board	4. Replace PSR board	4-23
	d. Light on right		1. Bent print finger	1. Straighten print finger	4-59/60
			2. Photocell timing	2. Adjust photocell timing	4-51
		3. PSR board	3. Replace PSR board		4-23

Table 4-3 . Troubleshooting Symptom Table -- Continued

ITEM	SYMPTOM	INDICATORS LIT	PROBABLE CAUSE	CORRECTIVE ACTION	SEE PARAGRAPH
5.	PRINTS LIGHT ON ALL CHRACTERS				
	a. Ribbon does not move		1. Ribbon cartridge defective	1. Replace ribbon cartridge	
			2. Ribbon cartridge not seated properly	2. Replace ribbon cartridge support spring	4-49
			3. Ribbon drive binding	3. Lubricate ribbon drive	4-48
			4. Ribbon drive gears cracked	4. Replace ribbon drive	447
	b. Ribbon moves		1. Ribbon worn - cartridge needs replacement	2. Replace ribbon cartridge	
6.	PRINTS DESIREO COLUMW PLUS ADDITIONHAL COLUIMIS				
			1. LOG board	1. Replace LOG board	4-23
			2 LHD boards	2.Swap H=LHD boards. Replace faulty board	4-23
	a. Double line feed single called for		Electrical	l	
			1. LOG board too far from clutch	1. Replace LOG board	4-23
			2. Linefeed solenoid defective	2. Replace Linefeed solenoid	4-43
			Mechanical		
			1. Linefeed solenoid arm	1. Adjust linefeed solenoid	4-44
			2. Linefeed solenoid defective	2. Replace linefeed solenoid	4-44
	d. Continuous line feeds when power is applied		1. Linefeed solenoid	1. Adjust linefeed solenoid or replace solenoid	4-44 4-43
	e. No line feed				1. LOG boar 2. Mother bo 3. XPS boar
	F. Multiple line or form feeds when applicable pushbutton is pushed once				1. Pushbutto 2. LOG boar

Table 4-3 . Troubleshooting Symptom Table -- Continued

ITEM	SYMPTOM	INDICATORS LIT	PROBABLE CAUSE	CORRECTIVE ACTION	SEE PARAGRAPH
8.	PAPER HANDLING PROBLEMS				
	a. Will not feed correctly		1. Toggle assembly bent	1. Replace toggle assembly	4-45
			2. Platen drive gear	2. Replace platen drive gear	4-61
			3. Line feed clutch binding or broken	3. Lubricate linefeed clutch Replace linefeed clutch	4-40 4-38
			4. VFU assembly not adjusted	4. Adjust VFU assembly	4-69
			5. Slew strobe assembly	5. Replace slew strobe assembly	4-41
			6. Strobe detector assembly not adjusted	6. Adjust strobe detector assembly	4-42
			7. Tractor shaft and gear assembly worn or broken	7. Replace tractor driveshaft and gear assembly	4-35
			8. Friction brake worn	8. Replace friction brake	4-36
			9. Jackshaft bearings worn	9. Replace jackshaft bearings	4-39
	b. Tracks to one side		1. Obstruction holding	1. Clear paper path	
			2. Adjustment of forms	2. Reset vernier mechanism	
			3. Platen not locked at ends	3. Reinstall platen	3-14
			4. Paper handler tractor	4. Replace paper handler tractor	4-37
9.	ON-LINE OPERATING PROBLEMS				
	a. Hammer fires repeatedly in column 1		1. Front reset tab missing.	1. Replace reference finger	4-60
	b. Hammer fires each time		1. LHO board	1. Replace LHD board finger passes photocell	4-23
	c. Random hammer misfire		1. XPS arc suppression defective	1. Replace XPS board	4-65
			2. Insufficient grounding	2. Make sure printer is grounded & all parts are correctly installed.	
			3. LHO board	3. Swap LHO boards. Replace faulty board	4-23
	d. Primary fuse blows when power applied		1. XPS board shorted	1. Replace XPS board	4-65
			2. Wiring shorted from XPS	2. Repair wire or connector	
			3. HVS board	3. Replace HVS board	4-23
			4. LHD board	4. Replace LHD board	4-23
			5. PSR board	5. Replace PSR board	4-23
			6. Transformer	6. Replace transformer	4-63
	e. Blows primary fuse at particular hammer position		1. Shorted coil	1. Replace hammerbank assembly	4-46

Table 4-3 . Troubleshooting Symptom Table -- Continued

ITEM	SYMPTOM	INDICATORS LIT	PROBABLE CAUSE	CORRECTIVE ACTION	SEE PARAGRAPH
	f. AL AR indicator lights	Alarm	1. LOG board 2. Print belt slippage	1. Replace LOG board 2. Replace pulley shaft bearings	4-23 4-53/54
	9. Power on - ALUAR indicator lights	Alarm	1. LOG board 2. XPS board	1. Replace LOG board 2. Replace XPS board	4-23 4-65
	i. Constant SELECT light	Select	1. INT board 2. LOG board	1. Replace INT board 3. Replace LOG board	4-23 4-23
	j. Garbled printing		1. [NT board 3. Pulley shaft bearings worn	2. Replace [NT board 3. Replace pulley shaft bearings	4-23 4-53/54
	k. Interface wil1 not enter the print cycle (CR4 indicator always off)		1. INT	1. Replace INT board	4-23
	l Interface will not leave the print cycle (CR4 indicator always on)	CR4	1. INT board	1. Replace INT board	4-23
	m. Printer w111 not respond then SELECT button is pressed		1. INT board	1. Replace INT board	4-23
	n. Printer will not enter print cycle when a control code is decoded				
	0. Printer memory will not clear when printed by data source		1. INT board	1. Replace INT board	4-23
	p. Interface will not respond code is decoded		1. INT board	1. Replace INT board	4-23
	q. PAPER OUT indicator will not light or go off when condition is cleared		1. [NT board	1. Replace INT board	4-23
	r. FORMS OVERRIDE pushbutton will not disable low paper indication		1. INT board	1. Replace INT board	4-23
	s. If equipment has bell, bell will not ring		1. INT board	1. Replace INT board	4-23

NOTE

If table 4-2 does not lead you to the cause of the problem, go to paragraph 4-12 and table 4-3 for further troubleshooting.

4-12. SYMPTOM TABLE TROUBLESHOOTING

Table 4-3 provides a listing of malfunction symptoms, indicators lit, probable cause for each symptom and a corrective action for each probable cause. Select the symptom and indications that best define the problem in the printer. Next, examine all the probable causes for that symptom. Select the cause that best matches the situation for which you are troubleshooting. For each such cause there is a corrective action in the last column. Do the corrective action that matches the probable cause you selected. When this task is completed, run a self-test to make sure the printer is again operating normally.

4-13. REFERENCE TO A MAINTENANCE PROCEDURE

As you follow the direction in the troubleshooting table, you will be lead to a maintenance procedure which can correct the fault. The reference will be to a paragraph in section III. Turn to that paragraph and do all the steps unless the reference tells you to do only some of the steps. Then do only the steps called for in the reference.

4-14. ALTERNATIVE TROUBLESHOOTING PROCEDURES

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

a. Understand Principles of Operation. Sometimes the symptom with 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.

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.

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 have the failure was corrected. Use the same fix this time.

d. Trial and Error Repair. Usually trail 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.

Section III. MAINTENANCE PROCEDURES

4-15. GENERAL

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

14-16. EQUIPMENT HANDLING PRECAUTIONS

As with most data processing equipment, the line printer 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 line printer.

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

c. Hold boards by their edges whenever you lift them.

d. If a board will be transported, place it in a sturdy box to protect it.
Pack it carefully with clean packing material that will prevent physical damage and will not cause corrosion.

e. 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 a board.

f. Do not put beverages on or near boards. An accidental spill can cause corrosion and chemical damage. It can also cause circuits to short out.

g. Do not allow food on or near boards. Crumbs and greasy residues can lead to chemical damage and corrosion.

h. Never leave boards lying around unprotected.

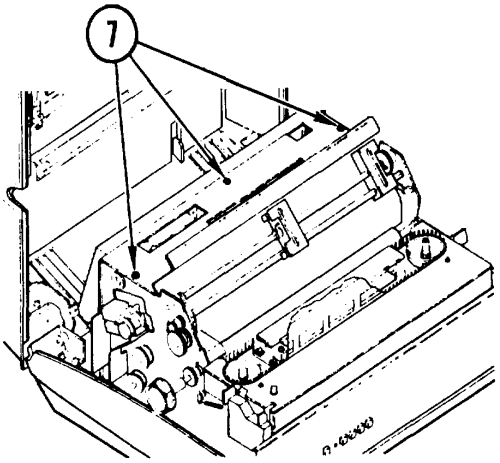
4-17. MAINTENANCE PROCEDURES

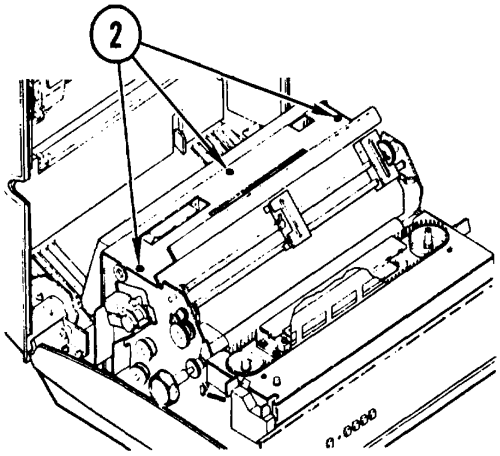
The following paragraphs contain the inspection, removal, installation, and testing procedures for the line printer. Repair of the line printer is limited to replacement of its subassemblies and components. Therefore, the following tasks contain step-by-step procedures for replacement of each subassembly and component only as authorized by the Maintenance Allocation Chart (MAC). Inspection of subassemblies and components during cleaning, removal, and installation consists of commonly accepted standard procedures for electronic equipment, except where included as part of the replacement procedures. Subassembly and component testing, except where included as part of a test or a procedure, consists of the satisfactory operation of the subassembly or component as a part of the overall assembly.

4-18. ACCESS/CLOSE UP LINE PRINTER

INITIAL SETUP

Common Tools
- Tool kit





Access

1. Power off. Pull ac plug from outlet.
2. Open top cover.
3. Remove paper.
4. Remove re-inker, if necessary.
5. Remove ribbon cartridge.
6. Remove platen (para 3-14).
7. Loosen three screws. Remove power supply cover.
8. Remove cosmetic shield (para 4-26).

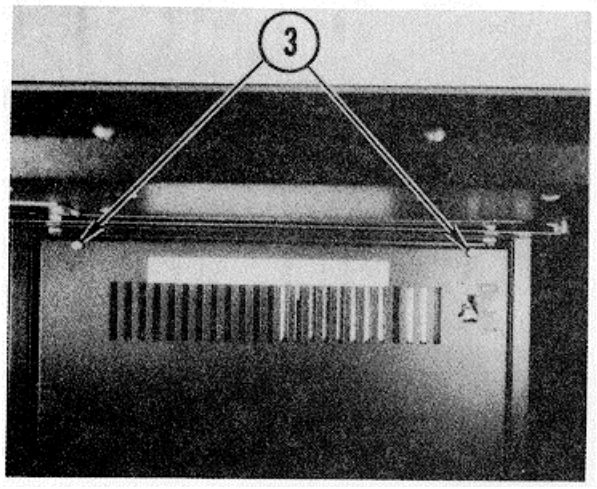
Close Up

1. Replace cosmetic shield (para 4-26).
2. Replace power supply cover. Tighten screws.
3. Replace platen (para 3-14).
4. Replace ribbon cartridge.
5. Replace re-inker, if necessary.
6. Install paper.
7. Close top cover.
8. Push ac plug into outlet. Power on.

4-19. ACCESS/CLOSE UP BUSTLE ASSEMBLY

INITIAL SETUP

Common Tools
- Tool kit



Access

1. Power off. Pull ac plug from outlet.
2. Remove paper.
3. Remove front cover screws. Remove cover.

Close Up

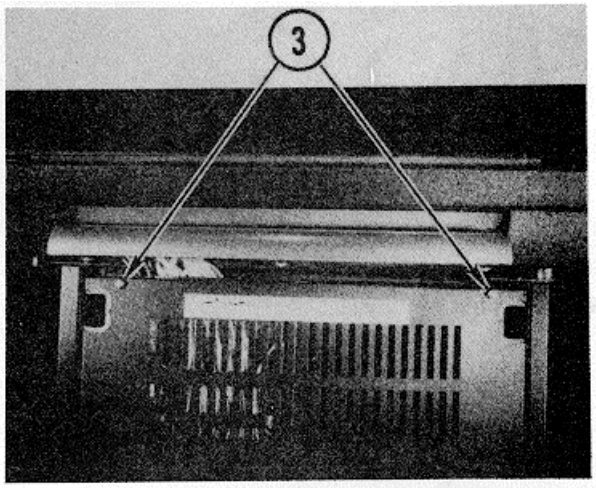
1. Replace cover. Tighten screws.
2. Install paper.
3. Push ac plug into outlet. Power on.

4-20. REMOVE/REPLACE BUSTLE ASSEMBLY

INITIAL SETUP

Common Tools
- Tool kit

Materials/Spare Parts
- Wire tags
- Tie wraps
- Pen or pencil



Remove

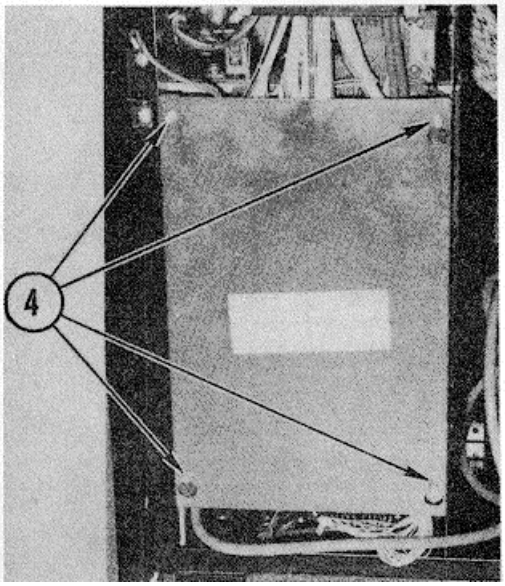
1. Access bustle assembly (para 4-19).

NOTE

Line printer may be mounted to wall and floor. If your printer is mounted this way, see your system manual for removal procedure.

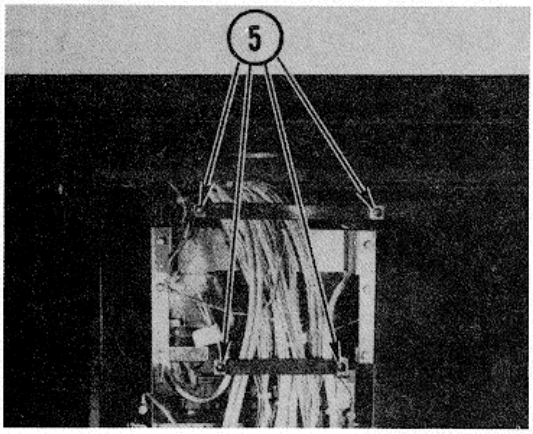
2. Pull line printer from wall.

3. Remove rear cover screws. Remove cover.

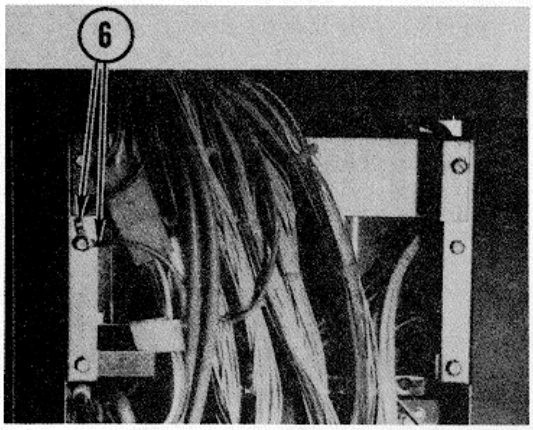


4. Loosen screws. Pull off cover.

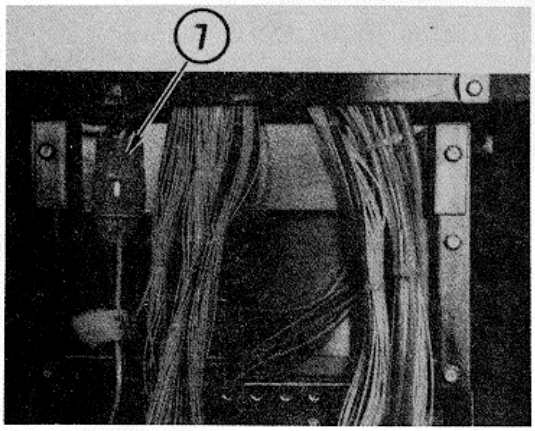
4-20. REMOVE/REPLACE BUSTLE ASSEMBLY (CONT)



5. Remove screws on brackets and standoffs. Remove brackets.

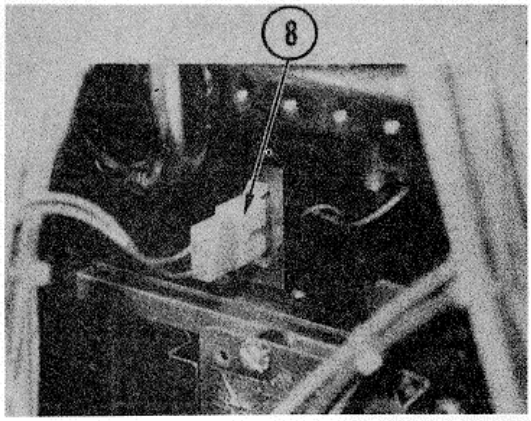


6. Tag, then remove ground wires.

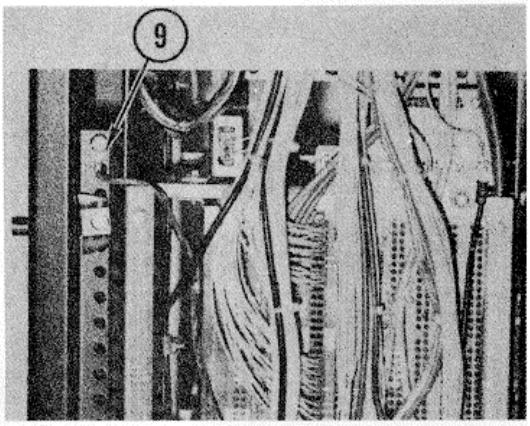


7. Tag, then pull apart power connector.

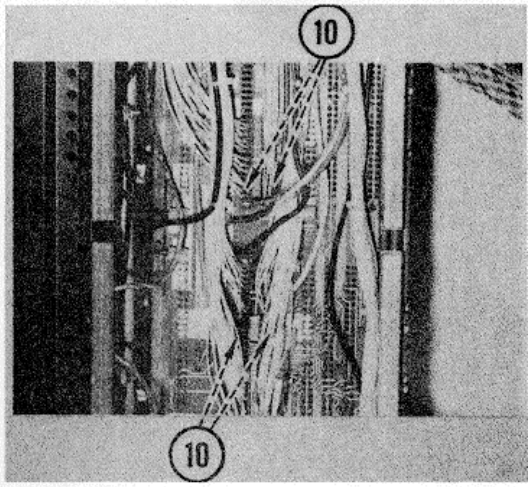
4-20. REMOVE/REPLACE BUSTLE ASSEMBLY (CONT)



8. If your equipment has a bell, tag, then remove bell connector.

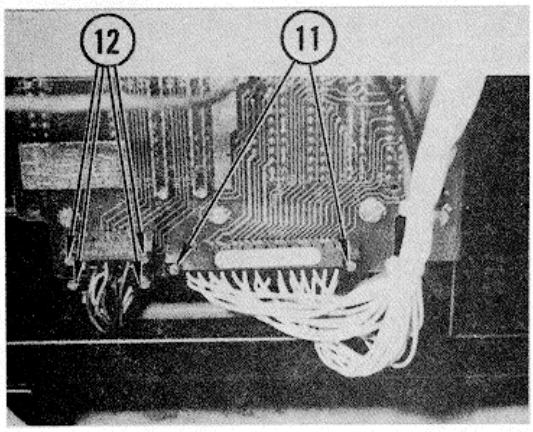


9. Tag, then remove ground wire.



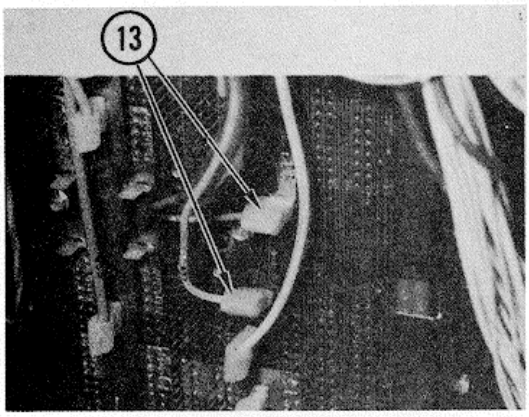
10. Remove screws from four hammerbank connectors. Tag, then pull out connectors.

4-20. REMOVE/REPLACE BUSTLE ASSEMBLY (CONT)



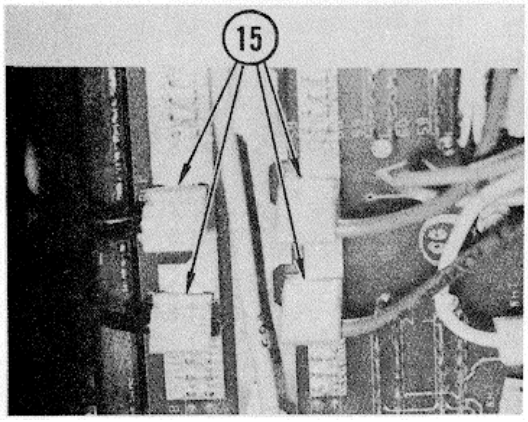
11. Remove screws from connector. Tag, then pull out connector.

12. Remove screws from both connectors. Tag, then pull out connectors.



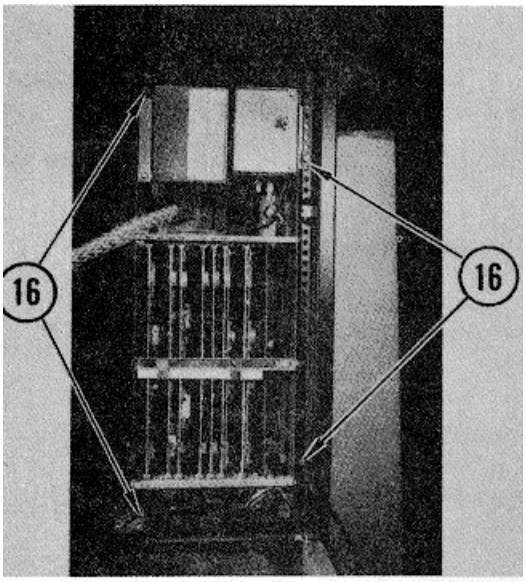
13. Remove orange and white wire connectors.

14. Locate ground wires on right corner of board. Tag, then remove wires.

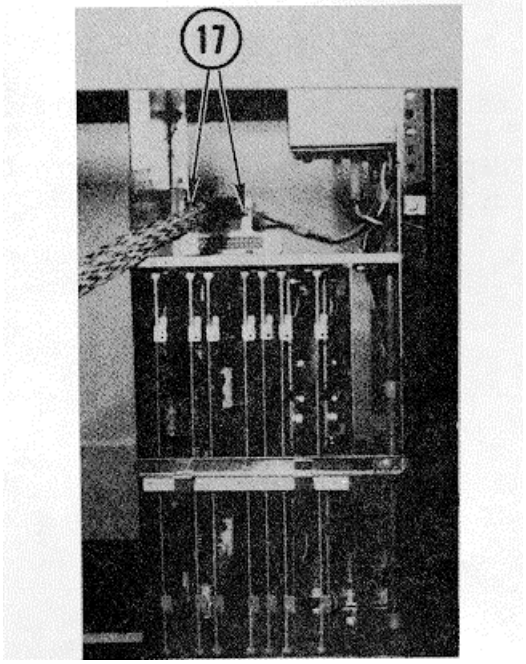


15. Tag, then pull out two red and two black wire connectors.

4-20. REMOVE/REPLACE BUSTLE ASSEMBLY (CONT)

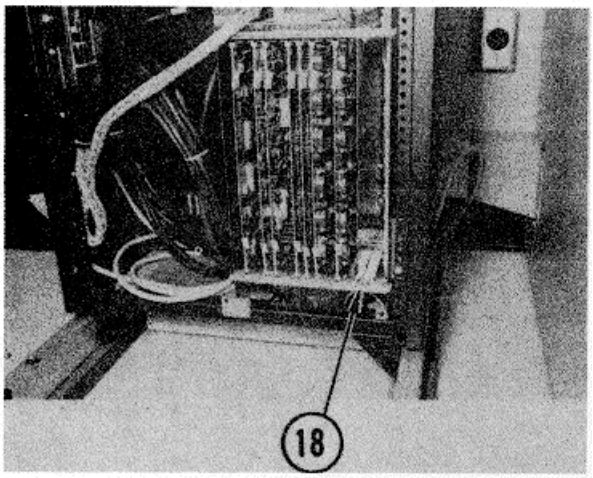


16. In front of pedestal remove mounting screws.



17. Remove screws. Disconnect data communications cable.

4-20. REMOVE/REPLACE BUSTLE ASSEMBLY (CONT)



CAUTION

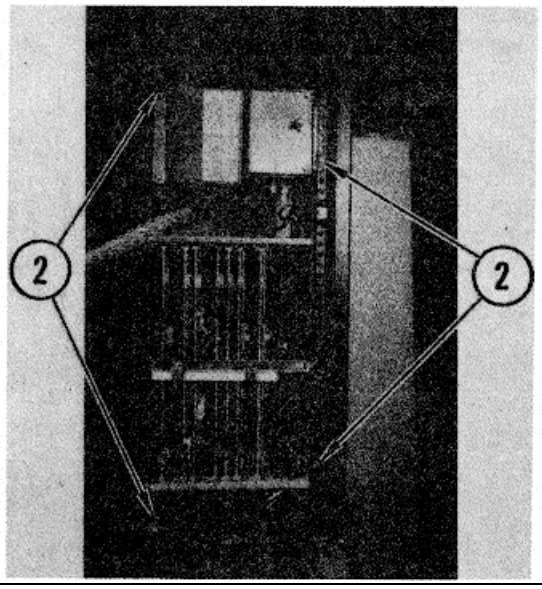
When removing bustle assembly use extreme care not to damage wire, standoffs, or any other components.

18. Pull out bustle assembly from rear of pedestal.

NOTE

If you will install new bustle assembly, retain the following from old bustle assembly:

- circuit boards
- retainer bar
- support strip
- mounting hardware

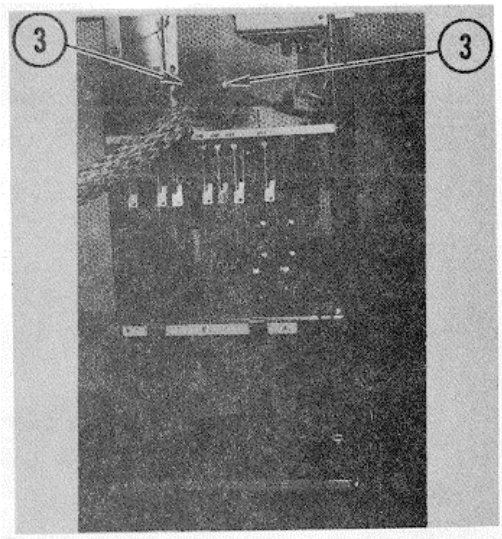


Replace

1. Set bustle assembly in pedestal.

2. Replace mounting screws in front of pedestal.

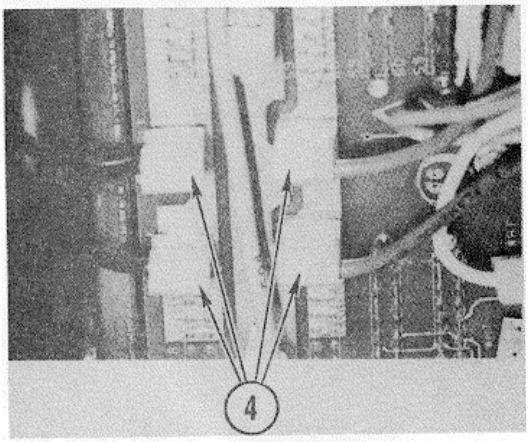
4-20. REMOVE/REPLACE BUSTLE ASSEMBLY (CONT)



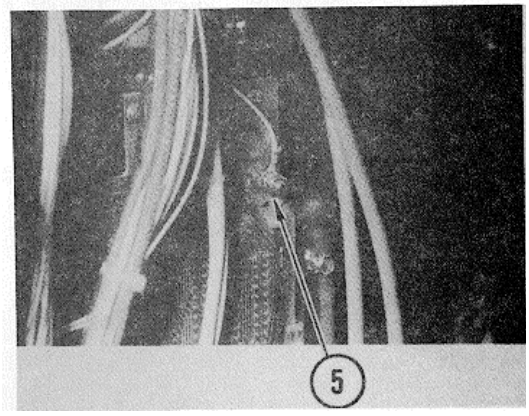
3. Connect communications cable. Replace and tighten screws.

CAUTION

Be careful when replacing connectors on mother board. Connecting pins bend easily.

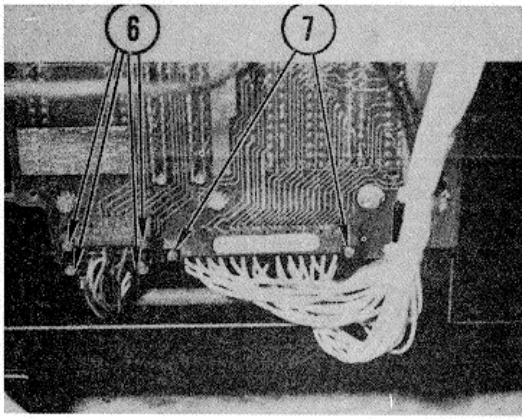


4. Push in two red and two black wire connectors.

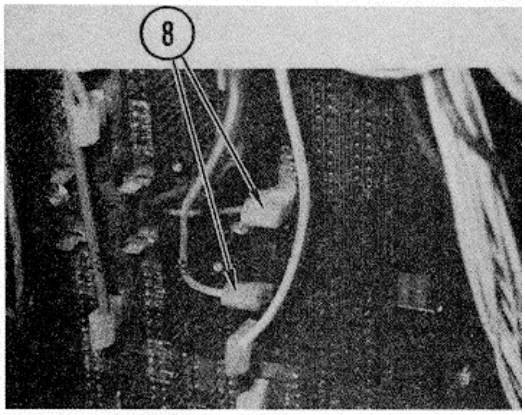


5. Replace wires. Tighten screw.

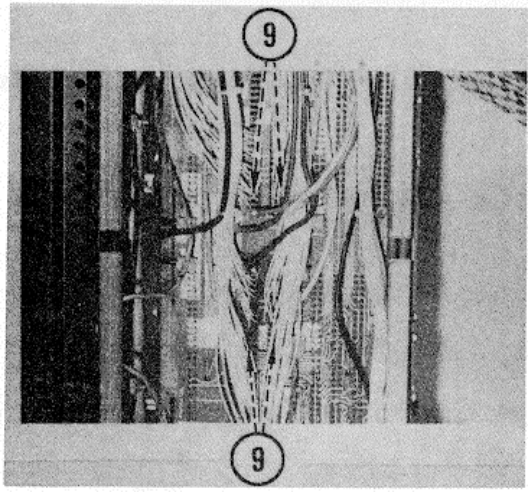
4-20. REMOVE/REPLACE BUSTLE ASSEMBLY (CONT)



6. Push in both connectors. Replace screws.
7. Push in connector. Replace screws.

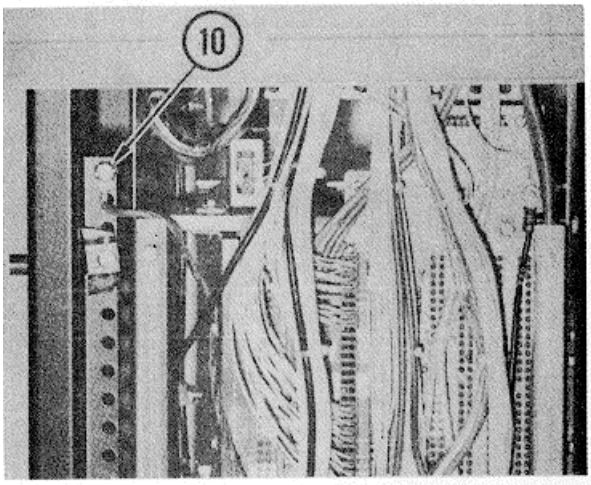


8. Push on orange and white wire connectors.

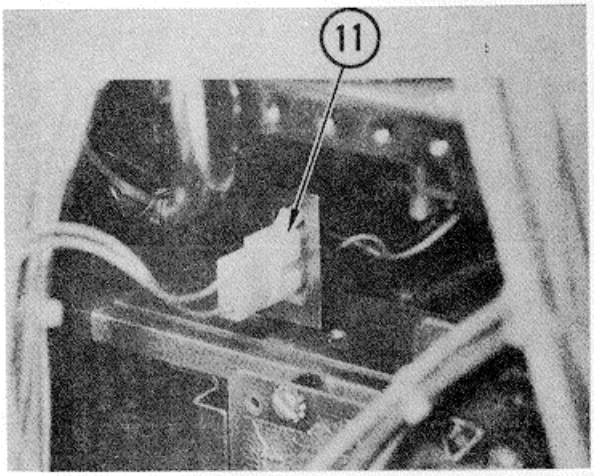


9. Push in four hammerbank connectors. Replace screws.

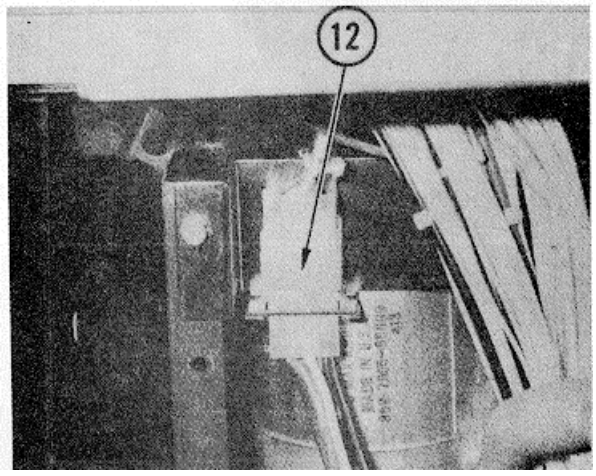
4-20. REMOVE/REPLACE BUSTLE ASSEMBLY (CONT)



10. Connect ground wire. Tighten screw.

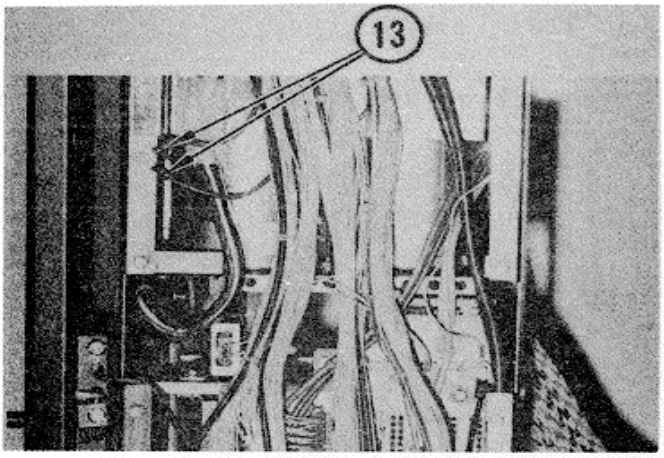


11. If your equipment has a bell, push in bell connector.

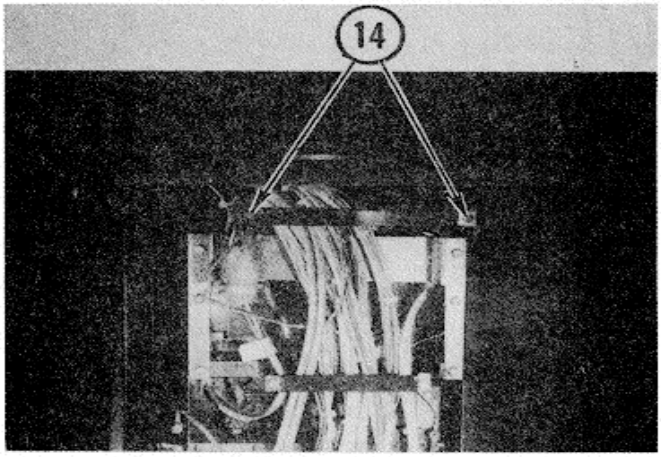


12. Push in power connector.

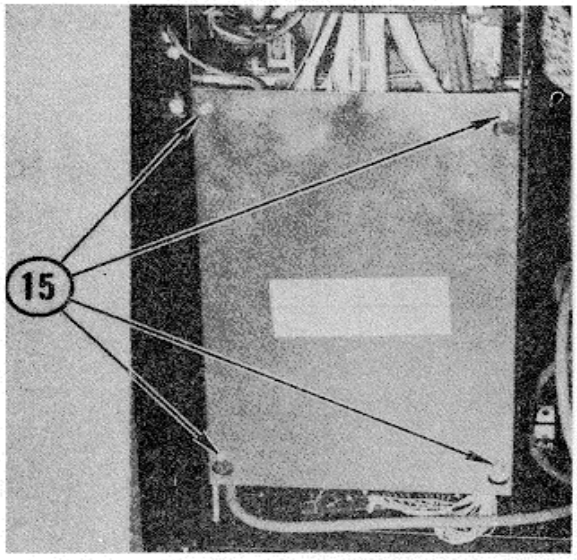
4-20. REMOVE/REPLACE BUSTLE ASSEMBLY (CONT)



13. Connect ground wires. Tighten screws.

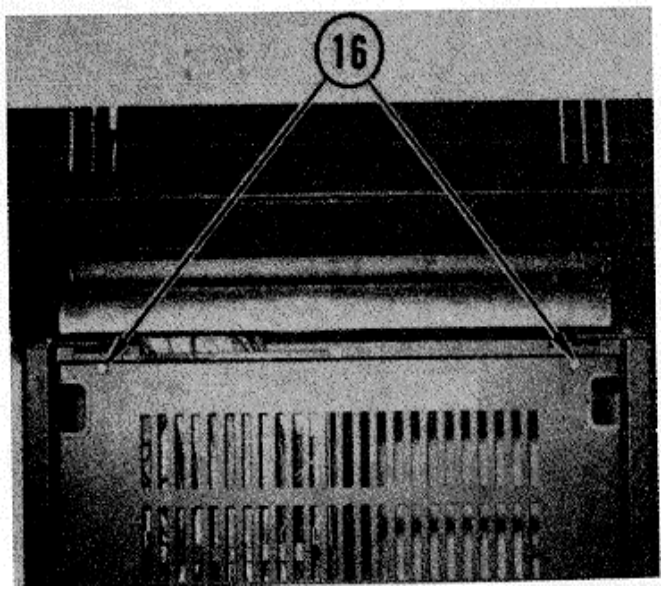


14. Set brackets and standoffs in place. Tighten screws.



15. Slip on cover. Tighten screws.

4-20. REMOVE/REPLACE BUSTLE ASSEMBLY (CONT)



16. Replace rear cover. Replace screws.

17. Push line printer back into position.

NOTE

Line printer may be mounted to wall and floor. If your unit is mounted this way, see your system manual for replacement procedure.

18. Close up bustle assembly (para 4-19).

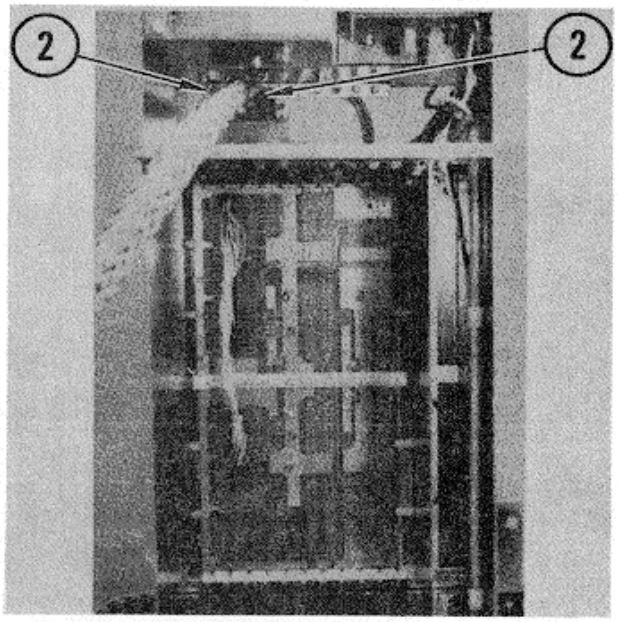
19. On control panel, press TEST button.

4-21. REMOVE/REPLACE MOTHER BOARD

INITIAL SETUP

Common Tools
- Tool kit

Materials/Spare Parts
- Wire tags
- Tie wraps
- Pen or pencil



Remove

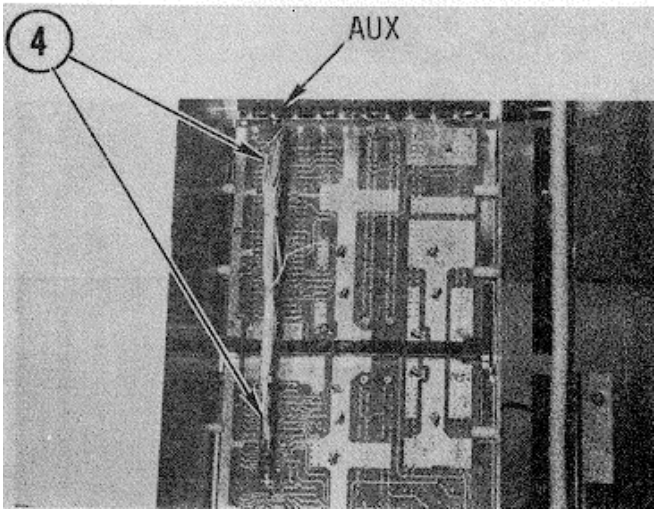
1. Remove all bustle boards (para 4-23).

2. Remove 2 screws (one on each side of cable connector). Disconnect communication cable.

NOTE

Line printer may be mounted to wall and floor. If your printer is mounted this way, see your system manual for removal procedure.

3. Pull line printer from wall.

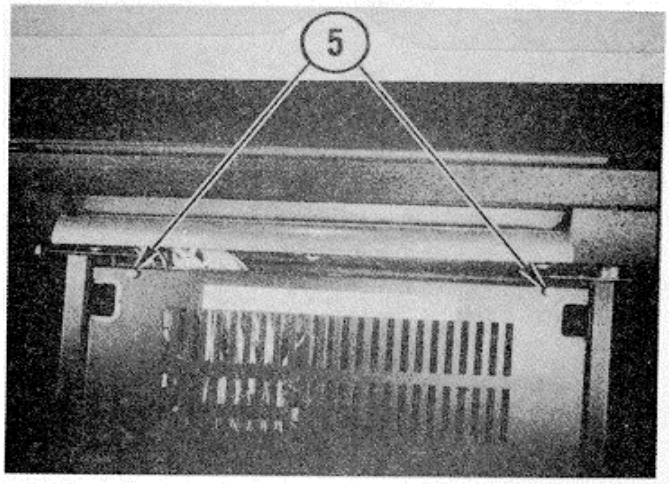


4. On mother board, find jumper cable in AUX slot. Note position of upper and lower connectors, then pull off.

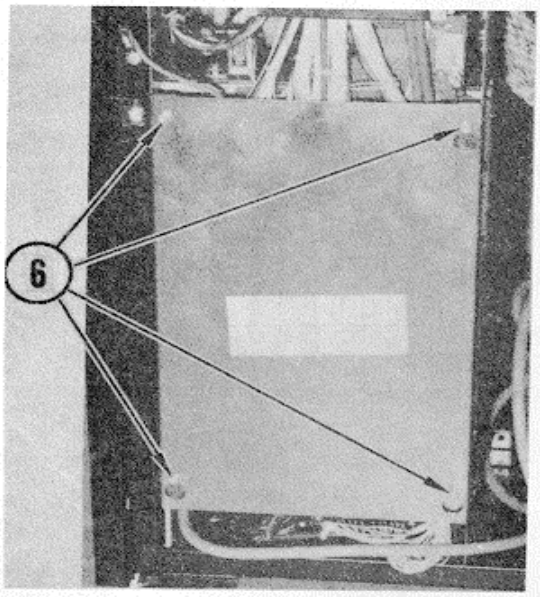
NOTE

Save jumper cable for replacement of mother board.

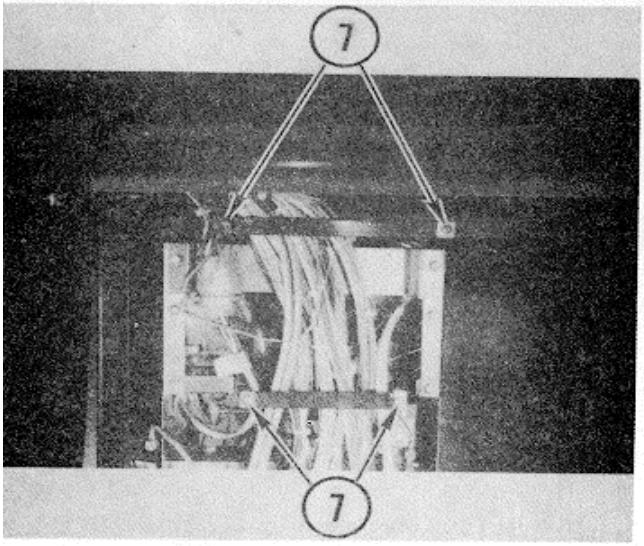
4-21. REMOVE/REPLACE MOTHER BOARD (CONT)



5. Remove screws on rear cover. Remove cover.

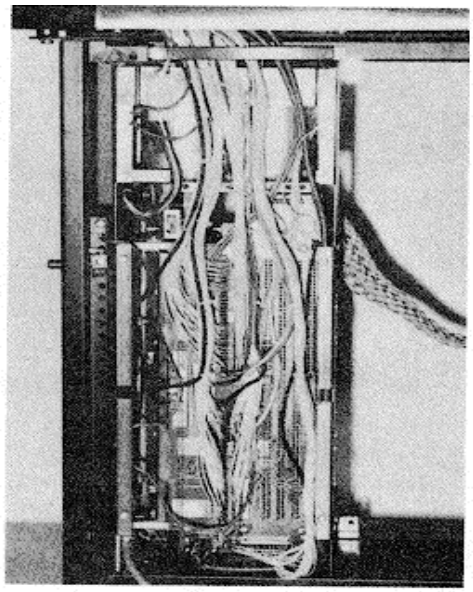


6. Loosen screws on plate enough to pull off plate. Pull off plate.

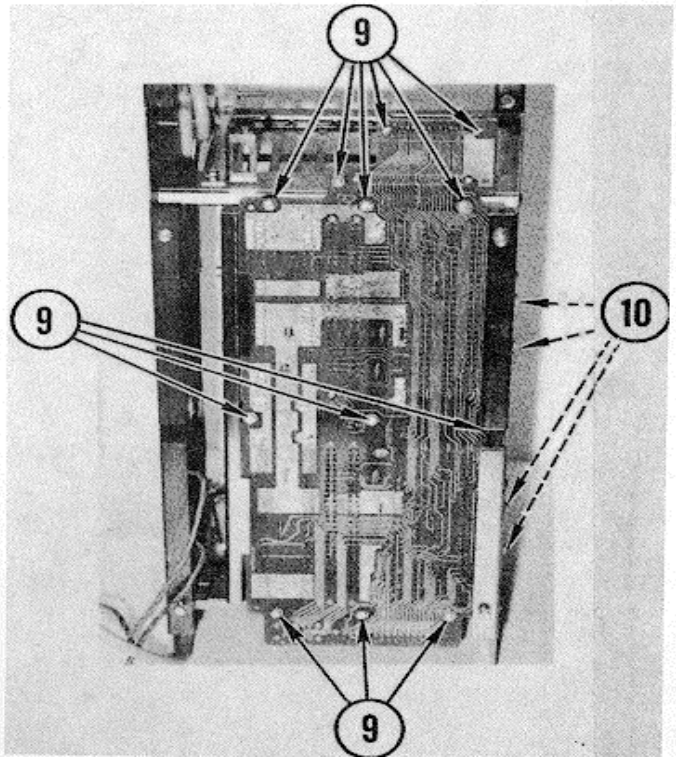


7. Remove screws on brackets and standoffs. Remove brackets.

4-21. REMOVE/REPLACE MOTHER BOARD (CONT)



8. Tag and disconnect all wires connected to mother board.

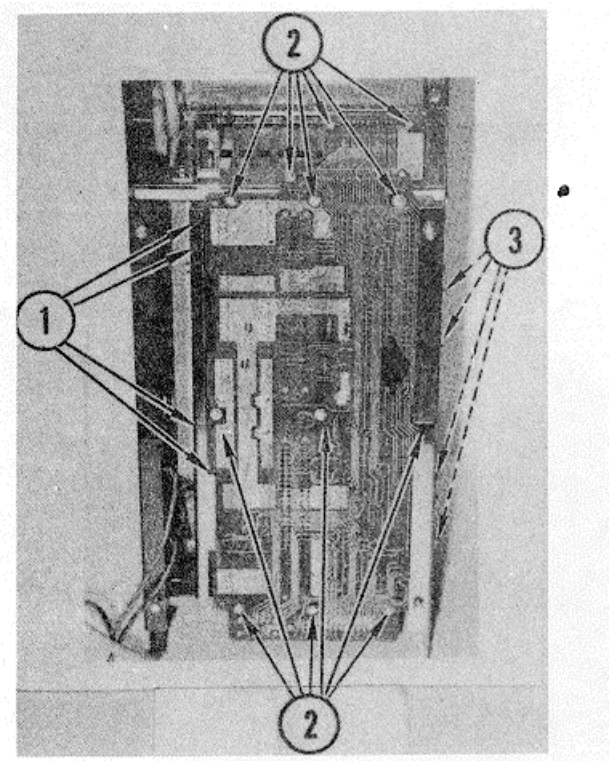


9. Remove screws and nuts holding mother board.

10. If necessary, remove screws from mounting clamps. Remove clamps.

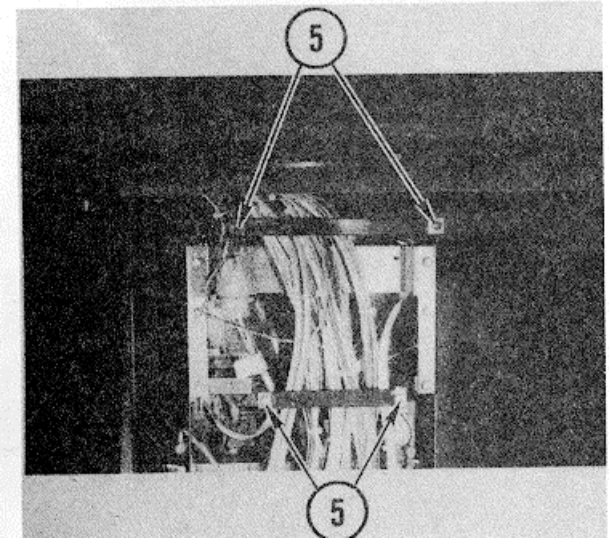
11. Pull out mother board.

4-21. REMOVE/REPLACE MOTHER BOARD (CONT)



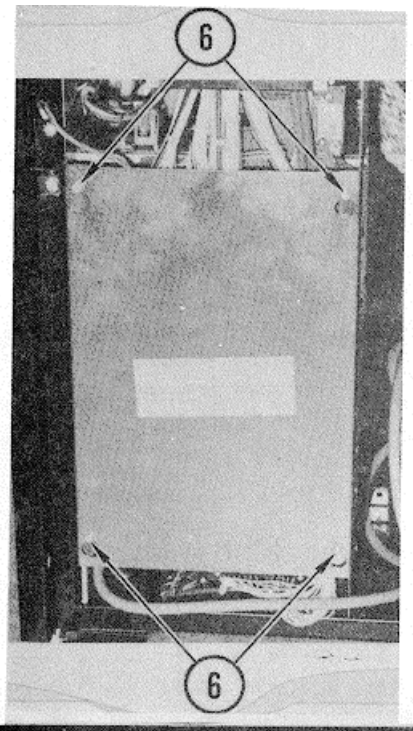
Replace

1. Slide mother board into position between mounting bracket and stand
2. Replace screws and nuts.
3. If necessary, replace mounting clamps. Replace and tighten screws.
4. Connect tagged wires.

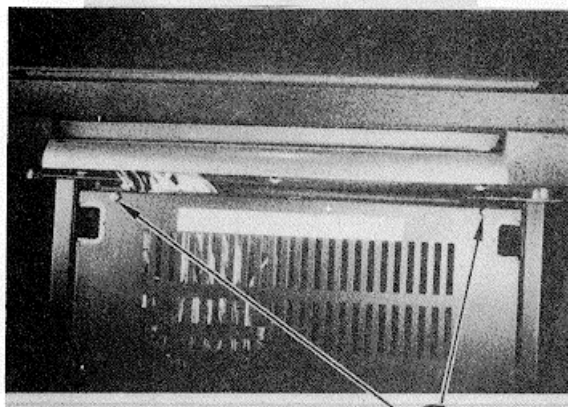


5. Push on brackets and standoffs. Replace screws.

4-21. REMOVE/REPLACE MOTHER BOARD (CONT)

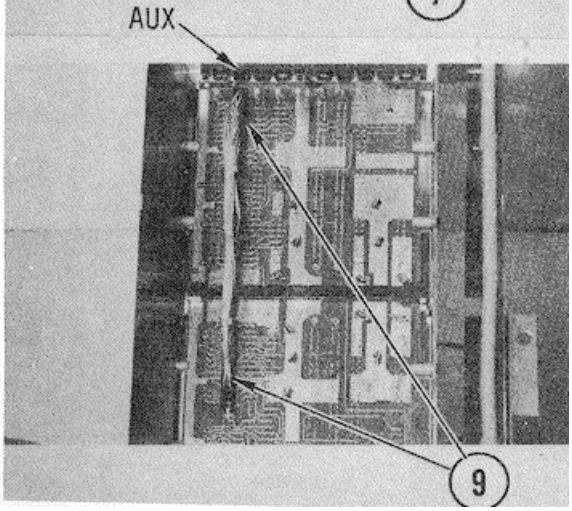


6. Position plate. Tighten screws.



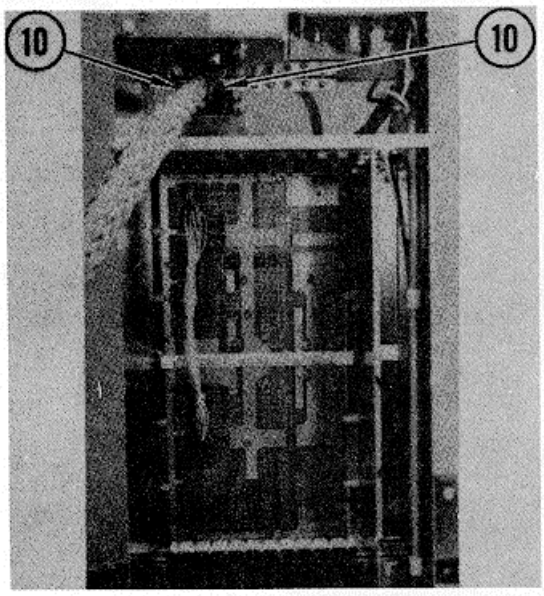
7. Replace rear cover. Replace screws.

8. Push printer in place.



9. On mother board, push on jumper cable at AUX slot.

4-21. REMOVE/REPLACE MOTHER BOARD (CONT)



10. Connect communications cable. Replace and tighten 2 screws.

11. Replace boards in bustle (para 4-23).

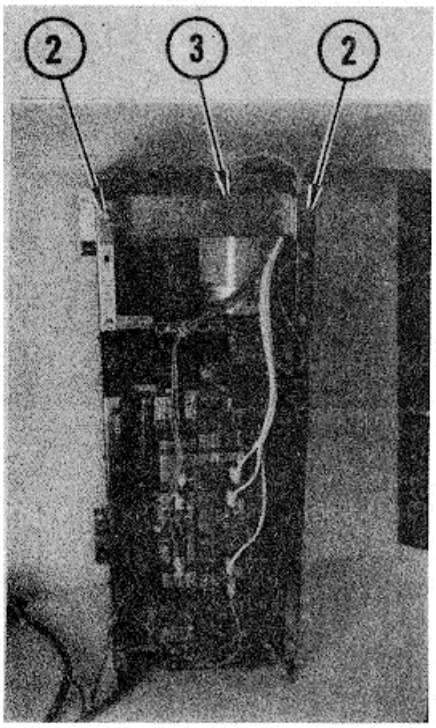
12. On control panel, press TEST button.

4-22. REMOVE/REPLACE AC SWITCH AND FILTER ASSEMBLY

INITIAL SETUP

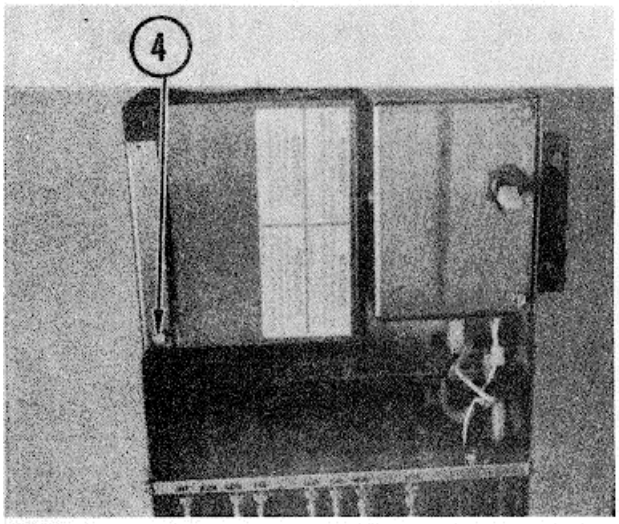
Common Tools
- Tool kit

Materials/Spare Parts
- Tags
- Pen or pencil



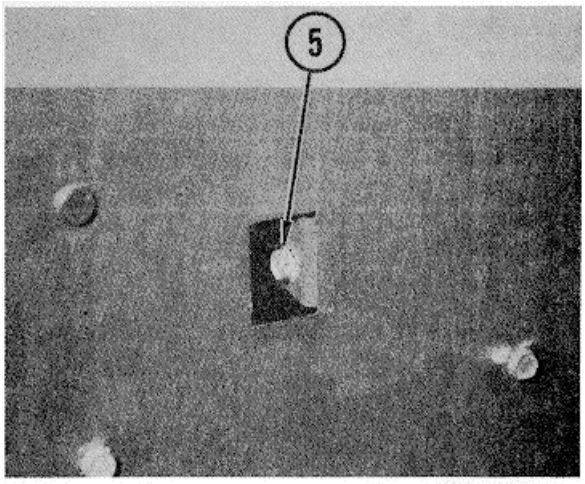
Remove

1. Remove bustle assembly (para 4-20).
2. Remove screws holding bracket.
3. Remove bracket.

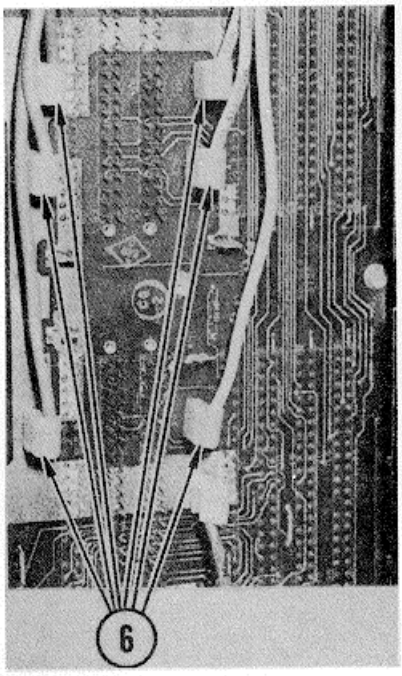


4. Remove screw.

4-22. REMOVE/REPLACE AC SWITCH AND FILTER ASSEMBLY (CONT)

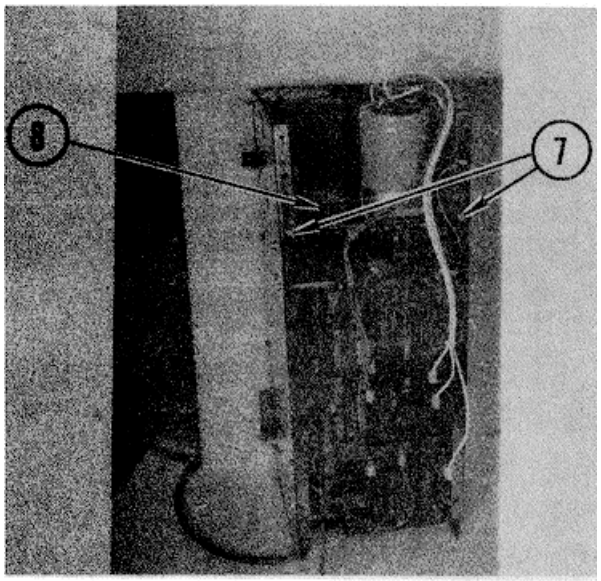


5. Remove indented screw on side of bustle assembly.

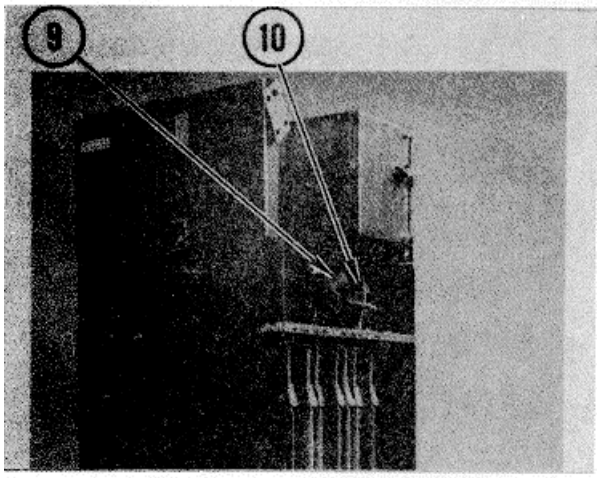


6. Note position of three blue and three white cables. Pull out cables.

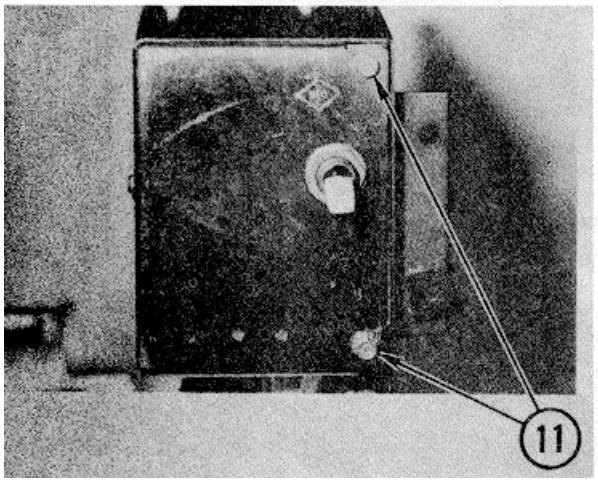
4-22. REMOVE/REPLACE AC SWITCH AND FILTER ASSEMBLY (CONT)



7. Remove screws.
8. Pull out shelf assembly.

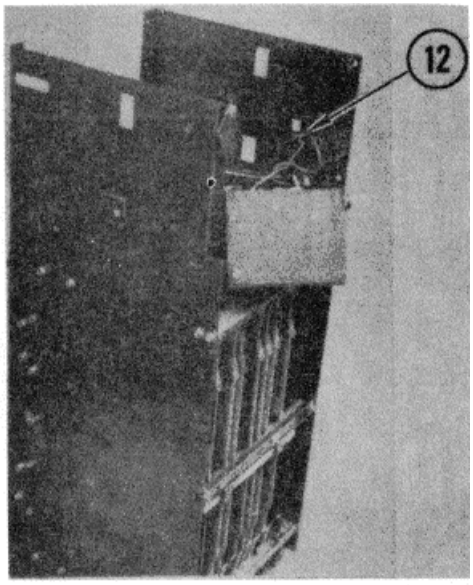


9. Pull off connector.
10. Remove nut. Pull off two retaining clamps.



11. Remove screws. Pull out ac switch and filter container.

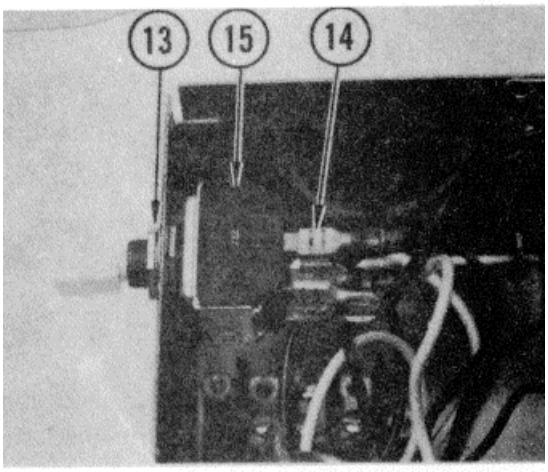
4-22. REMOVE/REPLACE AC SWITCH AND FILTER ASSEMBLY (CONT)



NOTE

Removal of ground wires provides easier assess to switch and filter assembly.

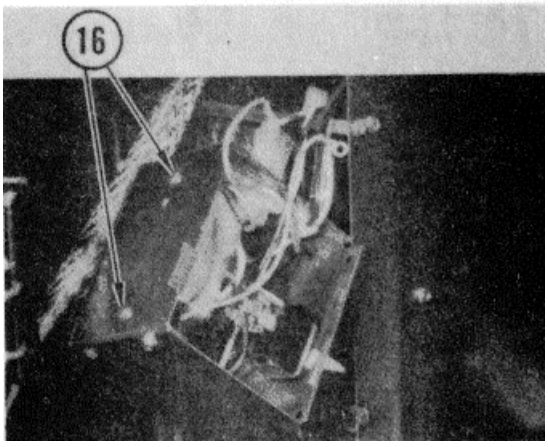
12. Remove nut. Pull off grounding wires.



13. To remove switch, screw off lock-nut.

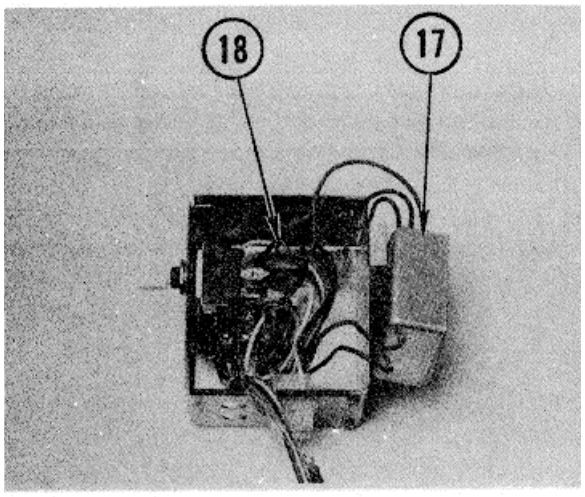
14. Tag wires and remove.

15. Pull out switch.



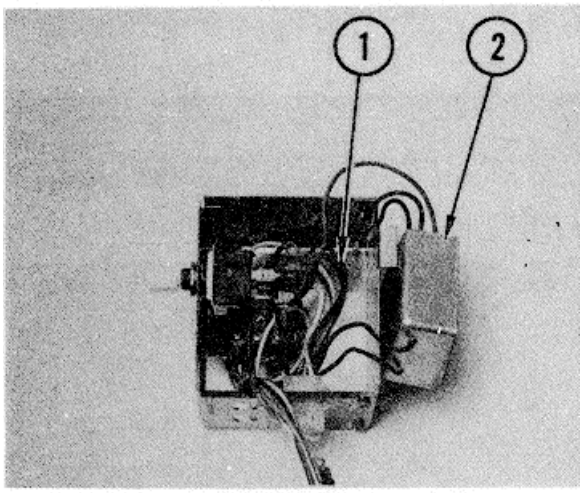
16. Remove filter mounting screws.

4-22. REMOVE/REPLACE AC SWITCH AND FILTER ASSEMBLY (CONT)



17. To remove filter assembly, pull out.

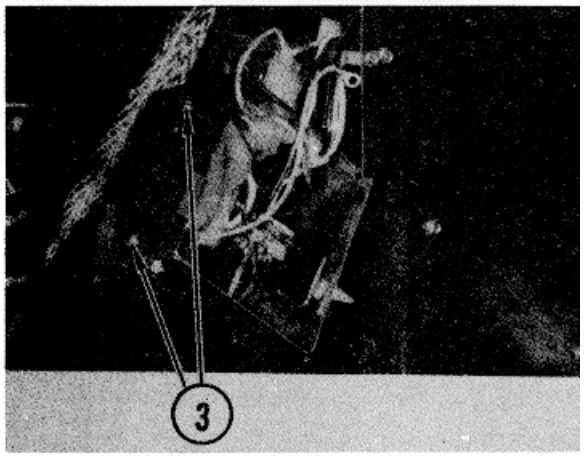
18. Tag wires and remove.



Replace

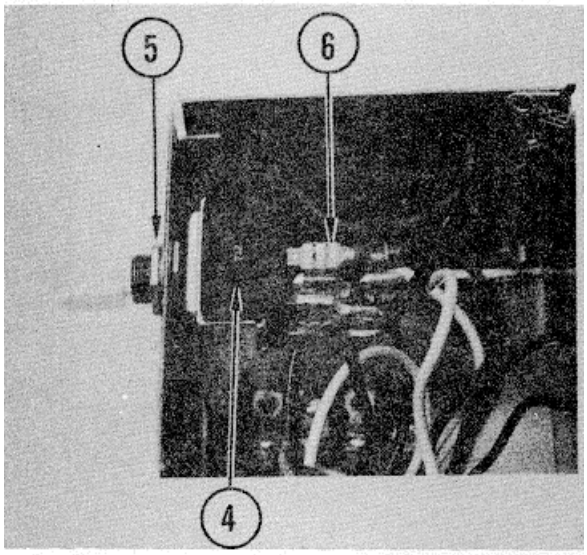
1. To replace filter, hook up wires.

2. Push filter in box.

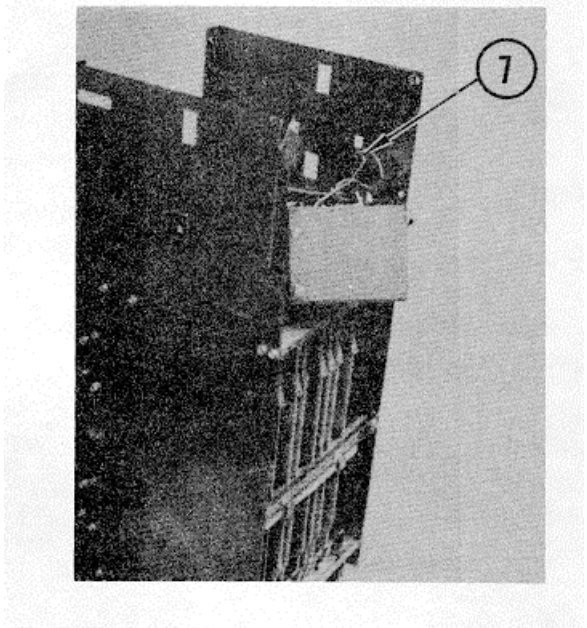


3. Replace filter mounting screws.

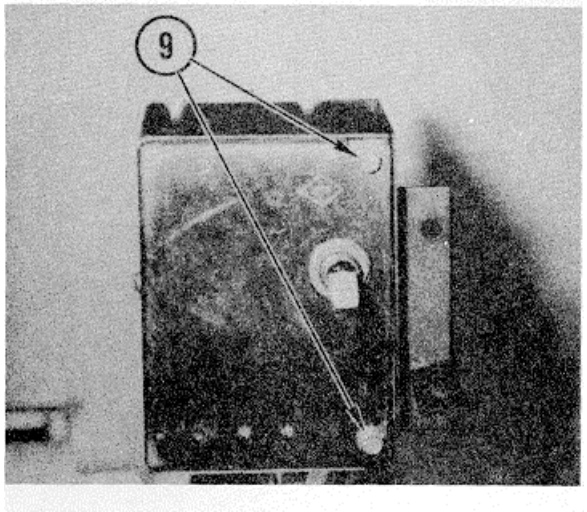
4-22. REMOVE/REPLACE AC SWITCH AND FILTER ASSEMBLY (CONT)



4. To replace switch, push switch in place.
5. Screw on locknut.
6. Push wires onto leads.

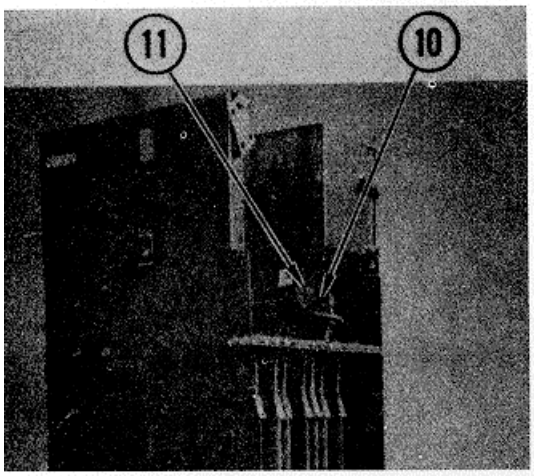


7. Replace ground wires. Tighten nut.



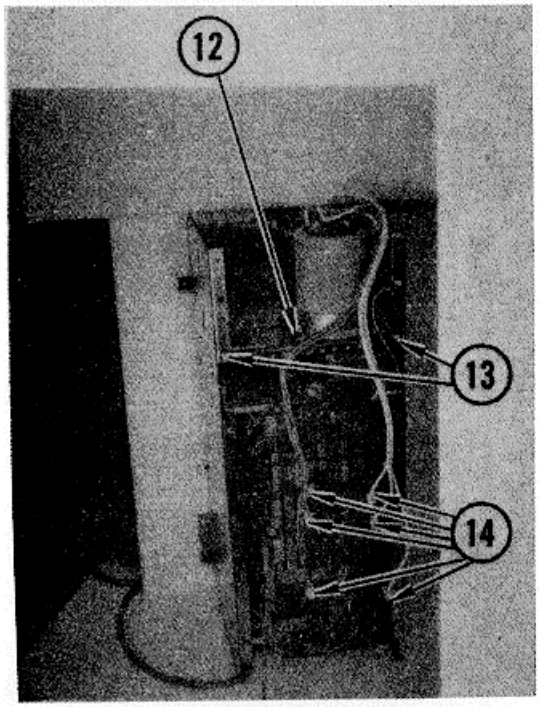
8. Position ac switch and filter container.
9. Replace and tighten screws.

4-22. REMOVE/REPLACE AC SWITCH AND FILTER ASSEMBLY (CONT)



10. Replace retaining clamps. Replace and tighten nut.

11. Push in connector.

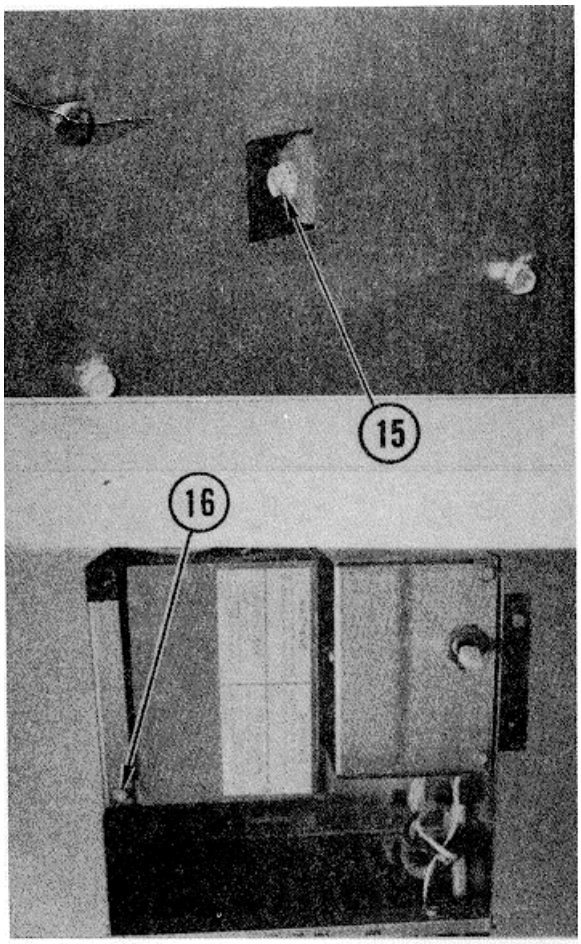


12. Place shelf assembly in position.

13. Replace screws.

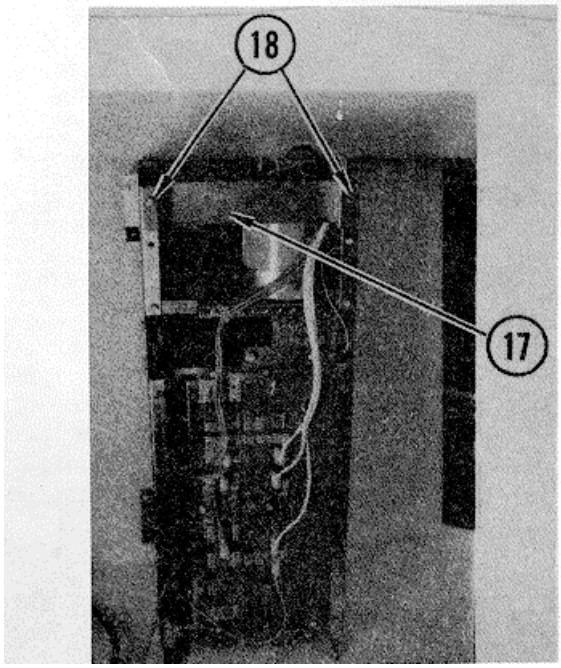
14. Push in three blue and three white cables.

4-22. REMOVE/REPLACE AC SWITCH AND FILTER ASSEMBLY (CONT)



15. Replace indented screw on side of bustle assembly.

16. Replace screw.



17. Replace bracket.

18. Replace screws.

19. Replace bustle assembly (para 4-20).

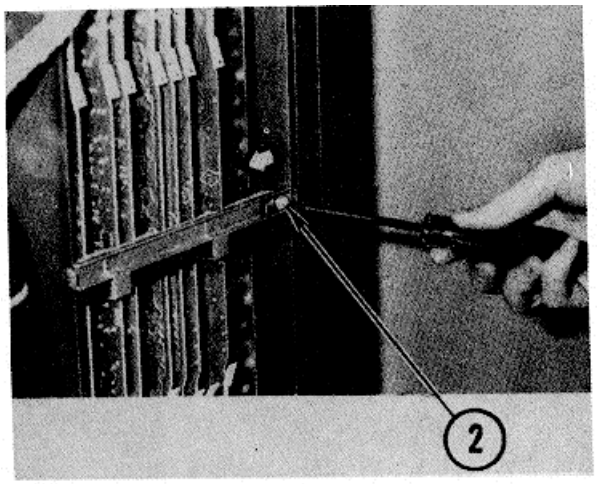
4-23. REMOVE/REPLACE BOARDS IN BUSTLE ASSEMBLY

INITIAL SETUP

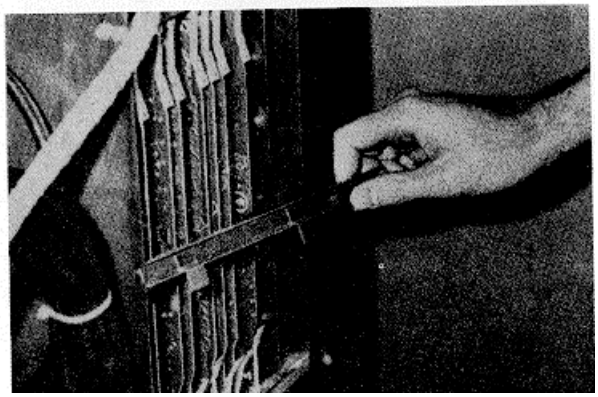
Common Tools
- Tool kit

Remove

1. Access bustle assembly (para 4-19).

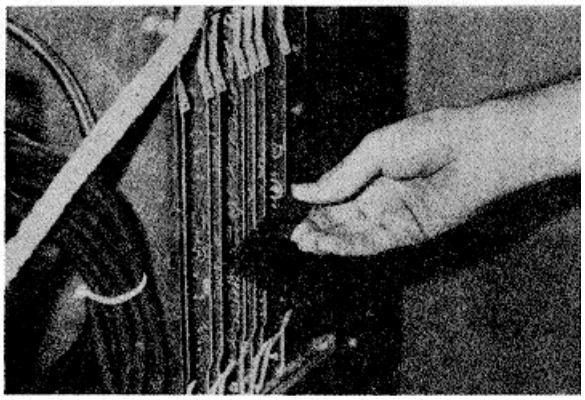


2. Loosen screw from board retainer. Slide latch under screw.

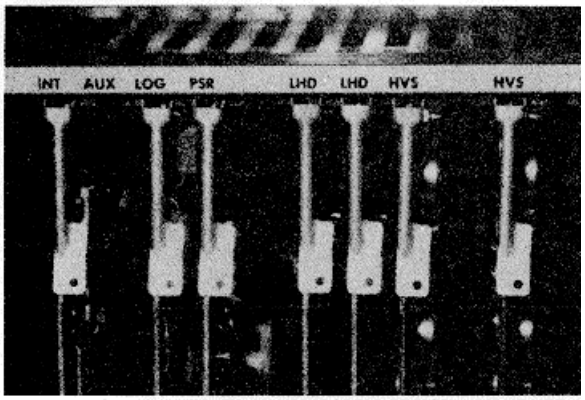


3. Remove board retainer. Check position of support strip under retainer bar.

4-23. REMOVE/REPLACE BOARDS IN BUSTLE ASSEMBLY (CONT)



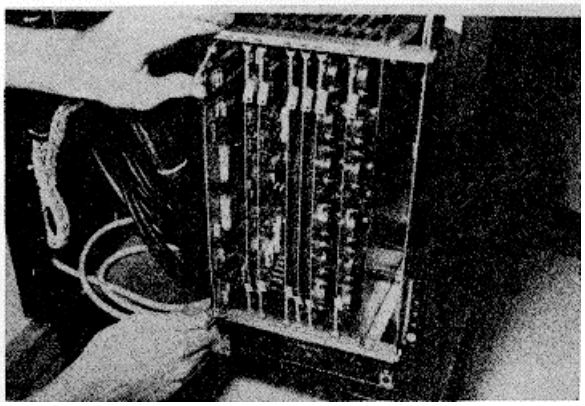
4. Pull out support strip.



5. Find board you will remove.

CAUTION

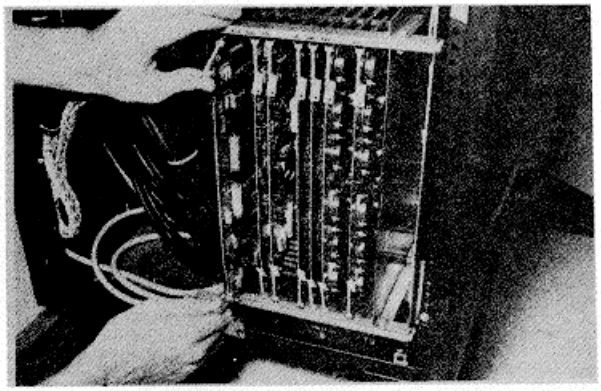
Do not remove more than one board at a time.



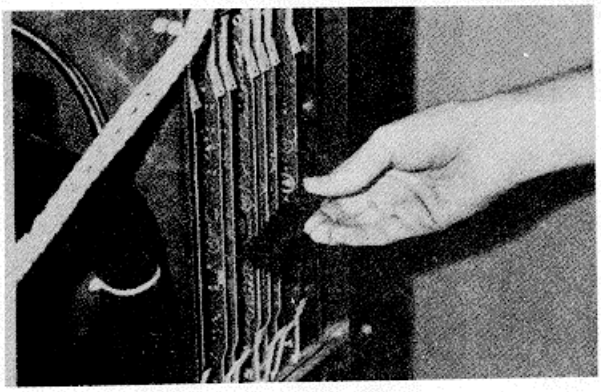
6. Pull out board as shown.

4-23. REMOVE/REPLACE BOARDS IN BUSTLE ASSEMBLY (CONT)

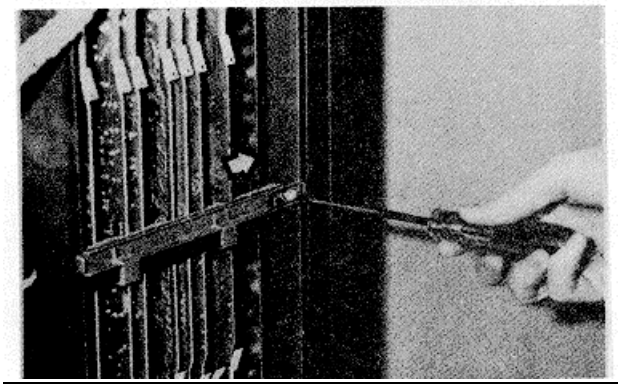
Replace



1. Firmly push in board as shown. It snaps in place.



2. Replace black support strip.



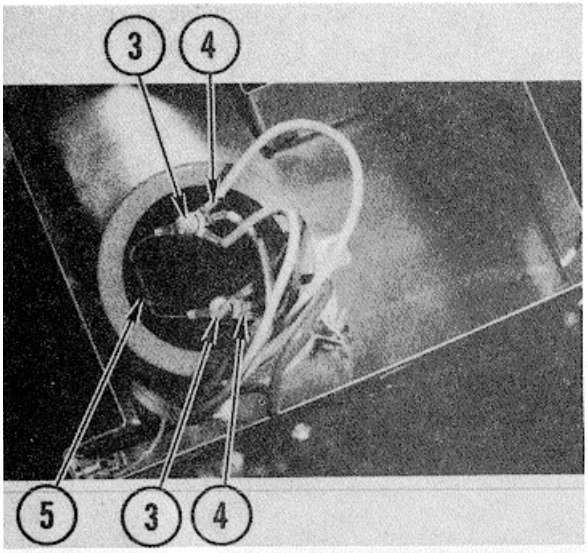
3. Replace board retainer.
4. Slide latch. Tighten screw.
5. Close up bustle assembly (para 4-19).
6. On control panel, press TEST button.

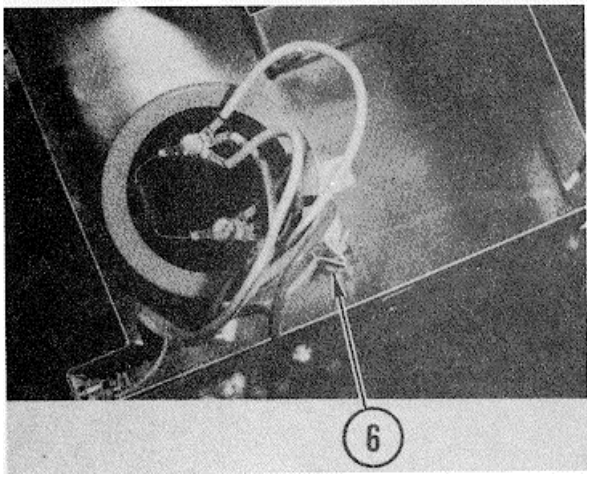
4-24. REMOVE/REPLACE SHELF ASSEMBLY CAPACITOR

INITIAL SETUP

Common Tools
- Tool kit

Materials/Spare Parts
- Pen or pencil
- Paper





Remove

1. Remove bustle assembly (para 4-20, Remove steps 1-9).

WARNING

Take special care to ground the capacitor before removing it.

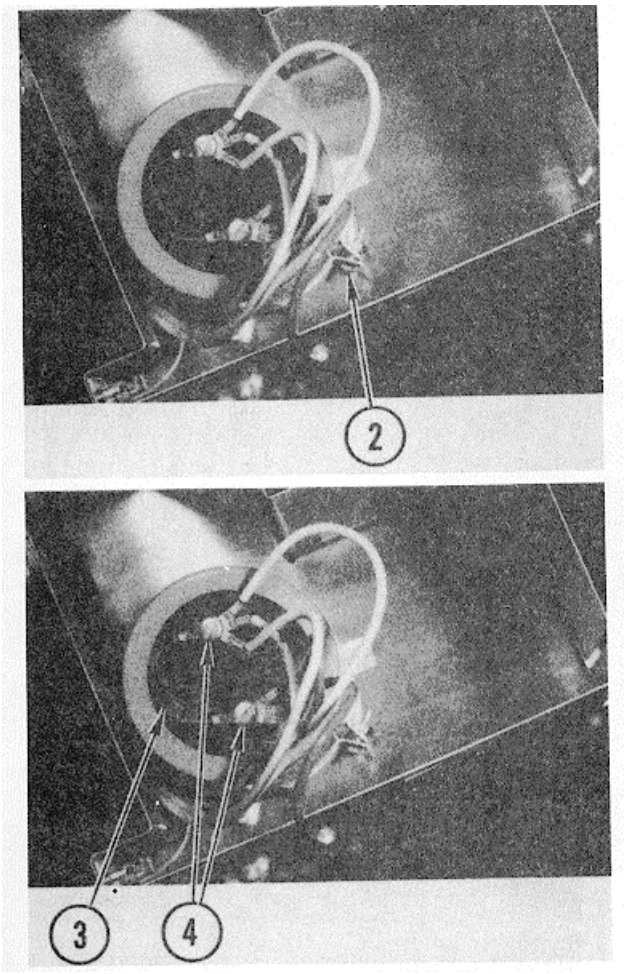
2. Check that capacitor is completely discharged.
3. Remove screws.

NOTE

Note the position of wires, polarity of capacitors, and the order in which connectors and washers are removed.

4. Remove cables and washers.
5. Remove resistor and washers.
6. Loosen screw on bracket.
7. Lift out capacitor.

4-24. REMOVE/REPLACE SHELF ASSEMBLY CAPACITOR (CONT)



Replace

1. Replace capacitor in bracket, observing polarity.
2. Tighten screw.
3. Using your notes replace resistor, washers and wire leads.
4. Tighten screws.
5. Replace bustle assembly (para 4-20).

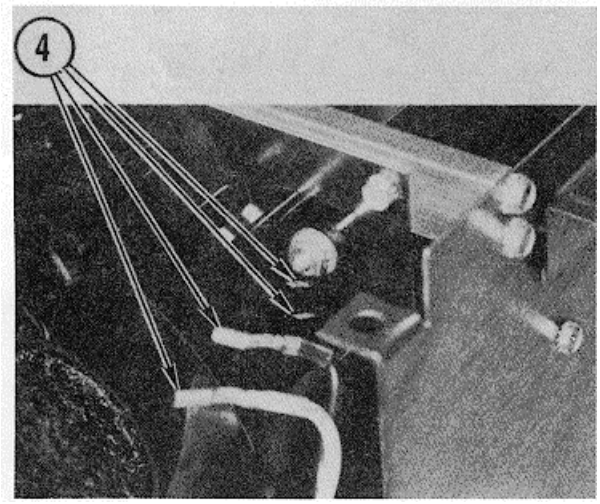
4-25. REMOVE/REPLACE BOTTOM COOLING FAN

INITIAL SETUP

Common Tools
- Tool kit

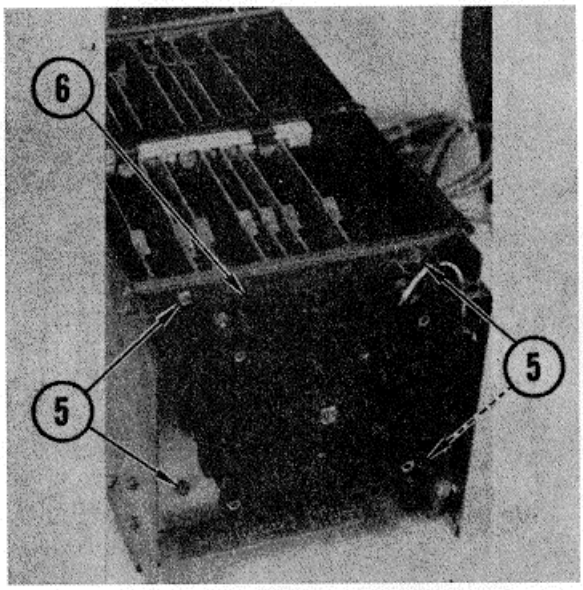
Remove

1. Remove bustle assembly (para 4-20).
2. Move bustle assembly to work area.
3. Lay assembly on its side.

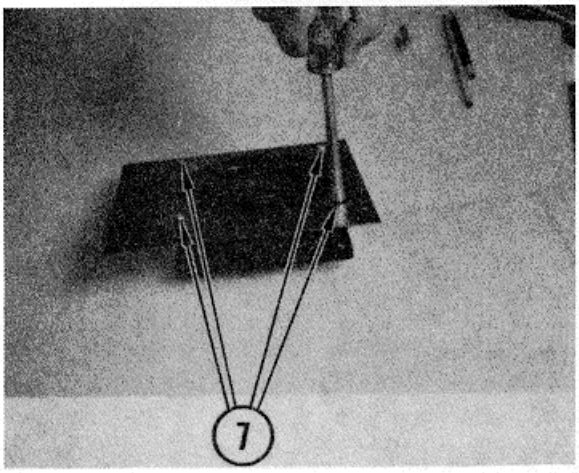


4. Pull wires from leads.

4-25. REMOVE/REPLACE BOTTOM COOLING FAN (CONT)



5. Remove nuts, bolts, and washers.
6. Pull off fan and mounting plate.

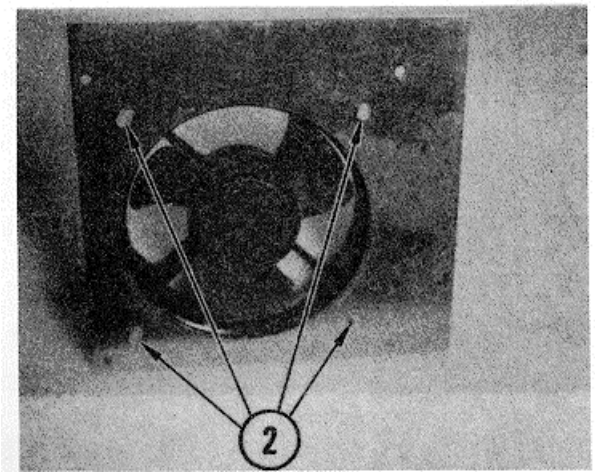


7. Remove nuts, bolts, and washers.
8. Lift off fan.

Replace

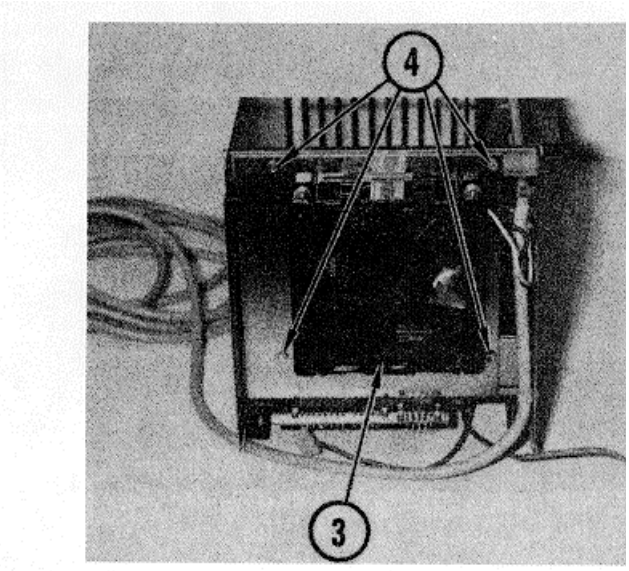
CAUTION

Be careful to position fan so air blows downward out of fan.



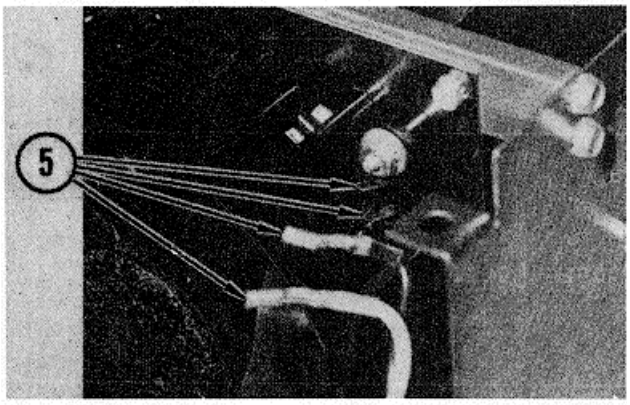
1. Position fan on mounting plate as shown.
2. Replace nuts, bolts, and washers.

4-25. REMOVE/REPLACE BOTTOM COOLING FAN (CONT)



3. Position fan and mounting plate on bustle assembly as shown.

4. Replace nuts, bolts, and washers.



5. Push wires onto leads.

6. Replace bustle assembly (para 4-20).

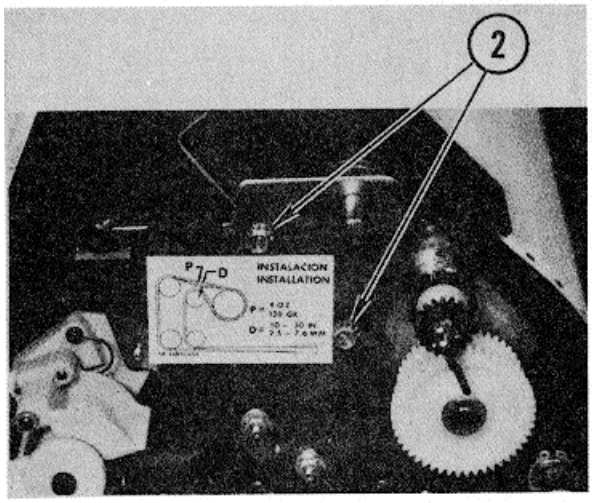
7. Place hand under pedestal. Make sure air is moving out bottom of pedestal.

4-26. REMOVE/REPLACE COSMETIC SHIELD

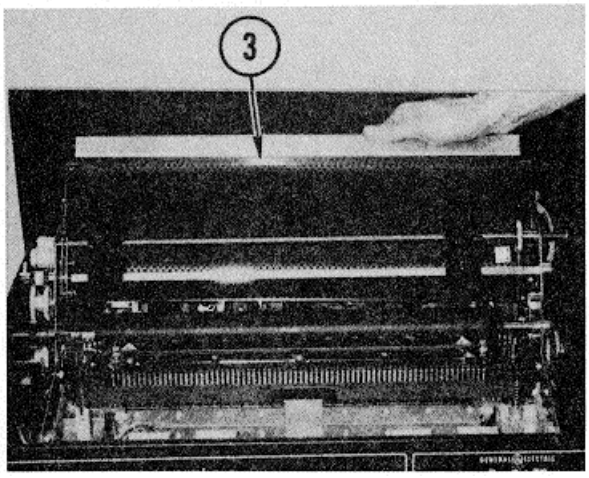
INITIAL SETUP

Common
- Tool kit

Remove



1. Access line printer (para 4-18, steps 1-7).
2. Remove screw and washers from each end of cosmetic shield.



3. Carefully slide shield up and out.

Replace

1. Carefully insert cosmetic shield.
2. Replace screws and washers in each end of shield.
3. Close up line printer (para 4-18, steps 2-8).

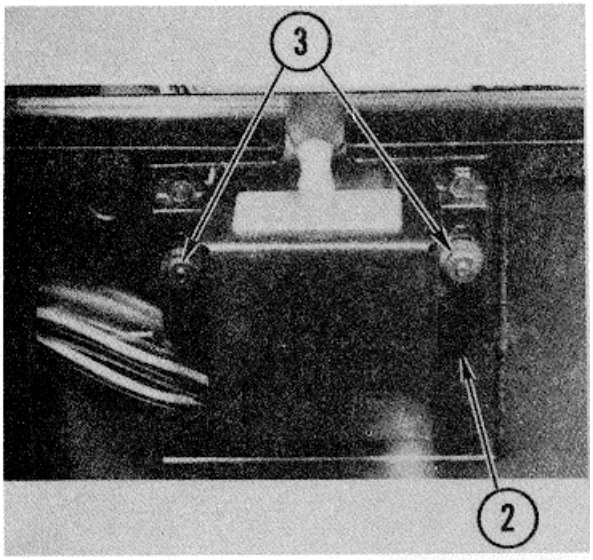
4-27. REMOVE/REPLACE TOP COVER INTERLOCK SWITCH

INITIAL SETUP

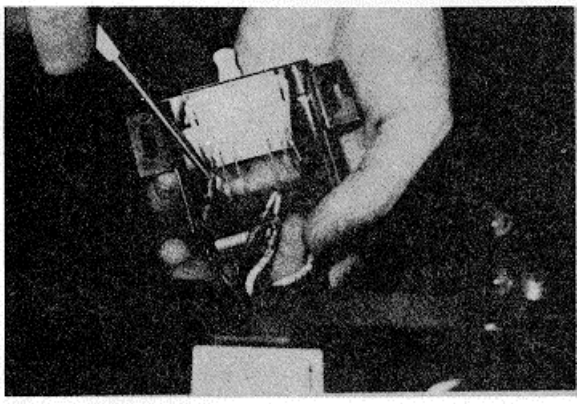
Common Tools
- Tool kit

Materials/Spare Parts
- Tags
- Pen or pencil

Remove

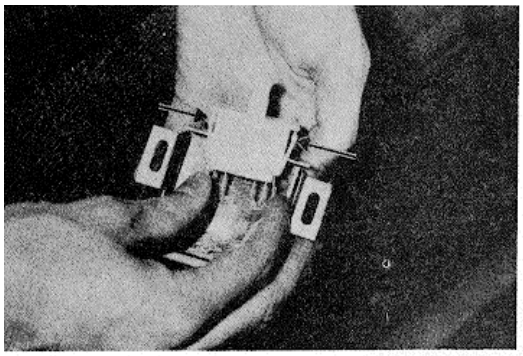


1. Access line printer (para 4-18, steps 1-3).
2. Mark the bottom edge of each mounting tab. Use mark to orient replacement switch.
3. Remove two mounting nuts.

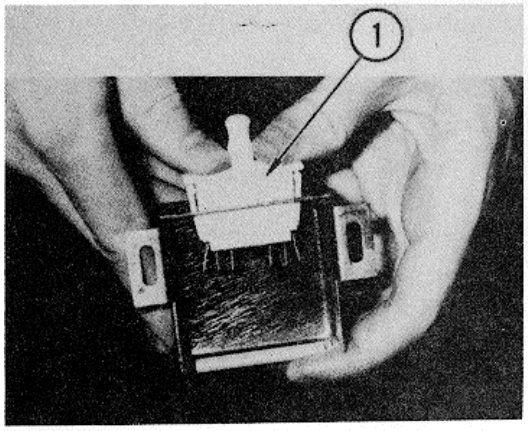


4. Turn switch housing around. Tag and remove wires.

4-27. REMOVE/REPLACE TOP COVER INTERLOCK SWITCH (CONT)



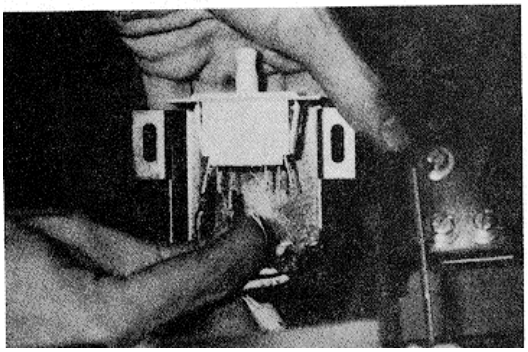
5. Squeeze the two plastic tabs together on sides of switch. Push switch out.



Replace

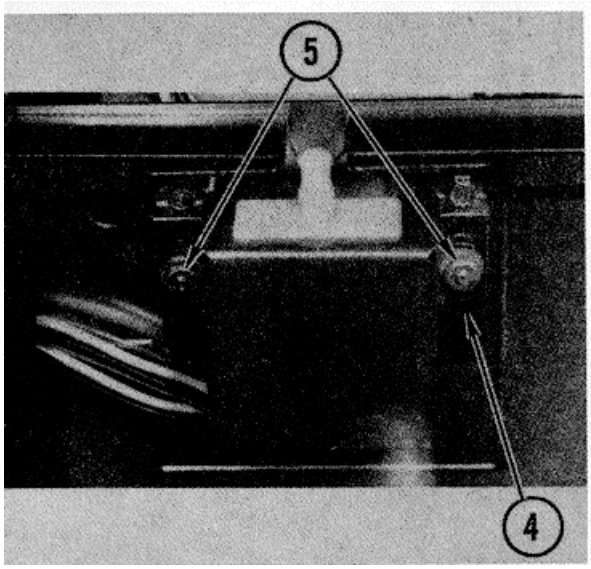
1. With identifying marks facing out, position replacement switch.

2. Push switch into housing. (Switch snaps into place.)



3. Connect wires.

4-27. REMOVE/REPLACE TOP COVER INTERLOCK SWITCH (CONT)



4. Place the bottom edges of mounting tabs against marks.

CAUTION

When remounted, top of deactivated switch should not extend above mount housing.

5. Insert and tighten two mounting screws.

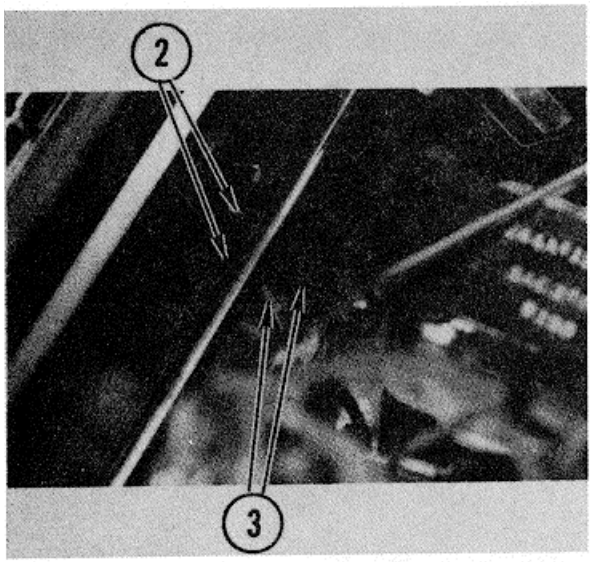
6. Close up line printer (para 4-18, steps 6-8).

7. To check operation of switch, open and close top cover. Printer motor should turn OFF when cover is raised 3/4 inch.

4-28. REMOVE/REPLACE PAPER OUT SWITCH

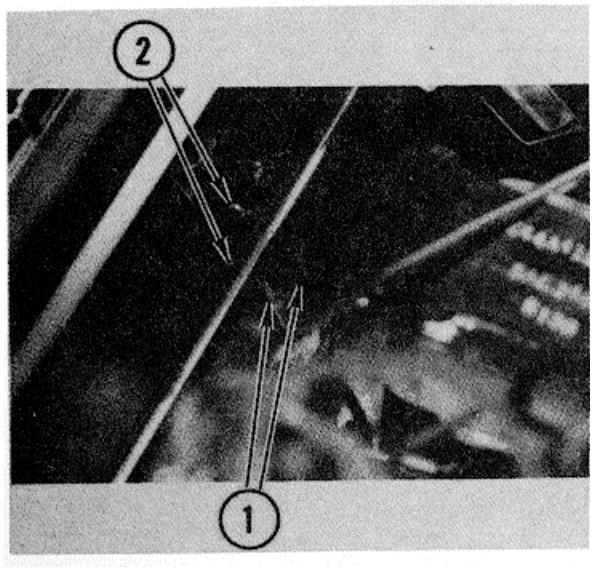
INITIAL SETUP

Common Tools	Materials/Spare Parts
• Tool kit	• Pen or pencil • Paper



Remove

1. Access line printer (para 4-18).
2. Remove two screws. Pull out switch.
3. Disconnect two wires.



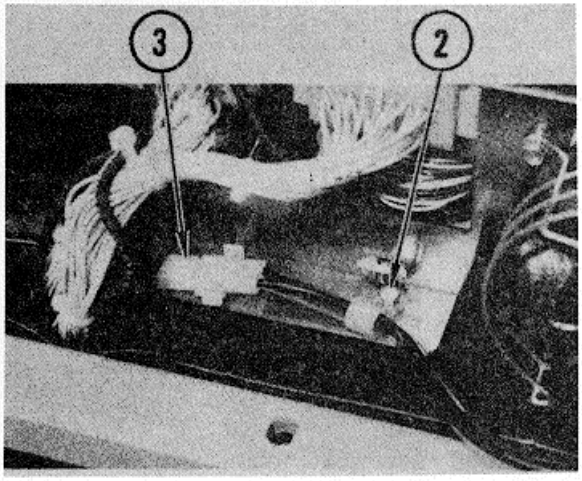
Replace

1. Connect wires.
2. Put switch in place. Replace two screws.
3. Close up line printer (para 4-18, steps 1-5).
4. Install 3-foot length of paper for test.
5. Close top cover.
6. Push ac plug into outlet. Power on.
7. On control panel, press TEST button until paper out switch is energized.
8. Install paper as usual.

4-29. REMOVE/REPLACE FRONT COOLING FAN

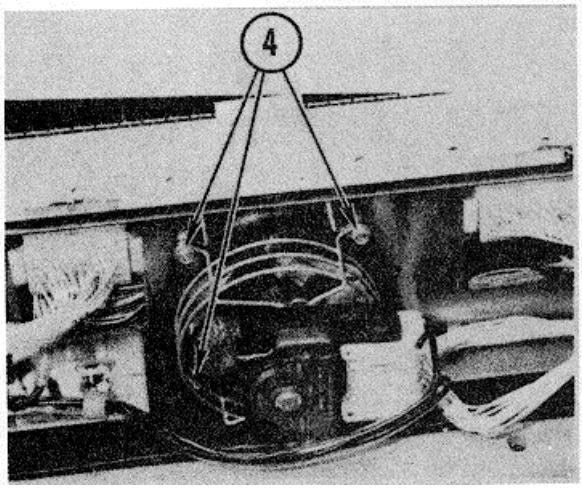
INITIAL SETUP

Common Tools
- Tool kit



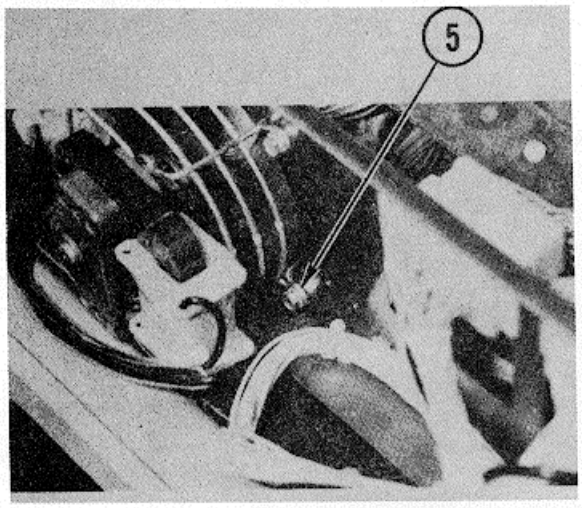
Remove

1. Remove control panel (para 4-67, steps 1-7).
2. Loosen screw on cable clamp.
3. Pull apart connector.

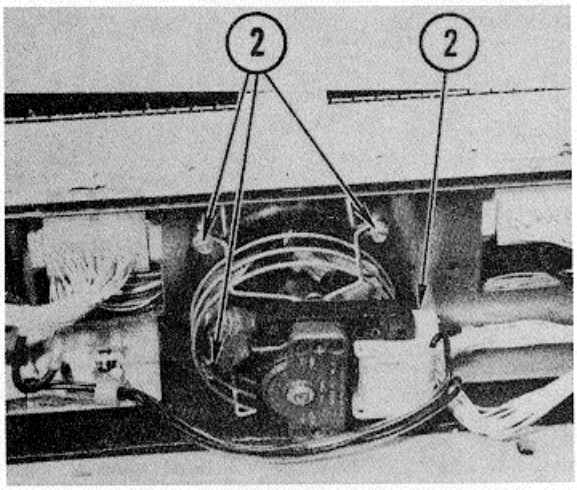


4. Remove three screws and washers.

4-29. REMOVE/REPLACE FRONT COOLING FAN (CONT)

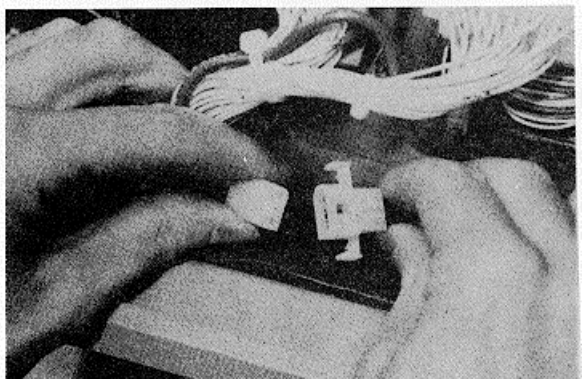


5. Using 1/4 in. open end wrench, remove fourth screw.
6. Pull out fan.



Replace

1. Position fan.
2. Replace four screws and washers.
3. Connect connector.
4. Tighten screw on cable clamp.



5. Replace control panel, (para 4-67, Replace steps 3-9).
6. Close cover. Install paper.

CAUTION

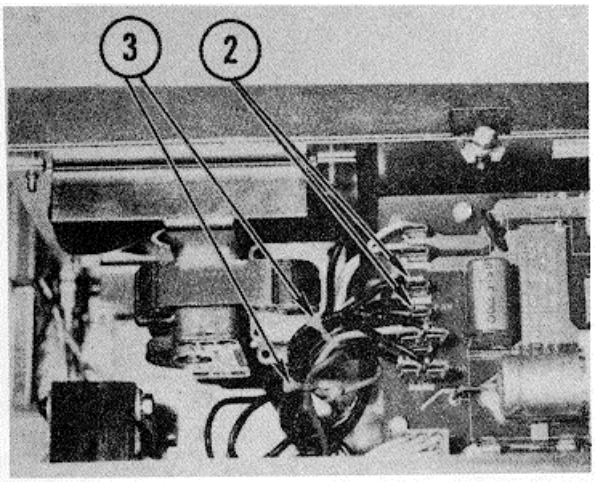
Be sure all wires are away from fan blades before powering on.

7. Power on printer.
8. Hold hand near fan. Make sure air flows into printer.

4-30. REMOVE/REPLACE REAR COOLING FAN

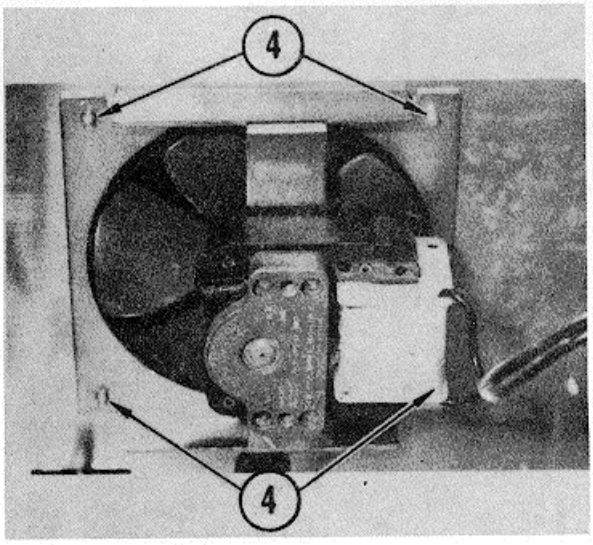
INITIAL SETUP

Common Tools	Materials/Spare Parts
• Tool kit	• Tie wraps (2 ea)



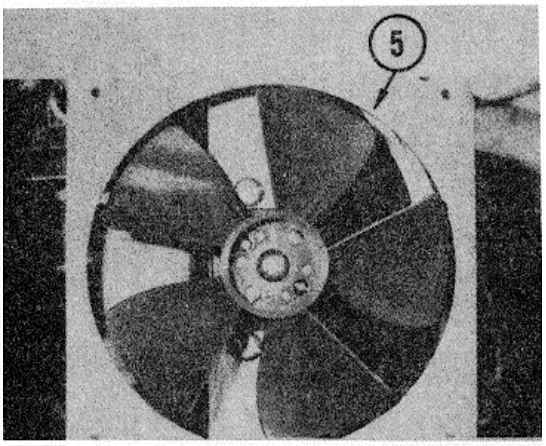
Remove

1. Access line printer (para 4-18, steps 1-7).
2. Pull wires from leads marked FAN.
3. If necessary cut tie wraps.

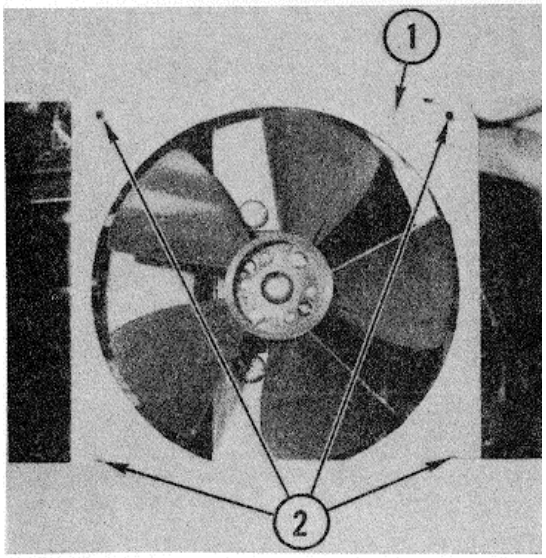


4. Remove screws.

4-30. REMOVE/REPLACE REAR COOLING FAN (CONT)

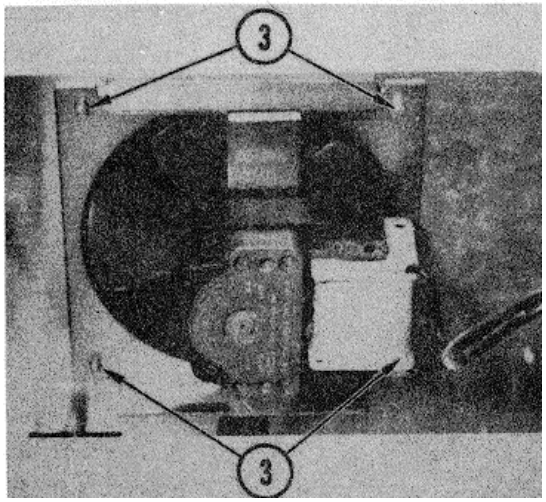


5. Remove fan assembly.



Replace

1. Mount fan assembly.
2. Align screw holes.

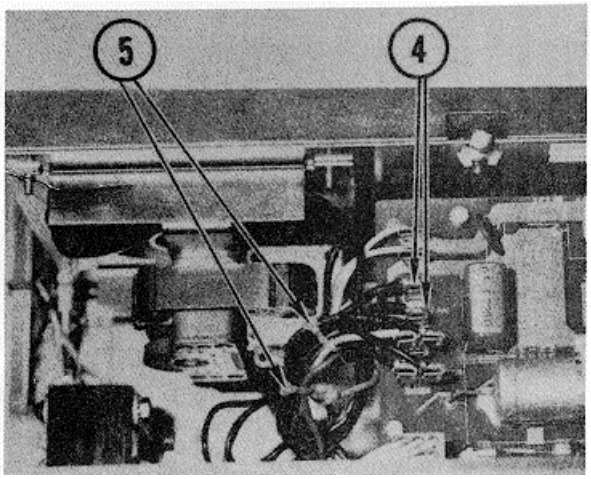


CAUTION

Overtightening will twist off screw heads.

3. Replace screws.

4-30. REMOVE/REPLACE REAR COOLING FAN (CONT)



4. Push wires onto leads marked FAN.
5. Wrap ties around wires.

CAUTION

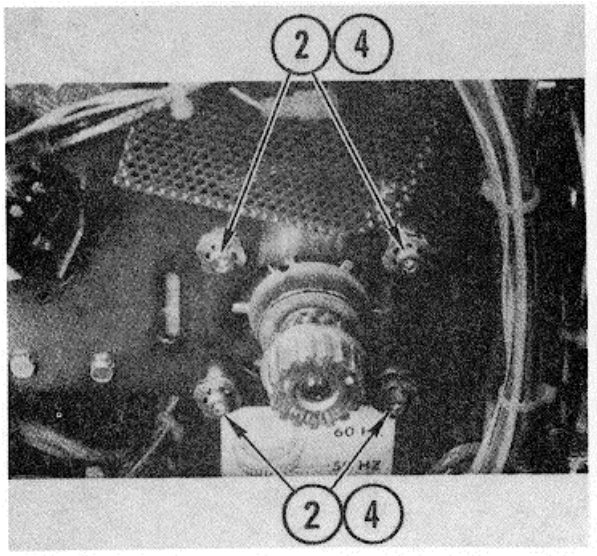
Be sure all wires are away from fan blades before powering on.

6. Close up line printer (para 4-18, steps 2-8).
7. Hold hand near fan. Make sure air flows into printer.

4-31. REMOVE/REPLACE MOTOR

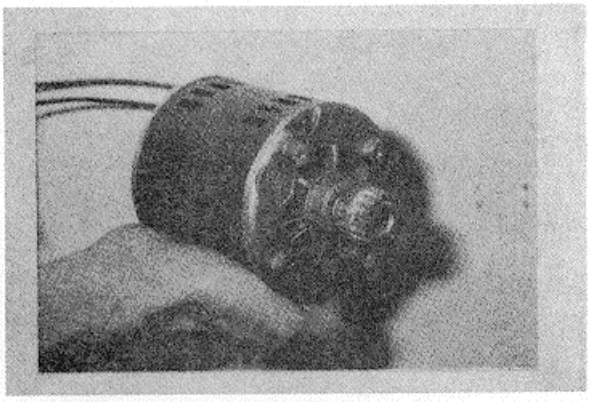
INITIAL SETUP

Common Tools
- Tool kit



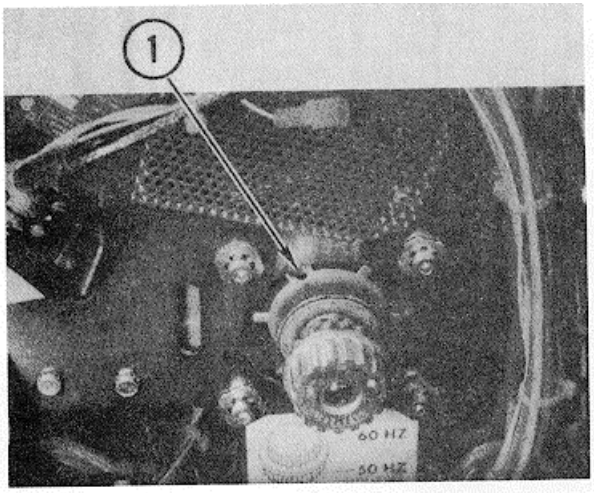
Remove

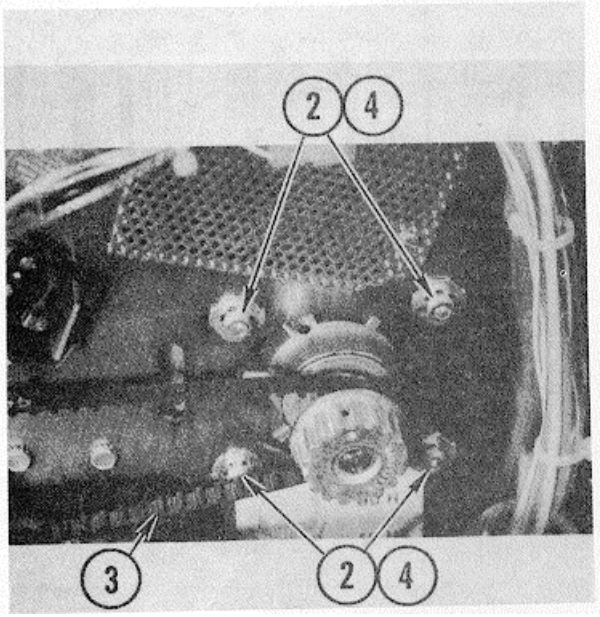
1. Remove power supply (para 4-62).
2. Using 9/64 hex key wrench, loosen motor screws.
3. Slide motor forward. Remove drive belt.
4. Remove motor screws and washers.



5. Lift out motor.

4-31. REMOVE/REPLACE MOTOR (CONT)





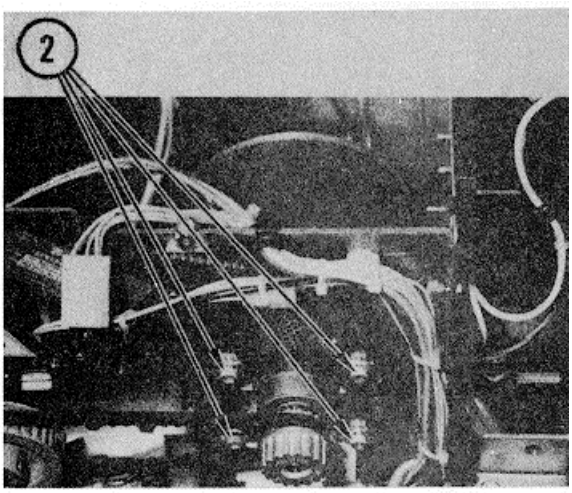
Replace

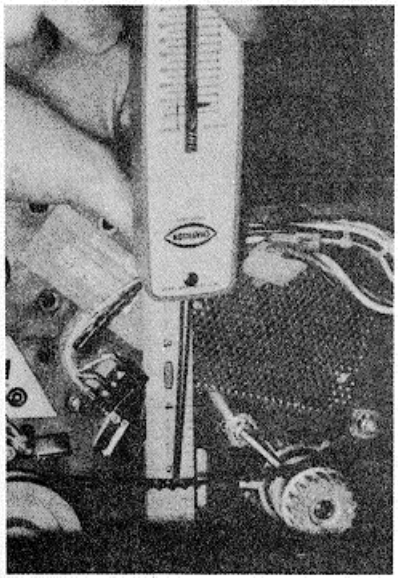
1. Position motor so that oil hole is on top.
2. Secure motor screws and washers. Do not tighten.
3. Replace right drive belt and adjust tension (para 4-32, steps 1-4).
4. Tighten screws.
5. Replace power supply (para 4-62).

4-32. REMOVE/REPLACE RIGHT DRIVE BELT

INITIAL SETUP

Common Tools
- Tool kit
- Belt tension gauge





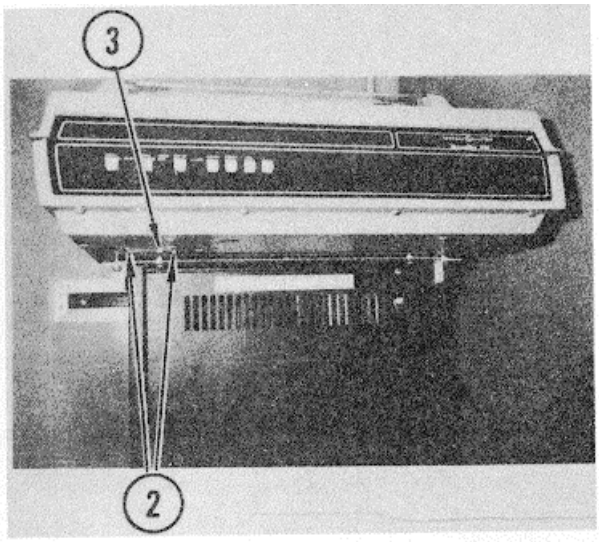
Remove

1. Access line printer (para 4-18, steps 1-3).
2. With 9/64 hex key wrench, loosen four motor screws. Do not remove screws.
3. Slide motor forward till belt is loose.
4. Remove belt. Replace/Adjust
1. Place belt on pulley.
2. Slide motor until belt is snug.
3. Using belt tension gauge, measure belt tension.
   - If tension is 4 ounces pressure with 1/4 in. deflection, go to step 5
   - If tension is not 4 ounces pressure with 1/4 in. deflection, go to step 4
4. Slide motor a little more. Measure tension. Repeat until tension is 4 ounces pressure with 1/4 in. deflection.
5. Tighten motor screws.
6. Close up line printer (para 4-18, steps 6-8).
7. On control panel, press TEST button.

4-33. REMOVE/REPLACE LEFT DRIVE BELT

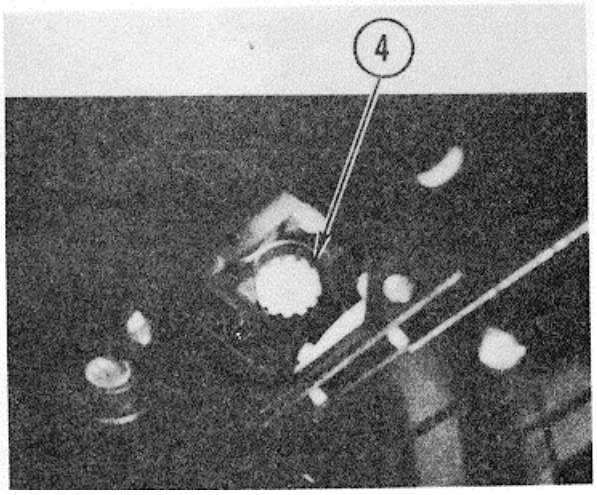
INITIAL SETUP

Common Tools
- Tool kit
- Belt tension gauge



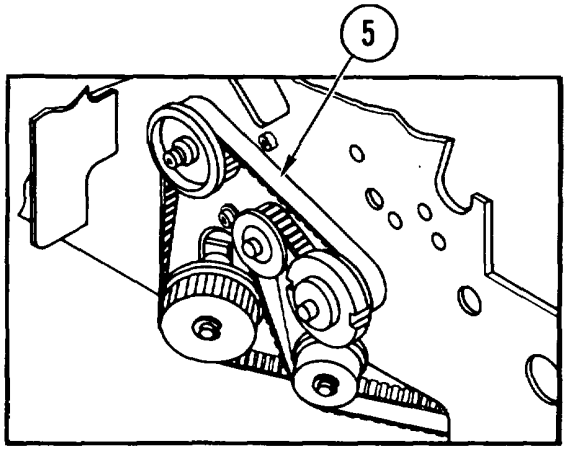
Remove

1. Access line printer (para 4-18, steps 1-6).
2. Loosen screws.
3. Pull off plate.

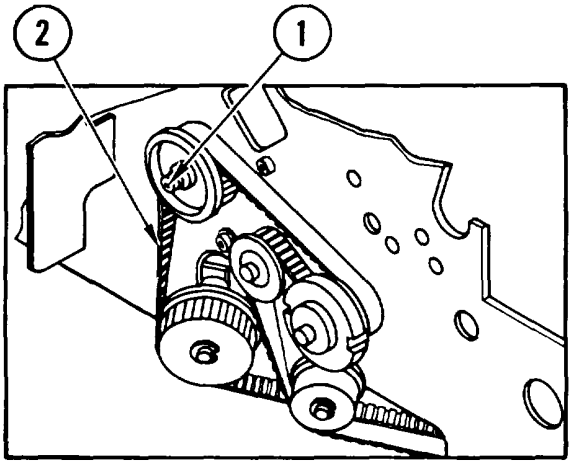


4. From beneath printer, slip belt off pulley.

4-33. REMOVE/REPLACE LEFT DRIVE BELT (CONT)



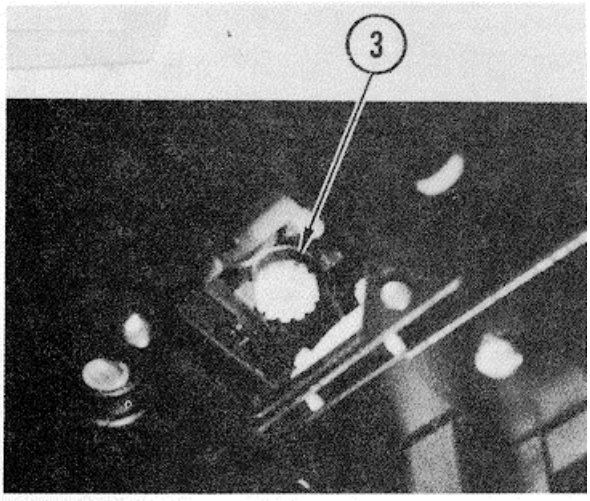
5. Pull out belt.



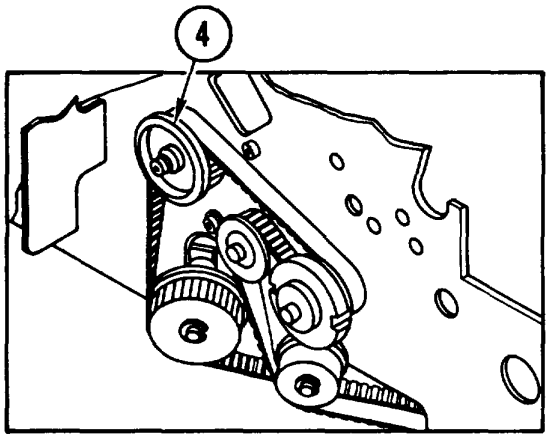
Replace

1. Loosen screw enough to move pulley..

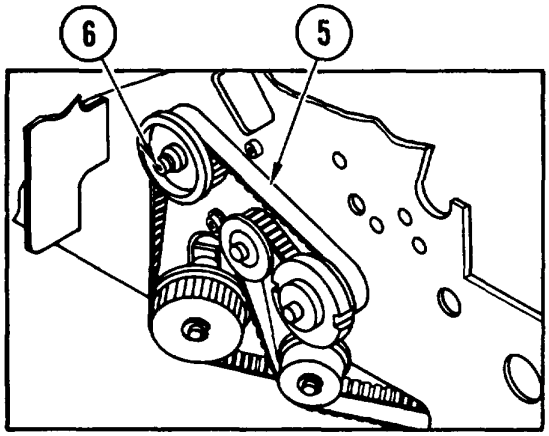
2. Fit new belt on pulleys, as shown.



3. From beneath printer, slip belt on pulley.



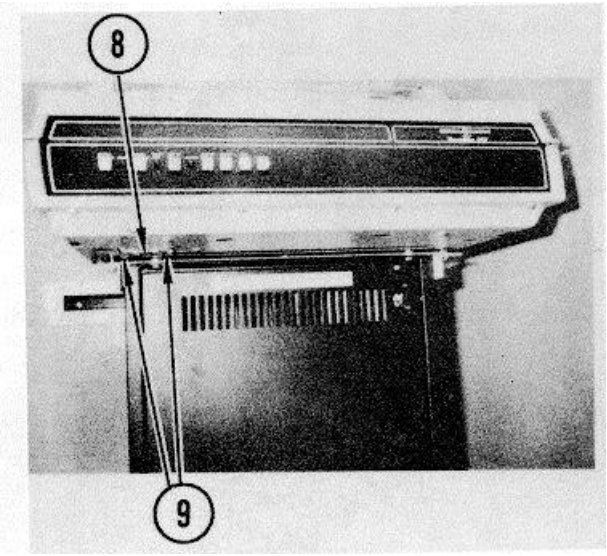
4. Move pulley up until belt is snug.



5. Using belt tension gauge, measure belt tension.

   - If tension is 4 ounces pressure with 1/4 in. deflection, go to step 7
   - If tension is not 4 ounces pressure with 1/4 in. deflection, go to step 6

6. Loosen screw. Move pulley up or down. Measure tension. Repeat until tension is 4 ounces pressure with 1/4 in. deflection. Tighten screw.



7. Turn motor drive pulley counter-clockwise. Make sure pulleys turn freely. If pulleys don't turn freely, go back to Replace, step 1.

8. Replace plate.

9. Tighten screws.

10. Close up line printer (para 4-18, steps 3-8).

11. On control panel, press TEST button.

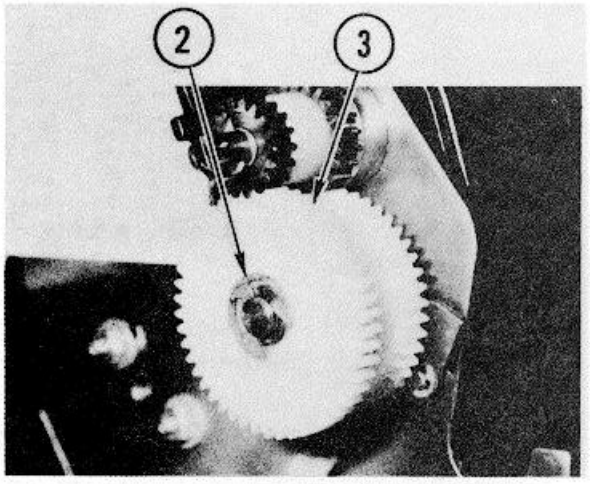
4-34. LUBRICATE LINEFEED IDLER GEAR

INITIAL SETUP

Common Tools
- Tool kit

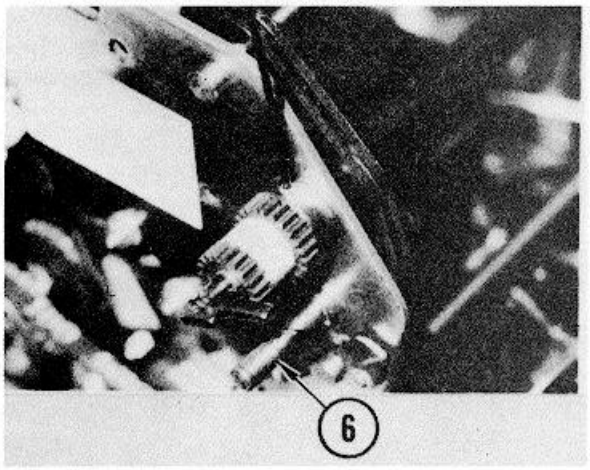
Material/Spare Parts
- Clean lint-free cloth
- SAE 10W-20W-40 motor oil
- Lubriplate #630-AAME-D6A3 grease

.



Remove

1. Access line printer (para 4-18, steps 1-6).
2. Remove retaining ring.
3. Slide off idler gear.
4. Wipe inside clean and check for scoring (scratching). If steel sleeve is scored, replace idler gear.
5. Apply two drops of oil to bearing.



6. Wipe gear shaft clean and coat with , grease.

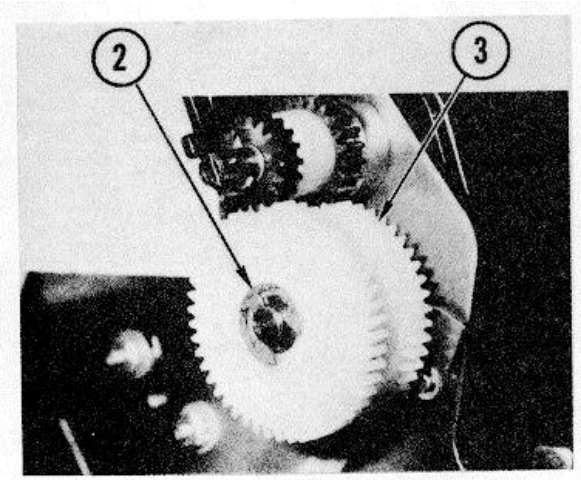
Replace

1. Slide idler gear on shaft.
2. Replace retaining ring.
3. Close up line printer (para 4-18, steps 3-8).
4. On control panel, press TEST button.

4-35. REMOVE/REPLACE TRACTOR DRIVE SHAFT AND GEAR ASSEMBLY

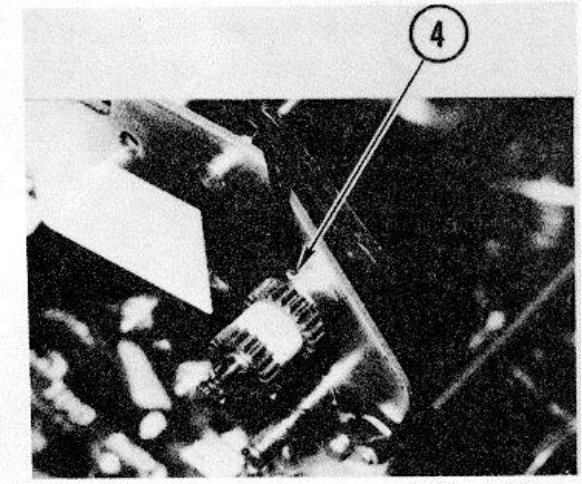
INITIAL SETUP

Common Tools
- Tool kit



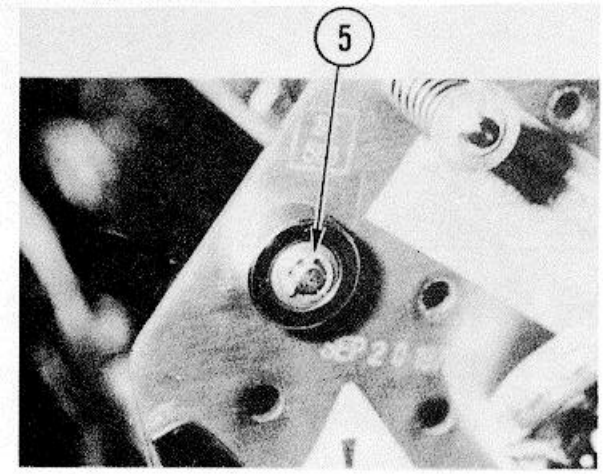
Remove

1. Access line printer (para 4-18).
2. Remove retaining ring.
3. Pull off pulley.

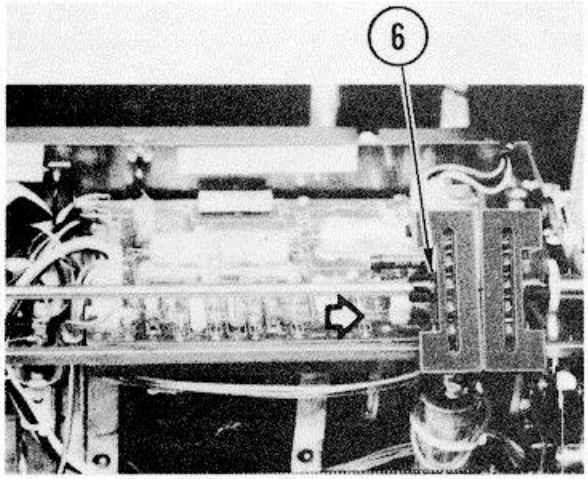


4. Loosen set screw enough to free square shaft.

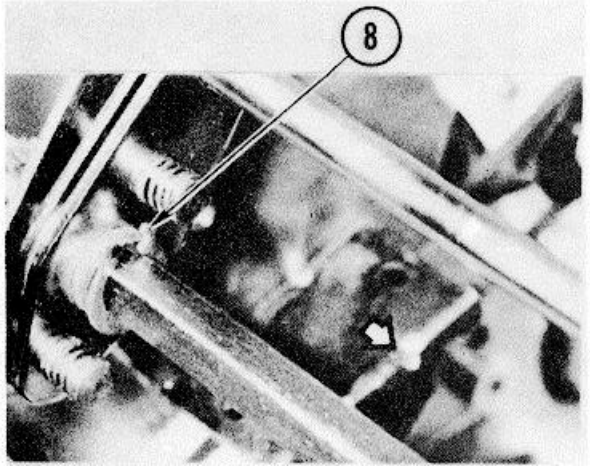
4-35. REMOVE/REPLACE TRACTOR DRIVE SHAFT AND GEAR ASSEMBLY (CONT)



5. Remove retaining ring.

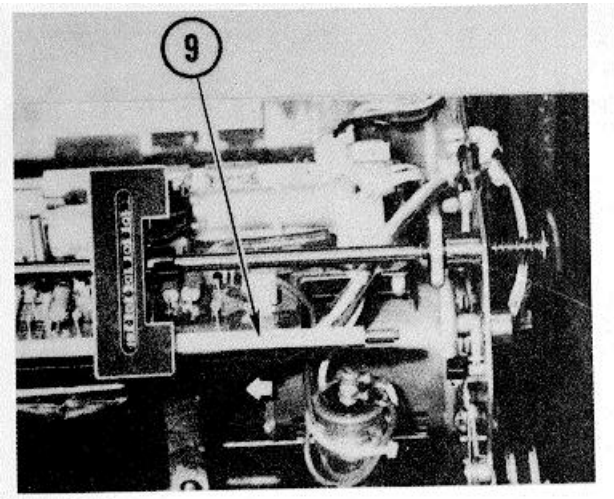


6. To unlock tractors, push down on lever.
7. Push tractors to side as shown.

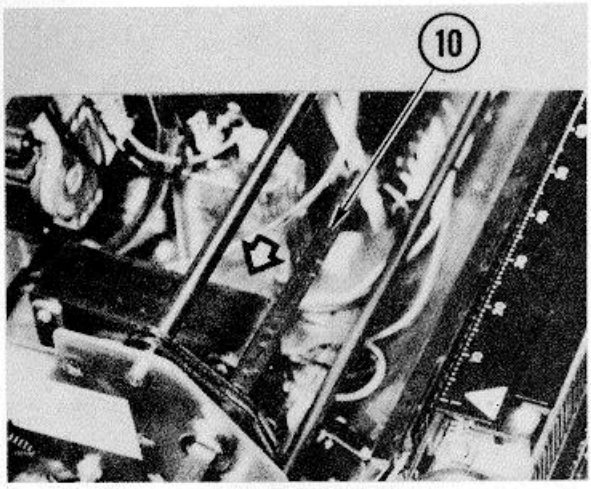


8. Remove retaining ring.

4-35. REMOVE/REPLACE TRACTOR DRIVE SHAFT AND GEAR ASSEMBLY (CONT)

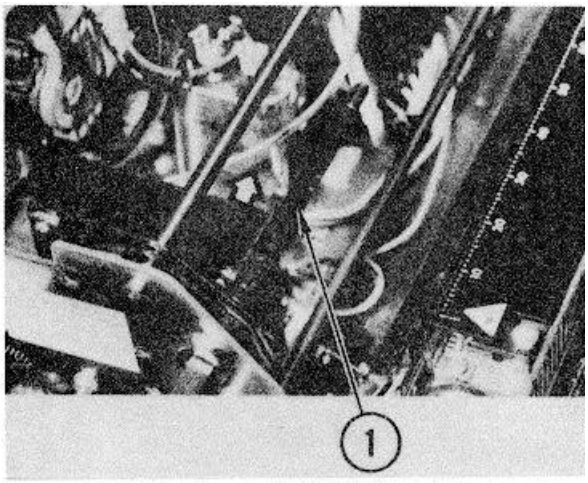


9. Slide square shaft in direction shown until tractors are free and hang from top rod.



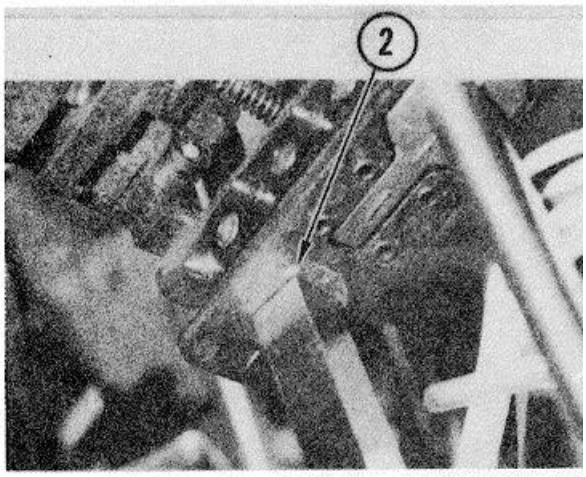
10. Slide out shaft as shown.

4-35. REMOVE/REPLACE TRACTOR DRIVE SHAFT AND GEAR ASSEMBLY (CONT)



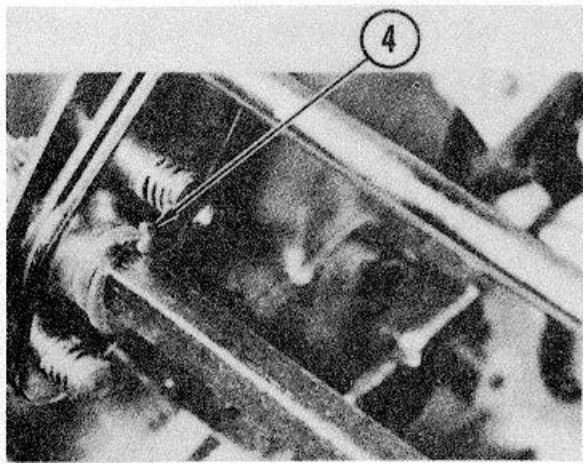
Replace

1. Slide in shaft as shown.



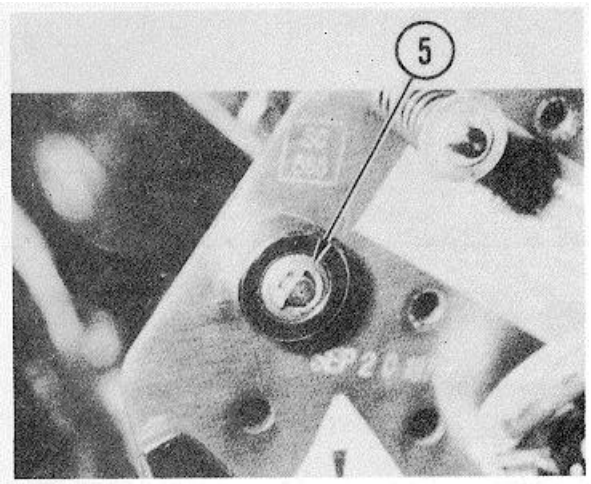
2. Make sure white dot on both tractors is at the same position on the square shaft.

3. Slide square shaft through tractors.

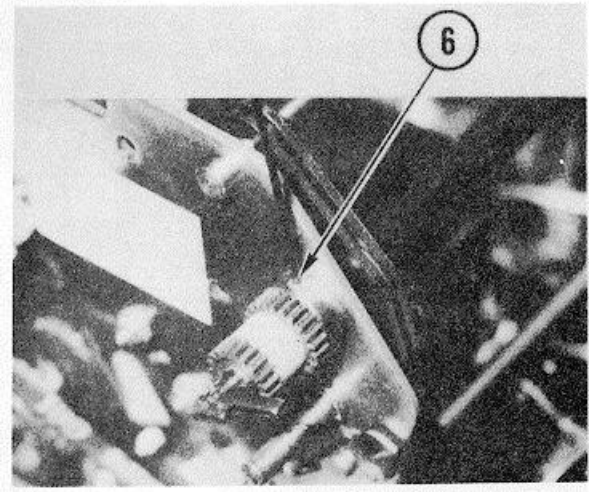


4. Push on retaining ring.

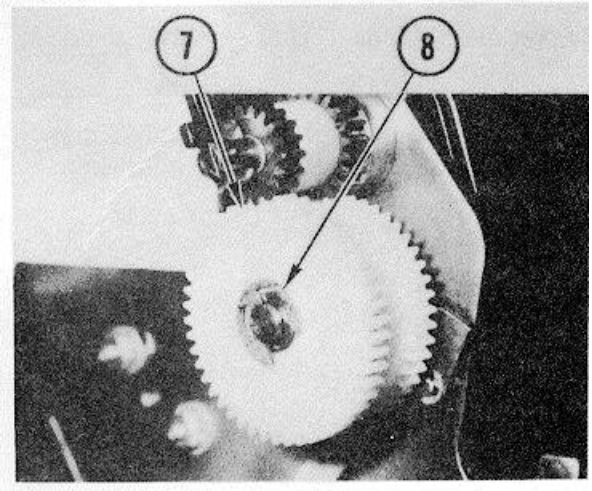
4-35. REMOVE/REPLACE TRACTOR DRIVE SHAFT AND GEAR ASSEMBLY (CONT)



5. Push on retaining ring.



6. Tighten set screw.



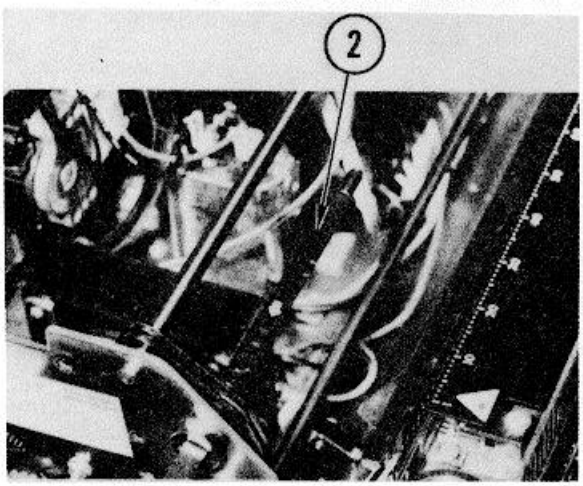
7. Push on pulley.
8. Push on retaining ring.
9. Close up line printer (para 4-18).
10. On control panel, press TEST button.

4-36. REMOVE/REPLACE FRICTION BRAKE

INITIAL SETUP

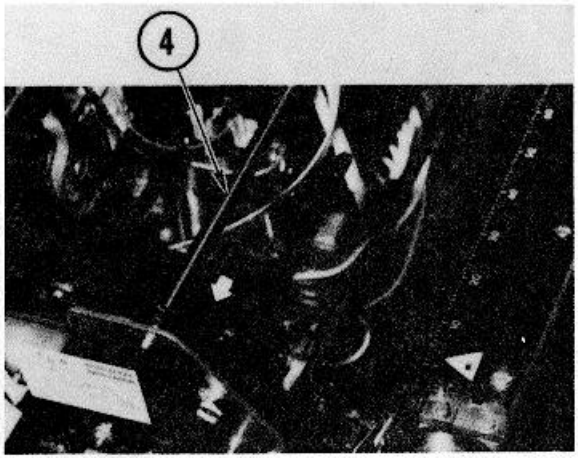
Common Tools
- Tool kit

Materials/Spare Parts
- SAE 10W-20W-40 motor oil



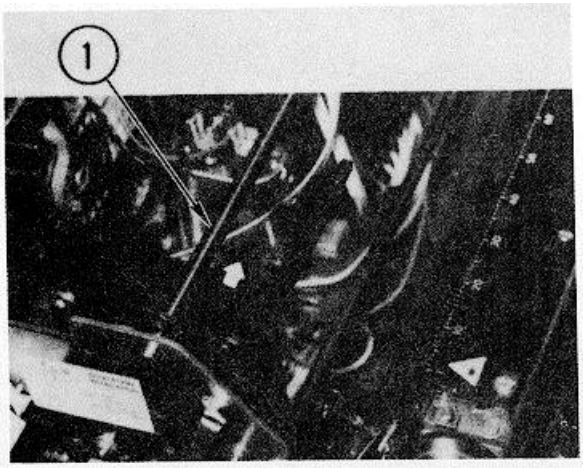
Remove

1. Remove drive shaft (para 4-37, Remove, steps 1-8).
2. Slide drive shaft in direction shown until friction brake hangs loose from tie rod.



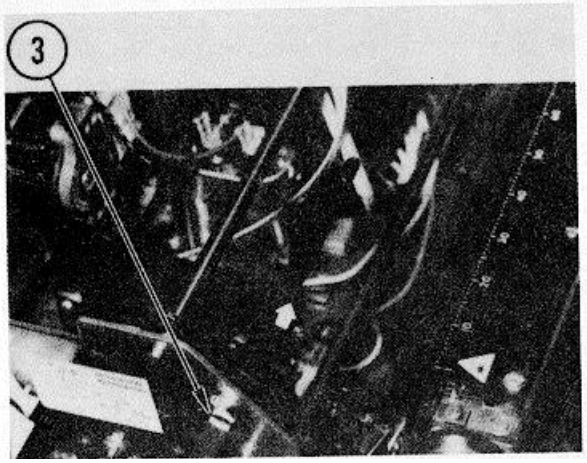
3. Remove tie rod (para 4-37, Remove, steps 9-16).
4. Slide tie rod in direction shown until it clears friction brake.
5. Lift out friction brake.

4-36. REMOVE/REPLACE FRICTION BRAKE

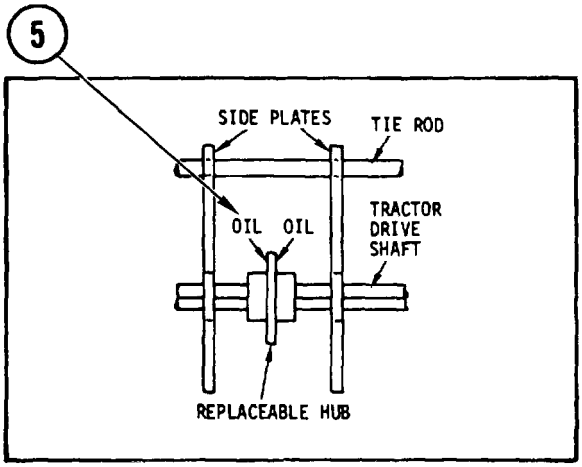


Replace

1. Insert tie rod in direction shown through frame and friction brake.
2. Replace tie rod (para 4-37, Replace, steps 1-5).



3. Insert drive shaft in direction shown through hole in frame and friction brake.
4. Replace drive shaft (para 4-37, Replace, steps 6-14).

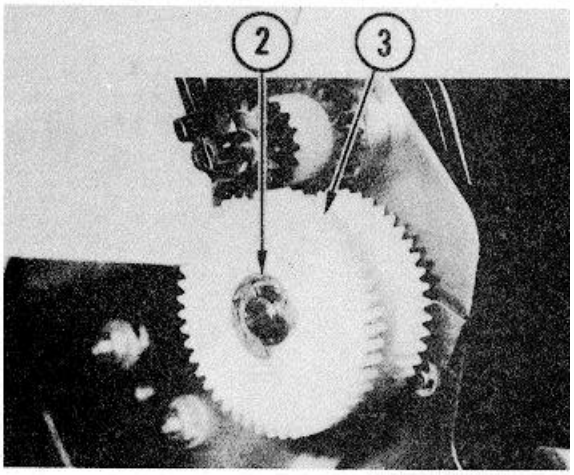


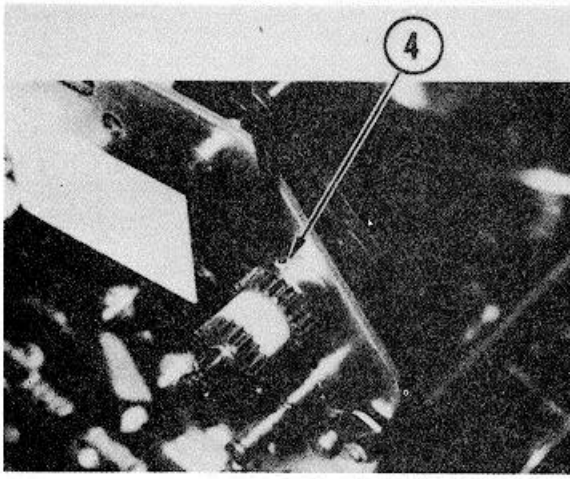
5. Lubricate friction brake by spreading apart side plates and applying one drop of oil on each side of hub.
6. Close up line printer.
7. On control panel, press TEST button.

4-37. REMOVE/REPLACE PAPER HANDLER TRACTOR

INITIAL.

Common Tools
- Tool kit





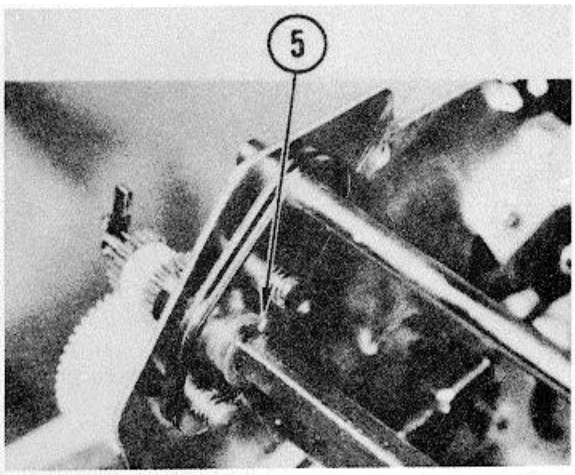
NOTE

Paper handler tractors should be replaced in pairs (left and right)@However, if only one tractor is damaged you may order a single replacement.

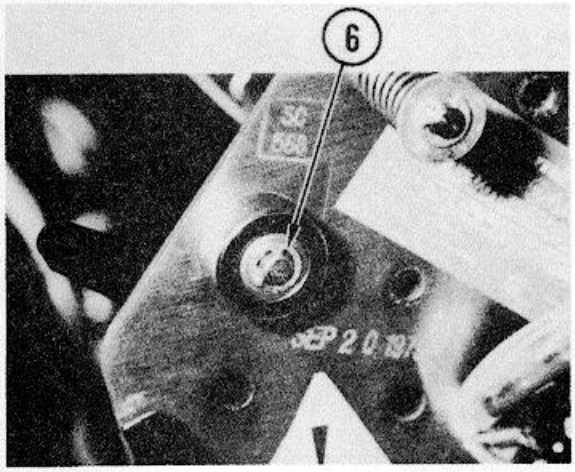
Remove

1. Access line printer (para 4-18).
2. Remove retaining ring.
3. Pull off pulley.
4. Loosen set screw enough to freesquare shaft.

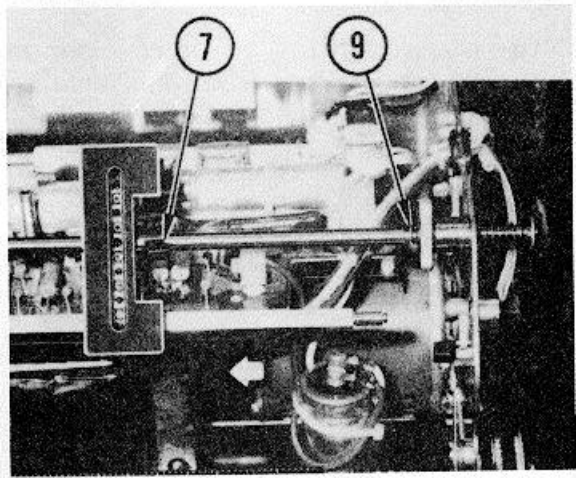
4-37 REMOVE/REPLACE PAPER HANDLER TRACTOR (CONT)



5. Remove retaining ring.



6. Remove retaining ring.

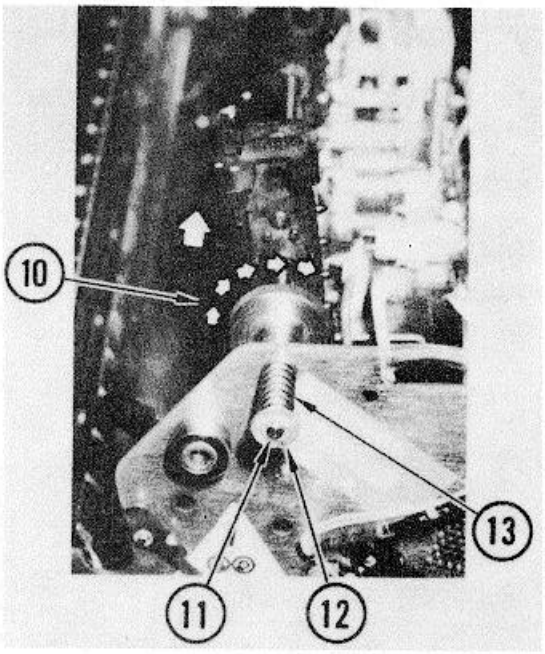


7. To unlock tractors, push down on lever.

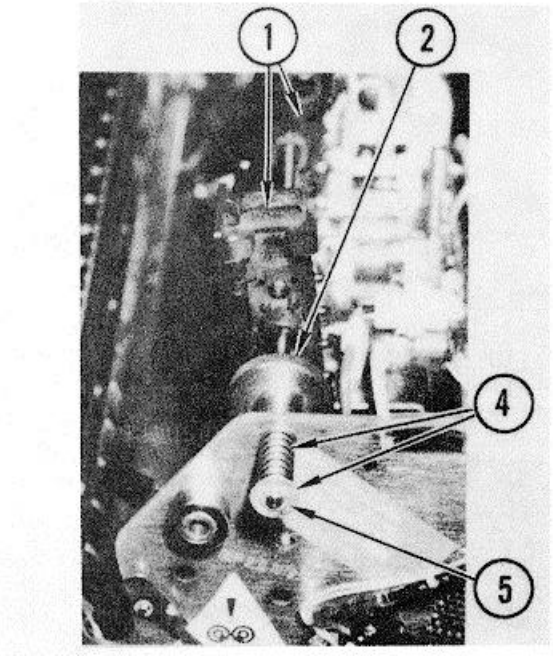
8. Slide square shaft in direction shown until tractors are free and hang from top rod.

9. Remove retaining ring.

4-37 REMOVE/REPLACE PAPER HANDLER TRACTOR (CONT)



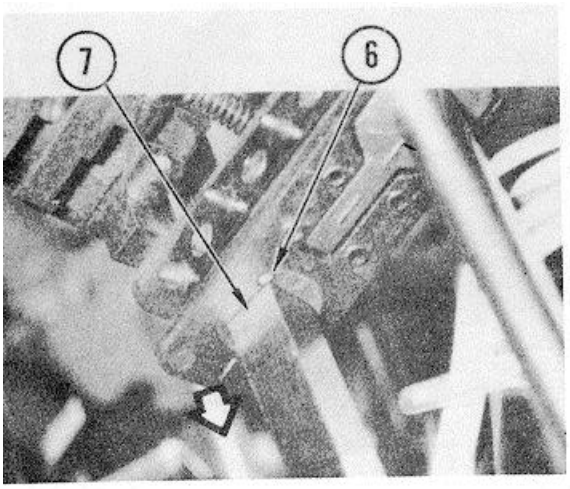
10. To release spring tension, turn adjustment wheel in direction shown.
11. Remove retaining ring.
12. Pull off washer.
13. Pull off spring.
14. Slide rod in direction shown enough _to free rod from frame.
15. Turn adjustment wheel until it comes off rod.
16. Slide tractor(s) off rod.



Replace

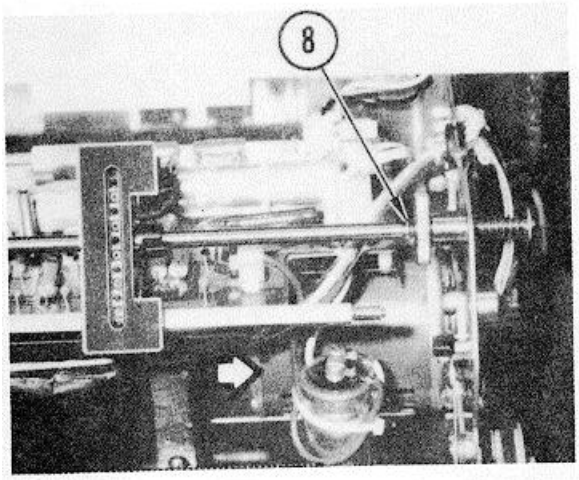
1. Slide tractor(s) onto upper rod.
2. Screw on and center adjustment wheel.
3. Slide rod through hole in frame.
4. Push on spring. Push on washer.
5. To release spring tension, push in spring and washer with one hand. With the other hand, push on retaining ring.

4-37 REMOVE/REPLACE PAPER HANDLER TRACTOR (CONT)



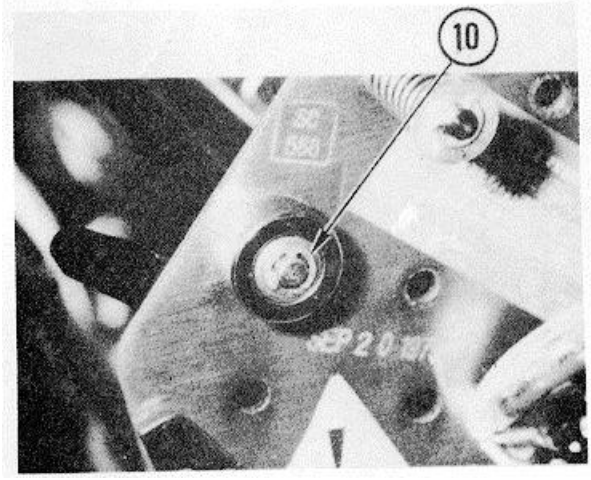
6. Make sure white dot on both tractors is at the same position on the square shaft.

7. Slide square shaft through tractors in direction shown.



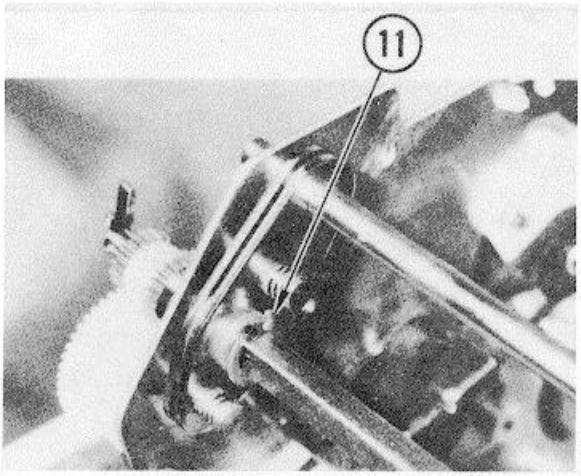
8. Push on retaining ring.

9. Slide shaft in direction shown until it snaps in place.

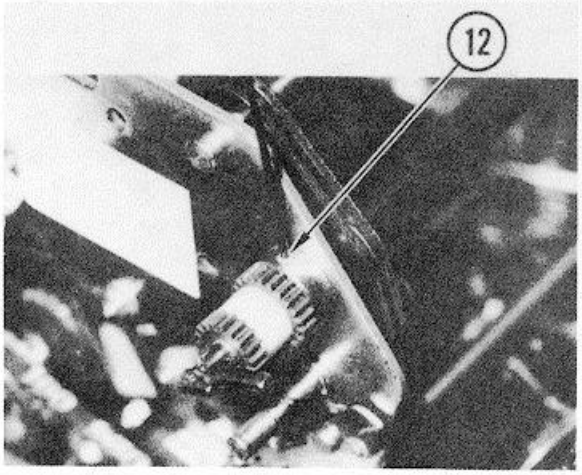


10. Push on retaining ring.

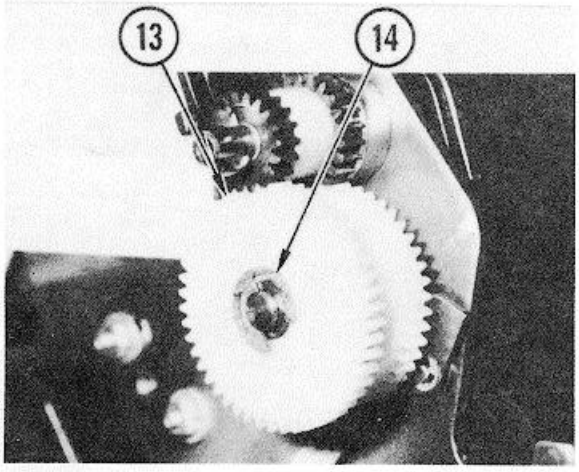
4-37 REMOVE/REPLACE PAPER HANDLER TRACTOR (CONT)



11. Push on retaining ring.



12. Tighten set screw.

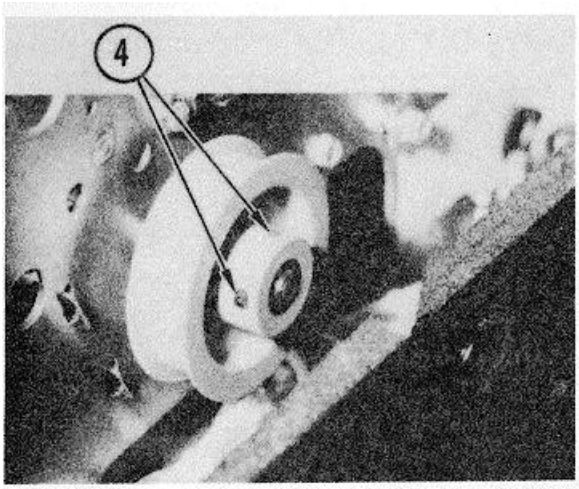


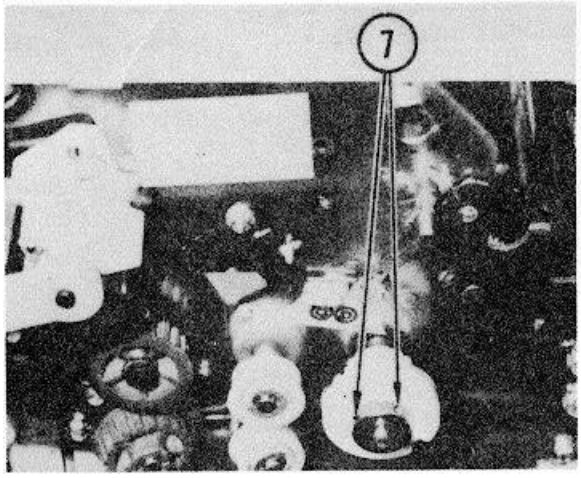
13. Push on pulley.
14. Push on retaining ring.
15. Close up line printer (para 4-18).
16. On control panel, press TEST button.

4-38. REMOVE/REPLACE JACKSHAFT AND LINEFEED CLUTCH

INITIAL SETUP

Common Tools
- Tool kit





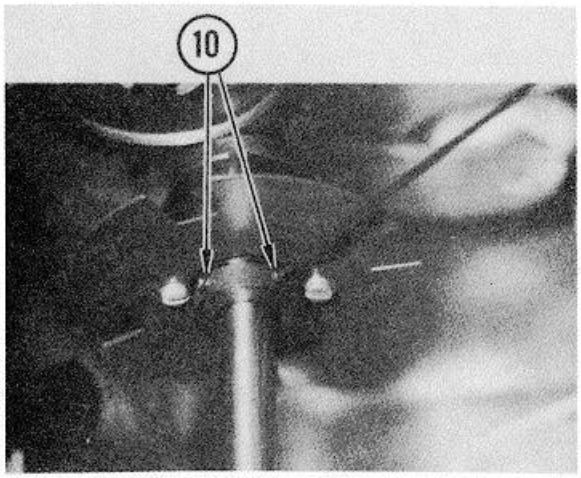
NOTE

Line printer may be mounted to wall and floor. If your printer is mounted this way, see your system manual for removal procedure.

Remove

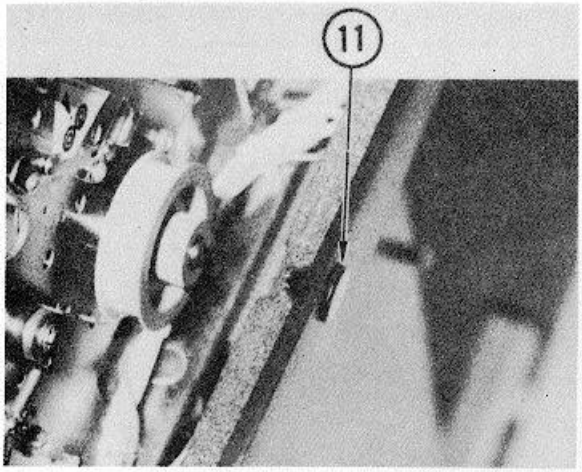
1. Pull line printer away from wall.
2. Access line printer (para 4-18).
3. Remove right drive belt (para 4-32, steps 2-4).
4. Loosen two set screws on right jackshaft pulley.
5. Take off pulley.
6. Remove left drive belt (para 4-33, Remove steps 2-5).
7. Loosen two set screws on left jackshaft pulley.
8. Take off pulley.
9. Remove slew strobe assembly (para 4-41, steps 2-5).

4-38. REMOVE/REPLACE JACKSHAFT AND LINEFEED CLUTCH (CONT)

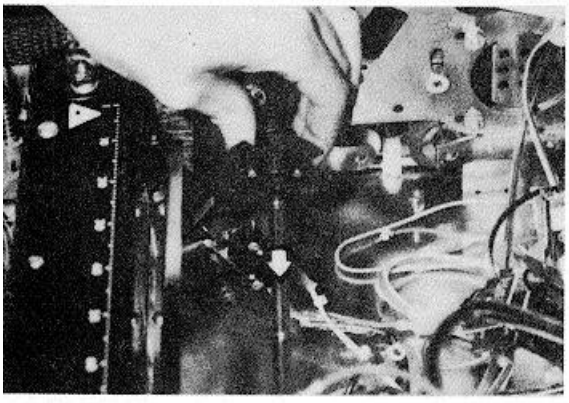


NOTE
Set screws can be accessed by turning jackshaft.

10. Loosen two set screws on strobe disc.



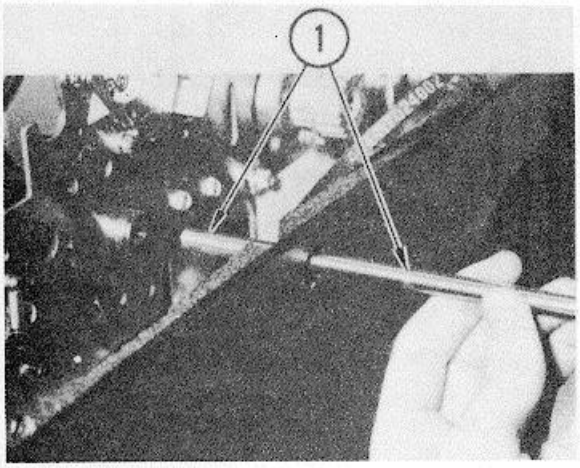
11. Pry out plug on side of line printer.



12. While carefully holding linefeed clutch and strobe disc assembly, slide jackshaft out hole.

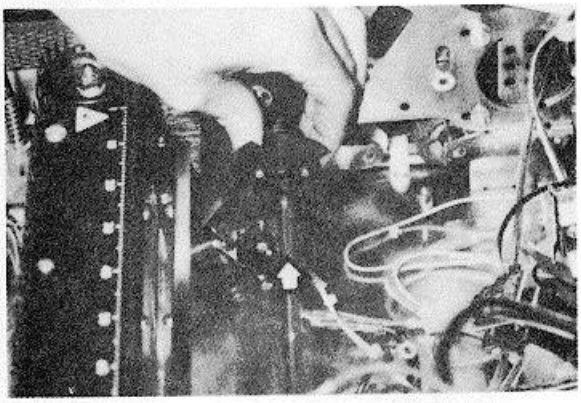
13. Remove linefeed clutch and strobe disc assembly.

4-38. REMOVE/REPLACE JACKSHAFT AND LINEFEED CLUTCH (CONT)

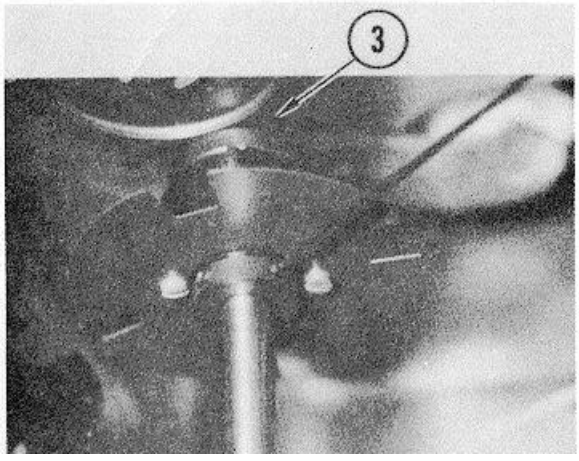


Replace

1. Slide jackshaft through hole in frame and right jackshaft bearing. Make sure end with notches goes in first.



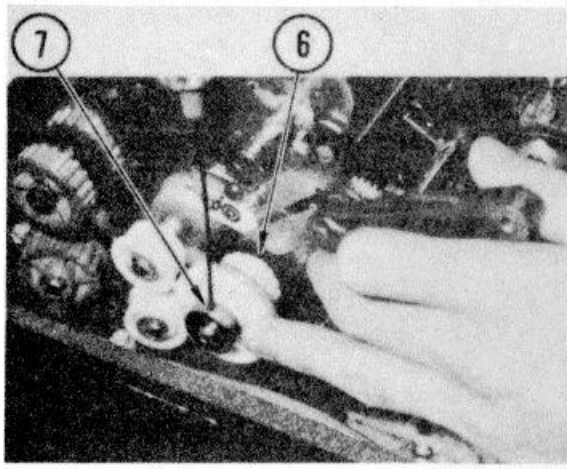
2. Replace linefeed clutch and strobe disc assembly by carefully sliding jackshaft through strobe disc, linefeed clutch, and left jackshaft bearing.



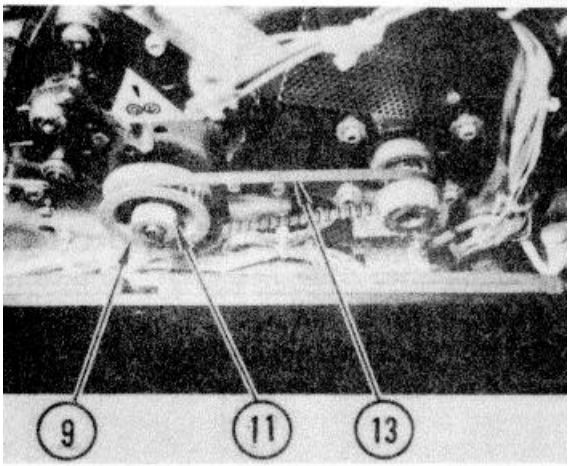
3. Aline gear on linefeed clutch with platen gear.

4. Replace slew strobe assembly (para 4-41, steps 1-4).

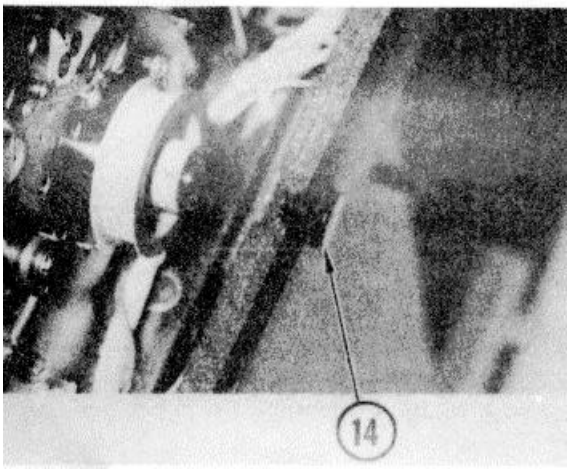
4-38. REMOVE/REPLACE JACKSHAFT AND LINEFEED CLUTCH (CONT)



5. Put on left jackshaft pulley.
6. Use feeler gauge to set 0.003-0.008 in. (0.08-0.20 mm) gap between pulley and bearing.
7. Tighten set screws on pulley.
8. Replace left drive belt (para 4-33, Replace steps 1-9).



9. Put on right jackshaft pulley.
10. Use feeler gauge to check jackshaft end position. It should be flush to 0.06 in. (1.5 mm) beyond outside edge of pulley.
11. Tighten set screws.
12 Tighten two set screws on strobe disc.
13. Replace right drive belt (para 4-32, Replace steps 1-5).

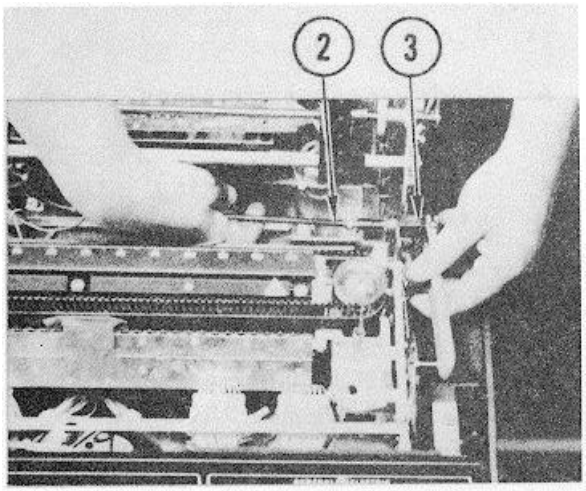


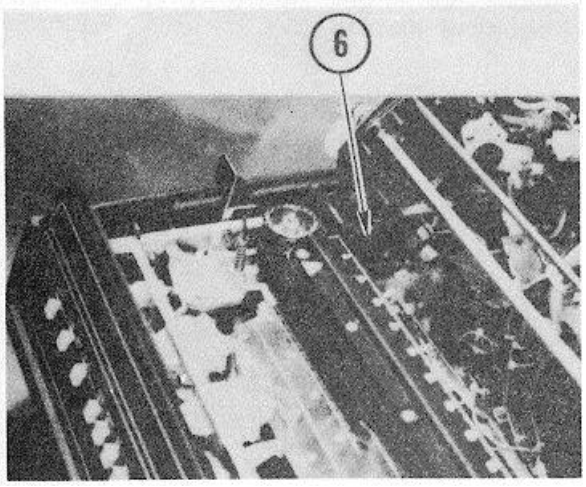
14. Push plug in hole.
15. Adjust strobe detector assembly (para 4-42).
16. Adjust linefeed solenoid (para 4-44 steps 2-14).
17. Close up line printer (para 4-18).
18. Power on.
19. On control panel, press TEST button.
20. Power off.
21. Push printer back in place.

4-39. REMOVE/REPLACE JACKSHAFT BEARINGS

INITIAL SETUP

Common Tools	Special Tools	Materials/Spare Parts
• Tool Kit	• Bearing puller tool	• Thread locking compound • Small-bristle brush or cotton swab





Remove

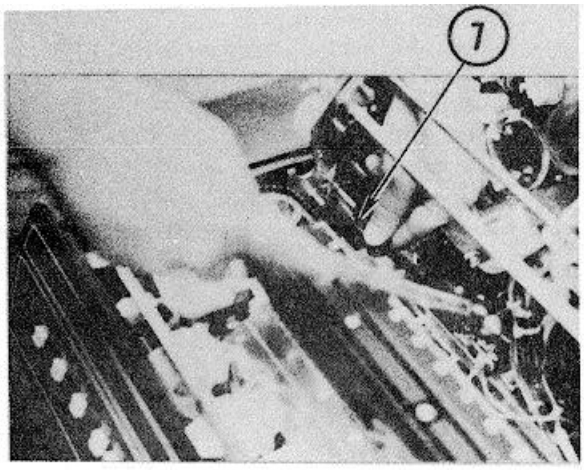
NOTE

If you are removing only one bearing do only the steps required:

- Right jackshaft bearing (steps 1-3)
- Left jackshaft bearing (steps 4-8)

1. Remove jackshaft and linefeed clutch (para 4-38).
2. Hold bearing puller bolt steady with hex wrench.
3. Turn bearing puller block with adjusted wrench until bearing comes out of housing.
4. Remove jackshaft and linefeed clutch (para 4-38).
5. Remove platen drive gear (para 4-61, Remove, steps 4-6).
6. Remove spring from bearing housing.

4-39. REMOVE/REPLACE JACKSHAFT BEARINGS (CONT)



7. Insert 1/8 in. pin punch into bearing housing until it is positioned firmly on ridge of bearing.

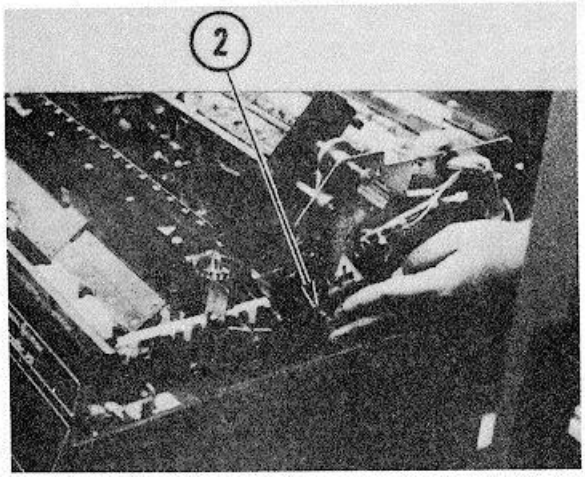
8. Tap punch with hammer until bearing drops out of housing.

Replace

NOTE

The left bearing is longer than the right bearing. If you are replacing only one bearing do only the steps required:

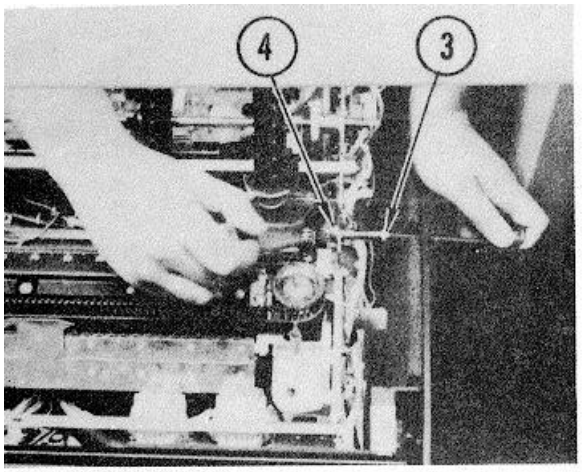
- Right jackshaft bearing (steps 1-5)
- Left jackshaft bearing (steps 6-12)



1. Coat outside surface of bearing lightly with thread interlock compound.

2. Push bearing a short distance into bearing housing.

4-39. REMOVE/REPLACE JACKSHAFT BEARINGS (CONT)

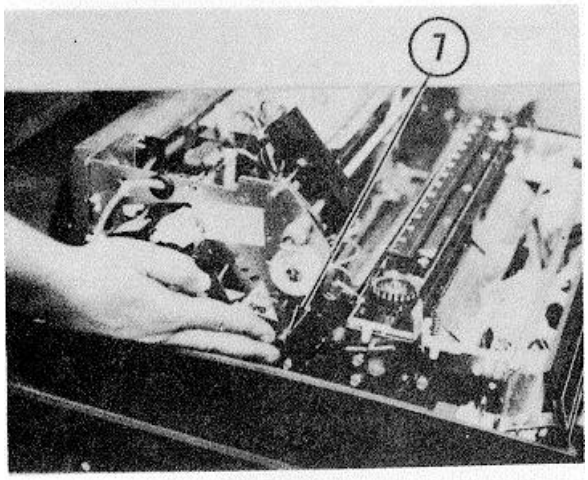


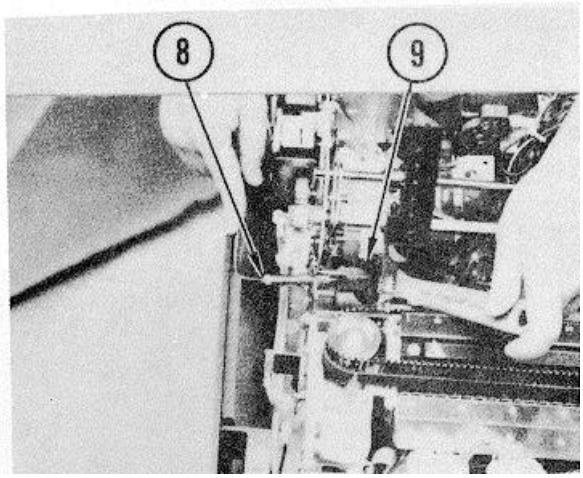
3. Hold bearing puller bolt steady with hex alien wrench.
4. Turn bearing puller block with adjusting wrench until bearing fits tightly in housing.

CAUTION

Thread locking compound must set for 30 minutes before testing or operating printer.

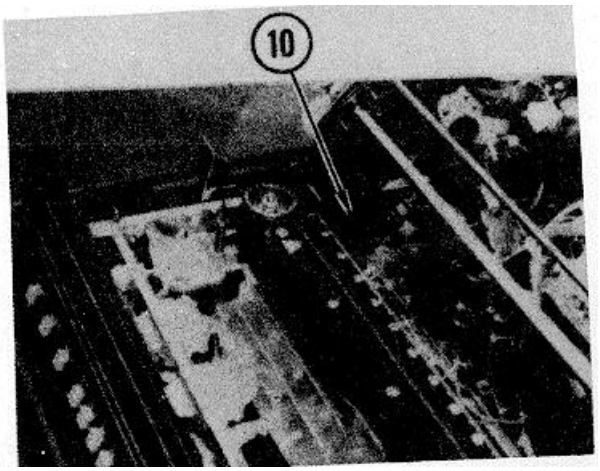
5. Replace jackshaft and linefeed clutch (para 4-38).
6. Coat outside surface of bearing lightly with thread locking compound.
7. Push bearing a short distance into bearing housing.





8. Hold bearing puller bolt steady with Allen wrench.
9. Turn bearing puller block with adjusting wrench until bearing fits tightly in housing.

4-39. REMOVE/REPLACE JACKSHAFT BEARINGS (CONT)



10. Replace spring on bearing housing.

11. Replace platen gear (para 4-61, steps 2-4).

CAUTION

Thread locking compound must set for 30 minutes before testing or operating printer.

12. Replace jackshaft and linefeed clutch (para 4-38).

4-40. LUBRICATE LINEFEED CLUTCH

INITIAL SETUP

Common Tools
- Tool kit

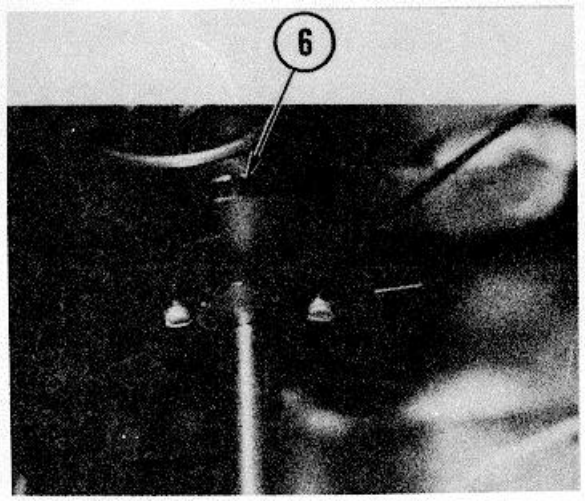
Materials/Spare Parts
- Freon-TF
- SAE 10W-20W-40 motor oil
- Small container for soaking parts

Remove

1. Remove linefeed clutch (para 4-38).

WARNING

Freon-TF vapor is toxic and can be injurious to health. Always clean items in a well ventilated area. Avoid prolonged breathing of vapor or repeated contact with skin. Use approved safety equipment. 2. Place linefeed clutch in container with enough Freon-TF to cover the clutch.



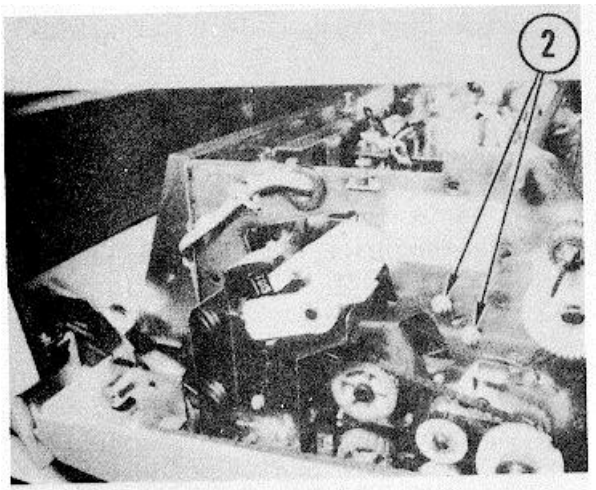
3. Soak and agitate clutch until clean.
4. Remove from solvent.
5. Shake clutch until dry.
6. Apply two drops of oil between clutch cam and stop collar.

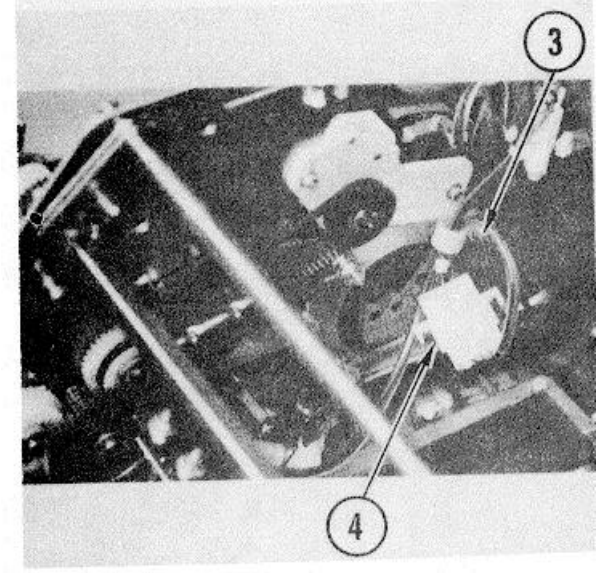
Replace

1. Replace linefeed clutch (para 4-38).

4-41. REMOVE/REPLACE SLEW STROBE ASSEMBLY

INITIAL SETUP
Common Tools
- Tool kit

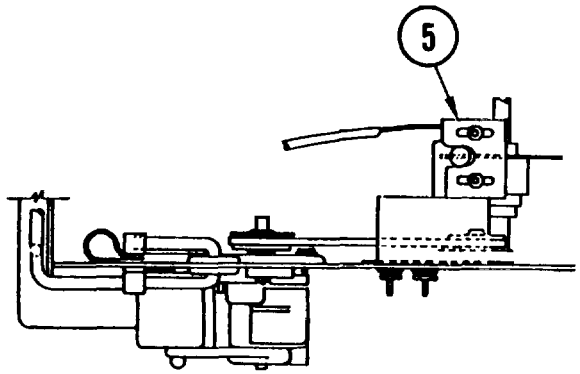




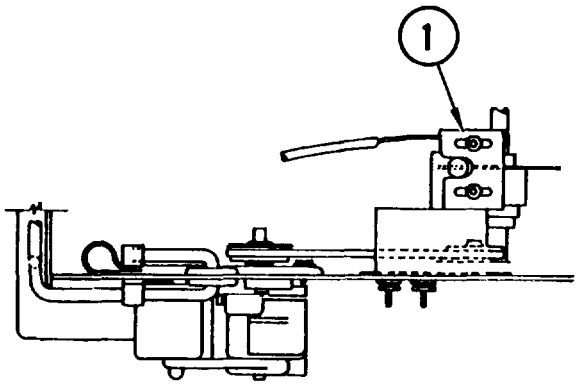
Remove

1. Access line printer (para 4-18).
2. Remove nuts and washers.
3. Remove nut. Open clamp enough to pull out cable. Pull cable out of clamp.
4. Pull apart connector.

4-41. REMOVE/REPLACE SLEW STROBE ASSEMBLY (CONT)

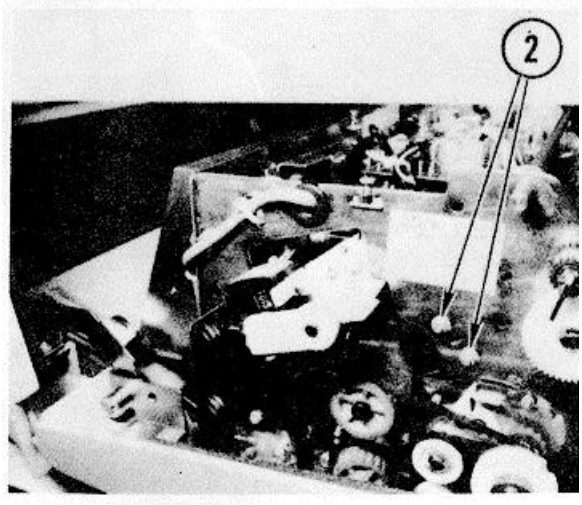


5. Lift out strobe assembly.



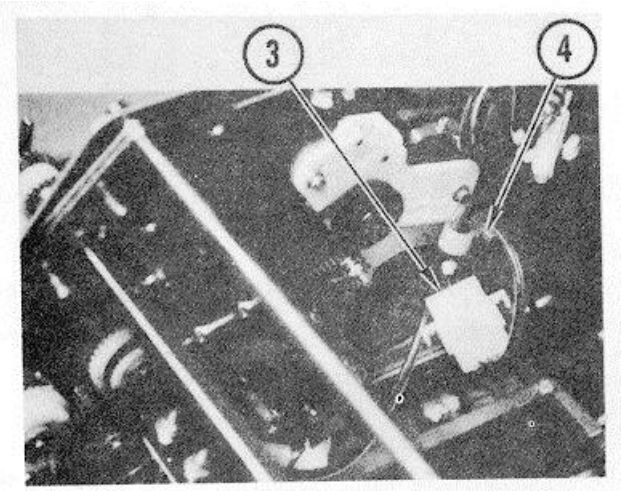
Replace

1. Lower slew strobe assembly into printer.

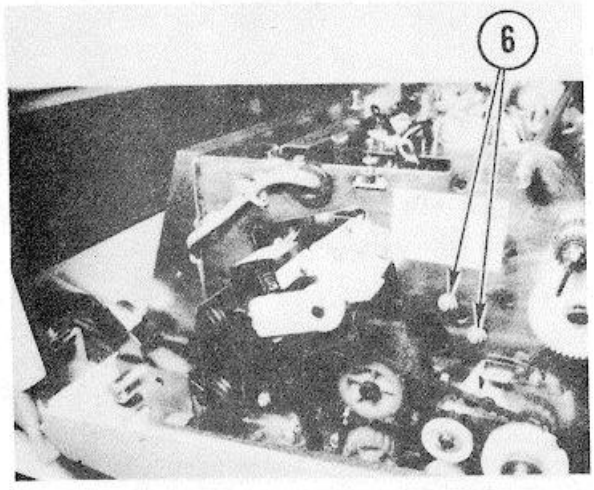


2. Replace nuts and washers. Hand-tighten nuts.

4-41. REMOVE/REPLACE SLEW STROBE ASSEMBLY (CONT)



3. Push together connector.
4. Push cable into clamp. Push clamp on screw. Put on and tighten nut.



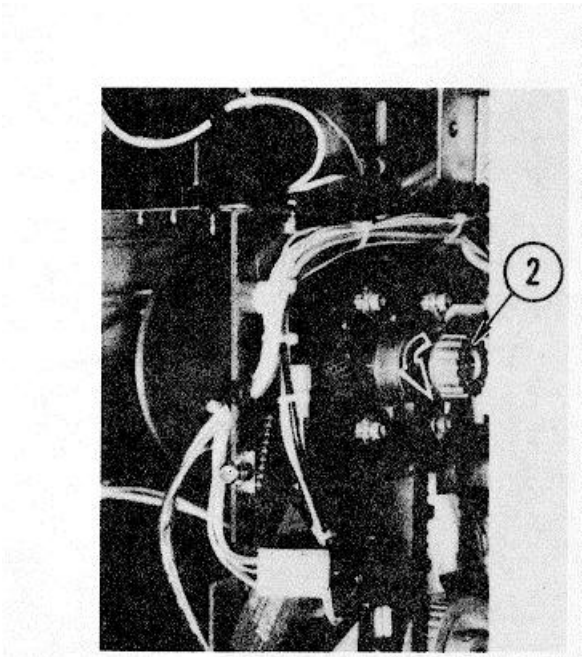
5. Adjust strobe detector assembly (para 4-42.)
6. Tighten nuts.
7. Close up line printer (para 4-18).
8. On control panel, press TEST button.

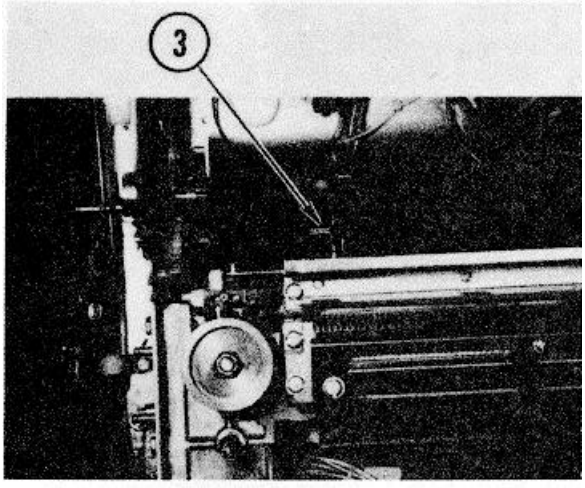
4-42. ADJUST STROBE DETECTOR ASSEMBLY

INITIAL SETUP

Common Tools
- Tool kit

Test Measurement and Diagnostic Equipment
- Oscilloscope (Method B only)





NOTE

There are two ways to make this adjustment. Method A is a rough adjustment. Method B is a precise adjustment but requires more time. Always try method A first. Method A 1. Access line printer (para 4-18).

Method A

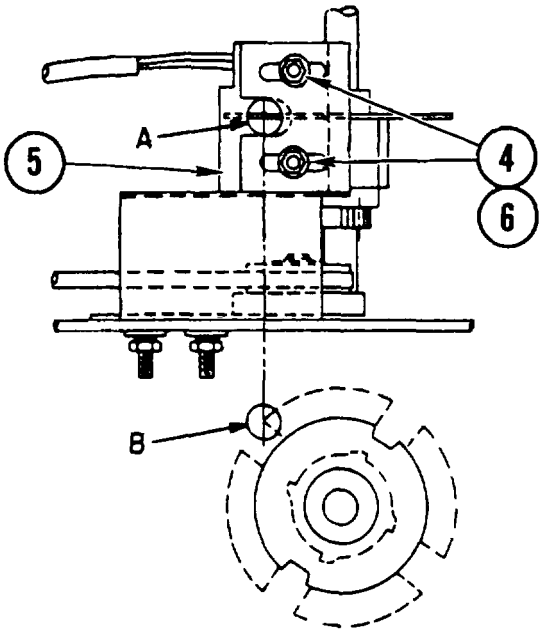
1. Access line printer (para 4-18).
2. Turn motor drive pulley counter-clockwise.

NOTE

Solenoid arm engages clutch lobe when clutch and strobe disc will not turn.

3. Check if linefeed solenoid arm engages clutch lobe.

4-42. ADJUST STROBE DETECTOR ASSEMBLY (CONT)



4. Loosen adjust nuts on detector assembly.

5. Looking at an angle of about 15 degrees over top of printed wire board, slide detector assembly forward or backward until leading edge of strobe disc slot (Point B) is alined with center of viewing hole (Point A) in printed wire board.

6. Tighten adjust nuts.

7. Close up line printer (para 4-18).

8. On control panel, press TEST button.

9. If paper handling is still faulty, use method B to adjust detector assembly.

NOTE

Method B uses oscilloscope readout to fine tune strobe detector position.

Method B

1. Check strobe detector adjustment using method A steps 1-8.

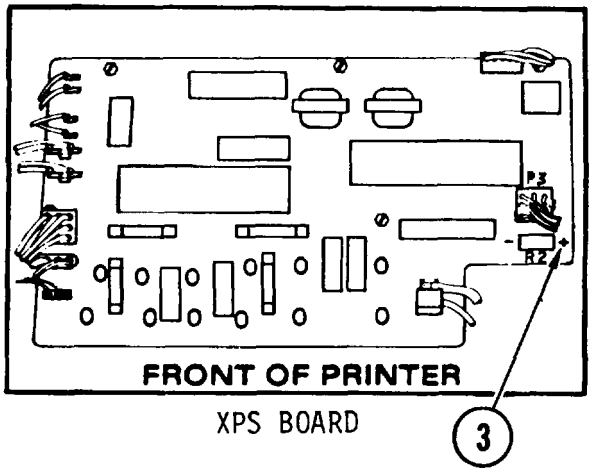
2. Set up oscilloscope as follows:

VOLTS/DIV
CH1 - 5V/cm
CH2 - 5V/cm

TIME/DIV
A - 2 ms
TRIGGER A: POSITIVE
TRIG MODE: AUTO/NORM
TRIG SOURCE: A-NORM/A or chan 1

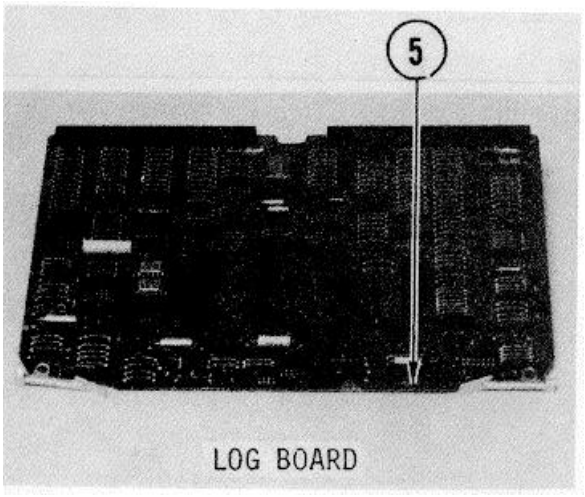
VERTICAL MODE: CHOP

4-42. ADJUST STROBE DETECTOR ASSEMBLY (CONT)



NOTE
Make sure to connect channel 1 probe to R2 lead nearest right end of board.

3. Connect channel 1 probe as shown, to resistor R2 located at right side of XPS board near P3.

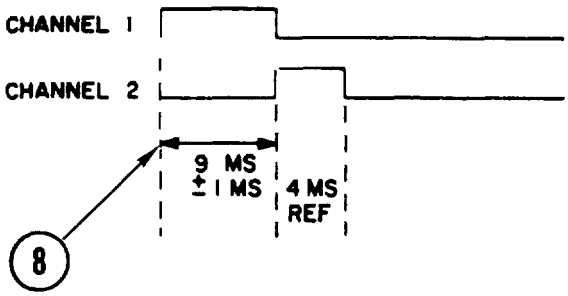


4. Remove front pedestal cover.

5. Connect channel 2 to TP1 on LOG board.

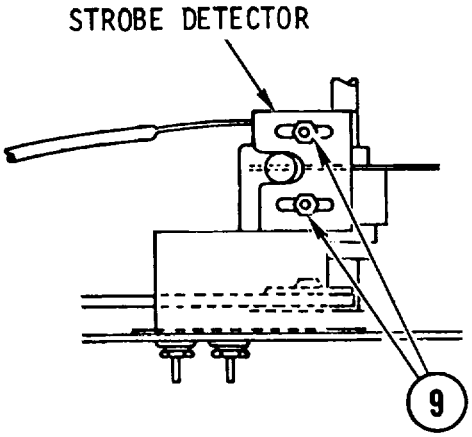
6. Pull up top cover interlock switch. Tape down paper out switch.

7. Power on. Start motor. Press LINEFEED button repeatedly to get a pattern on the oscilloscope screen.



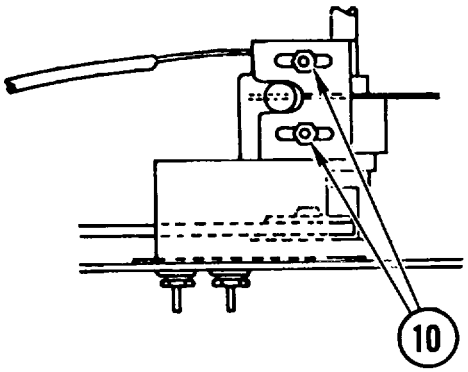
8. Check if time to the leading edge of pulse in channel 2 is 9 ms + 1 ms.

4-42. ADJUST STROBE DETECTOR ASSEMBLY (CONT)



9. If not, loosen screws and do the following:

   - If time to leading pulse edge is too long, move strobe detector toward rear of printer
   - If time to leading pulse edge is too short, move strobe detector toward front of printer



10. When pulse timing is properly adjusted, tighten screws and recheck pulse timing.

11. Disconnect oscilloscope leads. Remove tape from paper out switch.

12. Close up line printer (para 4-18).

13. On control panel, press TEST button.

    - If paper handling is still faulty continue troubleshooting (table 4-3)

4-43. REMOVE/REPLACE LINEFEED SOLENOID

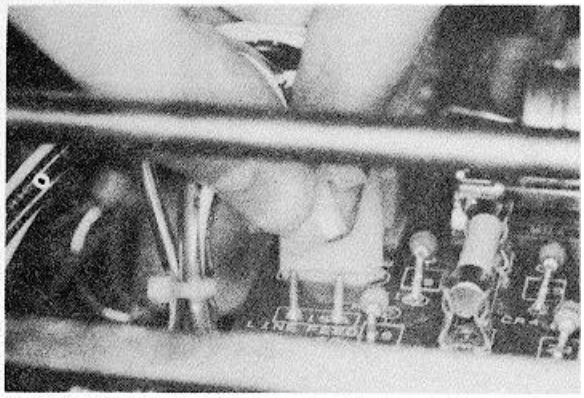
INITIAL SETUP

Common Tools
- Tool kit

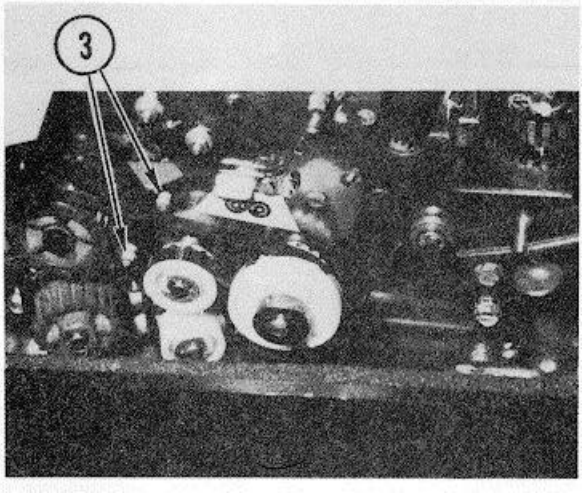
Materials/Spare Parts
- Tie wraps (2 ea)

Remove

1. Access line printer (para 4-18).

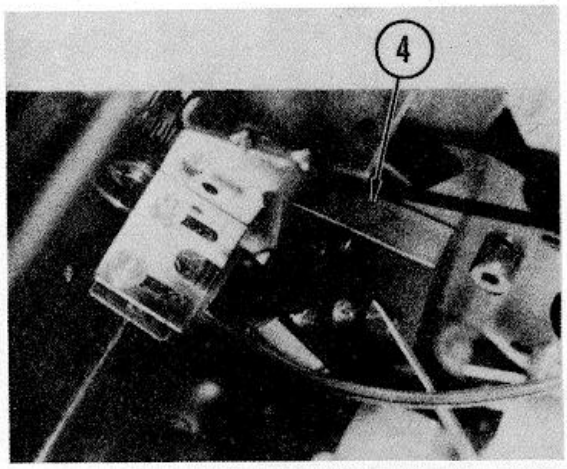


2. Pull LINEFEED cable off XPS board. Cut tie wraps to free cable.

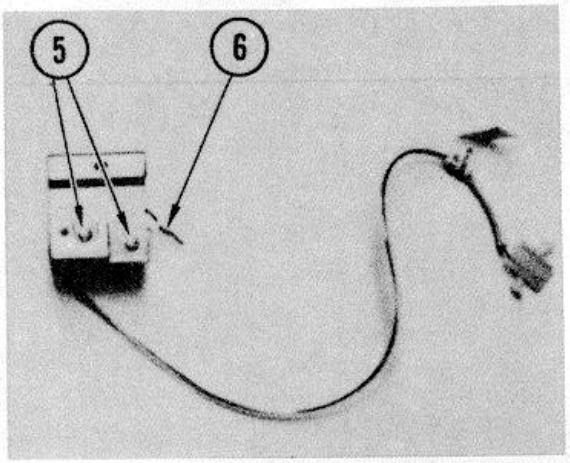


3. Remove screws and washers.

4-43. REMOVE/REPLACE LINEFEED SOLENOID (CONT)

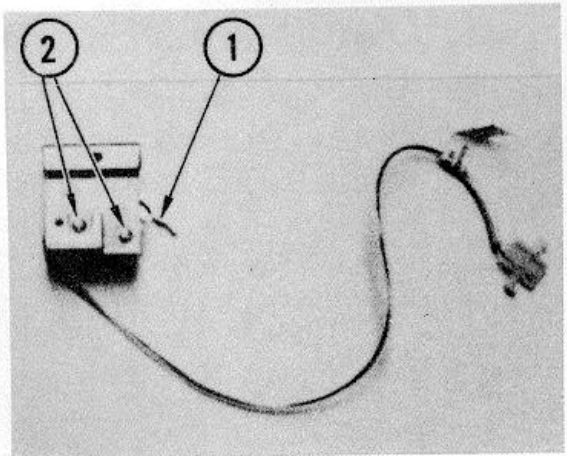


4. Pull out solenoid and mounting block.



5. Remove screws and washers.

6. Pull solenoid off mounting block.

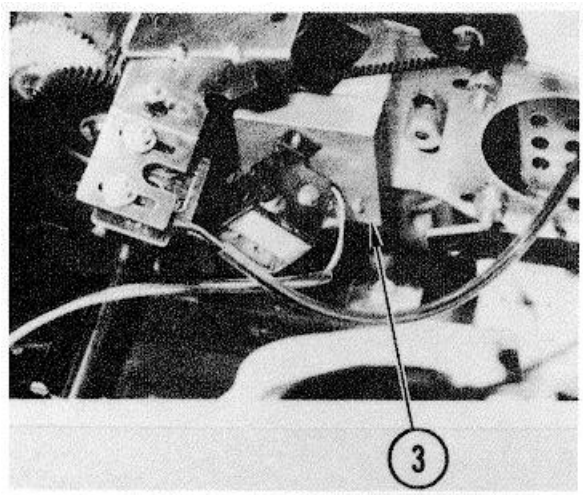


Replace

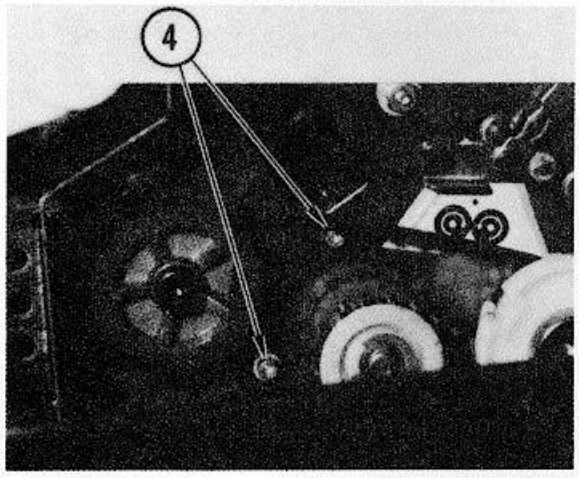
1. Place new solenoid on mounting block.

2. Replace and tighten screws and washers.

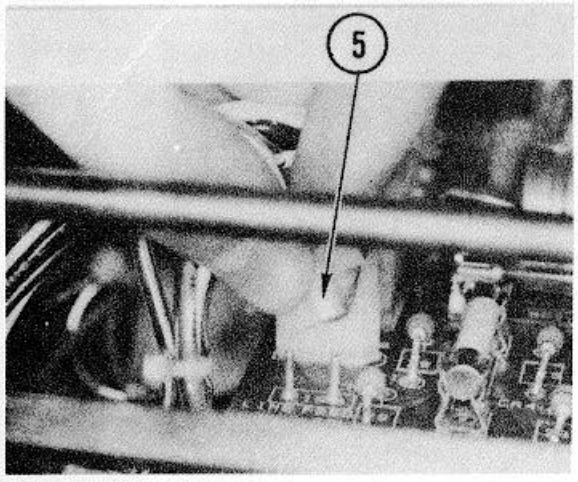
4-43. REMOVE/REPLACE LINEFEED SOLENOID (CONT)



3. Place solenoid and mounting block on frame.



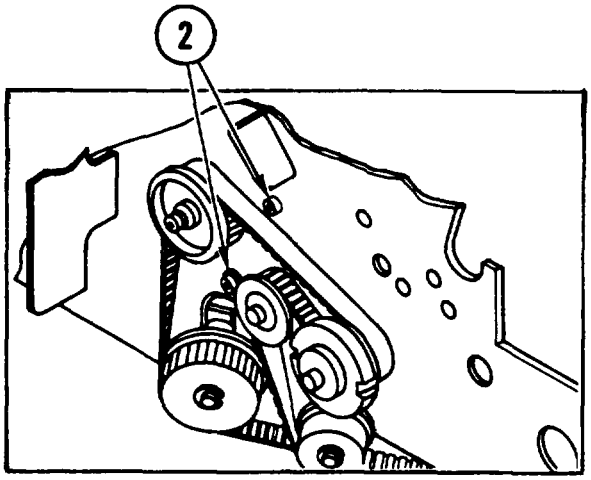
4. Replace screws and washers.



5. Push LINEFEED cable into pins on XPS board. Replace tie wraps making sure cable and wires cannot touch moving parts.
6. Adjust linefeed solenoid (para 4-44, steps 3-14).
7. Close up line printer (para 4-18).
8. On control panel, press TEST button.

4-44. ADJUST LINEFEED SOLENOID

INITIAL SETUP
Common Tools
- Tool kit



1. Access line printer (para 4-18).
2. Loosen but do not remove two screws.

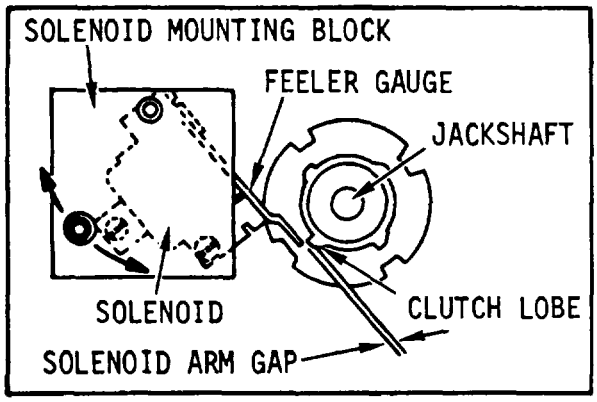
NOTE

Solenoid arm engages clutch lobe when clutch and strobe disc will not turn.

3. Determine if solenoid arm has engaged clutch lobe.
4. If necessary, rotate jackshaft by hand until a clutch lobe is lined up with solenoid arm.

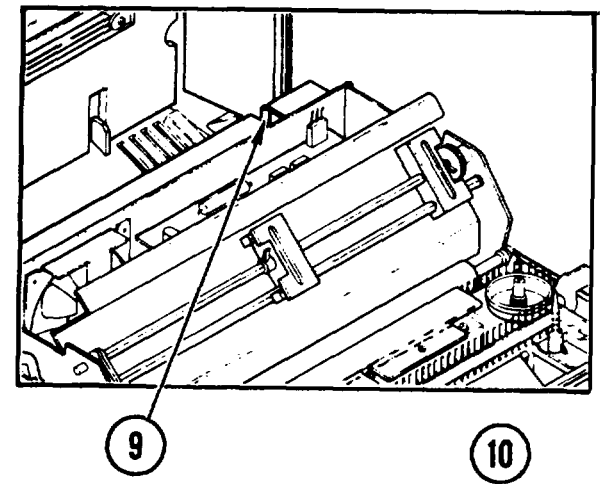
CAUTION

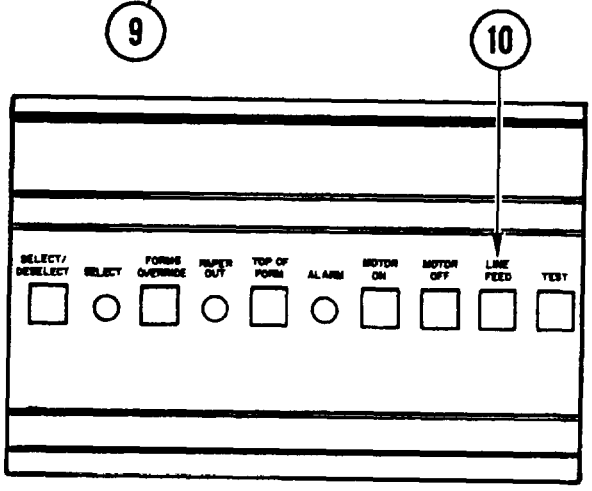
The clearance between solenoid arm and clutch lobe must be kept within specified tolerance (0.05 inches is best).

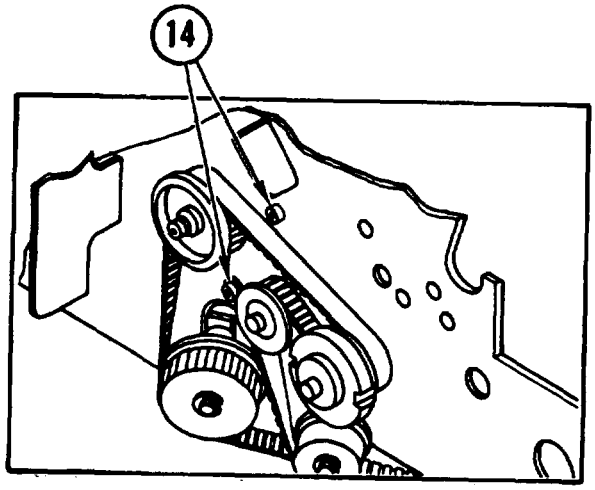


5. Using feeler gauge while moving solenoid mounting block, as shown, set gap between solenoid arm and clutch lobe at 0.05-0.010 in. (0.13-0.25 mm).
6. Hand tighten screws on solenoid block.

4-44. ADJUST LINEFEED SOLENOID (CONT)







7. Using needlenose pliers, pull out leads to paper out switch (para 4-28, Remove, step 3).

8. Push ac plug into outlet.

WARNING

To avoid severe electric shock when cover is up and power is on, do not touch anything in power supply area.

9. To power on, pull up top cover interlock switch.

10. While pressing LINEFEED, look at solenoid. Solenoid arm should engage clutch lobes for each linefeed command.

11. Does solenoid arm engage clutch lobes at each linefeed?

    - If yes, go to step 12
    - If no, go back to step 2

12. Pull ac plug from outlet.

13. Replace paper out switch leads (para 4-28, Replace, step 1).

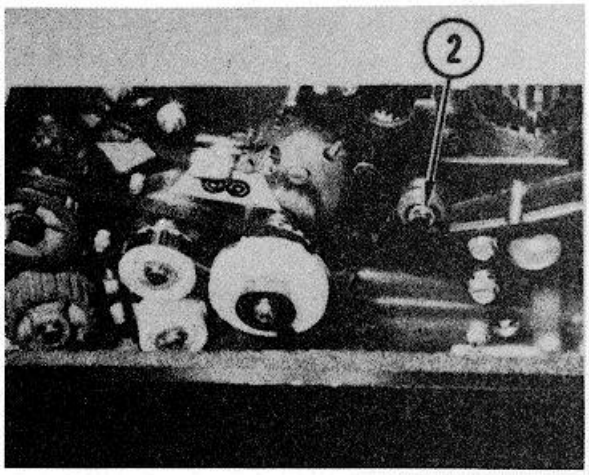
14. Tighten screws.

15. Close up line printer (para 4-18).

16. On control panel, press TEST button.

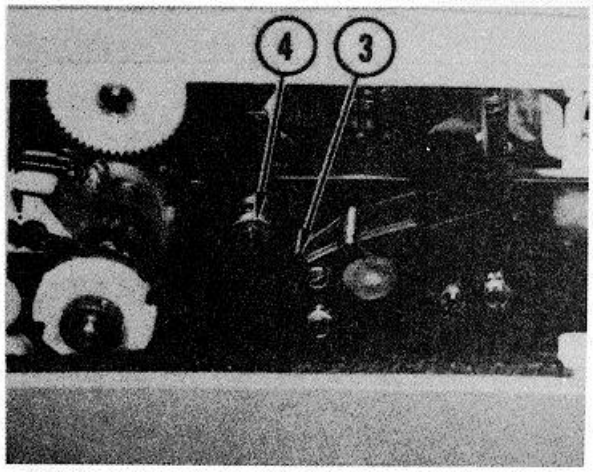
4-45. REMOVE/REPLACE TOGGLE ASSEMBLY

INITIAL SETUP
Common Tools
- Tool kit



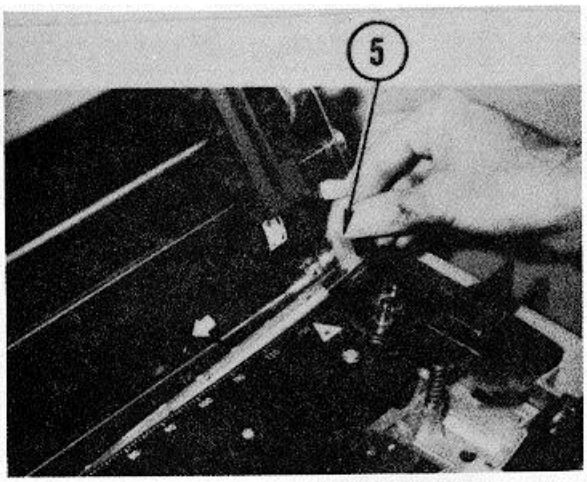
Remove

1. Access line printer (para 4-18).
2. Remove retaining ring from each end of assembly.

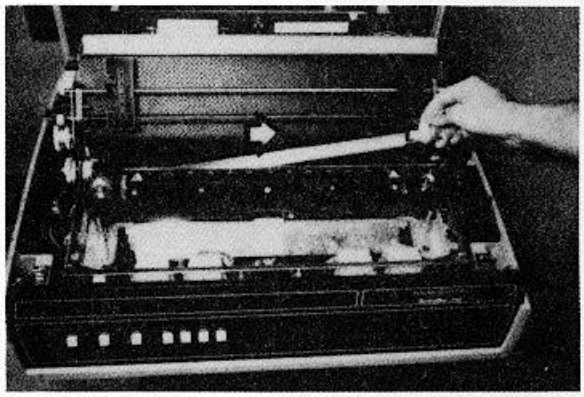


3. Pull washer off each end of assembly.
4. Pull bearing off each end of assembly.

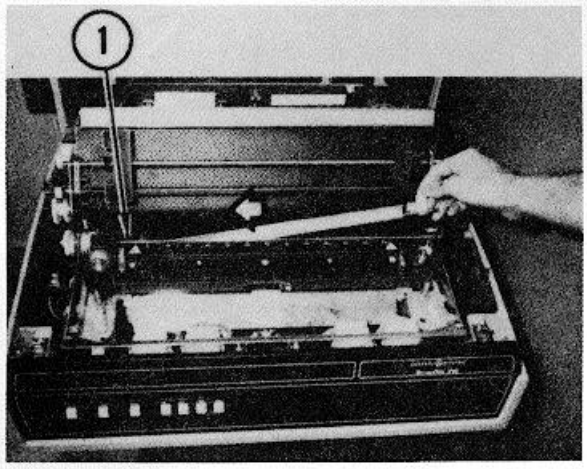
4-45. REMOVE/REPLACE TOGGLE ASSEMBLY (CONT)



5. Slide bar as shown until this end clears frame.
6. Grasp lever and pull up.



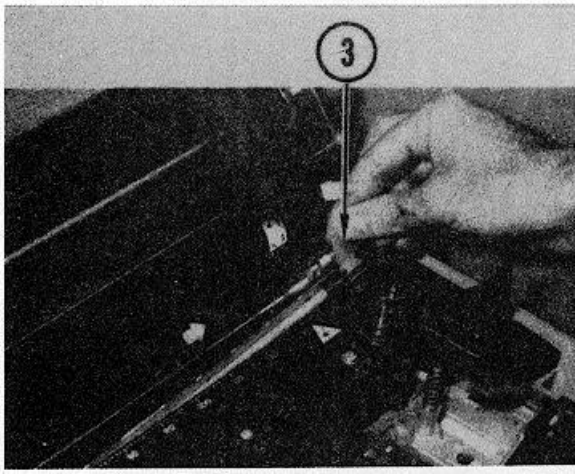
7. Slide bar as shown until free.
8. Lift bar out of printer.



Replace

1. While you hold lever, lower this end of bar into printer.
2. Slide bar as shown until end fits in hole.

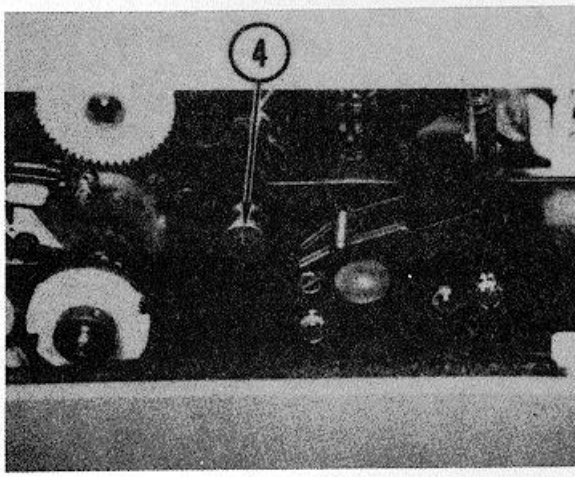
4-45. REMOVE/REPLACE TOGGLE ASSEMBLY (CONT)



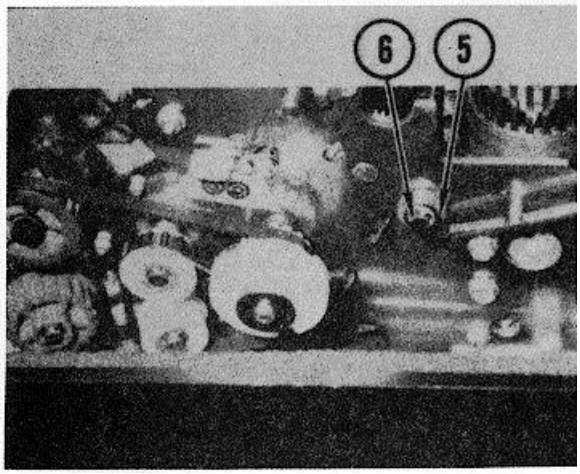
3. Lower this end and slide as shown until bar rests in place.

CAUTION

Make sure bearing is inserted with shoulder on outside of frame to prevent excessive wear.



4. Push bearing on each end of assembly.



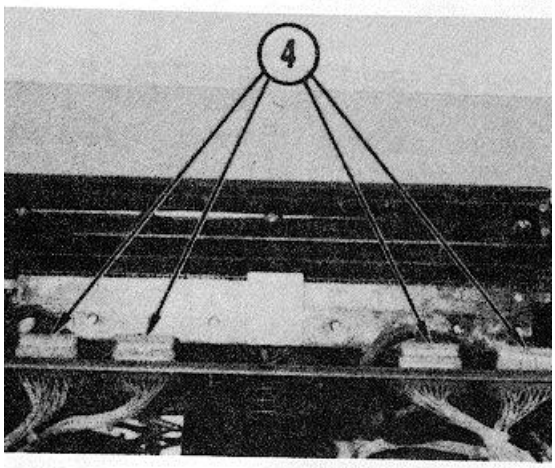
5. Push washer on each end of assembly.
6. Push retaining ring on each end of assembly.
7. Close up line printer (para 4-18).
8. On control panel, press TEST button.

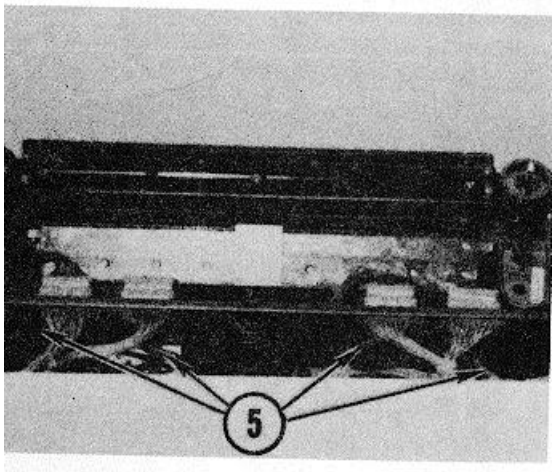
4-46. REMOVE/REPLACE HAMMERBANK ASSEMBLY

INITIAL SETUP
Common Tools
- Tool kit

Remove

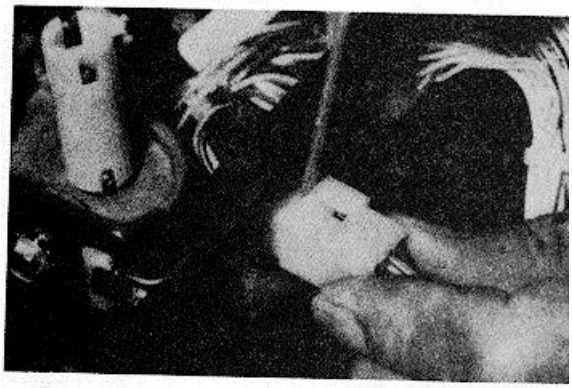
1. Access line printer (para 4-18, steps 1-6).
2. Remove print belt (para 4-57, steps 2-6).
3. Remove front control panel (para 4-67, steps 3-7).
4. Using a flat tip screwdriver, pry loose connectors. Push connector down and outward to disconnect.



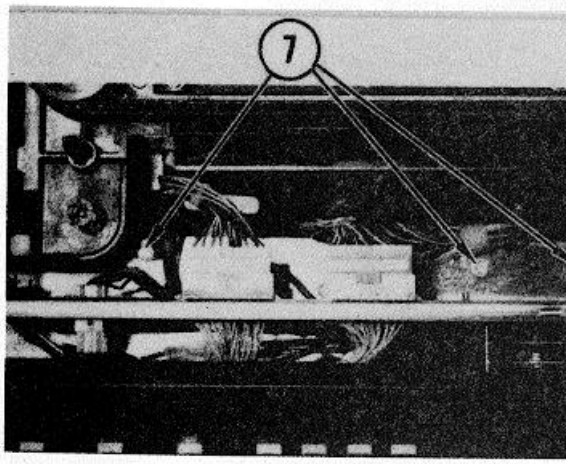


5. Disconnect two black cables and two red cables.

4-46. REMOVE/REPLACE HAMMERBANK ASSEMBLY (CONT)



6. Pry out photocell connector.

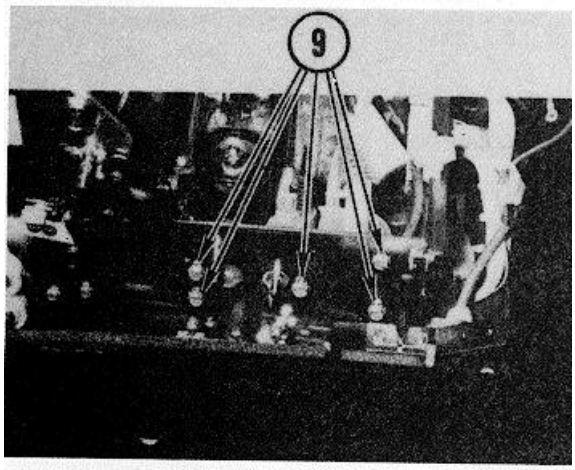


7. Remove screws from cable clamps.

8. Remove left drive belt (para 4-33, steps 2-5).

CAUTION

Do not loosen the three smaller screws securing alinement bars to side frame. Adjustment of these bars is critical and can only be done at the factory.

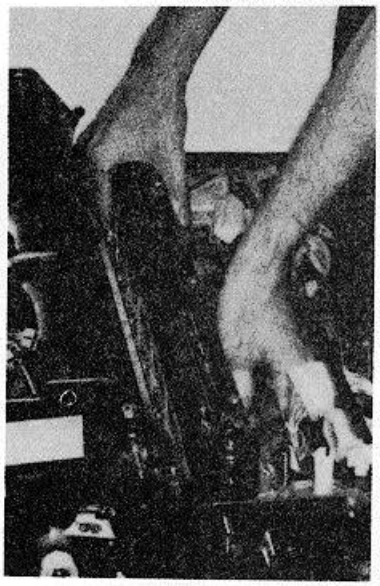


9. Remove five screws on both sides of printer. Remove belt tension screw on right side of assembly.

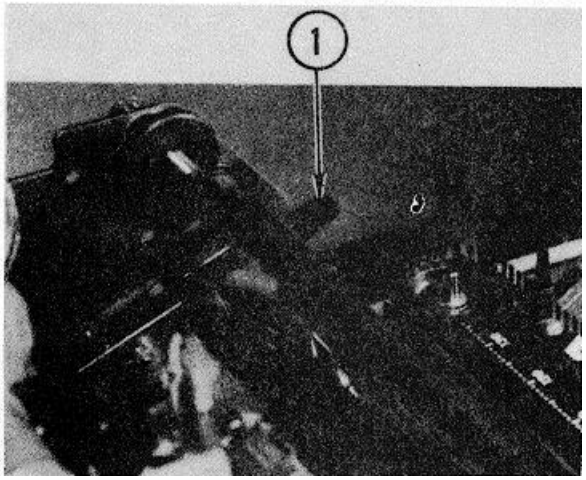
NOTE

It may be necessary to remove plastic shield from each side plate of chassis so hammerbank assembly will clear chassis. Retain plastic shields.

4-46. REMOVE/REPLACE HAMMERBANK ASSEMBLY (CONT)



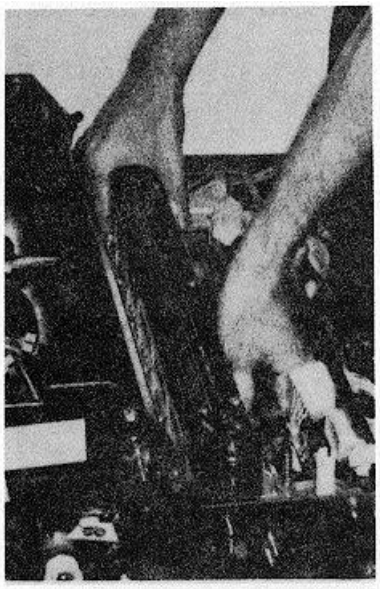
10. Lift assembly up and out.



Replace

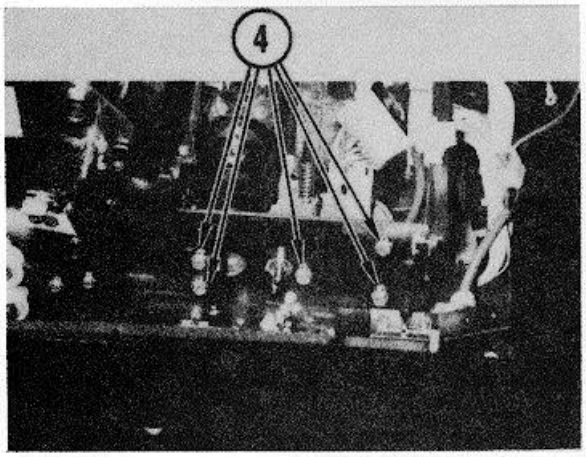
1. Before replacing assembly, raise up RUN/LOAD lever.

4-46. REMOVE/REPLACE HAMMERBANK ASSEMBLY (CONT)

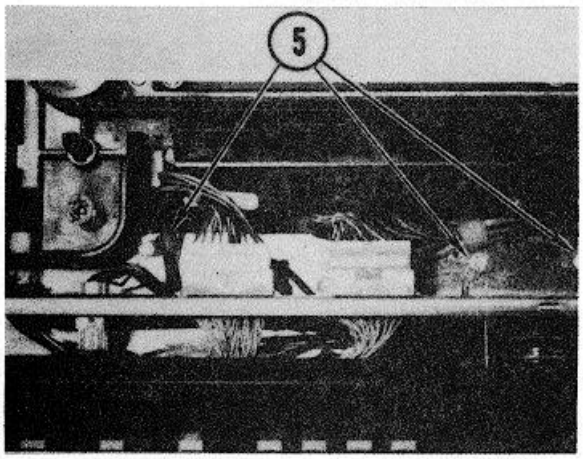


2. Lower assembly into frame until alinement bars on assembly rest firmly on alinement bars on side frames.

3. Check mating of alinement bars on both sides through observation holes in side frames. Press down RUN/LOAD lever.



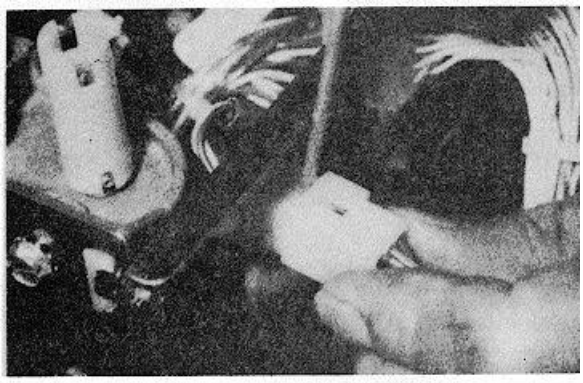
4. Insert and secure five screws on both sides of printer. Do not tighten.



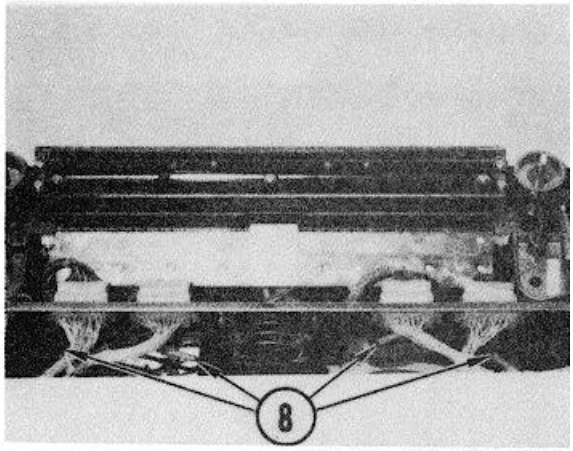
5. Replace left drive belt (para 4-33).

6. Connect three cable clamps.

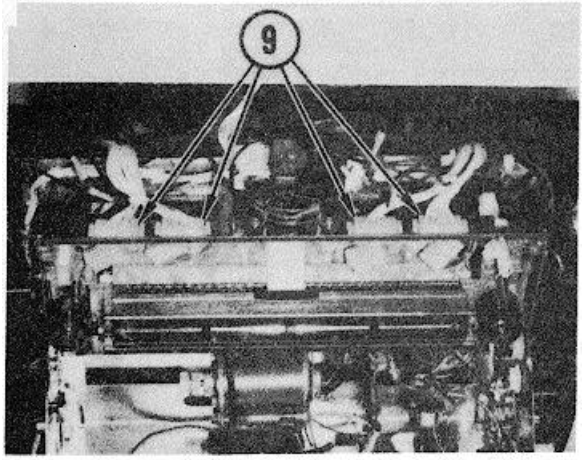
4-46. REMOVE/REPLACE HAMMERBANK ASSEMBLY (CONT)



7. Plug in photocell connector.

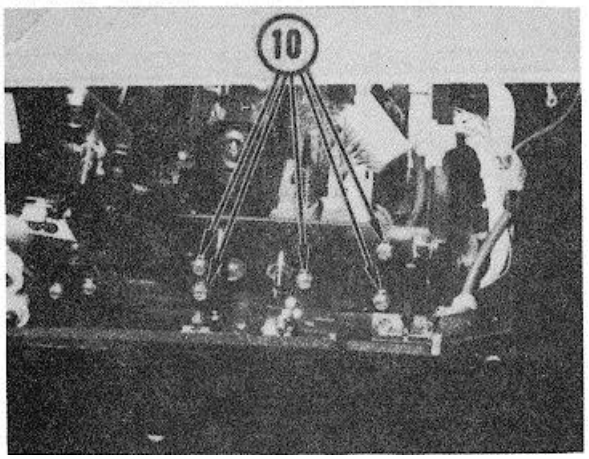


8. Connect two black cables and two red cables.



9. Replace four connectors.

4-46. REMOVE/REPLACE HAMMERBANK ASSEMBLY (CONT)



10. Tighten screws on both sides of frame.

NOTE

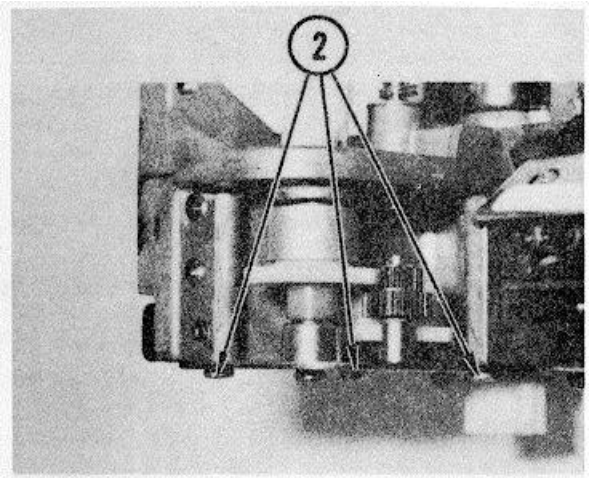
If plastic shields are removed, replace them now.

11. Replace control panel (para 4-67, Replace, steps 3-12).
12. Replace print belt (para 4-57).
13. Close up line printer (para 4-18).
14. On control panel, press TEST button.

4-47. REMOVE/REPLACE RIBBON DRIVE ASSEMBLY

INITIAL SETUP:

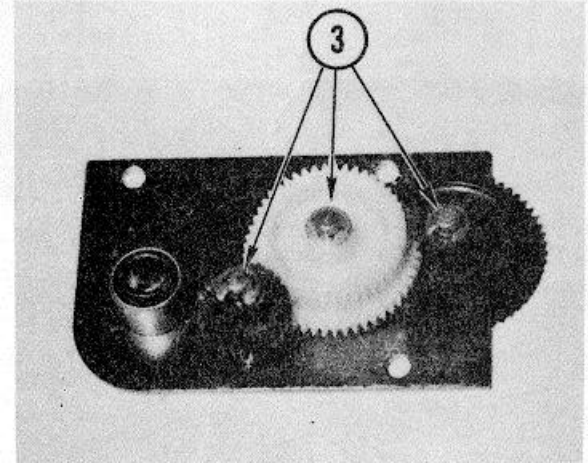
Common Tools
- Tool kit



Remove

1 Remove hammerbank assembly (para 4-46).

2. Remove three screws holding plate and gear assembly.

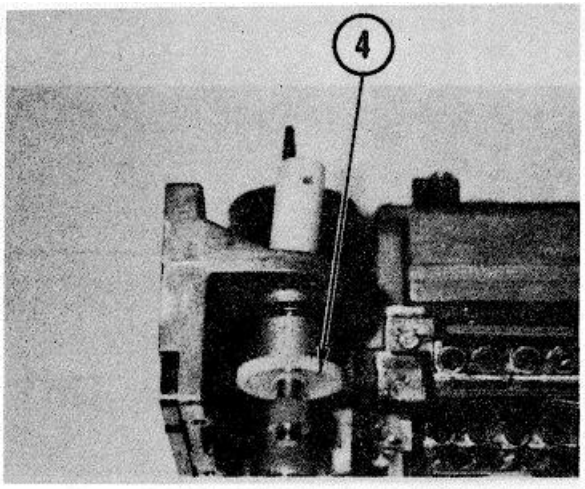


3. Remove plate and gear assembly.

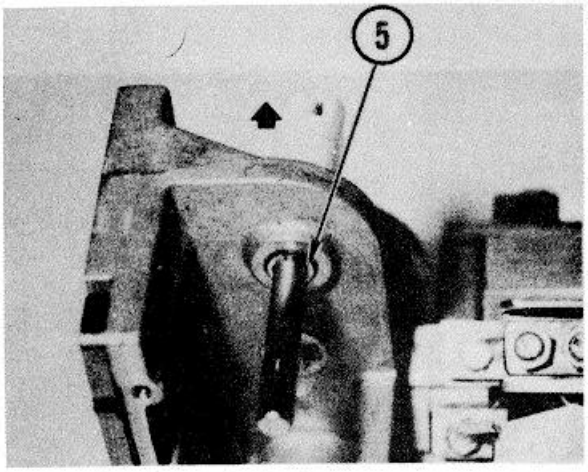
NOTE

If any or all gears are defective, pull off retaining ring with retaining ring tool, and pull gear off post.

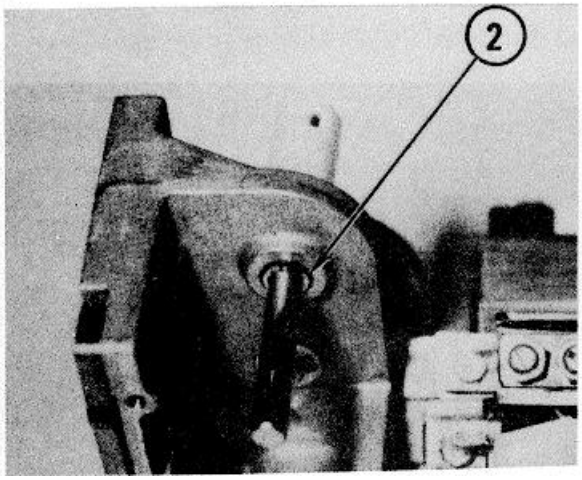
4-47. REMOVE/REPLACE RIBBON DRIVE ASSEMBLY (CONT)



4. Slide gear clutch off ribbon drive shaft.



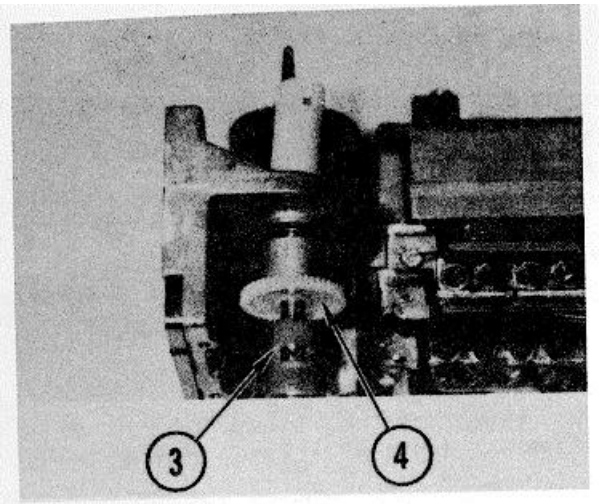
5. Remove retaining ring with retaining ring tool.
6. Pull shaft up and out.



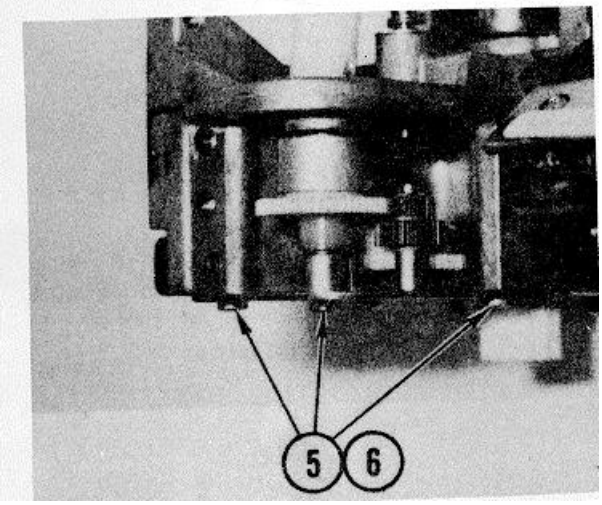
Replace

1. Push in ribbon drive shaft.
2. Replace retaining ring with retaining ring tool.

4-47. REMOVE/REPLACE RIBBON DRIVE ASSEMBLY (CONT)



3. Make sure spacer is on bottom of drive shaft.
4. Slide gear clutch onto ribbon drive shaft.



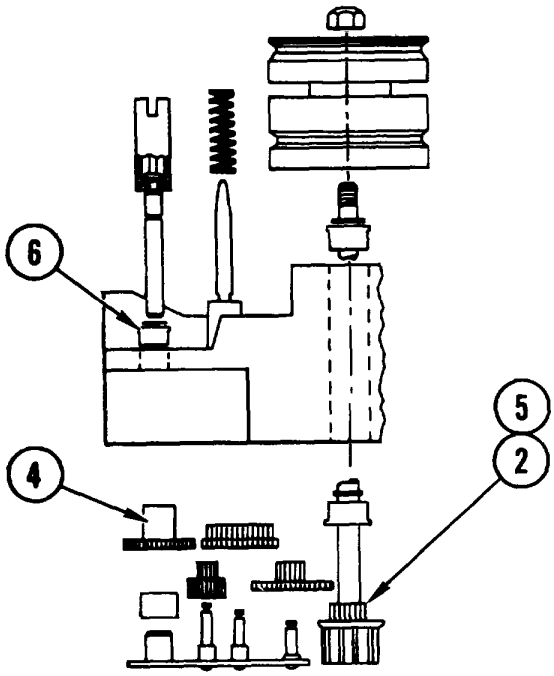
5. To replace plate and gear assembly, replace three screws.
6. Tighten screws.
7. Replace hammerbank assembly (para 4-46).

4-48. LUBRICATE RIBBON DRIVE ASSEMBLY

INITIAL SETUP:

Common Tools
- Tool kit

Materials/Spare Parts
- Freon-TF
- Small brush or swab
- SAE lOW-20W-40 motor oil
- Lubriplate #630-AAME-D6A3 grease



Remove

1. Remove ribbon drive assembly (para 4-47).
2. Using Freon-TF, clean dirt or dried grease from all gears with a small brush or swab.
3. Rotate all gears so all areas of gears can be cleaned.
4. Apply two drops of oil on drive shaft just above gear clutch assembly.
5. Lightly coat all gear teeth with grease.
6. Lift up bottom of drive spring and apply two drops of oil on drive shaft just above bushing.

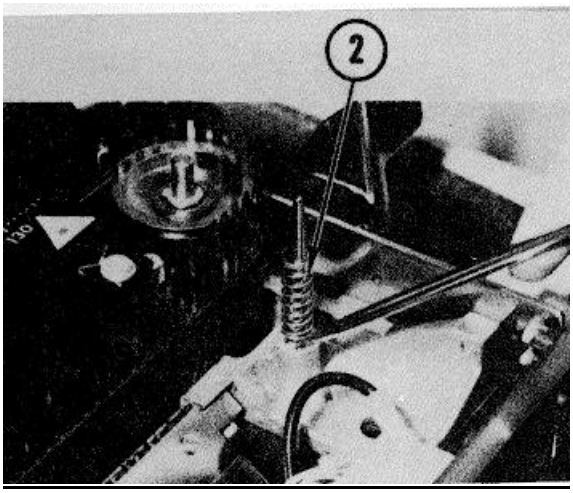
Replace

1. Replace ribbon drive assembly (para 4-47).

4-49. REMOVE/REPLACE RIBBON CARTRIDGE SUPPORT SPRING

INITIAL SETUP:

Common Tools
- Tool kit



Remove

1. Access line printer (para 4-18, steps 1-5).
2. Using flat-tip screwdriver pry spring loose. Slide up and off.

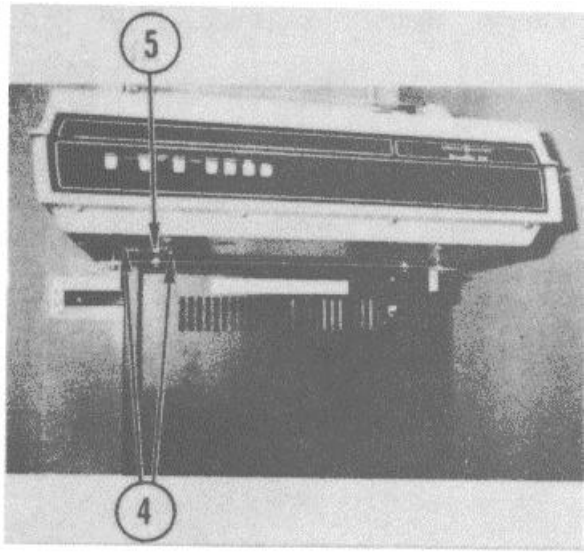
Replace

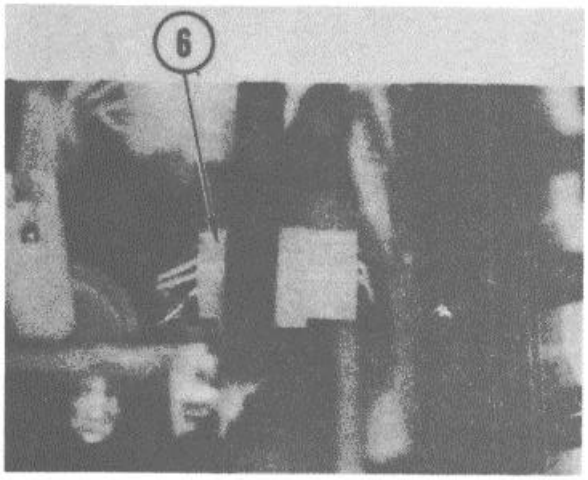
1. Push spring over pin until spring locks in place.
2. Close up line printer (para 4-18, steps 4-8).
3. On control panel, press TEST button.

4-50. REMOVE/REPLACE PHOTOCELL ASSEMBLY

INITIAL SETUP:

Common Tools
- Tool kit



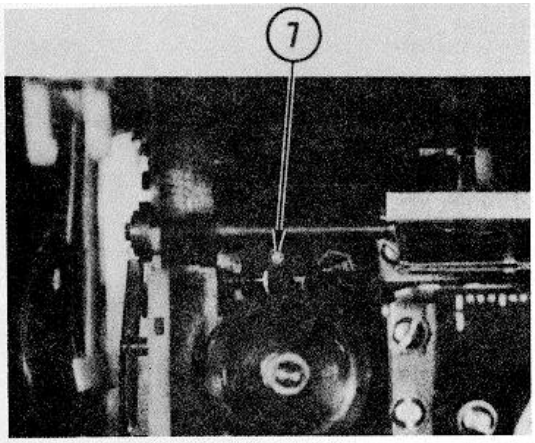


Remove

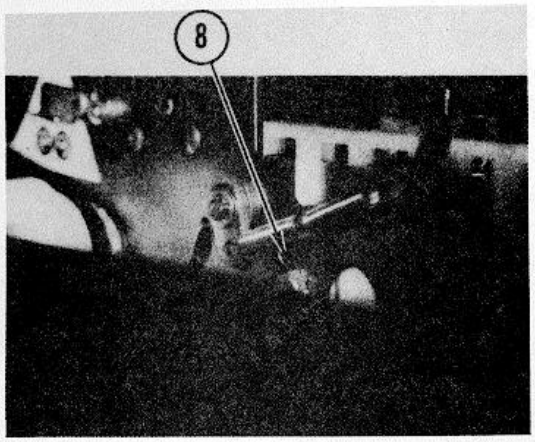
1. Access line printer (para 4-18, steps 1-6).
2. Remove print belt (para 4-57).
3. Remove toggle assembly (para 4-45).
4. Loosen screws.
5. Pull off plate.

6. Pull out connector. Remove cable clamp.

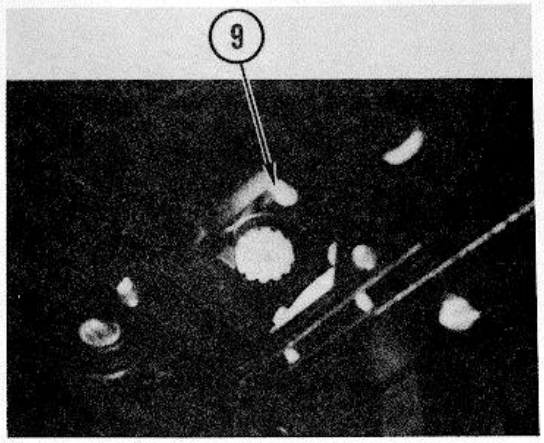
4-50. REMOVE/REPLACE PHOTOCELL ASSEMBLY (CONT)



7. Remove screws.

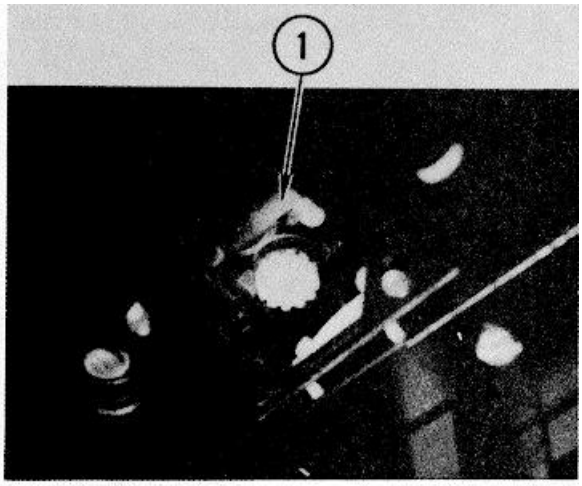


8. Remove adjustment screw and spring.



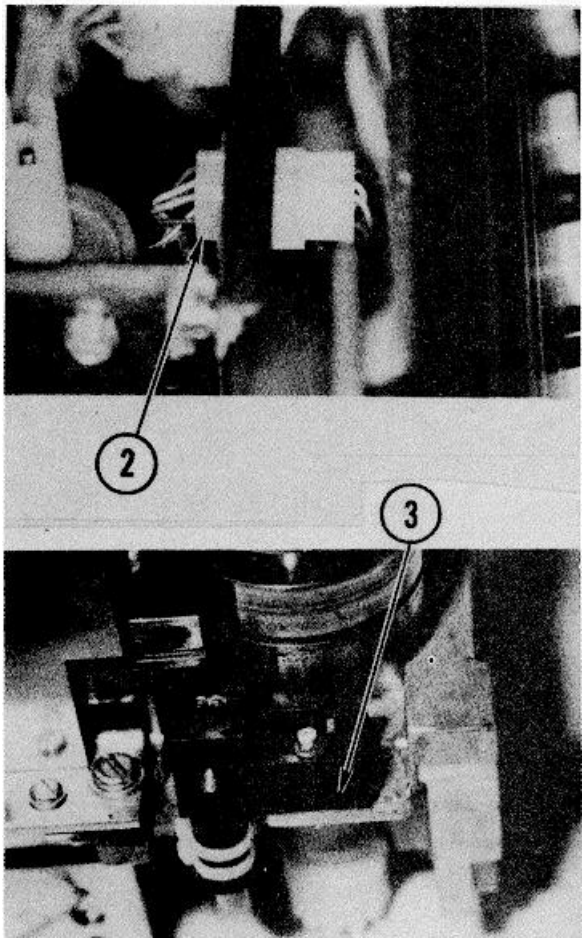
9. Pull photocell cable and assembly out through opening under panel.

4-50. REMOVE/REPLACE PHOTOCELL ASSEMBLY (CONT)



Replace

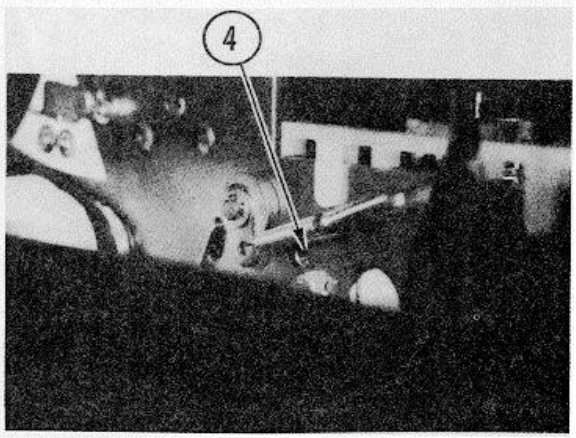
1. Push new photocell cable up through opening under printer.



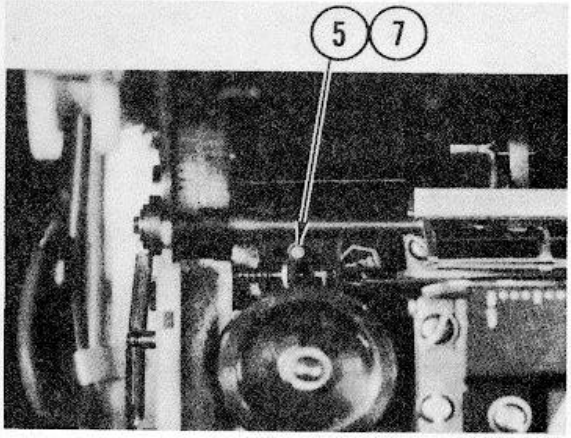
2. Push in cable connector. Replace cable clamp.

3. Place new photocell assembly on positioning pins.

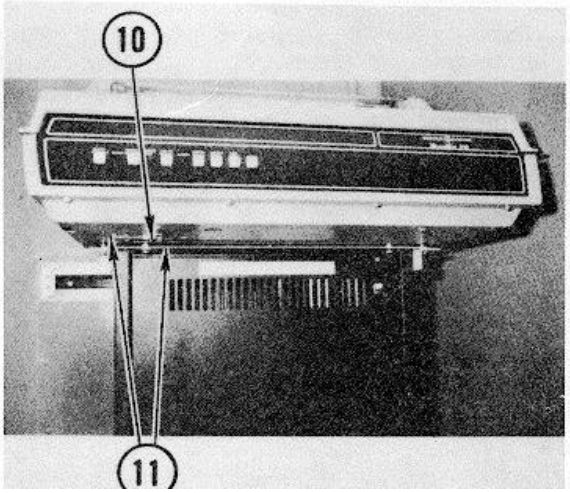
4-50. REMOVE/REPLACE PHOTOCELL ASSEMBLY (CONT)



4. Replace adjustment screw and spring.



5. Replace top screw and washers.
6. Turn adjustment screw until top screw is in center of slot.
7. Tighten top screw until head just touches top of assembly.
8. Replace toggle assembly (para 4-45).
9. Replace print belt (para 4-57).



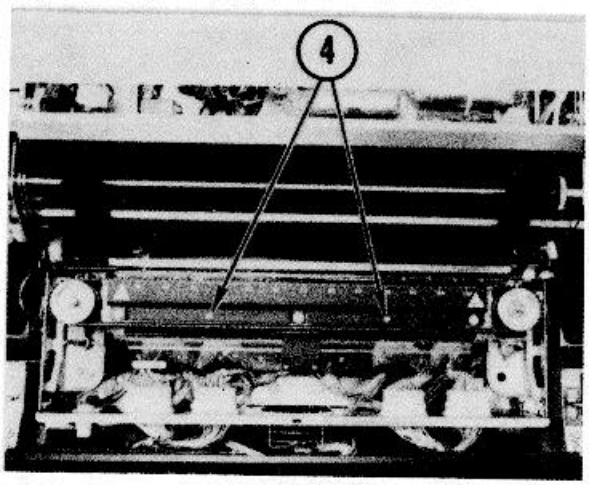
10. Push on plate.
11. Tighten screws.
12. Adjust photocell assembly (para 4-51).
13. Close up line printer (para 4-18, steps 3-8).
14. On control panel, press TEST button.

4-51. ADJUST PHOTOCELL ASSEMBLY

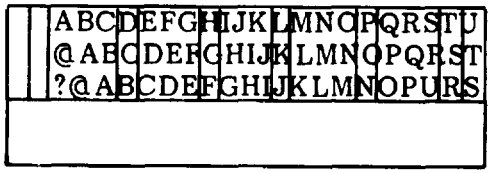
INITIAL SETUP:

Common Tools
- Tool kit

Special Tools
- Timing gauge

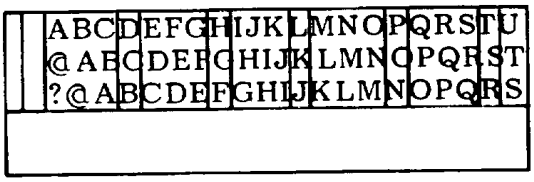


1. Power on.
2. On control panel, press TEST button.
3. Access line printer (para 4-18, steps 1-5).
4. Remove screws. Remove horizontal .W



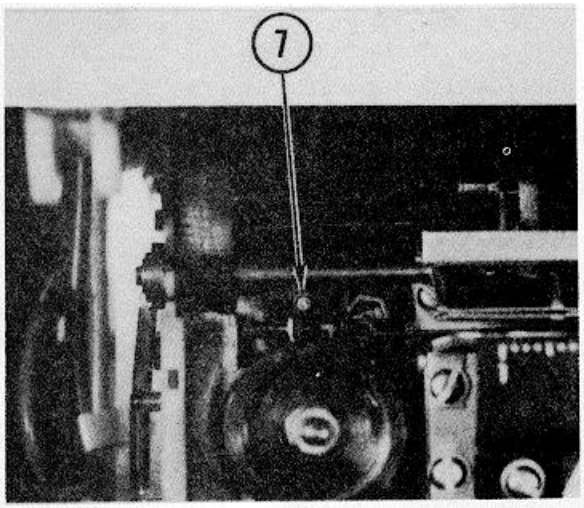
5. Place slots on underside of timing gauge over hammers, as shown, with tip of timing gauge over printed characters.

4-51. ADJUST PHOTOCELL ASSEMBLY (CONT)

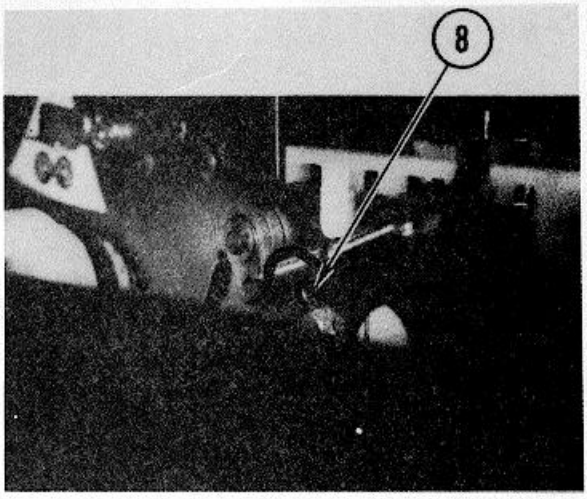


6. Check if characters are centered between hairlines on timing gauge.

   - If centered, go to step 10
   - If not centered, go to step 7

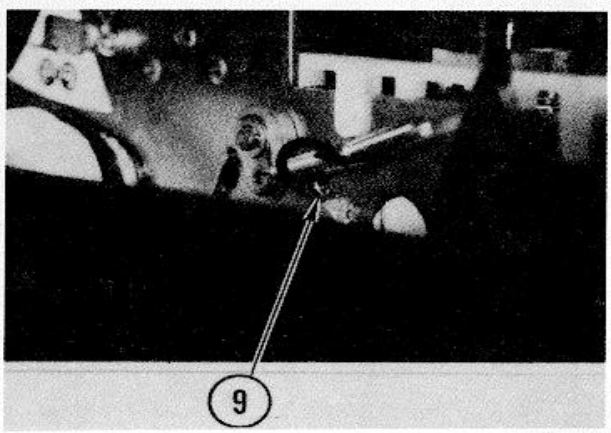


7. Loosen top allen head screw.

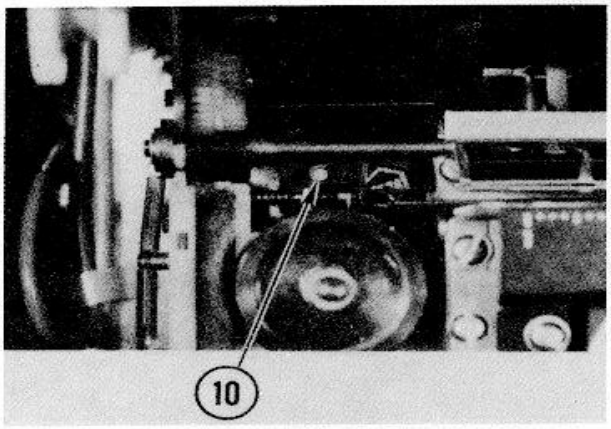


8. If characters between hairlines are too far to left, turn screw counterclockwise.

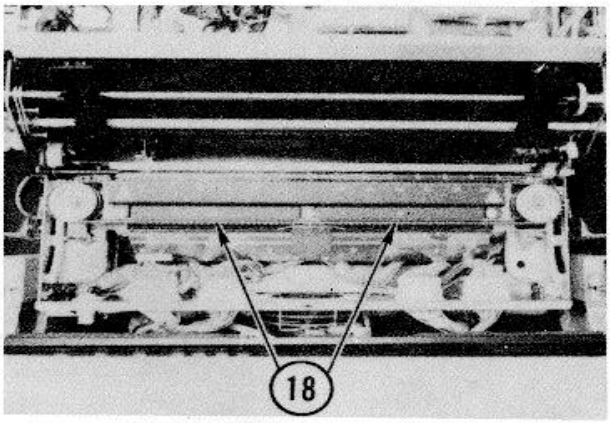
4-51. ADJUST PHOTOCELL ASSEMBLY (CONT)



9. If characters between hairlines are too far to right, turn screw clockwise.

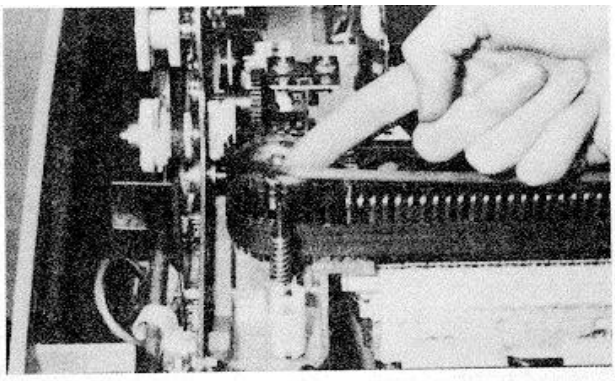


10. Tighten top screw.
11. Close up line printer (para 4-18, steps 4-8).
12. On control panel, press TEST button.
13. Open top cover.
14. Remove ribbon cartridge.
15. Using timing gauge, check if characters are centered between hairlines of gauge at left, middle, and right end of print line.
16. If characters are not centered in one or two positions, repeat steps 7-15.
17. If characters cannot be centered after photocell adjustment, replace photocell assembly.
18. Replace horizontal scale. Align with hammers. Tighten screws.
19. Replace ribbon cartridge. Close top



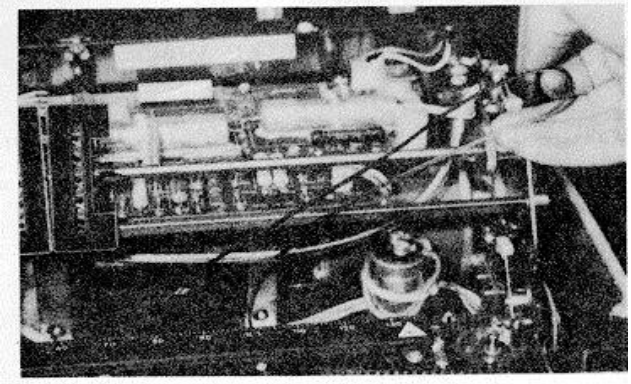
4-52. REMOVE/REPLACE REBOUND BELT

INITIAL SETUP
Materials/Spare Parts
- Rebound belt



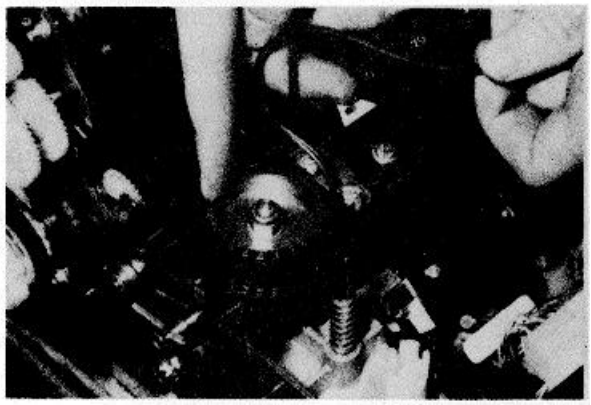
Remove

1. Access line printer (para 4-18, steps 1-6).
2. Push finger under belt, as shown, and pull up.



3. Pull belt out of printer.

4-52. REMOVE/REPLACE REBOUND BELT (CONT)

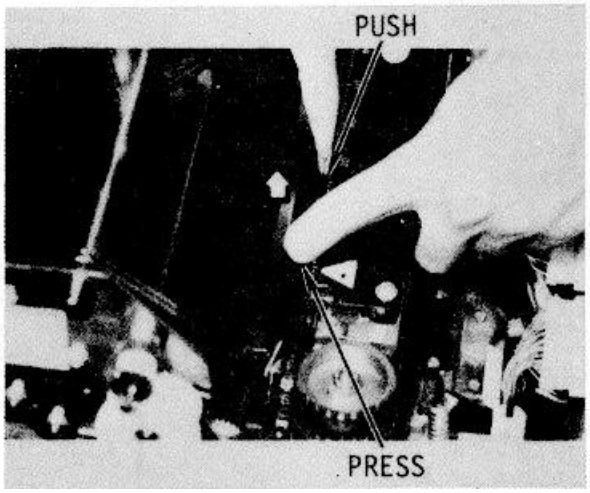


CAUTION

Handle type fingers gently. They bend easily.

Replace

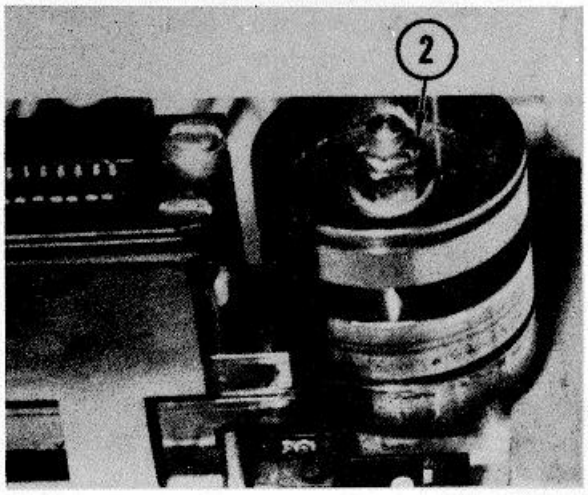
1. Push belt on runner, as shown.



2. With one hand, push type fingers away from runner. Move other hand as shown, to press belt into runner.
3. Make sure all type fingers are on outside of belt.
4. Turn motor drive pulley counter-clockwise to test print belt movement.
5. Close up line printer (para 4-18,steps 3-8).
6. On control panel, press TEST button.

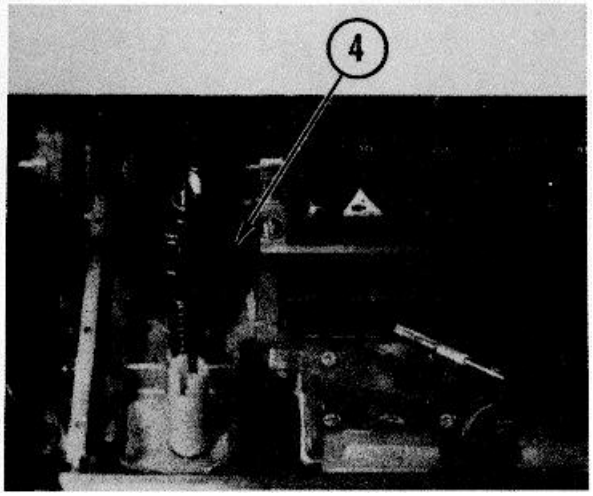
4-53. REMOVE/REPLACE LEFT PULLEY SHAFT BEARINGS

INITIAL SETUP
Common Tools
- Tool kit



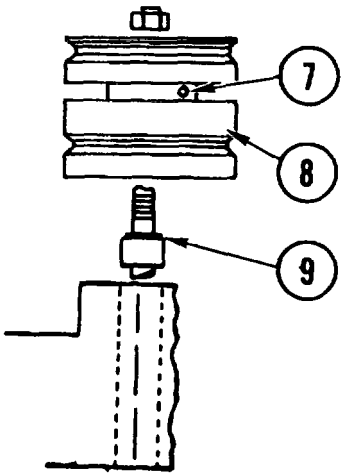
Remove

1. Remove hammerbank assembly (para 4-46).
2. Remove nut.
3. If nut is difficult to remove, follow steps 4-6. If not, go to step 7.



4. Insert hex alien wrench into set screw hole and hold against drive support casting.

4-53. REMOVE/REPLACE LEFT PULLEY SHAFT BEARINGS (CONT)

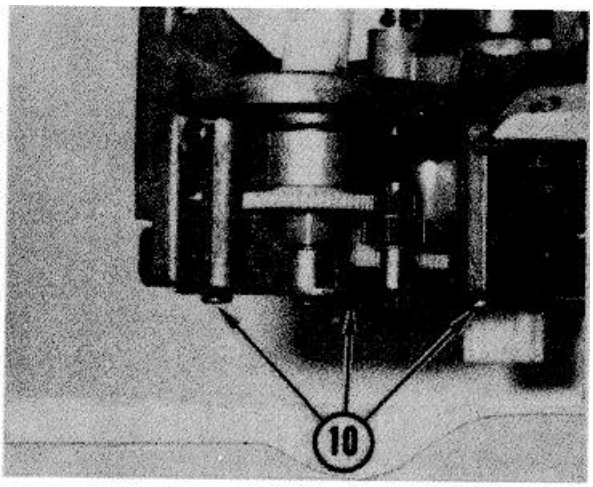


5. Place 7/16 in. box wrench over nut. Tap with hammer until loose.
6. Using box wrench, loosen and remove nut.
7. Loosen set screw until pulley is loose.
8. Pull pulley from shaft.

CAUTION

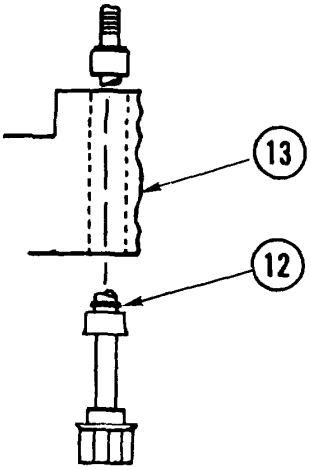
Remove shims carefully. Keep them in order.

9. Remove shims.



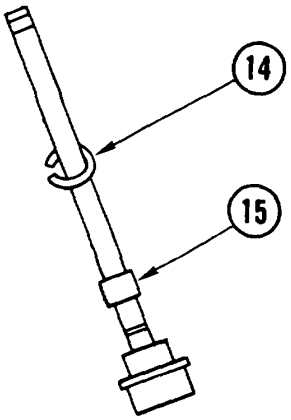
10. Remove three screws holding plate and gear assembly.
11. Pull off plate and gear assembly.

4-53. REMOVE/REPLACE LEFT PULLEY SHAFT BEARINGS (CONT)



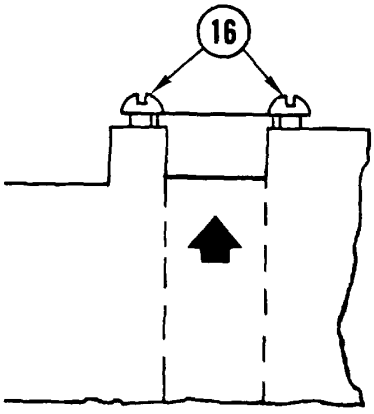
12. Tap lightly with hammer on shaft end until retaining ring pushes out bottom bearing.

13. Pull pulley shaft out of casting.



14. Remove retaining ring with retaining ring tool.

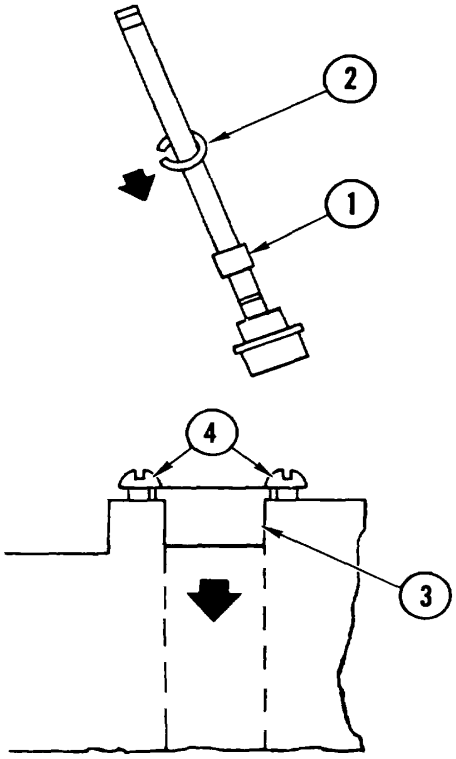
15. Pull off bearing.



16. Remove screws from top of drive support casting.

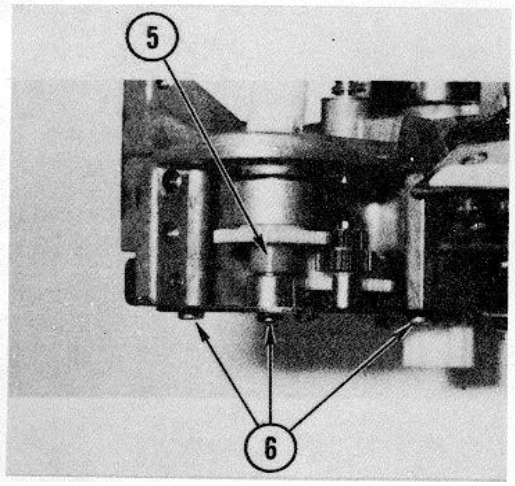
17. Push bearing up and out of casting.

4-53. REMOVE/REPLACE LEFT PULLEY SHAFT BEARINGS (CONT)



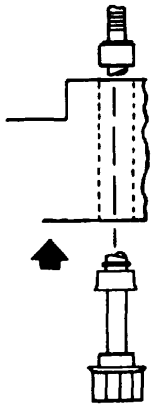
Replace

1. Slide bottom bearing on shaft.
2. Push on retaining ring.
3. Push top bearing into top of drive support casting.
4. Replace and tighten screws.

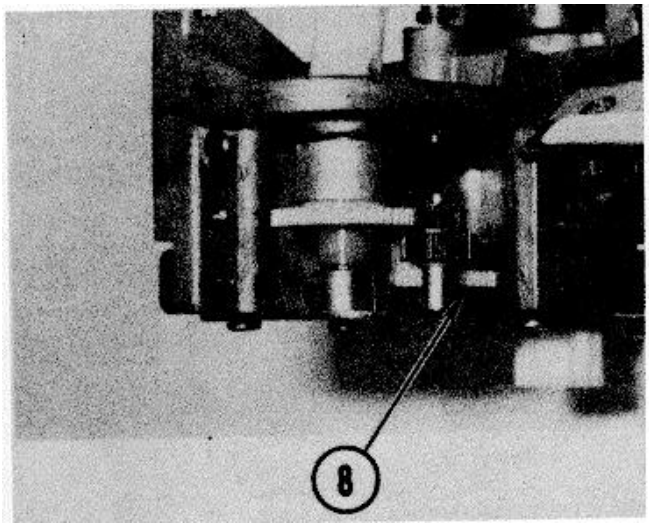


5. Make sure spacer is mounted on bottom of shaft.
6. Replace plate and gear assembly. Tighten screws.

4-53. REMOVE/REPLACE LEFT PULLEY SHAFT BEARINGS (CONT)

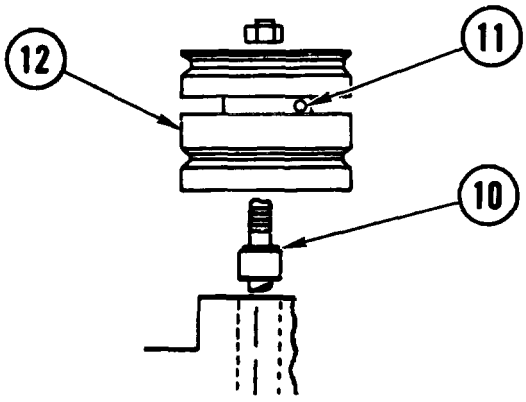


7. Push pulley shaft up through bottom of drive support casting.



8. Mesh pulley shaft gear with ribbon drive gear.

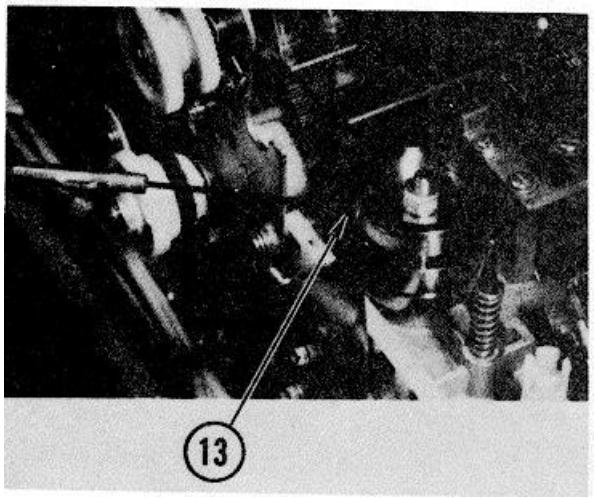
9. Push pulley shaft all the way up through drive support casting.



10. Replace shims.

11. Keeping set screw lined up with flat side of shaft, tighten slightly.
12. Replace pulley.

4-53. REMOVE/REPLACE LEFT PULLEY SHAFT BEARINGS (CONT)



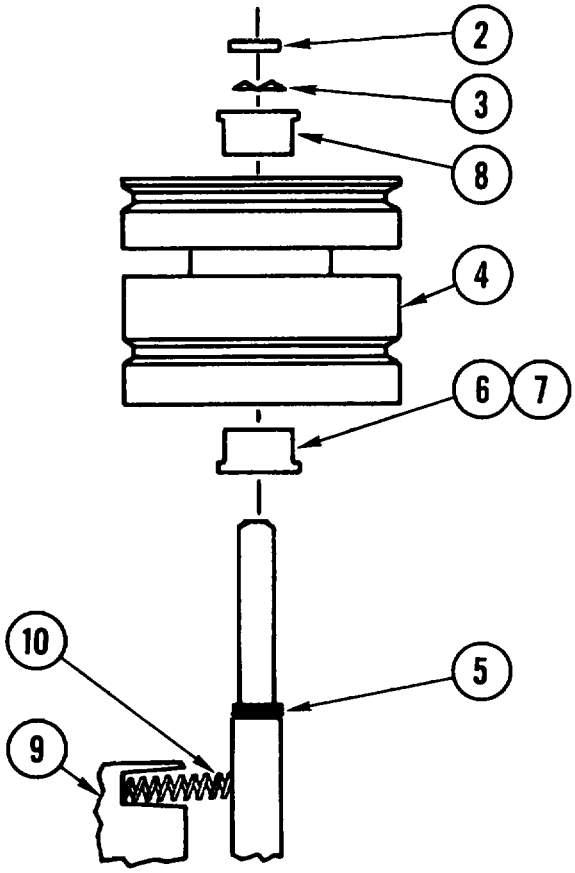
13. Insert hex Allen wrench into set screw hole and hold against drive support casting.

14. Replace nut and washer. Using 7/16 box wrench, tighten nut.

15. Replace hammerbank assembly (para 4-46).

4-54. REMOVE/REPLACE RIGHT PULLEY SHAFT BEARINGS

INITIAL SETUP
Common Tools
- Tool kit



Remove

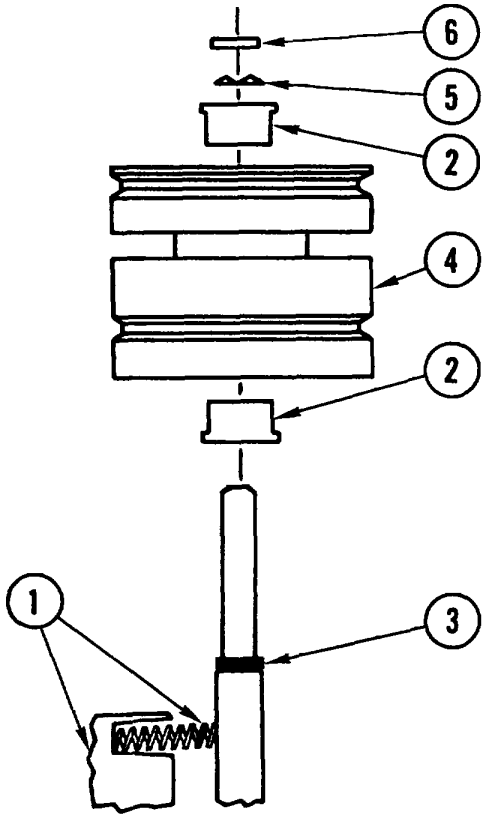
1. Remove print belt (para 4-57).
2. Remove grip ring.
3. Pull off spring washer.
4. Slide pulley off shaft.

CAUTION

Remove shims carefully. Keep them in order.

5. Remove shims.
6. To remove bottom bearing, push thin hex key wrench through top of pulley until it touches bearing.
7. Gently tap on wrench until bearing drops out of pulley.
8. To remove other bearing, turn pulley over and repeat steps 6 and 7.
9. To remove tension spring, push in tension support casting enough to slip spring out of arm assembly.
10. Pull off spring.

4-54. REMOVE/REPLACE RIGHT PULLEY SHAFT BEARINGS (CONT)

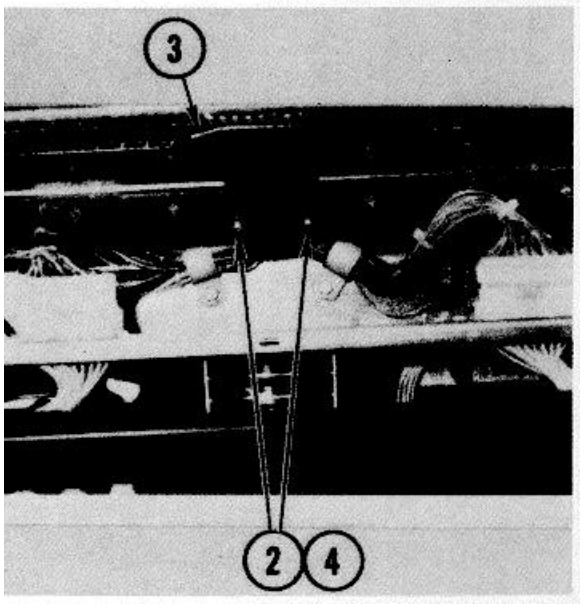


Replace

1. To replace tension spring, push in tension support casting enough to hook spring onto arm assembly.
2. Using finger, push bearings into pulley.
3. Place all shims on shaft.
4. Slide pulley onto pulley shaft.
5. Push spring washer over top of shaft.
6. Push on grip ring until there is no up and down movement in pulley.
7. Replace print belt (para 4-57).

4-55. ADJUST FRONT BELT GUIDE

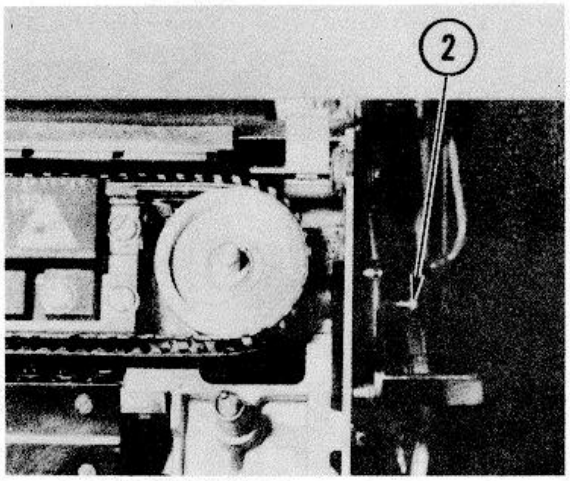
INITIAL SETUP
Common Tools
- Tool kit



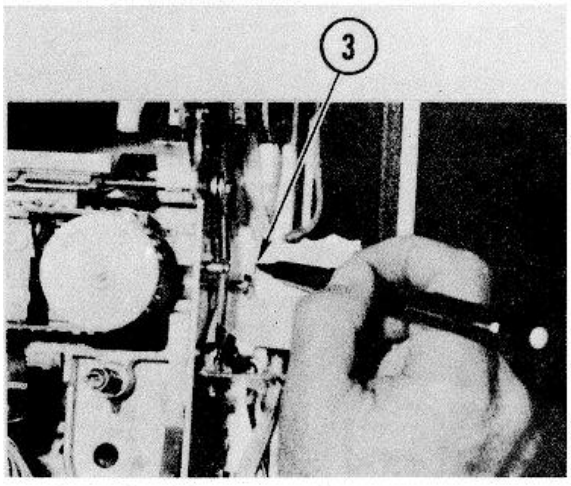
1. Access line printer (para 4-18,steps 1-2).
2. Loosen screws.
3. Using feeler gauge, set gap between belt guide and ribbon. It should measure 0.050-0.070 in. (1.3-1.8 mm).
4. Tighten screws.
5. Close up printer (para 4-18, steps 7-8).
6. On control panel, press TEST button.

4-56. ADJUST MAGNETIC BELT GUIDE AND REBOUND BAR

INITIAL SETUP			
Common Tools	Special Tools	Test, Measurement and Diagnostic Equipment	Personnel Required
• Tool kit	• 1-1/2 in. 10-32 screw	• Height alinement gauge	• Two

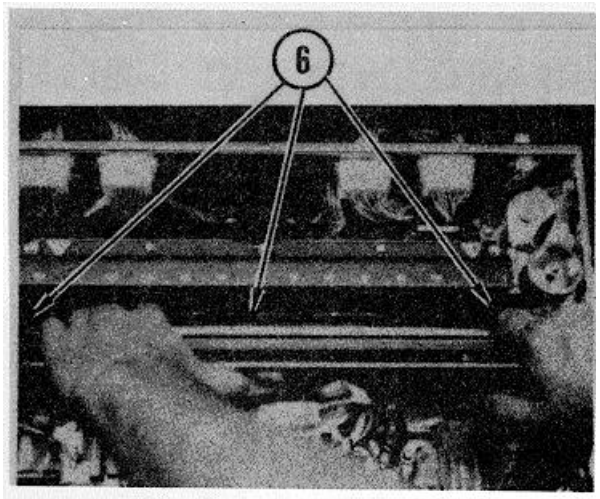


1. Access line printer (para 4-18, steps 1-6).
2. Install and turn 1-1/2 in. 10-32 screw as shown. Stop turning as soon as print belt begins to loosen.



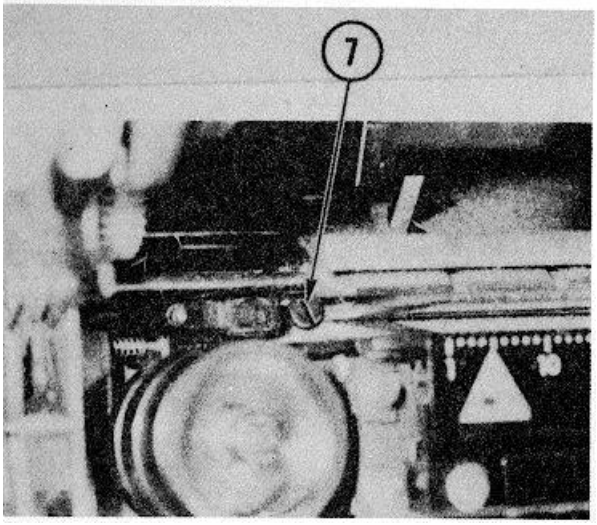
3. Note and mark length of 10-32 screw stem.
4. Remove print belt (para 4-57).

4-56. ADJUST MAGNETIC BELT GUIDE AND REBOUND BAR (CONT)

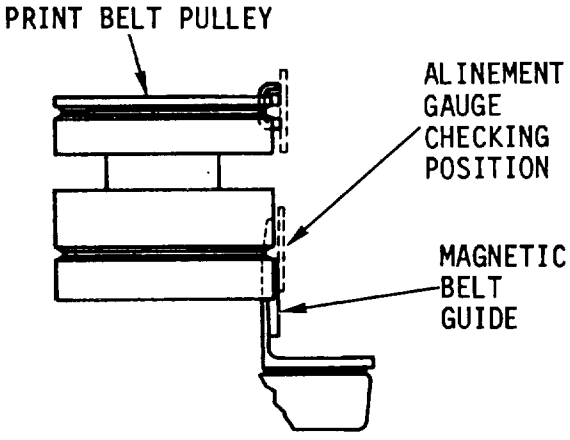


5. Reset 10-32 screw at mark noted in step 3.

6. Locate magnetic belt guide, which is positioned between print belt and lower rear area of hammerbank assembly.

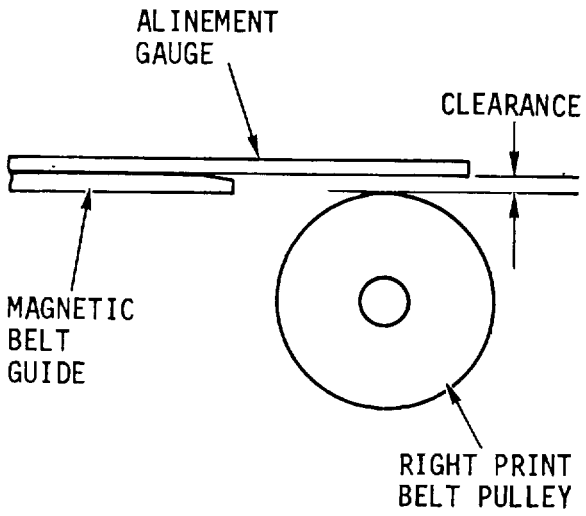


7. Loosen large slotted screw on each end of magnetic belt guide.

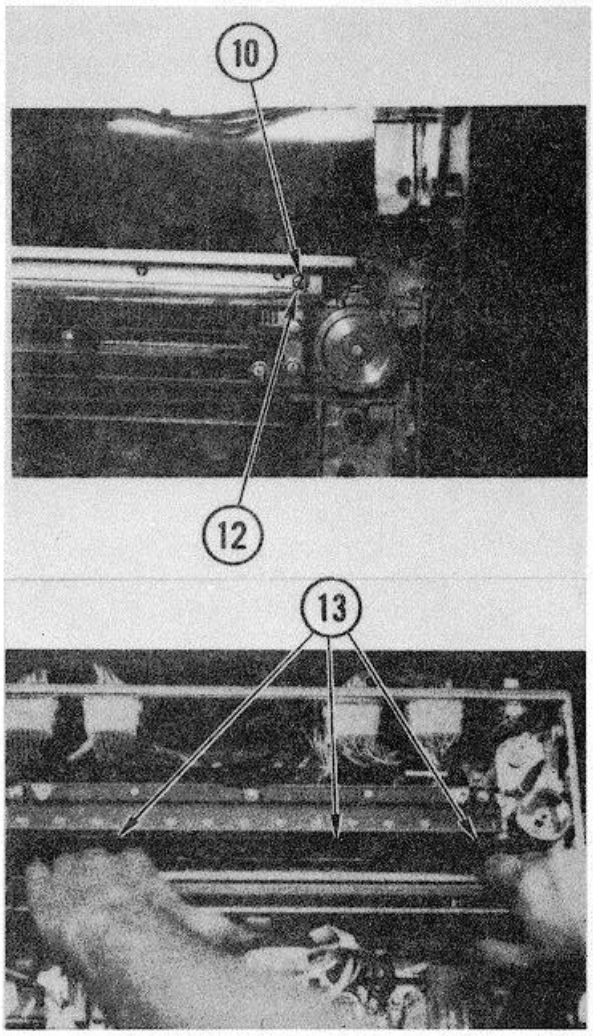


8. At right end of magnetic belt guide, hold alignment gauge, as shown, against groove in pulley and belt guide.

4-56. ADJUST MAGNETIC BELT GUIDE AND REBOUND BAR (CONT)



9. Using feeler gauge, set clearance gap of 0.039 ± 0.003 inch (1.0 + 0.08 mm), as shown, between pulley and alignment gauge.

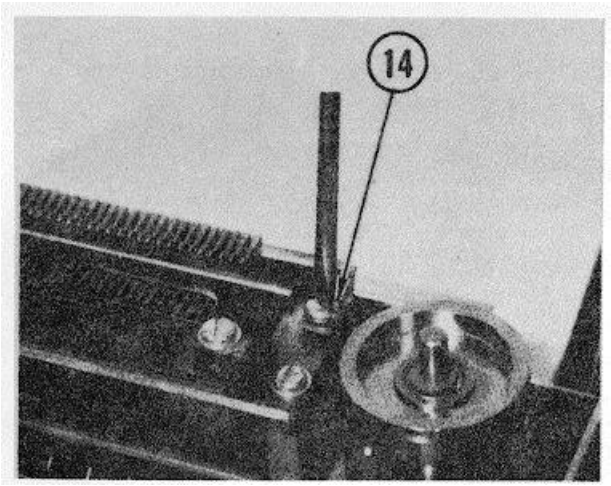


10. Snug down large slotted screw. 11. Go to left end of magnetic belt guide. Repeat steps 8-9.

12. Tighten large slotted screw at each end of magnetic belt guide.

13. Locate rebound bar, attached to top rear area of hammerbank assembly.

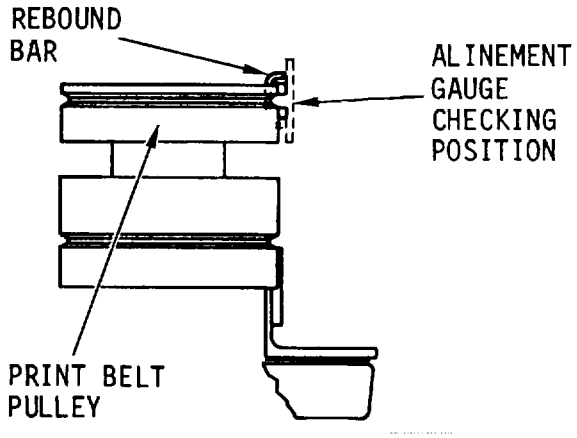
4-56. ADJUST MAGNETIC BELT GUIDE AND REBOUND BAR (CONT)



CAUTION

Do not loosen any other screws on top of hammerbank. They will affect a critical factory adjustment. 14. Loosen screw on each end of the rebound bar.

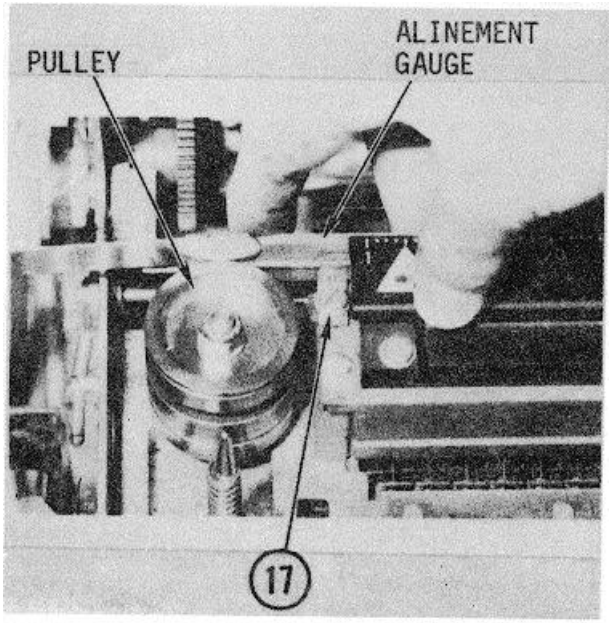
15. At one end of rebound bar, hold alignment gauge, as shown, against groove in pulley and rebound bar.



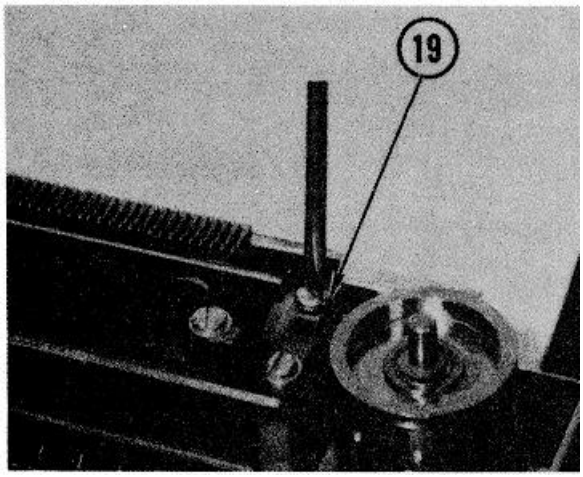
16. Using feeler gauge, set clearance gap of 0.031 inch (0.79 mm) between pulley and alignment gauge.

17. Snug down screw.

18. Go to other end of rebound bar. Repeat steps 15-17.



4-56. ADJUST MAGNETIC BELT GUIDE AND REBOUND BAR (CONT)



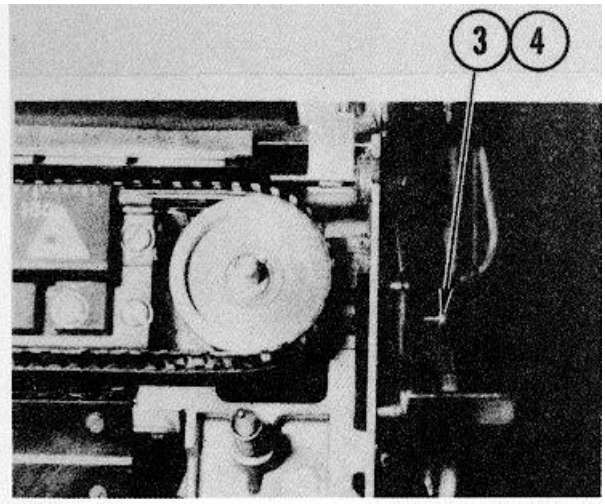
19. Tighten screw at each end of rebound bar.
20. Retighten 10/32 tension screw.
21. Replace printbelt (para 4-57).

4-57. REMOVE/REPLACE PRINT BELT

INITIAL SETUP

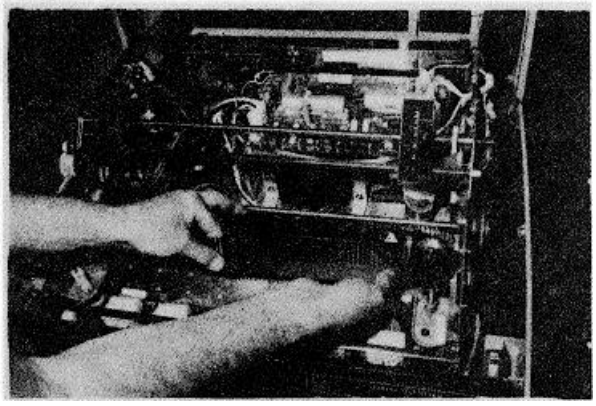
Common Tools
- Tool kit

Special Tools
- 1-1/2 in. 10/32



Remove

1. Access line printer (para 4-18, steps 1-6).
2. Remove rebound belt (para 4-52).
3. Install 1-1/2 in. 10-32 screw as shown.
4. Tighten screw all the way. Belt will loosen.

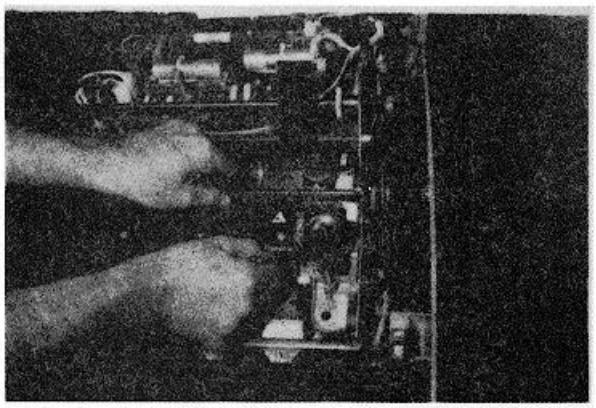


CAUTION

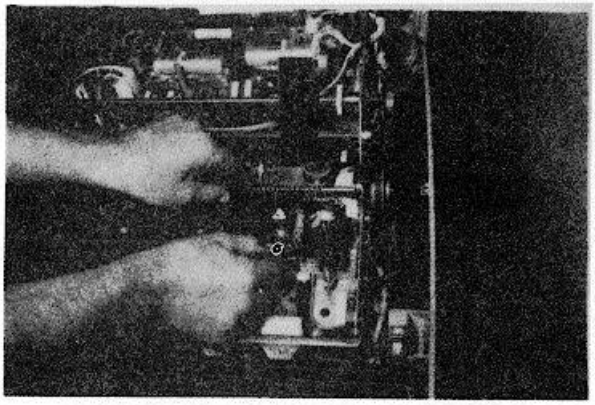
Do not use pressure on type fingers. They bend easily.

5. With two fingers grasp center of belt as shown.

4-57. REMOVE/REPLACE PRINT BELT (CONT)

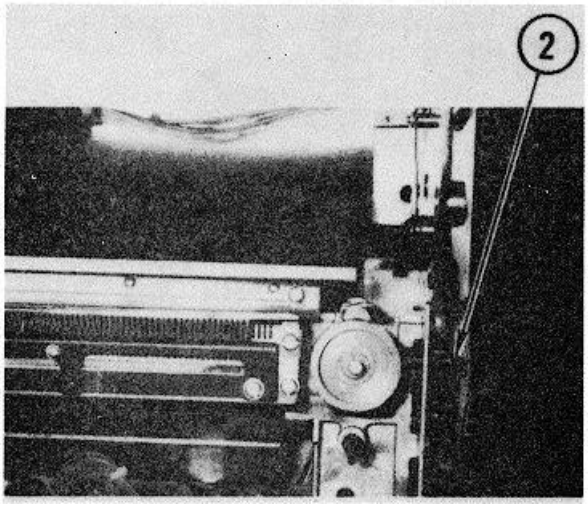


6. Carefully work belt up and off pulleys.



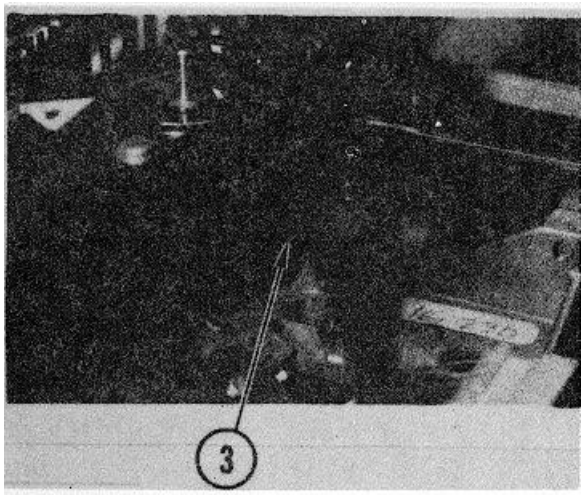
Replace

1. Slip belt onto pulleys.

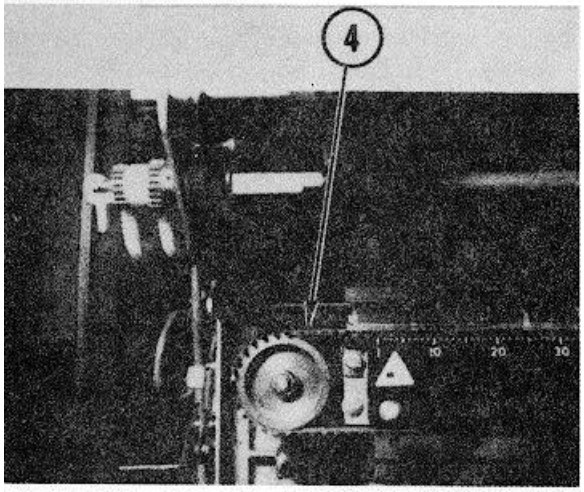


2. Loosen screw to tighten belt slightly.

4-57. REMOVE/REPLACE PRINT BELT (CONT)



3. Push inner belt guide rib into bottom groove of pulleys.

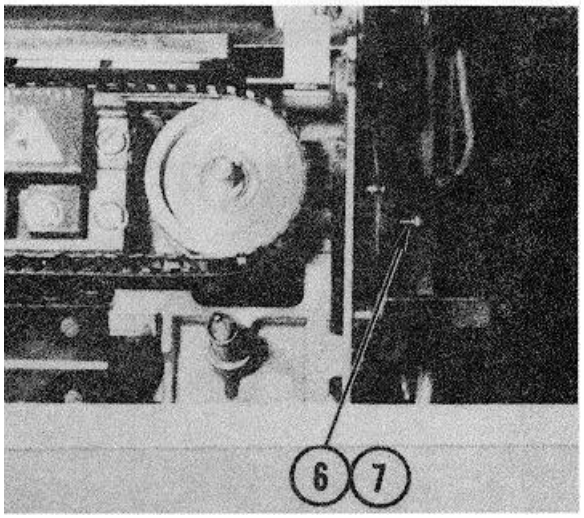


CAUTION

Make sure that type fingers are set completely inside opening in front of photocell. Otherwise, photocell will be damaged.

4. Check that type fingers are set completely inside opening in front of photocell.

5. Check bottom of type fingers all around belt to make sure that they are positioned properly.



6. Loosen screw all the way. Belt will fully tighten.

7. Remove screw.

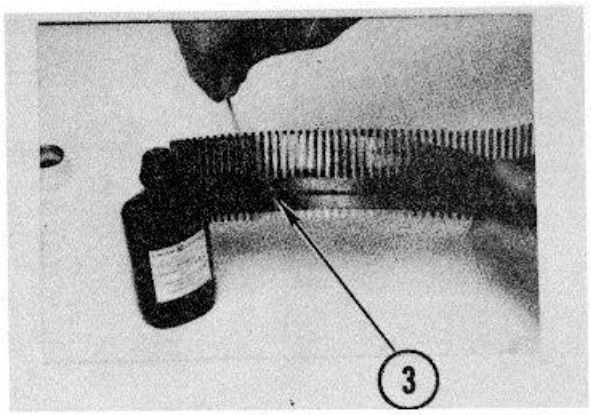
8. Replace rebound belt (para 4-52).

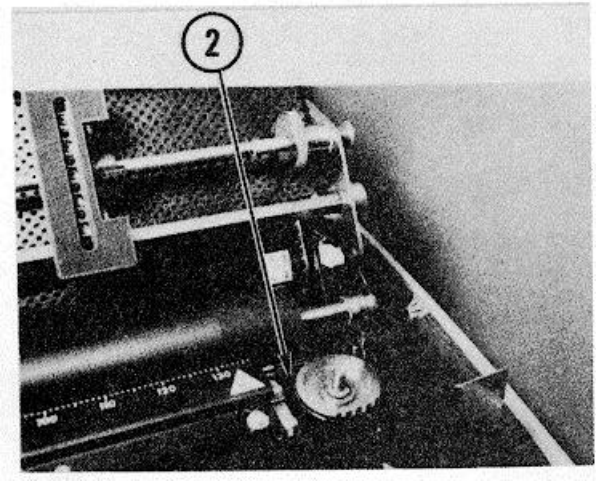
4-58. LUBRICATE PRINT BELT

INITIAL SETUP

Common Tools
- Tool kit

Materials/Spare Parts
- Graphite solution
- MS122 aerosol dry lubricant
- Clean, dry, lint-free cloth
- Small-bristle paint brush





Remove

1. Remove print belt (para 4-57).

CAUTION

Use no chemicals when cleaning print belt. They will damage print belt.

2. Thoroughly clean belt with a clean, dry, lint-free cloth.

3. Coat belt surface with graphite solution using small, bristle paint brush. Also, coat spaces between fingers and belt.

Replace

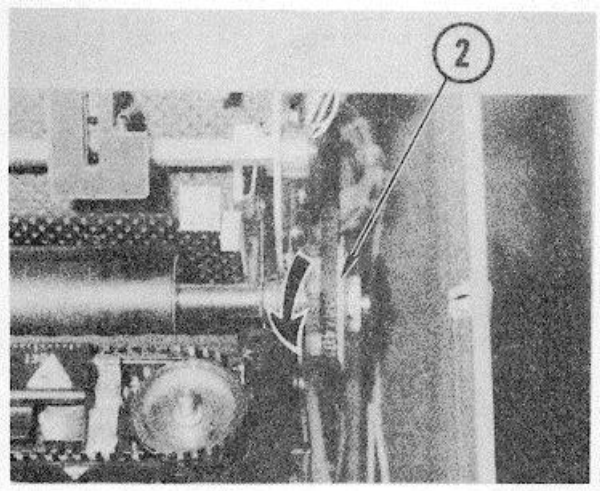
1. Replace print belt (para 4-57).

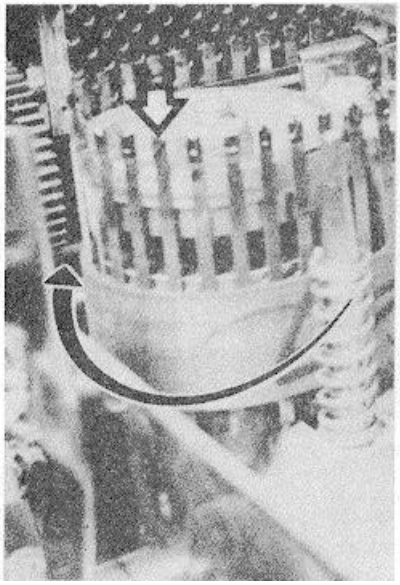
2. With print belt running, spray the inside of the belt with MS122 aerosol dry lubricant near right print belt pulley directed at guide rib for 1-2 seconds.

4-59. REMOVE/REPLACE DEFECTIVE TYPE FINGER

INITIAL SETUP

Common Tools
- Tool kit

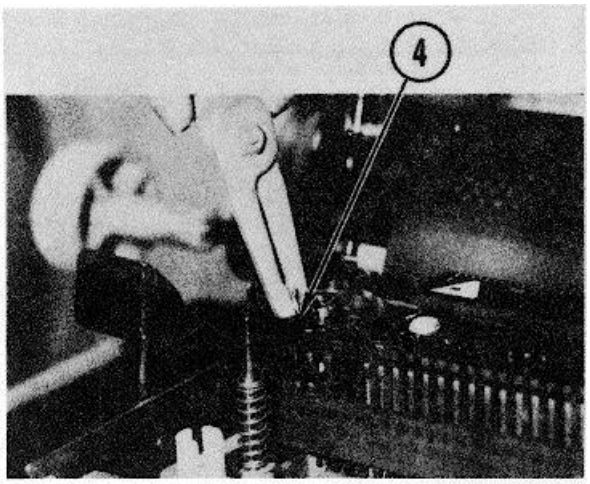




Remove

1. Access line printer (para 4-18, steps 1-5).
2. Move print belt by turning pulley as shown.
3. Check print belt until defective finger moves to position shown.

4-59. REMOVE/REPLACE DEFECTIVE TYPE FINGER (CONT)

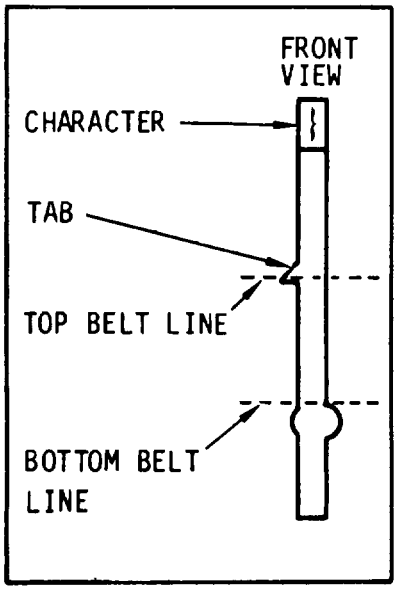


CAUTION

Use procedure in paragraph 4-60 to remove reference fingers. Do not use the procedure in this paragraph. Damage to finger and belt will result.

4. Using finger removal pliers, grasp defective type finger firmly near top of belt, as shown.

5. Slowly pull finger straight up until free from print belt.



Replace

1. Using finger removal pliers, grasp type finger near tab.

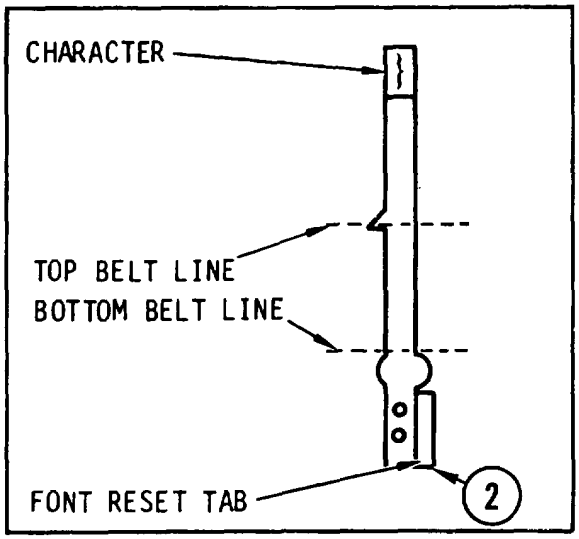
2. Slowly push finger into print belt until tab enters top of belt, as shown. Make sure character faces outside of belt.

3. Close up line printer (para 4-18, steps 4-8).

4. On control panel, press TEST button.

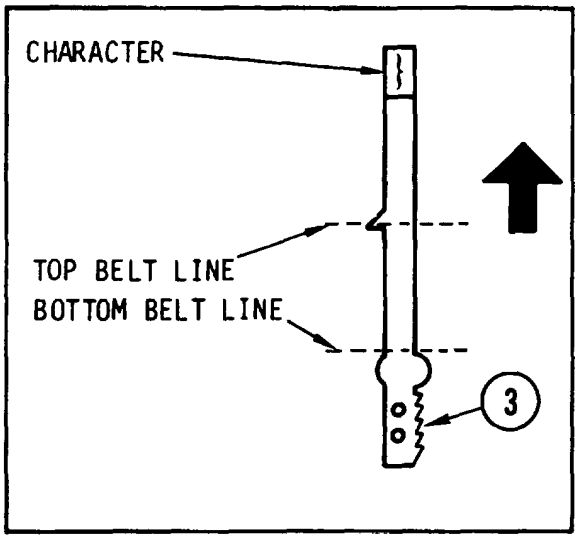
4-60. REMOVE/REPLACE DEFECTIVE REFERENCE TYPE FINGER

INITIAL SETUP
Common Tools
- Tool kit



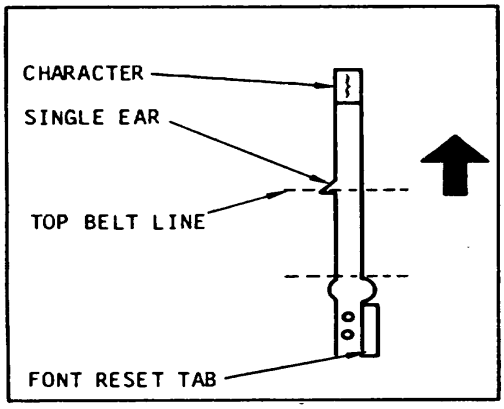
Remove

1. Remove print belt (para 4-57).
2. Break off welded tab.



3. File down sharp edges from bottom of type finger.
4. Pull type finger up and out of belt, as shown.

4-60. REMOVE/REPLACE DEFECTIVE REFERENCE TYPE FINGER (CONT)



Replace

NOTE

Make sure character on replacement finger matches character on defective finger.

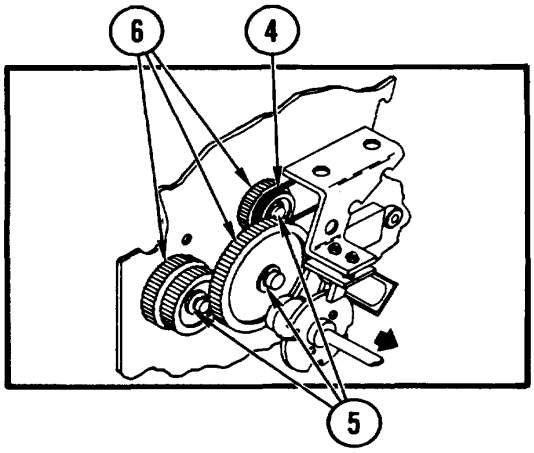
NOTE

When replacing type finger, make sure character faces outside of belt.

1. Push type finger up through bottom of belt as shown, until ear rests on top of belt.
2. Replace print belt (para 4-57).

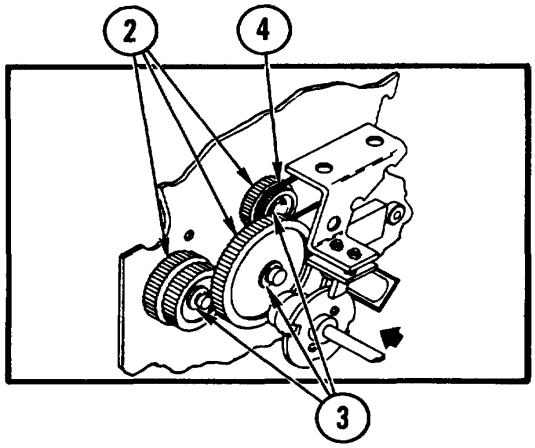
4-61. REMOVE/REPLACE PLATEN DRIVE GEAR

INITIAL SETUP	
Common Tools	Material/Spare Parts
Tool kit	• Lubriplate #630-AAME-D6A3 grease



Remove

1. Access line printer (para 4-18).
2. Remove jackshaft (para 4-38, Remove, steps 3-11).
3. Slide jackshaft in direction shown until linefeed clutch is out of way.
4. Slip off VFU drive belt.
5. Remove retaining rings from gears.
6. Pull gears off posts.

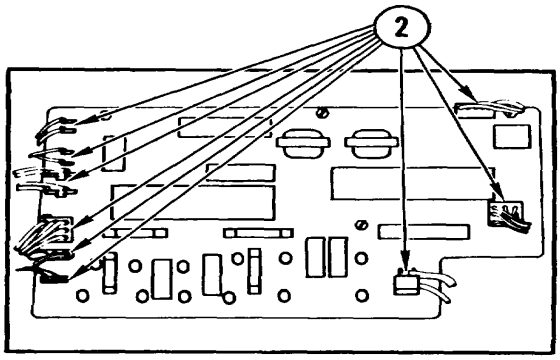


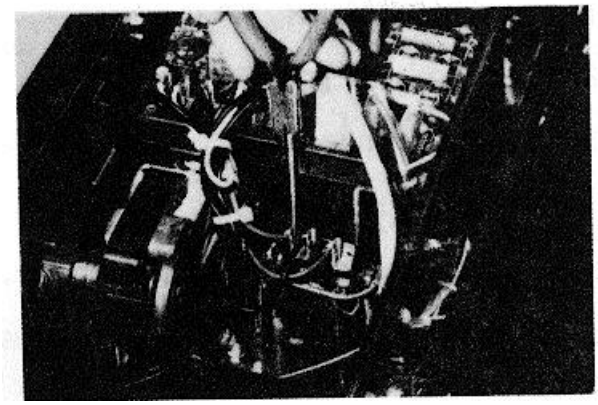
Replace

1. Coat gears lightly with grease.
2. Push gears on posts.
3. Push retaining rings onto gears.
4. Slip on VFU drive belt.
5. Slide jackshaft in direction shown.
6. Replace jackshaft (para 4-38, steps 2-20).

4-62. REMOVE/REPLACE POWER SUPPLY ASSEMBLY

INITIAL SETUP	
Common Tools • Tool kit	Materials/Spare Parts • Tags • Tie wraps • Pen or pencil

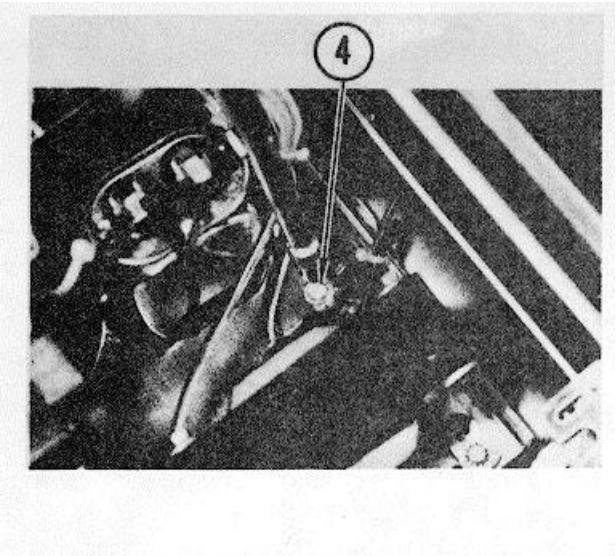




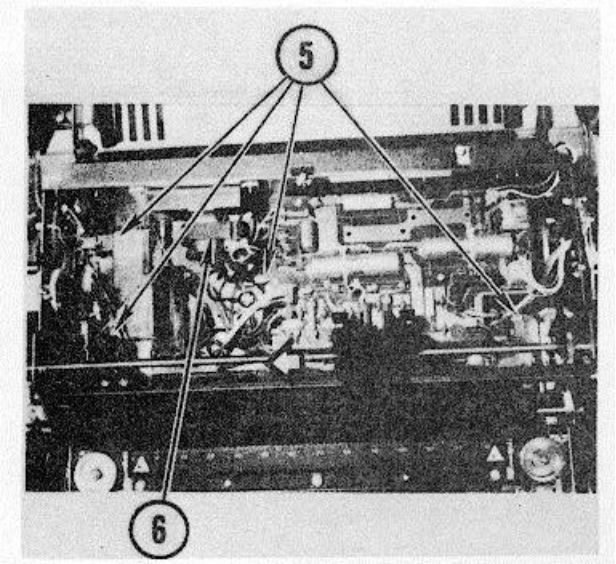
Remove

1. Access line printer (para 4-18).
2. Tag and pull connectors from XPS board.
3. Tag and disconnect leads from motor start capacitor.

4-62. REMOVE/REPLACE POWER SUPPLY ASSEMBLY (CONT)



4. Remove screw and washers holding grounding cables.



5. Remove four screws from base of power supply.

6. Remove rear fan assembly (para 4-30). Slide paper tractors to left side of printer.

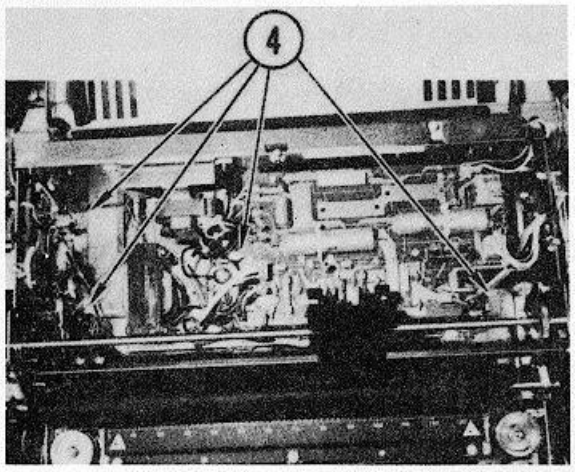
7. Cut tie wraps until assembly is free.

WARNING

Power supply assembly is heavy. Lift carefully.

8. Lift out power supply.

4-62. REMOVE/REPLACE POWER SUPPLY ASSEMBLY (CONT)



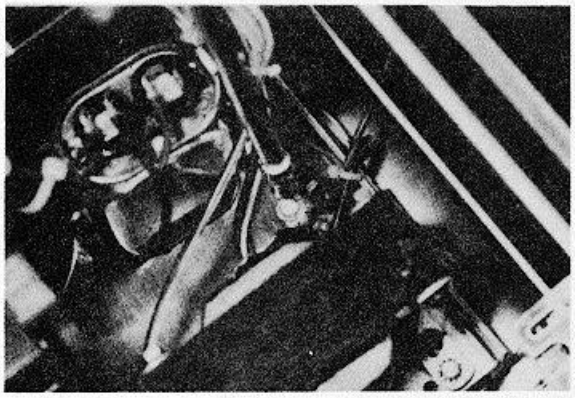
Replace

1. Make sure all wires are clear of power supply.
2. Lower power supply into frame.
3. Replace rear cooling fan (para 4-30).

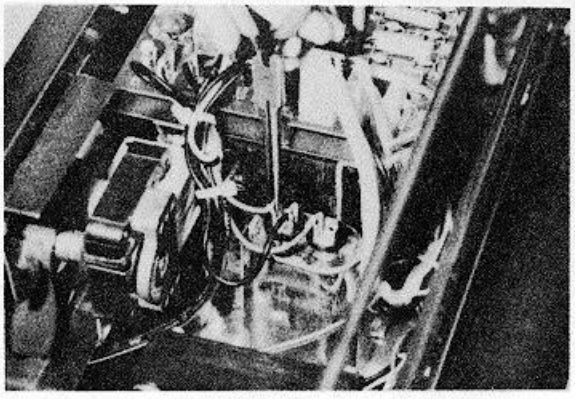
CAUTION

Overtightening will twist off screw heads.

4. Insert four screws in base of power supply. Tighten.

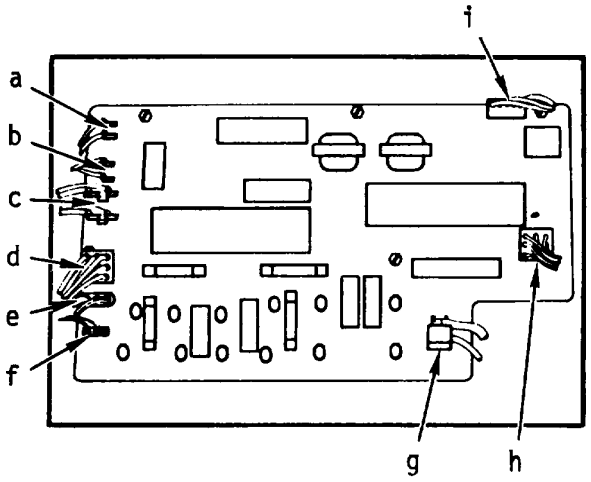


5. Insert screw and washers securing grounding cables. Tighten.



6. Connect leads to motor start capacitor. Red lead to connector marked in red. Black and blue leads to rear terminal.

4-62. REMOVE/REPLACE POWER SUPPLY ASSEMBLY (CONT)



7. Connect wires to XPS board, and install tie wraps.

   a. Two white TRANSFORMER wires. Non-polarized.

   b. Two black FAN wires. Non-polarized.

   c. Four MOTOR wires. Connect one black and one yellow wire to rear lead. Connect two black wires to front lead.

   d. P5 to J5. Six white, two black wires.

   e. P6 to J6. Orange wires.

   f. Linefeed solenoid.

   g. Capacitor wires. One white, one blue.

   h. P3 to J3. Six white wires.

   i. Ac cable input.

8. Close up line printer (para 4-18).

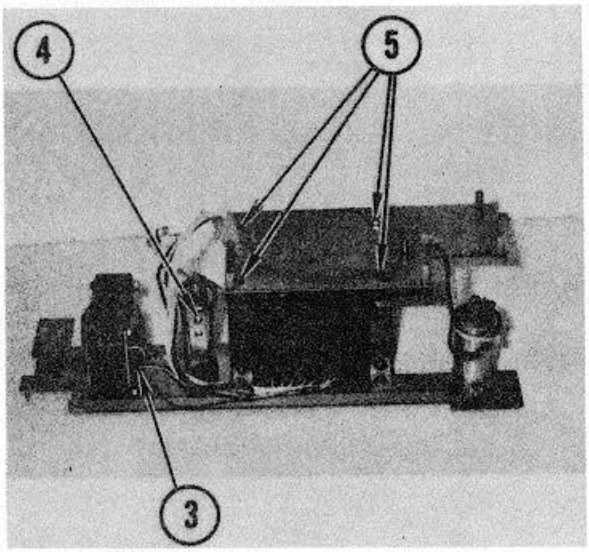
9. Place hand near rear fan assembly.

   - If air blows, go to step 10
   - If not, access XPS board. Check wire connections in step 7

10. On control panel, press TEST button.

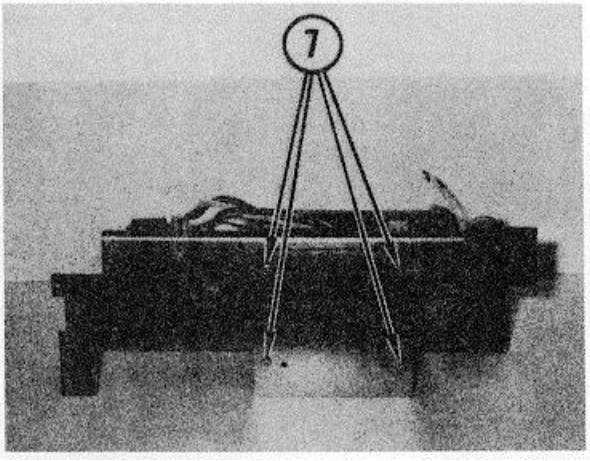
4-63. REMOVE/REPLACE TRANSFORMER

INITIAL SETUP	
Common Tools Tool kit	Materials/Spare Parts • Tape • Tags • Pen or pencil • Tie wraps



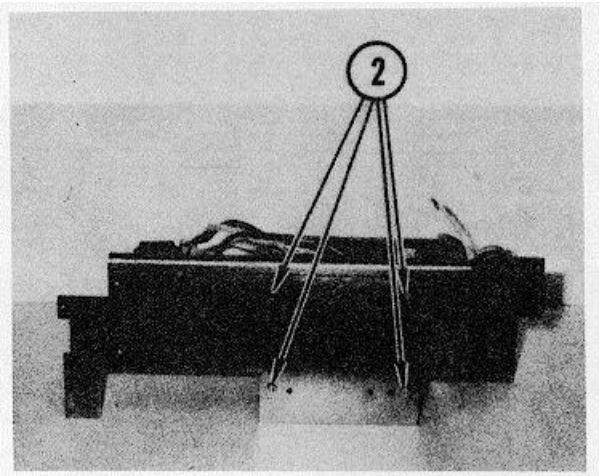
Remove

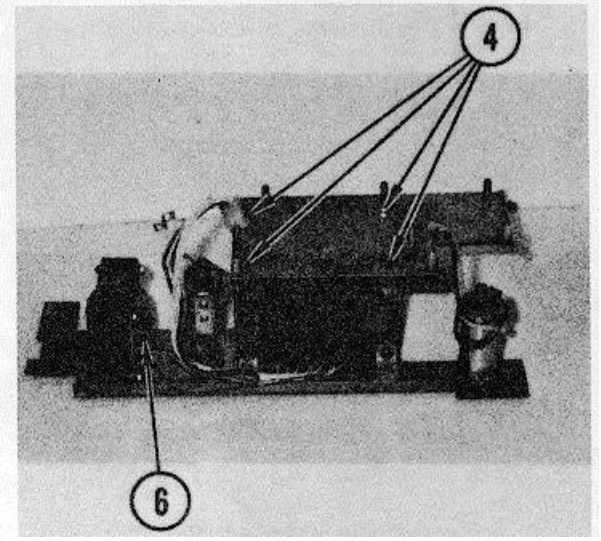
1. Remove XPS board (para 4-65).
2. Remove power supply (para 4-62).
3. Tag wires. Pull off wires.
4. Cut tie wraps.
5. Remove nuts and bolts or screws.



6. Position power supply as shown.
7. Remove nuts and bolts or screws.
8. Pull out transformer.

4-63. REMOVE/REPLACE TRANSFORMER (CONT)





Replace

1. Place transformer in power supply.
2. Replace screws.
3. Position power supply as shown.
4. Replace screw.
5. Replace tie wraps.
6. Push on wires.
7. Replace power supply (para 4-62).
8. Replace XPS board (para 4-65).

4-64. REMOVE/REPLACE POWER SUPPLY CAPACITORS AND REACTOR

INITIAL SETUP	
Common Tools • Tool kit	Materials/Spare Parts • Tags • Pen or pencil • Tie wraps

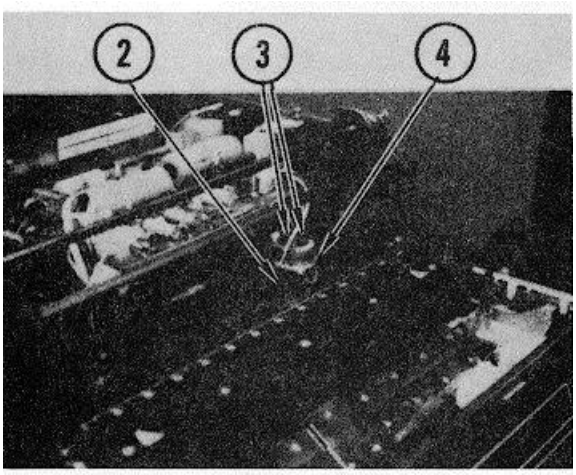
Remove

1. Access line printer (para 4-18).

NOTE

If you are removing only one component, do only the steps for removal of that component:

- C1 capacitor (steps 2-6)
- Motor start capacitor (steps 7-10)
- L1 reactor (steps 11-16)

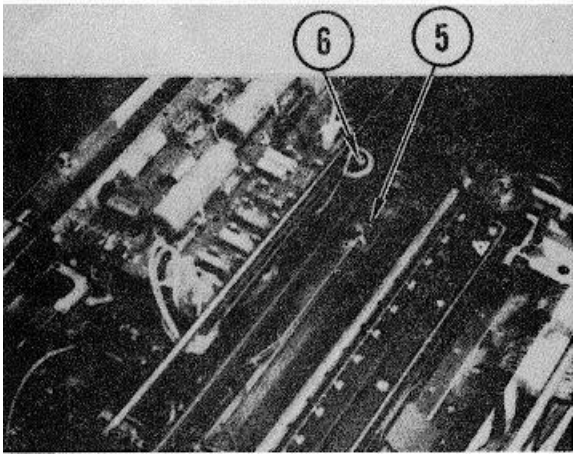


WARNING

Capacitor may contain dangerously high voltage.

2. Ground capacitor.

3. Tag wires, then remove screws, washers, and wires.

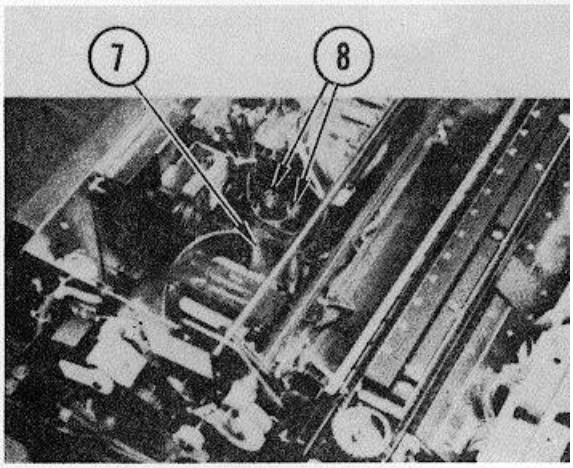


4. Cut tie wrap.

5. Loosen screw, washer, and nut in mounting bracket.

6. Lift out capacitor.

4-64. REMOVE/REPLACE POWER SUPPLY CAPACITORS AND REACTOR (CONT)

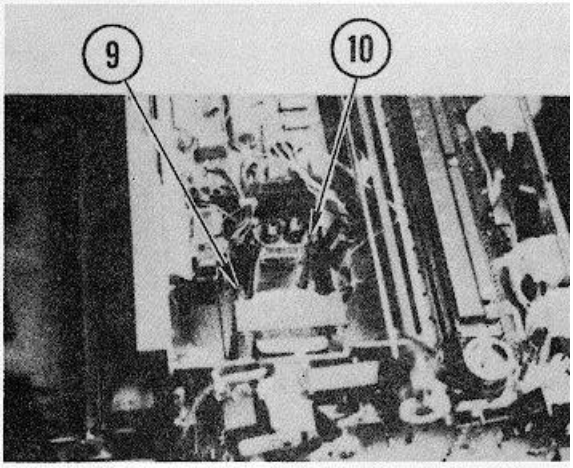


WARNING

Capacitor may contain dangerously high voltage.

7. Ground capacitor.
8. Tag, then remove wire leads.

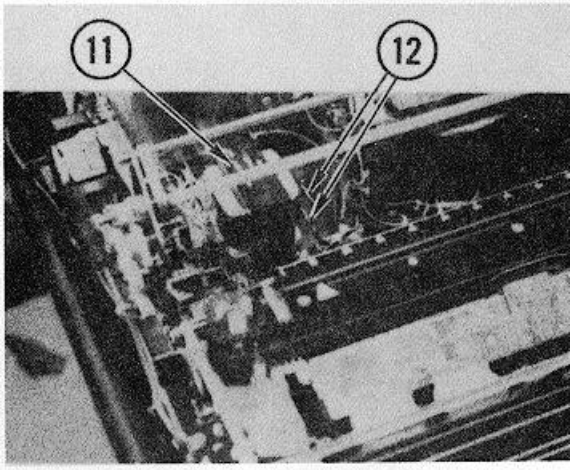
9. Remove screw. Pull off mounting clamp.



10. Lift out capacitor from under other mounting clamp.

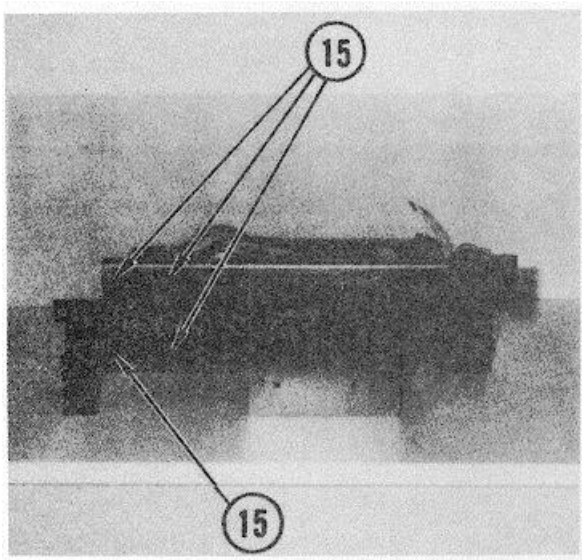
11. Locate reactor.

12. Tag, then remove wire leads.



13. Remove power supply assembly (para 4-62, steps 2-8).

4-64. REMOVE/REPLACE POWER SUPPLY CAPACITORS AND REACTOR (CONT)



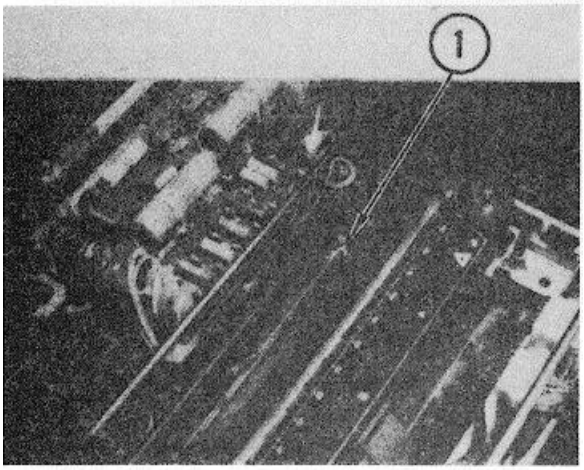
14. Position power supply as shown.
15. Remove screws, washers, and nuts.
16. Lift off reactor.

Replace

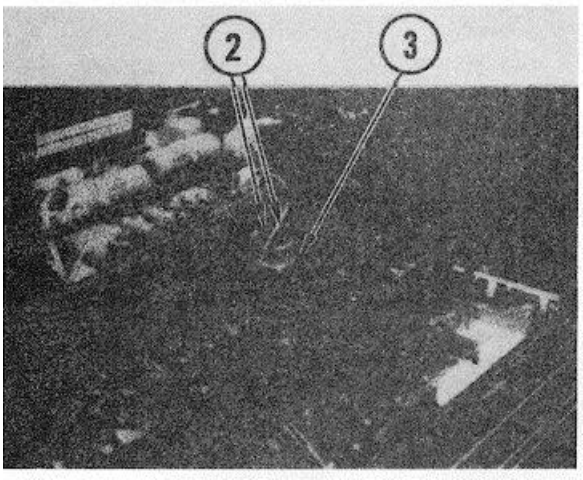
NOTE

If you are replacing only one component, do only the steps for replacement of that component:

- C1 capacitor (steps 1-4)
- Motor start capacitor (steps 5-8)
- L1 reactor (steps 9-15)

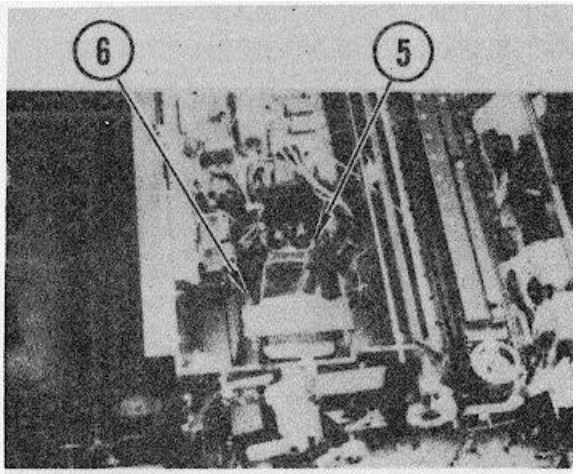


1. Position capacitor in mounting bracket. Tighten screw, washer, and nut.



2. Replace wires. Replace and tighten screws and washers.
3. Install wire wrap.
4. Close up line printer (para 4-8).

4-64. REMOVE/REPLACE POWER SUPPLY CAPACITORS AND REACTOR (CONT)

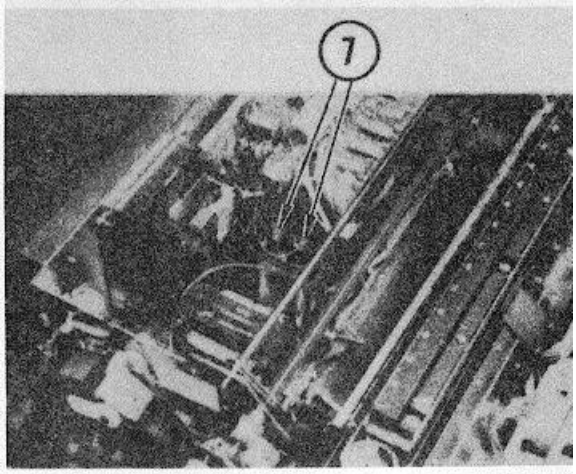


NOTE

Right wire leads on capacitor are thicker than left wire leads.

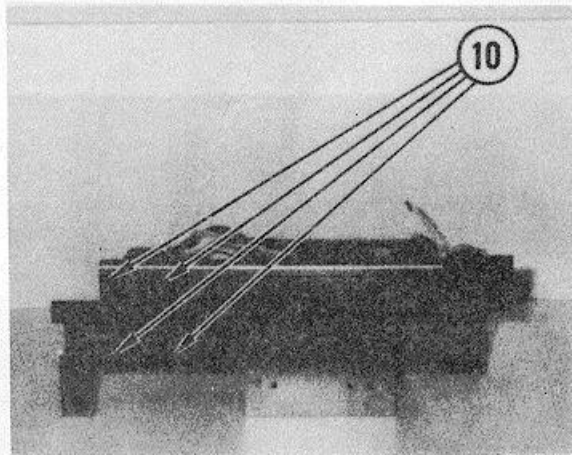
5. Place capacitor in position under right mounting clamp.

6 Replace left mounting clamp. Replace and tighten screw.



7. Replace wire leads.

8. lose up line printer (para 4-18).

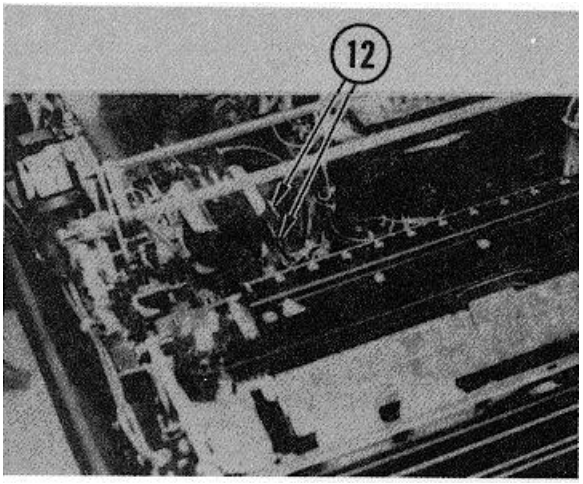


9. Position reactor on power supply assembly.

10. Replace and tighten screws, washers, and nuts.

11. Replace power supply assembly (para 4-62, steps 1-7).

4-64. REMOVE/REPLACE POWER SUPPLY CAPACITORS AND REACTOR (CONT)



12. Replace wire leads.

13. Close up line printer (para 4-18).

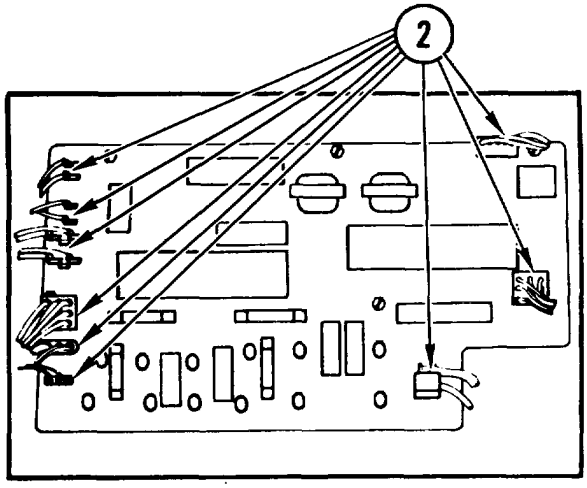
14. Place hand near fan assembly.

    - If you can feel air blowing, go to step 15
    - If not, access XPS board. Check wire connections (para 4-62, Replace, step 7)

15. On control panel, press TEST button.

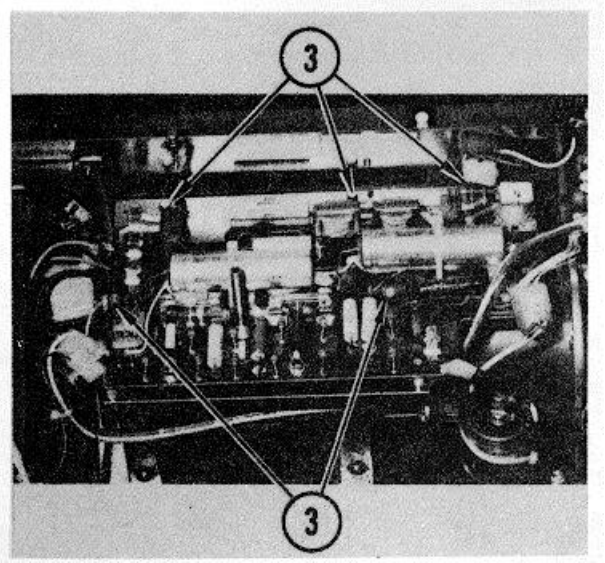
4-65. REMOVE/REPLACE POWER SUPPLY (XPS) BOARD

INITIAL SETUP
Common Tools
• Tool kit



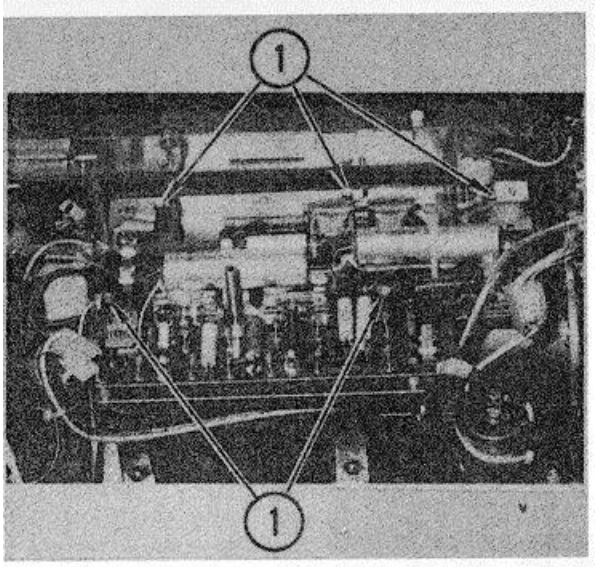
Remove

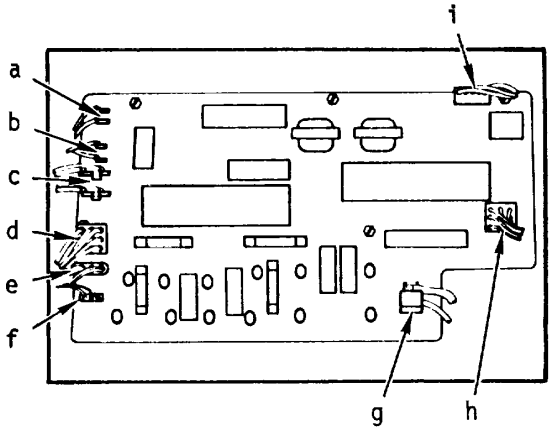
1. Access line printer (para 4-18, steps 1-7).
2. Disconnect all connectors from XPS board.



3. Take out five screws holding XPS board to power supply.
4. Lift out board.
5. Pull off plate. Pull off switch.

4-65. REMOVE/REPLACE POWER SUPPLY (XPS) BOARD (CONT)





Replace

1. Replace and tighten five screws holding XPS board to power supply.

2. Replace all connectors on XPS board.

   a. Two white TRANSFORMER wires (non-polarized).

   b. Two black FAN wires (non- polarized).

   c. Four MOTOR wires. Connect one black and one yellow wire to rear lead. Connect two black wires to front lead.

   d. P5 to J5. Six white, two black wires.

   e. P6 to J6. Orange wires.

   f. Linefeed solenoid.

   g. Capacitor leads. One white, one blue.

   h. P3 to J3. 6 white wires.

   i. Ac cable input.

3. Close up line printer (para 4-18, steps 2-8).

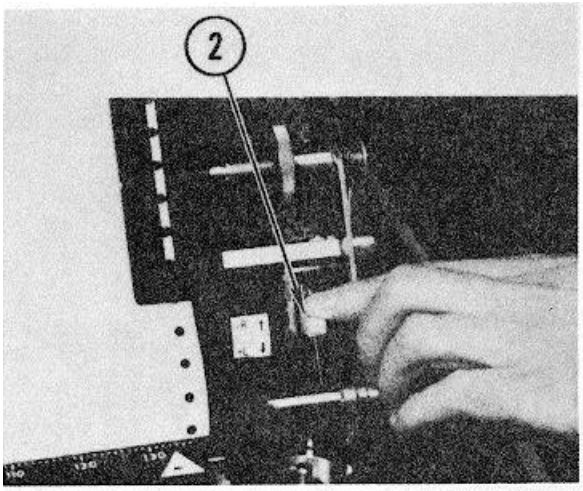
4. On control panel, press TEST button.

4-66. REMOVE/REPLACE RUN/LOAD SWITCH

INITIAL SETUP

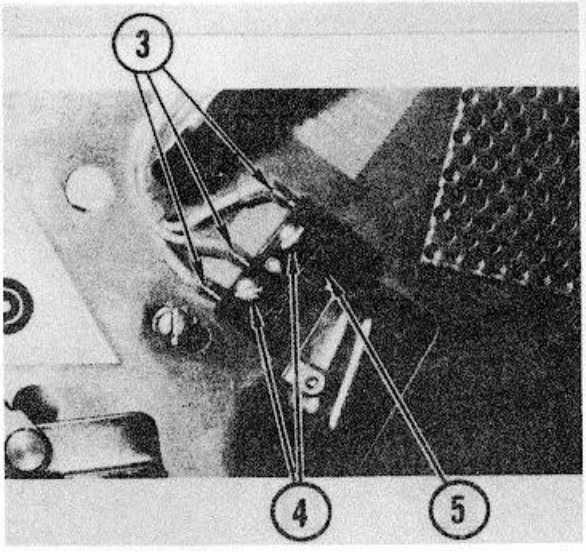
Common Tools
- Tool kit

Materials/Spare Parts
- Tape
- Pen or pencil
- Tags



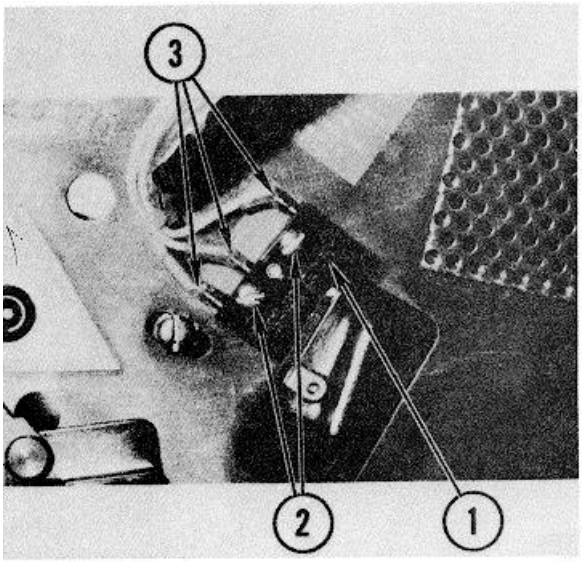
Remove

1. Access line printer (para 4-18).
2. Push in, then press RUN/LOAD lever down to L.



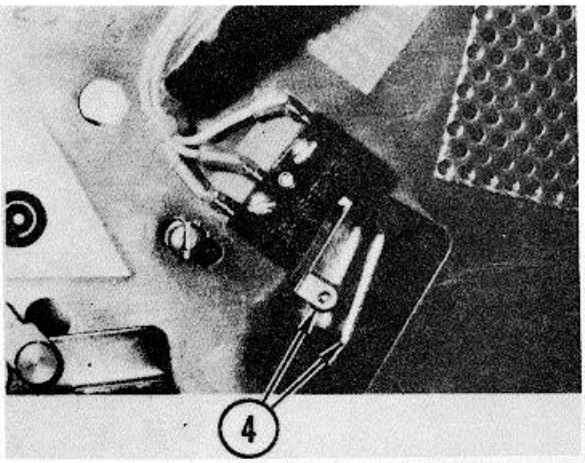
3. Tag wires. Pull back sleeving. Unsolder wires.
4. Remove screws.
5. Pull off plate. Pull off switch.

4-66. REMOVE/REPLACE RUN/LOAD SWITCH (CONT)

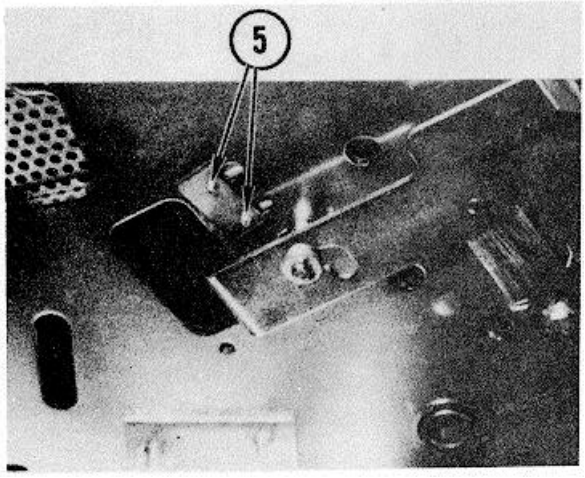


Replace

1. Push on switch. Push on plate.
2. Replace screws. Do not tighten.
3. Solder wires to switch. Push sleeving over solder.

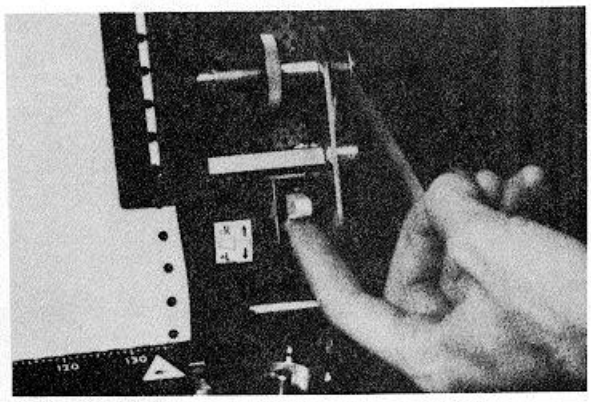


4. Check switch.
   - If switch arm does not touch lever, as shown, go to step 6
   - If switch arm touches lever, go to step 5

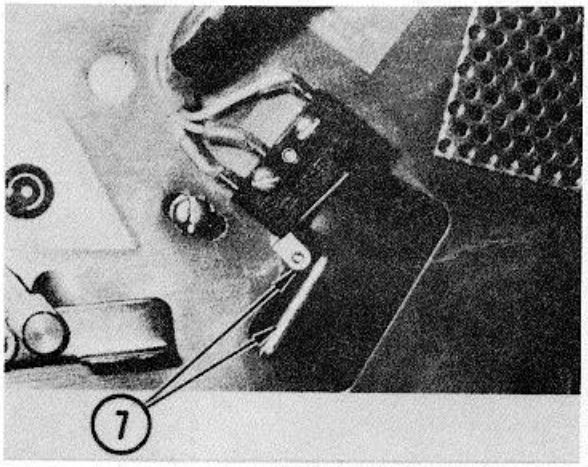


5. Move screws in direction shown until switch arm does not touch lever. Go back to step 4.

4-66. REMOVE/REPLACE RUN/LOAD SWITCH (CONT)

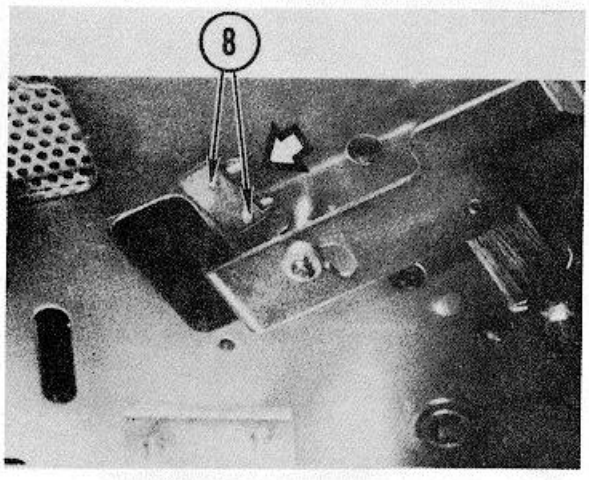


6. Pull up RUN/LOAD lever to R.



7. Check switch.

   - If switch arm touches lever, as shown, tighten screws. Go to step 9
   - If switch arm does not touch lever, go to step 8



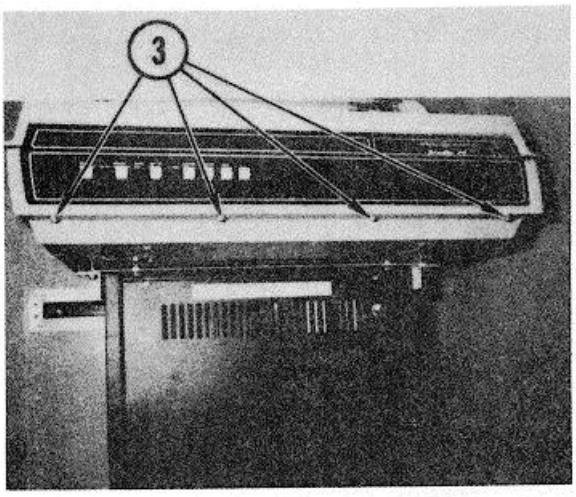
8. Move screws in direction shown until switch arm touches lever. Go back to step 7.

9. Close up line printer (para 4-18).

10. On control panel, press TEST button.

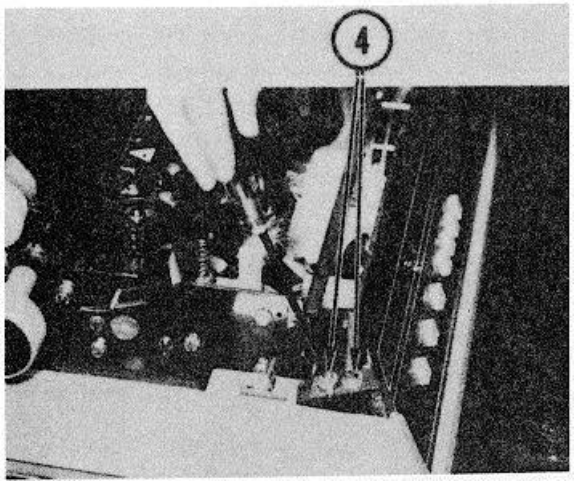
4-67. REMOVE/REPLACE CONTROL PANEL (LCP) BOARD

INITIAL SETUP
Common Tools
• Tool kit



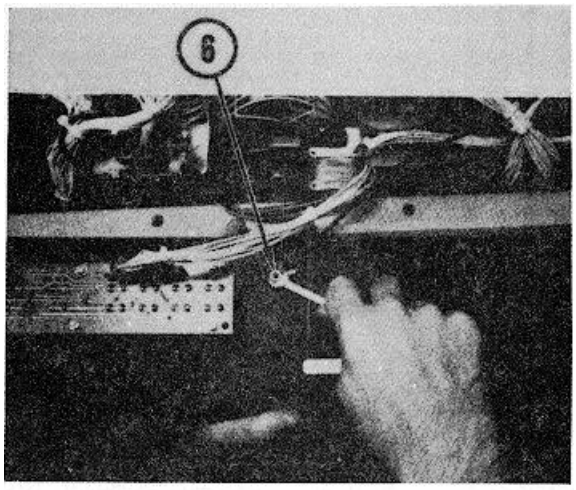
Remove

1. Power off. Pull ac plug from outlet.
2. Open cover.
3. Remove four screws. Keep these screws separate.

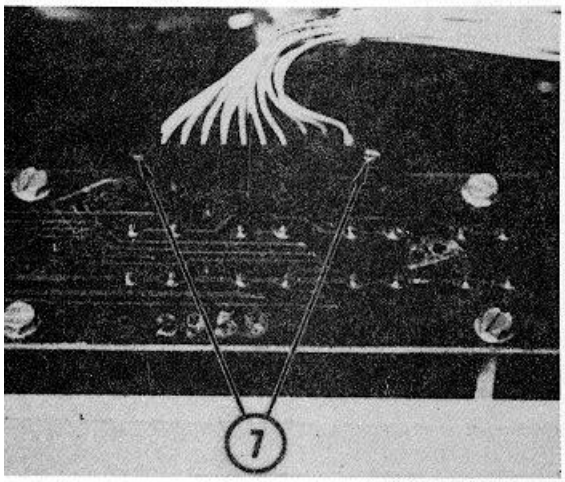


4. Remove two screws and washers from each end of control panel.
5. Lift up control panel. Turn it face down.

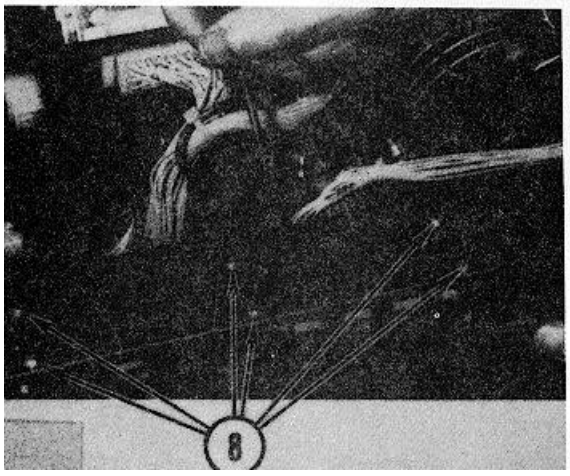
4-67. REMOVE/REPLACE CONTROL PANEL (LCP) BOARD (CONT)



6. To free grounding cable, remove screw and washers.



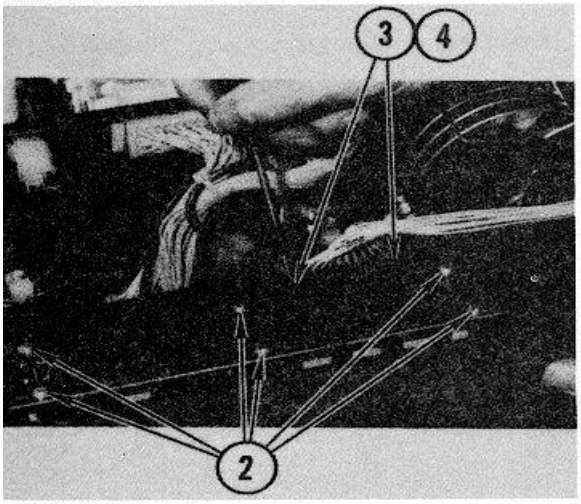
7. Remove two screws from connector. Pull out connector from LCP board.

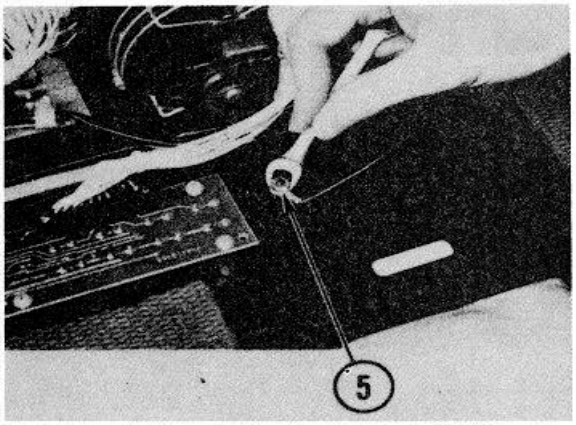


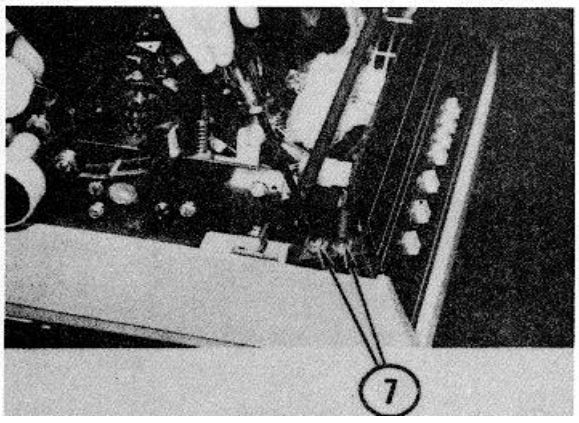
8. Remove screws.

9. Lift out LCP board.

4-67. REMOVE/REPLACE CONTROL PANEL (LCP) BOARD (CONT)



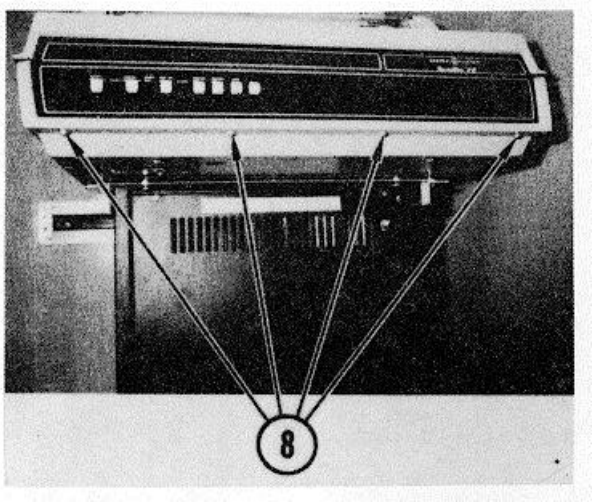




Replace

1. Place LCP board on spacers.
2. Tighten screws.
3. Push connector onto pins in LCP board.
4. Replace and tighten screws.
5. Replace grounding cable. Replace screw and washers. Tighten.
6. Insert control panel into printer.
7. Replace washers and two screws at both ends of control panel. Do not tighten.

4-67. REMOVE/REPLACE CONTROL PANEL (LCP) BOARD (CONT)



8. Replace four screws.

9. Tighten two screws at both ends of control panel.

10. Close cover.

11. Push ac plug into outlet. Power on.

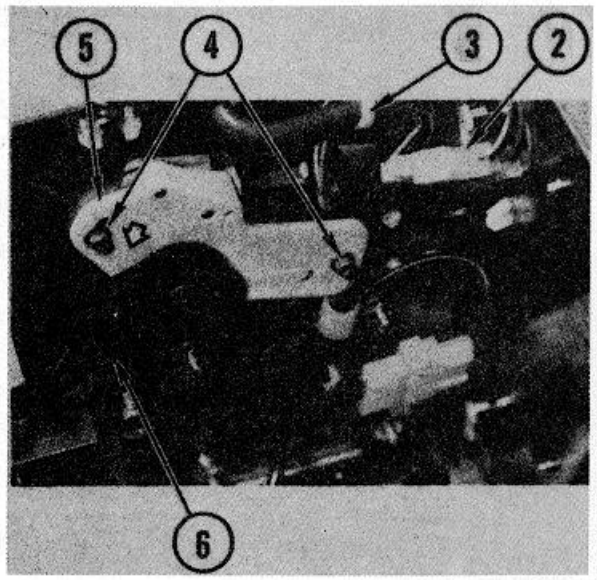
12. On control panel, press TEST button.

4-68. REMOVE/REPLACE VFU ASSEMBLY

INITIAL SETUP

Common Tools
- Tool kit
- Belt tension gauge

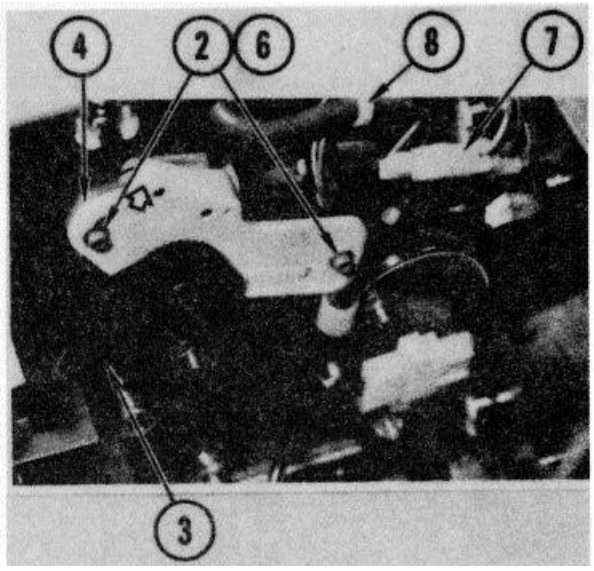
Materials/Spare Parts
- Tie wraps



Remove

1. Access line printer (para 4-18).
2. Pull apart VFU cable connector.
3. Cut tie wrap.
4. Loosen screws enough to move VFU assembly.
5. To loosen drive belt, push down here.
6. Remove belt.
7. Remove screws loosened in step 4.
8. Pull out VFU assembly.

4-68. REMOVE/REPLACE VFU ASSEMBLY (CONT)

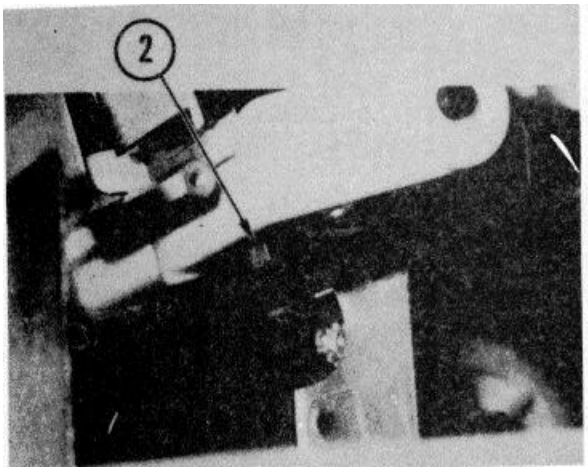


Replace

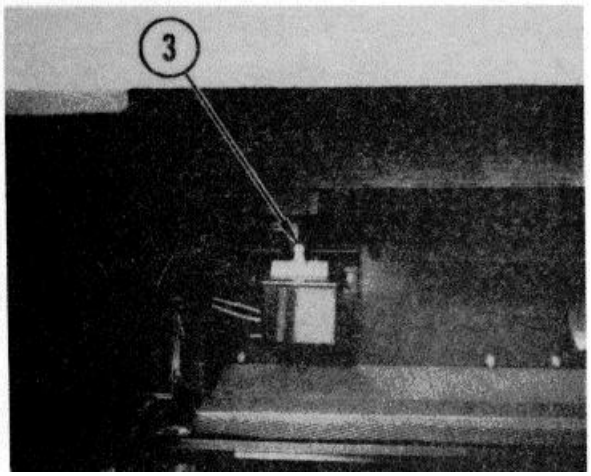
1. Push VFU assembly in place.
2. Replace and hand-tighten screws.
3. Slip on belt.
4. Move VFU assembly in direction shown to tighten belt.
5. Adjust belt tension so that 2 ounces pressure gives a 1/8 in. deflection.
6. When adjustment is correct, tighten screws.
7. Push together VFU wire connector.
8. Tie wrap VFU wire to chassis.
9. Install VFU punched tape.
10. Install paper.
11. Adjust VFU assembly (para 4-69, steps 2-12).

4-69. ADJUST VFU ASSEMBLY

INITIAL SETUP
Common Tools
- Tool kit

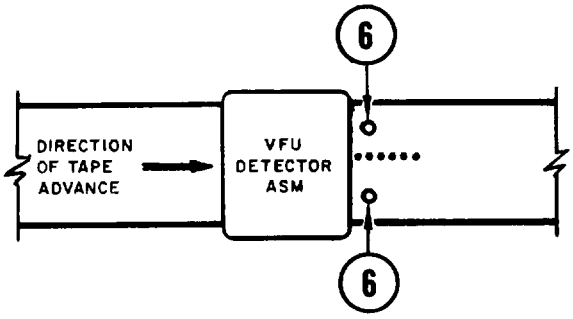


1. Access line printer (para 4-18).
2. Loosen VFU detector adjust screw.

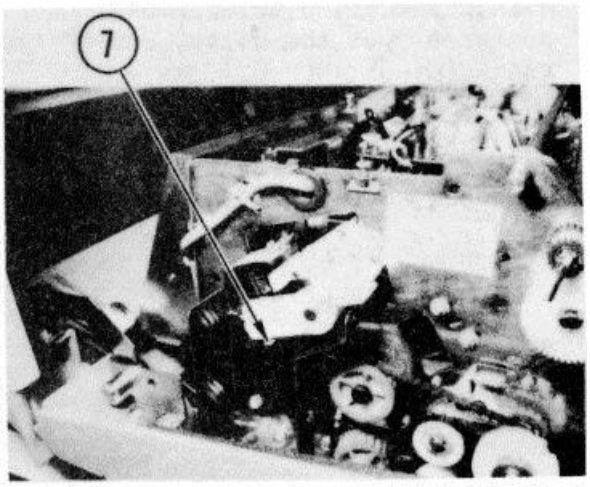


3. Pull up top cover interlock swith.
4. Power on. Tape down paper out switch.
5. On control panel, press LINEFEED button so that VFU tape will move.

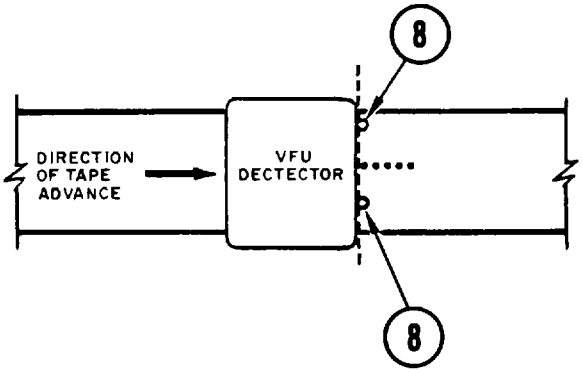
4-69. ADJUST VFU ASSEMBLY (CONT)



6. Press LINEFEED button until FF and/or VT holes appear next to detector assembly.

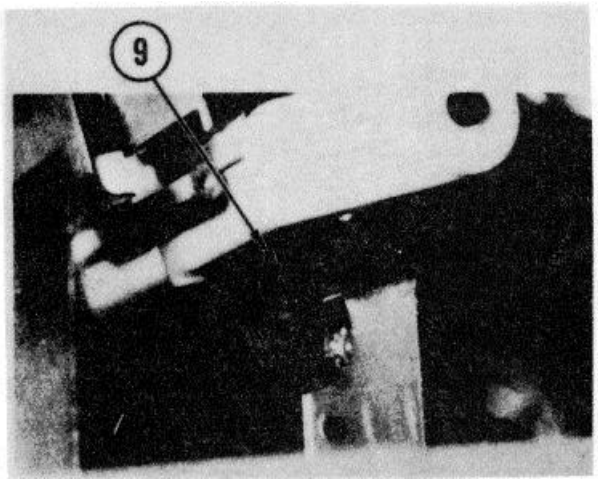


7. Locate adjustment lever.



8. Using adjustment lever, move detector assembly so that FF and/or VT holes are lined up with edge of detector, as shown.

4-69. ADJUST VFU ASSEMBLY (CONT)



CAUTION

Do not overtighten adjustment screw. Make sure detector does not move while adjustment screw is being tightened.

9. Snug adjust screw.

CAUTION

To ensure error-free operation of the VFU, it is extremely important that the clearance between linefeed solenoid arm and clutch lobe be kept within specified tolerances, preferably at the bottom end of the range (0.005 inch/0.13 mm).

10. Check adjustment of linefeed solenoid. If necessary, adjust linefeed solenoid (para 4-44, steps 2-14).

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

12. Synchronize VFU top-of-form code hole with paper top of form (TM 11-7025-210-10).

APPENDIX A
REFERENCES

A-1. INTRODUCTION

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 Shipping 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

Operator's Manual: Line Printer RP-273/MYQ-4 ..... TM 11-7025-210-10
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 line printer. 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 for the line printer. 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.

The following paragraphs of section I present maintenance function definitions, explanation of MAC column entries, and explanation of column entries of the tool and test equipment requirements section. Section II presents the MAC for the line printer and section III presents the tool and test equipment requirements for the line printer.

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 the 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" figure 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 equired 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.

Explanation of Column Entries of Tool and Test Equipment Requirements Table.

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 Federlal Supply Code for the Manufacturer (5 digit) in parentheses, when these numbers are fully identified.

SECTION II MAINTENANCE ALLOCATION CHART
FOR LINE PRINTER RP-273/MYQ-4

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
07	Line Printer (RP273/MYQ-4)	Service		0.3				1, 13, 15, 16, 18, 19	F
		Test			0.3			2, 4, 5	
		Replace			0.5			1, 3, 14'	
		Repair			0.5			1, 3, 5, 6, 7, 8, 9, 10, 11, 12, 14, 17	
		Overhaul					80.0		A
0701	Bustle Frame Assy.	Test			0.5			2, 5	
		Repair			1.0			1, 5	
070101	Circuit Card Assy.	Test			0.6			2	
		Replace			2.0			1	
		Repair					0.5		A
070102	Switch Cover Assy.	Replace			0.1			1	
		Repair			0.1			1	
070103	Circuit Card Assy.	Test			0.4			2	
		Replace			0.1			1	
		Repair					0.5		A
070104	Circuit Card Assy.	Test			0.4			2	
		Replace			0.1			1	
		Repair					0.5		A
070105	Circuit Card Assy.	Test			0.4			2	
		Replace			0.1			1	
		Repair					0.5		A
070106	Circuit Card Assy.	Test				0.4		2	
		Replace			0.1			1	
		Repair					0.5		A
070107	Circuit Card Assy.	Test			0.4			2	
		Replace			0.1			1	
		Repair					0.5		A
070108	Capacitor Shelf Assy.	Test			0.6			1, 5	
		Repair			0.8			1, 5	

SECTION II MAINTENANCE ALLOCATION CHART
FOR LINE PRINTER RP-273/MYQ-4

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
0702	Hammerbank Assy.	Test			0.5			1, 3	
		Replace			1.5			1, 3	
		Repair			0.2			1, 3	
		Repair					1.0		A
070201	Drive Support Assy.	Test			0.1			1	
		Repair			0.5			1, 9	
070202	Tension Support	Test			0.1			1, 11	
		Repair			0.5			1, 9, 11	
070203	Hammer Bar Assy.	Replace					0.4		A
		Repair					0.5		A
0703	Belt & Type Assy.	Replace			0.2			1, 10	
		Repair			0.2			1, 6, 10	
0704	Platen & Gear Assy.	Test			0.1			1, 11	
		Replace			0.1				
		Repair					1.0		A
0705	Power Supply	Test			0.3			2, 5	
		Replace			0.2			1	
		Repair			0.5			1	
070501	Circuit Card Assy.	Test			0.3			1	
		Replace			0.5			1	
		Repair			0.2				D
		Repair					0.5		A
0706	Universal Wire Harness	Test			1.0			5	
		Repair			0.4			1, 5, 11	E
		Repair					1.0		A
0707	Control Panel	Test			0.4			2, 5	
		Replace			0.3			1	
		Repair			0.3			1, 4, 5	
070701	Printed Wiring Bd.	Test			0.4			2	
		Inspect			0.5				
		Replace			0.2			1	
		Repair					0.3		A
0708	Vertical Format Unit	Test			0.3				
		Adjust			0.1			1, 11	
		Replace			0.2				
		Repair					0.3		A

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS FOR LINE PRINTER RP-273/MYQ-4

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O, F	Tool Kit Electronic Equipment TK17	5180-01-023-4982	
2	O, F	T&V Pack (Standard Part of DAS3 System)	TBD	HIS SHU 152J (33322)
3	F	Decimal Socket Set	5120-00-247-0748	
4	F	Oscilloscope, 05S-261/C	6625-00-127-0079	
5	F	Multimeter, Digital AN/USM-451	6625-01-060-6804	
6	F	Drive Adjustment Lock Screw	5305-01-119-3091	
7	F	Timing Gauge	5895-01-085-5468	
8	F	Bearing Puller Tool	5120-01-059-5029	
9	F	Pulley Alignment Gauge	5120-01-059-8916	
10	F	Finger Removal Pliers	5120-01-059-5030	
11	F	Belt Tension Gauge (0-72 oz)	6635-00-246-8465	
12	F	Screwdriver, Stubby, Phillips	TBD	HIS97017133-001 (33322)
13	F	Brush, Bristle	7920-01-101-6686	
14	F	Extension Light	6230-01-032-0677	
15	F	Vacuum Cleaner	TBD	51015030W (29335)
16	F	Solder Sucker	TBD	MB4 (30239)
17	F	Screwdriver, 1/8 x 8"	5120-01-039-6997	
18	F	Graphite Solution Molykote	TBD	44A410695-GO1 (01526)
19	F	Lubricant	TBD	TBD

SECTION IV MAINTENANCE ALLOCATION CHART FOR LINE PRINTER RP-273/MYQ-4

Reference Code	Remarks
A.	Repair by contractor.
B.	DS repair of 0107 Power Supply limited to replacement of fan and/or fuses.
C.	DS repair of 015 Power Distribution Unit limited to replacement of fuses.
D.	DUS repair of 070501 XPS/4 Board limited to replacement of fuses.
E.	DS repair of 0706 Universal Wire Harness limited to replacement of connectors and limit switch.
F.	See Technical System Manual for Complete Group Coding.

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 Line Printer RP-273/MYQ-4.

C-2. GENERAL

This list identifies items that do .not have to accompany Line Printer RP-273/MYQ-4 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
		7530-00-285-5836	Paper, Writing	
		5975-00-451-5001	Strap, Tiedown, 12-inch 96906 MS3367-3-9	FT
		7510-00-551-9823	Tape, Transparent, 3" Core	RO
		7530-00-264-5460	Label, White	BK
			Lubricant, DAG 200	

APPENDIX D
SCHEMATIC DIAGRAMS

Index of Schematic Diagrams

D-1. GENERAL

Appendix D illustrates and lists the major wire connections in the line printer as a help in troubleshooting.

D-2. DIAGRAMS

The following diagrams are arranged to show overall printer schematics, then the schematics of the mother board, the universal wire harness, and the hammers and frame.

a. Line Printer Interconnecting Block Diagram. This diagram (FO-1) provides information on wire connections between boards in the bustle and boards in the printer. It also provides information on wire connections between boards and the following switches and other components:

- Front/rear low paper switches
- Paper out switch
- RUN/LOAD switch
- Control panel switches
- Linefeed solenoid
- Bell

b. Mother Board Connection Diagram. This diagram (FO-2) provides information on wire connections between the following:

- Mother board and all bustle and printer boards
- Mother board and data communications cable connector
- Mother board and universal wire harness
- Mother board and linefeed connector

c. Universal Wire Harness Connections. This diagram (fig. D-1) and table (table D-1) illustrate wire connections between the universal wire harness and the following:

- Connector P1 on the LCP/3 board
- Connector P2 on the mother board
- Connector P3 on the XPS/3 board
- Connector P6 on the XPS/3 board
- Connector P13 on the bell
- Paper out switch
- Paper low switch
- RUN/LOAD switch
- Three grounds

d. Universal Wire Harness Wire and Connector Pin Numbers. This diagram (fig. D-2) provides information for making a continuity check between the universal wire harness and its various connections.

e. Hammer and Frame Connection Diagram. This diagram (FO-3) provides information on wire connection between the boards, attached components, and frame grounding wires.

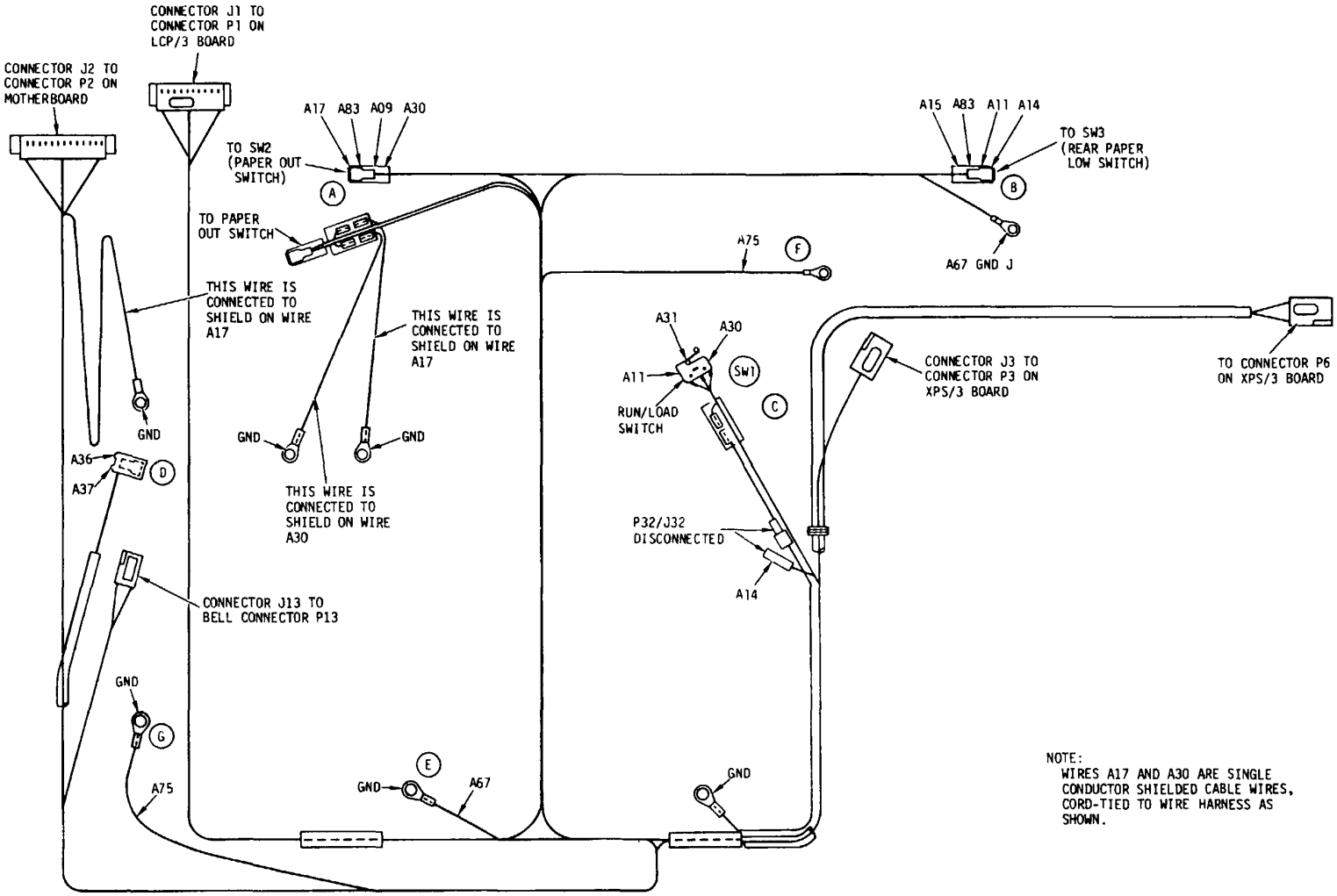


Figure D-1. Universal Wire Harness Connections

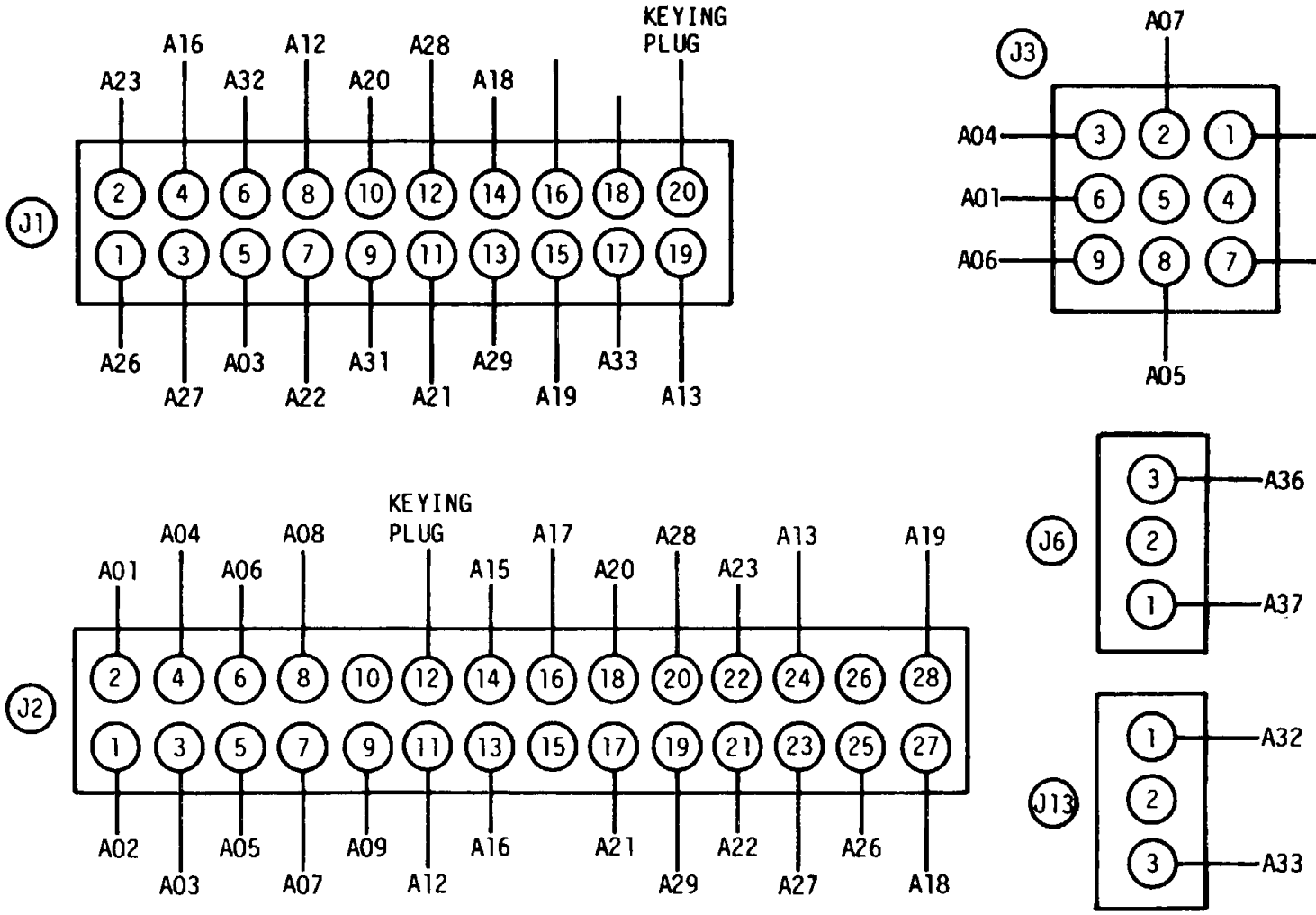


Figure D-2. Universal Wire Harness Wire and Connector Pin Numbers

Table D-1. Universal Wire Harness Wire Routing

WIRE MARKING	ROUTING	
	FROM	TO
A01	J2-2	J3-6
A02	J2-1	J3-7
A03	J2-3	J1-5
A04	J2-4	J3-3
A05	J2-5	J3-8
A06	J2-6	J3-9
A06	J2-7	J3-2
A08	J2-8	J3-1
A09	A **	J2-9
A83	A **	B **
A11	SW1-C**	B **
A12	J2-11	J1-8
A13	J2-24	J1-19
A14	J32	B**
A15	B **	J2-14
A16	J2-13	J1-4
A17	A **	J2-16
A18	J2-27	J1-14
A19	J2-28	J1-15
A20	J2-18	J-10
A21	J2-17	J1-11
A22	J2-21	J1-7
A23	J2-22	J1-2
--	--	--
--	--	--
A26	J2-25	J1-1
A27	J2-23	J1-3
A28	J2-20	J1-12
A29	J2-19	J1-13
--	--	--
A31	SW1 (NO)	J1-9
A32	J13-1	J1-6
A33	J13-3	J1-17
A17	A **	J2-16
A30	SW1 (NC)	A **
A36	J6-3	U **
A37	J6-1	D **
Keying Plug	J1-20	--
Keying Plug	J2-12	--
A67	B **	E **
A75	F **	G **

* Identifies the wire routing illustrated in figure D-1.
** Identifies connector areas in figure D-1.

GLOSSARY

Section I. DEFINITIONS OF SIGNAL NAMES

The following is a list of the most commonly used signal names and their definitions.

ACK	Acknowledge
ALML	Complement of Alarm Light
ALRM	Complement of Alarm
ANS	Answerback
BEL	Bell
BELS	Complement of Bell Signal
CBAR	Crowbar
D1-D8	Data lines 1 through 8
DBl-DB7	Complement of Data Bits 1 through 7
DSTB	Data Strobe
ECT	Even Commutate
EDR	Even Drive
EF	Even Finger
EHD	Even Hammer Drive
ELED	Even LED
EVNF	Even Finger
FCNT	Full Count
FCOM	Phototransistor Common
FEED	Paper Feed Signal
FEH	Fire Even Hammers
FF	Form Feed
FFPC	Formfeed Photocell
FFX	Complement of Formfeed Signal
FLTX	Complement of Fault Signal
FOH	Fire Odd Hammers
FRAME	Frame Ground
GND	Ground (Chassis)
HISX	Complement of Here Is Signal
HVL	High Voltage Low
HZ	Column Decoding Z line
HO	Column Decoding 0 Line
H2	Column Decoding 2 Line
H4	Column Decoding 4 Line
H6	Column Decoding 6 Line
H8	Column Decoding 8 Line
H10	Column Decoding 10 Line
H12	Column Decoding 12 line
H14	Column Decoding 14 Line
H16	Column Decoding 16 Line
H32	Column Decoding 32 Line
H48	Column Decoding 48 Line
H64	Column Decoding 64 Line
H80	Column Decoding 80 Line
H96	Column Decoding 96 Line
H112	Column Decoding 112 Line
H128	Column Decoding 128 Line

INT	Interrupt
INTX	Complement of Interrupt P.B.
LEDC	LED Common
LFSO	Linefeed Solenoid
LFX	Complement of Linefeed P.B.
LOPX	Complement of Low Paper Switch
LPFP	Low Paper from Printer
LTP	Ready Lamp
LV	Low Voltage
LVS	Low Voltage Signal for HVS
M+F	Motor or Paper Feed
MOF	Motor Off
MOFX	Complement of Motor Off P.B.
MON	Motor On
MONX	Complement of Motor On P.B.
MTR	Complement of Motor Signal
MTRL	Complement of Motor Light
MTRR	Complement of Motor Relay
OCT	Odd Commutate
ODDF	Odd Photocell
ODR	Odd Drive
OF	Odd Finger
OHD	Odd Hammer Drive
OLED	Odd LED
OSC	Oscillator Output
PC	Photocell
PER	Parity Error
PON	Power On
RFP	Ready from Printer
RLT	Complement of Ready Light
RTP	Ready to Printer
SOLl-SOL132	Solenoid Coil Connection for Print Position 1 through 132
SPKP	Sprocket Pulse
SPR1-SPR4	Spare #1 through Spare #4
SSTB	Slew Strobe
STB	Strobe
TSTX	Complement of Test P.B.
VT	Vertical Tab
VTFF	Vertical Tab Form Feed
VTPC	Vertical Tab Photocell
VTX	Complement of Vertical Tab P.B.
XFR	Complement of Transfer Signal
Z	Zener Diode Paralleling Connection
OV	Signal Ground

Section II. DEFINITION OF UNUSUAL TERMS

Crowbar (signal)	A signal from the power regulator on the power supply board (XPS) to the crowbar circuit on the power supply regulator board (PSR) that turns off the high voltage supply in case of overcurrent detection.
Voltage Transients	A temporary stray voltage that may consist of voltage spikes, static variations, or a second erratic voltage wave superimposed on the incoming voltage.

INDEX

SUBJECT **PARAGRAPH**

SUBJECT **L** **PARAGRAPH**

SUBJECT **P (CONT)** **PARAGRAPH**

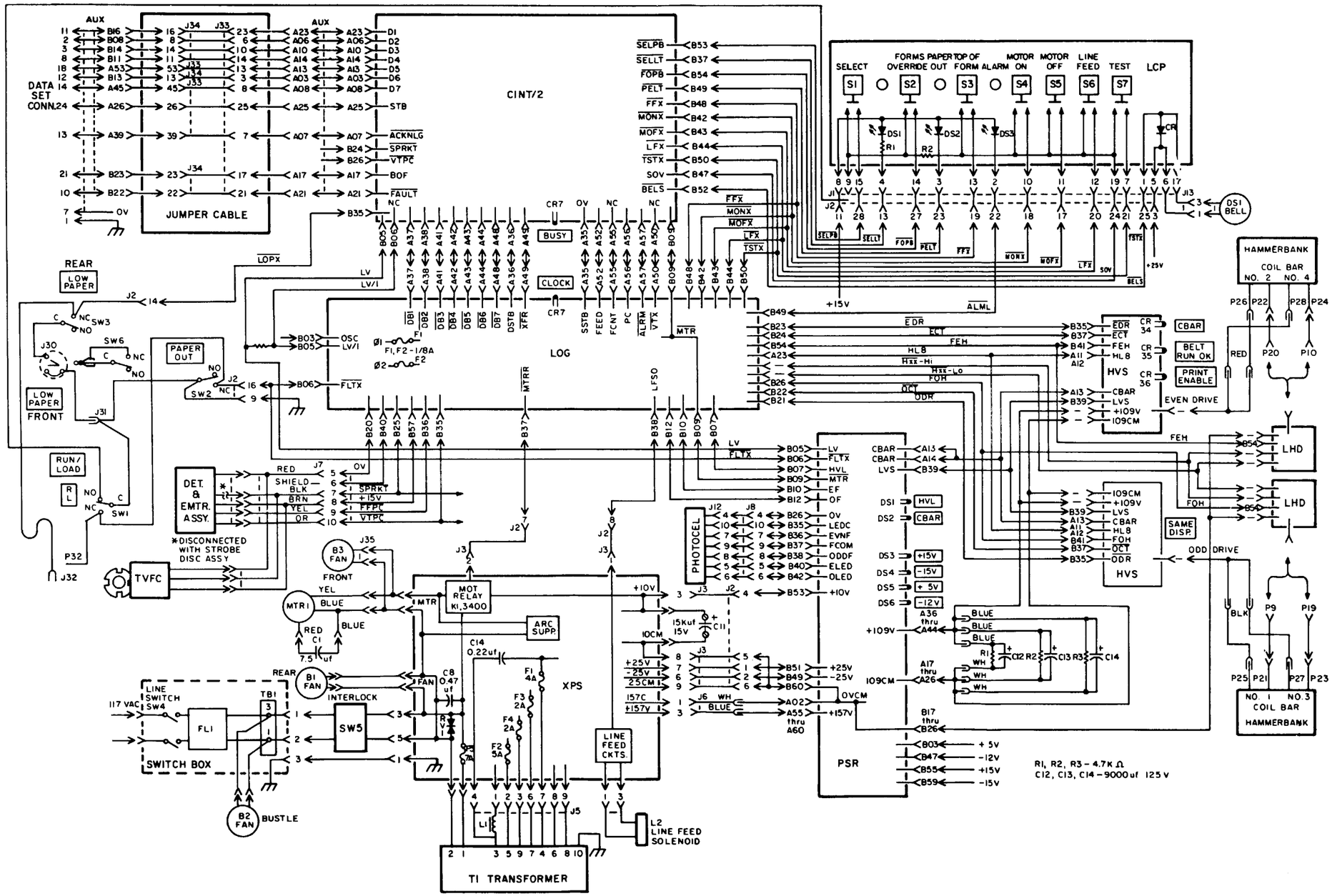
R

SUBJECT **R (CONT)** **PARAGRAPH**

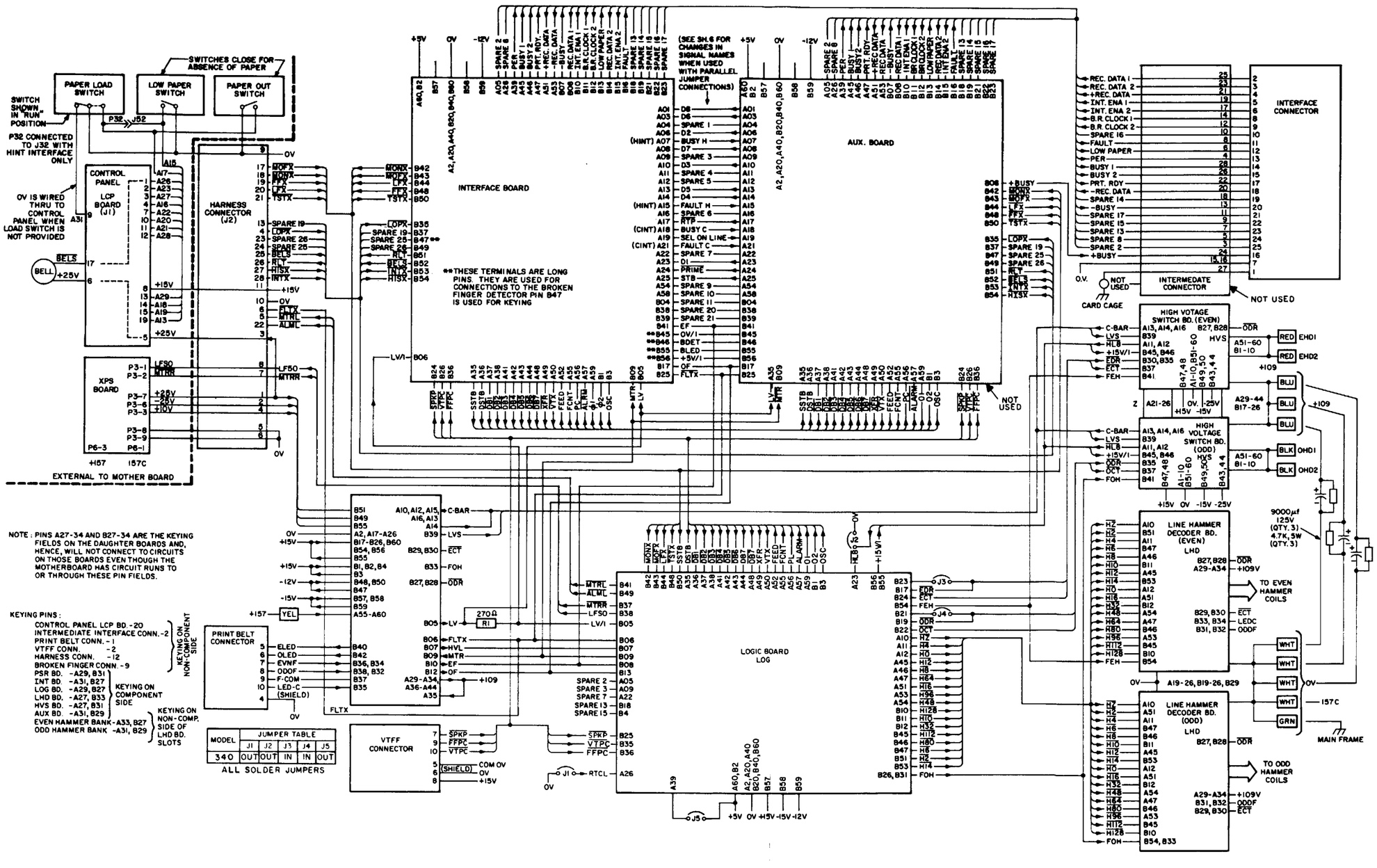
S

T

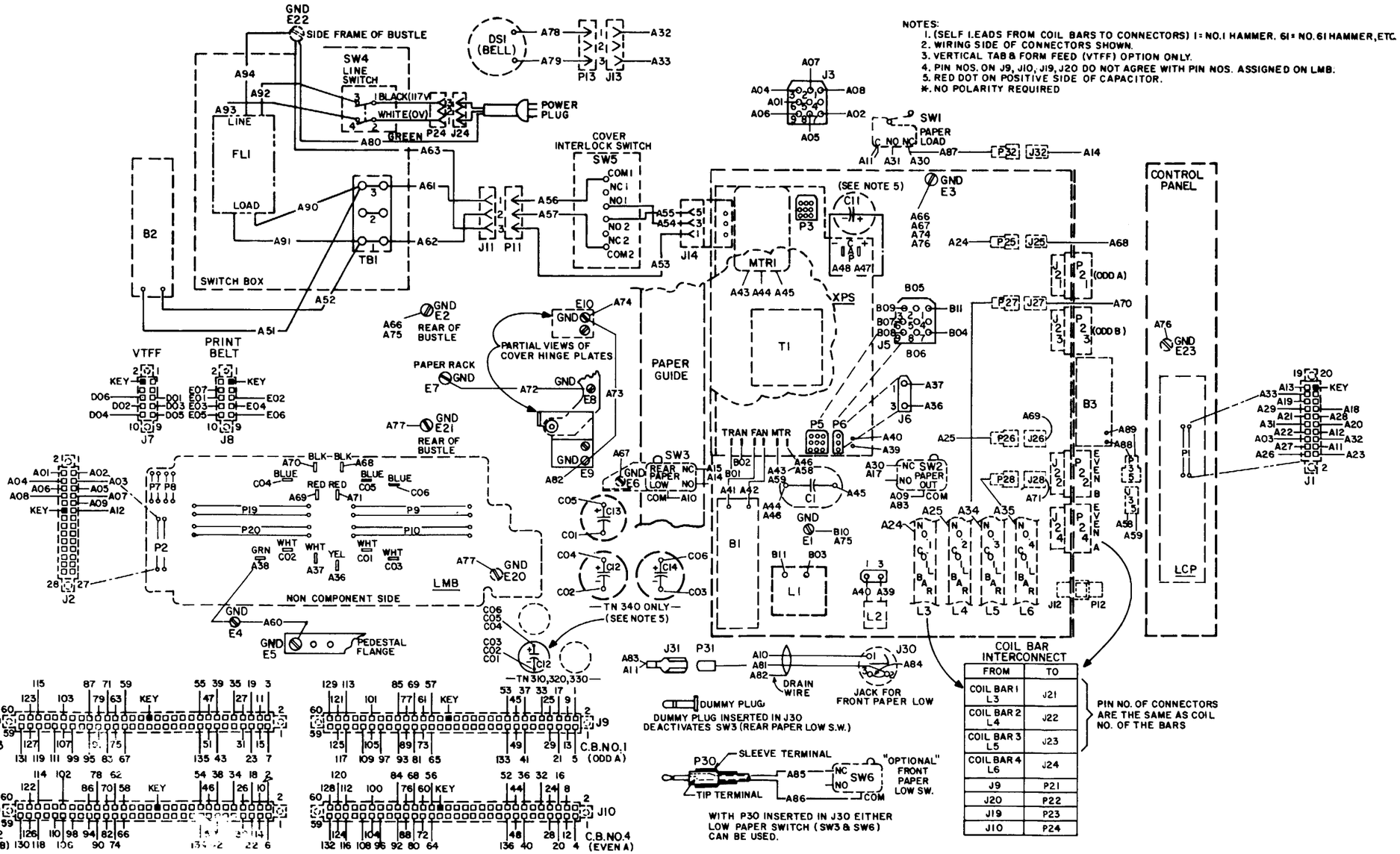
U



FO-1 Line Printer Interconnection Block Diagram



FO-2: Mother Board Connection Diagram



FO-3: hammer and Frame Connection Diagram

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