IBM **Maintenance Information Manual**

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5211 Printer Theory - Maintenance Volume 1

EC 155975A 05Dec77
EC 784017 01Mar78
EC 784068 31July78

PN 8324100
1 of 2

V1-000

PREFACE

This manual provides information relating to the theory of operation and maintenance of the IBM 5211 Printer, for Customer Engineers (CEs) who are assumed to be familiar with operating principles and mechanical construction of the printer.

The manual is divided into 22 sections (2 volumes) to reflect the type of maintenance activities that can be performed by a CE to detect and quickly isolate failures in the printer. Also included are Theory of Operation, Installation Instructions, and a Parts Catalog section. The manual breakdown is as follows:

VOLUME 1

- Section 1 — Plan (How to Use)
- Section 2 — Maintenance Aids
- Section 3 — Operator's Panel and Printer Signal Cable
- Section 4 — Print Belt and Drive
- Section 5 — Print Unit and Hammer Unit
- Section 6 — Ribbon Unit
- Section 7 — Forms Path
- Section 8 — Carriage
- Section 9 — Power
- Section 10 — Base and Covers
- Section 11 — Reserved
- Section 12 — Reserved
- Section 13 — Locations
- Section 14 — Preventive Maintenance(PM)

VOLUME 2

- Section 15 — Theory of Operation
- Section 16 — Diagnostic Descriptions
- Section 17 — Installation Instructions
- Section 18 — Printer Wiring Diagrams
- Section 19 — Functional Wiring and Timing Diagrams
- Section 20 — Parts Catalog
- Section 21 — General/Tools
- Section 22 — Index

Changes are continually made to the information in this manual. This manual is under EC control, and is updated as Engineering Changes are made to the machine that this manual accompanies.

Do not attempt to use this manual to service another machine because it may have other features not included in this manual or it may be at a different EC level.

ASSOCIATED DOCUMENTATION

IBM General Logic Probe II Manual, SY27-0127

IBM System/34 Theory — Diagrams Manual, SY31-0458

IBM System/34 Maintenance, SY31-0457

IBM System/34 System Data Areas and Diagnostic Aids, LY21-0049

IBM 5211 Printer Models 1 and 2 Component Description and Operator's Guide, GA24-3658

IBM System/34 Functions Reference, SA21-9243

IBM System/34 System Operator's Guide, SC21-5158

Form Design Reference Guide for Printers, GA24-3488

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5211 IR FUNCTIONAL UNIT CODE GUIDE

INSTRUCTIONS (How to Use)

This Code Guide is to be used for hardware troubles only. The Programming System Activity Report Booklet; Order No. Z229-0097, should be used for programming troubles.

For troubles where unit and cause are known:

This Code Guide lists the major machine units. Record the 3 digits for major and 2 digits for minor in the unit block on the IR Document.

Select the correct cause from the list of common "Cause of Trouble Codes" on the back page of this guide. Record the two digits in the cause block on the IR Document.

For intermittent troubles where unit or cause cannot be determined:

Error Indicated/Trouble Not Isolated - Use major code 960. Select the minor code that best describes the failure.

Trouble reported/No Trouble Found

Select the correct symptom from the list of "Symptom Codes" and record in the cause block on the IR Document.

Address comments concerning the contents or format of this publication to IBM Service Planning, Dept. 794, Bldg. 040-3, 1701 North Street, Endicott, N. Y. 13760.

5211 Index of Major Functional Codes

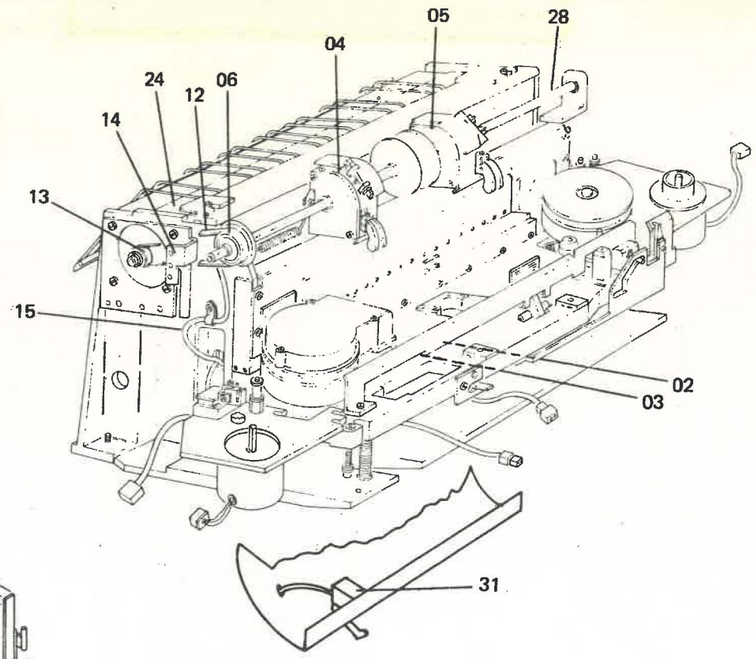
000 BASE/COVERS
520 CARRIAGE AND PAPER PATH
870 CUSTOMER RESPONSIBILITY
521 ELECTRONICS
960 ERROR INDICATED/NO TROUBLE FOUND
523 FRONT ASSEMBLY
522 HAMMER UNIT
577 OPERATOR PANEL
600 POWER
575 RIBBON FEED
576 STACKER
980 TROUBLE REPORTED/NO TROUBLE FOUND

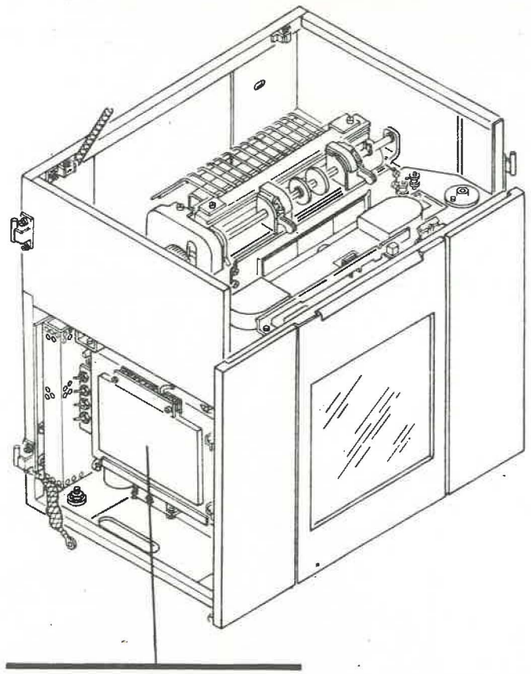
Major 000 Base/Covers

05 COVER COUNTER BALANCE HINGES
01 COVERS
03 DOORS FRONT/REAR
02 FRAME
06 WINDOWS
00 OTHER (EXPLAIN IN NARRATIVE)

Major 520 Carriage and Paper Path

12 BELT, CARRIAGE
15 CABLES/CONNECTORS
02 CLAMP, LOWER PAPER
13 DISK, EMITTER
03 DRAG FINGER ASM.
14 LED ASM., CARRIAGE EMITTER
04 LED ASM., FORMS JAM
24 MOTOR, CARRIAGE DRIVE
28 SHAFT ASM., TRACTOR
31 SWITCH, END-OF-FORMS
05 TRACTOR
06 VERNIER, FORMS POSITIONING
00 OTHER (EXPLAIN IN NARRATIVE)



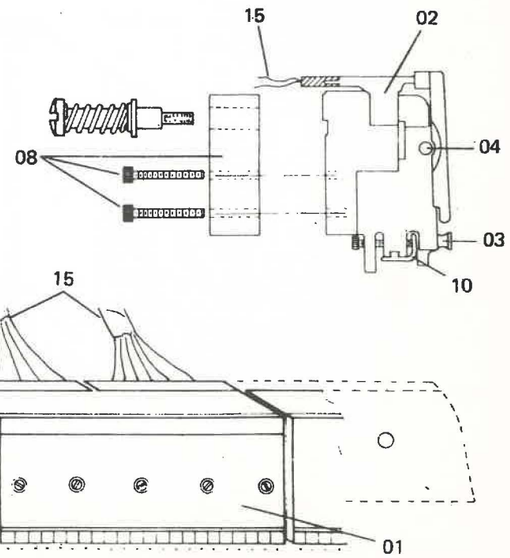


Major 521 Electronics

13 BLOWER
25 BOARD
15 CABLES/CONNECTORS
17 CARD
26 RELAY
00 OTHER (EXPLAIN IN NARRATIVE)

Major 522 Hammer Unit

01 BLOCK ASM.
10 BUMPER
15 CABLES/CONNECTORS
02 COIL, HAMMER
03 HAMMER
08 MOUNTING HARDWARE
04 PIVOT PIN
00 OTHER (EXPLAIN IN NARRATIVE)

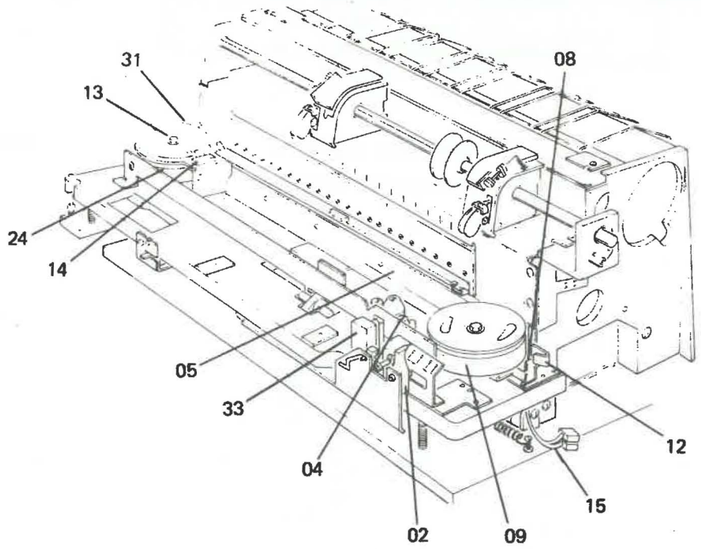


Note: For printer attachment problems, see System IR Functional Unit Code guide.

5211 IR FUNCTIONAL UNIT CODE GUIDE (continued)

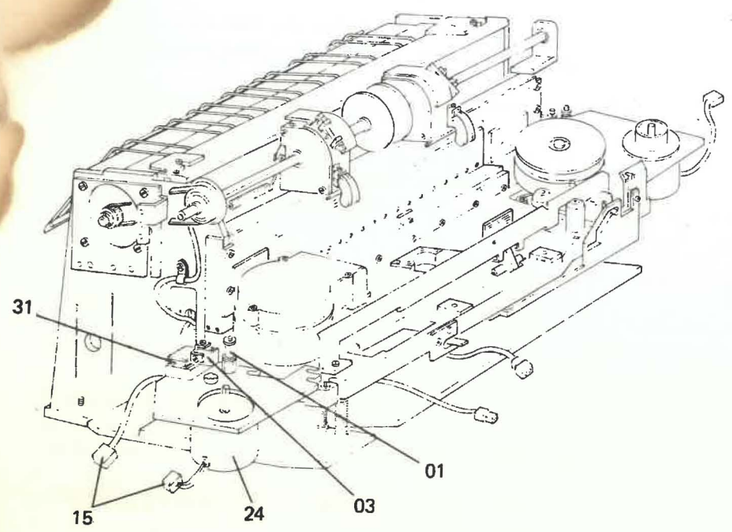
Major 523 Front Assembly

15 CABLES/CONNECTORS
13 DISK EMITTER BELT MOTOR
02 FORMS THICKNESS CONTROL
10 INERTIAL DAMPER
14 LED ASM., BELT MOTOR
24 MOTOR, BELT DRIVE
05 PLATEN
07 PRINT BELT
08 PRINT BELT GUIDE ROLLS
09 PRINT BELT PULLEYS/BEARINGS
12 PRINT BELT RELEASE
04 SCRAPER, EMITTER BEARING
31 SWITCH, INTERLOCK
33 TRANSDUCER, PRINT BELT
00 OTHER (EXPLAIN IN NARRATIVE)



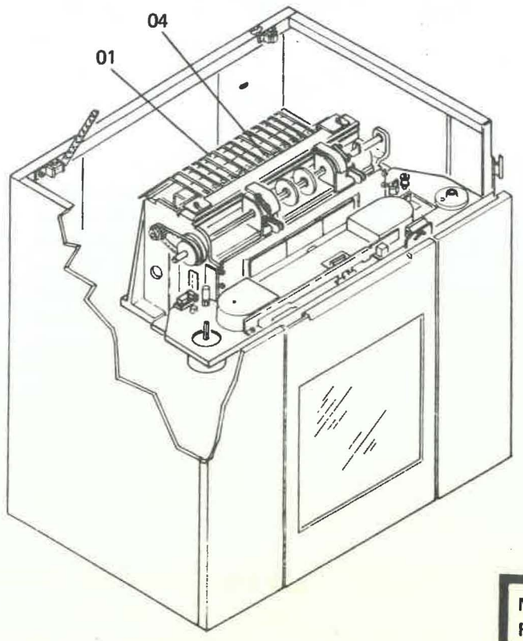
Major 575 Ribbon

15 CABLES/CONNECTORS
01 GUIDES
24 MOTOR, RIBBON DRIVE
03 RIBBON REVERSE MECHANISM
31 SWITCH, RIBBON REVERSE
00 OTHER (EXPLAIN IN NARRATIVE)



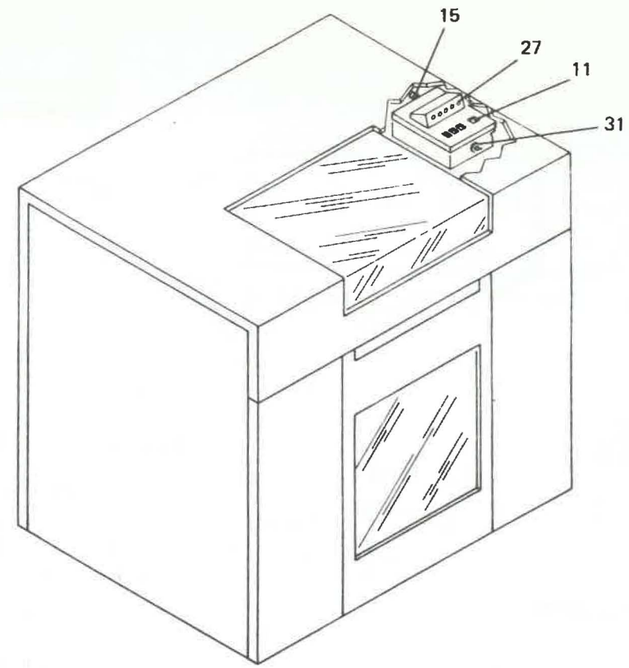
Major 576 Stacker

01 FORMS GUIDE, UPPER
04 TINSEL, STATIC DISCHARGE
00 OTHER (EXPLAIN IN NARRATIVE)



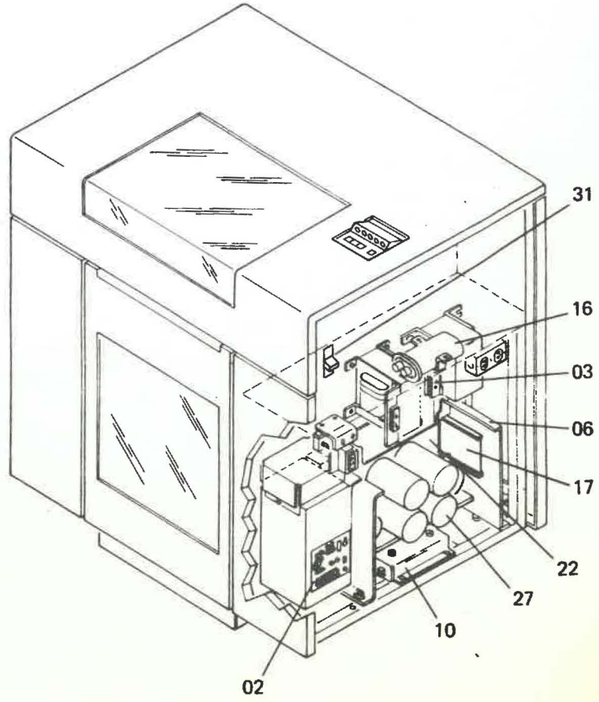
Major 577 Operator Panel

15 CABLE/CONNECTORS
27 LED ASM. INDICATOR
11 SWITCH ASM., DIAPHRAGM
31 SWITCH, 6-8 LPI
00 OTHER (EXPLAIN IN NARRATIVE)



Major 600 Power

15 CABLES/CONNECTORS
17 CARD
02 CIRCUIT BREAKER
03 CONTACTOR/RELAY
27 DIODE/RESISTOR/CAPACITOR
16 FERRO, 25-VOLT SUPPLY
22 FUSE
10 LINE FILTER
06 MULTI-LEVEL SUPPLY
31 SWITCH, POWER ON/OFF
00 OTHER (EXPLAIN IN NARRATIVE)



Note: For printer attachment problems, see System IR Functional Unit Code guide.

Major 870 Customer Responsibility

06 BUFFER LOAD
54 CARRIAGE CONTROLS
56 FORMS
60 INTERLOCKS
52 PRIMARY POWER
07 PRINT BELT
08 PROGRAM
61 RIBBON
00 OTHER (EXPLAIN IN NARRATIVE)

Cause Codes

DO NOT USE WITH MAJOR CODES 960 OR 980

01 ADJUSTMENT/MECHANICAL
02 ADJUSTMENT/ELECTRICAL
07 BENT
58 BINDING/STICKING
09 BLOWN
13 BROKEN
16 BURNED
15 BURRED/NICKED
21 DEFECTIVE
24 DEFECTIVE SOLDER/WELD/CRIMP
22 DIRTY
28 GROUNDED
18 JAMMED
34 LOOSE/RESEATED
38 MISSING
42 OPEN
46 SHORTED
54 STATIC
64 TENSION
65 TIMING/SEQUENCE
69 WEAK
37 WIRING ERROR
70 WORN
51 WRONG EC LEVEL
00 OTHER (EXPLAIN IN NARRATIVE)

Major 960 Error Indicated/No Trouble Found

01 CARRIAGE AND PAPER PATH
02 ELECTRONICS
04 FRONT CASTING ASM.
03 HAMMER UNIT
07 OPERATOR PANEL
06 POWER
05 RIBBON DRIVE
08 STACKER
00 OTHER (EXPLAIN IN NARRATIVE)

980 Trouble Reported/No Trouble Found

Use 980 only when 960 is not applicable

01 Action suspended or transferred to someone else
02 Trouble cannot be duplicated or is too intermittent to identify
03 This unit not at fault - action follows on another unit
00 Other

With major code 980 use 00 as the cause code.

Symptom Codes

USE IN PLACE OF CAUSE CODES WITH MAJOR CODES 960

05 ANY HAMMER ON CHECK
09 BELT SPEED CHECK
07 BELT SYNC CHECK
08 BELT UP TO SPEED CHECK
13 CABLE INTERLOCK CHECK
01 CARRIAGE CHECK 1
02 CARRIAGE CHECK 2

06 DATA PARITY CHECK
29 DROPS READY
36 FAILS TO PRINT COMPLETE CHAR.
39 FAILS TO PRINT COMPLETE LINE
43 FORMS FAIL TO FEED
15 FORMS JAM CHECK
44 FORMS JAM/TEAR
45 FORMS RUNAWAY
04 HAMMER ECHO CHECK
71 POWER CHECK
16 PRINTER BUSY TOO LONG CHECK
18 PRINTER BUSY TOO OFTEN CHECK
20 PRINTER POWER CHECK
72 PRINTS EXTRA CHARACTERS
22 RIBBON CHECK
75 RIBBON FAILS TO FEED
76 RIBBON JAMS
78 SMUDGE PRINTING
79 SPACES INCORRECTLY
90 STACKING FAILURES
99 OTHER (EXPLAIN IN NARRATIVE)

Note: For printer attachment problems, see System IR Functional Unit Code guide.

HOW TO USE THIS MANUAL

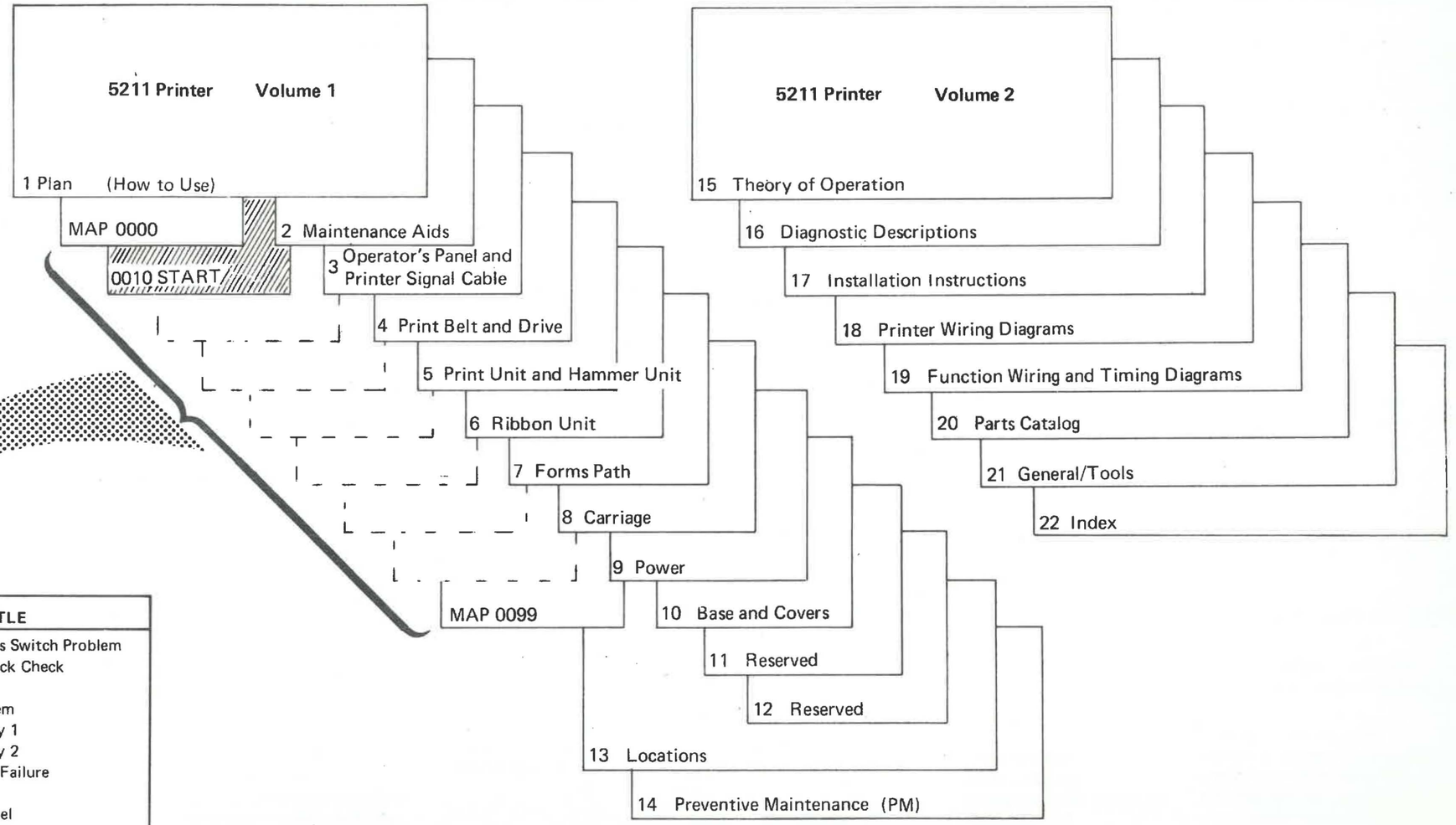
The information in this manual is reference material for use in diagnosing and repairing printer failures. This split-page MIM contains maintenance analysis procedures (MAPs), diagnostic aids, service aids, theory of operation, location drawings, wiring diagrams, and other information about the printer.

A section table of contents or entry index precedes each section, if required. The content/entry index page(s) lists the headings of the major and minor topics of each section.

The index (Section 22) provides a ready reference of alphabetic and numeric subjects for the manual.

STARTING A CALL

All calls that need the MAPs should start with the START MAP 0010.



MAP	TITLE	MAP	TITLE
0000	MAP Index	0054	End of Forms Switch Problem
0005	MAP Rules	0055	Cable Interlock Check
0010	START	0060	Ribbon Unit
0011	Interface Cable Signals	0070	Power Problem
0012	Printer Error Codes	0071	Power Supply 1
0014	Operational Symptoms	0072	Power Supply 2
0020	Printer Not Ready	0073	Gate Blower Failure
0022	Print Belt Motor Failures	0075	CE Switches
0024	Print Belt Sync Check	0079	Operator Panel
0030	Hammer Echo Check	0080	Carriage Space Key
0031	Any Hammer On Check	0081	Carriage Restore Key
0032	Data Parity Check	0082	Stop/Reset Key
0033	Smudged Printing	0083	Ready Key
0034	Horizontal Character Cut-Off	0084	6/8 LPI Switch
0035	Horizontal Registration	0085	Check Light
0036	Vertical Registration	0086	Forms Light
0037	Vertical Character Cut-Off	0087	Print Unit Interlock Light
0040	Carriage Drive	0088	Power On Light
0051	Forms Jam	0089	Ready Light
0052	Paper Clamp Failure	0099	Difficult Trouble Map
0053	Print Unit Interlock Switch Problem		

SECTION DESCRIPTIONS

VOLUME 1

SECTION 1: PLAN
— Describes how the MIM is organized, how to find information, and how the manual is laid out,by volume.

MAPs—0000 through 0099
— Step by step procedures used to diagnose problems in all functional areas of the printer. References are made to the support material in Sections 2 and 12.

SECTION 2: MAINTENANCE AIDS
— Describes the diagnostic hardware available for use by the CE in making repairs. (Example: CE Switches # 1, 2, 3, and 4.)

SECTION 3: OPERATOR'S PANEL AND PRINTER SIGNAL CABLE
—Provides removal, installation, and circuit diagrams of the panel lights, keys, and switch. The printer signal cable circuits are also provided.

SECTION 4: PRINT BELT AND DRIVE
— Covers all needed service checks, adjustments, removals, installations and circuit diagrams to maintain this area of the printer.

SECTION 5: PRINT UNIT AND HAMMER UNIT
— Contains all the needed maintenance procedures to make any needed repair on this unit.

SECTION 6: RIBBON UNIT
— Provides all adjustments, removal, installation, and circuit diagrams for the ribbon motors, shield, and ribbon tracking.

SECTION 7: FORMS PATH
— Covers all adjustments and service checks from the forms compartment through the printer, and to the stacker compartment. End-of-Forms (EOF) switch and Paper Clamp are also detailed in this section.

SECTION 8: CARRIAGE
— Contains maintenance information on carriage motor and drive, forms tractors, and form jam switch sensing.

SECTION 9: POWER
— All needed information for the power system is contained in this section. Wiring diagrams, service checks, Test Points (TPs), and load isolation plug information is provided.

SECTION 10: BASE AND COVERS
— Provides all checks and cover adjustment procedures needed to maintain this area of the printer.

SECTION 11: RESERVED

SECTION 12: RESERVED

SECTION 13: LOCATIONS
— Detailed graphic illustrations locating all Field Replaceable Units (FRUs) in the printer. (Examples: fuses, plugs, motors, switches, hammer magnets, etc.)

SECTION 14: PREVENTIVE MAINTENANCE (PM)
— Covers all cleaning procedures necessary for the print belt, pulleys, and platen during routine PM activities.

VOLUME 2

SECTION 15: THEORY OF OPERATION
— A detailed-operational description of the following functional areas is provided: Print Belt and Drive, Carriage, Forms Path, Print and Hammer Units, Ribbon Unit, Printer Power System, and the Operator's Panel. Second-Level positive logic diagrams are integrated as needed to support the text.

SECTION 16: DIAGNOSTIC DESCRIPTIONS
—Describes the printer diagnostic function and timing tests used by the CE in detecting and handling printer failures. Sample printouts of any required printed patterns are also included in this section. This section DOES NOT contain diagnostic program operating procedures.

SECTION 17: INSTALLATION INSTRUCTIONS
— Contains all needed step by step instructions required to install the printer.

SECTION 18: PRINTER WIRING DIAGRAMS
— Detailed point to point wiring diagrams of the entire printer.

SECTION 19: FUNCTIONAL WIRING AND TIMING DIAGRAMS
— This section contains second level diagrams and timing charts designed for use by the support-trained CE on the most difficult types of printer problems.

SECTION 20: PARTS CATALOG
— Provides illustrations and parts listings for the CE to order the appropriate parts needed to make repairs.

SECTION 21: GENERAL/TOOLS
—Contains
-How to use the MAPs, Legend, Logic gate, Voltage switching levels, and Special tools.

SECTION 22: INDEX
—Abbreviations, Glossary, and Alphanumeric subject index of MIM contents, keywords, and index of cross-referencing among the two volumes.

SAFETY

PERSONAL SAFETY

Personal safety cannot be overemphasized: it is a vital part of customer engineering. To ensure your safety and that of co-workers, always observe the safety precautions given during your safety training and adhere to the following:

Danger Notices

Observe all **DANGER** notices in this manual.

DANGER
After prolonged use, the resistors may become extremely hot. Be sure the resistors have cooled before performing maintenance in resistor areas.

Observe the general safety practices and the procedure for performing artificial respiration outlined on this page. A

Grounding

Ground current may reach dangerous levels. Never operate the printer with the grounding conductor removed.

Line-Powered Equipment

Ground all line-powered test equipment through the third-wire grounding conductor in the power cord of the machine being tested.

Machine Warning Labels

Heed the warning labels placed in hazardous areas of the machines.

EQUIPMENT SAFETY

Observe all **Caution** notices in this manual.

Caution: The transducer can be damaged if the timing marks on the print belt hit the transducer tip while the belt is moving.

CE Safety Practices

All Customer Engineers are expected to take every safety precaution possible and observe the following safety practices while maintaining IBM equipment:

1. You should not work alone under hazardous conditions or around equipment with dangerous voltage. Always advise your manager if you MUST work alone.
2. Remove all power (AC and DC) when removing or assembling major components, working in immediate area of power supplies, performing mechanical inspection of power supplies, and installing changes in machine circuitry.
3. Wall box power switch when turned off should be locked or tagged in off position. "Do not Operate" tags, Form 229-1266, affixed when applicable. Pull power supply cord whenever possible.
4. When it is absolutely necessary to work on equipment having exposed operating mechanical parts or exposed live electrical circuitry anywhere in the machine, the following precautions must be followed:
   a. Another person familiar with power off controls must be in immediate vicinity.
   b. Rings, wrist watches, chains, bracelets, metal cuff links, shall not be worn.
   c. Only insulated pliers and screwdrivers shall be used.
   d. Keep one hand in pocket.
   e. When using test instruments be certain controls are set correctly and proper capacity, insulated probes are used.
   f. Avoid contacting ground potential (metal floor strips, machine frames, etc. — use suitable rubber mats purchased locally if necessary).
5. Safety Glasses must be worn when:
   a. Using a hammer to drive pins, riveting, staking, etc.
   b. Power hand drilling, reaming, grinding, etc.
   c. Using spring hooks, attaching springs.
   d. Soldering, wire cutting, removing steel bands.
   e. Parts cleaning, using solvents, sprays, cleaners, chemicals, etc.
   f. All other conditions that may be hazardous to your eyes.
   REMEMBER, THEY ARE YOUR EYES.
6. Special safety instructions such as handling Cathode Ray Tubes and extreme high voltages, must be followed as outlined in CEM's and Safety Section of the Maintenance Manuals.
7. Do not use solvents, chemicals, greases or oils that have not been approved by IBM.
8. Avoid using tools or test equipment that have not been approved by IBM.
9. Replace worn or broken tools and test equipment.
10. The maximum load to be lifted is that which in the opinion of you and management does not jeopardize your own health or well-being or that of other employees.
11. All safety devices such as guards, shields, signs, ground wires, etc. shall be restored after maintenance.
12. Each Customer Engineer is responsible to be certain that no action on his part renders product unsafe or exposes hazards to customer personnel.
13. Place removed machine covers in a safe out-of-the-way place where no one can trip over them.
14. All machine covers must be in place before machine is returned to customer.
15. Always place CE tool kit away from walk areas where no one can trip over it (i.e., under desk or table).
16. Avoid touching mechanical moving parts (i.e., when lubricating, checking for play, etc.)
17. When using stroboscope — do not touch ANYTHING — it may be moving.
18. Avoid wearing loose clothing that may be caught in machinery. Shirt sleeves must be left buttoned or rolled above the elbow.
19. Ties must be tucked in shirt or have a tie clasp (preferably nonconductive) approximately 3 inches from end. Tie chains are not recommended.
20. Before starting equipment, make certain fellow CEs and customer personnel are not in a hazardous position.
21. Maintain good housekeeping in area of machine while performing and after completing maintenance.

A Artificial Respiration

General Considerations

1. Start Immediately, Seconds Count
   Do not move victim unless absolutely necessary to remove from danger. Do not wait or look for help or stop to loosen clothing, warm the victim or apply stimulants.
2. Check Mouth for Obstructions
   Remove foreign objects — Pull tongue forward.
3. Loosen Clothing — Keep Warm
   Take care of these items after victim is breathing by himself or when help is available.
4. Remain in Position
   After victim revives, be ready to resume respiration if necessary.
5. Call a Doctor
   Have someone summon medical aid.
6. Don't Give Up
   Continue without interruption until victim is breathing without help or is certainly dead.

Rescue Breathing for Adults
Victim on His Back Immediately

1. Clear throat of water, food, or foreign matter.
2. Tilt head back to open air passage.
3. Lift jaw up to keep tongue out of air passage.
4. Pinch nostrils to prevent air leakage when you blow.
5. Blow until you see chest rise.
6. Remove your lips and allow lungs to empty.
7. Listen for snoring and gurglings, signs of throat obstruction.
8. Repeat mouth-to-mouth breathings 10-20 times a minute.
   Continue rescue breathing until he breathes for himself.


Thumb and finger positions

Reprint Courtesy Mine Safety Applicances Co.

SECTION	MAP TITLE
0000	MAP Index
0005	Map Rules
0010	Printer Entry
0011	Interface Cable Signals
0012	Printer Error Codes
0014	Operational Symptoms
0020	Printer Not Ready
0022	Print Belt Motor Failures
0024	Print Belt Sync Check
0030	Hammer Echo Check (Mod 1)
0030	Hammer Echo Check (Mod 2)
0031	Any Hammer On Check (Mod 1)
0031	Any Hammer On Check (Mod 2)
0032	Data Parity Check
0033	Smudged Printing
0034	Horizontal Character Cut-Off
0035	Horizontal Registration
0036	Vertical Registration
0037	Vertical Character Cut-Off
0040	Carriage Drive

SECTION	MAP TITLE
0050	Power On Reset
0051	Forms Jam
0052	Paper Clamp Failure
0053	Print Unit Interlock Switch
0054	End of Forms switch Problem
0055	Cable Interlock Check
0060	Ribbon Unit
0070	Power Problem (PS Lev 2)
0070	Power Problem (PS Lev 3)
0071	Power Supply 1 (PS Lev 2)
0071	Power Supply 1 (PS Lev 3)
0072	Power Supply 2
0073	Gate Fan Failure
0075	CE Switches
0079	Operator Panel
0080	Carriage Space Key
0081	Carriage Restore Key
0082	Stop/Reset Key

5211 MAP INDEX

5211 MAP RULES

Table of Contents for Map Rules

A. The printer entry map 0010 ensures that the map first in the order of importance is used. It is the recommended starting point for all entries in the maps.

B. Maps are designed to locate a FRU that has a single mechanical or electrical failure. If the symptom changes after an adjustment or after installing a new FRU, use the system entry map with the new symptom.

C. If the map fails (the described repair does not correct the failure) repeat the diagnosis by starting again at the printer map, at least one more time.

D. If more than one symptom is present, use the most frequent one or the first one found in a map path.

E. Power off is required to remove, install, swap, reinstall, or reseat all logic cards and cables, unless specifically directed not to do so. Reseating of cards and cables is an assumed action before installing a new card, and is not shown as a step or command throughout the maps.

F. The maps do not include items such as removal and reinstalling external covers. The CE will do these as needed.

G. After a repair action, verify with the operation that displayed the failure. If a more specific test is needed, directions are supplied.

H. Questions about the probe lights are specific about both the up and down lights. Both lights must answer the status shown, which is normally on, off, flashing, or ignored. All probe and test points in the 5211 maps are located in the printer. Exceptions are written so they can be understood.

5211 PRINTER ENTRY

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	005	0020	A
2	007	0022	A
4	023	0022	A
4	021	0050	A
3	016	0055	A
3	015	0070	A

001
(Entry Point A)

This map is used to analyze the printer failure and direct you to the appropriate map.

Did the system maps direct you to the 5211 printer maps?
Y N

002
(Entry Point B)

Record failure indicators from the system and all operator detected symptoms.
Inspect the printer for obvious causes of failure, such as a broken ribbon or print belt.
If the cause of the failure is obvious, find the repair procedure in the table of contents.
Resolve printer power problems first.
Ensure that the printer is in a service mode.
Refer to (2-000) for printer function and timing tests.
Micro code in the system printer adapter is properly loaded.

Is a cable interlock problem or a printer power problem indicated?
(Power problem may be indicated by the printer Power Light being off)
Y N

003
Printer errors are indicated by a Check Light.

Is the Check Light on?
Y N

004
Press the Stop/Reset key and then the Ready key.
The Ready Light should come on and the print belt motor should start turning.

Printer set-up

1. Power is on
2. Forms are loaded
3. Print belt is installed
4. Print unit is closed
5. Forms thickness control is set correctly
6. Cover closed
7. The system must be varied OFFLINE or in a DIAGNOSTIC mode

Is the Ready Light on?
Y N

005
Printer not ready.
Go To Map 0020, Entry Point A.

006
Is the print belt motor turning in a counter clockwise direction?
Y N

007
Print belt motor failure.
Go To Map 0022, Entry Point A.

008
Refer to (2-000) for printer function and timing tests.
Run Ripple Print and Carriage Space/Skip tests to repeat the failure.

Are any printer checks detected by the system?
Y N

009

Inspect the printer output for failure symptoms. Compare the print results to the operator reported problem.
Refer to MAP 0014 for obvious printer symptoms.

Is an operational symptom defined?
Y N

010
Printer problem may be intermittent or application dependent.
Go to the system entry map, entry point A, if a printer problem is still suspected use the system to exercise the printer and try to generate another symptom to enter the 5211 Entry map with.
Look at the system error recording information to see if a printer problem does exist.

011
Select the map from map 0014.
GOTOMAP=0014

012
A printer error code is indicated.
Look at system error recording information to identify the printer error.
The information is recorded in ERAP.
Select the appropriate map.
GOTOMAP=0012.

013
A printer error code is indicated.
Look at system error recording information to identify the printer error.
The information is recorded in ERAP.
Select the appropriate map.
GOTOMAP=0012

014
Is there a cable interlock check indicated?
Y N

015
This is a power or power distribution problem.
Go To Map 0070, Entry Point A.

016
Cable Interlock Check.
Go To Map 0055, Entry Point A.

017
Refer to (2-000) for printer function and timing tests.
Ensure that the printer is in a service mode, (the system printer adapter micro code is loaded).

Was there a power or cable interlock check indicated by the system?
(A power problem is also indicated by the printer Power Light being off)
Y N

018
Is the print unit interlock light on or flashing?
Y N

019
Press the Stop/Reset key to reset any error.
Press the Ready Key.

\# NOTE #

Observe the Ready Light for at least 15 seconds.

Does the Ready Light go on and stay on?
Y N

020

Press Stop/Reset key to stop the belt motor.
Press the Stop/Reset Key a second time while observing the probe.
For basic setup of the GLP refer to (2-000).
- Probe A1D4G10 (+ POR).

Up Light: DON'T CARE
Down Light: ON or FLASHING

Are the lights correct?

Y N

021
Go To Map 0050, Entry Point A.

022

Press the Stop/Reset key while observing the probe.
- Probe A1D4J10 (+ 4.0 MHZ) and A1D4G13 (+ 1.0 MHZ),

Up Light: ON or FLASHING
Down Light: ON

Are the lights correct for both pins?

Y N

023
See the print belt motor failure map.
Go To Map 0022, Entry Point A.

024

Go to Step 025, Entry Point C.

3

025
(Entry Point C)

Refer to (2-000) for printer function and timing tests.
'THE FOLLOWING ARE PRINTER CHECKS LOCATED IN THE SYSTEM ERROR LOG.'

Cable Interlock Check
Any hammer on Check
Printer Power Check
Contactor Stuck Closed
Belt Speed Check
Belt Up To Speed Check
Printer Busy Too Often Check
Printer Busy Too Long Check
Belt Sync Check
Fire Tier Check
Print Subscan Emitter Check
Data Parity Check
Hammer Echo Check
Carriage Check 1
Carriage Check 2
Manual Carriage Check
Forms Jam Check
Ribbon Check
End of Forms check
Throat Interlock Check

Did any of the above checks occur?

Y N

026
All interface cable signals are correct unless the system indicated an incorrect signal level.

Do all interface lines appear good?

Y N

027
An interface signal level must be investigated.
Go to map 0011.

028

Go to Page 1, Step 002, Entry Point B.

029
A printer error was indicated.
Go To Map 0012.

030
See print unit interlock check.
Go To Map 0012.

031
See power or cable interlock check.
Go To Map 0012.

INTERFACE CABLE SIGNALS

Go to the printer map entry specified for faulty interface indicated by the system.

INTERFACE SIGNAL NAME	MAP ENTRY
- Power On	0070,A
- Carriage Space	0080,A
- Carriage Restore	0081,A
- Power Complete	0070,A
- Carriage 6LPI	0084,A
- Stop/Reset Switch	0082,A
- Single Space Switch	0082,A
- Cable Inlk 5	0055,A
- Cable Inlk 6	0055,A
- Power Check	0070,A
- Check Ind	0085,A
- Ready Switch	0083,A
- Interlock Ind	0087,A
- Forms Ind	0086,A
- Ready Ind	0089,A
+ End of Forms	0054,A
- Print Subscans	0024,A
- Throat Closed	0053,A
- Forms Pulse	0051,A
- Carriage Advance	0040,A
- Impression Ctl SS	0024,A
- Ribbon Check	0060,A
- CE Switch On	0075,A
- Belt Up To Speed	0022,A
- Cable Inlk 3	0055,A
- Carriage Go	0040,A
- Cable Inlk 4	0055,A
+ POR	0050,A
- Activate Paper Clamp	0052,A
- Close 25V Contactor	0070,A
- Home	0024,A
- Belt Go	0022,A
- Printer Busy	0022,F

- Data Bit 0 . . . . . 0032,A
- Data Bit 1 . . . . . 0032,A
- Data Bit 2 . . . . . 0032,A
- Data Bit 3 . . . . . 0032,A
- Data Bit 4 . . . . . 0032,A
- Data Bit 5 . . . . . 0032,A
- Data Bit 6 . . . . . 0032,A
- Data Bit 7 . . . . . 0032,A
- Parity Bit 0032,A
- Hammer Echo Return 0031,A
- Cable Inlk 1 . . . . . 0055,A
- Cable Inlk 2 . . . . . 0055,A
- Not Print Time 0030,C
- Data Parity Check 0032,A
- Strobe 0032,A
- Hammer Sample 0030,A
- Fire Tier 1 . . . . . 0030,A
- Fire Tier 2 . . . . . 0030,A
- Fire Tier 3 . . . . . 0030,A
- Fire Tier 4 . . . . . 0030,A
- Fire Tier 5 . . . . . 0030,A

5211 PRINTER ERROR CODE MAP

NOTE: ***** ERRORS ARE LISTED BY PRIORITY *****

PRINTER ERROR CODE	MAP ENTRY
Printer Power Check	0070-A
Cable Interlock Check	0055-A
Contactor Stuck Closed	0070-A
Any Hammer On Check	0031-A
Belt Speed Check	0022-A
Belt Up To Speed Check	0022-A
Printer Busy Too Often Check	0022-F
Printer Busy Too Long Check	0022-F
Belt Sync Check	0024-A
Fire Tier Check	0024-A
Print Subscan Emitter Check	0024-A
Data Parity Check	0032-A
Hammer Echo Check	0030-A
Carriage Check 1	0040-A
Carriage Check 2	0040-A
Manual Carriage Check	0040-A
Forms Jam Check	0051-A
Ribbon Check	0060-A
End of Forms Check	0054-A
Print Unit Interlock Check	0053-A

5211 OPERATIONAL SYMPTOMS

PRINTER NOT READY

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0010	A	1	001
0014	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	011	0070	A
2	005	0073	A
1	003	0079	A
2	009	0079	A
2	007	0082	A
2	019	0082	A

001
(Entry Point A)

The Ready Light does not come on or the printer drops ready.
- Power on
- Press the Stop/Reset key.
- Press the Ready Key

Does the Ready Light come on?
Y N

002
Jumper A1A3D13 (-Ready indicator) to A1A3D08 (Ground).

Does the Ready Light come on?
Y N

003
Remove the jumper from A1A3D13 to A1A3D08.
See Operator Panel MAP.
Go To Map 0079, Entry Point A.

004
Remove the jumper from A1A3D13 to A1A3D08.
Is the gate fan running?
Y N

The Ready Light is controlled by the host system.
The Check, Forms, and Interlock Light must be off and the Power On Light at printer must be on in order to make the printer ready.
- Pressing the Ready Key should put the Ready Light on and start the belt motor.

005
See Gate Fan Failure Map.
Go To Map 0073, Entry Point A.

006
Probe: A1A3B12 (-Stop key).
Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

007
The down light on indicates the Stop/Reset switch is shorted or a grounded cable.
See the Stop/Reset key map.
Go To Map 0082, Entry Point A.

008
Probe A1A3D10 (-Ready switch) while pressing the Ready key.
Up Light: DON'T CARE
Down Light: ON

Are the lights correct?
Y N

009
See Operator Panel MAP.
Go To Map 0079, Entry Point A.

010
- Measure DC voltages at printer:
Set multi meter to scale.
TB1-16 (+5 volts DC)
TB1-19 (+8.5 volts DC)
TB1-12 (+25 volts DC)
TB1-8 (+25 volts DC control)
- Lead to Frame Ground

Are all voltages correct?
Y N

011
See Power Distribution MAP.
Go To Map 0070, Entry Point A.

012
Did you start this call from the system entry maps?
Y N

013
Go to the system entry maps.

014
Possible trouble is a faulty interface cable from A1A3D13 (-ready ind.) or A1A3D10 (-ready switch) to the system.
Refer to (3-000) for the interface lines.
Test for an open or a short in the interface line.

015
The printer drops ready for no apparent reason.
- Probe A1A3B12 (-Stop switch)
- Set the latch switch on the probe in the down position.
- Operate the printer to recreate the drop ready condition.

Is the down light on when ready drops?
Y N

016
Did you start this call from the system entry maps?
Y N

017
Go to the system entry maps.

018
Possible trouble is a faulty interface cable from A1A3B12 or A1A3D13 to the system.
Refer to (3-000) for the interface lines.
Test for a ground in the interface cable.

019
Set the latch switch to the 'none' position.
- See the Stop/Reset key failure map.
Go To Map 0082, Entry Point A.

PRINT BELT MOTOR FAILURES

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0010	A	1	001
0012	F	11	105
0014	A	1	001
0099	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
10	101	0010	A
7	064	0024	A
7	068	0024	A
5	040	0050	A
7	072	0050	A
11	103	0050	A
3	018	0073	A

001
(Entry Point A)

This map is to analyze mechanical or electrical problems that cause a print belt mechanism or print belt motor failure.

- Power Off
- With your hand, turn the print belt pulley in a counter clockwise direction.

Does the print belt move easily?
Y N

002
Inspect the print belt path for interference with the ribbon, PSS transducer, or print line components.
- Remove any interference.
- Repair, adjust, or replace the defective unit.

IS the print belt still binding?
Y N

003
- Power On, press Stop/Reset key to reset the error.

Refer to (2-000) for the CE switch operations.
- Turn CE switch 1 (Belt Go) on.

Does the Print Belt turn continuously?
Y N

2 2 2 2

004
Go to Page 1, Step 001, Entry Point A.

005
Refer to (2-000) for printer function and timing tests.
- Run the Ripple Print test to verify repair.

006
Refer to (4-000) for belt information.
- Remove the print belt.
- Turn the print belt pulleys.

Is either print belt pulley binding?
Y N

007
- Check print belt path again.
- Check the ribbon path and drive mechanism.
- Repair, adjust, or replace the failing units.
- Install print belt.

Refer to (2-000) for printer function and timing tests.
Run the Ripple Print test to verify repair.

008
Refer to (4-000) for belt motor information.
- Check pulleys, the print belt, and the motor for binding.
- Repair, adjust or replace the failing units.

Refer to (2-000) for printer function and timing tests.
- Run the Ripple Print test to verify the repair.

009
Refer to (4-000) for belt information.
Is the print belt installed correctly?
Y N

010
Refer to (4-000) for belt information.
Install the print belt.

011
Refer to (4-000) for PSS transducer information.
Do the PSS transducer service check.

Is the PSS transducer correct?
Y N

012
Adjust or replace the transducer.

013
Refer to (4-000) for pulley information.
Verify that the belt idler pulley height is adjusted correctly.

Is the pulley height adjusted correctly?
Y N

014
Verify that the print belt is not damaged.
Refer to (4-000) for pulley information.
Adjust the belt idler pulley.

015
- Inspect the following while rotating the print belt pulleys.

1. Dirt or oil on inside of print belt. Clean with isopropyl-alcohol.
2. Dirt or oil on the surface of the print belt pulleys. Clean with isopropyl-alcohol.
3. Ensure that the screw (s) holding the belt emitter hub and disk are tightened properly.

Where the above inspections correct?
Y N

016
Refer to (2-000) for printer function and timing tests.
Run Ripple Print test and return printer to customer.

017
Power on, press Stop/Reset key to reset any error.

Is the gate fan running?
Y N

018
See Gate fan Failure Map.
Go To Map 0073, Entry Point A.

019
At this time the belt motor should not be running.

Is the belt motor stopped?
Y N

020
The belt motor is running.
Ensure belt CE switch 1 is off.
- Probe A1N2B12 (- belt go).

Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

021
Did you start this call from the System Entry maps?
Y N

022
Go to the System Entry maps.

023
Probable trouble is the card at A1N2.
Or
A faulty interface cable from A1A5D12 to the system.
Refer to (3-000) for the interface lines.
Test for opens or grounds in the interface line.

024
- Probe A1N2M08 (- Belt CE Switch 1 N/O).

Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

025
Go to map 0075 (CE Switches).

026
Install a new card at A1N2.

027
- Turn CE switch 1 (Belt Go) On and off 10 times.

NOTE: Each time the CE switch is turned on, allow enough time to observe the belt motor operation.
Refer to (2-000) for the CE switch operations.
If the Check Light comes on, press the Stop/Reset Key to reset the check.

VISUALLY CHECK THE BELT MOTOR FOR:

1.- Unusual noise,
2.- Unstable motion, (oscillation or hesitation).

Does the print belt motor run smoothly each time?
Y N

028
Turn CE switch 1 (Belt Go) on.

Does the belt motor run?
Y N

029

DANGER

Use caution when working in the area of the belt motor to avoid the sharp edge of the emitter disk.

Can you turn the print belt motor?

Y N

030

- Probe A1P2S07 (+ 1.0 MHZ).

Up Light: ON.
Down Light: ON.

Are the lights correct?

Y N

031

Install a new card in A1D4,

OR

a new card in A1P2.

032

Test the print belt motor LED assembly.

- Power Off.
- Disconnect the P4 connector (print belt motor plug)
- Power on, press Stop/Reset key to reset the error.
- Turn CE switch 1 (Belt Go) on.
- Probe A1D4G02 (- Feedback)
- With your hand, turn the belt motor very slowly for more than one revolution while observing the probe.

The lights should change levels for each hole in the belt motor LED disk.

Up Light: FLASHING
Down Light: ON or FLASHING

Are the lights correct?

Y N

5
M N P

033

The feedback pulse is missing.

- Turn the (belt go) CE switch 1 off.
- Power off.
- Connect P4 connector.
- Inspect for loose or defective wires at terminal TB4

Refer to (13-000) for cable plugging information.

- Inspect for a loose cable at location A1Z1.

Refer to (4-000) for LED information.

Refer to belt motor LED circuit and test the LED cable for opens or grounds from the logic board at A1Z1 to TB4.

Is there a defective circuit?

Y N

034

Refer to (4-000) for LED information.

Probable trouble is a defective LED assembly,

OR

a defective card in A1D4.

Verify the repair. Power up. Set the belt go CE switch 1 on and ensure the belt motor operates.

035

Refer to (2-000) for printer function and timing tests.

Repair the circuit and run the Ripple Print test to verify the repair.

036

(Entry Point B)

Test for 25 volts to the print belt motor.

- Measure +25 volts DC at A1Q2M10.
- Measure +25 volts DC at A1Q2G13.
- Measure +25 volts DC at A1Q2G12.

(-) lead to frame ground.

Is 25 volts present on each pin?

Y N

5 5
Q R

037
Refer to (18-000) logic page ZZ021 for the voltage slip-on connectors.
Ensure the voltage slip on connectors are installed correctly on A1Q2 card.
Install a new A1Q2 card.
- Connect P4 (print belt motor) plug if disconnected.

038
Go to Page 7, Step 069, Entry Point C.

039
Turn CE switch 1 (Belt Go) off.
Press the Stop/Reset Key to reset any errors.
Probe A1D4G10 (+POR),
Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

040
Go To Map 0050, Entry Point A.

041
- Probe A1M2B03 (+ contactor).
Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

042
Install a new card in A1P2,
OR
a new card in A1M3.

043
- Turn CE switch 1 (Belt Go) on.
- Probe A1N2S02 (+ Belt Go Delayed)
Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

044
- Probe A1N2B13 (- control).
Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

045
Install a wire from A1N2B13 to A1N2D08.

046
- Turn CE switch 1 (Belt Go) off.
- Probe A1N2G02 (+ 4 MHZ oscillator).
Up Light: ON
Down Light: ON

Are the lights correct?
Y N

047
- Measure for 5 volts DC on A1D4D03.
Is 5 volts DC present?
Y N

048
Refer to (9-000) for voltage distribution.
Locate the missing 5 volts.

049
Replace the card at A1D4,
OR
a new card in A1N2.

050
- Probe A1N2D09 (+ time N latch)
Up Light: ON
Down Light: ON

Are the lights correct?
Y N

051
Go to Page 11, Step 102, Entry Point G.

052
Install a new card at A1N2

053
Go to Page 4, Step 036, Entry Point B.

054
Go to Step 057, Entry Point H.

055
Set CE Switch 1 (Belt Go) on.
- Probe A1D4J13 (+ Early Emitter).

Up Light: ON
Down Light: ON

Are the lights correct?
Y N

056
Refer to (4-000) for the print belt motor circuit.
Ensure plug P5 is connected.
Test for an open or grounded cable from A1Z1 connector to the PSS transducer.
Install a new card at A1D4.

057
(Entry Point H)

Turn CE switch 1 (Belt Go) off.
Press the Stop/Reset key.
-Probe A1N2J07 (- belt up to speed).
Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

058
Did you start this call from the system entry maps?
Y N

059
Go to the system entry maps.

060
Probable trouble is the card at A1N2
OR
a faulty interface cable from A1A5B12 to the system.
Refer to (3-000) for the interface lines.
Test for an open or short in the interface line.

061
IN THE FOLLOWING SEQUENCE

1.- Turn CE switch 3 (Ribbon Go) on.
2.- Turn CE switch 4 (Paper Clamp) on.
3.- Turn CE switch 1 (Belt Go) on.
Probe A1N2J07 (-Belt Up to Speed),
Up Light: OFF,
Down Light: ON

Are the lights correct?
Y N

062
Go to Page 7, Step 069, Entry Point C.

063
Probe A1N2J05 (print subscan) and A1N2J09 (home).
Up Light: ON
Down Light: ON or FLASHING

Are the lights correct?
Y N

064
See BELT SYNC CHECK MAP.
Go To Map 0024, Entry Point A.

065
- Probe A1N2D11 (+ Print Subscan).
Up Light: ON
Down Light: ON

Are the lights correct?
Y N

066
Install a new A1N2 CARD.

067
- Probe A1P2B09 (- Impression control SS).
Up Light: ON
Down Light: ON

Are the lights correct?
Y N

068
Turn all CE switches off.
Go To Map 0024, Entry Point A.

069
(Entry Point C)

Turn all CE switches off.
Test the print belt motor control card.
- Power off.
- Disconnect the P4 connector (belt motor plug).
- Power on , press Stop/Reset key to reset the error.
- Turn (belt go) CE switch 1 on.
- Probe the following pins while slowly moving the print belt motor with your hand.
  A1N2S12 (A)
  A1N2S13 (Not A)
  A1N2S08 (B)
  A1N2S10 (Not B)

Up Light: FLASHING
Down Light: FLASHING

Are the lights correct on all the pins?
Y N

070
Are the lights correct on any of the pins?
Y N

071
Power down, reconnect P4 connector.
Power on
Press the Stop/Reset key to reset any errors.
- Probe A1D4G10 (+ POR).
Up Light: OFF.
Down light: ON.

Are the lights correct?
Y N

072
Go To Map 0050, Entry Point A.

073
- Probe A1D4G13 (+ 1.0 MHZ).
Up Light: ON.
Down Light: ON.

Are the lights correct?
Y N

074
Install a new card in A1D4.

075
Install a new card in A1N2.

076
Power off.
Replace card A1N2 or A1Q2.
Connect P4 connector.
Verify the repair. Test the print belt motor control card in map 0022,C and ensure all probe lights are pulsing.

077
- Turn CE switch 1 (Belt Go) off.
- Power off.
- Connect P4 connector.
- Power on, press Stop/Reset key to reset the error.
- Rotate the print belt pulley counterclockwise.

Does the print belt pulley move easily?
Y N

078
Probable defective motor drive card.
Power off
- Install a new card at location A1Q2.
Power on, press Stop/Reset key to reset the error.
- Verify the repair.Ensure that the print belt pulley moves easily.

A
B

079
Turn CE switch 1 (belt go) on.
-Probe,
A1Q2P12 (- drv A belt motor)
A1Q2P06 (- drv not A belt motor)
A1Q2P05 (- drv B belt motor)
A1Q2P07 (- drv not B belt motor)
Up Light: ON
Down Light: ON

Are the lights correct on all pins?
Y N

080
Test the print belt motor.
Refer to (4-000) for the print belt motor circuit.
Do the print belt motor checkout procedure.

Does the print belt motor circuit checkout correctly?
Y N

081
Test for an opens or shorts in the circuit,
OR
install a new part or repair the defective part.
Verify the repair by doing the print belt motor checkout procedure.

082
Install a new card in A1Q2

083
(Entry Point E)

- Test the print belt motor circuit.
Refer to (4-000) for the print belt motor circuit.
- Do print belt motor service check.

Does the print belt motor check out correctly?
Y N

9 9
A A
C D

084

Replace or repair the defective part.
Refer to (4-000) for the print belt motor circuit.
Verify the repair. Perform the belt motor check out procedure.

085

Measure resistance (Rx1 scale)
from A1Q2M10 to frame ground, and
from A1Q2G12 to frame ground.
The resistance on both pins should be greater than 100 ohms.

Is the resistance correct?
Y N

086

Refer to 6-000 for belt circuit.
Probable ground in the betl motor circuit, or a defective A1Q2 card.
Troubleshoot each output pin of A1Q2 card for a ground. If the ground disappears by removing the A2Q2 card, replace the card.

087

Refer to (4-000) for LED information.
- turn all CE switches off.
Refer to (2-000) for printer function and timing tests.
- Run the belt feedback LED timing program to check the LED timing.
Answer no if no test results appear.

Is the timing correct?
Y N

088

#DANGER#

Use caution when the adjusting the LED to avoid the sharp edge of the emitter disk.
- Adjust the print belt motor LED assembly (4-000).
Answer the following question no if no test results appear.
Can you make the adjustment?
Y N

089

Replace the belt motor LED and disk (4-000).
Refer to (2-000) for printer function test.
Run ripple print test to verify the repair.

090

Refer to (2-000) for printer function and timing tests.
Run Ripple Print test to verify the repair.

091

The following is a test of the print subscan (pss) timing.
Refer to (2-000) for printer function and timing tests.
Load the Belt Feedback LED Timing Program.
'NOTE:'
This test is a deviation from the Belt Feedback LED Timing Test, the same program is used to test the PSS Timing.
Only observe the High and Low Pulses that are being measured.
Ignore the remaining timing measurements and timing specifications that are being displayed.
Set all CE Switches Off. In the following order:
Set CE Switch 3 (Ribbon Go) on.
Set CE Switch 4 (Paper Clamp) on.
Set CE Switch 1 (Belt Go) on.
Press Stop/Reset Key then the Ready Key 3 times.
Each time observe the High and Low timings.
The High and Low timings should be within 620 and 756 microseconds.
(Step 091 continues)

(Step 091 continued)

Is the PSS Timing correct?
Y N

092
Install a new A1N2 card.
Run the PSS timing to verify the PSS pulses are within 620 and 756 microseconds.
Set all CE switches Off.

093
- Set all CE Switches Off.
- Install forms in the printer.
- Run the Character Print test and print all H's while observing the probe.

Refer to (2-000) for printer function and timing tests.
- Probe A1N2B12 (- Belt go)

Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

094
- Probe A1A5D12(- Belt go) with the program running and observe the probe.

Up Light: OFF.
Down light: ON

Are the lights correct?
Y N

095
Did you start this call from the system entry maps?
Y N

096
Go to the system entry maps.

097
- The probable trouble is a defective card in A1N2.

OR

a defective cable from A1A5D12 to the system.
Refer to (3-000) for the interface lines.
Test for an open or short in the interface line.

098
Install a new card in A1N2.

099
- Verify the cards at location A1D4,A1N2, and A1Q2 and the cables at A1A5 and A1Z1 are installed correctly.

Refer to (2-000) for printer function and timing tests.
- Run the Carriage Space/Skip test.

Will the test run correctly?
Y N

100
Install a new A1Q2 card,

OR

install a new A1N2 card.

101
See the printer entry map.
Go To Map 0010, Entry Point A.

A A A
G H J

102
(Entry Point G)

- Probe A1N2J04 (+POR).
Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

103
Go To Map 0050, Entry Point A.

104
Replace the card at A1N2.

105
(Entry Point F)

- Probe A1A5D13 (- Busy).
Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

106
Ensure the card at A1P2 and the connector at A1A5 are installed correctly.

Does the printer still fail?
Y N

107
Your trouble was a loose A1P2 card, or a loose A1A5 connector.

108
Did you start this call from the system entry maps?
Y N

109
Go to the system entry maps.

110
The probable trouble is a defective card in A1P2 or a faulty interface cable from A1A5D13 (- busy) to the system.
Refer to (3-000) for the interface lines.
Test for an open or a short in the interface line.

111

Turn CE switch 3 (Ribbon Go) on.

- Activate the left and then the right ribbon reverse switch lever while observing the probe.
- Probe A1A5D13 (- printer busy).

Up Light: ON
Down Light: FLASHING

Are the lights correct for both levers?

Y N

112

Install a new card at A1P2.

113

Turn CE switch 3 (Ribbon Go) off.

- Probe A1N2J13 (- Belt busy).

Up Light: ON
Down Light: OFF

Are the lights correct?

Y N

114

Install a new card at A1N2

115

Go to Page 1, Step 001, Entry Point A.

BELT SYNC CHECK

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0012	A	1	001
0022	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	010	0022	A
4	035	0022	A
2	012	0073	A

001
(Entry Point A)

Ensure that the system is configured for the proper print belt that is installed.
Test for a possible bad print belt.
Power off.
- Remove the print belt, and examine the entire print belt surface along the timing marks area looking for kinks or lower edge wear.

  Note: Near the beginning of each character set, there is a blank timing mark that is used for home pulse synchronization.

Does the print belt appear to be correct?
Y N

002
Refer to (4-000) for belt pulley information.
Do the belt pulley height adjustment.
- Repair or replace the belt.

003
Refer to (4-000) for belt information.
Install the print belt.
Refer to (4-000) for belt pulley information.
- Verify that the print belt idler pulley height is adjusted correctly.

Is the print belt pulley height adjusted correctly?
Y N

2 2

This map is used to analyze failures that cause a belt sync check.
A belt sync check is caused when the home pulse arrives at the host system when not expected, or if there is a missing home pulse.

The character set programmed into the print belt image buffer must match the character set on the print belt.

004
Refer to (4-000) for belt pulley information.
Do the belt idler pulley bracket adjustment.

005
Refer to 4-000 for belt transducer information.
- Check the PSS transducer tip for obvious damage.

Does the transducer appear OK?
Y N

006
Refer to (4-000) for belt transducer information.
- Replace the transducer assembly.

007
Refer to (4-000) for belt transducer information.
- Perform the belt transducer service check.

Is the transducer OK?
Y N

008
Refer to (4-000) for belt transducer information.
Adjust or replace the transducer.

009
- Power on, press Stop/Reset Key to reset the error

Refer to (2-000) for the CE switch descriptions.
- Turn CE switch 1 (Belt Go) on.

Is the print belt running smoothly?
Y N

010
Go To Map 0022, Entry Point A.

011
Is the gate fan running?
Y N

C D

012
See the Gate Fan Failure Map.
Go To Map 0073, Entry Point A.

013
Turn CE switch 1 (Belt Go) off.
In the following order
- Turn CE switch 3 (Ribbon Go) on.
- Turn CE switch 4 (Paper Clamp) on.
- Turn CE switch 1 (Belt Go) on.
- Probe A1N2J09 (-Home)
- Probe A1N2J05 (- Print Subscans)

Up Light: ON
Down Light: ON or FLASHING

Are the lights correct?
Y N

014
- Probe A1N2B02 (-Early Emitter)

Up Light: ON
Down Light: ON

Are the lights correct?
Y N

015
Refer to (4-000) for PSS emitter circuit information.
turn all CE switches off.
- Install new card at location A1D4.

016
Did you start this call from the system entry maps?
Y N

017
Go to the system entry maps.

E F

018
The probable trouble is a defective card at A1N2.
Or,
A faulty interface cable from A1A5D11 (-home) or A1A5B03 (-print subscan) to the system.
Refer to (3-000) for the interface lines.
Test for an open or a short in the interface line.

019
(Entry Point B)

Turn all CE switches off.
Refer to (2-000) for printer function and timing tests.
Run the Impression Control SS Timing Test.
Answer no if no test results are displayed.

Is the Impression Control SS Timing correct?
Y N

020
Refer to (5-000) for Impression Control SS information.
Answer no to the following question if no test results are displayed.

Can you make the adjustment?
Y N

021
Refer to (5-000) for Impression Control SS information.
Power off.
Remove the A1D4 card.
- Put the forms thickness lever on 4.
- Measure for 300 to 10,000 ohms from A1B6B02 to frame ground.

Is the resistance correct?
Y N

022
Refer to (5-000) for Impression Control SS information.
Disconnect P13,
Measure for 300 to 10,000 OHMS from P13-1 to P13-3.

Is the resistance correct?
Y N

023
Refer to (5-000) for Impression Control SS information.
Install a new Impression Control potentiometer.

024
Reconnect P13.
Refer to (5-000) for Impression Control SS information.
Test for an open or a ground in the cable or cable connectors from A1Z1 to P13.

025
Reinstall the A1D4 card.
Power on.

Did you start this call from the system entry maps?
Y N

026
Go to the system entry maps.

027
The probable trouble is the card at A1D4,
OR
The card at A1P2.
OR
The trouble is a faulty interface cable from A1A5B08 (- impression ctl SS) to the system.
Refer to (3-000) for the interface lines.
Test for an open or a short in the interface line.

028
Trouble was the impression control SS out of adjustment.

029
The following is a test of the Print Subscan (PSS) Timing.
Refer to (2-000) for printer function and timing tests.
Load the Belt Feedback LED Timing Program.
'NOTE:'
This test is a deviation from the Belt Feedback LED Timing test, the same program is used to test the PSS Timing.
Only observe the High and Low Pulses that are being measured.
Ignore the remaining timing measurements and timing specifications that are being displayed.
Set all CE Switches Off. In the following order:
Set CE Switch 3 (Ribbon Go) on.
Set CE Switch 4 (Paper Clamp) on.
Set CE Switch 1 (Belt Go) on.
Press Stop/Reset key then the Ready key 3 times.
Each time observe the High and the Low timings.
The High and Low timings should be within 620 and 756 microseconds.

Is the PSS timing correct?
Y N

030
Install a new A1N2 card.
Run the PSS timing to verify the PSS pulses are within 620 and 756 microseconds.
Set all CE Switches Off.

031
Press the Stop/Reset Key to reset any errors.
Set all CE switches Off.
- Probe A1A5B03 (-print subscan),

Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

032
Install a new card in A1N2

033
Belt sync checks still occur; however signals appear to be correct.
- Remove all foreign material from the print belt area, especially from around the PSS emitter area.
- Do the following:
- Turn all CE switches off.

Refer to (13-000) for cable and connector plugging.
- Reseat connectors P5, A1Z1, and A1A5
- Inspect the print belt path for interference
- Ensure the shielded cable from P5 to A1T7 is grounded.

Refer to (4-000) for belt transducer information.
- Insure the PSS emitter gap is correct.

Do the belt sync checks still occur?
Y N

034
The trouble is corrected.

035
See the print belt motor failure map.
Go To Map 0022, Entry Point A.

HAMMER ECHO CHECK

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0012	A	1	001
0012	C	4	031
0014	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	004	0073	A

001
(Entry Point A)

Refer to (2-000) for printer function and timing tests.
Run the Character Print test and print all H's.

Did the program determine a hammer echo check?
Y N

002
Go to Page 2, Step 009, Entry Point D.

003
Refer to (18-000) Logic ZZ025 for card plugging information.
- Verify the following cards are seated correctly. A1J2, A1H2, and A1M2.
- Verify that the top card connectors between A1H2 and A1J2 are seated correctly (13-000).
- Verify that the Hammer Coil Connector cables are seated correctly at the hammer unit.
- Verify the following connectors are seated properly.

Refer to (13-000) for cable connector plugging.
A1Y4, A1Y5, and A1Y6.

(Step 003 continues)

Hammer ECHO Check indicates improper response of a hammer driver during print time.

The Hammer Coils are tested during print subscan (PSS) time to verify the On/OFF status of every hammer coil. A Hammer Echo occurs if the status of any hammer is incorrect.

Mod 1

(Step 003 continued)

Is the gate fan running?

Y N

004

See Gate Fan Failure Map.

Go To Map 0073, Entry Point A.

005

Press Stop/Reset Key to reset all errors, then press Ready Key.

Refer to (2-000) for printer function and timing tests.

Run the Character Print test and print all H's.

Record the hammer position that the error occurred on.

Reset the error and print all H's again.

Were there any failing hammers?

Y N

006

Go to Page 4, Step 031, Entry Point C.

007

Did the hammer position change each time an error occurred?

NOTE: On a 66 position hammer unit, each hammer services two print positions.

Y N

008

(Entry Point B)

Did the (H) test detect a Hammer Echo Check?

Y N

4 3
A B C

009

(Entry Point D)

- Run character print test and print all H's.
- Probe A1A4D04 (-Not Print Time)

```
Up Light   : On or Flashing
Down light : On or Flashing
```

Are the lights correct?

Y N

010

Did you start this call from the system entry maps?

Y N

011

Go to the system entry maps.

012

The probable trouble is a faulty card at A1H2

or

The trouble is a faulty interface cable from A1A4D04 to the system. Refer to (3-000) for the interface lines. Test for an open or a short in the interface line.

013

Problem is intermittent. Some possible causes of the hammer echo check are:

- A connector that is not seated tightly may open due to machine vibration. Run Ripple Print test several times while tapping hammer cable connectors lightly.

Refer to (2-000) for printer function and timing tests.

- An open hammer coil when printer gets hot. Run the Ripple Print test several times with the covers closed.

014

Press the Stop/Reset key and then the Ready Key.

One or more hammer positions caused a hammer echo check.

Refer to (2-000) for printer function and timing tests.

-Run the Matrix Print test.

The program prints sequentially starting with print position 1.

It prints one hammer position per line.

Answer the following question NO if not sure.

Did The Hammer Position That Caused The Error print correctly?

Y N

015

Did The Failing Hammer Position Print Anything?

Answer 'NO' if not sure.

Y N

016

Refer to (18-000) Logic ZZ025 for card plugging information.

The faulty hammer position failed to print.

The probable trouble could be a top card connector from A1H2 to A1J2.

To verify a faulty top card connector swap the suspected connector with another connector and observe if the trouble moves.

Refer to (2-000) for printer function and timing tests.

Run the Matrix Print test.

Did the same print position fail?

Y N

017

Install a new top card connector.

018

Refer to (5-000) for the hammer coil circuitry.

The probable trouble is:

A defective hammer driver card at A1J2,

Or

a defective hammer decode and latch card at A1H2,

Or

a defective echo check card in A1M2.

Refer to (2-000) for printer function and timing tests.

- Run the Ripple Print test.

Does the Hammer Echo Check still occur?

Y N

019

Refer to (2-000) for printer function and timing tests.

Run Ripple Print and return printer to customer.

020

Refer to (5-000) for the hammer coil circuitry.

Test for an open between the hammer decode/latch card output pin and the hammer driver input pin of the failing print position.

021

Refer to (18-000) Logic ZZ025 for card plugging information.

The failing hammer position printed incorrectly.

The trouble could be a defective top card connector from A1H2 to A1J2.

To verify a defective top card connector swap the suspected connector with another connector and observe if the trouble moves.

Refer to (2-000) for printer function and timing tests.

Run the Matrix Print Test.

Did the same print position fail?

Y N

022
Install a new top card connector.

023
Refer to (5-000) for the hammer coil circuitry.
The probable trouble is,
A defective hammer decode/latch card at A1H2,
Or
a defective hammer driver card at A1J2,
Or
a defective echo check card in A1M2.

Is the printer still failing?
Y N

024
Refer to (2-000) for printer function and timing tests.
Run the Ripple Print test to verify the repair.

025
Refer to (5-000) for the hammer coil circuitry.
Test for opens between the hammer latch/decode card output at A1H2 and the hammer driver input pin of the failing print position.

026
Refer to (5-000) for the hammer coil circuitry.
The trouble could be a defective top crossover connector from the card at A1H2 to A1J2. To verify a defective top crossover connector swap the suspected connector with another connector and see if the trouble moves.

Run the Matrix Print Test.

Did the same print position fail?
Y N

027
Install a new top crossover connector. Run the matrix print test to verify the fix.

J

028
The probable trouble is,
a defective echo check card in A1M2,
Or
a defective card in A1D4,
Or
a defective card in A1J2.

Is the printer still failing?
Y N

029
Refer to (2-000) for printer function and timing tests.
Run the Ripple Print test to verify the repair.

030
Refer to (5-000) for the hammer coil circuitry.
Test for opens or grounds between the print magnet cable and the echo card input pins of the failing print position.

031
(Entry Point C)

Press the Stop/Reset key to reset any error condition.
Press the Ready Key to start the belt motor running.
There is a two minute time-out on the belt motor. If the belt motor times out, press the Ready Key.
Refer to (5-000) for the hammer coil circuitry.
Probe:
A1H2B11 FIRETIER 1
A1H2B05 FIRETIER 2
A1H2B07 FIRETIER 3
A1H2B04 FIRETIER 4
A1H2B06 FIRETIER 5
Up Light: ON
Down Light: ON

Are the lights correct on all pins?
Y N

5 5
K L

Hammer Echo Check

Mod 1

PAGE 5 OF 7

032

Set all CE switches off.
Run the Impression Control SS timing test.

Is the IMPSS timing correct?

Y N

033

Refer to (5-000) for Impression Control SS information.
Adjust the IMPSS.

034

Did you start this call from the system entry maps?

Y N

035

Go to the system entry maps.

036

- Probable Trouble is the card at A1H2.

Or

- A faulty interface cable from A1A4 (-Fire Tier) to the system.

Refer to (3-000) for the interface lines.
Test for an open or short in the interface line.

037

Set all CE switches off.
Refer to (2-000) for printer function and timing tests.
Run the Impression Control SS timing test.

Is the IMPSS timing correct?

Y N

038

Refer to (5-000) for Impression Control SS information.
Adjust the impression control SS.

039

Press the Stop/Reset key to reset any error condition,
and then press the Ready Key.
Refer to (2-000) for printer function and timing tests.
Run the Character Print test and print all H's.

Set the latch on the GLP from the none position to the down position. Reset the latch to the none position after observing the Probe.

- Probe A1A4D06 (- strobe).

```
Up   Light: DON'T CARE
Down Light: ON
```

Are the lights correct?

Y N

040

Did you start this call from the system entry maps?

Y N

041

Go to the system entry maps.

042

The probable trouble is a defective card in A1H2,

Or

a defective interface line from A1A4D06 (-strobe) to the system.
Refer to (3-000) for the interface lines.
Test for an open or short in the interface line.

043

Press Stop/Reset key to reset any error, then press Ready Key.
Probe A1H2D13 (+Print Subscan)
Up Light: ON
Down Light: ON

Are The Lights correct?

Y N

044
Install a new card in A1N2.

045
Press the Stop/Reset Key to stop the belt motor.
Press the Stop/Reset Key again, do not press the Ready Key.
- Probe A1A5B03 (- print subscan).
Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

046
Install a new card in A1N2.

047
Refer to (2-000) for printer function and timing tests.
Run Character Print test and print all H's.

Set the latch on the GLP from the none position to the up position. Reset the latch to the none position after observing the probe.

- Probe A1M2D09 (+hammer sample).
Up Light: ON
Down Light: ON

Are the lights correct?
Y N

7
Q R

048
Refer to (2-000) for printer function and timing tests.
Run the Character Print test and print all H's while observing the probe.

Set the latch on the GLP from the none position to the down position. Reset the latch to the none position after observing the Probe.

- Probe A1A4D07 (- hmr sample).
Up Light: ON
Down Light: ON

Are the lights correct?
Y N

049
Did you start this call from the system entry maps?
Y N

050
Go to the system entry maps.

051
Possible trouble is the card at A1H2.
Or
A faulty interface cable from A1A4D07 to the system.
Refer to (3-000) for the interface lines.
Test for an open or short in the interface line.

052
Install a new card at A1D4.

053
Press the Stop/Reset Key to reset the error.
Then press the Ready Key.
- Probe A1M2D07 (+ initiate sample ring reset).
Up Light: ON
Down Light: ON

Are the lights correct?
Y N

054
Install a new card in A1N2.

055
Press the Stop/Reset Key to reset the error,
Then press the Ready Key.
Refer to (2-000) for printer function and tim... tests.
Run the Character Print test and print all H's.

Set the latch on the GLP from the none position to the down position. Reset the latch to the none position after observing the Probe.

- Probe A1D4D05 (- hammer echo return).
Up Light: ON
Down Light: ON

Are the lights correct?
Y N

056
Press the Stop/Reset key to reset the error.
Then press Ready Key.
Refer to (2-000) for printer function and timing tests.
Run the Character Print test and print all H's.
Set the latch on the GLP from the none position to the up position. Reset the latch to the none position after observing the probe.

- Probe A1D4D06 (+ hammer echo return).
Up Light: ON
Down Light: ON

(Step 056 continues)

(Step 056 continued)
Are the lights correct?
Y N

057
Refer to (2-000) for printer function and timing tests.
Install a new A1M2 card and run the Character Print test and print all H's to verify the repair.

058
Did you start this call from the system entry maps?
Y N

059
Go to the system entry maps.

060
The probable trouble is the card at A1D4,
Or
A faulty interface cable from A1A4B12 (- hammer echo return) to the system.
Refer to (3-000) for the interface lines.
Test for an open or short in the interface line.

061
- Probe A1H2B12 (-66 POS OPT)
UP LIGHT : OFF
DOWN LIGHT : ON

Are the lights correct?
Y N

062
This pin should be grounded for 66 position hammer units.
Jumper A1H2B12 to A1H2D08.

063
Continue testing.
Go to Page 2, Step 008, Entry Point B.

HAMMER ECHO CHECK

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0012	A	1	001
0012	C	5	031
0014	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	004	0073	A

001
(Entry Point A)

Refer to (2-000) for printer function and timing tests.
Run Character Print Test and print all H's

Did the program determine a hammer echo check?
Y N

002
Go to Page 2, Step 009, Entry Point D.

003
Verify the following cards are seated correctly:

A1J2,A1E2,A1F2,A1H2,A1L2 and A1M2.
Refer to (18-000) Logic ZZ025 for top card connector plugging.
verify that the top card connectors ar seated correctly.

A1E2 to A1F2,A1H2 to A1J2 and A1L2 to A1M2.

- Verify that the Hammer Coil Connector cables are seated correctly at the hammer unit.

Refer to (13-000) for cable and connector plugging.
- Verify the following connectors are seated
(Step 003 continues)

Hammer ECHO Check indicates improper response of a hammer driver during print time.

The Hammer Coils are tested during print subscan (PSS) time to verify the On/OFF status of every hammer coil. A Hammer Echo occurs if the status of any hammer is incorrect.

(Step 003 continued)
properly.

A1Y1
A1Y2
A1Y3
A1Y4
A1Y5
A1Y6

Is the gate fan running?
Y N

004
See Gate Fan Failure Map.
Go To Map 0073, Entry Point A.

005
Press Stop/Reset Key to reset any errors. Then press Ready Key.
Refer to (2-000) for printer function and timing tests.
Run the Character Print test and print all H's.
Record the hammer position that the error occurred on.
Reset the error and print all H's again.

Were there any failing hammers?
Y N

006
Go to Page 5, Step 031, Entry Point C.

007
Did the hammer position change each time an error occurred?
Y N

008
(Entry Point B)

Did the (H) test detect a Hammer Echo Check?
Y N

5 3
A B C

C

009
(Entry Point D)

-Run character print test and print all H's.
-Probe A1A4D04 (- Not Print Time).

Up Light : On or Flashing
Down Light : On or Flashing

Are the lights correct?
Y N

010
Did you start this call from the system entry maps?
Y N

011
Go to the system entry maps.

012
The probable trouble is a faulty card at A1H2
or
The trouble is a faulty interface cable from A1A4D04 to the system. Refer to (3-000) for the interface lines. Test for an open or a short in the interface line.

013
Problem is intermittent. Some possible causes of the hammer echo check are:

Refer to (2-000) for printer function and timing tests.
- A connector that is not seated tightly may open due to machine vibration. Run the Ripple Print test several times while tapping hammer cable connectors lightly.
- A hammer coil may open when the printer gets hot. Run the Ripple Print test several times with the covers closed.

014

Press Stop/Reset Key to reset any errors. Then press Ready Key.

One or more hammer positions caused a hammer echo check.

Refer to (2-000) for printer function and timing tests.

- Run the matrix print test.

The program prints sequentially starting with print position 1.

It prints one hammer position per line.

Answer the following question 'NO' if not sure.

Did the hammer position that caused the error print correctly?

Y N

015

Answer the following question 'NO' if not sure.

Did The Failing Hammer Position Print Anything?

Y N

016

Refer to (5-000) for Hammer Coil Circuitry.

The faulty hammer position failed to print.

Refer to (18-000) Logic ZZ025 for top card connector plugging.

The trouble could be a defective top card connector from A1E2 to A1F2.

Or

a defective top card connector from A1H2 to A1J2.

To verify a defective top card connector swap the suspected connector with another connector and observe if the trouble moves.

Run the matrix print test.

Did the same print position fail?

Y N

4 4
D E F G

F G

017

Install a new top card connector.

Refer to (2-000) for printer function and timing tests.

Run the Ripple Print test to verify the repair.

018

The probable trouble is:

A Defective hammer driver card.

Odd print position is the A1F2 card.

Even print position is the A1J2 card.

'NOTE'

- To verify a faulty hammer driver card, swap the cards at A1J2 and A1F2 and observe if trouble moves.

Or

A defective hammer decode and latch card at A1H2.

Or

a defective echo check card at A1M2.

Refer to (2-000) for printer function and timing tests.

- Run the Ripple Print Test.

Does the Hammer Echo Check still occur?

Y N

019

End of call.

020

Refer to (5-000) for Hammer Coil Circuitry.

Test for an open between the hammer decode/latch card output pin and the hammer driver input pin of the failing print position.

021
The failing hammer position printed incorrectly.
Refer to (18-000) Logic ZZ025 for top card connector plugging.
The trouble could be a defective top card connector from A1E2 to A1F2.
Or
a defective top card connector from A1H2 to A1J2.
To verify a defective card connector swap the suspected connector with another connector and observe if the trouble moves.
Refer to (2-000) for printer function and timing tests.
Run the matrix print test.

Did the same print position fail?
Y N

022
Install a new top connector.

023
Refer to (5-000) for Hammer Coil Circuitry.
The probable trouble is,
A defective hammer decode/latch card at A1H2
Or
a defective hammer driver card.
Even print position at A1J2.
Odd print position at A1F2.
NOTE: To verify a faulty hammer driver card swap the cards at A1J2 with A1F2 to observe if the trouble moves.
Or
a defective echo check card at A1M2.

Is the printer still failing?
Y N

024
Refer to (2-000) for printer function and timing tests.
Run Ripple Print test to verify the repair.

N

D H 3 MAP 0030-4

025
Refer to (3-000) for the interface lines.
Test for opens or shorts between the hammer latch/decode card output pin and the hammer driver input pin of the failing print position.

026
Refer to (18-000) Logic ZZ025 for card plugging information.
The trouble could be a defective top card connector from A1E2 to A1F2.
Or
a defective top card connector from A1H2 to A1J2.
To verify a defective top card connector swap the suspected connector with another connector and observe if the trouble moves.
Run the matrix print test.

Did the same print position fail?
Y N

027
Install a new top connector.

028
Refer to (5-000) for Hammer Coil Circuitry.
The probable trouble is, a defective echo check card at A1M2,
Or
a defective A1D4 card,
Or
a defective hammer driver card at A1J2, even position,
Or
a defective hammer driver card at A1F2, odd position.

NOTE

To verify a defective hammer driver card, swap the card at A1J2 and A1F2 and observe if the trouble moves.

(Step 028 continues)

(Step 028 continued)

Is the printer still failing?

Y N

029

Refer to (2-000) for printer function and timing tests.

Run the Ripple Print test to verify the repair.

030

Refer to (5-000) for Hammer Coil Circuitry.

Test for opens or grounds between the print magnet cable and the echo card input pins of the failing print position.

031

(Entry Point C)

Press the Stop/Reset Key to reset any error condition.

Press the Ready Key to start the belt motor running.

There is a two minute time-out on the belt.

If the belt times-out, press the Ready key.

Refer to (5-000) for Hammer Coil Circuitry.

Probe:

A1H2B11 FIRETIER 1

A1H2B05 FIRETIER 2

A1H2B07 FIRETIER 3

A1H2B04 FIRETIER 4

A1H2B06 FIRETIER 5

Up Light: ON

Down Light: ON

Are the lights correct on all pins?

Y N

032

Refer to (2-000) for printer function and timing tests.

Run the IMPSS timing test.

Is the timing correct?

Y N

J K L

J K L

033

Refer to (5-000) for the IMPSS adjustment.

Adjust the Impression Control SS (IMPSS).

034

Did you start this call from the system entry maps?

Y N

035

Go to the system entry maps.

036

- Probable Trouble is a faulty card at A1H2.

OR

- Trouble is a faulty interface cable from A1A4D09 through A1A4D13 to the system.

Refer to (3-000) for the interface lines.

- Test for an open or a short in the interface line.

037

Refer to (2-000) for printer function and timing tests.

Run the Impression Control SS timing test.

Is the IMPSS timing correct?

Y N

038

Refer to (5-000) for the IMPSS adjustment.

Adjust the impression control SS timing.

6 M

039
Press Stop/Reset Key to reset any errors. Then press the Ready Key.
Refer to (2-000) for printer function and timing tests.
Run the character print test and print all H's.

- Probe A1A4D06 (-Strobe).

Set the latch on the GLP from the none position to the down position.

Up Light: DON'T CARE
Down Light: ON

Are the lights correct?
Y N

040
Set the latch on the GLP to the none position.

Did you start this call from the system entry maps?
Y N

041
Go to the system maps.

042
Your probable trouble is a faulty A1H2 card.
Or
The trouble is a faulty interface cable from A1A4D06 (-Strobe) to the system.
Refer to (3-000) for the interface lines
Test for an open or a short in the interface line.

043
Press the Stop/Reset Key and then the Ready Key.
Set the latch on the GLP to the none position.
Probe A1H2D13 (+ print subscan)
Up Light: ON
Down Light: ON

Are The Lights correct?
Y N

044
Install a new card in A1N2.

045
Press the Stop/Reset Key and then the Ready Key.
- Probe A1M2B03 (+ close contactor).
Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

046
Install a new card in A1M2.
Or
a new card in A1P2.

047
Press the Stop/Reset Key to stop the belt motor.
Press the Stop/Reset Key again.
(Do not press the Ready Key).
- Probe A1A5B03 (- print subscan).
Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

048
Install a new card in A1N2.

A 2

Hammer Echo Check

Mod 2

PAGE 5 OF 8

(Step 028 continued)

Is the printer still failing?

Y N

029

Refer to (2-000) for printer function and timing tests.

Run the Ripple Print test to verify the repair.

030

Refer to (5-000) for Hammer Coil Circuitry.

Test for opens or grounds between the print magnet cable and the echo card input pins of the failing print position.

031

(Entry Point C)

Press the Stop/Reset Key to reset any error condition.

Press the Ready Key to start the belt motor running.

There is a two minute time-out on the belt.

If the belt times-out, press the Ready key.

Refer to (5-000) for Hammer Coil Circuitry.

Probe:

A1H2B11 FIRETIER 1

A1H2B05 FIRETIER 2

A1H2B07 FIRETIER 3

A1H2B04 FIRETIER 4

A1H2B06 FIRETIER 5

Up Light: ON

Down Light: ON

Are the lights correct on all pins?

Y N

032

Refer to (2-000) for printer function and timing tests.

Run the IMPSS timing test.

Is the timing correct?

Y N

J K L

J K L

033

Refer to (5-000) for the IMPSS adjustment.

Adjust the Impression Control SS (IMPSS).

034

Did you start this call from the system entry maps?

Y N

035

Go to the system entry maps.

036

- Probable Trouble is a faulty card at A1H2.

OR

- Trouble is a faulty interface cable from A1A4D09 through A1A4D13 to the system.

Refer to (3-000) for the interface lines.

- Test for an open or a short in the interface line.

037

Refer to (2-000) for printer function and timing tests.

Run the Impression Control SS timing test.

Is the IMPSS timing correct?

Y N

038

Refer to (5-000) for the IMPSS adjustment.

Adjust the impression control SS timing.

6 M

039
Press Stop/Reset Key to reset any errors. Then press the Ready Key.
Refer to (2-000) for printer function and timing tests.
Run the character print test and print all H's.

- Probe A1A4D06 (-Strobe).

Set the latch on the GLP from the none position to the down position.

Up Light: DON'T CARE
Down Light: ON

Are the lights correct?
Y N

040
Set the latch on the GLP to the none position.

Did you start this call from the system entry maps?
Y N

041
Go to the system maps.

042
Your probable trouble is a faulty A1H2 card.
Or
The trouble is a faulty interface cable from A1A4D06 (-Strobe) to the system.
Refer to (3-000) for the interface lines
Test for an open or a short in the interface line.

043
Press the Stop/Reset Key and then the Ready Key.
Set the latch on the GLP to the none position.
Probe A1H2D13 (+ print subscan)
Up Light: ON
Down Light: ON

Are The Lights correct?
Y N

044
Install a new card in A1N2.

045
Press the Stop/Reset Key and then the Ready Key.
- Probe A1M2803 (+ close contactor).
Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

046
Install a new card in A1M2,
Or
a new card in A1P2.

047
Press the Stop/Reset Key to stop the belt motor.
Press the Stop/Reset Key again.
(Do not press the Ready Key).
- Probe A1A5803 (- print subscan).
Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

048
Install a new card in A1N2.

049

Press the Stop/Reset Key to reset the error.
Then press Ready Key.
Refer to (2-000) for printer function and timing tests.
Run Character Print test and print all (H)'s.

- Probe A1M2D09 (+ hammer sample).
Set the latch on the GLP from the none position to the up position.

Up Light: ON
Down Light: ON

Are the lights correct?

Y N

050

Press the Stop/Reset Key to reset the error.
Then press the Ready Key.
Run Charecter Print test and print all (H)'s while observing the probe.

- Probe A1A4D07 (- hmr sample).
Set the latch on the GLP to the none position then to the down position.

Up Light: ON
Down Light: ON or FLASHING

Are the lights correct?

Y N

051

Set the latch on the GLP to the none position.

Did you start this call from the system entry maps?

Y N

052

Go to the system entry maps.

Q R S

Q R S

053

The possible trouble is a defective A1H2 card.

Or

a faulty interface cable from A1A4D07 to the system.
Refer to (3-000) for the interface lines.
Test for an open or a short in the interface line.

054

Set the latch on the GLP to the none position.
Install a new card at A1D4.

055

Press the Stop/Reset Key to reset the error while observing the probe.
Then press the Ready Key.
Set the latch on the GLP to the none position.
- Probe A1M2D07 (+ initiate sample ring reset).

Up Light: ON
Down Light: ON

Are the lights correct?

Y N

056

Install a new card at A1N2

057

Press the Stop/Reset key to reset the error.
Then press Ready Key.
Refer to (2-000) for printer function and timing tests.
Run the Character Print test and print all H's.

- Probe A1D4D05 (- hammer echo return).
Set the latch on the GLP from the none position to the down position.

Up Light: ON
Down Light: ON

Are the lights correct?

Y N

8 8
T U

058
Press the Stop/Reset key to reset the error.
Then press Ready Key.
Refer to (2-000) for printer function and timing tests.
Run the Character Print test and print all H's.
- Probe A1D4D06 (+ hammer echo return).
Set the latch on the GLP to the none position then to the up position.

Up Light: ON
Down Light: ON

Are the lights correct?
Y N

059
Set the latch on the GLP to the none position.
Install a new card at A1M2.

060
Set the latch on the GLP to the none position.

Did you start this call from the system entry maps?
Y N

061
Go to the system entry maps.

062
The probable trouble is the card at A1D4.
Or
a defective interface cable from A1A4B12 (- hammer echo return) to the system.
Refer to (3-000) for the interface lines.
Test for an open or a short in the interface line.

063
Set the latch on the GLP to the none position.
- Probe A1H2B12 (-66 POS OPT)
UP LIGHT : DON'T CARE
DOWN LIGHT : OFF

Are the lights correct?
Y N

064
This pin should be floating for 132 position hammer units.

065
CONTINUE TESTING.
Go to Page 2, Step 008, Entry Point B.

ANY HAMMER ON CHECK

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0012	A	1	001
0099	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
1	002	0070	A
2	004	0073	A

001
(Entry Point A)

Press the Stop/Reset key while observing the probe.

Note: If you cannot observe the probe because of location, set the latch on the GLP from none position to up position. Reset the probe to none position after observing the probe.

- Probe A1Q2S13 (+ 25V CNTL)

Up Light: on or flashing
Down Light: Dont card

Are the lights correct.

Y N

002
See power distribution map.
Go To Map 0070, Entry Point A.

2
A

003
Observe the hammer coil connectors at the rear of the hammer unit to insure the connectors are seated .
- Observe the individual female connectors located within the hammer coil connectors to insure they are seated correctly and have not backed out.
- Observe the hammer unit for any obvious failure, such as burned coils or loose cables.

Is the gate fan running?
Y N

004
See the Gate Fan Failure map.
Go To Map 0073, Entry Point A.

005
Answer the following question 'NO' if not sure.

Does the system error log determine which hammer coil(s) caused the error?
Y N

006
Reset the printer by pressing the Stop/Reset Key and the Ready Key.

Does the check light come on?
Y N

007
Refer to (5-000) for the hammer magnet circuits.
Press the Stop/Reset Key to reset any errors.
Press the Ready Key to start the belt motor running.
There is a two minute timeout in the belt motor run circuitry.
- Probe A1H2B11 (firetier 1)
A1H2B05 (firetier 2)
A1H2B07 (firetier 3)
A1H2B04 (firetier 4)
A1H2B06 (firetier 5)
(Step 007 continues)

Any hammer on check indicates that a hammer circuit was active during non-print time.

The voltage at the active side of each hammer coil is constantly being monitored during non-print time. If a hammer coil energized or if a hammer coil opens during non-print time a any hammer on check will occur.

25JUL80 PN 8324026
EC 855865 PEC 784111
MAP 0031-2

(Step 007 continued)
Up Light: ON
Down Light: ON

Are the lights correct for all pins?
Y N

008
Did you start this call from the system entry maps?
Y N

009
Go to the system entry maps.

010
The probable trouble is a defective card in A1H2,
OR
a defective interface line from A1A4 to the system.
Refer to (3-000) for the interface lines.
Test for an open or short in the interface line.

011
The problem is intermittent. Some possible causes of an (ANY HAMMER ON) check are:
Refer to (2-000) for printer function and timing tests.
- An open hammer coil when the printer gets hot. Run the Ripple Print test several times with the covers closed.

Refer to (13-000) for cable and connector plugging.
- A loose cable. Verify that the following cables are seated correctly: A1Y1.A1Y2,A1Y3, and if installed, A1Y4,A1Y5, and A1Y6.
- All cables going to the hammer unit.
- Leads in the 25 volt common buss terminal block (TB6) located in the rear of the printer over the hammer unit.

Refer to (2-000) for printer function and timing tests.
Run the Ripple Print test to verify the repair.

C
2

012
Refer to (5-000) for the hammer magnet circuits.
- Power down.
- Remove A1F2 card.
- Power up.
- Reset the printer by pressing the Stop/Reset Key and then the Ready Key.

Does the check light come on?
Y N

013
Trouble is a defective card in A1F2,
OR
A defective card in A1J2.
Refer to (2-000) for printer function and timing tests.
Run the Ripple Print test after installing one or the other of the cards to verify the repair.

014
- Power down.
- Remove A1 '2 card.

Do nct install the A1F2 card at this time.
- Power up.

Reset the printer by pressing the Stop/Reset Key and then the Ready Key.

Does the check light come on?
Y N

015
Trouble is a defective card in A1J2,
OR
a defective card in A1F2.
Refer to (2-000) for printer function and timing tests.
Run the Ripple Print test to verify the repair.

016
Set the forms thickness lever to correspond to the number of forms.
Advance the forms at least 2 line spaces.
Reset the error by pressing the Stop/Reset Key.
Advance forms again and observe if any hammers fired.

Did any hammers fire?
Y N

017
To determine the defective coil circuit you must isolate the problem to within 22 coil circuits.
Ensure the hammer driver cards in A1F2 and A1J2 are not in the printer.
Jumper A1M2D06 (+ hammer echo rtn) to A1M2D08.
Reset the Check Light by pressing the Stop/Reset Key.
Does the check light go off and stay off?
Y N

018
Remove the jumper from A1M2D06 to A1M2D08.

Did you start this call from the system entry maps?
Y N

019
Go to the system entry maps.

020
Probable trouble is the card at A1D4.
Or,
A defective interface cable at A1A4B12 to the system.
Refer to (3-000) for the interface lines.
Test for an open or short in the interface line.

5
E F

021
(Entry Point B)

- Probe the following test points (TP).
A1M2B06 (even coil 2-46).
A1M2B07 (even coil 48-94).
A1M2B09 (even coil 96-132).
A1M2B10 (odd coil 95-131).
A1M2B11 (odd coil 47-93).
A1M2B12 (odd coil 1-45).
Up Light: ON
Down Light: OFF

Are the lights correct for all test points?
Y N

022
A down light indicates a defective hammer coil circuit within a group of 22 coil circuits.
Refer to (5-000) for the hammer magnet circuits.

'NOTE'

Refer to (13-000) for the top card connectors.
When probing the top card connectors at A1M2, the following pins can be used as a ground for the General Logic Probe (GLP).
A1M2W08
A1M2X08
A1M2Y08
A1M2Z08
- Probe the input pins of A1M2 card of the failing group.
Up Light: ON
Down Light: OFF

Are the lights correct on all of the pins?
Y N

5 5 5
G H J

023

A down light or no lights indicates a defective hammer coil circuit.

A hammer coil has approximately 3.5 ohms.

- Power down.
- Remove the jumper from A1M2D06 to A1M2D08.

Refer to (5-000) for the hammer magnet circuits.

'NOTE'

When installing a new hammer coil, obs·rve adjacent hammer coils for di· ·loring, burned marks or any other irregularities. The defective hammer coil may cause the associated hammer driver card to go bad.

Refer to (2-000) for printer function and timing tests.

Run the Ripple Print test to verify the repair.

024

- Remove the jumper from A1M2D06 to A1M2D08.

The trouble is a defective A1M2 card.

OR

a defective A1D4 card.

Refer to (2-000) for printer function and timing tests.

Run the Ripple Print test to verify the repair.

025

Remove the jumper between A1M2D06 and A1M2D08.

The trouble is a defective card at A1M2

OR

a defective card at A1D4.

Refer to (2-000) for printer function and timing tests.

Run the Ripple Print test to verify the repair.

026

Record the print positions that fired.

POWER DOWN

Refer to (5-000) for the hammer magnet circuits.

Trouble shoot for a ground from the hammer coil to the A1M2 card.

NOTE:

Set the resistance to the (R times 1) scale and compare th reading with a known good hammer coil circuit.

If the ground disappears when the A1M2 card is removed, install a new A1M2 card.

027

One or more hammer positions caused an (ANY HAMMER ON) check.

Refer to (5-000) for the hammer magnet circuits.

- Power down.

If the hammer positions that failed is an even number, re· ·ove hammer driver card at A1J2, and if the failing hammer position is an odd number, remove A1F2.

- Power up.

Reset the printer by pressing the Stop/Reset Key and then the Ready Key.

Does the check light come on?

Y N

028

The trouble is a defective hammer driver card at: even position is the A1J2 card

OR

odd position is the A1F2 card.

Refer to (2-000) for printer function and timing tests.

Run Ripple Print test to verify the repair.

029
Set the forms thickness lever to correspond to the number of forms.
Advance the forms at least 2 line spaces.
Reset the error by pressing the Stop/Reset Key.
Advance forms again and observe if any hammers fired.

Did any hammers fire?
Y N

030
Jumper A1M2D06 (+ hammer echo rtn) to A1M2D08.
Reset the Check Light by pressing the Stop/Reset Key.

Does the check light go off and stay off?
Y N

031
Remove the jumper from A1M2D06 to A1M2D08.

Did you start this call from the system entry maps?
Y N

032
Go to the system entry maps.

033
Probable trouble is the card at A1D4.
Or,
A defective interface cable at A1A4B12 to the system.
Refer to (3-000) for the interface lines.
Test for an open or short in the interface line.

034
Go to Page 4, Step 021, Entry Point B.

035
Record the print positions that fired.
POWER DOWN
Refer to (5-000) for the hammer magnet circuits.
Trouble shoot for a ground from the hammer coil to the A1M2 card.

NOTE:

Set the resistance to the (R times 1) scale and compare th reading with a known good hammer coil circuit.
If the ground disappears when the A1M2 card is removed, install a new A1M2 card.

DATA PARITY CHECK

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0012	A	1	001
0099	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	011	0073	A

001
(Entry Point A)

Ensure that the cable at A1A4 is seated properly.

Ensure that the A1H2 card is seated properly.

Refer to (2-000) for printer function and timing tests.
Run the Matrix Print test.

Do all hammers print correctly without a check?
Y N

002
Press the Stop/Reset key to reset any errors.
- Probe A1M2B03 (+ closed contactor).
Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

003
Go to Power Problem MAP 0070 Entry Point A.

004
Did you start this call from the system entry maps?
Y N

2 2 2

Data Parity Check indicates a parity check was detected on the hammer address buss.

The printer constantly monitors the data bits from the system that address the print positions for odd parity. If an even parity is detected a data parity check occurs.

005
Go to the system entry maps.

006
Possible trouble is a defective A1H2 card,
OR
a defective interface cable at A1A4 connector (-Data Bits/Parity Bit) to the system,
OR
A1A4D05 (- data parity check) to the system,
OR
A1A5D06 (+ POR) to the system.
Refer to (3-000) for the interface lines.
Test for an open or shorted interface line.

007
- Jumper A1H2B08 to A1H2D09.
Refer to 2-000 for printer function and timing testes.
- Run the matrix print test.

Does the Check light come on?
Y N

008
Remove the jumper from A1H2B08 to A1H2D09.

Did you start this call from the system maps?
Y N

009
Go to the system entry maps.

010
The probable trouble is a defective A1H2,
or
A defective interface cable from A1A4D05 to the system.
Refer to 3-000 for interface lines.
Test for an open or a short in the onterface line.

011
Remove the jumper from A1H2B08 to A1H2D09.
Trouble is intermittent. Some areas to verify are:
1. The cable that connects to A1A4 is not pinched or frayed.
2. The card at A1H2 is seated properly.
3. IF gate fan is not running,

Go To Map 0073, Entry Point A.

SMUDGE (SHADOW) PRINTING

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0014	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	018	0022	A

001
(Entry Point A)

Refer to (2-000) for smudge printing examples.
- Install multi-part forms.
- If multi-part forms are not available, go to entry point C.

- Set the forms thickness control to correspond with the number of forms.

Refer to (2-000) for printer function and timing tests.
- Run the Character Print test and print all H's.

Is the printing smudged?
Y N

002
Possible trouble is customer's forms or type arrangement.
- Stiff forms such as card stock can cause shadow printing.
- Printing of two close characters on the same subscan may cause a shadow print of a midway character.

003
Is printing on the second page smudged?
Y N

31JUL78 PN 8324028
EC 784068 PEC 155975B

004
(Entry Point C)

Probable ribbon trouble.
- Make the following ribbon tests:
- Left and right ribbon spools are installed correctly.
- The ribbon is outside the left and right guide rolls.
- The ribbon is threaded through the left and right guide rolls.
- The ribbon is between the ribbon shield and print belt.

Are the ribbon tests O.K.?
Y N

005
Correct the faulty ribbon condition.
Verify the fix.

006
Inspect the ribbon shield for wear or interference.

Is the ribbon shield O.K.?
Y N

007
Correct the faulty ribbon shield.

008
Go to Step 009, Entry Point D.

009
(Entry Point D)

Do all positions fail?
Y N

3
C D

010
(Entry Point B)

Is the smudge printing always the same hammer or group of hammers?
Y N

011
Smudge printing is random.
- Possibly the print belt is causing the failure.
- Install another print belt, if available, or inspect the original print belt for interference, or any irregularity.

Replace or repair the print belt.

012
Possible binding, loose or defective hammer.
- Determine hammer position(s) by aligning print with the platen scale.
- Remove the front paper guide.
- Using your spring hook, compare the movement of the suspected hammer(s) with a hammer that prints correctly. (Push/pull lower end of hammer.)

Is the suspected hammer(s) defective?
Y N

013
Refer to (5-000) for platen adjustments and checks.
Verify that the platen is adjusted correctly unless previously verified.

Is the platen gap correct?
Y N

014
Refer to (5-000) for platen adjustments and checks.
Adjust platen gap.
Refer to (2-000) for printer function and timing tests.
Run the Character Print tes and print all H's to verify the repair.

3 3
E F

015

- Inspect the following:
1. Print belt for interference of any irregularity.
2. Form path for obstructions.

Flight time the suspected hammer(s)

016

- Inspect for interference with plastic bumper between hammer and flight time screw.
- Remove hammer retaining plate from suspected hammer block.
- Inspect the following for:
1. Dirt or foreign material around the hammer.
2. Interference between the hammer and the coil.
3. Binding hammer pivot.
4. Interference between the hammer and the comb bar.

Replace or repair any faulty part.

5. Free movement of hammer return spring and plunger
6. Faulty Hammer Coil

(Burned, deformed, or Shorted Coil)

Refer to (5-000) for flight timing.

Adjust the flight time of the suspected hammer.

017

With the print belt running, observe the idler pulley through the hole in the cover to ensure that the print belt is running in a counter clockwise direction.

Is the direction of rotation correct?

Y N

018

Go To Map 0022, Entry Point A.

019

Verify that the print unit casting is held to the right (facing the printer) by the print unit casting spring.

The spring is located under the right rear of the print unit.

The form thickness control, which affects hammer fire time, may not be operating correctly.

Set the forms thickness lever to six.

(It is not necessary to insert six part forms)

Refer to (2-000) for printer function and timing tests.

Run the Impression Control SS timing test.

Is the single shot timing within tolerance?

Y N

020

Adjust impression control single shot.

(40-221)

Refer to (2-000) for printer function and timing tests.

Run the Character Print test and print all H's to verify the repair.

021

Refer to (5-000) for platen adjustments and checks.

Verify the platen is adjusted correctly.

Is the platen gap correct?

Y N

022

Refer to (5-000) for platen adjustments and checks.

Adjust platen gap.

Refer to (2-000) for printer function and timing tests.

Run the Character Print test and print all H's to verify the repair.

023

Go to Page 2, Step 010, Entry Point B.

HORIZONTAL CHARACTER CUT-OFF

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0014	A	1	001

001
(Entry Point A)

Refer to (2-000) for horizontal character cutoff.
- Install forms.
- Set form thickness control lever to 1 for single part forms, 2 for two part forms, etc.

Refer to (2-000) for printer function and timing tests.
- Run the Character Print test and Print several lines of H's.

Is The character cut-off on all characters?
Y N

002
Is The character cut-off on the same print position(s)?
Y N

003
Character cut-off is random.

- Ensure the print belt is installed correctly.
- Turn the print belt by hand and ensure there is no slippage or binds.
- Inspect for wear or excessive movement in the print belt drive pulley and print belt idler pulley.

Repair or replace any bad components.

004
Possible binding, loose or defective hammer(s).
- Determine hammer position(s) by aligning print with platen scale.
- Remove the front paper guide.
- Using your spring hook, compare the movement of the suspected hammer(s) with a hammer that prints correctly. (Push/Pull lower end of hammer.)

Is the movement of suspected hammer(s) defective?
Y N

005
Refer to (5-000) for flight timing procedure. Perform flight-time adjustment on the suspected hammer or hammers.

006
- Inspect for interference with plastic bumper between hammer and flight-time screw.
- Remove hammer retaining plate from the suspected hammer block.
- Inspect the following for:
  1. Dirt or foreign material around the hammer.
  2. Interference between the hammer and the coil.
  3. Binds in the hammer pivot.
  4. Interference between the hammer and the comb bar.
  5. Free movement of hammer return spring and plunger.
  6. Faulty Hammer Coil
  (Burned, Deformed, or Shorted Coil)

Adjust the flight time of the suspected hammer.
Replace or repair any faulty part.

007

- Verify the print unit casting is held to the right (facing the printer) by the print unit casting spring.

The spring is located under the right rear of the print unit casting.

- Verify that the hammer unit mounting screws are tight.

Refer to (4-000) for PSS information.

- Verify that the PSS transducer gap is correct.

Refer to (4-000) for PSS information.

-Perform PSS emitter adjustment if necessary.

HORIZONTAL REGISTRATION

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0014	A	1	001

001
(Entry Point A)

Refer to (2-000) for horizontal character registration.
- Install forms.
- Set the forms thickness control to correspond with the number of forms.

Refer to (2-000) for printer function and timing tests.
- Run the Character Print test and print all H's.

Is the print registration problem random?
Y N

002
Does the horizontal registration problem affect all print positions?
Y N

003
The print registration problem always occurs in the same print position.
Possible binding, loose or defective hammer.
- Determine hammer position(s) by aligning print with the platen scale.
- Remove the front paper guide.
- Using your spring hook, compare the movement of the suspected hammer(s) with a hammer that prints correctly.(Push/Pull lower end of hammer.)

(Step 003 continues)

(Step 003 continued)
Is the movement of suspected hammer(s) different?
Y N

004
- Inspect the following:
  1. Print belt for interference of any irregularity.
  2. Forms path for obstructions.

Refer to (5-000) for flight timing information.
Adjust the flight time of the suspected hammer(s).
Refer to (5-000) for platen to hammer unit adjustments.
3. Platen to hammer unit clearance.
Refer to (2-000) for printer function and timing tests.
Run the Character Print test and print all h's to verify the repair.

005
- Inspect for interference with plastic bumper between hammer and flight-time screw.
- Remove hammer retaining plate from suspected hammer block.
- Inspect the following for binds:
  1. Dirt or foreign material around the hammer.
  2. Interference between the hammer and the coil.
  3. Binding hammer pivot.
  4. Interference between the hammer and the comb bar.
  5. A Faulty Hammer Coil
  (Burned, Deformed, or Shorted Hammer Coil)

Refer to (5-000) for flight timing information.
Adjust the flight time of the suspected hammer.
Replace or repair any faulty part.
Refer to (2-000) for printer function and timing tests.
Run the Character Print test and print all H's to verify the repair.

006

-Verify that the print unit casting is held to the right (facing the printer) by the print unit casting spring.

The spring is located under the right rear of the print unit casting.

-Verify that the hammer unit mounting screws are tight.

Refer to (4-000) for PSS information.

- Verify that the PSS transducer gap is correct.

Perform the Pss emitter adjustment if necessary.

007

The cause of the horizontal registration problem is probably mechanical. The priority of units to inspect are:

Refer to (7-000) for paper clamp information.

- Inspect the lower paper clamp for holding the forms while printing.
- Inspect the print belt.
  1. Remove the print belt and insure the print belt and both print belt pulleys are free from dirt or foreign material.
  2. Inspect the print belt drive pulley and idle pulley for wear or excessive movement.
  3. Inspect the two print belt positioning rollers for binds,(Located at the rear of the print belt pulleys, under the print belt.).

Refer to (5-000) for platen to hammer unit adjustments.

Verify the platen to hammer unit gap.

- Inspect the tractors.
  1. There should be no movement between the tractor pin drum and the tractor shaft.
  2. There should be no lateral movement between the tractor shaft and the side frames.
- Inspect the hammer unit for being located correctly and the mounting screws are tight.

Repair or replace any faulty component.

Refer to (2-000) for printer function and timing tests.

Run the Character Print test and print all H's to verify the repair.

VERTICAL REGISTRATION

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0014	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	008	0040	A
1	003	0052	A
3	012	0052	A

001
(Entry Point A)

Refer to (2-000) for vertical print registration.
-The following determines if the problem is due to paper movement or belt movement.
-Load forms.
-Disengage the tractors from the carriage drive motor by pushing the carriage advance knob toward the printer.
Refer to (2-000) for printer function and timing tests.
-Run the Character Print test and print all H'S.
-If a forms jam occurs, reset the error.
-Print enough lines to observe if there are vertical registration problems.

Do vertical registration problems occur?
Y N

002
Refer to (2-000) for printer function and timing tests.
Run the Character Print test and print all H's.
Observe the paper clamp while printing.

Is the paper clamp operating?
Y N

003
See the Paper Clamp Failure map.
Go To Map 0052, Entry Point A.

004

The vertical registration problem is caused by paper movement.

Inspect the form path for interference between the forms and:

1. The carton that the forms are stored in.
2. Paper chute, especially in the area of the end-of-forms lever.
3. The lower paper clamp and/or forms drag assembly.
4. Tractors, especially where the tractor pins enter the holes in the forms.

Are there any interferences in the forms path?

Y N

005

Refer to (7-000) for forms pullout force information.

Test the pull-out force of the forms.

Is The Pull-Out force correct?

Y N

006

Adjust the Pull-out force.

Refer to (2-000) for printer function and timing tests.

Run the Character Print test and print all H's to verify the repair.

007

Inspect the carriage assembly for:

1. No movement between the tractor pin drums and tractor shaft.
2. No movement between the tractor vernier and tractor shaft.
3. No movement within the tractor vernier teeth when the vernier is engaged.

Refer to (4-000) for belt and pulley information.

4. No movement between the belt teeth and motor/vernier pulleys. Belt and pulleys not worn and adjusted correctly.

Is There Any Movement or Wear?

Y N

008

-Inspect the customer's forms. Refer to: Form Design Reference Guide for Printers GA24-3488.

If the trouble is not found, see the carriage motor failure map.

Go To Map 0040, Entry Point A.

009

Replace the worn component.

Refer to (2-000) for printer function and timing tests.

Run the Character Print test and print all H's to verify the repair.

010

Vertical registration problem is caused by print belt motion.

-Ensure the print belt is installed correctly.
-Turn the print belt by hand and ensure there are no binds or irregular motions.
-Inspect the belt drive pulley and print belt idle pulley for wear or excessive movement.
-Inspect the two print belt positioning rollers for wear or binds. (Located at the rear of the print belt pulleys, under the print belt.)

Repair or replace any bad component.

(Step 010 continues)

C D

Vertical Registration

(Step 010 continued)
Refer to (2-000) for printer function and timing tests.
Run the Character Print test and print all H's to verify the repair.

011
Refer to (2-000) for printer function and timing tests.
Observe the paper clamp while running the Character Print test and printing all H's.

Is the paper clamp operating?
Y N

012
See the Paper Clamp Failure map.
Go To Map 0052, Entry Point A.

013
Refer to (7-000) for paper clamp information.
Do the paper clamp service check.

Is the paper clamp service check all right?
Y N

014
Refer to (7-000) for paper clamp information.
Adjust the paper clamp.
Refer to (2-000) for printer function and timing tests.
Run the Character Print test and print all H's to verify the repair.

015
A vertical registration problem is caused by print belt motion.

Verify that the print belt is not damaged.
Refer to (4-000) for the pulley adjustment.
Verify the print belt pulley height adjustment.
Refer to (4-000) for belt installation information.
- Ensure the print belt is installed correctly.

Turn the print belt by hand and ensure that there are no binds or irregular motion.
Inspect the print belt drive pulley and print belt idler pulley for wear or excessive movement.
Inspect the two print belt positioning rollers for wear or binds (located at the rear of the print belt pulleys, under the print belt.
Refer to (8-000) for tractor shaft information.
If printing is up hill or down hill do the tractor shaft adjustment.
Refer to (2-000) for printer function and timing tests.
Run the Character Print test and print all H's to verify the repair.

VERTICAL CHARACTER CUT-OFF

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0014	A	1	001

001
(Entry Point A)

Vertical cutoff.
Probable ribbon trouble.
- Power off.
- Ensure that the ribbon is installed correctly.

1. - Turn each ribbon spool and observe the ribbon path.
2. - Both ribbon spools should turn freely.
3. - The ribbon should be threaded through both reverse switch actuating arms.
4. - The ribbon should be outside both guide rolls.
5. - The ribbon should be between the ribbon shield and the print belt.

Is the ribbon installed correctly?
Y N

002
Install the ribbon correctly.
Refer to (2-000) for printer function and timing tests.
Run the Character Print test and print all E's to verify the repair.

A

A

003
- Install multi-part forms and set the forms thickness control to the number corresponding to the number of forms.

Refer to (2-000) for printer function and timing tests.
- Run the Character Print test and print all E's.
- Compare the first form with the last form for vertical cut-off.

Is vertical cut-off present on the last form?
Y N

004
Refer to (6-000) for ribbon tracking.
Do the ribbon tracking adjustment.

005
- Observe the ribbon for tracking, especially for the ribbon moving up and down while printing all E's.

Is the ribbon tracking properly?
Y N

006
Refer to (6-000) for ribbon tracking.
Do the ribbon tracking adjustment and print all E's again to verify the repair.

007
Probable trouble with the print ribbon drive mechanics.
Refer to (6-000) for ribbon roller information.

1. - Inspect belt position rollers for wear.
2. - Inspect the belt idler pulley for the proper floating action (4-000).

Refer to (5-000) for platen to hammer unit information.

3. - Ensure that the platen to the hammer unit adjustment is correct.

Refer to (2-000) for printer function and timing tests.
Run the Character Print test and print all E's to verify the repair.

5211 CARRIAGE DRIVE

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0012	A	1	001
0014	A	1	001
0080	A	1	001
0099	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
9	073	0010	A
5	041	0050	A
2	010	0052	A
2	008	0073	A
3	017	0075	A

001
(Entry Point A)

The carriage is not operating properly.
- Power Down.
- Turn the forms advance knob and observe the tractors.

Do the tractors turn?
Y N

002
- Inspect the following:
  1. Worn or broken tractor(s).
  2. Belt pulley or motor binding.
- Repair or replace the bad parts.

Refer to (2-000) for printer function and timing tests.
Run the Carriage Space/Skip test to verify repair.

This map is used to analyze mechanical and electrical carriage drive failures.

NOTE:

To force a marginal carriage check or verify a carriage repair, additional torque should be applied to the tractor shaft.
The CE must use his own judgement as to how much torque to apply.

003

- Inspect the following parts:
  1. Carriage drive belt. Adjust or replace
Refer to (8-000) for carriage pulley information.
2. Broken or loose pulley adjust or replace.
Refer to (8-000) for carriage shaft information.
3. Vernier failure. Replace shaft.

Are belt, pulley, and vernier correct?

Y N

004

Repair or replace the bad parts.
Refer to (2-000) for printer function and timing tests.
Run the Carriage Space/Skip test to verify the repair.

005

- Remove forms from the tractors.
- Manually pull forms through the forms path.

Forms should pull evenly with no noticeable obstructions.

Do the forms pull evenly with equal tension on both sides?

Y N

006

Inspect the forms path for obstructions (7-000).
Verify the clampbar is not interfering. See paper clamp adjustment (7-000).
Do the forms tension service check (7-000).

007

Power on, press Stop/Reset key to reset the error.

Is the gate fan running?

Y N

008

See the Gate Fan Failure map.
Go To Map 0073, Entry Point A.

009

Refer to (7-000) for paper path information.
-Power on, press Stop/Reset Key to reset the error.

Can you pull forms through the paper path?

Y N

010

See the Paper Clamp Failure map.
Go To Map 0052, Entry Point A.

011

Press the Stop/Reset Key.
At this time the Check Light should stay off.

Is the Check Light off?

Y N

012

Ensure the Carriage Go CE2 switch is off.
-Probe A1P2J04 (- CARR GO).
Up Light: ON
Down Light: OFF

Are the lights correct?

Y N

013

Did you start this call from the system entry maps?

Y N

014

Go to the system entry maps.

015

Probable trouble is the card at A1P2,
OR
a faulty interface cable from A1A5D04 to the system.
Refer to (3-000) for the interface lines.
Test for an open or short in the interface line.

016
Ensure CE switch 2 (carriage go) is set off.
-Probe A1P2U06 (- carr CE SW-2 N/O).
Up . Light: ON
Down Light: OFF

Are the lights correct?
Y N

017
Go To Map 0075, Entry Point A.

018
Install a new A1P2 card.

019
The carriage should be partially detented.
- Use meter on +25 volt DC scale.
- Measure for 6 to 13 volts DC at:
  A1Q2U12 (+ PED DRV A CARR MTR)
  A1Q2S04 (+ PED DRV B CARR MTR)

(-Lead to frame ground).

Is 6 to 13 volts present on each pin?
Y N

The carriage motor should be electrically detented at this time. The motor should not turn freely. However, the customer should be able to turn the carriage knob.

020
- Probe A1Q2S07 (- Ped Dr control latch).
Up light: ON
Down light: OFF

Are the lights correct?
Y N

021
Replace the A1P2 card.

022
(Entry Point B)

Power off.

Refer to (8-000) for the carriage motor.
CARRIAGE CONTROL CARD CHECKOUT.
- Disconnect P1 (carriage motor plug).
Power on.
Press the Stop/Reset Key to reset any errors.
Refer to (2-000) for CE switch operation.
Verify that the CE switches are functioning properly.
- Turn CE switch 2 (Carriage Go) on.
- Rotate the carriage motor by turning the carriage knob.
- Turn the tractor knob slowly while probing the following pins.
  A1P2B12 (phase A)
  A1P2B10 (phase NOT A)
  A1P2D12 (phase B)
  A1P2D11 (phase NOT B)

Up Light: FLASHING
Down Light: FLASHING

Are the lights correct for all pins?
Y N

023
Turn the tractor knob slowly while probing A1P2S12 (+ carr motor FB).
Up Light: FLASHING
Down Light: FLASHING

Are the lights correct?
Y N

024
Install a new card in A1D4,
OR
install a new card in A1P2.

025
Install a new card in A1P2.
OR
install a new card in A1Q2.
Refer to (2-000) for printer function and timing tests.
Connect the P1 connector and run the Carriage Space/Skip test to verify the repair.

026
- Probe A1Q2S07 (- Ped dr control card).
Up Light: OFF
Down light: ON

Are the lights correct?
Y N

027
Replace the A1P2 card.
Refer to (2-000) for printer function and timing tests.
Reconnect P1 connector, and run the Carriage Space/Skip test to verify the repair.

028
- Turn CE switch 2 (Carriage Go) off.
Power off.
Reconnect P1 connector.
Refer to (8-000) for the carriage motor.
- Do the carriage motor service check.

Does the carriage motor appear to be correct?
Y N

029
Test for opens or grounds and correct all errors found during the carriage motor circuit test.
Refer to (2-000) for printer function and timing tests.
Run the carriage Space/Skip test to verify the repair.

030

Measure resistance (Rx1 scale)
from A1Q2U12 to frame ground, and
from A1Q2S04 to frame ground.

The resistance on both pins to frame ground should be grater than 20 ohms.

Is the resistance correct?

Y N

031

Refer to 8-000 for carriage motor circuit.
Probable ground in the carriage motor circuit, or a defective A1Q2 card.
Troubleshoot each output pin of A1Q2 card for a ground. If the ground disappears by removing the A2Q2 card, replace the card.

032

Power on.
Press the Stop/Reset Key to reset any errors.
Remove forms from the tractors.
Set CE switch 2 (carriage go) on and off at least 10 times.

Does the carriage motor ever run backwards?

Y N

033

Go to Page 7, Step 052, Entry Point C.

034

Set CE switch 2 off.
Refer to (2-000) for printer function and timing tests.
Run the Carriage Emitter timing test to measure the LED timing.

Is the timing correct?

Y N

035

Refer to (8-000) for carriage LED information.
Adjust the carriage LED.

Can you make the adjustment?

Y N

036

The trouble is a defective card in A1Q2.

037

Refer to (2-000) for printer function and timing tests.
Run the Space/Skip test to verify repair.

038

The trouble is a defective card in A1Q2.

039

- Remove forms from the tractors.

Refer to (2-000) for CE switch operation.

- Set CE switch 2 (Carriage Go) on and off at least 8 times.

Will the carriage motor turn continuously each time in the proper direction?

Y N

040

Press the Stop/Reset Key to reset any errors.
- Probe A1D4G10 (+POR)

Up Light: OFF
Down Light: ON

Are the lights correct?

Y N

041

Use the POWER ON RESET MAP.
Go To Map 0050, Entry Point A.

042

Procedure to test the carriage LED assembly.
This procedure tests if a signal is sensed each time the led goes from light to dark.

- Power down.

Refer to (8-000) for the carriage motor.
Disconnect connector P1 (Carriage motor plug).

- Power on, press Stop/Reset key to reset the error.

- Turn the (Carriage Go) CE switch 2 on.

- Probe A1D4B13 (+Carriage M Feedback).

- Turn the tractor knob very slowly for at least 360 degrees while observing the probe.

The signal level should change with each hole in the carriage motor disk.

```
Up   Light: FLASHING
Down Light: FLASHING
```

Are the lights correct?

Y N

043

- Connect P1 connector.
- Inspect TB5 and ensure the terminals are tight.

Refer to (8-000) for the carriage motor.

- Refer to Section (Carriage Motor LED Circuit) and test the LED cable for opens or grounds from the logic board at A1Z1 to TB5.

Is there a defective circuit?

Y N

P Q R

P Q R

044

Probable trouble is a defective LED assembly,

OR

a defective card at A1D4.
Refer to (2-000) for printer function and timing tests.
Run Carriage Space/Skip test to verify repair.

045

Refer to (2-000) for printer function and timing tests.
Repair the defective circuit and run the Carriage Space/Skip test to verify the repair.

046

- Ensure the plug P1 is disconnected (carriage motor plug).
- Set CE switch 2 (Carriage Go) on.
- Measure for +25vdc at:

A1Q2U12 (- PED DRV A CARR MOTOR)
A1Q2S04 (- PED DRV B CARR MOTOR)

(-) Lead to frame ground.

Is 25 volts DC present?

Y N

047

- Probe A1Q2S07 (- Ped Dr control latch)

```
Up    light: OFF
Down  light: ON
```

Are the lights correct?

Y N

048

Install a new card in A1P2.
Connect the P1 connector.
Refer to (2-000) for printer function and timing tests.
Run Carriage Space/Skip test to verify repair.

7 7
S T

049
Probable trouble is a defective card in A1Q2,
OR
a defective card in A1P2.
Connect the P1 connector.
Refer to (2-000) for printer function and timing tests.
Run the Carriage Space/Skip test to verify the repair.

050
Go to Page 4, Step 022, Entry Point B.

051
- Visually inspect the operating carriage motor for:
- Unusual noise .
- Unstable motion (oscillation or hesitation).

Are any of the visual indications present?
Y N

052
(Entry Point C)

- Remove the forms from the tractors.
- Set CE switch 2 (Carriage Go) on.
- Probe A1P2D04 (- Carr advance pulses).
  Up light: ON
  Down light: ON

Are the lights correct?
Y N

053
Probable trouble is the A1P2 card.
Or,
A faulty interface cable from A1A5B07 (-Carriage Advance) to the system.
Refer to (3-000) for the interface lines.
Test for an open or short in the interface line.

054
- Set CE switch 2 (Carriage Go) off.
Refer to (2-000) for printer function and timing tests.
- Run the Carriage emitter timing test to measure led timing.
Answer no if the timing test does not run.

Is timing correct?
Y N

055
DANGER
Use caution when adjusting the LED to avoid the sharp edge of the emitter disk.
NOTE: Prior to adjusting the carriage LED timing ensure :
- The timing disk windows are clean.
- The set screw holding the timing disk collar is tight.
- The carriage belt tension is correct (8-000).
- The carriage shaft is free of binds.

Refer to (8-000) for carriage LED information.
Adjust the carriage motor led assembly.
Answer no if no test results appear.

Can you make the adjustment?
Y N

056
Remove the forms.
Set (Carriage Go) CE switch 2 on.
-Probe A1A5B07 (-carriage advance).

Are the lights correct?
Y N

057
Set CE switch 2 off.

Did you start this call from the system entry maps?
Y N

058
Go to the system entry maps.

059
Probable trouble is the card at A1P2
or
A faulty interface line from A1A5B07 (-carriage advance) to the system.
Refer to (3-000) for the interface lines.
Test for an open or a ground in the interface line.

060
-Probe A1A5B08 (-impression CTL SS).
-Set (carriage Go) CE switch on and off.
UP LIGHT: OFF
DOWN LIGHT: ON

Are the lights correct?
Y N

061
-Set (carriage Go) CE switch off.
Install a new A1P2 card.

062
-Set (carriage Go) CE switch off.
Refer to (8-000) for carriage pulley information.
Install a new carriage disk and LED assembly.

063
Refer to (2-000) for printer function and timing tests.
Run Ripple Print test to verify the repair.

064
- Turn CE switch 2 (Carriage Go) off.
- Load forms
- Press the Carriage Space Key several times and observe the tractors.

If a check light comes on press the Stop/Reset key to reset the check.

Do the tractors move?
Y N

065
If the check light comes on press the Stop/Reset to reset the check.
- Probe A1P2J04 (- Carriage Go) while pressing the Carriage Space Key.

```
Up    light: DON'T CARE
Down  light: FLASHING
```

Are the lights correct?
Y N

066
- Probe A1A5D04 (- carr go) while pressing the Carriage Space Key.

```
up light: DON'T CARE
down light: FLASHING
```

Are the lights correct?
Y N

067
Did you start this call from the system entry maps?
Y N

068
Go to the system entry maps.

069
The possible trouble is a defective card at A1P2 or a defective cable from A1A5D04 (- CARR GO) to the system.
Refer to (3-000) for the interface lines.
Test for an open or short in the interface cable.

070
Open land pattern from A1P2J04 to A1A5D04.
OR
a bad A1P2 card.

071
Refer to (2-000) for printer function and timing tests.
Run Carriage Space/Skip test.

Will the test run correctly?
Y N

072
Install a new card in A1Q2,
OR
Install a new card in A1P2.

073
See the printer entry map.
Go To Map 0010, Entry Point A.

074
Refer to (2-000) for printer function and timing tests.
- Run the Carriage Space/Skip test.

Will the carriage still fail?
Y N

075
Refer to (2-000) for printer function and timing tests.
Run the Carriage Space/Skip test again to verify the repair.

076
Go to Page 4, Step 022, Entry Point B.

077
Go to Page 4, Step 022, Entry Point B.

POWER ON RESET

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0010	A	1	001
0011	A	1	001
0022	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	007	0070	A
2	011	0075	D

001
(Entry Point A)

Refer to (9-000) for the POR circuitry.
Probe A1D4G09 (+ POR system).
Up Light: OFF.
Down light: ON.

Are the lights correct?
Y N

002
Ensure the connector at A1A5 is installed correctly.

Did you start this call from the system entry maps?
Y N

003
Go to the system entry maps.

004
Refer to (3-000) for the interface lines.
Probable trouble is a faulty A1D4 card, or A1M2 card, or an open or short in the interface line A1A5D06 (+POR) to the system.

005
- Probe A1D4G08 (+ POR PS).
Up Light: OFF.
Down Light: ON.

Are the lights correct?
Y N

006
Refer to (13-000) for cable plugging information.
Ensure that the connector located in A1Z2 and PS27 located in the power supply is installed correctly.

Is the problem corrected?
Y N

007
See power problem map.
Go To Map 0070, Entry Point A.

008
Go to Page 1, Step 001, Entry Point A.

009
- Probe A1D4G07 (- POR FE).
Up Light: ON.
Down light: OFF.

Are the lights correct?
Y N

010
- Ensure CE switch 4 (Paper Clamp) is off.
- Probe A1P2P06 (+ FE paper clamp switch N/C).
Up Light: OFF.
Down Light: ON.

Are the lights correct?
Y N

B C D

011
Ensure the connector in A1V3 is installed correctly.
Test CE switch 4 (Paper Clamp) for correct operation.
Go To Map 0075, Entry Point D.

012
Install a new card in A1P2.

013
Refer to (9-000) for the POR circuitry.
POWER DOWN,
Remove the following cards,
A1H2, A1N2 and A1P2 (also A1T4 if installed).
POWER ON
Press the Stop/Reset key to reset any errors.
-Probe A1D4G10
Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

014
Install a new card in A1D4 and reinstall all other cards that were removed.

015
One of the removed cards is faulty.
Reinstall each of the removed cards one at a time while probing A1D4G10.
The card that puts the up light (ON) is faulty.
The Stop/Reset key must be pressed whenever the Check Light come on.

5211 FORMS JAMS

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0012	A	1	001
0099	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	022	0052	A

001
(Entry Point A)

This map is used to analyze a forms jamming condition or if the forms light comes on when no forms jam exists.

Any loose paper debris such as feed-hole chads and forms fastening crimps in the forms-feed hole area may cause false forms checks.

Are the forms jamming?
Y N

002
Power on.
Press Stop/Reset Key to reset any errors.
Press the Carriage Space Key.
Do the forms space?
Y N

003
GO to map 0040 (Carriage Drive).

004
The symptoms for this device are:
1. Failing to detect a paper jam.
   or
2. False sensing of a paper jam when no jam has occurred.

Both symptoms require a checking of the units in the feature.

The optic sensing area (on left tractor) must be clean.
- Clean the sensing area with a soft cloth, (no abrasive).

(Step 004 continues)

(Step 004 continued)
- Test jam detection operation.

Refer to (8-000) for the forms jam sensing circuit.
- Probe A1V2B07.
- Press carriage knob in, and turn carriage knob with forms in the printer.

Up Light: ON OR FLASHING
Down Light: FLASHING

Are the lights correct?
Y N

005
Power Off,
Refer to (8-000) for the forms jam sensing circuit.
Refer to forms jam sensing circuit and test the LED cable for opens or grounds from the logic board A1Z1 to P9.
Test continuity of the LED at P9-3 and P9-4 for low resistance in one direction and high resistance in the other).

Is the circuit correct?
Y N

006
Correct the circuitry,
Or
Refer to (2-000) for printer function and timing tests.
Replace the LED assembly and run the Carriage Space/Skip test to verify the repair.

007
Probably a bad LED assembly,
Or
a defective card in A1V2
Or
a defective card in A1P2.
Refer to (2-000) for printer function and timing tests.
Run the Carriage Space/Skip test to verify the repair.

008
- Probe A1P2P11 (+ disable UTS),

Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

009
Install a new card at A1N2.

010
Did you start this call from the system entry maps?
Y N

011
Go to the system entry maps.

012
Probable trouble is a faulty A1P2 card.
Or
Trouble is a faulty cable from A1A5B06 to the system.
Refer to (3-000) for the interface lines.
Test for an open or a short in the interface cable.

013
Forms are jamming within the paper path of the printer.
Refer to (7-000) for paper path information.
- Observe the forms thickness control.

Is the forms thickness control set correctly?
Y N

014
Set the forms thickness control to the correct setting.
Refer to (2-000) for printer function and timing tests.
- Run the Carriage Space/skip test several times to verify the fix.

015

- Observe the forms chute guide on the paper chute.
- The forms guide should not interfere with the forms.

Is the forms guide guiding the forms ?

Y N

016

Set the forms guide to just touch the forms.

Refer to (2-000) for printer function and timing tests.

- Run the Carriage Space/Skip test several times to verify the fix.

017

- Observe the lower ribbon shield.
- The ribbon shields should not interfere with the forms nor have any jagged edges.

Is the ribbon shield O.K.?

Y N

018

Refer to (6-000) for ribbon shield information.

Replace the ribbon shield.

Refer to (2-000) for printer function and timing tests.

- Run the Carriage Space/Skip test several times to verify the fix.

019

Refer to (7-000) for the forms tension service check.

- Perform the tension service check.

Is the pull-out force correct?

Y N

020

Refer to (7-000) for the forms tension assembly.

Adjust the forms tension assembly.

Refer to (2-000) for printer function and timing tests.

- Run the Carriage Space/Skip test several times to verify the repair.

021

Refer to (2-000) for printer function and timing tests.

Run the Carriage Space/Skip test while observing the paper clamp armature.

Does the paper clamp energize and de-energize?

Y N

022

See the Paper Clamp Failure map.

Go To Map 0052, Entry Point A.

023

- Set the stacker according to the recommended procedure.

Refer to (2-000) for printer function and timing tests.

- Run the Carriage Space/Skip test several times and observe the forms feeding into the stacker.
- The forms should free-fall into the stacker without stiffening or backing up into the printer.

Do the forms feed into the stacker correctly?

Y N

024

Refer to (10-000) for the static eliminator (tinsel).

Verify the static eliminator is installed correctly.

025

Refer to (7-000) for paper clamp check or adjustment.

Do the lower paper clamp service check.

Is the lower paper clamp correct?

Y N

026

Refer to (7-000) for paper clamp check or adjustment.

- Do adjustments for the lower paper clamp.

Refer to (2-000) for printer function and timing tests.

- Run the Carriage Space/Skip test several times to verify the fix.

027

Refer to (5-000) for the platen service check.

Do the platen gap service check.

Is the platen gap correct?

Y N

028

Refer to (5-000) for the platen gap adjustment.

Do the adjustments for the platen gap.

Refer to (2-000) for printer function and timing tests.

- Run the Carriage Space/Skip test several times to verify the fix.

029

Areas that could cause feeding problems that should not be overlooked are:

- Static electricity relative humidity at least 27%
- Customer's forms
- Printing at least 1/2 inch from perforation
- Multi-part forms should be fastened on the right side .
- Forms should be free of chads.
- No hard or metallic fasteners.
- Forms thickness should not exceed .020 in. thickness.

Refer to the forms design reference guide FN GA24-3488 for additional information.

PAPER CLAMP FAILURES

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	005	0075	A

001
(Entry Point A)

This map is used to analyze mechanical and electrical paper clamp failures.

- Check paper clamp failures as follows:
- Open the cover.
- Press the Stop/Reset Key to reset any checks.
- Remove the forms from the tractors.
- Load single part paper.

Refer to (2-000) for CE switch operation.

- Set CE switch 4 (Paper Clamp) on.
- Paper should be held tight by the paper clamp.

Is The Paper Held Tight By The Paper Clamp?
Y N

002
- Set CE switch 4 (Paper Clamp) off then on.

Does The Paper Clamp Move?
Y N

003
Refer to (7-000) for the paper clamp circuit.
With meter set for correct scale, measure for 25 volts DC (+) A1Q2G04,(-) frame ground.
- Set CE switch 4 (Paper Clamp) on.

Voltage should go from 25 volts to 0 volts.

Is 0 volts present?
Y N

004
- Probe A1P2P07 (-Paper Clamp CE Switch 4).
- Set CE switch 4 (Paper Clamp) on.

Up Light: OFF
Down Light: ON

Are The Lights correct?
Y N

005
- CE Switch 4 (Paper Clamp) failure.
Go To Map 0075, Entry Point A.

006
- Set CE Switch 4 (Paper Clamp) on.
Probe A1P2B03.

Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

007
Install a new A1P2 card.
Verify the fix by ensuring the paper is held tight when activating CE switch 4 (Paper Clamp).

008
Install a new A1Q2 card.
Verify the fix by ensuring the paper is held tight by activating CE Switch 4 (Paper Clamp).

009
- Disconnect P3 plug..
- With meter set for correct scale, measure the female side for 25 volts DC (+)P3 pin 1 (-) P3 Pin 2.

Is 25 Volts Present?
Y N

E F

010
- Ensure the A1V5 connector is seated correctly.
- Test for an open cable.

To test:
Measure for continuity between P3 pin 2 and A1Q2G04.
Measure for 20 ohms between P3-1 and A1Q2G10.
- Install a new A1Q2 card.

011
- Ensure the P3 pins are making contact.

Refer to (7-000) for paper clamp solenoid information.
- Replace the lower paper clamp solenoid.

012
Paper clamp moves but does not clamp paper.
Refer to (7-000) for paper clamp information.
Do the paper clamp service check and adjustment.

013
Is clamping equal across the width of the paper?
Y N

014
Refer to (7-000) for paper clamp information.
Do the paper clamp service check and adjustment.

015
Set CE Switch 4 (Paper Clamp) off.

Does the paper clamp return under spring tension?
Y N

3 3
G H

016

- Check the following:
  1. Binding clamp, guide, or linkage.
  2. Bind or residual magnetism in the lower clamp solenoid.
  3. Disconnect P3.
  4. Power on.
  5. Press Stop/Reset Key to reset any errors.
- Probe A1A5D07 (- activate paper clamp).

Up Light: ON
Down Light: Off

Are the lights correct?
Y N

017
Did you start this call from the system entry maps?
Y N

018
Go to the system entry maps.

019
The probable trouble is a defective card in A1P2,
OR
a defective interface line from A1A5D07 to the system.
Refer to (3-000) for the interface lines.
Check for open or shorts in the interface line.

020
Install a new card in A1Q2,
OR
a new card in A1P2.

021

- Paper clamp operates properly with (Paper Clamp) CE switch activated but not under normal operation.
- Load single part forms into the tractors.

Refer to (2-000) for printer function and timing tests.

- Run Character Print test and print blanks.
- Probe A1Q2G03 (-Activate Paper Clamp)

Up Light: ON
Down Light: ON

Are The Lights correct?
Y N

022
Refer to (2-000) for printer function and timing tests.
Run the Character Print test and print blanks.
-Probe A1P2M04 (-activate paper clamp)

Up Light: ON
Down Light: ON

Are the lights correct?
Y N

023
- Reseat the cable connector at A1A5.
- Probe A1A5D07 while printing blanks and spacing.

Up light: DONT CARE
Down Light: ON.

Are the lights correct?
Y N

024
Did you start this call from the system entry maps?
Y N

025
Go to the system entry maps.

026
The probable trouble is a faulty cable from A1A5D07 to the system.
Refer to (3-000) for the interface lines.
Test for an open or a short in the interface line.

027
The trouble is an open land from A1A5D07 to A1S2G03.

028
Install a new A1P2 card.

029
Replace A1Q2 card.
Refer to (2-000) for printer function and timing tests.
Run the character print test to verify repair.

PRINT UNIT INTERLOCK SWITCH

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0099	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
1	005	0073	A
1	003	0087	A

001
(Entry Point A)

Open the print unit.

This map is used to analyze a faulty print unit interlock switch circuit.
There is one interlock switch.
The print unit interlock switch.

The switch is the hall effect and requires three leads to it.

1. Black-ground.
2. Red +5volts
3. Yellow-signal

If the switch is opened, ready will drop and put the interlock light on.

Is the interlock light on or flashing?
Y N

002
Jumper pin A1A3D11 to A1A3D08.

Does the interlock light come on?
Y N

003
Remove jumper, see print unit interlock light map.
Go To Map 0087, Entry Point A.

004
Is the gate fan running?
Y N

005
See the Gate Fan Failure map.
Go To Map 0073, Entry Point A.

2A 2B

006

Go to Step 007, Entry Point B.

007

(Entry Point B)

If pin A1A3D11 to A1A3D08 is jumpered, remove the jumper.
Test the print unit interlock switch.
- Close the print unit.
- Probe A1A5B04 (- throat closed).

Up Light: OFF
Down Light: ON

Are the lights correct?

Y N

008

(Entry Point C)

Open the print unit and manually activate the print unit interlock switch.
- Probe A1A5B04 (- throat closed).

Up Light: OFF
Down Light: ON

Are the lights correct?

Y N

009

Remove the yellow switch wire and ground it to the frame.

Did the down light come on?

Y N

010

Refer to (5-000) for print unit interlock information.
Open cable from A1A5B04 to pin 3 of interlock switch.

011

Replace the yellow wire,
Measure with a multi meter(+) on the throat switch red lead,(-) on the black lead.

Did you measure 5 volts DC?

Y N

012

Refer to (5-000) for print unit interlock information.
Test for a missing ground on the black wire,

OR

Refer to (9-000) for the voltage distribution diagram.
Troubleshoot to find the missing + 5 volts.

013

Refer to (5-000) for print unit interlock adj.
Replace the throat switch.

014

Release the print unit interlock switch.
- Probe A1A5B04 (- throat closed).

Up Light: ON
Down Light: OFF

Are the lights correct?

Y N

015

Go to Page 3, Step 022, Entry Point D.

016

Refer to (5-000) for print unit interlock adj.
Adjust the throat switch.

017
Open the print unit.
- Probe A1A5B04 (- throat closed).
Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

018
Go to Page 2, Step 008, Entry Point C.

019
Did you start this call from the system entry maps?
Y N

020
Go to the system entry maps.

021
The probable trouble is a faulty cable from A1A5B04 to the system.
Refer to (3-000) for the interface lines.
Test for an open or a short in the interface line.

022
(Entry Point D)

Did you start this call from the system entry maps?
Y N

023
Go to the system entry maps.

024
Possible trouble is a bad interface cable from A1A5B04 to the system.
Refer to (3-000) for the interface lines.
Test for an open or short in the interface line.

END OF FORMS SWITCH PROBLEM

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0012	A	1	001
0014	A	1	001
0086	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
1	003	0086	A

This map is used to analyze a faulty end of forms switch circuit problem.

001
(Entry Point A)

Remove forms from the printer.
Manually activate the end of forms switch.
Push down on the EOF switch lever.
Ensure that the lever pivots freely and activates the EOF plunger.
- Probe A1A5B02 (+ end of forms).

Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

002
(Entry Point B)

- Jumper pin A1A3D12 to A1A3D08.

Does the Forms Light come on?
Y N

003
Remove jumper from A1A3D12 to A1A3D08.
Go To Map 0086, Entry Point A.

3 2
A B

004
0.2- Remove the jumper from A1A3D12 to A1A3D08.
Refer to (7-000) for EOF information.
- The wires on the EOF switch have slip-on connectors.
- Slip the wires back to connect the CE meter leads without disconnecting the wires from the switch.
- Measure for 5 volts DC from (+) pin 2 red wire) to (-) pin 1 (black wire).

Is 5 volts present?
Y N

005
Verify that connector A1Z1 is seated correctly.
Refer to (7-000) for EOF information.
Measure for 5 volts DC from (+) pin 2 (red wire) to (-) frame ground.

Is 5 volts DC present?
Y N

006
Measure for 5 volts DC from (+) A1C5D03 to (-) ground.

Is 5 volts DC present?
Y N

007
Refer to (9-000) for the voltage distribution diagram.
Troubleshoot for missing 5 volts DC.

008
Your trouble is an open connector at A1B6D02,
OR
an open cable from A1B6D02 to A1B6D02.

009
Your trouble is an open connector at A1B6E02,
OR
an open cable from A1B6E02 to the EOF switch.

010
- Connect the EOF switch wires.
- Probe A1A5B02 while de-activating the EOF switch.

(Lift the switch lever up).

Up Light: DON'T CARE
Down Light: ON

Are the lights correct?
Y N

011
Measure for continuity from A1A5B02 to pin 3 (yellow wire) of the (END OF FORM) switch.

Is continuity present?
Y N

012
Your trouble is an open connector at A1B6C02,
OR
an open cable from A1B6C02 to pin 3 of the EOF switch.

013
Refer to (7-000) for EOF information.
Replace the EOF switch.

014
Did you start this call from the system entry maps?
Y N

015
GO to the system entry maps.

016

Refer to (7-000) for EOF information.
The probable trouble is the EOF switch.

OR

The probable trouble is a faulty cable from A1A5B02 to the system.
Refer to (3-000) for the interface lines.
Test for an open or short in the interface line.

017

Deactivate the end of form switch.
(Pull up on the EOF lever).
- Probe A1A5B02 (+ end of forms).

Up Light: OFF
Down Light: ON

Are the lights correct?

Y N

018

Go to Page 1, Step 002, Entry Point B.

019

Refer to (7-000) for EOF information.
Perform the End of Forms Switch adjustment.

CABLE INTERLOCK CHECK

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0012	A	1	001

001

(Entry Point A)

CABLE INTERLOCK CHECK.

Ensure the cable connector at A1A2, A1A3, A1A4, and A1A5 are connected.

Ensure the cable to the operator control panel in the printer is connected properly.

Ensure the interface cables in the system are connected properly.

Refer to (3-000) for cable interlock information.

- Connect one end of a jumper to any D08 (ground) pin.
- Jumper the following pins in sequence.

Each time you jumper a pin press the Stop/Reset Key then the Ready Key.

The Ready Light will come on if the check can be reset.

- If it resets, this indicates the open circuit is between the pin that is jumpered now and the previous pin that was jumpered.

JUMPER:

1. - A1A3D04 to D08.
2. - A1A3B13 to D08.
3. - A1A5B13 to D08.
4. - A1A4B13 to D08 to isolate the open.

Has the trouble been located?

Y N

2 2

This map is used to analyze a cable interlock check.

A cable interlock will occur if the interface cable at A1A3, A1A4, A1A5 or the cable from A1A2 to the operator control panel in the printer is disconnected.

One end of a series loop is tied to ground at the system. It feeds through the three interface cables plus the operator control panel cable and terminates in a card at the system.

An open in the series loop will cause an up level at the card in the system resulting in a 'CABLE INTERLOCK CHECK'.

002

Refer to (3-000) for cable interlock information.

If the cable interlock check light cannot be reset, the trouble is an open between A1A4B13 and the card in the system.

003

Refer to (3-000) for cable interlock information.

Troubleshoot for an open circuit.

Refer to (2-000) for printer function and timing tests.

Run Ripple Print test to verify the repair.

RIBBON UNIT

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0012	A	1	001
0014	A	1	001
0099	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	004	0073	A

001
(Entry Point A)

Verify that the ribbon is installed correctly.

- Power down.

- Manually turn each ribbon spool and observe the ribbon path.

This map is used to analyze a mechanical or an electrical failure in the ribbon unit.

Correct Ribbon Installation:

- Both ribbon spools turn freely with power off.
- The ribbon is threaded through both reverse switch actuating arms.
- The ribbon is outside both guide poles.
- The ribbon is between the ribbon shield and print belt.

Does the ribbon feed smoothly in both directions?
Y N

002
Test for the following:
- Obstructions in the ribbon path.
- Ribbon jam within the left or right ribbon spool.
- Forms thickness control is correct.
- Left or right ribbon motor binding.

003
Power on, press Stop/Reset key to reset the error.

Is the gate fan running?
Y N

004
See the Gate Fan Failure map.
Go To Map 0073, Entry Point A.

005
Refer to (15-000) for the ribbon control circuit.
Probe A1P2G03 while manually operating (holding) the left ribbon reverse switch lever.
Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

006
Power off.
Remove one wire from the left ribbon reverse switch.
Test for continuity from the common to the normally open terminals of the left ribbon reverse switch while manually operating (holding) the switch.

Do you get continuity only when the switch is activated?
Y N

007
Refer to (6-000) for ribbon reverse switch information.
Replace the left ribbon reverse switch.

008
Reconnect the wire that was removed from the switch.
Refer to (15-000) for the ribbon control circuit.
Locate an open or short in the cable between A1P2G03 and Ground.

009
- Probe A1P2G03 (left spool switch).
- Release the left ribbon reverse switch.

Up Light: ON
Down Light: Off

Are the lights correct?
Y N

010
Install a new card at A1P2.

011
Probe A1P2J02 while manually operating (holding) the right ribbon reverse switch lever.
Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

012
Power off.
Remove one wire from the right ribbon reverse switch.
Test for continuity between the common to the normally open terminal of the right ribbon reverse switch while manually operating (holding) the switch.

Do you get continuity only when the switch is activated?
Y N

013
Refer to (6-000) for ribbon reverse switch information.
Replace the right ribbon reverse switch.

014
Reconnect the wire that was removed from the switch.
Refer to (15-000) for the ribbon control circuit.
Locate an open or short in the cable between A1P2J02 and Ground.

015

- Probe A1P2J02 (right spool switch).
- Release the right ribbon reverse switch.

Up Light: ON
Down Light: OFF

Are the lights correct?

Y N

016

Install a new card at A1P2.

017

Test if the ribbon motors operate correctly.

To test:

- Remove ribbon.

Compare the torque of the left and right ribbon motors by holding the ribbon spool hub and applying pressure with your fingers. The torque should be equal.

- Refer to (2-000) for CE switch operation.
- Set (Ribbon Go) CE switch 3 on.
- Manually operate the left ribbon reverse switch. The left ribbon motor should run.
- Verify the torque.
- Manually operate the right ribbon reverse switch. The right ribbon motor should run.
- Verify the torque.

Do both ribbon motors operate correctly with equal torque?

Y N

018

Do both motors fail to operate?

Y N

019

Turn off CE switch 3 (ribbon go), reinstall ribbon.

Turn on CE switch 3 (ribbon go).

NOTE: If a ribbon spool is empty and the ribbon eyelet does not reverse the ribbon motor, set the (Ribbon Go) CE switch 3 off. Manually rewind the ribbon from the full to the empty spool, then set (Ribbon Go) CE switch 3 on.

Activate the right ribbon reverse switch.

Does the right motor fail to operate correctly?

Use some torque if necessary.

Y N

020

The left motor fails to operate correctly when the left ribbon reverse switch is activated.

- Turn (Ribbon Go) CE switch 3 on.

- Manually operate the left ribbon reverse switch.

- Measure for + 25VDC at A1Q2U04 (Ped Drv A Left Mtr).
- Measure for + 25V at A1Q2U05 (Ped Drv B Left Mtr).

(-) Lead to frame ground.

Is 25 VDC present on each pin?

Y N

021

Probe A1Q2U07 (Left Motor Pedestal Driver).

Up Light: OFF
Down Light: ON

Are the lights correct?

Y N

022
Install new A1P2 card.
Verify the repair using the CE switch.

023
Install new A1Q2 card.
Verify the repair using the CE switch.

024
Probe the following pins:
A1P2D05 (A Left)
A1P2D06 (NOT A LEFT)
A1P2B05 (B LEFT)
A1P2B07 (NOT B LEFT)

```
Up   Light: ON
Down Light: ON
```

Are the lights correct on all pins?
Y N

025
Install new A1P2 card.
or
A new A1Q2 card.

026
Probable left ribbon motor or pedestal driver problem.
- Check P6 (Left Ribbon Motor Plug).
Refer to (6-000) for the ribbon motor checkout.
- Do the left ribbon motor service check.

Does left motor check out O.K.?
Y N

027
Test the left ribbon motor circuit for opens or shorts,
OR
replace the defective part and verify the repair using the CE switch.

028
Measure resistance (Rx1 scale)
from A1Q2U04 to frame ground, and
from A1Q2U05 to frame ground.
The resistance on both pins should be greater than 100 ohms.

Is the resistance correct?
Y N

029
Refer to 6-000 for left ribbon motor circuit.
Probable ground in the ribbon motor circuit, or a defective A1Q2 card.
Troubleshoot each output pin of A1Q2 card for a ground. If the ground disappears by removing the A2Q2 card, replace the card.

030
Install new A1Q2 card.
Verify the repair using the CE switch.

031
The right motor fails to operate correctly when the right ribbon reverse switch is activated.
- Turn CE switch 3 (Ribbon Go) on.
- Manually operate the right ribbon reverse switch.
- Measure for 25VDC at A1Q2S02 (Ped Drv A Right Mtr).
- Measure for 25VDC at A1Q2U02 (Ped Drv B Right Mtr)
(-) Lead to frame ground.

Are the voltages correct on both pins?
Y N

032
Probe A1Q2U06 (Right Motor Pedestal Driver).
Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

033
Install new A1P2 card and verify the repair using the CE switch.

034
Install new A1Q2 card and verify the repair using the CE switch.

035
Probe the following pins:
A1Q2D04 (A Right)
A1Q2B04 (Not A Right)
A1Q2D11 (B Right)
A1Q2D12 (Not B Right)
Up Light: ON
Down Light: ON

Are all lines correct?
Y N

036
Install a new A1Q2 card,
OR
a new A1P2 card and verify the repair using the CE switch.

037
Probable right ribbon motor or pedestal driver problem.
- Check P2 (Right Ribbon Motor Plug).
Refer to (6-000) for the ribbon motor checkout.
- Do the right ribbon motor service check.

Does the right motor check out correctly?
Y N

038
Test the right ribbon motor circuit for opens or shorts,
OR
replace or repair the defective part and verify the repair using the CE switch.

039
Measure resistance (Rx1 scale)
from A1Q2S02 to frame ground, and
from A1Q2U02 to frame ground.
The resistance on both pins should be greater than 100 ohms.

Is the resistance correct?
Y N

040
Refer to 6-000 for right ribbon motor circuit.
Probable ground in the ribbon motor circuit, or a defective A1Q2 card.
Troubleshoot each output pin of A1Q2 card for a ground. If the ground disappears by removing the A2Q2 card, replace the card.

041
Install new A1Q2 card and verify the repair using the CE switch.

042
- Turn off CE switch 3 (Ribbon Go), reinstall ribbon.
- Turn on CE switch 3.
- Probe A1P2D13 (0.25 MH)
Up Light: ON
Down Light: ON

Are all lines correct?
Y N

043
Install a new card in A1D4.

044
Go to Step 045, Entry Point B.

045
(Entry Point B)

Power off.
Reinstall the ribbon.
- Turn CE switch 3 (Ribbon Go) off.
- Power on.

Press the Stop/Reset Key to reset any errors.
Check that the ribbon motors are detented when neither motor is driving.
The interlock light must be off.
- Manually try turning the left and right ribbon spool.
- The detented motor should not turn easily.

Are both motors detented?
Y N

046
Measure 25VDC at TB2-5,6,7,and 8 (25 Volt Control). (-)lead to frame ground.

Is 25 VDC present on all pins?
Y N

047
Refer to (9-000) for the voltage distribution diagram.
Locate the missing voltage.

048
Press the Ready Key.
Probe A1P2G12 (+ belt go control).
Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

049
Install new A1N2 card.

050
Refer to (6-000) for the motor checkout procedure.
Perform the motor checkout procedure section.

051
Press the Stop/Reset Key.
- Probe A1A5B09 (- ribbon check).

Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

052
Did you start this call from the system entyr maps?
Y N

053
Go to the system entry maps.

054
Probable trouble is a defective A1P2 card,
OR
a faulty interface cable from A1A5B09 (- ribbon check) to the system.
Refer to (3-000) for the interface lines.
Test for an open or short in the interface line.

055
The ribbon motors should operate with a print or a carriage command.
Refer to (2-000) for printer function and timing tests.
- Run the Character Print test and print all H's.

NOTE: If a ribbon check prevents running the program, jumper A1P2P02 to A1P2P08.

Remove jumper after running the test.

CAUTION

Only run the print test long enough to observe the probe, to prevent damage to the ribbon.
- Probe A1P2G13 (+ Not Print Time).

Up Light: ON or FLASHING
Down Light: ON
(Step 055 continues)

(Step 055 continued)

Are the lights correct?
Y N

056
Install a new A1H2 card and run the Character Print test to verify the repair.

057
- Probe A1P2J11 (- Belt Go Delay).

Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

058
Refer to (2-000) for printer function and timing tests.
Install a new A1N2 card and run the Character Print test to verify the repair.

059
Press the Stop/Reset Key.
Press the Carriage Space Key while observing the probe.
Probe A1P2J04 (- Carr Go).

Up Light: ON
Down Light: FLASHING

Are the lights correct?
Y N

060
Ensure the connector at A1A5 is seated correctly.
There is an open circuit between A1A5D04 and A1P2J04.
Refer to (2-000) for printer function and timing tests.
Correct the circuit and verify the repair by running the Character Print test.

V

061
Do the following:
- Reseat the cards at location A1P2,A1H2, and A1N2.
- Reseat the left and right ribbon connectors: P2 and P6.
Refer to (2-000) for printer function and timing tests.
Run the character print test and print H's.
Operate the left and right ribbon reverse levers at the same time during the print test.

Do you get the ribbon check?
Y N

062
Run the Character Print test and print all H's.
Activate both ribbon reverse switches at same time.

Does the check light come on?
Y N

063
Refer to (2-000) for printer function and timing tests.
Run the Character Print test and print all H's.
Probe A1A5B09.
Activate both ribbon reverse switches at the same time.

Up Light: DON'T CARE
Down Light: FLASHING

Are the lights correct?
Y N

064
If a jumper is on A1P2P02 to A1P2P08 remove it.

OR

Install a new card in A1P2.

065
Did you start this call from the system entry maps?
Y N

066
Go to the system entry maps.

067
The possible problem is a faulty cable from A1A5B09 to the system.
Refer to (3-000) for the interface lines.
Test for an open or a short in the interface line.

068
Press the Stop/Reset Key to reset the check.

Does the ribbon unit fail to operate correctly?
Y N

069
The problem was a loose card or cable connector.

070
Probable trouble is a defective card in A1P2,
OR
a defective card in A1D4.

071
Refer to (2-000) for printer function and timing tests.
Ensure the printer is in a service mode, (the micro code in the system printer adapter is loaded.
Set CE switch 3 (ribbon go) on.
Activate the right ribbon reverse lever.
- Probe A1D4B10 (- DR right A) and A1D4D10 (- DR right not A).

```
Up    Light: ON
Down  Light: ON
```

(Step 071 continues)

(Step 071 continued)
Are the lights correct on both pins?
Y N

072
Set CE switch 3 off and install a new card in A1D4.

073
Activate the left ribbon reverse lever.
- Probe A1D4G12 (- DR left A 0 and A1D4J11 (- DR left not A).

```
Up    Light: ON
Down  Light: ON
```

Are the lights correct?
Y N

074
Install a new A1D4 card.

075
Install a new card in A1D4,
OR
a new card in A1P2.

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0010	A	1	001
0011	A	1	001
0012	A	1	001
0020	A	1	001
0022	A	1	001
0031	A	1	001
0032	A	1	001
0099	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	008	0071	A
3	009	0072	A
5	036	0073	A
3	010	0088	A

001
(Entry Point A)

Power on.

Press the Stop/Reset key to reset the error.
The steps 1. through 10. on the right side of this page and page two are for information only. Please go to page two in the left hand column to continue this map.

(Step 001 continues)

PRINTER POWER SEQUENCE

1.- Primary voltage of 208/230 VAC 60Hz, or 220/240 VAC 50Hz, or 200 volts 60Hz, 24 volts DC, and proper voltage to the convenience outlet is available at the power supply at all times.

2.- Host system activates the interface line (POWER ON).

3.- The interface line 'POWER ON' is in series with the ON/OFF power switch in the printer.

4.- The signal 'POWER ON' picks PS-K2 located in the power supply.

5.- PS-K2 allows the primary AC voltage to operate the fan and also allows primary voltage to convert to 5, 8.5, and 25 volts DC that will be active at TB1 in the printer located on the logic gate.

6.- The signal 'Power on Complete' becomes active.

7.- The host system activates the interface line
(Step 001 continues)

(Step 001 continued)

(Step 001 continued)
'CLOSE 25V CONTACTOR'.

8.- The signal 'CLOSE 25V CONTACTOR' picks the 25 VDC contactor K1 in the printer.

9.- The 25 VDC contactor K1 allows 25 VDC controlled voltage at TB1-10 that supplies the voltage for the hammer coils, stepper motors and lower paper clamp.

10.- To reset a power check, set the printer power ON/OFF switch off and then on.
Then press the Stop/Reset Key.

Is the Power On light on?
Y N

002
Measure on TB 1 connectors on the logic gate for the following voltages.
- Measure for 5 VDC at TB1-16 — 4.5 to 5.4 volts,
- Measure for 8.5vDC at TB1-19 — 7.65 to 9.18 volts,
- Measure for 25 vDC at TB1-12 — 23.5 to 27.5 volts.

Are all voltages present?
Y N

003
(Entry Point B)

#DANGER#

There is primary voltage of 208/230 VAC 60Hz, or 220/240 VAC 50Hz present in the power supply when the Power ON/OFF switch is in the (OFF) position.
No voltage at TB1 (located on the logic gate).

- Measure for correct VAC (input voltage to power supply) at PS TB1 terminals 1 and 2 (located on the power supply).

Refer to (13-000) for power supply locations.

(Step 003 continues)

3 3
A B

(Step 003 continued)
Is the proper voltage present?
Y N

004
- Remove the printer AC plug from the customers outlet.
- Meter customers voltage for correct voltage.

Is the voltage correct?
Y N

005
Contact the customer to fix the voltage problem.

006
With the printer AC plug disconnected:
1. Inspect the cable from the AC plug to the PSTB-1 for loose connections.
2. Replace the line cable.

007
Ensure the following conditions exist;
- CP1 (and CP2 if installed) is on. (up position).
- F1, F2, F3, F4, or F6 (50 HZ only) have continuity (not open).
- All power supply cables are seated correctly.

CORRECT ANY FAULTY CONDITION.
Reset the power check by setting the printer power ON/OFF switch off then on.
If the problem persists continue with these maps.
- Power down.
- Disconnect the cables at P23 and P25 from the power supply.
- Connect two power supply test plugs located in the power supply to P23 and P25.

Ensure the following conditions exist:
- CP1 (and CP2 if installed) is on.
- F1, F2, F3, F4, or F6 (50 Hz only) have continuity.
- Power on.

Press the Stop/Reset key to reset the error.

(Step 007 continues)

A2 B2

(Step 007 continued)
Is the gate fan running?
Y N

008
Remove the P/S test plugs from P23 and P25 and reconnect the original cables.
Go To Map 0071, Entry Point A.

009
Remove the P/S test plugs from P23 and P25 and reconnect the original cables.
Go To Map 0072, Entry Point A.

010
To diagnose a faulty 'Power On' light circuitry.
Go To Map 0088, Entry Point A.

011
-Probe A1A3D07 (-power check).
Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

012
Did you start this call from the system entry maps?
Y N

013
Go to the system entry maps.

014

Refer to (9-000) for the power supply signals.
Probable trouble is the power supply card,
OR
ground in the cable from A1E6E02 to PS P27-7 in the power supply,
OR
a faulty interface cable from A1A3D07 to the system.
Refer to (3-000) for the interface lines.
Test for an open or a ground in the interface line.

015

- Probe A1E6B02 (POR PS).
Up Light: OFF
Down Light: ON

Are the lights correct?

Y N

016

Refer to (9-000) for the power supply signals.
Probable trouble is an open cable from A1E6B02 to P27-5 in the power supply,
OR
a defective power supply card in the supply.

017

Refer to (9-000) for TB1 power distribution.
Measure TB1-10 on the logic gate for (+) 25VDC (25 volt control)

Is 25 volts present?

Y N

5
E F

018

Refer to (9-000) for the 25V circuit.
- Probe A1A5D09 (-close 25v contactor).
Press the Stop/Reset Key to reset the error while observing the probe.
Up Light: DON'T CARE
Down Light: ON or FLASHING

Are the lights correct?

Y N

019

- Probe A1A3B08 (-Power Complete).

Up Light: OFF
Down Light: ON

Are the lights correct?

Y N

020

Power off.
Measure for 5V DC from A1A3B08 to frame ground.

Is 5V DC present?

Y N

021

Refer to (3-000) for the interface lines.
Probable trouble is an open interface line from A1A3B08 to the system.

022

Refer to (9-000) for the power supply signals.
Probable trouble is an open cable from A1F6A04 to the power supply cable at PS-P27-3.
Or,
The power supply card.

023

Did you start this call from the system entry maps?

Y N

5 5 5
G H J

024
Go to the system entry maps.

025
The possible trouble is a faulty interface cable from A1A5D09 to the system, or a faulty interface cable that was indicated by the system.
Refer to (3-000) for the interface lines.
Test for an open or short in the interface line.

026
Press the Stop/Reset Key to reset the error while observing the probe.
- Probe A1P2U11 (+ close contactor).
Up Light: ON or FLASHING
Down Light: DON'T CARE

Are the lights correct?
Y N

027
The probable trouble is a defective card in A1P2,
OR
a defective card in A1M2.

028
- Probe A1P2G02 (-close 25v contactor).
Press the Stop/Reset Key to reset the error while observing the probe.
Up Light: DON'T CARE
Down Light: ON or FLASHING

Are the lights correct?
Y N

029
Trouble is the A1P2 card.
Or,
The A1Q2 card.

030
- Probe A1Q2J09 (- close 25v contactor).
Press the Stop/reset Key to reset the error while observing the probe.
Up Light: DON'T CARE
Down Light: ON or FLASHING

Are the lights correct?
Y N

031
Install new A1Q2 card.

032
Power down.
Refer to (9-000) for the 25V circuit.
Test the circuitry to Relay K1 (25 volt contactor) to ensure there are no open circuits.
Ensure that the connection at A1V5B06 is not open by measuring continuity (Rx1 scale) from A1V5B06 to the black wire on K1 coil.
Install new K1.

033
Refer to (9-000) for TB1 power distribution.
Measure for 25 VDC (25v clamp) at TB1-1.

Is 25 volts present?
Y N

034
The trouble is either an open lead from TB1 to diode D1 (9-000) or a faulty diode.
Refer to (9-000) for diode information.
Do the diode D1 service check.

035
Is the gate fan running?
Y N

036
See the Gate Fan Failure map.
Go To Map 0073, Entry Point A.

037
Is there voltage at the convenience outlet?
Y N

038
(Entry Point C)

- CONVENIENCE OUTLET PROBLEMS.
- Refer to (18-000) for power supply circuitry.
- Ensure CP1 is in the (ON) position.
- Measure for 115 volts AC at the convenience outlet.

Is 115 volts AC present?
Y N

039
- Insure that CP1 is not tripped.
- Inspect the terminals at PSTB1 and T2TB1 for connections being loose.
- Measure for 115 volts A/C at T2TB1-5 and T2TB1-7.

Is the voltage correct?
Y N

040
Your trouble is a faulty convenience outlet.

Or

A faulty cable from the convenience outlet to T2 in the power supply.

041
Replace the Power Supply.

042
The convenience outlet has the proper voltage.
Return the printer to the customer.

043
Measure for +25VDC at TB1-10.
Open the print unit to cause the interlock light to come on.

Does the voltage go from 25V to 0V?
Y N

044
Refer to (9-000) for the 25V circuit.
With the print unit open,
- Probe A1A5D09 (-Close Contractor).

Up Light: ON
Down Light: OFF
Are the lights correct?
Y N

045
Did you start this call from the System Entry maps?
Y N

046
Go to the System Entry maps.

047
Your trouble is the A1P2 card.

OR

A faulty interface cable from A1A5D09 to the system.
Refer to (3-000) for the interface lines.
Test for a ground in the interface line.

048
- Probe A1P2G02 (-Close Contactor).

Up Light: ON
Down Light: OFF
Are the lights correct?
Y N

049
Trouble is the card at A1P2.
Or,
The card at A1Q2.

050
- Probe A1Q2J09 (-Close Contactor DR).

Up Light: ON
Down Light: OFF
Are the lights correct?
Y N

051
Trouble is the card at A1Q2.
Or,
A ground in the cable from A1V5B06 to the K1 contactor.

052
Trouble is a faulty K1 contactor.
Repair or replace the contactor.

053
Power off,
- Probe A1D4G08 (+ POR PS),
observe the probe while setting power on,
Up Light: FLASHING
Down Light: DON'T CARE

Are the lights correct?
Y N

054
Probable trouble is an open or ground from A1C6B02 to the power supply connector at P27-5 (9-000),
OR
a defective power supply card located in the supply.

055
Refer to (9-000) for the voltage distribution diagram.

POWER SUPPLY 1 (PS lev 3)

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0070	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	028	0072	A
4	029	0072	A
3	021	0073	A

001
(Entry Point A)

Power supply problems.

- Refer to 18-000 for power supply circuitry.
- Make sure that the power ON/OFF switch is on.
- Jumper A1D6E04 (- Power On) to A1D4D08 (GND).

Does the power on light come on and stay on?
Y N

002
- Remove the jumper from A1D6E04 to A1D4D08.

Is F1, F2, F3, F4, or (F6 for 50 Hz only) blown?
Y N

003
Is CP1 (or CP2 if installed) tripped?
Y N

4 3 3 2

004

'DANGER'

THERE IS PRIMARY AC VOLTAGE PRESENT IN THE POWER SUPPLY WHEN THE ON/OFF SWITCH IS IN THE OFF POSITION.

Ensure A1Z2 connector and the power supply connector at P27 are seated correctly.

- Power down.
- Connect the CE meter to measure 5 volts DC at logic board (+)TB1-17 and (-) frame ground.
- Power up.

Does the voltage try to come on?

Y N

005

- Power off.
- Power on,

A sharp click in the power supply ensures that PS-K2 has picked.

Did PS K2 pick?

Y N

006

Refer to (2-000) for the power supply test points (TP).

Meter for 24 VDC at (+) power supply TP4 and (-) frame ground.

- Power off.

Is 24 volts DC present?

Y N

007

Ensure F3 or F4 is not blown.

Ensure that the power supply card is seated properly.

Ensure that CP1 is not tripped.

Your trouble is a faulty power supply card.

OR

A faulty power supply.

008

- Set CP1 off.
- Insure the power ON/OFF switch is in the ON position.
- Test for continuinty between the power supply TP7 and A1D6E04.
- Refer to (9-000) for power supply signals.

Is continuity present?

Y N

009

Test for continuity from A1D6E04 to the power ON/OFF switch N/O contacts.

Is continuity present?

Y N

010

Your trouble is an open A1D6E04 connector.

Or

A faulty power ON/OFF switch.

011

Your problem is an open PS27-1 connector.

Or

An open cable from the power ON/OFF switch to PS27-1.

- Set CP1 on.

012

- Set CP1 on.
- Measure for 24 volts DC from TP8 to frame ground.

Is 24 volts present?

Y N

013

Your problem is a faulty power supply card.

Or

A faulty power supply.

014

Your trouble is a faulty PS K2 relay.

31JUL78 PN 8324075
EC 784068 PEC 784034
MAP 0071-2

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0070	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	028	0072	A
4	029	0072	A
3	021	0073	A

001
(Entry Point A)

Power supply problems.

- Refer to 18-000 for power supply circuitry.
- Make sure that the power ON/OFF switch is on.
- Jumper A1D6E04 (- Power On) to A1D4D08 (GND).

Does the power on light come on and stay on?
Y N

002
- Remove the jumper from A1D6E04 to A1D4D08.

Is F1, F2, F3, F4, or (F6 for 50 Hz only) blown?
Y N

003
Is CP1 (or CP2 if installed) tripped?
Y N

4 3 3 2

004
'DANGER'
THERE IS PRIMARY AC VOLTAGE PRESENT IN THE POWER SUPPLY WHEN THE ON/OFF SWITCH IS IN THE OFF POSITION.
Ensure A1Z2 connector and the power supply connector at P27 are seated correctly.
- Power down.
- Connect the CE meter to measure 5 volts DC at logic board (+)TB1-17 and (-) frame ground.
- Power up.

Does the voltage try to come on?
Y N

005
- Power off.
-Power on,
A sharp click in the power supply ensures that PS-K2 has picked.

Did PS K2 pick?
Y N

006
Refer to (2-000) for the power supply test points (TP).
Meter for 24 VDC at (+) power supply TP4 and (-) frame ground.
- Power off.

Is 24 volts DC present?
Y N

007
Ensure F3 or F4 is not blown.
Ensure that the power supply card is seated properly.
Ensure that CP1 is not tripped.
Your trouble is a faulty power supply card.
OR
A faulty power supply.

008
- Set CP1 off.
- Insure the power ON/OFF switch is in the ON position.
- Test for continuinty between the power supply TP7 and A1D6E04.
- Refer to (9-000) for power supply signals.

Is continuity present?
Y N

009
Test for continuity from A1D6E04 to the power ON/OFF switch N/O contacts.

Is continuity present?
Y N

010
Your trouble is an open A1D6E04 connector.
Or
A faulty power ON/OFF switch.

011
Your problem is an open PS27-1 connector.
Or
An open cable from the power ON/OFF switch to PS27-1.
- Set CP1 on.

012
- Set CP1 on.
- Measure for 24 volts DC from TP8 to frame ground.

Is 24 volts present?
Y N

013
Your problem is a faulty power supply card.
Or
A faulty power supply.

014
Your trouble is a faulty PS K2 relay.

31JUL78 PN 8324075
EC 784068 PEC 784034
MAP 0071-2

015
Ensure PSP1,PSP20,PSP25,and PSP23 are seated properly.
Install a new PS-K2 contactor.
OR
Install a new power supply card.

016
Ensure PSP1,PSP20,PSP25,and PSP23 are seated properly.
Possible trouble is an open PSC1.
or
A faulty power supply card.
or
A faulty power supply.

017
Answer No to the following question if CP2 is not installed.

Is CP2 tripped?
Y N

018
CP1 is tripped.
- Disconnect any unit that is plugged into the convience outlet.

Does CP1 trip?
Y N

019
The unit that was plugged into the outlet is faulty.

020
Disconnect the gate fan plug (PSP7).

Does CP1 trip?
Y N

021
See the Gate Fan Failure map .
Go To Map 0073, Entry Point A.

022
Ensure that the power supply transformers are wired correctly for the customers voltage.
Ensure PSC1 is not opened or shorted.
Install new power supply.
Reconnect (PSP7).

023
Ensure that the power supply transformers are wired correctly for the customers voltage.
CP2 is tripped.
- Install a new PSC1, refer to 13-000 for location.

Does CP2 trip?
Y N

024
The trouble is corrected, return printer to the customer.

025
Probable trouble is a faulty transformer (PST1)
or
A faulty Power Supply card.

026
Is F3, F4,or F6 blown?
Y N

027
Is F1 blown?
Y N

028
F2 is blown.
Ensure that F2 is the proper value(6A).
Possible fault is in 5 volt load to the printer or the power supply card.
Go To Map 0072, Entry Point A.

029
F1 is blown.
Ensure that F1 is the correct value (3A).
Possible fault is in the 8.5 v load to the printer or the power supply card.
Go To Map 0072, Entry Point A.

030
Is F4 or F6 blown?
Y N

031
F3 is blown.
Ensure that F3 is the correct value (3A).
Probable parts that could cause F3 to blow are:
Relay PS-K2 or power supply card.

Is F3 still blowing?
Y N

032
The trouble is corrected.

033
Install new power supply.

034
F4 or F6 is blown.
Refer to (9-000) for the customer input voltage.
Ensure that the power supply transformers are wired correctly for the customer's voltage.

Is the input voltage wired correctly?
Y N

035
Correct the faulty wiring.

036
Ensure that F4 (5A) or F6 (1A) is the correct value.
Install a new power supply.

1

037
Disconnect jumper A1D6E04.
Verify the cable in A1A3 is seated correctly.

Did you start this call from the system entry maps?
Y N

038
Go to the system entry maps.

039
Possible trouble is a faulty interface cable from A1A3B02 to the system.
Refer to (3-000) for the interface lines.
Test for an open or shorted interface line.

POWER SUPPLY 2

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0070	A	1	001
0071	A	1	001

001
(Entry Point A)

- Power down.

Observe the pin side of the A1 gate for burned marks, or foreign objects shorting voltage pins, etc.
Correct any unusual observations.
(25 VOLT LOAD TEST)
Refer to (13-000) for power supply locations.
- Remove the cable from P23 in the power supply.
- Connect the ground test lead to P23.
- Power up.

Does the power light come on and stay on?
Y N

002
(5 volt and 8.5 volt load test.)
- Power down.
- Remove the test cable from P23 and reconnect the original cable.
- Remove the cable from P25 in the power supply.
- Connect the ground test to P25.
- Power on.

IF power comes on, press the Stop/Reset key to reset the error.

Does the power light come on and stay on?
Y N

The power supply operates correctly when isolated with the test leads. however, when the cables are connected to the printer electrical load an over or under voltage condition exists causing the power supply to shut down.

2 2 2

003
(Entry Point B)

- Power down.
- Disconnect the cables that are connected to P23 P25.
- Measure resistance between TB1-17 and ground.

Is the resistance between 5 and 20 ohms?
Y N

004
Refer to (9-000) for 5V or 8V distribution.
Trouble shoot for opens or grounds.

005
(Entry Point C)

- Power down.
- Disconnect the cables that are connected to P23 and P25 of the power supply.
- Measure resistance between TB1-19 and ground.

Is the resistance between 5 and 30 ohms?
Y N

006
Refer to (9-000) for 5V or 8V distribution.
Trouble shoot for opens or grounds.

007
(Entry Point D)

- Power down.
- Disconnect the cables that are connected to P23 and P25 of the power supply unless already disconnecred.
- Measure resistance between TB1-12 and ground.

Is the resistance between 25 and 75 ohms?
Y N

D E

008
Refer to (9-000) for 25V distribution.
Trouble shoot for opens or grounds.

009
(Entry Point E)

- Measure resistance between TB1-7 and ground.

Is the resistance between 5 and 20 ohms?
Y N

010
Refer to (9-000) for 25V distribution.
Trouble shoot for opens or grounds.

011
Resistance on the voltage loads are correct.
Some causes of power supply shut down are:
1. Loose power supply signal cable at power supply or A1Z2 or A1A3.
2. Loose cable at P23 or P25.
3. Loose terminals at TB1.

012
Go to Step 003, Entry Point B.

013
Go to Step 007, Entry Point D.

CE SWITCH PROBLEMS

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0012	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
7	074	0050	A

001
(Entry Point A)

Refer to (2-000) for CE switch information.
CE SWITCH PROBLEMS
Refer to (2-000) for CE switch operation.
CE SWITCHES

Switch 1---belt go switch
Switch 2---carriage go switch
Switch 3---ribbon go switch
Switch 4---paper clamp switch

Do all CE switches fail to function correctly?
Y N

002
Refer to (2-000) for CE switch information.
- Turn CE switch 1 (Belt Go) on and then off.

Did the belt motor run and then stop?
Y N

003
- Turn CE switch 1 (Belt Go) on.
- Probe A1N2M08 (- belt FE SW N/O).

Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

7A 2B 2C 2D

'NOTE'
The CE switches are operational only when the 25 volt DC contactor K1 is energized and there is not a Power On Reset (POR) signal active.

004
- Ensure the connector at A1V3 is seated correctly.
- Test for continuity between A1N2M08 and pin 3 of CE switch 1 (Belt Go).

Is continuity present?
Y N

005
The trouble is an open connector at A1V3B03
Or
an open cable between A1V3B03 and pin 3 of CE switch 1.

006
Install a new CE switch 1 (Belt Go).

007
- Turn CE switch 1 (Belt Go) off.
- Probe A1N2M07 (+ belt ce switch N/C).

Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

008
Refer to (2-000) for CE switch information.
The trouble is an open circuit from ground through switch 1 (Belt Go) N/C to A1N2M07.

009
Refer to (2-000) for CE switch information.
- Power off.

Probable trouble is a ground from belt CE switch to A1V3 connector,
Or
a defective card in A1N2.

010
(Entry Point B)

Turn CE switch 2 (Carriage Go) on and off.
Did the carriage motor run?
Y N

011
- Remove forms from the tractors.
- Turn CE switch 2 (Carriage Go) on.
- Probe A1P2U06 (- carr FE sw N/O).

Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

012
- Ensure the connector at A1V3 is seated correctly.
- Test for continuity between A1P2U06 and pin 3 of CE switch 2 (Carriage Go).

Is continuity present?
Y N

013
The trouble is an open connector at A1V3B05,
Or
an open cable between A1V3B05 and pin 3 of CE switch 2.

014
Install a new CE switch 2 (Carriage Go).

015
- Turn CE switch 2 (Carriage Go) off.
- Probe A1P2S04 (+ carr ce switch N/C).

Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

016
Refer to (2-000) for CE switch information.
The trouble is an open circuit from ground through CE switch 2 (Carriage Go) N/C to A1P2S04.

017
Refer to (2-000) for CE switch information.
- Power off.
Probable trouble is a ground from the carriage CE switch to A1V3 connector,
Or
a defective card in A1P2.

018
(Entry Point C)
Turn CE switch 3 (Ribbon Go) on and off.

Did the ribbon motor run and then stop?
Y N

019
- Turn CE switch 3 (Ribbon Go) on.
- Probe A1P2U07 (- FE ribbon go N/O).
Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

020
- Ensure the connector at A1V3 is seated correctly.
- Test for continuity between A1P2U07 and pin 3 of CE switch 3 (Ribbon Go).

Is continuity present?
Y N

021
The trouble is an open connector at A1V3B08,
Or
an open cable between A1V3B08 and pin 3 of CE switch 3.

H J K

022
- Turn CE switch 3 (Ribbon Go) off.
- Probe A1P2U09 (+ ce ribbon sw N/C).
Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

023
Refer to (2-000) for CE switch information.
The trouble is an open circuit from ground through CE switch 3 (Ribbon Go) N/C to A1P2U09.

024
Install a new (ribbon go) CE switch 3.

025
Refer to (2-000) for CE switch information.
- Power off.
Probable trouble is a ground from the ribbon CE switch to the A1V3 connector,
Or
a defective card in A1P2.

026
(Entry Point D)
Turn CE switch 4 (Paper Clamp) on and off.

Did the paper clamp pick and then drop?
Y N

027
- Turn CE switch 4 (Paper Clamp) on.
ALL OTHER CE SWITCHES OFF.

- Probe A1P2P07 (- FE paper clamp sw N/O).
Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

6 4 4
L M N

028
- Ensure the connector at A1V3 is seated correctly.
- Test for continuity between A1V3B09 and pin 3 of CE switch 4 (Paper Clamp).

Is continuity present?
Y N

029
The trouble is an open connector at A1V3B09,
Or
an open cable between A1V3B09 and pin 3 of CE switch 4.

030
Install a new CE switch 4 (Paper Clamp).

031
- Probe A1P2U12 (- POR FE).
Up Light: OFF
Down Light: on

Are the lights correct?
Y N

032
- Ensure CE switch 4 (Paper Clamp) is set on and all other CE switches are set off.
- Probe A1N2M07 (+ belt FE switch N/C).
Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

033
- Ensure the connector at A1V3 is seated correctly.
- Test for continuity between A1N2M07 and pin 1 of CE switch 1 (Belt Go).

Is continuity present?
Y N

034
The trouble is an open connector at A1V3B02
Or
an open cable between A1V3B02 and pin 1 of CE switch 1.

035
Install a new CE switch 1 (Belt Go).

036
- Probe A1P2S04 (+ carr FE switch N/C).
Up Light: OFF
Down LIGHT: ON

Are the lights correct?
Y N

037
- Ensure the connector at A1V3 is seated correctly.
- Test for continuity between A1P2S04 and pin 1 of CE switch 2 (Carriage Go).

Is continuity present?
Y N

038
The trouble is an open connector at A1V3B04,
Or
an open cable between A1P2S04 and pin 1 of CE switch 2 (Carriage Go).

039
Install a new CE switch 2 (Carriage Go).

040
- Probe A1P2U09 (FE ribbon switch N/C).
Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

041
- Ensure the connector at A1V3 is seated correctly.
- Test for continuity between A1P2U09 and pin 1 of CE switch 3 (Ribbon Go).

Is continuity present?
Y N

042
The trouble is an open connector at A1V3B06,
Or
an open cable between A1V3B06 and pin 1 of CE switch 3 (Ribbon Go).

043
Install a new CE switch 3 (ribbon Go).

044
Turn CE switch 4 (Paper Clamp) off.
- Probe A1P2P06 (+ FE paper clamp N/C).

Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

045
- Ensure the connector at A1V3 is seated correctly.
- Test for continuity between A1P2P06 and pin 1 of CE switch 4 (Paper Clamp).

Is continuity present?
Y N

046
The trouble is an open connector at A1V3B08,
Or
an open cable between A1V3B08 and pin 1 of CE switch 4 (Paper Clamp).

047
Install a new CE switch 4 (Paper Clamp).

4

048
Install a new card at A1P2,
Or
Install a new card at A1N2.

049
- Probe A1P2S08 (+ POR).

Up Light: ON
Down Light: OFF

Are the lightcorrect?
Y N

050
Install a new card at A1D4.

051
- Turn CE switch 4 (Paper Clamp) off.
- Probe A1P2P06 (+ ce paper clamp N/C).

Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

052
Refer to (2-000) for CE switch information.
The trouble is an open circuit from ground through CE switch (PaperClamp) N/C to A1P2P06.

053
Refer to (2-000) for CE switch information.
Power off.
Probable trouble is a ground from the paper clamp CE switch to the A1P2 card,
Or
a defective card in A1P2.

054
Refer to (2-000) for CE switch information.
- Turn all CE switches off.
- Probe A1A5B11 (- CE switch on).
Up Light: ON
Down Light: OFF

Are the lights correct?
Y N

055
Power down.
Disconnect cable at A1A5.
- Measure for continuity (RX1 scale) from A1A5B11 to frame ground.

Is continuity present?
Y N

056
Reconnect A1A5 connector.
Did you start this call from the system entry maps?
Y N

057
Go to the system entry maps.

058
Possible trouble is a faulty interface cable from A1A5B11 to the system.
Refer to (3-000) for the interface lines.
Test for an open or a short in the interface line.

059
Reconnect A1A5 connector.
- Test for a ground between A1A5B11 and the CE switches,
Or
test for a shorted CE switch.

060
- Probe A1A5B11 (- CE switch).
Turn CE switch 1 (Belt Go) on.
Turn all other CE switches off.
Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

061
- Test for continuity between A1A5B11 and pin 6 of CE switch 1 (Belt Go).

Is continuity present?
Y N

062
The trouble is an open connector at A1A3B10,
Or
an open cable from A1V3B10 to pin 6 of CE switch 1.

063
Install a new CE switch 1 (Belt Go).

064
Remove forms from the tractors
- Probe A1A5B11 (- CE switch on).
Turn CE switch 2 (Carriage Go) on.
Turn all other CE switches off.
Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

065
Install a new CE switch 2 (Carriage Go).

066
- Probe A1A5B11 (- CE switch on).
Turn CE switch 3 (Ribbon Go) on,
Turn all other CE switches off.
Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

067
Install a new CE switch 3 (Ribbon Go).

068
- Probe A1A5B11 (- CE switch on).
Turn CE switch 4 (Paper Clamp) on.
Turn all other CE switches off.
Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

069
Install a new CE switch 4 (Paper Clamp).

070
If there is still a trouble with the CE switch function,
Install a new card at A1P2,
Or
Install a new card at A1N2.

071
The four CE switches fail to perform their function.
Press Stop/Reset key. The printer Check light must be off.
Measure for 25 volts DC (25 volt control) from TB1-7 to frame ground.

Is 25 volts DC present?
Y N

Y Z

072
Go to map 0070 and test for missing 25 VDC control.

073
- Probe A1D4G10 (+ POR).
Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

074
Go To Map 0050, Entry Point A.

075
Inspect A1V3 connector for being installed correctly.

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0014	A	1	001
0070	A	1	001

001

(Entry Point A)

If your problem is defined as a particular operator panel key, indicator lamp problem, 6/8 LPI, or single cycle switch problem, refer to the chart and go to the specified MAP.

DESCRIPTION	CHART MAP
Carriage Space Key	0080
Carriage Restore Key	0081
Stop/Reset Key	0082
Ready Key	0083
6/8 LPI Switch	0084
Single Cycle Switch	0084
Check Light	0085
Forms Light	0086
Interlock Light	0087
Power On Light	0088
Ready Light	0089

Jumper the following pins (one at a time) and then remove the jumper after each test.

-A1A2D09 to A1A2D08 (Check Light)
-A1A2D12 to A1A2D08 (Forms Light)
-A1A2D11 to A1A2D08 (IntLk light)
-A1A2B07 to A1A2D08 (Power On Light)
-A1A2D13 to A1A2D08 (Ready Light)

(Step 001 continues)

The operator panel consists of five indicator lights and four switches.

The switches are:

Ready Switch-to signal the host system the printer is ready to print.

Stop/reset switch to signal the host system to stop all printer operations and reset all error lights.

Carriage Restore Switch to move the carriage to print line one of the forms control buffer.

Carriage Space Switch-to move the carriage one space.

The lights are:

Power On Light-indicates power is available at the printer.

Intlk Light-indicates the print unit is open.

Forms Light-indicates that the printer is out of forms, or a forms light and a check light together indicates a carriage error.

Check Light-indicates that the printer or adapter did not function properly.

Ready Light-indicates the printer is ready to print.

A
1

Carriage Space Key

MAP 0080-2

PAGE 2 OF 2

005

The probable trouble is a faulty cable from A1A3B05 to the system.
Refer to (3-000) for the interface lines.
Test for an open or short in the interface line.

CARRIAGE RESTORE KEY

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0014	A	1	001
0079	A	1	001

001
(Entry Point A)

This map is used to analyze a faulty Carriage Restore Key.

- Power down.
- Disconnect the cable at A1A3.

Refer to (3-000) for the restore key circuit.

- Measure continuity from A1A2B06 to A1A2D08 while pressing the Carriage restore Key.

Do you measure continuity only when the Carriage Restore Key is pressed?
Y N

002
Reconnect A1A3 connector.
Your problem is a faulty Carriage Restore key circuit.
Probable trouble is an open or a ground in the cable from the Operator Panel to A1A2 connector.
Or,
A faulty Carriage Restore key switch.

003
- Reconnect A1A3 connector.

Did you start this call from the system entry maps?
Y N

004
Go to the system entry maps.

2
A

005

The probable trouble is a faulty cable from A1A3B06 to the system.
Refer to (3-000) for the interface lines.
Test for an open or short in the interface line.

STOP RESET KEY

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0014	A	1	001
0079	A	1	001

This MAP is used to analyze a faulty Stop switch.

001
(Entry Point A)

- Power down.
- Disconnect the cable at A1A3.

Refer to (3-000) for the Stop/Reset Key circuit.

- Measure continuity from A1A2B12 to A1A2D08 while pressing the Stop/Reset key.

Do you measure continuity only when you press the Stop/Reset key?
Y N

002
Reconnect A1A3 connector.
Your problem is a faulty STOP/RESET key circuit.
- Probable trouble is an open or a ground in the cable from the Operator Panel to A1A2 connector.

Or,
A faulty STOP/RESET switch.

003
Reconnect A1A3 connector.
Did you start this call from the system entry maps?
Y N

004
Go to the system entry maps.

2
A

005

The probable trouble is a faulty cable from A1A3B12 to the system.
Refer to (3-000) for the interface lines.
Test for an open or short in the interface line.

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0014	A	1	001
0079	A	1	001

001
(Entry Point A)

This map is used to analyze a faulty ready switch.

- Power down.
- Disconnect the cable at A1A3.

Refer to (3-000) for the Ready Key circuit.

- Measure continuity from A1A2D10 to A1A2D08 while pressing the Ready Key.

Do you measure continuity only when the Ready Key is pressed?

Y N

002
Reconnect the cable at A1A3.
Your problem is a faulty Ready Key circuit.
Probable trouble is an open or a ground in the cable from the Operator Panel to A1A3 connector.
Or,
A faulty Ready switch.

003
Reconnect A1A3 connector.
Did you start this call from the system entry maps?

Y N

004
Go to the system entry maps.

005

The probable trouble is a faulty cable from A1A3D10 to the system.

Refer to (3-000) for the interface lines.

Test for an open or short in the interface line.

6/8 LPI SWITCH

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0014	A	1	001
0079	A	1	001

This map is used to analyze a faulty 6/8 LPI switch.

001
(Entry Point A)

The 6/8 line per inch switch is failing.
- Power down.
- Measure for continuity from A1A2B11 to A1A2D08 while operating the 6/8 LPI switch.

Do you measure continuity only when the switch is set to 6 LPI?
Y N

002
Verify that the cables in A1A2 and A1A3 are installed correctly.
Refer to (3-000) for the 6/8 LPI switch circuit.
- Test for opens or grounds in the cable to the 6/8 LPI switch.

Replace the 6/8 LPI switch.

003
Did you start this call from the system entry maps?
Y N

004
Go to the system entry maps.

005
The probable trouble is a faulty cable from A1A3B11 to the system.
Refer to (3-000) for the interface lines.
Test for an open or short in the interface line.

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0079	A	1	001

001
(Entry Point A)

Refer to (2-000) for printer function and timing tests.
- Force a check condition by removing the forms from the tractors and run the Character Print test and print blanks.
Refer to (3-000) for the check light circuit.
- The printer should stop with a check condition.

Is the Check Light on or flashing?
Y N

002
- Probe A1A3D09 (- Check Indicator)
Up Light: ON or FLASHING
Down Light: ON or FLASHING

Are the lights correct?
Y N

003
- Probe A1A2D09 (- Check Indicator)
Up Light: DON'T CARE
Down Light: FLASHING

Are the lights correct?
Y N

004
Did you start this call from the system entry maps?
Y N

2A 2B 2C 2D 2E

This map is used to analyze a faulty light circuit only. For example, the Check Light is burned out.

B C D E
1 1 1 1

Check Light

005
Go to the system entry maps.

006
Disconnect the cabe at A1A3.
Measure for continuity from A1A3D09 to frame ground.
(Meter set on the RX1 scale).

Do you have an open circuit?
Y N

007
Reconnect the cable at A1A3.
Test for a ground from A1A2D09 to the operator panel,
OR
Refer to (3-000) for LED information.
Install a new operator panel LED board.

008
Probable trouble is a bad interface cable from A1A3D09 to the system.
Refer to (3-000) for the interface lines.
Test for an open or a short in the interface cable.

009
Refer to (3-000) for the check light circuit.
The trouble is an open or grounded wire from A1A2D09 to the operator panel.
OR
Refer to (3-000) for LED information.
Install a new Operator Panel LED board.

010
Verify the cable in A1A2 is seated correctly.
Refer to (3-000) for LED information.
Install a new operator panel LED board.

A
1

011
Reset the Check Light by pressing the Stop/Reset Key.

Does the Check Light stay on or pulse all the time?
Y N

012
The Check Light works correctly.

013
Did you start this call from the system entry maps?
Y N

014
Go to the system entry maps.

015
Probable trouble is a faulty interface cable from A1A3D09 to the system.
Refer to (3-000) for the interface lines.
Test for an open or a short in the interface line.

FORMS LIGHT

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0054	A	1	001
0079	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	023	0082	A

001
(Entry Point A)

Press STOP/RESET Key to reset any errors.
Refer to (3-000) for the forms light circuit.
Remove the forms to force an end of forms condition and press the carriage space key.

Is the Forms Light on or pulsing?
Y N

002
Probe A1A2D12 (- Forms Indicator)
Up Light: ON or FLASHING
Down Light: ON or FLASHING

Are the lights correct?
Y N

003
- Probe A1A3D12 (- Forms Indicator)
Up Light: DON'T CARE
Down Light: FLASHING

Are the lights correct?
Y N

004
Did you start this call from the system entry maps?
Y N

005
Go to the system entry maps.

2A 2B 2C 2D

this map is used to analyze a bad light circuit only.
FOR EXAMPLE: The forms light is burned out. The Forms Light turns on when the END OF FORMS is sensed. Also the Forms Light turns on with a check light that is caused by a carriage error.

PRINT UNIT INTERLOCK LIGHT

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0053	A	1	001
0079	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	014	0053	A

001
(Entry Point A)

Refer to (3-000) for the print unit interlock circuit.
Force an Interlock Light by opening the print unit.
Is the Interlock Light on or pulsing?
Y N

This map is used to analyze a bad light circuit only.
FOR EXAMPLE: The interlock light is burned out.

002
Refer to (3-000) for the print unit interlock circuit.
Probe A1A2D11 (- Interlock Light)
Up Light: ON or FLASHING
Down Light: ON or FLASHING

Are the lights correct?
Y N

003
Probe A1A3D11 (- Interlock Light)
Up Light: DON'T CARE
Down Light: ON or FLASHING

Are the lights correct?
Y N

004
Did you start this call from the system entry maps?
Y N

2A 2B 2C 2D 2E

Print Unit Interlock

005
Go to the system entry maps.

006
Power down.
Disconnect the cable in A1A3.
Measure for continuity from A1A3D11 to frame ground.
(Meter set on Rx1 scale).

Do you have an open circuit?
Y N

007
Reconnect the cable in A1A3.
Test for a ground from A1A3D11 to the operator panel,
OR
Refer to (3-000) for LED information.
Install a new operator panel LED.

008
The probable trouble is a faulty cable from A1A3D11 to the system.
Refer to (3-000) for the interface lines.
Test for an open or a ground in the interface line.

009
The trouble is an open cable or ground wire from A1A2D11 to P8-10 at the operator control panel.
Or,
Refer to (3-000) for LED information.
Install a new Operator Panel LED board.

010
Verify that the cable in A1A3 is seated correctly.
Refer to (3-000) for LED information.
Install a new operator panel LED board.

011
Close the front unit

Does the Interlock Light stay on or pulse all the time?
Y N

012
The Interlock Light is working correctly.

013
Probe A1A5B04 (- Throat Closed)
Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

014
See the Interlock switch problem map.
Go To Map 0053, Entry Point A.

015
Did you start this call from the system entry maps?
Y N

016
Go to the system entry maps.

017
Power off.
Disconnect the cable at A1A3.
Measure for continuity from A1A3D11 to frame ground.
(Meter set on RX1 scale).

Do you have an open circuit?
Y N

018
Reconnect the cable at A1A3.
Test for a ground from A1A2D11 to the operator panel,
OR
install a new operator panel LED board.

019

The probable trouble is a faulty cable from A1A3D11 to the system.
Refer to (3-000) for the interface lines.
Test for an open or a ground in the interface line.

POWER LIGHT

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0079	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
1	004	0070	A

001
(Entry Point A)

This map is used to analyze a faulty light circuit only.
For examPle the power On Light is burned out.

- Power up.
Press the Stop/Reset key to reset the error.

Is the Power On Light on?
Y N

002
Probe A1A2D03 (+ 5 volts).
Up Light: ON
Down light: OFF

Are the lights correct?
Y N

003
- Measure for 5 volts DC at (+)TB1-17 and (-)frame ground.

Is 5 volts DC present?
Y N

004
See the power problem map.
Go To Map 0070, Entry Point A.

005
Refer to (9-000) for the voltage distribution diagram.
Locate the missing 5 volts DC at A1A2D03.

2 A 2 B

006

Verify that the cables in A1A2, A1A3, and the operator control panel are seated properly. Refer to (3-000) for LED information. Install a new operator panel LED board.

007

The Power On Light is working correctly.

READY LIGHT

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0079	A	1	001

001
(Entry Point A)

This map is used to analyze a faulty light circuit only.
For example, the Ready Light is burned out.

The Ready Light does not operate correctly.
Press the Stop/Reset Key to reset any errors.
- Press the Ready Key.

Is the Ready Light on?
Y N

002
Probe A1A3D13 (- Ready Indicator)
Up Light: OFF
Down Light: ON

Are the lights correct?
Y N

003
Did you start this call from the system entry maps?
Y N

004
Go to the system entry maps.

005
The probable trouble is a faulty cable from A1A3D13 to the system.
Refer to (3-000) for the interface lines.
Test for an open or a ground in the interface line.

2 A 2 B

A B
1 1

Ready Light

006
The trouble is an open cable from A1A2D13 to P8-7 at the operator panel,
OR
a defective operator panel LED board.

007
Press the Stop/Reset key.

Does the Ready Light go off?
Y N

008
- Probe A1A3D13 (- Ready Indicator).
UP Light: OFF
Down Light: ON

Are the lights correct?
Y N

009
Did you start this call from the system entry maps?
Y N

010
Go to the system entry maps.

011
The probable trouble is a faulty cable from A1A3D13 to the system.
Refer to (3-000) for the interface lines.
Test for an open or a ground in the interface line.

012
Disconnect the cable at A1A3.
Measure for continuity from A1A2D13 to frame ground.
(Meter set on RX1 scale).

Do you have an open circuit?
Y N

C D E

013
Reconnect the cable at A1A3.
Refer to (3-000) for LED information.
Install a new operator panel LED board,
OR
Test for a ground from A1A2D13 to the Operator Panel.

014
The probable trouble is a faulty cable from A1A3D13 to the system.
Refer to (3-000) for the interface lines.
Test for an open or a short in the interface line.

015
The Ready Light is operating correctly.

DIFFICULT TROUBLE MAP

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0022	A	1	001
0024	A	1	001
0030	A	1	001
0031	A	1	001
0032	A	1	001
0040	A	1	001
0051	A	1	001
0054	A	1	001
0055	A	1	001
0060	A	1	001
0070	A	1	001
0071	A	1	001
0072	A	1	001

001
(Entry Point A)

This map identifies the fru's by priority that could cause a printer check.
Section (19-000) of this MLM shows wiring/timing diagrams of the carriage motor, belt motor, ribbon motors and the hammer unit circuitry.

Cable Interlock Check?
Y N

002
Printer Power Check?
Y N

003
Any Hammer on Check?
Y N

5 A | 5 B | 4 C | D

004
Belt Speed Check?
Y N

005
Belt Up to Speed Check?
Y N

006
Printer Busy Too Often Check?
Y N

007
Printer Busy Too Long Check?
Y N

008
Belt Sync Check?
Y N

4 E | 4 F | 4 G | 4 H | 4 J | 2 K

009
Firetier Check?
Y N

010
Data Parity Check?
Y N

011
Hammer Echo Check?
Y N

012
Carriage Check 1?
Y N

013
Carriage Check 2?
Y N

014
Forms Jam Check?
Y N

015
Ribbon Check?
Y N

016
You should not be here if you do not have one of the previous failures listed.

017
(Entry Point P)

Some probable causes of a ribbon check are,

1. A broken or incorrectly installed ribbon.
2. Interference in the ribbon path.
3. A defective (left/right) ribbon reverse switch.
4. A defective ribbon control card at A1P2.
5. A defective ribbon motor driver card at A1Q2.
6. A defective amplifier card at A1D4.

018
(Entry Point O)

Some probable causes of a forms jam check:

1. The forms thickness lever not set properly.
2. Interference in the forms path, such as, 'FORMS PULL OUT FORCE TOO HIGH'.
3. The stacker not being adjusted properly.

'FALSE FORMS JAMS'

1. A defective amplifier card at A1D4.
2. A defective carriage/ribbon control card at A1P2.

019
(Entry Point N)

Some probable causes of a carriage check 2:

1. Interference in the forms path such as, 'FORMS PULL OUT FORCE TOO HIGH'.
2. The forms thickness lever not set correctly.
3. The carriage LED ASM not adjusted properly.
4. The carriage belt tension being out of adjustment.
5. A defective carriage/ribbon control card at A1P2.
6. A defective stepper motor driver card at A1Q2.
7. A defective amplifier card at A1D4.
8. A defective A1N2.

020
(Entry Point M)

Some probable causes of a carriage check 1:

1. Interference in the forms path such as, 'FORMS PULL OUT FORCE TOO HIGH'.
2. Forms thickness lever not set correctly.
3. Carriage LED ASM out of adjustment.
4. Carriage belt tension is not correct.
5. A defective carriage/ribbon control card at A1P2.
6. A defective stepper motor driver card at A1Q2.
7. A defective amplifier card at A1D4.
8. A defective A1N2.
9. Dirt in the carriage disk.
10. Carriage motor pulley or hub set screw loose.
11. Paper clamp out of adjustment.

021
(Entry Point L)

Some probable causes of a hammer echo check:

1. A defective hammer driver card at A1J2 and/or A1F2 for model 2 printers.
2. A defective hammer coil.
3. A defective hammer decode and latch card at A1H2.
4. A defective hammer echo card at A1M2.
5. A defective feed through card at A1E2 or A1L2 for model 2 printers.
6. Defective or loose top crossover connectors from A1H2 to A1J2 and A1L2 to A1D4.
7. A defective amplifier card at A1D4.
8. A defective carriage/ribbon control card at A1P2.
9. A defective 25 volts or ground Mini-Bus to hammer driver card(s).

022
(Entry Point K)

Some probable causes of a data parity check:

1. A defective hammer decode and latch card A1H2.
2. 25 volt DC contactor points.

023
(Entry Point J)

Some probable causes of a firetier check:

1. Impression control potentiometer.
3. A defective amplifier card at A1D4.
4. A defective carriage/ribbon control card A1P2.
5. The PSS emitter out of adjustment.

024
(Entry Point I)

Some probable causes of a belt sync check:

1. PSS emitter adjusted wrong.
2. Impression control SS adjusted wrong.
3. A defective belt control card A1N2.
4. A defective stepper motor card A1Q2.
5. A defective amplifier card A1D4.
6. A defective carriage/ribbon control card A1P2.
7. Character Set on print belt if configured incorrect.

025
(Entry Point H)

Some causes of a Printer Busy Too Long Check:

1. A defective belt control card A1N2.
2. A defective ribbon control card A1P2.
3. A defective amplifier card A1D4.

026
(Entry Point G)

Some probable causes of printer busy too often checks are:

1. A defective belt control card A1N2.
2. A defective ribbon control card A1P2.
3. A defective amplifier card A1D4.

027
(Entry Point F)

Some probable causes of a belt up to speed check:

1. A defective amplifier card A1D4.
2. A defective belt control card A1N2.
3. A defective stepper motor driver card in A1Q2.
4. The voltage slip-on connectors on the pin side of the A1Q2 row of the electronic board being loose.
5. A defective carriage/ribbon control card A1P2.
6. PSS emitter gap out of adjustment.
7. Belt motor mounting screws not tight.

028
(Entry Point E)

Some probable causes of a belt speed check:

1. A defective amplifier card A1D4.
2. A defective belt control card A1N2.
3. PSS emitter gap.
4. Belt motor disk mounting screws not tight.

029
(Entry Point D)

Some probable causes of a Any Hammer on Check:

1. Loose berg connecter at the hammer magnet unit.
2. Hammer driver card A1J2 or A1F2 MOD 2 only.
3. A faulty hammer magnet.
4. The hammer echo card A1M2.
5. The hammer decode and latch card A1H2.
6. Loose or disconnected top crossover connectors from A1H2 to A1J2, 5211 MOD 2 only.

030
(Entry Point C)

Some probable causes of a Printer Power Check:

1. CP1 (CP2 or CP3 if installed) transferred to off position.
2. F1, F2, F3 or F4 defective.
3. Power system plug P23, P25 or P27 disconnected.
4. PCS1 (Resonate capacitor) being opened or shorted.

031
(Entry Point B)

Some probable causes of a Cable Interlock Check:

1. Cables at A1A3, A1A4, or A1A5 loose or disconnected.
2. Cable at A1A2 or at the printer control panel is disconnected.
3. One of the printer interface cable connectors within the system is disconnected.

SECTION 2: MAINTENANCE AIDS

INTRODUCTION

- This section describes the various maintenance aids for the CE. It includes a description and how-to-use procedures for the various aids, including the CE Switch Panel, Power Supply Test Plugs, Power Supply Test Points, and connecting the CE General Logic Probe. A chart of poor print quality samples, a brief description of the printer function and timing tests, and a description of the 5211 error checks is provided.

ENTRY INDEX

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CE SWITCH PANEL

DESCRIPTION

The CE Switches can be used to operate the following functional units on the 5211.

- Print Belt Drive Motor
- Carriage Drive Motor
- Ribbon Drive Motors
- Paper Clamp Magnet

SERVICE CHECK

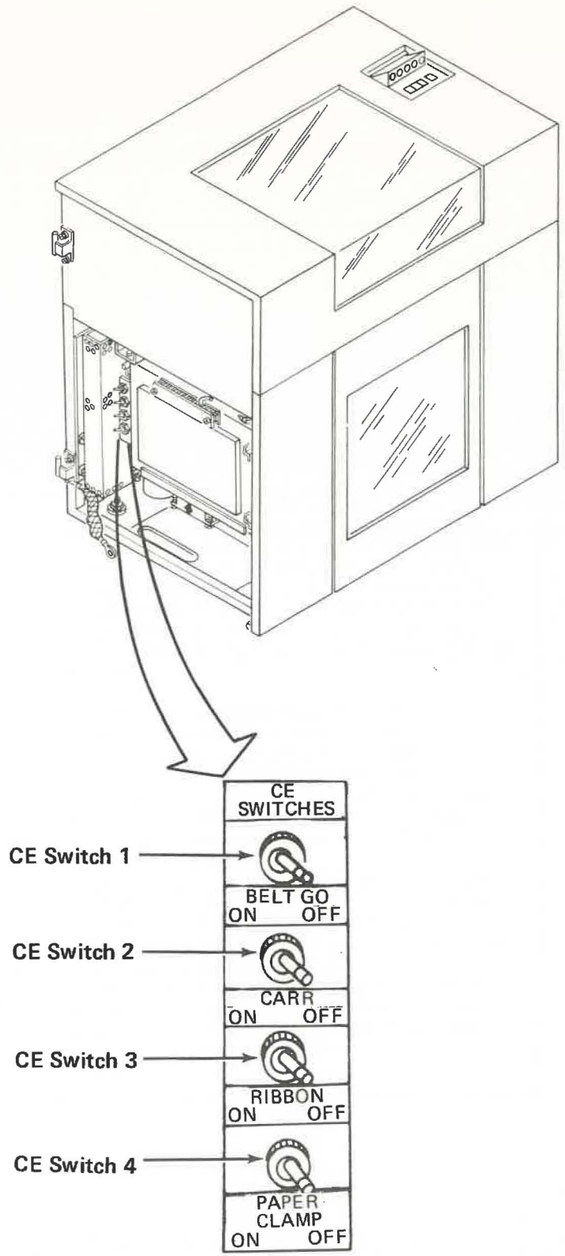
Note: Before using the CE Switches, (1) the printer must be put into diagnostic mode by the host system, and (2) the microcode must be loaded in the host system's printer adapter.

See the maintenance information for the printer's host system.

To verify that the CE Switches can be used:

1. Turn CE Switch 3 (Ribbon) on. The ribbon should run. Turn CE Switch 3 off.
2. Turn CE Switch 4 (Paper Clamp) on. The paper clamp should operate. Turn CE Switch 4 off.

Note: If you suspect a CE Switch failure, go to MAP 0075, Entry Point A.



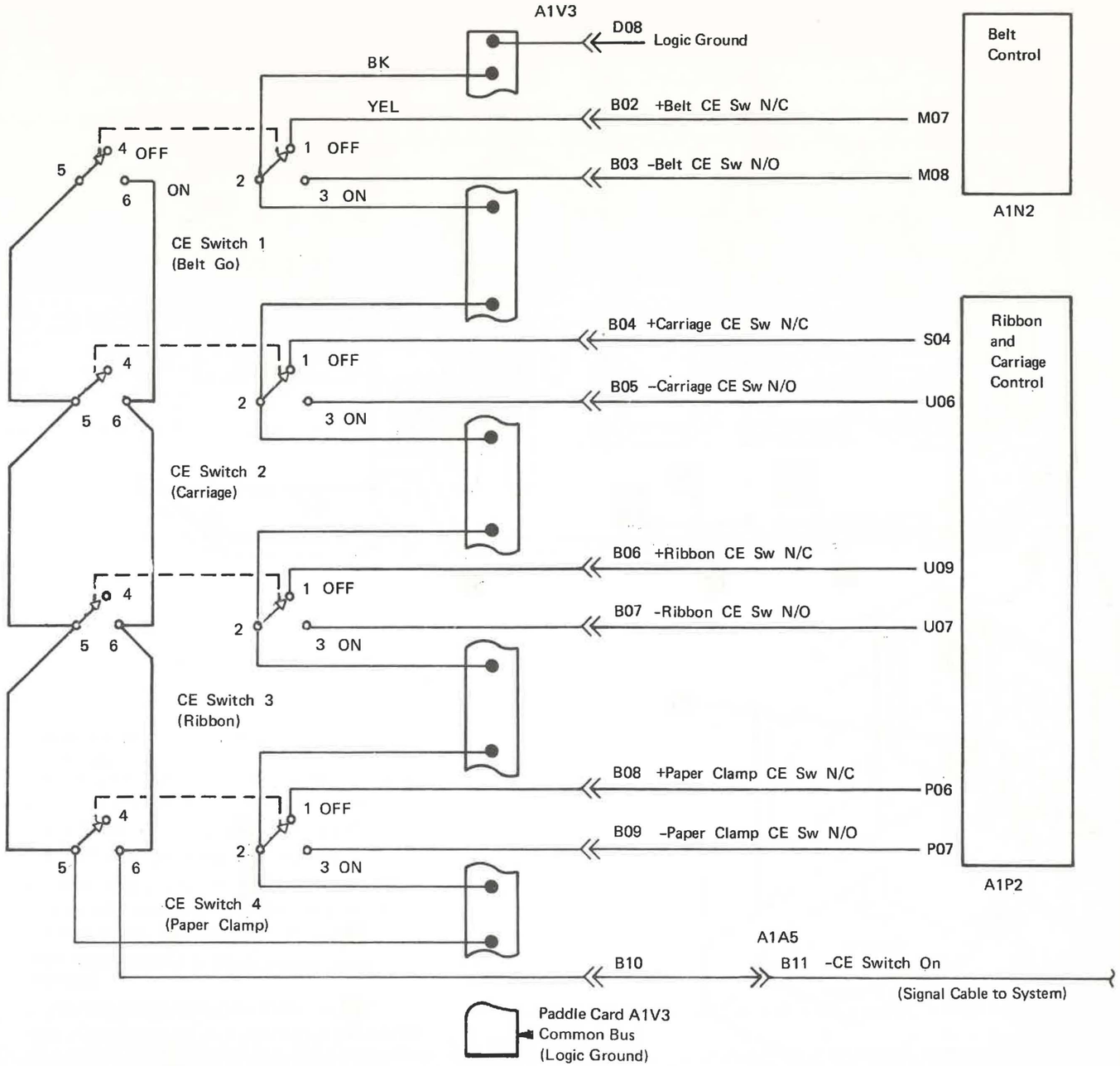
CE SWITCH PANEL TESTS

The following tests are described

- Belt Motor Start and Run (Closed Loop)
- Belt Motor Start and Run (Open Loop)
- Carriage Motor Run
- Ribbon Motors Run
- Paper Clamp Operation

Test	Switch(es)	Operations	Comments
Belt Motor Start and Run (Closed Loop)	CE Switch 1 Belt Go	Motor phases detent. Belt motor starts, and accelerates to closed loop speed. It continues to run from the belt feedback pulses (closed loop). The ribbon motors run during first start.	The switch performs the function of the 'Belt Go' signal from the system. The 'Belt Go Delayed' signal is gated to the 'Belt Up To Speed' signal line. The 'AMP Belt LED' signal is gated to the 'Print Subscans' signal line. This test prevents the motor control from switching from the feedback pulses to the oscillator pulses. Used to perform the Belt Motor Feedback LED Adjustment. See Section 4, 4-000.
Belt Motor Start and Run (Open Loop)	CE Switches: (Turn on in sequence) 3 Ribbon 4 Clamp 1 Belt Go	Motor phases detent. Belt motor starts, and accelerates to operating speed. It then switches from feedback pulses to run from the oscillator pulses. Ribbon motors run.	The Belt Motor operates normally. The 'PSS' and 'Belt Up To Speed' are normal. The ribbon can be reversed by operating the correct reverse switch. This test is used to observe the PSS emitter pulses while running the Belt Motor Feedback LED test.
Carriage Motor Run	CE Switch 2 Carr (Carriage)	Carriage motor starts and runs.	The switch performs the function of the 'Carriage Go' signal from the system. The 'Carriage Go' signal is gated to the 'Impression Control Single Shot' signal line. The 'Carriage Feedback Pulse' signal is gated to the 'Carriage Advance Pulse' signal line. Forms jam sensing is suppressed. Used to perform the Carriage Motor Feedback LED Adjustment. See Section 8, 8-000.
Ribbon Motors Run	CE Switch 3 Ribbon	One of the ribbon motors runs. The non-driving motor has normal drag current to provide tension for the ribbon	The ribbon can be reversed by activating the reverse switch on the non-driving side. The circuits to sense ribbon motion failures remain active.
Paper Clamp Operation	CE Switch 4 Paper Clamp	The paper clamp magnet is activated and the paper clamp is operated. A POR is provided to the printer logic.	The switch performs the function of the 'Activate Paper Clamp' signal from the system. The POR functions only when CE Switch 4 is turned on before any other CE switches are turned on. The POR remains active if other CE switches are turned on after CE Switch 4 is turned on.

CIRCUIT – CE SWITCHES



EC 784017 01Mar78 EC 784034 01Mar78 EC 784068 31July78	PN 8324130 1 of 2	**2-030**

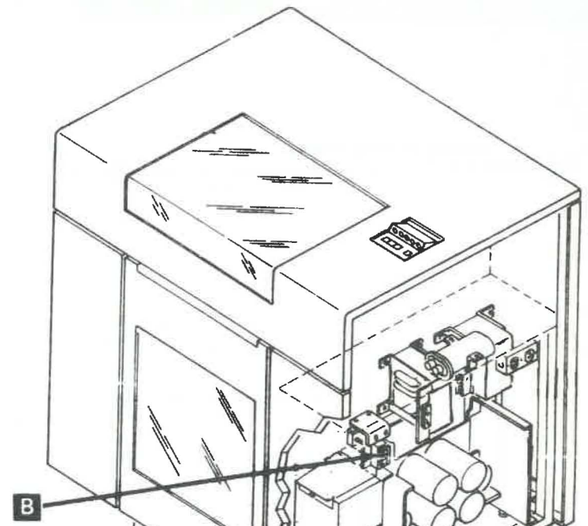
CE P/S (POWER SUPPLY) TEST PLUGS

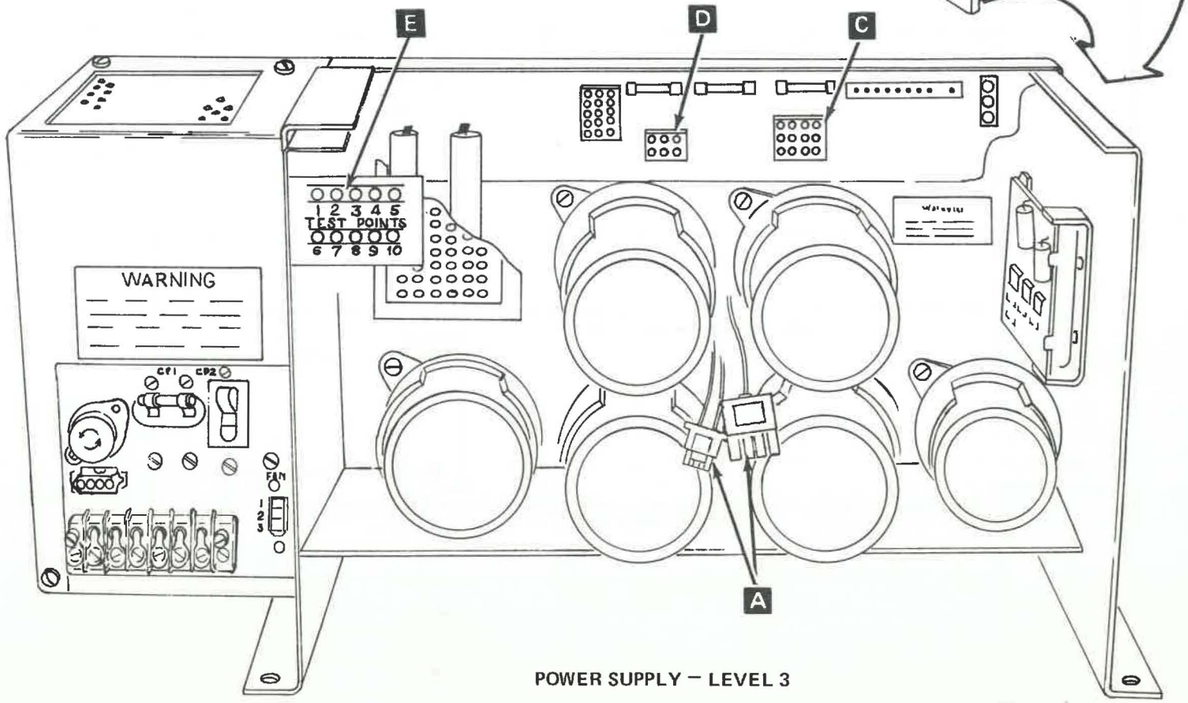
The P/S Test Plugs, A are used to allow the power supply to be turned on with the 5211 logic circuits disconnected.

1. Turn the Power On/Power Off Switch off. B

DANGER
Line voltage is present in the 5211 Power Supply.

2. Disconnect P23 C (12-position) and P25 D (6-position) from the power supply circuit board.
3. Connect the P/S Test Plugs A to the circuit board:
   a. 12-position plug to P23 C. (25 volts)
   b. 6-position plug to P25 D. (5 and 8.5 volts)
4. Turn the Power On/Power Off Switch on. The printer power supply powers on, but there is no power to the 5211 logic circuits.
   Note: System power must be on.





POWER SUPPLY – LEVEL 3

POWER SUPPLY TEST POINTS

The test points E (2-040) can be used to diagnose power failures by testing power supply circuits.

Test Point	Active Level	Function	Comments
1	+ 8.5		
2	+ 5		
3	+25		
4	+24	Internal + 24 V	(PS) K1 Picked
5	0	Power Complete	Signal from power supply to host system if voltages are good.
6	0	Power Check	Signal from power supply to host system if any power supply voltages are wrong.
7	0	Power On	Signal from host system.
8	+24	(PS) K2 Pick	
9	0	(PS) K2 Drive	
10	+ 5	Internal +5 Volts	

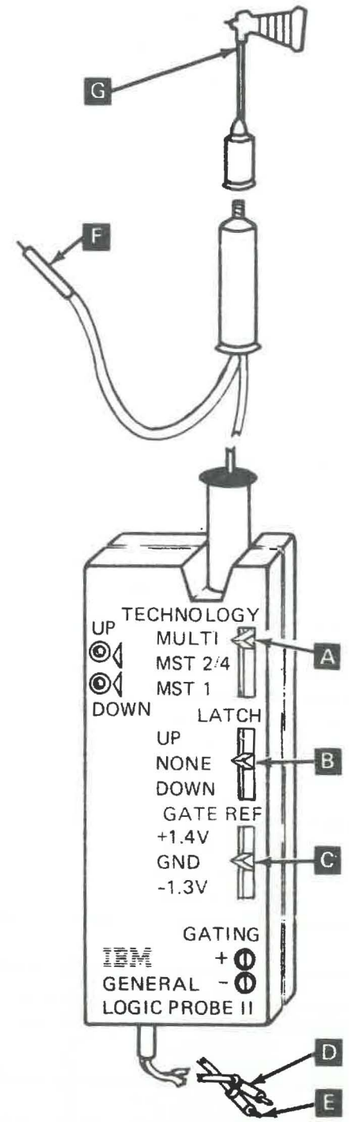
TEST POINTS – LEVEL 3 POWER SUPPLY

CE GENERAL LOGIC PROBE II (GLP)

This page shows the basic setup for the 5211 Printer.

1. Set the Technology switch to MULTI. A
2. Set the Latch switch to NONE. B
3. Set the Gate Ref. switch to GND. C
4. Connect the GLP Power:
   a. Power lead D (black) to A1M2D08 (logic ground) or any D08 pin.
   b. Power lead E (red) to A1M2D03 (+5 volts) or any D03 pin except the A and V rows.
5. Connect the GLP Signal Probe:
   a, Ground lead F to any convenient D08 pin.
   b. Connect the signal probe G to the pin to be measured.

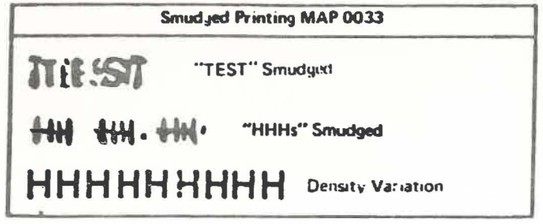
For more detailed information on the GLP, see "General Logic Probe II", Section 21, 21-000, and General Logic Probe II Manual, SY27-0127-0.



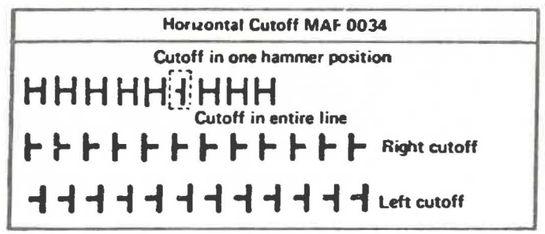
PRINT QUALITY IDENTIFICATION — MODEL 2

SAMPLES OF POOR PRINT QUALITY

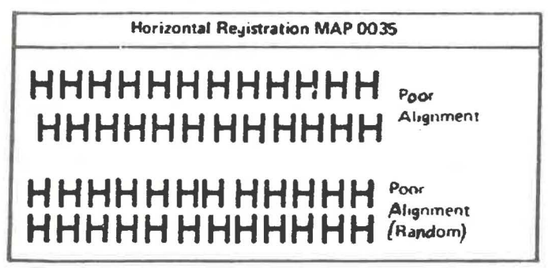
Smudged Printing MAP 0033



Horizontal Cutoff MAP 0034



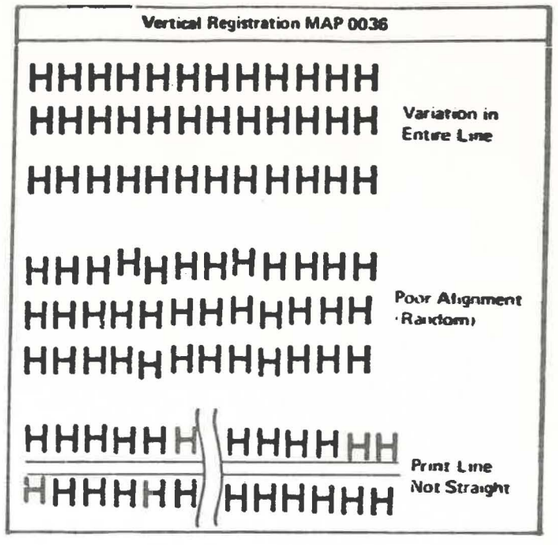
Horizontal Registration MAP 0035



Print Belt Motor Failures MAP 0022

Printed characters that cannot be recognized.

Vertical Registration MAP 0036



Vertical Cutoff MAP 0037

OCR PRINT QUALITY

The Optical Loupe is an additional aid that can be used to inspect OCR printing.

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PRINTER FUNCTION AND TIMING TESTS

The following tests are available from the host system to aid in the maintenance of the IBM 5211 Printer.

- Matrix Print Test
- Ripple Print Test
- Character Print Test
- Carriage Space/Skip Test
- Impression Control Single Shot (IMPSS) Timing Test
- Belt Motor Feedback LED Timing Test
- Carriage Motor Feedback LED Timing Test

For information on output from the tests, see "Diagnostic Descriptions", Section 16, 16-010.

Note: The printer is controlled by signals from the host system. When diagnosing printer failures, the microcode must be loaded in the system's printer adapter.

For information on how to run the test from the system, see the maintenance information for the printer's host system.

MATRIX PRINT TEST

Addresses and prints one print position per line, starting at print position-1.

RIPPLE PRINT TEST

Prints every character from the character set in every print position.

CHARACTER PRINT TEST

Prints any character selected by the CE, including blank. Prints the character in any single print position or all 132 print positions, as selected by the CE.

CARRIAGE SPACE/SKIP TEST

Performs spacing and skipping to test the forms path and carriage. The CE can select either 6 lines-per-inch or 8 lines-per-inch.

IMPRESSION CONTROL SINGLE SHOT TIMING

Measures the print impression control potentiometer timing.

For details on how to adjust, see "Impression Control Potentiometer", Section 5, 5-000.

BELT FEEDBACK LED TIMING

Measures the belt motor feedback LED timing. For details on how to adjust, see "Belt Motor Feedback LED", Section 4, 4-000.

CARRIAGE FEEDBACK LED TIMING

Measures the carriage motor feedback LED timing. For details on how to adjust, see "Carriage Motor Feedback LED", Section 8, 8-000.

5211 ERROR CHECKS

The following error conditions are sensed and logged by the system. The Check light is turned on for each of these errors, except Power Check and Cable Interlock Check.

BELT SYNC CHECK

A belt sync check occurs if a home pulse arrives when not expected or if there is a missing home pulse.

BELT UP-TO-SPEED CHECK

A Belt up-to-speed check occurs if the time between the signals '–Belt Go' and '–Belt Up-to-Speed' exceeds 1.4 seconds. Each error is logged. If the second retry is unsuccessful, the printer stops.

BELT SPEED CHECK

A Belt speed check occurs if the 'Belt UTS' signal goes from active to inactive when the 'Belt Go' signal is active.

DATA PARITY CHECK

A data parity check indicates that even parity was sensed by the printer on the hammer address bus.

The printer constantly monitors the data bits from the system that address the print positions for odd parity. If an even parity is sensed, a data parity check occurs. The printer activates the 'Data Parity Check' signal.

HAMMER ECHO CHECK

A hammer echo check occurs during 'print time' if either (a) or (b):

(a) The failing hammer position activates the 'Hammer Echo Return' signal when the hammer should be off.

(b) The failing hammer position fails to activate the 'Hammer Echo Return' signal when the hammer should be on.

ANY HAMMER ON CHECK

An any hammer on check occurs during 'not print time' if the 'Hammer Echo Return' signal is active (indicating that the voltage in the hammer coil circuit is incorrect).

PRINTER BUSY TOO LONG CHECK

The Printer busy too long check occurs if the 'Printer Busy' signal exceeds three seconds during a print cycle.

PRINTER BUSY TOO OFTEN CHECK

A Printer busy too often check occurs if the 'Printer Busy' signal becomes active three times during a print cycle.

RIBBON CHECK

A Ribbon check occurs if the 'Ribon Check' signal from the printer is active. The line 'Ribbon Check' becomes active if the ribbon is not moving or if both ribbon reverse switches are activated at the same time.

FORMS JAM CHECK

A forms jam check occurs if a '-Forms Pulse' signal from the printer is not sensed within 50 to 70 mm (2 to 3 in) of forms motion.

CARRIAGE CHECK 1

This check occurs if there are missing or extra carriage advance pulses during a carriage operation.

CARRIAGE CHECK 2

(Single Space) This check occurs if the timing between the deactivation of the paper clamp and the deactivation of the 'paper settling' pulse (within the host system) exceeds 34 ms. three or more times while printing from line 1 of one form to line 1 of the next form.

PRINTER POWER CHECK

A Printer power check occurs if the 'Power Check' signal from the printer is active. The Check light is not turned on. The Power On/Power Off Switch must be turned off, then turned on to reset the power check condition.

CABLE INTERLOCK CHECK

The Cable interlock check occurs if any signal cable or operator panel cable is not connected correctly in the printer or host system.

SECTION 3: OPERATOR'S PANEL AND PRINTER SIGNAL CABLE

INTRODUCTION

- This section describes installation and removal procedures related to the 5211 Operator's Panel LED Board and EDS Assembly. Operator's Panel circuts, cable and connectors are also shown.

ENTRY INDEX

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OPERATOR'S PANEL LED BOARD

REMOVAL

1. Lift printer cover.
2. Remove 4 screws **A** from top of operator's panel cover and lift cover assembly off.
3. Remove 2 screws **B** holding plate, spacer and ribbon cable to LED board.

   Note: Two nuts **C** behind LED board will be loose. Care must be taken to ensure parts do not fall into printer.
4. Remove printer cable from connector on back of LED board.
5. Remove 2 screws **D** holding LED board to grid support housing.
6. Remove LED board.

INSTALLATION

1. Place LED board on grid support housing assembly with 2 screws **D** . Before completely tightening screws, place the operator's panel cover over the LED and EDS assemblies and align the LEDs with the holes in the cover assembly. Remove the cover assembly and tighten screws.
2. Place diaphragm switch assembly ribbon cable as shown in detail **E** .
3. Connect printer cable to back of LED board.
4. Place operator's panel cover assembly on grid support housing.
5. Using screw starter, place 4 screws **A** in cover assembly.

   Note: Do not tighten these screws.
6. Carefully close printer cover and align operator's panel.
7. Lift printer cover and tighten 4 operator's panel screws.

OPERATOR'S PANEL EDS ASSEMBLY

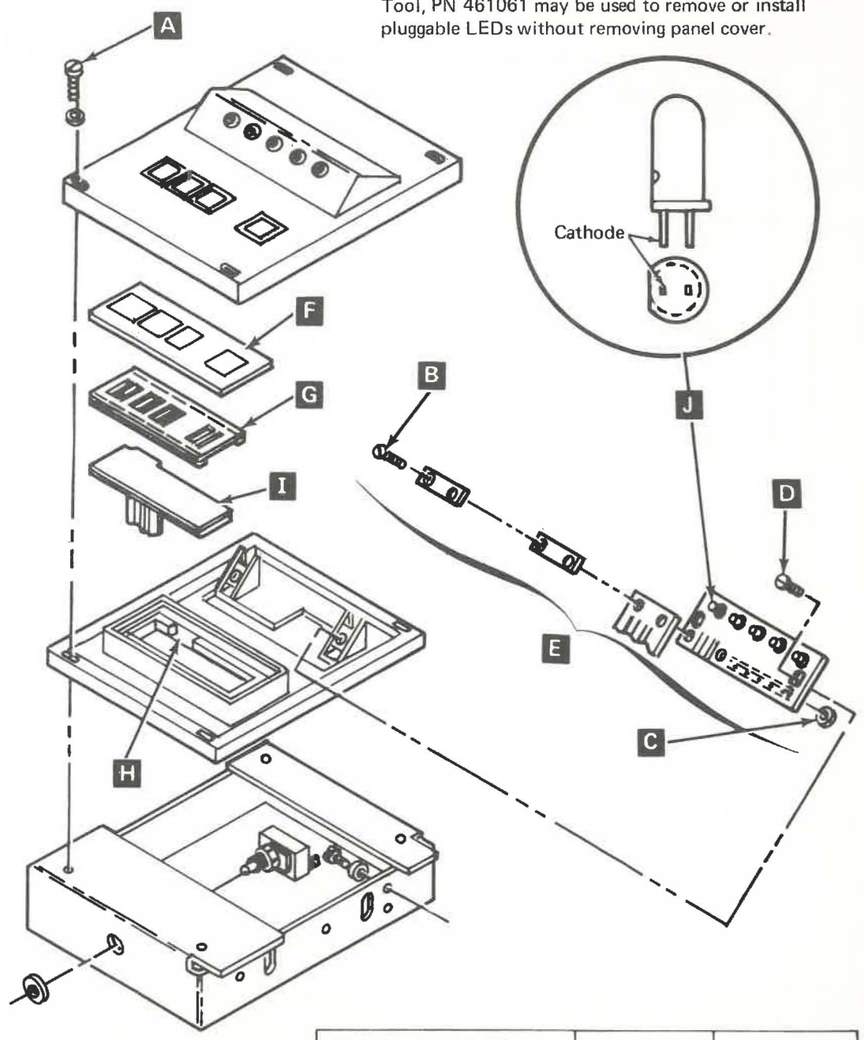
REMOVAL

1. Complete steps 1, 2, and 3 of operator's panel LED board removal.
2. Remove overlay **F**
3. Remove underlay **G** by lifting corner **G** to separate from grid support housing.
4. Lift diaphragm switch assembly **I** including ribbon cable out of grid support housing.

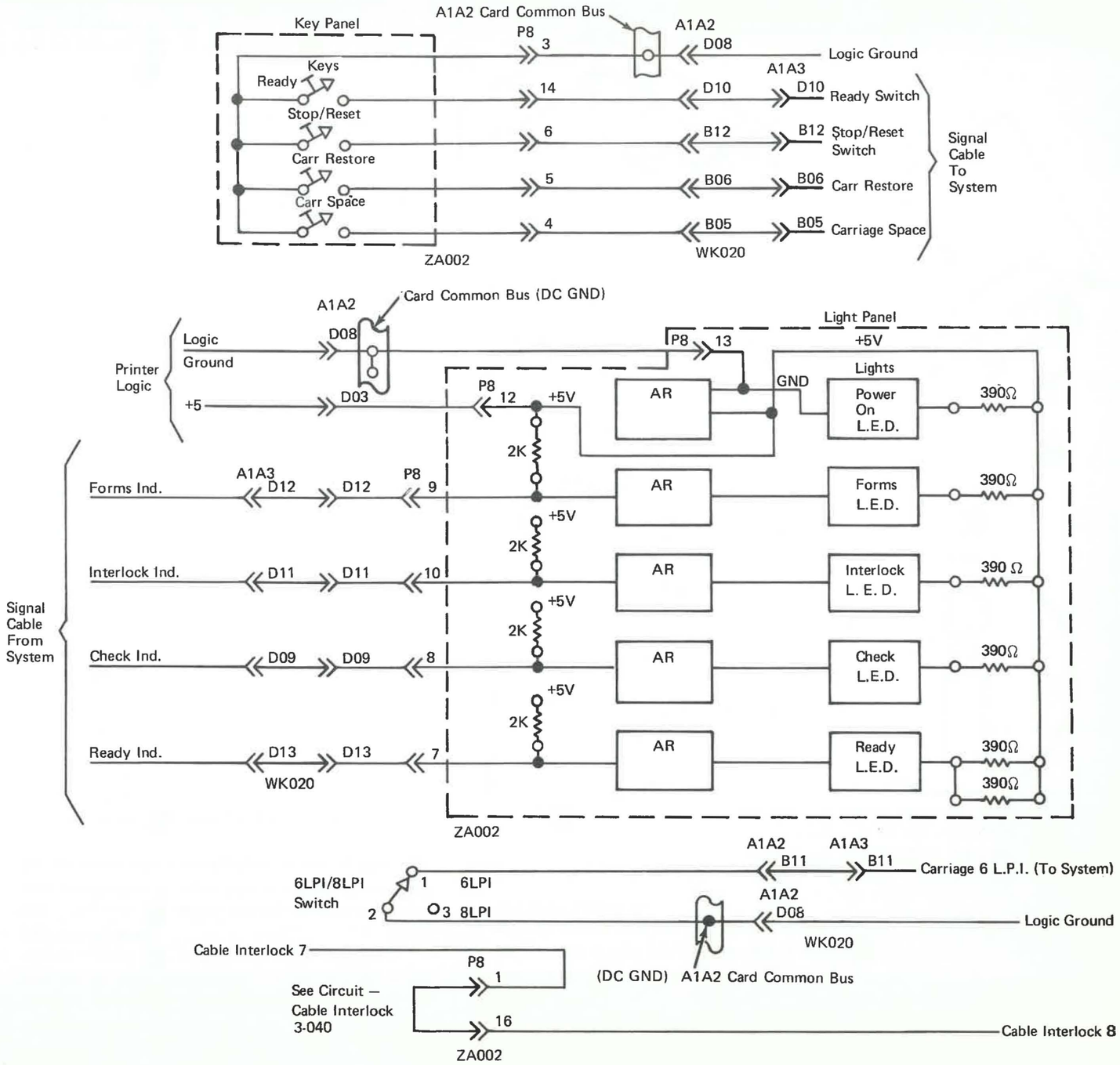
INSTALLATION

1. Place ribbon cable through slot **H** in base of grid support housing and seat diaphragm switch assembly **I** in bottom of grid support housing.
2. Place underlay **G** in grid support housing with adhesive strips.
3. Place overlay **F** in grid support housing.
4. Place free end of LED board ribbon cable as shown **E**
5. Complete steps 4, 5, 6, and 7 of operator's panel LED board installation.

Note: On machines with pluggable LEDs, the cathode (flat side or dot) must be located to the left **J** . Tool, PN 461061 may be used to remove or install pluggable LEDs without removing panel cover.



CIRCUIT - OPERATOR'S PANEL



EC 784017 01Mar78 EC 784068 31July78	PN 8324136 2 of 2	**3-020**

SIGNAL CABLE AND CONNECTORS

A1A3

Pin	Signal Name	Source
B02	Power On	system
B03		
B04	(Spare)	
B05	– Carriage Space	printer
B06	– Carriage Restore	printer
B07		
B08	– Power Complete	printer
B09	(Spare)	
B10		
B11	– Carriage 6 LPI	printer
B12	– Stop/Reset Switch	printer
B13	– Cable INLK 5	system
D02	(Spare)	
D03		
D04	–Cable INLK 6	system
D05	(Spare)	
D06		
D07	–Power Check	printer
D08	DC Ground	system
D09	–Check IND	system
D10	–Ready Switch	printer
D11	–Interlock IND	system
D12	–Forms IND	system
D13	–Ready IND	system

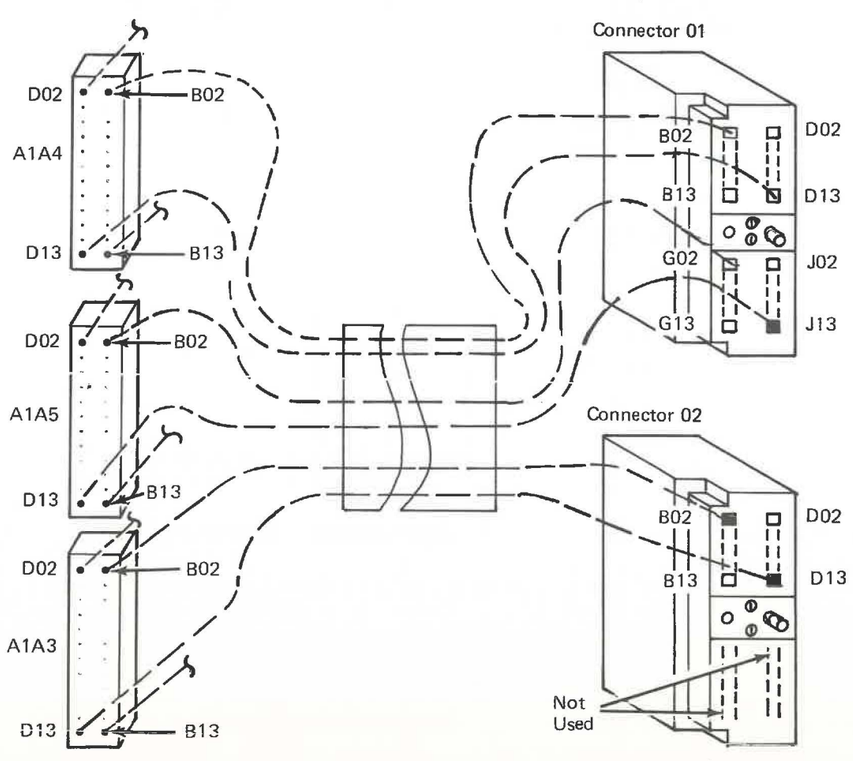
A1A4

Pin	Signal Name	Source
B02	– Data Bit 0	system
B03	– Data Bit 1	system
B04	– Data Bit 2	system
B05	– Data Bit 3	system
B06	– Data Bit 4	system
B07	– Data Bit 5	system
B08	– Data Bit 6	system
B09	– Data Bit 7	system
B10	– Parity Bit	system
B11	(Spare)	
B12	– Hammer Echo Return	printer
B13	– Cable INLK 1	system
D02		
D03	–Cable INLK 2	system
D04	–Not Print Time	printer
D05	–Data Parity Check	printer
D06	–Strobe	system
D07	–Hammer Sample	system
D08	DC Ground	system
D09	–Fire Tier 1	system
D10	–Fire Tier 2	system
D11	–Fire Tier 3	system
D12	–Fire Tier 4	system
D13	– Fire Tier 5	system

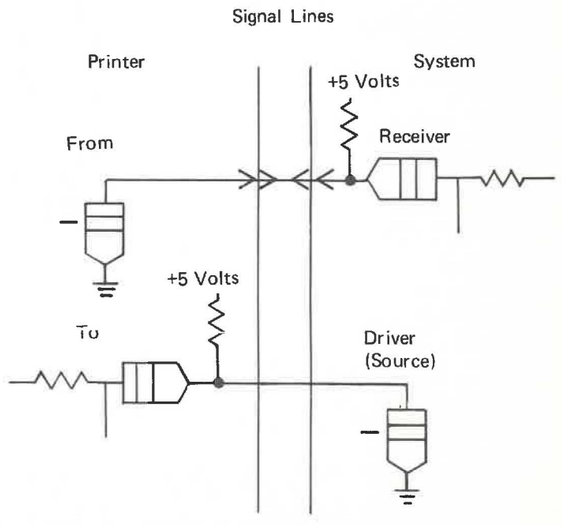
A1A5

Pin	Signal Name	Source
B02	+ End of Forms	printer
B03	– Print Subscans	printer
B04	– Throat Closed	printer
B05		
B06	– Forms Pulse	printer
B07	– Carriage Advance	printer
B08	– Impression CTL SS	printer
B09	– Ribbon Check	printer
B10	(Spare)	
B11	– CE Switch On	printer
B12	– Belt Up To Speed	printer
B13	– Cable INLK 3	system
D02		
D03		
D04	–Carriage Go	system
D05	–Cable INLK 4	system
D06	+POR	system
D07	–Activate Paper Clamp	system
D08	DC Ground	system
D09	–Close 25V Contactor	system
D10	(Spare)	system
D11	–Home	printer
D12	–Belt Go	system
D13	–Printer Busy	printer

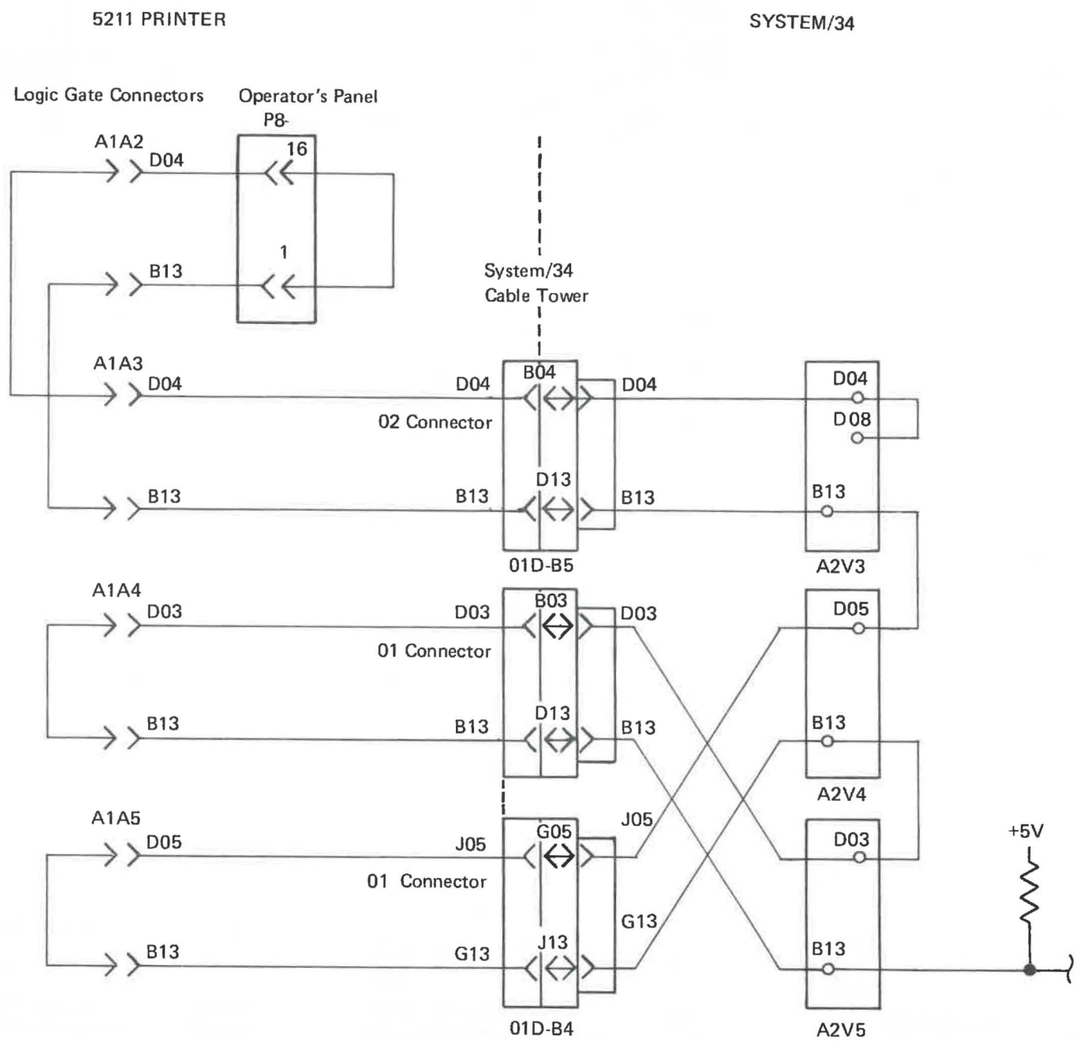
Signal Cable Connector Numbering



Signal Lines



CIRCUIT – CABLE INTERLOCK



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SECTION 4: PRINT BELT AND DRIVE

INTRODUCTION

- This section describes installation and removal procedures related to the 5211 print belt and drive. Circuits describing belt motor feedback, drivers, and print sub-scan transducer operation are discussed. Adjustments and service checks are also included. For a detailed description, see the Theory of Operation, Section 15.

ENTRY INDEX

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PRINT BELT

REMOVAL

1. Open the print unit casting by pulling the print unit release lever **A** forward.

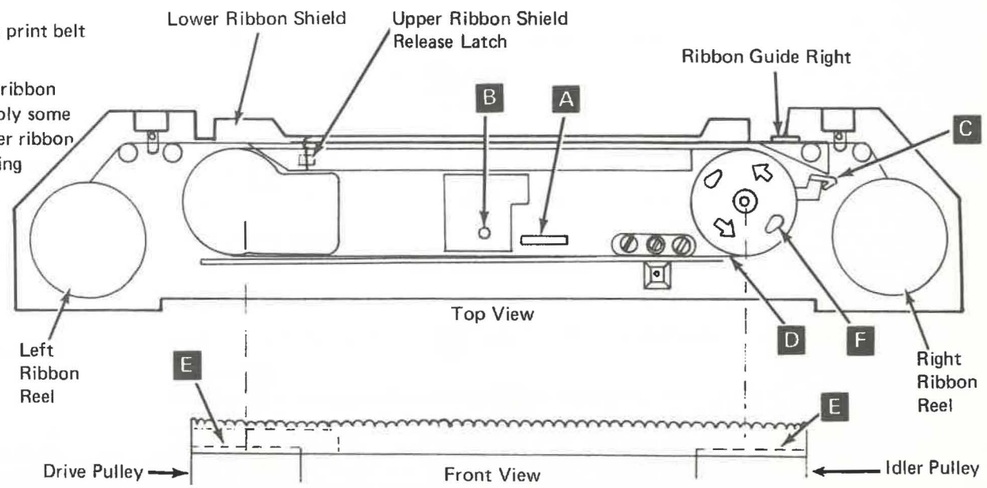
   Note: This de-activates the print unit interlock switch.

2. Loosen screw **B**, and remove the print belt cover. Press the ribbon shield release latch and open the upper ribbon shield.
3. Remove the right ribbon reel. Remove the ribbon from under the right and left ribbon guides. Place the right reel on top of the left reel. See "Section 6", 6-000.
4. Pull the print belt release lever **C** forward to loosen the tension on the print belt.
5. Remove the print belt **D**.

INSTALLATION

Note: The Print belt can be installed easily if the print belt release lever is first pushed to the rear and the upper ribbon shield opened.

1. Push the print belt release lever **C** to the rear.
2. Install the print belt evenly around the top of the pulleys **E**. Ensure that the print belt is positioned between the lower ribbon shield and the platen.
3. Turn the idler pulley **F** counterclockwise until the print belt moves down to the positioning rollers (located under the ribbon shield) and is fully seated.
4. Install the ribbon and the right ribbon reel. See "Section 6", 6-000.
5. Turn the print belt pulley again. Ensure that the print belt does not interfere with the ribbon.
6. Turn one of the ribbon reels and ensure that the ribbon feeds under the right and left ribbon guides. Apply some tension to ribbon while checking. Close the upper ribbon shield. Feed the ribbon and verify that it is feeding correctly.
7. Install the print belt cover.
8. Close the print unit casting.



BELT MOTOR FEEDBACK LED

OPERATIONAL DESCRIPTION

Light from a light emitting diode (LED) is distributed through a turning feedback emitter timing disk. When light from the LED goes through one of the holes to the photo transistor (PT) it generates a belt motor feedback pulse.

DANGER

Use caution when adjusting the LED to avoid sharp edgees of the feedback disk.

SERVICE CHECK

1. Remove print belt cover. See "Removal", 4-010.
2. Remove the feedback LED cover by removing the mounting screws A .
3. Turn the disk pulley and verify that the disk is flat and tracking between LED and PT.
4. Run the belt feedback LED timing test for your system and verify that the following timings are correct:

Maximum	1000 microseconds
Minimum	600 microseconds
Average	690 to 740 microseconds

   If wrong, perform the adjustment.
5. Install LED cover and print belt cover. See "Adjustment", 4-020.

ADJUSTMENT

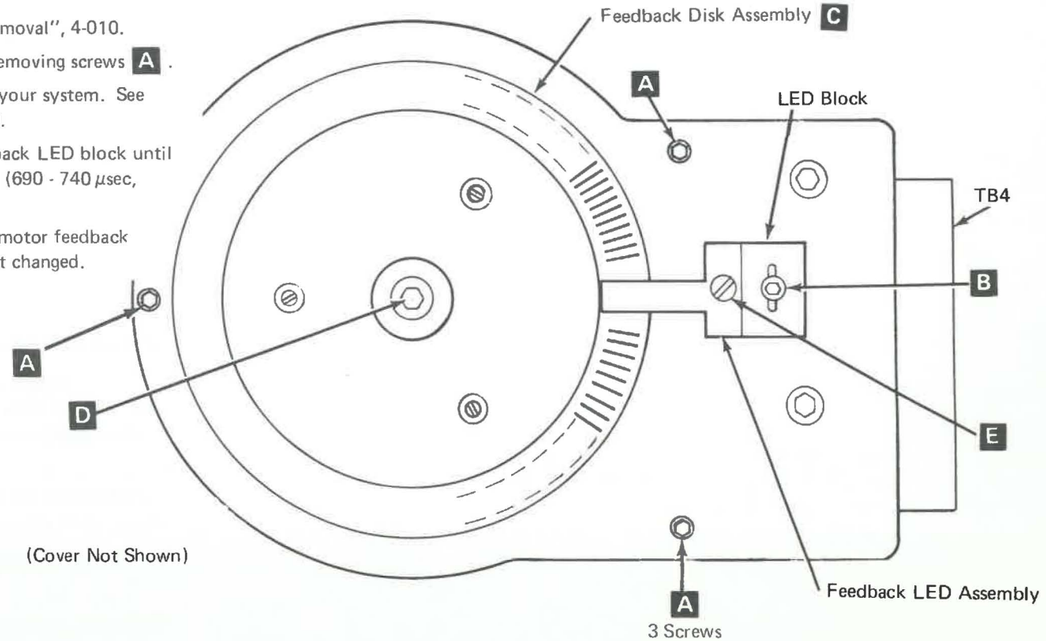
1. Remove the print belt cover. See "Removal", 4-010.
2. Remove the feedback LED cover by removing screws A .
3. Run the belt feedback timing test for your system. See "Maintenance Aids", Section 2, 2-000.
4. Loosen screw B and move the feedback LED block until the timing test displays correct timing (690 - 740 μsec, average 714 μsec).
5. Tighten the screw and install the belt motor feedback LED cover. Verify that timing has not changed.
6. Install print belt cover.

REMOVAL

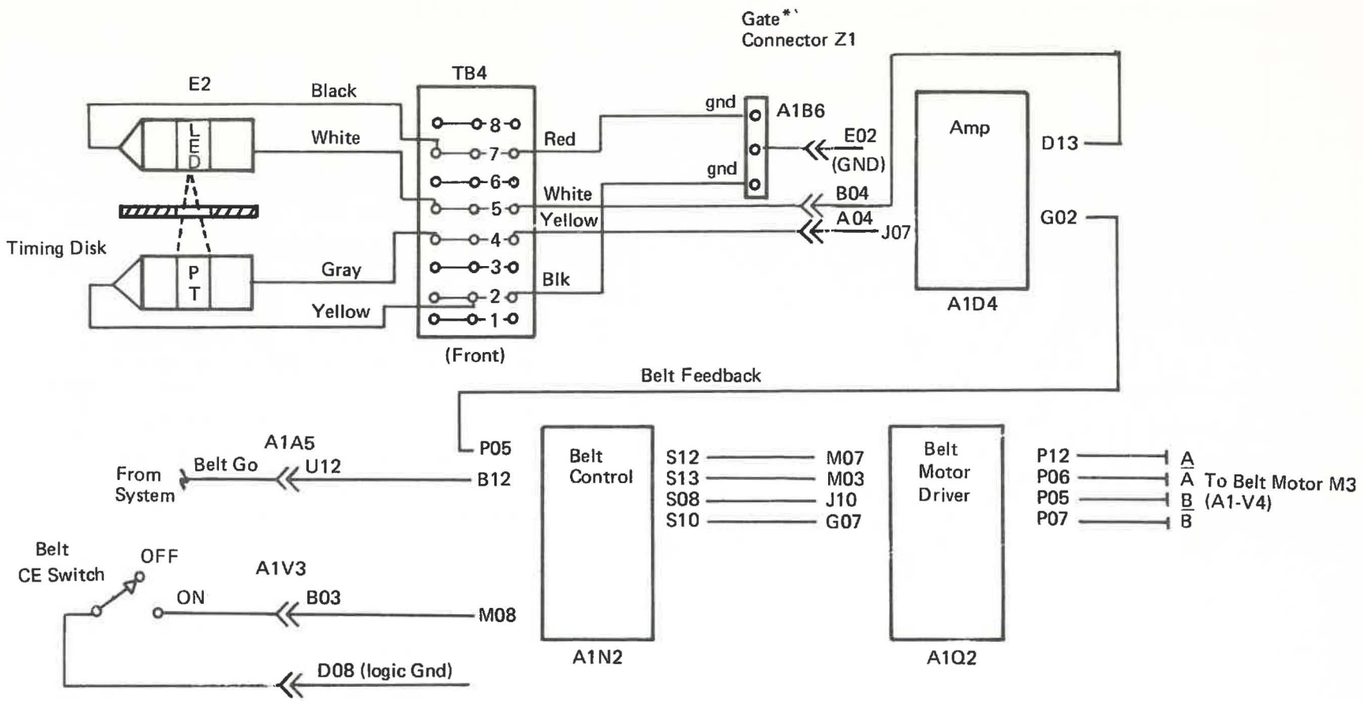
1. Remove the feedback LED cover by removing the mounting screws A .
2. Remove the 4 LED wires from terminal block (TB) 4.
3. Remove the feedback disk assembly C by removing screw D.
4. Remove the mounting screw E , then the LED, pulling wires up.

INSTALLATION

1. Place the LED assembly on the block as shown. Tighten screw E .
2. Install 4 wires on the terminal block. See "Circuit", 4-030.
3. Install the timing disk and mounting screw D .
   Caution: Ensure that screw D is tight.
4. Perform the belt motor feedback LED adjustment. See "Adjustment", 4-020.
5. Install feedback LED cover.
6. Install print belt cover.



CIRCUIT – BELT MOTOR FEEDBACK



*Gate Connector Location Chart

A1 Z1 ⟵ A1B6	
Connector	Pins
D08	E02
B05	B04
B04	A04

BELT DRIVE PULLEY

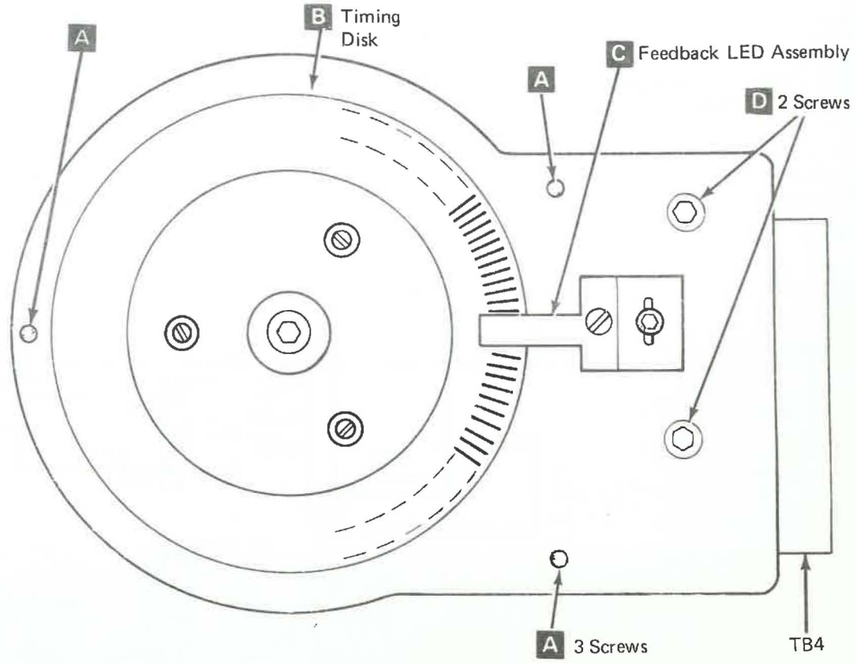
REMOVAL

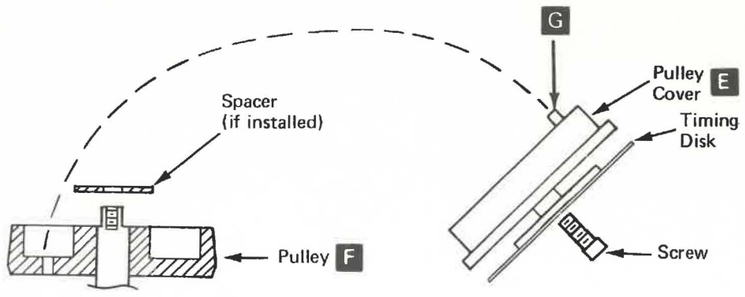
1. Remove:
   a. Print belt cover.
   b. Print belt. See "Removal", 4-010.
   c. Belt motor feedback cover by removing 3 screws A .
2. Remove feedback timing disk B . See "Removal", 4-020. DO NOT remove the LED assembly C .
3. Remove the feedback mounting plate by removing screws D .
4. Remove the pulley cover E , 4-050.
5. Remove the pulley F , 4-050.

INSTALLATION

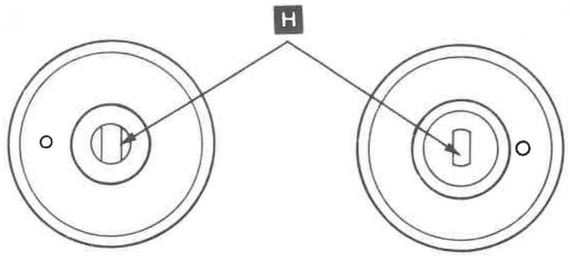
1. Install the pulley on the motor shaft.
2. Place the pulley cover E on the motor shaft. Ensure that pin G , 4-050, engages the hole in the pulley, and that the hole in the cover aligns with the motor shaft H .

   Note: Die cast cover requires use of spacer. The steel cover does not require the spacer.
3. Verify that the pulley can be moved up and down on the motor shaft:
   a. Hold down the pulley cover with one hand.
   b. At the same time, with the other hand, hold the outside of the pulley from opposite sides and lift evenly.
   c. The pulley should move up and down freely.
4. Install the feedback mounting plate. Do not tighten screws D .
5. Install the feedback disk B and rotate pulley checking disk tracking. Assure disk is not rubbing edge of hole in plate. Tighten screws D .
6. Install print belt. See "Installation", 4-010.
7. Perform the belt motor feedback LED adjustment. See "Adjustment", 4-020.
8. Install:
   a. Belt motor feedback cover A .
   b. Print belt cover.





Assembling the Drive Pulley



Pulley, Top View

Cover, Bottom View

BELT DRIVE MOTOR

SERVICE CHECK

1. Power the printer off, then remove card A1Q2.
2. Measure the resistance of each motor phase circuit:

A1Q2P12	to	A1Q2M10	4 ohms	A-phase
A1Q2P06	to	A1Q2M10	4 ohms	Not A-phase
A1Q2P05	to	A1Q2G12	4 ohms	B-phase
A1Q2P07	to	A1Q2G12	4 ohms	Not B-phase

Note: The resistance values may differ because of the meter. Compare values of similar parts on the circuits to determine failing parts, for example, R5 and R6.

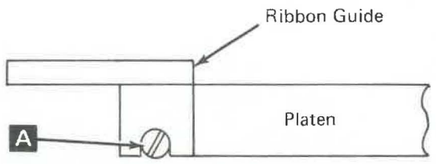
3. Install A1Q2 card.
4. Power on.

REMOVAL

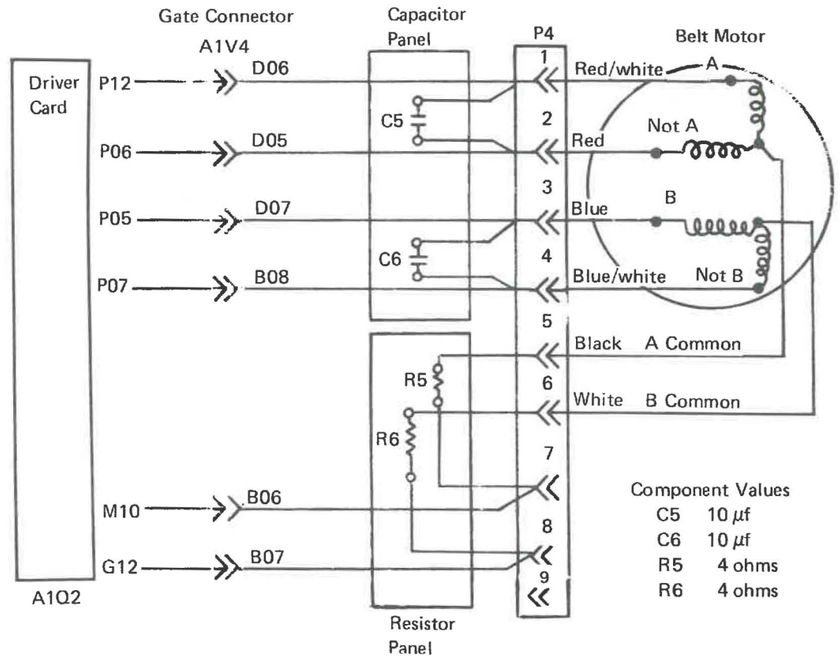
1. Remove the ribbon and print belt.
2. Remove the print unit casting and the print belt cover. See "Print Unit", Section 5, 5-000.
3. Remove the belt motor feedback cover, the emitter disk, and the pulley assembly. See "Removal", 4-040.
4. Loosen lower ribbon shield mounting screw **A** (left end of platen) and remove ribbon guide.
5. Remove the three motor mounting screws and the belt motor feedback mounting bracket.
6. Rotate the motor to align cable with clearance slot and lift cable and motor up and out of the print unit casting.

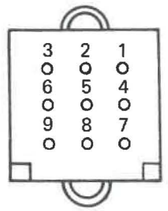
INSTALLATION

1. Place the motor in the print unit and rotate to ensure that the cable is toward the rear of the printer. Install the left ribbon guide and tighten mounting screw **A** .
2. Install the belt motor feedback mounting bracket over the motor, then install the screws (2 long, 1 short).
3. Install the print belt pulley and belt feedback disk. See "Adjustment", 4-020.
4. Install the print unit casting. See "Print Unit" Section 5, 5-000.
5. Perform the belt feedback LED adjustment. See "Adjustment", 4-020.
6. Install the feedback LED cover and the print belt cover.



CIRCUIT – BELT MOTOR



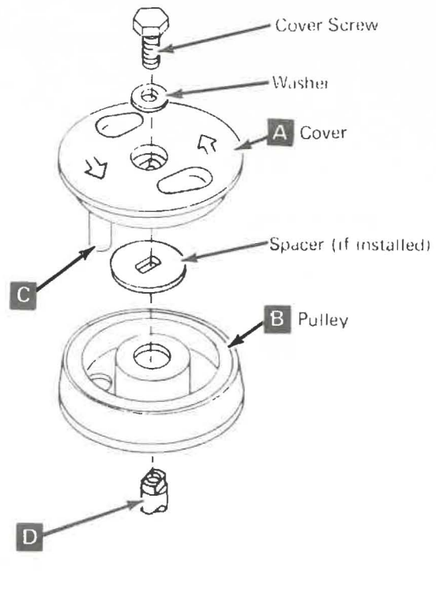


P4 Pins
(Male Connector)

BELT IDLER PULLEY

SERVICE CHECK

Verify that the up and down pulley movement on the shaft is smooth. To verify, hold the outside rim of the pulley from opposite sides and lift evenly. Rotate idler pulley counterclockwise and ensure print belt is seated properly. Verify that the pulley height is correct. See "Adjustment", 4-080.



REMOVAL

1. Remove print belt cover. See "Removal", 4-010.
2. Remove the ribbon. See "Ribbon Unit" Section 6, 6-000, and print belt. See "Removal", 4-010.
3. Remove the cover A by removing the screw and washer.
4. Remove spacer if installed.
5. Remove the pulley B by pulling straight up.

INSTALLATION

1. Install the pulley B on the shaft.
2. If the spacer was removed, align and replace on the shaft.
3. Install the cover A.
   a. Ensure that the pin C engages the hole in the pulley and that the hole in the cover aligns with the shaft D.
   b. Install the washer and screw.
4. Install the Print belt. See "Installation", 4-010.
5. After installing the pulley assembly, verify that the pulley can be moved up and down on the shaft. To verify: hold the outside rim of the pulley from opposite sides and lift evenly. The pulley should move up and down freely. Rotate idler pulley counterclockwise and ensure print belt is seated properly. Verify that the pulley height is correct. See "Adjustment", 4-080.
6. Install the ribbon. See "Ribbon", Section 6, 6-000.
7. Install the print belt cover.

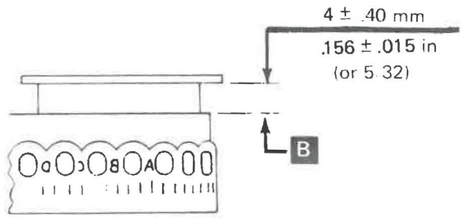
BELT IDLER PULLEY BRACKET

ADJUSTMENT

Note: The pulley height is adjusted by changing the position of the eccentric (upper pivot) **A** .

1. Open the print unit casting and remove the print belt cover. See 4-010.
2. Remove the ribbon and the front inner cover panel. See "Section 13," 13-000.
3. Turn the right print belt pulley several times by hand. Measure the pulley height **B** .
4. Adjust by loosening screw **C** , then turn eccentric **A** slightly.

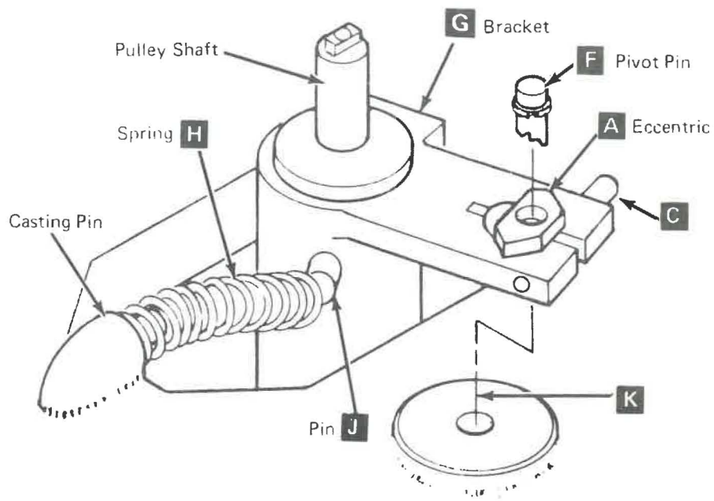
   Note: Clockwise moves the pulley up. Turn the pulley again and measure the pulley height **B** . When the pulley height is correct, tighten screw **C** . Print belt must be on.
5. Run the print belt under power for a few belt revolutions. Stop the motor, then measure the pulley height again. If not correct, repeat steps 4 and 5 until correct.
6. Install the ribbon and the print belt cover.
7. Close the print unit casting and install the front inner cover panel.



REMOVAL

1. Remove print belt cover, ribbon, and the print belt. See "Removal", 4-010.
2. Remove the print unit casting. See "Removal" Section 5, 5-000.
3. Remove the print belt idler pulley. See "Removal", 4-070.
4. Carefully remove the print belt release lever **D** (under spring tension). See 4-090.
5. Carefully remove the lower clip **E** , then remove pin **F** from the top.

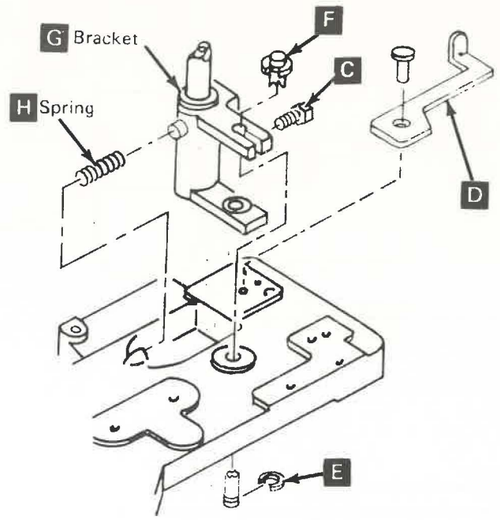
   Note: Interference between wrench and spring clip may occur. Rotate spring clip to allow for wrench clearance. It may be necessary to remove the right-hand mounting plate. See "Section 6", 6-000.
6. Carefully turn the bracket **G** counterclockwise until it is free of the spring **H** . Ensure that this spring remains in place.
7. Remove the bracket from the top.



See view, 4-090

INSTALLATION

1. Place eccentric A in the bracket with the large flat surface facing the shaft as shown. Install screw C and tighten slightly.
2. Place spring H on the casting pin as shown. Place bracket G in the casting hole with pin F in position as shown.
3. Place the right end of the spring on pin J, then turn the bracket clockwise until the pivot holes are aligned K. Replace pivot pin F from the top, then replace clip E on the bottom of the pivot pin.
4. Install the print belt release lever. D
5. Install the print belt idler pulley see "Installation", 4-070.
6. Install the print belt. See "Installation", 4-010.
7. Install the print unit casting. See "Print Unit", Section 5, 5-000.
8. Perform the pulley height adjustment. See "Adjustment", 4-080.



See enlarged view, 4-080

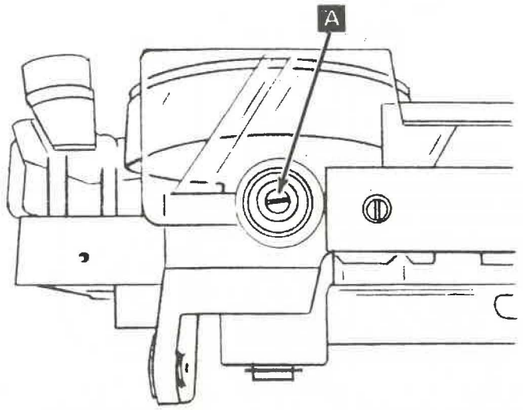
BELT POSITIONING ROLLERS

REMOVAL

1. Remove the print unit casting. See "Print Unit", Section 5, 5-000
2. Remove the positioning roller mounting screw(s) A and the roller(s).

INSTALLATION

1. Install the positioning roller mounting screw(s) and the roller(s).
2. Install the print unit casting. See "Print Unit", Section 5 5-000.



PRINT SUB-SCAN (PSS) TRANSDUCER

SERVICE CHECK

1. Ensure that the roller A is clean and that the cleaning blade B is positioned as shown. Loosen the screw in the roller and position blade if needed.
2. While turning the print belt, ensure that the belt turns the roller and that the roller is not worn.
3. With the power off and the print belt removed, verify for a gap of 0.48 ± 0.03 mm (.019 ±.001 in) C between the transducer tip D and the guide roller.
4. Disconnect the transducer plug P-5, and measure for 465 ± 30 ohms resistance on the transducer (pins 1 and 2). Connect P5.

ADJUSTMENT

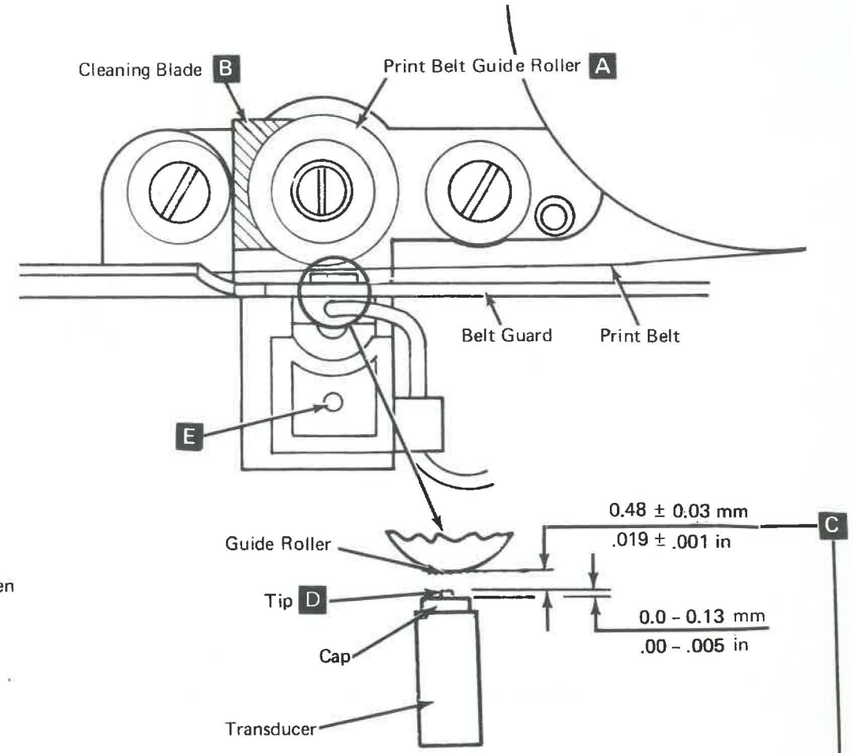
Caution: The transducer can be damaged if the timing marks on the print belt hit the transducer tip while the belt is moving.

1. Remove the print belt. See "Removal", 4-010.
2. Loosen screw(s) E and adjust the transducer in the mounting block to obtain 0.48 ± 0.03 mm (.019 ± .001 in) gap C between the transducer tip and the guide roller.

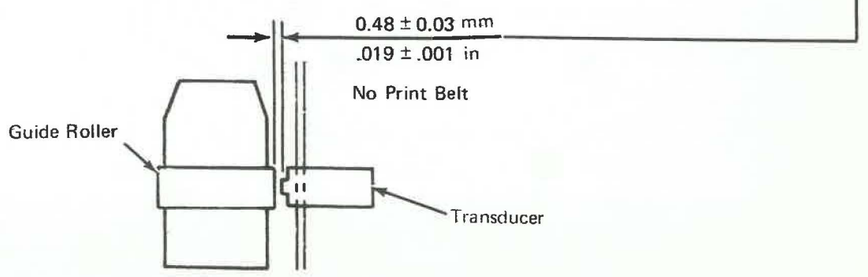
Caution: Do not overtighten the transducer clamping screw(s) E.

3. Install the print belt. See "Installation", 4-010. Turn the print belt pulley until a timing mark is in line with the transducer tip.

Note: This should result in a gap of 0.10±0.05 mm (.004 ± .002 in) between the transducer tip and a timing mark on the print belt.



Note: Ensure that the transducer tip is not damaged, and that it protrudes 0.00 to 0.13 mm (.000 to .005 in) from the cap.



REMOVAL

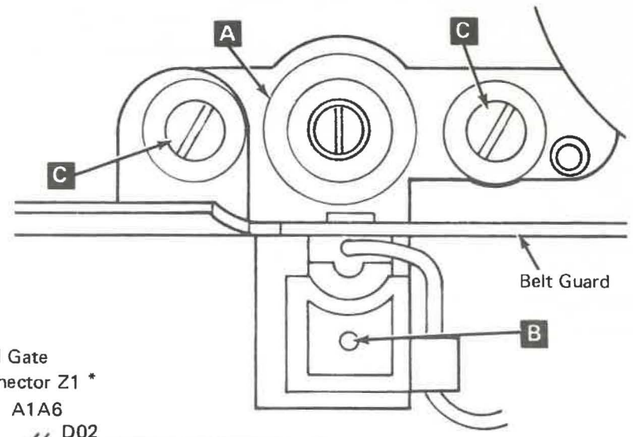
1. Open the top cover.
2. Remove the print belt. See "Removal", 4-010.
3. Disconnect P5.

Note: Transducer leads are clamped on end of print unit casting under the ribbon drive plate.

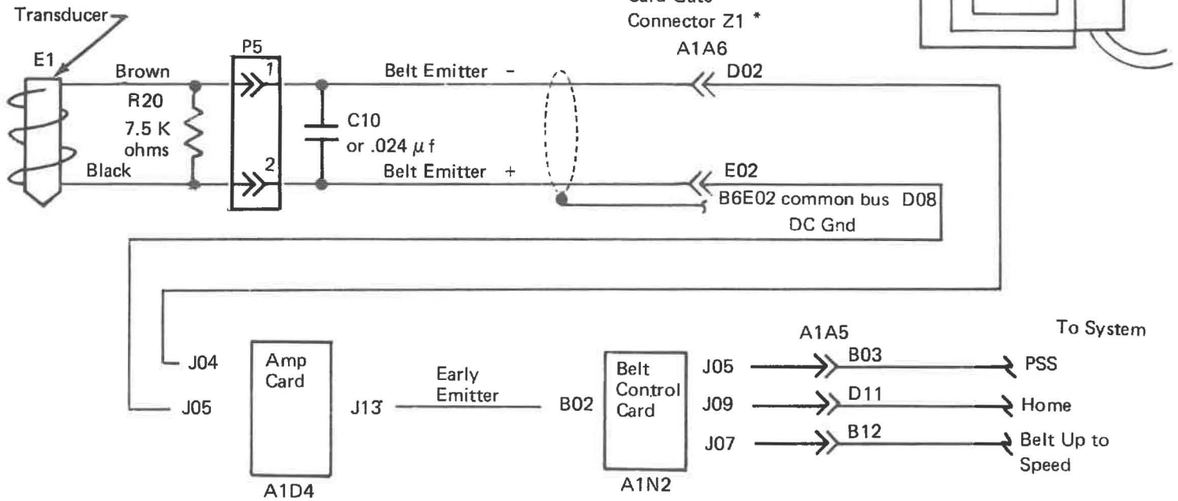
4. Remove the print belt guide roller **A** by removing screw.
5. Loosen the transducer mounting screw **B**.
6. Remove screws **C** and lift belt guard slightly for clearance. Pivot assembly to front.
7. Remove the transducer.

INSTALLATION

1. Install transducer in holder and locate assembly in position. Lift belt guard slightly for clearance.
2. Install screws **C**.
3. Secure transducer in holder by tightening screw **B**.
4. Install print belt guide roller **A**.
5. Install P5 and assure transducer leads are clamped.
6. Install the print belt and close top cover.
7. Perform the PSS transducer assembly adjustment. See "Adjustment" 4-100.



CIRCUIT – PRINT SUB-SCAN (PSS) TRANSDUCER



*

Gate Connector Location Chart

A1 Z1 ← A1A6 (pins)	
D02	D02
D03	E02

PRINT SUB-SCAN (PSS) EMITTER ASSEMBLY

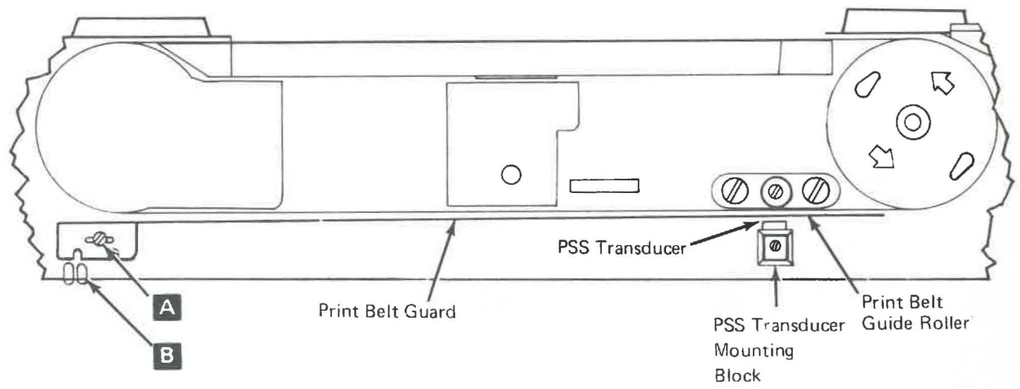
MECHANICAL OPERATIONAL DESCRIPTION

The print belt guard, transducer mounting block, and the print belt guide roller are separate parts but move as one unit when assembled. (Design of the assembly allows for heat expansion.) The right end of the assembly is spring loaded to the print unit. The left end is fastened to the print unit with a mounting screw A. When an adjustment is made, loosen only the left mounting screw.

ADJUSTMENT

1. Remove print belt cover. See "Removal", 4-010.
2. Perform the PSS transducer assembly service check and adjust if needed. See "Service Check", 4-100.
3. Verify the impression control potentiometer adjustment.
4. Install six-part forms (multiple-part forms if six-part forms are not available) and run the Character Print Test. See "Section 2", 2-000.

   Print all Hs. Check for a cut-off pattern across the entire print line. Make adjustment by loosening the screw A , inserting a screwdriver at point B , and adjusting the unit for minimum cutoff across the print line.
5. Tighten the screws.
6. Install the print belt cover. See "Installation", 4-010.



SECTION 5: PRINT UNIT AND HAMMER UNIT

INTRODUCTION

This section describes installation and removal procedures related to 5211 print units and hammer units. Circuits describing hammer and interlock operation are duscussed. Adjustments and service checks are also included. For further detailed descriptions, see the Theory of Operation in Section 15.

ENTRY INDEX

PRINT UNIT CASTING

SERVICE CHECK

Ensure that the forms thickness gap adjustment is correct. See "Adjustment", 5-010.

ADJUSTMENT

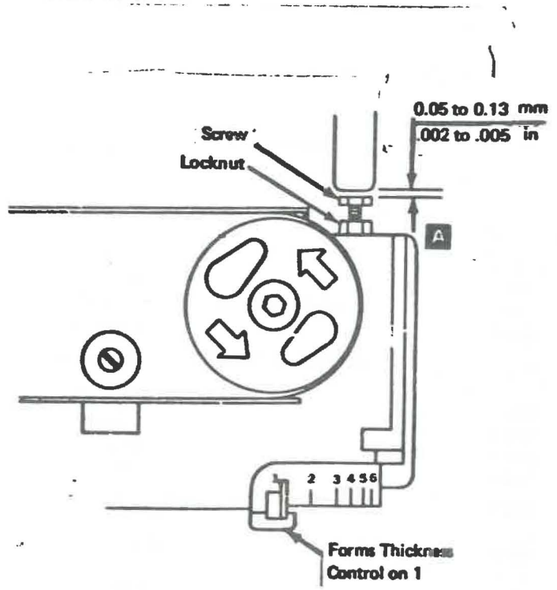
1. Open the print unit casting and remove print belt cover. Close print unit casting.
2. Move the forms thickness control to "1".
3. Measure for a gap of 0.05 to 0.13 mm (.002 to .005 in) at A. If not correct, loosen the locknut and adjust screw for proper clearance. Secure by tightening the locknut.
4. Install print belt cover.

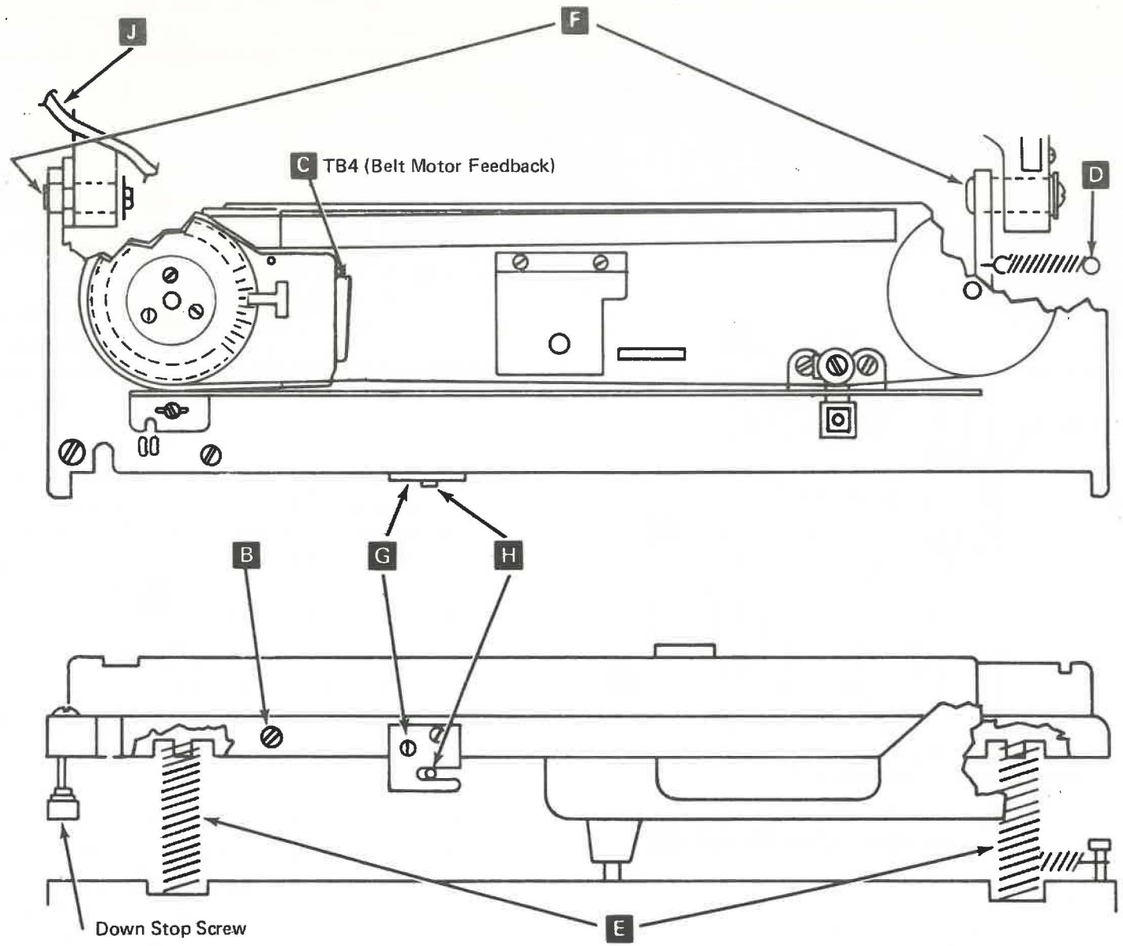
REMOVAL

1. Remove the inner panel from in front of the print mechanism. See "Section 13", 13-000.
2. Open the print unit casting and remove the print belt cover.
3. Remove the ribbon, the right ribbon guide and the right and left ribbon plates. See "Ribbon Unit", Section 6, 6-000. Carefully move the mounting plates towards the rear and place them on the printer base so that they are free of the print unit casting. It is not necessary to disconnect the motor plugs or the ribbon reverse switches.
4. Disconnect P4, P5, P13 and the ground wire at screw B. Disconnect the four cable wires from the belt motor feedback assembly at TB4 C and the cable clamp holding cable to the feedback assembly. Observe and/record color code. See "Section 4", 4-000.
5. Disconnect spring D from the screw.
6. Remove two support springs E and open print unit.
7. While supporting the casting from both ends, slide the casting to the left until it clears the pivot pins F and the guide plate G clears paper clamp lever H.

INSTALLATION

1. Raise the paper clamp lever H.
2. Place the print unit casting on the main casting so that the pivot holes are aligned to the left of the pivot pins F. Ensure that the motor cable (P4) is placed behind the casting as shown J.
3. While supporting the casting, open the print unit casting release lever. Move the casting to the right until stopped by the left pivot. Ensure that the casting pivots on both pins F and the paper clamp lever H is in its guide G.
4. Connect spring D on the screw, and install the support springs E.
5. Connect P4, P5, P13, and the ground wire screw B. Connect the wires at TB4 according to the recorded color code.
6. Install the right and left ribbon mounting plates, print belt and print ribbon.
7. Install the print belt cover.
8. Install the panel in front of the print mechanism.
9. Close machine cover.





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PRINT UNIT INTERLOCK SWITCH

SERVICE CHECK

1. Ensure that the print belt cover is installed correctly.
2. Set the forms thickness control to one-part forms setting.

Caution: Do not use meter on resistance scale. Damage to the electronic switch may result.

3. Connect voltmeter as shown at A, or see 5-040 for board connections.
4. Verify the following conditions:
   a. The voltage should be 5 volts with the print unit open.
   b. The voltage should switch to 0 volts when the print unit is closed.

ADJUSTMENT

1. Ensure that the print belt cover is installed correctly.
2. Set the forms thickness control to 1.
3. Close the print unit casting and loosen the switch bracket mounting screws B.
4. Adjust for 0.36 ± 0.13 mm (.014 ± .005 in) clearance between the switch lever and the belt cover actuator with the lever bottomed on the switch housing. Tighten the screws.
5. Perform the service check to test the switch operation.

REMOVAL

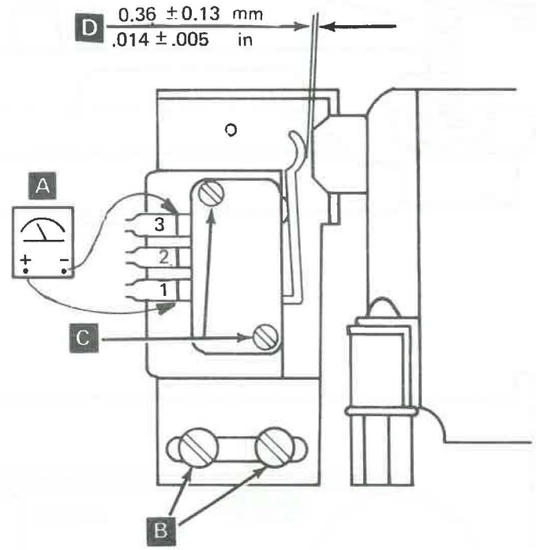
1. Open the main cover, observe the switch wire color code and remove the wires.
2. Remove two screws C and the switch.

INSTALLATION

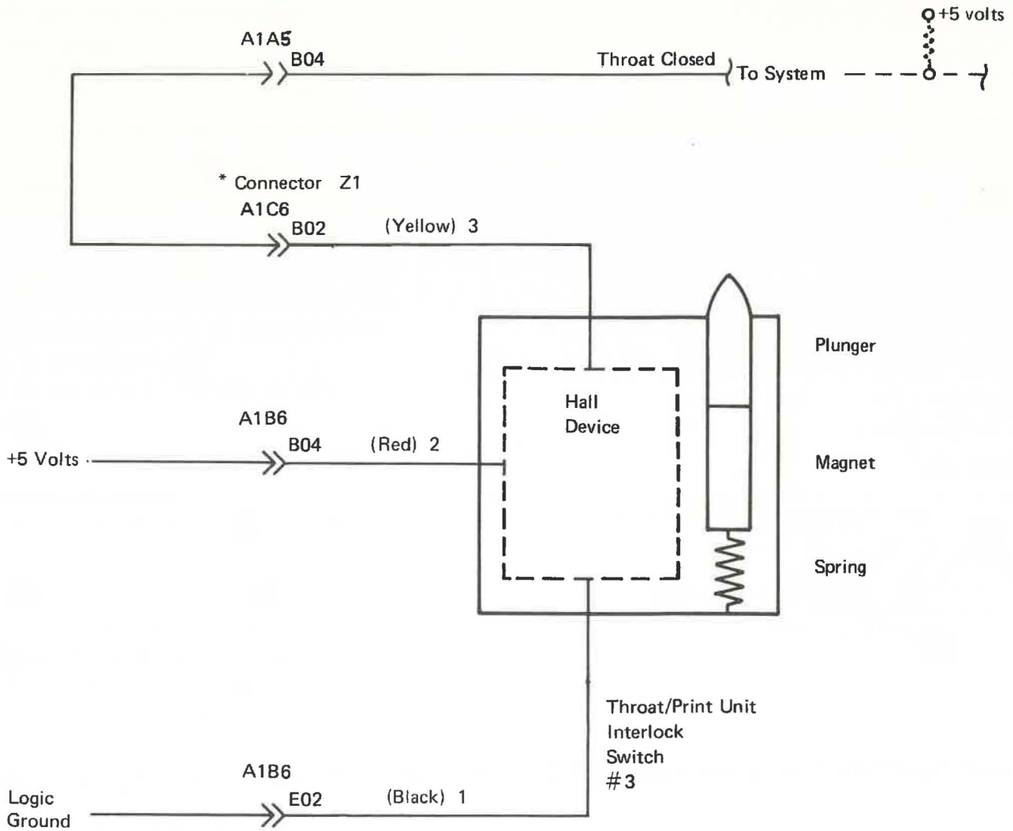
1. Install two screws C and the switch.
2. Install the switch wires:

   Black to 1
   Red to 2
   Yellow to 3

3. Check adjustment at D. Perform service check, 5-030.
4. Close the main cover.



CIRCUIT – PRINT UNIT INTERLOCK SWITCH



CAUTION: Do not use meter on the resistance scale. Damage to the electronic switch may result.

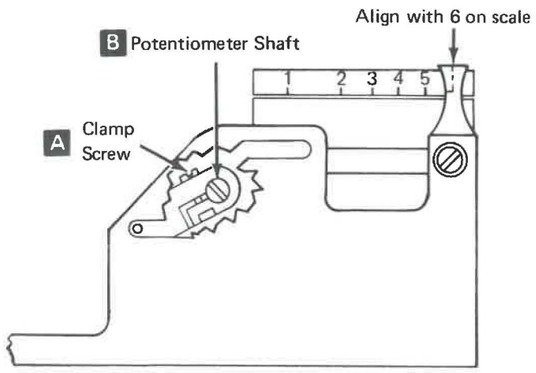
* Connector Z1 →

Pin Side	A1Z1
A1B6E02	D08
A1B6B04	B05
A1C6B02	D10

IMPRESSION CONTROL POTENTIOMETER

SERVICE CHECK

1. Remove inner panel from in front of print unit.
2. Set the forms thickness control to 6 on the scale.
3. Perform the impression control SS (single shot) timing test and check for SS timing of 507 to 523 μs. If the timing does not fall within this range, perform the adjustment.
4. Install inner panel in front of print unit.



ADJUSTMENT

1. Set forms thickness to 6 on the scale.
2. Loosen clamp screw A.
3. While running the impression control SS timing test, adjust the potentiometer shaft B to obtain 507 to 523 microseconds.
4. Tighten clamp screw A.

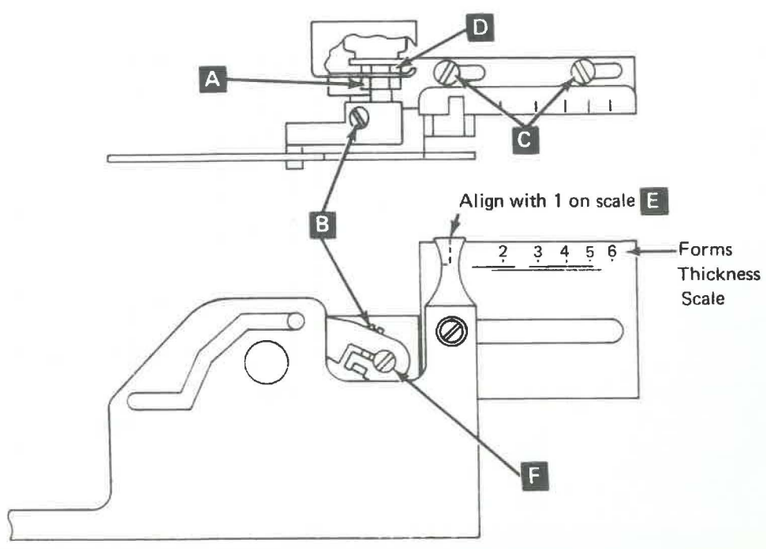
   Note: With the forms thickness control set to 1, the impression control SS timing should be 240 to 325 microseconds.

REMOVAL

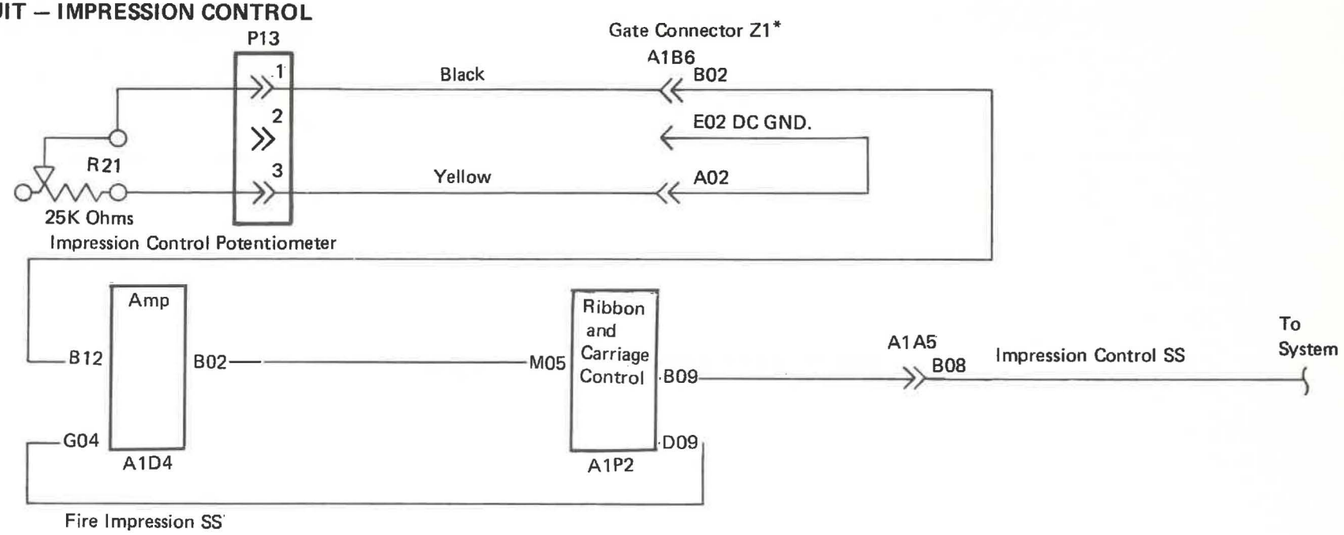
1. Open the front cover and remove front inner panel. Remove print belt cover. See "Section 13", 13-000.
2. Loosen nut A then remove potentiometer cover.
3. Disconnect the potentiometer connector, P13.
4. Loosen screw B, and remove two screws C.
5. Remove the potentiometer and bracket assembly.
6. Slide the arm off the shaft. Remove nut D and remove the potentiometer from the bracket.

INSTALLATION

1. Assemble the potentiometer to the bracket assembly and the arm to the shaft. Tighten nut D.
2. Move the forms thickness control to the leftmost position.
3. Install the bracket assembly and align 1 on the scale to the index pointer E. Tighten screws C. Install potentiometer cover and arm.
4. Move the forms thickness control to 4. Connect an ohmmeter to the leads and adjust the potentiometer F for 5000 ohms. (Coarse adjustment.) Tighten screw B slightly.
5. Install the terminals in the plug if needed. Connect plug, P13.
6. Be sure there is a gap between the arm and bracket to prevent binding. Perform the potentiometer adjustment. See "Adjustment", 5-050.
7. Install the inner front cover and print belt cover.



CIRCUIT – IMPRESSION CONTROL



* Logic Gate Connector Location Chart

A1Z1 Plug	A1B6 Pin
D05	B02
D08	E02
D04	A02

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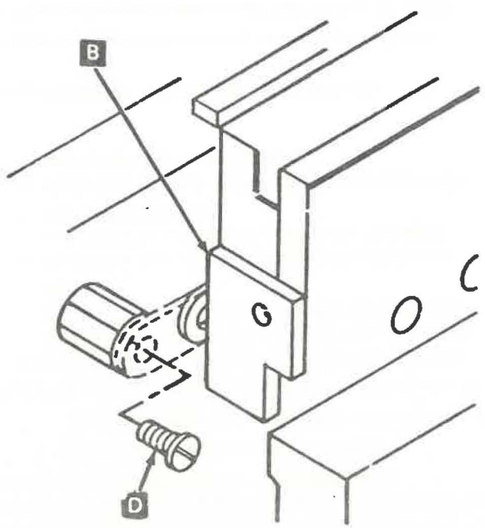
SERVICE CHECK – PLATEN – MODEL 2

Note: The platen gap gauge, part 1814638, (part of BM 1815365) is needed to perform the service check. Perform the platen gap service check with both ribbon drive assemblies installed.

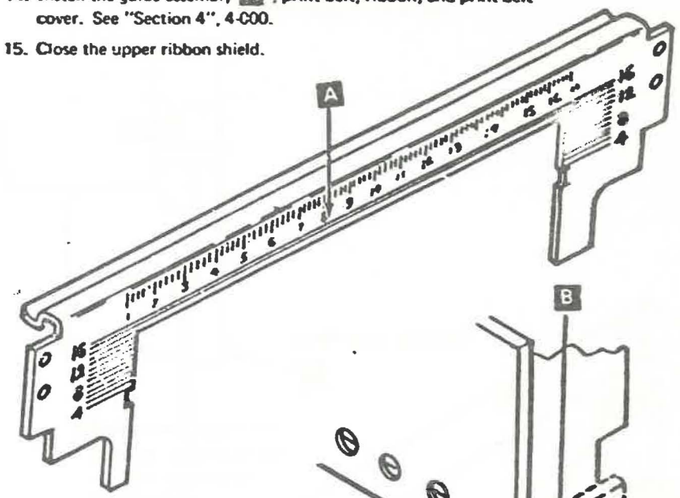
1. Open the print unit casting and the upper ribbon shield.
2. Remove the ribbon from the ribbon guides. See "Section 6", 6-000.
3. Remove the print belt and the forms. See "Section 4", 4-000.
4. Slide the tractors to the left, then remove the guide assembly A.
5. Remove the lower ribbon shield by removing the screws from the front of the platen. See "Section 6", 6-000.
6. Close the print unit. Push down on the center of the print unit casting to remove any play in the support mechanism.
7. Move the forms thickness control to 6. Hold the gauge B (hole side up as shown) against the hammer bar and the right hammer block assembly. The step on the gauge should rest on the lower edge of the platen G.
8. Lift the guage about 1.52 mm (.060 in) and set the forms thickness control on 1 to clamp the guage with the upper part of the platen.
9. Slowly, and with no downward pressure, move the forms thickness control toward 6. Observe the position on the forms thickness scale when the gauge drops (drop point). Repeat several times until a constant drop point is observed.
10. Remove screw D and slide the hammer position scale to the right. Place the gauge on the left side and repeat steps 6, 7, 8, and 9.

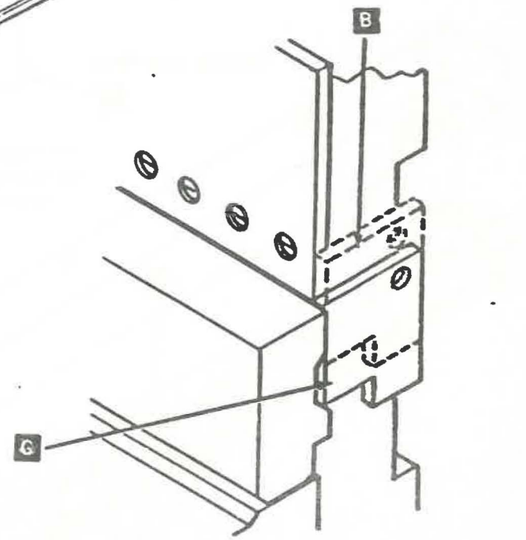


11. The drop points in steps 9 and 10 should occur when the forms thickness control is between 1-1/2 and 3-1/2 with a maximum end-to-end difference of 1.

    Based on the results of the service check and previous conditions, one of the following conditions exist:

    a. Service Check good and no print-quality failures, go to step 12.
    b. Service Check end-to-end is good, but gap is wrong, perform the Forms Gap Adjustment, 5-100.
    c. Service Check is good, but print quality failures (weak tops or bottoms of characters) exist, do all 3 platen adjustments, 5-090.
    d. Service Check end-to-end is wrong, perform all 3 platen adjustments, 5-090.
12. Slide the hammer position scale to the left and install screw D.
13. Install the lower ribbon shield and the left ribbon guide. See "Section 6", 6-000.
14. Install the guide assembly A, print belt, ribbon, and print belt cover. See "Section 4", 4-000.
15. Close the upper ribbon shield.





PLATEN ADJUSTMENTS – MODEL 2

Note: RM 1815365 contains the special tools needed to do the service check. The BM contains the following tools:

Platen-to-Casting Gauge (2) part 1815362

Platen Gap Gauge (1) part 1814638 and 4-40 Screws (2)

The platen adjustment has 3 parts that are adjusted in sequence:

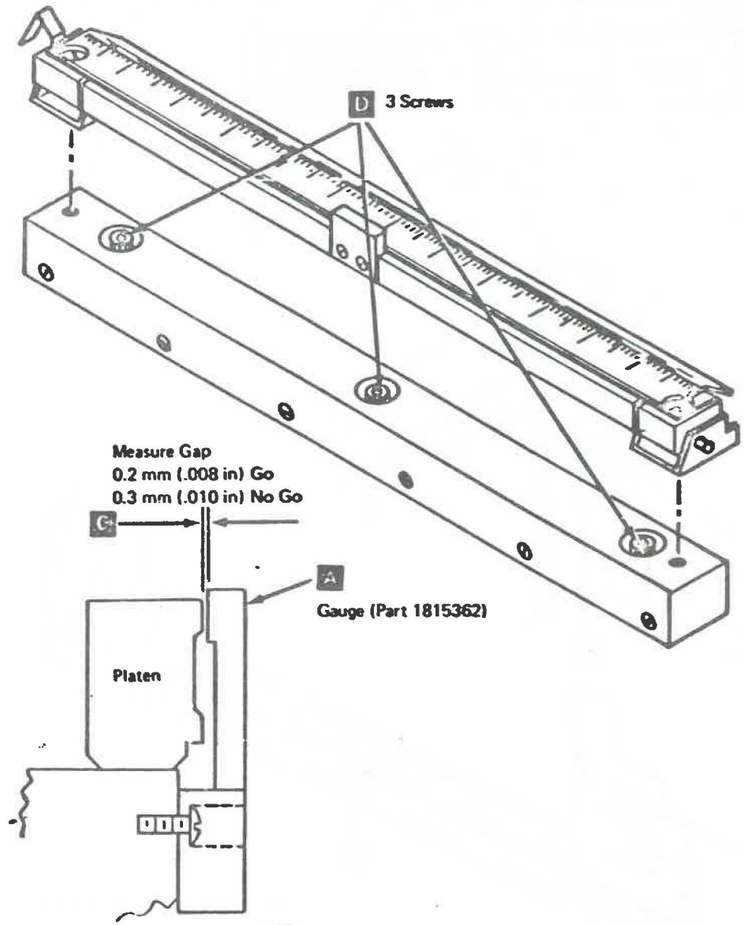
a. *Platen-to-Casting.* Locates the platen on the print unit casting using 2 gauges. This is a preliminary adjustment that is used to enable the adjustment of the forms path gap.

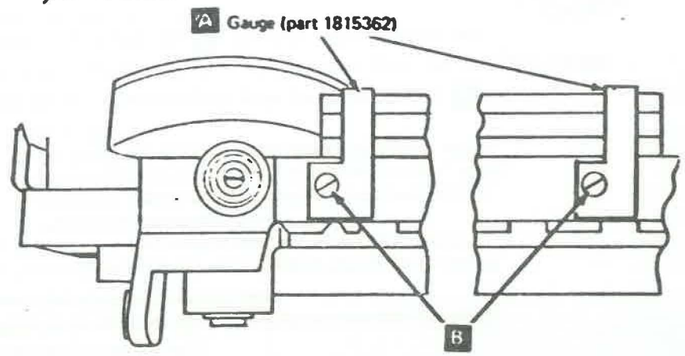
b. *Forms Path Gap.* Locates the print unit casting to the hammer bar by adjusting the eccentric in the support arm. (vertical alignment)

c. *Platen Gap.* Aligns the platen so that it is parallel to the hammer bar. (horizontal alignment)

ADJUSTMENT – PLATEN-TO-CASTING

1. Remove the print unit casting. See "Removal", 5-010.
2. Remove the upper ribbon shield. See "Section 6", 6-000.
3. Remove the print belt. See "Section 4", 4-000
4. Remove the lower ribbon shield. See "Section 6", 6-000.
5. Install special gauges A on each end as shown.
   a. Ensure that the mounting surfaces are clean and smooth.
   b. Mount the gauge using the 2 screws B supplied in BM 1815365.
6. Measure at both ends for a gap between the platen and the gauge as shown G . If both gaps are correct, go to step 7. If either gap is wrong, perform steps a through e:
   a. Loosen 3 platen mounting screws D . It may be necessary to remove sealant from screwheads.
   b. Hold the 0.23 mm (.009 in) feeler gauges between the platen and the right platen-to-casting gauge (part 1815362) and push the platen against the gauge. Tighten the right screw slightly.
   c. Repeat step b for the left side.
   d. Measure gap G at both ends and adjust again if not correct.
   e. Gradually tighten all 3 mounting screws D , then measure gap G again. Adjust again if not correct.
7. Remove gauges A .
8. Install the print unit casting. See "Installation", 5-010.
9. Perform the forms path gap adjustment next. See "Adjustment" .5-100.





ADJUSTMENT – FORMS GAP MODEL 2

Note: Ensure that both support springs and ribbon drive assemblies are installed.

1. Remove the guide assembly. See 5-080.
2. Close the print unit casting. Push down on the center of the print unit casting to remove any play in the support mechanism.
3. Move the forms thickness control to 6. Hold the gauge **A** (hole side up as shown) against the hammer bar and the right hammer block assembly.
4. Lift the gauge about 1.52 mm (.060 in) from the edge of the forms guide and set the forms thickness to 1 to clamp the guage.

   Note: If the guage clearance to hammer bar is too tight or too loose to perform adjustment, rotate eccentric **B** to establish a starting point.
5. Carefully, with no downward pressure, move the forms thickness control toward 6. Observe the position on the forms thickness scale when the gauge drops (drop point). Repeat several times until a constant drop point is observed.
6. Remove screw **C** and slide the hammer position scale to the right. Place the gauge on the left side **D** and repeat steps 2, 3, 4, and 5.
7. Use the average of the right and left drop points to adjust the eccentric.
   a. Adjust eccentric **B**, then repeat steps 4-8 until the average of the right and left drop points is 2-1/2 ± 1/2.

      Note: When adjusting, be sure that the high side of the eccentric is toward the front (operator) **E**.

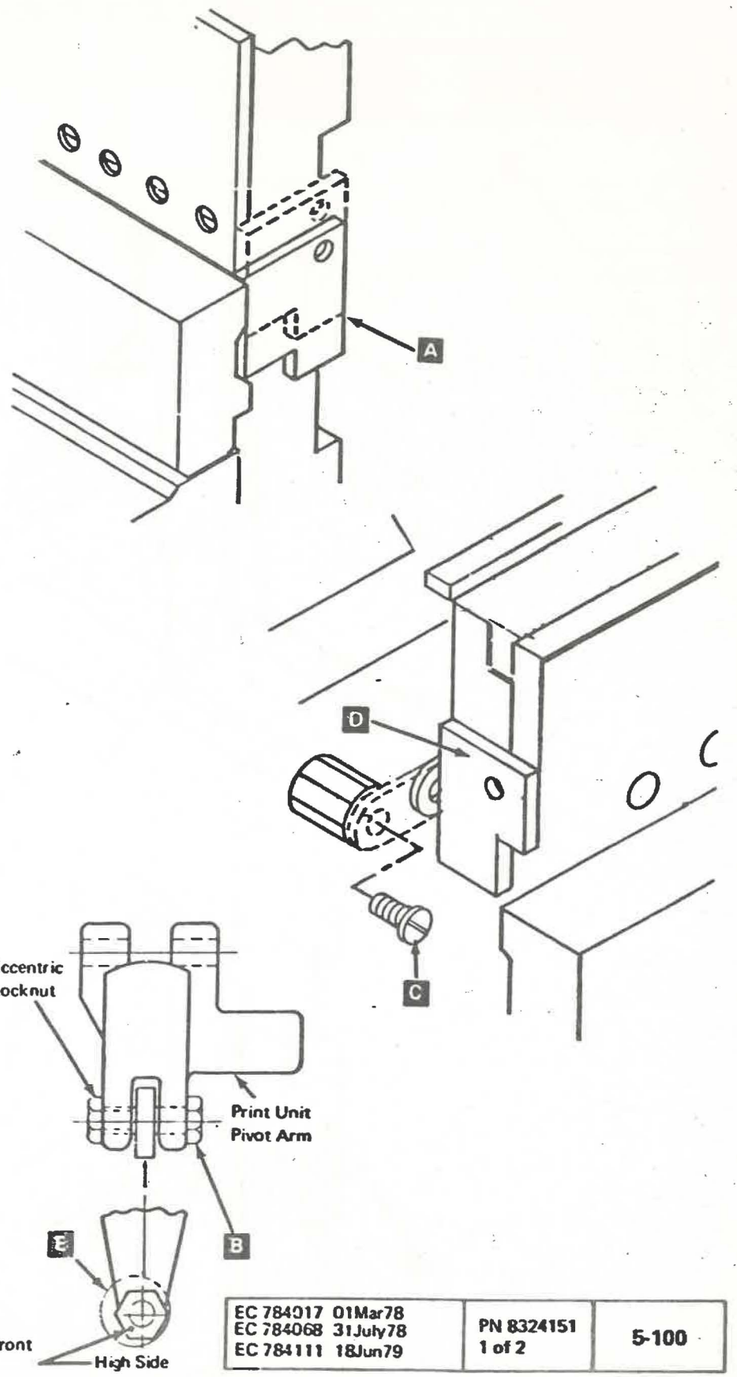
      For example:

      Right drop point = 3-1/2
      Left drop point = 5-1/2
      Average = 4-1/2

      Using the drop points from the preceding example, after adjustments, the drop points should be:

      Right drop point = 1-1/2
      Left drop point = 3-1/2
      Average = 2-1/2

   b. If the difference between the right and left drop points is 1 or less, the gap is correct (1/2 or less is recommended). Go to step 8.
   c. If the difference between the right and left drop points is more than 1, omit the remaining steps and perform the platen gap adjustment. See "Adjustment", 5-110.
8. Slide the hammer position scale to the left and install screw **C**.
9. Install the upper and lower ribbon guides. See "Section 6", 6-000.
10. Install the guide assembly, print belt and ribbon, and lower the upper ribbon shield.
11. Perform the forms tension service check. See "Service Check", 7-080.
12. Close the covers.



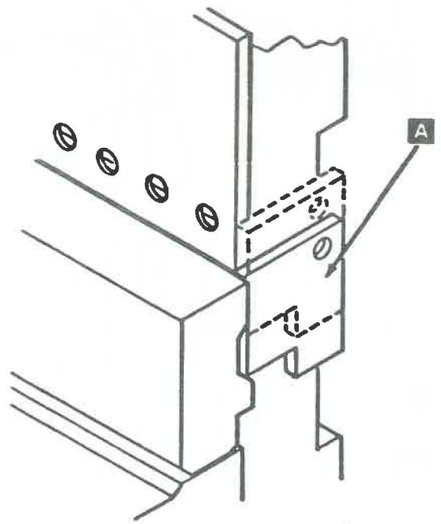
ADJUSTMENT – PLATEN GAP – MODEL 2

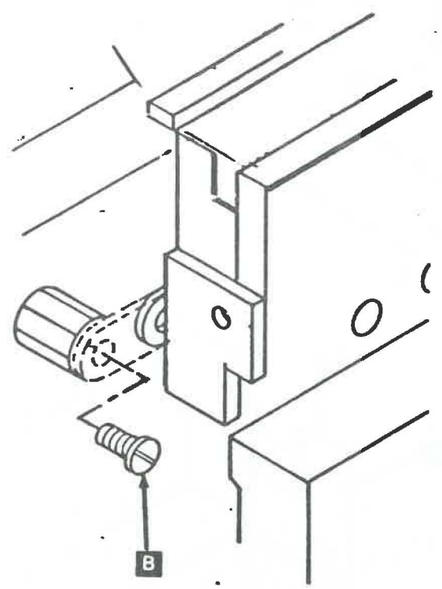
Note: Do not adjust the platen gap until the forms path gap is correct.

Note: Ensure that both support springs and ribbon drive assemblies are installed.

1. Loosen the platen:
   a. Remove the sealant from the heads of the platen mounting screws.
   b. Loosen the platen mounting screws.
2. Close the print unit and set the forms thickness control on 2-1/2.
3. Place the gauge A against the hammer bar and the platen on the right side. The hole side must be up. If needed, move the platen toward you until the gauge drops into position. Move the platen against the gauge and tighten the mounting screws.
4. Set the forms thickness control to 6.
5. Lift the gauge approximately 1.52 mm (.060 in) and move the forms thickness control to 1. Ensure that the gauge is against the side of the hammer block assembly.
6. Carefully, with no downward pressure, move the forms thickness control toward 6.
7. Observe the position on the forms thickness scale when the gauge drops (drop point). Repeat this procedure several times until a constant drop point is observed. The gauge should drop when the forms thickness control is between 2 and 3.

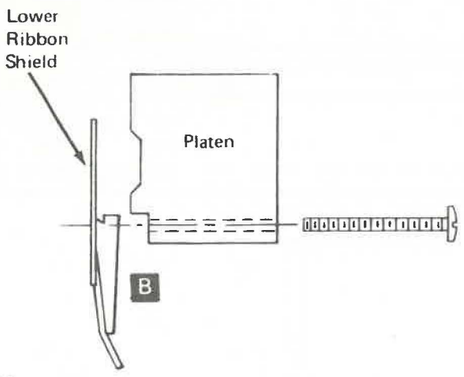
   Note: The drop points of 1-1/2 and 3-1/2 are used for the service check only.
8. Remove screw B and slide the hammer number strip to the right.
9. Place the gauge alternately on both sides of the hammer block assembly and verify that the drop points on both sides are between 2 and 3 on the forms thickness control, with a maximum end-to-end difference of 1/2.
10. If the end-to-end difference is more than 1/2 or if the drop point of either side of the platen is outside the 2 to 3 forms thickness control setting, repeat steps 2 through 9.
11. If the adjustment is correct, slide the hammer number strip to the left and install the holding screw B.
12. Install the following:
    a. Lower ribbon shield and left ribbon guide.
    b. Print belt.
    c. Ribbon.
    d. Guide assembly.
13. Install the upper ribbon shield and perform the adjustment.
14. Perform the forms tension service check. See "Service Check", 7-080.

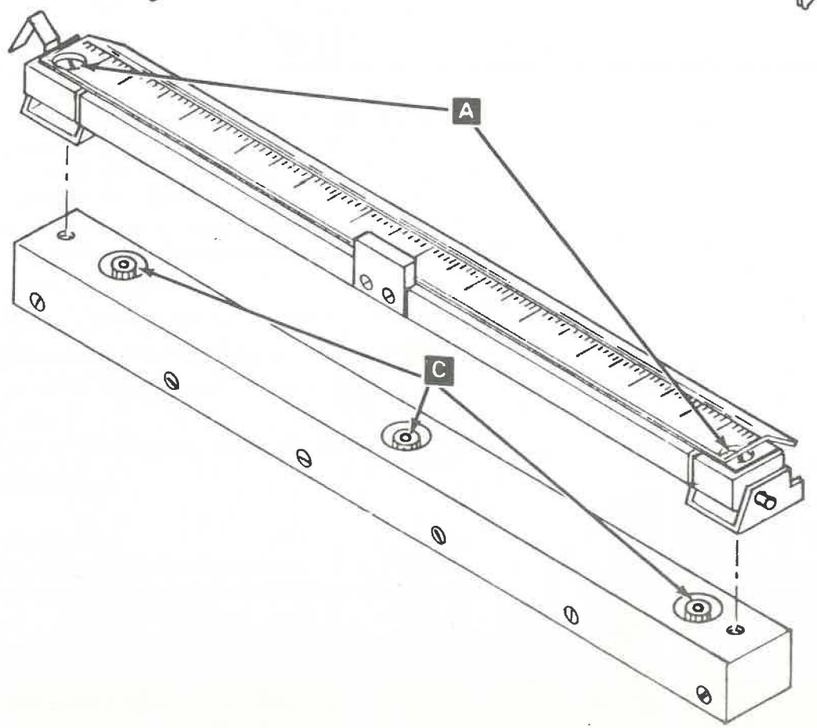




REMOVAL – PLATEN

1. Open the front cover and remove the print belt safety cover.
2. Remove the print unit casting. See "Removal", 5-010.
3. Remove the upper ribbon shield by removing the screws A at each end.
4. Remove the print belt and remove the ribbon from the ribbon guides. See "Section 4", 4-000.
5. Remove the lower ribbon shield B. See "Section 6", 6-000.
6. Remove the sealant from the screw heads C then remove the screws and the platen.

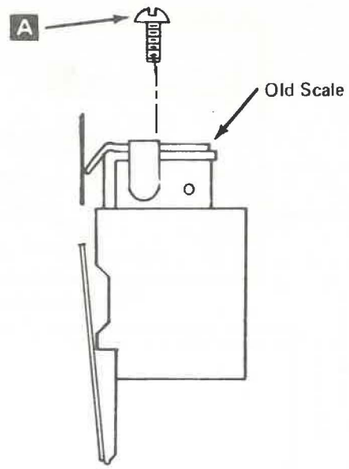




INSTALLATION – PLATEN

1. Install the platen with the mounting screws and washers, do not tighten.

   Note: Do not use sealant after installing the new platen.
2. Perform the platen adjustments. See "Adjustments", 5-090, 5-100, and 5-110.



HAMMER UNIT - MODEL 2

Caution: The hammer unit weighs approximately 6.50 kg. (14 lb). Use extreme care while installing or removing the hammer unit.

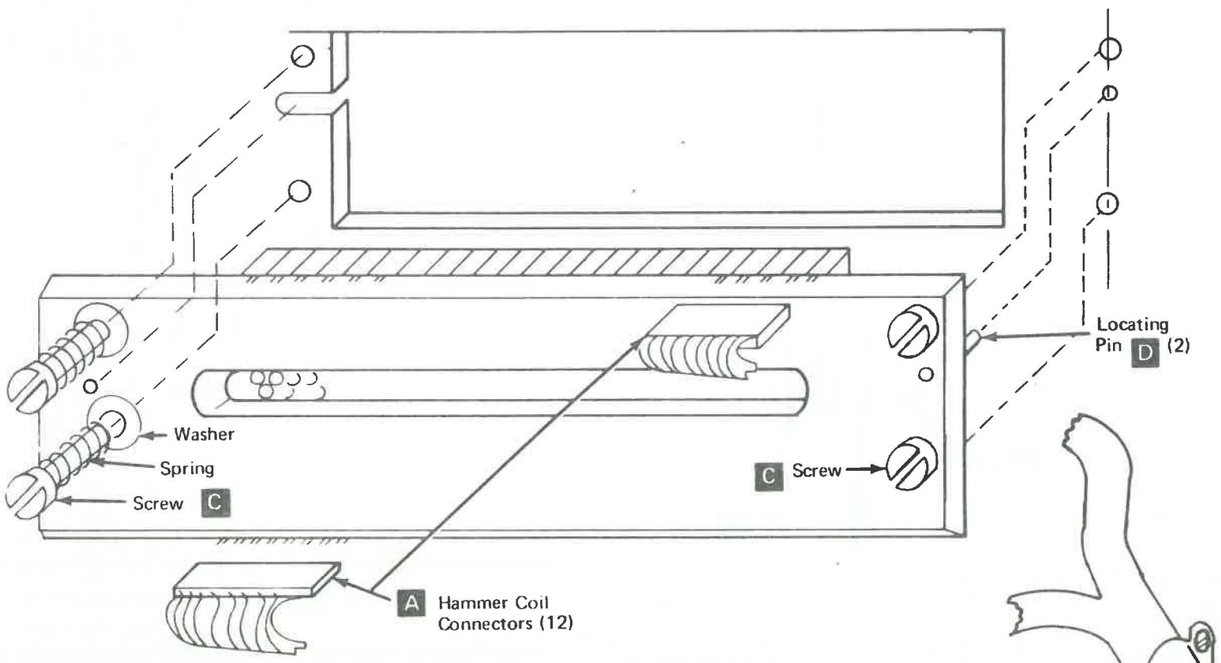
REMOVAL

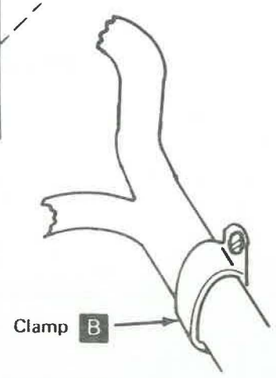
1. Open the rear cover and remove the forms guide and safety cover.
2. Disconnect 12 hammer coil connectors A .
3. Disconnect P1 (carriage motor) and cable clamp B .
4. Remove 4 screws holding the hammer unit – as shown C .
5. Remove the hammer unit.
6. If more parts must be removed from the hammer mounting bar, go to the correct removal procedure:

   Hammer See "Removal", 5-140.
   Hammer Coil See "Removal", 5-150.
   Hammer Block See "Removal",5-160.
   Hammer Springs/Plungers See "Removal",5-170 .

INSTALLATION

1. Place the hammer unit in position using the two locating pins D
2. Install the screws, springs and washers and mount the unit C
3. Connect P1 (carriage motor) and cable clamp B .
4. Install the 12 hammer coil connectors A . Verify that each plug is connected correctly.





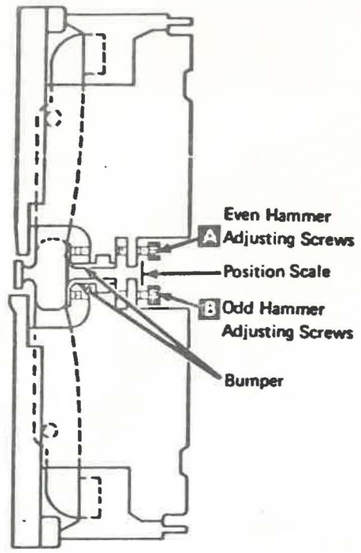
HAMMER - MODEL 2

ADJUSTMENT – FLIGHT TIME

1. Open the top and back covers.
2. Set the forms thickness control to 6 and install six-part paper. Run Character Print Test and print H in 132 print positions. See Section 2, 2-000.

   Note: If six-part forms are not available, use multipart forms and set the forms-thickness control to match.
3. Inspect the Hs on the last copy for cutoff and for horizontal alignment with each other.
4. Remove form guide and safety cover over rear of hammer unit. Adjust the hammer adjusting screws A and B so that Hs print with no cutoff and with equal horizontal alignment to each other. Inspect the last copy for this condition.

   Note: Turning the screw clockwise corrects for left cutoff.
5. Install form guide and safety cover.
6. Close the covers.



HAMMER BLOCK, UPPER, FRONT VIEW

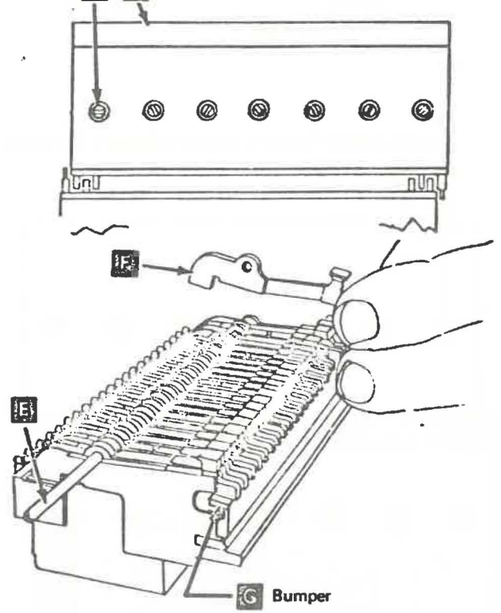
REMOVAL

1. Remove the hammer unit. See "Removal", 5-130.
2. Remove screws C and the hammer plate D. (The hammer springs and plungers cannot come out.)
3. Each hammer block assembly has one pivot pin E. With the hammers facing upward, use a pointed object such as a pin punch) to start the pivot pin out of the hammer block assembly. Pull the pivot pin E out of the defective hammer ano remove the hammer F.

   Caution: Interchanging hammers may change Light time. Keep good hammers in their original positions.

.NSTALLATION

1. Install the new hammer, then slide the pivot pin back into position.
2. Verify that the bumper G is between the hammer and the adjusting screw.
3. Install the plate with the two outer screws (small hole first), then tighten slightly. Start the inner screws. Tighten all screws gradually, starting from the small hole.
4. Perform hammer block installation. See "Installation", steps 1 and 2, 5-160.
5. Perform hammer flight-time test. See "Adjustment", steps 2, 3, and 4, 5-140.



HAMMER COIL - MODEL 2

REMOVAL

1. Remove the hammer unit. See "Removal", 5-130.
2. Determine the blocks having the bad coils by print sample or visual inspection.
3. Remove the screws A and the hammer plate B.
4. While holding the lower ends of the hammers back toward the guide bar, use pliers C to carefully move the hammers out of the coils.

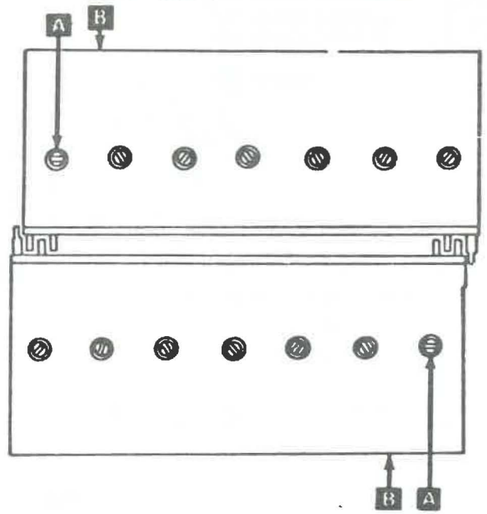
Caution: Do not allow dirt or dust to get into the hammer guide or the coils.

5. Use pliers D to carefully pull the bad coil out from the hammer block.
6. Remove the coils next to the bad coil, and inspect the inner and outer surfaces. Replace coils if either surface looks overheated or is not smooth.

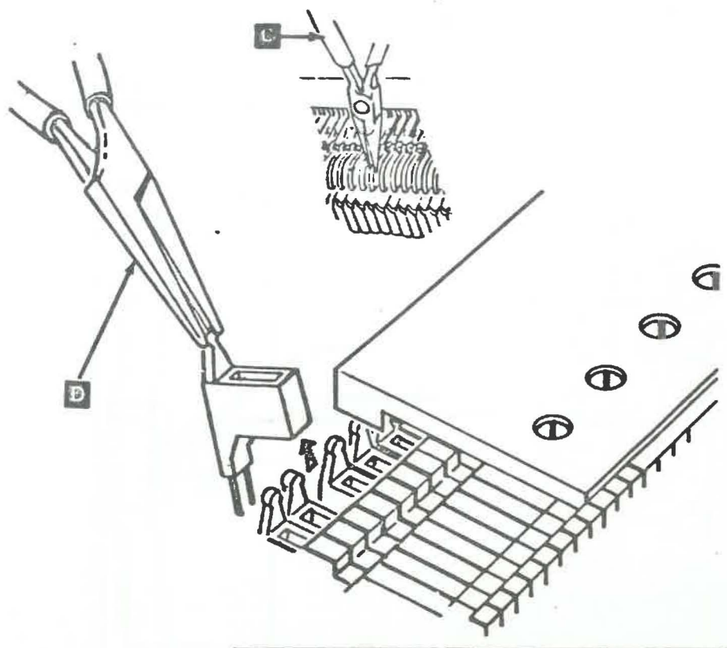
INSTALLATION

1. Measure the resistance of the new coil (4 ohms), or compare resistance with a good coil in the printer. Install the coil by carefully pushing it back into position. Ensure that the connector pins are straight and are aligned with the pins of the other coils.
2. Carefully position the hammers and pivot pin into the hammer guide bar and coils.
3. Install the plate with the two outer screws, then tighten slightly. Start the inner screws. Tighten all screws.
4. Inspect the alignment of the hammer faces. If any hammer face is much behind the others, the plastic bumper may not be positioned between the hammer and the adjusting screw. See "Installation", 5-140. Place the bumper in position.
5. Pull each hammer face forward. Be sure each hammer moves freely.
6. Install the hammer unit. See "Installation", 5-130.
7. Close the print unit casting.
8. Perform the hammer flight-time test steps 2, 3, and 4. See "Adjustment", 5-140.

MODEL 2 HAMMER BLOCK, UPPER, FRONT VIEW

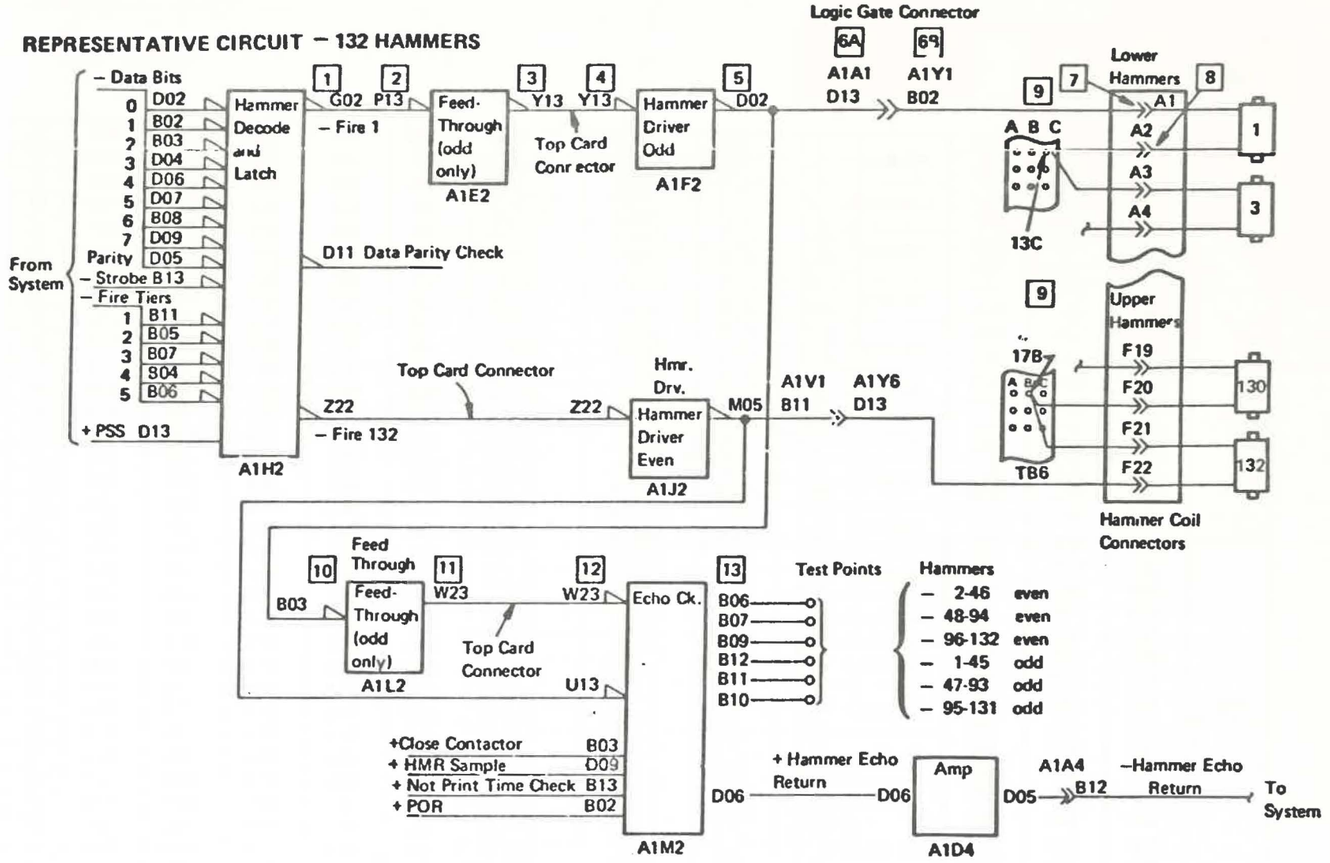


MODEL 2 HAMMER BLOCK, LOWER, FRONT VIEW

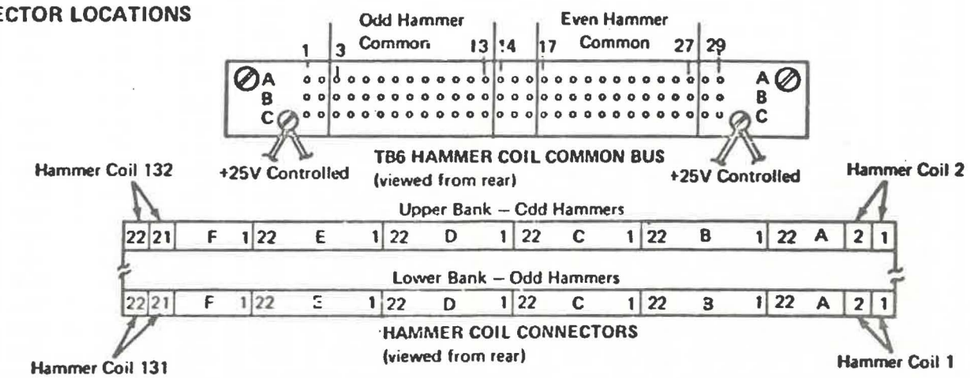


HAMMER CIRCUITS

REPRESENTATIVE CIRCUIT – 132 HAMMERS



CONNECTOR LOCATIONS



HAMMER PROBING CHART ODD – 132 HAMMERS

Odd	1 A1H2	2 A1E2	3 A1E2	4 A1F2	5 A1F2	6A A1	6B A1	7 Coil	8 Common	9 Bus	10 A1L2	11 A1L2	12 A1M2	13 A1M2
1	G02	P13	Y13	Y13	D02-	A1D13	Y1B02	A-1	A-2	TB6-13C	B03	W23	W23	B12
3	J02	M13	Y33	Y33	B04-	A1D11	Y1D02	A-4	A-3		B04	W24	W24	
5	G03	P12	Y12	Y12	B03-	A1E13	Y1B03	A-5	A-6	TB6-13A	D05	W05	W05	
7	J04	M12	Y32	Y32	B06-	A1E11	Y1D03	A-8	A-7		B05	W25	W25	
9	G04	P11	Y11	Y11	B02-	B1A13	Y1B04	A-9	A-10	TB6-13B	D07	W07	W07	
11	J05	M11	Y31	Y31	D06-	B1A11	Y1D04	A-12	A-11		B06	W26	W26	
13	G05	P10	Y10	Y10	M07-	B1B13	Y1B05	A-13	A-14	TB6-12C	B10	W30	W30	Hammers 1-45 odd
15	J06	M10	Y30	Y30	P02-	B1B11	Y1D05	A-16	A-15		D06	W06	W06	
17	G06	P09	Y09	Y09	M10-	B1C13	Y1B06	A-17	A-18	TB6-12A	B08	W28	W28	
19	J07	M09	Y29	Y29	S10-	B1C11	Y1D06	A-20	A-19		B09	W29	W29	
21	G07	M08	Y28	Y28	M02-	B1D13	Y1B07	A-21	A-22	TB6-12B	D12	W12	W12	
23	J09	P07	Y07	Y07	U05-	B1D11	Y1D07	B-2	B-1		D09	W09	W09	
25	G08	M07	Y27	Y27	P06-	C1A13	Y1B09	B-3	B-4	TB6-11C	D11	W11	W11	
27	J10	P06	Y06	Y06	U10-	C1A11	Y1D09	B-6	B-5		B13	W33	W33	
29	G09	M06	Y26	Y26	S04-	C1A13	Y1B10	B-7	B-8	TB6-11A	D13	W13	W13	
31	J11	P05	Y05	Y05	S05-	C1B11	Y1D10	B-10	B-9		G03	X23	X23	
33	G10	M05	Y25	Y25	J13-	C1C13	Y1B11	B-11	B-12	TB6-11B	G02	X22	X22	
35	J12	P04	Y04	Y04	P10-	C1C11	Y1D11	B-14	B-13		J04	X04	X04	
37	G11	M04	Y24	Y24	M06-	C1D13	Y1B12	B-15	B-16	TB6-10C	G06	X26	X26	
39	J13	M03	Y23	Y23	J12-	C1D11	Y1D12	B-18	B-17		G04	X24	X24	
41	G12	P02	Y02	Y02	D07-	C1E13	Y1B13	B-19	B-20	TB6-10A	J05	X05	X05	
43	G13	M02	Y22	Y22	D10	C1E11	Y1D13	B-22	B-21		J06	X06	X06	
45	M02	J13	X13	X13	D04-	D1E13	Y2B02	C-1	C-2	TB6-10B	J10	X10	X10	
47	P02	G13	X33	X33	J05-	D1E11	Y2D02	C-4	C-3		J07	X07	X07	B11
49	M03	J12	X12	X12	G02-	E1A13	Y2B03	C-5	C-6	TB6-9C	G08	X28	X28	
51	P04	G12	X32	X32	D09-	E1A11	Y2D03	C-8	C-7		J12	X12	X12	
53	M04	J11	X11	X11	B07-	E1B13	Y2B04	C-9	C-10	TB6-9A	J09	X09	X09	
55	P05	G11	X31	X31	G05-	E1B11	Y2D04	C12	C-11		J11	X11	X11	
57	M05	J10	X10	X10	D11-	E1C13	Y2B05	C-13	C-14	TB6-9B	G10	X30	X30	
59	P06	G10	X30	X30	B11-	E1C11	Y2D05	C-16	C-15		G13	X33	X33	
61	M06	J09	X09	X09	J09-	E1D13	Y2B06	C-17	C-18	TB6-8C	J13	X13	X13	Hammers 47-93 odd
63	P07	G09	X29	X29	G03-	E1D11	Y2D06	C-20	C-19		G12	X32	X32	
65	M07	G08	X28	X28	G10-	E1E13	Y2B07	C-21	C-22	TB6-8A	M03	Y23	Y23	
67	P09	J07	X07	X07	G07-	E1E11	Y2D07	D-2	D-1		P02	Y02	Y02	
69	M08	G07	X27	X27	G06-	F1B13	Y2B09	D-3	D-4	TB6-8B	P05	Y05	Y05	
71	P10	J06	X06	X06	D13-	F1B11	Y2D09	D-6	D-5		M04	Y24	Y24	
73	M09	G06	X26	X26	G04-	F1C13	Y2B10	D-7	D-8	TB6-7C	M02	Y22	Y22	
75	P11	J05	X05	X05	J04-	F1C11	Y2D10	D-10	D-9		M06	Y26	Y26	
77	M10	G05	X25	X25	J06-	F1D13	Y2B11	D-11	D-12	TB6-7A	P04	Y04	Y04	
79	P12	J04	X04	X04	J11-	F1D11	Y2D11	D-14	D-13		M05	Y25	Y25	
81	M11	G04	X24	X24	J07-	F1E13	Y2B12	D-15	D-16	TB6-7B	M08	Y28	Y28	
83	P13	G03	X23	X23	G11-	F1E11	Y2D12	D-18	D-17		P07	Y07	Y07	
85	M12	J02	X02	X02	D12-	G1A13	Y2B13	D-19	D-20	TB6-6C	P06	Y06	Y06	
87	M13	G02	X22	X22	J10-	G1A11	Y2D13	D-22	D-21		M10	Y30	Y30	
89	S02	U13	Z13	Z13	S02-	H1A13	Y3B02	E-1	E-2	TB6-6A	M07	Y27	Y27	
91	U02	S13	Z33	Z33	D05	H1A11	Y3D02	E-4	E-3		P12	Y12	Y12	
93	S03	U12	Z12	Z12	U04-	H1B13	Y3B03	E-5	E-6	TB6-6B	P09	Y09	Y09	
95	U04	S12	Z32	Z32	B05-	H1B11	Y3D03	E-8	E-7		P11	Y11	Y11	B10

HAMMER PROBING CHART ODD – 132 HAMMERS (Continued)

Odd	1 A1H2	2 A1E2	3 A1E2	4 A1F2	5 A1F2	6A A1	6B A1	7 Coil	8 Common	9 Bus	10 A1L2	11 A1L2	12 A1M2	13 A1M2
97	S04	U11	Z11	Z11	P13-	H1C13	Y3B04	E-9	E-10	TB6-5C	M11	Y31	Y31	B10
99	U05	S11	Z31	Z31	U07-	H1C11	Y3D04	E-12	E-11		M12	Y32	Y32	
101	S05	U10	Z10	Z10	P12-	H1D13	Y3B05	E-13	E-14	TB6-5A	P13	Y13	Y13	Hammers
103	U06	S10	Z30	Z30	P05-	H1D11	Y3D05	E-16	E-15		S03	Z23	Z23	95-131
105	S06	U09	Z09	Z09	U02-	H1E13	Y3B06	E-17	E-18	TB6-5B	S02	Z22	Z22	odd
107	U07	S09	Z29	Z29	J02-	H1E11	Y3D06	E-20	E-19		U02	Z02	Z02	
109	S07	S08	Z28	Z28	U12-	J1A13	Y3B07	E-21	E-22	TB6-4C	S05	Z25	Z25	
111	U08	U07	Z07	Z07	U09-	J1A11	Y3D07	F-2	F-1		U05	Z05	Z05	
113	S08	S07	Z27	Z27	U13-	J1C13	Y3B09	F-3	F-4	TB6-4A	U04	Z04	Z04	
115	U10	U06	Z06	Z06	S07-	J1C11	Y3D09	F-6	F-5		S07	Z27	Z27	
117	S09	S06	Z26	Z26	P09-	J1D13	Y3B10	F-7	F-8	TB6-4B	U06	Z06	Z06	
119	U11	U05	Z05	Z05	P10-	J1D11	Y3D10	F-10	F-9		S06	Z26	Z26	
121	S10	S05	Z25	Z25	S06-	J1E13	Y3B11	F-11	F-12	TB6-3C	U07	Z07	Z07	
123	U12	U04	Z04	Z04	M03-	J1E11	Y3D11	F-14	F-13		S08	Z28	Z28	
125	S11	S04	Z24	Z24	P04-	K1A13	Y3B12	F-15	F-16	TB6-3A	U09	Z09	Z09	
127	U13	S03	Z23	Z23	U06-	K1A11	Y3D12	F-18	F-17		S10	Z30	Z30	
129	S12	U02	Z02	Z02	S03-	K1B13	Y3B13	F-19	F-20	TB6-3B	U11	Z11	Z11	
131	S13	S02	Z22	Z22	M05-	K1B11	Y3D13	F-22	F-21		U10	Z10	Z10	

HAMMER PROBING CHART EVEN – 132 HAMMERS

Even	1 A1H2			4 A1J2	5 A1J2	6A A1	6B A1	7 Coil	8 Common	9 Bus			12 A1M2	13 A1M2
2	Y13	Feedthrough		Y13	D02-	L1D13	Y4B02	A-1	A-2	TB6-27C	Feedthrough		G02	B06
4	Y33	card is not used		Y33	B04-	L1D11	Y4D02	A-4	A-3		card is not used		J02	
6	Y12	for even hammers		Y12	B03-	L1E13	Y4B03	A-5	A-6	TB6-27A	for even hammers		G03	Hammers
8	Y32			Y32	B06-	L1E11	Y4D03	A-8	A-7				G04	2-46
10	Y11			Y11	B02-	M1A13	Y4B04	A-9	A-10	TB6-27B			J04	even
12	Y31			Y31	D06-	M1A11	Y4D04	A-12	A-11				G05	
14	Y10			Y10	M07-	M1B13	Y4B05	A-13	A-14	TB6-26C			J05	
16	Y30			Y30	P02-	M1B11	Y4D05	A-16	A-15				G06	
18	Y09			Y09	M10-	M1C13	Y4B06	A-17	A-18	TB6-26A			J06	
20	Y29			Y29	S10-	M1C11	Y4D06	A-20	A-19				G07	
22	Y28			Y28	M02-	M1D13	Y4B07	A-21	A-22	TB6-26B			J07	
24	Y07			Y07	U05-	M1D11	Y4D07	B-2	B-1				G08	
26	Y27			Y27	P06-	N1A13	Y4B09	B-3	B-4	TB6-25C			G09	
28	Y06			Y06	U10-	N1A11	Y4D09	B-6	B-5				J09	
30	Y26			Y26	S04-	N1B13	Y4B10	B-7	B-8	TB6-25A			G10	
32	Y05			Y05	S05-	N1B11	Y4D10	B-10	B-9				J10	
34	Y25			Y25	J13-	N1C13	Y4B11	B-11	B-12	TB6-25B			G11	
36	Y04			Y04	P10-	N1C11	Y4D11	B-14	B-13				J11	
38	Y24			Y24	M06-	N1D13	Y4B12	B-15	B-16	TB6-24C			G12	
40	Y23			Y23	J12-	N1D11	Y4D12	B-18	B-17				J12	
42	Y02			Y02	D07-	N1E13	Y4B13	B-19	B-20	TB6-24A			G13	
44	Y22			Y22	D10-	N1E11	Y4D13	B-22	B-21				J13	
46	X13			X13	D04-	P1E13	Y5B02	C-1	C-2	TB6-24B			M02	
48	X33			X33	J05-	P1E11	Y5D02	C-4	C-3				P02	B07

EC 784017 01Mar78
EC 784068 31July78
EC 784111 18Jun79

PN 8324156
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HAMMER PROBING CHART EVEN — 132 HAMMERS (Continued)

Even	1 A1H2			4 A1J2	5 A1J2	6A A1	6B A1	7 Coil	8 Common	9 Bus			12 A1M2	13 A1M2
50	X12	Feedthrough card is not used for even hammers		X12	G02-	Q1A13	Y5B03	C-5	C-6	TB6-23C	Feedthrough card is not used for even hammers		M03	B07
52	X32			X32	D09-	Q1A11	Y5D03	C-8	C-7				M04	
54	X11			X11	B07-	Q1B13	Y5B04	C-9	C-10	TB6-23A			P04	
56	X31			X31	G05-	Q1B11	Y5D04	C-12	C-11				M05	
58	X10			X10	D11-	Q1C13	Y5B05	C-13	C-14	TB6-23B			P05	
60	X30			X30	B11-	Q1C11	Y5D05	C-16	C-15				M06	
62	X09			X09	J09-	Q1D13	Y5B06	C-17	C-18	TB6-22C			P06	
64	X29			X29	G03-	Q1D11	Y5D06	C-20	C-19				M07	
66	X28			X28	G10-	Q1E13	Y5B07	C-21	C-22	TB6-22A			P07	Hammers 48-94 even
68	X07			X07	G07-	Q1E11	Y5D07	D-2	D-1				M08	
70	X27			X27	G06-	R1B13	Y5B09	D-3	D-4	TB6-22B			M09	
72	X06			X06	D13-	R1B11	Y5D09	D-6	D-5				P09	
74	X26			X26	G04-	R1C13	Y5B10	D-7	D-8	TB6-21C			M10	
76	X05			X05	J04-	R1C11	Y5D10	D-10	D-9				P10	
78	X25			X25	J06-	R1D13	Y5B11	D-11	D-12	TB6-21A			M11	
80	X04			X04	J11-	R1D11	Y5D11	D-14	D-13				P11	
82	X24			X24	J07-	R1E13	Y5B12	D-15	D-16	TB6-21B			M12	
84	X23			X23	G11-	R1E11	Y5D12	D-18	D-17				P12	
86	X02			X02	D12-	S1A13	Y5B13	D-19	D-20	TB6-20C			M13	
88	X22			X22	J10-	S1A11	Y5D13	D-22	D-21				P13	
90	Z13			Z13	S02-	T1A13	Y6B02	E-1	E-2	TB6-20A			S02	
92	Z33			Z33	D05-	T1A11	Y6D02	E-4	E-3				U02	
94	Z12			Z12	U04-	T1B13	Y6B03	E-5	E-6	TB6-20B			S03	
96	Z32			Z32	B05-	T1B11	Y6D03	E-8	E-7				S04	B09
98	Z11			Z11	P13-	T1C13	Y6B04	E-9	E-10	TB6-19C			U04	
100	Z31			Z31	U07-	T1C11	Y6D04	E-12	E-11				S05	
102	Z10			Z10	P12-	T1D13	Y6B05	E-13	E-14	TB6-19A			U05	
104	Z30			Z30	P05-	T1D11	Y6D05	E-16	E-15				S06	
106	Z09			Z09	U02-	T1E13	Y6B06	E-17	E-18	TB6-19B			U06	
108	Z29			Z29	J02-	T1E11	Y6D06	E-20	E-19				S07	Hammers 96-132 even
110	Z28			Z28	U12-	U1A13	Y6B07	E-21	E-22	TB6-18C			U07	
112	Z07			Z07	U09-	U1A11	Y6D07	F-2	F-1				S08	
114	Z27			Z27	U13-	U1C13	Y6B09	F-3	F-4	TB6-18A			S09	
116	Z06			Z06	S07-	U1C11	Y6D09	F-6	F-5				U09	
118	Z26			Z26	P09-	U1D13	Y6B10	F-7	F-8	TB6-18B			S10	
120	Z05			Z05	B10-	U1D11	Y6D10	F-10	F-9				U10	
122	Z25			Z25	S06-	U1E13	Y6B11	F-11	F-12	TB6-17C			S11	
124	Z04			Z04	M03-	U1E11	Y6D11	F-14	F-13				U11	
126	Z24			Z24	P04-	V1A13	Y6B12	F-15	F-16	TB6-17A			S12	
128	Z23			Z23	U06-	V1A11	Y6D12	F-18	F-17				U12	
130	Z02			Z02	S03-	V1B13	Y6B13	F-19	F-20	TB6-17B			S13	
132	Z22			Z22	M05-	V1B11	Y6D13	F-22	F-21				U13	

SECTION 6: RIBBON UNIT

INTRODUCTION

- This section describes installation and removal procedures related to the 5211 ribbon unit. Circuits describing left and right ribbon drive motor operation are dicussed. Adjustments and service checks are also indicated. For further detailed descriptions, see the theory of operation in Section 15.

ENTRY INDEX

RIBBON

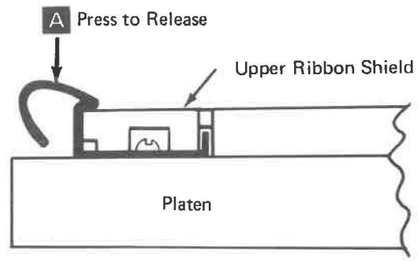
REMOVAL

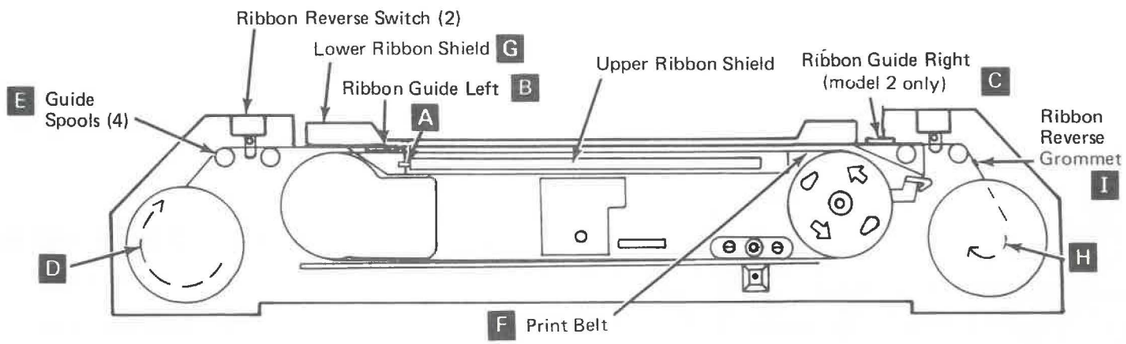
1. Open print unit casting, remove belt cover, and raise the upper ribbon shield by depressing release lever **A** at left end of platen.
2. Remove the ribbon from under the left guide **B** and the right guide **C** . Remove both ribbon reels.

INSTALLATION

Note: Use the ribbon figure on the print belt cover as a guide for installing the ribbon.

1. Place the ribbon reel with the most ribbon on the drive hub. Ensure that the ribbon tracks from the outside of the reel as shown **D** .
2. Install the ribbon:
   a. Behind the guide spools and through the reverse switch **E** .
   b Between the print belt **F** the lower ribbon shield **G** .
   c. Behind the opposite guide spools and through the reverse switch.
3. Place the other reel on the opposite ribbon hub. Ensure that;
   a. The ribbon goes through from the outside of the reel **H** .
   b. The grommet **I** (to reverse the ribbon) is between the reverse switch and the reel.
4. Close the upper ribbon shield.
5. Turn the right reel until the ribbon is tight. Ensure that the ribbon goes under the left guide **B** and the right guide **C** (Model 2 only). Turn the right ribbon reel again and verify that the ribbon tracks correctly.
6. Install print belt cover.
7. Close the print unit casting.





RIBBON TRACKING

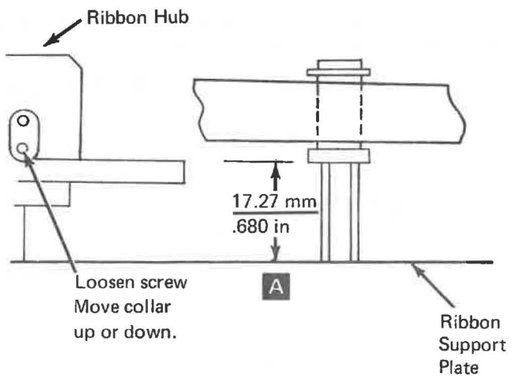
SERVICE CHECK

Ensure that the ribbon is tracking through the guides and is turning properly on the reels.

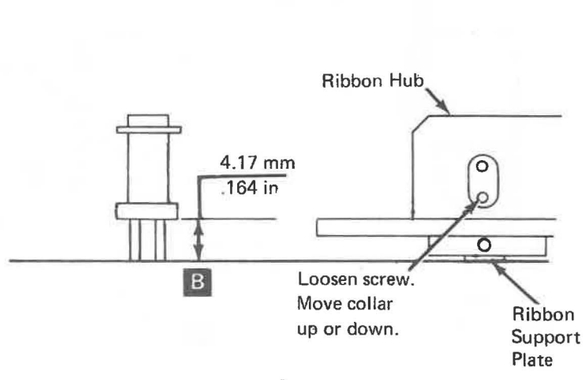
ADJUSTMENT

The ribbon tracking is set at the print line by four fixed guides. The ribbon reels may be adjusted up or down on the motor shafts so that the reels are slightly below the ribbon guides. See A and B. A steel scale, (mm/in) may be used as shown C to set tracking at right or left ribbon reels.

Note: Adjust with ribbon reel removed

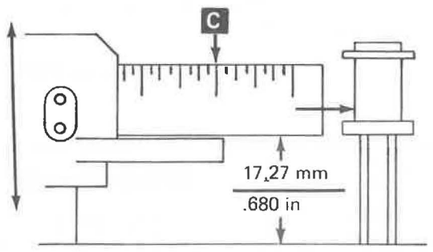


Adjusting the Left Ribbon Height



Adjusting the Right Ribbon Height

Note: (use the same method used to determine left ribbon height)



Method of Measuring Dimension
17.27 mm (.680 in) or 11/16 inch.

Note:
Hold all dimensions to ± 0.25 mm (± .010 in).

UPPER RIBBON SHIELD

SERVICE CHECK

Ensure that the ribbon is under the plastic end of the shield.

ADJUSTMENT

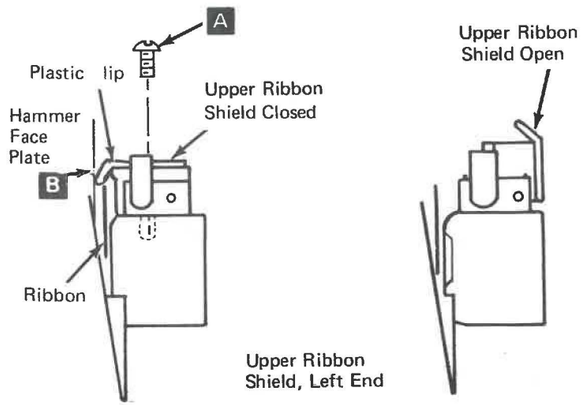
1. Set the forms thickness knob to 6 and loosen screws **A** at each end of upper ribbon shield.
2. Adjust the ribbon shield assembly (upper) so that the plastic lip just touches the hammer face plate at the high spots across its length without forms in printer **B**.
3. Verify that forms tension is correct. See "Section 7", 7-000.
4. Set the forms thickness lever to 1.
5. Test forms tension with upper ribbon shield closed. If the pull out force exceeds 300 grams adjust the upper ribbon shield. See "Section 7",7-000.

REMOVAL

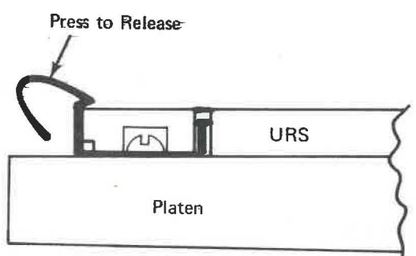
With the upper ribbon shield in the closed position, cut a hole in the print position scale and remove the screw **A** at each end. Then remove the shield. The mounting screws are located under the print position scale at positions 3 and 128.

INSTALLATION

Install the upper ribbon shield with two screws and verify that the ribbon is under the plastic end of the shield.



Upper Ribbon
Shield, Left End



Left End of Upper
Ribbon Shield (URS)

LOWER RIBBON SHIELD

REMOVAL

1. Open the print unit casting and remove the print belt cover. See "Section 4", 4-000.
2. Remove the ribbon and the print belt. See "Section 4", 4-000.
3. Close the print unit casting.
4. Remove 6 screws A from the front of the platen. Open the print unit casting while holding the end of the ribbon shield. Left ribbon guide is mounted under left platen screw.
5. Remove the ribbon shield B by holding the ends of the plastic; release from under platen and lift up and out.

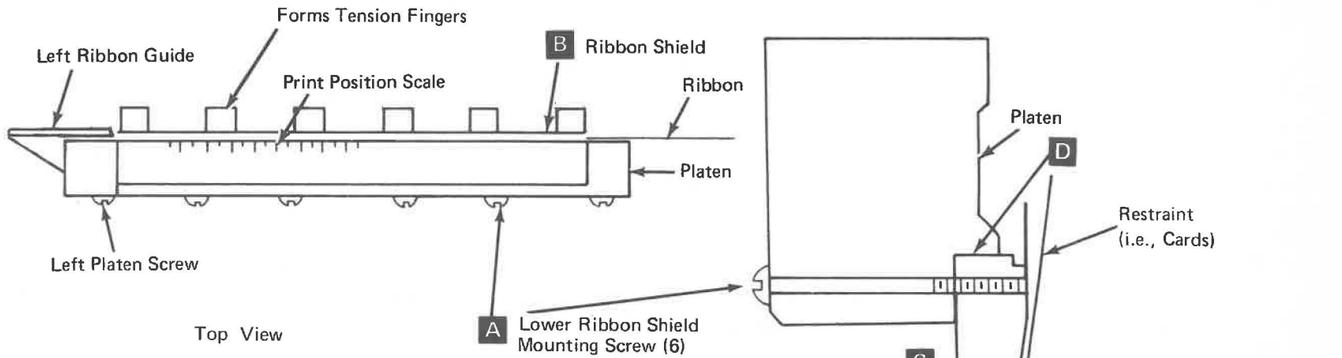
Note: The lower ribbon shield assembly is supplied complete with plastic shield in place.

INSTALLATION

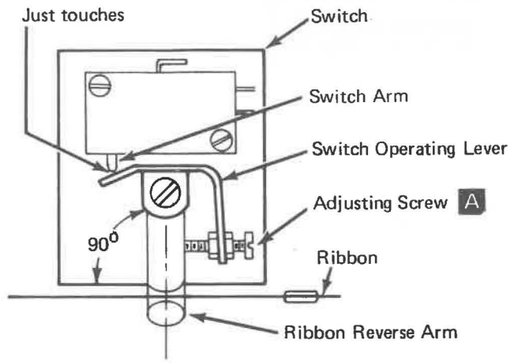
1. Open print unit casting.
2. Place restraints (i.e., cards) in front of forms tension fingers to hold them back and lower the ribbon shield into position. C
3. Install the ribbon shield in front of the cards, using the 6 screws A . (Do not tighten.)

Note: Left ribbon guide mounts under left screw.

4. Lift end of plastic shield and assure the mounting bar is properly seated under lip of platen as shown D .
5. Hold the ribbon shield up against the platen as shown C and tighten the screws. Hold left ribbon guide down on top of platen when tightening its mounting screw.
6. Remove the restrictions and check that the tension fingers are in front of the guide.
7. Install the ribbon and the print belt. See "Section 4," 4-000.
8. Close the print unit casting.
9. Install the print belt cover.



RIBBON REVERSE SWITCHES



SERVICE CHECK

Ensure that the switch operating lever just touches the switch arm.

ADJUSTMENT

With the reverse arm 90° to the ribbon adjust the screw **A** so that the switch operating lever just touches the switch arm.

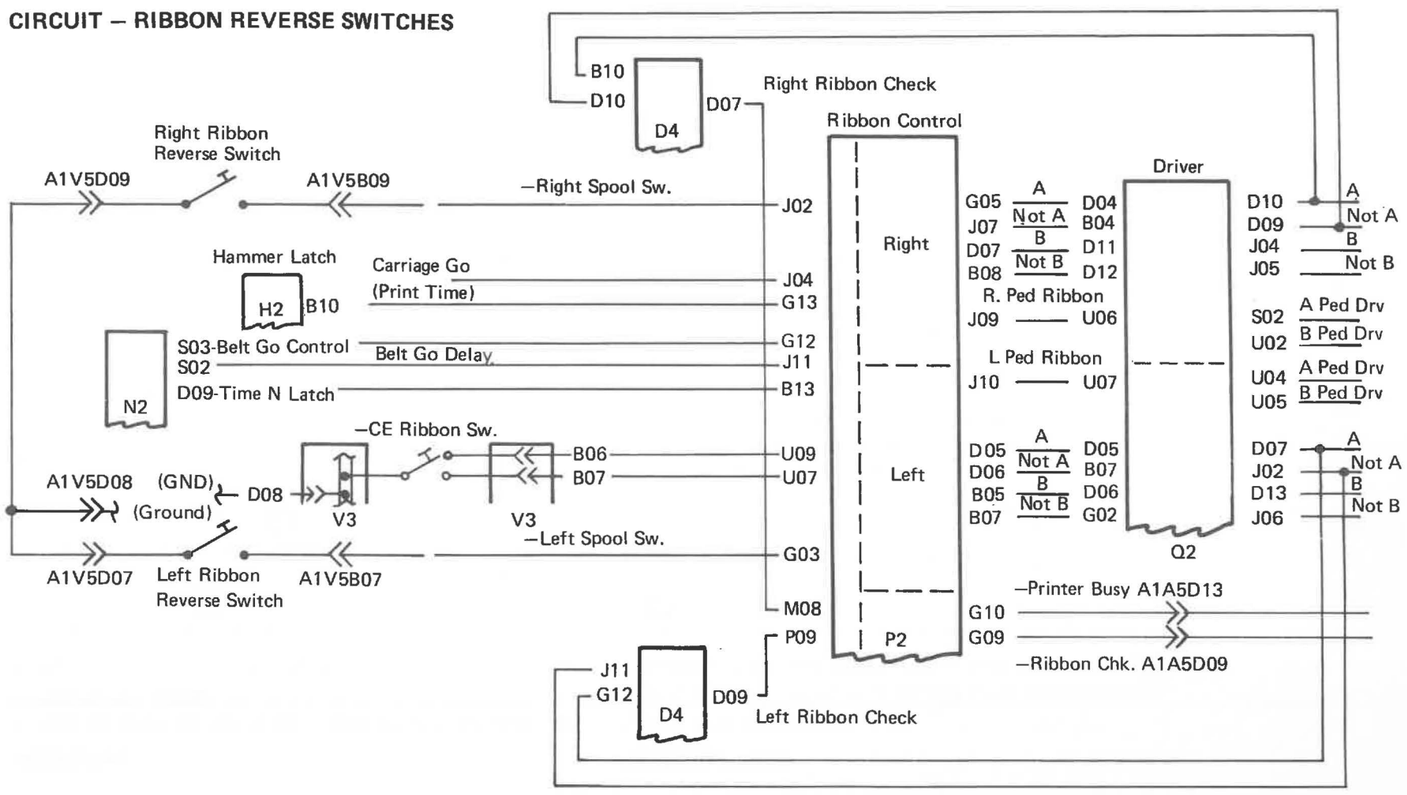
REMOVAL

1. Power OFF. Remove 2 wires from switch terminals. Note color code.
2. Remove the 2 screws from the switch, then the switch and the insulator.

INSTALLATION

1. Install the switch and insulator with the 2 screws.
2. Install the wires as indicated by color code.
3. Check reverse arm adjustment. Restore power and check operation of switch.

CIRCUIT – RIBBON REVERSE SWITCHES



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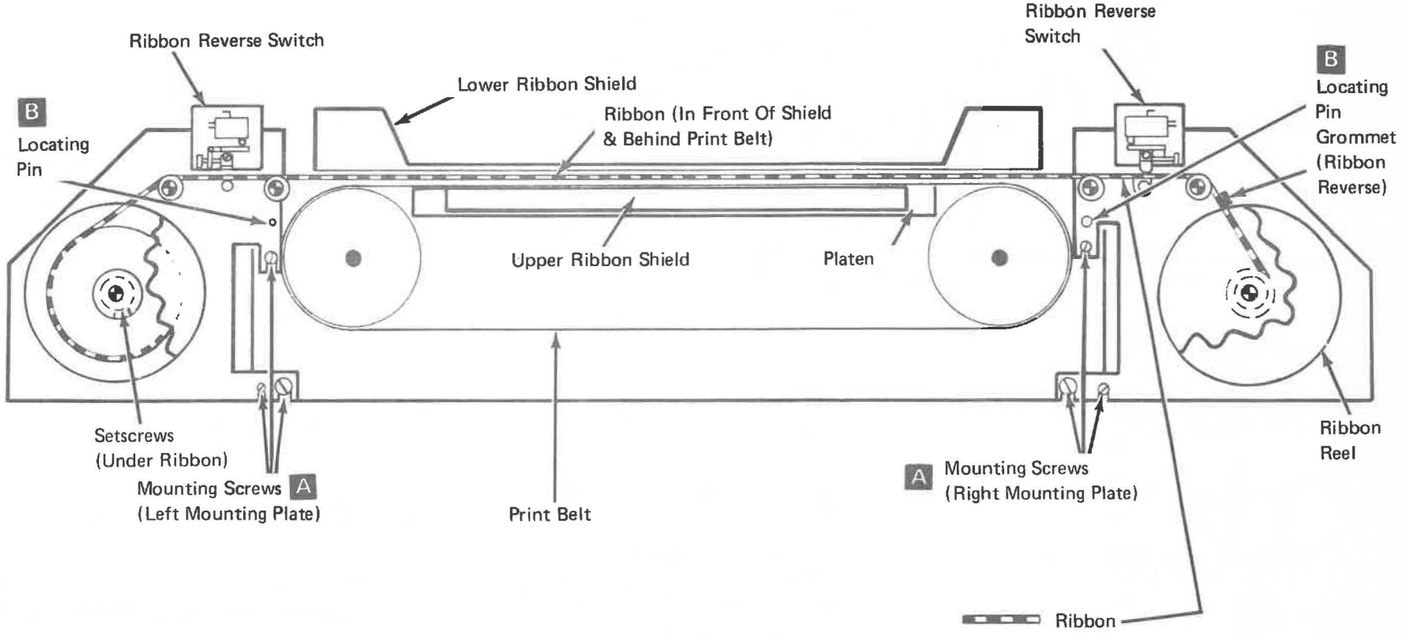
RIBBON MOUNTING PLATES

REMOVAL

1. Open the print unit casting and remove the print belt cover. See "Section 4", 4-000.
2. Remove the ribbon reel from the bracket to be removed.
3. Disconnect the wires to the ribbon reverse switch and note color code. Disconnect P2 or P6.
4. Loosen the 3 mounting screws **A** so that the bracket is free of the locating pin **B**.
5. Slide the bracket toward the back and remove.

INSTALLATION

1. Place the brackets on the casting using the locating pins, and then tighten the mounting screws **A**.
2. Connect P2 or P6 and wires to switch as noted by color code.
3. Install the ribbon and the print belt cover. See "Section 4", 4-000.
4. Close the print unit casting.
5. Verify that the ribbon tracks and reverses correctly.



RIBBON MOTOR - LEFT

SERVICE CHECK

1. Switch power off, then remove card A1Q2.
2. Measure the resistance of each motor phase circuit and each ribbon brake resistor:

A1Q2J02	to	A1Q2U04	13 ohms	Not A-Phase
A1Q2D07	to	A1Q2U04	13 ohms	A-Phase
A1Q2D13	to	A1Q2U05	13 ohms	B-Phase
A1Q2J06	to	A1Q2U05	13 ohms	Not B-Phase
TB1-10	to	A1Q2U04	100 ohms	A-Brake
TB1-10	to	A1Q2U05	100 ohms	B-Brake

3. Install A1Q2 card.

   Note: The resistance values may differ because of the multimeter. Compare values of similar parts in the circuit to determine failing parts.

4. Operate CE sw # 3 and verify motor operation. See "Section 2", 2-000.

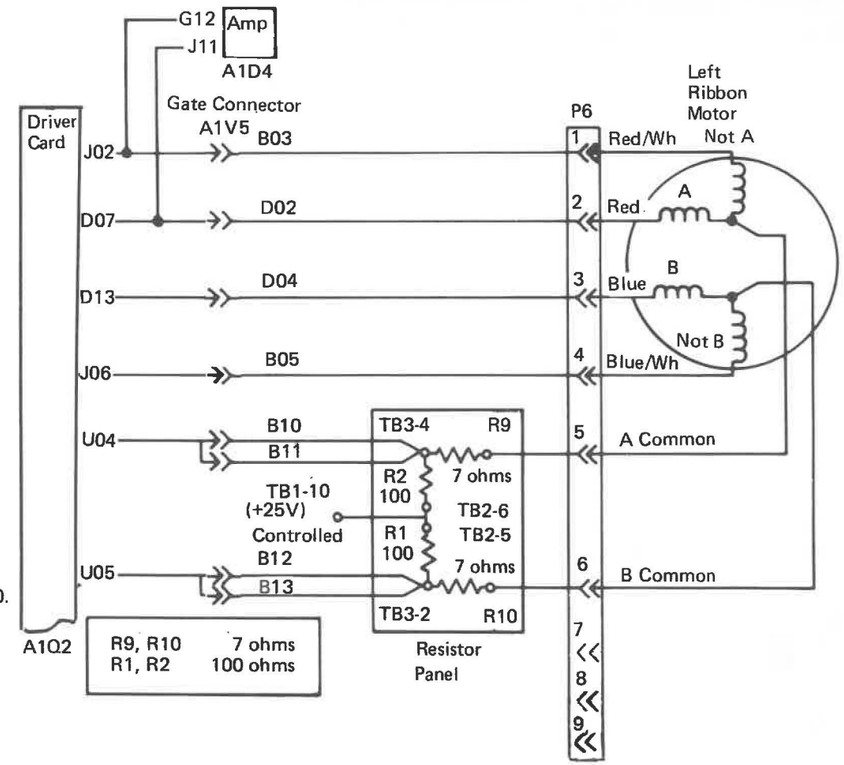
REMOVAL

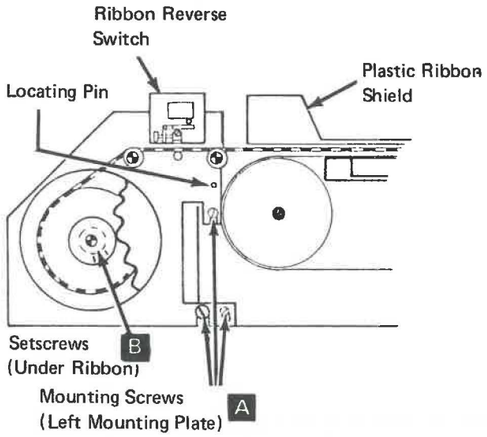
1. Remove Left Motor Mounting Plate. A See "Removal", 6-060.
2. Loosen setscrews B, then remove ribbon drive hub.
3. Remove the mounting screws from the motor.
4. Remove motor.

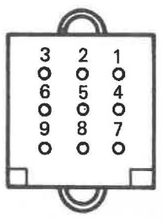
INSTALLATION

1. Place the motor on the bracket with the plug toward the rear.
2. Install the mounting screws.
3. Install the ribbon drive hub and perform the ribbon tracking adjustment. See "Adjustment", 6-020.
4. Install ribbon mounting plate. See "Installation", 6-060.

CIRCUIT -- LEFT RIBBON MOTOR







P6 Pins
(Male Connector)

RIBBON MOTOR - RIGHT

SERVICE CHECK

1. Power off, then remove card A1Q2.
2. Measure the resistance of each motor phase circuit and each ribbon brake resistor:

A1Q2D09	to	A1Q2S02	13 ohms	Not A-Phase
A1Q2D10	to	A1Q2S02	13 ohms	A-Phase
A1Q2J04	to	A1Q2U02	13 ohms	B-Phase
A1Q2J05	to	A1Q2U02	13 ohms	Not B-Phase
TB1-10	to	A1Q2U02	100 ohms	A-Brake
TB1-10	to	A1Q2S02	100 ohms	B-Brake

3. Install A1Q2 card.

   Note: The resistance values may differ because of the meter. Compare values of similar parts in the circuits to determine failing parts.

4. Operate CE sw. #3 to verify motor operation. See "Section 2", 2-000.

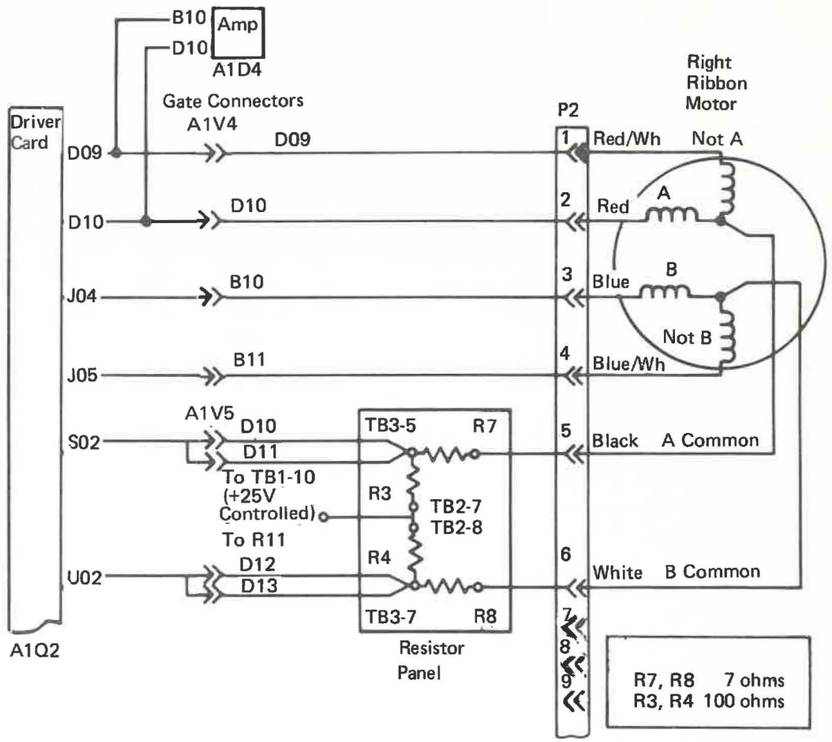
REMOVAL

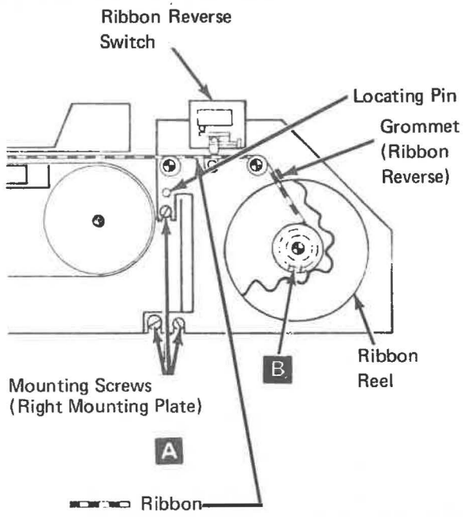
1. Remove Right Motor Mounting Plate. A See "Removal", 6-060.
2. Loosen setscrew B, then remove ribbon drive hub.
3. Remove the mounting screws from the motor.
4. Remove motor.

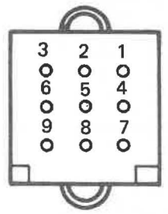
INSTALLATION

1. Place the motor on the bracket with the plug toward the rear.
2. Install the mounting screws.
3. Install the ribbon drive hub and perform the ribbon tracking adjustment. See "Adjustment", 6-020.
4. Install ribbon mounting plate. See "Installation", 6-060.

CIRCUIT – RIGHT RIBBON MOTOR







P2 Pins
(Male Connector)

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SECTION 7: FORMS PATH

INTRODUCTION

- This section describes installation and removal procedures related to the 5211 form switch, paper clamp and paper clamp coil. Circuits concerned with these devices are discussed. Adjustments and service checks are also included. For a further detailed description, see the theory of operation in Section 15.

ENTRY INDEX

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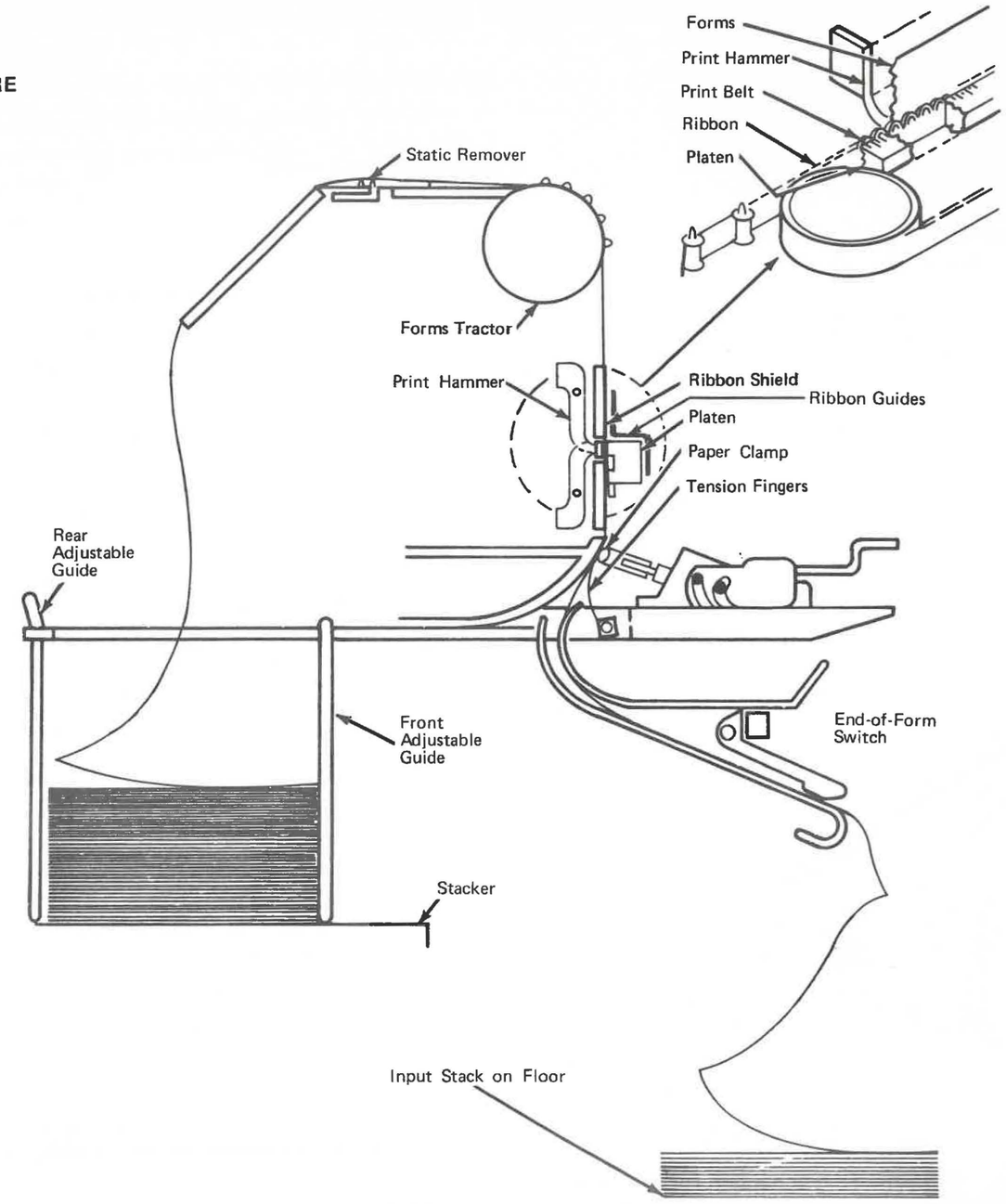
FORMS PATH

FIGURE



END-OF-FORMS SWITCH

Caution: Do not use meter on resistance scale. Damage to the electronic switch may result.

SERVICE CHECK

1. Connect voltmeter between A1A5B02 (+) and frame ground (–) or probe A1A5B02 with IBM General Logic Probe.
2. Verify the following conditions:
   a. Voltage measures 5 volts with no forms under the end of forms lever. If you are using the probe the UP light is on.
   b. Insert a single part form under the end-of-forms lever and the voltage should shift to 0 volts. If you are using the probe, the DOWN light should be on.

ADJUSTMENT

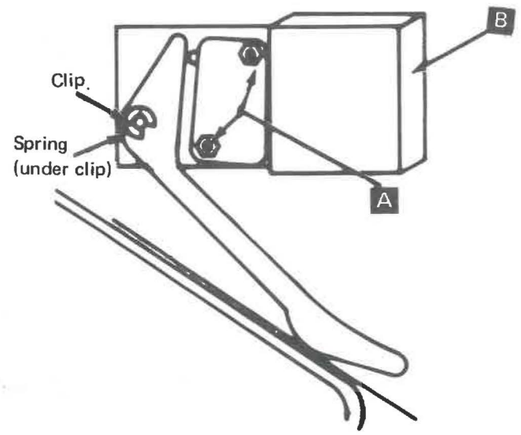
1. Open the front cover and remove the forms.
2. With the end-of-forms lever resting in the slot on the lower forms chute, loosen screws A .
3. Connect voltmeter between A1A5B02 (+) and frame ground (–) or probe A1A5B02 with IBM General Logic Probe. Move the switch toward the rear until the voltage switches to +5V or UP light is on. Move the switch to provide for 0.13 - 0.51 mm (.005 - .020 in) clearance between the switch case and lever. The forms light on the operator panel should come on. See "Circuit," 7-030.
4. Insert a single part form under the lever and the forms light should go off, or voltage should switch to "0." DOWN light is on.
5. Tighten screws.
6. Perform end-of-forms switch service check.
7. Close the front cover and install forms.

REMOVAL

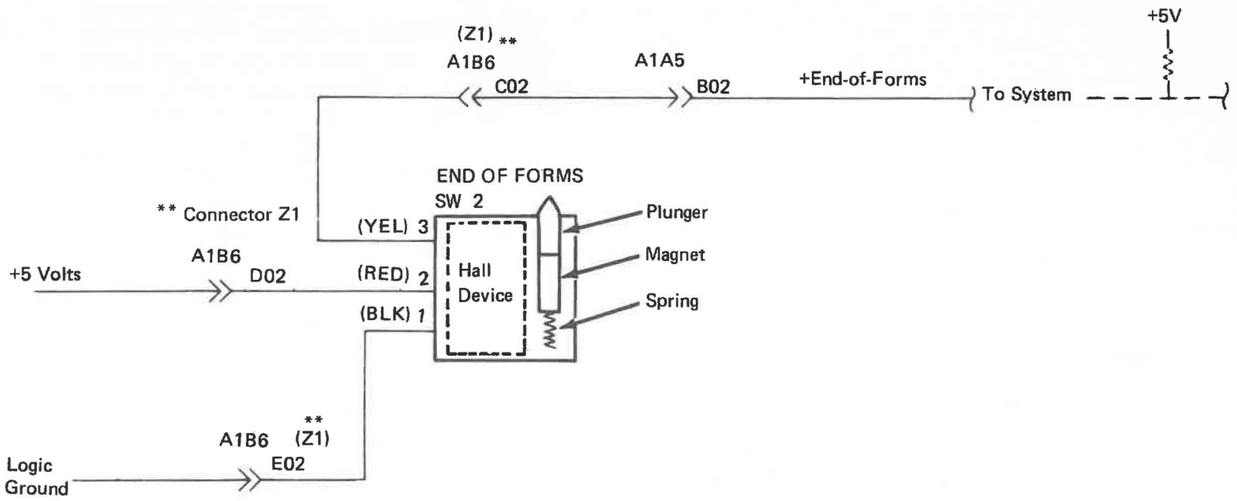
1. Open the covers.
2. Remove screws A , switch and cover B .
3. Note the wire color code and remove the wires.

INSTALLATION

1. Install the wires according to color code.
2. Install the two screws and nuts A , and install the switch and cover B .
3. Perform switch adjustment, 7-020.
4. Close the covers.



CIRCUIT-END-OF-FORMS INTERLOCK SWITCH



CAUTION: Do not use meter or resistance scale. Damage to the electric switch may result.

End-of-Forms Switch Condition	Test Points		Indication	
	–	+	Voltmeter	Probe Light *
Forms Out	Frame Gnd	A1A5 B02	+5	UP On
Forms In	Frame Gnd	A1A5 B02	0	DOWN On

* IBM General Logic Probe. P/N 453212

** Logic Gate Connector Locations

A1Z1	A1B6
D06	C02
D08	E02
D07	D02

PAPER CLAMP ASSEMBLY

SERVICE CHECK

1. Install single-part forms that are wide enough to cover the print line. Close the print unit casting and open left end cover.
2. Turn the CE switch #4 (paper clamp switch) ON to activate the paper clamp. The switch is located on the panel inside the left machine cover.
3. Hold the forms and try to pull them upward. The forms must be held tightly on both ends. If forms are not held tightly, perform the paper clamp adjustment. Turn the C E switch #4 off. Close the left end cover.

Caution: The paper clamp switch should not be left on for extended periods of time. Turn the switch OFF as soon as the service check is performed.

ADJUSTMENT

1. Remove forms.
2. Remove the print unit casting. See "Section 5", 5-000.
3. Engage the paper clamp by lifting lever A . Inspect the mechanical action by engaging the armature, while holding lever A up.
4. Ensure that parts move easily. Ensure that the clamp bar fully returns on both sides when the armature is disengaged.
5. Measure between the two outer tension fingers (both ends) for 1.85 ± 0.127 mm (.073 ± .005 in) gap B . The maximum difference between both gaps B is 0.25 mm (.010 in). If correct, go to step 6.

   To adjust:

   a. Remove seal from screws C , if necessary. Loosen screws in both stop plates.

   b. Loosen four holding screws D .

   c. Move the clamp assembly to obtain gap B , then tighten screws D . Measure gap again.

   d. While holding the stop plates against the clamp assembly, tighten screws C .

   Turn the CE paper clamp switch #4 ON to activate the paper clamp. Be sure armature is seated on the end blocks E .

   a. Measure for 0.15 - 0.20 mm (.006 - .008 in) gap at F (both ends). Adjust, if needed, by turning screw(s) G . *Note:* Clockwise increases gap.

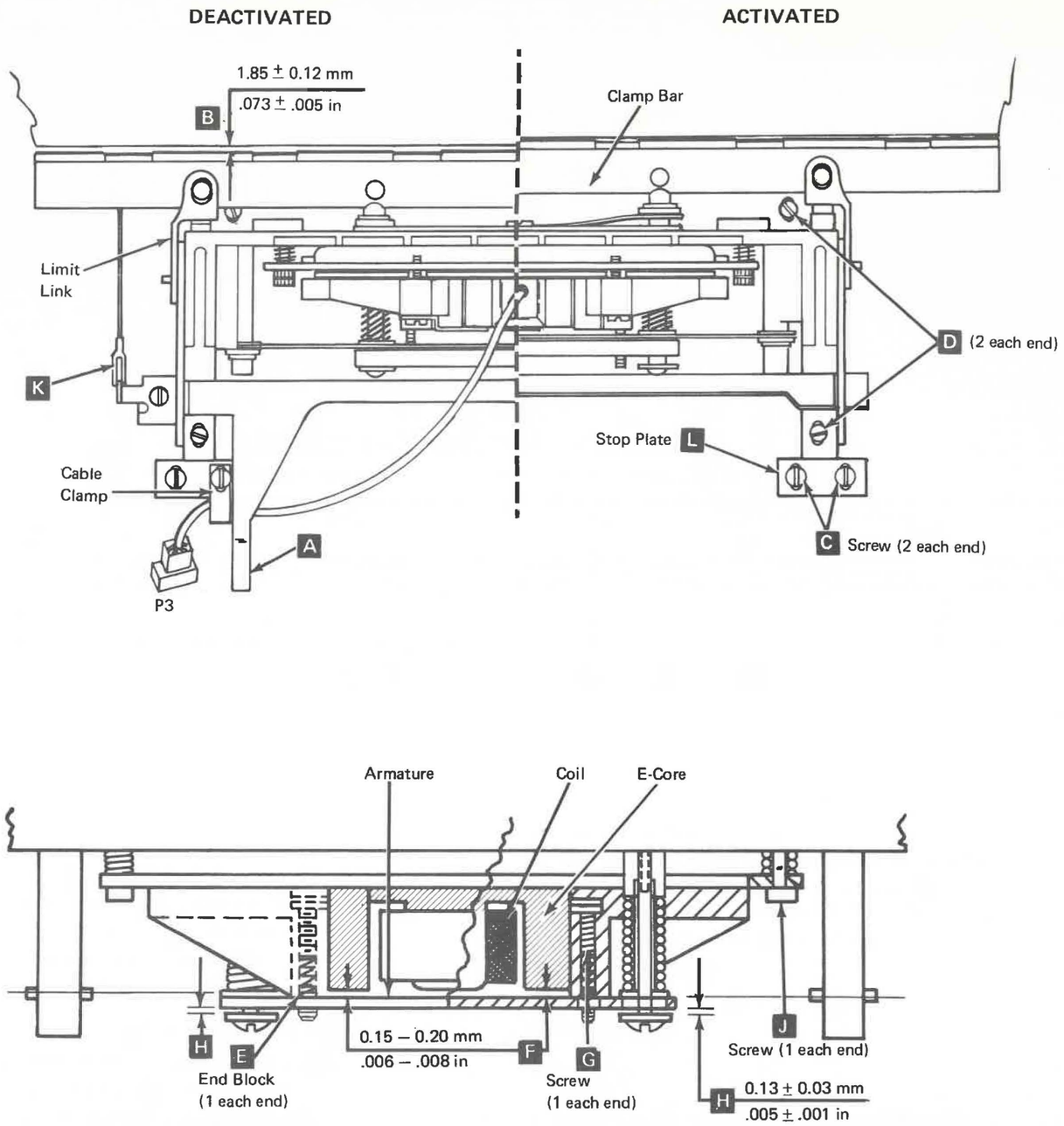
6. Measure for 0.13 ± 0.03 mm (.005 ± .001 in) gap at H (both ends). Adjust, if needed, by turning screw(s) J . *Note:* Clockwise increases gap. Measure both gaps H again after adjusting.
7. De-activate the clamp, then perform Paper Clamp Service Check, 7-040.
8. Perform the tension service check steps 4 and 5. See "Forms Tension Assembly", 7-080.
9. Install the print unit casting and the covers. See "Section 5", 5-000.

REMOVAL

1. Open the front cover, then remove the print unit casting. See "Section 5", 5-000.
2. Unhook clip K . Disconnect P3 and remove cable clamp.
3. Remove four screws D , then remove assembly.

INSTALLATION

1. Place clamp assembly in position. Place P3 cable as shown and connect plug. Install cable clamp.
2. Start the four screws D , but do not tighten. Hold the assembly against the stop plates L , and tighten the four screws D .
3. Install clip K .
4. Perform Forms Tension Service Check steps 4 and 5. See "Forms Tension Assembly", 7-080.
5. Install print unit casting and covers. See "Section 5", 5-000.
6. Perform the Paper Clamp Service Check.



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PAPER CLAMP COIL

REMOVAL

1. Remove paper clamp assembly. See "Removal", 7-040.
2. Remove pins A from both rods B .
3. Move armature C away from coil.
4. Loosen screw and remove coil holder D .
5. Remove coil E by pulling it off core F .

INSTALLATION

1. Place coil on core as shown E .
2. Install coil holder D and tighten screw.
3. Hold armature C toward core, and insert pins A in rods B .
4. Install paper clamp assembly. See "Installation", 7-040.

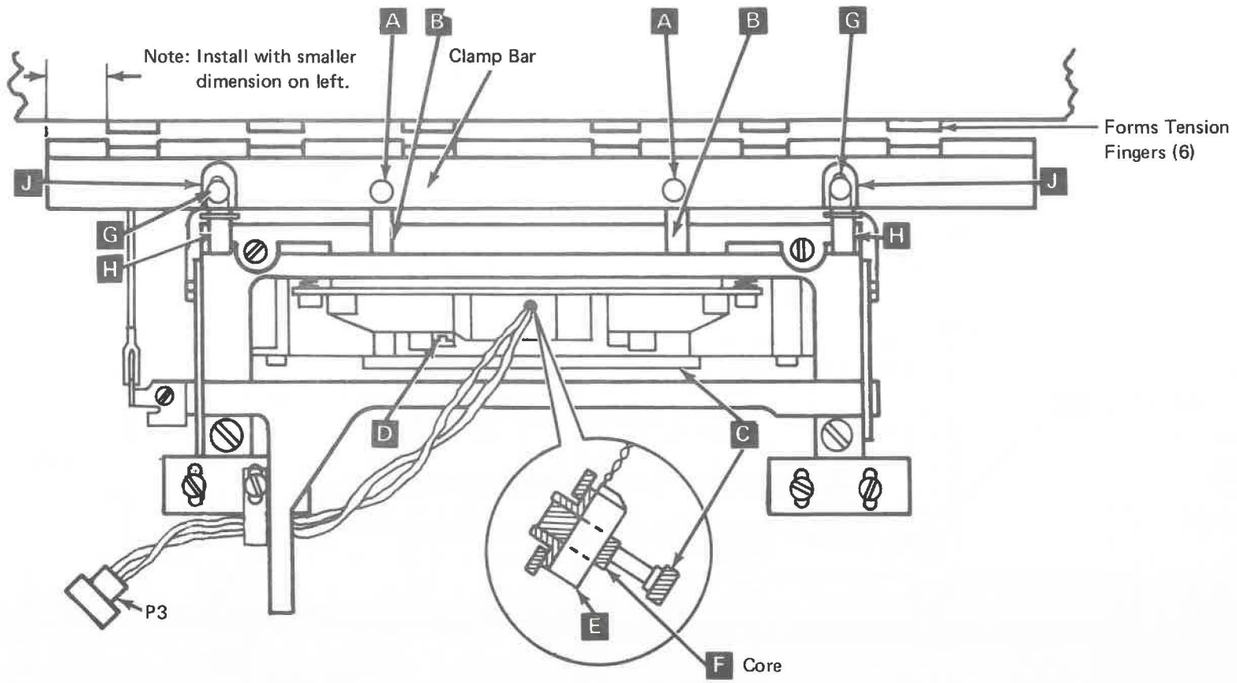
PAPER CLAMP BAR

REMOVAL

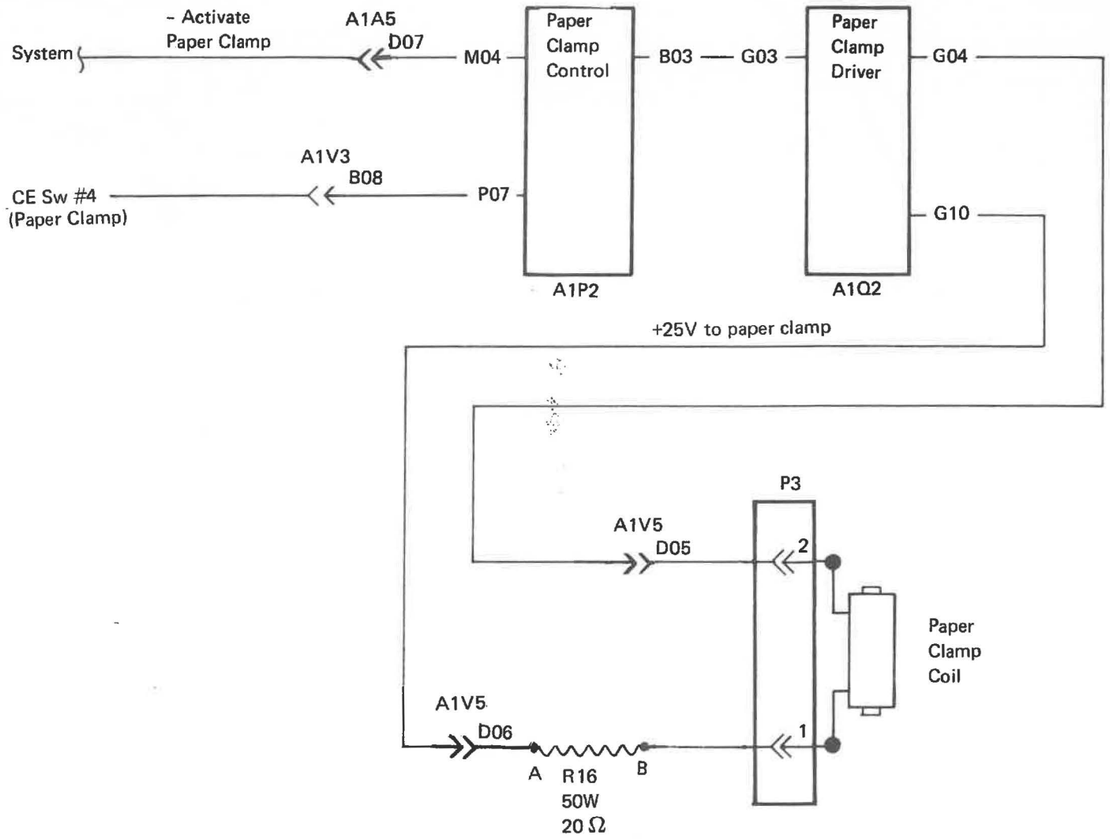
1. Remove paper clamp assembly. See "Removal", 7-040.
2. Remove pins A from rods B and pins G from rods H .
3. Remove bar.

INSTALLATION

1. Position bar over rods B and pins G .
2. Install pins in rods B .
3. Locate spring loops in rods H to align with holes in bar.
4. Install pins G in bar through spring loop and snap in place so that head of pin fits holes in limit links J .
5. Manually operate armature to assure freedom of movement.
6. Install clamp assembly. See "Installation", 7-040.



CIRCUIT – PAPER CLAMP



FORMS TENSION ASSEMBLY

SERVICE CHECK

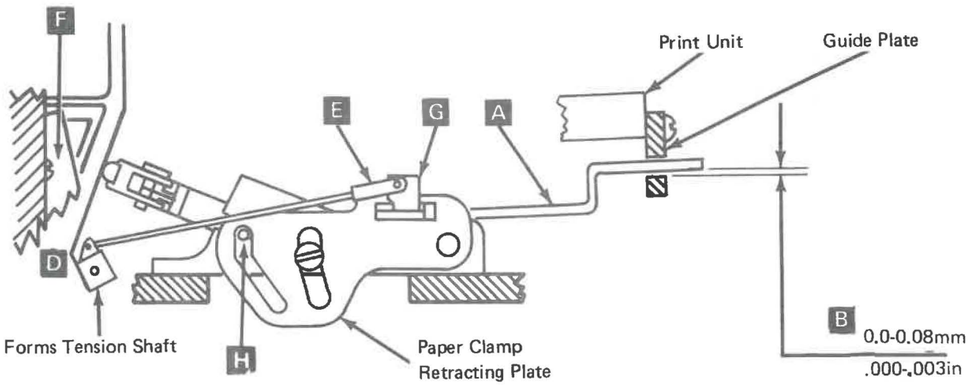
1. Open top cover and remove the front inner panel.
2. Hold lever A up and measure gap as shown B between lever and guide plate.
3. Insert into the printer approximately 900 mm (35 in) of single part forms, wide enough to contact all six tension fingers. See C .
4. Open the upper ribbon shield and set the forms thickness control to 1.
5. With the print unit casting closed, ribbon and belt removed, measure for 250 - 280 grams tension while pulling the forms upward C . Without the print unit casting installed, the tension while holding lever A up should be 200 - 250 grams.

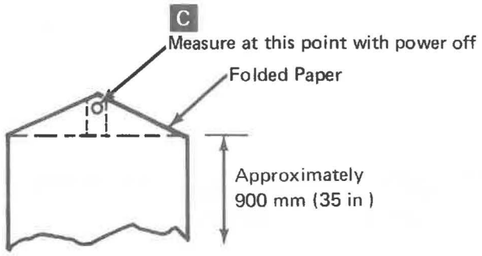
   Note 1: With the upper ribbon shield closed, the maximum tension is 300 grams.

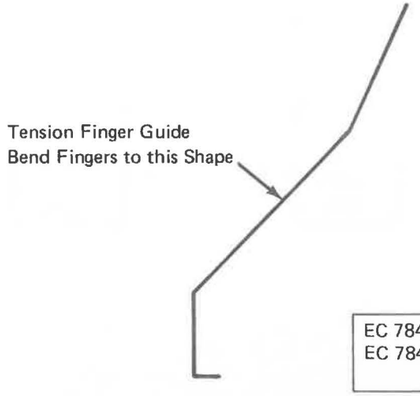
   Note 2:
   - Weak tension may cause vertical registration problems.
   - Heavy tension may cause carriage checks, overprinting, or forms tearing.
6. Install the inner panel and close the top cover.

ADJUSTMENT

1. Remove the forms and the front inner panel.
2. Insert into the printer approximately 900 mm (35 in) of single part forms, wide enough to contact all six tension fingers. See C . Open the upper ribbon shield and set the forms thickness control to 1. Visually check all six tension fingers for equal contact.
3. Adjust forms tension assembly D for 200 - 250 grams on wide forms. To adjust, unhook clip under the left end of print unit casting and adjust by turning link. Note: Clockwise decreases tension E .
4. Install clip and perform service check-steps 4 and 5. See 7-080.
5. Install the front inner panel and forms.







REMOVAL

1. Remove the front inner panel.
2. Remove the print unit casting. See "Section 5", 5-000.
3. Disconnect clip E and remove link and clip assembly from shaft.
4. Remove paper clamp assembly. See "Removal", 7-040.
5. Remove pivot bracket F from the left end of the forms tension shaft.
6. Slide the shaft assembly to the left until clear of the right pivot bracket and remove the forms tension shaft assembly from machine.

INSTALLATION

1. Install the shaft by inserting the right pivot, then install the left pivot bracket F .
2. Install the paper clamp. See "Installation", 7-040.
3. Install the link and clip assembly E between the shaft and lever assembly G .
4. Operate the tension fingers against the forms by lifting lever A . Ensure that the top of the hole in the left paper clamp retracting plate is against the pin H . Verify that all tension fingers touch the rear forms guide at the same time. If not, correct by bending each finger as shown D .
5. Perform the paper clamp service check. See "Service Check", 7-040.
6. Perform the forms tension service check steps 4 and 5. See "Service Check", 7-080.
7. Install the print unit casting, front inner panel, and covers. See "Section 13", 13-000.

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SECTION 8: CARRIAGE

INTRODUCTION

- This section describes installation and removal procedures related to the 5211 carriage unit. Circuits describing forms motion,the carriage motor feedback LED, and the carriage motor are also included. For further detailed descriptions see the theory of operation in section number 15.

ENTRY INDEX

TRACTOR

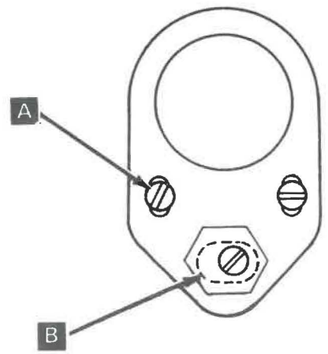
ADJUSTMENT

Verify that the forms guides on the paper entry chute are located correctly before performing this adjustment (the forms alignment scale should align with the alignment scale in the forms chute).

Objective

To align the print line with the margin holes.

1. Insert wide single-part forms and print several lines in all print positions.
2. Place a straight edge (ruler or paper) tangent to the margin holes and determine whether the line is up or down in relation to the holes.
3. If the line is up or down, loosen three retainer screws on the right end of the tractor drive shaft A, and turn the eccentric B to either raise or lower the right tractor. Tighten the screws, run another sample of printing, and recheck the adjustment.



REMOVAL

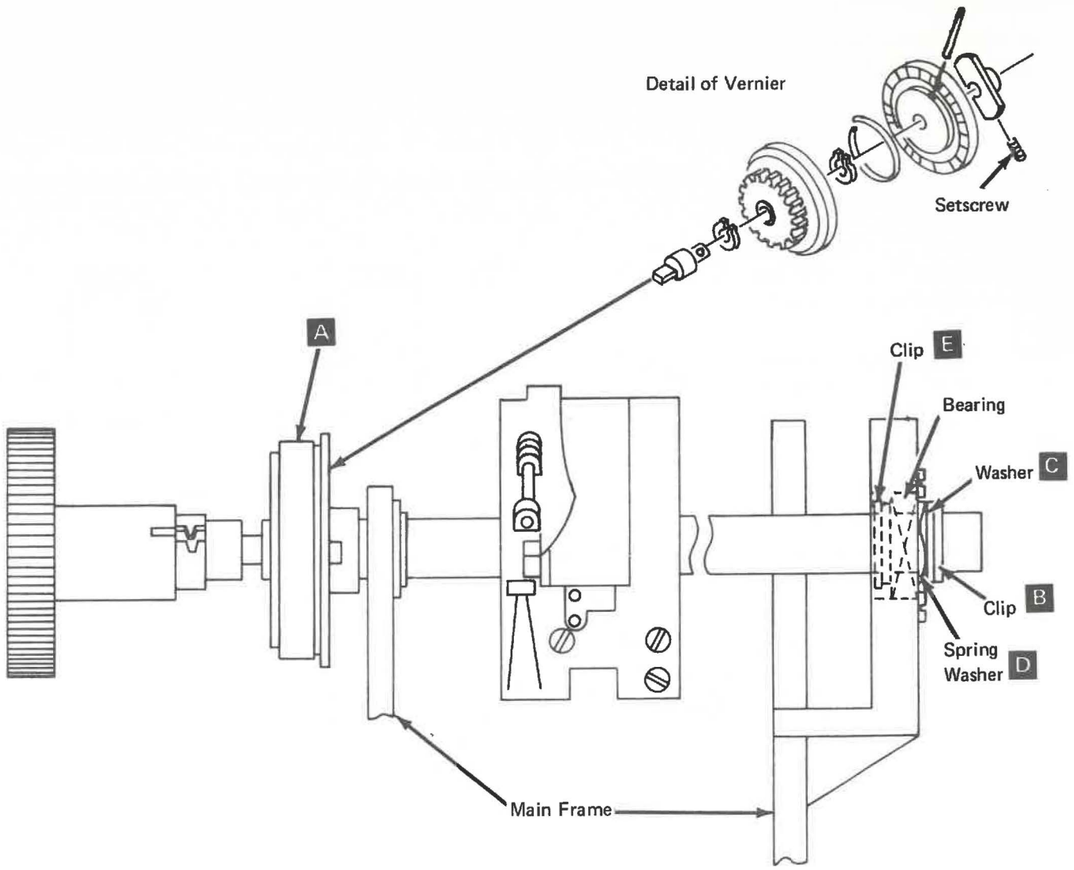
Note 1: Tractor drive shaft verniers are factory adjusted. If the verniers become worn, replace the complete drive shaft and vernier assembly.

Note 2: Use pliers, IBM part 9900317 to remove spring clips.

1. Remove the carriage belt cover.
2. Loosen the carriage belt tension bracket and remove the tractor drive belt A. Remove tractor knob. See 8-020.
3. Remove the spring clip B, the washer C, and the spring washer D. See 8-020.
4. Move the shaft to the left and remove the spring clip E.
5. Pinch the right hand tractor release lever together, slide the tractor to the right off the drive shaft and pull the tractor forward from the slot.
6. Remove paper guide and left hand tractor.
7. Move shaft to left and up to remove.

INSTALLATION

1. Pinch the tractor release lever together, slide tractor to left on the drive shaft and push the tractor to slot.
2. Install spring clip and move shaft to right thru bearing housing. E
3. Install clip B, washer C, and spring washer D.
4. Install tractor drive belt A and adjust tension. Adjust the carriage drive belt to produce 2.54 ± 0.65 mm (.100 ± .025 in) deflection with 200 grams force applied between pulleys. Tighten the belt tension bracket. Perform tractor drive shaft adjustment.
5. Install carriage belt cover.



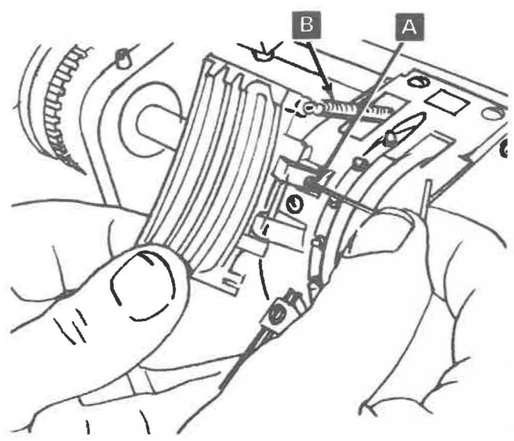
TRACTOR COVER

REMOVAL

1. Loosen one set screw A and remove the shaft that holds the cover onto the tractor assembly.
2. Remove the spring B from the cover. Remove the cover.

INSTALLATION

1. Install the shaft that holds the cover onto the tractor assembly thru cover tabs and support bracket. Tighten the set screw A .
2. Install the spring on the cover B .
3. Install the cover.



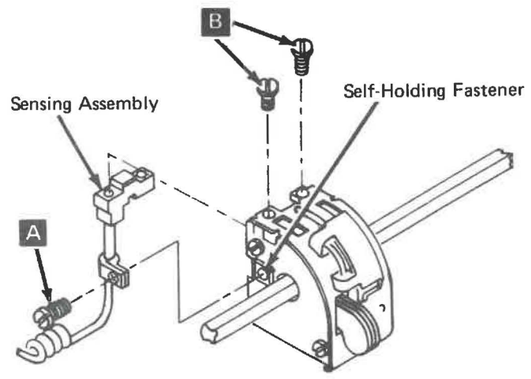
FORMS MOTION SENSING

REMOVAL

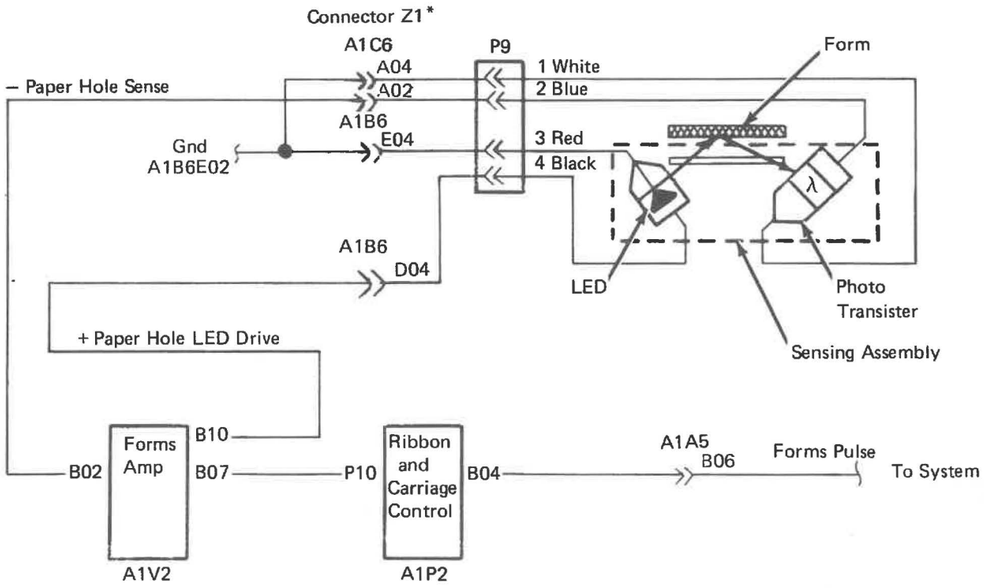
1. Disconnect P9 and remove the cable clamp from the end of the cable.
2. Remove screw A and the cable clamp.
3. Remove screws B and the sensing assembly.

INSTALLATION

1. Install the clamps on the cable.
2. Install the sensing assembly on the tractor with 2 screws B .
3. Install the cable clamp A .
4. Connect P9 and install the cable clamp.



CIRCUIT – FORMS MOTION



Logic Gate Connector Locations

A1Z1 Plug ← Pin	
B04	B6E04
B09	C6A04
D02	C6A02
B07	B6D04

CARRIAGE DRIVE BELT

SERVICE CHECK

Verify correct belt tension.

ADJUSTMENT

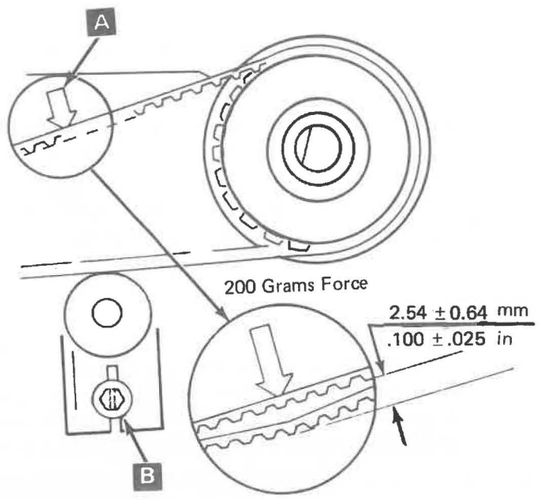
1. Verify for correct belt tension A .
2. Adjust by loosening the locking screw B , then move the roller bracket until the tension is correct. Tighten screw B .

REMOVAL

1. Remove belt cover and the carriage feedback LED cover.
2. Remove the carriage advance knob.
3. Loosen the belt tension roller locking screw B .
4. Disconnect the terminals and note color code. See 8-060.
5. Remove the belt.

INSTALLATION

1. Install the belt on the pulleys.
2. Connect the carriage feedback LED terminals. See 8-060.
3. Install carriage advance knob.
4. Perform the carriage drive belt adjustment.
5. Install belt cover.



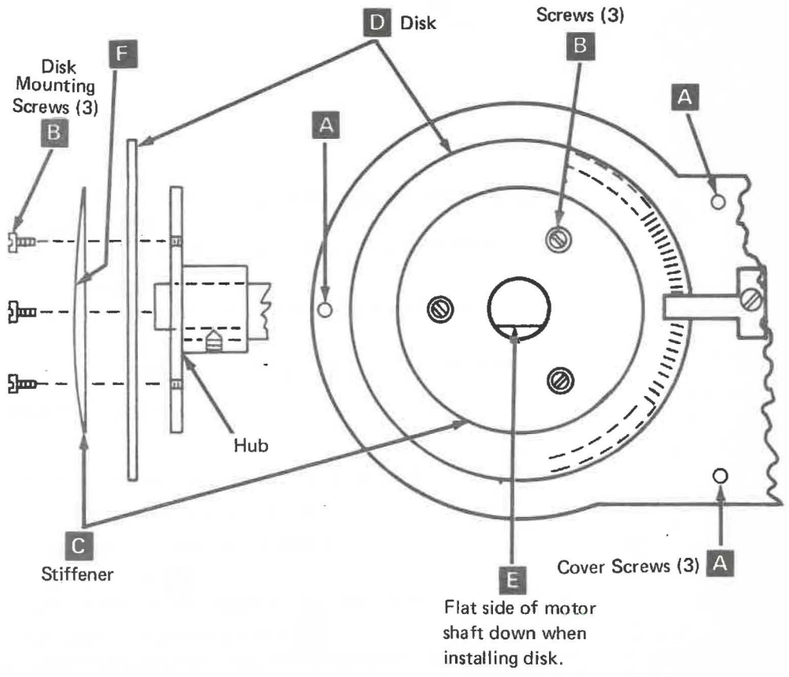
CARRIAGE MOTOR FEEDBACK DISK

REMOVAL

1. Remove the cover from the carriage feedback LED assembly by removing 3 screws A .
2. Remove 3 screws B , the stiffener C and the disk D .

INSTALLATION

1. Turn the motor shaft so the flat side is down as shown E .
2. Install the disk D , and the stiffener C with the concave side toward the disk as shown F . Tighten 3 screws B .
3. Perform the Belt Motor Feedback LED Service Check, 8-050.



CARRIAGE MOTOR FEEDBACK LED

OPERATIONAL DESCRIPTION

Light from a light emitting diode (LED) is distributed through a turning feedback emitter timing disk. When light from the LED goes through one of the holes to the photo transistor (PT) it generates a carriage motor feedback pulse.

SERVICE CHECK

1. Turn the disk pulley and verify that the disk is flat and tracking between the LED and the PT as shown at A.
2. Run the carriage feedback LED timing test for your system and verify that the following timings are correct:

   Maximum = 910 μsecs.
   Minimum = 790 μsec.
   Average = 833-870 μsec.

ADJUSTMENT

1. Remove the carriage feedback LED cover by removing 3 screws B, then run the carriage feedback LED timing test.
2. Adjust the position of the disk to track in slot of LED assembly. Adjust closer to PT as shown at A.
3. Loosen screw C and move the adjusting block until the timing is correct.

   Maximum = 910 μsecs.
   Minimum = 790 μsec.
   Average = 833-870 μsec.

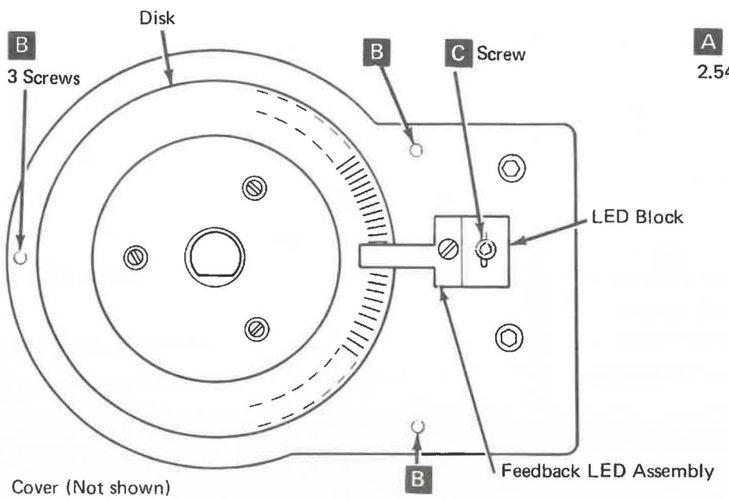
4. Tighten screw C and verify that the timing is still correct.
5. Install the carriage motor feedback cover.

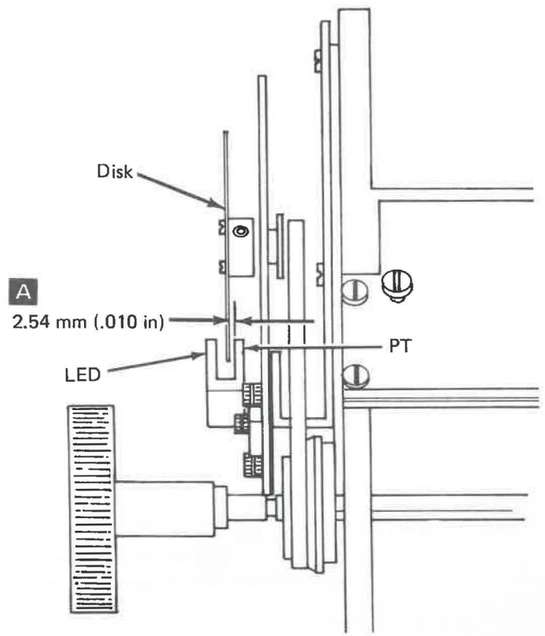
REMOVAL

1. Remove the cover from the carriage feedback LED assembly by removing 3 screws B.
2. Remove the carriage feedback LED assembly by removing screw C.
3. Remove the feedback disk if needed.
   a. Loosen the set screw in the collar.
   b. Slide the disk and collar off the motor shaft.

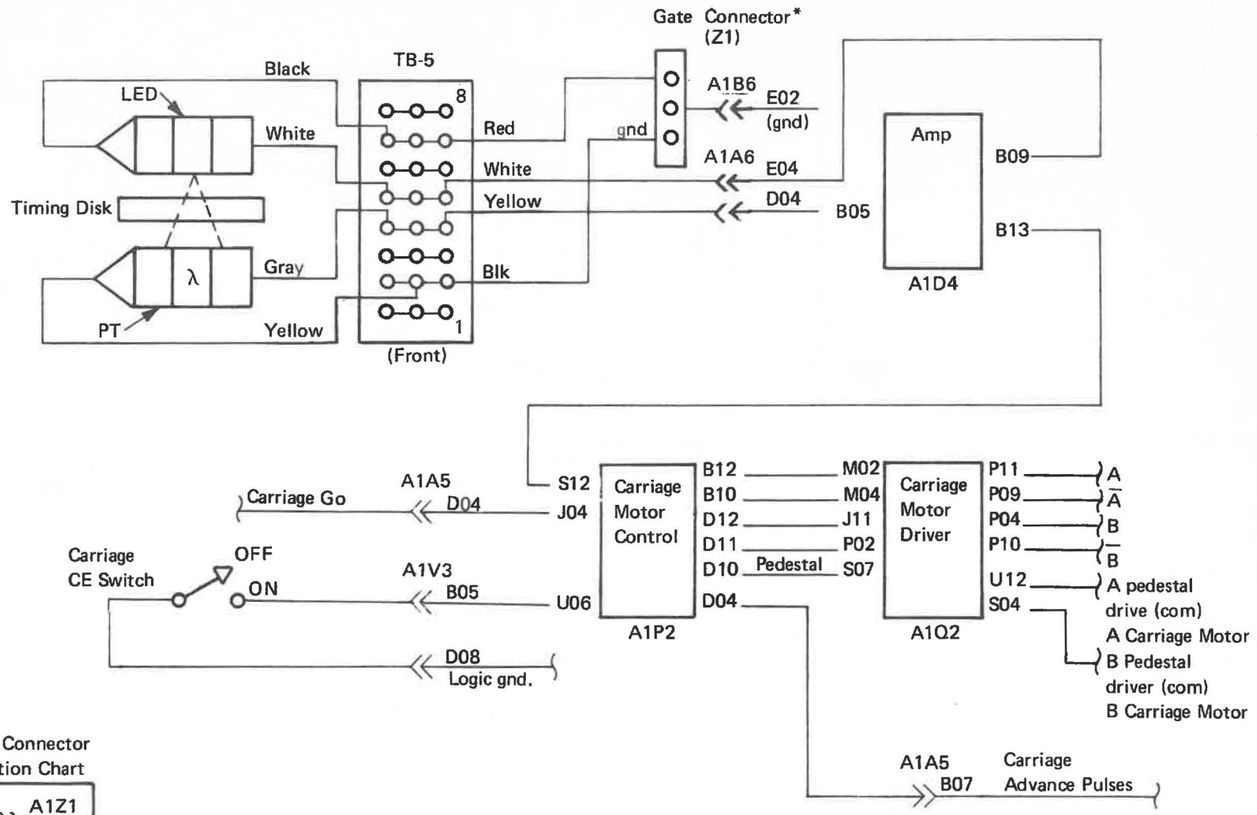
INSTALLATION

1. If removed, install the carriage feedback disk on the motor shaft.
2. Install the carriage motor feedback LED sensing device with screw C.
3. Adjust the disk to track in the slot of the LED assembly as shown at A.
4. Perform the carriage motor feedback LED adjustment, 8-050.





CIRCUIT – CARRIAGE MOTOR FEEDBACK LED



*Gate Connector Location Chart

Pins → A1Z1 Plug	
B6 E02	D08
A6 E04	B02
A6 D04	B03

CARRIAGE MOTOR

SERVICE CHECK

1. Power off, then remove card A1Q2.
2. Measure the resistance of each motor phase circuit and each carriage detent resistor:

A1Q2P11	to	A1Q2U12	9 ohms	A-Phase
A1Q2P09	to	A1Q2U12	9 ohms	Not A-Phase
A1Q2P04	to	A1Q2S04	9 ohms	B-Phase
A1Q2P10	to	A1Q2S04	9 ohms	Not B-Phase
TB2-8	to	A1Q2U12	15 ohms	A-Detent
TB2-8	to	A1Q2S04	15 ohms	B-Detent

3. Install A1Q2 Card.

Note: The resistance values may differ because of the meter. Compare values of similar parts in the circuits to determine failing parts.

REMOVAL

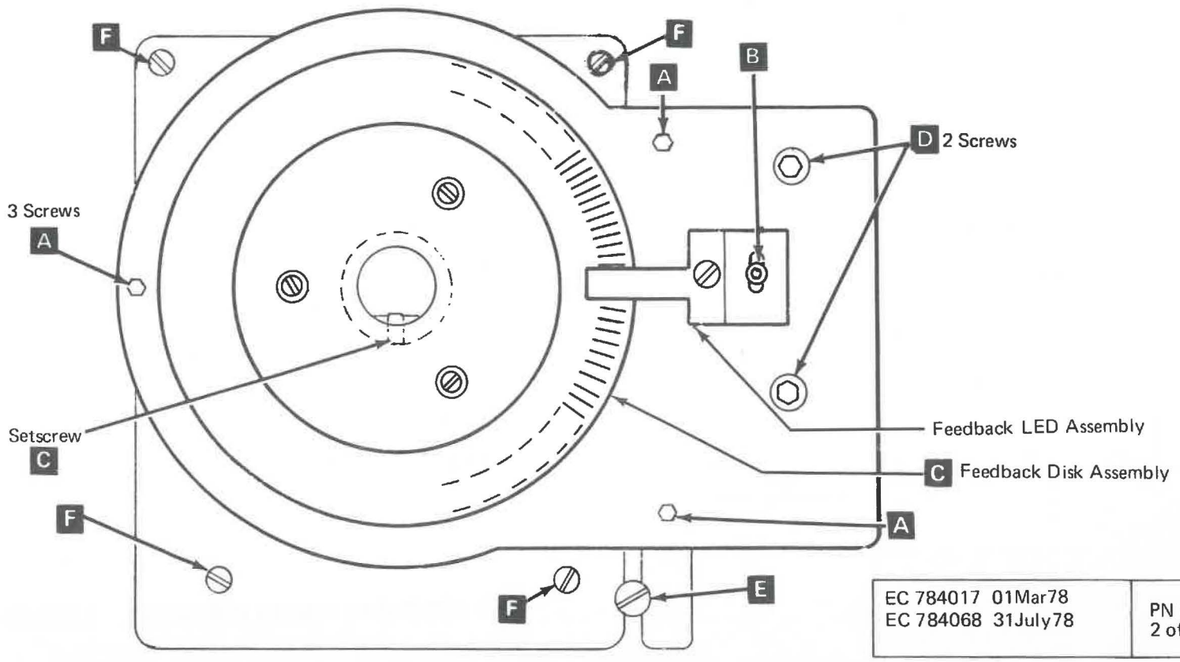
1. Disconnect P1.
2. Remove carriage belt guard and forms guide.
3. Remove the carriage feedback cover, 3 screws A.
4. Remove the LED feedback assembly by removing screw B.
5. Remove the feedback disk assembly C by loosening the setscrew in the collar.
6. Remove the feedback assembly mounting plate by removing 2 screws D.
7. Loosen screw E, then remove the roller bracket.
8. Remove the motor and the mounting bracket by removing screws F.
9. Remove the motor pulley.

INSTALLATION

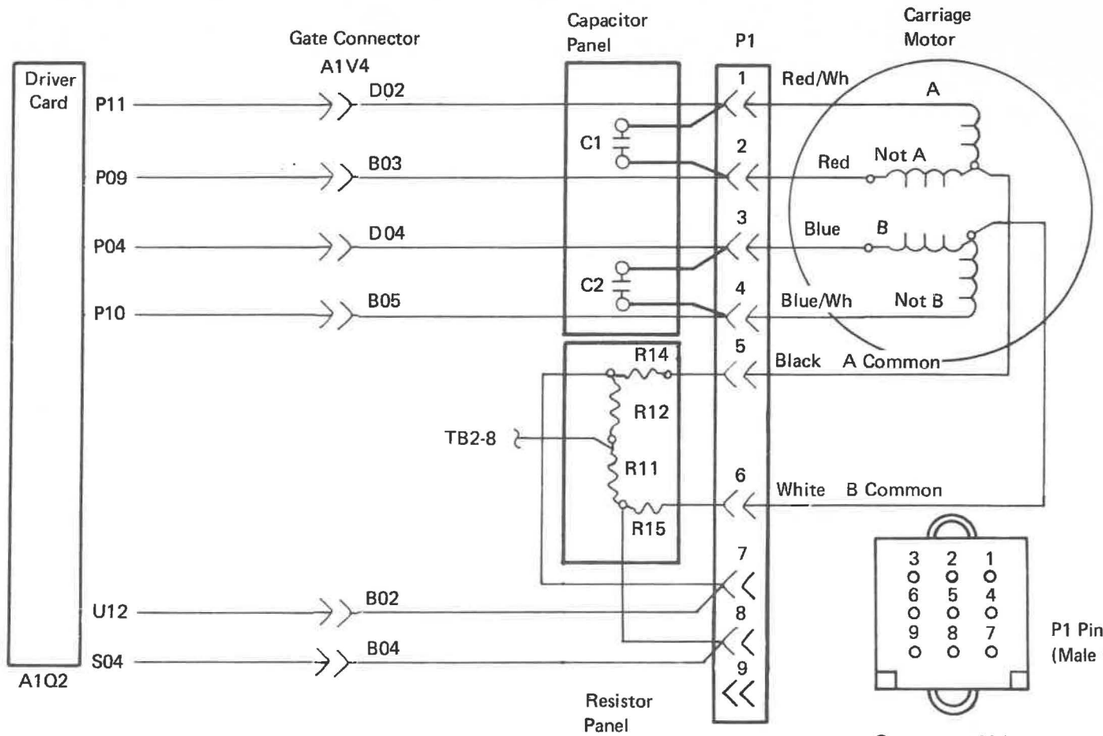
1. Install the pulley.
2. Place the motor in position, then install the mounting bracket with the 4 screws F.
3. Install the belt and belt tension bracket E.
4. Perform the belt tension adjustment. See 8-040.
5. Install the feedback assembly mounting plate with 2 screws D.
6. Place the feedback disk assembly C on the shaft. Do not tighten the setscrew.
7. Install the feedback LED assembly B.

Caution: Position wires away from disk. The disk may possibly cut the wires.

8. Align the disk in the slot 2.54 mm (.010 in) from the photo transistor, and tighten the screws. See 8-050.
9. Connect P1 and LED wires. See 8-080.
10. Perform the carriage motor feedback timing adjustment. See 8-050.
11. Install the carriage feedback cover.



CIRCUIT – CARRIAGE MOTOR



Component Values

C1	8 microfarads
C2	8 microfarads
R11	15 ohms
R12	15 ohms
R14	7 ohms
R15	7 ohms
Each motor phase	1.5 ohms

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SECTION 9: POWER

INTRODUCTION

- This section includes information on removing and installing the power supply, the 25-volt contactor, and logic gate cooling fan. Adjustments and service checks are provided for the transformers and diode D1. Circuits for the power distribution, power on reset, and power supply signals are also included.

ENTRY INDEX

POWER SUPPLY

REMOVAL

1. Turn printer power off A .
2. Disconnect power cord from customer's power source.
3. Raise the top cover.
4. Remove the right rear cover by removing the two screws and their washers located below the right top-cover spring.
5. Open right end cover.
6. Disconnect 4-position connector, (PS) P1 B by pinching the sides and pulling straight out.
7. Disconnect 3-position connector, (PS) P4 C by pulling straight out.
8. Remove plastic shield over 6-position terminal board, (PS) TB1 D .
9. Disconnect the 6 wires on (PS) TB1.

   Note: Make sure leads are marked for proper reconnection. Care should be taken not to misplace jumper between positions 3 and 4.

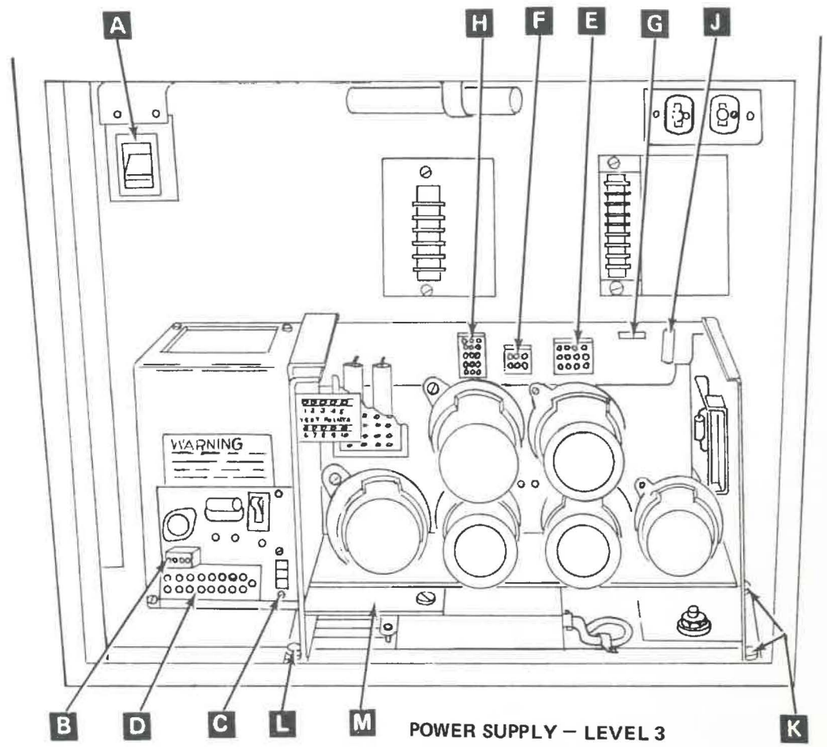
Caution: Care should be taken while removing connectors in steps 10-14 so the single pin connections on the control board are not damaged.

10. Disconnect 12-position connector (PS) P23 E by pinching the sides and pulling straight out.
11. Disconnect 6-position connector (PS) P25 F by pinching top and bottom and pulling straight out.
12. Disconnect 10-position connector (PS) P27 G by pulling straight out.
13. Disconnect 15-position connector (PS) P20 H by pinching the sides and pulling straight out.
14. Disconnect 3-position connector (PS) P26 J by pinching top and bottom and pulling straight out.
15. Remove the two bolts K that secure the right end of the power supply to the frame.
16. Remove the bolt L on the left end of the power supply below the primary power section.
17. Lift front of the power supply slightly and pull out.

INSTALLATION

Care should be taken to assure the plate M , attached to the filter, is over the power cord connection to the left end of the filter.

1. Reverse steps 2 through 17 to reinstall power supply.



POWER SUPPLY – LEVEL 3

PRIMARY POWER SECTION

It is necessary to remove the cover from the primary power supply A to replace K2.

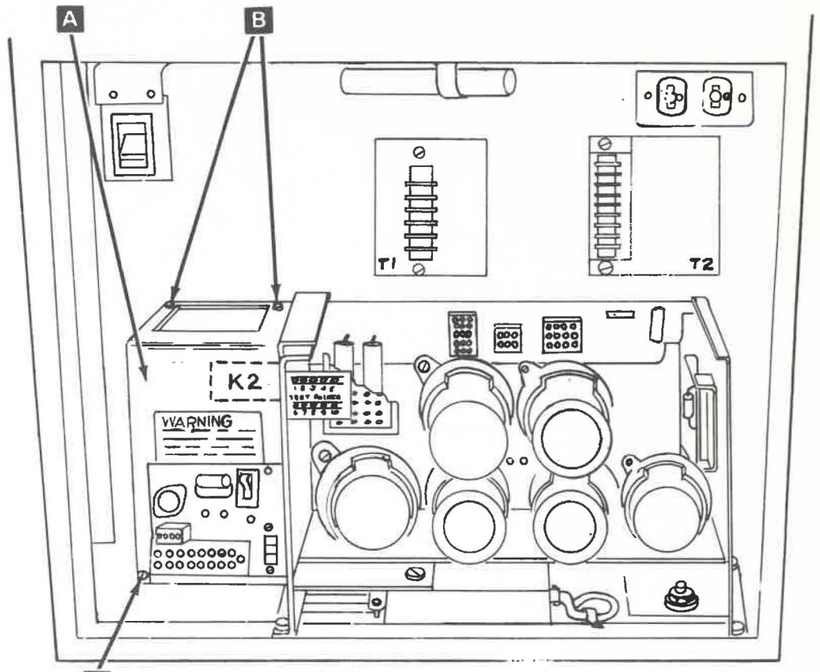
DANGER
Line voltage present in primary box with normal power off. Disconnect line cord from customer's power source before removing cover.

COVER REMOVAL

1. Remove the two screws B at the top of the cover and one screw C at the bottom left corner of the cover.
2. Remove primary cover by sliding it to the front.

COVER INSTALLATION

1. Reinstall cover by sliding to the rear.
2. Reinstall the three screws.



POWER SUPPLY – LEVEL 3

VOLTAGE SELECTION 50/60 Hz

For 100/115-volt convenience outlets:

The power supply should be wired to match the customer's power source by moving the wires at TB1 on each transformer, T1 D and T2 E. The wiring for the convenience outlet should be connected as shown on T2 E.

D T1 TB1

60 Hz (50 Hz)	
Com (Com)	1
200V (200V)	2
208V (220V)	3
230V (240V)	4
	5

E T2 TB1

Com	1
200V	2
208V	3
230V	4
To Convenience Outlet Com	5
To Convenience Outlet 100V	6
To Convenience Outlet 115V	7

VOLTAGE SELECTION 50 Hz

For 200/220/240-volt convenience outlets:

The power supply should be wired to match the customer's power source by moving the wires at TB1 on each transformer, T1 D and T2 F.

F T2 TB1

Com	1
200V	2
220V	3
240V	4

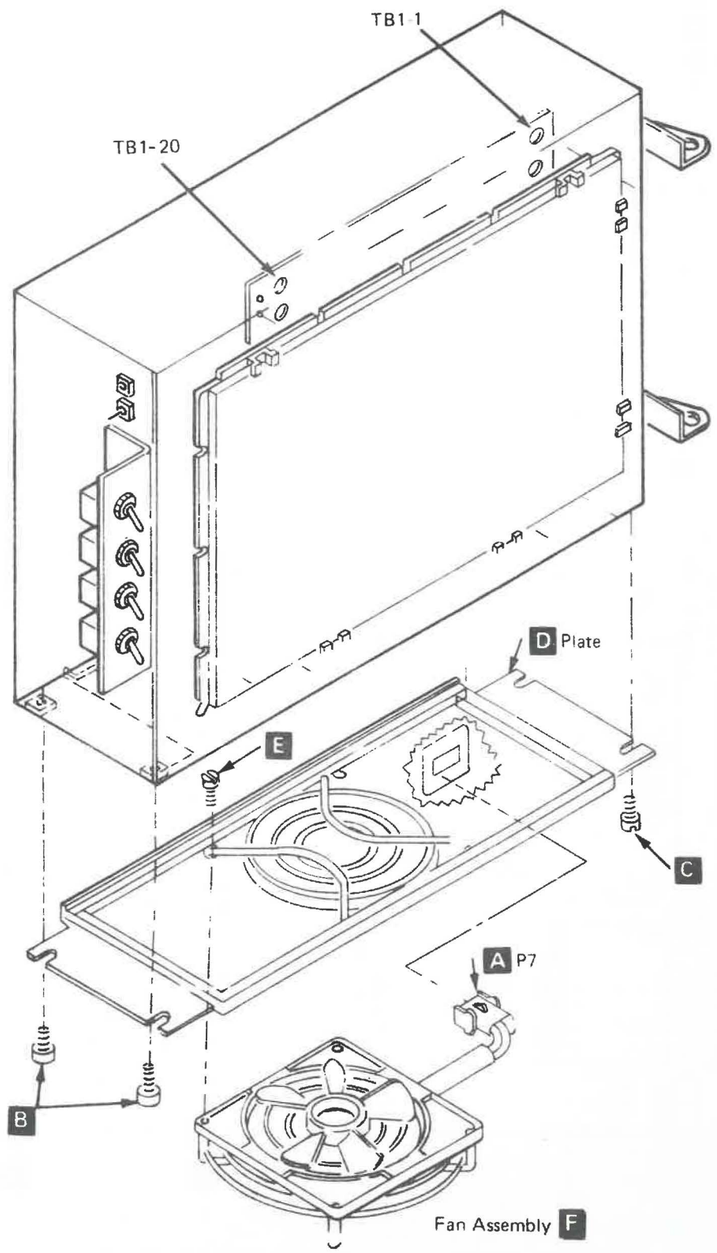
COOLING FAN

REMOVAL

1. Open the left cover and the logic gate.
2. Disconnect P7 **A** .
3. Loosen two screws **B** .
4. Remove two screws **C** .
5. Slide plate **D** toward the hinge, then remove the plate and fan assembly.
6. Remove four screws **E** , then remove the fan **F** .

INSTALLATION

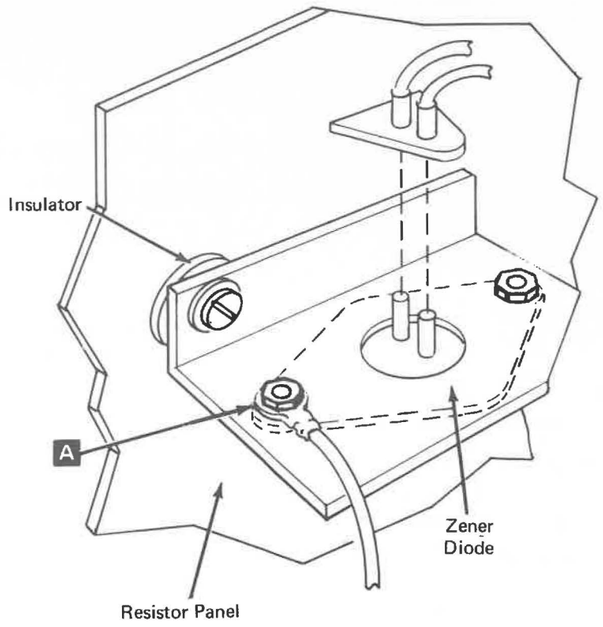
1. Install the fan on the plate using screws **E** .
2. Install plate **D** on the bottom of the logic gate. Tighten screws **B** and **C** .
3. Connect P7 **A** .



DIODE D1

SERVICE CHECK

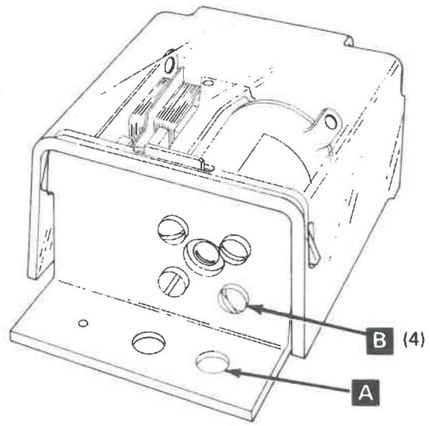
1. Turn printer power off.
2. Open the left cover, then the logic gate.
3. Remove the cover from the rear panel D1.
4. Disconnect the wire A from diode.
5. Using an ohmmeter (X10 scale), measure the resistance between TB1-2 and the metal case of the diode. The readings should be:
   a. Low forward resistance: less than 250 ohms.
   b. High backward resistance: near maximum. (To measure, reverse the meter leads.)
6. Connect the wire and mounting screw after the diode is tested and restore power.



25—VOLT CONTACTOR—K1

REMOVAL

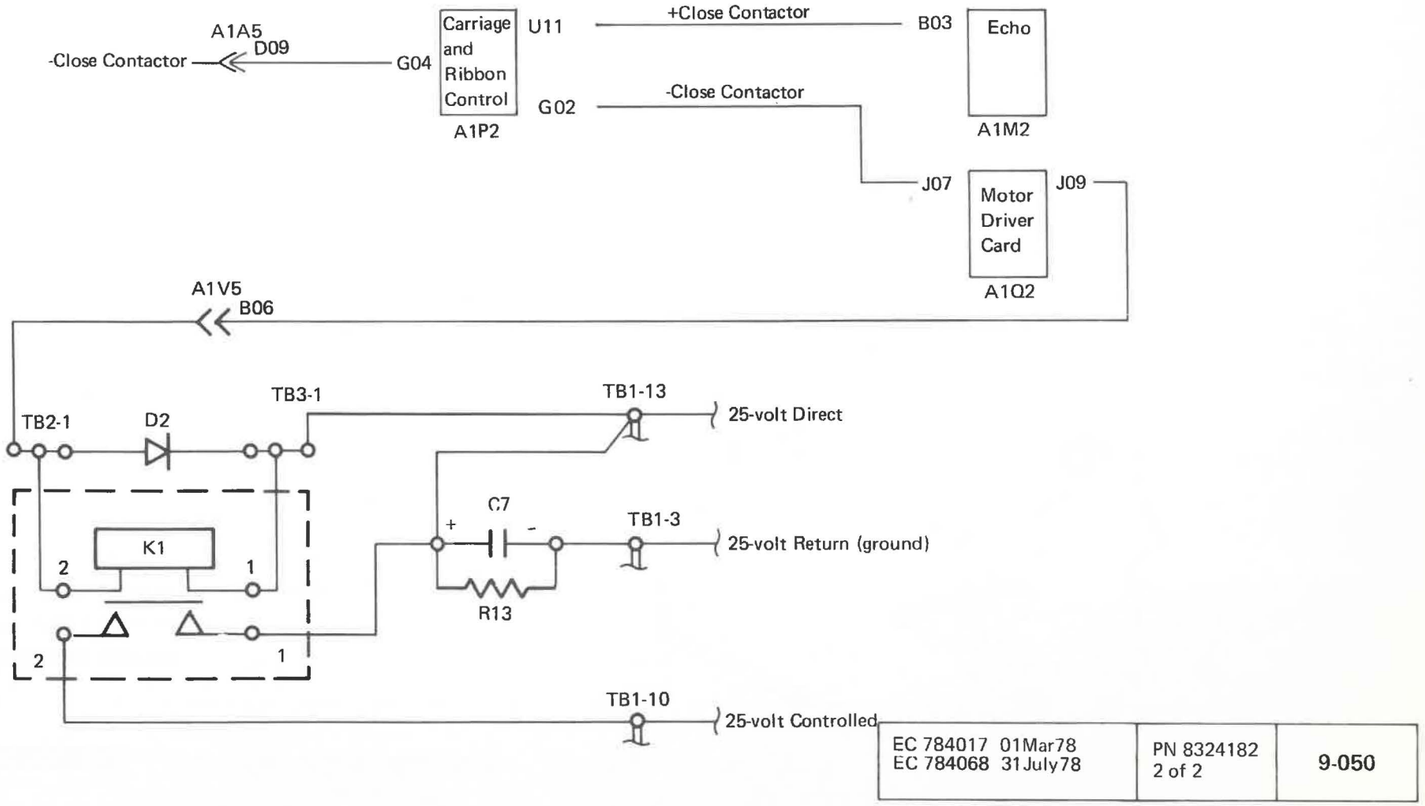
1. Open the left cover, then the logic gate.
2. Remove two mounting bracket screws **A** .
3. Use a soldering iron to disconnect the 4 wires from contactor terminals.
4. Remove the four contactor mounting screws **B** .



INSTALLATION

1. Replace the four screws **B** .
2. Resolder the four contacter terminal wires.
3. Replace the two mounting screws **A** .
4. Close the logic gate and the left cover.

CIRCUIT — 25-VOLT CONTACTOR



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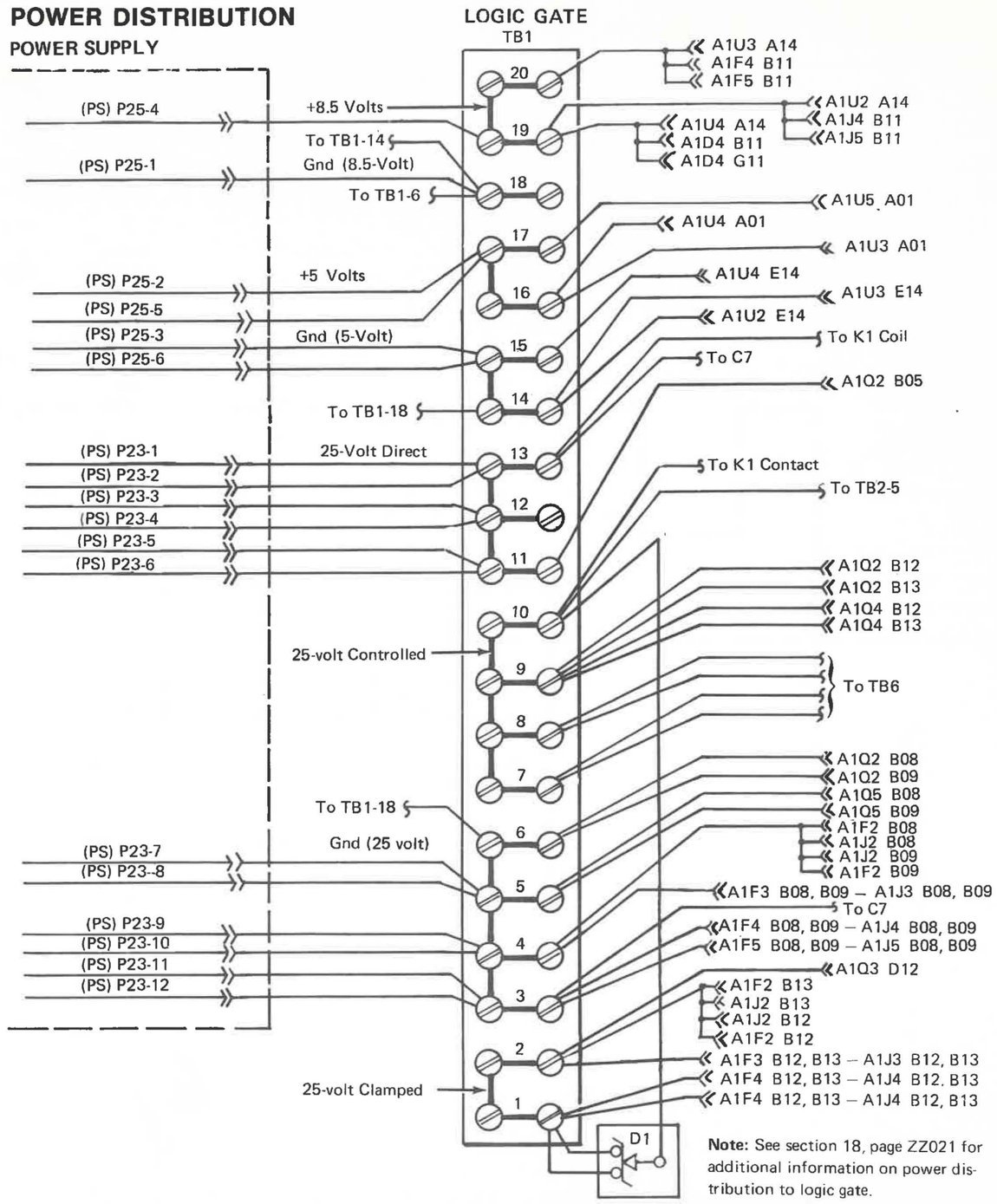
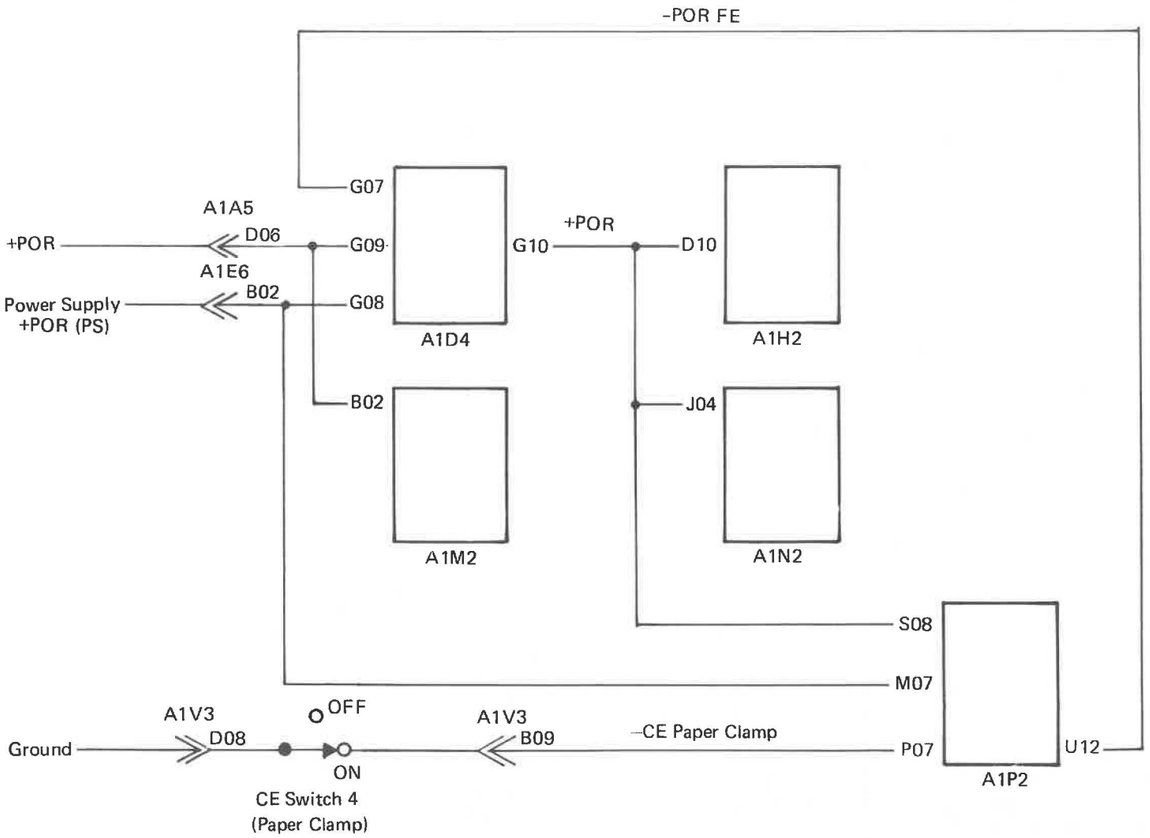
POWER DISTRIBUTION



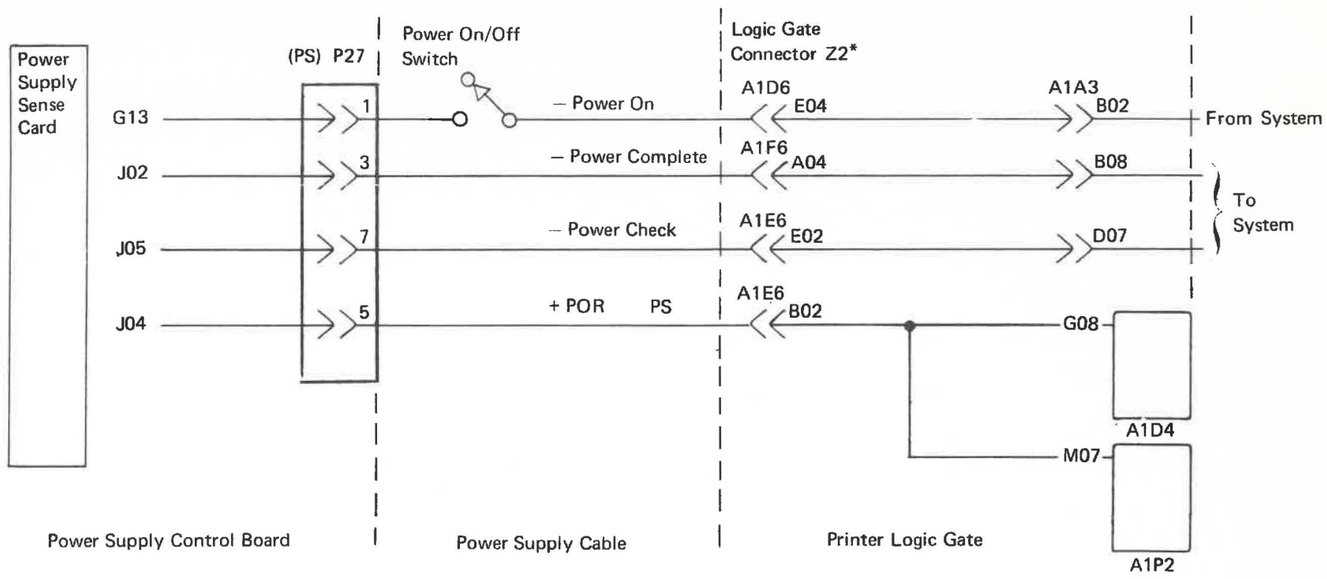
Note: See section 18, page ZZ021 for additional information on power distribution to logic gate.

POWER ON RESET (POR)

CIRCUIT



POWER SUPPLY SIGNALS



*Logic Gate Connector Details

Connector A1Z2	A1XX
B02	D6E04
B08	F6A04
D07	E6E02
D04	E6B02

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SECTION 10: BASE AND COVERS

INTRODUCTION

- This section illustrates the base and covers of the 5211. It describes the adjustments necessary to latch all covers and to allow correct movement of the top cover. Base-to-cover grounding cables are shown as well as acoustic skirts and their adjustments.

ENTRY INDEX

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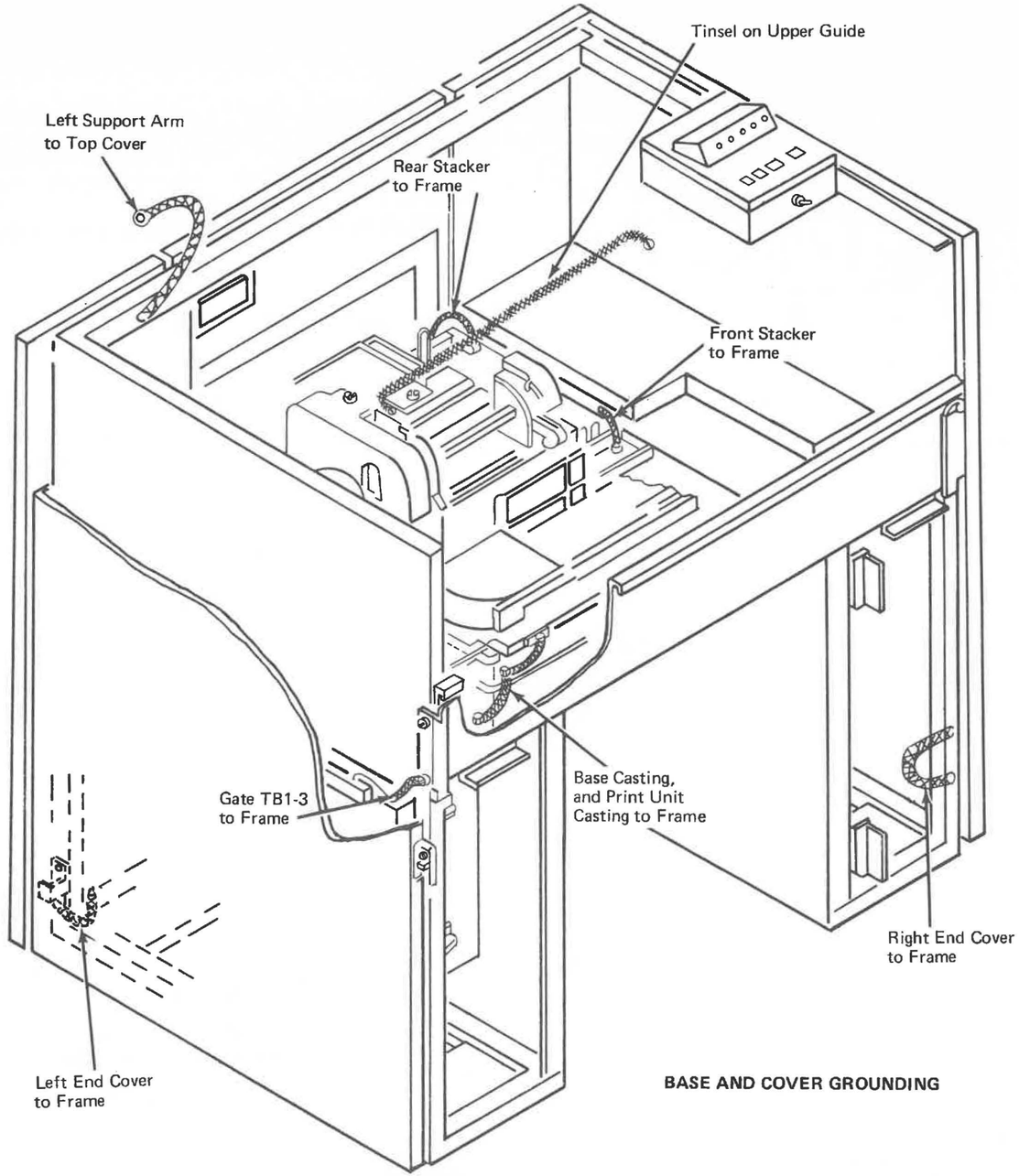
BASE AND COVER GROUNDING



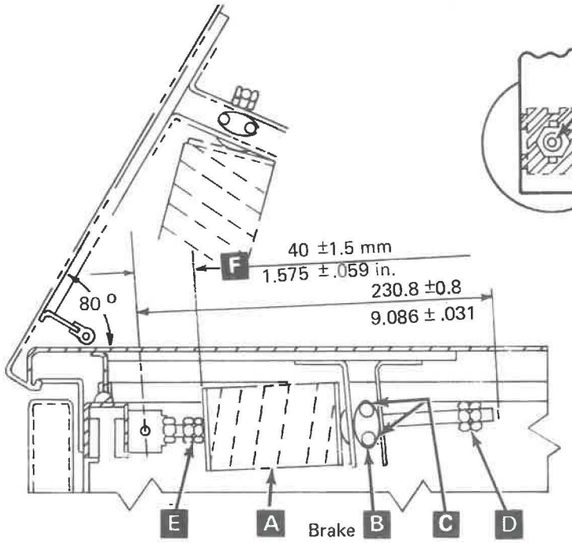
BASE AND COVER GROUNDING

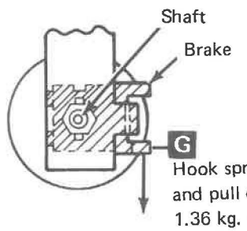
COVER ADJUSTMENTS

TOP COVER LIFT MECHANISM ADJUSTMENT

The top cover support mechanism has a heavy spring A and a brake B on each end of the cover. The brake tension screws C adjust the tension needed to open and close the cover. The adjusting nuts D limit the cover opening.

1. Loosen the screws C on the brake B.
2. Open the top cover and adjust the nuts D so the cover will open to 80°.
3. Adjust the nuts E to obtain the dimension shown F. The spring should just support the cover when it is open to approximately 60°.
4. Adjust the screws C in each brake to obtain a slipping force shown at G.



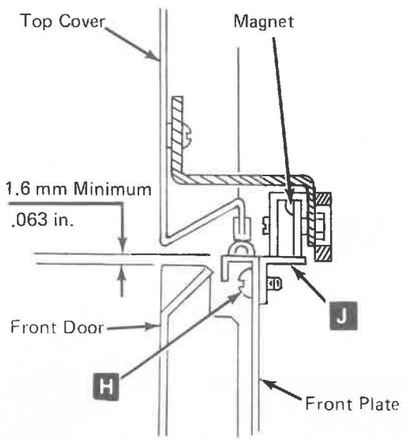


Hook spring scale on brake and pull downward for 1.13 to 1.36 kg. (2.5 to 3.0 lb.) slippage force of the brake on the shaft.

TOP COVER MAGNETIC LATCH ADJUSTMENT

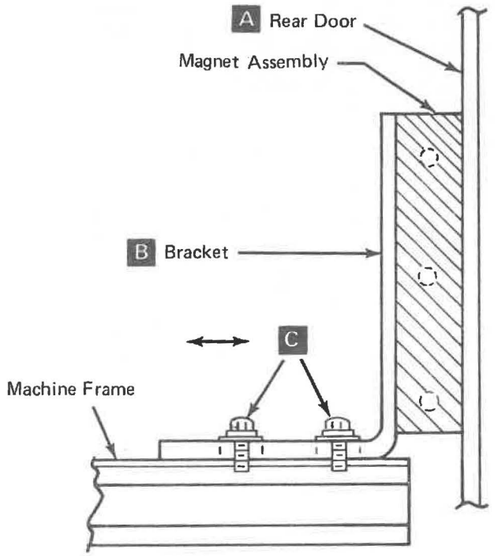
Open the front access door, loosen the screws H and adjust the bracket J so that it makes contact with the magnet when the top cover is in the fully closed position. Tighten the screws.

Note: There should be no gap in the seals when the cover is closed. The front plate must be assembled a minimum of 1.6 mm (.063 in.) above the front door.



REAR ACCESS DOOR ADJUSTMENTS

1. A magnet assembly on the rear door **A** strikes a bracket **B** mounted on the machine frame to hold the rear door closed. Adjust the plate by loosening the screws **C** slightly and moving the plate forward or back so that when the door latches, the seals are pressed evenly around the door.
2. Tighten the screws and recheck the adjustment.



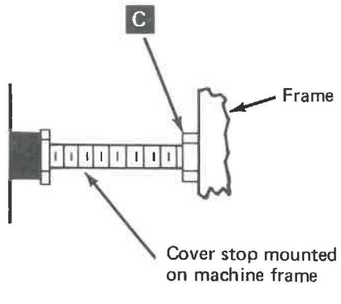
FRONT ACCESS DOOR ADJUSTMENTS

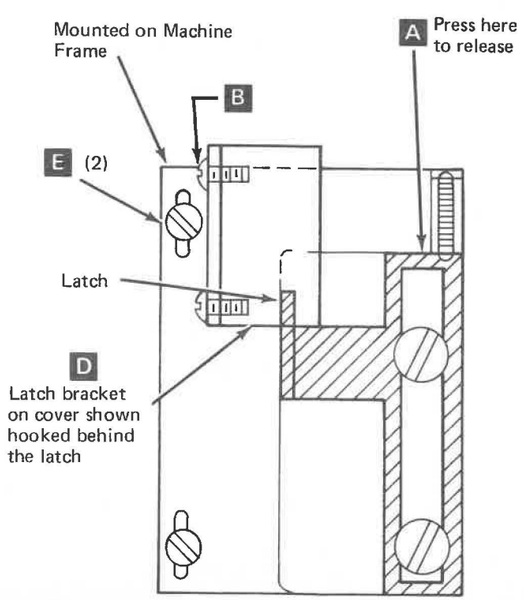
Loosen the two magnet mounting screws on the machine frame and adjust the magnet so that it latches tightly to the plate on the front cover. Tighten the screws.

LEFT AND RIGHT END COVER ADJUSTMENTS

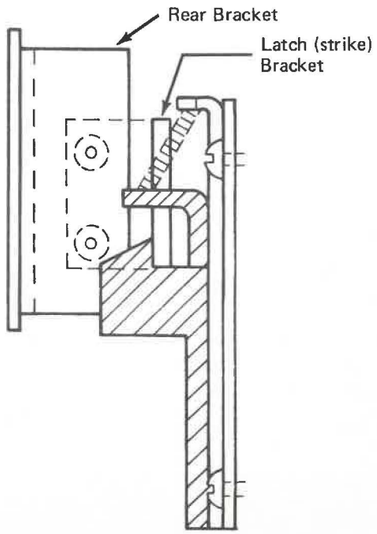
The side covers can be opened by placing a thin object through the openings between the covers and pressing down on the latch **A**. With the latch released, the cover can be pulled open. The cover adjustments are as follows:

1. Loosen the screws **B** on the cover latch bracket so that it will not interfere with the following steps.
2. Loosen the nuts **C** on the cover stops and adjust the stops so that the side cover is even with the front and top cover. Tighten the nuts.
3. Adjust the bracket on the cover so that the bracket presses the latch down and hooks behind the latch **D**. The latch mechanism can also be adjusted up or down by loosening screws **E**. Adjust the latch and bracket assemblies so that the cover closes securely without bending the cover. Tighten the screws.

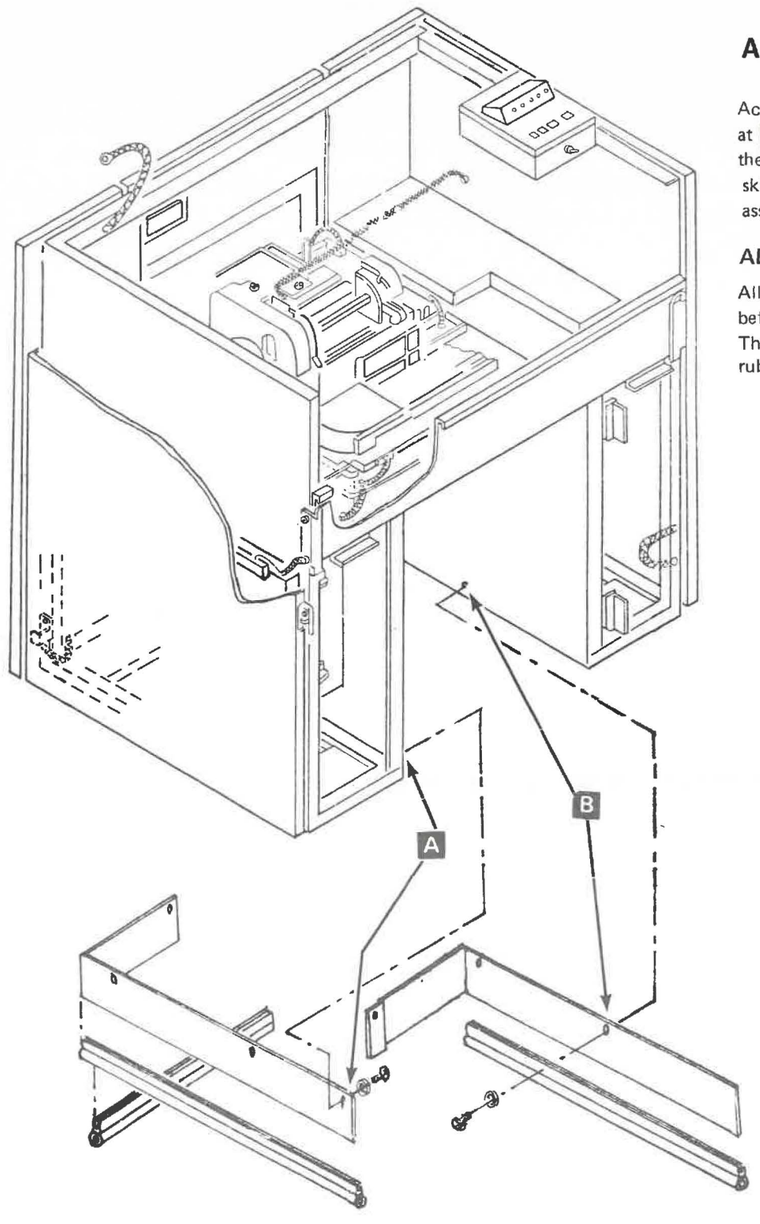




Latch Mechanism, Front View



Latch Mechanism, Side View

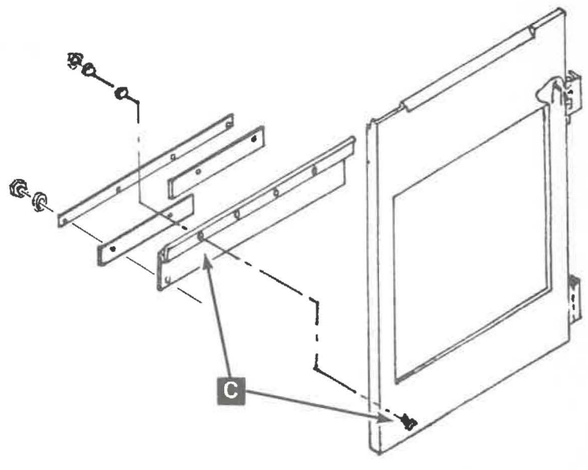


ACOUSTIC SKIRTS

Acoustic skirts are attached to the base of the printer as shown at A and B . The skirts extend around the two sides and the back of the printer. The front door also has an acoustic skirt attached as shown at C . (Skirt A must be assembled first.)

ADJUSTMENT

All skirts should be adjusted down tight against the floor before tightening the screws.
The skirt attached to the door should be adjusted so the rubber seal just touches the floor when the cover is closed.



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SECTION 11: RESERVED

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SECTION 12: RESERVED

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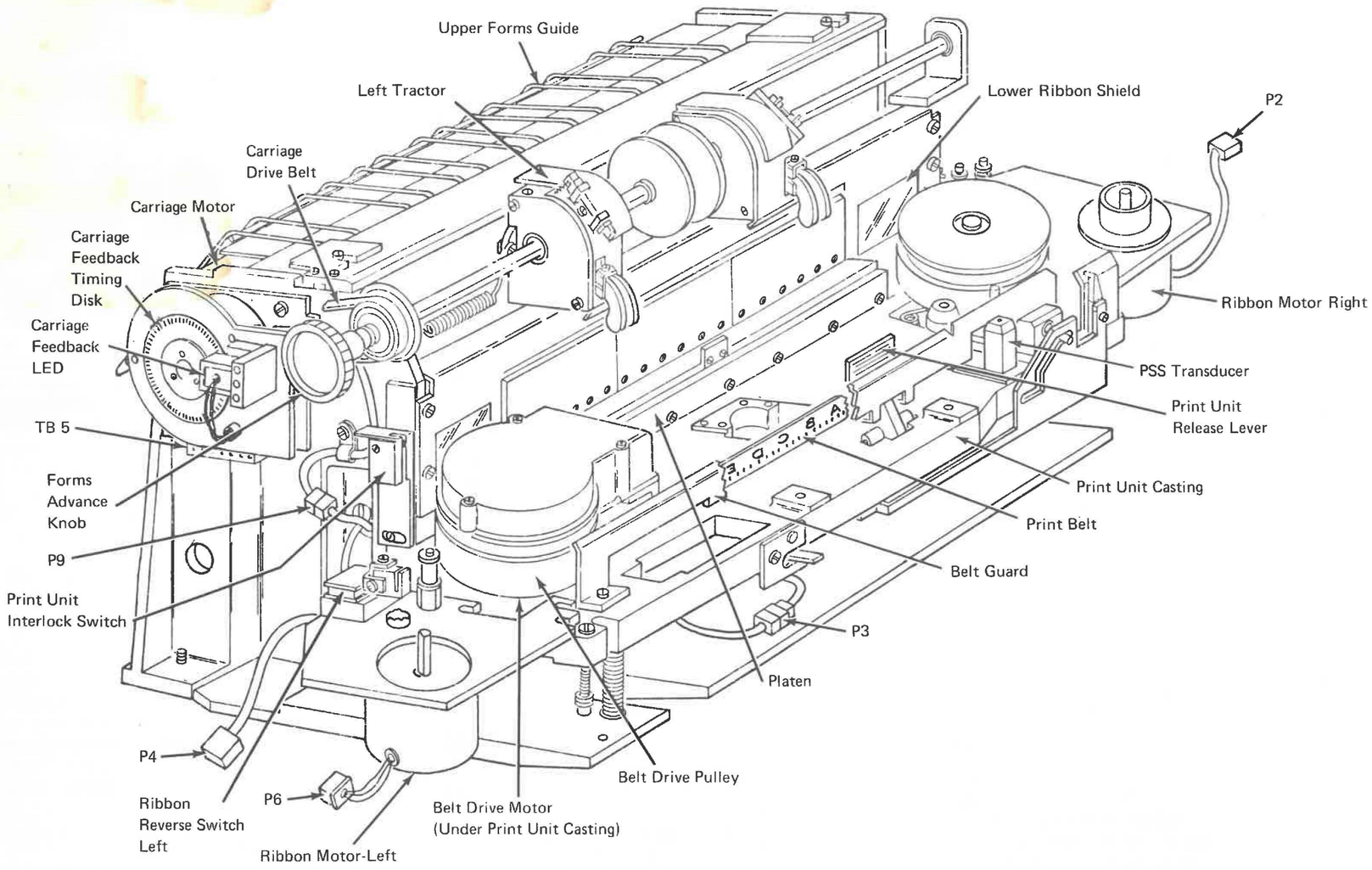
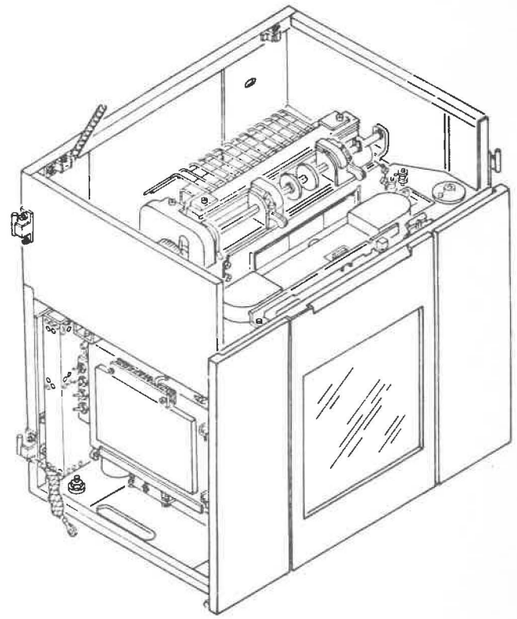
SECTION 13: LOCATIONS

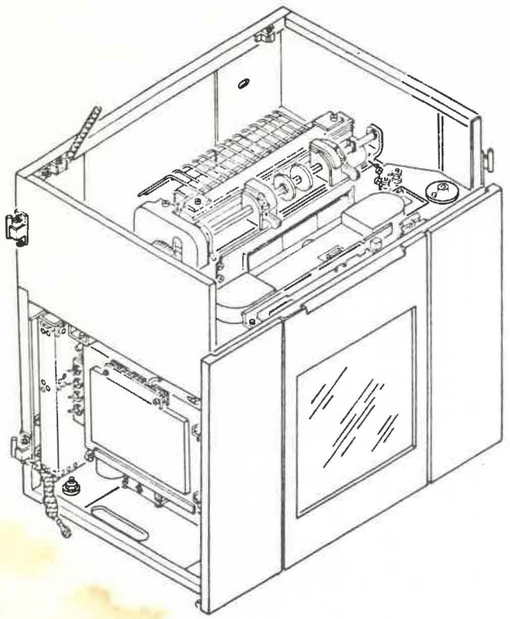
LOCATIONS INDEX

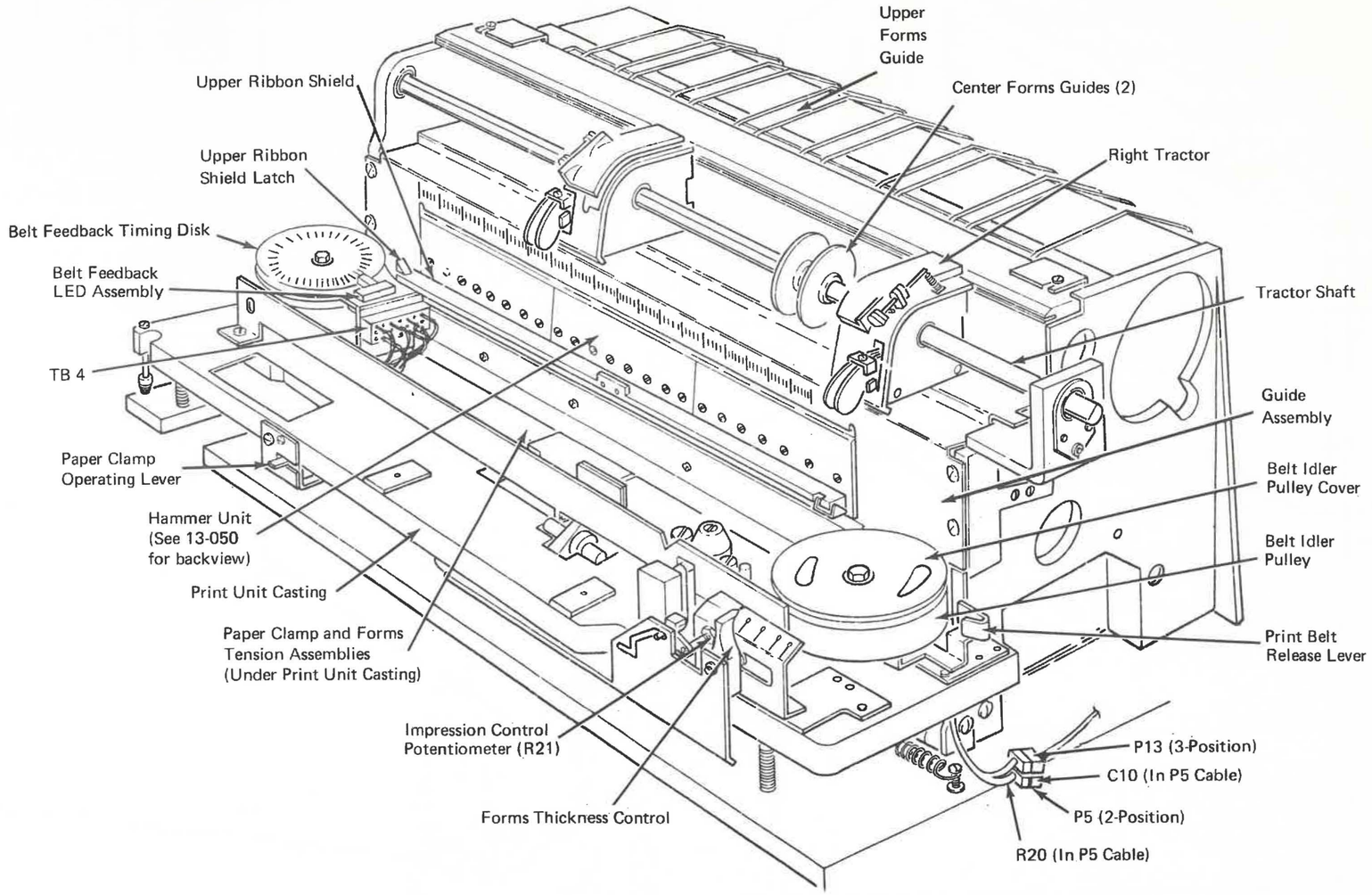
PRINTER MECHANISM—LEFT

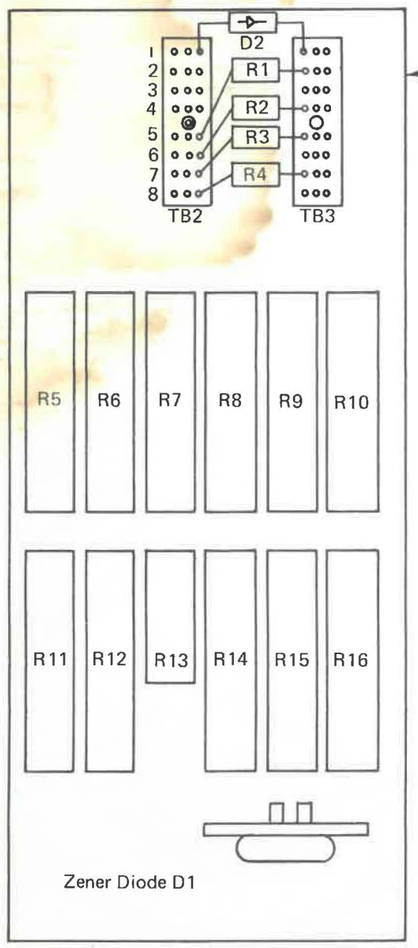




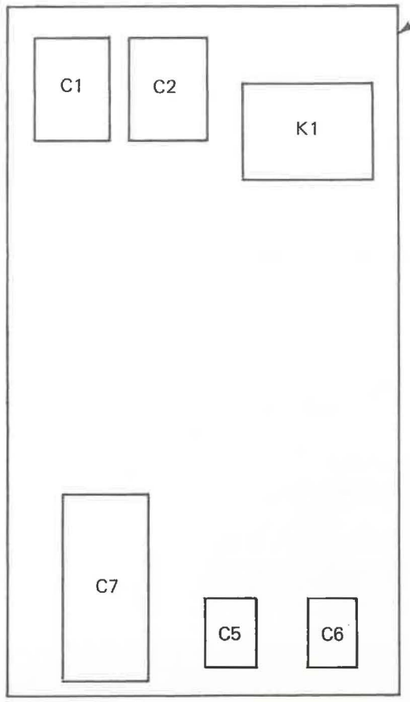
PRINTER MECHANISM–RIGHT



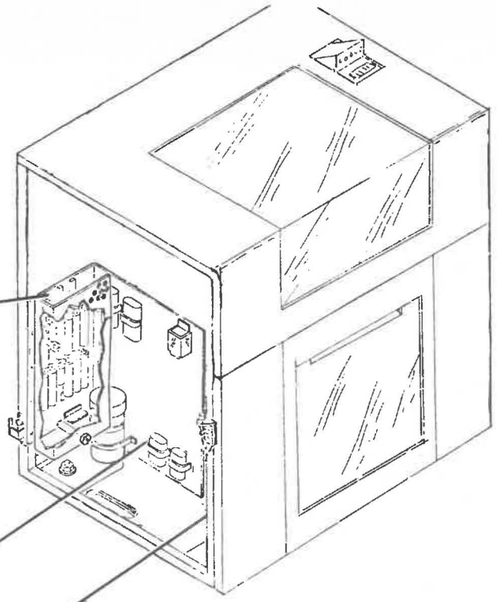


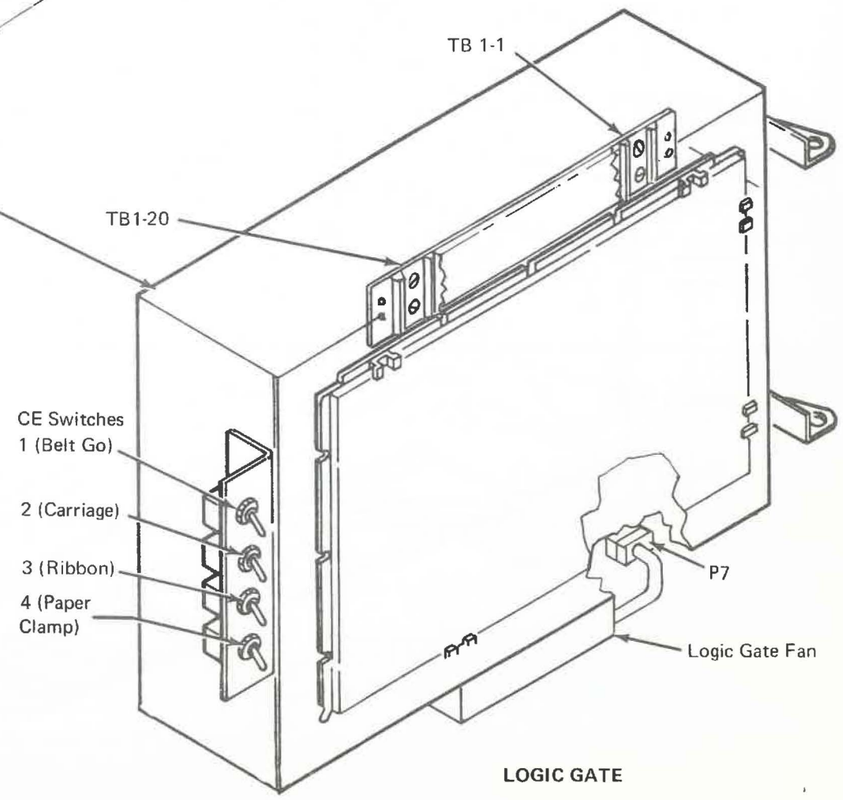


RESISTOR PANEL



CAPACITOR PANEL



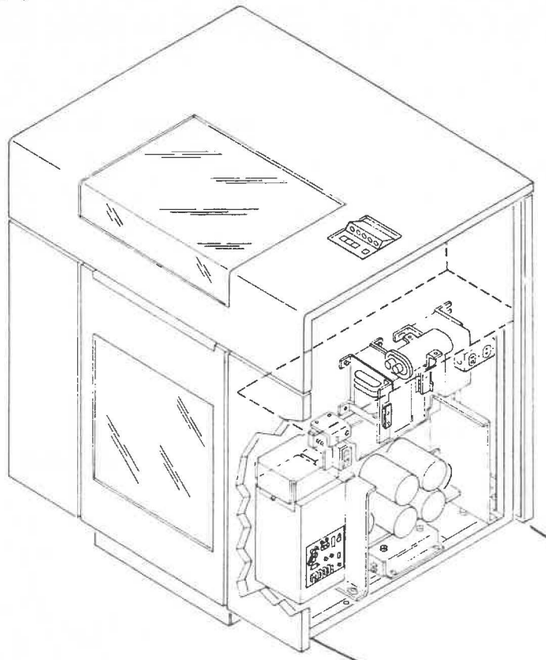


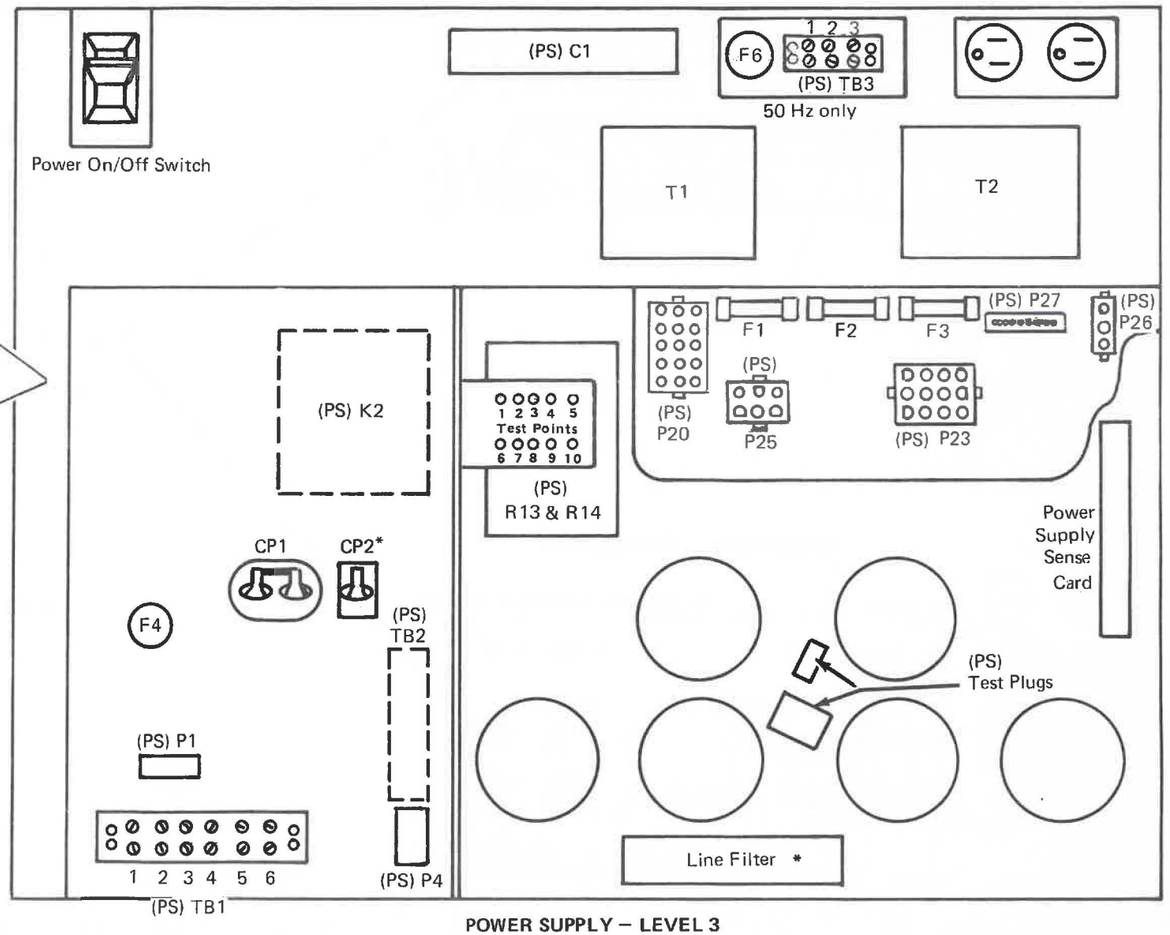
LOGIC GATE

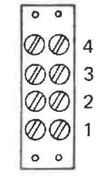
EC 784017 01Mar78 EC 784068 31July78	PN 8324190 2 of 2	13-030

POWER SUPPLY

(LEVEL 3)







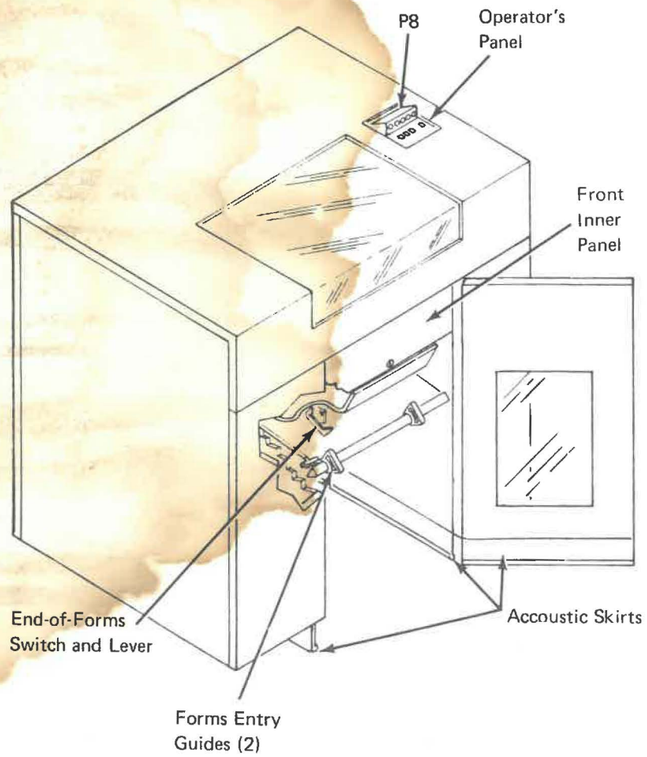
(PS) TB2 Detail

POWER SUPPLY – LEVEL 3

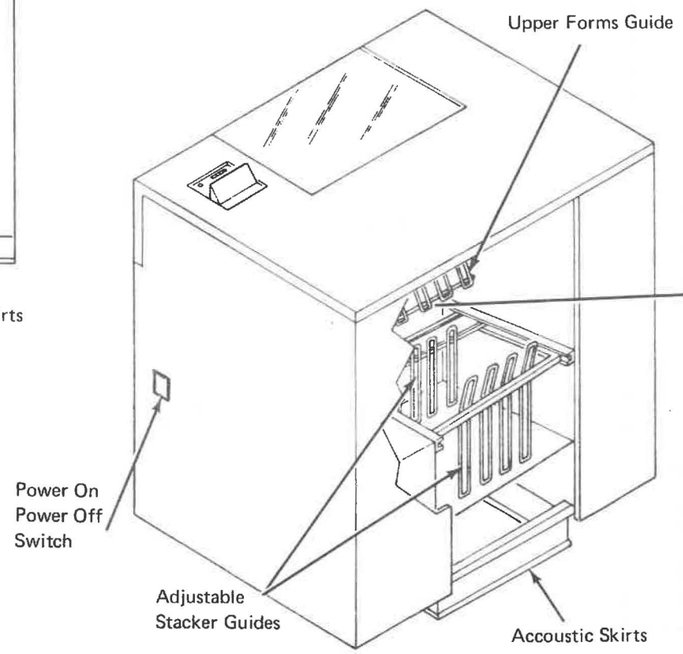
* **Note:** These parts may not be installed on all 5211 power supplies.

EC 784017 01Mar78 EC 784034 01Mar78 EC 784068 31July78	PN 8324191 1 of 2	13-040

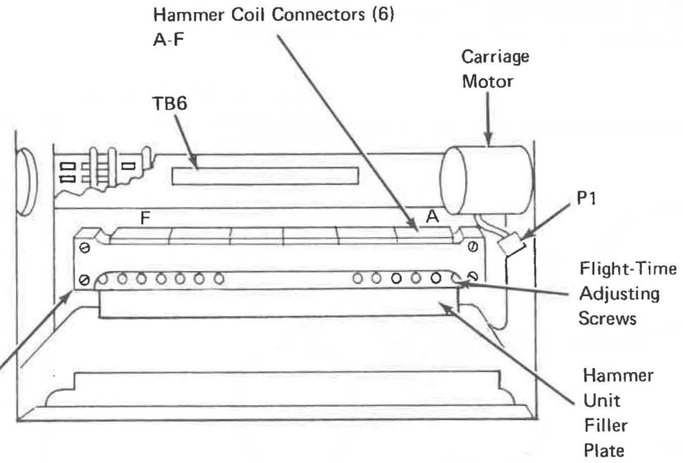
FRONT AND REAR VIEWS



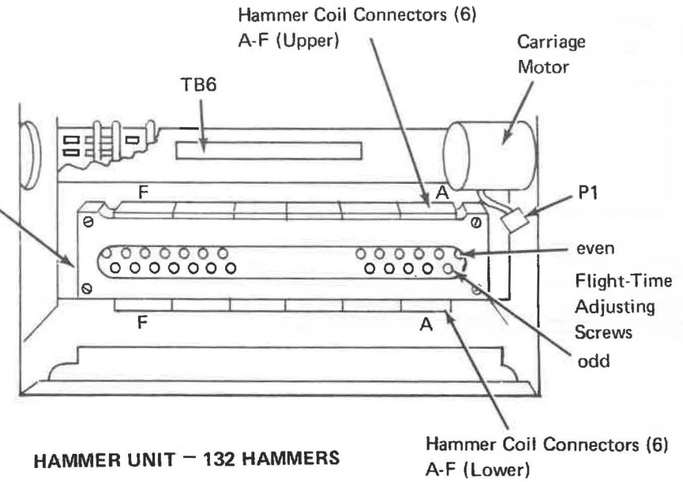
FRONT VIEW



BACK VIEW

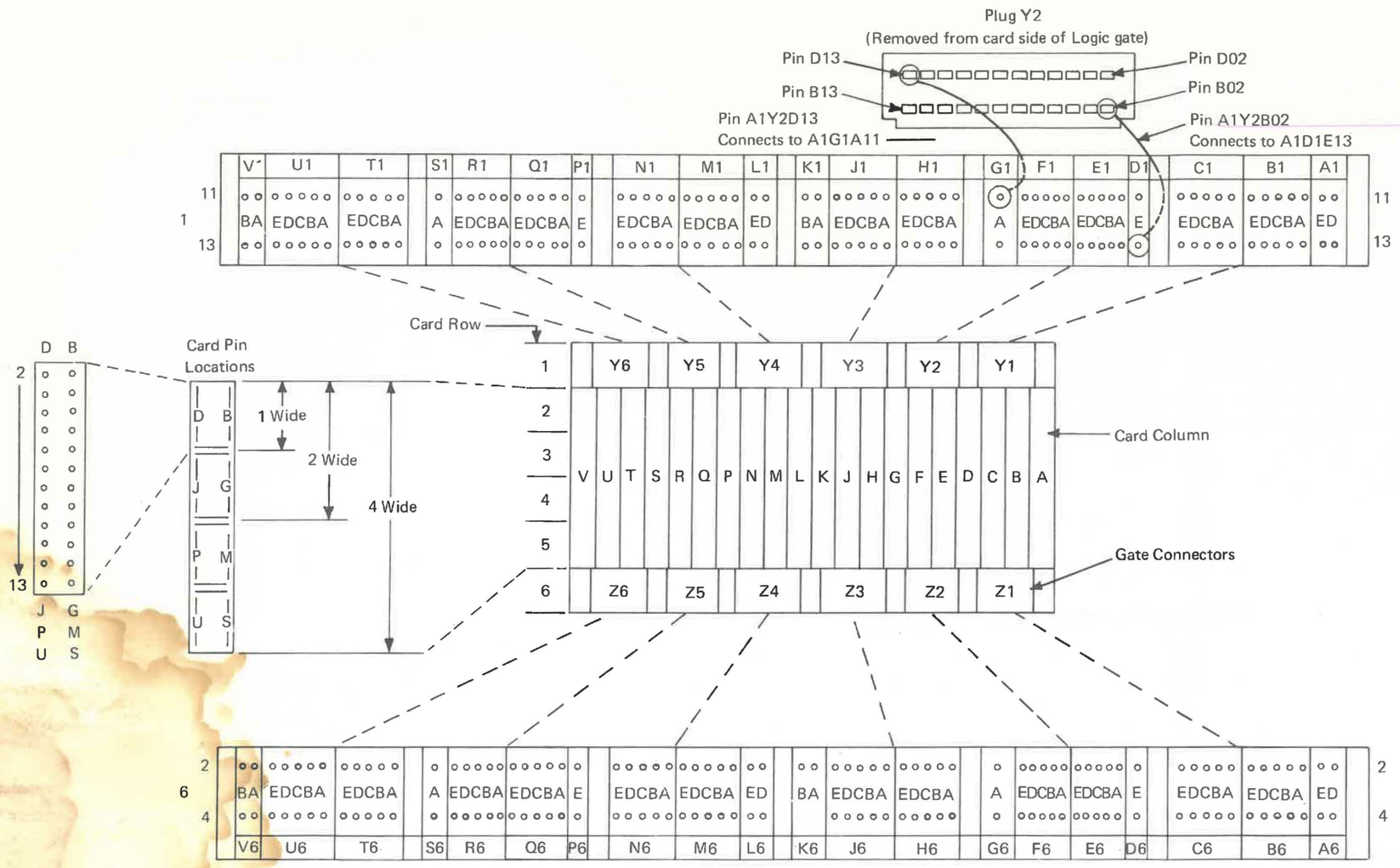


HAMMER UNIT – 66 HAMMERS

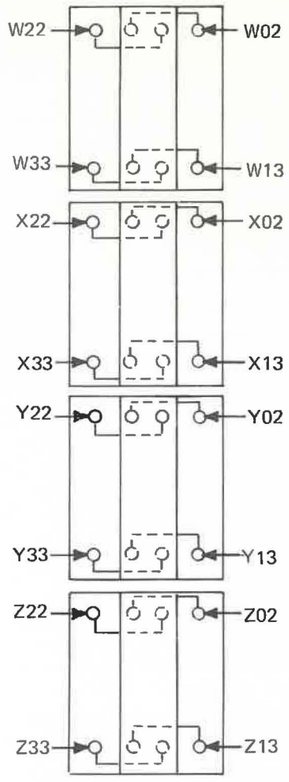


HAMMER UNIT – 132 HAMMERS

LOGIC GATE CONNECTOR DETAILS



LOGIC GATE CONNECTORS
(Pin Side of Logic Gate)



TOP CARD CONNECTORS
(as viewed from Card Side of Logic Gate)
See "Card Location Chart"
Section 18, 18-000.

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SECTION 14: PREVENTIVE MAINTENANCE (PM)

The IBM 5211 Printer has no scheduled frequency for PM. The frequency will be determined by the CE, based on customer usage.

For the appropriate unit/cause code information see Volume 1, "5211 IR Functional Unit Code Guide".

The only Preventive Maintenance to be performed is CLEANING in the following areas:

- Print Belt **A**
- Print Belt Drive & Idler Pulleys **B**
- Platen **C**
- Print Belt Guide Roller **D** and Emitter Cleaner Blade. (Roller should be clean and turn freely.)

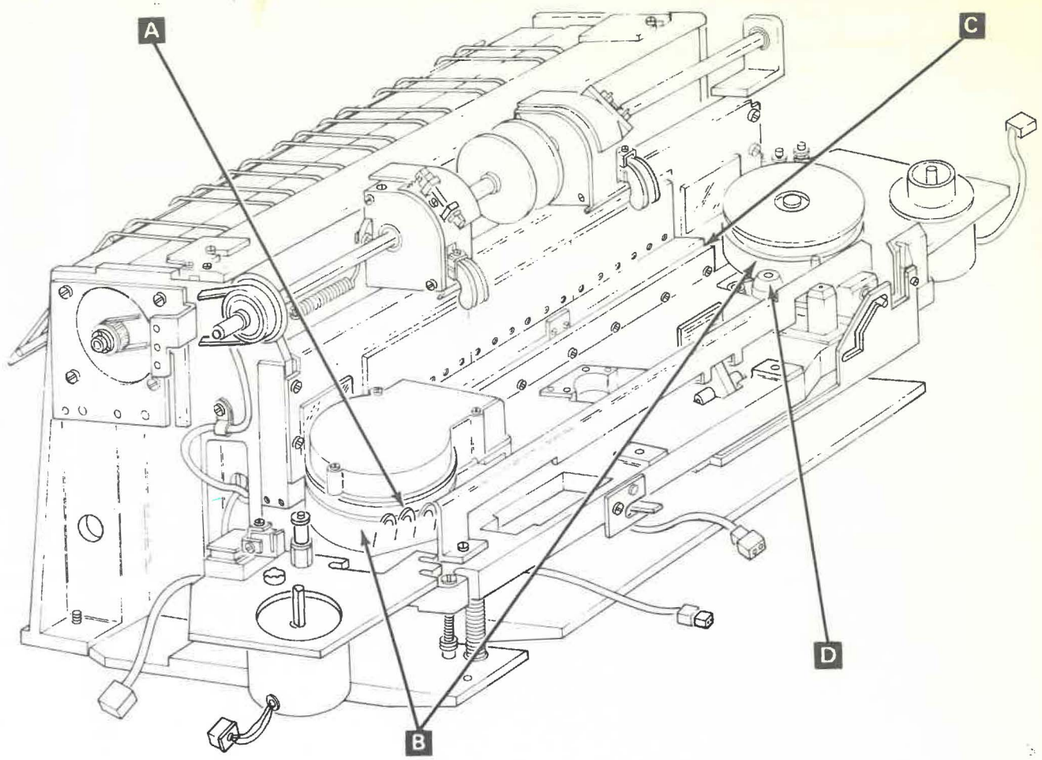
Note: NO LUBRICATION activity is required while performing PM on the printer.

CLEANING AID	AREA
Alcohol, 91% Isopropyl, part 2200200 OR	Belt, Platen, Idler and Drive Pulleys
Freon (spray can), part 2200032	Belt, Platen, Idler and Drive Pulleys

Caution: DO NOT USE IBM Cleaning Fluid, PN 1280017 (gal container) or PN 450608 (6 ounce container) to clean the print belt, platen, and pulleys as it may damage those areas of the printer.

SERVICE CHECK

Ensure the logic gate cooling fan turns freely, and the motor operates when power is applied to the printer.



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