TP 760 LETTER QUALITY PRINTER

MAINTENANCE MANUAL

NOTE:

This manual is currently under revision to reflect recent technical improvements the TP 760 Letter Quality Printer. While the general scope and content of the manual accurately reflects the maintenance of the TP 760 printer, it is possible that certain portions of the manual may be in error, due to technical enhancements to the printer.

A revised TP 760 Maintenance Manual will be available for distribution 8/15/85; at that time, update information will be made available to those in possession of this manual. In the meantime, direct questions regarding the maintenance of the TP 760 printer to John John, (408) 971-0255 ext. 592, and direct questions specifically regarding this manual to Jim Wagner, (408) 971-0255 ext. 460.

TP 760

MAINTENANCE MANUAL

TeleVideo Systems, Inc.
550 East Brokaw Road
P.O. Box 6602
San Jose, CA 95150-6602

FCC NOTICE

The following warning is in conformance to FCC government rules and regulations:

WARNING

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class B Computing Device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

WARRANTY

Warranted against defects in materials and workmanship for one year from the date of arrival at the customer's premises.

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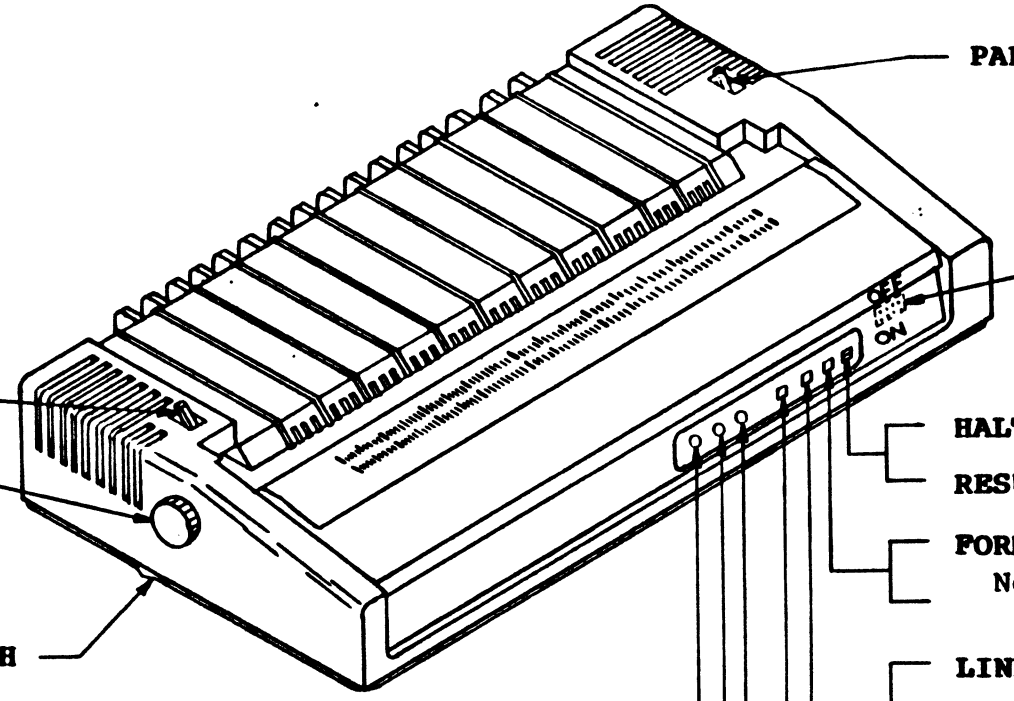
TP 760 Printer

OPERATOR INTERFACE



PAPER RELEASE LEVER

DIP SWITCH
(Inside Cover)

BAIL RELEASE LEVER

PLATEN KNOB

POWER SWITCH

HALT - Pause Printing

RESUME - Resumes Printing

FORM FEED - Feeds Paper to the Next Top of Form Position

LINE FEED -

- One Line when depressed Momentarily
- Continuous Feed when kept Depressed

SET T.O.F. -

- Sets Top of Form Position When Depressed
- Self-Test Mode - Turn On Power Switch While Depressing This Switch

*Terminate Self Test by Depressing and Holding This Switch Down

STEADY LIGHT - Printwheel Check

BLINKING LIGHT - Carriage Check

STEADY LIGHT - Print Buffer Overflow

BLINKING LIGHT - Cover Open/ Out of Ribbon/Out of Paper

STEADY LIGHT - Power is On and Printer Ready

BLINKING LIGHT - Power is On But Printing is Halted

DIP SWITCH SETTINGS ON FRONT PANEL

SECTION I

INTRODUCTION

1.1 PURPOSE

This manual provides information necessary for maintenance and service of the TP 760 letter-quality printer. The manual is intended to serve both the field and the depot service person. It includes troubleshooting flow charts and tables, along with exploded assembly illustrations and a theory of operation.

While this document contains information for assembly and disassembly of the printer subassemblies, it contains no detailed procedures for troubleshooting modules to the component level. Each field service organization is expected to develop its own procedures for component-level repair based on the equipment and talent available to that organization.

This manual is divided into ten sections:

Section	I	Introduction
Section	II	Levels of Maintenance
Section	III	Maintenance Precautions
Section	IV	Theory of Operation
Section	V	Adjustments & Unscheduled Maintenance
Section	VI	Power Distribution
Section	VII	Troubleshooting Procedures
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Comments on TeleVideo publications are invited. These should be addressed to:

Manager, Customer Service
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San Jose, CA 95150-6602

TeleVideo Systems, Inc., reserves the right to make changes and/or improvements to its products without incurring any obligation to incorporate such changes or improvements in units previously sold or shipped.

1.2 RETURN MATERIAL AUTHORIZATION

TeleVideo printer parts, assemblies or components will only be accepted for repair by TeleVideo if they are accompanied by an RMA number. Shipments arriving at TeleVideo Receiving without an RMA number will be returned to the sender freight collect.

Items returned for repair and found to have no failures will be billed at the current basic repair price. Repair prices are non-discountable and subject to change without prior notice.

To obtain an RMA number, call TeleVideo Order Entry at (408) 971-0255. Be prepared to provide TeleVideo with a Purchase Order number, along with the part number, description, serial number (if applicable) and description of failure for each item to be returned.

1.3 GENERAL DESCRIPTION

The TP 760 is a letter-quality, serial-impact, full-character printer designed for use with any personal, micro- or minicomputer, as well as advanced word-processing systems. The standard interface is Centronics parallel communications which is IBM-PC compatible. Optional printer accessories include a bidirectional forms tractor, sheet feeders, and a serial communications interface. An internal PCA slot accommodates custom interfaces for OEMs.

The TP 760 incorporates standard replacement components that are readily available. The ribbon printing element is the Diablo cartridge type (HyType II) in either multistrike film or endless-loop fabric ribbon. Silver Reed or TeleVideo print wheels can be used on the machine, which is character-set compatible with Diablo and Qume printers.

Specifications for the TP 760 are listed in Table 1-1.

The printer is designed to simplify operator interface. The power on/off switch is located at the left side of the printer within easy reach of the operator. Four front panel controls set all operator-controllable parameters in the printer. The TP 760 operator interface elements are shown in Figure 1-1.

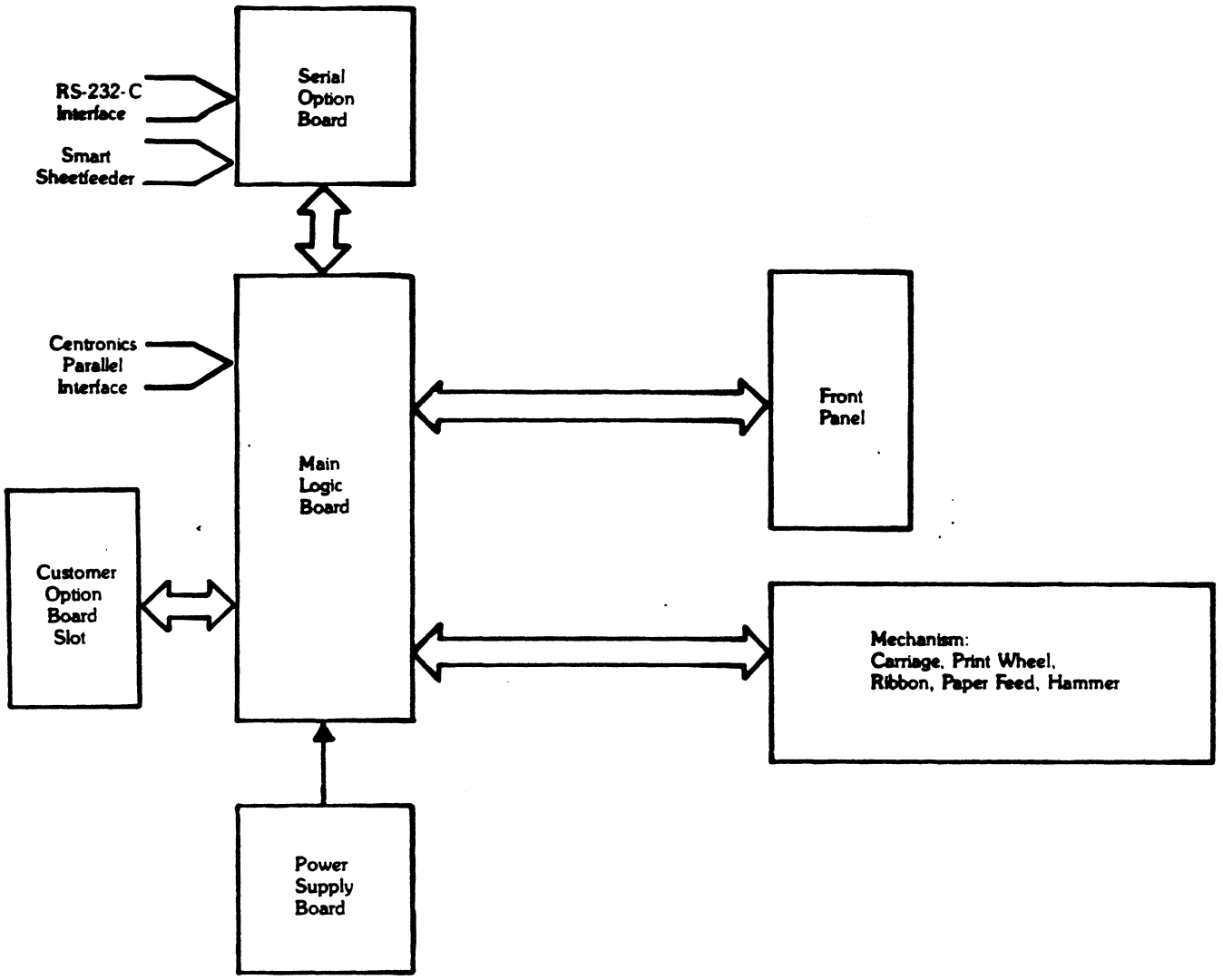


FIGURE 4-1

TP 760 Printer System Block Diagram

SECTION II

MAINTENANCE PHILOSOPHY

2.1 GENERAL

The mechanical design of the TP 760 combines the printer base structure and the printer frame into a single cast aluminum part, thereby eliminating the complex and costly sheet-metal frame. In the printer electronics, the use of custom designed gate arrays and HYBRIDs further reduces the parts count. Mechatron has two copyrights, eight utility patents and one design patent pending in mechanical hardware, electronic hardware, firmware and gate array electronics. These design innovations not only lower the initial cost of the machine and substantially increase the mean time between failures (MTBF); they produce a major reduction in the mean time to repair(MTTR) as well while retaining the quality and print features of more expensive designs.

Maintenance is simplified by the fast, easy removal and replacement of subassemblies. The entire machine is serviced with little more than a socket screwdriver and a handful of removeable bits. Parts which require expensive tooling to assemble, such as the printwheel and carriage encoders, are field replaced only as assembled units.

Cleaning of the printer can be performed by the operator. Under normal operating conditions, the printer requires no lubrication. Because of the simplicity of the printer's mechanical design, adjustments are required only after subassembly replacement. As a result, except under severe environmental conditions, the printer does not require either preventive maintenance or regularly scheduled adjustments. Periodic cleaning will suffice to keep the printer efficiently producing quality documentation. This simplifies maintenance and greatly reduces the printer down time.

2.2 LEVELS OF MAINTENANCE

Maintenance for the TP 760 printer can be divided into three levels. Level one is service to be performed by the operator. Level two is that which is done at the user site by field service technicians. Level three is depot repair.

Level 1: Ribbon cartridge and printwheel changes and cleaning.

Level 2: Level 1 items plus unit replacement, circuit board exchange, subassembly replacement and minor adjustments and alignments.

Level 3: Levels 1 and 2 items plus major disassembly and refurbishment of subassemblies, and circuit board assembly repair.

User service activity is limited to Level 1 procedures.

It is recommended that only qualified field service technicians from either TeleVideo or an authorized third-party service be allowed to service the machine after the warranty period has elapsed.

SECTION III

MAINTENANCE PRECAUTIONS

3.1 GENERAL

The purpose of this section is to provide suggestions and basic precautions which, if observed while performing maintenance on the printer, will reduce the chance of a technician's being injured or a machine or machine component being inadvertently destroyed.

3.2 POWER ~~SAFETY~~

~~Do NOT remove or install circuit boards while the POWER is ON.~~

~~Do NOT connect or disconnect any plug or cable while the POWER is ON.~~

~~Do NOT turn the power on while the machine does not have its normal complement of circuit boards installed.~~

~~3.3 CARRIAGE~~

~~Before power is applied, make sure there is no obstruction between the carriage and the carriage stop on the left-hand wall of the printer access area. When power is applied, the printer executes a restore sequence which includes moving the carriage leftward beyond the left-hand margin, and then returning the carriage to the left margin position.~~

~~Operating the TP 760 printer with its access cover removed and the Cover-Open Interlock Switch defeated~~ is always hazardous. It is recommended that this course be taken only by qualified service personnel. If this action is taken, AT NO TIME is it safe to have fingers or hands within the carriage travel path (area of possible movement by the carriage). The force of the carriage movement is easily sufficient to break bones.

WARNING

High-velocity carriage movement occurs during normal operation of the printer and unpredicatable, maximum-velocity carriage movement to the carriage stops occurs during certain types of malfunctions.

3.4 USING SOLVENTS

Fedron Platen Cleaner is recommended for cleaning the surface of the rubber machine components. Do not use alcohol to clean the platen or the paperfeed rollers. Alcohol will harden the surface of these items, thereby reducing the friction between the surface the paper. Once this has occurred, the component must be replaced.

WARNING

Fedron solvent is flammable. Keep away from heat, sparks and open flame. Should a fire occur, use foam or CO2 to extinguish it.

Fedron vapor is harmful to the respiratory system. Fedron is harmful if swallowed and is irritating to the eyes and skin.

In case of eye contact with Fedron, flush the eye with water. Get medical attention. If there is skin contact with Fedron, wash the area thoroughly with soap and water.

If swallowed, call a physician immediately. Do not induce vomiting.

3.5 CLEANING COVER AND OTHER PLASTIC COMPONENTS

Do not use platen cleaner to clean plastic parts. These products are usually harmful to plastics and will cause damage.

Do not use acetone or methyl ethyl ketone to clean the cover or other plastic printer components. Both will destroy plastic parts.

Periodic cleaning is necessary to ensure high-quality printing and printer reliability. Dust, ink, and paper particles commonly accumulate in a printer. General light cleaning should be done often; in-depth cleaning should be done only when necessary. Light cleaning includes washing the outside case, removing internal debris with a soft cloth, and cleaning the printwheel. In-depth cleaning includes removing the platen for ink removal. Before any cleaning, BE CERTAIN THAT THE POWER CORD IS DISCONNECTED.

The cover should be cleaned with a mild, non-caustic solution such as Zoom, Formula 409, or Fantastik. Clean internal surfaces of the cover with the same type of solution and a soft cloth or solution-moistened cotton swab. Do not spray the cleaners directly into the printer. Apply the cleaner to the cloth or cotton swab.

3.6 TOOLS REQUIRED

The tools required for performing the maintenance described in this manual are:

Hex-socket screwdriver, 1/4-inch with T-9 and T-15. Torx bits and #1 and #2 Phillips bits.

Heavy-duty spring hook, pull type.

Small, flat-blade screwdriver.

Voltmeter, 1% or better.

Push-pull belt tension guage, 0.1-inch, 0.1-pound increment scales.

3.7 SUPPLIES REQUIRED

Fedron Platen Cleaner, or equivalent
Isopropyl Alcohol
Lint-free wipers

3.8 RECOMMENDED SPARES FOR FIELD SERVICE

Description	Quantity	Price
ASSEMBLY LOWER CARRIAGE	2	$ 60.00
ASSEMBLY UPPER CARRIAGE	5	$460.00
ASSEMBLY PRINTWHEEL MOTOR	4	$130.00
ASSEMBLY RIBBON MOTOR	4	$ 44.00
ASSEMBLY PLATEN	4	$ 46.00
ASSEMBLY CARRIAGE MOTOR	5	$160.00
ASSEMBLY PAPER FEED MOTOR	4	$ 50.00
ASSEMBLY PAPER BAIL	5	$ 35.00
ASSEMBLY COVER INTERLOCK	4	$ 44.00
ASSEMBLY CARD GUIDE	4	$ 11.00
ASSEMBLY IDLER PULLEY	5	$ 26.00
ASSEMBLY PRESSURE ROLLER	4	$ 13.00
ASSEMBLY PAPER CRADLE	5	$ 26.00
KNOB PLATEN	6	$ 4.00
LEVER, PAPER BAIL	2	$ 2.00
LATCH, RIBBON CARTRIDGE	5	$ 4.00
ROLLER, PRESSURE FRONT	5	$ 10.00
ROLLER, PRESSURE REAR	5	$ 11.00
LEVER, PRESSURE ROLLER	5	$ 5.00
PULLEY, RIBBON	4	$ 1.00
CARRIAGE BELT	4	$ 12.00
BELT, PAPER FEED	4	$ 1.00
WASHER, FELT	6	$ 1.00
CRADLE, SPRING	6	$ 4.00
LID	4	$ 11.00
WINDOW	4	$ 11.00
BELT, RIBBON DRIVE	4	$ 4.00
LINK, PRESSURE ROLLER	6	$ 2.00
FUSES, MISC. (TIMES 5)	5	$ 22.00
HAMMER, PRINT	9	$ 48.00
TRANSFORMER	6	$ 54.00
HYBRID	6	$ 55.00
GATE ARRAY	6	$ 19.00
IC 27128 PROGRAMMED EPROM	6	$ 36.00
RIBBON, SENSOR	5	$ 24.00
SWITCH TOGGLE	4	$ 6.00
COVER INTERLOCK SWITCH	4	$ 9.00
ASSEMBLY POWER SUPPLY CABLE	2	$ 23.00
ASSEMBLY CARRIAGE CABLE	2	$ 50.00
ASSEMBLY AC RECEPTACLE	6	$ 17.00
ASSEMBLY AC SWITCH	6	$ 11.00
ASSEMBLY MAIN LOGIC	6	$390.00

Description	Quantity	Price
ASSEMBLY POWER SUPPLY	4	$120.00
ASSEMBLY FRONT PANEL	4	$ 55.00
RS-232 SERIAL INTERFACE	6	$120.00

SECTION IV

THEORY OF OPERATIONS

4.1 GENERAL

This section contains a brief description of the printer. Its purpose is to introduce the technician to the printer by providing an overview of the machine which can be quickly read and understood.

4.2 PHYSICAL DESCRIPTION

The TP 760 is a 34-pound printer that is 22.5 inches wide, 16 inches deep and six inches in height. It is a full-character, serial -impact printer. All major subassemblies are mounted on a cast aluminum base. The complete printer, called the Top Assembly in Engineering documentation, consists of the Cover Assembly and the Base Assembly. On the Base Assembly are the following major subassemblies:

Platen Assembly
Cover Interlock Switch Assembly
Paperfeed Motor Assembly
Pressure Lever Arm Assembly
Carriage Assembly
Carriage Motor Assembly
Paper Bail Assembly
Pressure Roller Assembly
Paper Out Sensor Assembly (Optional)
Front Panel Assembly
Main Control PCB Assembly
Power Supply PCB Assembly
RS-232C Serial Interface PCB Assembly (Optional)

In addition to the subassemblies listed, minor subassemblies and cables are mounted on the base casting. These assemblies and components thereof are illustrated in Section IX of this Manual.

4.3 THEORY OF OPERATION

The TP 760 is an Intel 8031 microprocessor-based system which communicates with host computers through either a Centronics Parallel Interface or an optional RS-232C Serial Interface port. The Centronics Parallel is standard. The printer is functionally illustrated in Figure 4-1.

The operational software resides in 16 Kbytes of ROM memory. The standard machine has 1.5 Kbytes of RAM memory serving as a print buffer for input data from the host computer. As an option, 7.5 Kbytes of RAM may be installed.

In addition to the handshaking and data handling necessary to accept data from the host computer, the printer must internally control paperfeed, ribbon feed, printweel motion, carriage motion and the hammer intensity and motion.

Carriage and printwheel are DC servo-motor driven and closed-loop controlled from the microprocessor. Motion is output as an 8-bit DAC (Digital to Analog Converter) value from the microprocessor to the appropriate I/O latch. The I/O latch frees the microprocessor while inputing the data to the analog control logic. In the analog control logic, the data is converted to current pulses which drive the motors. The position of the carriage or printwheel is sensed by a 192 CT encoder and fed back to the microprocessor.

Paperfeed and ribbonfeed stepper motors are open-loop controlled from the microprocessor. The control signals are output from the microprocessor to the ribbonfeed/paperfeed latch. The latch inputs the data to the analog control circuitry, which converts the digital input to motor drive currents.

The circuitry required to convert the digital velocity word to DC motor driver currents is included in its entirety in a TeleVideo proprietary HYBRID I.C. The HYBRID is functionally diagrammed in Figure 4-2.

During initialization, the printer circuitry returns the carriage to the left margin and rotates the printwheel to the zero, or index, character.

The hammer force is firmware controlled to vary according to the surface area of the character being printed. Five levels of intensity are correlated to the print character in a look-up table in the firmware.

Ribbon movement is also controlled to vary from character to character. The ribbon is moved according to the width of the character being printed to conserve ribbon. The microprocessor gets the ribbon move distance from a look-up table in the printer firmware.

For 10-, 12-, and 15-pitch printing, the character spacing is uniform from character to character. If proportional spacing is set by the host computer or selected by setting the DIP switch inside the front panel, the printer microprocessor will get the specific spacing for each character from another look-up table in the firmware.

Form length, horizontal pitch, vertical pitch, automatic line feed and printwheel configuration are user selectable via a DIP switch located on the front, right-hand side of the operator access area of the printer.

The printer reacts to several interrupts by halting, but retaining track of where it is at in the print job so that data is not lost when the interrupt has been cleared. These interrupts are: Paper-out, ribbon out, printer cover open, printer halt switch actuated. The various interrupting signals enter the printer electronics at through an input buffer on the Main Control Logic Board.

When the Paper-Out signal is received from the sensor by the printer logic, the printer will finish the current print line (continue printing until it finds a linefeed in the data), then stop.

When the HALT switch on the Control Panel is actuated, the printer will stop, rotate the printwheel to printwheel home, then turn off the high-gain portion of the carriage and printwheel drive motor circuits. Pressing the switch again will reactivate the high-gain circuits and printing will be resumed at the next character in the print buffer.

When the End-of-Ribbon sensor is activated by a spent ribbon, the printer control logic follows the same process as it does when the HALT switch is actuated.

A Cover-Open signal to the printer control logic causes the printer to stop printing, shuts down the high gain portion of the carriage and printwheel drive motor circuits, then shuts off all current to the two servo motors so that the printwheel and the carriage can be moved freely.

A front control panel provides line feed, form feed, set top-of-form, and halt/resume controls. LEDs labelled CHECK and ATTEND indicate problem conditions in the printer.

The front panel controls perform the following functions:

LINE FEED: Moves the paper upward one line when actuated. Continuous actuation produces multiple linefeeds.

FORM FEED: When actuated, the paper is scrolled to the point where Top Of Form has been set.

SET T O F: When pressed, sets the present paper (platen) location as the Top-Of-Form reference for the microprocessor. If pressed while the printer power is turned on, this switch causes the printer to go into a self-test mode. Actuating the switch a second time resets the printer for normal operation.

HALT/RESUME: If the printer is in a halt state (resulting from a Paper-Out or other halt signal), actuation of this switch will restart the printer.

CHECK: When the printer is operating normally, this LED is off. Lit continuously, this light indicates a printwheel malfunction. When blinking, this light indicates a carriage problem.

ATTEND: If the printer is operating normally, this LED is off. This LED blinks on and off when the printer is halted as a result of having received a Paper-Out, End-of-Ribbon, or Cover Interlock Switch signal. Lit continuously, this LED indicates a buffer overload condition.

POWER/READY: This LED is lit continuously when the power is on and the printer is ready for operation. It blinks when a halt or pause condition exists.

4.4 INTERFACE

The TP 760 interfaces with the host computer via one of two I/O ports. The standard is a Centronics Parallel Communications interface. An RS-232C Serial interface is available from TeleVideo as an option. Connection for both interfaces is at the rear of the machine, as shown in Figure 4-3.

4.4.1 Centronics Parallel Interface

Control of the Centronics Parallel interface is provided by the Main Control PCB Assembly electronics. The interface has the following characteristics:

Format:	8 data bits
Buffer size	1.5K byte (7.5K byte optional)
Physical interface	Amphenol 36-pin "Blue Ribbon" connector

4.4.1.1 Pin Configuration

Table 4-1 defines the pin configuration for the Centronics parallel interace connector. Pin 18 has an available current of 100 ma.

SIGNAL	PIN NUMBER	SIGNAL SOURCE
DATA STROBE/	1	Host Machine
DATA 0	2	Host Machine
DATA 1	3	Host Machine
DATA 2	4	Host Machine
DATA 3	5	Host Machine
DATA 4	6	Host Machine
DATA 5	7	Host Machine
DATA 6	8	Host Machine
DATA 7	9	Host Machine
ACKNOWLEDGE/	10	Printer
PRINTER BUSY	11	Printer
PAPER OUT	12	Printer
SELECT	13	Printer
N/C	14	
N/C	15	
GROUND	16	
CHASSIS GROUND	17	Printer
+5 VOLTS	18	Printer
GROUND	19	
GROUND	20	
GROUND	21	
GROUND	22	
GROUND	23	
GROUND	24	
GROUND	25	
GROUND	26	
GROUND	27	
GROUND	28	
GROUND	29	
GROUND	30	
INITIALIZE/	31	Host Machine
ERROR/	32	Printer
GROUND	33	
N/C	34	
N/C	35	
N/C	36	

4.4.1.2 Signal Definition

STROBE/	Negative true pulse of greater than 0.5 microseconds. When sent by the host machine, data is read from the buss into printer memory. Data is latched on leading negative edge. This signal drives TTL logic terminated by a 1K Ohm resistor to +5 Volts.
DATA 0-7	Data bits are high for a logic 1 and low for a logic 0. Data must be true for 0.5 microseconds before the leading negative transition of the STROBE pulse and remain true for another 0.5 microseconds after the trailing positive edge of the STROBE pulse. The 8 data lines drive TTL logic terminated by a 1K Ohm resistor to +5 Volts.
ACKNOWLEDGE/	An approximately 5-microsecond pulse that tells the host that the data transfer is complete. The trailing positive transition of this pulse tells the host that the printer is ready for the next data transfer. The acknowledge pulse is sourced from a TTL logic circuit.
BUSY	A positive true signal indicating that the printer is busy. When low, this signal tells the host that the printer is ready for a data transfer. This signal is sourced from the output of a TTL logic circuit.
INITIALIZE/	This signal is normally high during printer operation. A negative signal of 50 microseconds on this pin will reinitialize the printer and clear printer memory. This signal is sourced from the output of a TTL logic circuit.
SELECT	A high signal indicates that the printer is in the selected state.

PAPER OUT	A signal that is normally low. If the Paper Out Sensor (optional equipment) is installed, this signal will go high when the printer is out of paper. If no Paper Out Sensor is installed, this signal is low.
ERROR/	This signal indicates that the printer is in a halt state. The signal is sent when the only 64 bytes of memory is available in the buffer; or the halt state could result from an out-of-paper condition, a buffer overflow, a ribbon-out signal, or a cover-interlock signal.

4.4.1.3 Data Transmitting Sequence

Timing for the parallel communications data transmission is shown in Figure 4-4.

4.4.1.3 Electrical Specifications

Voltage Levels: 0 Volts and +5 Volts (nominal), TTL logic (SN74LSXX Series for signals in ouput, Intel 8031 PIO for signals in input).

Logic Levels: A logic one (or high) signal is defined as a voltage in the range of +2.4 to +5 Volts, not to exceed peak positive voltage of +5.5 Volts.

A logic 0 (or low) signal is defined as a voltage in the range of 0.0 to 0.8 Volts, not to exceed a peak negative voltage of -0.5 Volts.

Line Termination: The printer interface I/O lines are terminated with 1K Ohm resistors to +5 Volts.

4.4.2 Serial Interface DIP switch settings.

FUNCTION	SECTION	SETTING
RS-232C Communications	1	On
Centronics Parallel Comm.		Off
Modem connected	2	On
No Modem connected		Off
110 BAUD rate	3	On
	4	Off
	5	Off
150 BAUD rate	3	Off
	4	Off
	5	On
300 BAUD rate	3	Off
	4	On
	5	Off
600 BAUD rate	3	Off
	4	On
	5	On
1200 BAUD rate	3	Off
	4	Off
	5	Off
2400 BAUD rate	3	On
	4	Off
	5	On
4800 BAUD rate	3	On
	4	On
	5	Off
9600 BAUD rate	3	On
	4	On
	5	On
Parity enable	6	On
Parity disable	6	Off
Space/odd parity	7	On
Mark/even parity	7	Off
Data Terminal Ready (DTR)	8	On
DC1/DC3	8	Off
Legend: On = switch down		
Off = switch up		
DTR, Pin 11	9	On
DTR, Pin 20	10	On

4.4.2.2 Pin Configuration

SIGNAL	PIN	TRANSMISSION FROM PRINTER	TRANSMISSION TO PRINTER
Protective Ground	1	x	x
Transmitted Data	2	x	
Received Data	3		x
Request to Send	4	x	
Data Set Ready	6		x
Signal Ground	7	x	x
Data Terminal Ready	20	x	

4.4.2.3 Electrical Specifications

Connector	EIA Standard 25-pin D type
Start bit	1 bit
Data bits	7 bits
Parity bit	Odd/Even or Space/Mark. Both the transmitting and receiving stations must use the same parity convention.
Stop bit	1 or 2 bits
Signal Polarity	Mark = 1 (-3 Volts to -12 Volts) Space = 0 (+3 Volts to +12 Volts)
BAUD rates	110, 150, 300, 600, 1200, 2400, 4800, 9600

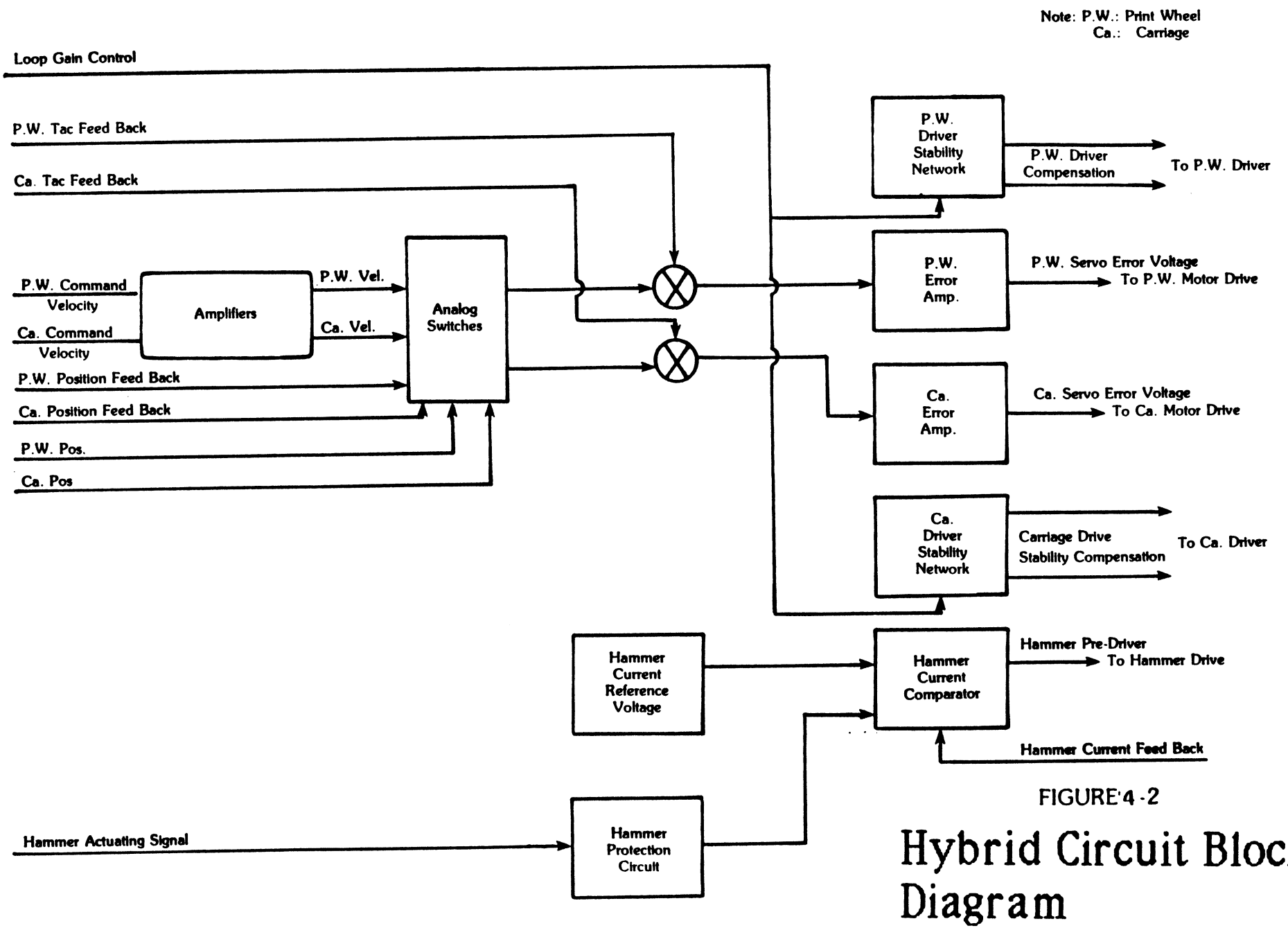


FIGURE 4-2

Hybrid Circuit Block Diagram

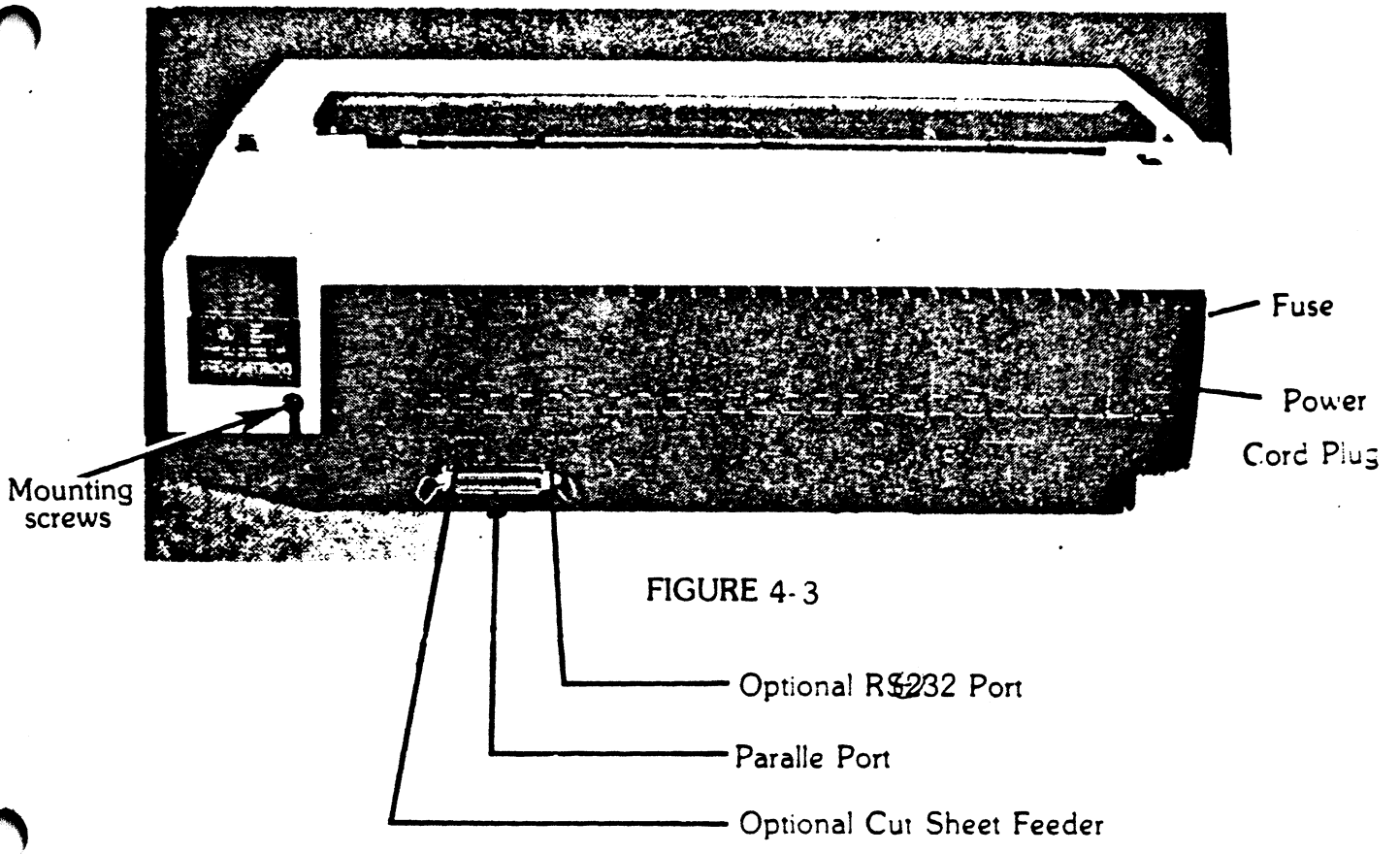

Fuse
Power
Cord Plug
Mounting
screws
Optional RS232 Port
Paralle Port
Optional Cut Sheet Feeder

FIGURE 4-3

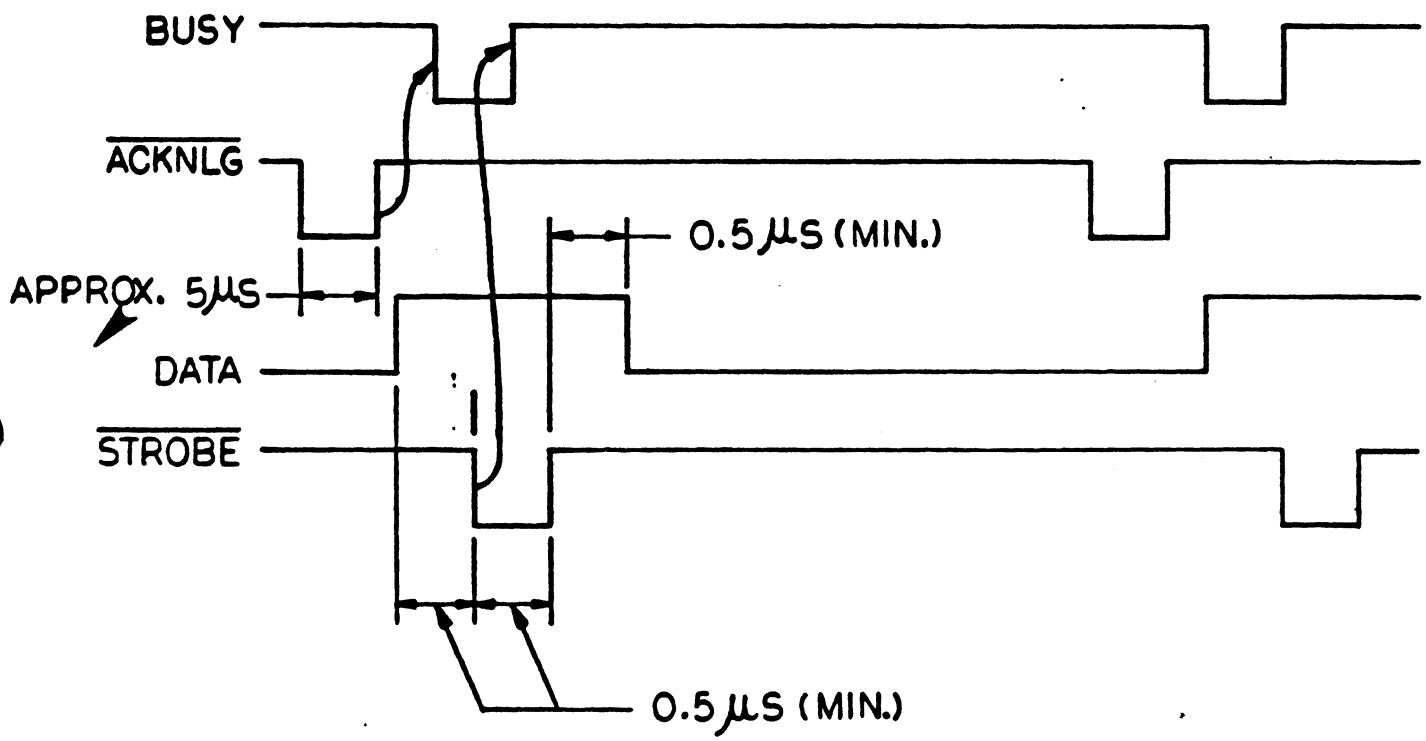


FIGURE 4-4

PARALLEL INTERFACE TIMING DIAGRAM

SECTION V

ADJUSTMENTS

5.1 GENERAL

This Section contains procedures for adjustments that are expected to be made by field service people using standard service equipment. Adjustments such as printwheel hub alignments, which require specialized tools, are not expected to be performed in the field and are not covered in this manual.

5.4 MECHANICAL ADJUSTMENT

5.4.1 Carriage Drive Belt Tension:

Move the carriage to the right-hand carriage stops.

Measuring the belt at a point approximately 7-1/2 inches from the left end of the belt, a force of 0.2 pound should deflect the belt 0.10 0.01 inch. See Figure 5-4.

If adjustment is necessary, remove the belt at the carriage motor pulley. Loosen the two screws at the idler pulley bracket.

Move the bracket to increase or decrease the tension on the belt as required.

Retighten the screws.

Mount the belt back onto the carriage motor pulley.

Recheck the tension.

5.4.2 Paperfeed Belt Tension Adjustment:

Check the belt tension. A force of 0.3 pounds should deflect the belt 0.1 inch 10%. See figure 5-5

If the belt is not within tolerance, loosen the screws that secure the motor to the base casting and lower or raise the motor. (Lowering the motor increases the belt tension; raising the motor decreases the tension.)

5.4.3 Print Quality Adjustment:

The print quality is adjusted by rotating two eccentric washer on either side of the upper carriage subassembly.

If the upper carriage subassembly is being replaced with a new unit, the unit will already have been adjusted at the factory to at least a coarse adjustment level.

Should a situation occur where a coarse adjustment must be made in the field, it can be made by pushing the hammer forward until the printwheel petal touches the paper. Observe the face of the character to determine whether all the character is in contact with the paper.

When the coarse adjustment has been made, print a full line of characters and examine the results.

If the print is lighter at the bottom of the character than at the top, adjust the eccentric washer so that the upper carriage is raised. If the printed character is lighter at the top than at the bottom, adjust the eccentric so that the upper carriage subassembly is lowered. See Figure 5-6.

After each attempt, print a full line of characters and examine the printing. When the characters are all of uniform darkness, the adjustment is successful.

5.4.5 Cover Interlock Switch Adjustment:

With the printer power on and the printer in the ready state, slowly lift the cover lid. A cover open condition should be indicated by a blinking ATTEND light when the cover has been raised approximately a quarter of an inch.

If the cover interlock switch does not function correctly, adjust the switch by loosening screws A and B indicated in Figure 5-8.

Reposition the switch and repeat the test until the cover interlock functions correctly.

5.5 ELECTRICAL ADJUSTMENT

5.5.1 Power Supply +5 Volt Adjustment

Adjust potentiometer R5 on the power supply PCB for an output of +5 to +5.1 Volts on the +5 Volt test point terminal.

The voltage output is increased by turning the screw in the clockwise direction.

(The test point terminals are located near the edge of the board toward the front of the machine. Looking from the front of the machine, R5 is located beside connector P1D near the right edge of the board.)

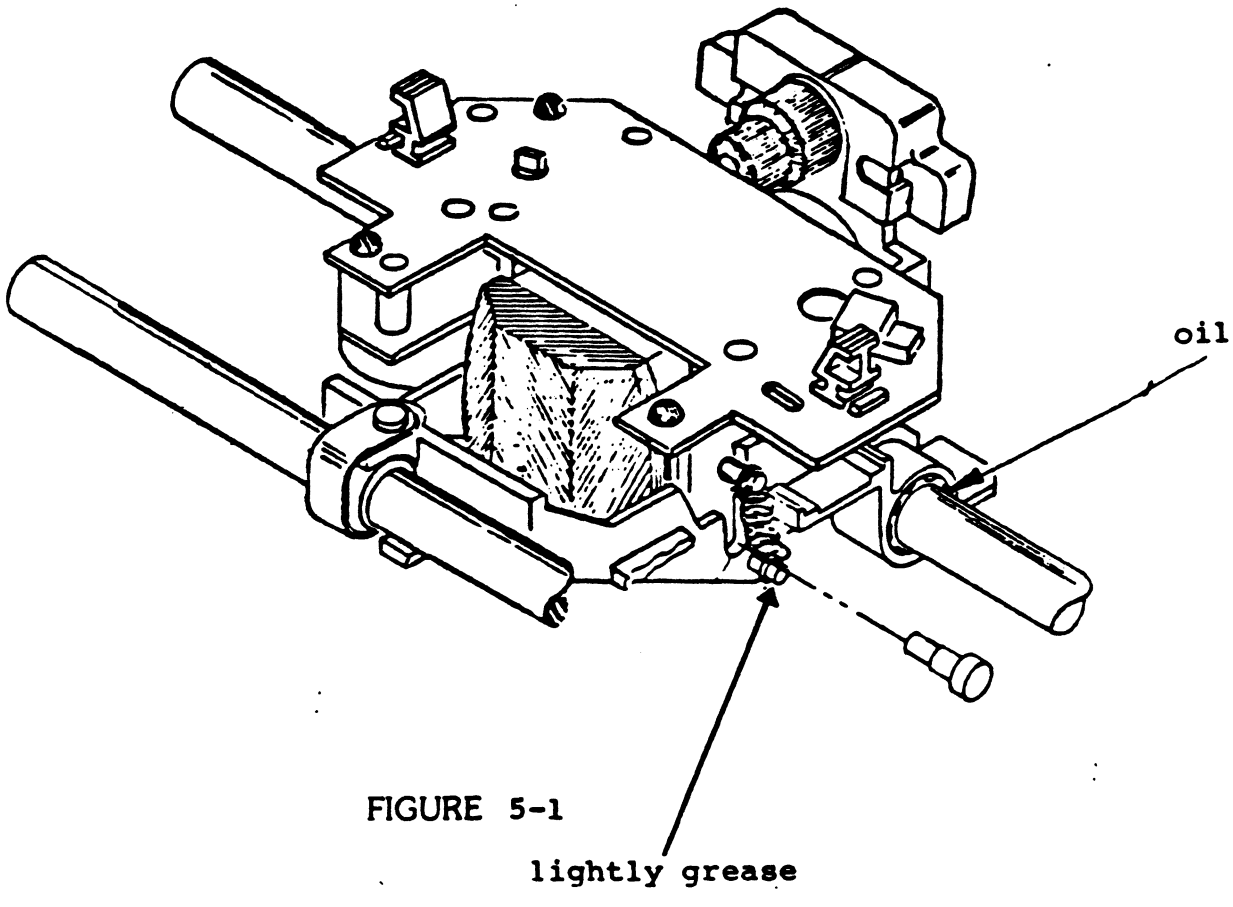


FIGURE 5-1

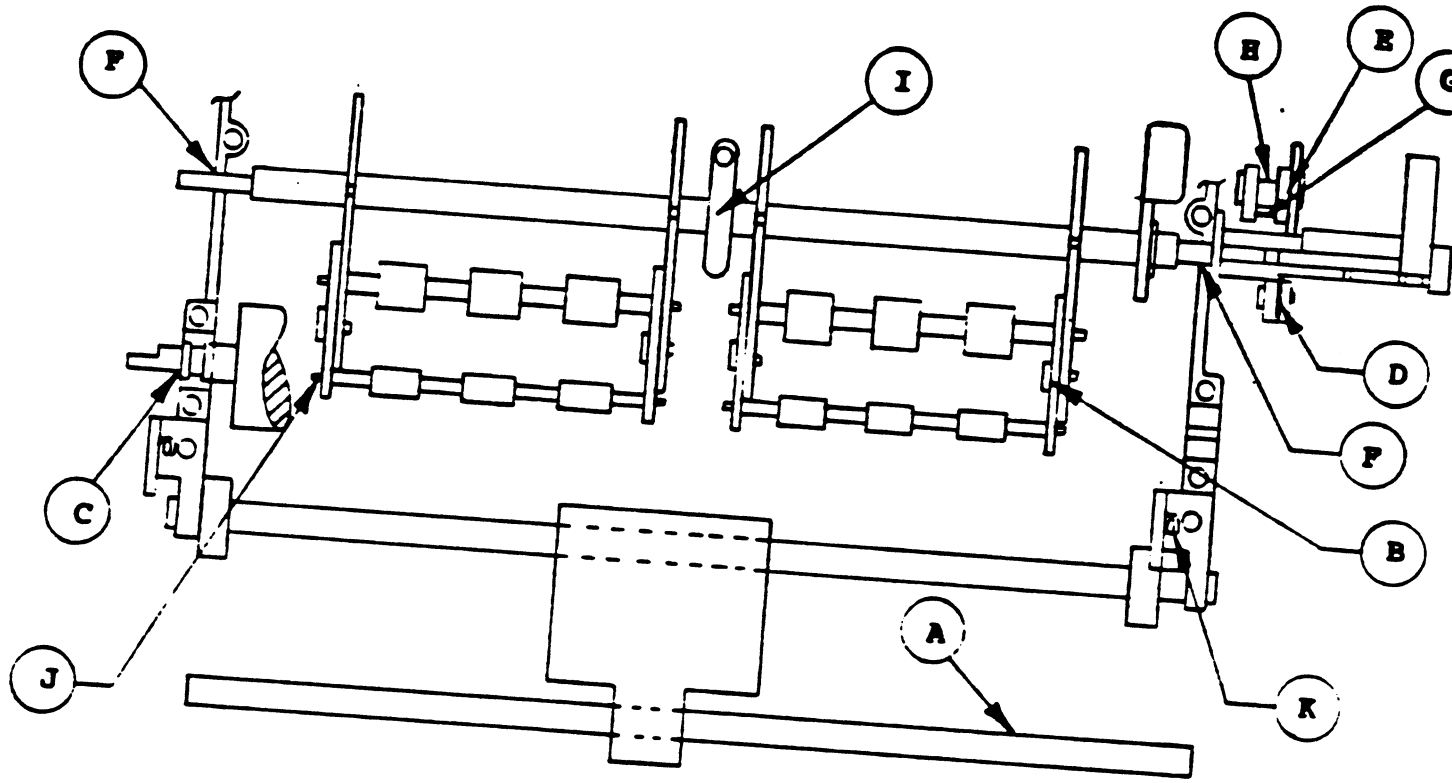


FIGURE 5-2

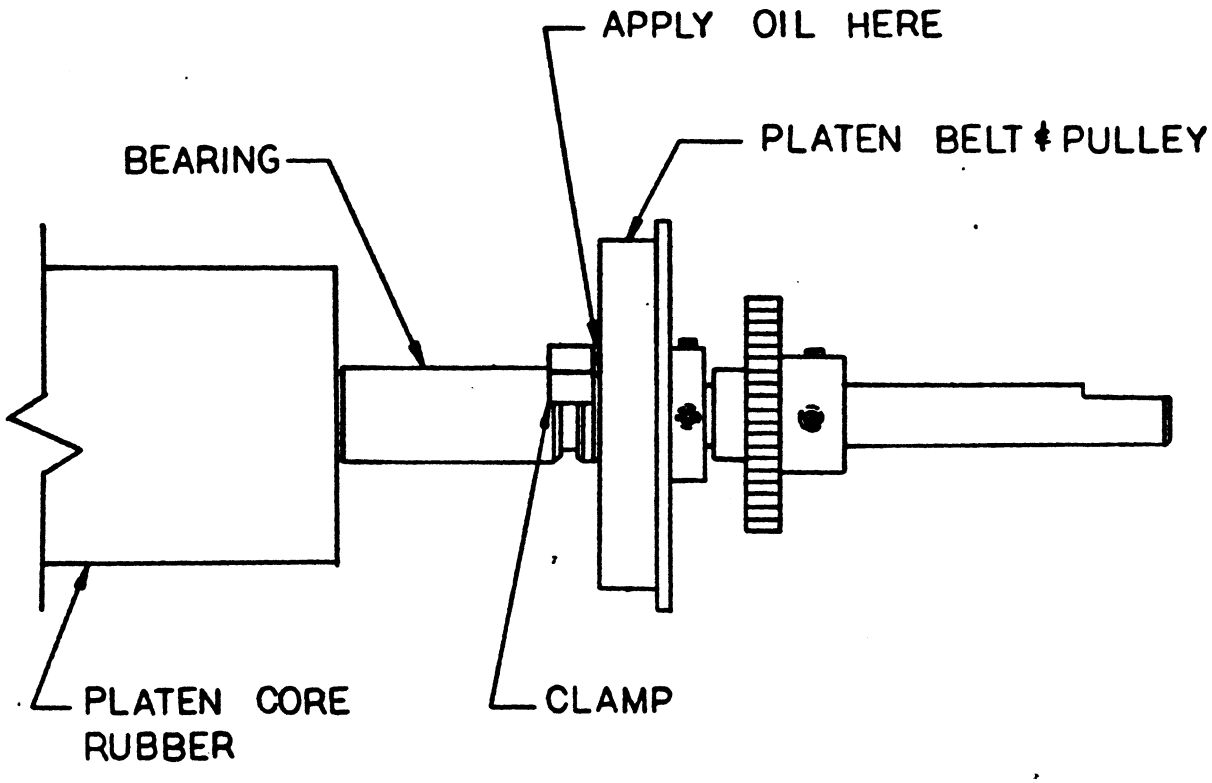

APPLY OIL HERE
PLATEN BELT & PULLEY
BEARING
PLATEN CORE RUBBER
CLAMP

FIGURE 5-3

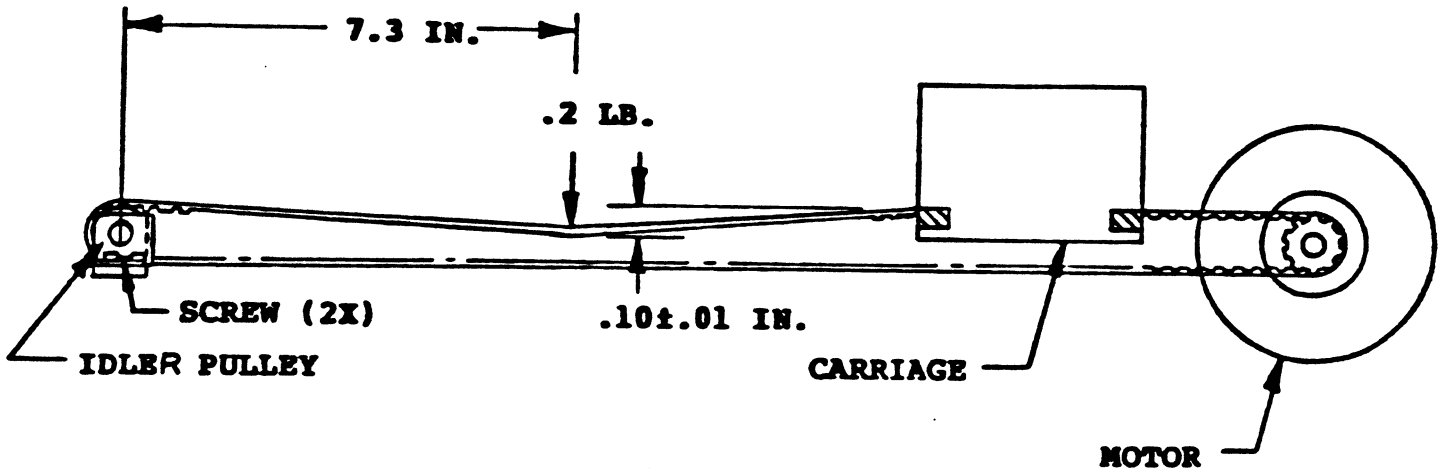


FIGURE 5-4

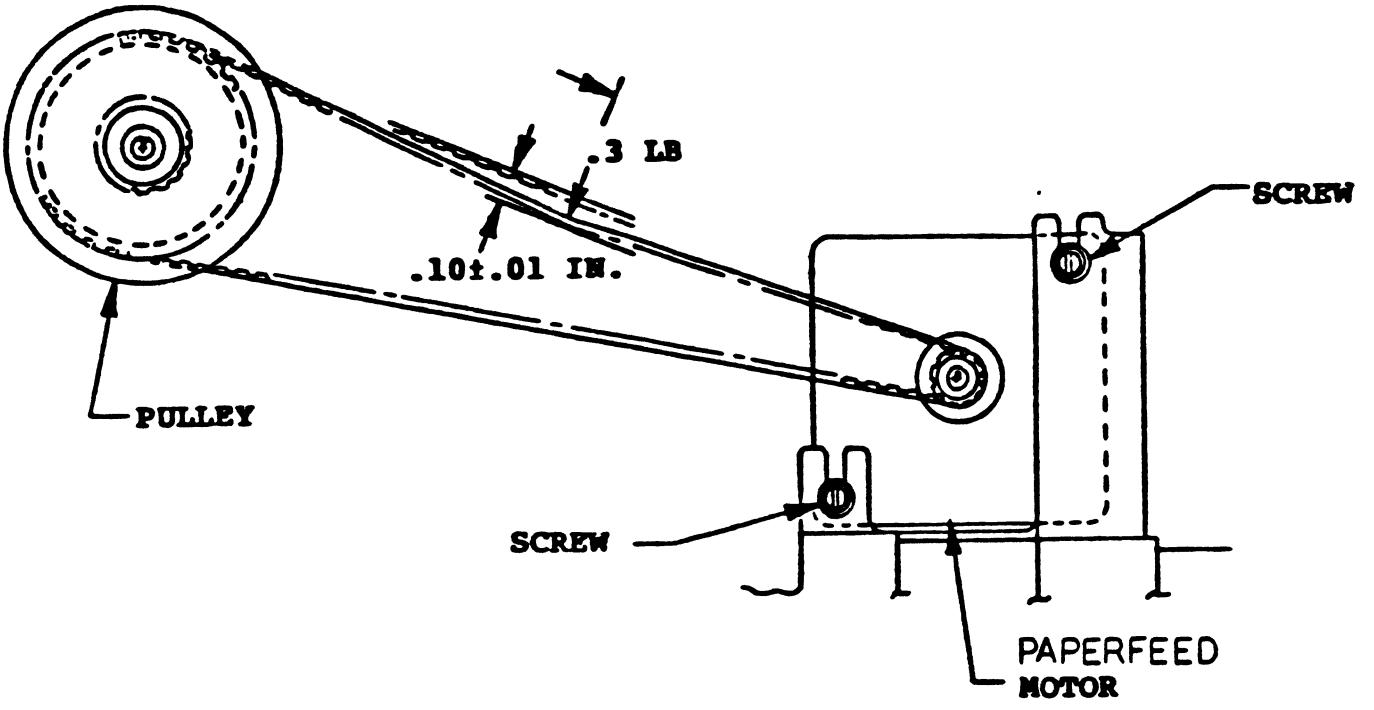


FIGURE 5-5

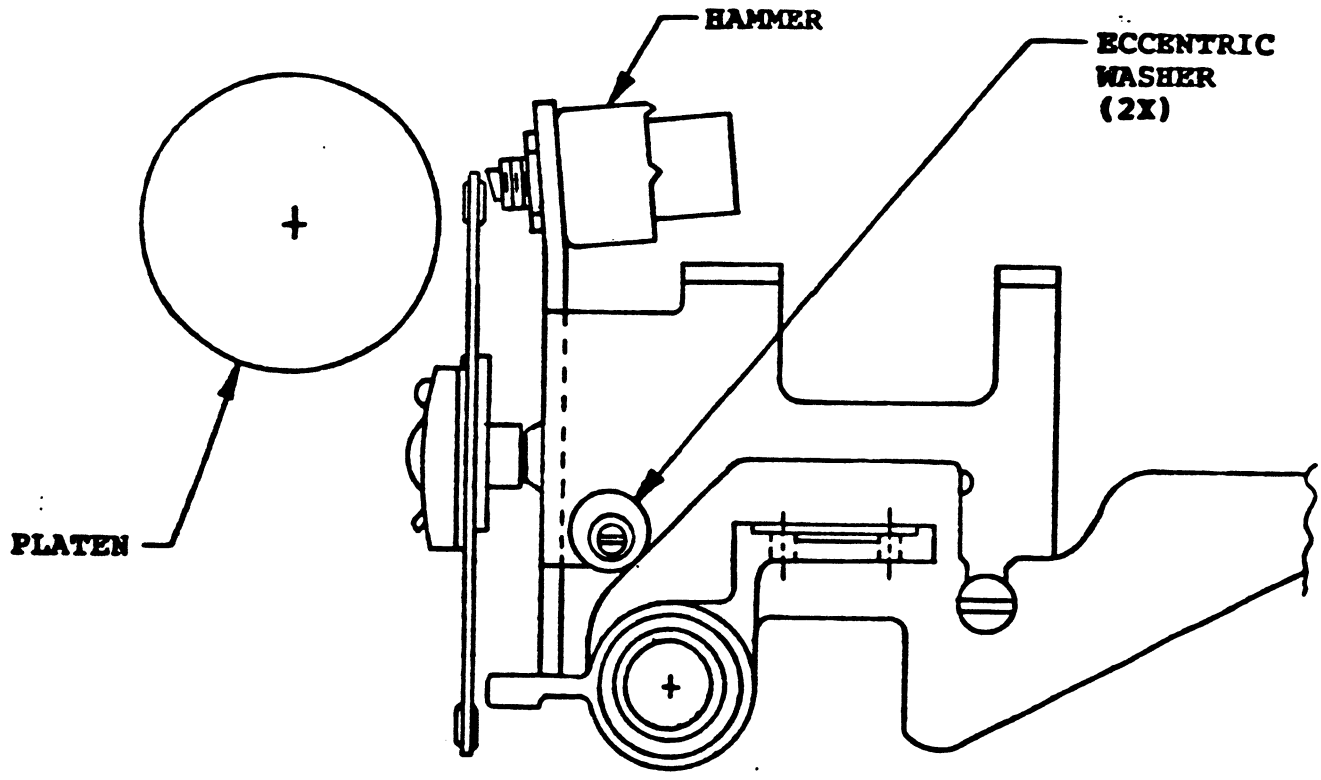


FIGURE 5-6

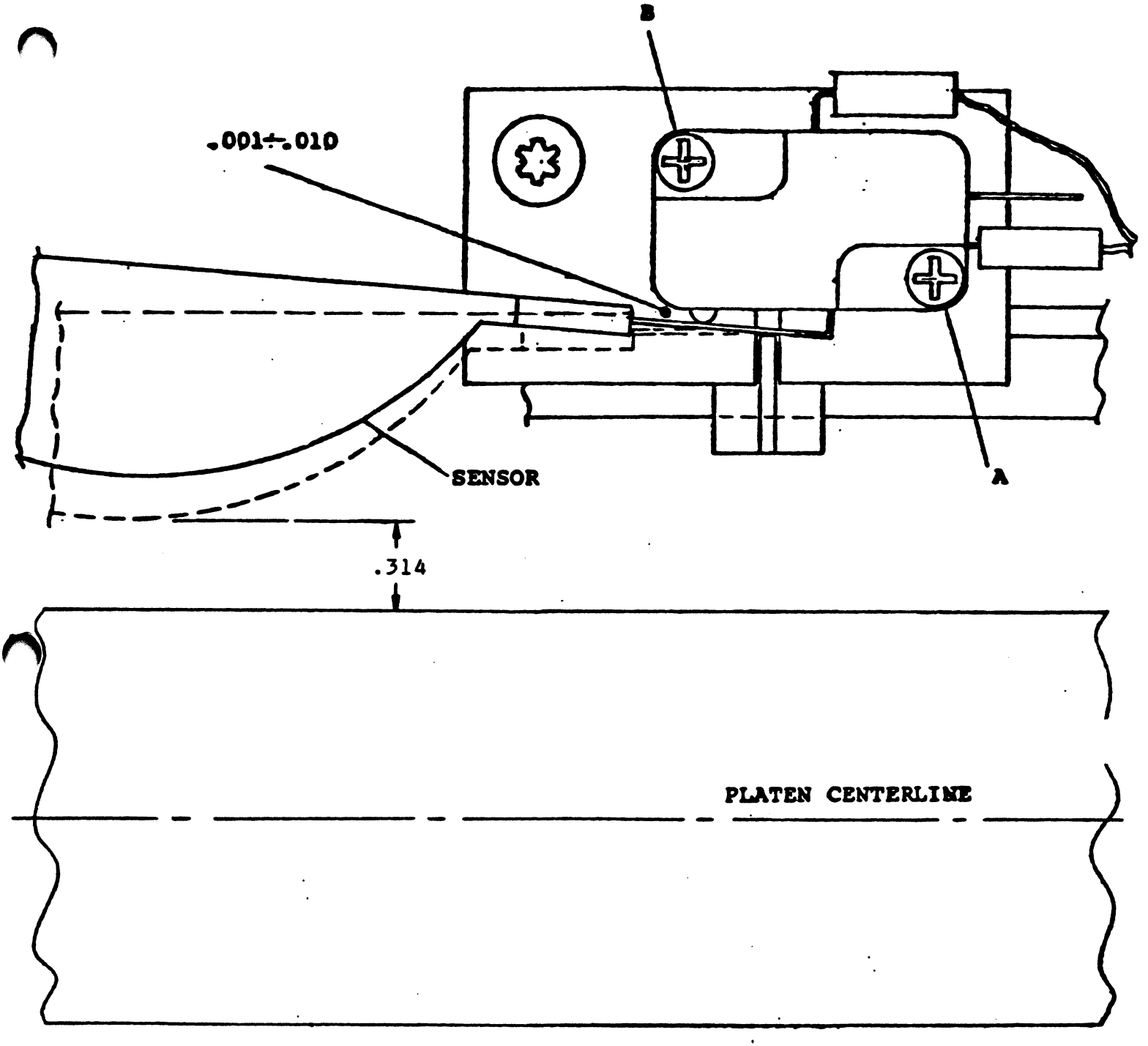


FIGURE 5-7

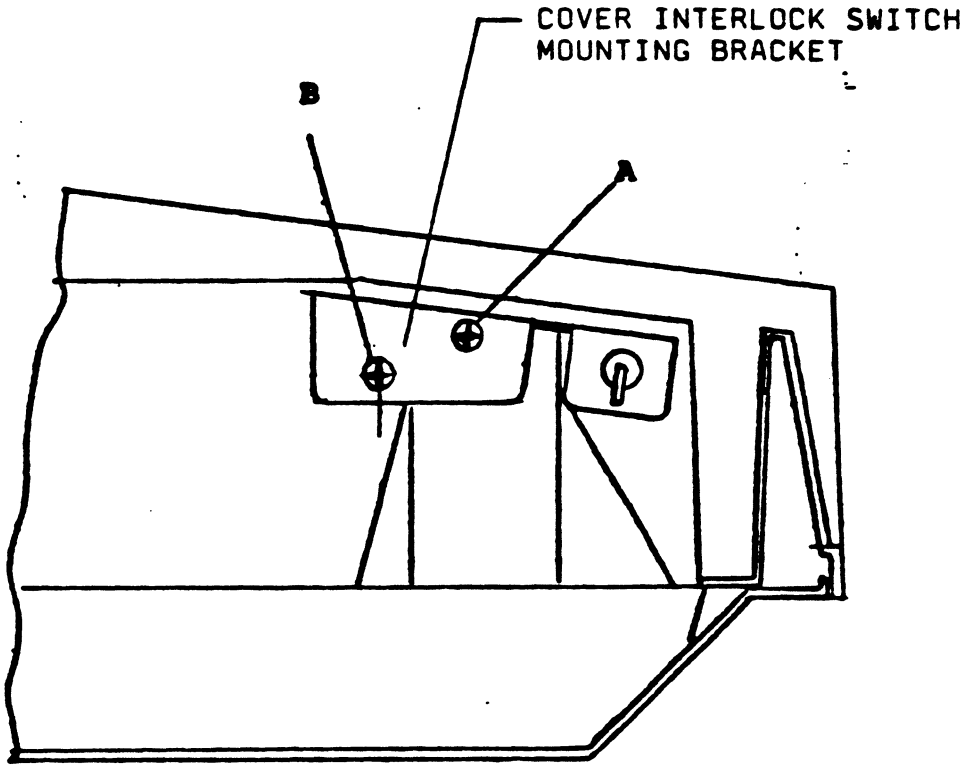


FIGURE 5-8

SECTION VI

POWER DISTRIBUTION

6.1 DISTRIBUTION

Primary power is connected to the machine through a recessed male three conductor connector at the back of the machine. The high side of the A.C. line is fused with a 3 Amp slow-blow fuse. High and neutral lines are connected to the Power Supply PCB. From the Power Supply PCB, the input A.C. power runs through a switch to a connector and thence to the Power Supply Transformer. The switch determines whether the two primary coils of the transformer are connected in parallel (for 115 Volt power input) or in series (for 230 Volt power input). Connection is accomplished via a slide switch. The voltage to which the switch is set appears in a window on top of the switch. Electrical specifications for the transformer are shown in Figure 6-1.

Secondary voltages are returned from the transformer secondary coils to the Power Supply PCB, where they are rectified and regulated to +24 Volts, +12 Volts +5 Volts and -12 Volts. The positive voltages are derived from the output section A of the power transformer secondary. The -12 volts is derived from the output of Section B.

Refer to Figure 6-2, A.C. Wiring Diagram, for the routing of the A.C. power from the input line to the power supply printed circuit board.

The secondary power distribution is diagrammed in Figure 6-3. The printer components are interconnected with flat ribbon and harness cabling. Only the ribbon cables are replaceable as discrete assemblies. The harness cables are hardwired to the assemblies which they serve. The system interconnect cabling is shown in Figure 6-4.

Operating Frequency: 50 to 60Hz

For 115 Volt operation, the primary coils are connected in parallel (H1 is connected to H3 and H2 is connected to H4) and the 115-Volt source is applied across the primaries from H1/H3 to H2/H4.

For 230 Volt operation, the primary coils are connected in series (H2 is connected to H3) and the 230-Volt source is applied across the primary from H1 to H4.

Power Transformer

VOLTAGE SPECIFICATION:

INPUT: H_1 H_3 - H_2 H_4 = 115V 60/50 HZ
OUTPUT: S_1 - S_2 = 30V @ NO LOAD
S_3 - S_4 = 18V @ NO LOAD

WINDING RESISTANCE SPECIFICATION:

1) H_1 - H_2 = 4.12 OHM ±10%
2) H_3 - H_4 = 3.58 OHM ±10%
3) S_1 - S_2 = .27 OHM ±10%
4) S_3 - S_4 = 1.16 OHM ±10%

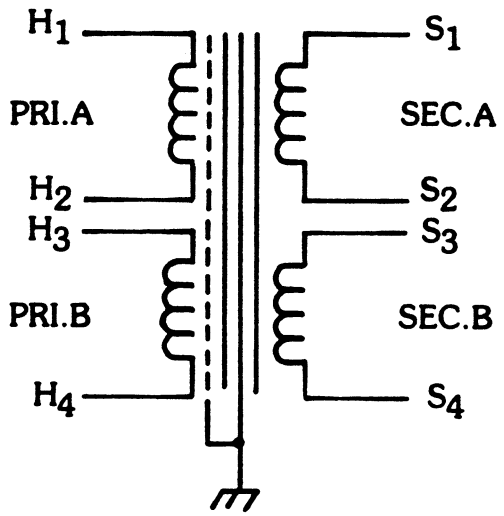


Figure 6-1

A.C. Wire Diagram Reference List

ITEM	DESCRIPTION
1	Fuse Holder
2	Connector, quick disconnect, female .187 Tab
3	Receptacle
4	Lug, Solder, Internal Star
5	A.C. Power Switch
6	Connector, Quick Disconnect Female, .250 Tab
7	Pin, Receptacle
8	Connector, Hdr, .156 Ctr.

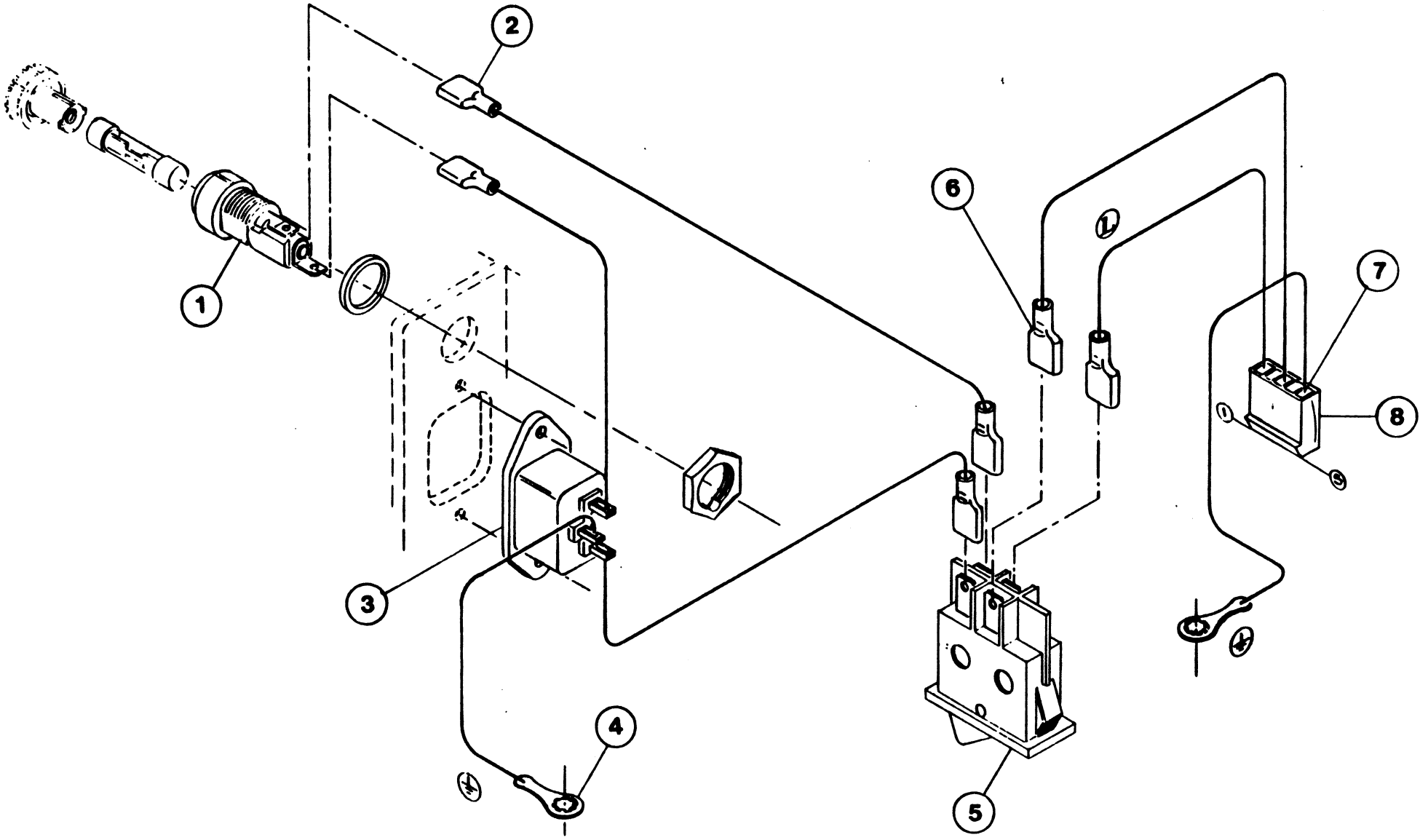


FIGURE 6-2 A.C. Wire Diagram

Printer Interconnect Diagram Reference List

ITEM	DESCRIPTION
1	Front Panel Assembly
2	Transformer
3	Power Switch Assembly
4	Power Supply Board
5	Cable Assembly
6	Cable Assembly, Carriage
7	Cable Assembly, Front Panel
8	Cable Assembly
9	Carriage Motor Assembly
10	Paperfeed Motor Assembly
11	Cover Interlock Assembly
12	Paper Out Switch, Optional

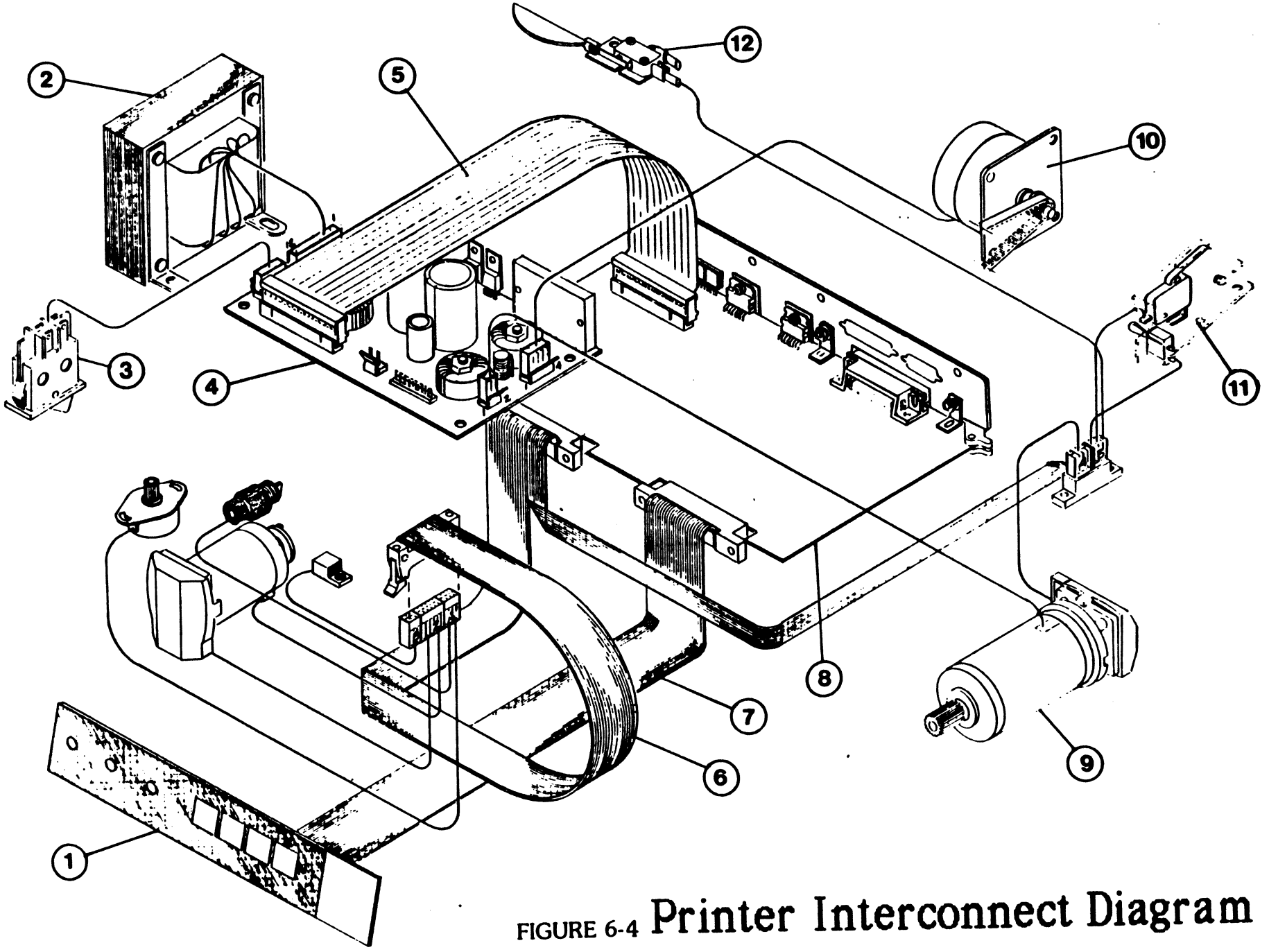


FIGURE 6-4 Printer Interconnect Diagram

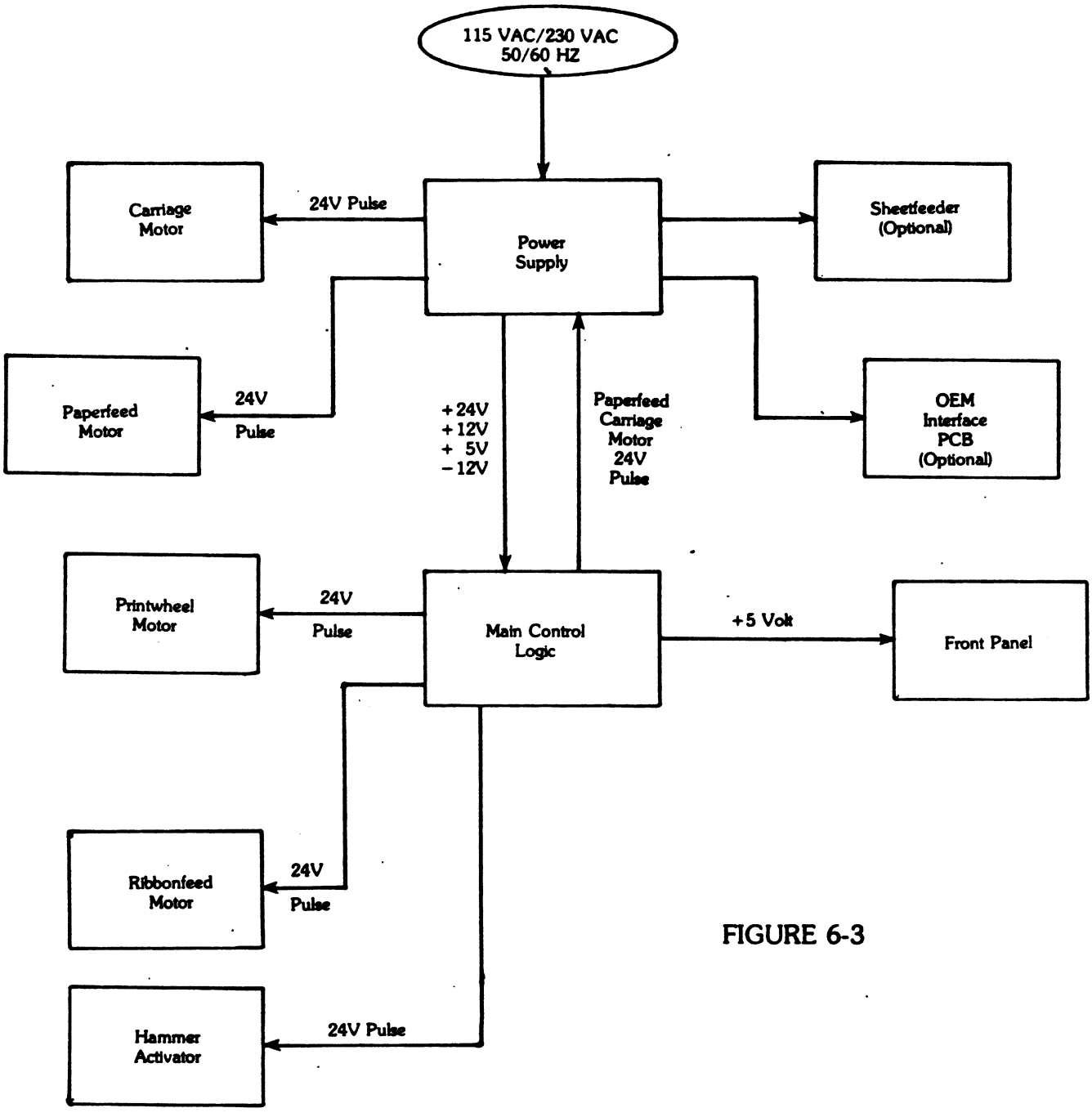

115 VAC/230 VAC
50/60 HZ
Carriage
Motor
24V Pulse
Power
Supply
Sheetfeeder
(Optional)
Paperfeed
Motor
24V
Pulse
+24V
+12V
+ 5V
−12V
Paperfeed
Carriage
Motor
24V
Pulse
OEM
Interface
PCB
(Optional)
Printwheel
Motor
24V
Pulse
Main Control
Logic
+5 Volt
Front Panel
Ribbonfeed
Motor
24V
Pulse
Hammer
Activator
24V Pulse

FIGURE 6-3

SECTION VII

TROUBLESHOOTING PROCEDURE

7.1 GENERAL

This section provides tabulated troubleshooting information and flow charts to aid the serviceperson in repair of the printer.

7.1.1 Troubleshooting Guide Tables

Table 7-1 lists typical malfunctions which may occur in the printer.

7.2 PROCEDURE

To use this section, the serviceperson should note the malfunction that is occurring in the printer, then look up the symptom(s) being exhibited by the machine in the Troubleshooting Guide Table (Table 7-1). The symptoms are in the first column of the table. In the third column are recommended actions for solving the problem. Should the information provided not be sufficient for locating the source of the problem, the user should go to the Diagnostic Flow Charts and begin troubleshooting as directed by the charts. The applicable flow chart is noted in the right hand column of the Troubleshooting Table under Reference Paragraph.

Should the directions in this section be exhausted before the printer problem is solved, it is recommended that the printer be tested with the host system before being returned to the depot for further troubleshooting.

This Section contains troubleshooting flow charts for the following subsystem functions:

DIAGNOSTIC CHART	PAGE
Interface I/O	
Front Panel	
Main Control Logic	
Power On Restore Sequence	
Check Light	
Power Supply	
Hammer	
Printwheel	
Carriage	
Cover Open Interlock Switch	
End of Ribbon Sensor	
Ribbonfeed	
Paperfeed System	

7.2.1 FLOW CHART REFERENCES

Please note the letter designations which are marked in circles or ovals on the flow charts. An oval indicates the technician should move from that point on the flow chart to the chart location pointed to by the same designator in a circle. Unless noted in the oval below the designator, the circled designator will be on the same page.

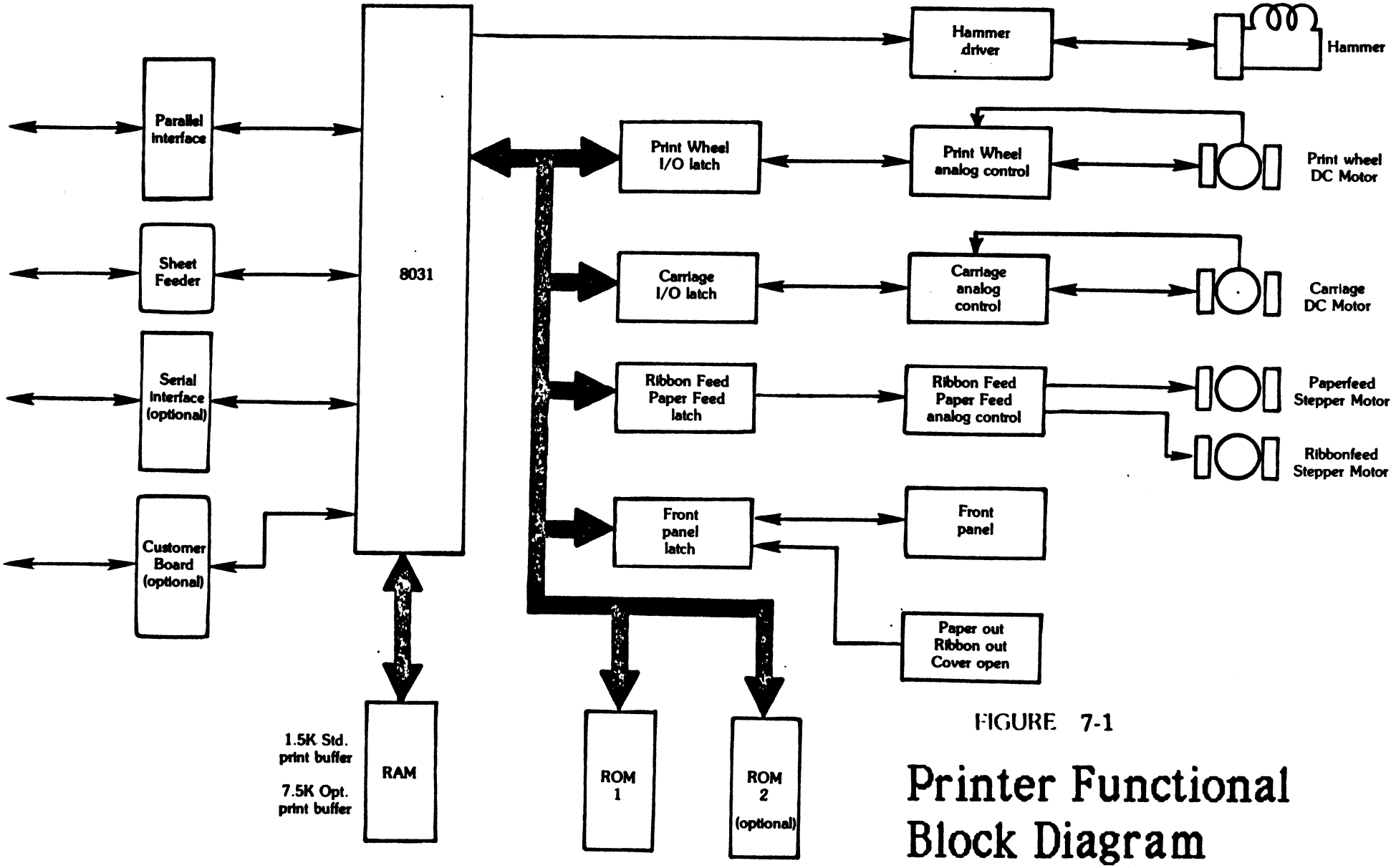


FIGURE 7-1

Printer Functional Block Diagram

TROUBLE SHOOTING GUIDE

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Uneven print density	a. Incorrect printwheel installation	Check printwheel installation
	b. Printwheel defective	Check printwheel
	c. Improper ribbon cartridge installation	Check ribbon cartridge installation
	d. Carriage misadjustment	Adjust carriage Adjust hammer position
	e. Control Logic Faulty	Replace main control board
	f. Hammer defective	Replace carriage assembly
	g. Platen defective	Replace platen
	h. Printwheel hub misadjustment	Adjust printwheel hub
	i. Hammer position misaligned	Adjust hammer position
Print line is skewed	a. Pressure roller is not engaged fully and evenly	Check pressure roller
	b. Cradle interference	Check cradle
	c. Card-guide interference	Check card-guide
	d. Paper path interference outside the printer	Check paper path
Print rate too slow	a. Excessive carriage friction	Check carriage-belt tension, adjust or replace belt
	b. Carriage motor disfunctional	Replace carriage motor
	c. Printwheel motor disfunctional	Replace printwheel motor
	d. Main control logic PCB defective	Replace PCB

TABLE 7-1

TROUBLE SHOOTING GUIDE

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Uneven print density	a. Incorrect printwheel installation	Check printwheel installation
	b. Printwheel defective	Check printwheel
	c. Improper ribbon cartridge installation	Check ribbon cartridge installation
	d. Carriage misadjustment	Adjust carriage
		Adjust hammer position
	e. Control Logic Faulty	Replace main control board
	f. Hammer defective	Replace carriage assembly
	g. Platen defective	Replace platen
	h. Printwheel hub misadjustment	Adjust printwheel hub
	i. Hammer position misaligned	Adjust hammer position
Print line is skewed	a. Pressure roller is not engaged fully and evenly	Check pressure roller
	b. Cradle interference	Check cradle
	c. Card-guide interference	Check card-guide
	d. Paper path interference outside the printer	Check paper path
Print rate too slow	a. Excessive carriage friction	Check carriage-belt tension, adjust or replace belt
	b. Carriage motor disfunctional	Replace carriage motor
	c. Printwheel motor disfunctional	Replace printwheel motor
	d. Main control logic PCB defective	Replace PCB

TABLE 7-1

TABLE 7-1

TROUBLE SHOOTING GUIDE

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Horizontal margin alignment inconsistent or non-uniform	a. Loose carriage timing belt b. Misaligned idler pulley c. Damaged left-hand rubber stop d. Defective encoder e. Defective main control logic	Adjust the belt Align the pulley Replace the rubber stop Replace carriage motor assembly Replace PCB
Paper Advance Fault: 1. Paper does not advance	a. Pressure roller lever is not pushed back [When form tractor is not used]. b. Paperfeed belt not installed, broken, or has misadjusted tension c. Control logic faulty d. Paperfeed cables defective e. Paperfeed motor defective	Reposition pressure roller lever Check paperfeed belt, replace the belt if necessary Replace main control board Check cabling connections replace as necessary Replace paperfeed motor
2. Paper does not advance when LINE FEED switch is pressed	a. LINE FEED switch defective b. Control panel cable loose or defective c. Main control logic PCB defective	Replace control panel Check the cable, replace if necessary Replace PCB
3. Paper does not advance when FORM FEED switch is pressed	a. FORM FEED switch defective b. Control panel cable connector disconnected or defective c. Main control logic PCB defective	Replace the switch Check the cable connector and replace if required. replace PCB

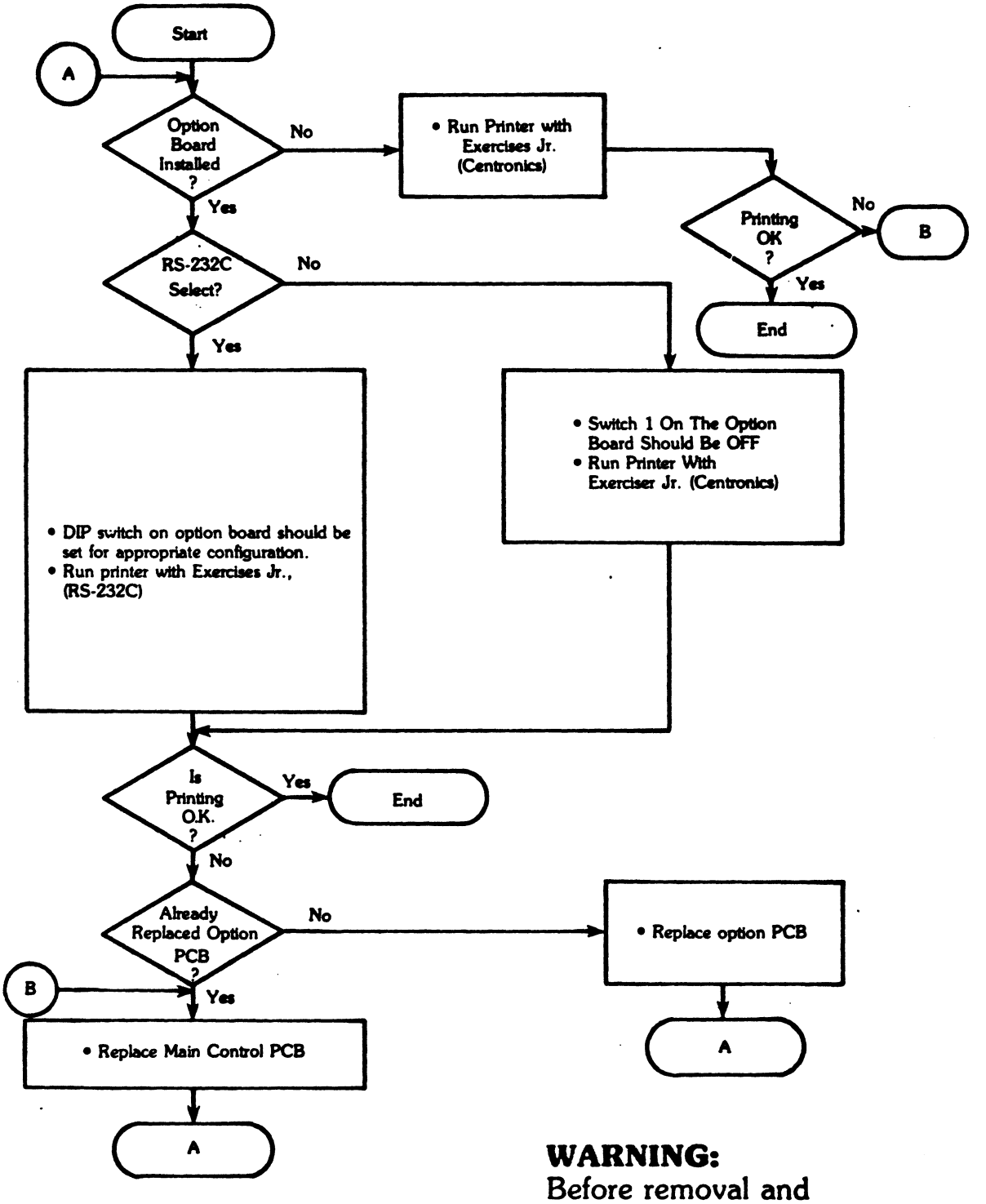
TROUBLE SHOOTING GUIDE

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
4. Paper does not align to-top-of-form position	a. TOF (Top Of Form) not set	Set the TOF
	b. 6/8 LPI (Line Per Inch) switch is set improperly	Check the 6/8 LPI switch
	c. FORM LENGTH dip switch set improperly	Check the switch setting
	d. Paper improperly loaded	Reload the paper
Ribbon is not advancing	a. Ribbon cartridge improperly installed	Reinstall the ribbon
	b. Ribbon cartridge defective	Change the ribbon cartridge
	c. Control logic faulty	Replace main control board
	d. Ribbon motor leads disconnected	Connect the motor leads or replace the motor assembly
	e. Ribbon drive motor defective	Replace the drive motor
	f. Carriage flat cable disconnected	Connect or replace the cable
Carriage does not move or moves erratically	a. Mechanical interference or paper jam	Check and clear the paper path
	b. Control logic faulty	Replace main control board
	c. Carriage timing belt defective or jammed	Adjust or replace the timing belt
	d. Carriage motor defective	Replace carriage motor assembly
Printwheel does not rotate or rotates erratically	a. Mechanical interference	Replace upper carriage assembly
	1. Hammer caught in spokes	Clear and check ribbon feed operation
	2. Ribbon caught in printwheel spokes	Reseat carriage
	3. Carriage not locked in place	Replace printwheel
	4. Printwheel spokes bent	Replace main control board
	b. Control board faulty	Reconnect motor cable
	c. Motor cable faulty	Replace motor cable
	d. Printwheel motor defective	Replace motor assembly
Printwheel spins continuously	a. Printwheel motor cable defective	Reconnect or replace cable
	b. Main control board faulty	Replace main control board
	c. Printwheel encoder defective	Replace printwheel encoder

TABLE 7-1

Interface I/O Diagnostics

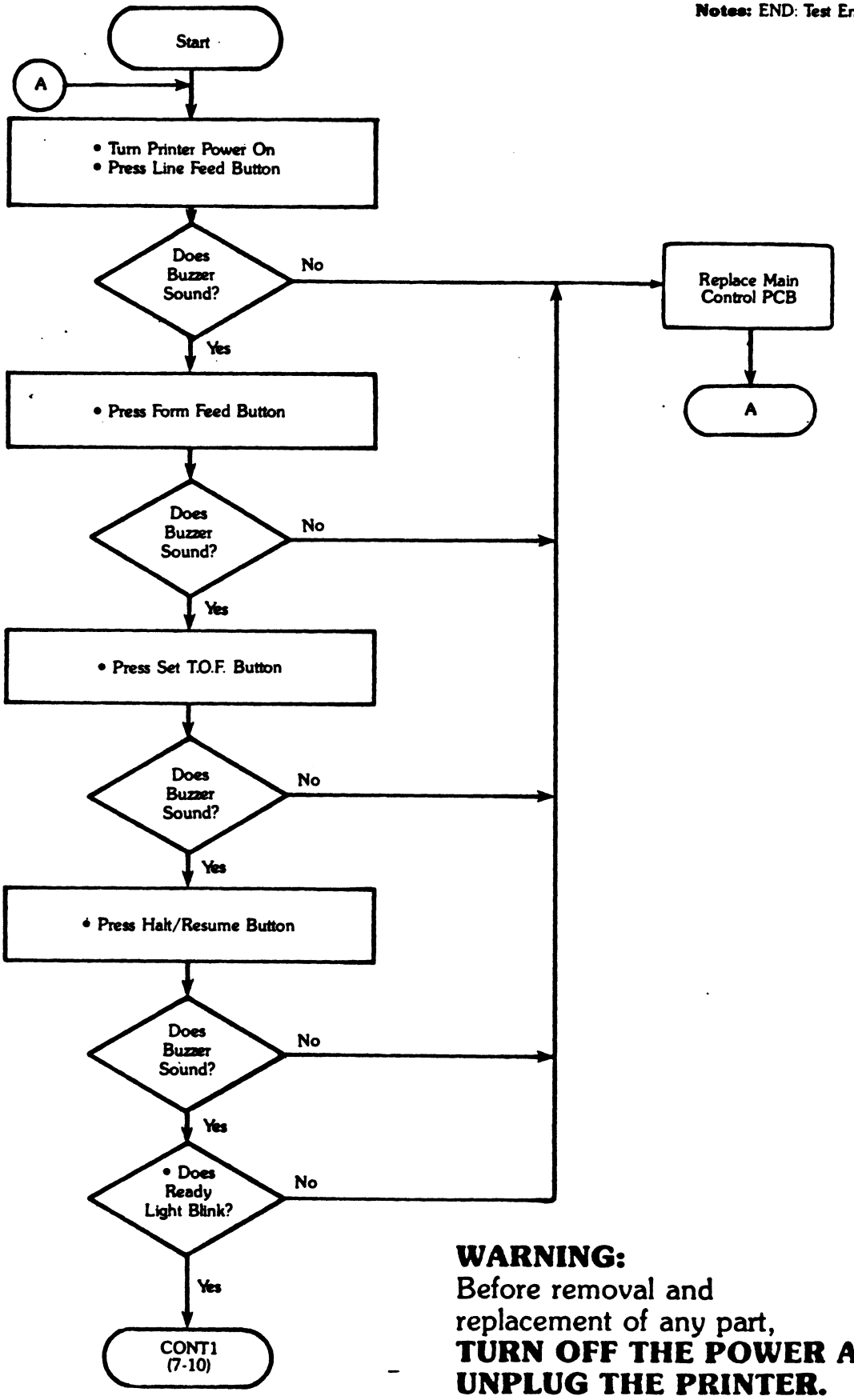
Required Equipment: Known good tester (such as Exerciser Jr.) with RS-232C and Centronics interfaces.



WARNING:
Before removal and replacement of any part,
TURN OFF THE POWER AND UNPLUG THE PRINTER.

Front Panel/Main Logic Board Diagnostics Chart

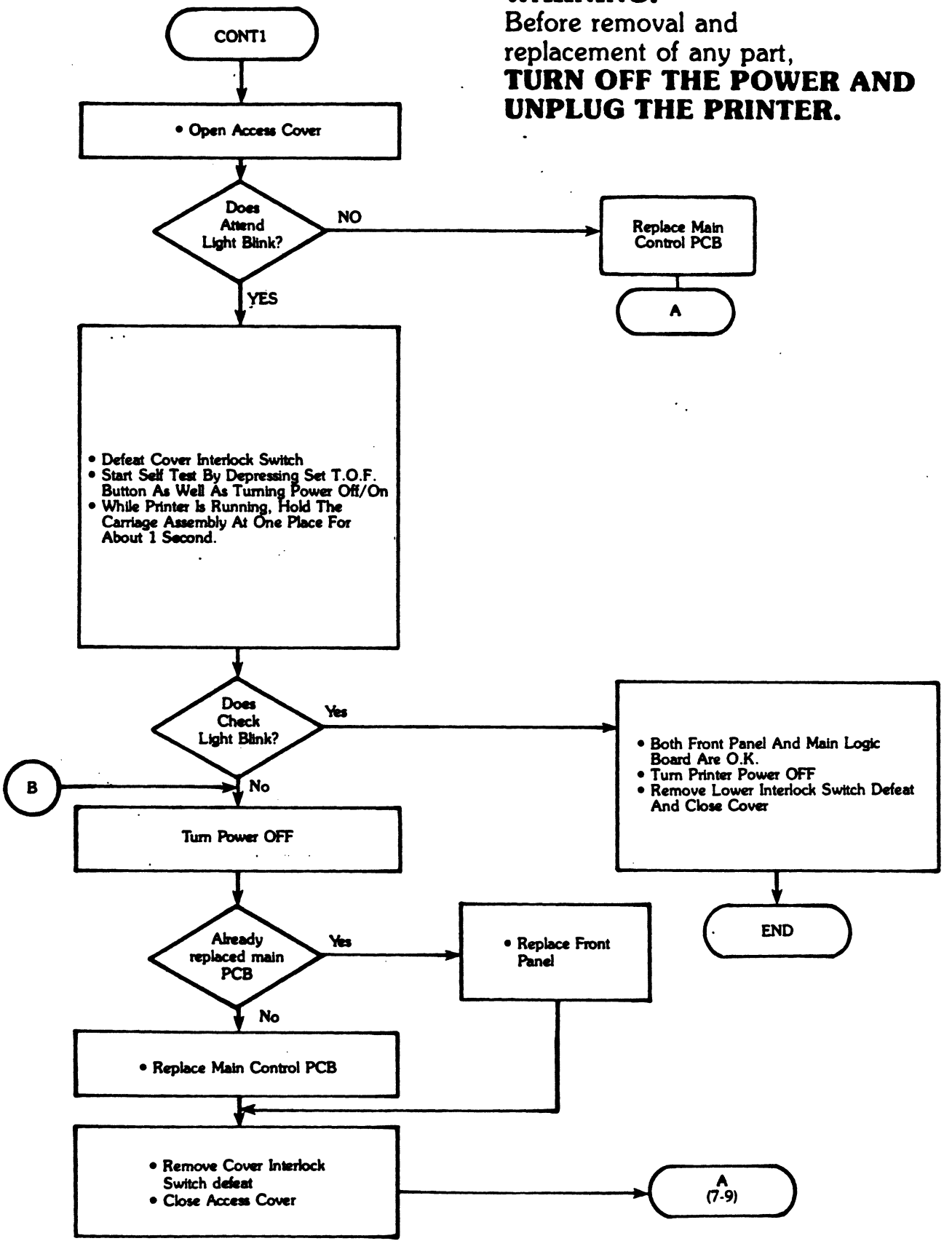
Notes: END: Test Ends



WARNING:
Before removal and replacement of any part, **TURN OFF THE POWER AND UNPLUG THE PRINTER.**

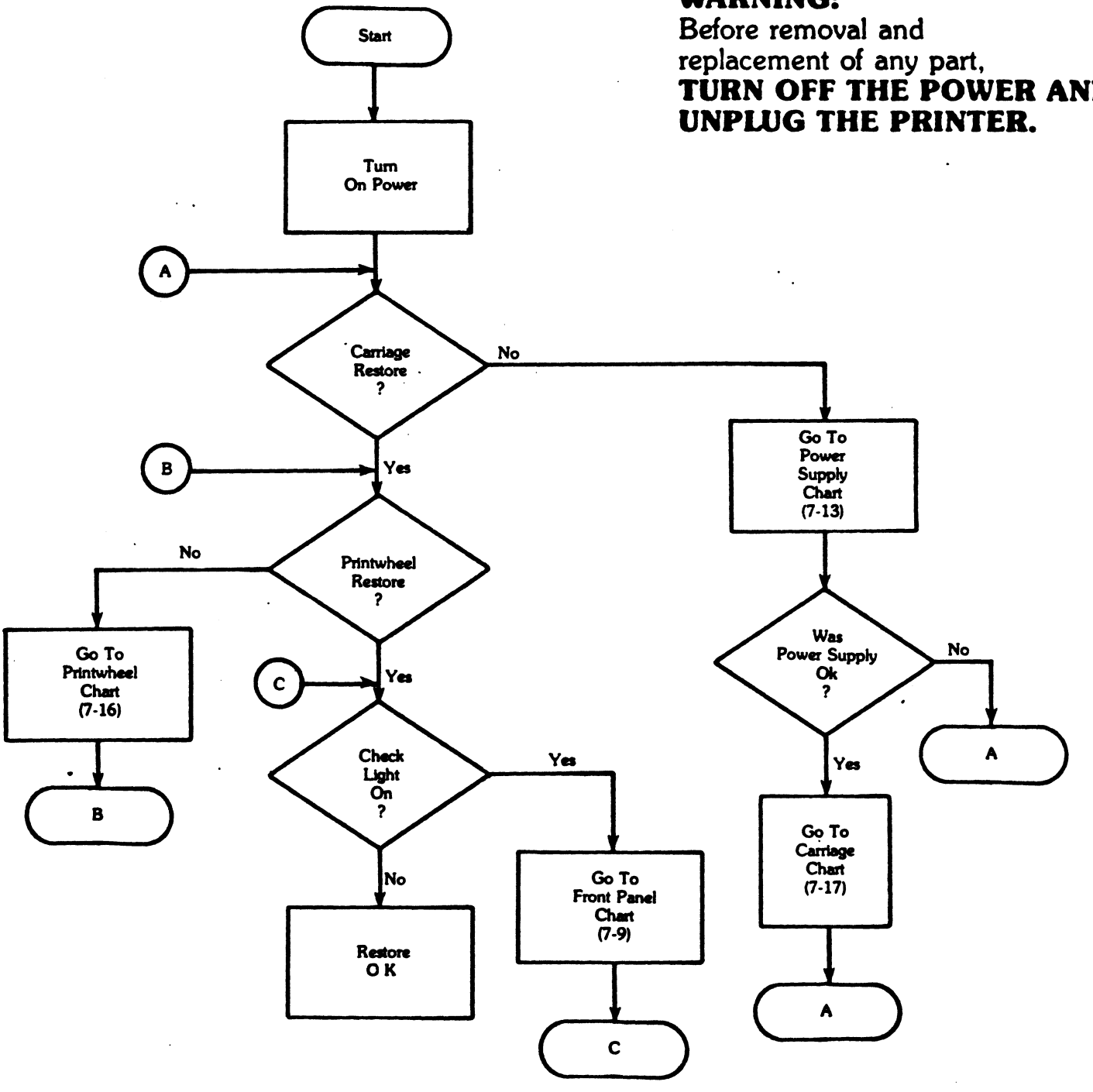
Front Panel/Main Logic Board Diagnostics Chart (Cont'd)

WARNING:
Before removal and replacement of any part, **TURN OFF THE POWER AND UNPLUG THE PRINTER.**

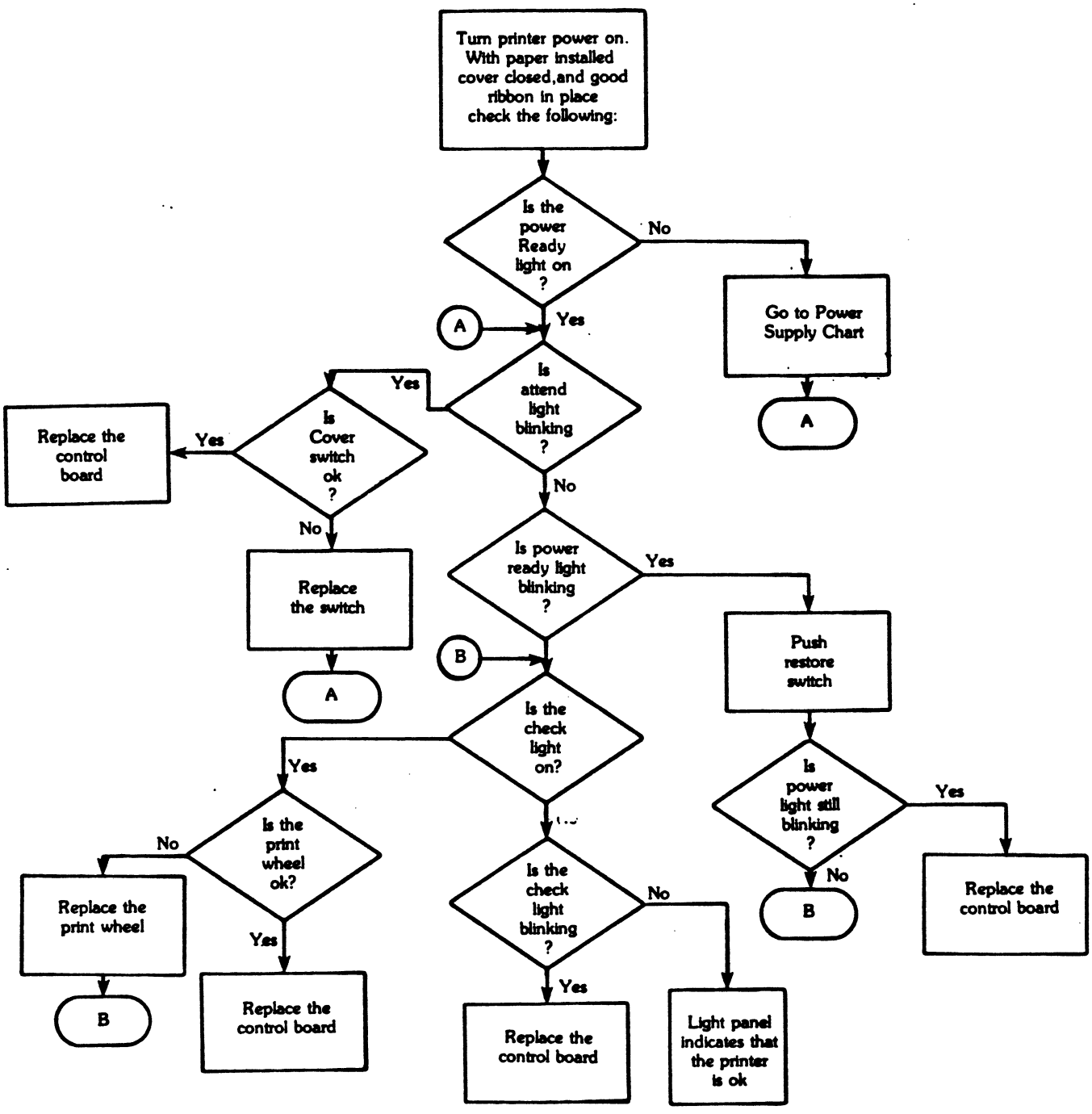


Power On Restore Diagnostics Chart

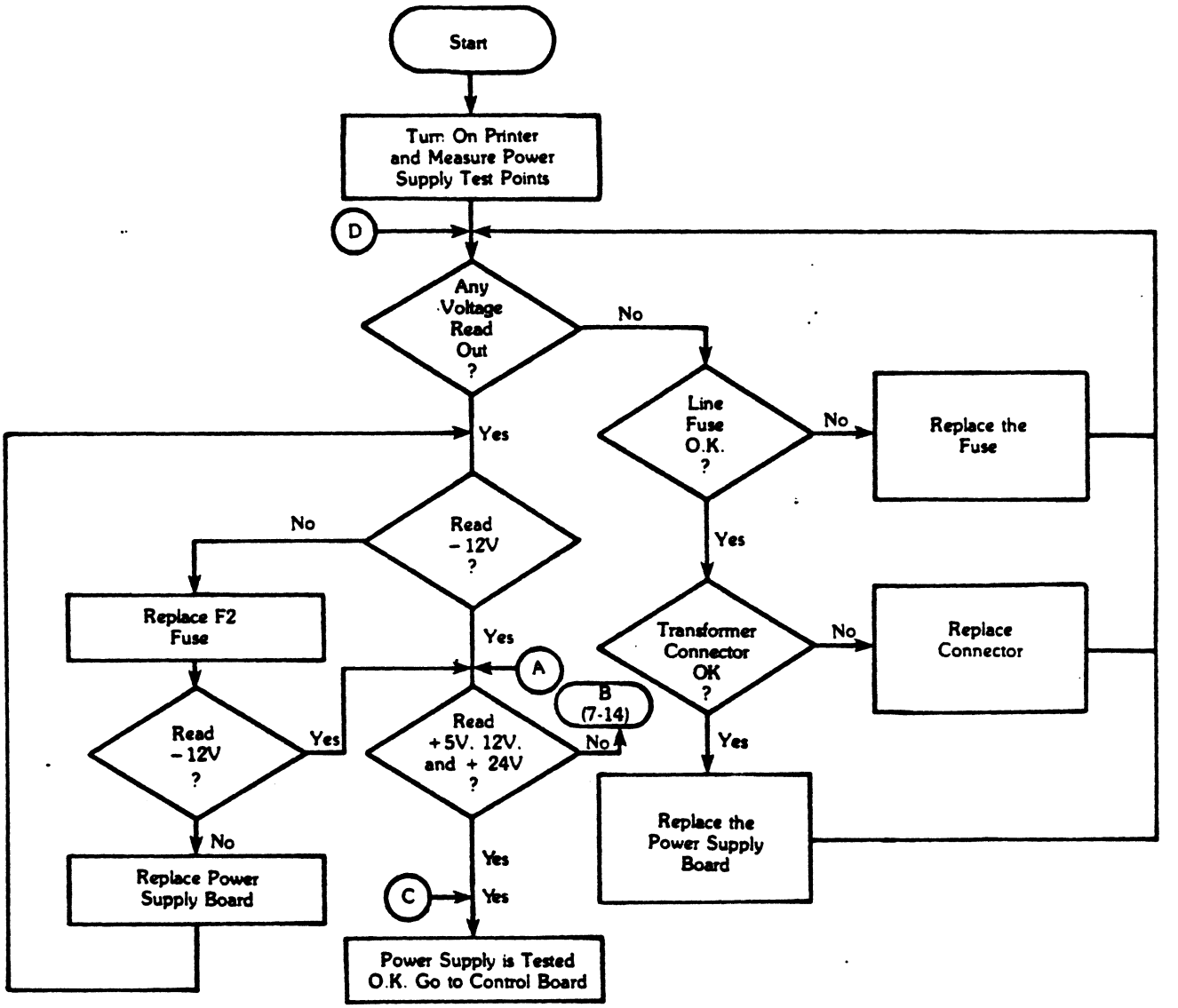
WARNING:
Before removal and replacement of any part, **TURN OFF THE POWER AND UNPLUG THE PRINTER.**



Check Light Diagnostics Chart

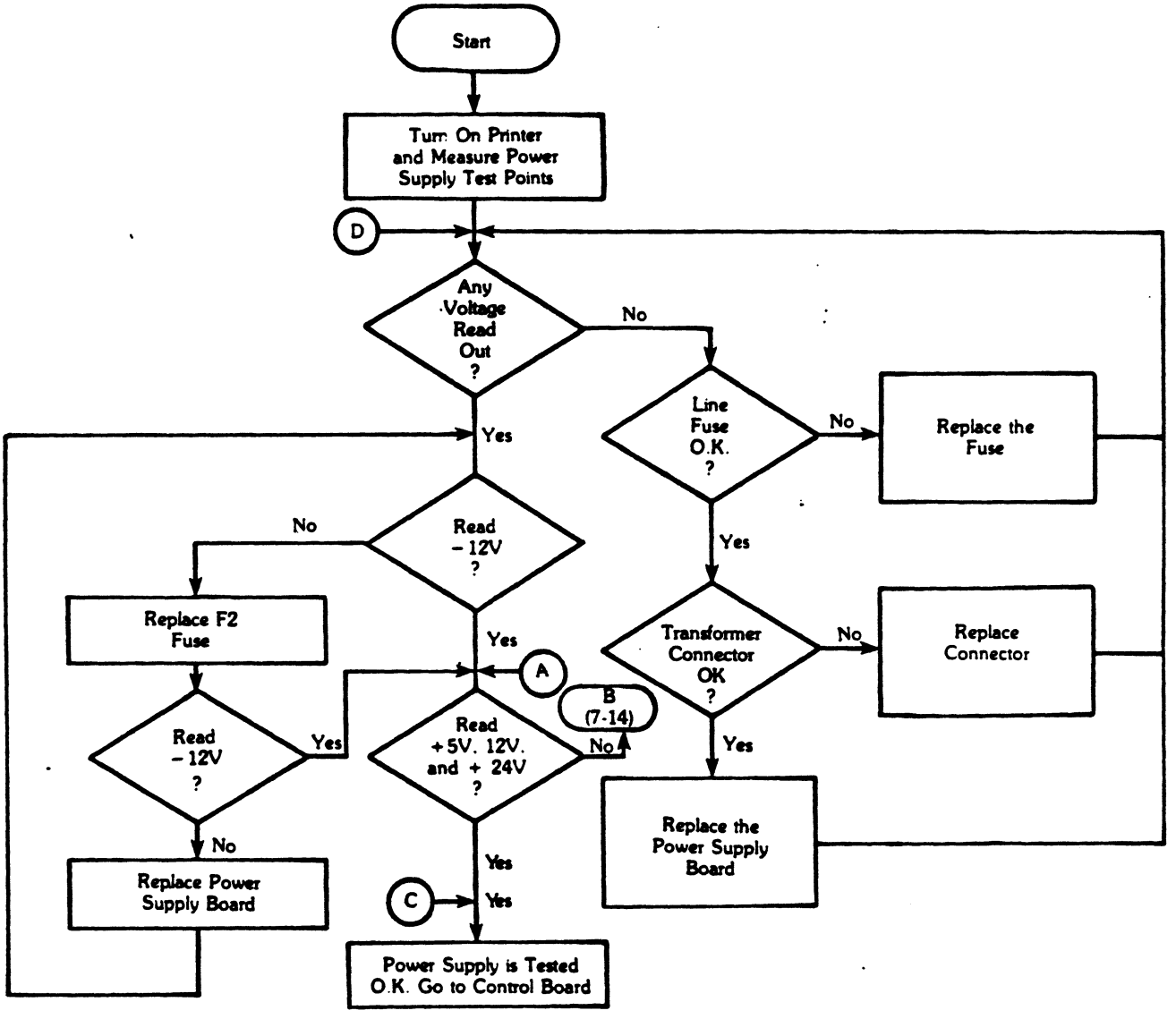


Power Supply Diagnostics Chart



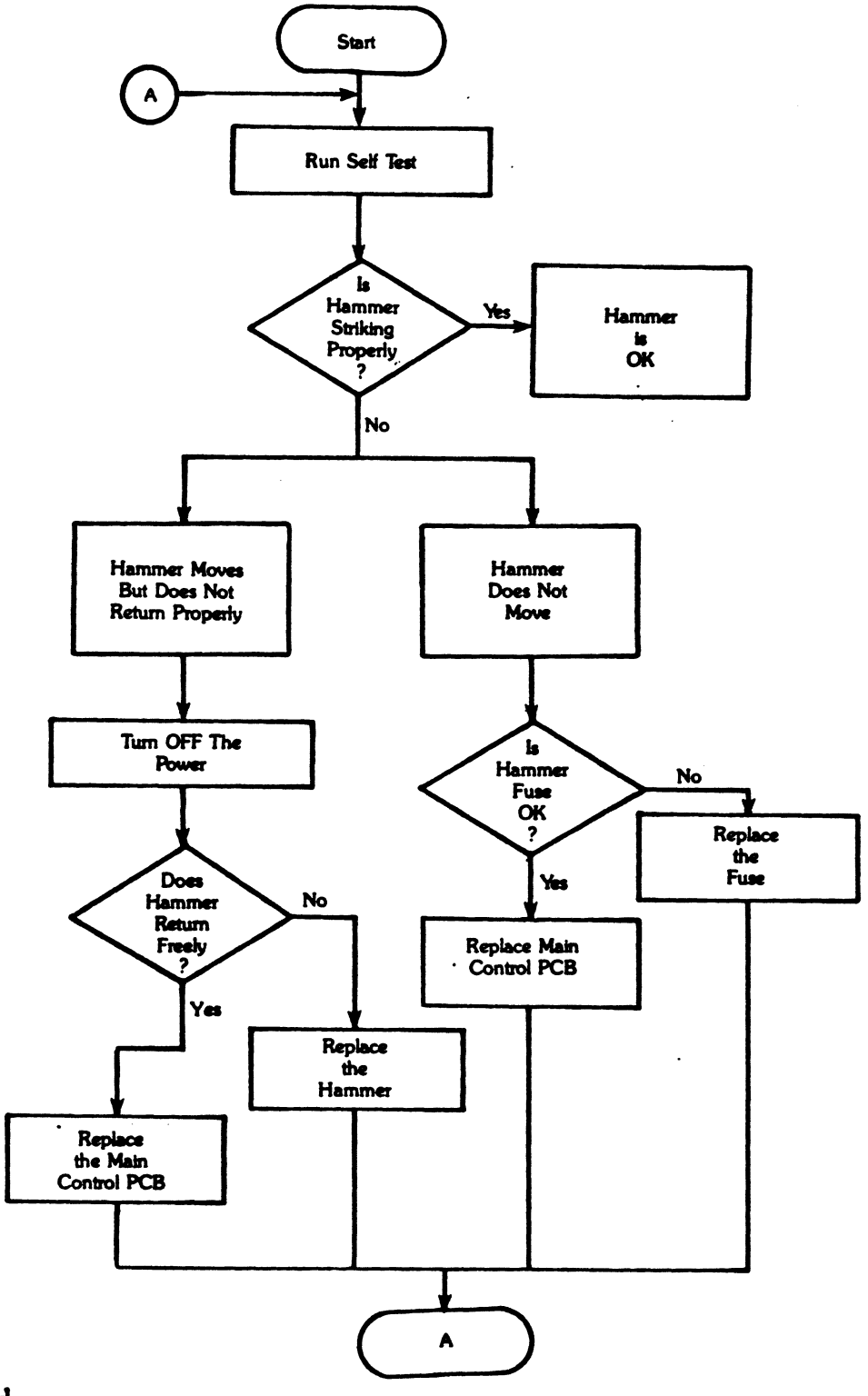
WARNING:
Before removal and replacement of any part,
TURN OFF THE POWER AND UNPLUG THE PRINTER.

Power Supply Diagnostics Chart



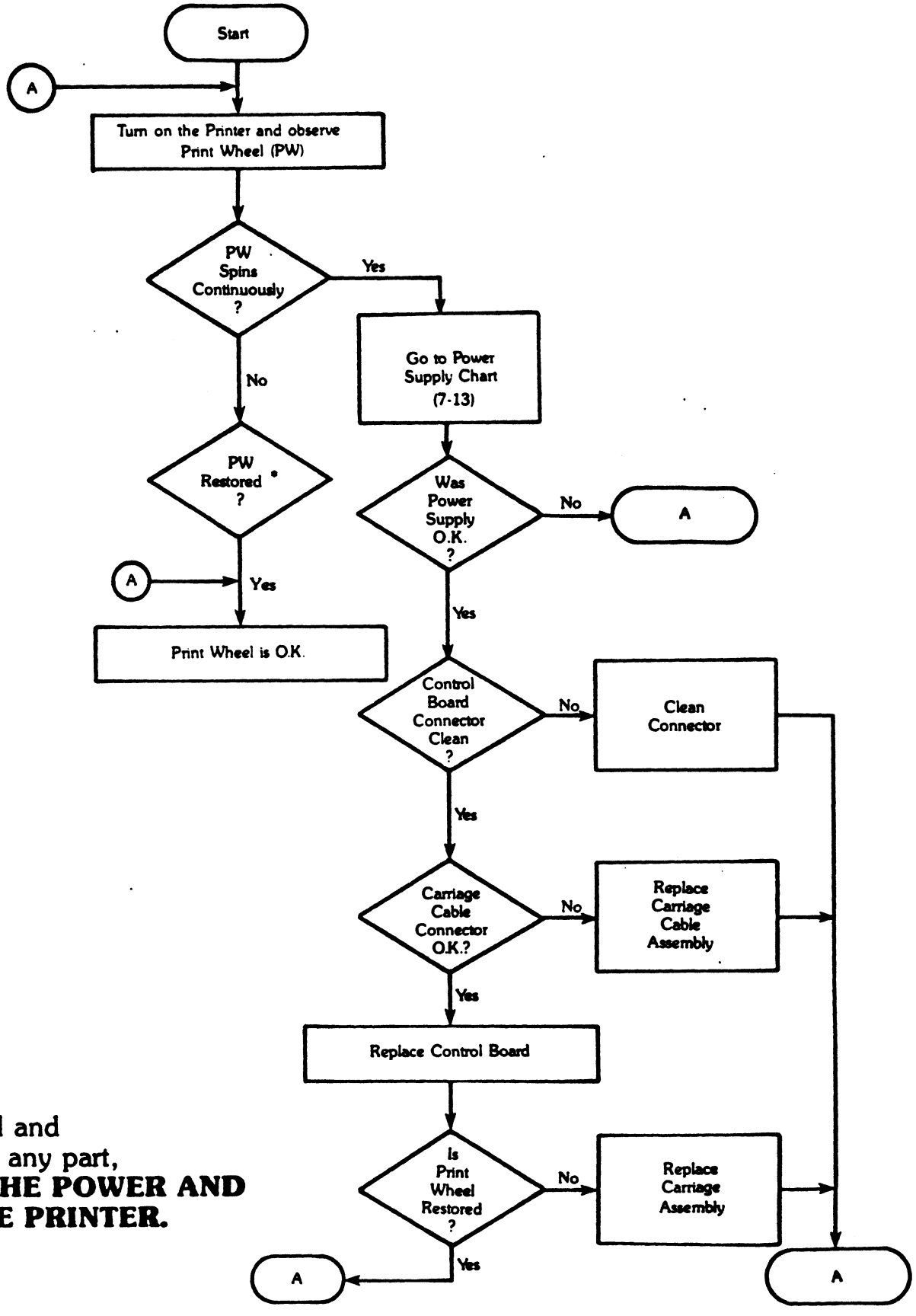
WARNING:
Before removal and replacement of any part,
TURN OFF THE POWER AND UNPLUG THE PRINTER.

Hammer Diagnostics Chart



WARNING:
Before removal and replacement of any part,
TURN OFF THE POWER AND UNPLUG THE PRINTER.

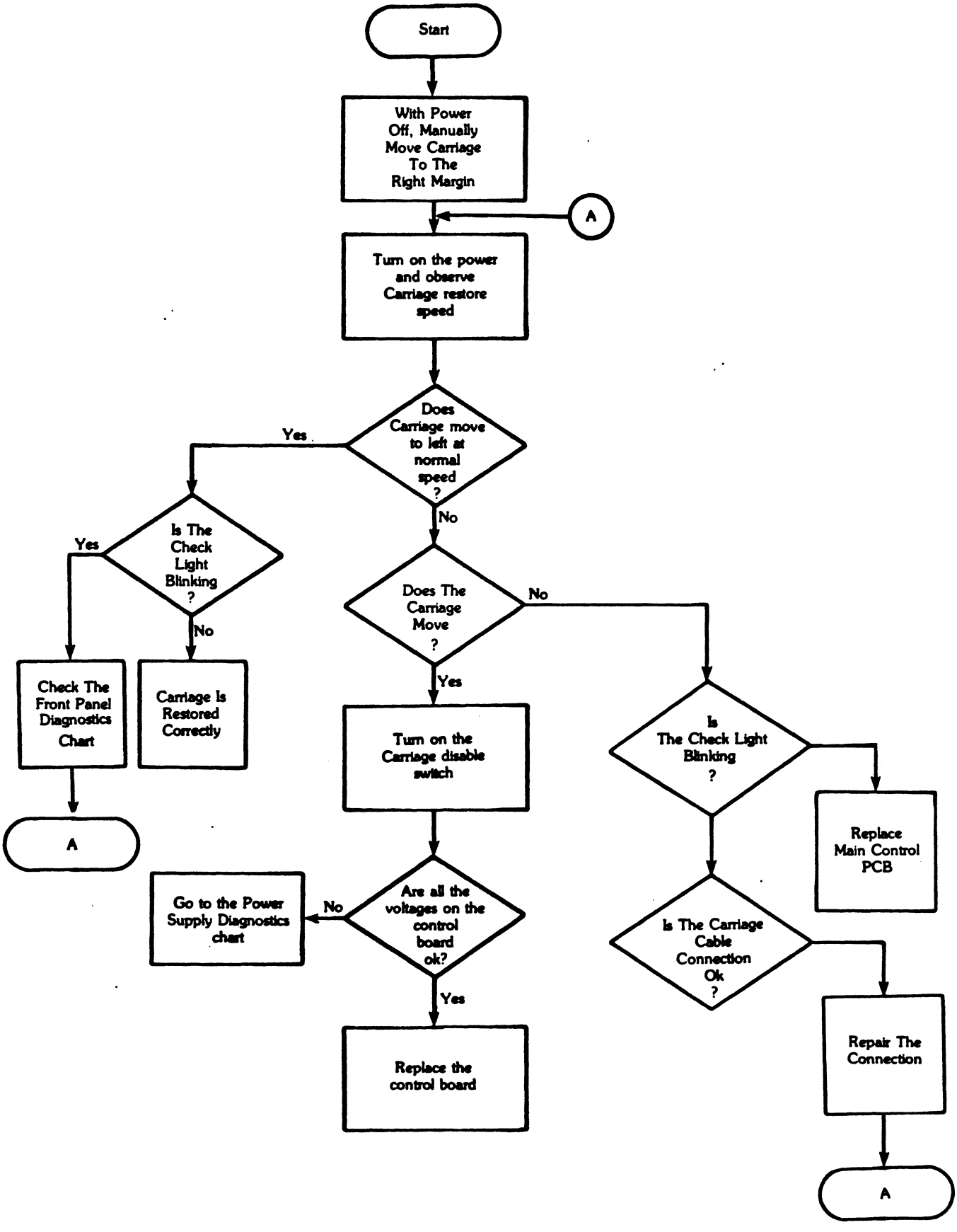
Print Wheel Diagnostics Chart



WARNING:
Before removal and replacement of any part,
TURN OFF THE POWER AND UNPLUG THE PRINTER.

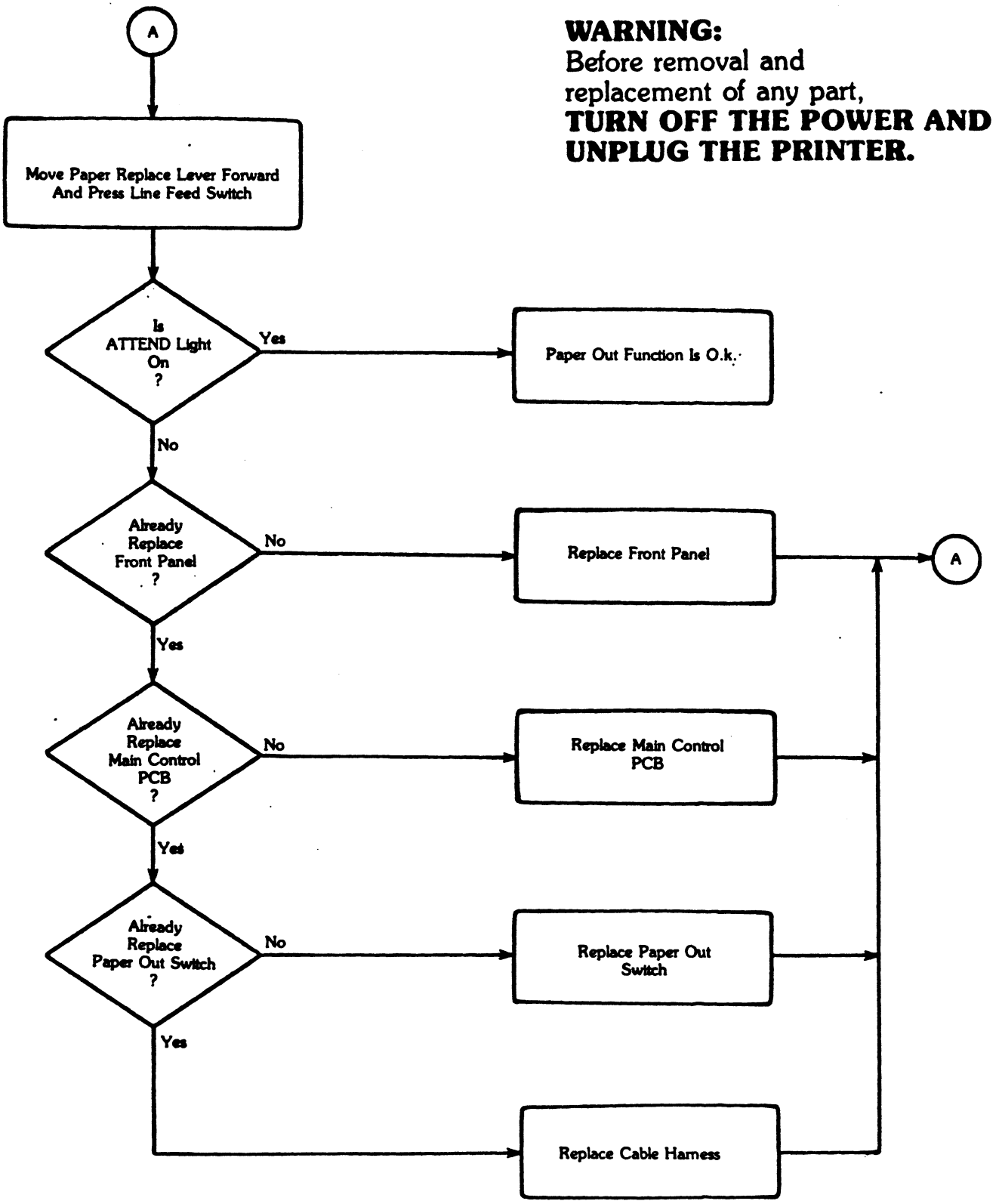
Restored: Printwheel kicks, then stops at the index character.

Carriage Diagnostics Chart



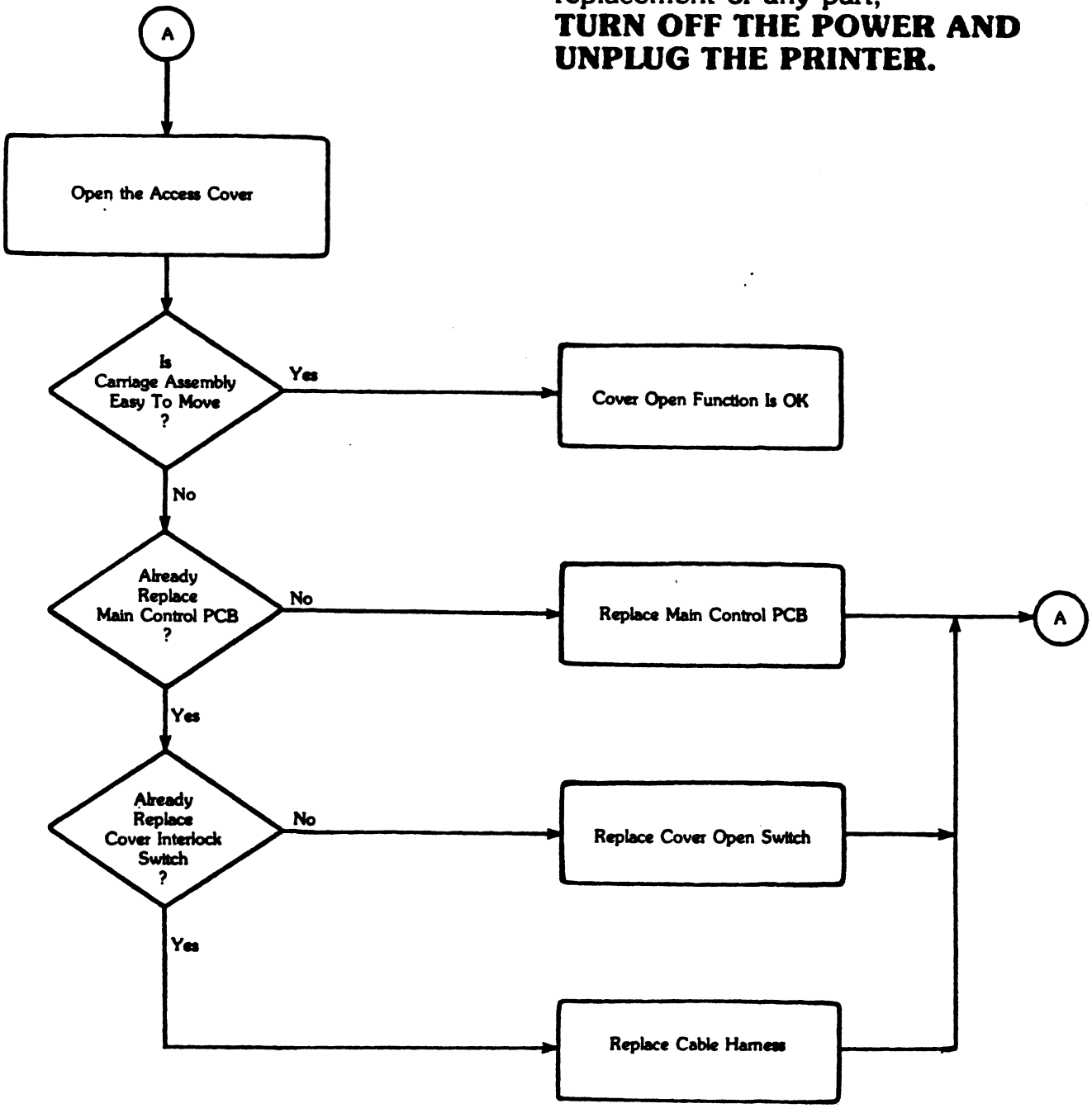
Paper Out Sensor Diagnostics Chart

WARNING:
Before removal and replacement of any part, **TURN OFF THE POWER AND UNPLUG THE PRINTER.**



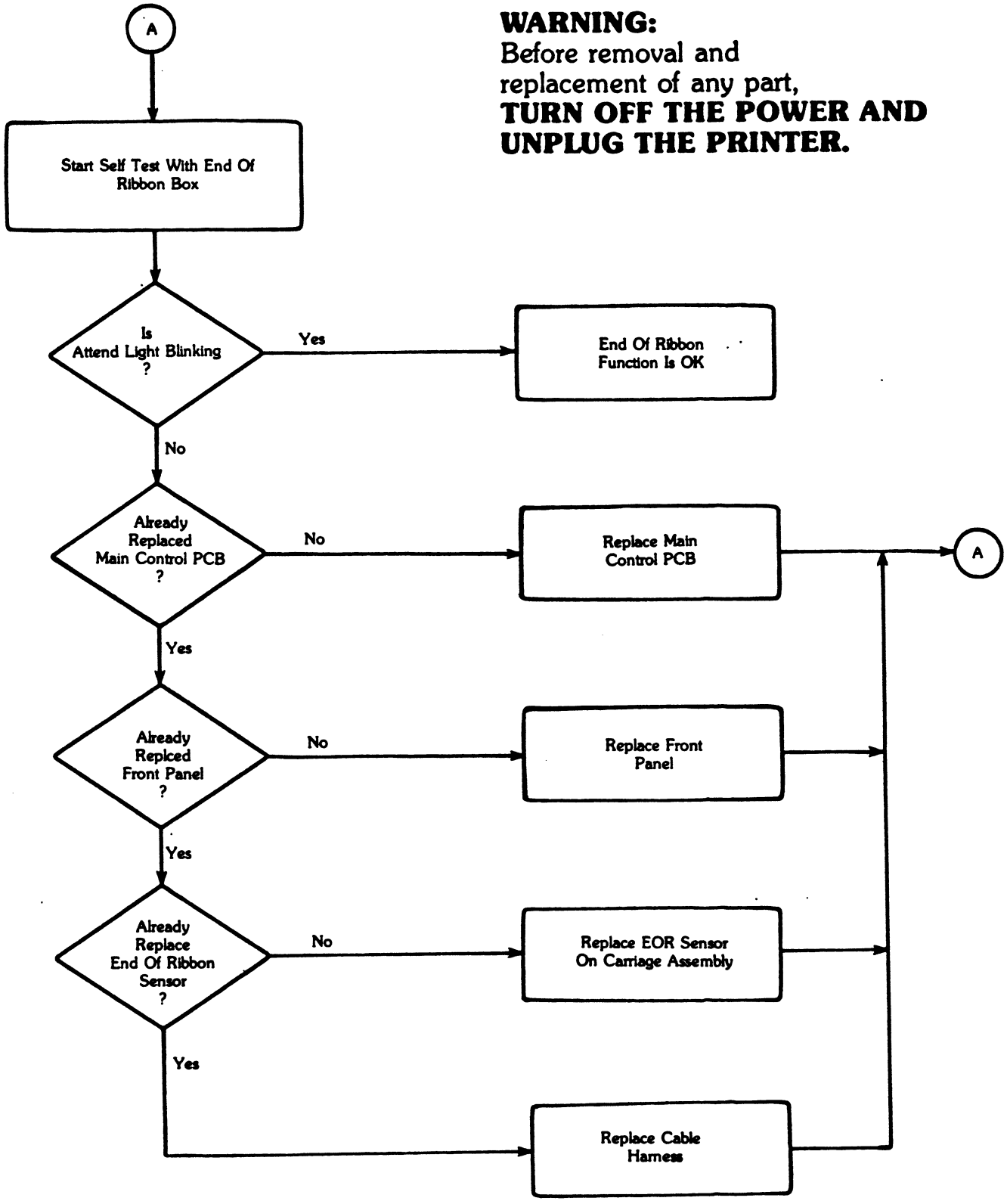
Cover Open Interlock Switch Diagnostics Chart

WARNING:
Before removal and replacement of any part, **TURN OFF THE POWER AND UNPLUG THE PRINTER.**



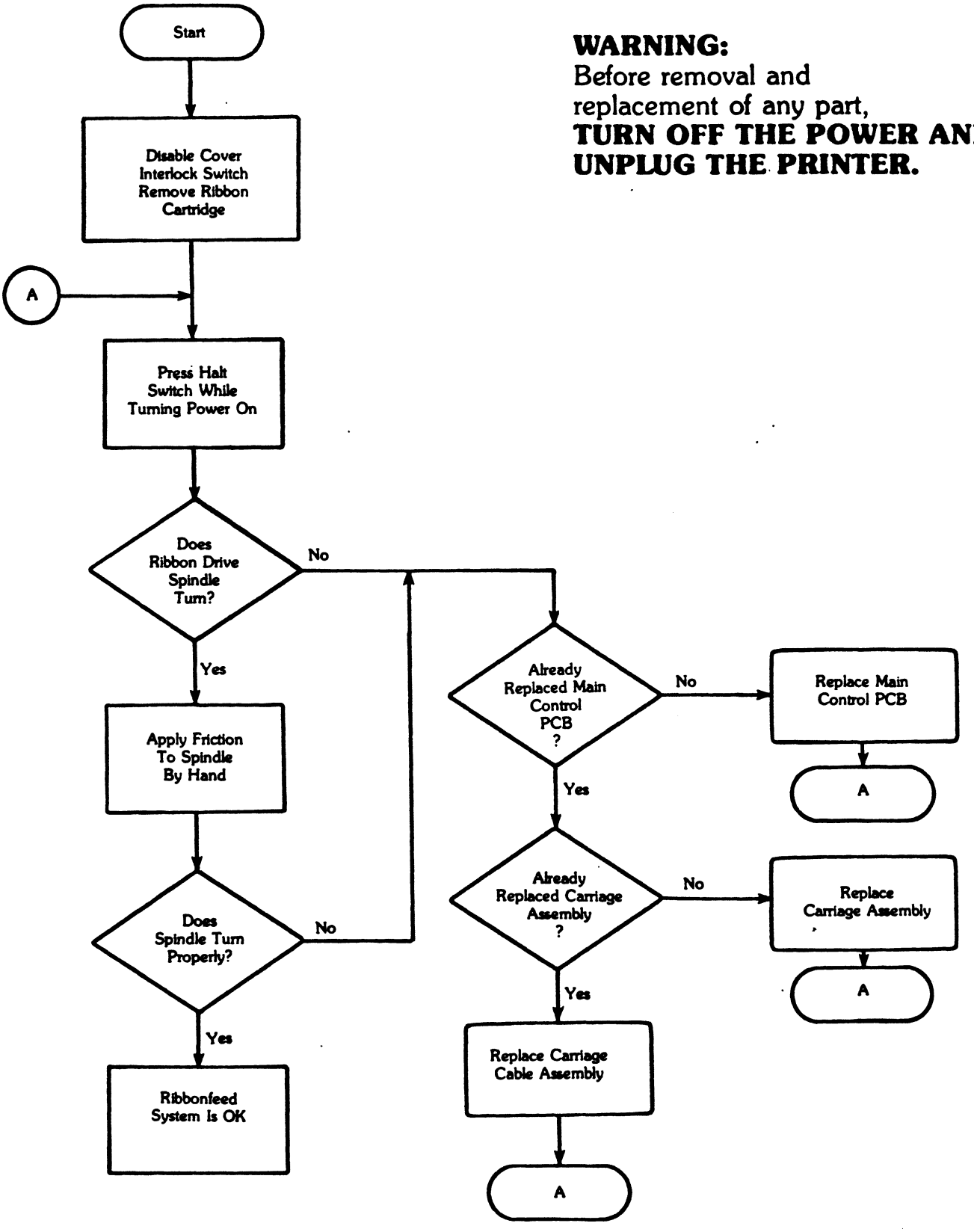
End of Ribbon Sensor Diagnostics Chart

WARNING:
Before removal and replacement of any part,
TURN OFF THE POWER AND UNPLUG THE PRINTER.



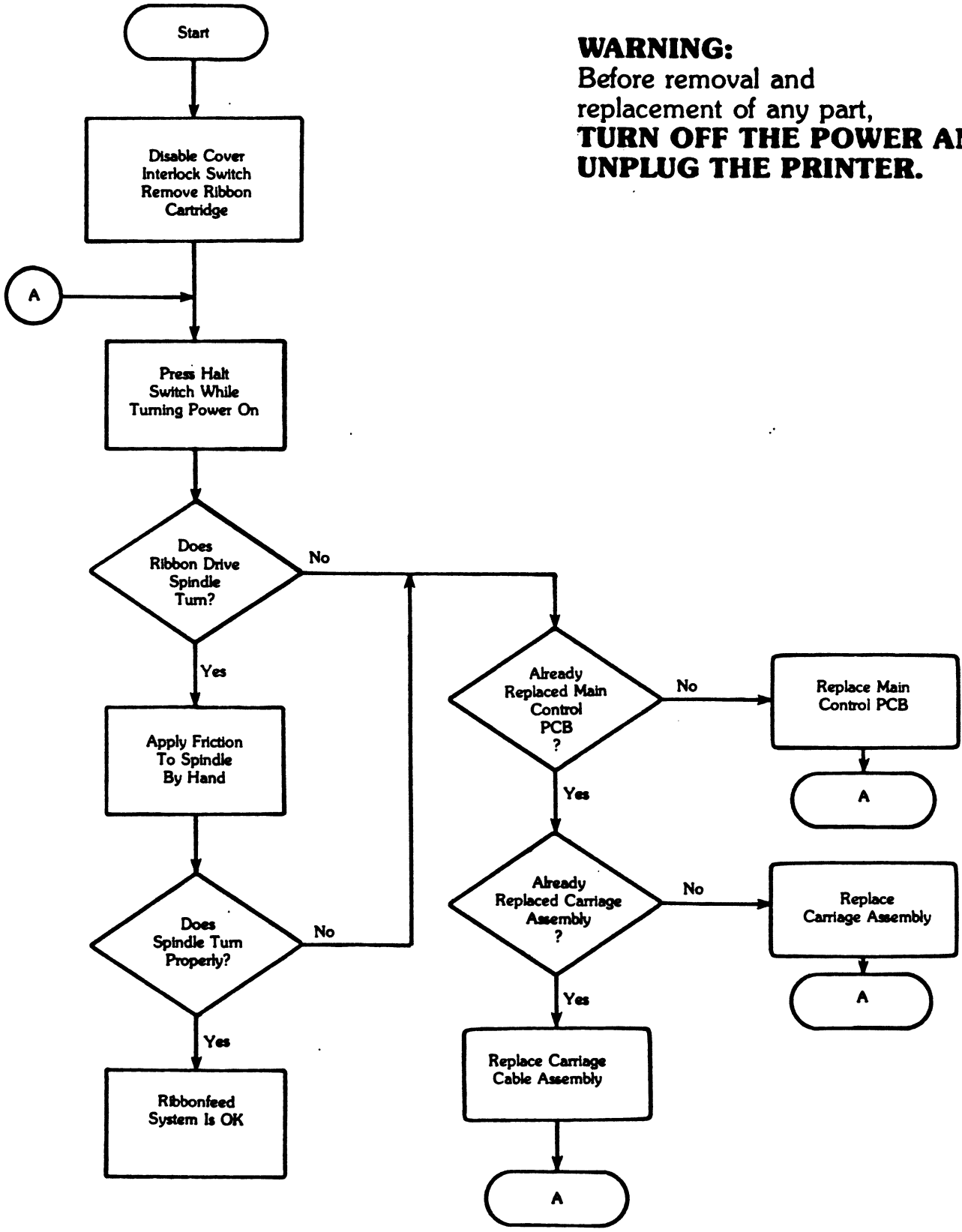
Ribbonfeed Diagnostics Chart

WARNING:
Before removal and replacement of any part, **TURN OFF THE POWER AND UNPLUG THE PRINTER.**



Ribbonfeed Diagnostics Chart

WARNING:
Before removal and replacement of any part,
TURN OFF THE POWER AND UNPLUG THE PRINTER.



SECTION VIII

REMOVAL & REPLACEMENT PROCEDURES

8.1 INTRODUCTION

This section contains the information necessary to accomplish removal and replacement of the printer subassemblies. Each subassembly removal and replacement procedure assumes that the printer is intact at the outset of the procedure. Along with each written procedure is one or more illustrations to aid the serviceperson in understanding the instructions.

8.2 SECTION CONTENT

This section contains the removal and replacement procedures for the following subassemblies:

PARAGRAPH	SUBASSEMBLY
8.3	Cover Assembly
8.4	Main Control PCB
8.5.1	Upper Carriage Subassembly
8.5.2	Carriage Assembly
8.6	Carriage Drive Motor Assembly
8.7	Paper Bail Assembly
8.8	Paperfeed Belt
8.9	Platen Assembly
8.10	Paperfeed Motor Assembly
8.11	Platen Cradle Assembly
8.12	Pressure Roller Assembly
8.13	Front Panel Assembly
8.14	Power Supply PCB
8.15	Power Supply Transformer
8.16	Power Switch Assembly
8.17	Fuse Holder Assembly
8.18	EPROM Firmware

Illustrations are at the end of the section.

8.3 COVER ASSEMBLY REMOVAL & REPLACEMENT

8.3.1 Removal:

Disconnect the power cord.

Remove the platen knob on each side of the printer by inserting a screwdriver into the hole in the center of the knob and removing the screw securing the knob to the platen shaft.

Remove the two mounting screws from the front inside corners of the cover (Mounting screw locations are shown in Figure 8-1).

Loosen the two mounting screws securing the cover to the base casting at the rear of the printer. See Figure 8-2.

Lift the cover off the base assembly.

8.3.2 Replacement:

Position the bail arm lever and the pressure roller lever at about the midpoint of their movement ranges.

Lower the cover assembly onto the base assembly. Reposition the bail arm lever and the pressure roller lever such that they offer no impediment to the cover as is is fitted into place on the base assembly.

Replace the two mounting screws in the front corners of the operator access area.

Tighten the two mounting screws at the rear of the printer.

Reinstall the platen knobs.

Reconnect the power cord.

CAUTION

> Check to ascertain that the power switch is in the off position before connecting the power cord.

8.4 MAIN CONTROL PCB REMOVAL & REPLACEMENT

8.4.1 Removal:

Disconnect the power cord.

Remove the three mounting screws along the top edge of the printer back panel shown in Figure 8-3.

Lift the ejector levers on both sides of the back panel to unseat the PCB.

Pull the circuit board out just far enough to get access to the ribbon cable connector as shown in Figure 8-4.

Disconnect the ribbon cable.

Remove the main control PCB from the printer.

8.4.2 Replacement:

Reverse the procedure in Paragraph 8.4.1 to reinstall the main control PCB.

CAUTION

During the installation procedure, be careful to correctly reseat the PCB and to avoid damage to the ribbon cable.

Reconnect the power cord.

CAUTION

Check to ascertain that the power switch is in the off position before connecting the power cord.

8.5 CARRIAGE ASSEMBLY REMOVAL & REPLACEMENT

8.5.1.1 Upper Carriage Subassembly Removal:

Disconnect the power cord.

Lift the cover lid.

Remove the ribbon cartridge.

Tilt the upper carriage away from the platen. Remove the printwheel.

(The Upper Carriage Subassembly is electrically connected to the printer through a wire bundle which is terminated in a connector which plugs into the connector on the flat ribbon cable looping up from the base casting. This connector is immediately below the connector on the flat ribbon cable.)

Loosen the carriage wire-bundle connector by levering it away from its mate with the cable lock ejectors mounted on either side of the connector.

Remove the two springs securing the upper carriage subassembly to the lower carriage subassembly. See Figure 8-5.

Lift the upper carriage subassembly out of the printer.

8.5.1.2 Upper Carriage Subassembly Replacement:

Reversing the procedure in Paragraph 8.5.1.1, replace the upper carriage subassembly into the printer.

Reconnect the power cord.

CAUTION

Check to ascertain that the power switch is in the off position before connecting the power cord.

8.5.2 Carriage Belt Removal & Replacement

8.5.2.1 Removal:

Disconnect the power cord.

Remove the cover assembly as described in Paragraph 8.3.

To remove the belt, place the right index finger behind the carriage belt at the carriage motor pulley. Gently walk the belt off the pulley while moving the carriage from left to right. See Figure 8-6.

NOTE

If possible, this operation should be completed without disturbing the idler pulley assembly which secures the left-hand pulley to the base casting.

If the belt is within specification, no adjustment is necessary after replacement. If the idler pulley assembly is moved, then adjustment becomes necessary.

Remove the belt plates securing the cable ends to the carriage assembly by removing two screws from each belt plate.

Slip the belt out of the machine.

8.5.2.2 Replacement:

Replace the belt by reversing the procedures in Paragraph 8.5.2.1.

Check the belt for adjustment in accordance with the tolerances given in Section V. If necessary adjust the carriage belt as described in Section V (See Paragraph 5.2 for the page location of the carriage belt adjustment procedure).

NOTE

Belt tension and tracking is critical to the proper operation of the printer.

Replace the cover assembly as described in Paragraph 8.3.

Reconnect the power cord.

CAUTION

Check to ascertain that the power switch is in the off position before connecting the power cord.

8.5.3 CARRIAGE ASSEMBLY REMOVAL & REPLACEMENT

8.5.3.1 Removal

Disconnect the power cord.

Remove the Cover Assembly as described in Paragraph 8.3.

Disconnect the carriage wire-bundle connector by levering it away from its mating connector with the cable lock ejectors.

Disconnect the carriage cable by removing the cable mounting screws shown in Figure 8-7.

Disconnect the carriage drive belt by removing the two screws securing the belt plate to the carriage assembly.

Remove the bail assembly as described in Paragraph 8.7.

NOTE

The hardware securing the Bail Assembly also secures the clamps which hold the lower carriage guide rail.

Remove the two screws (one at each end of the rail) securing the front carriage guide rail to the base casting.

Lift the carriage and guide rails out of the machine.

Slide the carriage assembly off the rails.

8.5.3.2 Replacement:

Slide the new carriage assembly onto the carriage guide rails.

Replace the carriage and carriage guide rails into the machine by reversing the procedures in Paragraph 8.5.3.1.

Adjust the carriage belt as described Section V (See Paragraph 5.2 for the page location of the carriage belt adjustment procedure).

Lubricate the carriage assembly as described in Section V.

Replace the cover assembly as described in Paragraph 8.3.

Reconnect the power cord.

CAUTION

Check to ascertain that the power switch is in the off position before connecting the power cord.

8.6 CARRIAGE MOTOR REMOVAL & REPLACEMENT

8.6.1 Removal

Disconnect the power cord.

Remove the cover assembly as described in Paragraph 8.3.

Remove the carriage belt by walking it off the carriage drive gear as described in Paragraph 8.5.3.

Disconnect the carriage motor cables from the connectors as shown in Figure 8-8.

Remove the three carriage motor mounting screws (shown in Figure 8-9).

Remove the screw securing the motor clamp to the base casting (See Figure 8-10).

Remove the carriage motor from the base assembly.

Remove the screw securing the motor clamp to the carriage motor.

8.6.2 Replacement

Secure the motor clamp to the new carriage motor.

Reversing the procedure in 8.6.1, replace the carriage motor assembly.

Replace the carriage belt by positioning the belt around the idler pulley on the left of the carriage, then work the right end of the belt over the pulley on the carriage motor shaft. Walk the belt back into place by moving the carriage assembly while putting gentle pressure against the side of the belt at the motor shaft pulley.

Check the belt for adjustment in accordance with the tolerances given in Section V. If necessary, adjust the carriage belt as described in Section V (See Paragraph 5.2 for the page location of the belt adjustment procedure).

Replace the cover assembly as described in Paragraph 8.3.

Reconnect the power cord.

CAUTION

Check to ascertain that the power switch is in the off position before connecting the power cord.

8.7 PAPER BAIL ASSEMBLY REMOVAL & REPLACEMENT

8.7.1 Removal

Disconnect the power cord.

Remove the cover assembly as described in Paragraph 8.3.

Remove the two mounting screws securing the paper bail assembly to the base casting (See Figure 8-11).

Disconnect the bail lever linkage arm from the paper bail assembly while lifting the paper bail assembly out of the base assembly.

8.7.2 Replacement

Reverse the procedure in Paragraph 8.7.1 to replace the paper bail assembly.

8.8 PAPERFEED BELT REMOVAL & REPLACEMENT

8.8.1 Removal:

Disconnect the power cord.

Remove the cover assembly as described in Paragraph 8.3.

Replace the platen assembly knob on the right end of the platen shaft.

Walk the paperfeed belt off the pully by placing the right index finger behind the belt next to the paperfeed motor pulley, then gently slide the belt off the pulley while turning the platen with the left hand as shown in Figure 8-12.

Remove the belt from the base assembly.

8.8.2 Replacement:

Position the belt on the platen pulley so that the lugs on the inside of the belt are meshed with the cogs on the pulley.

Reversing the procedures in 8.8.1, replace the belt on the paperfeed motor pulley.

Check the belt tension. If necessary, adjust the paperfeed belt tension as described in Section V (See Paragraph 4.2 for the page location of the belt adjustment procedure).

Remove the platen knob from the platen.

Replace the cover assembly as described in Paragraph 8.3.

Reconnect the power cord.

CAUTION

Check to ascertain that the power switch is in the off position before connecting the power cord.

8.9 PLATEN ASSEMBLY REMOVAL & REPLACEMENT

8.9.1 Removal

Disconnect the power cord.

Remove the cover assembly as described in Paragraph 8.3.

Remove the paperfeed belt as described in Paragraph 8.8.

Remove the two sets of three mounting screws which secure the platen clamps to the base casting. See Figure 8-13. (Note that the left and right platen clamps are unique and non-interchangeable.)

Lift out the platen assembly.

8.9.2 Replacement

Reposition the platen in the base casting.

CAUTION

> Be sure that the ends of all four pressure roller arms are positioned in the slots in the base casting at the rear of the operator access area. If the platen is forced into position with an arm out of its slot, damage to the carriage cradle and the pressure roller assembly will occur.

Replace the platen clamps. Secure each clamp with the three screws removed earlier.

Reinstall the paperfeed belt so that it is correctly mounted on both the platen pulley and the paperfeed motor pulley.

Check that the belt tension is within the tolerance defined in Section V. If necessary, adjust the belt tension in accordance with the procedures in Section V (See Paragraph 5.2 for the page location of the belt adjustment procedure).

Replace the cover assembly as described in Paragraph 8.3.

8.10 PAPERFEED MOTOR REMOVAL & REPLACEMENT

8.10.1 Removal:

Disconnect the power cord.

Remove the cover as described in Paragraph 8.3.

Remove the paperfeed belt as described in Paragraph 8.8.

Loosen the paperfeed motor mounting screws shown in Figure 8-14.

Disconnect the paperfeed motor cable from the power supply PCB. See Figure 8-15.

Lift the paperfeed motor out of the base assembly.

8.10.2 Replacement:

Reverse the procedures in Paragraph 8.10.1 to replace the paperfeed motor assembly.

Check that the paperfeed belt tension is within the tolerance defined in Section V. If necessary, adjust the belt tension in accordance with the procedures in of Section V (See Paragraph 5.2 for the page location of the belt adjustment procedure).

Replace the cover assembly as described in Paragraph 8.3.

Reconnect the power cord.

CAUTION

Check to ascertain that the power switch is in the off position before connecting the power cord.

8.11 PLATEN CRADLE REMOVAL & REPLACEMENT

8.11.1 Removal:

Disconnect the power cord.

Remove the cover assembly as described in Paragraph 8.3.

Unhook the springs securing the platen cradle to the base assembly (See Figure 8-16).

Move the carriage to the center of the platen.

Remove the cradle assembly by rotating it upward around the back side of the platen.

8.11.2 Replacement:

Reverse the procedures in Paragraph 8.11.1 to replace the platen.

CAUTION

Ascertain that the cradle is seated properly onto the alignment posts before attaching the platen cradle springs.

Replace the cover assembly as described in Paragraph 8.3.

Reconnect the power cord.

CAUTION

Check to ascertain that the power switch is in the off position before connecting the power cord.

8.12 PRESSURE ROLLER ASSEMBLY REMOVAL & REPLACEMENT

8.12.1 Removal:

Disconnect the power cord.

Remove the cover assembly as described in Paragraph 8.3.

Remove the paperfeed belt as described in Paragraph 8.8.

Remove the platen assembly as described in paragraph 8.9.

Unhook the springs securing the platen cradle to the base assembly.

Remove the cradle assembly.

Remove the pressure roller assembly by pushing the assembly to one side while slipping the other end from its mounting hole. Lift out the unit. See Figure 8-17.

8.12.2 Replacement:

Replace the pressure roller assembly by reversing the procedure described in Paragraph 8.12.1.

Replace the cover assembly as described in Paragraph 8.3.

Reconnect the power cord.

CAUTION

Check to ascertain that the power switch is in the off position before connecting the power cord.

8.13 FRONT PANEL ASSEMBLY REMOVAL & REPLACEMENT

8.13.1 Removal:

Disconnect the power cord.

Remove the cover assembly as described in Paragraph 8.3.

Disconnect the front panel cable from the connector on the operator access side of the fron panel (See Figure 8-18).

Insert a screwdriver between the front panel and the base casting (See Figure 8-17). Gently separate the panel from the base casting (the front panel is secured to the base casting with adhesive.

Lift the front panel assembly out of the base assembly.

8.13.2 Replacement:

Replace the front panel assembly by reversing the procedure described in Paragraph 8.13.1.

Replace the cover assembly as described in Paragraph 8.3.

Reconnect the power cord.

CAUTION

Check to ascertain that the power switch is in the off position before connecting the power cord.

8.14 POWER SUPPLY PCB REMOVAL & REPLACEMENT

8.14.1 Removal:

Disconnect the power cord.

Remove the cover assembly as described in Paragraph 8.3.

Disconnect all cables from their connectors on the power supply PCB as shown in Figure 8-19.

Remove the two screws securing the large regulator to the base casting. See Figure 8-20.

Remove the two screws securing the small regulators to the base casting. See Figure 8-20.

CAUTION

Note the position of the hardware securing the regulator heatsinks to the base casting.

The heatsinks are at +12 Volts when the printer power is on; the mylar shoulder bushing (00-82217-78) and the elastomeric pad (00-87304-01) insulate the heatsinks and prevent the +12 Volts from being shorted to ground.

Remove the power supply PCB mounting screws as shown in Figure 8-21.

CAUTION

Note the location of the washers. The internal star lockwashers are diagonally opposite of each other.

Remove the PCB from the base assembly.

8.14.2 Replacement:

Swab fresh heatsink compound onto the large regulator on the side that will contact the base casting when the module is installed.

Swab fresh heatsink compound on the back of the elastomeric insulator pads. Stick to pads to the base casting with the holes correctly aligned with those in the casting.

Place the power supply PCB into the base assembly locating the mounting holes on the board and components with the corresponding mounting holes in the base casting.

Asceertain that the elastomeric pads are still in place.

Replace the four Phillips screws securing the PCB to the base casting. Be sure to get the internal star washers in the correct locations (See Figure 8-21).

Insert the mylar shoulder bushings through the regulator heatsinks and into the mounting holes in the base casting.

Assemble and reinstall the remaining hardware to secure the heatsinks to the base casting.

Reinstall the two screws securing the large regulator to the base casting.

Reconnect the cables: paperfeed, carriage motor, main control PCB, and Transformer. (See Figure 8-19).

Replace the cover assembly as described in Paragraph 8.3.

Reconnect the power cord.

CAUTION

Check to ascertain that the power switch is in the off position before connecting the power cord.

8.15 POWER SUPPLY TRANSFORMER REMOVAL & REPLACEMENT

8.15.1 Removal:

Disconnect the power cord.

Remove the cover assembly as described in Paragraph 8.3.

Disconnect the transformer cable from the power supply PCB as shown in Figure 8-22.

Remove the transformer from the base assembly.

8.15.2 Replacement:

Replace the power supply transformer by reversing the procedure described in Paragraph 8.15.1.

Replace the cover assembly as described in Paragraph 8.3.

Reconnect the power cord.

CAUTION

Check to ascertain that the power switch is in the off position before connecting the power cord.

8.16 POWER SWITCH REMOVAL & REPLACEMENT

8.16.1 Removal

Disconnect the power cord.

Remove the cover assembly as described in Paragraph 8.3.

Disconnect the power switch connectors. See Figure 8-23.

Remove the power switch by pushing downward on the switch while compressing the sides of the switch.

8.16.2 Replacement:

Replace the power switch by reversing the procedure described in Paragraph 8.16.1.

Replace the cover assembly as described in Paragraph 8.3.

Reconnect the power cord.

CAUTION

Check to ascertain that the power switch is in the off position before connecting the power cord.

8.17 FUSE HOLDER ASSEMBLY REMOVAL & REPLACEMENT

8.17.1 Removal

Disconnect the power cord.

Remove the cover assembly as described in Paragraph 8.3.

Disconnect the lug terminals shown in Figure 8-24 from the fuse holder connectors.

Unscrew the fuse holder assembly from the printer base casting.

8.17.2 Replacement:

Replace the fuse holder assembly by reversing the procedure described in Paragraph 8.17.1.

Replace the cover assembly as described in Paragraph 8.3.

Reconnect the power cord.

CAUTION

> Check to ascertain that the power switch is in the off position before connecting the power cord.

8.18 EPROM FIRMWARE REMOVAL & REPLACEMENT

8.18.1 Removal:

Disconnect the power cord.

Remove the main control logic PCB as described in Paragraph 8.4.

Using a small, flat-blade screwdriver, remove the EPROM from the socket at IC location U40 on the main control PCB.

NOTE

> To avoid damage to the EPROM legs, insert the screw driver under the EPROM between the EPROM and the socket. Twist the screwdriver to raise the EPROM while holding the EPROM so that it is raised out of the socket evenly.

Insert the new EPROM into the U40 socket. Ascertain that all legs are seated properly into the socket and that the notch at the end of the EPROM matches the notch in the silk-screen on the board as shown in Figure 8-25.

Replace the main control PCB into the printer as described in Paragraph 8.4.

Reconnect the power cord.

CAUTION

Check to ascertain that the power switch is in the off position before connecting the power cord.

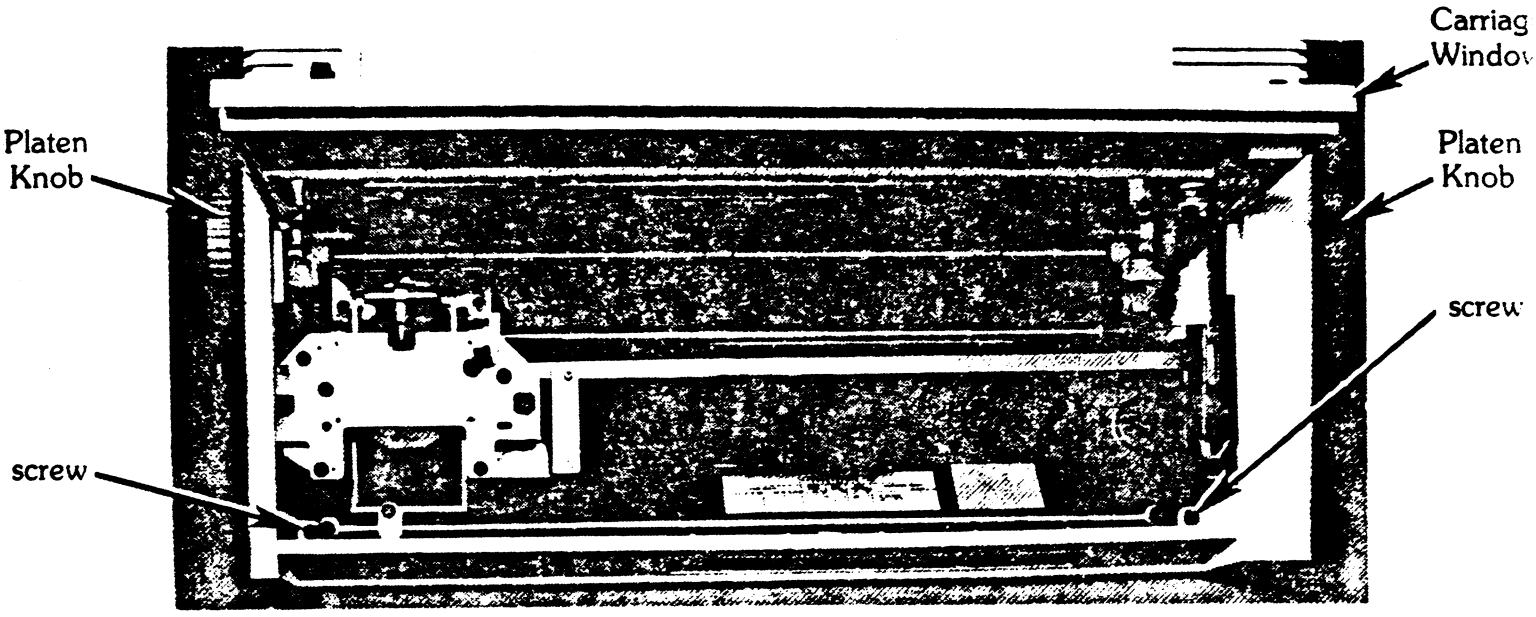


FIGURE 8-1

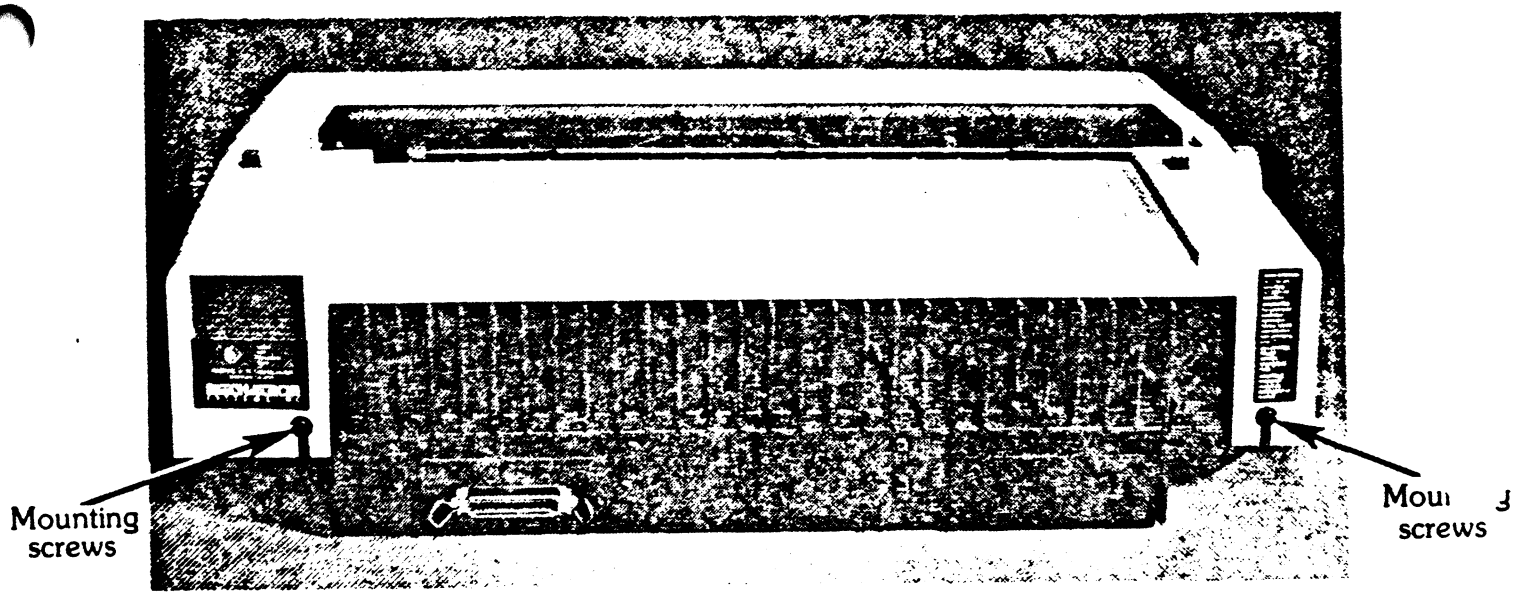


FIGURE 8-2

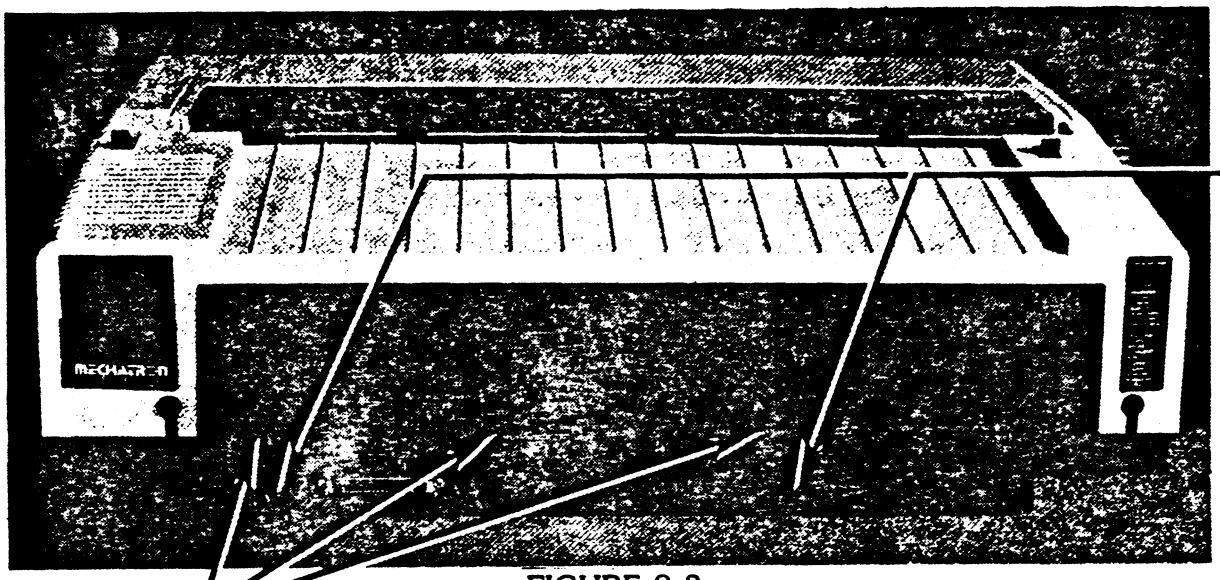


FIGURE 8-3
Main Logic P.C. Board Removal

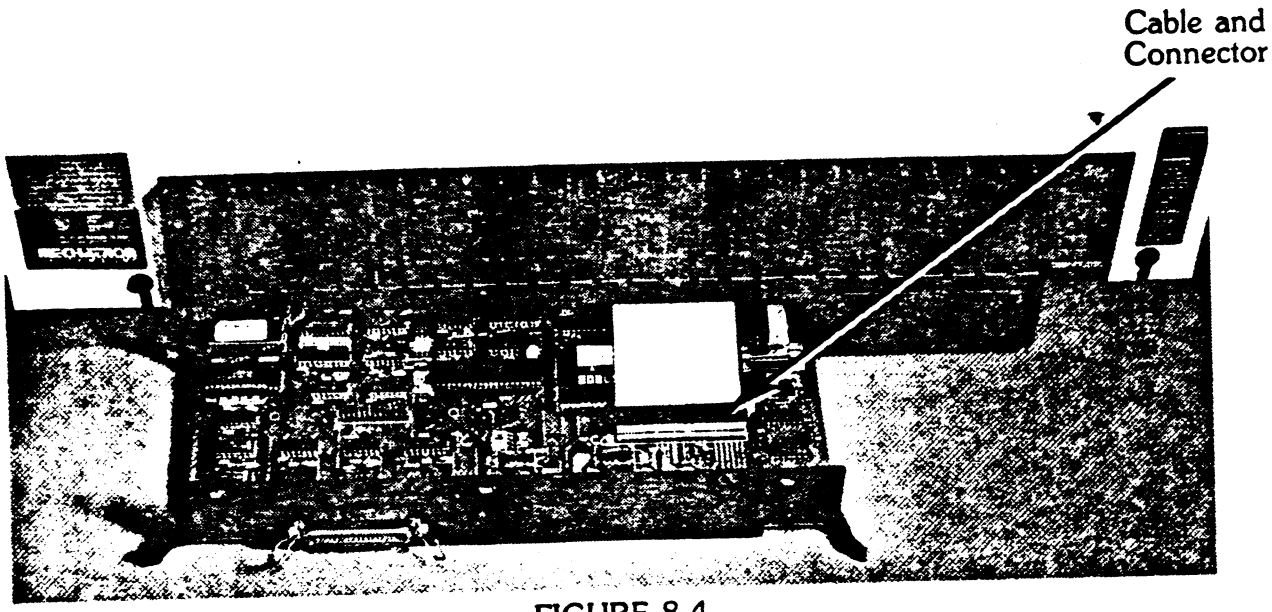


FIGURE 8-4

Main Logic P.C. Board Cable Removal

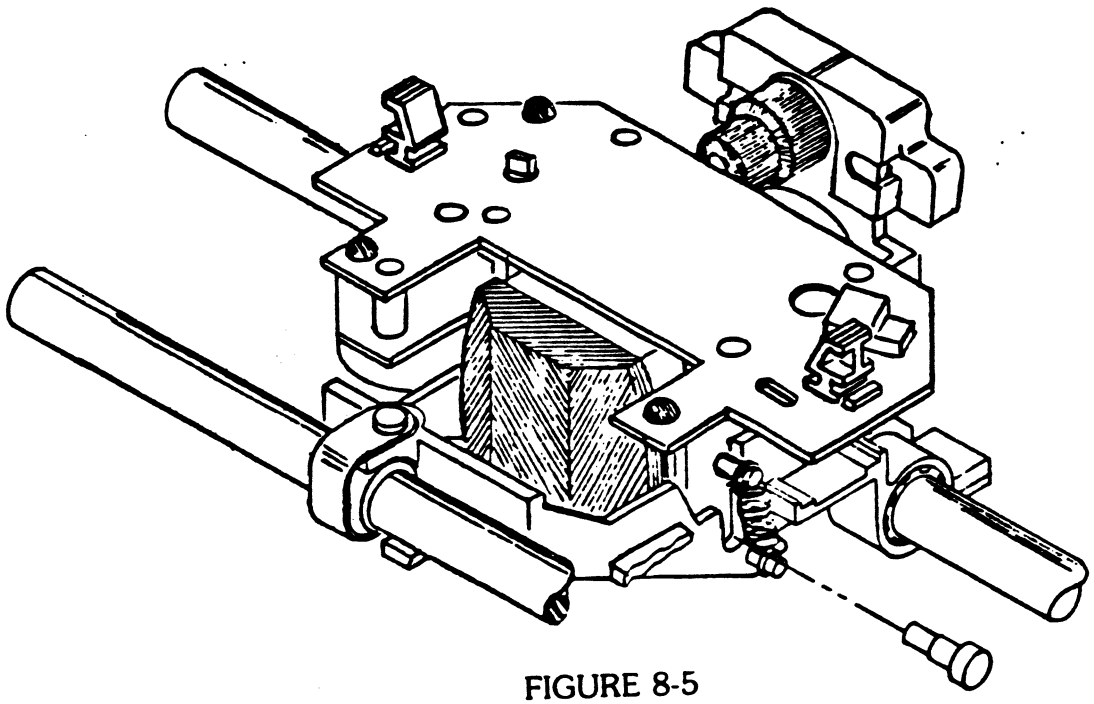


FIGURE 8-5

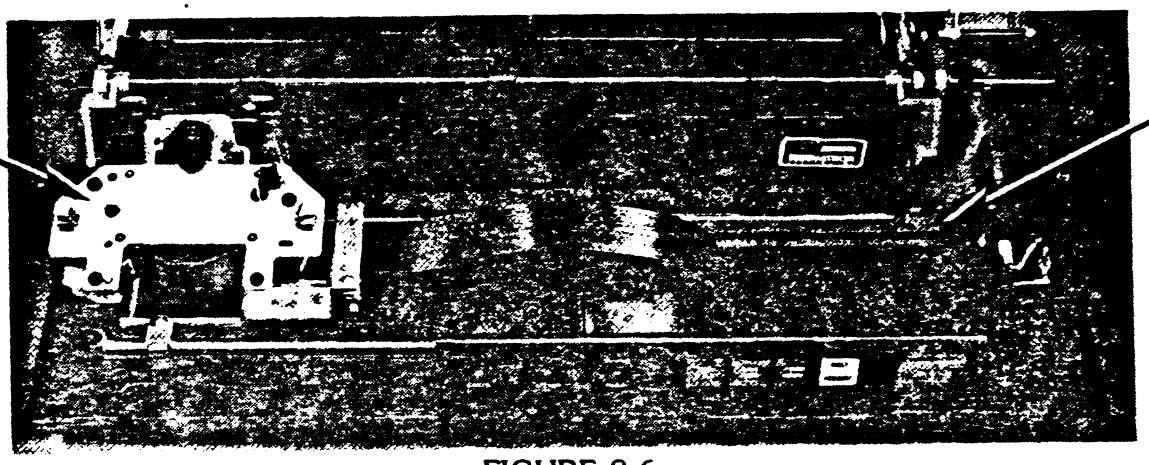


FIGURE 8-6
Carriage Belt Removal

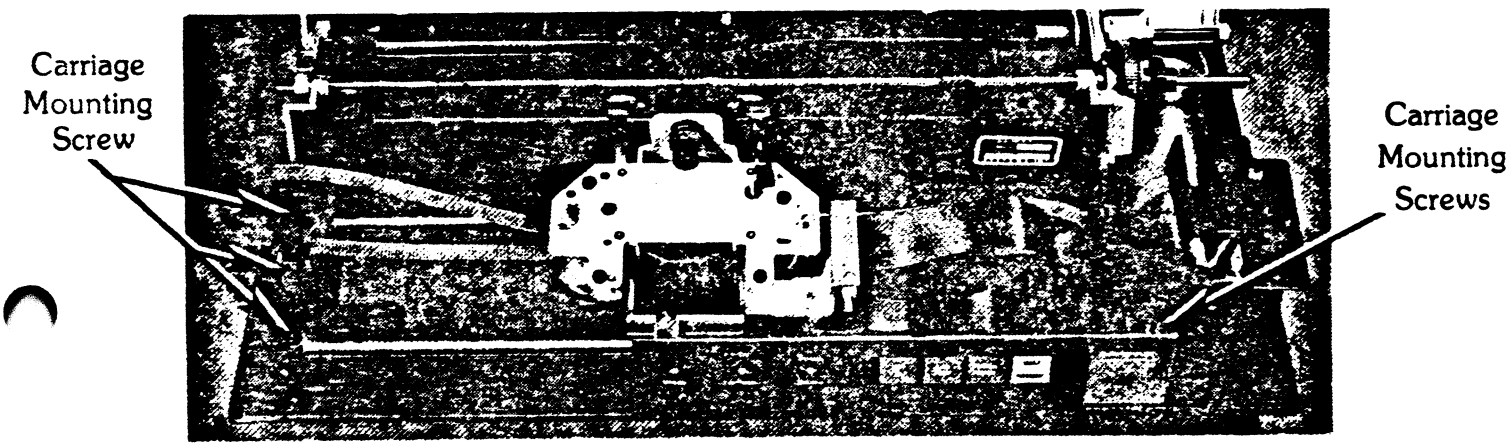


FIGURE 8-7
Carriage Assembly Removal

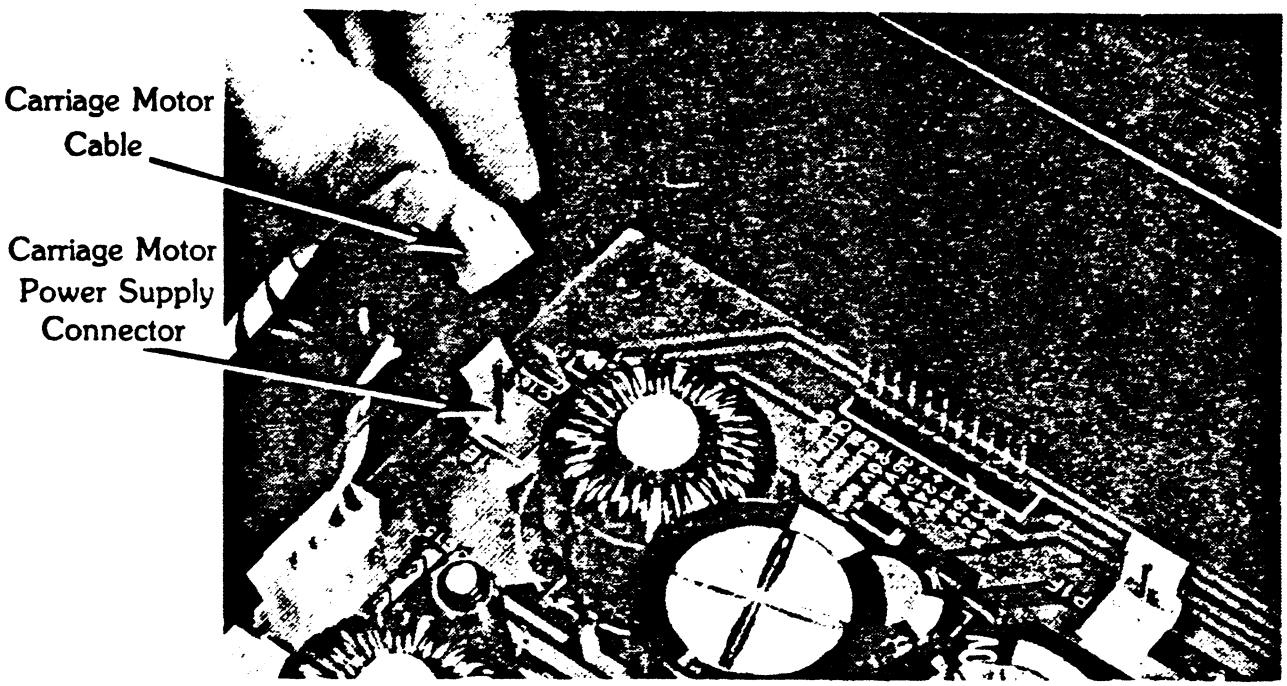


FIGURE 8-8
Carriage Motor Removal

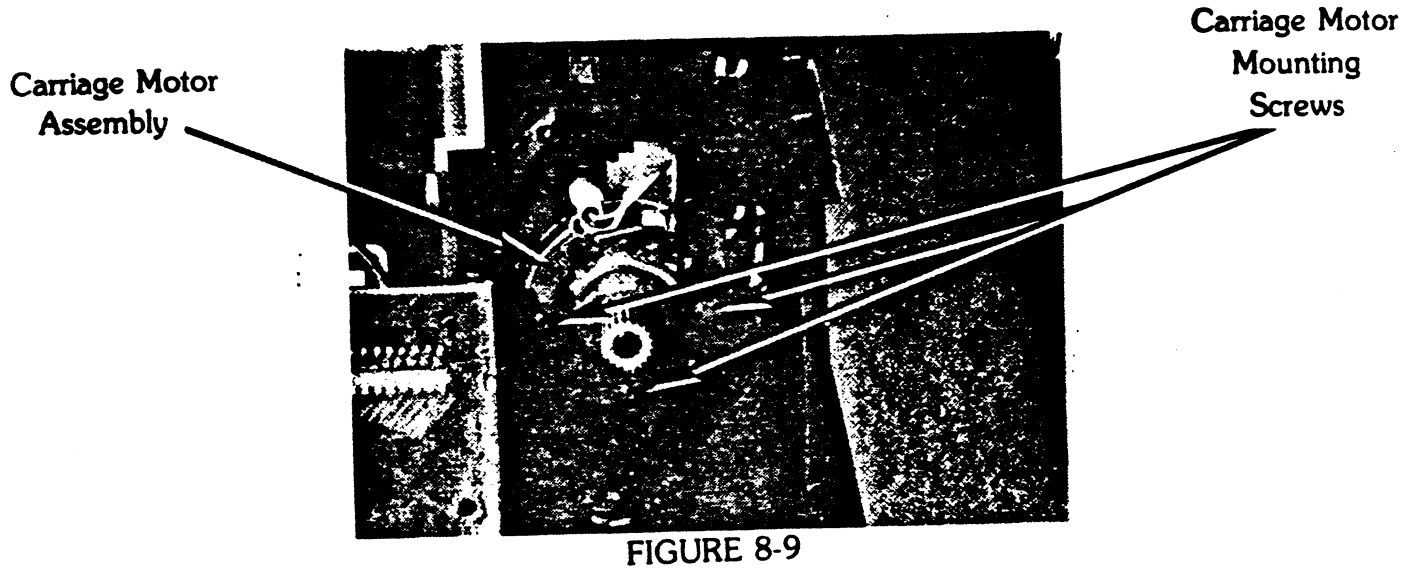


FIGURE 8-9
Carriage Motor Removal

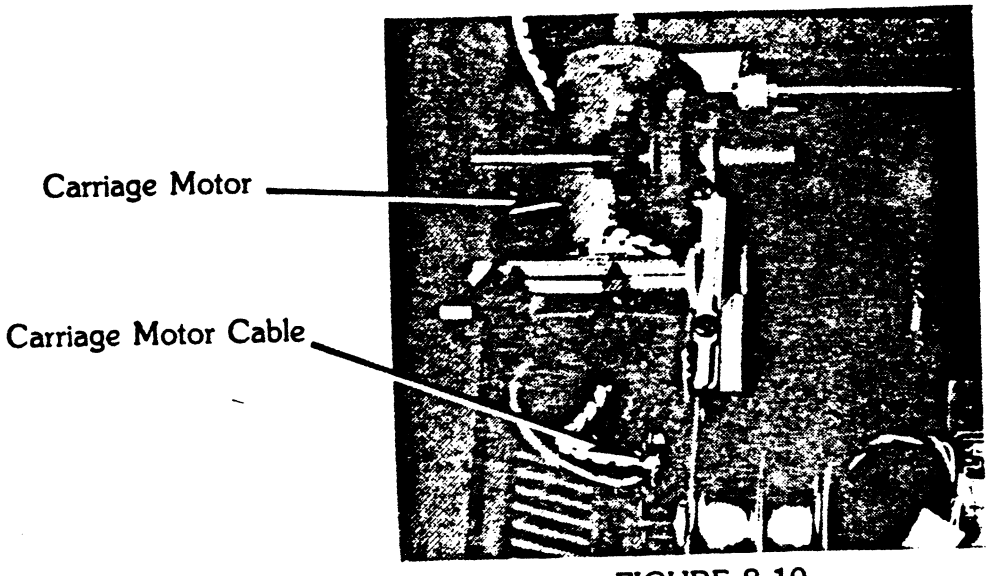


FIGURE 8-10
Carriage Motor Removal

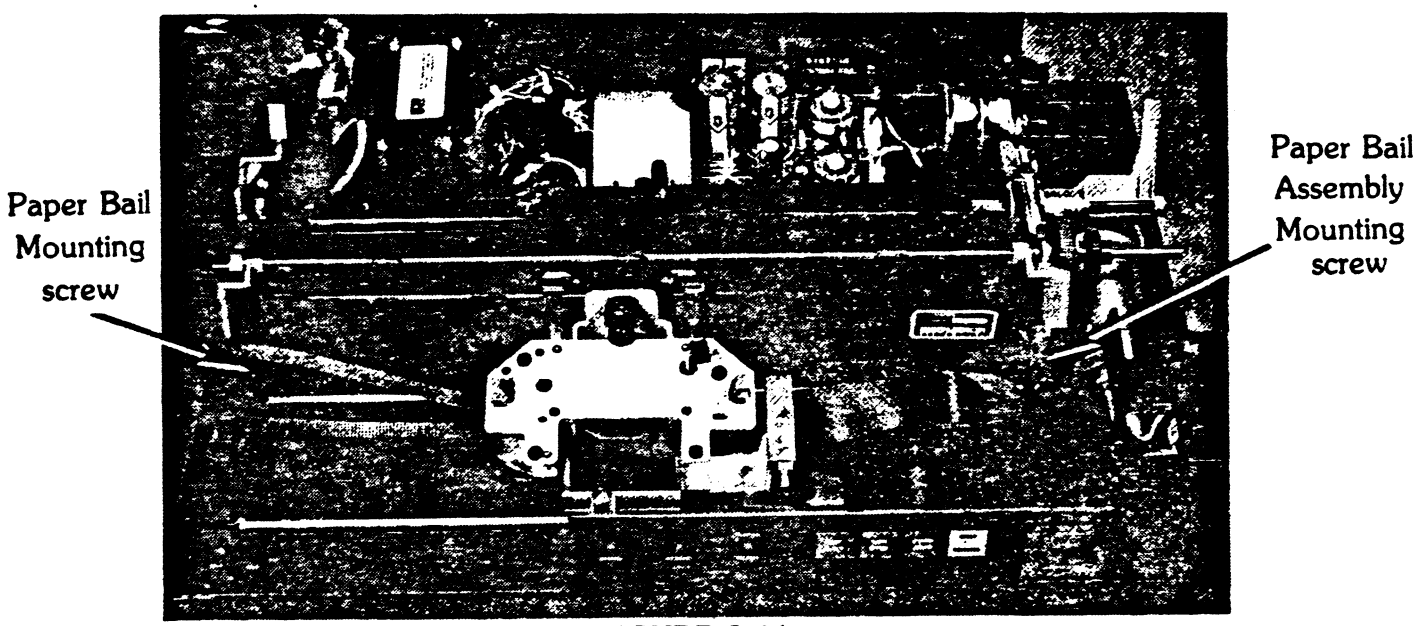


FIGURE 8-11
Paper Bail Removal

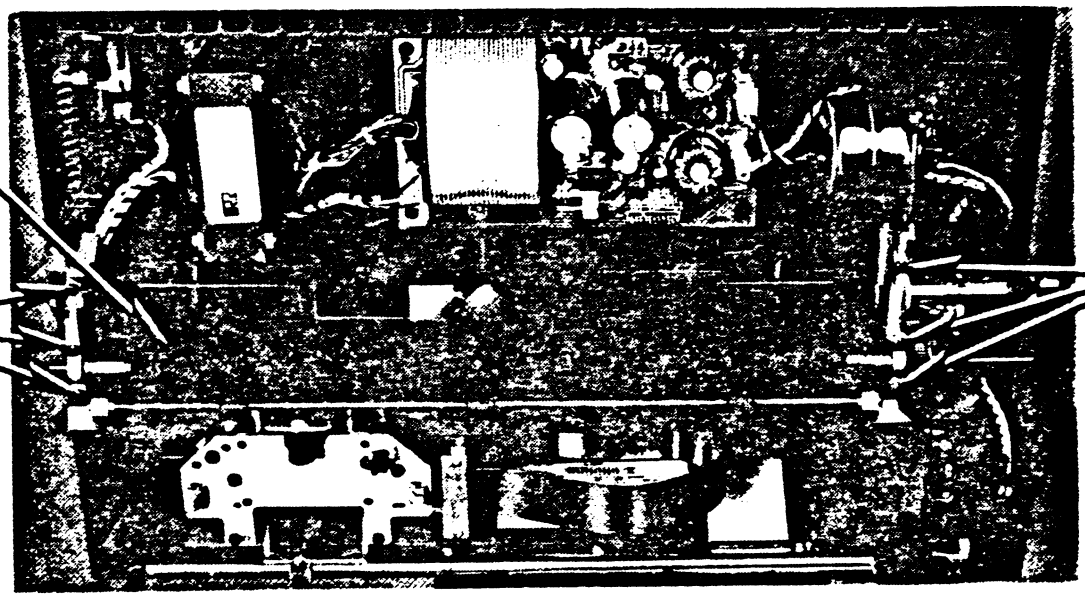


FIGURE 8-13
Platen Assembly Removal

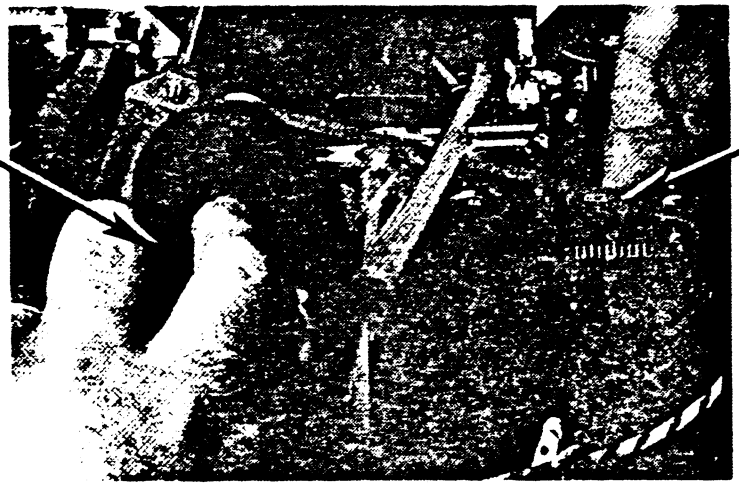


FIGURE 8-12
Paperfeed Belt Removal

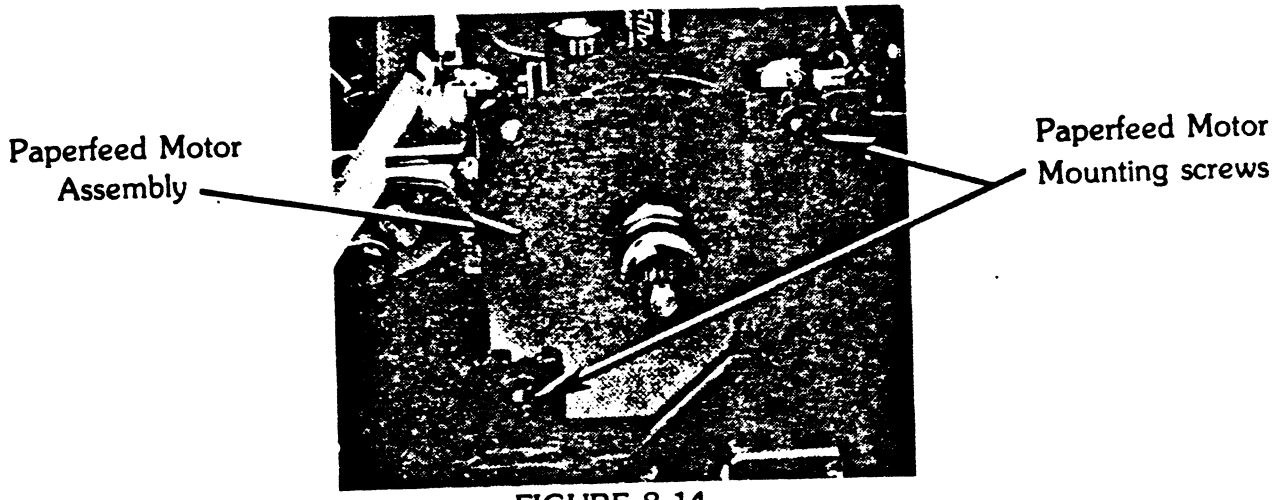


FIGURE 8-14
Paperfeed Motor Removal

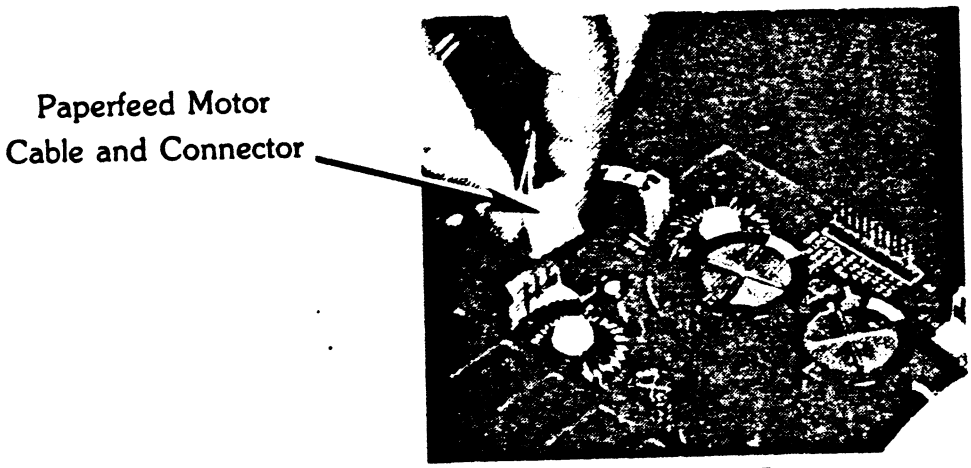


FIGURE 8-15
Paperfeed Motor Removal

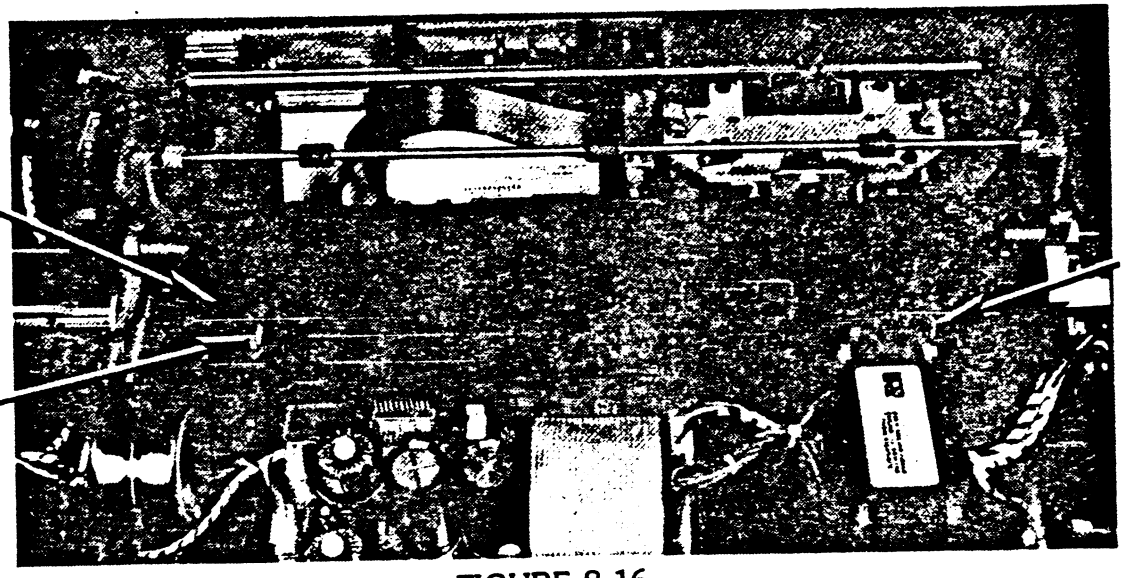


FIGURE 8-16
Platen Cradle Removal

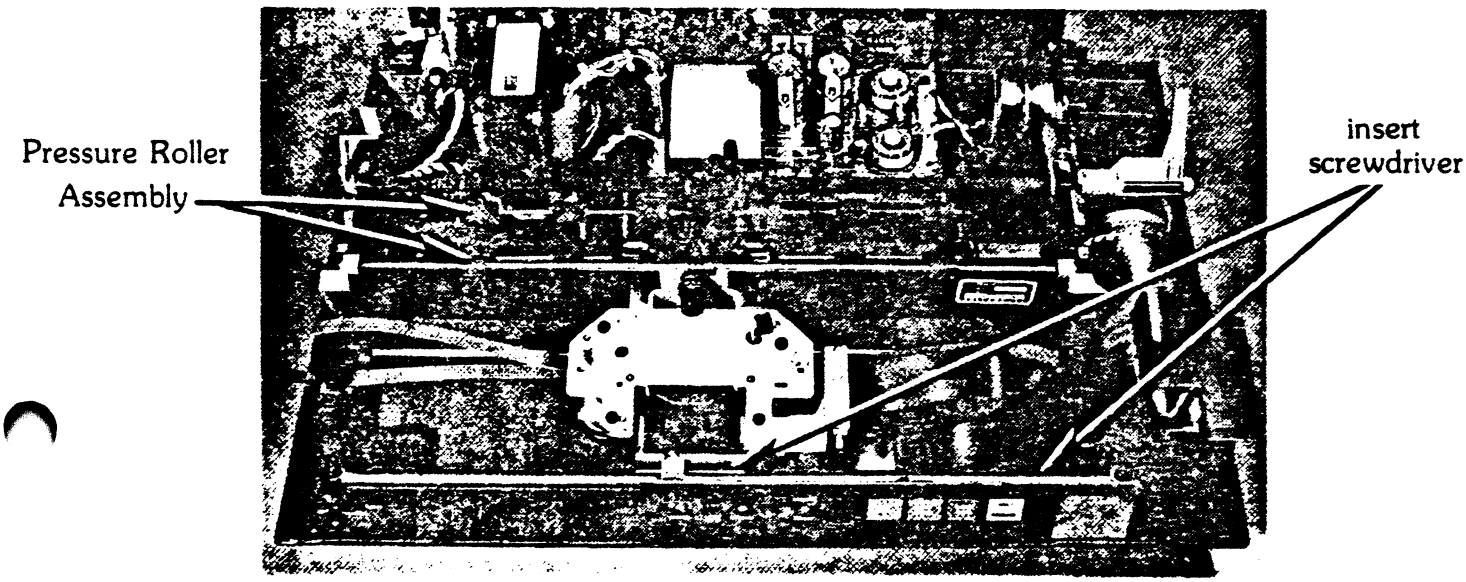


FIGURE 8-17
Pressure Roller Assembly Removal

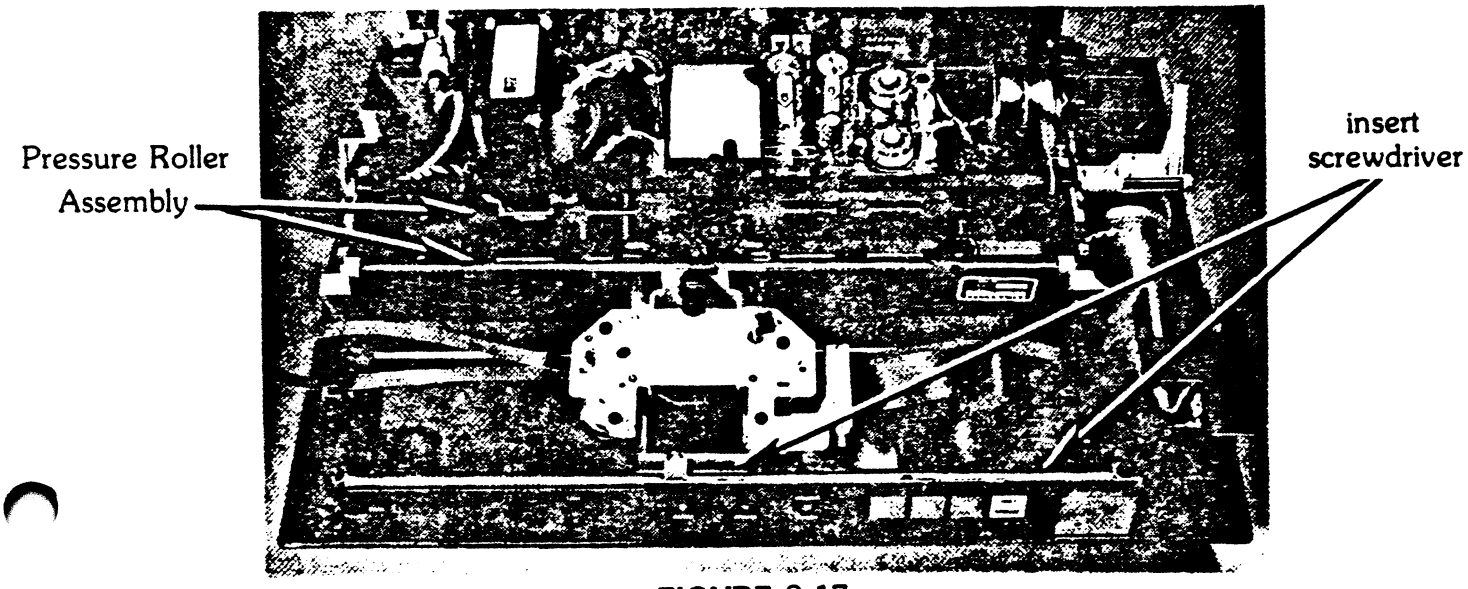


FIGURE 8-17
Pressure Roller Assembly Removal

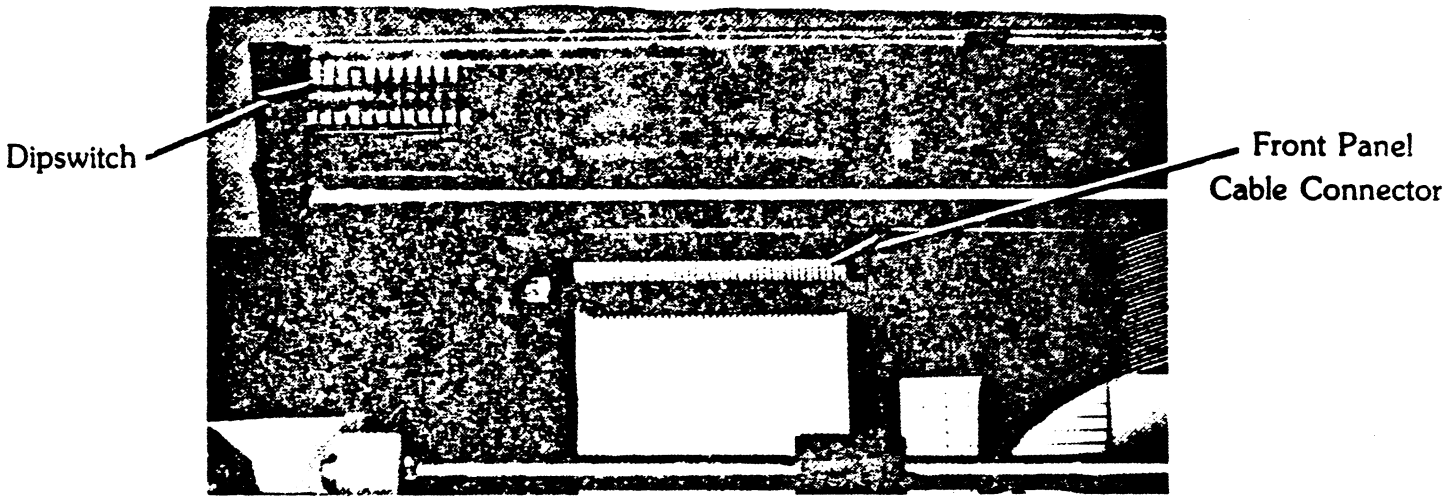


FIGURE 8-18
Front Panel Removal

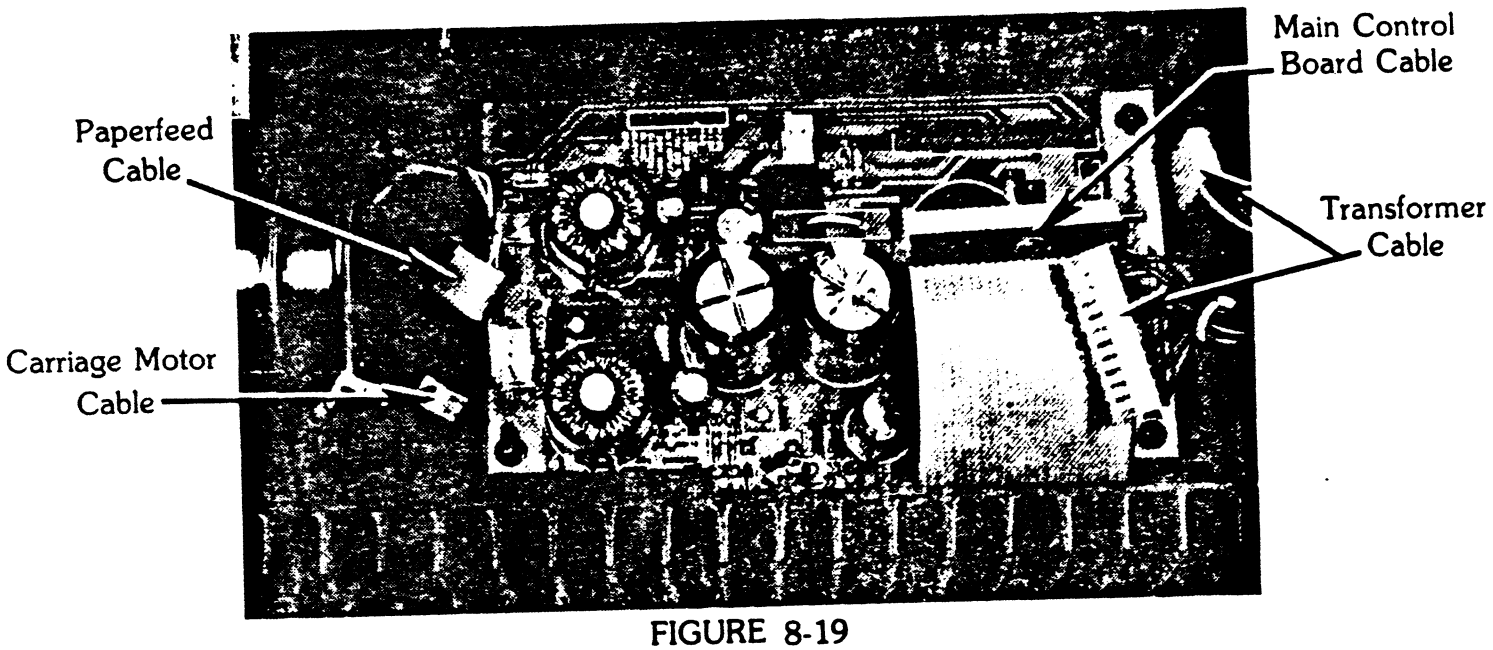


FIGURE 8-19
Power Supply Removal

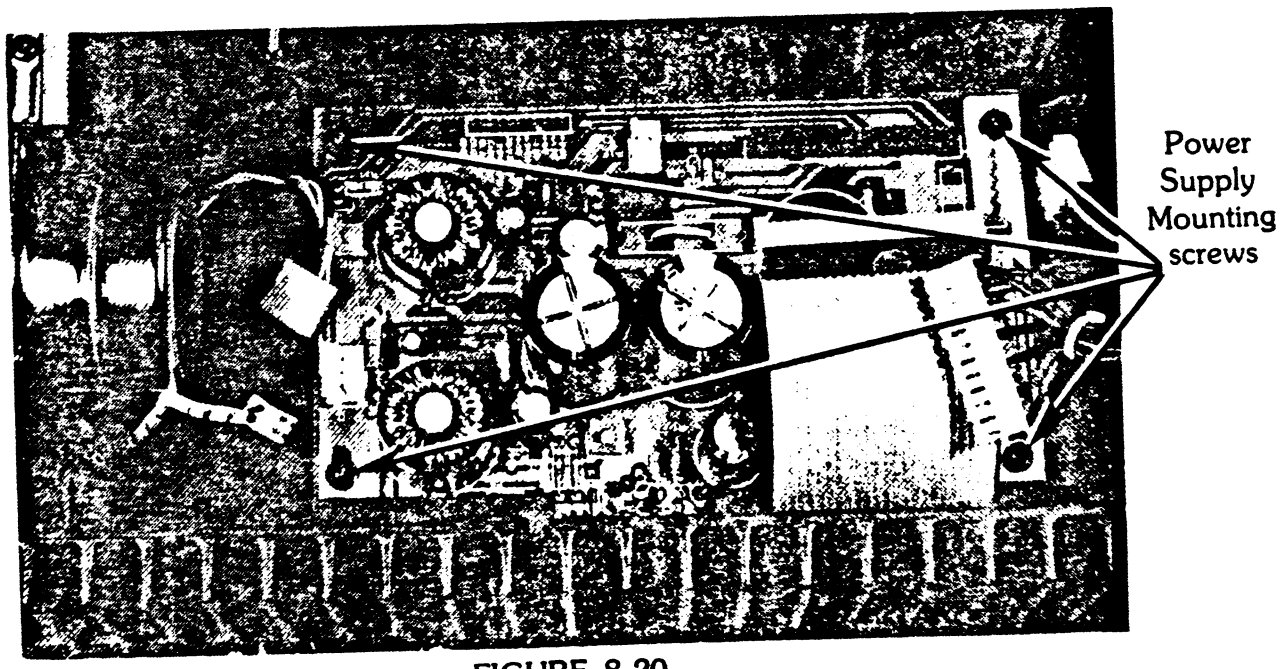


FIGURE 8-20
Power Supply Removal

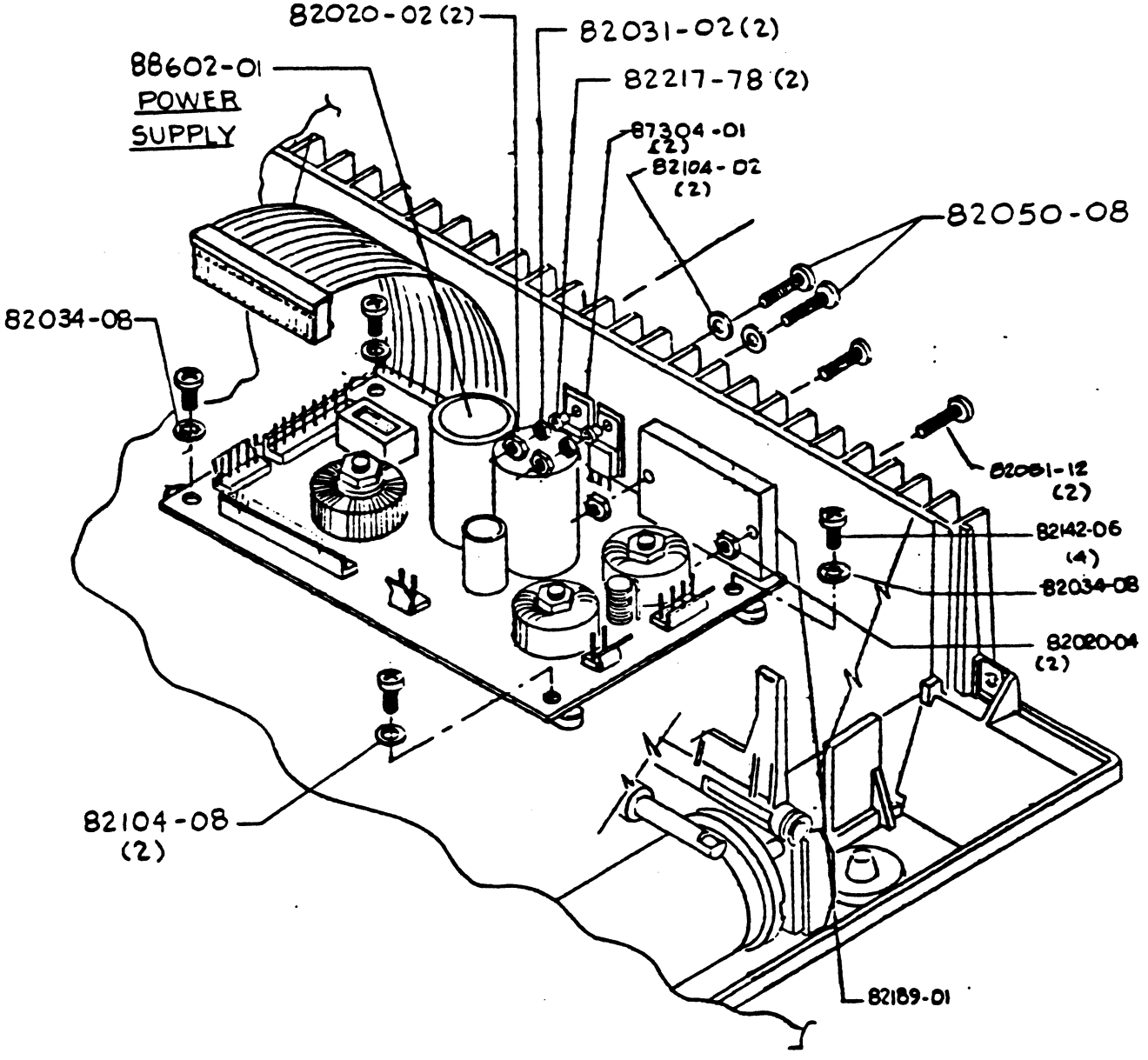

82020-02 (2)
82031-02 (2)
88602-01
POWER
SUPPLY
82217-78 (2)
87304-01
(2)
82104-02
(2)
82050-08
82034-08
82001-12
(2)
82142-06
(4)
82034-08
82020-04
(2)
82104-08
(2)
82189-01

FIGURE 8-21

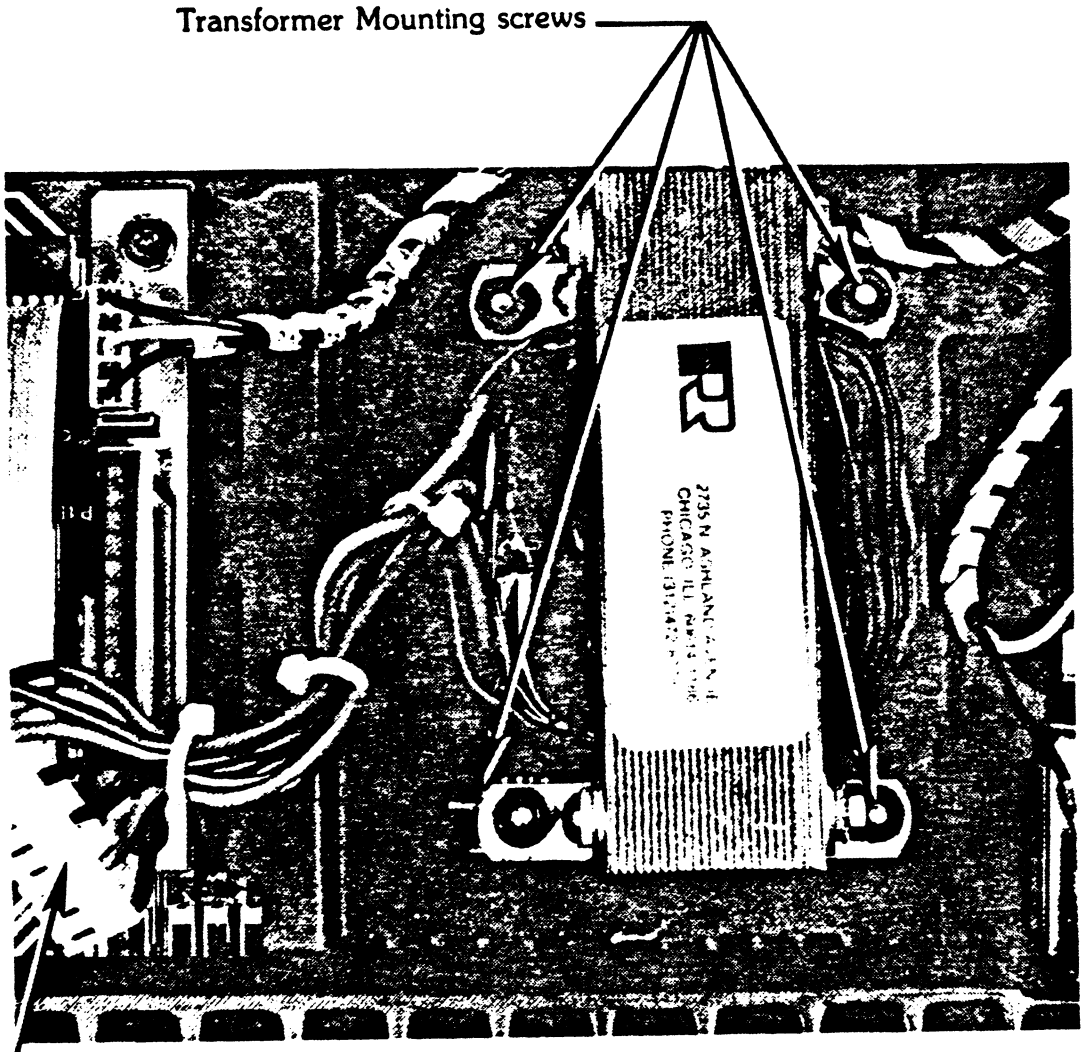


FIGURE 8-22

Power Supply Transformer Removal

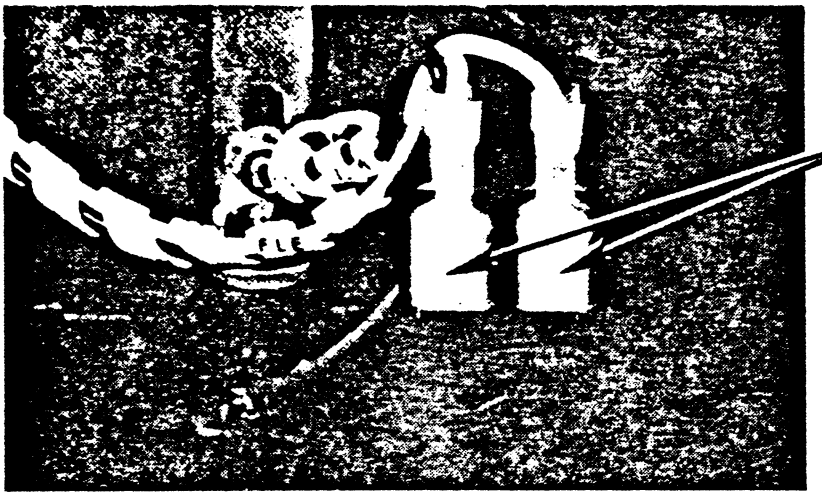


FIGURE 8-23
Power Switch Removal

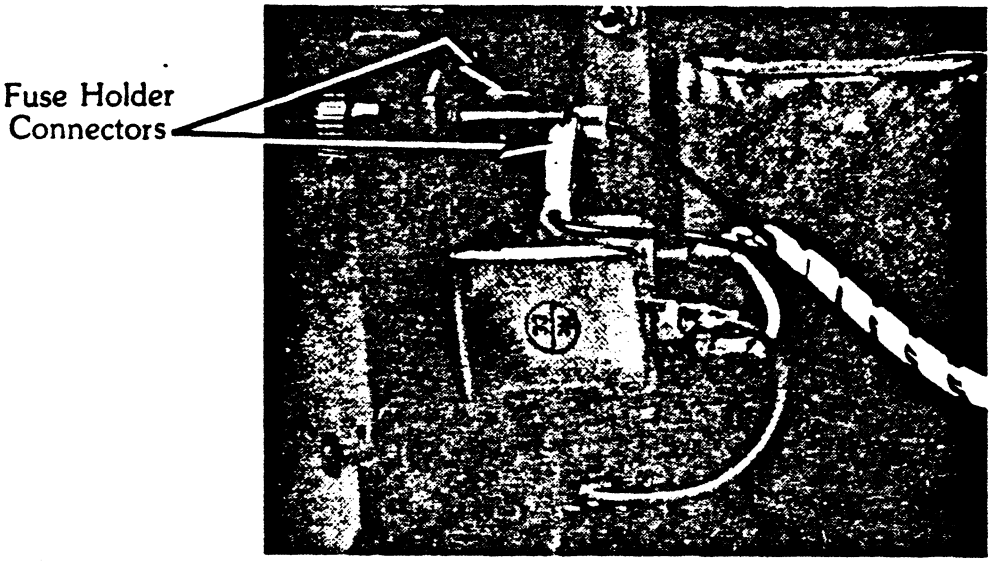


FIGURE 8-24

Fuse Holder Removal

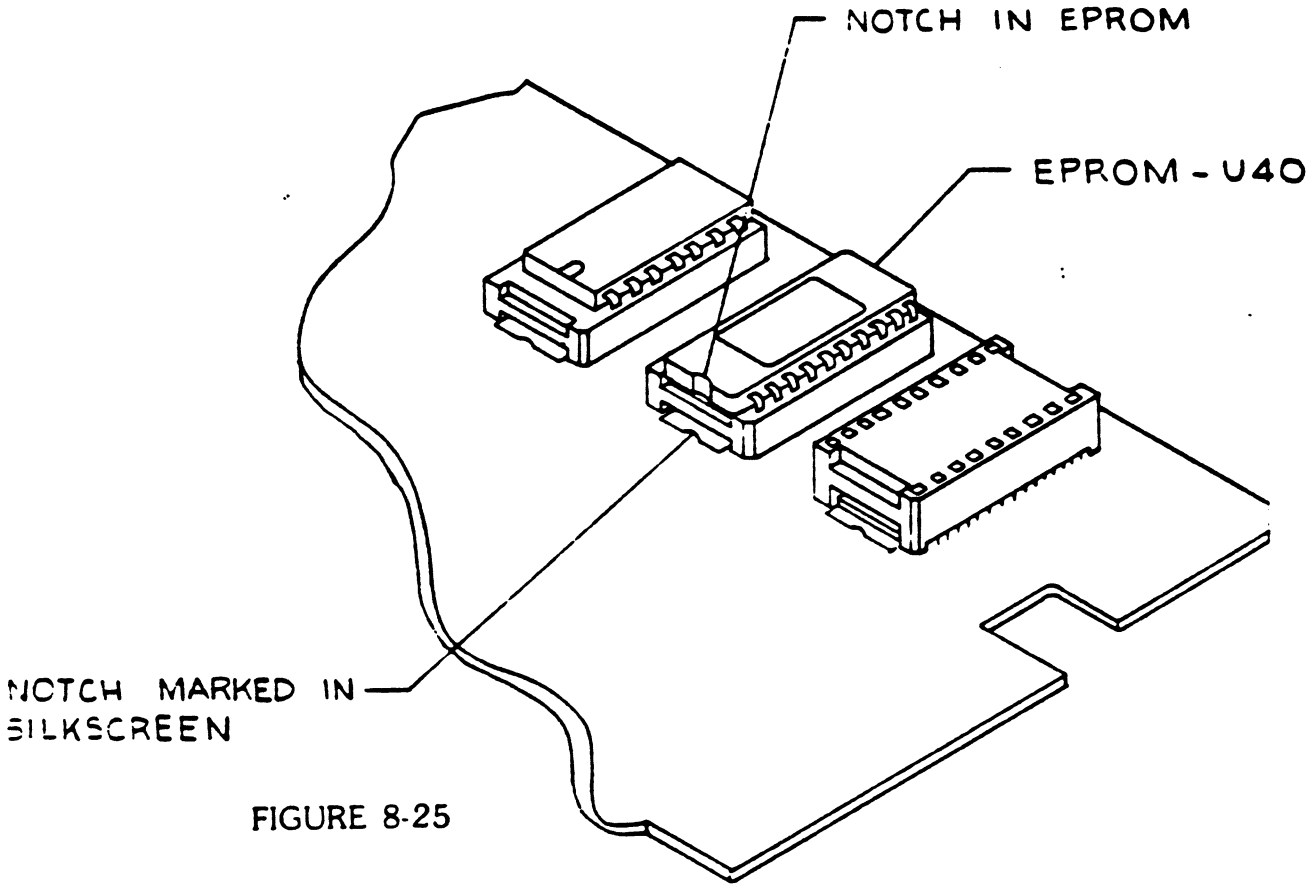


FIGURE 8-25

SECTION IX

ILLUSTRATED PARTS LIST

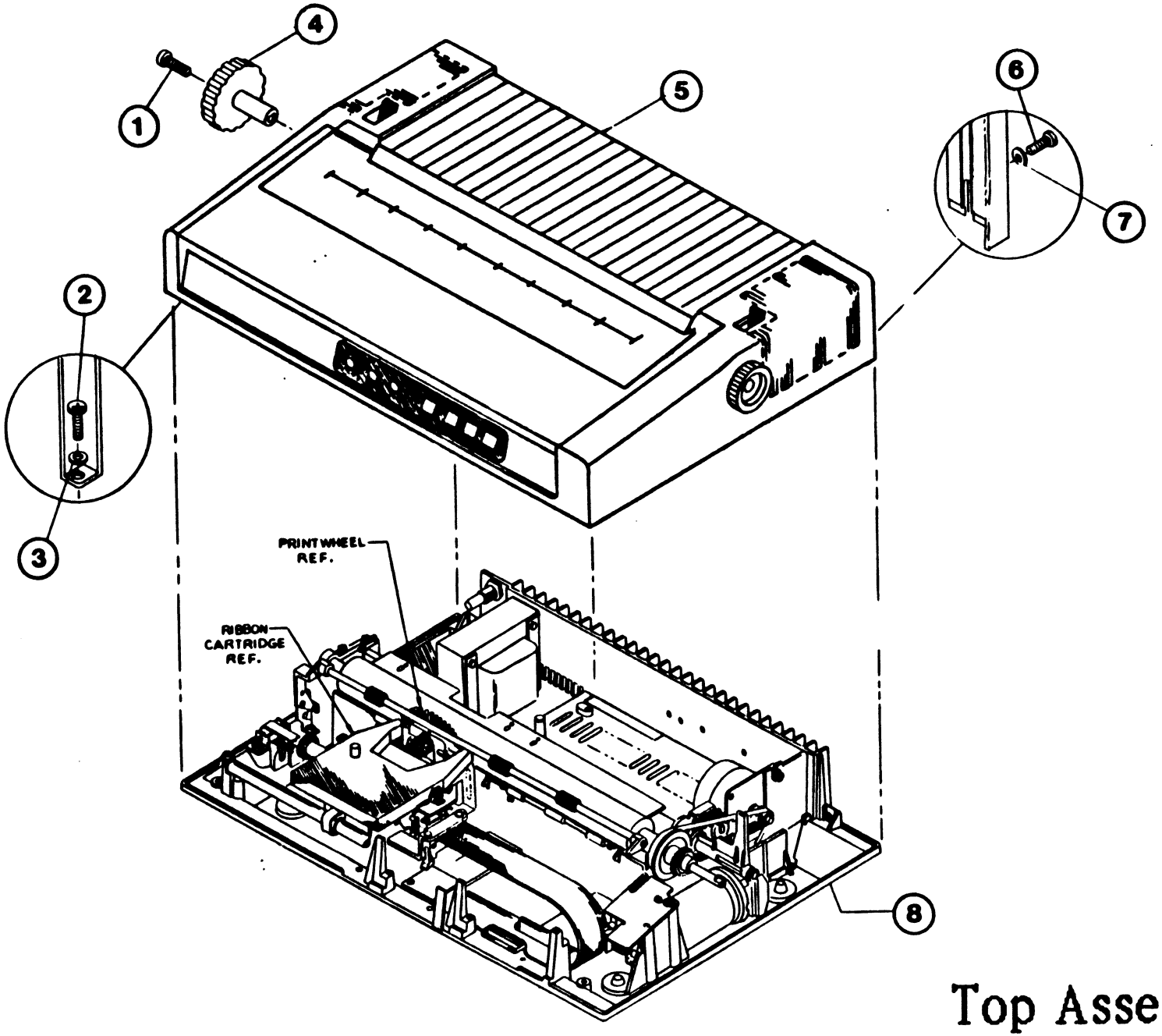
This section contains illustrated parts lists to facilitate repair and/or replacement of parts in the printer major assemblies.

The section is formatted so that assembly illustrations are on pages facing the corresponding parts list. The parts lists are illustrated with the item number.

The parts list item number corresponds to the appropriate part subassembly on the facing assembly illustration. The description column contains an abbreviated description of the part or subassembly.

Top Assembly
Parts List Number 06-50100 01

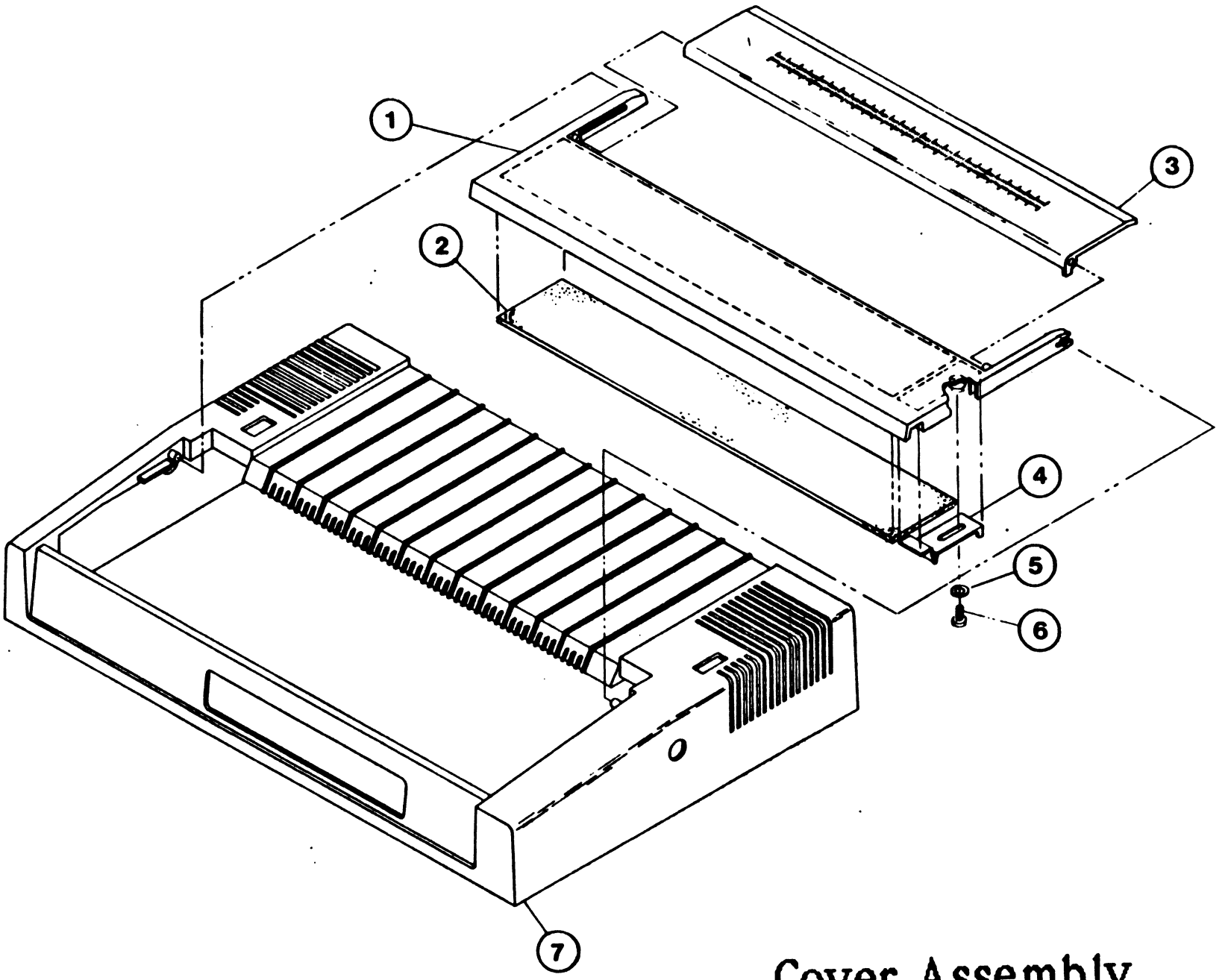
ITEM	DESCRIPTION
1	Screw, Pan Hd., 8-32 × 1/2, Phil. Blk.
2	Screw, Pan Hd., 8-32 × 3/8, Phil. Blk.
3	Washer, Flat Std. #8 Blk.
4	Knob, Platen
5	Cover Assembly
6	Screw, Pan Hd., 8-32 × 1/2, Phil. Blk.
7	Washer Flat Std. #8 Blk.
8	Base Assembly



Top Assembly

Cover Assembly
Parts List Number 06-50018-00

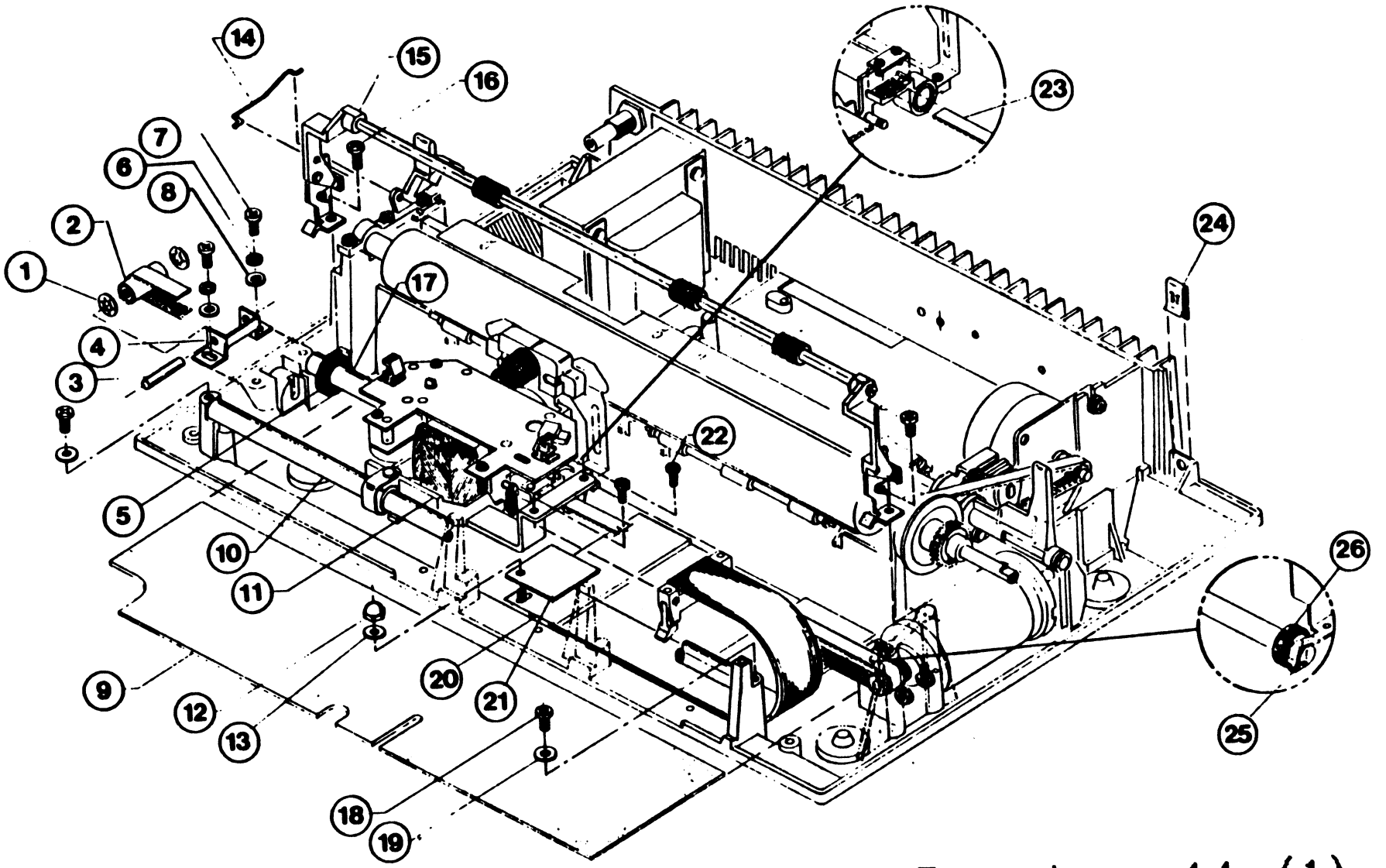
ITEM	DESCRIPTION
1	Lid
2	Foam, Lid
3	Window
4	Slider
5	Washer, Flat Std.,#8 Blk.
6	Screw, Pan Hd., 8-18 × 3/8, Torx Zc.
7	Main Cover



Cover Assembly

Base Assembly (1)
Parts List 06-50009-00

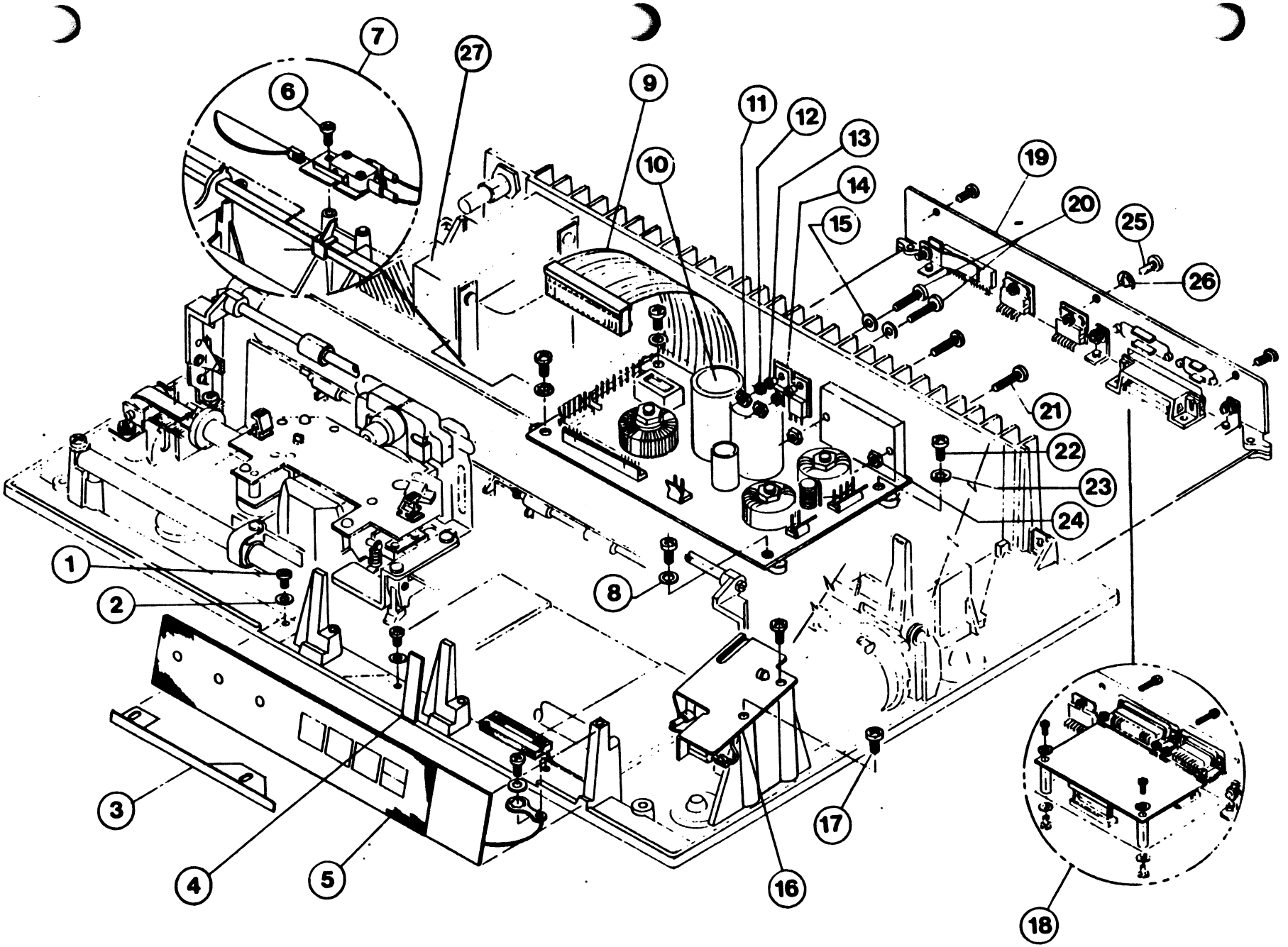
ITEM	DESCRIPTION
1	Washer, Idler Pulley
2	Idler Pulley Assembly
3	Idler Shaft
4	Idler Pulley Bracket
5	Rubber Stop, Carriage .280 Lt.
6	Washer, Split-Lock #8 Blk.
7	Screw, Pan Hd., 8-32 × 1/2, Torx Blk.
8	Washer, Flat #8 Blk.
9	Foam Base
10	Guide, Shaft
11	Carriage Assembly
12	Nut, Acorn #8 Blk.
13	Washer, Flat #8 Blk.
14	Bail Lever Linkage
15	Paper Bail Assembly
16	Screw, Pan Hd., 8-32 × 3/8, Torx Blk.
17	Guide Shaft
18	Screw, Pan Hd., 8-32 × 3/8, Torx Blk.
19	Washer, Flat #8 Blk.
20	Spring, Belt Flexure
21	Carriage Plate Cable Restraint
22	Screw, Pan Hd., 4-24 × 1/2, Torx Zc.
23	Belt, Timing, Carriage
24	Thread Clip, #8 Tinnerman
25	Retaining Gripring, .50 I.D.
26	Rubber Stop, Carriage .250 Rt.



Base Assembly (1)

Base Assembly (2)
Parts List Number 06-50009-00

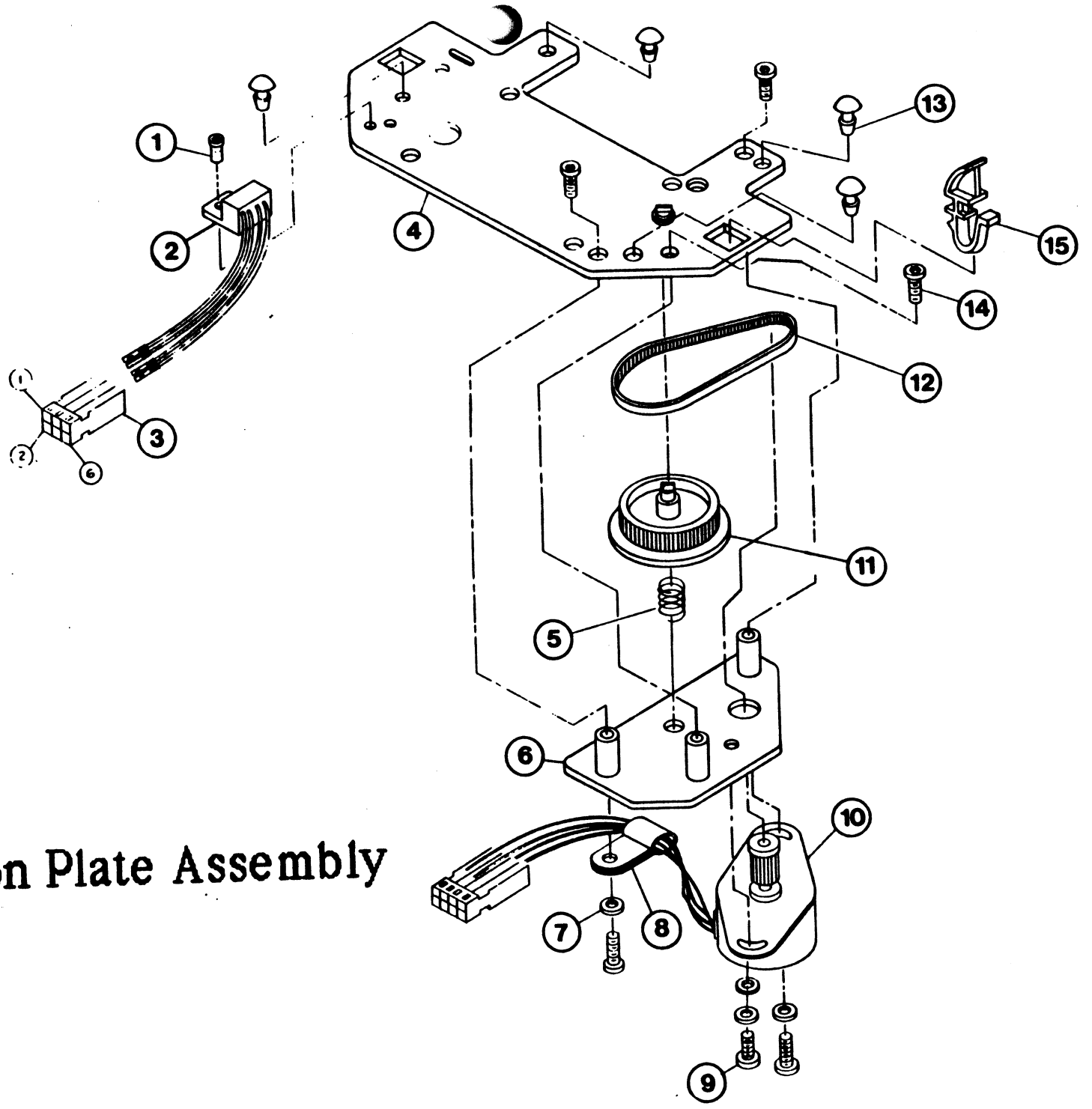
ITEM	DESCRIPTION
1	Retainer, 'E' Ring
2	Washer, Bowed
3	Bail Arm Lever, L.H.
4	Bearing, Platen
5	Shaft, Pressure Roller
6	Arm Assembly, Pressure Roller
7	Pressure Roller Assembly, Front
8	Pressure Roller Assembly, Rear
9	Platen Assembly
10	Platen Clamp, Left
11	Spring Ext., Cradle
12	Cradle Assembly
13	Plate, Retainer
14	Screw, Pan Hd., 8-32 × 3/8, Torx Blk.
15	Bumper, Rubber
16	Spring Pressure Roller
17	Screw, Pan Hd., 4-40 × 1/4, Torx Zc.
18	Pressure Lever Assembly
19	Fastener Internal Tooth
20	Motor Assembly, Carriage
21	Cam Lever
22	Screw, Pan Hd., 8-32 × 1/2, Torx Blk.
23	Platen Clamp, Right
24	Motor Assembly, Paperfeed
25	Belt, Paperfeed Drive
26	Washer, Flat #8 Blk.
27	Screw, Pan Hd., 8-32 × 3/8, Torx Blk.
28	Washer, Split-Lock #8 Blk.
29	Screw, Pan Hd., 8-32 × 3/8, Torx Blk.
30	Washer, Split-Lock #8 Blk.
31	Washer, Flat #8 Blk.
32	Screw, Pan Hd., 8-32 × 1/4, Phil. Blk.
33	Support Bracket, Carriage Motor



Base Assembly (3)

Ribbon Plate Assembly
Parts List Number 06-50007-00

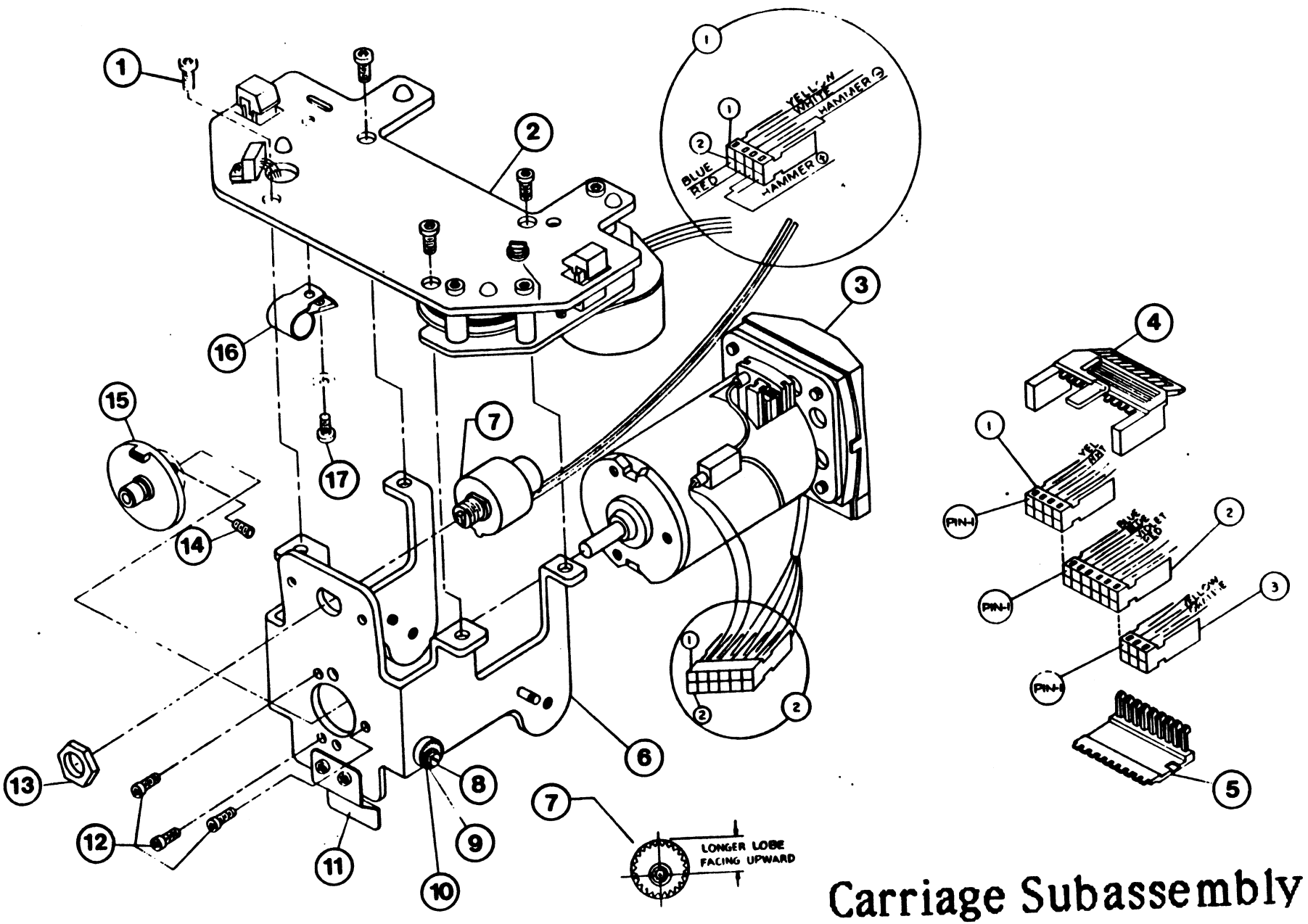
ITEM	DESCRIPTION
1	Screw, Pan Hd., 2-56 × 1/8, Phil. Zc.
2	Sensor, End of Ribbon
3	Connector, Amp 8-Pin
4	Plate, Ribbon Cartridge Assembly
5	Spring, Comp., Ribbon Drive
6	Plate, Ribbon Motor
7	Washer, Flat Steel #4, Zc.
8	Clamp, Cable Nylon
9	Screw, Pan Hd., 4-40 × 1/4, Torx Blk.
10	Ribbon Motor Assembly
11	Pulley, Ribbon Drive
12	Belt, Ribbon Drive
13	Bumper, Rubber
14	Screw, Pan Hd., 4-40 × 1/4, Torx Blk.
15	Latch, Ribbon



Ribbon Plate Assembly

Carriage Subassembly
Parts List Number 06-50004-00

ITEM	DESCRIPTION
1	Screw, Pan Hd., 4-40 × 1/4, Torx Blk.
2	Ribbon Plate Assembly
3	Print Wheel Motor Assembly
4	Ejector Cover Connector
5	Back Cover Connector
6	Carriage Motor Mounting Bracket Assembly
7	Hammer Assembly
8	Screw, Pan Hd., 4-40 × 3/8, Torx Blk.
9	Washer, Flat Steel #4 Blk.
10	Washer, Eccentric
11	Leaf Spring, Carriage Lock
12	Screw, Pan Hd., 4-40 × 1/4, Torx Blk.
13	Nut, Hex, 3/8 32 NEF, Steel
14	Screw, Set, Hex Socket Hd., 6-32 × 1/8, Blk.
15	Hub
16	Clamp, Cable, Nylon
17	Screw, Pan Hd., 4-40 × 1/4, Torx Blk.



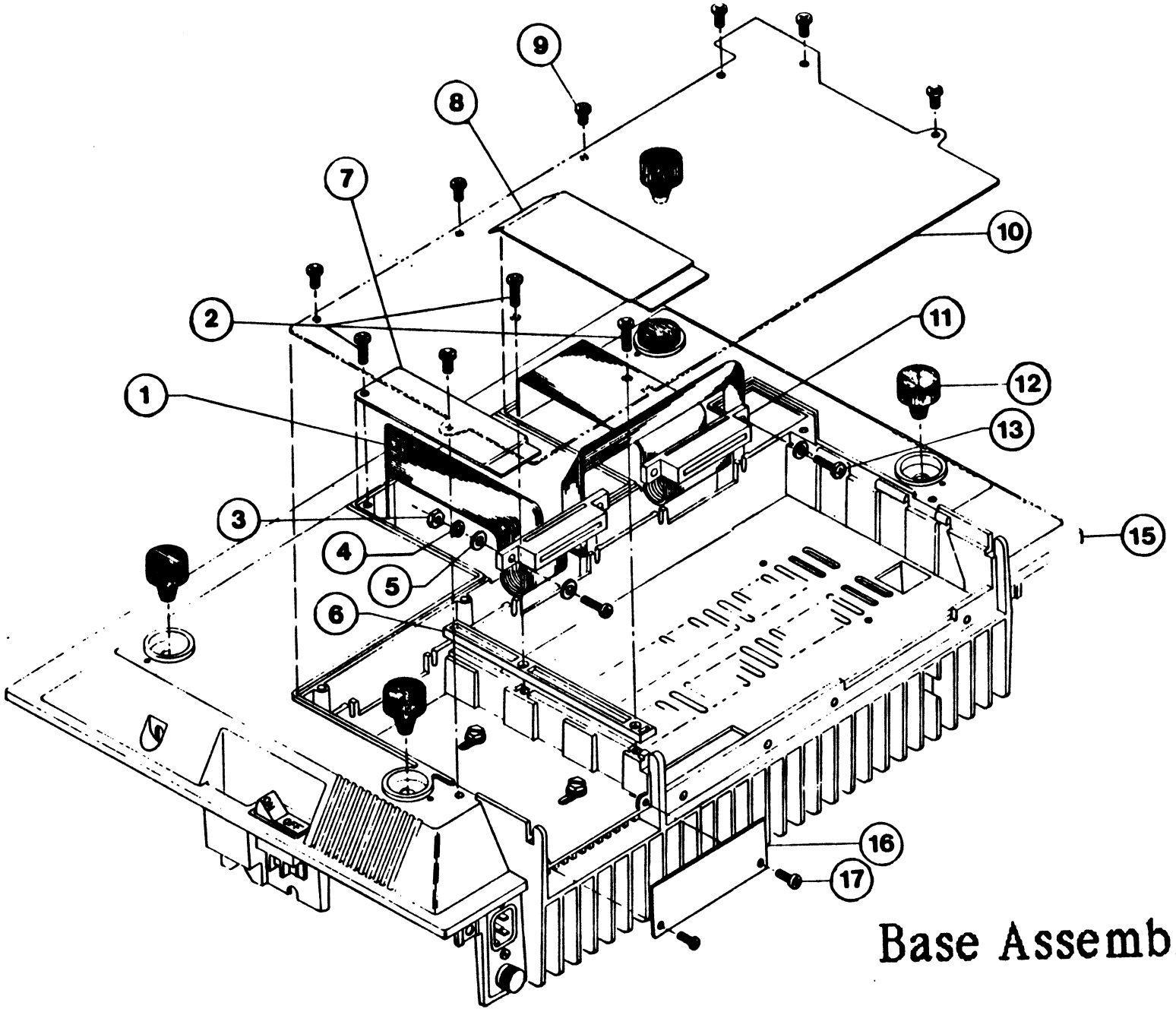
Carriage Subassembly

Base Assembly (3)
Parts List Number 06-50009-00

ITEM	DESCRIPTION
1	Screw, Pan Hd., 8-32 × 1/4 Torx Blk.
2	Washer, Flat #8 Blk.
3	Front Panel Cover Support
4	Tape, Doubled Contact 1/32 Foam
5	Front Panel Assembly
6	Screw, Pan Hd., 8-32 × 1/4 Torx Blk.
7	Out-of-Paper Switch Assembly
8	Washer, Flat #8 Blk.
9	Cable Assembly, Power Supply
10	Power Supply P.C.A.
11	Nut, Hex #2 Zc.
12	Washer, Split-Lock #2 Zc.
13	Shoulder Bushing #2 Blk.
14	Insulator
15	Flat Washer #2 Blk.
16	Cover Interlock Switch Assembly
17	Screw, Pan Hd., 8-32 × 3/8, Torx Blk.
18	Serial Interface Option Kit
19	Main Logic Control PCB.
20	Screw, Pan Hd., 2-56 × 1/2, Phil. Blk.
21	Screw, Pan Hd., 4-40 × 3/4, Phil. Blk.
22	Screw, Pan Hd., 8-32 × 3/8, Torx, Blk.
23	Washer, Internal Star #8 Zc.
24	Nut, Hex #4 Zc.
25	Screw, Pan Hd., 8-32 × 3/8, Phil. Blk.
26	Washer, Internal Star #8 Zc.
27	Transformer, Power

Base Assembly (4)
Parts List Number 06-50009-00

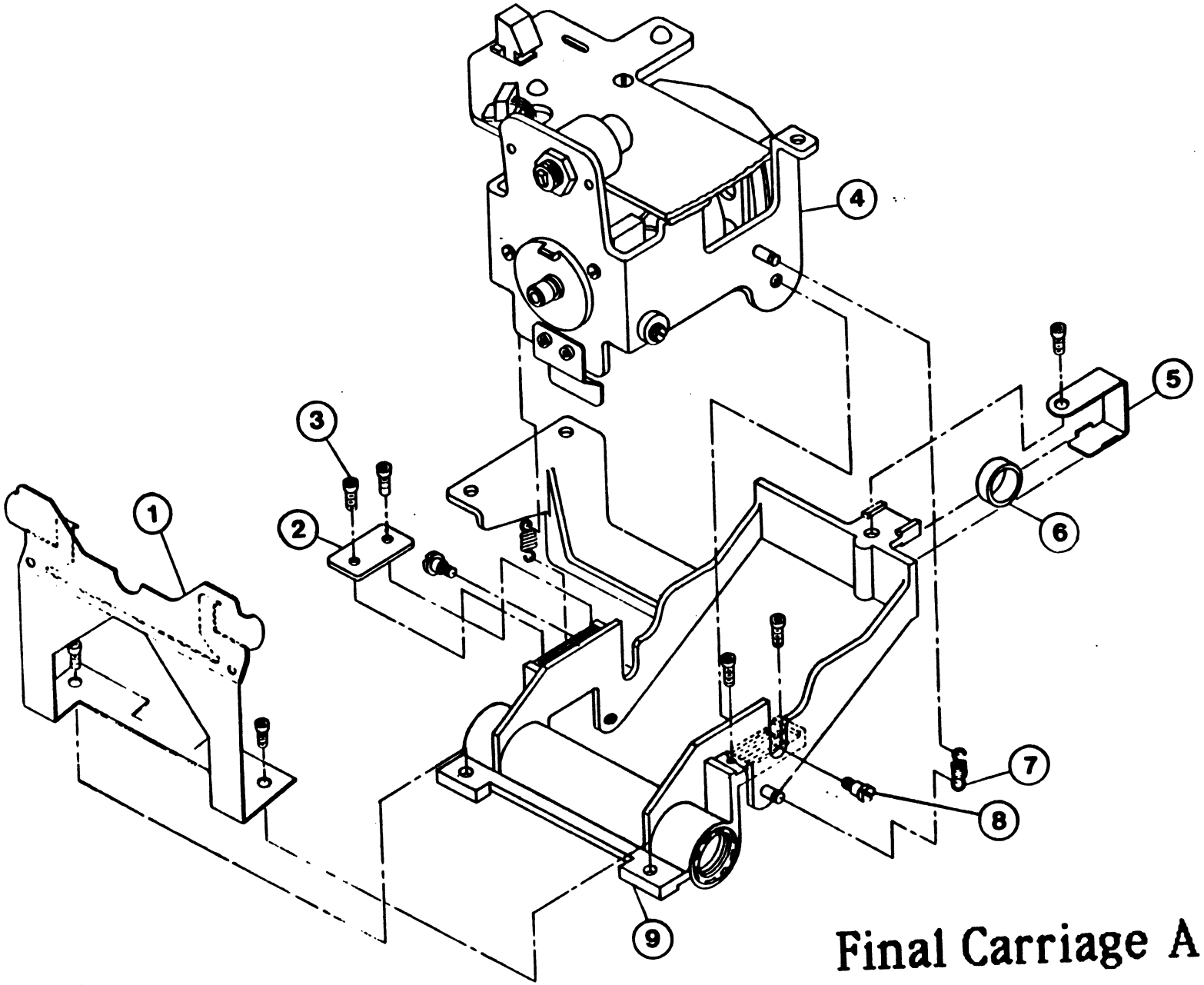
ITEM	DESCRIPTION
1	Cable Assembly, Carriage
2	Screw, Pan Hd., 8-32 × 1/2, Torx Blk.
3	Nut, Hex, #4 Blk.
4	Washer, Split-Lock #4 Blk.
5	Washer, Flat #4 Blk.
6	Control Board Spacer Guide
7	Enclosure Cover, Carriage Cable
8	Enclosure Cover, Control Panel
9	Screw, Pan Hd., 8-32 × 3/8, Torx Blk.
10	Bottom Cover Closure
11	Cable Assembly, Front Panel
12	Foot, Rubber, Base
13	Screw, Pan Hd., 4-40 × 3/4, Torx Blk.
15	Base Casting
16	Enclosure Cover, Optional
17	Screw, Pan Hd., 8-32 × 3/8, Torx Blk.



Base Assembly (4)

Final Carriage Assembly
Parts List Number 06-50002-00

ITEM	DESCRIPTION
1	Card Guide Assembly
2	Plate, Belt
3	Screw, Pan Hd., 8-32 × 1/4, Torx Blk.
4	Carriage Subassembly
5	Clamp, Bearing
6	Bearing, Sleeve
7	Spring, Extension, Carriage
8	Screw, Carriage Pivot
9	Lower Carriage Assembly

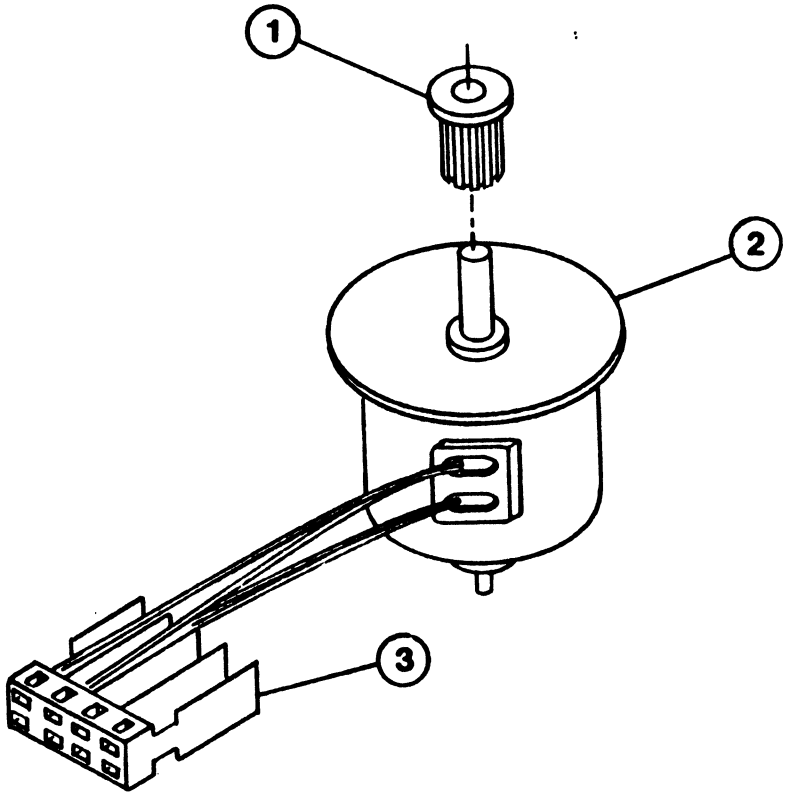


Final Carriage Assembly

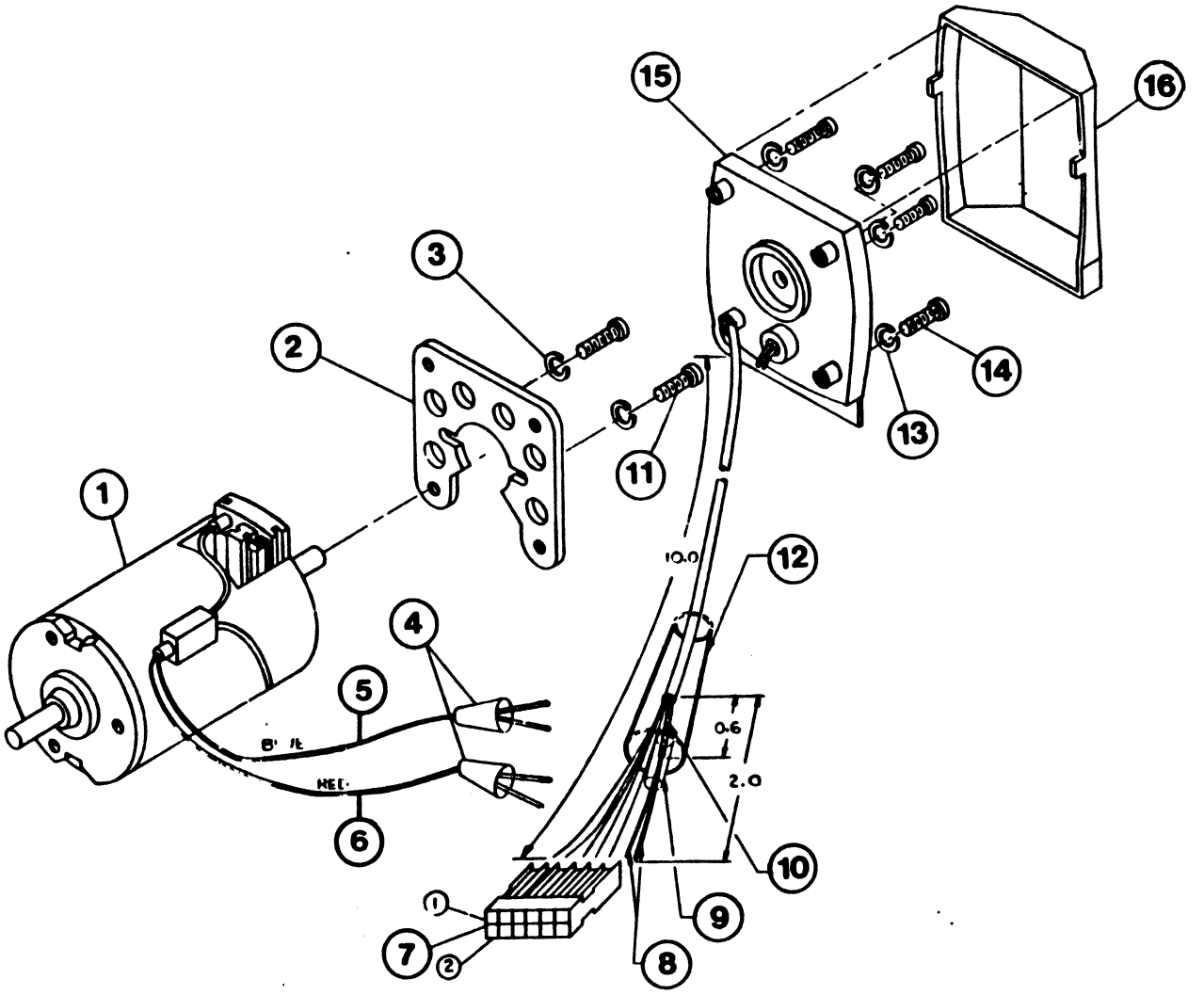
Ribbon Motor Assembly
Parts List Number 06-50006-00

ITEM	DESCRIPTION
1	Pulley
2	Motor, Ribbon Feed
3	Connector, 8-Pin

PIN NO.	WIRE COLOR
1	RED
2	BRN
3	ORG
4	YEL



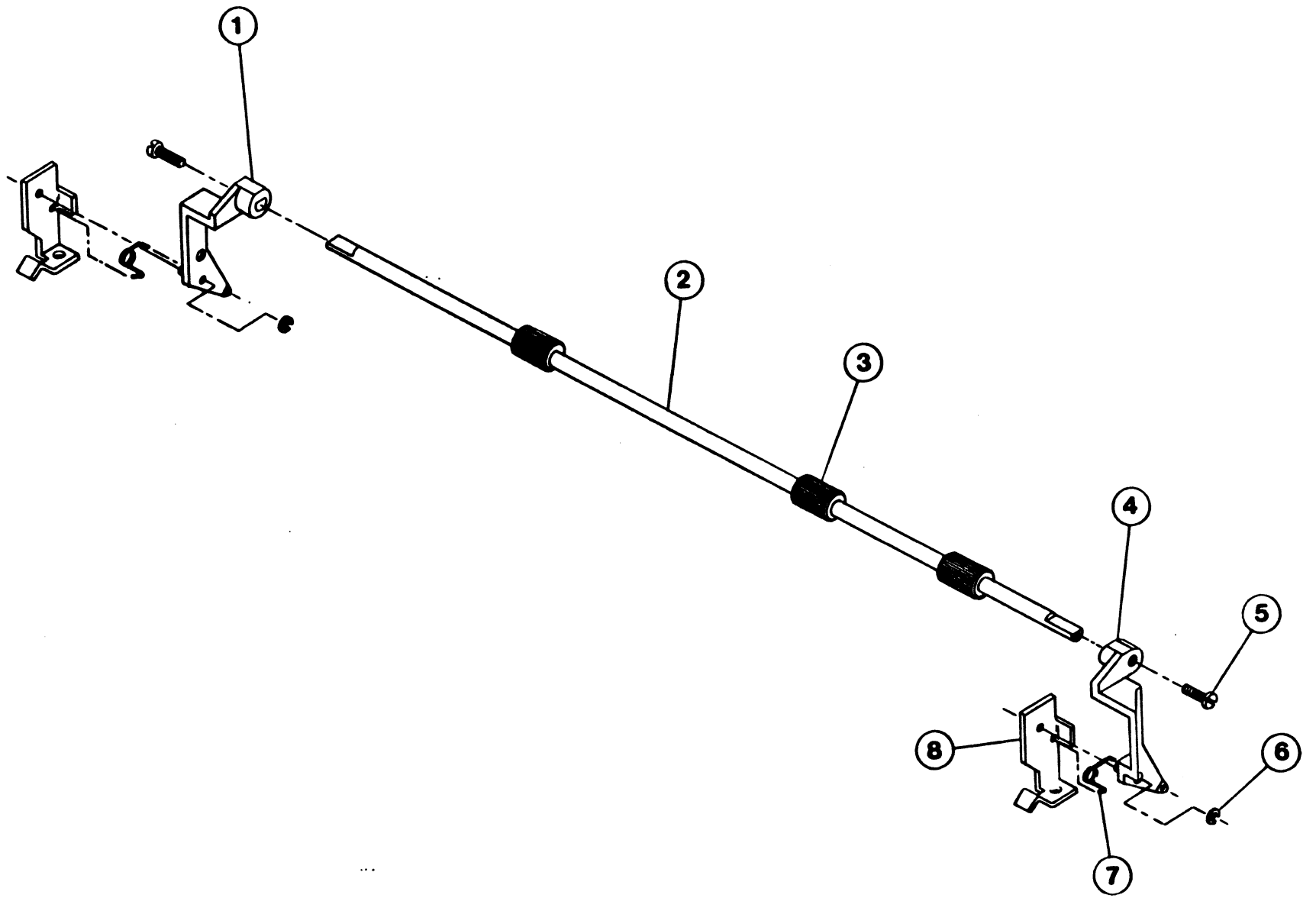
Ribbon Motor Assembly



Print Wheel Motor Assembly

Paper Bail Assembly
Parts List Number 06-50019-00

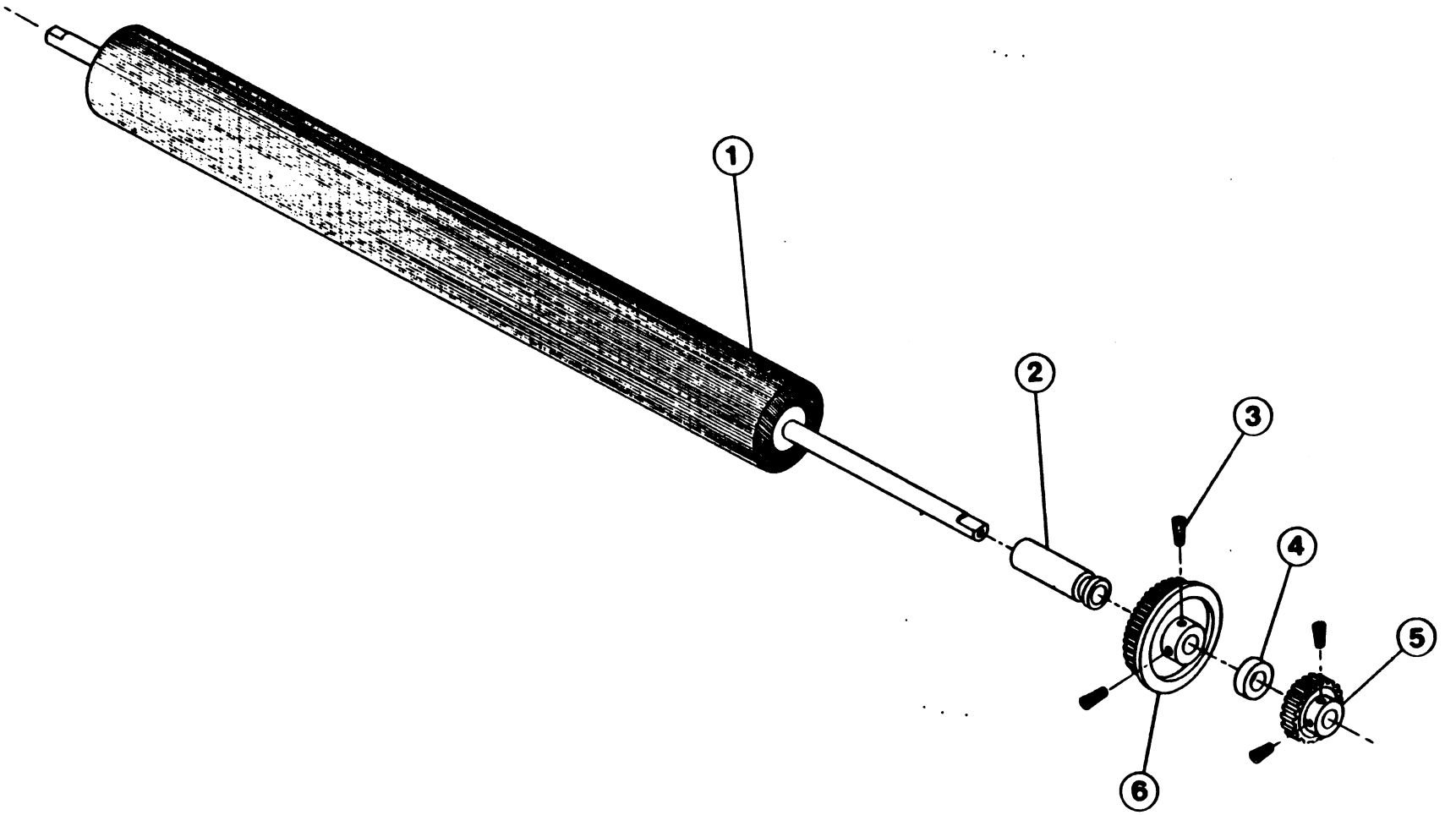
ITEM	DESCRIPTION
1	Bail Arm, L.H.
2	Shaft, Bail
3	Roller, Paper Bail
4	Bail Arm, R.H.
5	Screw, Pan Hd., 6-32 × 1/4, Torx Blk.
6	Retaining Ring, 'E' Ring Type
7	Spring, Bail
8	Clamp Assembly, Lower



Paper Bail Assembly

Platen Assembly
Parts List Number 06-50008-00

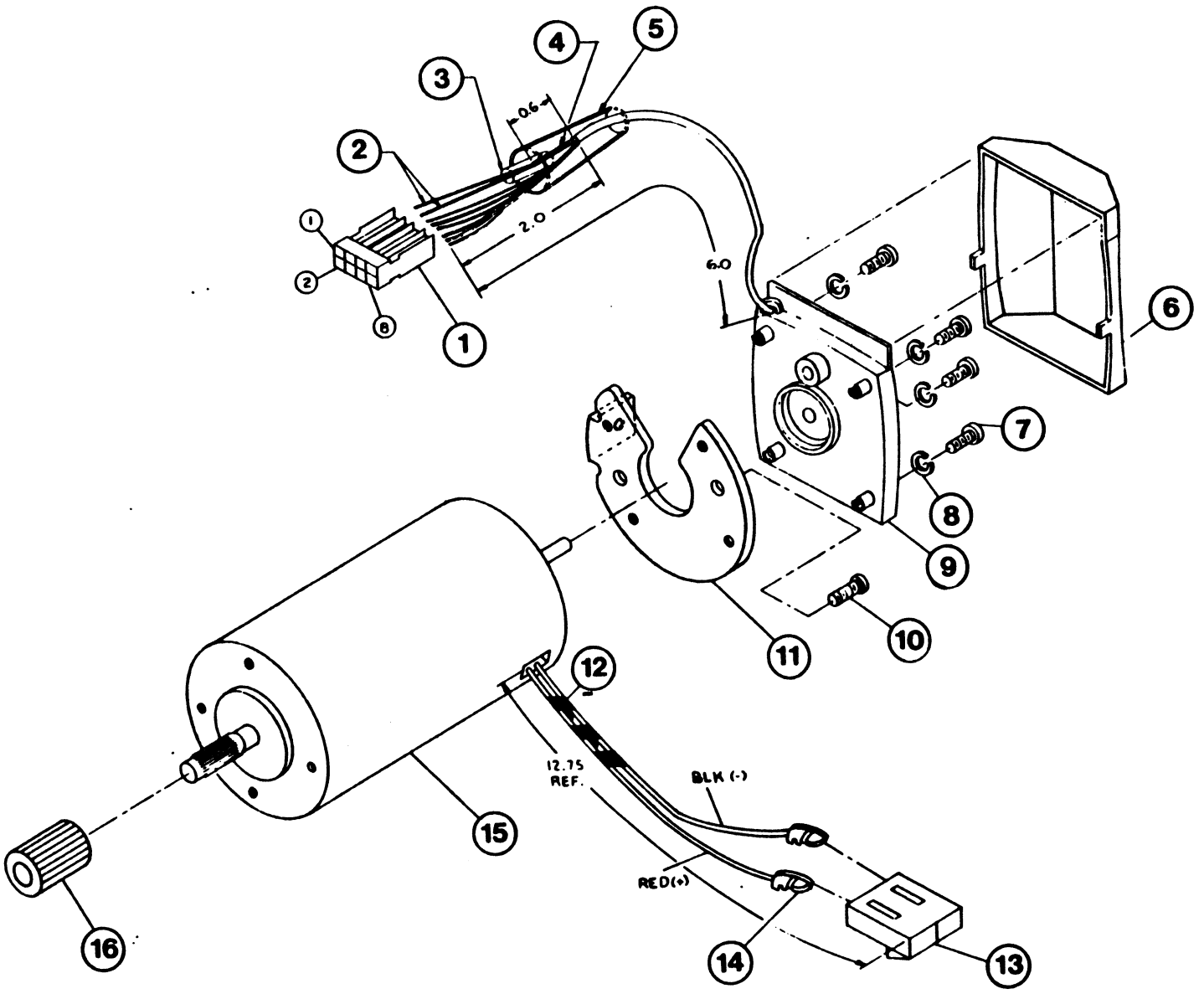
ITEM	DESCRIPTION
1	Platen Assembly
2	Bearing, Platen
3	Screw, Hex Socket Hd., 6-32 × 3/16, Blk.
4	Bushing, Tractor
5	Gear, Tractor Drive
6	Pulley, Drive Belt



Platen Assembly

Carriage Motor Assembly
Parts List Number 06-50014-00

ITEM	DESCRIPTION
1	Connector, Modular Mt.
2	Wire 28 AWG, Violet
3	Tubing, Heat Shrinkable 1/2 Dia.
4	Braid Gnd
5	Tubing, Heat Shrinkable 3/4 Dia.
6	Cover, Encoder
7	Screw, Pan Hd., 4-40 × 1/2, Torx Blk.
8	Washer, Split-Lock #4 Zc.
9	Encoder
10	Screw, Pan Hd., 6-32 × 1/4, Torx Blk.
11	Plate, Adaptor B.C.
12	Spiral Wrap, .125 O.D.
13	Connector, Housing
14	Connector, Crimp Terminal, .156 Center
15	Motor Carriage Drive
16	Pulley, Carriage Motor



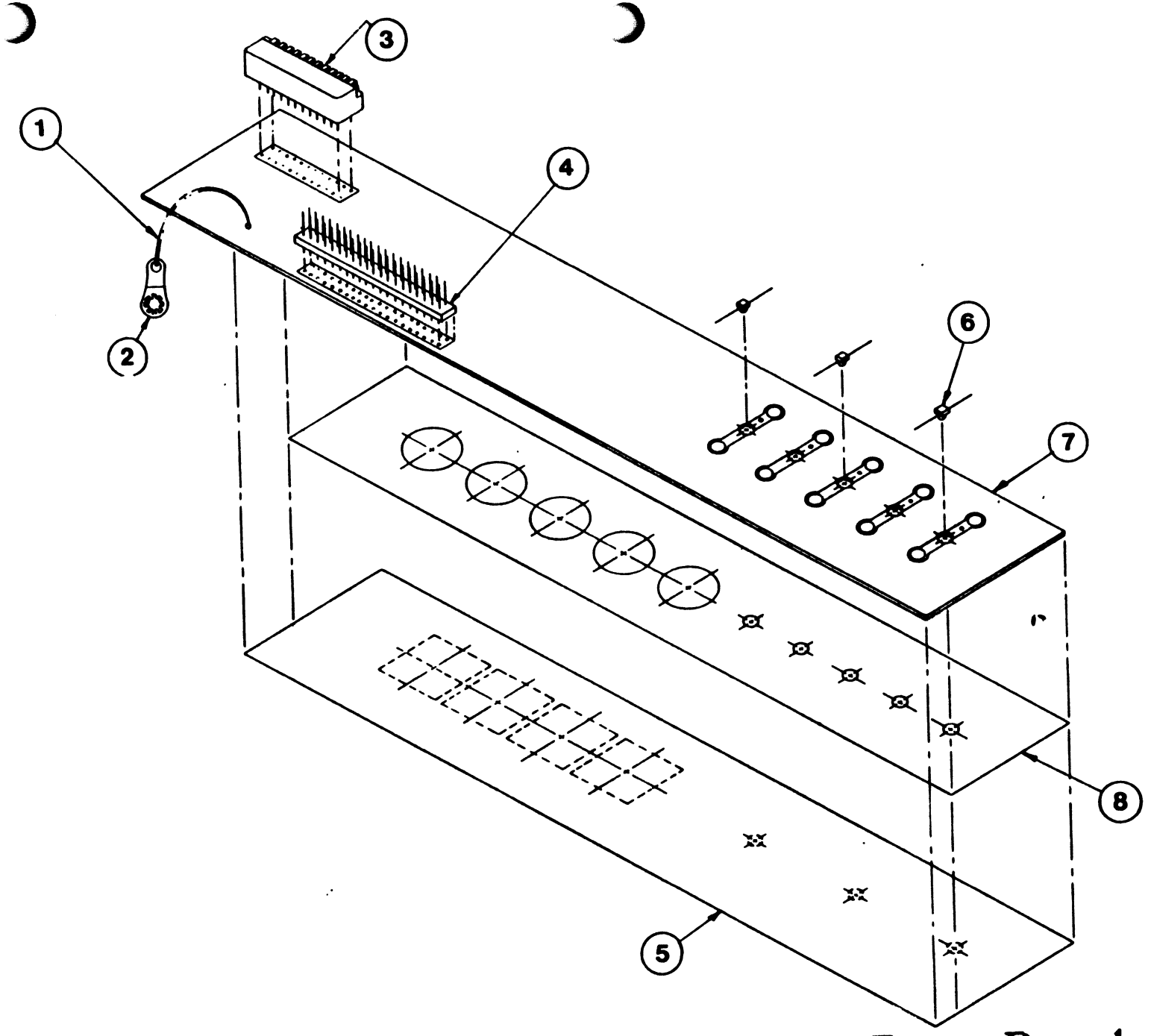
Carriage Motor Assembly

Front Panel Assembly
Parts List Number 06-88603-01

ITEM	DESCRIPTION
1	Wire, 18 AWG, Black
2	Lug, Solder, Intl. Star #8 Comm.
3	DIP Switch, 12-Pos
4	Header 40-Pin
5	Graphic Overlay, Front Panel
6	LED, Axial Leads
7	PCB Fabrication
8	Spacer,Front Panel Membrane Switch

Print Wheel Motor Assembly
Parts List Number 06-50005-00

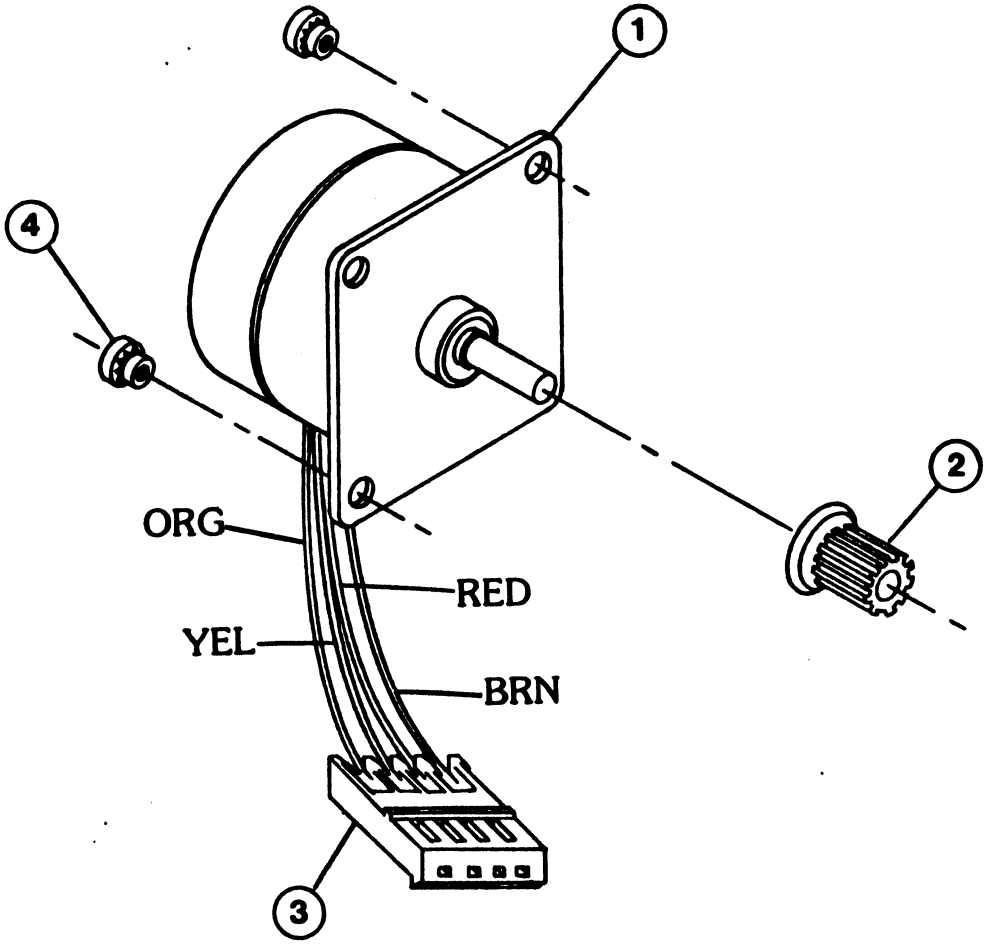
ITEM	DESCRIPTION
1	Motor, Printwheel Drive
2	Plate, Adaptor P.W.
3	Washer, Split-Lock #4 Zc.
4	Tubing, Heat Shrinkable, 3/32 Dia.
5	Wire, 26 AWG Blue,
6	Wire, 26 AWG Red,
7	Connector, Modular Mt. 12-Pin
8	Wire, 28 AWG Violet
9	Tubing, Heat Shrinkable, 1/8 Dia.
10	Braid Lead
11	Screw, Pan Hd., 4-40 × 1/4, Torx Blk.
12	Tubing, Heat Shrinkable, 3/4 Dia.
13	Washer, Split Lock #4 Zc.
14	Screw, Pan Hd., 4-40 × 1/2, Torx Blk.
15	Encoder, Print Wheel
16	Encoder Cover



Front Panel Assembly

Paperfeed Motor Assembly
Parts List Number 06-50016-00

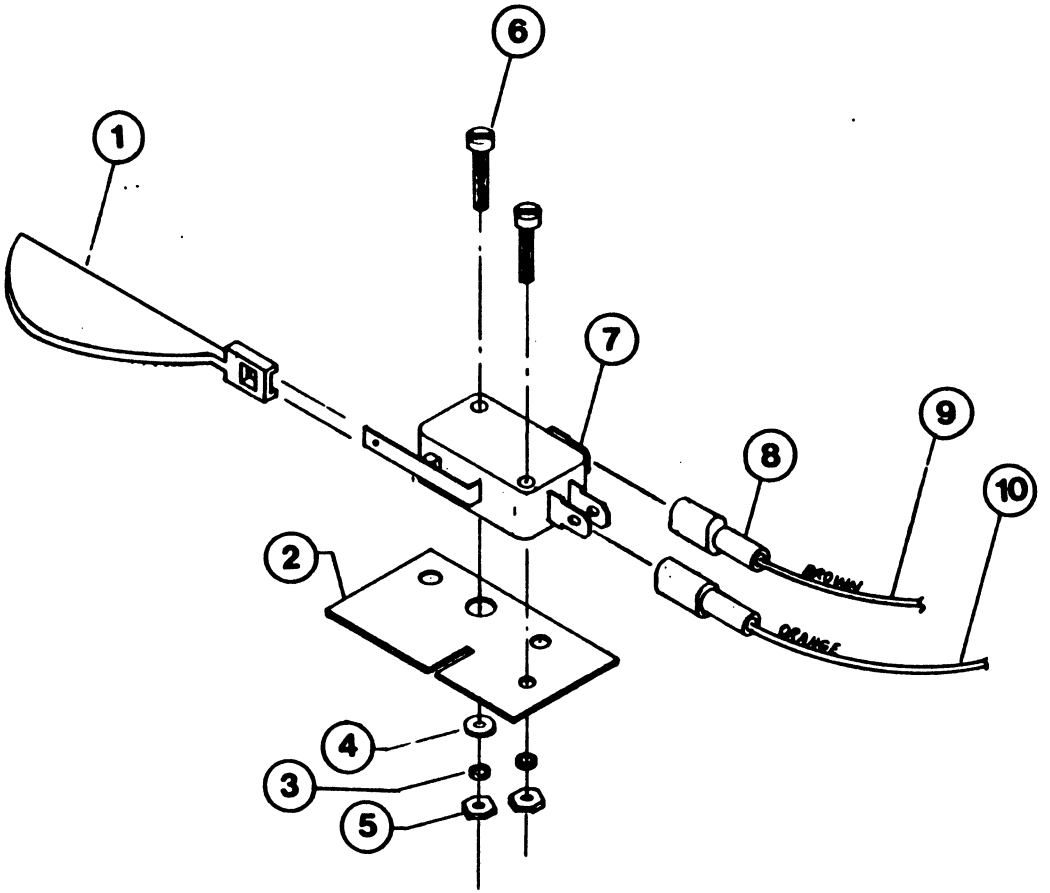
ITEM	DESCRIPTION
1	Paperfeed Motor
2	Pulley, Paperfeed, Motor
3	Connector, Molex 4-Pin
4	Pem-Nut, 8-32



Paperfeed Motor Assembly

Paper Sensor Assembly
Parts List Number 06-50021-01

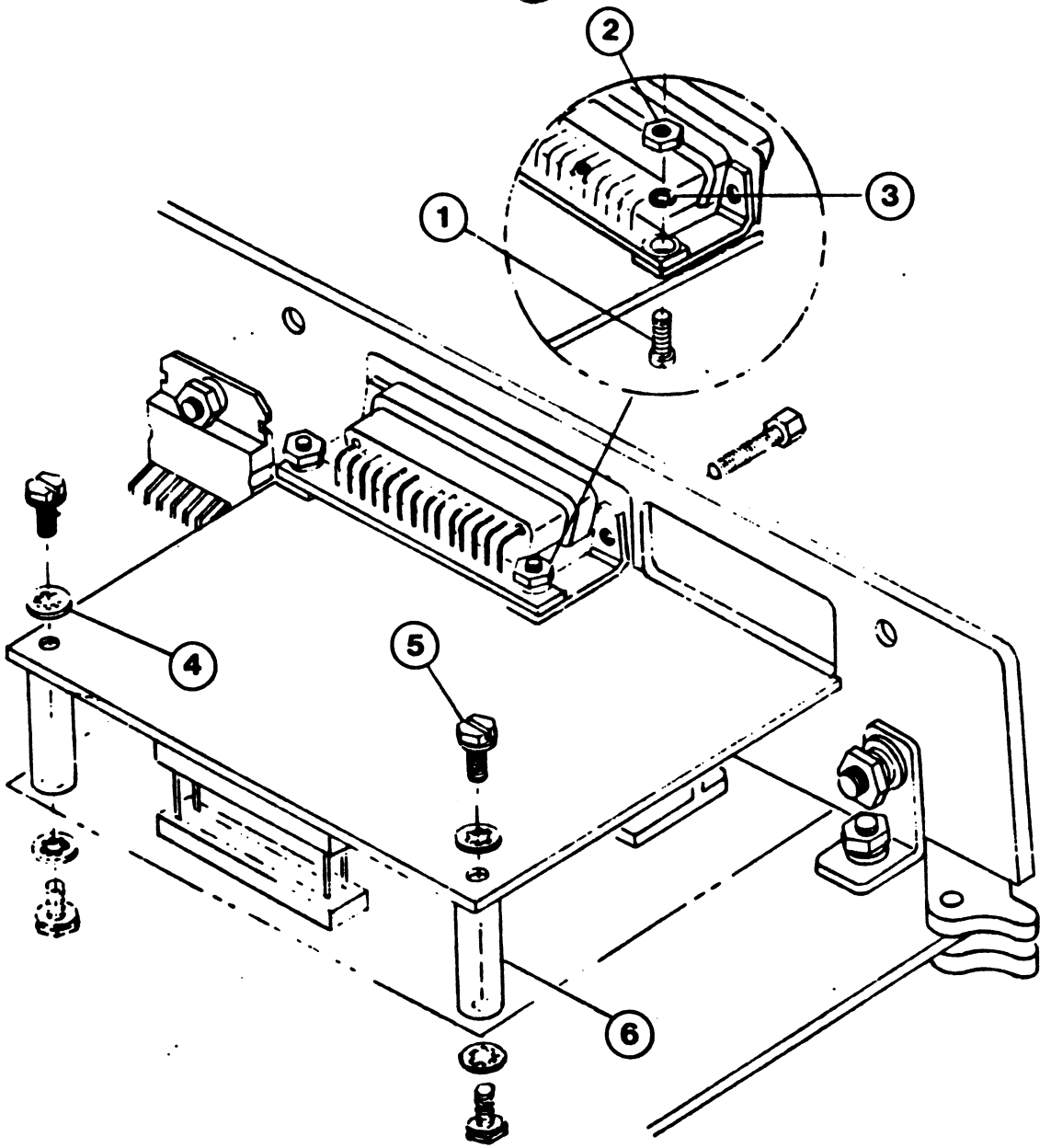
ITEM	DESCRIPTION
1	Sensor
2	Plate, Paper Sensor
3	Washer, Split Lock #4 Blk.
4	Washer, Flat #4 Blk.
5	Nut, Hex 4-40
6	Screw, Truss Hd., 4-40 × 3/4, Torx Blk.
7	Switch, Snap Action
8	Connector, Female Quick Disconnect
9	Wire, 26 AWG Brown
10	Wire, 26 AWG Orange



Paper Sensor Assembly

Serial Interface Assembly
Parts List Number 06-88604-10

ITEM	DESCRIPTION
1	Screw, Fillister Hd., 4-40 × 5/16, Zc.
2	Nut, Hex #4 Zc.
3	Washer, Split Lock #4 Zc.
4	Washer, Int Star #4 Zc.
5	Screw, Hex Washer Hd., 4-40 × 1/4, Zc.
6	Spacer, 4-40 × 11/16, Cl. Anodiee

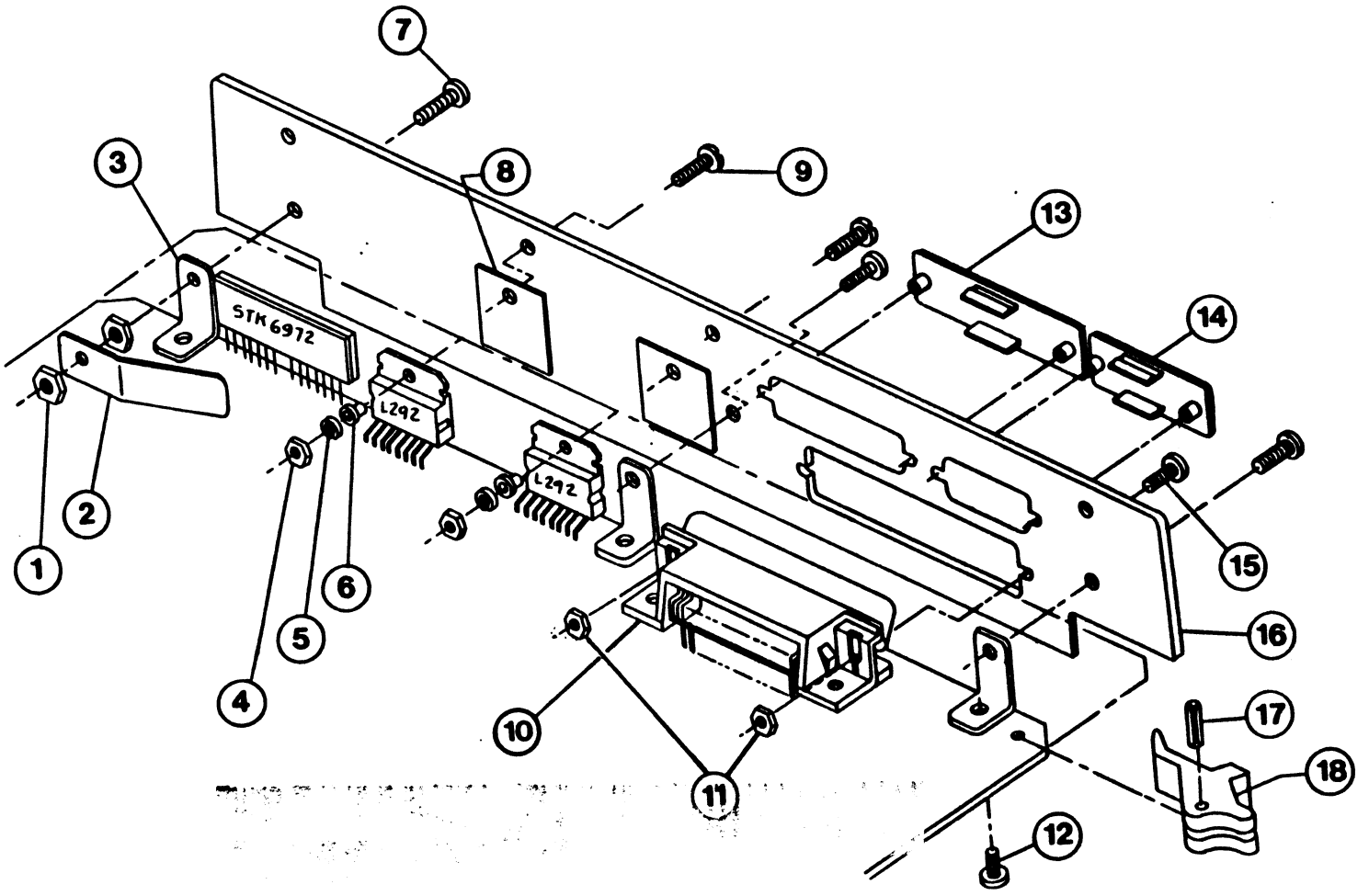


Serial Interface Assembly

Part N

Main Logic Assembly
Parts List Number 06-88601-01

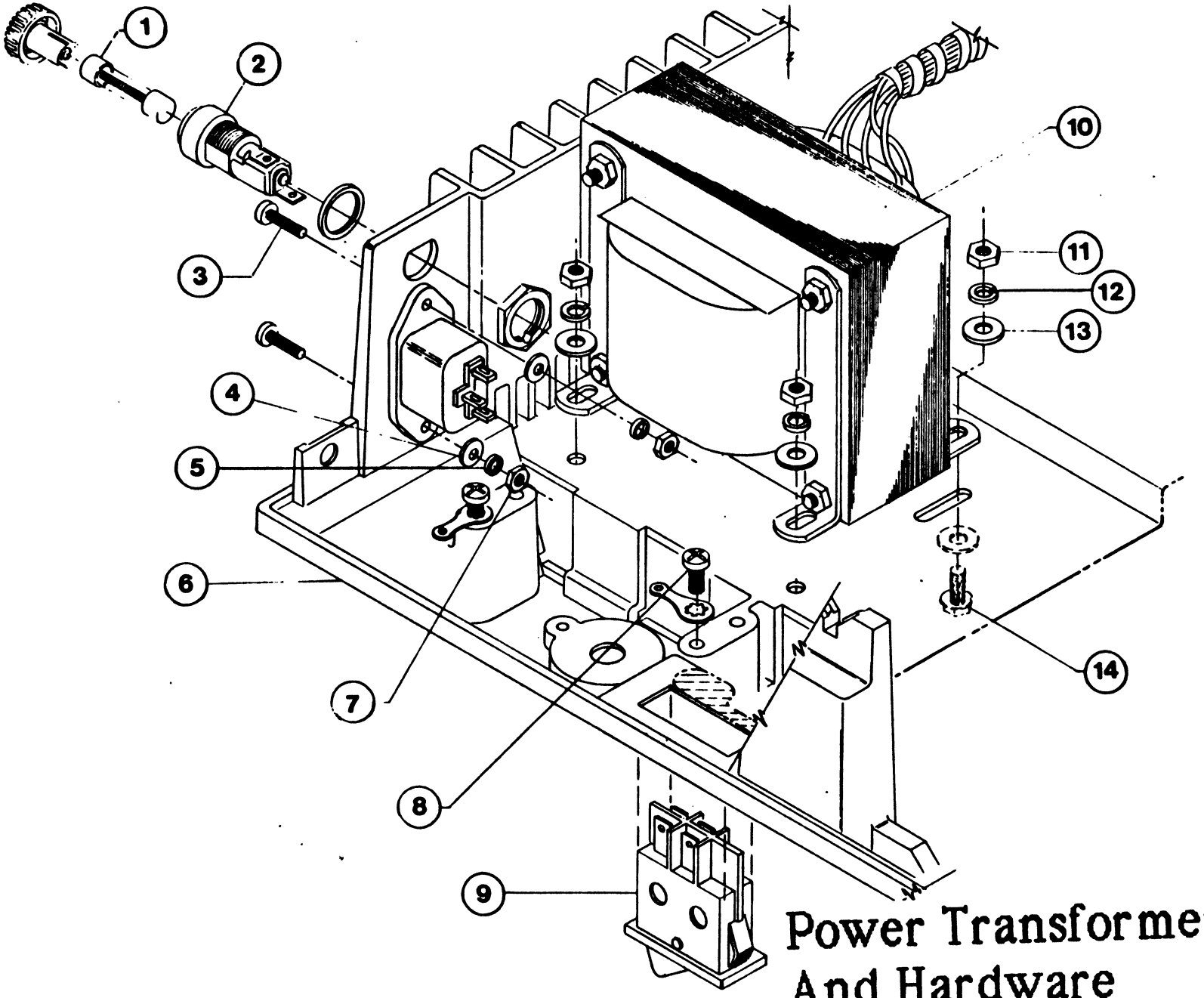
ITEM	DESCRIPTION
1	Nut, Hex #8 Zc.
2	Spring, Retainer
3	Bracket, Control Board Mounting
4	Nut, Hex #4 Zc.
5	Washer, Split-Lock #4 Zc.
6	Shoulder Bushing, Nylon
7	Screw, Pan Hd., 8-32 × 1/2, Torx Blk.
8	Insulator, L292, Elastomeric
9	Screw, Pan Hd., 4-40 × 3/8, Torx Blk.
10	Receptacle, Centronics Metal
11	Hardware, Receptacle
12	Screw, Pan Hd., 6-32 × 1/4, Torx Blk.
13	Plug, Connector, 25-Pin D
14	Plug, Connector, 9-Pin D
15	Hardware, Receptacle
16	Panel, Control Board Mounting
17	Pin, Spring .125 × .375
18	Ejector, PC Board



Main Logic Assembly Drawing

Power Transformer and Hardware
Refer to Parts List Number 06-50009-00

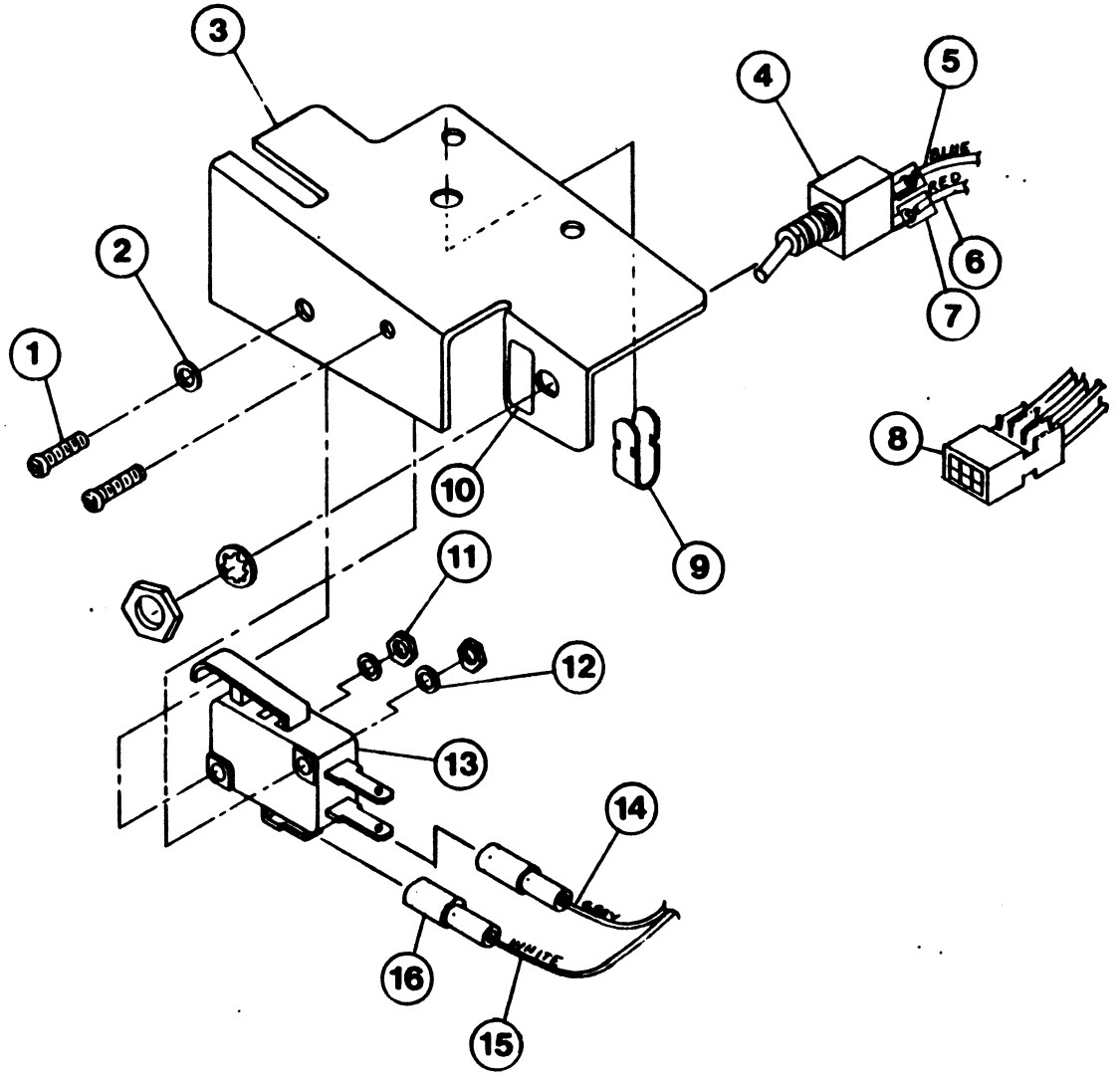
ITEM	DESCRIPTION
1	Fuse, 3 AG SLO-BLO, 3 Amp
2	Fuse Holder Assembly
3	Screw, Pan Hd., 4-40 × 1/2, Torx Blk.
4	Washer, Flat #4 Blk.
5	Washer, Split-Lock #4 Blk.
6	Base Casting (reference)
7	Nut, Hex #4 Blk.
8	Screw, Pan Hd., 8-32 × 3/8, Torx Blk.
9	Switch, A.C. Power, On/Off
10	Transformer, Power
11	Nut, Hex #8 Blk.
12	Washer, Split-Lock #8 Blk.
13	Washer, Flat #8 Blk.
14	Screw, Slotted Hex Hd., 8-32 × 1/2, Zc.



Power Transformer
And Hardware

Cover Interlock Assembly
Parts List Number 06-50020-00

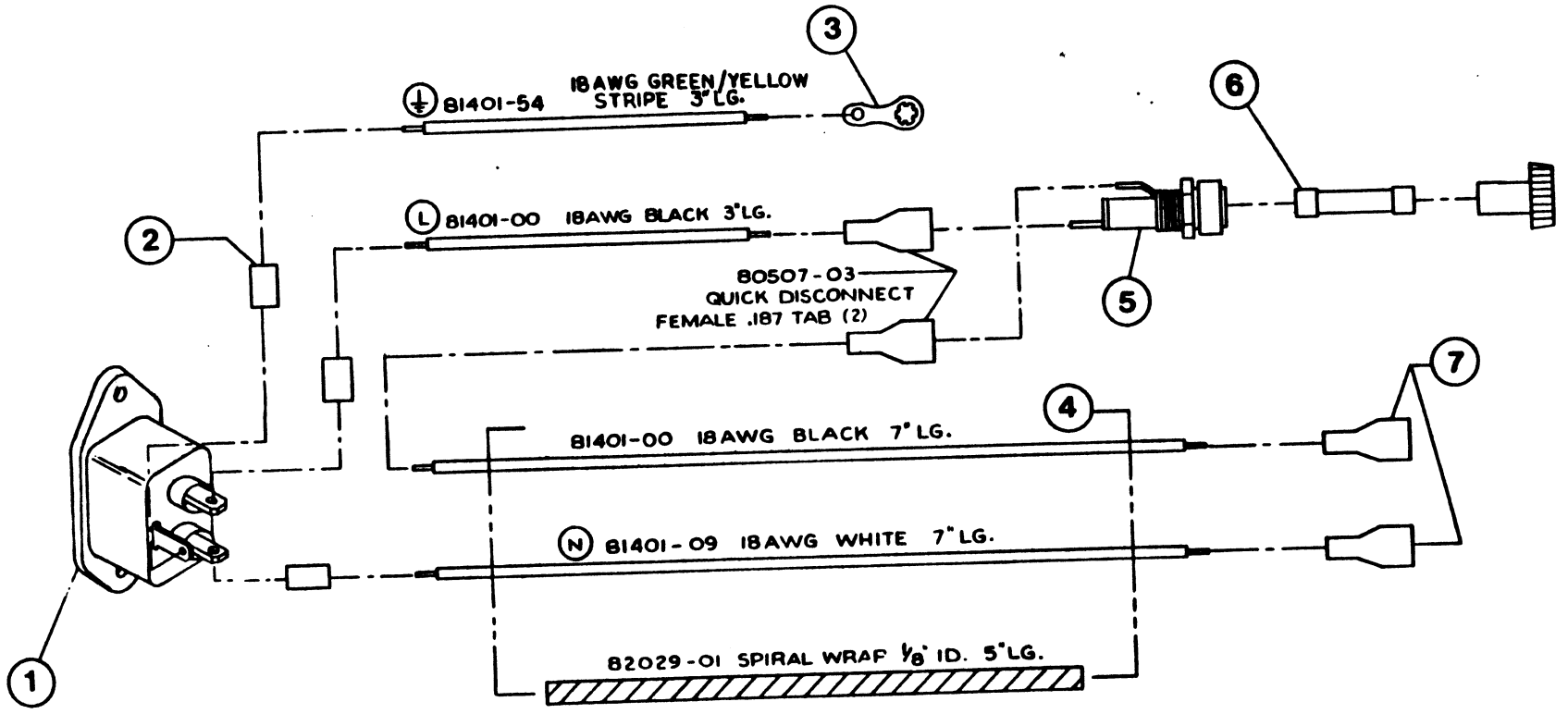
ITEM	DESCRIPTION
1	Screw, Pan Hd., 4-40 × 3/4, Phil. Blk.
2	Washer, Flat Std. #4, Blk.
3	Bracket, Switch
4	Switch, Toggle,
5	Wire, 26 AWG Stranded, Blue,
6	Wire, 26 AWG Stranded, Red,
7	Tubing, Heat Shrinkable, 1/4 Dia.
8	Connector, AMP 12-Pin
9	Guide Cup
10	Label, Print Force
11	Nut, Hex #4, Blk.
12	Washer, Split Lock #4, Blk.
13	Switch, Snap Action
14	Wire, 26 AWG Stranded, Grey,
15	Wire, 26 AWG Stranded, White,
16	Connector, Female Quick Disconnect



Cover Interlock Assembly

A.C. Power Receptacle Assembly
Parts List Number 06-88004-00

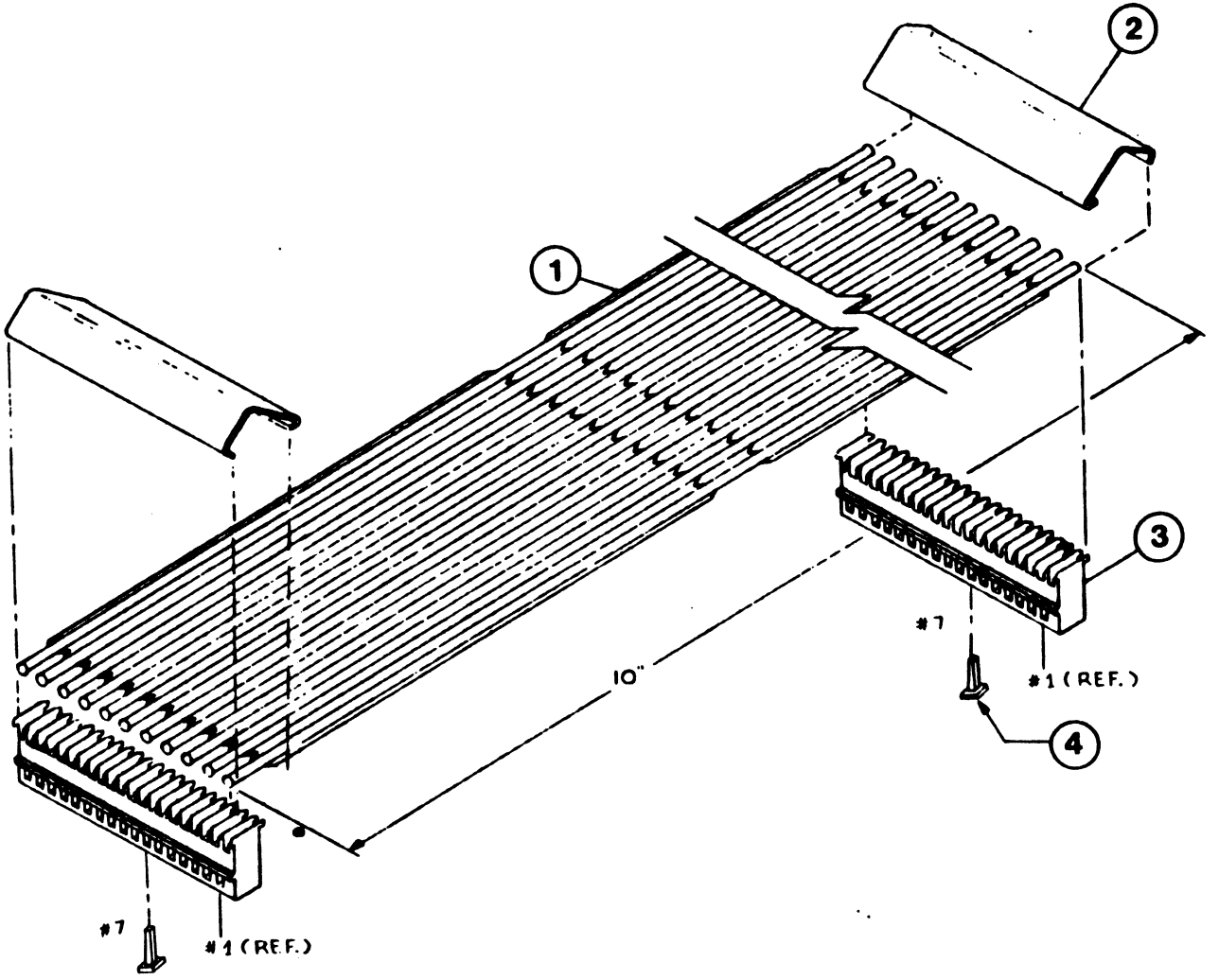
ITEM	DESCRIPTION
1	Connector, A.C. Receptacle
2	Tubing, Heat Shrinkable
3	Lug, Solder, Intl Star #8
4	Spiral Wrap 1/8 I.D.
5	Assembly, Fuse Holder
6	Fuse, 3 AG SLO-BLO 3 Amp
7	Connector F.M. Quick Disconnect .250 Tab



A.C. Power Receptacle Assembly

Power Supply Cable Assembly
Parts List Number 06-88001-24

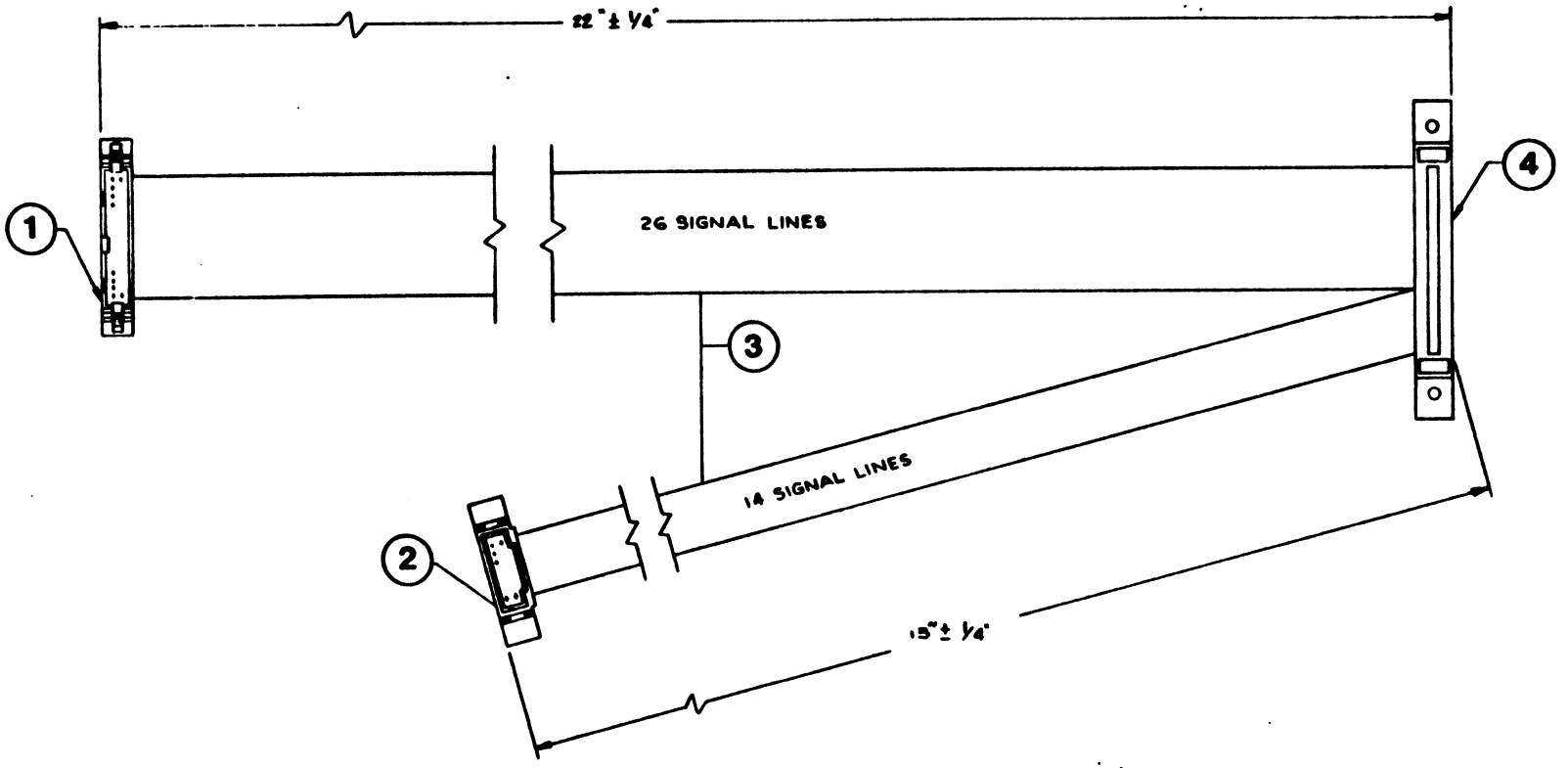
ITEM	DESCRIPTION
1	Wire, 18 AWG Black
2	Wire, 18 AWG White
3	Screw, Binder Hd., Slotted, 10-24 × 1 Nylon
4	Bushing, Flanged Nylon #10
5	Nut, Hex Nylon #10



Power Supply Cable Assembly

Carriage Cable Assembly
Parts List 06-88003-00

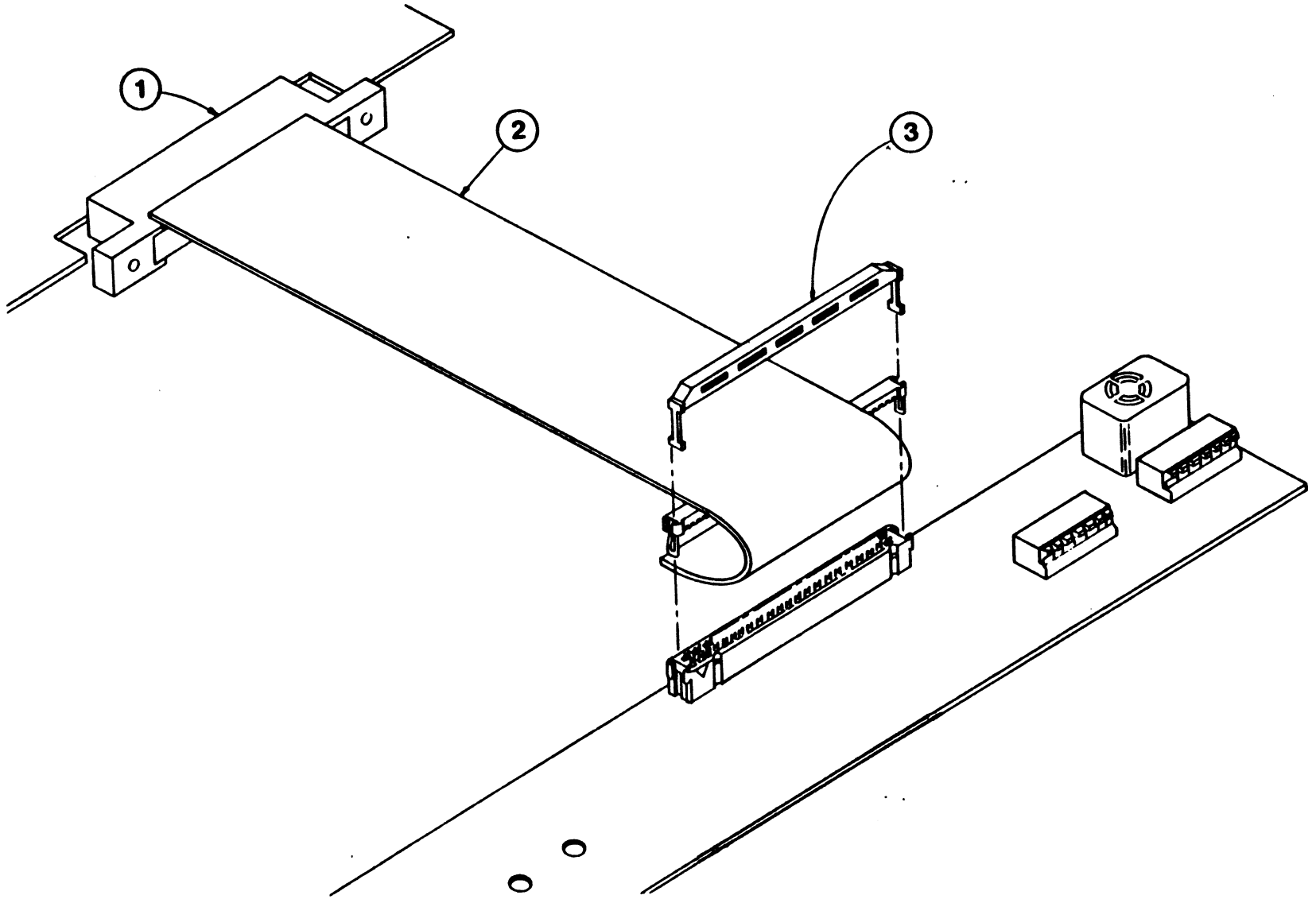
ITEM	DESCRIPTION
1	Connector 26-Pin Header
2	Connector 14-Pin W/Mounting Ear
3	Cable, Flat. High Flex 40-Conductor
4	Connector, Card Edge 40-Pin



Carriage Cable Assembly

Front Panel Cable Assembly
Parts List Number 06-88002-00

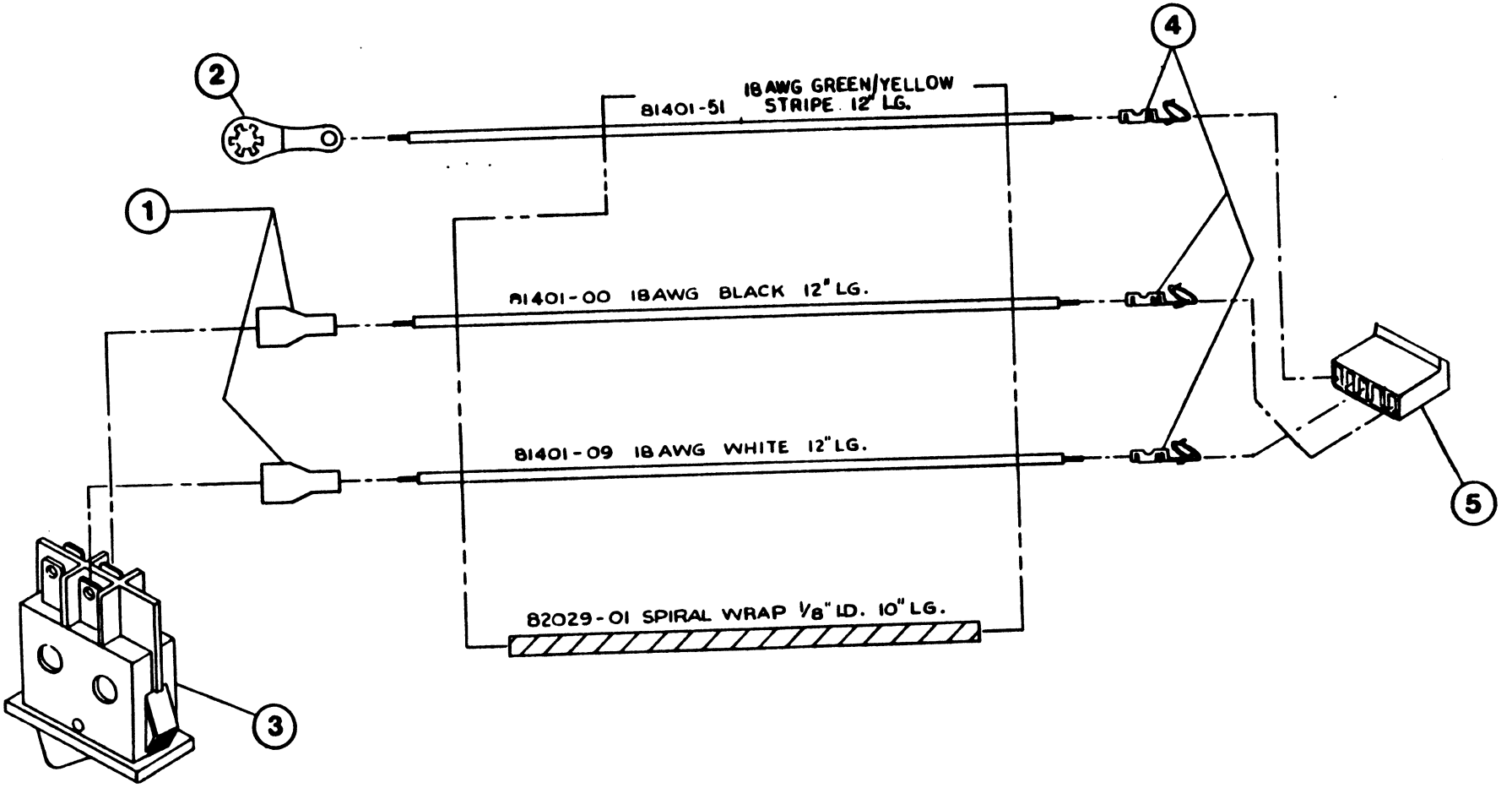
ITEM	DESCRIPTION
1	Connector, Card Edge, 40-Pin
2	Cable, Ribbon
3	Connector, Socket, 40-Pin



Front Panel Cable Assembly

A.C. Switch Wiring Assembly
Parts List Number 06-88006-00

ITEM	PART NUMBER	DESCRIPTION
1	00-80507-04	Connector, Quick-Disconnect Female, .250 Tab
2	00-82043-08	Lug, Solder Internal Star #8
3	00-83020-01	Switch, A.C. Power
4	00-80013-01	Connector, Crimp Terminal KK156
5	00-80012-05	Connector Housing, .156 W/Ramp Molex 4-Pin



A.C. Switch Wiring Assembly

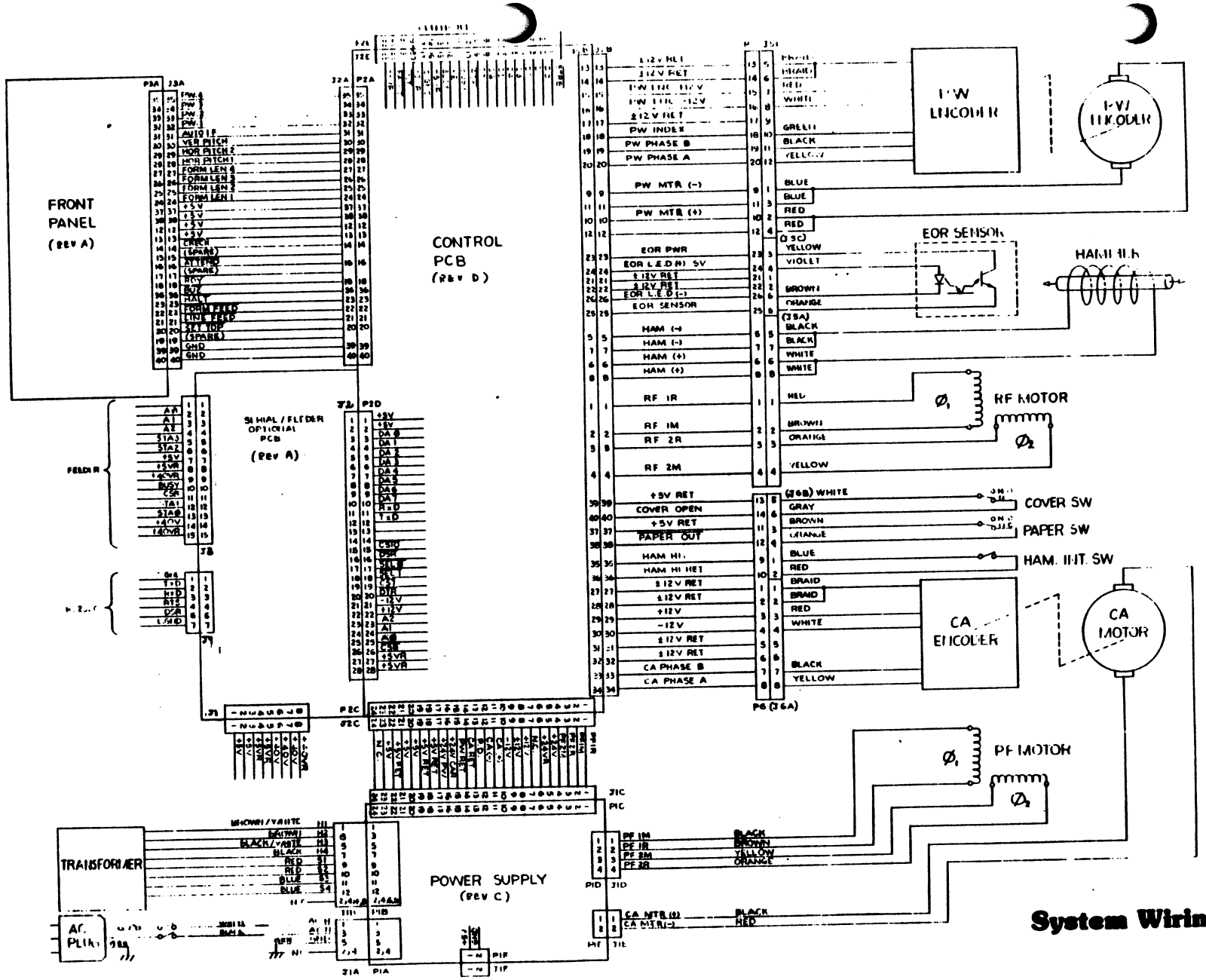
SECTION X

SCHEMATICS AND FABRICATION DRAWINGS

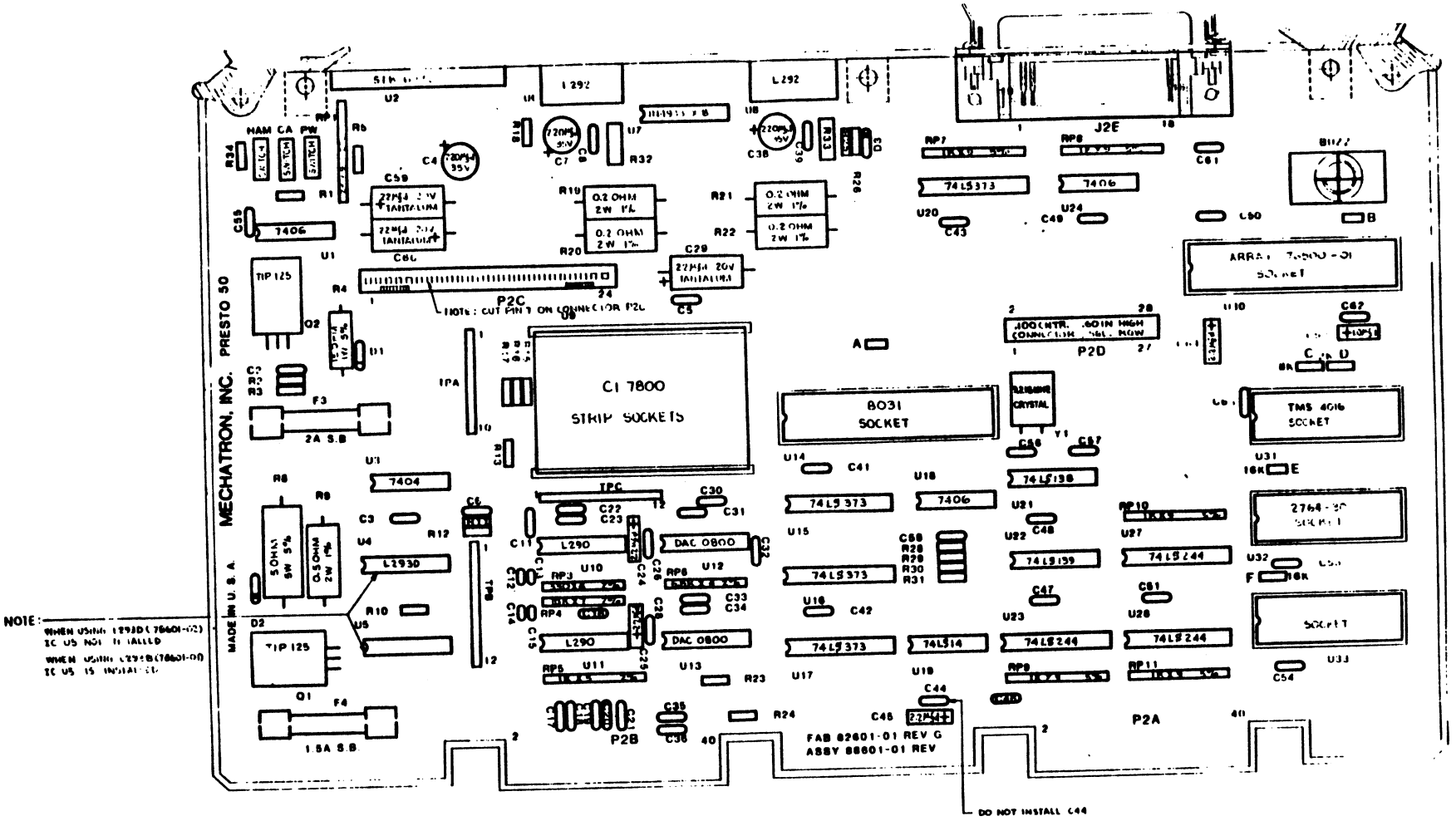
10.1 INTRODUCTION

This section provides the schematic drawings, fabrication drawings, and assembly drawings for the electronic subassemblies of the TP 760 printer. The section is formatted such tht the parts lists are on pages facing the fabrication drawings for easy reference when using the drawings.

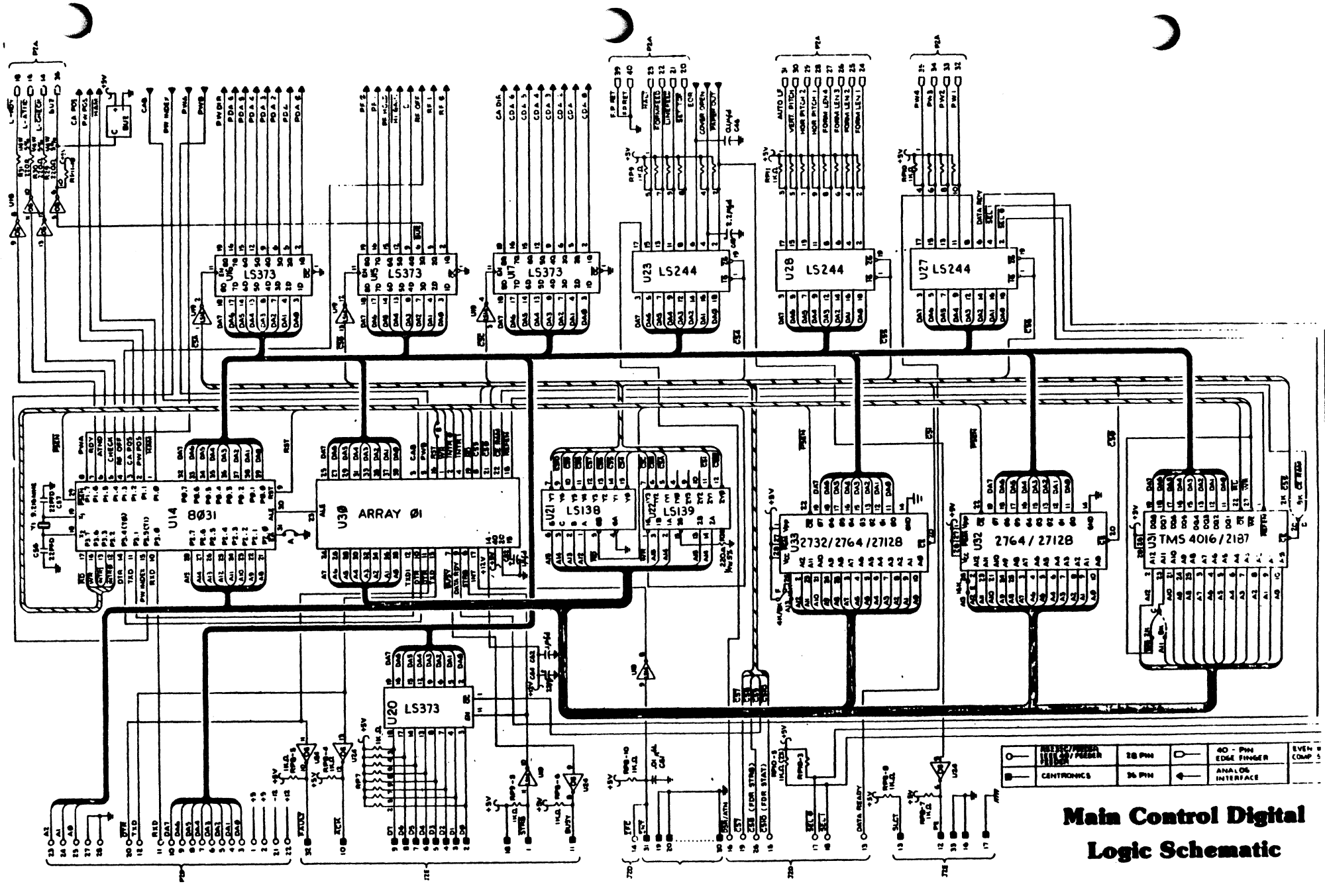
10.2 SECTION CONTENTS



System Wiring Diagra



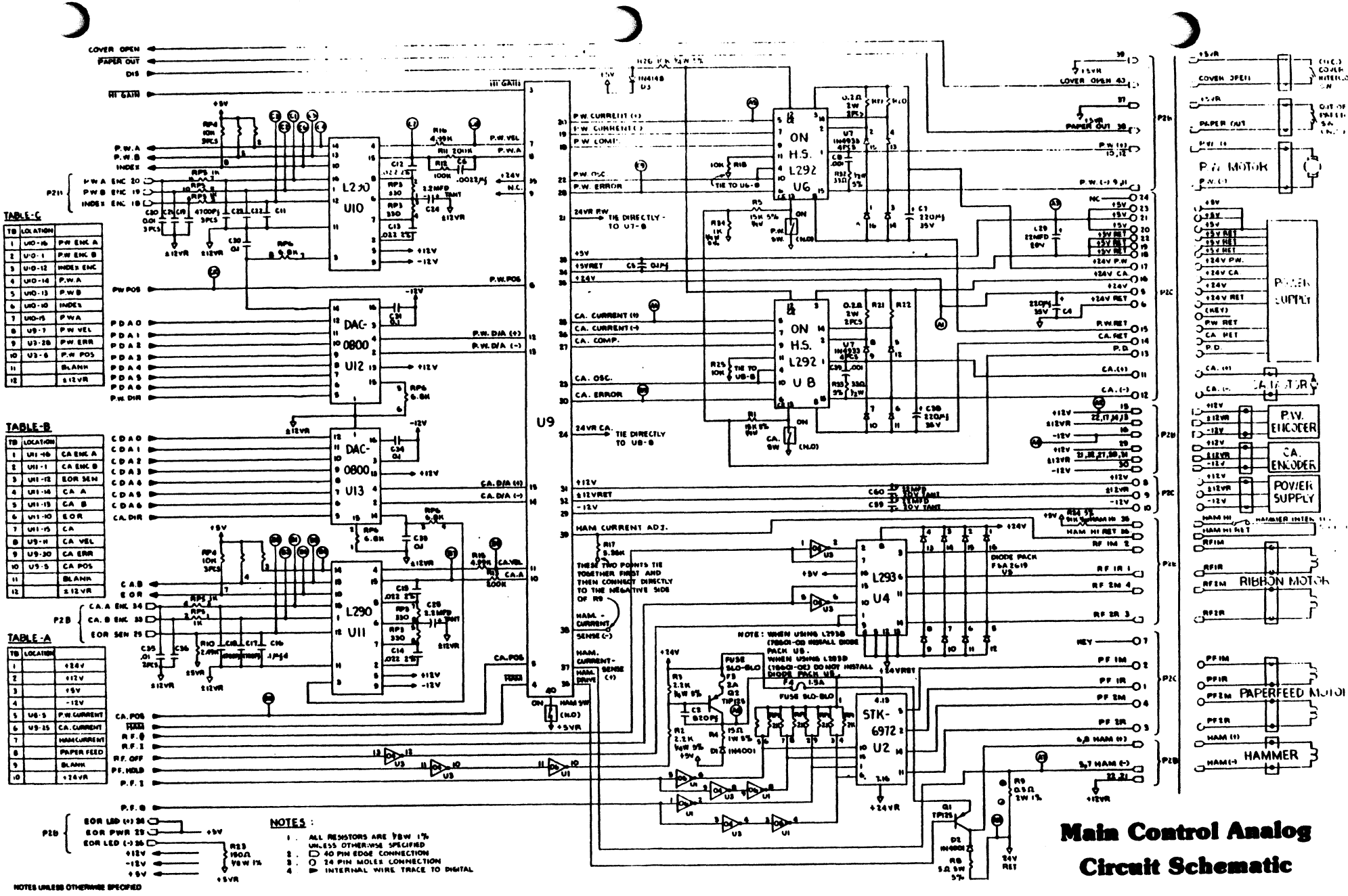
Main Logic Assembly Drawing



Main Control Digital Logic Schematic

P.C.B ASSEMBLY MAIN CONTROL BOARD PARTS LIST

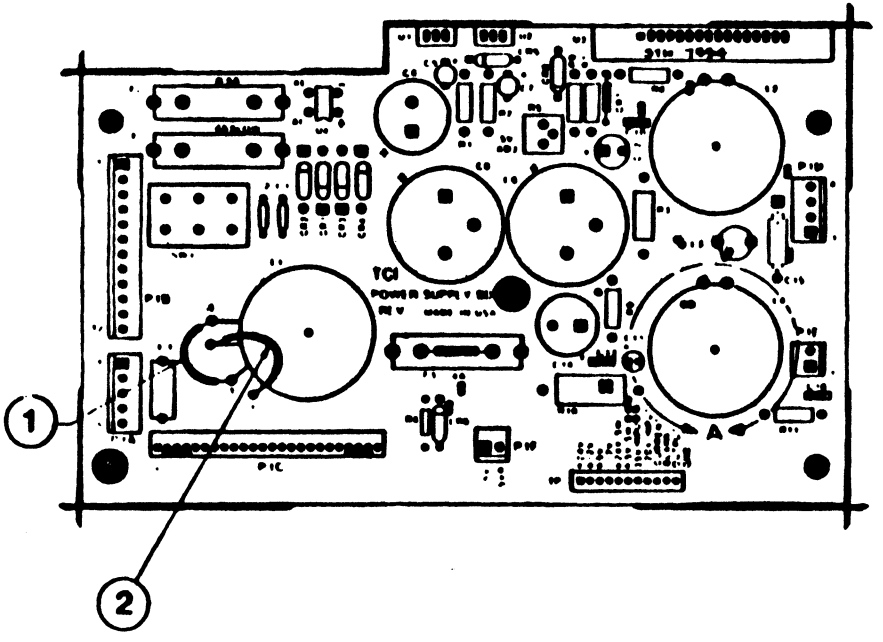
DESCRIPTION	REFERENCE
Capacitor 22 pfd 50V Cer-Axial ±5% Cog	C56, C57
Capacitor 820 pfd 50V Cer-Axial ±5% Cog	C2
Capacitor 1000 pfd 50V Cer-Axial +80% −20%	C8, C39
Capacitor 2200 pfd 50V Cer-Axial ±10% x 7R	C6, C10
Capacitor 4700 pfd 50V Cer-Axial +80% −20%	C11, C17, C18, C22, C23
Capacitor 01 ufd 50V Cer-Axial +80% −20%	C19, C20, C21, C35, C36, C61
Capacitor 0.1 ufd 50V Cer-Axial +80% −20%	C3, C5, C16, C26, C28, C30, C31, C32, C33, C34, C41, C42, C43, C46, C47, C48, C49, C50, C51, C53, C54, C55, C58, C62, C63
Capacitor 1.0 ufd 35V Tant-Axial ±10%	C52
Capacitor 2.2 ufd 25V Tant-Axial ±10%	C24, C25, C45, C64
Capacitor 22 ufd 20V Tant-Axial ±20%	C29, C59, C60
Capacitor .022 ufd 100V Mylar ±2%	C12, C13, C14, C15
Capacitor 22 ufd 35V Electro +80% −20%	C4, C7, C38
Resistor 150 Ohm 1/8W 1%	R23
Resistor 2.49 K Ohm 1/8W 1%	R10
Resistor 4.99 K Ohm 1/8W 1%	R15, R16
Resistor 5.36 K Ohm 1/8W 1%	R17
Resistor 10 K Ohm 1/8W 1%	R18, R25
Resistor 100 K Ohm 1/8W 1%	R12, R14
Resistor 200 K Ohm 1/8W 1%	R11, R13
Resistor 220 Ohm 1/4W 5%	R28, R29, R30, R31
Resistor 1 K Ohm 1/4W 5%	R34
Resistor 2.2 K Ohm 1/4W 5%	R2, R3
Resistor 10 K Ohm 1/4W 5%	R26
Resistor 15 K Ohm 1/4W 5%	R1, R5
Resistor 91 K Ohm 1/4W 5%	R24
Resistor 33 Ohm 1/2W 5%	R32, R33
Resistor 15 Ohm 1W 5%	R4
Resistor 0.2 Ohm 2W 1%	R19, R20, R21, R22
Resistor 0.5 Ohm 2W 1%	R9
Resistor 5 Ohm 5W 5%	R8
Resistor Sip Pack 330 x 4 2%	RP3
Resistor Sip Pack 1 K x 5 2%	RP5
Resistor Sip Pack 2 K x 9 2%	RP1
Resistor Sip Pack 10 K x 7 2%	RP4
Resistor Sip Pack 1 K x 9 5%	RP7, RP8, RP9, RP10, RP11
Resistor Sip Pack 6.8 K x 4 2%	RP6
Diode 1N4001	D1, D2
Diode 1N4148	D3
Diode 1N4933	U7
Transistor TIP125	Q1
Transistor TIP125	Q2

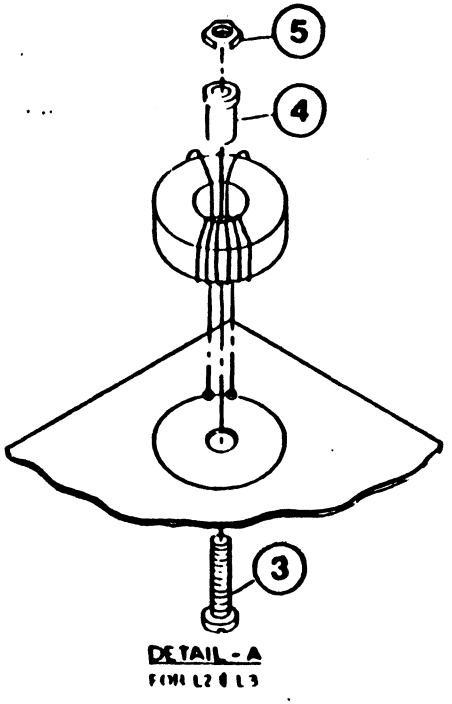


Main Control Analog Circuit Schematic

P.C.B ASSEMBLY MAIN CONTROL BOARD PARTS LIST

DESCRIPTION	REFERENCE
Xtal 9.216 Mhz series resonant	Y1
I.C. 8031 CPU	U14
I.C. Gate Array	U30
I.C. TMS4016 Ram	U31
I.C. EPROM (programmed)	U32
I.C. 7404	U3
I.C. 7406	U1, U18, U24
I.C. 74LS14	U19
I.C. 74LS138	U21
I.C. 74LS139	U22
I.C. 74LS244	U23, U27, U28
I.C. 74LS373	U15, U16, U17, U20
I.C. L290	U10, U11
I.C. L292	U6, U8
I.C. L293D	U4
I.C. DAC0800	U12, U13
I.C. STK6972	U2
I.C. C17800 Hybrid	U9

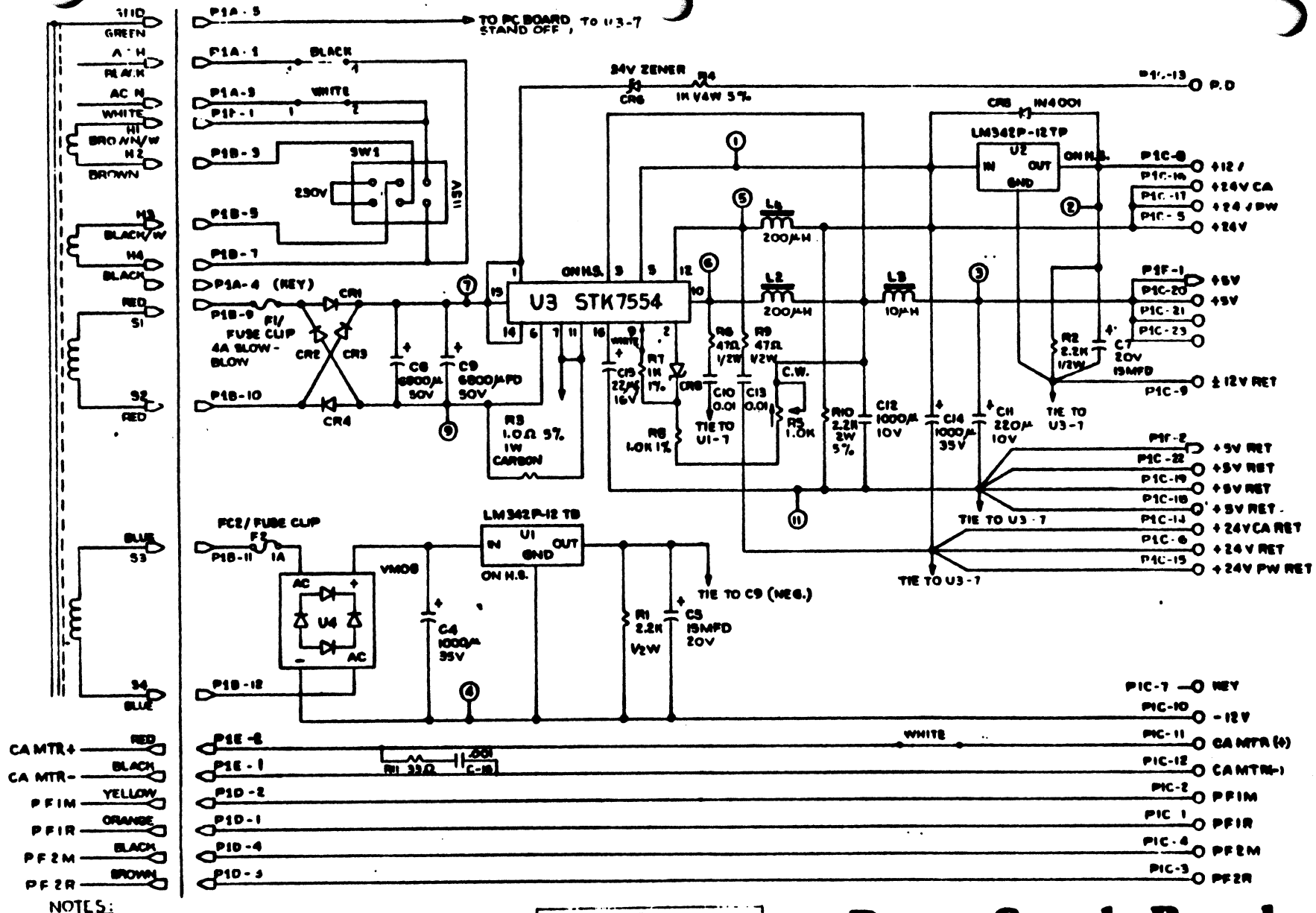




Power Supply Assembly

Power Supply Assembly Part List

ITEM	DESCRIPTION
1	18 AWG Black 1.0 in. Long
2	18 AWG White 1.0 in. Long
3	Screw Binder Hd. Slotted, 10-24 Nylon
4	Bushing Flanged Nylon
5	Nut Hex Nylon



NOTES:

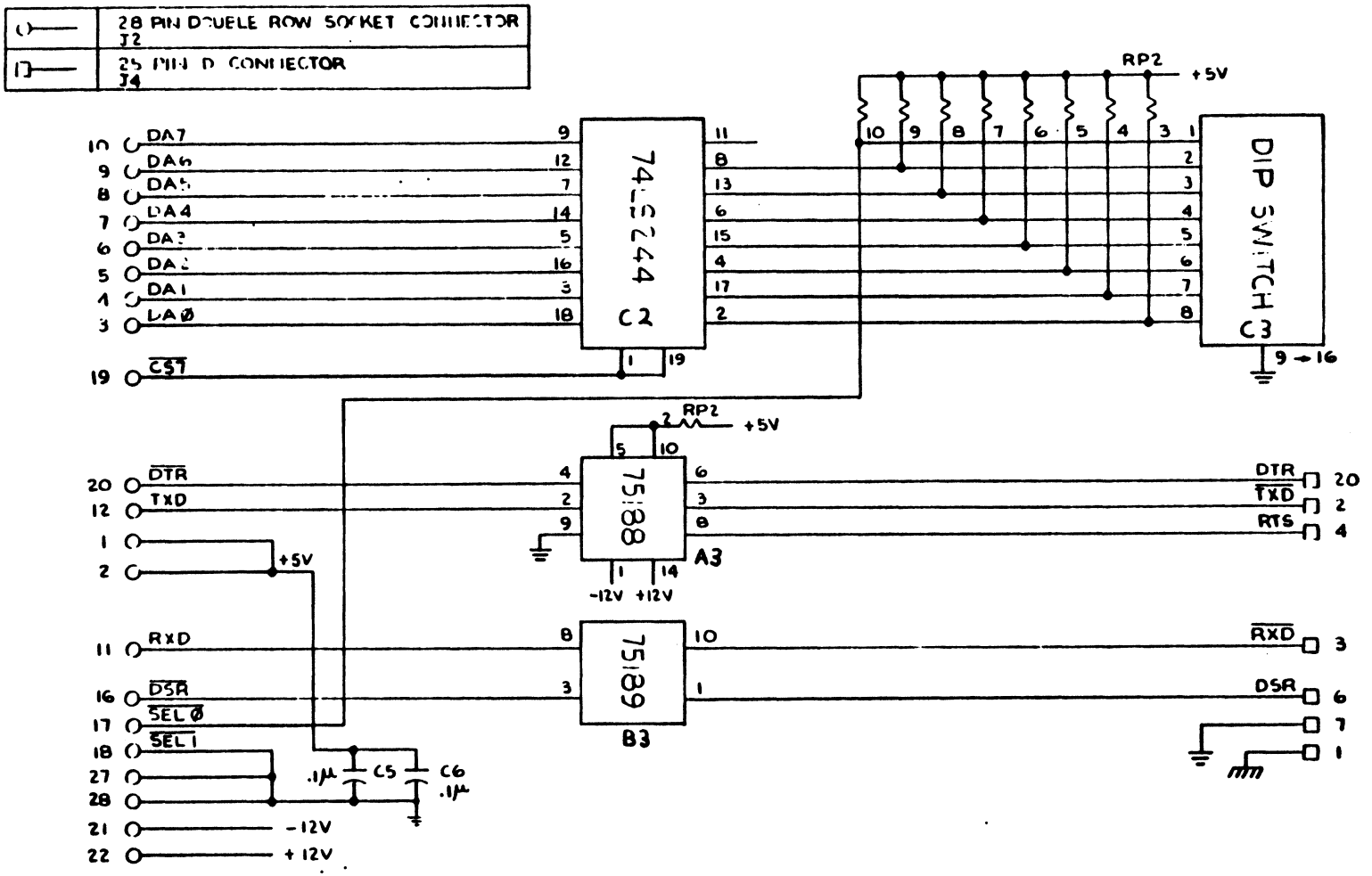
1. ALL RESISTORS 1/2W 5% CARBON UNLESS SPECIFIED
   1% 1/4W FILM RESISTOR
2. THIS IT BLANK
3. MCA [illegible] BLANK

TEST POINT			
1	+24V	6	+5V SW
2	+12V	7	10V INPUT
3	+5V	8	-20V INPUT
4	-12V	9	CURRENT
5	+24 SW	10	HEATER

Power Supply Board Schematic

P.C.B. POWER SUPPLY PARTS LIST

DESCRIPTION	REFERENCE
P.C.B. Power Supply fab	
Reg. STK 7554	U3
Reg. LM 342P-12 TP	U1, U2
Diode, Bridge Rectifier	U4
Diode, MR 501	CR1, CR2, CR3, CR4
Diode, 1N4001	CR5
Zener Diode 1N4681 ± 5% 2.4V	CR8
Zener Diode, HZ2CLL	CR8
Zener Diode, 24V ± 5% 500mW	CR6
Capacitor 1000 ufd ± 20% 10V	CR12
Capacitor 6800 ufd ± 20% 50V	CR6, C9
Capacitor 22 ufd ± 20% 16V	C15
Capacitor 1000 ufd ± 20% 35V	C4, C14
Capacitor 220 ufd ± 20% 10V	C11
Capacitor 15 ufd ± 20% 20V Tant	C5, C7
Capacitor .01 ufd +80% −20% 50V	C10, C13
Capacitor .001 ufd ±20% 50V Cer-Mono	C16
Resistor 1 k Ohm $^1/_4$W 5%	R4
Resistor 1 k Ohm $^1/_8$W 1%	R7, R8
Resistor 47 k Ohm $^1/_2$W 5%	R6, R9
Resistor 2.2 k Ohm $^1/_2$W 5%	R1, R2
Resistor 2.2 k Ohm 2W 5%	R10
Resistor 1 Ohm 1W 5%	R3
Resistor 33 Ohm $^1/_2$W 5%	R11
Resistor, Pot., Trim 1 k Ohm	R5
Choke 200 mH	L2, L4
Choke 10 mH (2 AMP)	L3
Tubing PVC Clear 22 AWG	L1 choke
Fuse 4 Amp SLO-BLO 3AG	F1
Fuse 1 Amp NOR-BLO 3AG	F2
Fuse Clip 3AG	F1, F2
Header 24 Pin .100 Center	P1C
Header 12 Pin .156 Center	P1B
Header 5 Pin .156 Center With Ramp	P1A
Header 4 Pin .156 Center With Ramp	P1D
Header 2 Pin .156 Center With Ramp	P1E, P1F
Header 11 Pin .100 Center Single Row	TP
Screw 10-24 x 1.00LG Nylon Black	L1, L2,L4
Bushing Flanged #10	L2, L4
Nut, Hex 10-24 Nylon	L1, L2, L4
Switch Slide 115/230 Volt	SW1
Wire 18 AWG Black	L1, P3 to P4
Wire 18 AWG White	L1, P2 to P1
AC Line Filter Receptacle 3 Amp	
Wire 18 AWG White	



Serial Interface Schematic

P.C.B. SERIAL INTERFACE PARTS LIST
OPTIONAL

DESCRIPTION	REFERENCE
P.C.B., Serial/Feeder Option Board	
Connector, RS-232C Metal Case	J4
Connector, Pin Receptacle 28 Pin	J2
Switch, 8 Position Dip	C3
Sip Resistor Pack, 1k x 9 5%	RP2
Capacitor, .1 ufd 50V Cer-Mono .1in	C5,C6
IC, 74LS244	C2
IC, 75188	A3
IC, 75189A	B3
Stand-off, #4-40 x 11/16 in.	
Screw, Lock Kit	J4
Screw, Hex Hd. #4-40 x .250 in.	
Screw, Fillister Hd. #4-40 x 5/16 in.	J4
Washer, Split-Lock #4	J4
Washer, Star Lock	
Nut, Hex #4-40	J4